Project Nujio'qonik: Amendment to the Environmental Impact Statement

Appendix WRM36-A Fracflow_EIS-Input on Groundwater Impacts



Project Nujio'qonik: Amendment to the Environmental Impact Statement



<u>Groundwater Conditions and Impacts – Surface Water Chemistry - Industrial</u> <u>Water Supply and Hydrogen Plant Site</u>

The Groundwater Aquifer and Flow System

As noted, the industrial water supply will be taken from the three pond system (Gull [Mine] Pond, Muddy Pond and Noels Pond) with the last two ponds being fed by the discharge from the Warm Creek drainage basin. Provision of the required water flows to the Hydrogen Plant will require careful management of the water levels (the active storage) in all three ponds. This water management will result in variations in the pond levels throughout the year by 1.0 - 1.5 m relative to the base of the Noels Pond outflow control gates.

Two of the three source ponds are located on or adjacent to and contribute recharge to the thick overburden aquifer that provides groundwater to two existing well fields (Figure 1a). These two well fields are located at the bottom of the Warm Creek drainage basin. The granular aquifer in which these six production wells have been constructed is known to be up to approximately 80 m thick in the well fields where two deep monitoring wells were drilled into the underlying bedrock. The granular aquifer is underlain by fractured carbonate bedrock and is bounded on the east by an elevated area of fractured metamorphic/igneous bedrock. The hydraulic head contours in Figure 1a shows that there is a fairly uniform northeast to southwest hydraulic gradient of 0.004 - 0.006. Most of the southern part of the aquifer is covered by a 3 - 5 m thick layer of bog or peat producing a perched water table, with the depth below ground surface to the water table ranging from 16 - 24 m. Most of the ponds in this area are perched. One of the existing well fields is located between 150 and 400 m east to southeast of the Muddy Pond shoreline.

Based on the aquifer test data that is on file with DECC, the well fields are estimated to have total well yield capacity of approximately $8 - 10 \text{ m}^3/\text{min}$. The model simulation (Figure 1a) shows that the groundwater withdrawals from two existing well fields are not dewatering the aquifer and that the drawdowns over time will extend out underneath Muddy Pond and Noels Pond.

The granular aquifer is assumed to extend up into the Warm Creek drainage basin and to Long Gull Pond. The 3D groundwater flow and transport model hydraulic head contour map in Figure 1a demonstrates that the groundwater withdrawals from the two existing well fields are obtained from recharge on the east side of Warm Creek with an ultimate source area in the Long Gull Pond area. The hydraulic head contour lines in Figure 1a show that the surface water withdrawals by World Energy GH2 Limited Partnership on the eastern side of the aquifer will have very little impact on groundwater levels in the western side of the aquifer adjacent to Muddy Pond-Noels Pond.

Groundwater Interaction with the Source Ponds

Figure 1a shows the model simulation that was completed to evaluate what impact changing the water levels in the three source ponds would have on the groundwater system that supplies the existing well fields. The model confirms that Muddy Pond and Noels Pond both have very low permeability pond sediments that produce a perched pond condition. Muddy Pond and Noels

Pond, while both ponds do provide limited recharge to the aquifer, have little to no impact on the underlying water table elevations. This is confirmed by the actual water level measurements in three nearby monitoring wells (BH2, MW1 and NSW-S, Figure 1b) where the water level in Muddy Pond and Noels Pond are approximately 21 m above mean sea level while the average non-pumping water levels/hydraulic heads in the underlying aquifer ranges from 11 - 13 m. In addition, the Warm Creek stream bed between the community of Noels Pond and the point where Warm Creek discharges into Noels Pond is a losing stream. Changes in the water levels in Muddy Pond and in Noels Pond will have no significant negative impact on the groundwater resources that can be removed from the granular aquifer.

Figure 1a shows the strong hydraulic gradient between Gull (Mine) Pond and the adjacent granular aquifer. In this area, the average water level elevation in Gull (Mine) Pond is approximately 32 - 33 m. By contrast the hydraulic head in FMW11, immediately east of the discharge from Gull (Mine) Pond, is approximately 12.5 - 14.5 m. The hydraulic head in BH1, that is located immediately west of FMW11, is approximately 13.5 m. As one proceeds down along the flow line to FMW10, the hydraulic head decreases to 6 - 7 m. Clearly, all of the surface water systems in the Gull (Mine) Pond area are perched and changes in the water level in Gull (Mine) Pond of 1 - 3 m will have no significant impacts on the groundwater system.

Groundwater Conditions at the Former Abitibi Mill Site

Figure 2 shows the average or historical water table contours across the former Abitibi Mill site based on 2007 water level measurements. Figure 2 also shows the location of three cross-sections (Figures 3, 4 and 5) in which the ground surface and depth to the water table are plotted. These cross-sections show that the local groundwater table can be up to 8 - 10 m below ground surface and that the water table near the harbour shoreline is shallow.

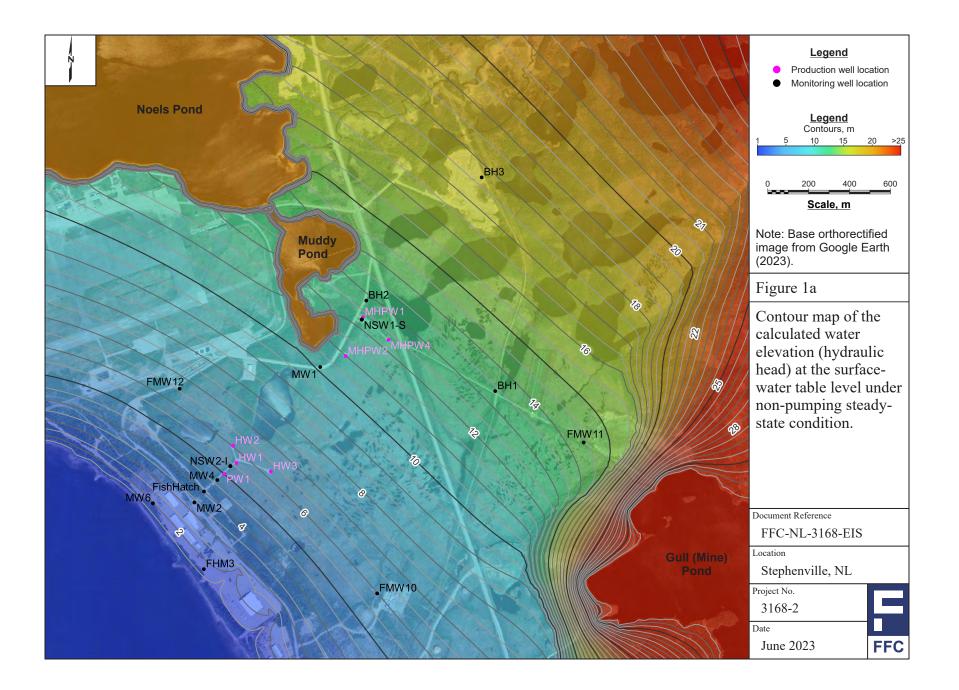
Groundwater Quality

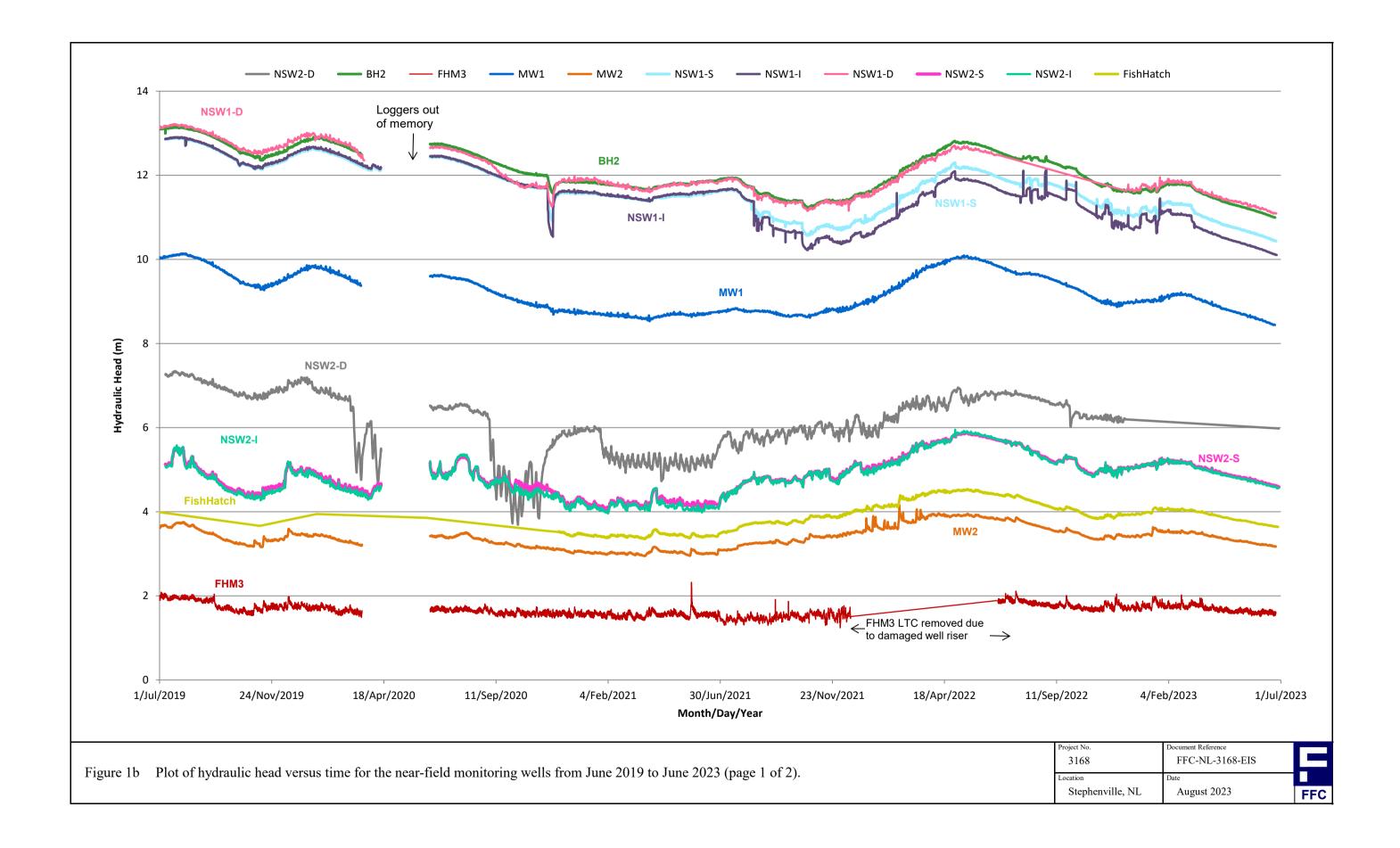
Data from three existing monitoring wells are included to show the overburden characteristics and the groundwater chemistry. Figures 6, 7 and 8 show the logs for the three monitoring wells including the water level that were measured at the time the monitoring wells were constructed. Tables 1, 2 and 3 provide the water chemistry data from these three monitoring wells. It is important to note that FMW11 and FMW10 are both located down-gradient from old industrial landfills and as such exhibit elevated TDS. BH1 is located towards the central part of the granular aquifer but trans-gradient to down-gradient of a commercial sod farm. The water chemistry from BH1 has lower TDS that the other two monitoring wells but does show impacts from the use of fertilizers for the sod growing operation.

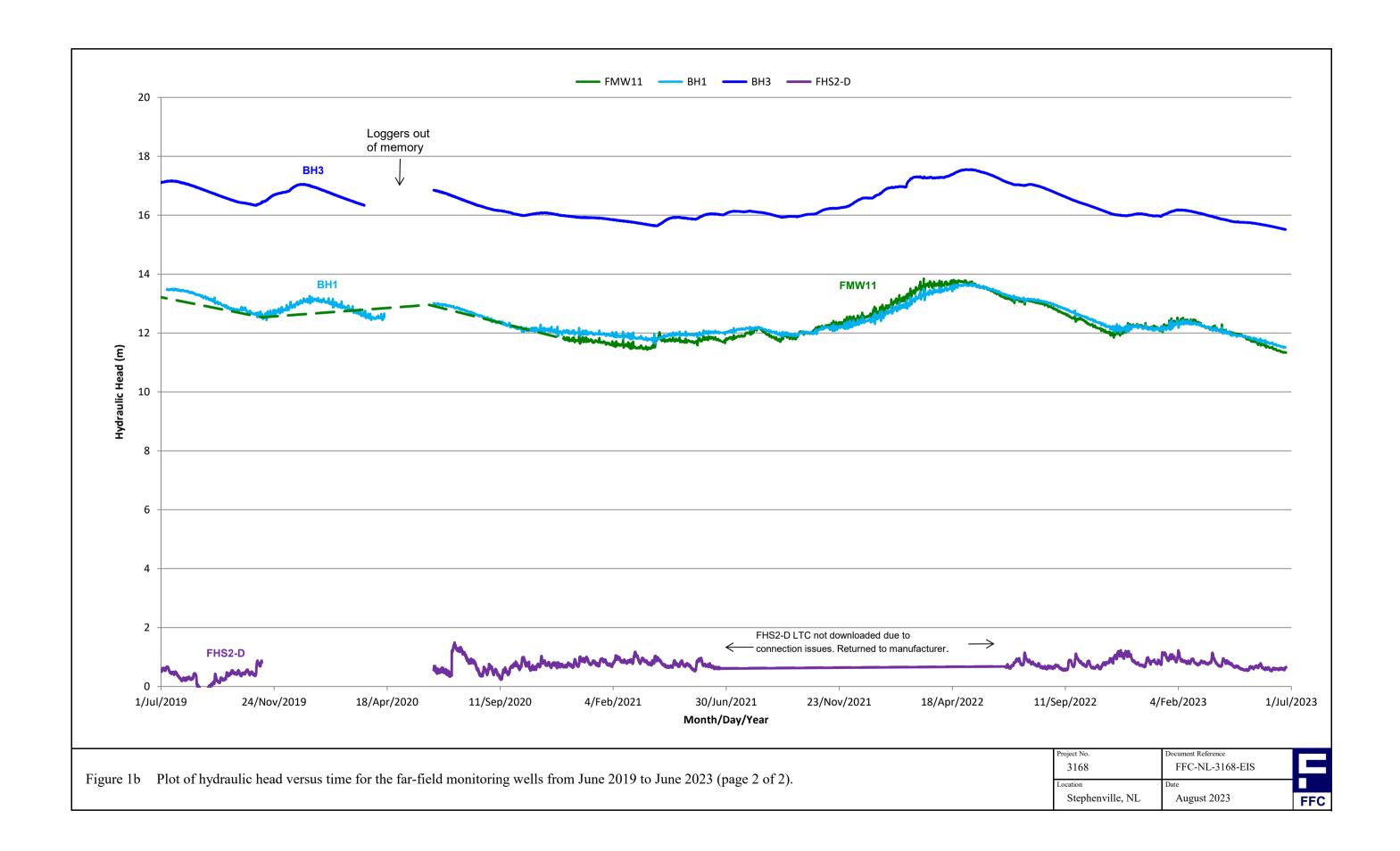
Surface Water Chemistry

The surface water in the three ponds, Noels Pond, Muddy Pond and Gull (Mine) Pond was sampled in the fall of 2022, in July, 2023 and in November 2023 to capture seasonal changes in water chemistry. The water samples were collected at nine locations, three in each pond. At each location a water sample was collected at approximately 1 m below the water surface and approximately 1 m above the pond bottom, except at one shallow water location in Muddy Pond.

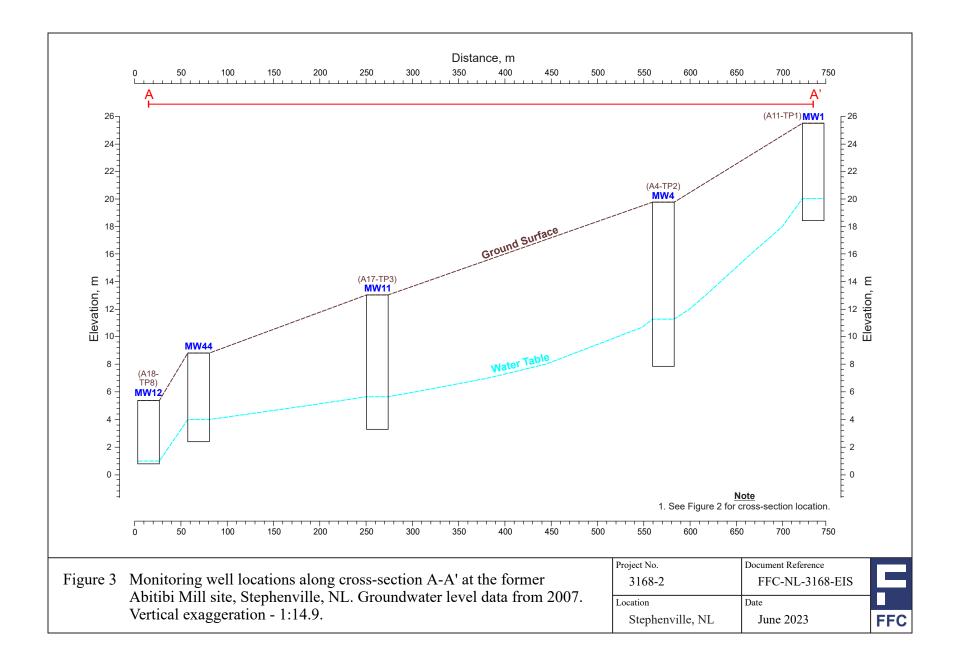
At each of the nine locations, pond sediment samples were collected in the Fall of 2022 and analyzed for a range of parameters, including BTEX/TPH. In addition, four Level, Temperature and Fluid Conductivity (LTC) sensors were installed in February 2023 in the Warm Creek and Noels Pond system with measurements every 30 minutes. These sensors are tracking the seasonal variations in water chemistry as well as pond level. The water chemistry data for the two sampling events are attached to this document as Appendix 1.1 and 1.2.

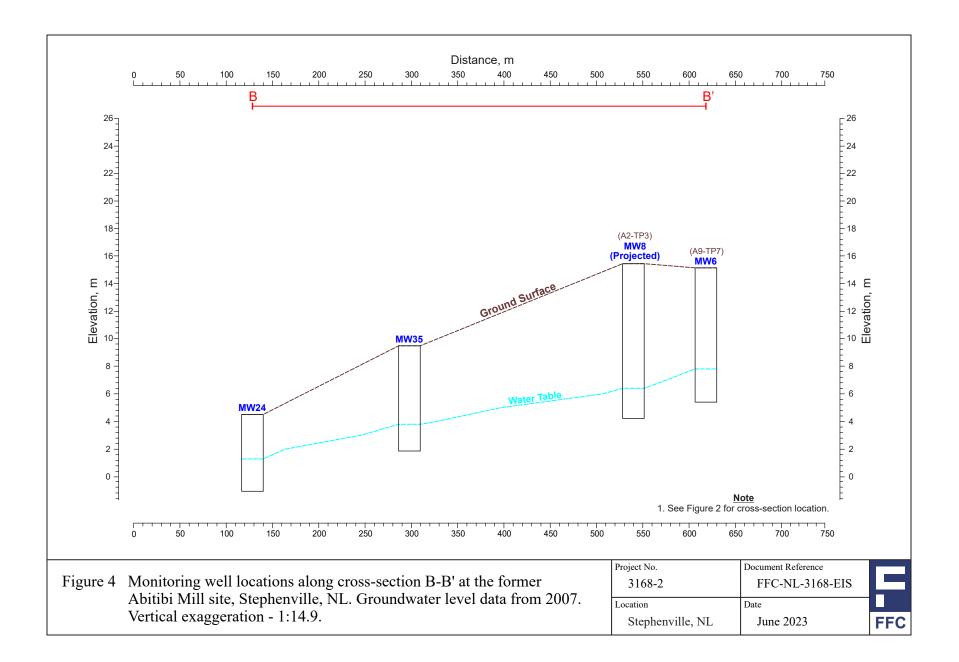












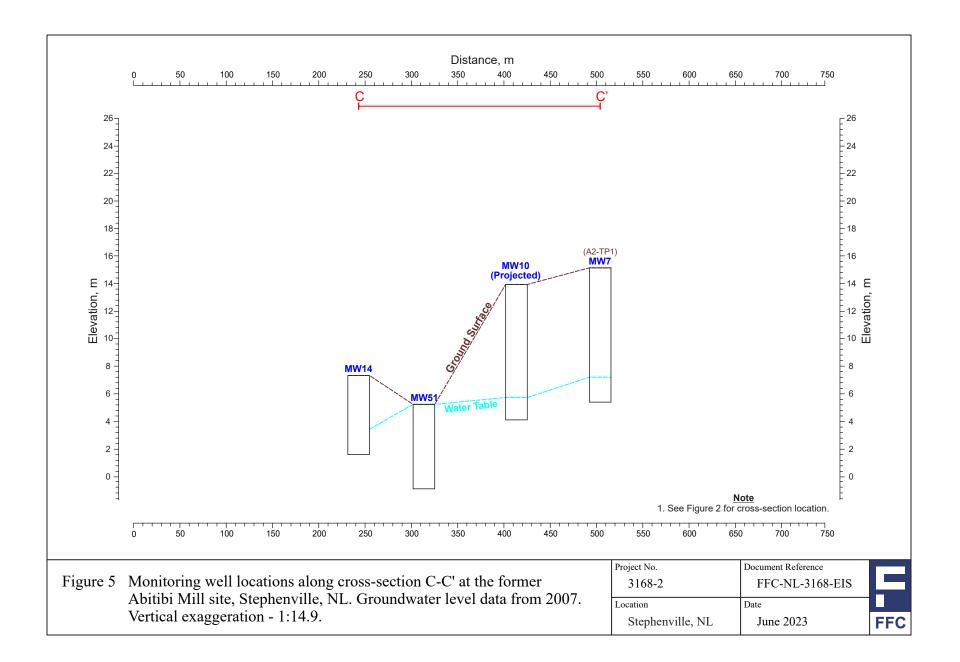


Figure 6 (page 1 of 5) Project: Geotechnical Investigation

Client:

Location: Stephenville, NL

Log of Borehole: BH1

Project No: 3113

Date: November 16 - 19, 2017

		SUBSURFACE PROFILE		S	AMF	PLE					
Depth	Symbol	Geologic Description	Elevation (m)	Sample Type	Sample Sequence	"N" Value	Recovery (%)	% Fines	Standard Penetration Test "N" Value per 300 mm 20 60	Well Data	Well Description
oft m		Ground Surface (GS)	31.4								
0 1 1 1 1 1 1 1 1 1 1 1 1 1		Auger	30								Well head protection installed Cement packing from 0.05 m to 0.46 m Native sand packing from 0.46 m to 0.91 m Bentonite packing from 0.91 m to 1.12 m
5 6 6		SPT: 4 / 18 / 36 / 36 Wet, brown, medium sand	29.4	SS	1	54	31				
7 1 8 1 9 1 9 1		Auger									0.05 m dia. riser from 0 m to 16.68 m
10 - 0 11 - 1 12 - 1		SPT: 7 / 12 / 21 / 22 Damp, brown, medium sand with red and black particles	28.3 27.7	SS	2	33	52				
13 - 4 14 - 4		Auger	26.9								
15 16 5		SPT: 13 / 16 / 19 /14 Damp,brown, medium sand	26.3	SS	3	35	25				Native sand packing from 1.12 m to 26.48 m
17 18 19 19		Auger	25.4								
20 21 22		SPT: 10 / 39 / 27 / 16 No recovery	24.8	SS	4	66	0				
23-		Auger									
	F	Fracflow Consultants Inc.									



Fracflow Consultants Inc 154 Major's Path St. John's, NL A1A 5A1 Phone: (709) 739-7270 Fax: (709) 753-5101

Drilling Method: Hollow Stem Augering Dynamic Cone Penetration Test Driller: Formation Drilling Ltd. Datum: Geodetic

Sheet: 1 of 5

Figure 6 (page 2 of 5) Project: Geotechnical Investigation

Client:

Location: Stephenville, NL

Log of Borehole: BH1

Project No: 3113

Date: November 16 - 19, 2017

		SUBSURFACE PROFILE		S	AMF	PLE					
g Depth	Symbol	Geologic Description	Elevation (m)	Sample Type	Sample Sequence	"N" Value	Recovery (%)	% Fines	Standard Penetration Test "N" Value per 300 mm 20 60	Well Data	Well Description
23			23.9								
25 26 8		SPT: 7 / 25 / 53 / 53 Dry, brown, fine to medium sand with some rock fragments	23.3	SS	5	78	20				
27 28 29		Auger	00.4								
30 31 31 32		SPT: 43 / 52 for 0.03 m (Refusal) Brown and tan, fine sand with some rock fragments	22.4 22.2	SS	6	52	36				0.05 m dia. riser from 0 m to 16.68 m
33 10 34		Auger	00.0								
35- 36		SPT: 44 / 62 for 0.06 m (Refusal) Dry, grey and brown, fine sand with some rock fragments	20.9 20.6	SS	7	62	97				Native sand packing from 1.12 m
37 38 39		Auger									to 26.48 m
40 12 40 41		SPT: 17 / 52 / 66 / 42 Dry, light grey to dark brown, fine sand with some coarse sand	19.3 18.7	SS	8	118	62				
42 43 43 44		Auger	17.8								
45 - 46 14		SPT: 9 / 15 / 17 / 20 Dry, grey and some brown, fine sand with some rock fragments	17.0				41				
Fracflow Consultants Inc. 154 Major's PathDrilling Method: Hollow Stem Augering Dynamic Cone Penetration TestDatum: Geod Dotum: Geod Dynamic Cone Penetration TestPhone: (709) 739-7270 Fax: (709) 753-5101Driller: Formation Drilling Ltd.Sheet: 2 of 5											

Figure 6 (page 3 of 5) Project: Geotechnical Investigation

Client:

Location: Stephenville, NL

Log of Borehole: BH1

Project No: 3113

Date: November 16 - 19, 2017

		SUBSURFACE PROFILE		S	AMF	PLE					
Depth	Symbol	Geologic Description	Elevation (m)	Sample Type	Sample Sequence	"N" Value	Recovery (%)	% Fines	Standard Penetration Test "N" Value per 300 mm 20 60	Well Data	Well Description
46			17.2	SS	9	32	41				
47 48 49 49 15		Auger	16.2								Native sand packing
50 51 52		SPT: 10 / 12 / 15 / 13 Brown and grey, fine sand with some rock fragments	15.6	SS	10	27	54				from 1.12 m to 26.48 m
53 - 16 53 - 16		Auger									
55			14.7								
56 17		SPT: 9 / 17 / 17 / 16 Damp, brown, fine sand	14.1	SS	11	34	67				0.05 m dia. screen from 16.68 m to 25.82 m
57 58 59 18		Auger									
60			13.2								
61 62		SPT: 10 / 18 / 17 / 15 Dry, grey and brown, fine sand	12.6	SS	12	35	58				
62 19 63 19 64 1		Auger	11 7								19.17 m BGS (Nov. 27, 2017)
65 66 20		SPT: 9 / 15 / 19 / 19 Wet, grey, very fine sand	11.7	SS	13	34	46				
67 68 69 21		Auger									



Fracflow Consultants Inc. 154 Major's Path St. John's, NL A1A 5A1 Phone: (709) 739-7270 Fax: (709) 753-5101

Drilling Method: Hollow Stem Augering Dynamic Cone Penetration Test Driller: Formation Drilling Ltd. Datum: Geodetic

Sheet: 3 of 5

Figure 6 (page 4 of 5) Project: Geotechnical Investigation

Client:

Location: Stephenville, NL

Log of Borehole: BH1

Project No: 3113

Date: November 16 - 19, 2017

		SUBSURFACE PROFILE		S	AMF	PLE					
Depth	Symbol	Geologic Description	Elevation (m)	Sample Type	Sample Sequence	"N" Value	Recovery (%)	% Fines	Standard Penetration Test "N" Value per 300 mm 20 60	Well Data	Well Description
69			10.3								
70 -1 71 -1		SPT: 12 / 28 / 39 / 18 CFEM: Sand, trace Gravel, trace Silt/Clay	9.65	SS	14	67	37				
72 22 73 22		Auger									0.05 m dia. screen from 16.68 m to 25.82 m
/4			8.68							•=•	
75 - 23 76 - 23		SPT: 32 / 49 / 32 / 34 CFEM: Gravelly Sand, trace Silt/Clay	8.07	SS	15	81	33				
77 - 78 - 79 - 24		Auger									Native sand packing from 1.12 m to 26.48 m
			7.14								
80 -1 81 -1		SPT: 29 / 54 / 67 / 52 for 0.03 m (Refusal) No recovery	6.66	SS	16	121	0				
82 25 83		Auger									
1 1			5.57								Screw-on cap
⁸⁵ 26		SPT: 14 / 13 / 19 / 23 CFEM: Sand, some Silt/Clay, trace Gravel	4.97	SS	17	32	27				
87 88 89 90 91 91 92 28		DCPT (Blow counts per 150 mm)		PC PC PC PC PC PC PC PC PC PC	 	27 28 37 36 39 33 28 28 28 35 28					
	- F	Fracflow Consultants Inc.									



Fracflow Consultants Inc 154 Major's Path St. John's, NL A1A 5A1 Phone: (709) 739-7270 Fax: (709) 753-5101

Drilling Method: Hollow Stem Augering Dynamic Cone Penetration Test Driller: Formation Drilling Ltd.

Datum: Geodetic

Sheet: 4 of 5

Figure 6 (page 5 of 5) Project: Geotechnical Investigation

Client:

Location: Stephenville, NL

Log of Borehole: BH1

Project No: 3113

Date: November 16 - 19, 2017

		SUBSURFACE PROFILE		S	AMF	PLE					
Depth	Symbol	Geologic Description	Elevation (m)	Sample Type	Sample Sequence	"N" Value	Recovery (%)	% Fines	Standard Penetration Test "N" Value per 300 mm 20 60	Well Data	Well Description
92 93 94 95 94 95 96 97 98 97 98 97 98 97 98 97 98 99 97 98 97 98 97 98 99 97 98 97 98 97 98 97 98 97 98 97 98 97 98 97 98 97 98 97 98 97 98 97 98 97 98 97 97 98 97 98 97 98 97 98 97 98 97 97 98 97 97 97 97 97 97 97 97 97 97		DCPT (Blow counts per 150 mm) End of Borehole	1.2			31 32 35 29 28 41 48 46 40 37 39 49 45 53 57					



Fracflow Consultants Inc. 154 Major's Path St. John's, NL A1A 5A1 Phone: (709) 739-7270 Fax: (709) 753-5101

Drilling Method: Hollow Stem Augering Dynamic Cone Penetration Test Driller: Formation Drilling Ltd. Datum: Geodetic

Sheet: 5 of 5

Figure 7 (page 1 of 3) Project: Well Field Monitoring

Client:

Location: Stephenville, NL

Log of Monitoring Well: FMW10

Project No: 3113

Date: October 17, 2018

			SUBSURFACE PROFILE			SA	AMPI	_E				
Depth		Symbol	Geologic Description	Elevation (m)	Sample Type	Sample Sequence	"N" Value	Recovery (%)	% Fines	Standard Penetration Test "N" Value per 300 mm 20 60	Well Data	Well Description
ft m			Ground Surface (GS)	26.7								
1 1 2 1 1 1 1 1 1 1 1 1 1 1 1	1		Augering	05.0	OB	-						Protective well casing
	+			25.3							÷	Riser SU 0.22 m
0 1 2 3 4 5 6 7 8 9 10 11 12 11 12	2		Augering Dark brown sand, some cobbles	23.8	OB	-						
10-1-1 11-1 12-1 13-1 14-1	3		Augering Brown gravelly sand	22.2	ОВ	-						Native material packing from 0.00 m to 5.49 m
15 16 17 17	5		Augering Brown gravel and sand		ОВ	_						
19				20.7								
20 21 22 23 23	6		Augering Sand, some gravel	19.2	ОВ	-					3	Bentonite packing from 5.49 m to 7.01 m
25 26 27 28 28	8		Augering Gravelly sand	17.7	OB	-						0.05 m dia. PVC riser from 0.00 m to 19.67 m
30 31 32 33	9		Augering Medium sand									
Fracflow Consultants Inc.											: Geodetic 1 of 3	

Figure 7 (page 2 of 3) Project: Well Field Monitoring

Client:

Location: Stephenville, NL

Log of Monitoring Well: FMW10

Project No: 3113

Date: October 17, 2018

			SUBSURFACE PROFILE				SA	MPL	E					
Depth		Symbol	Geologic Description		Elevation (m)	Sample Type	Sample Sequence	"N" Value	Recovery (%)	% Fines	Pen "N" V	andard etration Test 'alue per 0 mm 60	Well Data	Well Description
33 34 35					16.2	ОВ	-							
36 37 38 38	11		Augering Medium sand		14.7	ОВ	-							
40 4 41 4 42 4	12		Augering Fine to medium sand		13.1	OB	-							Native material packing from 7.01 m to 18.44 m
47	14		Augering		11.6	OB	-							0.05 m dia.
50 51 52 53 53 54	16		Augering		10	ОВ	-							PVC riser from 0.00 m to 19.67 m
57 58 59	17 18		Augering		8.5	ОВ	-							
63 64 65	19 20		Augering		6.93	ОВ	-							WL 19.66 m bgs (Oct. 19, 2018)
G	Fracflow Consultants Inc. 154 Major's Path St. John's, NL A1A 5A1 Phone: (709) 739-7270 Fax: (709) 753-5101 Drilling Method: Hollow Stem Auger Drilling Ltd.												Datum Sheet:	2 of 3

Figure 7 (page 3 of 3) Project: Well Field Monitoring

Client:

Location: Stephenville, NL

Log of Monitoring Well: FMW10

Project No: 3113

Date: October 17, 2018

SUBSURFACE PROFILE SAMPLE											
Depth	Symbol	Geologic Description	Elevation (m)	Sample Type	Sample Sequence	"N" Value	Recovery (%)	% Fines	Standard Penetration Test "N" Value per 300 mm 20 60	Well Data	Well Description
66 67 68 69 21		Augering Brown fine to medium sand Up-coning sand (0.91 m) afterwards	5.46	ОВ	-						0.05 m dia. PVC screen from
70 71 72 73 73 74		Augering Fine to medium sand	3.91	ОВ	-						19.67 m to 22.71 m No.2 silica sand packing from 18.44 m to 22.78 m Pointed screw-on
75 76 77 78 79 78 81 79 78 81 82 83 84 85 86 87 91 14 15 82 83 84 85 86 87 91 14 14 15 88 89 91 14 14 14 14 15 80 80 14 14 14 14 14 14 14 14 14 14		End of Borehole									Pointed screw-on end cap at 22.71 m
	Fracflow Consultants Inc.Drilling Method: Hollow Stem Auger154 Major's PathDrilling Method: Hollow Stem AugerSt. John's, NL A1A 5A1Phone: (709) 739-7270Phone: (709) 753-5101Driller: Formation Drilling Ltd.										: Geodetic 3 of 3

Figure 8 (page 1 of 3) Project: Well Field Monitoring

Client:

Location: Stephenville, NL

Log of Monitoring Well: FMW11

Project No: 3113

Date: October 14, 2018

			SUBSURFACE PROFILE			SA	AMPI	_E				
Denth		Symbol	Geologic Description	Elevation (m)	Sample Type	Sample Sequence	"N" Value	Recovery (%)	% Fines	Standard Penetration Test "N" Value per 300 mm 20 60	Well Data	Well Description
0 ^{ft}	m		Ground Surface (GS)	31.4								
1 2 3 4 1 3	- - - - 1 -		Augering Bog/Overburden	29.9	ОВ	-						Protective well casing Riser SU 0.15 m
0 1 2 3 4 5 6 7 8 9 10 10	-2		Augering Dark brown sand, some fine to medium gravel	28.4	OB	-						Native material packing from 0.00 m to 4.57 m
11 12 13 14	- 4 - 4		Augering Top 0.9 m: Light brown sand, some fine gravel Bottom 0.6 m fine to medium gravel	26.9	ОВ	-						0.05 m dia. PVC riser from 0.00 m to 19.34 m
15 16 17	- 5		SPT: 6 / 10 / 12 / 22 Brown medium to coarse sand	26.3	SS	1	22	38		++++		Bentonite
18 19 20	-		Augering Brown sand, some fine to medium gravel	25.3	ОВ	-						packing from 4.57 m to 6.10 m
21 22 23 24	-		Augering Medium gravel and sand	23.8	OB	-						Native material
25 26 27	- 8		SPT: 6 / 10 / 10 / 9 Fine to medium sand	23.2	SS	2	20	50				packing from 6.10 m to 17.98 m
27 28 29 30	9		Augering Fine to medium gravel	22.2	ОВ	-						
31 32	- 10		Augering									
E	Fracflow Consultants Inc. 154 Major's PathDrilling Method: Hollow Stem AugerDatum: GeodeticSt. John's, NL A1A 5A1 Phone: (709) 739-7270 Fax: (709) 753-5101Driller: Formation Drilling Ltd.Sheet: 1 of 3											

Figure 8 (page 2 of 3) Project: Well Field Monitoring

Client:

Location: Stephenville, NL

Log of Monitoring Well: FMW11

Project No: 3113

Date: October 14, 2018

			SUBSURFACE PROFILE			SA	MPI	.E				
Depth		Symbol	Geologic Description	Elevation (m)	Sample Type	Sample Sequence	"N" Value	Recovery (%)	% Fines	Standard Penetration Test "N" Value per 300 mm 20 60	Well Data	Well Description
33 34 35				20.8	ОВ	-						
	11		SPT: 7 / 10 / 10 / 9 Fine to medium sand	20.1	SS	3	25	58				
38 39 40	12		Augering Medium gravel (Top) changing to fine sand (Bottom)	19.2	OB	-						
41 42 43 43	13		Augering Medium to large gravel, some sand		ОВ	-						
44 45				17.7							33	0.05 m dia. PVC riser from
=	14		SPT: 20 / 32 / 16 / 36 Fine to coarse sand (Top) changing to medium gravel and rock fragments	17.1	SS	4	48	54				0.00 m to 19.34 m
48	15		(Bottom) Augering Brown gravel and sand	16.2	ов	-						
51 52 53 54	16		Augering	14.6	OB	-						
Foc	17		SPT: 7 / 13 / 15 / 28 Brown, fine to medium sand	14	SS	5	28	56				
57 58 59 60	18		Augering	13.1	ОВ	-						No.2 Silica sand packing from 17.98 m to 22.86 m
61 62 63 64 65	19		Augering Water table encountered	11.6	OB	-						WL 18.88 m bgs (Oct. 19, 2018)
	20											
ŀ	Fracflow Consultants Inc.Drilling Method: Hollow Stem AugerDatum: Geodetic154 Major's PathDrilling Method: Hollow Stem AugerDatum: GeodeticSt. John's, NL A1A 5A1Phone: (709) 739-7270Driller: Formation Drilling Ltd.Sheet: 2 of 3Fax:(709) 753-5101Fax: (709) 753-5101Sheet: 2 of 3											

Figure 8 (page 3 of 3) Project: Well Field Monitoring

Client:

Location: Stephenville, NL

Log of Monitoring Well: FMW11

Project No: 3113

Date: October 14, 2018

		SUBSURFACE PROFILE			SA	MPI	E				
Depth	Symbol	Geologic Description	Elevation (m)	Sample Type	Sample Sequence	"N" Value	Recovery (%)	% Fines	Standard Penetration Test "N" Value per 300 mm 20 60	Well Data	Well Description
66 67		SPT: 7 / 15 / 14 / 14 Brown medium to fine sand	11	SS	6	29	46				
68 69 70		Augering Up-coning sand (0.10 m) at the beginning	10	ОВ	-						0.05 m dia. PVC screen from
71 72 73 73 74		Augering	8.5	OB	-						19.34 m to 22.39 m Pointed screw-on end cap at 22.39 m
75 shi 76 shi 77 shi 79 shi 80 shi 81 shi 82 shi 84 shi 84 shi 84 shi 84 shi 85 shi 89 shi 90 shi 91 shi 92 shi 93 shi 93 shi 94 shi 95 shi 93 shi 93 shi 93 shi 94 shi 95 shi 93 shi 93 shi 93 shi 94 shi 95 shi 93 shi 93 shi 93 shi 94 shi 95 shi 95 shi 96 shi 97 shi 93 shi 93 shi 94 shi 95 shi 95 shi 96 shi 97 shi 98 shi 93 shi 93 shi 94 shi 95 shi 93 shi 93 shi 93 shi 94 shi 95 shi 95 shi 96 shi 97 shi 98 shi 97 shi 98 shi 97 shi 98 shi 97		End of Borehole	8.5								
	1 S P	Fracflow Consultants Inc. 54 Major's Path Drilling M 5t. John's, NL A1A 5A1 Phone: (709) 739-7270 Driller: F Fax: (709) 753-5101		Datum Sheet:	: Geodetic 3 of 3						

Workorder No. Date Sampled			17K289906 28-Nov-17	19K479456 11-Jun-19	20K614700 15-Jun-20	20K658687 28-Sep-20	21K767120 06/22/2021	22K912449 06/22/2022
Sample Description			3113-BH1- WS1	3113-BH1- WS2	3113-BH1- WS-200615	3113-BH1- WS-200928	3113-BH1- WS-210622	3113-BH1- WS-220622
Package Name	Parameter Name	Unit	8944411	272195	1207836	1514447	2668129	4017814
	рН		_	7.53		7.43	7.83	8.00
	Temperature Turbidity	°C NTU		8.20 2578.00	8.20 22.00	11.20 4.00	8.50 0.85	8.20 0.25
Field Paramaters	Electrical Conductivity	umho/cm		340.00	330.60	454.40	353.90	341.70
	Dissolved Oxygen	mg/L		7.37	8.93	8.70	9.69	7.83
	Temperature (DO Meter)	°C	_					
	pH	4	8.18	8.19	7.99		8.05	8.05
	Reactive Silica as SiO2 Chloride	mg/L	7.90	7.90	10.20		11.70	7.40
	Fluoride	mg/L	27.00 0.16	24.00 <0.12	24.00 <0.12		28.00 <0.12	25.00 <0.12
	Sulphate	mg/L mg/L	6.00	5.00			6.00	5.00
	Alkalinity	mg/L	128.00	125.00			124.00	119.00
	True Color	TCU	<5	<5	<5		<5.00	<5.00
	Turbidity	NTU	1.70	1.10			1.40	
	Electrical Conductivity	umho/cm	333.00	352.00	335.00		345.00	348.00
	Nitrate + Nitrite as N	mg/L	0.14	0.08	0.08		0.11	0.11
	Nitrate as N	mg/L	0.14	0.08	0.08		0.11	0.11
	Nitrite as N	mg/L	<0.05	<0.05	<0.05		<0.05	<0.05
	Ammonia as N	mg/L	0.03	0.05	0.07		<0.03	< 0.03
	Total Organic Carbon	mg/L	0.90	3.60			<0.5	
	Ortho-Phosphate as P	mg/L	< 0.01	< 0.01	< 0.01		0.01	< 0.01
	Total Sodium	mg/L	15.60	15.20				
	Total Potassium	mg/L	2.10	1.10				
	Total Calcium	mg/L	44.40	44.20				
	Total Magnesium Dissolved Sodium	mg/L	7.80	7.30	8.80		15.60	39.40
Standard Water	Dissolved Sodium Dissolved Potassium	mg/L mg/L					15.60	39.40 5.46
Analysis	Dissolved Calcium	mg/L					39.70	1.04
	Dissolved Magnesium	mg/L					7.10	16.60
	Bicarb. Alkalinity (as CaCO3)	mg/L	128.00	125.00	115.00		124.00	119.00
	Carb. Alkalinity (as CaCO3)	mg/L	<10	<10			<10	<10
	Hydroxide	mg/L	<5	<5	<5		<5	<5
	Calculated TDS	mg/L	181.00	172.00	167.00		172.00	164.00
	Hardness	mg/L	143.00	140.00	136.00		128.00	121.00
	Langelier Index (@20C)	NA	0.32	0.32			0.13	0.11
	Langelier Index (@ 4C)	NA	0.00	0.00	-0.28		-0.19	-0.21
	Saturation pH (@ 20C)	NA	7.86	7.87			7.92	
	Saturation pH (@ 4C)	NA marka	8.18				8.24	
	Anion Sum Cation sum	me/L me/L	3.46 3.62	3.29 3.50			3.40 3.27	
	% Difference/ Ion Balance	%	2.30				2.00	
	Bromide	mg/L	2.50	5.20	7.20		2.00	0.10
	Conductivity	uS/cm						
	Total Hardness (calc)	ug CaCO3/L						
	Total Kjeldahl Nitrogen as N	mg/L						
	Total Kjeldahl Nitrogen	mg/L						
	Dissolved Organic Carbon	mg/L						
UVT (Water)	UV Transmittance	% UVT						
	Total Aluminum	ug/L	119.00			15.00		
	Total Antimony	ug/L	<2			<2		
	Total Arsenic	ug/L	<2			<2		
	Total Barium	ug/L	27.00			29.00		
	Total Beryllium	ug/L	<2			<2		
	Total Bismuth	ug/L	<2			<2		
	Total Boron	ug/L	11.00			10.00		
	Total Cadmium	ug/L	< 0.017			< 0.017		
	Total Chromium Total Cobalt	ug/L	2.00			2.00		
		ug/L	<1			<1		

Table 1 Groundwater chemistry for BH1 (page 1 of 4).

Vorkorder No. Date Sampled			17K289906 28-Nov-17	19K479456 11-Jun-19	20K614700 15-Jun-20	20K658687 28-Sep-20	21K767120 06/22/2021	
Sample Description			3113-BH1- WS1	3113-BH1- WS2	3113-BH1- WS-200615	3113-BH1- WS-200928	3113-BH1- WS-210622	3113-BH1 WS-22062
ackage Name	Parameter Name	Unit	8944411	272195	1207836	1514447	2668129	4017814
	Total Copper	ug/L	<1			1.00		
	Total Iron	ug/L	258.00			90.00		
	Total Lead	ug/L	<0.5			<0.5		
Total Matala	Total Manganese	ug/L	32.00			<2		
Total Metals	Total Molybdenum	ug/L	2.00			<2		
	Total Nickel	ug/L	4.00			3.00		
	Total Phosphorous	mg/L	0.03					
	Total Selenium	ug/L	<1			<1		
	Total Silver	ug/L	<0.1			<0.1		
	Total Strontium	ug/L	143.00			149.00		
	Total Thallium	ug/L	<0.1			<0.1		
	Total Tin	ug/L	<2			<2		
	Total Titanium	ug/L	7.00			<2		
	Total Uranium	ug/L	0.50			0.50		
	Total Vanadium	ug/L	<2			<2		
	Total Zinc	ug/L	6.00			<5		
	Total Mercury	ug/L		<0.026		<0.026		
	Sulphide as Hydrogen Sulphide Calc. Total Calcium Total Lithium	mg/L						
	Dissolved Aluminum	ug/L	13.00	7.00	15.00	<5	<5	14.0
	Dissolved Antimony	ug/L	<2	<2	<2	<2	<2	<1
	Dissolved Arsenic	ug/L	<2	<2	<2	<2	<2	<1
	Dissolved Barium	ug/L	26.00	25.00	30.00	30.00	29.00	24.3
	Dissolved Beryllium	ug/L	<2	<2	<2	<2	<2	<0.5
	Dissolved Bismuth	ug/L	<2	<2	<2	<2	<2	<2
	Dissolved Boron	ug/L	10.00	8.00	8.00	9.00	<5	10.2
	Dissolved Cadmium	ug/L	<0.017	<0.09	0.05	<0.09	<0.017	0.1
	Dissolved Chromium	ug/L	3.00	3.00	3.00	2.00	3.00	<2
	Dissolved Cobalt	ug/L	<1	<1	<1	<1	<1	<0.5
	Dissolved Copper	ug/L	<2	<2	<2	<2	<2	<1
	Dissolved Iron	ug/L	<50	<50	51.00	95.00	<50	14.0
	Dissolved Lead	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Dissolved Lithium	ug/L						
Dissolved Metals	Dissolved Manganese	ug/L	21.00	<2	<2	<2	<2	<2
	Dissolved Molybdenum	ug/L	<2	<2	<2	<2	<2	<2
	Dissolved Nickel	ug/L	<2	<2	<2	<2	<2	<1
	Dissolved Phosphorus	mg/L		<0.02	<0.02		<0.02	<0.0
	Dissolved Selenium	ug/L	<1	<1	1.00	<1	<1	2.3
	Dissolved Silicon	ug/L						
	Dissolved Silver	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Dissolved Strontium	ug/L	123.00	109.00	176.00	118.00	127.00	101.0
	Dissolved Thallium	ug/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3
	Dissolved Tin	ug/L	<2	<2	<2	<2	<2	<2
	Dissolved Titanium	ug/L	<2	<2	<2	<2	<2	<2
	Dissolved Uranium	ug/L	0.40	0.40	0.60	0.50	0.40	<0.5
	Dissolved Vanadium	ug/L	<2					
	Dissolved Zinc	ug/L	7.00	<5	<5	<5	<5	<5
	Dissolved Zirconium	ug/L						
	Dissolved Mercury	ug/L			<0.026	<0.026	<0.026	<0.02
Other Inorganics	Biochem. Oxy. Demand, 5 Day (BOD5) Chem. Oxy. Demand	mg/L mg/L						
	Benzene	mg/L	<0.001	<0.001			<0.001	
				< 0.001	< 0.001		< 0.001	
	Toluene Ethylbenzene	mg/L mg/L	<0.001 <0.001	<0.001			<0.001	

Table 1 Groundwater chemistry for BH1 (page 2 of 4).

Polycyclic Aromatic Hydrocarbons (PAH) Polycyclic Aromatic Hydrocarbons (PAH) Polycyclic Aromatic Hydrocarbons (PAH) Polycyclic Aromatic Hydrocarbons (PAH) Polycyclic Aromatic Hydrocarbons (PAH) Polycyclic Aromatic Hydrocarbons (PAH) Piluo Fluo Fluo Fluo Fluo Fluo Fluo Fluo F	1-C32 Hydrocarbons dified TPH (Tier 1) emblance Comment urn to Baseline at C32 butylbenzene - EPH butylbenzene - VPH otriacontane - EPH lethylnaphthalene naphthene naphthylene dine hracene zo(a)anthracene zo(a)anthracene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(k)fluoranthene ysene enzo(a,h)anthracene prene eno(1,2,3-cd)pyrene	Unit mg/L mg/L mg/L mg/L mg/L mg/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L u	28-Nov-17 3113-BH1- WS1 8944411 <0.01 <0.05 <0.05 <0.01 <0.1 NR Y 94.00 100.00 98.00	<0.1 NR Y 84.00	15-Jun-20 3113-BH1- WS-200615 1207836 <0.01 <0.05 <0.05 <0.05 LR Y 100.00 112.00 98.00	3113-BH1-	06/22/2021 3113-BH1- WS-210622 2668129 <0.001 <0.05 <0.05 <0.01 <0.05 NR Y 96.00 78.00 85.00	3113-BH1- WS-220622 4017814
Package Name Para Atlantic RBCA Tier 1 Hydrocarbons PAC Note Polycyclic Aromati Hydrocarbons (PAH) Polycyclic Aromati Hydrocarbons (PAH) Polycyclic Aromati Hydrocarbons (PAH) Polycyclic Aromati Hydrocarbons (PAH) Polycyclic Aromati Hydrocarbons (PAH) Piloe Pil	ene (Total) C10 (less BTEX) 0-C16 Hydrocarbons 6-C21 Hydrocarbons 1-C32 Hydrocarbons dified TPH (Tier 1) emblance Comment urn to Baseline at C32 butylbenzene - EPH butylbenzene - VPH otriacontane - EPH lethylnaphthalene lethylnaphthalene lethylnaphthalene aphthene naphthylene dine hracene zo(a)anthracene zo(a)anthracene zo(b)fluoranthene zo(e)pyrene zo(b)fluoranthene zo(e)pyrene zo(k)fluoranthene ysene enzo(a,h)anthracene prene eno(1,2,3-cd)pyrene	mg/L mg/L mg/L mg/L mg/L % % % % ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	WS1 8944411 <0.01 <0.05 <0.05 <0.01 <0.1 NR Y 94.00 100.00	WS2 272195 <0.001 <0.05 <0.05 <0.01 <0.1 NR Y 84.00 84.00	WS-200615 1207836 <0.001 <0.05 <0.05 <0.03 <0.05 LR Y 100.00 112.00	WS-200928	WS-210622 2668129 <0.01 <0.05 <0.05 <0.01 <0.05 NR Y 96.00 78.00	WS-220622 4017814
Polycyclic Aromatic Hydrocarbons (PAH) Polycyclic Aromatic Hydrocarbons (PAH) Polycyclic Aromatic Hydrocarbons (PAH) Polycyclic Aromatic Hydrocarbons (PAH) Polycyclic Aromatic Hydrocarbons (PAH) Polycyclic Aromatic Hydrocarbons (PAH) Piluo Fluo Fluo Fluo Fluo Fluo Fluo Fluo F	ene (Total) C10 (less BTEX) 0-C16 Hydrocarbons 6-C21 Hydrocarbons 1-C32 Hydrocarbons dified TPH (Tier 1) emblance Comment urn to Baseline at C32 butylbenzene - EPH butylbenzene - VPH otriacontane - EPH lethylnaphthalene lethylnaphthalene lethylnaphthalene aphthene naphthylene dine hracene zo(a)anthracene zo(a)anthracene zo(b)fluoranthene zo(e)pyrene zo(b)fluoranthene zo(e)pyrene zo(k)fluoranthene ysene enzo(a,h)anthracene prene eno(1,2,3-cd)pyrene	mg/L mg/L mg/L mg/L mg/L % % % % ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<0.001 <0.01 <0.05 <0.05 <0.01 <0.1 NR Y 94.00 100.00	<0.001 <0.01 <0.05 <0.05 <0.01 <0.1 NR Y 84.00 84.00	<0.001 <0.05 <0.05 0.03 <0.05 LR Y 100.00 112.00	1514447	<0.001 <0.01 <0.05 <0.05 <0.01 <0.05 NR Y 96.00 78.00	
Polycyclic Aromatic Hydrocarbons (PAH) Polycyclic Aromatic Hydrocarbons (PAH) Polycyclic Aromatic Hydrocarbons (PAH) Polycyclic Aromatic Hydrocarbons (PAH) Polycyclic Aromatic Hydrocarbons (PAH) Polycyclic Aromatic Hydrocarbons (PAH) Piloe Fluo Fluo Fluo Fluo Fluo Fluo Fluo Fluo	C10 (less BTEX) 0-C16 Hydrocarbons 6-C21 Hydrocarbons 1-C32 Hydrocarbons dified TPH (Tier 1) emblance Comment urn to Baseline at C32 putylbenzene - EPH putylbenzene - VPH otriacontane - EPH lethylnaphthalene naphthene naphthene naphthylene dine hracene zo(a)anthracene zo(a)anthracene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene pysene enzo(a,h)anthracene prene eno(1,2,3-cd)pyrene	mg/L mg/L mg/L mg/L % % % % ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<0.01 <0.05 <0.05 <0.01 <0.1 NR Y 94.00 100.00	<0.01 <0.05 <0.05 <0.01 <0.1 NR Y 84.00 84.00	<0.01 <0.05 <0.05 <0.03 <0.05 LR Y 100.00 112.00		<0.01 <0.05 <0.05 <0.01 <0.05 NR Y 96.00 78.00	
Atlantic RBCA Tier 1 Hydrocarbons Hydrocarbons Polycyclic Aromatio Hydrocarbons (PAH) Polycyclic Aromatio Hydrocarbons (PAH) Polycyclic Aromatio Hydrocarbons (PAH) Polycyclic Aromatio Hydrocarbons (PAH) Polycyclic Aromatio Hydrocarbons (PAH) Pilow	0-C16 Hydrocarbons 6-C21 Hydrocarbons 1-C32 Hydrocarbons dified TPH (Tier 1) emblance Comment urn to Baseline at C32 butylbenzene - EPH butylbenzene - VPH otriacontane - EPH lethylnaphthalene naphthene naphthylene dine hracene zo(a)anthracene zo(a)anthracene zo(b)fluoranthene zo(e)pyrene zo(b)fluoranthene zo(e)pyrene zo(b)fluoranthene ysene enzo(a,h)anthracene prene eno(1,2,3-cd)pyrene	mg/L mg/L mg/L mg/L % % % % ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<0.05 <0.05 <0.01 <0.1 NR Y 94.00 100.00	<0.05 <0.05 <0.01 <0.1 NR Y 84.00 84.00	<0.05 <0.05 0.03 <0.05 LR Y 100.00 112.00		<0.05 <0.05 <0.01 <0.05 NR Y 96.00 78.00	
Atlantic RBCA Tier 1 >C16 Hydrocarbons >C2: Mod Rese Retu Isob Isob n-Dc Polycyclic Aromati Hydrocarbons (PAH) Polycyclic Aromati Polycyclic Aromati Hydrocarbons (PAH) Polycyclic Aromati Polycyclic Aromatic Polycyclic Aromatic Pol	6-C21 Hydrocarbons 1-C32 Hydrocarbons dified TPH (Tier 1) emblance Comment urn to Baseline at C32 butylbenzene - EPH butylbenzene - VPH otriacontane - EPH lethylnaphthalene naphthene naphthylene dine hracene zo(a)anthracene zo(a)anthracene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(k)fluoranthene ysene enzo(a,h)anthracene prene eno(1,2,3-cd)pyrene	mg/L mg/L mg/L % % % w ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<0.05 <0.01 <0.1 NR Y 94.00 100.00	<0.05 <0.01 <0.1 NR Y 84.00 84.00	<0.05 0.03 <0.05 LR Y 100.00 112.00		<0.05 <0.01 <0.05 NR Y 96.00 78.00	
Polycyclic Aromati Hydrocarbons (PAH) Polycyclic Aromati Polycyclic Aromatic Polycyclic Aromat	1-C32 Hydrocarbons dified TPH (Tier 1) emblance Comment urn to Baseline at C32 butylbenzene - EPH butylbenzene - VPH otriacontane - EPH lethylnaphthalene naphthene naphthylene dine hracene zo(a)anthracene zo(a)anthracene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(k)fluoranthene ysene enzo(a,h)anthracene prene eno(1,2,3-cd)pyrene	mg/L mg/L % % % ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<0.01 <0.1 NR Y 94.00 100.00	<0.01 <0.1 NR Y 84.00 84.00	0.03 <0.05 LR Y 100.00 112.00		<0.01 <0.05 NR Y 96.00 78.00	
Polycyclic Aromatic Hydrocarbons (PAH) PCBsMod Rese Retu Isob Isob In-Do 2-Mi 2-Mi 2-Mi 2-Mi 2-Mi 2-Mi 2-Mi 2-Mi	dified TPH (Tier 1) emblance Comment urn to Baseline at C32 outylbenzene - EPH outylbenzene - VPH otriacontane - EPH lethylnaphthalene naphthene naphthylene dine hracene zo(a)anthracene zo(a)anthracene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene ysene enzo(a,h)anthracene oranthene orene eno(1,2,3-cd)pyrene	mg/L % % % ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<0.1 NR Y 94.00 100.00	<0.1 NR Y 84.00 84.00	<0.05 LR Y 100.00 112.00		<0.05 NR Y 96.00 78.00	
Polycyclic Aromatic Hydrocarbons (PAH) PCBs PCBs Total	emblance Comment urn to Baseline at C32 butylbenzene - EPH butylbenzene - VPH otriacontane - EPH lethylnaphthalene naphthene naphthylene dine hracene zo(a)anthracene zo(a)anthracene zo(a)pyrene zo(b)fluoranthene zo(e)pyrene zo(b)fluoranthene zo(e)pyrene zo(k)fluoranthene ysene enzo(a,h)anthracene poranthene porene eno(1,2,3-cd)pyrene	% % % ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	NR Y 94.00 100.00	NR Y 84.00 84.00	LR Y 100.00 112.00		NR Y 96.00 78.00	
Polycyclic Aromatic Hydrocarbons (PAH) PCBsRetu Isob Isob n-Dc 2-M 2-M 2-M 2-M 2-M 2-M 2-M 2-M 2-M 2-M	urn to Baseline at C32 butylbenzene - EPH butylbenzene - VPH otriacontane - EPH lethylnaphthalene naphthene naphthylene dine hracene zo(a)anthracene zo(a)anthracene zo(b)fluoranthene zo(b)fluoranthene zo(e)pyrene zo(b)fluoranthene zo(k)fluoranthene ysene enzo(a,h)anthracene poranthene porene eno(1,2,3-cd)pyrene	% % ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	Y 94.00 100.00	Y 84.00 84.00	Y 100.00 112.00		Y 96.00 78.00	
Polycyclic Aromatic Hydrocarbons (PAH) PCBs PCBs Total	butylbenzene - EPH butylbenzene - VPH otriacontane - EPH lethylnaphthalene naphthene naphthylene idine hracene zo(a)anthracene zo(a)anthracene zo(b)fluoranthene zo(e)pyrene zo(b)fluoranthene zo(e)pyrene zo(k)fluoranthene ysene enzo(a,h)anthracene porene eno(1,2,3-cd)pyrene	% % ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	94.00 100.00	84.00 84.00	100.00 112.00		96.00 78.00	
Polycyclic Aromatic Hydrocarbons (PAH) PCBs PCBs Total	vutylbenzene - VPH otriacontane - EPH lethylnaphthalene naphthene naphthylene dine hracene zo(a)anthracene zo(a)anthracene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(ghi)perylene zo(ghi)perylene zo(k)fluoranthene ysene enzo(a,h)anthracene pranthene prene eno(1,2,3-cd)pyrene	% % ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	100.00	84.00	112.00		78.00	
Polycyclic Aromatic Hydrocarbons (PAH) Hydrocarbons (PAH) PCBs Tota	otriacontane - EPH lethylnaphthalene naphthene naphthylene dine hracene zo(a)anthracene zo(a)anthracene zo(b)fluoranthene zo(b)fluoranthene zo(b)fluoranthene zo(ghi)perylene zo(k)fluoranthene ysene enzo(a,h)anthracene oranthene orene eno(1,2,3-cd)pyrene	% ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L						
Polycyclic Aromatic Hydrocarbons (PAH) PCBs PCBs Tota	lethylnaphthalene lethylnaphthalene naphthene naphthylene idine hracene zo(a)anthracene zo(a)anthracene zo(b)fluoranthene zo(b)fluoranthene zo(e)pyrene zo(ghi)perylene zo(ghi)perylene zo(k)fluoranthene ysene enzo(a,h)anthracene poranthene porene eno(1,2,3-cd)pyrene	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	98.00	102.00	98.00		85.00	
Polycyclic Aromatic Hydrocarbons (PAH) Fluo Fluo Fluo Fluo Fluo Fluo Fluo Fluo	lethylnaphthalene naphthene naphthylene idine hracene zo(a)anthracene zo(a)pyrene zo(b)fluoranthene zo(e)pyrene zo(ghi)perylene zo(ghi)perylene zo(k)fluoranthene ysene enzo(a,h)anthracene pranthene prene eno(1,2,3-cd)pyrene	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L						
Polycyclic Aromatic Hydrocarbons (PAH Fluo Fluo Polycyclic Aromatic Hydrocarbons (PAH Fluo Fluo Fluo Fluo Fluo Fluo Pory Pory Pory Pory Pory Pory Pory Por	naphthene naphthylene idine hracene zo(a)anthracene zo(a)pyrene zo(b)fluoranthene zo(e)pyrene zo(ghi)perylene zo(ghi)perylene zo(k)fluoranthene ysene enzo(a,h)anthracene pranthene prene eno(1,2,3-cd)pyrene	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L						
Polycyclic Aromatic Hydrocarbons (PAH Fluo Fluo Polycyclic Aromatic Hydrocarbons (PAH Fluo Fluo Fluo Pory Pery Pher Pyre Quir Nitro 2-Flu Terp	naphthylene dine hracene zo(a)anthracene zo(a)pyrene zo(b)fluoranthene zo(b)fluoranthene zo(ghi)perylene zo(ghi)perylene zo(k)fluoranthene ysene enzo(a,h)anthracene pranthene prene eno(1,2,3-cd)pyrene	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L						
Polycyclic Aromatic Hydrocarbons (PAH Fluo Fluo Polycyclic Aromatic Hydrocarbons (PAH Fluo Fluo Fluo Pory Pery Pher Pyre Quir Nitro 2-Flu Terp	idine hracene zo(a)anthracene zo(a)pyrene zo(b)fluoranthene zo(c)pyrene zo(ghi)perylene zo(k)fluoranthene ysene enzo(a,h)anthracene prene eno(1,2,3-cd)pyrene	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L						
Polycyclic Aromatic Hydrocarbons (PAH Hugrocarbons (PAH Hugrocarbons (PAH Hugrocarbons (PAH Fluo Fluo Inde Napi Pery Pery Pher Pyre Quir Nitro 2-Flu Terp	hracene zo(a)anthracene zo(a)pyrene zo(b)fluoranthene zo(e)pyrene zo(ghi)perylene zo(k)fluoranthene ysene enzo(a,h)anthracene oranthene orene eno(1,2,3-cd)pyrene	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L						
Polycyclic Aromatic Hydrocarbons (PAH Fluo Fluo Inde Napi Pery Pery Pery Pery Pery Pery Pery Pery	zo(a)anthracene zo(a)pyrene zo(b)fluoranthene zo(e)pyrene zo(ghi)perylene zo(k)fluoranthene ysene enzo(a,h)anthracene oranthene orene eno(1,2,3-cd)pyrene	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L						
Polycyclic Aromatic Hydrocarbons (PAH Fluo Fluo Polycyclic Aromatic Hydrocarbons (PAH Fluo Fluo Inde Napi Pery Pher Pyre Quir Nitro 2-Flu Terp	zo(a)pyrene zo(b)fluoranthene zo(e)pyrene zo(ghi)perylene zo(k)fluoranthene ysene enzo(a,h)anthracene oranthene orene eno(1,2,3-cd)pyrene	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L						
Polycyclic Aromatic Hydrocarbons (PAH Fluo Fluo Inde Napi Pery Pice Quir Nitro 2-Flu Terp	zo(b)fluoranthene zo(e)pyrene zo(ghi)perylene zo(k)fluoranthene ysene enzo(a,h)anthracene oranthene orene eno(1,2,3-cd)pyrene	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L						
Polycyclic Aromatic Hydrocarbons (PAH Fluo Fluo Inde Napi Pery Pher Pyre Quir Nitro 2-Flu Terp	zo(e)pyrene zo(ghi)perylene zo(k)fluoranthene ysene enzo(a,h)anthracene oranthene orene eno(1,2,3-cd)pyrene	ug/L ug/L ug/L ug/L ug/L ug/L ug/L						
Polycyclic Aromatic Hydrocarbons (PAH Fluo Fluo Inde Napi Pery Pher Pyre Quir Nitro 2-Flu Terp	zo(ghi)perylene zo(k)fluoranthene ysene enzo(a,h)anthracene oranthene orene eno(1,2,3-cd)pyrene	ug/L ug/L ug/L ug/L ug/L ug/L						
Polycyclic Aromatic Hydrocarbons (PAH Fluo Fluo Inde Napi Pery Pher Pyre Quir Nitro 2-Flu Terp	zo(k)fluoranthene ysene enzo(a,h)anthracene oranthene orene eno(1,2,3-cd)pyrene	ug/L ug/L ug/L ug/L ug/L						
Polycyclic Aromatic Hydrocarbons (PAH Fluo Fluo Inde Napi Pery Pher Pyre Quir Nitro 2-Flu Terp PCBs Tota	ysene enzo(a,h)anthracene oranthene orene eno(1,2,3-cd)pyrene	ug/L ug/L ug/L ug/L						
PCBs Tota	enzo(a,h)anthracene pranthene prene eno(1,2,3-cd)pyrene	ug/L ug/L ug/L						
Fluo Fluo Inde Napi Pery Pher Pyre Quir Nitro 2-Flu Terp PCBs Tota	oranthene orene eno(1,2,3-cd)pyrene	ug/L ug/L						
Fluo Inde Napi Pery Pher Pyre Quir Nitrr 2-Flu Terp PCBs Tota	orene eno(1,2,3-cd)pyrene	ug/L						
Inde Napi Pery Pher Pyre Quir Nitro 2-Flu Terp PCBs Tota	eno(1,2,3-cd)pyrene	-						
Napi Pery Pher Pyre Quir Nitro 2-Flu Terp PCBs Tota								
Pery Pher Pyre Quir Nitro 2-Flu Terp PCBs Tota	hthalene	ug/L						
Pher Pyre Quir Nitro 2-Flu Terp PCBs Tota	ylene	ug/L						
Quir Nitro 2-Flu Terp PCBs Tota	nanthrene	ug/L						
Quir Nitro 2-Flu Terp PCBs Tota		ug/L						
2-Flu Terp PCBs Tota	noline	ug/L						
Terp PCBs Tota	obenzene-d5	%						
PCBs Tota	uorobiphenyl	%						
	phenyl-d14	%						
Phenols Tota	al PCB	ug/L						
	al Phenolics	mg/L						
Gam	nma-Hexachlorocyclohexane	μg/L		<0.01	<0.01			
	otachlor	μg/L		< 0.01	< 0.01			
Aldr		μg/L		<0.01	<0.01			
Hept	tachlor Epoxide	μg/L		<0.01	<0.01			
Endo	osulfan	μg/L		<0.05	<0.05			
Chlo	ordane	μg/L		<0.04	< 0.04			
DDE		μg/L		<0.01	<0.01			
DDD		μg/L		<0.05	<0.05			
OC Pesticides DDT		μg/L		<0.04	<0.04			
Dielo		μg/L		<0.02	<0.02			
Endr		μg/L		<0.05	<0.05			
	thoxychlor	μg/L		<0.04	< 0.04			
	achlorobenzene	ug/L		<0.01	< 0.01			
	achlorobutadiene	ug/L		<0.01	< 0.01			
	achloroethane	ug/L		< 0.01	< 0.01			
TCM		%		70.00	73.00			
Deca								
alph	1X achlorobiphenyl	%		74.00	76.00			

Table 1 Groundwater chemistry for BH1 (page 3 of 4).

Workorder No. Date Sampled			17K289906 28-Nov-17	19K479456 11-Jun-19	20K614700 15-Jun-20	20K658687 28-Sep-20	21K767120 06/22/2021	
Jute Jumpieu			3113-BH1-	3113-BH1-	3113-BH1-	3113-BH1-	3113-BH1-	
Sample Description			WS1	WS2			WS-210622	
Package Name	Parameter Name	Unit	8944411	272195	1207836	1514447	2668129	4017814
	Hexachlorobenzene	ug/L					<0.01	
	beta-BHC	μg/L					<0.05	
	Gamma-Hexachlorocyclohexane	μg/L					< 0.01	
	delta-BHC	μg/L					< 0.01	
	Heptachlor	μg/L					<0.01	
	Aldrin	μg/L					<0.01	
	Heptachlor Epoxide	μg/L					< 0.01	
	Oxychlordane	μg/L					<0.05	
	gamma-Chlordane	μg/L					<0.1	
	op'-DDE	μg/L					< 0.01	
	Endosulfan I	μg/L					< 0.002	
	alpha - chlordane	μg/L					<0.05	
	pp'-DDE	μg/L					<0.05	
	Dieldrin	μg/L					<0.02	
	op'-DDD	μg/L					<0.05	
	Endrin	μg/L					<0.05	
	Endosulfan II	μg/L					< 0.002	
	pp'-DDD	μg/L					<0.05	
	op'-DDT	μg/L					<0.04	
	Endrin Aldehyde	μg/L					<0.05	
	Endosulfan Sulfate	μg/L					<0.05	
	pp'-DDT	μg/L					<0.05	
	Endrin Ketone	μg/L					<0.05	
	Methoxychlor	μg/L					<0.04	
	, Mirex	μg/L					<0.05	
	тсмх	%					73.00	
	Decachlorobiphenyl	%					85.00	
	Trifluralin	μg/L		<1.0				
	Simazine	μg/L		<1.0				
	Atrazine	μg/L		<0.5				
Triazine Pesticides	Metribuzin	μg/L		<0.25				
Indzine Pesticides	Prometryne	μg/L		<0.25				
	Metolachlor	μg/L		<0.11				
	Alachlor	μg/L		<0.5				
	Cyanazine	μg/L		<1.0				
	2,4-D	μg/L			<0.5		<0.5	
	2,4,5-T	μg/L			<0.5		<0.5	
	2,4,5-TP	μg/L			<0.5		<0.5	
	Dicamba	μg/L			<0.5		<0.5	
	Dichlorprop	μg/L			<0.5		<0.5	
	Dinoseb	μg/L			<0.5		<0.5	
	Picloram	μg/L			<0.5		<0.5	
Phenoxy Acid	Diclofop-methyl	μg/L			<0.5		<0.5	
Herbicides	2,3,4,6-Tetrachlorophenol	μg/L			<0.5		<0.5	
i lei bicides	2,4-Dichlorophenol	μg/L			<0.2		<0.2	
	2,4,5-Trichlorophenol	μg/L			<0.5		<0.5	
	2,4,6-Trichlorophenol	μg/L			<0.5		<0.5	
	Bromoxynil	μg/L			<0.3		<0.3	
	МСРА	ug/L			<5.0		<5.0	
	МСРР	μg/L			<5.0		<5.0	
	Pentachlorophenol	μg/L			<0.1		<0.1	

Table 1 Groundwater chemistry for BH1 (page 4 of 4).

Workorder No. 18K399778 19K479456 20K614700 20K658687 21K767498 22K913584 Date Sampled 20-Oct-18 11-Jun-19 16-Jun-20 28-Sep-20 06/24/2021 06/23/2022 3113-3113-3113-3113-3113-3113-FMW10-FMW10-FMW10-WS- FMW10-WS- FMW10-WS-Sample Description WS1 WS2 200616 200928 210624 220623 Package Name Parameter Name Unit 9640943 272177 1207843 1514448 2672614 4028196 7.42 7.45 7.53 pН 7.40 7.23 °C 9.80 9.90 Temperature 8.90 10.30 8.10 NTU Turbidity 25.50 9.60 4.73 0.05 **Field Paramaters Electrical Conductivity** umho/cm 501.40 607.60 485.10 450.00 473.20 **Dissolved Oxygen** mg/L 9.57 8.40 8.34 5.60 Temperature (DO Meter) °Ċ 8.04 8.09 7.87 рΗ 8.11 Reactive Silica as SiO2 mg/L 10.00 7.10 7.60 9.30 mg/L Chloride 38.00 47.00 53.00 33.00 Fluoride mg/L <0.12 <0.12 <0.12 <0.12 Sulphate mg/L 20.00 4.00 6.00 4.00 Alkalinity mg/L 207.00 161.00 133.00 172.00 True Color TCU <5 8.00 10.00 6.45 Turbidity NTU 340.00 44.60 45.10 < 0.5 Electrical Conductivity umho/cm 520.00 504.00 459.00 489.00 0.29 Nitrate + Nitrite as N mg/L 0.69 0.28 0.18 Nitrate as N mg/L 0.69 0.29 0.28 0.18 Nitrite as N < 0.05 <0.05 < 0.05 < 0.05 mg/L Ammonia as N mg/L 0.06 0.04 0.05 < 0.03 Total Organic Carbon mg/L 1.50 1.90 1.40 1.80 Ortho-Phosphate as P mg/L < 0.01 < 0.01 0.01 0.02 **Total Sodium** mg/L 25.60 33.60 28.60 Total Potassium 2.00 1.30 1.50 mg/L **Total Calcium** 75.50 61.20 60.70 mg/L **Total Magnesium** mg/L 8.10 6.00 6.30 **Dissolved Sodium** mg/L 29.20 Standard Water **Dissolved Potassium** mg/L 1.30 Analysis 60.80 **Dissolved** Calcium mg/L **Dissolved Magnesium** mg/L 6.00 Bicarb. Alkalinity (as CaCO3) 207.00 161.00 133.00 172.00 mg/L Carb. Alkalinity (as CaCO3) mg/L <10 <10 <10 <10 Hydroxide mg/L <5 <5 <5 <5 Calculated TDS mg/L 297.00 251.00 237.00 238.00 Hardness mg/L 222.00 178.00 178.00 177.00 Langelier Index (@20C) NA 0.67 0.46 0.15 0.43 Langelier Index (@ 4C) NA 0.35 0.14 -0.17 0.11 Saturation pH (@ 20C) NA 7.44 7.63 7.72 7.61 Saturation pH (@ 4C) NA 7.76 7 95 8.04 7.93 Anion Sum 5.68 4 65 4.30 4 4 7 me/L 4.83 Cation sum 5.61 5.05 4.84 me/L % Difference/ Ion Balance % 0.60 4.10 5.90 4.00 Bromide mg/L Conductivity uS/cm ug CaCO3/L Total Hardness (calc) Total Kjeldahl Nitrogen as N mg/L Total Kjeldahl Nitrogen mg/L **Dissolved Organic Carbon** mg/L % UVT UVT (Water) UV Transmittance **Total Aluminum** 11100.00 304.00 ug/L **Total Antimony** <2 ug/L <2 Total Arsenic ug/L 6.00 <2 Total Barium ug/L 97.00 34.00 Total Bervllium ug/L <2 <2 Total Bismuth ug/L <2 <2

10.00

0.15

27.00

17.00

ug/L

ug/L

ug/L

ug/L

7.66

9.40

0.16

7.80

7.53

7.40

24.00

<0.12

3.00

122.00

18.40

1.60 323.00

0.23

0.23

<0.05

17.60

1.40

0.01

17.70

0.66

36.30

3.49

<10

<5

122.00

182.00

105.00

-0.44

-0.76

7.97

8.29 3.20

4.15

13.00

5.00

2.00

1.00

< 0.017

347.20

Table 2 Groundwater chemistry for FMW10 (page 1 of 4).

Total Boron

Total Cobalt

Total Cadmium

Total Chromium

Table 2 Groundwater chemistry for FMW10 (page 2 of 4).

/orkorder No. ate Sampled			18K399778 20-Oct-18	19K479456 11-Jun-19	20K614700 16-Jun-20	20K658687 28-Sep-20	21K767498 06/24/2021	
			3113-	3113-	3113-	3113-	3113-	3113-
ample Description			FMW10-	FMW10-	FMW10-WS	FMW10-WS-	FMW10-WS-	FMW10-
			WS1	WS2	200616	200928	210624	22062
ackage Name	Parameter Name	Unit	9640943	272177	1207843	1514448	2672614	402819
	Total Copper	ug/L	52.00			3.00		
	Total Iron	ug/L	19400.00			844.00		
	Total Lead	ug/L	9.80			0.90		
Total Metals	Total Manganese	ug/L	1270.00			89.00		
	Total Molybdenum	ug/L	<2			<2		
	Total Nickel	ug/L	26.00			4.00		
	Total Phosphorous	mg/L	_					
	Total Selenium	ug/L	<1			<1		
	Total Silver	ug/L	<0.1			<0.1		
	Total Strontium	ug/L	151.00			113.00		
	Total Thallium	ug/L	0.10			<0.1		
	Total Tin	ug/L	<2			<2		
	Total Titanium	ug/L	948.00			24.00		
	Total Uranium	ug/L	1.20			0.80		
	Total Vanadium	ug/L	31.00			<2		
	Total Zinc	ug/L	43.00			<5		
	Total Mercury	ug/L		<0.026		<0.026		
	Sulphide as Hydrogen Sulphide Calc.	mg/L						
	Total Calcium							
	Total Lithium							
	Dissolved Aluminum	ug/L	15.00	<5	<5	<5	<5	1
	Dissolved Antimony	ug/L	<2	<2	<2		<2	-
	Dissolved Arsenic	ug/L	<2	<2	<2		<2	
	Dissolved Barium	ug/L	35.00	30.00	26.00		32.00	2
	Dissolved Beryllium	ug/L	<2	<2	3.00	<2	<2	<
	Dissolved Bismuth	ug/L	<2	<2	<2		<2	
	Dissolved Boson	ug/L	7.00	6.00	<5	6.00		<
	Dissolved Cadmium	ug/L	<0.09	<0.09	0.28	< 0.09	<0.017	
	Dissolved Chromium	ug/L	5.00	3.00	3.00		4.00	
	Dissolved Cobalt	ug/L	<1	<1	<1		<1	<
	Dissolved Copper	ug/L	<2	<2	<2		<2	
	Dissolved Iron	ug/L	<50	<50	<50			
	Dissolved Lead	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<
	Dissolved Lithium	ug/L	-0.5	-0.5	×0.5	-0.5	(0.5	
	Dissolved Manganese		112.00	<2	3.00	<2	<2	
Dissolved Metals	Dissolved Molybdenum	ug/L ug/L	<2	<2	3.00 <2		<2	
	Dissolved Nickel	ug/L	<2	<2				
	Dissolved Phosphorus	mg/L	<0.02	<0.02	3.00 <0.02		<0.02	
	Dissolved Selenium	ug/L	<0.02	<0.02			<0.02	
	Dissolved Selenium Dissolved Silicon	ug/L ug/L	<1	<1	1.00	<1	<1	
	Dissolved Silicon Dissolved Silver	-	0.20	-0.1	-0.1	-0.1	-0.1	
	Dissolved Silver Dissolved Strontium	ug/L	0.20	<0.1	<0.1	<0.1	<0.1	0
		ug/L	150.00	101.00			119.00	8
	Dissolved Thallium Dissolved Tin	ug/L	<0.1	<0.1	<0.1		<0.1	<
		ug/L	<2	<2				
	Dissolved Titanium	ug/L	<2	<2				
	Dissolved Uranium	ug/L	1.00	0.80				
	Dissolved Vanadium	ug/L	<2	<2				
	Dissolved Zinc	ug/L	<5	14.00	<5	<5	<5	
	Dissolved Zirconium	ug/L			.0.000	.0.000	.0.020	
	Dissolved Mercury	ug/L			< 0.026	< 0.026	< 0.026	<0
	Biochem. Oxy. Demand, 5 Day (BOD5)	mg/L						
Other Inorganics	Biochem. Oxy. Demand, 5 Day (BOD5) Chem. Oxy. Demand	mg/L mg/L						
Other Inorganics		-						
Other Inorganics	Chem. Oxy. Demand	mg/L	-0.001	-0.001	-0.004		-0.001	
Other Inorganics		-	<0.001 <0.001	<0.001 <0.001	<0.001 <0.001		<0.001 <0.001	

Table 2 Groundwater chemistry for FMW10 (page 3 of 4).

Workorder No.			18K399778	19K479456	20K614700	20K658687	21K767498	22K913584
Date Sampled			20-Oct-18	11-Jun-19	16-Jun-20			06/23/2022
			3113-	3113-	3113-	3113-	3113-	3113-
Sample Description			FMW10-	FMW10-	FMW10-WS	FMW10-WS	FMW10-WS	FMW10-WS-
			WS1	WS2	200616	200928	210624	220623
Package Name	Parameter Name	Unit	9640943	272177	1207843	1514448	2672614	4028196
	Xylene (Total)	mg/L	<0.002	<0.001			<0.001	
	C6-C10 (less BTEX)	mg/L	<0.01	<0.01	<0.01		<0.01	
	>C10-C16 Hydrocarbons	mg/L	<0.05	<0.05	<0.05		<0.05	
Atlantic RBCA Tier 1	>C16-C21 Hydrocarbons	mg/L	<0.10	<0.05	<0.05		<0.05	
Hydrocarbons	>C21-C32 Hydrocarbons	mg/L	<0.1	<0.01			<0.01	
	Modified TPH (Tier 1)	mg/L	<0.1	<0.1			< 0.05	
	Resemblance Comment		NR	NR			NR	
	Return to Baseline at C32		Y	Y			Y	
	Isobutylbenzene - EPH	%	110.00	100.00			105.00	
	Isobutylbenzene - VPH	%	76.00	84.00			88.00	
	n-Dotriacontane - EPH	%	114.00	121.00	101.00		105.00	
	1-Methylnaphthalene	ug/L						
	2-Methylnaphthalene	ug/L						
	Acenaphthene	ug/L						
	Acenaphthylene	ug/L						
	Acridine	ug/L						
	Anthracene	ug/L						
	Benzo(a)anthracene	ug/L						
	Benzo(a)pyrene	ug/L						
	Benzo(b)fluoranthene	ug/L						
	Benzo(e)pyrene	ug/L						
	Benzo(ghi)perylene	ug/L						
Polycyclic Aromatic	Benzo(k)fluoranthene	ug/L						
Hydrocarbons (PAH)	Chrysene	ug/L						
	Dibenzo(a,h)anthracene	ug/L						
	Fluoranthene	ug/L						
	Fluorene	ug/L						
	Indeno(1,2,3-cd)pyrene	ug/L						
	Naphthalene	ug/L						
	Perylene	ug/L						
	Phenanthrene	ug/L						
	Pyrene	ug/L						
	Quinoline	ug/L						
	Nitrobenzene-d5	%						
	2-Fluorobiphenyl	%						
	Terphenyl-d14	%						
PCBs	Total PCB	ug/L						
Phenols	Total Phenolics	mg/L						
	Gamma-Hevachlorogyclohovana			-0.01	~0.01			
	Gamma-Hexachlorocyclohexane	μg/L μg/L		<0.01 <0.01				
	Heptachlor Aldrin			<0.01 <0.01				
	Heptachlor Epoxide	μg/L μg/L		<0.01 <0.01				
	Endosulfan	μg/L		<0.01				
	Chlordane	μg/L		<0.05 <0.04				
	DDE	μg/L		<0.04				
	DDD	μg/L		<0.01				
OC Pesticides	DDT	μg/L		<0.03				
	Dieldrin	μg/L		<0.04				
	Endrin	μg/L		<0.02				
	Methoxychlor	μg/L		<0.03				
	Hexachlorobenzene	ug/L		<0.04				
	Hexachlorobutadiene	ug/L		<0.01				
	Hexachloroethane	ug/L		<0.01				
	TCMX	%	'	64.00				
	Decachlorobiphenyl	%		91.00				
	r - 7							
	alpha-BHC	μg/L					<0.01	
		-	-					

Norkorder No. Date Sampled			18K399778 20-Oct-18 3113-	19K479456 11-Jun-19 3113-	20K614700 16-Jun-20 3113-		21K767498 06/24/2021 3113-	
Sample Description			FMW10- WS1	FMW10- WS2	FMW10-WS- 200616	FMW10-WS- 200928	FMW10-WS- 210624	FMW10-W 220623
Package Name	Parameter Name	Unit	9640943	272177	1207843	1514448	2672614	4028196
	Hexachlorobenzene	ug/L					<0.01	
	beta-BHC	μg/L					<0.05	
	Gamma-Hexachlorocyclohexane	μg/L					<0.01	
	delta-BHC	μg/L					<0.01	
	Heptachlor	μg/L					<0.01	
	Aldrin	μg/L					<0.01	
	Heptachlor Epoxide	μg/L					<0.01	
	Oxychlordane	μg/L					<0.05	
	gamma-Chlordane	μg/L					<0.1	
	op'-DDE	μg/L					<0.01	
	Endosulfan I	μg/L					<0.002	
	alpha - chlordane	μg/L					<0.05	
	pp'-DDE	μg/L					<0.05	
	Dieldrin	μg/L					<0.02	
	op'-DDD	μg/L					<0.05	
	Endrin	μg/L					<0.05	
	Endosulfan II	μg/L					<0.002	
	pp'-DDD	μg/L					<0.05	
	op'-DDT	μg/L					<0.04	
	Endrin Aldehyde	μg/L					<0.05	
	Endosulfan Sulfate	μg/L					<0.05	
	pp'-DDT	μg/L					<0.05	
	Endrin Ketone	μg/L					<0.05	
	Methoxychlor	μg/L					<0.04	
	Mirex	μg/L					<0.05	
	TCMX	%					83.00	
	Decachlorobiphenyl	%	-				89.00	
	Trifluralin	μg/L		<1.0				
	Simazine	μg/L		<1.0				
	Atrazine	μg/L		<0.5				
Triazine Pesticides	Metribuzin	μg/L		< 0.25				
	Prometryne	μg/L		< 0.25				
	Metolachlor	μg/L		<0.11				
	Alachlor	μg/L		< 0.5				
	Cyanazine	μg/L		<1.0				
	2,4-D	μg/L			<0.5		<0.5	
	2,4,5-T	μg/L			<0.5		<0.5	
	2,4,5-TP	μg/L			<0.5		<0.5	
	Dicamba	μg/L			<0.5		<0.5	
	Dichlorprop	μg/L			<0.5		<0.5	
	Dinoseb	μg/L			<0.5		<0.5	
	Picloram	μg/L			<0.5		<0.5	
Phenoxy Acid	Diclofop-methyl	μg/L			<0.5		<0.5	
Herbicides	2,3,4,6-Tetrachlorophenol	μg/L			<0.5		<0.5	
	2,4-Dichlorophenol	μg/L			<0.2		<0.2	
	2,4,5-Trichlorophenol	μg/L			<0.5		<0.5	
	2,4,6-Trichlorophenol	μg/L			<0.5		<0.5	
	Bromoxynil	μg/L			<0.3		<0.3	
	MCPA	ug/L			<5.0		<5.0	
	MCPP	μg/L			<5.0		<5.0	
	Pentachlorophenol	μg/L			<0.1		<0.1	
	DCAA	%			96.00		94.00	

Table 2 Groundwater chemistry for FMW10 (page 4 of 4).

Workorder No. Date Sampled Sample Description			18K399778 17-Oct-18 3113- FMW11-	19K481097 15-Jun-19 3113 - FMW11-	20K613477 11-Jun-20 3113-	21K767120 06/22/2021 3113- FMW11-WS-	3113-
Sample Description			WS1	WS2	200611	210622	220622
Package Name	Parameter Name	Unit	9640945	283773	1201479	2668128	4017815
	рН т		6.58	6.59	6.76	6.78	6.7
	Temperature Turbidity	°C NTU	7.30	7.40 28.80	6.30 2.75	7.20 0.03	8.6 0.8
Field Paramaters	Electrical Conductivity	umho/cm	1278.00	828.70	519.70	592.30	1015.0
	Dissolved Oxygen	mg/L		3.58	5.18	4.57	1.0
	Temperature (DO Meter)	°C	_				
	рН		7.39	7.36	7.51	7.61	7.3
	Reactive Silica as SiO2	mg/L	22.10	16.90	9.90	13.50	9.3
	Chloride	mg/L	83.00	42.00	12.00	18.00	49.0
	Fluoride	mg/L	<0.12	<0.12		<0.12	<0.3
	Sulphate	mg/L	2.00	3.00	4.00	3.00	3.0
	Alkalinity	mg/L	610.00	435.00	246.00	303.00	493.0
	True Color	TCU	12.00	<5	11.00	5.24	<5.0
	Turbidity	NTU	1900.00	85.30	17.10	<0.5	0.5
	Electrical Conductivity	umho/cm	1270.00	915.00	531.00	634.00	1109.0
	Nitrate + Nitrite as N	mg/L	0.12	<0.05	0.16	<0.05	0.0
	Nitrate as N	mg/L	0.12	<0.05	0.16		0.0
	Nitrite as N	mg/L	< 0.05	<0.05	<0.05	<0.05	<0.0
	Ammonia as N	mg/L	< 0.03	<0.03	< 0.03	< 0.03	<0.0
	Total Organic Carbon	mg/L	24.30	<0.5			8.9
	Ortho-Phosphate as P	mg/L	< 0.01	< 0.01			<0.0
	Total Sodium	mg/L	140.00	53.30			
	Total Potassium	mg/L	2.20	2.00			
	Total Calcium	mg/L	109.00	90.80			
	Total Magnesium	mg/L	44.20	26.60	17.00		
Standard Water	Dissolved Sodium	mg/L				19.30	101.0
Analysis	Dissolved Potassium	mg/L				1.40	22.3
	Dissolved Calcium	mg/L				64.30	2.0
	Dissolved Magnesium	mg/L	640.00	425.00	246.00	14.10	55.0
	Bicarb. Alkalinity (as CaCO3)	mg/L	610.00	435.00	246.00	303.00	493.0
	Carb. Alkalinity (as CaCO3)	mg/L	<10	<10	<10	<10	<1
	Hydroxide	mg/L	<5	<5	<5	<5	520 (
	Calculated TDS	mg/L	762.00	479.00	275.00	302.00	529.0
	Hardness	mg/L	454.00	336.00	251.00	219.00	344.0
	Langelier Index (@20C)	NA	0.54	0.30		0.26	0.4
	Langelier Index (@ 4C)	NA	0.22	-0.02		-0.06	0.0
	Saturation pH (@ 20C)	NA	6.85	7.06		7.35	6.9
	Saturation pH (@ 4C)	NA maga (l	7.17	7.38			7.2
	Anion Sum	me/L	14.60	9.95	5.35	6.63	11.3
	Cation sum	me/L	15.80	9.10		5.25	9.3
	% Difference/ Ion Balance	%	3.90	4.40	5.10	11.60	9.0
	Bromide	mg/L					
	Conductivity	uS/cm					
	Total Hardness (calc)	ug CaCO3/L					
	Total Kjeldahl Nitrogen as N	mg/L					
	Total Kjeldahl Nitrogen Dissolved Organic Carbon	mg/L mg/L					
· · · · · · · · · · · · · · · · · · ·							
UVT (Water)	UV Transmittance	% UVT					
	Total Aluminum	ug/L	23800.00				
	Total Antimony Total Arsenic	ug/L ug/L	<2 25.00				
	Total Barium	ug/L	437.00				
		US/L	437.00				

Table 3 Groundwater chemistry for FMW11 (page 1 of 5).

Workorder No. Date Sampled			18K399778 17-Oct-18 3113-	19K481097 15-Jun-19 3113 -	20K613477 11-Jun-20 3113-	21K767120 06/22/2021 3113-	22K912449 06/22/2022 3113-
Sample Description			FMW11- WS1	FMW11- WS2		FMW11-WS- 210622	
Package Name	Parameter Name	Unit	9640945	283773	1201479	2668128	4017815
	Total Bismuth	ug/L	<2				
	Total Boron	ug/L	33.00				
	Total Cadmium	ug/L	0.77				
	Total Chromium	ug/L	47.00				
	Total Cobalt	ug/L	38.00				
	Total Copper	ug/L	137.00				
	Total Iron	ug/L	48900.00				
	Total Lead	ug/L	32.40				
Total Metals	Total Manganese	ug/L	19700.00				
	Total Molybdenum	ug/L	<2				
	Total Nickel	ug/L	69.00				
	Total Phosphorous	mg/L					
	Total Selenium	ug/L	2.00				
	Total Silver	ug/L	0.10				
	Total Strontium	ug/L	324.00				
	Total Thallium	ug/L	0.20				
	Total Tin	ug/L	<2				
	Total Titanium	ug/L	1240.00				
	Total Uranium	ug/L	8.30 65.00				
	Total Vanadium Total Zinc	ug/L	149.00				
		ug/L	149.00	<0.026			
	Total Mercury Sulphide as Hydrogen Sulphide Calc.	ug/L mg/L		<0.020			
	Total Calcium	ilig/L					
	Total Lithium						
	Dissolved Aluminum	ug/L	<5	<5	<u>ر ج</u>		
	Dissolved Antimony	ug/L	<2	<2	<2	<2	<1.0
	Dissolved Arsenic	ug/L ug/L	<2 <2	<2 <2	<2 <2	<2 <2	<1.0 <1.0
	Dissolved Arsenic Dissolved Barium	ug/L ug/L ug/L	<2 <2 112.00	<2 <2 62.00	<2 <2 23.00	<2 <2 36.00	<1.0 <1.0 41.00
	Dissolved Arsenic Dissolved Barium Dissolved Beryllium	ug/L ug/L ug/L ug/L	<2 <2 112.00 <2	<2 <2 62.00 <2	<2 <2 23.00 <2	<2 <2 36.00 <2	<1.0 <1.0 41.00 <0.50
	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth	ug/L ug/L ug/L ug/L ug/L	<pre><2 <2 <2 112.00 <2 <2 <2 <2 <2 </pre>	<2 <2 62.00 <2 <2	<2 <2 23.00 <2 <2	<2 <2 36.00 <2 <2	<1.0 <1.0 41.00 <0.50 <2.0
	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron	ug/L ug/L ug/L ug/L ug/L ug/L	<pre><2 <</pre> <2 112.00 <2 <2 <20.00	<pre><2 <pre><2 62.00 <pre><2 <pre><pre><pre><pre><pre><pre><pre><pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre>	<pre><2 <2 23.00 <2 <2 <2 <2 <2 <2 <2 20.00</pre>	<pre><2 </pre> <pre><2 36.00 </pre> <pre><2 </pre> <pre></pre> <pre><!--</td--><td><1.0 <1.0 41.00 <0.50 <2.0 25.60</td></pre>	<1.0 <1.0 41.00 <0.50 <2.0 25.60
	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium	ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<pre><2 <</pre> 112.00 <2<2<20.00<0.31	<pre><2 <pre><2 62.00 <pre><2 <pre><2 28.00 <pre><20</pre></pre></pre></pre></pre>	<pre><2 <2 23.00 <2 <2 <2 20.00 <20.00 <0.017</pre>	<pre><2 <2 <36.00 <2 <2 <2 <13.00 <30.00 </pre>	<1.0 <1.0 41.00 <0.50 <2.0 25.60 <0.10
	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Chromium	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<pre><2 <p></p></pre>	<pre><2 <2 <62.00 <2 <2 <2 <2 28.00 <0.09 <9.00 </pre>	<pre><2 <2 <2 23.00 <2 <2 20.00 <0.017 <7.00</pre>	<pre><2 <2 <36.00 <2 <2 <2 <13.00 <0.017 <0.017 <7.00</pre>	<1.0 <1.0 41.00 <0.50 <2.0 25.60 <0.10 <2.0
	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Chromium Dissolved Cobalt	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<pre><2 </pre> 2 112.00 2 20.00 0.31 18.00 4.00	<pre><2 <2 <62.00 <2 <2 <2 28.00 <0.09 <9.00 <1 </pre>	<pre><2 <2 23.00 <2 20.00 <0.017 7.00 <1</pre>	<pre><2 <2 <36.00 <2 <2 <13.00 <0.017 <0.017 <7.00 <1</pre>	<1.0 <1.0 41.00 <0.50 <2.0 25.60 <0.10 <2.0 <0.50
	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Chromium Dissolved Cobalt Dissolved Copper	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<2 <2 112.00 <2 20.00 0.31 18.00 4.00 6.00	<pre><2 <2 <62.00 <2 <2 <2 28.00 <0.09 <9.00 <1 2.00</pre>	<pre><2 <2 <2 23.00 <2 <2 20.00 <0.017 7.00 <1 <2 </pre>	<pre><2 <2 36.00 <2 42 <2 13.00 <0.017 7.00 <1 <2 </pre>	<1.0 <1.0 41.00 <0.50 <2.0 25.60 <0.10 <2.0 <0.50 <1.0
	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Chromium Dissolved Cobalt Dissolved Copper Dissolved Iron	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<pre><2 </pre> 2 112.00 22 20.00 0.31 18.00 4.00 6.00	<pre><2 <pre><2 <pre><2 <pre>62.00 <pre><2 <pre><2 <pre><2 <pre><2 <pre><2 <pre><2 <pre><2 <pre><2 <pre><pre><pre><pre><pre><pre><pre><pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre>	<pre><2 <2 <23.00 <2 <2 <2 <2 <20.00 <0.017 <7.00 <1 <2 <2 <50</pre>	<pre><2 <2 36.00 <2 40 <3000 <2 3000 <0.017 <7.00 <1 <2 <2 <50</pre>	<1.0 <1.0 41.00 <0.50 <2.0 25.60 <0.10 <2.0 <0.50 <1.0 <10
	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Chromium Dissolved Cobalt Dissolved Copper Dissolved Iron Dissolved Lead	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<2 <2 112.00 <2 20.00 0.31 18.00 4.00 6.00	<pre><2 <2 <62.00 <2 <2 <2 28.00 <0.09 <9.00 <1 2.00</pre>	<pre><2 <2 <23.00 <2 <2 <2 <2 <2 <20.00 <0.017 <7.00 <1 <2 <2 <50</pre>	<pre><2 <2 36.00 <2 42 <2 13.00 <0.017 7.00 <1 <2 </pre>	<1.0 <1.0 41.00 <0.50 <2.0 25.60 <0.10 <2.0 <0.50 <1.0 <10
	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Chromium Dissolved Cobalt Dissolved Cobalt Dissolved Iron Dissolved Lead Dissolved Lithium	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<2 <2 112.00 <2 20.00 0.31 18.00 4.00 6.00 <50 <0.5	<2 <2 62.00 <2 28.00 <0.09 9.00 <1 2.00 <50 <0.5	<2 <2 23.00 <2 <2 20.00 <0.017 7.00 <1 <2 <50 <0.5	<2 <2 36.00 <2 <2 13.00 <0.017 7.00 <1 <2 <50 <0.5	<1.0 <1.0 41.00 <0.50 <2.0 25.60 <0.10 <2.0 <0.50 <1.0 <10 <0.50
Dissolved Metals	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Chromium Dissolved Cobalt Dissolved Copper Dissolved Iron Dissolved Lead Dissolved Lithium Dissolved Manganese	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<2 <2 112.00 <2 20.00 0.31 18.00 4.00 6.00 <50 <0.5	<pre><2 <pre><pre><pre><pre><pre><pre><pre><pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre>	<pre><2 <2 <23.00 <22 <20.00 <0.017 7.00 <1 <2 <50 <0.5 </pre>	<pre><2 <2 <36.00 <22 <2 13.00 <0.017 7.00 <1 <2 <50 <0.5 </pre>	<1.0 <1.0 41.00 <0.50 <2.0 25.60 <0.10 <2.0 <0.50 <1.0 <10 <0.50
Dissolved Metals	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Chromium Dissolved Cobalt Dissolved Cobalt Dissolved Copper Dissolved Iron Dissolved Lead Dissolved Lithium Dissolved Manganese Dissolved Molybdenum	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<2 <2 112.00 <2 2 20.00 0.31 18.00 4.00 6.00 <50 <50 <50 <2	<2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2	<2 <2 <23.00 <2 <2 <20.00 <0.017 <0.017 <0.017 <1 <2 <50 <0.5 <15.00 <2	<2 <2 36.00 <2 <2 13.00 <0.017 7.00 <1 <2 <50 <0.5 208.00 <2	<1.0 <1.0 41.00 <0.50 <2.0 25.60 <0.10 <2.0 <0.50 <1.0 <10 <0.50 <5.70 <2.0
Dissolved Metals	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Cadmium Dissolved Chromium Dissolved Cobalt Dissolved Cobalt Dissolved Copper Dissolved Iron Dissolved Lead Dissolved Lithium Dissolved Manganese Dissolved Molybdenum Dissolved Nickel	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<2 <2 112.00 <2 <2 20.00 0.31 18.00 <4.00 <6.00 <50 <0.5 <0.5 <15500.00 <2 10.00	<pre><2 <2 <62.00 <2 <2 28.00 <0.09 9.00 <1 2.00 <50 <50 346.00 <2 10.00</pre>	<2 <2 <23.00 <2 <20.00 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017 <0.017	<2 <2 36.00 <2 <2 13.00 <0.017 7.00 <1 <2 <50 <0.5 208.00 <2 208.00	<1.0 <1.0 41.00 <0.50 <2.0 25.60 <0.10 <2.0 <0.50 <1.0 <10 <5.70 <2.0 <1.0
Dissolved Metals	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Chromium Dissolved Cobalt Dissolved Cobalt Dissolved Copper Dissolved Iron Dissolved Iron Dissolved Lead Dissolved Lithium Dissolved Manganese Dissolved Molybdenum Dissolved Nickel Dissolved Phosphorus	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<2 <2 112.00 <2 <2 20.00 0.31 18.00 <4.00 <6.00 <50 <0.5 <15500.00 <2 10.00 <0.02	<pre><2 <2 <2 62.00 <2 28.00 <0.09 9.00 <1 2.00 <50 <50 346.00 <2 10.00 <0.2</pre>	<pre><2 <2 <2 23.00 <2 2.000 <0.017 7.00 <1 <2 <50 <0.5 </pre>	2 36.00 22 36.00 20.017 7.00 41 42 50 50 208.00 22 208.00 22 208.00	<1.0 <1.0 41.00 <0.50 <2.0 25.60 <0.10 <2.0 <0.50 <1.0 <0.50 <1.0 <0.50 <1.0 <0.50 <1.0 <0.50
Dissolved Metals	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Cadmium Dissolved Cobalt Dissolved Cobalt Dissolved Copper Dissolved Copper Dissolved Iron Dissolved Iron Dissolved Lead Dissolved Lithium Dissolved Lithium Dissolved Manganese Dissolved Molybdenum Dissolved Nickel Dissolved Phosphorus Dissolved Selenium	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<2 <2 112.00 <2 <2 20.00 0.31 18.00 <4.00 <6.00 <50 <0.5 <0.5 <15500.00 <2 10.00	<pre><2 <2 <62.00 <2 <2 28.00 <0.09 9.00 <1 2.00 <50 <50 346.00 <2 10.00</pre>	<pre><2 <2 <2 23.00 <2 2.000 <0.017 7.00 <1 <2 <50 <0.5 </pre>	2 36.00 22 36.00 20.017 7.00 41 42 50 50 208.00 22 208.00 22 208.00	<1.0 <1.0 41.00 <0.50 <2.0 25.60 <0.10 <2.0 <0.50 <1.0 <0.50 <1.0 <0.50 <1.0 <0.50 <1.0 <0.50
Dissolved Metals	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Cadmium Dissolved Cobalt Dissolved Cobalt Dissolved Cobalt Dissolved Copper Dissolved Copper Dissolved Iron Dissolved Iron Dissolved Lithium Dissolved Lithium Dissolved Manganese Dissolved Manganese Dissolved Nickel Dissolved Nickel Dissolved Phosphorus Dissolved Selenium Dissolved Silicon	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<2 <2 112.00 <2 2 20.00 0.31 18.00 4.00 6.00 <50 <0.5 15500.00 <2 10.00 <0.2 2.00	<pre><2 <2 <2 62.00 <22 <28.00 <0.09 9.00 <11 2.00 <50 <50 346.00 <2 10.00 <0.02 1.00</pre>	<pre><2 <2 <2 23.00 <22 <20.00 <0.017 7.00 <11 <22 <50 <0.5 15.00 <22 3.00 <0.2 <1 </pre>	<pre><2 <2 36.00 <22 <36.00 <22 <13.00 <0.017 7.00 <11 <22 <50 <0.5 208.00 <22 <22 <20</pre>	<1.0 <1.0 41.00 <0.50 <2.0 25.60 <0.10 <2.0 <0.50 <1.0 <0.50 5.70 <2.0 <1.0 <0.05 <1.0
Dissolved Metals	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Cadmium Dissolved Cobalt Dissolved Cobalt Dissolved Cobalt Dissolved Copper Dissolved Copper Dissolved Iron Dissolved Iron Dissolved Lithium Dissolved Lithium Dissolved Lithium Dissolved Manganese Dissolved Molybdenum Dissolved Nickel Dissolved Phosphorus Dissolved Selenium Dissolved Silicon Dissolved Silicon	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<2 <2 112.00 <2 <2 20.00 0.31 18.00 <4.00 <6.00 <50 <0.5 15500.00 <2 10.00 <0.02 <0.01	<pre><2 <2 <2 62.00 <22 <28.00 <0.09 9.00 <11 2.00 <50 <50 346.00 <22 10.00 <0.02 1.00 <0.02 <1.00</pre>	<pre><2 <2 <2 23.00 <22 <20.00 <0.017 7.00 <1 <22 <50 <0.5 </pre>	<pre><2 <2 <36.00 <22 <36.00 <22 <13.00 <0.017 7.00 <1 <2 <50 <0.5 208.00 <22 <22 <0.02 <1 </pre>	<1.0 <1.0 <1.0 <0.50 <2.0 25.60 <0.10 <2.0 <1.0 <0.50 <1.0 <0.50 <1.0 <0.05 <1.0 <0.05 <1.0
Dissolved Metals	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Cadmium Dissolved Cobalt Dissolved Iron Dissolved Lithium Dissolved Manganese Dissolved Manganese Dissolved Manganese Dissolved Manganese Dissolved Manganese Dissolved Manganese Dissolved Manganese Dissolved Manganese Dissolved Manganese Dissolved Selenium Dissolved Silicon Dissolved Silicon Dissolved Siliver Dissolved Strontium	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<2 <2 112.00 <2 20.00 0.31 18.00 4.00 6.00 <50 <0.5 15500.00 <2 10.00 <0.02 <0.02 <0.1 <0.1 <254.00	<pre><2 <2 <2 62.00 <2 28.00 <0.09 9.00 <1 2.00 <50 <50 346.00 <2 10.00 <0.02 1.00 <0.02 1.00 </pre>	<2 <2 <23.00 <2 <20.00 <0.017 <0.017 <7.00 <1 <2 <50 <0.5 <15.00 <2 <3.00 <0.02 <1 <0.02 <1 <0.01 <0.01 <0.01 <0.01	<2 <2 36.00 <2 <36.00 <2 <0.017 <0.017 <0.017 <0.017 <0.01 <20.01 <208.00 <208.00 <22 <0.02 <10 <0.1 <0.1 <0.1 <0.1 <0.1	<1.0 <1.0 <1.0 <0.50 <2.0 25.60 <0.10 <2.0 <0.50 <1.0 <0.50 <1.0 <0.50 <1.0 <0.05 <1.0 <0.05 <1.0
Dissolved Metals	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Cadmium Dissolved Cobalt Dissolved Cobalt Dissolved Cobalt Dissolved Copper Dissolved Copper Dissolved Iron Dissolved Iron Dissolved Iron Dissolved Lithium Dissolved Lithium Dissolved Lithium Dissolved Manganese Dissolved Manganese Dissolved Molybdenum Dissolved Nickel Dissolved Nickel Dissolved Selenium Dissolved Selenium Dissolved Silicon Dissolved Silicon Dissolved Strontium Dissolved Thallium	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<2 <2 112.00 <2 20.00 0.31 18.00 <0.01 <0.02 <0.02 <0.02 <0.01 <0.1	<pre><2 <2 <2 62.00 <2 28.00 <0.09 9.00 <1 2.00 <50 <50 346.00 <2 10.00 <0.02 1.00 <0.02 1.00 <0.02 <0.1 169.00 <0.1 </pre>	<2 <2 <2 <2 <2 <2 <20.00 <0.017 <0.017 <7.00 <1 <2 <50 <0.5 <0.5 <15.00 <2 <3.00 <0.02 <1 <0.02 <0.1 <120.00 <0.1	<2 <2 36.00 <2 <2 13.00 <0.017 <0.017 <0.017 <0.017 <0.01 <20 <20 <208.00 <20 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00 <208.00	<1.0 <1.0 <1.0 <0.50 <2.0 25.60 <0.10 <2.0 <0.50 <1.0 <0.50 <1.0 <0.05 <1.0 <0.05 <1.0 <0.05 <1.0 <0.00 <0.10 (1.0 0 <0.00 <0.10 (1.0 0 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.000 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <00 <
Dissolved Metals	Dissolved Arsenic Dissolved Barium Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Cadmium Dissolved Cobalt Dissolved Iron Dissolved Lithium Dissolved Manganese Dissolved Manganese Dissolved Manganese Dissolved Manganese Dissolved Manganese Dissolved Manganese Dissolved Manganese Dissolved Nickel Dissolved Nickel Dissolved Silicon Dissolved Silicon Dissolved Silicon Dissolved Siliver Dissolved Thallium Dissolved Tin	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<2 <2 <2 <2 <2 <20.00 <31 <8.00 <31 <8.00 <4.00 <6.00 <50 <0.5 <15500.00 <2 <10.00 <0.02 <0.02 <0.02 <0.02 <0.02 <0.02 <0.02 <0.02 <0.02 <0.02 <0.02 <0.02 <0.02 <0.01 <24 <0.1 <2 <0.1 <2	<pre><2 <2 <2 62.00 <2 28.00 <0.09 9.00 <1 2.00 <50 <50 346.00 <2 10.00 <0.12 1.00 <0.02 1.00 <0.12 <0.1 169.00 <0.1 <22</pre>	<2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <2 <300 <1 <2 <300 <2 <3.00 <0.02 <1 <0.02 <0.1 <0.1 <0.1 <2 <0.1 <2	<2 <2 36.00 <2 <36.00 <2 <0.017 <0.017 <0.017 <0.01 <1 <20 <20 <0.02 <10 <0.1 <0.1 <2 <0.1 <21	<1.0 <1.0 <1.0 41.00 <2.0 25.60 <0.10 <2.0 <1.0 <1.0 <0.50 <1.0 <0.55 <1.0 <0.05 <1.0 <0.05 <1.0 <0.05 <1.0 <0.00 <0.10 (162.00 <0.30 <2.0
Dissolved Metals	Dissolved Arsenic Dissolved Barium Dissolved Beryllium Dissolved Bismuth Dissolved Bismuth Dissolved Boron Dissolved Cadmium Dissolved Cadmium Dissolved Cobalt Dissolved Cobalt Dissolved Cobalt Dissolved Copper Dissolved Copper Dissolved Iron Dissolved Iron Dissolved Iron Dissolved Lithium Dissolved Lithium Dissolved Lithium Dissolved Manganese Dissolved Manganese Dissolved Molybdenum Dissolved Nickel Dissolved Nickel Dissolved Selenium Dissolved Selenium Dissolved Silicon Dissolved Silicon Dissolved Strontium Dissolved Thallium	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	<2 <2 112.00 <2 20.00 0.31 18.00 <0.01 <0.02 <0.02 <0.02 <0.01 <0.1	<pre><2 <2 <2 62.00 <2 28.00 <0.09 9.00 <1 2.00 <50 <50 346.00 <2 10.00 <0.02 1.00 <0.02 1.00 <0.02 <0.1 169.00 <0.1 </pre>	<2 <2 <2 <2 <2 <2 <2 <20.00 <0.017 <0.017 <7.00 <1 <2 <50 <0.5 <15.00 <2 <3.00 <0.02 <11 <0.02 <0.1 <0.1 <0.1 <2 <2 <2 <2 <2	<2 <2 36.00 <2 <36.00 <2 <0.017 <0.017 <0.017 <0.01 <1 <20 <20 <0.02 <10 <0.1 <0.1 <22 <0.1 <22 <0.1 <22 <0.1 <22 <0.1 <22 <22 <20 <21 <22 <22 <20 <21 <22 <22 <20 <21 <22 <21 <22 <21 <22 <22 <22 <22 <22 <22 <22 <22 <22 <22 <22 <22 <22 <22 <22 <22 <22 <22 <22 <22 <22 <22 <22 <22	9.20 <1.0 <1.0 <1.0 <0.50 <2.0 25.60 <0.10 <2.0 <1.0 <1.0 <0.50 <1.0 <0.50 <1.0 <0.05 <1.0 <0.05 <1.0 <0.05 <1.0 <0.05 <1.0 <0.05 <1.0 <0.05 <1.0 <0.05 <1.0 <0.05 <1.0 <0.05 <1.0 <0.05 <1.0 <0.05 <1.0 <0.05 <1.0 <0.05 <1.0 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05

Table 3 Groundwater chemistry for FMW11 (page 2 of 5).

Workorder No.			18K399778	19K481097	20K613477		22K912449
Date Sampled			17-Oct-18	15-Jun-19	11-Jun-20	06/22/2021	
			3113-	3113 -	3113-	3113-	3113-
Sample Description			FMW11-	FMW11-		FMW11-WS-	
			WS1	WS2	200611	210622	220622
Package Name	Parameter Name	Unit	9640945	283773	1201479	2668128	4017815
	Dissolved Zinc	ug/L	<5	7.00	<5	<5	<5.0
	Dissolved Zirconium	ug/L					
	Dissolved Mercury	ug/L			< 0.026	< 0.026	<0.026
	Biochem. Oxy. Demand, 5 Day (BOD5)	mg/L	_				
Other Inorganics	Chem. Oxy. Demand	mg/L					
	Benzene	mg/L	<0.001	<0.001	<0.001	<0.001	
	Toluene	mg/L	< 0.001	<0.001	<0.001	<0.001	
	Ethylbenzene	mg/L	< 0.001	<0.001	<0.001	<0.001	
	Xylene (Total)	mg/L	< 0.002	<0.001	<0.001	<0.001	
	C6-C10 (less BTEX)	mg/L	< 0.01	<0.01	<0.01	<0.01	
	>C10-C16 Hydrocarbons	mg/L	< 0.05	<0.05	<0.05	<0.05	
Atlantic RBCA Tier 1	>C16-C21 Hydrocarbons	mg/L	<0.10	<0.05	<0.05	<0.05	
Hydrocarbons	>C21-C32 Hydrocarbons	mg/L	<0.1	<0.01	<0.01		
	Modified TPH (Tier 1)	mg/L	<0.1	<0.1			
	Resemblance Comment		NR	NR			
	Return to Baseline at C32		Y	Y		Y	
	Isobutylbenzene - EPH	%	108.00	87.00	101.00	94.00	
	Isobutylbenzene - VPH	%	70.00	103.00			
	n-Dotriacontane - EPH	%	115.00	89.00	102.00	86.00	
	1-Methylnaphthalene	ug/L					
	2-Methylnaphthalene	ug/L					
	Acenaphthene	ug/L					
	Acenaphthylene	ug/L					
	Acridine	ug/L					
	Anthracene	ug/L					
	Benzo(a)anthracene	ug/L					
	Benzo(a)pyrene	ug/L					
	Benzo(b)fluoranthene	ug/L					
	Benzo(e)pyrene	ug/L					
	Benzo(ghi)perylene	ug/L					
Polycyclic Aromatic	Benzo(k)fluoranthene	ug/L					
Hydrocarbons (PAH)	Chrysene	ug/L					
	Dibenzo(a,h)anthracene	ug/L					
	Fluoranthene	ug/L					
	Fluorene	ug/L					
	Indeno(1,2,3-cd)pyrene	ug/L					
	Naphthalene	ug/L					
	Perylene	ug/L					
	Phenanthrene	ug/L					
	Pyrene	ug/L					
	Quinoline	ug/L					
	Nitrobenzene-d5	%					
	2-Fluorobiphenyl Terphenyl-d14	% %					
PCBs	Total PCB	ug/L	-				
Phenols	Total Phenolics	mg/L					
	Gamma-Hexachlorocyclohexane	μg/L		<0.01	<0.01		
	Heptachlor	μg/L		< 0.01	<0.01		
	Aldrin	μg/L		< 0.01	< 0.01		

Table 3 Groundwater chemistry for FMW11 (page 3 of 5).

Workorder No. Date Sampled			18K399778 17-Oct-18	19K481097 15-Jun-19	20K613477 11-Jun-20	21K767120 06/22/2021	
Date Sampled			3113-	3113 -	3113-	3113-	3113-
Sample Description			FMW11-	FMW11-		FMW11-WS-	
			WS1	WS2	200611	210622	220622
Package Name	Parameter Name	Unit	9640945	283773	1201479	2668128	4017815
0	Heptachlor Epoxide	μg/L	-	< 0.01	< 0.01		
	Endosulfan	μg/L		< 0.05			
	Chlordane	μg/L		< 0.04			
	DDE	μg/L		< 0.01			
	DDD	μg/L		< 0.05			
OC Pesticides	DDT	μg/L		<0.04			
	Dieldrin	μg/L		<0.02			
	Endrin	μg/L		<0.02			
	Methoxychlor	μg/L		<0.03			
	Hexachlorobenzene	ug/L		<0.04			
	Hexachlorobutadiene	ug/L		<0.01			
	Hexachloroethane			<0.01			
	TCMX	ug/L					
		%		73.00			
	Decachlorobiphenyl	%		72.00	92.00		
	alpha-BHC	μg/L				< 0.01	
	Hexachlorobenzene	ug/L				<0.01	
	beta-BHC	μg/L				<0.05	
	Gamma-Hexachlorocyclohexane	μg/L				<0.01	
	delta-BHC	μg/L				<0.01	
	Heptachlor	μg/L				< 0.01	
	Aldrin	μg/L				<0.01	
	Heptachlor Epoxide	μg/L				<0.01	
	Oxychlordane	μg/L				<0.05	
	gamma-Chlordane	μg/L				<0.1	
	op'-DDE	μg/L				<0.01	
	Endosulfan I	μg/L				<0.002	
	alpha - chlordane	μg/L				< 0.05	
	pp'-DDE	μg/L				< 0.05	
	Dieldrin	μg/L				< 0.02	
	op'-DDD	μg/L				< 0.05	
	Endrin	μg/L				< 0.05	
	Endosulfan II	μg/L				<0.002	
	pp'-DDD	μg/L				< 0.05	
	op'-DDT	μg/L				<0.03	
	Endrin Aldehyde	μg/L μg/L				<0.04	
	Endosulfan Sulfate					<0.05	
		μg/L				< 0.05	
	pp'-DDT	μg/L					
	Endrin Ketone	μg/L				< 0.05	
	Methoxychlor	μg/L				< 0.04	
	Mirex	μg/L				< 0.05	
	TCMX Decachlorobiphenyl	% %				106.00 109.00	
	Trifluralin				<1.0		
	Simazine	μg/L μg/L			<1.0 <1.0		
					<1.0 <0.5		
	Atrazine Motribuzin	μg/L					
Triazine Pesticides	Metribuzin	μg/L			<0.25		
	Prometryne	μg/L			<0.25		
	Metolachlor	μg/L			<0.11		
	Alachlor	μg/L			< 0.5		
	Cyanazine	μg/L	-		<1.0		
	2,4-D	μg/L		<0.5		<0.5	
	2,4,5-T	μg/L		<0.5		<0.5	

Table 3 Groundwater chemistry for FMW11 (page 4 of 5).

Workorder No. Date Sampled			18K399778 17-Oct-18	19K481097 15-Jun-19	20K613477 11-Jun-20		22K912449 06/22/2022
Sample Description	n		3113- FMW11-	3113 - FMW11-	3113- FMW11-WS- 200611	3113- - FMW11-WS- 210622	
Package Name	Parameter Name	Unit	WS1 9640945	WS2 283773	1200811 1201479	210622 2668128	220622 4017815
	2,4,5-TP	μg/L		<0.5		<0.5	
	Dicamba	μg/L		<0.5		<0.5	
	Dichlorprop	μg/L		<0.5		<0.5	
	Dinoseb	μg/L		<0.5		<0.5	
	Picloram	μg/L		<0.5		<0.5	
Phenoxy Acid	Diclofop-methyl	μg/L		<0.5		<0.5	
Herbicides	2,3,4,6-Tetrachlorophenol	μg/L		<0.5		<0.5	
Terbicides	2,4-Dichlorophenol	μg/L		<0.2		<0.2	
	2,4,5-Trichlorophenol	μg/L		<0.5		<0.5	
	2,4,6-Trichlorophenol	μg/L		<0.5		<0.5	
	Bromoxynil	μg/L		<0.3		<0.3	
	MCPA	ug/L		<5.0		<5.0	
	MCPP	μg/L		<5.0		<5.0	
	Pentachlorophenol	μg/L		<0.1		<0.1	
	DCAA	%		75.00		76.00	

Table 3 Groundwater chemistry for FMW11 (page 5 of 5).

APPENDIX 1.1

Report FFC-NL-3168-007

Active Storage and Water Quality Noels Pond, Muddy Pond and Gull (Mine) Pond Stephenville, NL





Active Storage and Water Quality Noels Pond, Muddy Pond and Gull (Mine) Pond Stephenville, NL

(FFC File 3168)

Prepared by:

Fracflow Consultants Inc. 154 Majors Path St. John's, NL A1A 5A1

Submitted to:

World Energy GH2 87 Water Street St. John's, NL A1C 1A5



December 16, 2022



Executive Summary

INTRODUCTION

World Energy GH2 is planning to develop a plant for hydrogen production within the municipal boundaries of the Town of Stephenville. World Energy GH2 is considering obtaining the required supply of industrial water from two sources, Gull (Mine) Pond (the primary source) and from Muddy Pond-Noels Pond (the secondary source). Two of the three ponds are located within the Warm Creek drainage basin.

Muddy Pond-Noels Pond is fed by the Warm Creek drainage basin which has an area of approximately $65,000,000 \text{ m}^2$ that is similar to the Blanche Brook drainage Basin from which the Town of Stephenville draws its potable water supply. The stream flow data from Blanche Brook, Harry's River and Barachois Brook, given their similar underlying geology, provide the available information with which to determine the precipitation runoff relationships and baseflow in Warm Creek once corrections for the differences in area were completed.

Based on the historical precipitation records for the Stephenville area and the runoff records for Harry's River, the average discharge from Warm Creek into Noels Pond was calculated at51.8 m³/min (Fracflow, 2022a). The calculated flow exceedance calculations show that this flow is exceeded approximately 80% of the time. The projected World Energy GH2 industrial water demand is 40 m³/min or greater and this flow is exceeded for approximately 90% of a typical year.

Muddy Pond is connected to Noels Pond via two large culverts that are currently submerged under Carolina Avenue. A large diameter pipeline was constructed between Muddy Pond-Noels Pond and Gull (Mine) Pond. This pipeline was used to provide additional industrial water to the original Liner Board Mill and subsequently to the Abitibi Mill operations. The records (The Water Resources Atlas of Newfoundland) show that the previous Abitibi Mill site operators used an average of more than 4,200 USgpm of industrial water that was drawn from the Muddy Pond-Noels Pond system through the large diameter pipeline between Muddy Pond-Noels Pond and Gull (Mine) Pond. Noels Pond was also part of the original source of the potable water for the Town of Stephenville, but was decommissioned in the early 2000s in favour of a groundwater source in the Blanche Brook drainage basin. It is estimated that more than 10,000 USgpm of water were being withdrawn from Noels Pond when both the Town of Stephenville and the industrial users were withdrawing water from Noels Pond.

ACTIVE STORAGE

The active storage in the industrial water supply system when all three ponds, Noels Pond, Muddy Pond and Gull (Mine) Pond, are combined is conservatively estimated at 47 days at the projected peak demand of 40 m³ per minute. It is expected that completion of the planned HEC-HMS analysis of the Warm Creek drainage basin, which will take into account the additional

storage and buffering that is provided by the ponds in the upper part of the drainage basin, will produce a longer period of active storage in which the required flows needed to support fish passage into and through Noels Pond will be maintained.

INDUSTRIAL WATER SUPPLY INFRASTRUCTURE

The details of the individual components of the existing industrial water transfer infrastructure will be presented in a separate companion report. An order of magnitude estimate of the cost to re-establish and upgrade the overall industrial water supply infrastructure, including the gravity feed structure from Gull (Mine) Pond to the old Abitibi plant site will be provided. General comments are provided below.

The infrastructure on Gull (Mine) Pond is relatively old, but the earthen berm is still retaining water in the pond with limited evidence of seepage through the berm. The cleaning of the canal, road repairs, minor ditching and culvert installation, and extensions on the cribwork are a few of the changes needed with regards to developing the full active water storage.

The infrastructure on Noels Pond is in relatively good shape, and the refurbishing and upgrading work is limited to installing water control gates, a fish ladder or bypass, and removing driftwood debris.

The infrastructure on Muddy Pond is relatively old, but was well maintained during the Mill's operation. However, the key infrastructure for controlling the storage in Muddy Pond is located on Noels Pond, and water is conveyed through the culverts beneath Carolina Avenue. The pump house and equipment, located on Muddy Pond, will require significant upgrading and refurbishing.

WATER QUALITY

A sonar survey was conducted on each of the three industrial water supply ponds and bathymetry maps have been constructed from that data, showing in addition the areas that would be flooded by raising the water level in each pond by 1 m and then by 2 m. During this sonar survey, water and pond sediment samples were collected from three locations in each pond. The water and sediment samples were analyzed for a range of components that were considered to be relevant to the intake water for the proposed World Energy GH2 Hydrogen plant.

The general water chemistry for the water samples from all three ponds met FWAL guidelines, except for three noted exceedances. There was no detectable BTEX/TPH when using low-level detection analysis.

The pond sediments do show some detectable levels of petroleum hydrocarbons in the form of TPHs and PAHs.

The measured TPH values in the pond sediments are considered to reflect organic signatures but confirmation would require successive silica gel clean-ups to remove all or most residual organic material. The visible sheen observed with sample MP02-SS1 suggests that the measured TPH values reflect hydrocarbon signatures, rather than organics. Also selected metals such as selenium are most likely related to the discharge of deep bedrock ground water as noted in other parts of this ground water flow system.

The Total Suspended Solids levels are expected to vary on a seasonal basis.

Table of Contents

Executive Summary	i
List of Figures	v
List of Tables	v
List of Appendices	vi
1.0 INTRODUCTION	1-1
1.1 Report Structure	1-1
2.0 INDUSTRIAL WATER SUPPLY STORAGE INFRASTRUCTURE	2-1
2.1 Gull (Mine) Pond	2-1
2.2 Noels Pond	2-2
2.3 Muddy Pond	2-3
3.0 WATER QUALITY AND POND SEDIMENT CHEMISTRY DATA	3-1
3.1 Standard Water Analysis, Organic Carbon and Total Solids	3-1
3.2 Total Metals in Water	3-1
3.3 Dissolved Metals in Water	3-1
3.4 Petroleum Hydrocarbons in Water	
3.5 Volatile Organic Compounds in Water	
3.6 Petroleum Hydrocarbons in Soil	
3.7 Polycyclic Aromatic Hydrocarbons in Soil	3-3
4.0 CONCLUSIONS AND OBSERVATIONS	4-1
5.0 REFERENCES	5-1

List of Figures

Figure 1	General location map of the project site in Stephenville, NL.
Figure 2	Location map showing source of industrial water supply, Stephenville, NL.
Figure 3a	Gull (Mine) Pond related infrastructure and sampling locations.
Figure 3b	Noels Pond related infrastructure and sampling locations.
Figure 3c	Muddy Pond related infrastructure and sampling locations.
Figure 4a	Contour map of the bathymetry data for Gull (Mine) pond and outlines of the
	pond water surface with 1 m and 2 m increases in water depth.
Figure 4b	Contour map of the bathymetry data for Noels Pond and outlines of the pond
	water surface with 1 m and 2 m increases in water depth.
Figure 4c	Contour map of the bathymetry data for Muddy Pond and outlines of the pond
	water surface with 1 m and 2 m increases in water depth.
Figure 5	Flow duration curve for Warm Creek calculated from values from Harry's River (02YJ001).
	(0210001).

List of Tables

Table 1	Analytical results of standard water analysis in water samples from Gull (Mine)
Table 2	Pond, Stephenville, NL.
Table 2	Analytical results of standard water analysis in water samples from Noels Pond, Stephenville, NL.
Table 3	Analytical results of standard water analysis in water samples from Muddy Pond,
	Stephenville, NL.
Table 4	Analytical results of total metals in water samples for Gull (Mine) Pond,
14010	Stephenville, NL.
Table 5	Analytical results of total metals in water samples for Noels Pond, Stephenville,
	NL.
Table 6	Analytical results of total metals in water samples for Muddy Pond, Stephenville,
	NL.
Table 7	Analytical results of dissolved metals in water samples for Gull (Mine) Pond,
	Stephenville, NL.
Table 8	Analytical results of dissolved metals in water samples for Noels Pond,
	Stephenville, NL.
Table 9	Analytical results of dissolved metals in water samples for Muddy Pond,
T_{-1} , 1, 1, 1, 0	Stephenville, NL.
Table 10	Analytical results of BTEX/TPH in water samples for Gull (Mine) Pond,
Table 11	Stephenville, NL. Analytical results of BTEX/TPH in water samples for Noels Pond, Stephenville,
	NL.
Table 12	Analytical results of BTEX/TPH in water samples for Muddy Pond, Stephenville,
	NL.

Table 13	Analytical results of Volatile Organic Compounds in water samples from Gull
	(Mine) Pond, Muddy Pond and Noels Pond, Stephenville, NL.
Table 14	Analytical results of BTEX/TPH in soil samples for Gull (Mine) Pond,
	Stephenville, NL.
Table 15	Analytical results of BTEX/TPH in soil samples for Noels Pond, Stephenville,
	NL.
Table 16	Analytical results of BTEX/TPH in soil samples for Muddy Pond, Stephenville,
	NL.
Table 17	Analytical results of Polycyclic Aromatic Hydrocarbons in soil samples from Gull
	(Mine) Pond, Stephenville, NL.
Table 18	Analytical results of Polycyclic Aromatic Hydrocarbons in soil samples from
	Noels Pond, Stephenville, NL.
Table 19	Analytical results of Polycyclic Aromatic Hydrocarbons in soil samples from
	Muddy Pond, Stephenville, NL.

List of Appendices

Appendix A Water and Pond Sediment Chemistry Data

1.0 INTRODUCTION

World Energy GH2 is planning to develop a plant for hydrogen production within the municipal boundaries of the Town of Stephenville (**Figure 1**). World Energy GH2 is considering obtaining the required supply of industrial water from two sources (**Figure 2**), Gull (Mine) Pond (the primary source) and from Muddy Pond-Noels Pond (the secondary source). Two of the three ponds are located within the Warm Creek drainage basin.

Muddy Pond-Noels Pond is fed by the Warm Creek drainage basin which has an area of approximately 65,000,000 m² that is similar to the Blanche Brook drainage basin. The stream flow data from Blanche Brook, Harry's River and Barachois Brook, given their similar underlying geology, provide the available information with which to determine the precipitation runoff relationships and baseflow in Warm Creek once corrections for the differences in area were completed.

Muddy Pond is connected to Noels Pond via two large culverts that are currently submerged under Carolina Avenue. A large diameter pipeline was constructed between Muddy Pond-Noels Pond and Gull (Mine) Pond (**Figure 2**). This pipeline was used to provide additional industrial water to the original Linerboard Mill and subsequently to the Abitibi Mill operations. The records (The Water Resources Atlas of Newfoundland) show that the previous Abitibi Mill site operators used an average of more than 4,200 USgpm of industrial water that was drawn from the Muddy Pond-Noels Pond system through a large diameter pipeline between Muddy Pond-Noels Pond and Gull (Mine) Pond.

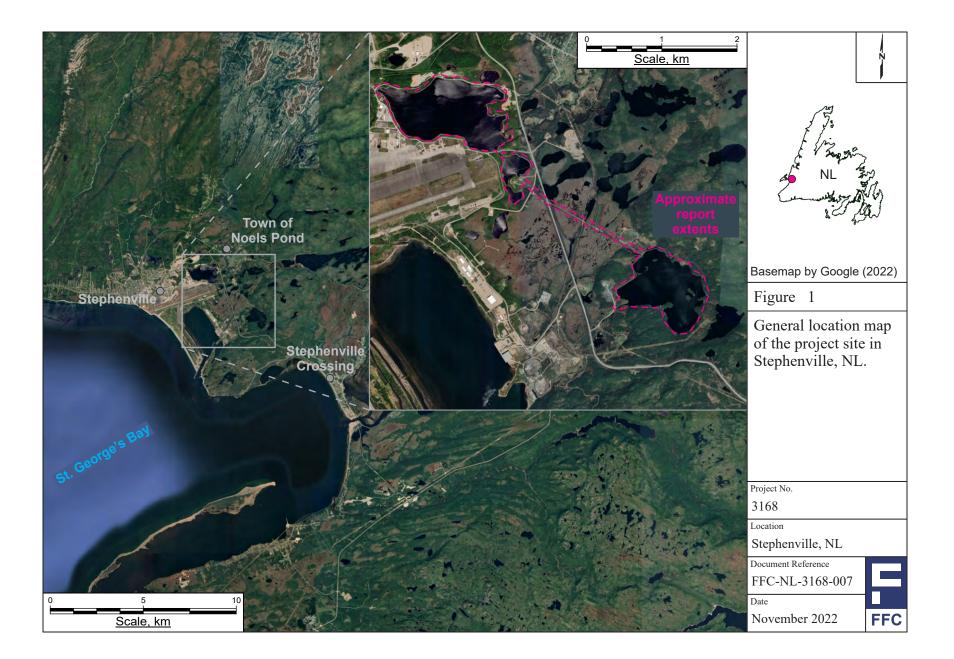
1.1 Report Structure

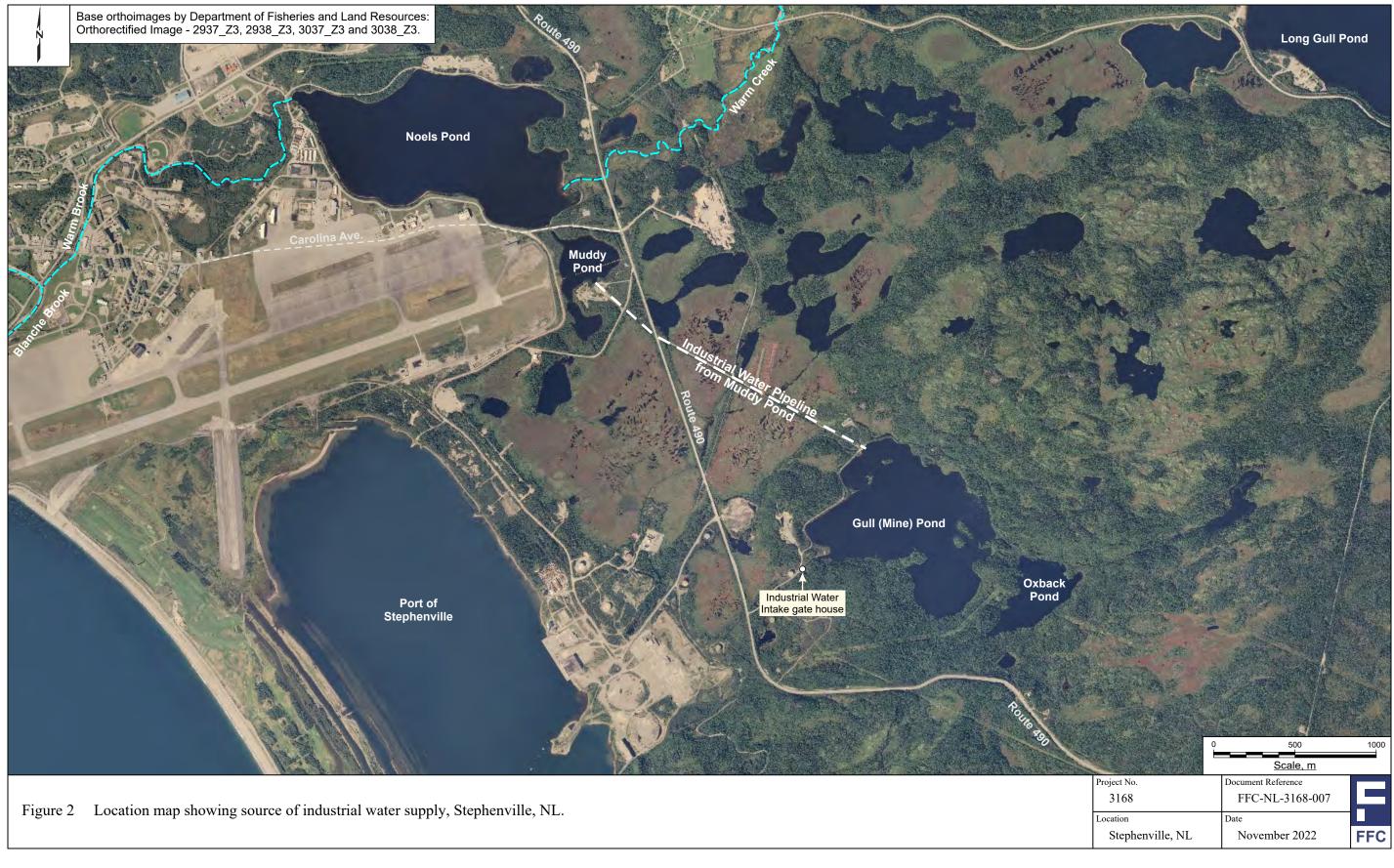
This Report has been structured with a brief overview of each component of the industrial water infrastructure that has been summarized from another report (Fracflow, 2022b). **Figure 2** shows the main components of the old Linerboard Mill-Abitibi Mill industrial water supply system.

The industrial water secondary supply intake area at Muddy Pond consists of an old pump house from the Linerboard Mill time period that pumped water from Muddy Pond to Gull (Mine) Pond via a pipeline. This pipeline contains a surge standpipe that is located adjacent to Route 490. A new pump house was constructed by the Town of Stephenville in 2012 to draw water from Gull (Mine) Pond to supply the current industrial water users. Muddy Pond is connected to Noels Pond by two culverts, in an excavated and covered channel, that run underneath Carolina Avenue (locally known as The Ramp). These two culverts are located about 3 m below the current water level in Muddy Pond.

The main source of additional industrial water for the proposed project is the Warm Creek drainage basin, which flows into Noels Pond through Warm Creek. Noels Pond is the former

source of potable water for the Town of Stephenville, but was decommissioned in the early 2000s in favour of a groundwater source in the Blanche Brook drainage basin.





2.0 INDUSTRIAL WATER SUPPLY STORAGE INFRASTRUCTURE

2.1 Gull (Mine) Pond

The primary industrial water source area, Gull (Mine) Pond, which has a small drainage basin capture area, contains the main components (**Figure 3a**) of the industrial water supply system. The components highlighted in this Report are the water delivery pipeline and the overflow structure in the northwest area of Gull (Mine) Pond, and water intake channel at the southwest end of Gull (Mine) Pond. The water intake channel area was constructed by excavating in bedrock a 30 m long, 3 to 4 m wide, channel from Gull (Mine) Pond to the intake structure (**Figure 3a**).

The Gull (Mine) Pond drainage basin or the area that contributes flow to Gull (Mine) Pond is approximately $3,556,000 \text{ m}^2$. Gull (Mine) Pond itself has a surface area of approximately $673,900 \text{ m}^2$ and Oxback Pond/Upper Mine Pond has a surface area of $129,000 \text{ m}^2$.

Fracflow conducted a preliminary assessment in 2022 (Fracflow, 2022a) using historical records and climate data that concluded that an average of 750 USgpm of industrial water could be supplied by Gull (Mine) Pond using existing infrastructure. **Figure 4a** includes the bathymetry data for Gull (Mine) Pond using 2 m contour intervals that were generated from a sonar survey of the pond.

This bathymetry map provided the basis for estimating active storage in the primary source pond. The surface area of the pond is $653,614 \text{ m}^2$, when we exclude the area of the islands in the pond. **Figure 4a** shows the 1 m and the 2 m contour lines around Gull (Mine) Pond relative to the zero water level contour line recorded on September 22, 2022. The water depth in the intake channel entrance was approximately 2.5 m on September 22, 2022. To maintain peak flow of up to 40 m^3 /min, the depth of the water in the channel should not drop below 1 m, which would produce an acceptable water velocity of 0.16 m/s in open channel flow.

The active storage of Gull (Mine) Pond is limited by the minimum depth of water though the intake channel, and the maximum depth of water before overtopping the overflow structure. From its measured level in September 22, 2022 the water level can fall by 1.5 m and rise by 0.5 m with some minor changes to the outflow structure. There are no shallow water areas that would produce orphaned/isolated areas of the pond (**Figure 4a**) if the pond level was lowered by 1.5 m. However, a number of shallow shoals may be exposed during variations in the active storage water levels that would connect the four small islands on the pond to the shoreline.

Using a working estimate of 2 m for active storage, the computed active storage is 1,307,228 m³, which provides approximately 22.7 days of supply at peak water usage of 40 m³/min. Note that this is a conservative estimate since it does not include any inflow from precipitation or inflow from the stream that channels flow from the drainage basin capture area into and from active storage in Oxback Pond which is estimated to have a combined average flow of 3 m³/min.

Figure 4a shows that Gull (Mine) Pond has a number of deep water zones, up to 20 and 28 m of depth. Assuming an average water depth of 6 m, the passive storage, below the 2 m active storage with the raised outflow control structure, is estimated to be approximately 3,500,000 m³, which would not be accessible without significantly deepening the intake channel and creating temporarily orphaned areas of the pond. However, if submersible pumps are placed in a deeper section of the pond, a large percentage of this passive storage can be converted to active storage.

The outflow structure (**Figure 3a**) is a wooden benched structure, with a wide rectangular shape, constructed integrally with the berm and captures any flow from Gull (Mine) Pond and directs it into a small watercourse. The water once flowed through a metal grate with 25 mm openings that prevented wood/logs from entering the overflow structure. This metal grate will need to be replaced to establish the full extent of the active storage. The downstream watercourse starts as a small pool surrounded by the outflow structure, and is directed beneath Mine Pond Road by three culverts. Downstream beaver activity has raised the water level in the area. This watercourse ultimately flows through streams that cross under Route 490, and through culverts across and through the Port's property, which is known to be sensitive to flooding.

2.2 Noels Pond

Figure 3b shows the location of the outflow control structure on Noels Pond, the culvert connection between Noels Pond and Muddy Pond, and the location of the Warm Creek discharge into Noels Pond. **Figure 4b** provides a bathymetry map of Noels Pond, based on the water level in the pond on September 21, 2022 with the extended boundaries of the pond shown for given incremental rises in water level.

The main water outflow control structure in Noels Pond is the two broad crested weirs sections on either side of three flow control gates. This control structure was installed in the 1970*s*, and is downstream from a flood-sensitive area. The upstream and downstream faces of the weir extend from the continuous concrete base that extends across the area. The gates on the control structure have been removed, leaving a nylon sealing strip on the east-most and west-most gates. Some granular materials have also been deposited downstream of these strips.

At its September 21, 2022 water level, the area of Noels Pond was $1,078,321 \text{ m}^2$. The outflow channel from Noels Pond is partly filled in with sand and gravel that somewhat controls the outflow from Noels Pond since the flow control gates have been removed. The bottom of the outflow gate was 0.40 m below the observed main pond water level. Once the flow control gates have been restored, the pond level can be increased by 1.2 m before the water overflows the broad crested weir and/or the flow control gates.

Assuming an active storage of 1.2 m, before the pond water would overflow the broad crested weir or the reduced water levels would impede fish passage through an engineered control

structure (fish way), would provide approximately 22 days of active storage in Noels Pond at a withdrawal flow rate of 40 m³ per minute. This calculation assumes that inflow from Warm Creek into Noels Pond is sufficient to maintain an acceptable outflow from Noels Pond to meet fish migration requirements.

Based on the historical precipitation records for the Stephenville area and the runoff records for Harry's River, the average discharge from Warm Creek into Noels Pond was calculated at 51.8 m³/min (Fracflow, 2022b). The calculated flow exceedance shows in **Figure 5** that this flow is exceeded approximately 80% of the time.

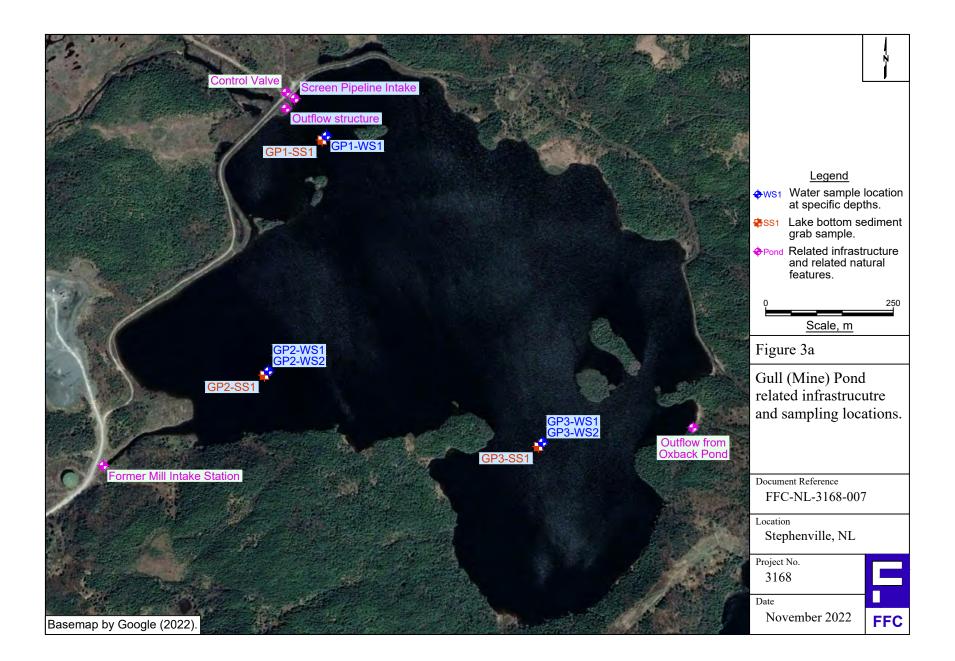
2.3 Muddy Pond

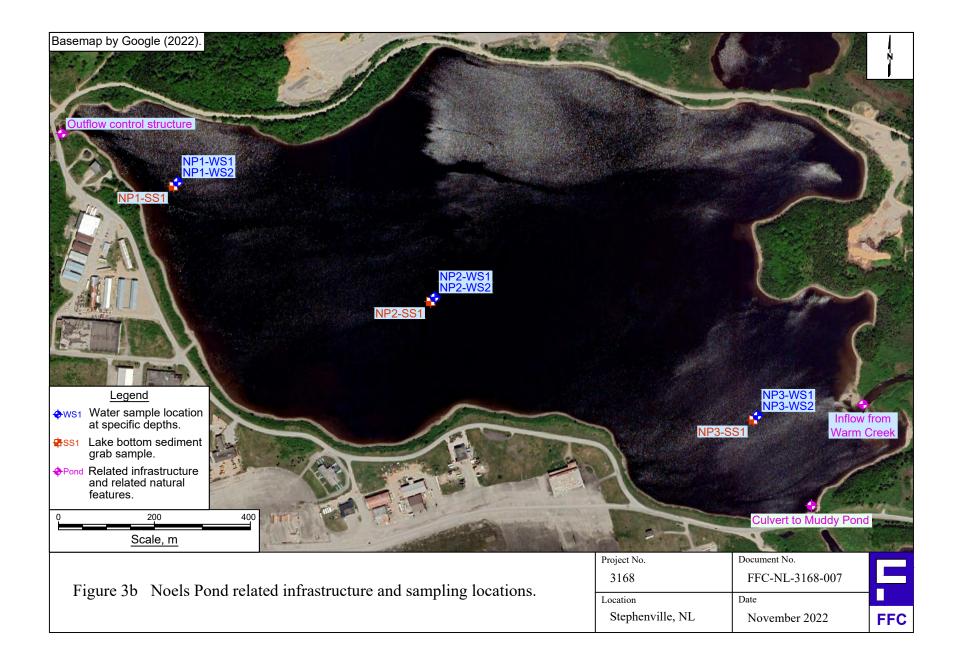
Carolina Avenue, known more commonly as "the Ramp access," crosses a narrow 40 m section between Noels Pond and Muddy Pond. Beneath this section of the paved highway there are two culverts that cross beneath the road (**Figure 3c**). Muddy Pond (**Figure 4c**) has a surface area of 133,552 m² and its water level is controlled by the water level in Noels Pond since the ponds are connected. The top of the culverts was approximately 3 m below the water level on September 21, 2022. At peak water demand, each culvert would have to carry 20 m³/min and the flow would be from a submerged intake to a submerged outflow.

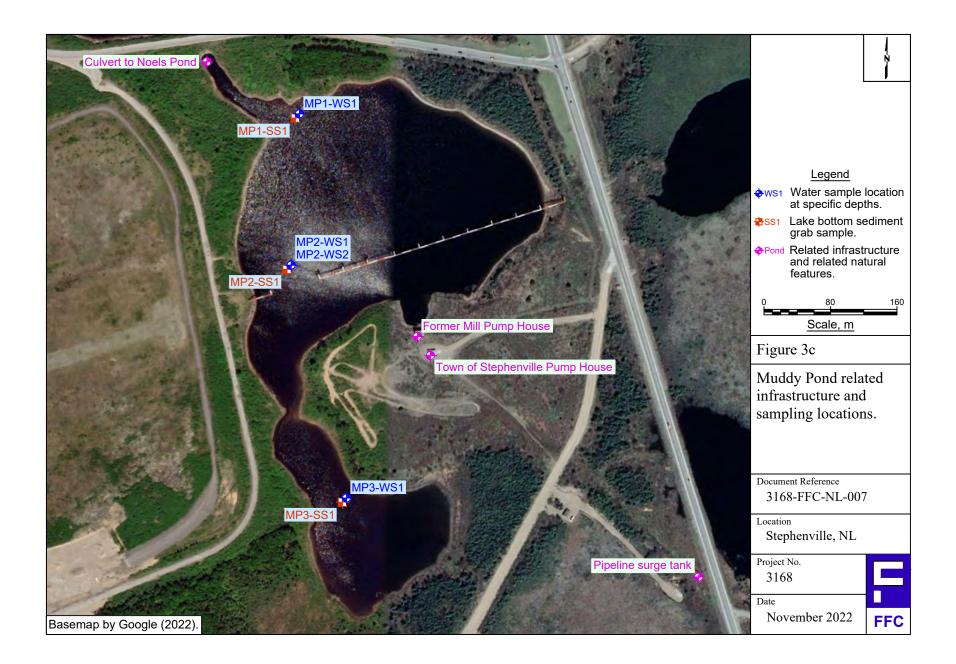
The active storage in Muddy Pond has to be limited to an acceptable range of water levels in Noels Pond and also by the depth below the water level of the bottom of the wet wells from which water is pulled and pumped to Gull (Mine) Pond. Applying the same 1.2 m water level change for active storage as applied to Noels Pond provides a conservative estimate of active storage of 2.3 days at a withdrawal rate of 40 m³/min.

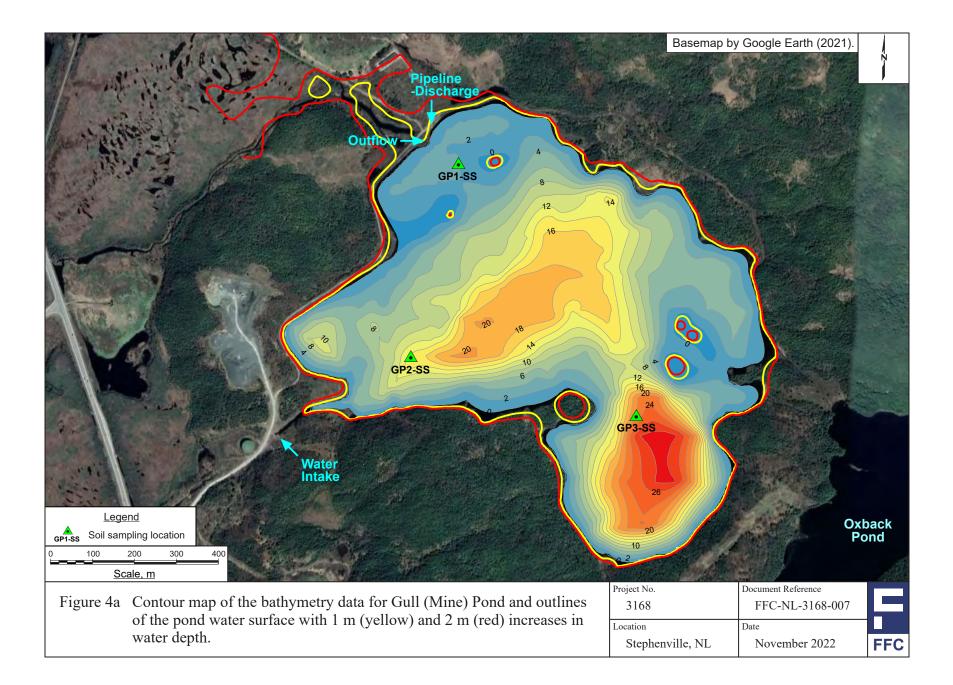
The southern portion of Muddy Pond is a very shallow area with a gentle sloping bottom that was difficult to navigate with a flat bottomed boat during the sonar survey. Large portions of shoreline are exposed with small changes in water levels during the summer months. The active storage water level in this pond is 1.2 m above the current level, so isolated bodies of water should not form in the shallow areas unless water levels are drawn down below the proposed active storage level.

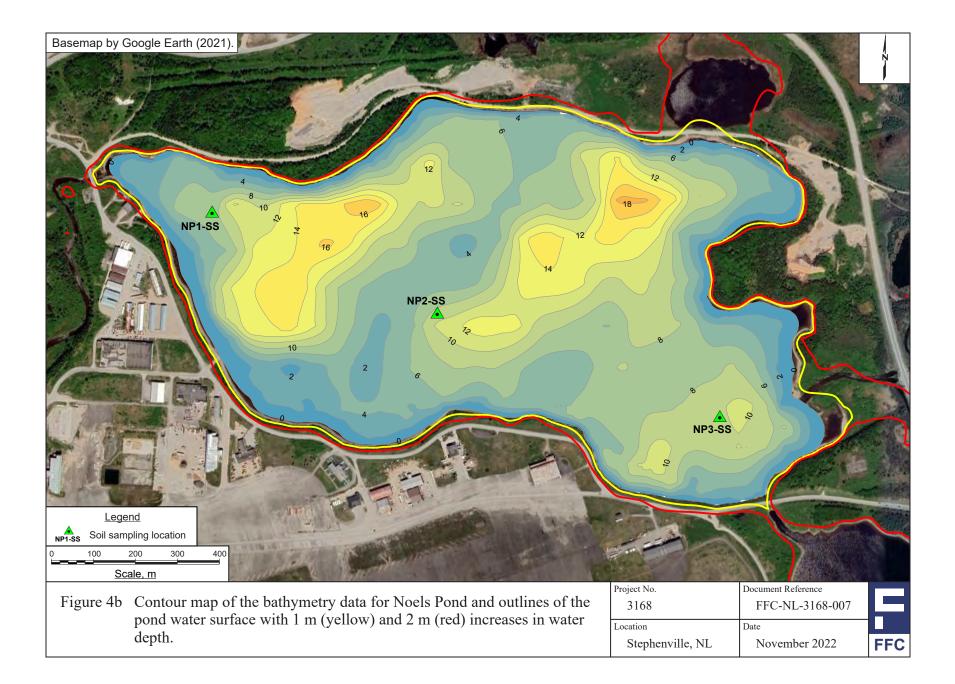
The active storage in the industrial water supply system when all three ponds, Noels Pond, Muddy Pond and Gull (Mine) Pond, are combined is conservatively estimated at 47 days at the projected peak demand of 40 m³ per minute. It is expected that completion of the planned HEC-HMS analysis of the Warm Creek drainage basin, which will take into account the additional storage and buffering that is provided by the ponds in the upper part of the drainage basin, will produce a longer period of active storage in which the required flows needed to support fish passage will be maintained.

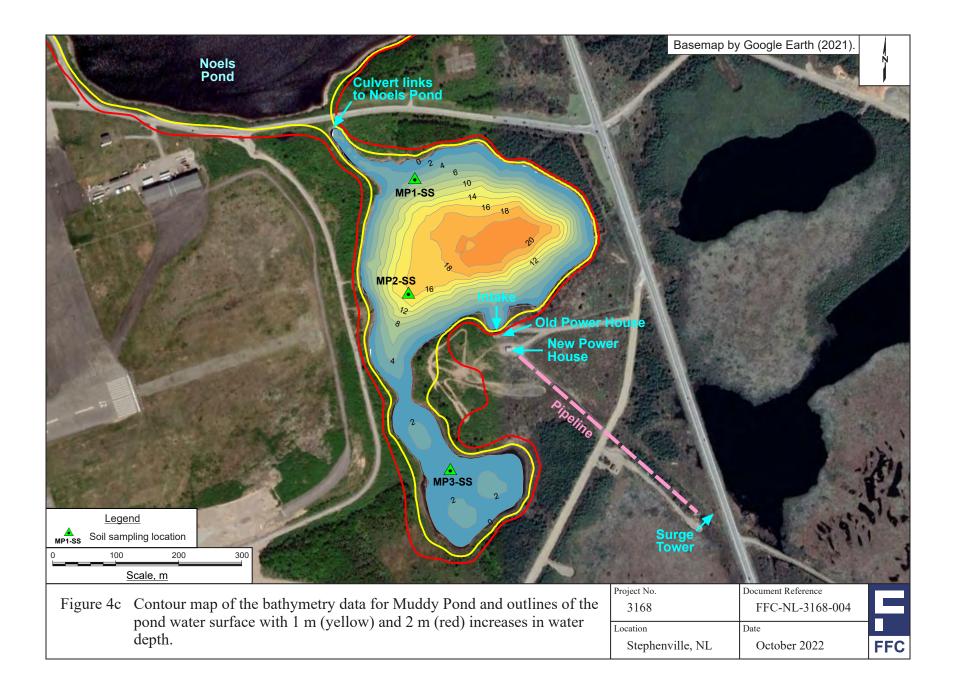


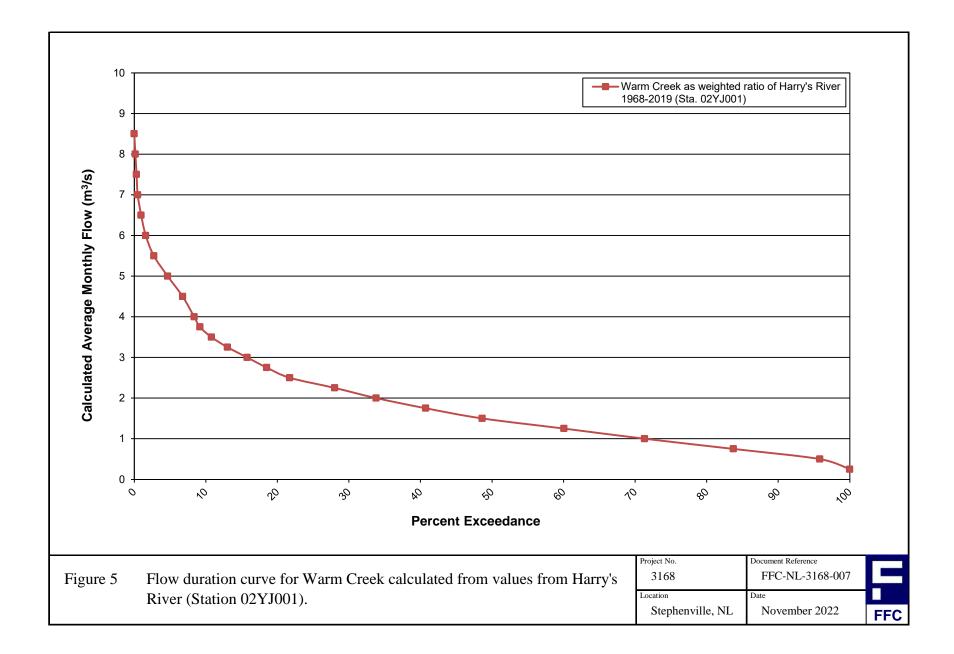












3.0 WATER QUALITY AND POND SEDIMENT CHEMISTRY DATA

Water samples and pond sediment samples were collected at three locations in each pond. The locations were selected with adequate spacing to provide a representation of the overall water chemistry. The water sample data have been compared against CCME's Freshwater Aquatic Life (FWAL) guidelines based on the assumption that the ponds are fish habitat. At each location, the water was sampled at 1.5 m below the water surface, and 1.5 m above the pond bottom except for three locations (GP01, MP01, and MP03) where the water depths were 4.1 m or less and only one water sample, at 1.5 m of depth, was collected at each of those three locations.

The pond sediment samples were collected from the pond bottom using a grab sampler. The grab sampler was decontaminated with soapy water and methanol prior to each soil sample to prevent cross-contamination.

3.1 Standard Water Analysis, Organic Carbon and Total Solids

A total of nine water samples were collected at the shallow water depths, and six water samples were collected from the deep water level at locations shown in **Figures 3a to 3c**. The samples were analyzed for typical parameters in the standard water analysis package offered by the laboratory, plus total and dissolved organic carbon, and total suspended solids (TSS) and total dissolved solids (TDS). The results are reported in **Tables 1** to **3**. One sample (GP02-WS2) fell outside the FWAL acceptable range for pH. No other parameters were identified outside FWAL guidelines (**Appendix A**).

3.2 Total Metals in Water

Water samples for total metal analysis samples were collected and acidified at each sampling location. A total of 15 samples were taken at shallow and deep water intervals at the locations shown in **Figures 3a to 3c**. The total metals data were compared against FWAL guidelines. The results are reported in **Tables 4** to **6**. One sample (NP01-WS2) exceeded guidance values for aluminum and iron. This sample (NP01-WS2) had elevated turbidity and solids, which is known to elevate iron concentrations in water in the area. No other parameters were identified outside FWAL guidelines (**Appendix A**).

3.3 Dissolved Metals in Water

Dissolved metal samples were also collected and filtered and preserved in the field. A total of 15 samples were taken at shallow and deep water intervals at the locations shown in **Figures 3a to 3c**. The samples were compared against FWAL guidelines. The results are reported in

Tables 7 to 9. One dissolved metal sample (GP03-WS2) exceeded guidance values for selenium. However, the total metal value reported for selenium did not exceed guidelines. No other parameters were identified that plot outside FWAL guidelines (**Appendix A**).

3.4 Petroleum Hydrocarbons in Water

Three water samples were collected at the shallow sampling depth for each pond, as shown in **Figures 3a to 3c**, for a total of nine samples. The samples were analyzed for total petroleum hydrocarbons (TPH) and BTEX (benzene, toluene, ethylbenzene, and xylene) using low-level detection limits. The results are reported in **Tables 10 to 12**. No BTEX/TPH components were identified above detection limits (**Appendix A**).

3.5 Volatile Organic Compounds in Water

One sample was collected at the shallow water sampling depth location for each pond, as shown in **Figures 3a to 3c**, for a total of three samples. The sample locations were chosen based on potential historical impacts (Muddy and Gull (Mine) Pond) or the furthest sample downstream (Noels Pond). The samples were analyzed using the standard list of VOCs offered by the analytical laboratory. The results are reported in **Table 13**. No parameters were identified above detection limits (**Appendix A**).

3.6 Petroleum Hydrocarbons in Soil

Samples were collected from the pond bottom using a grab sampler at three locations per pond as shown in **Figures 3a to 3c**, for a total of nine sediment samples. Field observations noted visible sheens emitting from only one of the recovered grab samples, MP02-SS1. The samples were analyzed for total petroleum hydrocarbons and BTEX using regular detection limits, and low-level on one sample (MP01-SS1). The results are reported in **Tables 14 to 16**. No BTEX components were observed above detection limits. The detected TPH values ranged from 42 to 218 mg/kg across all three ponds. The effects of suspected organic materials were evaluated with a single silica gel cleanup. After silica gel cleanup, the TPH results ranged from 17 to 136 mg/kg. The silica gel clean-up values are compared to the original values in **Tables 14 to 16**. Successive silica gel cleanups were not conducted, and the complete laboratory results can be found in **Appendix A**.

3.7 Polycyclic Aromatic Hydrocarbons in Soil

Sediment grab samples were collected at the same time as the BTEX/TPH samples were collected and analyzed for Polycyclic Aromatic Hydrocarbons (PAHs) as shown in in **Figures 3a to 3c**. The samples were analyzed using the standard list of PAHs offered by the analytical laboratory. The results are reported in **Tables 17 to 19**.

In Gull (Mine) Pond (**Table 17**), Fluoranthene and Napthalene were identified in all three sediment samples, and Acenaphthylene was identified in GP03-SS1.

In Noels Pond (**Table 18**), Fluotanthene and Perylene were found in all three sediment samples, Pyrene was found in NP02-SS2 and NP01-SS1. NP01-SS1 also had 1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Anthracene, Benzo(a)pyrene, Chrysene, Fluorene, and Phenanthrene reported above detection limits.

In Muddy Pond (**Table 19**), Fluotanthene and Perylene were found in all three samples, Pyrene was found in MP01-SS1, and in MP02-SS1 Anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(j+k)fluoranthene, Benzo(e)pyrene, Fluorene, and Phenanthrene were reported above detection limits.

All other components were not identified above detection limits (Appendix A).

4.0 CONCLUSIONS AND OBSERVATIONS

The infrastructure on Gull (Mine) Pond is relatively old, but the earthen berm is still retaining water in the pond with limited evidence of seepage through the berm. The cleaning of the canal, road repairs, minor ditching and culvert installation, and extensions on the cribwork are a few of the changes needed with regards to developing the full active water storage.

The infrastructure on Noels Pond is in relatively good shape, and the refurbishing and upgrading work is limited to installing water control gates, a fish ladder or bypass, and removing driftwood debris.

The infrastructure on Muddy Pond is relatively old, but was well maintained during the Mill's operation. However, the key infrastructure to controlling the storage in Muddy Pond is located on Noels Pond, and water is conveyed through the culverts beneath Carolina Avenue. The pump house and equipment, located on Muddy Pond, will require significant upgrading and refurbishing.

The details of the individual components of the existing industrial water transfer infrastructure are presented in a separate companion report. An order of magnitude estimate of the cost to reestablish and upgrade the overall industrial water supply infrastructure, including the gravity feed structure from Gull (Mine) Pond to the old Abitibi Mill site will be provided in a separate report.

The general water chemistry for the water samples from all three ponds met FWAL guidelines, except for four noted exceedances. There was no detectable BTEX/TPH when using low-level detection analysis.

The pond sediments do show some detectable levels of petroleum hydrocarbons in the form of TPHs and PAHs.

The measured TPH values are considered to reflect organic signatures, except for one sample, but confirmation would require successive silica gel clean-ups to remove all or most residual organic material. Also selected metals such as selenium are most likely related to the discharge of deep bedrock groundwater as noted in other parts of this groundwater flow system.

The Total Suspended Solids levels are expected to vary on a seasonal basis.

	Project 3168 - Stephenville, NL - Industrial Water Supply								
Fracflow Sample ID				3168-GP01- WS1-220923	3168-GP02- WS1-220923	3168-GP02- WS2-220923			
Sampling Date	Units	G/S		09/23/2022	09/23/2022				
AGAT ID				4355773	4355762	4355770			
Standard Water Analysis + Additional Parameters									
pH		6.5 - 9.0		6.6	6.59	6.48			
Reactive Silica as SiO2	mg/L		0.5	2.1	2	2.6			
Chloride	mg/L	640, 120	1	23	23	23			
Fluoride	mg/L	0.12	0.12	<0.12	<0.12	<0.12			
Sulphate	mg/L		2	3	4	4			
Alkalinity	mg/L		5	10	11	12			
True Color	TCU	Narrative	5.00	32.1	33.9	34.6			
Turbidity	NTU	Narrative	0.5	1.7	<0.5	1.8			
Electrical Conductivity	umho/cm		1	119	118	119			
Nitrate + Nitrite as N	mg/L		0.05	<0.05	<0.05	0.06			
Nitrate as N	mg/L	550, 13	0.05	<0.05	<0.05	0.06			
Nitrite as N	mg/L	0.06	0.05	<0.05	<0.05	< 0.05			
Ammonia as N	mg/L	Fact Sheet	0.03	0.08	0.11	0.1			
Total Organic Carbon	mg/L		0.5	7.3	7.2	6.8			
Dissolved Organic Carbon	mg/L		0.5	5.7	5.1	4.8			
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01			
Total Sodium	mg/L		0.1	16	16	15			
Total Potassium	mg/L		0.1	0.5	0.5	0.5			
Total Calcium	mg/L		0.1	4.9	4.7	4.7			
Total Magnesium	mg/L		0.1	1.8	1.8	1.8			
Bicarb. Alkalinity (as CaCO3)	mg/L		5	10	11	12			
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10			
Hydroxide	mg/L		5	<5	<5	<5			
Calculated TDS	mg/L		1	55	57	57			
Hardness	mg/L			19.6	19.1	19.1			
Langelier Index (@20C)	NA			-3.27	-3.26	-3.33			
Langelier Index (@ 4C)	NA			-3.59	-3.58	-3.65			
Saturation pH (@ 20C)	NA			9.87	9.85	9.81			
Saturation pH (@ 4C)	NA			10.2	10.2	10.1			
Anion Sum	me/L			0.91	0.95	0.98			
Cation Sum	me/L			1.12	1.11	1.07			
% Difference/Ion Balance	%			10.1	7.5	4.5			
Total Suspended Solids	mg/L	Narrative	5	<5	<5	<5			
Total Dissolved Solids	mg/L		5	76	74	74			

Table 1Analytical results of standard water analysis in water samples from Gull (Mine) Pond,
Stephenville, NL (page 1 of 2).

Comments: - Bold/Shaded - Exceeds Guideline/Standard

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- RDL - Reported Detection Limit;

	Project 3168 - Stephenville, NL - Industrial Water Supply								
Fracflow Sample ID				3168-GP03- WS1-220923	3168-GP03- WS2-220923				
Sampling Date	Units	G/S	RDL	09/23/2022	09/23/2022				
AGAT ID				4355740	4355744				
Standard Water Analysis + Additional Parameters									
рН		6.5 - 9.0		7.32	6.50				
Reactive Silica as SiO2	mg/L		0.5	2.0	2.7				
Chloride	mg/L	640, 120	1	23	24				
Fluoride	mg/L	0.12	0.12	<0.12	<0.12				
Sulphate	mg/L		2	5	4				
Alkalinity	mg/L		5	12	14				
True Color	TCU	Narrative	5.00	31.4	40.1				
Turbidity	NTU	Narrative	0.5	0.7	0.7				
Electrical Conductivity	umho/cm		1	118	123				
Nitrate + Nitrite as N	mg/L		0.05	<0.05	0.08				
Nitrate as N	mg/L	550, 13	0.05	<0.05	0.08				
Nitrite as N	mg/L	0.06	0.05	<0.05	<0.05				
Ammonia as N	mg/L	Fact Sheet	0.03	0.1	0.12				
Total Organic Carbon	mg/L		0.5	7.2	6.8				
Dissolved Organic Carbon	mg/L		0.5	11.2	6.1				
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01				
Total Sodium	mg/L		0.1	17	16				
Total Potassium	mg/L		0.1	0.5	0.5				
Total Calcium	mg/L		0.1	4.8	5.1				
Total Magnesium	mg/L		0.1	1.8	1.9				
Bicarb. Alkalinity (as CaCO3)	mg/L		5	12	14				
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10				
Hydroxide	mg/L		5	<5	<5				
Calculated TDS	mg/L		1	60	61				
Hardness	mg/L			19.4	20.6				
Langelier Index (@20C)	NA			-2.48	-3.21				
Langelier Index (@ 4C)	NA			-2.8	-3.53				
Saturation pH (@ 20C)	NA			9.8	9.71				
Saturation pH (@ 4C)	NA			10.1	10				
Anion Sum	me/L			0.99	1.05				
Cation Sum	me/L			1.16	1.15				
% Difference/Ion Balance	%			7.6	4.6				
Total Suspended Solids	mg/L	Narrative	5	<5	<5				
Total Dissolved Solids	mg/L		5	60	72				

Table 1Analytical results of standard water analysis in water samples from Gull (Mine) Pond,
Stephenville, NL (page 2 of 2).

Comments: - Bold/Shaded - Exceeds Guideline/Standard

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- RDL - Reported Detection Limit;

	Project 316	8 - Stephenv	ille, NL - I	ndustrial Water S	upply				
Fracflow Sample ID				3168-NP01- WS1-220922	3168-NP01- WS2-220922	3168-NP02- WS2-220922			
Sampling Date	Units	G/S	RDL	09/22/2022	09/22/2022	09/22/2022			
AGAT ID				4355939	4355955	4355938			
Standard Water Analysis + Additional Parameters									
рН		6.5 - 9.0		7.26	7.26	7.25			
Reactive Silica as SiO2	mg/L		0.5	2.7	2.4	2.4			
Chloride	mg/L	640, 120	1	7	7	7			
Fluoride	mg/L	0.12	0.12	<0.12	<0.12	<0.12			
Sulphate	mg/L		2	<2	<2	<2			
Alkalinity	mg/L		5	57	58	57			
True Color	TCU	Narrative	5.00	52.8	43.3	44.6			
Turbidity	NTU	Narrative	0.5	2.5	2.7	1.2			
Electrical Conductivity	umho/cm		1	140	141	139			
Nitrate + Nitrite as N	mg/L		0.05	0.08	0.07	0.08			
Nitrate as N	mg/L	550, 13	0.05	0.08	0.07	0.08			
Nitrite as N	mg/L	0.06	0.05	<0.05	<0.05	<0.05			
Ammonia as N	mg/L	Fact Sheet	0.03	< 0.03	<0.03	0.07			
Total Organic Carbon	mg/L		0.5	5.8	5.9	5.8			
Dissolved Organic Carbon	mg/L		0.5	4.2	3.9	3.6			
Ortho-Phosphate as P	mg/L		0.01	0.05	<0.01	<0.01			
Total Sodium	mg/L		0.1	5.9	5.9	5.7			
Total Potassium	mg/L		0.1	0.4	0.5	0.4			
Total Calcium	mg/L		0.8	16.9	16.9	16.2			
Total Magnesium	mg/L		0.1	3.1	3.1	2.9			
Bicarb. Alkalinity (as CaCO3)	mg/L		5	57	58	57			
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10			
Hydroxide	mg/L		5	<5	<5	<5			
Calculated TDS	mg/L		1	68	69	67			
Hardness	mg/L			55	55	52.4			
Langelier Index (@20C)	NA			-1.33	-1.32	-1.35			
Langelier Index (@ 4C)	NA			-1.65	-1.64	-1.67			
Saturation pH (@ 20C)	NA			8.59	8.58	8.6			
Saturation pH (@ 4C)	NA			8.91	8.9	8.92			
Anion Sum	me/L			1.34	1.36	1.34			
Cation Sum	me/L			1.37	1.41	1.32			
% Difference/Ion Balance	%			1.1	1.7	0.9			
Total Suspended Solids	mg/L	Narrative	5	<5	<5	<5			
Total Dissolved Solids	mg/L		5	78	104	78			

Table 2Analytical results of standard water analysis in water samples from Noels Pond,
Stephenville, NL (page 1 of 2).

Comments: - Bold/Shaded - Exceeds Guideline/Standard

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- RDL - Reported Detection Limit;

	Project 316	8 - Stephenv	ille, NL - I	ndustrial Water S	upply				
Fracflow Sample ID				3168-NP02- WS1-220922	3168-NP03- WS1-220922	3168-NP03- WS2-220922			
Sampling Date	Units	G/S		09/22/2022	09/22/2022				
AGAT ID				4355927	4355911	4355924			
Standard Water Analysis + Additional Parameters									
pН		6.5 - 9.0		7.25	7.16	7.26			
Reactive Silica as SiO2	mg/L		0.5	2.4	2.2	2.4			
Chloride	mg/L	640, 120	1	7	7	7			
Fluoride	mg/L	0.12	0.12	<0.12	<0.12	<0.12			
Sulphate	mg/L		2	<2	<2	<2			
Alkalinity	mg/L		5	57	58	61			
True Color	TCU	Narrative	5.00	42.5	39	39.8			
Turbidity	NTU	Narrative	0.5	2	3	1.6			
Electrical Conductivity	umho/cm		1	139	138	147			
Nitrate + Nitrite as N	mg/L		0.05	0.08	0.07	0.08			
Nitrate as N	mg/L	550, 13	0.05	0.08	0.07	0.08			
Nitrite as N	mg/L	0.06	0.05	< 0.05	<0.05	< 0.05			
Ammonia as N	mg/L	Fact Sheet	0.03	0.07	0.06	0.07			
Total Organic Carbon	mg/L		0.5	5.7	6	5.6			
Dissolved Organic Carbon	mg/L		0.5	3.5	3.7	3.8			
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01			
Total Sodium	mg/L		0.1	5.7	5.7	5.7			
Total Potassium	mg/L		0.1	0.4	0.4	0.4			
Total Calcium	mg/L		0.8	16.6	16.3	18.1			
Total Magnesium	mg/L		0.1	3	2.9	3.2			
Bicarb. Alkalinity (as CaCO3)	mg/L		5	57	58	61			
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10			
Hydroxide	mg/L		5	<5	<5	<5			
Calculated TDS	mg/L		1	67	68	72			
Hardness	mg/L			53.8	52.6	58.4			
Langelier Index (@20C)	NA			-1.34	-1.43	-1.27			
Langelier Index (@ 4C)	NA			-1.66	-1.75	-1.59			
Saturation pH (@ 20C)	NA			8.59	8.59	8.53			
Saturation pH (@ 4C)	NA			8.91	8.91	8.85			
Anion Sum	me/L			1.34	1.36	1.42			
Cation Sum	me/L			1.35	1.32	1.44			
% Difference/Ion Balance	%			0.1	1.4	0.6			
Total Suspended Solids	mg/L	Narrative	5	<5	<5	<5			
Total Dissolved Solids	mg/L		5	78	76	74			

Table 2Analytical results of standard water analysis in water samples from Noels Pond,
Stephenville, NL (page 2 of 2).

Comments: - Bold/Shaded - Exceeds Guideline/Standard

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- RDL - Reported Detection Limit;

	Project 316	8 - Stephenv	ille, NL - I	Industrial Water S	upply				
Fracflow Sample ID				3168-MP01- WS1-220925	3168-MP02- WS1-220925				
Sampling Date	Units	G/S	RDL	09/25/2022	09/25/2022				
AGAT ID				4355870	4355871				
Standard Water Analysis + Additional Parameters									
рН		6.5 - 9.0		6.84	6.91				
Reactive Silica as SiO2	mg/L		0.5	1.3	1.3				
Chloride	mg/L	640, 120	1	7	7				
Fluoride	mg/L	0.12	0.12	<0.12	<0.12				
Sulphate	mg/L		2	<2	<2				
Alkalinity	mg/L		5	34	34				
True Color	TCU	Narrative	5.00	51.1	49.1				
Turbidity	NTU	Narrative	0.5	<0.5	1.1				
Electrical Conductivity	umho/cm		1	97	99				
Nitrate + Nitrite as N	mg/L		0.05	0.05	0.06				
Nitrate as N	mg/L	550, 13	0.05	0.05	0.06				
Nitrite as N	mg/L	0.06	0.05	<0.05	<0.05				
Ammonia as N	mg/L	Fact Sheet	0.03	0.24	0.07				
Total Organic Carbon	mg/L		0.5	6.1	6.5				
Dissolved Organic Carbon	mg/L		0.5	3.9	3.7				
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01				
Total Sodium	mg/L		0.1	5.7	5.5				
Total Potassium	mg/L		0.1	0.4	0.4				
Total Calcium	mg/L		0.8	10.4	10.6				
Total Magnesium	mg/L		0.1	2.2	2.1				
Bicarb. Alkalinity (as CaCO3)	mg/L		5	34	34				
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10				
Hydroxide	mg/L		5	<5	<5				
Calculated TDS	mg/L		1	47	47				
Hardness	mg/L			35	35.1				
Langelier Index (@20C)	NA			-2.17	-2.09				
Langelier Index (@ 4C)	NA			-2.49	-2.41				
Saturation pH (@ 20C)	NA			9.01	9				
Saturation pH (@ 4C)	NA			9.33	9.32				
Anion Sum	me/L			0.88	0.88				
Cation Sum	me/L			0.99	0.97				
% Difference/Ion Balance	%			5.7	4.7				
Total Suspended Solids	mg/L	Narrative	5	<5	<5				
Total Dissolved Solids	mg/L		5	64	54				

Table 3Analytical results of standard water analysis in water samples from Muddy Pond,
Stephenville, NL (page 1 of 2).

Comments: - Bold/Shaded - Exceeds Guideline/Standard

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- RDL - Reported Detection Limit;

	Project 316	8 - Stephenv	ille, NL - I	ndustrial Water S	upply				
Fracflow Sample ID				3168-MP02- WS2-220925	3168-MP03- WS1-220925				
Sampling Date	Units	G/S	RDL	09/25/2022	09/25/2022				
AGAT ID				4355901	4355903				
Standard Water Analysis + Additional Parameters									
рН		6.5 - 9.0		6.76	6.83				
Reactive Silica as SiO2	mg/L		0.5	1.7	0.9				
Chloride	mg/L	640, 120	1	8	7				
Fluoride	mg/L	0.12	0.12	<0.12	<0.12				
Sulphate	mg/L		2	<2	<2				
Alkalinity	mg/L		5	28	29				
True Color	TCU	Narrative	5.00	71.6	43.7				
Turbidity	NTU	Narrative	0.5	5	4.8				
Electrical Conductivity	umho/cm		1	92	88				
Nitrate + Nitrite as N	mg/L		0.05	0.13	<0.05				
Nitrate as N	mg/L	550, 13	0.05	0.13	<0.05				
Nitrite as N	mg/L	0.06	0.05	<0.05	<0.05				
Ammonia as N	mg/L	Fact Sheet	0.03	0.08	0.06				
Total Organic Carbon	mg/L		0.5	6.9	6.7				
Dissolved Organic Carbon	mg/L		0.5	3.7	4.2				
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01				
Total Sodium	mg/L		0.1	5.8	5.9				
Total Potassium	mg/L		0.1	0.4	0.4				
Total Calcium	mg/L		0.1	9.5	9.4				
Total Magnesium	mg/L		0.1	1.9	1.9				
Bicarb. Alkalinity (as CaCO3)	mg/L		5	28	29				
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10				
Hydroxide	mg/L		5	<5	<5				
Calculated TDS	mg/L		1	43	42				
Hardness	mg/L			31.5	31.3				
Langelier Index (@20C)	NA			-2.37	-2.28				
Langelier Index (@ 4C)	NA			-2.69	-2.6				
Saturation pH (@ 20C)	NA			9.13	9.11				
Saturation pH (@ 4C)	NA			9.45	9.43				
Anion Sum	me/L			0.79	0.78				
Cation Sum	me/L			0.91	0.91				
% Difference/Ion Balance	%			6.9	7.8				
Total Suspended Solids	mg/L	Narrative	5	<5	10				
Total Dissolved Solids	mg/L		5	48	44				

Table 3Analytical results of standard water analysis in water samples from Muddy Pond,
Stephenville, NL (page 2 of 2).

Comments: - Bold/Shaded - Exceeds Guideline/Standard

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- RDL - Reported Detection Limit;

Project 3168 - Stephenville, NL - Industrial Water Supply										
Franklaur Gammla ID				3168-GP01-WS1-	3168-GP02-WS1-	3168-GP02-WS2-				
Fracflow Sample ID	Unite	0/0	RDL	220923	220923	220923				
Sampling Date	Units	G/S	RDL	09/23/2022	09/23/2022	09/23/2022				
AGAT ID				4355773	4355762	4355770				
Total Metals										
Total Aluminum	ug/L	100	5	49	44	74				
Total Antimony	ug/L		2	<2	<2	3				
Total Arsenic	ug/L	5	2	<2	<2	<2				
Total Barium	ug/L		5	13	9	12				
Total Beryillium	ug/L		2	<2	<2	<2				
Total Bismuth	ug/L		2	<2	<2	<2				
Total Boron	ug/L	29000	5	6	6	5				
Total Cadmium	ug/L	Equation	0.017	<0.017	<0.017	<0.017				
Total Chromium	ug/L		1	<1	<1	1				
Total Cobalt	ug/L		1	<1	<1	<1				
Total Copper	ug/L	Equation	1	2	<1	<1				
Total Iron	ug/L	300	50	72	60	113				
Total Lead	ug/L	Equation	0.5	<0.5	<0.5	0.7				
Total Manganese	ug/L		2	19	17	10				
Total Molybdenum	ug/L	73	2	<2	<2	<2				
Total Nickel	ug/L	Equation	2	<2	<2	<2				
Total Phosphorous	mg/L	Fact Sheet	0.02	0.03	0.02	0.03				
Total Selenium	ug/L	1	1	<1	<1	<1				
Total Silver	ug/L	0.25	0.1	<0.1	<0.1	<0.1				
Total Strontium	ug/L		5	28	26	25				
Total Thallium	ug/L	0.8	0.1	<0.1	<0.1	<0.1				
Total Tin	ug/L		2	<2	<2	<2				
Total Titanium	ug/L		2	<2	<2	<2				
Total Uranium	ug/L	33, 15	0.2	<0.2	<0.2	<0.2				
Total Vanadium	ug/L		2	<2	<2	<2				
Total Zinc	ug/L	30	5	<5	<5	<5				
Total Metals, Mercury	•			-						
Total Mercury	ug/L	0.026	0.026	<0.026	<0.026	<0.026				

Table 4 Analytical results of total metals in water samples for Gull (Mine) Pond, Stephenville, NL (page 1 of 2).

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality

Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- RDL - Reported Detection Limit;

Project 3168 - Stephenville, NL - Industrial Water Supply									
Fracflow Sample ID Sampling Date AGAT ID	Units	G/S	RDL	3168-GP03-WS1- 220923 09/23/2022 4355740	3168-GP03-WS2- 220923 09/23/2022 4355744				
Total Metals									
Total Aluminum	ug/L	100	5	53	83				
Total Antimony	ug/L		2	3	<2				
Total Arsenic	ug/L	5	2	<2	<2				
Total Barium	ug/L		5	13	10				
Total Beryillium	ug/L		2	<2	<2				
Total Bismuth	ug/L		2	<2	<2				
Total Boron	ug/L	29000	5	6	6				
Total Cadmium	ug/L	Equation	0.017	<0.017	<0.017				
Total Chromium	ug/L		1	1	<1				
Total Cobalt	ug/L		1	<1	<1				
Total Copper	ug/L	Equation	1	<1	<1				
Total Iron	ug/L	300	50	98	204				
Total Lead	ug/L	Equation	0.5	<0.5	2.2				
Total Manganese	ug/L		2	17	64				
Total Molybdenum	ug/L	73	2	<2	<2				
Total Nickel	ug/L	Equation	2	<2	<2				
Total Phosphorous	mg/L	Fact Sheet	0.02	0.03	0.03				
Total Selenium	ug/L	1	1	<1	<1				
Total Silver	ug/L	0.25	0.1	<0.1	<0.1				
Total Strontium	ug/L		5	27	31				
Total Thallium	ug/L	0.8	0.1	<0.1	<0.1				
Total Tin	ug/L		2	<2	<2				
Total Titanium	ug/L		2	<2	<2				
Total Uranium	ug/L	33, 15	0.2	<0.2	<0.2				
Total Vanadium	ug/L		2	<2	<2				
Total Zinc	ug/L	30	5	<5	<5				
Total Metals, Mercury									
Total Mercury	ug/L	0.026	0.026	<0.026	<0.026				

Table 4Analytical results of total metals in water samples for Gull (Mine) Pond, Stephenville, NL
(page 2 of 2).

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality

Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- RDL - Reported Detection Limit;

Project 3168 - Stephenville, NL - Industrial Water Supply									
Fracflow Sample ID	Units	G/S	RDL	3168-NP01-WS1- 220922	RDL	3168-NP01-WS2- 220922			
Sampling Date	01110	0/0	NDE	09/22/2022	NDL	09/22/2022			
AGAT ID				4355939		4355955			
Total Metals						_			
Total Aluminum	ug/L	100	5	36	5	183			
Total Antimony	ug/L		2	<2	2	<2			
Total Arsenic	ug/L	5	2	<2	2	<2			
Total Barium	ug/L		5	21	5	27			
Total Beryillium	ug/L		2	<2	2	<2			
Total Bismuth	ug/L		2	<2	2	<2			
Total Boron	ug/L	29000	5	5	5	5			
Total Cadmium	ug/L	Equation	0.017	<0.017	0.017	<0.017			
Total Chromium	ug/L		1	<1	1	<1			
Total Cobalt	ug/L		1	<1	1	<1			
Total Copper	ug/L	Equation	1	<1	1	<1			
Total Iron	ug/L	300	50	96	50	391			
Total Lead	ug/L	Equation	0.5	0.5	0.5	0.5			
Total Manganese	ug/L		2	27	38	176			
Total Molybdenum	ug/L	73	2	<2	2	<2			
Total Nickel	ug/L	Equation	2	<2	2	<2			
Total Phosphorous	mg/L	Fact Sheet	0.02	0.03	0.02	0.03			
Total Selenium	ug/L	1	1	<1	1	<1			
Total Silver	ug/L	0.25	0.1	<0.1	0.1	<0.1			
Total Strontium	ug/L		5	35	5	34			
Total Thallium	ug/L	0.8	0.1	<0.1	0.1	<0.1			
Total Tin	ug/L		2	<2	2	<2			
Total Titanium	ug/L		2	<2	2	3			
Total Uranium	ug/L	33, 15	0.2	<0.2	0.2	<0.2			
Total Vanadium	ug/L		2	<2	2	<2			
Total Zinc	ug/L	30	5	<5	5	<5			
Total Metals, Mercury	-								
Total Mercury	ug/L	0.026	0.026	<0.026	0.026	<0.026			

Table 5Analytical results of total metals in water samples for Noels Pond, Stephenville, NL
(page 1 of 3).

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality

Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- RDL - Reported Detection Limit;

Project 3168 - Stephenville, NL - Industrial Water Supply									
				3168-NP02-WS1-	3168-NP02-WS2-	3168-NP03-WS1-			
Fracflow Sample ID	11-16-	G/S	RDL	220922	220922	220922			
Sampling Date	Units	6/5	RDL	09/22/2022	09/22/2022	09/22/2022			
AGAT ID				4355927	4355938	4355911			
Total Metals									
Total Aluminum	ug/L	100	5	34	36	39			
Total Antimony	ug/L		2	<2	<2	<2			
Total Arsenic	ug/L	5	2	<2	<2	<2			
Total Barium	ug/L		5	19	24	22			
Total Beryillium	ug/L		2	<2	<2	<2			
Total Bismuth	ug/L		2	<2	<2	<2			
Total Boron	ug/L	29000	5	5	5	5			
Total Cadmium	ug/L	Equation	0.017	<0.017	<0.017	<0.017			
Total Chromium	ug/L		1	<1	<1	<1			
Total Cobalt	ug/L		1	<1	<1	<1			
Total Copper	ug/L	Equation	1	<1	<1	<1			
Total Iron	ug/L	300	50	91	94	109			
Total Lead	ug/L	Equation	0.5	3.1	0.8	1			
Total Manganese	ug/L		2	28	27	28			
Total Molybdenum	ug/L	73	2	<2	<2	<2			
Total Nickel	ug/L	Equation	2	<2	<2	<2			
Total Phosphorous	mg/L	Fact Sheet	0.02	0.03	0.02	0.02			
Total Selenium	ug/L	1	1	<1	<1	<1			
Total Silver	ug/L	0.25	0.1	<0.1	<0.1	<0.1			
Total Strontium	ug/L		5	35	33	34			
Total Thallium	ug/L	0.8	0.1	<0.1	<0.1	<0.1			
Total Tin	ug/L		2	<2	<2	<2			
Total Titanium	ug/L		2	<2	<2	<2			
Total Uranium	ug/L	33, 15	0.2	<0.2	<0.2	<0.2			
Total Vanadium	ug/L		2	<2	<2	<2			
Total Zinc	ug/L	30	5	<5	<5	<5			
Total Metals, Mercury				-					
Total Mercury	ug/L	0.026	0.026	<0.026	<0.026	<0.026			

Table 5Analytical results of total metals in water samples for Noels Pond, Stephenville, NL
(page 2 of 3).

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality

Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- RDL - Reported Detection Limit;

	Project	3168 - Stepl	henville, N	IL - Industrial Water	r Supply					
Fracflow Sample ID Sampling Date AGAT ID	Units	G/S	RDL	3168-NP03-WS2- 220922 09/22/2022 4355924						
Total Metals										
Total Aluminum	ug/L	100	5	40						
Total Antimony	ug/L		2	<2						
Total Arsenic	ug/L	5	2	<2						
Total Barium	ug/L		5	24						
Total Beryillium	ug/L		2	<2						
Total Bismuth	ug/L		2	<2						
Total Boron	ug/L	29000	5	5						
Total Cadmium	ug/L	Equation	0.017	<0.017						
Total Chromium	ug/L		1	<1						
Total Cobalt	ug/L		1	<1						
Total Copper	ug/L	Equation	1	<1						
Total Iron	ug/L	300	50	152						
Total Lead	ug/L	Equation	0.5	<0.5						
Total Manganese	ug/L		2	36						
Total Molybdenum	ug/L	73	2	<2						
Total Nickel	ug/L	Equation	2	<2						
Total Phosphorous	mg/L	Fact Sheet	0.02	0.03						
Total Selenium	ug/L	1	1	<1						
Total Silver	ug/L	0.25	0.1	<0.1						
Total Strontium	ug/L		5	40						
Total Thallium	ug/L	0.8	0.1	<0.1						
Total Tin	ug/L		2	<2						
Total Titanium	ug/L		2	<2						
Total Uranium	ug/L	33, 15	0.2	<0.2						
Total Vanadium	ug/L		2	<2						
Total Zinc	ug/L	30	5	<5						
Total Metals, Mercury	-	· · · · ·		-						
Total Mercury	ug/L	0.026	0.026	<0.026						

Table 5 Analytical results of total metals in water samples for Noels Pond, Stephenville, NL (page 3 of 3).

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality

Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- RDL - Reported Detection Limit;

	Project	3168 - Stepl	nenville, N	IL - Industrial Water	r Supply	
Fracflow Sample ID Sampling Date AGAT ID	Units	G/S	RDL	3168-MP01-WS1- 220925 09/25/2022 4355870	3168-MP02-WS1- 220925 09/25/2022 4355871	
Total Metals				4		
Total Aluminum	ug/L	100	5	72	71	
Total Antimony	ug/L		2	<2	<2	
Total Arsenic	ug/L	5	2	<2	<2	
Total Barium	ug/L		5	15	13	
Total Beryillium	ug/L		2	<2	<2	
Total Bismuth	ug/L		2	<2	<2	
Total Boron	ug/L	29000	5	5	<5	
Total Cadmium	ug/L	Equation	0.017	<0.017	<0.017	
Total Chromium	ug/L		1	<1	<1	
Total Cobalt	ug/L		1	<1	<1	
Total Copper	ug/L	Equation	1	<1	<1	
Total Iron	ug/L	300	50	118	111	
Total Lead	ug/L	Equation	0.5	1	<0.5	
Total Manganese	ug/L		2	8	7	
Total Molybdenum	ug/L	73	2	<2	<2	
Total Nickel	ug/L	Equation	2	<2	<2	
Total Phosphorous	mg/L	Fact Sheet	0.02	0.03	0.03	
Total Selenium	ug/L	1	1	<1	<1	
Total Silver	ug/L	0.25	0.1	<0.1	<0.1	
Total Strontium	ug/L		5	21	21	
Total Thallium	ug/L	0.8	0.1	<0.1	<0.1	
Total Tin	ug/L		2	<2	<2	
Total Titanium	ug/L		2	<2	<2	
Total Uranium	ug/L	33, 15	0.2	<0.2	<0.2	
Total Vanadium	ug/L		2	<2	<2	
Total Zinc	ug/L	30	5	<5	<5	
Total Metals, Mercury						
Total Mercury	ug/L	0.026	0.026	<0.026	<0.026	

Table 6 Analytical results of total metals in water samples for Muddy Pond, Stephenville, NL (page 1 of 2).

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality

Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- RDL - Reported Detection Limit;

	Project	3168 - Stepl	henville, N	IL - Industrial Water	Supply	
Fracflow Sample ID Sampling Date AGAT ID	Units	G/S	RDL	3168-MP02-WS2- 220925 09/25/2022 4355901	3168-MP03-WS1- 220925 09/25/2022 4355903	
Total Metals	I					
Total Aluminum	ug/L	100	5	85	62	
Total Antimony	ug/L		2	<2	<2	
Total Arsenic	ug/L	5	2	<2	<2	
Total Barium	ug/L		5	11	11	
Total Beryillium	ug/L		2	<2	<2	
Total Bismuth	ug/L		2	<2	<2	
Total Boron	ug/L	29000	5	<5	<5	
Total Cadmium	ug/L	Equation	0.017	<0.017	<0.017	
Total Chromium	ug/L		1	<1	1	
Total Cobalt	ug/L		1	<1	<1	
Total Copper	ug/L	Equation	1	<1	<1	
Total Iron	ug/L	300	50	119	124	
Total Lead	ug/L	Equation	0.5	<0.5	<0.5	
Total Manganese	ug/L		2	8	7	
Total Molybdenum	ug/L	73	2	<2	<2	
Total Nickel	ug/L	Equation	2	<2	<2	
Total Phosphorous	mg/L	Fact Sheet	0.02	0.03	0.03	
Total Selenium	ug/L	1	1	<1	<1	
Total Silver	ug/L	0.25	0.1	<0.1	<0.1	
Total Strontium	ug/L		5	18	18	
Total Thallium	ug/L	0.8	0.1	<0.1	<0.1	
Total Tin	ug/L		2	<2	<2	
Total Titanium	ug/L		2	<2	<2	
Total Uranium	ug/L	33, 15	0.2	<0.2	<0.2	
Total Vanadium	ug/L		2	<2	<2	
Total Zinc	ug/L	30	5	<5	<5	
Total Metals, Mercury						
Total Mercury	ug/L	0.026	0.026	<0.026	<0.026	

Table 6 Analytical results of total metals in water samples for Muddy Pond, Stephenville, NL (page 2 of 2).

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality

Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- RDL - Reported Detection Limit;

	Project	3168 - Stepl	henville, N	IL - Industrial Water	· Supply	
				3168-GP01-WS1-	3168-GP02-WS1-	3168-GP02-WS2-
Fracflow Sample ID	11	0/0	RDL	220923	220923	220923
Sampling Date	Units	G/S	RDL	09/23/2022	09/23/2022	09/23/2022
AGAT ID				4355773	4355762	4355770
Total Metals						
Dissolved Aluminum	mg/L	0.100	0.004	0.034	0.033	0.033
Dissolved Antimony	mg/L		0.001	<0.001	<0.001	<0.001
Dissolved Arsenic	mg/L	0.005	0.001	<0.001	<0.001	<0.001
Dissolved Barium	mg/L		0.002	0.005	0.005	0.005
Dissolved Beryllium	mg/L		0.0005	<0.0005	<0.0005	<0.0005
Dissolved Bismuth	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Boron	mg/L	29, 1.5	0.010	<0.010	<0.010	<0.010
Dissolved Cadmium	mg/L	Equation	0.0001	<0.0001	<0.0001	<0.0001
Dissolved Chromium	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Cobalt	mg/L		0.0005	<0.0005	<0.0005	<0.0005
Dissolved Copper	mg/L	Equation	0.001	0.001	0.001	0.002
Dissolved Iron	mg/L	0.300	0.010	0.057	0.062	0.067
Dissolved Lead	mg/L	Equation	0.0005	<0.0005	<0.0005	<0.0005
Dissolved Lithium	mg/L		0.05	<0.05	<0.05	<0.05
Dissolved Manganese	mg/L		0.002	<0.002	<0.002	0.005
Dissolved Molybdenum	mg/L	0.073	0.002	<0.002	<0.002	<0.002
Dissolved Nickel	mg/L	Equation	0.001	0.001	0.001	0.001
Dissolved Phosphorus	mg/L		0.05	<0.05	0.05	<0.05
Dissolved Selenium	mg/L	0.001	0.001	<0.001	0.003	<0.001
Dissolved Silicon	mg/L		0.05	0.95	1.01	1.16
Dissolved Silver	mg/L	0.00025	0.0001	<0.0001	<0.0001	<0.0001
Dissolved Strontium	mg/L		0.005	0.021	0.023	0.025
Dissolved Thallium	mg/L	0.0008	0.0003	< 0.0003	<0.0003	<0.0003
Dissolved Tin	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Titanium	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Uranium	mg/L	0.033, 0.015	0.0005	<0.0005	<0.0005	<0.0005
Dissolved Vanadium	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Zinc	mg/L	0.03	0.005	<0.005	<0.005	<0.005
Dissolved Zirconium	mg/L		0.004	<0.004	<0.004	<0.004
Dissolved Mercury						
Dissolved Mercury	ug/L	0.026	0.026	<0.026	<0.026	<0.026

Table 7 Analytical results of dissolved metals in water samples for Gull (Mine) Pond, Stephenville, NL (page 1 of 2).

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL) - RDL - Reported Detection Limit;

	Project	3168 - Stepl	henville, N	IL - Industrial Water	· Supply	
				3168-GP03-WS1-	3168-GP03-WS2-	
Fracflow Sample ID	11	0/0		220923	220923	
Sampling Date	Units	G/S	RDL	09/23/2022	09/23/2022	
AGAT ID				4355740	4355744	
Total Metals						
Dissolved Aluminum	mg/L	0.100	0.004	0.028	0.043	
Dissolved Antimony	mg/L		0.001	<0.001	<0.001	
Dissolved Arsenic	mg/L	0.005	0.001	<0.001	0.001	
Dissolved Barium	mg/L		0.002	0.005	0.004	
Dissolved Beryllium	mg/L		0.0005	<0.0005	<0.0005	
Dissolved Bismuth	mg/L		0.002	<0.002	<0.002	
Dissolved Boron	mg/L	29, 1.5	0.010	<0.010	<0.010	
Dissolved Cadmium	mg/L	Equation	0.0001	<0.0001	<0.0001	
Dissolved Chromium	mg/L		0.002	<0.002	<0.002	
Dissolved Cobalt	mg/L		0.0005	<0.0005	<0.0005	
Dissolved Copper	mg/L	Equation	0.001	0.001	0.001	
Dissolved Iron	mg/L	0.3	0.010	0.047	0.1	
Dissolved Lead	mg/L	Equation	0.0005	<0.0005	<0.0005	
Dissolved Lithium	mg/L		0.05	<0.05	<0.05	
Dissolved Manganese	mg/L		0.002	<0.002	0.035	
Dissolved Molybdenum	mg/L	0.073	0.002	<0.002	<0.002	
Dissolved Nickel	mg/L	Equation	0.001	<0.001	0.001	
Dissolved Phosphorus	mg/L		0.05	<0.05	<0.05	
Dissolved Selenium	mg/L	0.001	0.001	<0.001	0.002	
Dissolved Silicon	mg/L		0.05	0.86	1.03	
Dissolved Silver	mg/L	0.00025	0.0001	<0.0001	<0.0001	
Dissolved Strontium	mg/L		0.005	0.023	0.024	
Dissolved Thallium	mg/L	0.0008	0.0003	<0.0003	<0.0003	
Dissolved Tin	mg/L		0.002	<0.002	<0.002	
Dissolved Titanium	mg/L		0.002	<0.002	<0.002	
Dissolved Uranium	mg/L	0.033, 0.015	0.0005	<0.0005	<0.0005	
Dissolved Vanadium	mg/L		0.002	<0.002	<0.002	
Dissolved Zinc	mg/L	0.03	0.005	<0.005	<0.005	
Dissolved Zirconium	mg/L		0.004	<0.004	<0.004	
Dissolved Mercury						
Dissolved Mercury	ug/L	0.026	0.026	<0.026	<0.026	

Table 7 Analytical results of dissolved metals in water samples for Gull (Mine) Pond, Stephenville, NL (page 2 of 2).

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL) - RDL - Reported Detection Limit;

	Project	3168 - Stepl	henville, N	IL - Industrial Water	r Supply	
Fracflow Sample ID				3168-NP01-WS1-	3168-NP01-WS2-	3168-NP02-WS1-
Fractiow Sample ID	Units	G/S	RDL	220922	220922	220922
Sampling Date	Units	673	RDL	09/22/2022	09/22/2022	09/22/2022
AGAT ID				4355939	4355955	4355927
Total Metals						
Dissolved Aluminum	mg/L	0.100	0.004	0.02	0.02	0.019
Dissolved Antimony	mg/L		0.001	<0.001	<0.001	<0.001
Dissolved Arsenic	mg/L	0.005	0.001	<0.001	<0.001	<0.001
Dissolved Barium	mg/L		0.002	0.012	0.012	0.012
Dissolved Beryllium	mg/L		0.0005	<0.0005	<0.0005	<0.0005
Dissolved Bismuth	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Boron	mg/L	29, 1.5	0.010	<0.010	<0.010	<0.010
Dissolved Cadmium	mg/L	Equation	0.0001	<0.0001	<0.0001	<0.0001
Dissolved Chromium	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Cobalt	mg/L		0.0005	<0.0005	<0.0005	<0.0005
Dissolved Copper	mg/L	Equation	0.001	0.001	0.001	0.001
Dissolved Iron	mg/L	0.300	0.010	0.065	0.081	0.071
Dissolved Lead	mg/L	Equation	0.0005	<0.0005	<0.0005	<0.0005
Dissolved Lithium	mg/L		0.05	<0.05	<0.05	<0.05
Dissolved Manganese	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Molybdenum	mg/L	0.073	0.002	<0.002	<0.002	<0.002
Dissolved Nickel	mg/L	Equation	0.001	<0.001	<0.001	<0.001
Dissolved Phosphorus	mg/L		0.05	<0.05	<0.05	<0.05
Dissolved Selenium	mg/L	0.001	0.001	<0.001	<0.001	<0.001
Dissolved Silicon	mg/L		0.05	1.17	1.2	0.93
Dissolved Silver	mg/L	0.00025	0.0001	<0.0001	<0.0001	<0.0001
Dissolved Strontium	mg/L		0.005	0.032	0.031	0.027
Dissolved Thallium	mg/L	0.0008	0.0003	<0.0003	<0.0003	<0.0003
Dissolved Tin	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Titanium	mg/L		0.002	<0.002	0.004	<0.002
Dissolved Uranium	mg/L	0.033, 0.015	0.0005	<0.0005	<0.0005	<0.0005
Dissolved Vanadium	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Zinc	mg/L	0.030	0.005	<0.005	<0.005	<0.005
Dissolved Zirconium	mg/L		0.004	<0.004	<0.004	<0.004
Dissolved Mercury						
Dissolved Mercury	ug/L	0.026	0.026	<0.026	<0.026	<0.026

Table 8 Analytical results of dissolved metals in water samples for Noels Pond, Stephenville, NL (page 1 of 2).

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL) - RDL - Reported Detection Limit;

	Project	3168 - Stepl	henville, N	IL - Industrial Water	[.] Supply	
				3168-NP02-WS2-	3168-NP03-WS1-	3168-NP03-WS2-
Fracflow Sample ID	11:0:40	<u> </u>	RDL	220922	220922	220922
Sampling Date	Units	G/S	RDL	09/22/2022	09/22/2022	09/22/2022
AGAT ID				4355938	4355911	4355924
Total Metals						
Dissolved Aluminum	mg/L	0.100	0.004	0.021	0.031	0.02
Dissolved Antimony	mg/L		0.001	<0.001	<0.001	<0.001
Dissolved Arsenic	mg/L	0.005	0.001	<0.001	<0.001	<0.001
Dissolved Barium	mg/L		0.002	0.012	0.013	0.014
Dissolved Beryllium	mg/L		0.0005	<0.0005	<0.0005	<0.0005
Dissolved Bismuth	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Boron	mg/L	29, 1.5	0.010	<0.010	<0.010	<0.010
Dissolved Cadmium	mg/L	Equation	0.0001	<0.0001	<0.0001	<0.0001
Dissolved Chromium	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Cobalt	mg/L		0.0005	<0.0005	<0.0005	<0.0005
Dissolved Copper	mg/L	Equation	0.001	0.001	0.002	0.002
Dissolved Iron	mg/L	0.3	0.010	0.061	0.069	0.068
Dissolved Lead	mg/L	Equation	0.0005	<0.0005	<0.0005	<0.0005
Dissolved Lithium	mg/L		0.05	<0.05	<0.05	<0.05
Dissolved Manganese	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Molybdenum	mg/L	0.073	0.002	<0.002	<0.002	<0.002
Dissolved Nickel	mg/L	Equation	0.001	<0.001	<0.001	<0.001
Dissolved Phosphorus	mg/L		0.05	<0.05	0.06	<0.05
Dissolved Selenium	mg/L	0.001	0.001	<0.001	<0.001	<0.001
Dissolved Silicon	mg/L		0.05	1.07	0.95	0.97
Dissolved Silver	mg/L	0.00025	0.0001	<0.0001	<0.0001	<0.0001
Dissolved Strontium	mg/L		0.005	0.032	0.03	0.036
Dissolved Thallium	mg/L	0.0008	0.0003	< 0.0003	<0.0003	<0.0003
Dissolved Tin	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Titanium	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Uranium	mg/L	0.033, 0.015	0.0005	<0.0005	<0.0005	<0.0005
Dissolved Vanadium	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Zinc	mg/L	0.03	0.005	<0.005	<0.005	<0.005
Dissolved Zirconium	mg/L		0.004	<0.004	<0.004	<0.004
Dissolved Mercury						
Dissolved Mercury	ug/L	0.026	0.026	<0.026	<0.026	<0.026

Table 8Analytical results of dissolved metals in water samples for Noels Pond, Stephenville, NL
(page 2 of 2).

- RDL - Reported Detection Limit;

⁻ Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

	Project	3168 - Stepl	henville, N	IL - Industrial Water	Supply	
				3168-MP01-WS1-	3168-MP02-WS1-	3168-MP02-WS2-
Fracflow Sample ID	11	0/0	RDL	220925	220925	220925
Sampling Date	Units	G/S	RUL	09/25/2022	09/25/2022	09/25/2022
AGAT ID				4355870	4355871	4355901
Total Metals						
Dissolved Aluminum	mg/L	0.1	0.004	0.043	0.016	0.06
Dissolved Antimony	mg/L		0.001	<0.001	<0.001	<0.001
Dissolved Arsenic	mg/L	0.005	0.001	<0.001	<0.001	<0.001
Dissolved Barium	mg/L		0.002	0.009	0.008	0.006
Dissolved Beryllium	mg/L		0.0005	<0.0005	<0.0005	<0.0005
Dissolved Bismuth	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Boron	mg/L	29, 1.5	0.010	<0.010	<0.010	<0.010
Dissolved Cadmium	mg/L	Equation	0.0001	<0.0001	<0.0001	<0.0001
Dissolved Chromium	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Cobalt	mg/L		0.0005	<0.0005	<0.0005	<0.0005
Dissolved Copper	mg/L	Equation	0.001	0.003	0.001	0.002
Dissolved Iron	mg/L	0.3	0.010	0.067	0.081	0.08
Dissolved Lead	mg/L	Equation	0.0005	0.0005	<0.0005	<0.0005
Dissolved Lithium	mg/L		0.05	<0.05	<0.05	<0.05
Dissolved Manganese	mg/L		0.002	0.002	<0.002	<0.002
Dissolved Molybdenum	mg/L	0.073	0.002	<0.002	<0.002	<0.002
Dissolved Nickel	mg/L	Equation	0.001	0.001	<0.001	<0.001
Dissolved Phosphorus	mg/L		0.05	<0.05	<0.05	<0.05
Dissolved Selenium	mg/L	0.001	0.001	<0.001	0.002	<0.001
Dissolved Silicon	mg/L		0.05	0.58	0.48	0.8
Dissolved Silver	mg/L	0.00025	0.0001	<0.0001	<0.0001	<0.0001
Dissolved Strontium	mg/L		0.005	0.02	0.021	0.016
Dissolved Thallium	mg/L	0.0008	0.0003	<0.0003	<0.0003	<0.0003
Dissolved Tin	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Titanium	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Uranium	mg/L	0.033, 0.015	0.0005	<0.0005	<0.0005	<0.0005
Dissolved Vanadium	mg/L		0.002	<0.002	<0.002	<0.002
Dissolved Zinc	mg/L	0.030	0.005	<0.005	<0.005	<0.005
Dissolved Zirconium	mg/L		0.004	<0.004	<0.004	<0.004
Dissolved Mercury						
Dissolved Mercury	ug/L	0.026	0.026	<0.026	<0.026	<0.026

Table 9 Analytical results of dissolved metals in water samples for Muddy Pond, Stephenville, NL (page 1 of 2).

⁻ Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL) - RDL - Reported Detection Limit;

	Project 3168 - Stephenville, NL - Industrial Water Supply										
				3168-MP03-WS1-							
Fracflow Sample ID	Unite	G/S	RDL	220925							
Sampling Date	Units	6/5	RDL	09/25/2022							
AGAT ID				4355903							
Total Metals											
Dissolved Aluminum	mg/L	0.100	0.004	0.042							
Dissolved Antimony	mg/L		0.001	<0.001							
Dissolved Arsenic	mg/L	0.005	0.001	<0.001							
Dissolved Barium	mg/L		0.002	0.006							
Dissolved Beryllium	mg/L		0.0005	<0.0005							
Dissolved Bismuth	mg/L		0.002	<0.002							
Dissolved Boron	mg/L	29, 1.5	0.010	<0.010							
Dissolved Cadmium	mg/L	Equation	0.0001	<0.0001							
Dissolved Chromium	mg/L		0.002	<0.002							
Dissolved Cobalt	mg/L		0.0005	<0.0005							
Dissolved Copper	mg/L	Equation	0.001	0.001							
Dissolved Iron	mg/L	0.3	0.010	0.062							
Dissolved Lead	mg/L	Equation	0.0005	<0.0005							
Dissolved Lithium	mg/L		0.05	<0.05							
Dissolved Manganese	mg/L		0.002	<0.002							
Dissolved Molybdenum	mg/L	0.073	0.002	<0.002							
Dissolved Nickel	mg/L	Equation	0.001	<0.001							
Dissolved Phosphorus	mg/L		0.05	<0.05							
Dissolved Selenium	mg/L	0.001	0.001	<0.001							
Dissolved Silicon	mg/L		0.05	0.41							
Dissolved Silver	mg/L	0.00025	0.0001	<0.0001							
Dissolved Strontium	mg/L		0.005	0.018							
Dissolved Thallium	mg/L	0.0008	0.0003	<0.0003							
Dissolved Tin	mg/L		0.002	<0.002							
Dissolved Titanium	mg/L		0.002	<0.002							
Dissolved Uranium	mg/L	0.033, 0.015	0.0005	<0.0005							
Dissolved Vanadium	mg/L		0.002	<0.002							
Dissolved Zinc	mg/L	0.030	0.005	<0.005							
Dissolved Zirconium	mg/L		0.004	<0.004							
Dissolved Mercury											
Dissolved Mercury	ug/L	0.026	0.026	<0.026							

Table 9Analytical results of dissolved metals in water samples for Muddy Pond, Stephenville, NL
(page 2 of 2).

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- RDL - Reported Detection Limit;

Pro	Project 3168 - Stephenville, NL - Industrial Water Supply									
Fracflow Sample ID		0/0		3168-GP01- WS1-220923	3168-GP02- WS1-220923	3168-GP03- WS1-220923				
Sampling Date	Units	G/S	RDL	09/23/2022	09/23/2022	09/23/2022				
AGAT ID				4355773	4355762	4355740				
Petroleum Hydrocarbons										
Benzene	mg/L	0.37	0.001	<0.001	<0.001	<0.001				
Toluene	mg/L	0.002	0.001	<0.001	<0.001	<0.001				
Ethylbenzene	mg/L	0.09	0.001	<0.001	<0.001	<0.001				
Xylene (Total)	mg/L		0.002	<0.002	<0.002	<0.002				
C6-C10 (less BTEX)	mg/L		0.01	<0.01	<0.01	<0.01				
>C10-C16 Hydrocarbons	mg/L		0.05	<0.05	<0.05	<0.05				
>C16-C21 Hydrocarbons	mg/L		0.05	<0.05	<0.05	<0.05				
>C21-C32 Hydrocarbons	mg/L		0.01	<0.01	<0.01	<0.01				
Modified TPH (Tier 1)	mg/L		0.05	<0.05	<0.05	<0.05				
Resemblance Comment				NR	NR	NR				
Return to Baseline at C32				Y	Y	Y				
Surrogate Recovery (%)										
Isobutylbenzene - EPH	%			100	88	92				
Isobutylbenzene - VPH	%			105	109	111				
n-Dotriacontane - EPH	%			104	79	83				

Table 10Analytical results of BTEX/TPH in water samples for Gull (Mine) Pond,
Stephenville, NL.

Comments: - Tier I - Atlantic RBCA Version 3 Minimum requirements and reference guidelines for

environmental assessments of petroleum impacted sites in Atlantic Canada (Non-potable

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality

Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- Bold/Shaded - Exceeds Tier I Criteria.

- RDL - Reported Detection Limit;

- G / S - Guideline / Standard

Resemblance Comment Kev:

FOF - Fuel Oil Fraction FR - Product in Fuel Oil Range

GF - Gasoline Fraction

GR - Product in Gasoline Range

UC - Unidentified Compounds

WFOF - Weathered Fuel Oil Fraction

WGF - Weathered Gasoline Fraction

LOF - Lube Oil Fraction LR - Lube Range NA - Not Applicable NR - No Resemblance

Pro	ject 316	8 - Stephen	ville, NL -	Industrial Water	Supply	
Fracflow Sample ID	Unite	C/S		3168-NP01- WS1-220922	3168-NP02- WS1-220922	3168-NP03- WS1-220922
Sampling Date	Units	G/S	RDL	09/22/2022	09/22/2022	09/22/2022
AGAT ID				4355939	4355927	4355911
Petroleum Hydrocarbons						
Benzene	mg/L	0.37	0.001	<0.001	<0.001	<0.001
Toluene	mg/L	0.002	0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/L	0.09	0.001	<0.001	<0.001	<0.001
Xylene (Total)	mg/L		0.002	<0.002	<0.002	<0.002
C6-C10 (less BTEX)	mg/L		0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L		0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L		0.05	<0.05	<0.05	<0.05
>C21-C32 Hydrocarbons	mg/L		0.01	<0.01	<0.01	<0.01
Modified TPH (Tier 1)	mg/L		0.05	<0.05	<0.05	<0.05
Resemblance Comment				NR	NR	NR
Return to Baseline at C32				Y	Y	Y
Surrogate Recovery (%)						
Isobutylbenzene - EPH	%			99	96	100
Isobutylbenzene - VPH	%			82	83	103
n-Dotriacontane - EPH	%			103	98	101

Table 11 Analytical results of BTEX/TPH in water samples for Noels Pond, Stephenville, NL.

Comments: - Tier I - Atlantic RBCA Version 3 Minimum requirements and reference guidelines for environmental assessments of petroleum impacted sites in Atlantic Canada (Non-potable

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality

Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- Bold/Shaded - Exceeds Tier I Criteria.

- RDL - Reported Detection Limit;

- G / S - Guideline / Standard

Resemblance Comment Kev:

FOF - Fuel Oil Fraction

- FR Product in Fuel Oil Range
- GF Gasoline Fraction
- GR Product in Gasoline Range
- UC Unidentified Compounds WFOF - Weathered Fuel Oil Fraction

WGF - Weathered Gasoline Fraction

LOF - Lube Oil Fraction LR - Lube Range NA - Not Applicable NR - No Resemblance

Pre	oject 316	8 - Stephen	ville, NL -	Industrial Water	Supply				
Fracflow Sample ID		0/0		3168-MP01- WS1-220925	3168-MP02- WS1-220925	3168-MP03- WS1-220925			
Sampling Date	Units	G/S	RDL	09/25/2022	09/25/2022	09/25/2022			
AGAT ID				4355870	4355871	4355903			
Petroleum Hydrocarbons									
Benzene	mg/L	0.37	0.001	<0.001	<0.001	<0.001			
Toluene	mg/L	0.002	0.001	<0.001	<0.001	<0.001			
Ethylbenzene	mg/L	0.09	0.001	<0.001	<0.001	<0.001			
Xylene (Total)	mg/L		0.002	<0.002	<0.002	<0.002			
C6-C10 (less BTEX)	mg/L		0.01	<0.01	<0.01	<0.01			
>C10-C16 Hydrocarbons	mg/L		0.05	<0.05	<0.05	<0.05			
>C16-C21 Hydrocarbons	mg/L		0.05	<0.05	<0.05	<0.05			
>C21-C32 Hydrocarbons	mg/L		0.01	<0.01	<0.01	<0.01			
Modified TPH (Tier 1)	mg/L		0.05	<0.05	<0.05	<0.05			
Resemblance Comment				NR	NR	NR			
Return to Baseline at C32				Y	Y	Y			
Surrogate Recovery (%)	Surrogate Recovery (%)								
Isobutylbenzene - EPH	%			100	100	100			
Isobutylbenzene - VPH	%			102	102	96			
n-Dotriacontane - EPH	%			101	100	101			

Table 12 Analytical results of BTEX/TPH in water samples for Muddy Pond, Stephenville, NL.

Comments: - Tier I - Atlantic RBCA Version 3 Minimum requirements and reference guidelines for

environmental assessments of petroleum impacted sites in Atlantic Canada (Non-potable

- Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality

Guidelines for the protection of Freshwater Aquatic Life, (Short Term, Long Term) (FWAL)

- Bold/Shaded Exceeds Tier I Criteria.
- RDL Reported Detection Limit;
- G / S Guideline / Standard
- Resemblance Comment Kev:
 - FOF Fuel Oil Fraction FR - Product in Fuel Oil Range
 - GF Gasoline Fraction
 - GR Product in Gasoline Range
 - UC Unidentified Compounds WFOF - Weathered Fuel Oil Fraction

WGF - Weathered Gasoline Fraction

LOF - Lube Oil Fraction LR - Lube Range NA - Not Applicable NR - No Resemblance

Proje	ect 3168 - S	Stephenvil	le, NL - Inc	dustrial Water S	upply	
Fracflow Sample ID Sampling Date	Units	G / S	RDL	3168-GP02- WS1-220923 09/23/2022	3168-MP02- WS1-220925 09/25/2022	3168-NP01- WS1-220922 09/22/2022
AGAT ID				4355762	4355871	4355939
Volatile Organic Compounds						
Chloromethane	ug/L		1	<1	<1	<1
Vinyl Chloride	ug/L		0.6	<0.6	<0.6	<0.6
Bromomethane	ug/L		0.89	<0.89	<0.89	<0.89
Chloroethane	ug/L		5	<5	<5	<5
Trichlorofluoromethane (FREO	ug/L		5	<5	<5	<5
Acetone	ug/L		10	<10	<10	<10
1,1-Dichloroethylene	ug/L		0.6	<0.6	<0.6	<0.6
Methylene Chloride (Dichlorom	ug/L		2	<2	<2	<2
trans-1,2-Dichloroethylene	ug/L		2	<2	<2	<2
1,1-Dichloroethane	ug/L		1	<1	<1	<1
cis-1,2-Dichloroethylene	ug/L		2	<2	<2	<2
Chloroform	ug/L		1	<1	<1	<1
1,2-Dichloroethane	ug/L	100	2	<2	<2	<2
1,1,1-Trichloroethane	ug/L		1	<1	<1	<1
Carbon Tetrachloride	ug/L		0.56	<0.56	<0.56	<0.56
Benzene	ug/L	370	1	<1	<1	<1
1,2-Dichloropropane	ug/L		0.7	<0.7	<0.7	<0.7
Trichloroethylene	ug/L		1	<1	<1	<1
Bromodichloromethane	ug/L		1	<1	<1	<1
cis-1,3-Dichloropropene	ug/L		0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	ug/L		0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	ug/L		1	<1	<1	<1
Toluene	ug/L	2	2	<2	<2	<2
2-Hexanone	ug/L		10.0	<10.0	<10.0	<10.0
Dibromochloromethane	ug/L		1	<1	<1	<1
1,2-Dibromoethane	ug/L		0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	ug/L		2	<2	<2	<2
1,1,1,2-Tetrachloroethane	µg/L		0.5	<0.5	<0.5	<0.5
Chlorobenzene	ug/L		1	<1	<1	<1
Ethylbenzene	ug/L	90	2	<2	<2	<2
m,p-Xylene	ug/L		4	<4	<4	<4
Bromoform	ug/L		1	<1	<1	<1
Styrene	ug/L	72	1	<1	<1	<1
1,1,2,2-Tetrachloroethane	ug/L		1	<1	<1	<1
o-Xylene	ug/L		1	<1	<1	<1
1,3-Dichlorobenzene	ug/L	150	1	<1	<1	<1
1,4-Dichlorobenzene	ug/L	26	1	<1	<1	<1
1,2-Dichlorobenzene	ug/L		0.7	<0.7	<0.7	<0.7
Toluene-d8	%		1	101	100	100
4-Bromofluorobenzene	%		1	98	97	97

Table 13 Analytical results of Volatile Organic Compounds in water samples from Gull (Mine) Pond, Muddy Pond and Noels Pond, Stephenville, NL.

Comments: - RDL - Reported Detection Limit;

- G / S - Guideline / Standard

Exceeds Guideline - Guideline Legend:

Within Guideline

Below RDL

	Project 3168 - Stephenville, NL - Industrial Water Supply									
Fracflow Sample ID		(1)		3168-GP01-SS1 (Original)	3168-GP01-SS1 (Silica Gel)	3168-GP02-SS1 (Original)	3168-GP02-SS1 (Silica Gel)			
Sampling Date	Units	ESL ⁽¹⁾ (mg/kg)	RDL	09/21/2022	09/21/2022	09/21/2022	09/21/2022			
AGAT ID		(ing/kg)		4352947	4352947	4352946	4352946			
Sampling Depth (m)				2.45	2.45	13.80	13.80			
Petroleum Hydrocarbons										
Benzene	mg/L	31	0.02	<0.02	<0.02	<0.02	<0.02			
Toluene	mg/L	75	0.04	<0.04	<0.04	<0.04	<0.04			
Ethylbenzene	mg/L	55	0.03	<0.03	<0.03	<0.03	<0.03			
Xylene (Total)	mg/L	95	0.05	<0.05	<0.05	<0.05	<0.05			
C6-C10 (less BTEX) (F1)	mg/L	210	3	<3	<3	<3	<3			
>C10-C16 Hydrocarbons (F2)	mg/L	150	15	<15	<15	<15	<15			
>C16-C21 Hydrocarbons (F3)	mg/L	300	15	<15	<15	16	<15			
>C21-C32 Hydrocarbons (F3)	mg/L	300	15	42	17	110	44			
Modified TPH (Tier 1)	mg/L		15	42	17	126	44			
Resemblance Comment				LOF, UC	UC	LOF, UC	UC			
Return to Baseline at C32				N	Y	N	Y			
Silica Gel Clean Up				N	Y	N	Y			
Surrogate Recovery (%)										
Isobutylbenzene - EPH	%			93	111	92	109			
Isobutylbenzene - VPH	%			68	68	71	71			
n-Dotriacontane - EPH	%			87	112	90	112			
Inorganics		-								
% Moisture	%			68	68	90	90			

Table 14Analytical results of BTEX/TPH in soil samples for Gull (Mine) Pond, Stephenville,
NL (Page 1 of 2).

residential for coarse-grained soils).

- Atlantic PIRI lab protocol does not include the analysis of beyond C32 (i.e., F4).
- RDL Reported Detection Limit
- G / S Guideline / Standard
- Results are based on the dry weight of the soil.
- Guideline Legend:

Exceeds Guideline	
Within Guideline	
Below RDL	

- Resemblance Comment Key:
 - FOF Fuel Oil Fraction FR - Product in Fuel Oil Range
 - GF Gasoline Fraction
 - GR Product in Gasoline Range LOF - Lube Oil Fraction
 - LR Lube Range

- NA Not Applicable
- NR No Resemblance
- UC Unidentified Compounds
- WFOF Weathered Fuel Oil Fraction
- WGF Weathered Gasoline Fraction

	Project 3168 - Stephenville, NL - Industrial Water Supply								
Fracflow Sample ID		 (1)		3168-GP03-SS1 (Original)	3168-GP03-SS1 (Silica Gel)				
Sampling Date	Units	ESL ⁽¹⁾ (mg/kg)	RDL	09/21/2022	09/21/2022				
AGAT ID		(ilig/kg)		4352945	4352945				
Sampling Depth (m)				24.10	24.10				
Petroleum Hydrocarbons									
Benzene	mg/L	31	0.02	<0.02	<0.02				
Toluene	mg/L	75	0.04	<0.04	<0.04				
Ethylbenzene	mg/L	55	0.03	<0.03	<0.03				
Xylene (Total)	mg/L	95	0.05	<0.05	<0.05				
C6-C10 (less BTEX) (F1)	mg/L	210	3	<3	<3				
>C10-C16 Hydrocarbons (F2)	mg/L	150	15	<15	<15				
>C16-C21 Hydrocarbons (F3)	mg/L	300	15	47	39				
>C21-C32 Hydrocarbons (F3)	mg/L	300	15	149	97				
Modified TPH (Tier 1)	mg/L		15	196	136				
Resemblance Comment				LOF, UC	UC				
Return to Baseline at C32				N	Y				
Silica Gel Clean Up				N	Y				
Surrogate Recovery (%)									
Isobutylbenzene - EPH	%			93	110				
Isobutylbenzene - VPH	%			70	70				
n-Dotriacontane - EPH	%			89	113				
Inorganics							-		
% Moisture	%			91	91				

Table 14Analytical results of BTEX/TPH in soil samples for Gull (Mine) Pond, Stephenville,
NL (Page 2 of 2).

residential for coarse-grained soils).

- Atlantic PIRI lab protocol does not include the analysis of beyond C32 (i.e., F4).

- RDL - Reported Detection Limit

- G / S - Guideline / Standard

- Results are based on the dry weight of the soil.

- Guideline Legend:

Exceeds Guideline	
Within Guideline	
Below RDL	

- Resemblance Comment Key:

FOF - Fuel Oil Fraction FR - Product in Fuel Oil Range

GF - Gasoline Fraction

GR - Product in Gasoline Range LOF - Lube Oil Fraction

LR - Lube Range

NA - Not Applicable

NR - No Resemblance

UC - Unidentified Compounds

WFOF - Weathered Fuel Oil Fraction

WGF - Weathered Gasoline Fraction

	Project 3168 - Stephenville, NL - Industrial Water Supply									
Fracflow Sample ID		 (1)		3168-NP01-SS1 (Original)	3168-NP01-SS1 (Silica Gel)	3168-NP02-SS1 (Original)	3168-NP03-SS1 (Silica Gel)			
Sampling Date	Units	ESL ⁽¹⁾ (mg/kg)	RDL	09/21/2022	09/21/2022	09/21/2022	09/21/2022			
AGAT ID		(ilig/kg)		4352950	4352950	4352949	4352948			
Sampling Depth (m)				7.20	7.20	12.40	12.40			
Petroleum Hydrocarbons										
Benzene	mg/L	31	0.02	<0.02	<0.02	<0.02	<0.02			
Toluene	mg/L	75	0.04	<0.04	<0.04	<0.04	<0.04			
Ethylbenzene	mg/L	55	0.03	<0.03	<0.03	<0.03	<0.03			
Xylene (Total)	mg/L	95	0.05	<0.05	<0.05	<0.05	<0.05			
C6-C10 (less BTEX) (F1)	mg/L	210	3	<3	<3	<3	<3			
>C10-C16 Hydrocarbons (F2)	mg/L	150	15	<15	<15	<15	<15			
>C16-C21 Hydrocarbons (F3)	mg/L	300	15	22	18	<15	<15			
>C21-C32 Hydrocarbons (F3)	mg/L	300	15	107	80	61	27			
Modified TPH (Tier 1)	mg/L		15	129	98	61	27			
Resemblance Comment				LOF, UC	LOF, UC	LOF, UC	UC			
Return to Baseline at C32				N	Y	N	Y			
Silica Gel Clean Up				N	Y	N	Y			
Surrogate Recovery (%)										
Isobutylbenzene - EPH	%			95	112	95	95			
Isobutylbenzene - VPH	%			121	121	121	121			
n-Dotriacontane - EPH	%			91	114	88	88			
Inorganics										
% Moisture	%			72	72	76	76			

Table 15 Analytical results of BTEX/TPH in soil samples for Noels Pond, Stephenville, NL (Page 1 of 2).

residential for coarse-grained soils). - Atlantic PIRI lab protocol does not include the analysis of beyond C32 (i.e., F4).

- RDL Reported Detection Limit
- G / S Guideline / Standard
- Results are based on the dry weight of the soil.

- Guideline Legend:

Exceeds Guideline							
Within Guideline							
Below RDL							

- Resemblance Comment Key:

FOF - Fuel Oil Fraction FR - Product in Fuel Oil Range

GF - Gasoline Fraction

GR - Product in Gasoline Range

LOF - Lube Oil Fraction

LR - Lube Range

NA - Not Applicable

- NR No Resemblance
- UC Unidentified Compounds
- WFOF Weathered Fuel Oil Fraction
- WGF Weathered Gasoline Fraction

Project 3168 - Stephenville, NL - Industrial Water Supply									
Fracflow Sample ID		 (1)		3168-NP03-SS1 (Original)	3168-NP03-SS1 (Silica Gel)				
Sampling Date	Units	ESL ⁽¹⁾ (mg/kg)	RDL	09/21/2022	09/21/2022				
AGAT ID		(ilig/kg)		4352948	4352948				
Sampling Depth (m)				10.40	10.40				
Petroleum Hydrocarbons									
Benzene	mg/L	31	0.02	<0.02	<0.02				
Toluene	mg/L	75	0.04	<0.04	<0.04				
Ethylbenzene	mg/L	55	0.03	<0.03	<0.03				
Xylene (Total)	mg/L	95	0.05	<0.05	<0.05				
C6-C10 (less BTEX) (F1)	mg/L	210	3	<3	<3				
>C10-C16 Hydrocarbons (F2)	mg/L	150	15	<15	<15				
>C16-C21 Hydrocarbons (F3)	mg/L	300	15	26	<15				
>C21-C32 Hydrocarbons (F3)	mg/L	300	15	83	30				
Modified TPH (Tier 1)	mg/L		15	109	30				
Resemblance Comment				LOF, UC	UC				
Return to Baseline at C32				N	Y				
Silica Gel Clean Up				N	Y				
Surrogate Recovery (%)									
Isobutylbenzene - EPH	%			93	109				
Isobutylbenzene - VPH	%			65	65				
n-Dotriacontane - EPH	%			89	110				
Inorganics									
% Moisture	%			70	70				

Table 15Analytical results of BTEX/TPH in soil samples for Noels Pond, Stephenville, NL
(Page 2 of 2).

Comments: - (1) ESL: Atlantic RBCA v4 Ecological Screening Levels for the Protection of Plants and Soil Invertebrates; Direct Soil Contact - Surface Soils ≤1.5 metres below ground surface (Non-potable residential for coarse-grained soils).

- Atlantic PIRI lab protocol does not include the analysis of beyond C32 (i.e., F4).

- RDL - Reported Detection Limit

- G / S - Guideline / Standard

- Results are based on the dry weight of the soil.

- Guideline Legend:

Exceeds Guideline	
Within Guideline	
Below RDL	

- Resemblance Comment Key:

FOF - Fuel Oil Fraction FR - Product in Fuel Oil Range

GF - Gasoline Fraction

GR - Product in Gasoline Range

LOF - Lube Oil Fraction LR - Lube Range NA - Not Applicable

NR - No Resemblance

UC - Unidentified Compounds

WFOF - Weathered Fuel Oil Fraction

WGF - Weathered Gasoline Fraction

	Project 3168 - Stephenville, NL - Industrial Water Supply									
Fracflow Sample ID		 (1)		3168-MP01-SS1 (Original)	3168-MP01-SS1 (Silica Gel)	3168-MP02-SS1 (Original)	3168-MP02-SS1 (Silica Gel)			
Sampling Date	Units	ESL ⁽¹⁾ (mg/kg)	RDL	09/25/2022	09/25/2022	09/25/2022	09/25/2022			
AGAT ID		(ilig/kg)		4353078	4353078	4353079	4353079			
Sampling Depth (m)				4.10	4.10	16.60	16.60			
Petroleum Hydrocarbons										
Benzene	mg/L	31	0.02	<0.02	<0.02	<0.02	<0.02			
Toluene	mg/L	75	0.04	<0.04	<0.04	<0.04	<0.04			
Ethylbenzene	mg/L	55	Varies	<0.03	<0.01	<0.03	<0.03			
Xylene (Total)	mg/L	95	0.05	<0.05	<0.05	<0.05	<0.05			
C6-C10 (less BTEX) (F1)	mg/L	210	3	<3	<3	<3	<3			
>C10-C16 Hydrocarbons (F2)	mg/L	150	15	<15	<15	<15	<15			
>C16-C21 Hydrocarbons (F3)	mg/L	300	15	<15	<15	30	22			
>C21-C32 Hydrocarbons (F3)	mg/L	300	15	75	44	188	109			
Modified TPH (Tier 1)	mg/L		15	75	44	218	131			
Resemblance Comment				LOF, UC	LOF, UC	LOF, UC	LOF, UC			
Return to Baseline at C32				Ν	Y	N	Y			
Silica Gel Clean Up				N	Y	N	Y			
Surrogate Recovery (%)										
Isobutylbenzene - EPH	%			95	108	94	110			
Isobutylbenzene - VPH	%			117	117	118	118			
n-Dotriacontane - EPH	%			90	111	92	116			
Inorganics										
% Moisture	%			79	79	88	88			

Table 16 Analytical results of BTEX/TPH in soil samples for Muddy Pond, Stephenville, NL (Page 1 of 2).

residential for coarse-grained soils).

- Atlantic PIRI lab protocol does not include the analysis of beyond C32 (i.e., F4).
- RDL Reported Detection Limit
- G / S Guideline / Standard
- Results are based on the dry weight of the soil.
- Guideline Legend:

Exceeds Guideline	
Within Guideline	
Below RDL	

- Resemblance Comment Key:
 - FOF Fuel Oil Fraction FR Product in Fuel Oil Range GF Gasoline Fraction
 - GR Product in Gasoline Range
 - LOF Lube Oil Fraction
 - LR Lube Range

- NA Not Applicable
- NR No Resemblance
- UC Unidentified Compounds
- WFOF Weathered Fuel Oil Fraction
- WGF Weathered Gasoline Fraction

Project 3168 - Stephenville, NL - Industrial Water Supply									
Fracflow Sample ID		 (1)		3168-MP03-SS1 (Original)	3168-MP03-SS1 (Silica Gel)				
Sampling Date	Units	ESL ⁽¹⁾ (mg/kg)	RDL	09/25/2022	09/25/2022				
AGAT ID		(ilig/kg)		4353080	4353080				
Sampling Depth (m)				2.00	2.00				
Petroleum Hydrocarbons									
Benzene	mg/L	31	0.02	<0.02	<0.02				
Toluene	mg/L	75	0.04	<0.04	<0.04				
Ethylbenzene	mg/L	55	0.03	<0.03	<0.03				
Xylene (Total)	mg/L	95	0.05	<0.05	<0.05				
C6-C10 (less BTEX) (F1)	mg/L	210	3	<3	<3				
>C10-C16 Hydrocarbons (F2)	mg/L	150	15	<15	<15				
>C16-C21 Hydrocarbons (F3)	mg/L	300	15	47	26				
>C21-C32 Hydrocarbons (F3)	mg/L	300	15	145	71				
Modified TPH (Tier 1)	mg/L		15	192	97				
Resemblance Comment				LOF, UC	UC				
Return to Baseline at C32				N	Y				
Silica Gel Clean Up				N	Y				
Surrogate Recovery (%)									
Isobutylbenzene - EPH	%			93	108				
Isobutylbenzene - VPH	%			115	115				
n-Dotriacontane - EPH	%			92	110				
Inorganics				-					
% Moisture	%			88	88				

Table 16 Analytical results of BTEX/TPH in soil samples for Muddy Pond, Stephenville, NL (Page 2 of 2).

Comments: - (1) ESL: Atlantic RBCA v4 Ecological Screening Levels for the Protection of Plants and Soil Invertebrates; Direct Soil Contact - Surface Soils ≤1.5 metres below ground surface (Non-potable residential for coarse-grained soils).

- Atlantic PIRI lab protocol does not include the analysis of beyond C32 (i.e., F4).

- RDL - Reported Detection Limit

- G / S - Guideline / Standard

- Results are based on the dry weight of the soil.

- Guideline Legend:

Exceeds Guideline	
Within Guideline	
Below RDL	

- Resemblance Comment Key:

FOF - Fuel Oil Fraction FR - Product in Fuel Oil Range GF - Gasoline Fraction

GR - Product in Gasoline Range LOF - Lube Oil Fraction

LR - Lube Range

NA - Not Applicable

NR - No Resemblance

UC - Unidentified Compounds

WFOF - Weathered Fuel Oil Fraction

WGF - Weathered Gasoline Fraction

F	Project 3168	3 - Stephe	nville, NL -	Industrial Water	Supply	
Fracflow Sample ID				3168-GP01-SS1	3168-GP02-SS1	3168-GP03-SS1
Sampling Date	Units	G/S	RDL	09/21/2022	09/21/2022	09/21/2022
AGAT ID				4352947	4352946	4352945
Polychclic Aromatic Hydroca	rbons					
1-Methylnaphthalene	mg/kg		0.05	<0.01	<0.01	<0.01
2-Methylnaphthalene	mg/kg		0.01	<0.01	<0.01	<0.01
Acenaphthene	mg/kg		0.00671	<0.00671	<0.00671	<0.00671
Acenaphthylene	mg/kg		0.004	<0.004	<0.004	0.01
Acridine	mg/kg		0.05	<0.01	<0.01	<0.01
Anthracene	mg/kg		0.03	<0.01	<0.01	<0.01
Benzo(a)anthracene	mg/kg		0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	mg/kg		0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	mg/kg		0.05	<0.01	<0.01	<0.01
Benzo(j+k)fluoranthene	mg/kg		0.05	<0.01	<0.01	<0.01
Benzo(e)pyrene	mg/kg		0.05	<0.01	<0.01	<0.01
Benzo(ghi)perylene	mg/kg		0.01	<0.01 <0.01		<0.01
Chrysene	mg/kg		0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	mg/kg		0.006	<0.006	<0.006	<0.006
Fluoranthene	mg/kg		0.05	0.01	0.1	0.16
Fluorene	mg/kg		0.01	<0.01	<0.01	<0.01
Indeno(1,2,3)pyrene	mg/kg		0.01	<0.01	<0.01	<0.01
Naphthalene	mg/kg		0.01	<0.01	<0.01	<0.01
Perylene	mg/kg		0.05	0.82	8.61	17.8
Phenanthrene	mg/kg		0.03	<0.01	<0.01	<0.01
Pyrene	mg/kg		0.05	<0.01	<0.01	<0.01
Quinoline	mg/kg		0.05	<0.01	<0.01	<0.01
Surrogate Recovery (%)						
Naphthalene-d8	%			85	81	80
Terphenyl-d14	%		1	64	60	54
Pyrene-d10 (%)	%		1	57	61	57

Table 17Analytical results of Polycyclic Aromatic Hydrocarbons in soil samples from Gull
(Mine) Pond, Stephenville, NL.

Comments: - RDL - Reported Detection Limit;

- G / S - Guideline / Standard

- Guideline Legend:

Exceeds Guideline Within Guideline Below RDL

F	Project 3168 - Stephenville, NL - Industrial Water Supply											
Fracflow Sample ID				3168-NP01-SS1	3168-NP02-SS1	3168-NP03-SS1						
Sampling Date	Units	G/S	RDL	09/21/2022	09/21/2022	09/21/2022						
AGAT ID				4352950	4352949	4352948						
Polychclic Aromatic Hydroca	rbons											
1-Methylnaphthalene	mg/kg		0.05	0.01	<0.01	<0.01						
2-Methylnaphthalene	mg/kg		0.01	0.01	<0.01	<0.01						
Acenaphthene	mg/kg		0.00671	0.0549	<0.00671	<0.00671						
Acenaphthylene	mg/kg		0.004	<0.004	<0.004	<0.004						
Acridine	mg/kg		0.05	<0.01	<0.01	<0.01						
Anthracene	mg/kg		0.03	0.13	<0.01	<0.01						
Benzo(a)anthracene	mg/kg		0.01	<0.01	<0.01	<0.01						
Benzo(a)pyrene	mg/kg		0.01	0.2	<0.01	<0.01						
Benzo(b)fluoranthene	mg/kg		0.05	<0.01	<0.01	<0.01						
Benzo(j+k)fluoranthene	mg/kg		0.05	<0.01	<0.01	<0.01						
Benzo(e)pyrene	mg/kg		0.05	0.16	<0.01	<0.01						
Benzo(ghi)perylene	mg/kg		0.01	<0.01	<0.01	<0.01						
Chrysene	mg/kg		0.01	0.31	<0.01	<0.01						
Dibenzo(a,h)anthracene	mg/kg		0.006	<0.006	<0.006	<0.006						
Fluoranthene	mg/kg		0.05	0.53	0.12	0.03						
Fluorene	mg/kg		0.01	0.06	<0.01	<0.01						
Indeno(1,2,3)pyrene	mg/kg		0.01	<0.01	<0.01	<0.01						
Naphthalene	mg/kg		0.01	<0.01	<0.01	<0.01						
Perylene	mg/kg		0.05	3.65	3.92	1.05						
Phenanthrene	mg/kg		0.03	0.46	<0.01	<0.01						
Pyrene	mg/kg		0.05	0.4	0.1	<0.01						
Quinoline	mg/kg		0.05	<0.01	<0.01	<0.01						
Surrogate Recovery (%)												
Naphthalene-d8	%			93	93	78						
Terphenyl-d14	%		1	67	62	59						
Pyrene-d10 (%)	%		1	65	63	66						

Table 18Analytical results of Polycyclic Aromatic Hydrocarbons in soil samples from Noels
Pond, Stephenville, NL.

Comments: - RDL - Reported Detection Limit;

- G / S - Guideline / Standard

- Guideline Legend:

Exceeds Guideline Within Guideline Below RDL

F	Project 3168 - Stephenville, NL - Industrial Water Supply												
Fracflow Sample ID				3168-MP01-SS1	3168-MP02-SS1	3168-MP03-SS1							
Sampling Date	Units	G/S	RDL	09/25/2022	09/25/2022	09/25/2022							
AGAT ID				4353078	4353079	4353080							
Polychclic Aromatic Hydroca	rbons												
1-Methylnaphthalene	mg/kg		0.05	<0.01	<0.01	<0.01							
2-Methylnaphthalene	mg/kg		0.01	<0.01	<0.01	<0.01							
Acenaphthene	mg/kg		0.00671	<0.00671	<0.00671	<0.00671							
Acenaphthylene	mg/kg		0.004	<0.004	<0.004	<0.004							
Acridine	mg/kg		0.05	<0.01	<0.01	<0.01							
Anthracene	mg/kg		0.03	<0.01	0.08	<0.01							
Benzo(a)anthracene	mg/kg		0.01	<0.01	<0.01	<0.01							
Benzo(a)pyrene	mg/kg		0.01	<0.01	0.18	<0.01							
Benzo(b)fluoranthene	mg/kg		0.05	<0.01	0.14	<0.01							
Benzo(j+k)fluoranthene	mg/kg		0.05	<0.01	0.26	<0.01							
Benzo(e)pyrene	mg/kg		0.05	<0.01	0.13	<0.01							
Benzo(ghi)perylene	mg/kg		0.01	<0.01	<0.01	<0.01							
Chrysene	mg/kg		0.01	<0.01	<0.01	<0.01							
Dibenzo(a,h)anthracene	mg/kg		0.006	<0.006	<0.006	<0.006							
Fluoranthene	mg/kg		0.05	0.09	0.58	0.09							
Fluorene	mg/kg		0.01	<0.01	0.05	<0.01							
Indeno(1,2,3)pyrene	mg/kg		0.01	<0.01	<0.01	<0.01							
Naphthalene	mg/kg		0.01	<0.01	<0.01	<0.01							
Perylene	mg/kg		0.05	1.15	1.02	1.82							
Phenanthrene	mg/kg		0.03	<0.01	0.33	<0.01							
Pyrene	mg/kg		0.05	0.08	0.5	<0.01							
Quinoline	mg/kg		0.05	<0.01	<0.01	<0.01							
Surrogate Recovery (%)													
Naphthalene-d8	%			60	82	75							
Terphenyl-d14	%		1	80	89	75							
Pyrene-d10 (%)	%		1	74	84	68							

Table 19Analytical results of Polycyclic Aromatic Hydrocarbons in soil samples from Muddy
Pond, Stephenville, NL.

Comments: - RDL - Reported Detection Limit;

- G / S - Guideline / Standard

- Guideline Legend:

Exceeds Guideline Within Guideline Below RDL

5.0 **REFERENCES**

- Fracflow Consultants Inc., 2022a. Technical Memorandum. Assessment of the Potential to Obtain an Industrial Water Supply, North of the Port of Stephenville, NL. Report No. FFC-NL-3168-001. 13p. June 1, 2022.
- Fracflow Consultants Inc., 2022b. Report. Evaluation of Industrial Water Supply. Stephenville, NL. Report No. FFC-NL-3168-004.

APPENDIX A

Water and Pond Sediment Chemistry Data



CLIENT NAME: FRACFLOW CONSULTANTS 154 MAJOR'S PATH ST. JOHN'S PATH, NL A1A5A1 (709) 739-7270 ATTENTION TO: John Gale PROJECT: 3168 Horizon Maritime AGAT WORK ORDER: 22K950750 TRACE ORGANICS REVIEWED BY: Dylan McCarthy, Trace Organics Lab Technician WATER ANALYSIS REVIEWED BY: Jason Coughtrey, Inorganics Supervisor DATE REPORTED: Oct 11, 2022 PAGES (INCLUDING COVER): 35 VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

 Indese

 Indese

 Indese

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
 incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
 merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
 contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Iember of: Association of Professional Engineers and Geoscientists of Alberta
(APEGA)
Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

Page 1 of 35

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



ATTENTION TO: John Gale

SAMPLED BY:

AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

Atlantic RBCA Tier 1 Hydrocarbons in Water - Low Level Version 3.1

DATE RECEIVED: 2022-09-27

DATE RECEIVED. 2022-09-27									_D. 2022-10-11	
			3168-GP03-WS	1 3168-GP02-WS1	3168-GP01-WS1	1 3168-MP01-WS1	3168-MP02-WS	3168-MP03-WS1	3168-NP03-WS1	3168-NP02-WS
		SAMPLE DESCRIPTIC	DN: -220923	-220923	-220923	-220925	-220925	-220925	-220922	-220922
		SAMPLE TYP	PE: Water	Water						
		DATE SAMPLE	ED: 2022-09-23 13:20	2022-09-23 14:30	2022-09-23 15:00	2022-09-25 10:50	2022-09-25 11:45	2022-09-25 13:40	2022-09-22 10:15	2022-09-22 11:45
Parameter	Unit	G / S RDL	4355740	4355762	4355773	4355870	4355871	4355903	4355911	4355927
Benzene	mg/L	0.00	1 <0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	mg/L	0.00	1 <0.001	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001
Ethylbenzene	mg/L	0.00	1 <0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Xylene (Total)	mg/L	0.002	2 <0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
C6-C10 (less BTEX)	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L	0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L	0.05	< 0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C21-C32 Hydrocarbons	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Modified TPH (Tier 1)	mg/L	0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sediment			NO	NO	NO	NO	NO	NO	NO	NO
Resemblance Comment			NR	NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32			Y	Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits								
Isobutylbenzene - EPH	%	70-130	92	88	100	100	100	100	100	96
Isobutylbenzene - VPH	%	70-130	111	109	105	102	102	96	103	83
n-Dotriacontane - EPH	%	70-130	83	79	104	101	100	101	101	98

Certified By:

Julon Munt

DATE REPORTED: 2022-10-11



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water - Low Level Version 3.1

DATE RECEIVED: 2022-09-27

DATE RECEIVED. 2022-03-21				DATE NET ONTED. 2022-10-11
			3168-NP01-WS1	
	5	SAMPLE DESCRIPTION:	-220922	
		SAMPLE TYPE:	Water	
		DATE SAMPLED:	2022-09-22 13:15	
Parameter	Unit	G/S RDL	4355939	
Benzene	mg/L	0.001	<0.001	
Toluene	mg/L	0.001	<0.001	
Ethylbenzene	mg/L	0.001	<0.001	
Xylene (Total)	mg/L	0.002	<0.002	
C6-C10 (less BTEX)	mg/L	0.01	<0.01	
>C10-C16 Hydrocarbons	mg/L	0.05	<0.05	
>C16-C21 Hydrocarbons	mg/L	0.05	<0.05	
>C21-C32 Hydrocarbons	mg/L	0.01	<0.01	
Modified TPH (Tier 1)	mg/L	0.05	<0.05	
Sediment			NO	
Resemblance Comment			NR	
Return to Baseline at C32			Y	
Surrogate	Unit	Acceptable Limits		
lsobutylbenzene - EPH	%	70-130	99	
Isobutylbenzene - VPH	%	70-130	82	
n-Dotriacontane - EPH	%	70-130	103	

Certified By:

Julon Mant

DATE REPORTED: 2022-10-11



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water - Low Level Version 3.1

DATE RECEIVED: 2022-09-27

DATE REPORTED: 2022-10-11

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

4355740-4355939 Modified TPH, Xylene(Total)and C6-C10(less BTEX) are calculated parameters. The calculated parameter is non-accredited. The component parameters of the calculation are accredited.

Sediment parameter is comment only based on visual inspection of the sample prior to extraction and is not an accredited test.

Resemblance Comment Key: GF - Gasoline Fraction WGF - Weathered Gasoline Fraction GR - Product in Gasoline Range FOF - Fuel Oil Fraction WFOF - Weathered Fuel Oil Fraction FR - Product in Fuel Oil Range LOF - Lube Oil Fraction LR - Lube Range UC - Unidentified Compounds NR - No Resemblance NA - Not Applicable

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

Julon Mants



ATTENTION TO: John Gale

SAMPLED BY:

AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

			Volatile O	rganic Comp	ounds in Wat	er
DATE RECEIVED: 2022-09-27						DATE REPORTED: 2022-10-11
			3168-GP02-WS	1 3168-MP02-WS1	3168-NP01-WS1	
		SAMPLE DESCRIPTION SAMPLE TYPE DATE SAMPLED	: Water	-220925 Water 2022-09-25 11:45	-220922 Water 2022-09-22 13:15	
Parameter	Unit	G/S RDL	4355762	4355871	4355939	
Chloromethane	ug/L	1	<1	<1	<1	
Vinyl Chloride	ug/L	0.6	<0.6	<0.6	<0.6	
Bromomethane	ug/L	0.89	<0.89	<0.89	<0.89	
Chloroethane	ug/L	5	<5	<5	<5	
Trichlorofluoromethane (FREON 11)	ug/L	5	<5	<5	<5	
Acetone	ug/L	10	<10	<10	<10	
1,1-Dichloroethylene	ug/L	0.6	<0.6	<0.6	<0.6	
Methylene Chloride (Dichloromethane)	ug/L	2	<2	<2	<2	
trans-1,2-Dichloroethylene	ug/L	2	<2	<2	<2	
1,1-Dichloroethane	ug/L	1	<1	<1	<1	
cis-1,2-Dichloroethylene	ug/L	2	<2	<2	<2	
Chloroform	ug/L	1	<1	<1	<1	
1,2-Dichloroethane	ug/L	2	<2	<2	<2	
1,1,1-Trichloroethane	ug/L	1	<1	<1	<1	
Carbon Tetrachloride	ug/L	0.56	<0.56	<0.56	<0.56	
Benzene	ug/L	1	<1	<1	<1	
1,2-Dichloropropane	ug/L	0.7	<0.7	<0.7	<0.7	
Trichloroethylene	ug/L	1	<1	<1	<1	
Bromodichloromethane	ug/L	1	<1	<1	<1	
cis-1,3-Dichloropropene	ug/L	0.5	<0.5	<0.5	<0.5	
trans-1,3-Dichloropropene	ug/L	0.5	<0.5	<0.5	<0.5	
1,1,2-Trichloroethane	ug/L	1	<1	<1	<1	
Toluene	ug/L	2	<2	<2	<2	
2-Hexanone	ug/L	10.0	<10.0	<10.0	<10.0	
Dibromochloromethane	ug/L	1	<1	<1	<1	
1,2-Dibromoethane	ug/L	0.5	<0.5	<0.5	<0.5	
Tetrachloroethylene	ug/L	2	<2	<2	<2	
1,1,1,2-Tetrachloroethane	µg/L	0.5	<0.5	<0.5	<0.5	

Certified By:

Julon Mant



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

			Volutilo O	igaine comp		
DATE RECEIVED: 2022-09-27						DATE REPORTED: 2022-10-11
			3168-GP02-WS			
		SAMPLE DESCRIPTIO	N: -220923	-220925	-220922	
		SAMPLE TYP	E: Water	Water	Water	
		DATE SAMPLEI	D: 2022-09-23 14:30	2022-09-25 11:45	2022-09-22 13:15	
Parameter	Unit	G/S RDL	4355762	4355871	4355939	
Chlorobenzene	ug/L	1	<1	<1	<1	
Ethylbenzene	ug/L	2	<2	<2	<2	
m,p-Xylene	ug/L	4	<4	<4	<4	
Bromoform	ug/L	1	<1	<1	<1	
Styrene	ug/L	1	<1	<1	<1	
1,1,2,2-Tetrachloroethane	ug/L	1	<1	<1	<1	
o-Xylene	ug/L	1	<1	<1	<1	
1,3-Dichlorobenzene	ug/L	1	<1	<1	<1	
1,4-Dichlorobenzene	ug/L	1	<1	<1	<1	
1,2-Dichlorobenzene	ug/L	0.7	<0.7	<0.7	<0.7	
Surrogate	Unit	Acceptable Limits				
Toluene-d8	%	60-140	101	100	100	
4-Bromofluorobenzene	%	60-140	98	97	97	

Volatile Organic Compounds in Water

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

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

Julon Munt



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

					DOC)					
DATE RECEIVED: 2022-09-27									DATE REPORTI	ED: 2022-10-11	
				3168-GP03-WS1	3168-GP03-WS2	3168-GP02-WS1	3168-GP02-WS2	3168-GP01-WS1	3168-MP01-WS1	3168-MP02-WS1	3168-MP02-WS
		SAMPLE DESCRIPTION:		-220923	-220923	-220923	-220923	-220923	-220925	-220925	-220925
		SAM	PLE TYPE:	Water							
		DATE SAMPLED:		2022-09-23 13:20	2022-09-23 13:55	2022-09-23 14:30	2022-09-23 14:30	2022-09-23 15:00	2022-09-25 10:50	2022-09-25 11:45	2022-09-25 12:25
Parameter	Unit	G / S	RDL	4355740	4355744	4355762	4355770	4355773	4355870	4355871	4355901
Dissolved Organic Carbon	mg/L		0.5	11.2	6.1	5.1	4.8	5.7	3.9	3.7	3.7
				3168-MP03-WS1	3168-NP03-WS1	3168-NP03-WS2	3168-NP02-WS1	3168-NP02-WS2	2 3168-NP01-WS1	3168-NP01-WS2	
		SAMPLE DES	CRIPTION:	-220925	-220922	-220922	-220922	-220922	-220922	-220922	
		SAM	PLE TYPE:	Water							
	DATE SAMPLI		SAMPLED:	2022-09-25 13:40	2022-09-22 10:15	2022-09-22 11:00	2022-09-22 11:45	2022-09-22 12:15	2022-09-22 13:15	2022-09-22 14:10	
Parameter	Unit	G / S	RDL	4355903	4355911	4355924	4355927	4355938	4355939	4355955	
Dissolved Organic Carbon	mg/L		0.5	4.2	3.7	3.8	3.5	3.6	4.2	3.9	

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

Analysis performed at AGAT Halifax (unless marked by *)

Jason Coto

Certified By:



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

					11/21/21/21/21/21/21/21/21/21/21/21/21/2	alei (Dissoli	veu)				
DATE RECEIVED: 2022-09-27									DATE REPORT	ED: 2022-10-11	
				3168-GP03-WS1	1 3168-GP03-WS2	2 3168-GP02-WS1	3168-GP02-WS2	3168-GP01-WS1	1 3168-MP01-WS1	3168-MP02-WS1	3168-MP02-WS
		SAMPLE DES	CRIPTION:	-220923	-220923	-220923	-220923	-220923	-220925	-220925	-220925
		SAM	PLE TYPE:	Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2022-09-23 13:20	2022-09-23 13:55	2022-09-23 14:30	2022-09-23 14:30	2022-09-23 15:00	2022-09-25 10:50	2022-09-25 11:45	2022-09-25 12:25
Parameter	Unit	G/S	RDL	4355740	4355744	4355762	4355770	4355773	4355870	4355871	4355901
Dissolved Mercury	ug/L		0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026
		SAMPLE DESCRIPTION:			3168-NP03-WS1 -220922	3168-NP03-WS2 -220922	2 3168-NP02-WS1 -220922	3168-NP02-WS2 -220922	2 3168-NP01-WS1 -220922	3168-NP01-WS2 -220922	
		SAM	PLE TYPE:	Water	Water	Water	Water	Water	Water	Water	
		DATE SAMPLED:		2022-09-25 13:40	2022-09-22 10:15	2022-09-22 11:00	2022-09-22 11:45	2022-09-22 12:15	2022-09-22 13:15	2022-09-22 14:10	
Parameter	Unit	G / S	RDL	4355903	4355911	4355924	4355927	4355938	4355939	4355955	
Dissolved Mercury	ug/L		0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	

Mercury Analysis in Water (Dissolved)

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

Analysis performed at AGAT Halifax (unless marked by *)

Jason Court



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

				Mercur	y Analysis in	water (Tota	ai)				
DATE RECEIVED: 2022-09-27									DATE REPORT	ED: 2022-10-11	
				3168-GP03-WS1	1 3168-GP03-WS2	2 3168-GP02-WS1	3168-GP02-WS2	3168-GP01-WS	1 3168-MP01-WS1	3168-MP02-WS1	3168-MP02-WS
	SAMPLE DESCRIPTION:			-220923	-220923	-220923	-220923	-220923	-220925	-220925	-220925
		SAM	PLE TYPE:	Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2022-09-23 13:20	2022-09-23 13:55	2022-09-23 14:30	2022-09-23 14:30	2022-09-23 15:00	2022-09-25 10:50	2022-09-25 11:45	2022-09-25 12:25
Parameter	Unit	G/S	RDL	4355740	4355744	4355762	4355770	4355773	4355870	4355871	4355901
Total Mercury	ug/L		0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026
		SAMPLE DESCRIPTION:			1 3168-NP03-WS1 -220922	3168-NP03-WS2 -220922	2 3168-NP02-WS1 -220922	3168-NP02-WS2 -220922	2 3168-NP01-WS1 -220922	3168-NP01-WS2 -220922	
		SAM	PLE TYPE:	Water	Water	Water	Water	Water	Water	Water	
		DATE SAMPLED:		2022-09-25 13:40	2022-09-22 10:15	2022-09-22 11:00	2022-09-22 11:45	2022-09-22 12:15	2022-09-22 13:15	2022-09-22 14:10	
Parameter	Unit	G/S	RDL	4355903	4355911	4355924	4355927	4355938	4355939	4355955	
Total Mercury	ug/L		0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	

Mercury Analysis in Water (Total)

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

Analysis performed at AGAT Halifax (unless marked by *)

Jason Cour



ATTENTION TO: John Gale

SAMPLED BY:

AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

Metals - Lab Filtered Dissolved Metals in Water (mg/L)

DATE RECEIVED: 2022-09-27							DATE REPORTED: 2022-10-11			
			3168-GP03-WS1	3168-GP03-WS2	3168-GP02-WS1	3168-GP02-WS2	3168-GP01-WS1	3168-MP01-WS1	3168-MP02-WS1	3168-MP02-WS2
		SAMPLE DESCRIPTION:	-220923	-220923	-220923	-220923	-220923	-220925	-220925	-220925
		SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:	2022-09-23 13:20	2022-09-23 13:55	2022-09-23 14:30	2022-09-23 14:30	2022-09-23 15:00	2022-09-25 10:50	2022-09-25 11:45	2022-09-25 12:25
Parameter	Unit	G/S RDL	4355740	4355744	4355762	4355770	4355773	4355870	4355871	4355901
Dissolved Aluminum	mg/L	0.004	0.028	0.043	0.033	0.033	0.034	0.043	0.016	0.060
Dissolved Antimony	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Arsenic	mg/L	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Barium	mg/L	0.002	0.005	0.004	0.005	0.005	0.005	0.009	0.008	0.006
Dissolved Beryllium	mg/L	0.0005	< 0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Bismuth	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Dissolved Boron	mg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Dissolved Cadmium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Chromium	mg/L	0.002	< 0.002	<0.002	<0.002	<0.002	<0.002	< 0.002	<0.002	<0.002
Dissolved Cobalt	mg/L	0.0005	< 0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.0005	<0.0005	<0.0005
Dissolved Copper	mg/L	0.001	0.001	0.001	0.001	0.002	0.001	0.003	0.001	0.002
Dissolved Iron	mg/L	0.010	0.047	0.100	0.062	0.067	0.057	0.067	0.081	0.080
Dissolved Lead	mg/L	0.0005	< 0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005
Dissolved Lithium	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dissolved Manganese	mg/L	0.002	< 0.002	0.035	<0.002	0.005	<0.002	0.002	<0.002	<0.002
Dissolved Molybdenum	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Dissolved Nickel	mg/L	0.001	<0.001	0.001	0.001	0.001	0.001	0.001	<0.001	<0.001
Dissolved Phosphorus	mg/L	0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dissolved Selenium	mg/L	0.001	< 0.001	0.002	0.003	<0.001	<0.001	<0.001	0.002	<0.001
Dissolved Silicon	mg/L	0.05	0.86	1.03	1.01	1.16	0.95	0.58	0.48	0.80
Dissolved Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Strontium	mg/L	0.005	0.023	0.024	0.023	0.025	0.021	0.020	0.021	0.016
Dissolved Thallium	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	<0.0003
Dissolved Tin	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Dissolved Titanium	mg/L	0.002	< 0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Dissolved Uranium	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Vanadium	mg/L	0.002	< 0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Dissolved Zinc	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Certified By:

Jason Coto



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Metals - Lab Filtered Dissolved Metals in Water (mg/L) DATE RECEIVED: 2022-09-27 DATE REPORTED: 2022-10-11 3168-GP03-WS1 3168-GP03-WS2 3168-GP02-WS1 3168-GP02-WS2 3168-GP01-WS1 3168-MP01-WS1 3168-MP02-WS1 3168-MP02-WS2 SAMPLE DESCRIPTION: -220923 -220923 -220923 -220923 -220923 -220925 -220925 -220925 SAMPLE TYPE: Water Water Water Water Water Water Water Water DATE SAMPLED: 2022-09-23 2022-09-23 2022-09-23 2022-09-23 2022-09-23 2022-09-25 2022-09-25 2022-09-25 13:20 13:55 14:30 14:30 15:00 10:50 11:45 12:25 G/S 4355740 4355744 4355762 4355901 Unit RDL 4355770 4355773 4355870 4355871 Parameter 0.004 < 0.004 < 0.004 < 0.004 < 0.004 < 0.004 < 0.004 < 0.004 < 0.004 Dissolved Zirconium mg/L Lab Filtration Performed 2022/10/05 2022/10/05 2022/10/05 2022/10/05 2022/10/05 2022/10/05 2022/10/05 2022/10/05

Certified By:



ATTENTION TO: John Gale

SAMPLED BY:

AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

Metals - Lab Filtered Dissolved Metals in Water (mg/L)

DATE RECEIVED: 2022-09-27 DATE REPORTED: 2022-10-11										
		3	3168-MP03-WS1	3168-NP03-WS1	3168-NP03-WS2	3168-NP02-WS1	3168-NP02-WS2	3168-NP01-WS1	3168-NP01-WS2	
		SAMPLE DESCRIPTION:	-220925	-220922	-220922	-220922	-220922	-220922	-220922	
		SAMPLE TYPE:	Water							
l		DATE SAMPLED:	2022-09-25	2022-09-22	2022-09-22	2022-09-22	2022-09-22	2022-09-22	2022-09-22	
			13:40	10:15	11:00	11:45	12:15	13:15	14:10	
Parameter	Unit	G/S RDL	4355903	4355911	4355924	4355927	4355938	4355939	4355955	
Dissolved Aluminum	mg/L	0.004	0.042	0.031	0.020	0.019	0.021	0.020	0.020	
Dissolved Antimony	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Dissolved Arsenic	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Dissolved Barium	mg/L	0.002	0.006	0.013	0.014	0.012	0.012	0.012	0.012	
Dissolved Beryllium	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Dissolved Bismuth	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Dissolved Boron	mg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Dissolved Cadmium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Dissolved Chromium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Dissolved Cobalt	mg/L	0.0005	< 0.0005	<0.0005	< 0.0005	<0.0005	< 0.0005	<0.0005	<0.0005	
Dissolved Copper	mg/L	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001	
Dissolved Iron	mg/L	0.010	0.062	0.069	0.068	0.071	0.061	0.065	0.081	
Dissolved Lead	mg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Dissolved Lithium	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Dissolved Manganese	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Dissolved Molybdenum	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Dissolved Nickel	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Dissolved Phosphorus	mg/L	0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	
Dissolved Selenium	mg/L	0.001	<0.001	<0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	
Dissolved Silicon	mg/L	0.05	0.41	0.95	0.97	0.93	1.07	1.17	1.20	
Dissolved Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Dissolved Strontium	mg/L	0.005	0.018	0.030	0.036	0.027	0.032	0.032	0.031	
Dissolved Thallium	mg/L	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	
Dissolved Tin	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Dissolved Titanium	mg/L	0.002	<0.002	<0.002	< 0.002	<0.002	< 0.002	<0.002	0.004	
Dissolved Uranium	mg/L	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	<0.0005	<0.0005	
Dissolved Vanadium	mg/L	0.002	< 0.002	< 0.002	< 0.002	<0.002	< 0.002	< 0.002	<0.002	
Dissolved Zinc	mg/L	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	

Certified By:

Jason Cotto



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Metals - Lab Filtered Dissolved Metals in Water (mg/L)

DATE RECEIVED: 2022-09-27	ATE RECEIVED: 2022-09-27 DATE REPORTED: 2022-10-11													
				3168-MP03-WS1	3168-NP03-WS1	3168-NP03-WS2	3168-NP02-WS1	3168-NP02-WS2	3168-NP01-WS1	3168-NP01-WS2				
		SAMPLE DES	CRIPTION:	-220925	-220922	-220922	-220922	-220922	-220922	-220922				
		SAM	PLE TYPE:	Water										
		DATES	SAMPLED:	2022-09-25 13:40	2022-09-22 10:15	2022-09-22 11:00	2022-09-22 11:45	2022-09-22 12:15	2022-09-22 13:15	2022-09-22 14:10				
Parameter	Unit	G / S	RDL	4355903	4355911	4355924	4355927	4355938	4355939	4355955				
Dissolved Zirconium	mg/L		0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004				
Lab Filtration Performed				2022/10/05	2022/10/05	2022/10/05	2022/10/05	2022/10/05	2022/10/05	2022/10/05				

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

4355740-4355955 Metals analysis completed on a lab filtered sample.

Analysis performed at AGAT Toronto (unless marked by *)

Jason Court

Certified By:



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime

11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

				Standard V	Vater Analys	is + Total M	etals				
DATE RECEIVED: 2022-09-27								DA	TE REPOR	TED: 2022-10-11	
	S/	AMPLE DESC		3168-GP03-WS1 -220923 Water	3168-GP03-WS2 -220923 Water	3168-GP02-WS1 -220923 Water	3168-GP02-WS2 -220923 Water	3168-GP01-WS1 -220923 Water		3168-MP01-WS1 -220925 Water	3168-MP02-WS -220925 Water
		DATE S	AMPLED:	2022-09-23 13:20	2022-09-23 13:55	2022-09-23 14:30	2022-09-23 14:30	2022-09-23 15:00		2022-09-25 10:50	2022-09-25 11:45
Parameter	Unit	G/S	RDL	4355740	4355744	4355762	4355770	4355773	RDL	4355870	4355871
рН				7.32	6.50	6.59	6.48	6.60		6.84	6.91
Reactive Silica as SiO2	mg/L		0.5	2.0	2.7	2.0	2.6	2.1	0.5	1.3	1.3
Chloride	mg/L		1	23	24	23	23	23	1	7	7
Fluoride	mg/L		0.12	<0.12	<0.12	<0.12	<0.12	<0.12	0.12	<0.12	<0.12
Sulphate	mg/L		2	5	4	4	4	3	2	<2	<2
Alkalinity	mg/L		5	12	14	11	12	10	5	34	34
True Color	TCU		5.00	31.4	40.1	33.9	34.6	32.1	5.00	51.1	49.1
Turbidity	NTU		0.5	0.7	0.7	<0.5	1.8	1.7	0.5	<0.5	1.1
Electrical Conductivity	umho/cm		1	118	123	118	119	119	1	97	99
Nitrate + Nitrite as N	mg/L		0.05	<0.05	0.08	<0.05	0.06	<0.05	0.05	0.05	0.06
Nitrate as N	mg/L		0.05	<0.05	0.08	<0.05	0.06	<0.05	0.05	0.05	0.06
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	0.10	0.12	0.11	0.10	0.08	0.03	0.24	0.07
Total Organic Carbon	mg/L		0.5	7.2	6.8	7.2	6.8	7.3	0.5	6.1	6.5
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Total Sodium	mg/L		0.1	17	16	16	15	16	0.1	5.7	5.5
Total Potassium	mg/L		0.1	0.5	0.5	0.5	0.5	0.5	0.1	0.4	0.4
Total Calcium	mg/L		0.1	4.8	5.1	4.7	4.7	4.9	0.8	10.4	10.6
Total Magnesium	mg/L		0.1	1.8	1.9	1.8	1.8	1.8	0.1	2.2	2.1
Bicarb. Alkalinity (as CaCO3)	mg/L		5	12	14	11	12	10	5	34	34
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	5	<5	<5
Calculated TDS	mg/L		1	60	61	57	57	55	1	47	47
Hardness	mg/L			19.4	20.6	19.1	19.1	19.6		35.0	35.1
Langelier Index (@20C)	NA			-2.48	-3.21	-3.26	-3.33	-3.27		-2.17	-2.09
Langelier Index (@ 4C)	NA			-2.80	-3.53	-3.58	-3.65	-3.59		-2.49	-2.41
Saturation pH (@ 20C)	NA			9.80	9.71	9.85	9.81	9.87		9.01	9.00
Saturation pH (@ 4C)	NA			10.1	10.0	10.2	10.1	10.2		9.33	9.32

Jason Cotophi



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

				Standard V	Vater Analys	is + Total M	etals				
DATE RECEIVED: 2022-09-27								DA	TE REPOR	TED: 2022-10-11	
		3 SAMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED:		3168-GP03-WS1 -220923 Water 2022-09-23 13:20	3168-GP03-WS2 -220923 Water 2022-09-23 13:55	3168-GP02-WS1 -220923 Water 2022-09-23 14:30	3168-GP02-WS2 -220923 Water 2022-09-23 14:30	3168-GP01-WS1 -220923 Water 2022-09-23 15:00		3168-MP01-WS1 -220925 Water 2022-09-25 10:50	3168-MP02-WS -220925 Water 2022-09-25 11:45
Parameter	Unit	G / S	RDL	4355740	4355744	4355762	4355770	4355773	RDL	4355870	4355871
Anion Sum	me/L			0.99	1.05	0.95	0.98	0.91		0.88	0.88
Cation sum	me/L			1.16	1.15	1.11	1.07	1.12		0.99	0.97
% Difference/ Ion Balance	%			7.6	4.6	7.5	4.5	10.1		5.7	4.7
Total Aluminum	ug/L		5	53	83	44	74	49	5	72	71
Total Antimony	ug/L		2	3	<2	<2	3	<2	2	<2	<2
Total Arsenic	ug/L		2	<2	<2	<2	<2	<2	2	<2	<2
Total Barium	ug/L		5	13	10	9	12	13	5	15	13
Total Beryllium	ug/L		2	<2	<2	<2	<2	<2	2	<2	<2
Total Bismuth	ug/L		2	<2	<2	<2	<2	<2	2	<2	<2
Total Boron	ug/L		5	6	6	6	5	6	5	5	<5
Total Cadmium	ug/L		0.017	<0.017	<0.017	<0.017	<0.017	<0.017	0.017	<0.017	<0.017
Total Chromium	ug/L		1	1	<1	<1	1	<1	1	<1	<1
Total Cobalt	ug/L		1	<1	<1	<1	<1	<1	1	<1	<1
Total Copper	ug/L		1	<1	<1	<1	<1	2	1	<1	<1
Total Iron	ug/L		50	98	204	60	113	72	50	118	111
Total Lead	ug/L		0.5	<0.5	2.2	<0.5	0.7	<0.5	0.5	1.0	<0.5
Total Manganese	ug/L		2	17	64	17	10	19	2	8	7
Total Molybdenum	ug/L		2	<2	<2	<2	<2	<2	2	<2	<2
Total Nickel	ug/L		2	<2	<2	<2	<2	<2	2	<2	<2
Total Phosphorous	mg/L		0.02	0.03	0.03	0.02	0.03	0.03	0.02	0.03	0.03
Total Selenium	ug/L		1	<1	<1	<1	<1	<1	1	<1	<1
Total Silver	ug/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Total Strontium	ug/L		5	27	31	26	25	28	5	21	21
Total Thallium	ug/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Total Tin	ug/L		2	<2	<2	<2	<2	<2	2	<2	<2
Total Titanium	ug/L		2	<2	<2	<2	<2	<2	2	<2	<2
Total Uranium	ug/L		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2
Total Vanadium	ug/L		2	<2	<2	<2	<2	<2	2	<2	<2

Certified By:

Jason Cought



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

Standard Water Analysis + Total Metals															
ATE RECEIVED: 2022-09-27 DATE REPORTED: 2022-10-11															
	3168-GP03-WS1 3168-GP03-WS2 3168-GP02-WS1 3168-GP02-WS2 3168-GP01-WS1 3168-MP01-WS1 3168-MP02-WS														
		SAMPLE DESCRIPTION: -220923 -220923 -220923 -220923 -220923 -220925 -220													
		SAM	PLE TYPE:	Water	Water	Water	Water	Water		Water	Water				
		DATE	SAMPLED:	2022-09-23 13:20	2022-09-23 13:55	2022-09-23 14:30	2022-09-23 14:30	2022-09-23 15:00		2022-09-25 10:50	2022-09-25 11:45				
Parameter	Unit	G/S	RDL	4355740	4355744	4355762	4355770	4355773	RDL	4355870	4355871				
Total Zinc	ug/L		5	<5	<5	<5	<5	<5	5	<5	<5				

Certified By:

Jasan Court



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

			Standard V	Vater Analysis	+ Total	Metals				
DATE RECEIVED: 2022-09-27							[DATE REPORT	ED: 2022-10-11	
	S/	AMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED:	3168-MP02-WS2 -220925 Water 2022-09-25 12:25	3168-MP03-WS1 -220925 Water 2022-09-25 13:40		3168-NP03-WS1 -220922 Water 2022-09-22 10:15	3168-NP03-WS2 -220922 Water 2022-09-22 11:00	3168-NP02-WS1 -220922 Water 2022-09-22 11:45	3168-NP02-WS2 -220922 Water 2022-09-22 12:15	3168-NP01-WS1 -220922 Water 2022-09-22 13:15
Parameter	Unit	G/S RDL	4355901	4355903	RDL	4355911	4355924	4355927	4355938	4355939
рН			6.76	6.83		7.16	7.26	7.25	7.25	7.26
Reactive Silica as SiO2	mg/L	0.5	1.7	0.9	0.5	2.2	2.4	2.4	2.4	2.7
Chloride	mg/L	1	8	7	1	7	7	7	7	7
Fluoride	mg/L	0.12	<0.12	<0.12	0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Sulphate	mg/L	2	<2	<2	2	<2	<2	<2	<2	<2
Alkalinity	mg/L	5	28	29	5	58	61	57	57	57
True Color	TCU	5.00	71.6	43.7	5.00	39.0	39.8	42.5	44.6	52.8
Turbidity	NTU	0.5	5.0	4.8	0.5	3.0	1.6	2.0	1.2	2.5
Electrical Conductivity	umho/cm	1	92	88	1	138	147	139	139	140
Nitrate + Nitrite as N	mg/L	0.05	0.13	<0.05	0.05	0.07	0.08	0.08	0.08	0.08
Nitrate as N	mg/L	0.05	0.13	<0.05	0.05	0.07	0.08	0.08	0.08	0.08
Nitrite as N	mg/L	0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L	0.03	0.08	0.06	0.03	0.06	0.07	0.07	0.07	<0.03
Total Organic Carbon	mg/L	0.5	6.9	6.7	0.5	6.0	5.6	5.7	5.8	5.8
Ortho-Phosphate as P	mg/L	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.05
Total Sodium	mg/L	0.1	5.8	5.9	0.1	5.7	5.7	5.7	5.7	5.9
Total Potassium	mg/L	0.1	0.4	0.4	0.1	0.4	0.4	0.4	0.4	0.4
Total Calcium	mg/L	0.1	9.5	9.4	0.8	16.3	18.1	16.6	16.2	16.9
Total Magnesium	mg/L	0.1	1.9	1.9	0.1	2.9	3.2	3.0	2.9	3.1
Bicarb. Alkalinity (as CaCO3)	mg/L	5	28	29	5	58	61	57	57	57
Carb. Alkalinity (as CaCO3)	mg/L	10	<10	<10	10	<10	<10	<10	<10	<10
Hydroxide	mg/L	5	<5	<5	5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	1	43	42	1	68	72	67	67	68
Hardness	mg/L		31.5	31.3		52.6	58.4	53.8	52.4	55.0
Langelier Index (@20C)	NA		-2.37	-2.28		-1.43	-1.27	-1.34	-1.35	-1.33
Langelier Index (@ 4C)	NA		-2.69	-2.60		-1.75	-1.59	-1.66	-1.67	-1.65
Saturation pH (@ 20C)	NA		9.13	9.11		8.59	8.53	8.59	8.60	8.59
Saturation pH (@ 4C)	NA		9.45	9.43		8.91	8.85	8.91	8.92	8.91

Jasan Count



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

			Standard V	Vater Analysis	s + Total	Metals				
DATE RECEIVED: 2022-09-27							[DATE REPORTE	ED: 2022-10-11	
		SAMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED:	3168-MP02-WS2 -220925 Water 2022-09-25 12:25	2 3168-MP03-WS1 -220925 Water 2022-09-25 13:40		3168-NP03-WS1 -220922 Water 2022-09-22 10:15	3168-NP03-WS2 -220922 Water 2022-09-22 11:00	3168-NP02-WS1 -220922 Water 2022-09-22 11:45	3168-NP02-WS2 -220922 Water 2022-09-22 12:15	3168-NP01-WS1 -220922 Water 2022-09-22 13:15
Parameter	Unit	G/S RDL	4355901	4355903	RDL	4355911	4355924	4355927	4355938	4355939
Anion Sum	me/L		0.79	0.78		1.36	1.42	1.34	1.34	1.34
Cation sum	me/L		0.91	0.91		1.32	1.44	1.35	1.32	1.37
% Difference/ Ion Balance	%		6.9	7.8		1.4	0.6	0.1	0.9	1.1
Total Aluminum	ug/L	5	85	62	5	39	40	34	36	36
Total Antimony	ug/L	2	<2	<2	2	<2	<2	<2	<2	<2
Total Arsenic	ug/L	2	<2	<2	2	<2	<2	<2	<2	<2
Total Barium	ug/L	5	11	11	5	22	24	19	24	21
Total Beryllium	ug/L	2	<2	<2	2	<2	<2	<2	<2	<2
Total Bismuth	ug/L	2	<2	<2	2	<2	<2	<2	<2	<2
Total Boron	ug/L	5	<5	<5	5	5	5	5	5	5
Total Cadmium	ug/L	0.017	<0.017	<0.017	0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Total Chromium	ug/L	1	<1	1	1	<1	<1	<1	<1	<1
Total Cobalt	ug/L	1	<1	<1	1	<1	<1	<1	<1	<1
Total Copper	ug/L	1	<1	<1	1	<1	<1	<1	<1	<1
Total Iron	ug/L	50	119	124	50	109	152	91	94	96
Total Lead	ug/L	0.5	<0.5	<0.5	0.5	1.0	<0.5	3.1	0.8	0.5
Total Manganese	ug/L	2	8	7	2	28	36	28	27	27
Total Molybdenum	ug/L	2	<2	<2	2	<2	<2	<2	<2	<2
Total Nickel	ug/L	2	<2	<2	2	<2	<2	<2	<2	<2
Total Phosphorous	mg/L	0.02	0.03	0.03	0.02	0.02	0.03	0.03	0.02	0.03
Total Selenium	ug/L	1	<1	<1	1	<1	<1	<1	<1	<1
Total Silver	ug/L	0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Strontium	ug/L	5	18	18	5	34	40	35	33	35
Total Thallium	ug/L	0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Tin	ug/L	2	<2	<2	2	<2	<2	<2	<2	<2
Total Titanium	ug/L	2	<2	<2	2	<2	<2	<2	<2	<2
Total Uranium	ug/L	0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total Vanadium	ug/L	2	<2	<2	2	<2	<2	<2	<2	<2

Certified By:

Jason Cought



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime

11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

Standard Water Analysis + Total Metals															
DATE RECEIVED: 2022-09-27															
	3168-MP02-WS2 3168-MP03-WS1 3168-NP03-WS1 3168-NP03-WS2 3168-NP02-WS1 3168-NP02-WS2 3168-NP01-WS														
		SAMPLE DES	CRIPTION:	-220925	-220925		-220922	-220922	-220922	-220922	-220922				
		SAM	PLE TYPE:	Water	Water		Water	Water	Water	Water	Water				
		DATE	SAMPLED:	2022-09-25 12:25	2022-09-25 13:40		2022-09-22 10:15	2022-09-22 11:00	2022-09-22 11:45	2022-09-22 12:15	2022-09-22 13:15				
Parameter	Unit	G/S	RDL	4355901	4355903	RDL	4355911	4355924	4355927	4355938	4355939				
Total Zinc	ug/L		5	<5	<5	5	<5	<5	<5	<5	<5				

Certified By:



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

ATTENTION TO: John Gale

			Standard Wat	er Analysis + Total Metals
DATE RECEIVED: 2022-09-27				DATE REPORTED: 2022-10-11
	SA	MPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED:	3168-NP01-WS2 -220922 Water 2022-09-22 14:10	
Parameter	Unit	G/S RDL	4355955	
рН			7.26	
Reactive Silica as SiO2	mg/L	0.5	2.4	
Chloride	mg/L	1	7	
Fluoride	mg/L	0.12	<0.12	
Sulphate	mg/L	2	<2	
Alkalinity	mg/L	5	58	
True Color	TCU	5.00	43.3	
Turbidity	NTU	0.5	2.7	
Electrical Conductivity	umho/cm	1	141	
Nitrate + Nitrite as N	mg/L	0.05	0.07	
Nitrate as N	mg/L	0.05	0.07	
Nitrite as N	mg/L	0.05	<0.05	
Ammonia as N	mg/L	0.03	<0.03	
Total Organic Carbon	mg/L	0.5	5.9	
Ortho-Phosphate as P	mg/L	0.01	<0.01	
Total Sodium	mg/L	0.1	5.9	
Total Potassium	mg/L	0.1	0.5	
Total Calcium	mg/L	0.8	16.9	
Total Magnesium	mg/L	0.1	3.1	
Bicarb. Alkalinity (as CaCO3)	mg/L	5	58	
Carb. Alkalinity (as CaCO3)	mg/L	10	<10	
Hydroxide	mg/L	5	<5	
Calculated TDS	mg/L	1	69	
Hardness	mg/L		55.0	
Langelier Index (@20C)	NA		-1.32	
Langelier Index (@ 4C)	NA		-1.64	
Saturation pH (@ 20C)	NA		8.58	
Saturation pH (@ 4C)	NA		8.90	

Certified By:

Jason Cotophi



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

			Standard Wa	ter Analysis + Total Metals
DATE RECEIVED: 2022-09-27				DATE REPORTED: 2022-10-11
		:	3168-NP01-WS2	
	S	AMPLE DESCRIPTION:	-220922	
		SAMPLE TYPE:	Water	
		DATE SAMPLED:	2022-09-22 14:10	
Parameter	Unit	G/S RDL	4355955	
Anion Sum	me/L		1.36	
Cation sum	me/L		1.41	
% Difference/ Ion Balance	%		1.7	
Total Aluminum	ug/L	5	183	
Total Antimony	ug/L	2	<2	
Total Arsenic	ug/L	2	<2	
Total Barium	ug/L	5	27	
Total Beryllium	ug/L	2	<2	
Total Bismuth	ug/L	2	<2	
Total Boron	ug/L	5	5	
Total Cadmium	ug/L	0.017	<0.017	
Total Chromium	ug/L	1	<1	
Total Cobalt	ug/L	1	<1	
Total Copper	ug/L	1	<1	
Total Iron	ug/L	50	391	
Total Lead	ug/L	0.5	0.5	
Total Manganese	ug/L	38	176	
Total Molybdenum	ug/L	2	<2	
Total Nickel	ug/L	2	<2	
Total Phosphorous	mg/L	0.02	0.03	
Total Selenium	ug/L	1	<1	
Total Silver	ug/L	0.1	<0.1	
Total Strontium	ug/L	5	34	
Total Thallium	ug/L	0.1	<0.1	
Total Tin	ug/L	2	<2	
Total Titanium	ug/L	2	3	
Total Uranium	ug/L	0.2	<0.2	
Total Vanadium	ug/L	2	<2	

Certified By:

Jason Cotoph

11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com



AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

				Standard Water Analysis	s + Total Metals
DATE RECEIVED: 2022-09-2	27				DATE REPORTED: 2022-10-11
				3168-NP01-WS2	
	:	SAMPLE DES	CRIPTION:	-220922	
		SAM	PLE TYPE:	Water	
		DATE	SAMPLED:	2022-09-22 14:10	
Parameter	Unit	G/S	RDL	4355955	
Total Zinc	ug/L		5	<5	

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

4355740-4355955 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:



ATTENTION TO: John Gale

SAMPLED BY:

AGAT WORK ORDER: 22K950750 PROJECT: 3168 Horizon Maritime 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

TSS, TDS													
DATE RECEIVED: 2022-09-27									DATE REPORTE	ED: 2022-10-11			
				3168-GP03-WS1	3168-GP03-WS2	3168-GP02-WS1	3168-GP02-WS2	3168-GP01-WS1	3168-MP01-WS1	3168-MP02-WS1	3168-MP02-WS2		
		SAMPLE DES	CRIPTION:	-220923	-220923	-220923	-220923	-220923	-220925	-220925	-220925		
		SAM	PLE TYPE:	Water									
		DATE	SAMPLED:	2022-09-23 13:20	2022-09-23 13:55	2022-09-23 14:30	2022-09-23 14:30	2022-09-23 15:00	2022-09-25 10:50	2022-09-25 11:45	2022-09-25 12:25		
Parameter	Unit	G / S	RDL	4355740	4355744	4355762	4355770	4355773	4355870	4355871	4355901		
Total Suspended Solids	mg/L		5	<5	<5	<5	<5	<5	<5	<5	<5		
Total Dissolved Solids	mg/L		5	60	72	76	74	74	64	54	48		
				3168-MP03-WS1	3168-NP03-WS1	3168-NP03-WS2	3168-NP02-WS1	3168-NP02-WS2	2 3168-NP01-WS1	3168-NP01-WS2			
		SAMPLE DES	CRIPTION:	-220925	-220922	-220922	-220922	-220922	-220922	-220922			
		SAM	PLE TYPE:	Water									
		DATE	SAMPLED:	2022-09-25 13:40	2022-09-22 10:15	2022-09-22 11:00	2022-09-22 11:45	2022-09-22 12:15	2022-09-22 13:15	2022-09-22 14:10			
Parameter	Unit	G / S	RDL	4355903	4355911	4355924	4355927	4355938	4355939	4355955			
Total Suspended Solids	mg/L		5	10	<5	<5	<5	<5	<5	<5			
Total Dissolved Solids	mg/L		5	44	76	74	78	78	78	104			

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

Analysis performed at AGAT Halifax (unless marked by *)

Jason Cotight

Certified By:



Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 Horizon Maritime

SAMPLING SITE:

AGAT WORK ORDER: 22K950750 ATTENTION TO: John Gale

SAMPLED BY:

Trace Organics Analysis DUPLICATE REFERENCE MATERIAL RPT Date: Oct 11, 2022 METHOD BLANK SPIKE MATRIX SPIKE Method Acceptable Acceptable Acceptable Measured Sample Blank Limits Limits Limits Dup #1 Dup #2 PARAMETER Batch RPD Recovery Recovery Value ld Upper Lower Lower Upper Lower Upper Volatile Organic Compounds in Water 70% 76% 62% 140% Chloromethane 4329349 < 1 < 1 50% 140% 60% 130% 50% 1 < 1 NA Vinyl Chloride 140% 1 4329349 < 0.6 < 0.6 NA < 0.6 69% 50% 140% 64% 60% 130% 65% 50% Bromomethane 1 4329349 < 0.89 < 0.89 NA < 0.89 109% 50% 140% 107% 60% 130% 97% 50% 140% Chloroethane 1 4329349 < 5 < 5 NA < 5 74% 50% 140% 72% 60% 130% 120% 50% 140% Trichlorofluoromethane (FREON 4329349 < 5 < 5 < 5 82% 50% 140% 71% 60% 130% 82% 50% 140% 1 NA 11) Acetone 1 4329349 < 10 < 10 NA < 10 97% 50% 140% 94% 50% 140% 90% 50% 140% 1,1-Dichloroethylene 1 4329349 < 0.6 < 0.6 NA < 0.6 82% 50% 140% 76% 60% 130% 76% 50% 140% Methylene Chloride 4329349 89% 130% 84% 140% 1 < 2 < 2 NA < 2 91% 50% 140% 60% 50% (Dichloromethane) trans-1.2-Dichloroethylene < 2 88% 140% 1 4329349 < 2 < 2 NA 50% 140% 86% 60% 130% 77% 50% 1.1-Dichloroethane 4329349 < 1 < 1 NA < 1 90% 50% 140% 90% 60% 130% 80% 50% 140% 1 cis-1,2-Dichloroethylene 1 4329349 97% 50% 96% 130% 86% 50% 140% < 2 < 2 NA < 2 140% 60% Chloroform 1 4329349 < 1 < 1 NA < 1 105% 50% 140% 106% 60% 130% 83% 50% 140% 1,2-Dichloroethane 1 4329349 < 2 < 2 NA < 2 91% 50% 140% 97% 60% 130% 91% 50% 140% 1,1,1-Trichloroethane 4329349 < 1 91% 50% 140% 88% 130% 50% 140% 1 < 1 NA < 1 60% 83% 4329349 140% Carbon Tetrachloride 1 < 0.56 < 0.56 NA < 0.56 92% 50% 140% 84% 60% 130% 84% 50% Benzene 1 4329349 < 1 < 1 NA < 1 95% 70% 130% 94% 60% 140% 84% 60% 140% 1,2-Dichloropropane 1 4329349 < 0.7< 0.7NA < 0.7 95% 50% 140% 93% 60% 130% 84% 50% 140% Trichloroethylene 1 4329349 < 1 < 1 < 1 97% 50% 140% 93% 60% 130% 84% 50% 140% NA Bromodichloromethane 4329349 95% 130% 140% 1 < 1 < 1 NA < 1 94% 50% 140% 60% 86% 50% cis-1,3-Dichloropropene 4329349 97% 88% 140% 1 < 0.5< 0.5NA < 0.598% 50% 140% 60% 130% 50% trans-1.3-Dichloropropene 1 4329349 < 0.5 < 0.5 NA < 0.5 91% 50% 140% 90% 60% 130% 79% 50% 140% 4329349 94% 50% 1,1,2-Trichloroethane 1 < 1 < 1 NΑ < 1 50% 140% 94% 60% 130% 86% 140% 140% Toluene 1 4329349 < 2 < 2 NA < 2 88% 70% 130% 87% 60% 140% 76% 60% 2-Hexanone 4329349 < 10.0 < 10.0 NA < 10.0 98% 50% 140% 95% 50% 140% 93% 50% 140% 1 Dibromochloromethane 4329349 < 1 93% 50% 94% 130% 85% 50% 140% 1 < 1 < 1 NA 140% 60% 1,2-Dibromoethane 4329349 < 0.5 < 0.5 NA < 0.5 93% 50% 140% 91% 60% 130% 85% 50% 140% 1 4329349 < 2 < 2 < 2 50% 87% Tetrachloroethvlene 1 NA 94% 140% 60% 130% 80% 50% 140% 1.1.1.2-Tetrachloroethane 1 4329349 < 0.5 < 0.5 NA < 0.5 94% 50% 140% 94% 60% 130% 82% 50% 140% Chlorobenzene 4329349 < 1 < 1 NA < 1 92% 50% 140% 92% 60% 130% 79% 50% 140% 1 Ethylbenzene 4329349 < 2 < 2 NA < 2 90% 70% 130% 87% 60% 140% 75% 60% 140% 1 1 4329349 < 4 < 4 NA < 4 94% 70% 130% 91% 60% 140% 78% 60% 140% m.p-Xvlene 50% Bromoform 1 4329349 < 1 NA < 1 89% 140% 89% 60% 130% 82% 50% 140% < 1 140% Styrene 1 4329349 < 1 < 1 NA < 1 92% 50% 140% 91% 60% 130% 77% 50% 1,1,2,2-Tetrachloroethane 140% 1 4329349 < 1 < 1 NA < 1 100% 50% 140% 99% 60% 130% 93% 50% o-Xylene 1 4329349 < 1 < 1 NA < 1 94% 70% 130% 93% 60% 140% 80% 60% 140% 1,3-Dichlorobenzene 1 4329349 < 1 < 1 NA < 1 96% 50% 140% 91% 60% 130% 80% 50% 140% < 1 1,4-Dichlorobenzene 1 4329349 < 1 NA < 1 98% 50% 140% 94% 60% 130% 82% 50% 140% 50% 98% 140% 1.2-Dichlorobenzene 1 4329349 < 0.7 < 0.7 NA < 0.7 99% 140% 60% 130% 86% 50%

AGAT QUALITY ASSURANCE REPORT (V1)

Page 24 of 35



Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 Horizon Maritime

SAMPLING SITE:

AGAT WORK ORDER: 22K950750

ATTENTION TO: John Gale

SAMPLED BY:

Trace Organics Analysis (Continued)

			-			-			-				·		
RPT Date: Oct 11, 2022		DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		KE	
PARAMETER	Batch Samp		Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	Acceptable Limits				ptable nits
		Ia		• *			Value	Lower	Upper	,	Lower	Upper		Lower	Upper

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. Matrix spike performed on different sample than duplicate.

If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Water - Low Level Version 3.1

Benzene	1	4332051	< 0.001	< 0.001	NA	< 0.001	78%	70%	130%	86%	70%	130%			
Toluene	1	4332051	< 0.001	< 0.001	NA	< 0.001	80%	70%	130%	81%	70%	130%			
Ethylbenzene	1	4332051	< 0.001	< 0.001	NA	< 0.001	84%	70%	130%	82%	70%	130%			
Xylene (Total)	1	4332051	< 0.002	< 0.002	NA	< 0.002	89%	70%	130%	91%	70%	130%			
C6-C10 (less BTEX)	1	4332051	< 0.01	< 0.01	NA	< 0.01	111%	70%	130%	109%	70%	130%	111%	70%	130%
>C10-C16 Hydrocarbons	1	4332813	< 0.05	< 0.05	NA	< 0.05	89%	70%	130%	100%	70%	130%	99%	70%	130%
>C16-C21 Hydrocarbons	1	4332813	< 0.05	< 0.05	NA	< 0.05	86%	70%	130%	100%	70%	130%	99%	70%	130%
>C21-C32 Hydrocarbons	1	4332813	< 0.01	< 0.01	NA	< 0.01	85%	70%	130%	100%	70%	130%	99%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. Matrix spike performed on a different sample than the duplicate.

If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons i	n Water	- Low Leve	Version 3	.1											
Benzene	1	4355911	< 0.001	< 0.001	NA	< 0.001	84%	70%	130%	120%	70%	130%			
Toluene	1	4355911	< 0.001	< 0.001	NA	< 0.001	83%	70%	130%	122%	70%	130%			
Ethylbenzene	1	4355911	< 0.001	< 0.001	NA	< 0.001	83%	70%	130%	124%	70%	130%			
Xylene (Total)	1	4355911	< 0.002	< 0.002	NA	< 0.002	88%	70%	130%	120%	70%	130%			
C6-C10 (less BTEX)	1	4355911	< 0.01	< 0.01	NA	< 0.01	79%	70%	130%	98%	70%	130%	100%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. Matrix spike performed on a different sample than the duplicate.

If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Certified By:

Julon Mant

AGAT QUALITY ASSURANCE REPORT (V1)

Page 25 of 35



Page 26 of 35

Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 Horizon Maritime

SAMPLING SITE:

AGAT WORK ORDER: 22K950750 ATTENTION TO: John Gale

SAMPLED BY:

				Wate	er An	alysis	6								
RPT Date: Oct 11, 2022			C	UPLICATE			REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured	Acce Lin	ptable nits	Recovery		ptable nits	Recovery		ptable nits
		ld					Value	Lower	Upper	,	Lower	Upper		Lower	Upper
Standard Water Analysis + Total I	Metals														
рН	1		6.88	6.94	0.9%	<	100%	80%	120%						
Reactive Silica as SiO2	4335113		11.9	12.3	3.1%	< 0.5	97%	80%	120%	102%	80%	120%	101%	80%	120%
Chloride	4354156		508	522	2.7%	< 1	84%	80%	120%	NA	80%	120%	NA	70%	130%
Fluoride	4354156		0.17	0.18	NA	< 0.12	86%	80%	120%	NA	80%	120%	89%	70%	130%
Sulphate	4354156		10	10	NA	< 2	91%	80%	120%	NA	80%	120%	83%	70%	130%
Alkalinity	1 4	4359442	72	72	0.0%	< 5	118%	80%	120%						
True Color	4335113		<5.00	<5.00	NA	< 5	99%	80%	120%	90%	80%	120%	NA		
Turbidity	4355740 4	4355740	0.7	0.7	NA	< 0.5	99%	80%	120%	NA			NA		
Electrical Conductivity	1		113	113	0.0%	< 1	97%	90%	110%						
Nitrate as N	4354156		<0.05	<0.05	NA	< 0.05	97%	80%	120%	NA	80%	120%	89%	70%	130%
Nitrite as N	4354156		<0.05	<0.05	NA	< 0.05	81%	80%	120%	NA	80%	120%	116%	70%	130%
Ammonia as N	4355337		<0.03	<0.03	NA	< 0.03	NA	80%	120%	84%	80%	120%	103%	70%	130%
Total Organic Carbon	4335114		1.1	1.1	NA	< 0.5	100%	80%	120%	NA	80%	120%	99%	80%	120%
Ortho-Phosphate as P	4335113		<0.01	<0.01	NA	< 0.01	106%	80%	120%	109%	80%	120%	115%	80%	120%
Total Sodium	4355882		456	454	0.4%	< 0.1	101%	80%	120%	102%	80%	120%	NA	70%	130%
Total Potassium	4355882		95.6	94.4	1.2%	< 0.1	99%	80%	120%	98%	80%	120%	NA	70%	130%
Total Calcium	4355882		19.4	19.2	1.0%	< 0.1	100%	80%	120%	96%	80%	120%	NA	70%	130%
Total Magnesium	4355882		34.8	34.8	0.0%	< 0.1	101%	80%	120%	101%	80%	120%	NA	70%	130%
Bicarb. Alkalinity (as CaCO3)		4359442	72	72	0.0%	< 5	NA	80%	120%						
Carb. Alkalinity (as CaCO3)	1		<10	<10	NA	< 10	NA	80%	120%						
Hydroxide	1		<5	<5	NA	< 5	NA	80%	120%						
Total Aluminum	4355882		57	57	0.5%	< 5	100%	80%	120%	103%	80%	120%	110%	70%	130%
Total Antimony	4355882		<2	<2	NA	< 2	80%	80%	120%	NA	80%	120%	NA	70%	130%
Total Arsenic	4355882		9	9	NA	< 2	95%	80%	120%	98%	80%	120%	NA	70%	130%
Total Barium	4355882		141	155	9.3%	< 5	103%	80%	120%	111%	80%	120%	NA	70%	130%
Total Beryllium	4355882		<2	<2	NA	< 2	103%	80%	120%	101%	80%	120%	89%	70%	130%
Total Bismuth	4355882		<2	<2	NA	< 2	105%	80%	120%	117%	80%	120%	97%	70%	130%
Total Boron	4355882		1190	1210	1.5%	< 5	101%	80%	120%	104%	80%	120%	NA	70%	130%
Total Cadmium	4355882		0.019	<0.017	NA	< 0.09	98%	80%	120%	103%	80%	120%	91%	70%	130%
Total Chromium	4355882		3	3	NA	< 1	94%	80%	120%	98%	80%	120%	107%	70%	130%
Total Cobalt	4355882		3	3	NA	< 1	96%	80%	120%	97%	80%	120%	98%	70%	130%
Total Copper	4355882		2	2	NA	< 1	99%	80%	120%	101%	80%	120%	90%	70%	130%
Total Iron	4355882		888	876	1.3%	< 50	99%	80%	120%	100%		120%	NA	70%	130%
Total Lead	4355882		0.6	0.7	NA	< 0.5	100%	80%	120%	106%	80%	120%	84%	70%	130%
Total Manganese	4355882		516	523	1.4%	< 2	97%	80%	120%	98%		120%	NA	70%	130%
Total Molybdenum	4355882		2	2	NA	< 2	94%	80%	120%	95%	80%	120%	111%	70%	130%
Total Nickel	4355882		29	29	0.0%	< 2	98%	80%	120%	104%	80%	120%	NA	70%	130%
Total Phosphorous	4355882		0.9	0.9	NA	< 0.02	115%	80%	120%	114%	80%	120%	NA	70%	130%
	-00000Z		0.0	0.0	11/1	- 0.02	11070	0070	120 /0	11-770	00/0	12070	11/1	10/0	100 /0

AGAT QUALITY ASSURANCE REPORT (V1)



Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 Horizon Maritime

SAMPLING SITE:

AGAT WORK ORDER: 22K950750 ATTENTION TO: John Gale

SAMPLED BY:

PARAMETER PARAMETER Total Silver Total Strontium Total Thallium Total Tin	Batch Sample Id		DUPLICATE	E		REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SP	ΙKE
otal Silver otal Strontium otal Thallium	Batch Id	Dup #1	Dur #0											
otal Silver otal Strontium otal Thallium	Id		1 1110 #2 1	RPD	Method Blank	Measured		ptable nits	Recoverv		ptable nits	Recovery	Acce Lir	ptab nits
otal Strontium otal Thallium	4355882		Dup #2	N D		Value	Lower	Upper	Recovery	Lower	Upper	Recovery	Lower	Up
otal Thallium		<0.1	<0.1	NA	< 0.1	97%	80%	120%	92%	80%	120%	77%	70%	13
	4355882	145	145	0.0%	< 5	93%	80%	120%	95%	80%	120%	NA	70%	13
otal Tin	4355882	<0.1	<0.1	NA	< 0.1	102%	80%	120%	108%	80%	120%	88%	70%	13
	4355882	<2	<2	NA	< 2	96%	80%	120%	97%	80%	120%	96%	70%	13
otal Titanium	4355882	<2	<2	NA	< 2	98%	80%	120%	99%	80%	120%	93%	70%	13
otal Uranium	4355882	0.9	1.0	NA	< 0.2	95%	80%	120%	102%	80%	120%	95%	70%	13
otal Vanadium	4355882	6	6	NA	< 2	91%	80%	120%	92%	80%	120%	NA	70%	13
otal Zinc	4355882	<5	<5	NA	< 5	97%	80%	120%	100%	80%	120%	86%	70%	13
omments: If RPD value is NA, the	results of the duplicat	es are less	than 5x the	RDL and	the RPD v	will not be	calcula	ted.						
tandard Water Analysis + Total M	letals													
eactive Silica as SiO2	4355644	15.9	14.6	8.6%	< 0.5	96%	80%	120%	106%	80%	120%	94%	80%	12
rue Color	4355644	<5.00	<5.00	NA	10.8	86%	80%	120%	89%	80%	120%	NA		
mmonia as N	4355729	< 0.03	<0.03	NA	< 0.03	105%	80%	120%	89%	80%	120%	103%	70%	13
otal Organic Carbon	4355927 4355927	5.7	5.8	1.3%	< 0.5	100%	80%	120%	NA	80%	120%	102%	80%	12
rtho-Phosphate as P	4355644	<0.01	<0.01	NA	< 0.01	108%	80%	120%	109%	80%	120%	105%	80%	12
omments: If RPD value is NA, the	results of the duplicat	es are less	than 5x the	RDL and	the RPD v	will not be	calcula	ted.						
lercury Analysis in Water (Total)														
otal Mercury	4327973	<0.026	<0.026	NA	< 0.026	83%	80%	120%	NA	80%	120%	82%	70%	13
comments: If RPD value is NA, the	results of the duplicat	es are less	than 5x the	RDL and	the RPD v	will not be	calcula	ted.						
lercury Analysis in Water (Dissolv	red)													
issolved Mercury	4355740 4355740	<0.026	<0.026	NA	< 0.026	83%	80%	120%	NA	80%	120%	95%	70%	13
omments: If RPD value is NA, the	results of the duplicat	es are less	than 5x the	RDL and	the RPD v	will not be	calcula	ted.						
OC														
issolved Organic Carbon	4357599	2.9	2.9	1.2%	< 0.5	96%	80%	120%	NA	80%	120%	102%	80%	12
comments: If RPD value is NA, the	results of the duplicat	es are less	than 5x the	RDL and	the RPD v	will not be	calcula	ted.						
SS, TDS														
otal Suspended Solids	4355740 4355740	<5	<5	NA	< 5	103%	80%	120%	NA			112%	80%	12
otal Dissolved Solids	4361872	352	334	5.2%	< 5	100%	80%	120%	NA			NA		
comments: If RPD value is NA, the	results of the duplicat	es are less	than 5x the	RDL and	the RPD v	will not be	calcula	ted.						
00														
issolved Organic Carbon	4355955 4355955	3.9	4.0	1.2%	< 0.5	100%	80%	120%	NA	80%	120%	101%	80%	12
omments: If RPD value is NA, the	results of the duplicat	es are less	than 5x the	RDL and	the RPD v	will not be	calcula	ted.						
letals - Lab Filtered Dissolved Me	tals in Water (mg/L)													
issolved Aluminum	4374486	0.016	0.018	NA	< 0.004	93%	70%	130%	105%	80%	120%	86%	70%	13



Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 Horizon Maritime

SAMPLING SITE:

AGAT WORK ORDER: 22K950750 ATTENTION TO: John Gale SAMPLED BY:

Water Analysis (Continued)

RPT Date: Oct 11, 2022 DUPLICATE REFERENCE MATERIAL METHOD BLANK SPIKE PARAMETER Batch Sample Id Dup #1 Dup #2 RPD Method Blank ReFERENCE MATERIAL METHOD BLANK SPIKE Dissolved Antimony 4374486 <0.001 <0.001 NA <0.001 97% 70% 130% 100% 80% 120% Dissolved Arsenic 4374486 <0.001 <0.001 NA <0.001 89% 70% 130% 102% 80% 120%	MAT Recovery 99% 102%	Lim Lower	ptable
PARAMETER Batch Sample Id Dup #1 Dup #2 RPD Blank Measured Value Limits Recovery Limits Dissolved Antimony 4374486 <0.001 <0.001 NA <0.001 97% 70% 130% 100% 80% 120%	99%	Lim Lower	nits
Dissolved Antimony 4374486 <0.001			Uppe
,		70%	
Dissolved Arsenic 4374486 <0.001 <0.001 NA <0.001 89% 70% 130% 102% 80% 120%	102%		130%
		70%	130%
Dissolved Barium 4374486 0.097 0.100 3.0% < 0.002 94% 70% 130% 96% 80% 120%	97%	70%	130%
Dissolved Beryllium 4374486 <0.0005 <0.0005 NA < 0.0005 98% 70% 130% 108% 80% 120%	104%	70%	130%
Dissolved Bismuth 4374486 <0.002 <0.002 NA < 0.002 98% 70% 130% 98% 80% 120%	95%	70%	130%
Dissolved Boron 4374486 0.360 0.396 9.5% < 0.010 98% 70% 130% 106% 80% 120%	101%	70%	130%
Dissolved Cadmium 4374486 <0.0001 <0.0001 NA < 0.0001 97% 70% 130% 100% 80% 120%	96%	70%	130%
Dissolved Chromium 4374486 <0.002 <0.002 NA < 0.002 94% 70% 130% 100% 80% 120%	98%	70%	130%
Dissolved Cobalt 4374486 0.0011 0.0012 NA < 0.0005 90% 70% 130% 98% 80% 120%	95%	70%	130%
Dissolved Copper 4374486 0.002 0.002 NA < 0.001 95% 70% 130% 99% 80% 120%	90%	70%	130%
Dissolved Iron 4374486 0.011 <0.010 NA < 0.010 97% 70% 130% 102% 80% 120%	101%	70%	130%
Dissolved Lead 4374486 <0.0005 <0.0005 NA < 0.0005 93% 70% 130% 97% 80% 120%	94%	70%	130%
Dissolved Lithium 4374486 0.10 0.10 NA < 0.05 94% 70% 130% 107% 80% 120%	101%	70%	130%
Dissolved Manganese 4374486 0.308 0.297 3.6% < 0.002 94% 70% 130% 99% 80% 120%	95%	70%	130%
Dissolved Molybdenum 4374486 0.006 0.006 NA < 0.002 99% 70% 130% 104% 80% 120%	102%	70%	130%
Dissolved Nickel 4374486 0.002 0.002 NA < 0.001 92% 70% 130% 98% 80% 120%	92%	70%	130%
Dissolved Phosphorus 4374486 <0.05 0.10 NA < 0.05 94% 70% 130% 110% 80% 120%	120%	70%	130%
Dissolved Selenium 4374486 <0.001 0.002 NA < 0.001 105% 70% 130% 110% 80% 120%	111%	70%	130%
Dissolved Silicon 4374486 5.94 5.76 3.1% < 0.05 92% 70% 130% 109% 80% 120%	NA	70%	130%
Dissolved Silver 4374486 <0.0001 <0.0001 NA < 0.0001 92% 70% 130% 97% 80% 120%	91%	70%	130%
Dissolved Strontium 4374486 1.59 1.52 4.5% < 0.005 102% 70% 130% 101% 80% 120%	NA	70%	130%
Dissolved Thallium 4374486 <0.0003 <0.0003 NA < 0.0003 97% 70% 130% 97% 80% 120%	97%	70%	130%
Dissolved Tin 4374486 <0.002 <0.002 NA < 0.002 85% 70% 130% 89% 80% 120%	86%	70%	130%
Dissolved Titanium 4374486 <0.002 <0.002 NA < 0.002 102% 70% 130% 111% 80% 120%	110%	70%	130%
Dissolved Uranium 4374486 0.0068 0.0069 1.5% < 0.0005 98% 70% 130% 102% 80% 120%	102%	70%	130%
Dissolved Vanadium 4374486 <0.002 <0.002 NA < 0.002 92% 70% 130% 101% 80% 120%	98%	70%	130%
Dissolved Zinc 4374486 <0.005 <0.005 NA < 0.005 97% 70% 130% 102% 80% 120%	95%	70%	130%
Dissolved Zirconium 4374486 <0.004 <0.004 NA < 0.004 100% 70% 130% 101% 80% 120%	100%	70%	130%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Certified By:

Jason Cotophil νu

AGAT QUALITY ASSURANCE REPORT (V1)

Page 28 of 35



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 Horizon Maritime

AGAT WORK ORDER: 22K950750

ATTENTION TO: John Gale

		, an Elanoit ro.	
SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Benzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Toluene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Ethylbenzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Xylene (Total)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
C6-C10 (less BTEX)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
>C10-C16 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C16-C21 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C21-C32 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Modified TPH (Tier 1)	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION
Sediment			GC/MS/FID
Resemblance Comment	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
Return to Baseline at C32	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - VPH	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
n-Dotriacontane - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Chloromethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Vinyl Chloride	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Bromomethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Chloroethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Trichlorofluoromethane (FREON 11)	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Acetone	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,1-Dichloroethylene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Methylene Chloride (Dichloromethane)	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
trans-1,2-Dichloroethylene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,1-Dichloroethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
cis-1,2-Dichloroethylene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Chloroform	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,2-Dichloroethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,1,1-Trichloroethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Carbon Tetrachloride	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Benzene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,2-Dichloropropane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Trichloroethylene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Bromodichloromethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
cis-1,3-Dichloropropene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
trans-1,3-Dichloropropene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,1,2-Trichloroethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Toluene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 Horizon Maritime

SAMPLING SITE:

AGAT WORK ORDER: 22K950750 ATTENTION TO: John Gale

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
2-Hexanone	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Dibromochloromethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,2-Dibromoethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Tetrachloroethylene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,1,1,2-Tetrachloroethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Chlorobenzene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Ethylbenzene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
m,p-Xylene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Bromoform	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Styrene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,1,2,2-Tetrachloroethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
o-Xylene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,3-Dichlorobenzene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,4-Dichlorobenzene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,2-Dichlorobenzene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Toluene-d8	VOL-120-5001	EPA SW846 5030B/8260B	GC/MS
4-Bromofluorobenzene	VOL-120-5001	EPA SW846 5030B/8260B	GC/MS



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 Horizon Maritime

AGAT WORK ORDER: 22K950750 ATTENTION TO: John Gale

PROJECT: 3168 Horizon Maritime		ATTENTION TO:	John Gale
SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Dissolved Organic Carbon	INOR-121-6026	SM 5310 B	TOC ANALYZER
Dissolved Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
Total Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
Dissolved Aluminum	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Antimony	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Arsenic	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Barium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Beryllium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Bismuth	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Boron	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Cadmium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Chromium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Cobalt	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Copper	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Iron	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Lead	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Lithium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Manganese	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Molybdenum	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Nickel	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Phosphorus	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Selenium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Silicon	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Silver	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Strontium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Thallium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Tin	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Titanium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 Horizon Maritime

AGAT WORK ORDER: 22K950750 ATTENTION TO: John Gale

		ATTENTION TO.	Conn Calo
SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Dissolved Uranium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Vanadium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Zinc	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Zirconium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
ab Filtration Performed			FILTRATION
DH	INOR-121-6001	SM 4500 H+B	PC TITRATE
Reactive Silica as SiO2	INOR-121-6027	SM 4500-SiO2 F	COLORIMETER
Chloride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Fluoride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Alkalinity	INOR-121-6001	SM 2320 B	
True Color	INOR-121-6008	SM 2120 B	LACHAT FIA
Turbidity	INOR-121-6022	SM 2130 B	NEPHELOMETER
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC TITRATE
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-121-6047	SM 4500-NH3 H	COLORIMETER
Fotal Organic Carbon	INOR-121-6026	SM 5310 B	TOC ANALYZER
Ortho-Phosphate as P	INOR-121-6012	SM 4500-P G	COLORIMETER
Total Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Potassium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Hydroxide	INORG-121-6001	SM 2320 B	PC-TITRATE
Calculated TDS	CALCULATION	SM 1030E	CALCULATION
Hardness	CALCULATION	SM 2340B	CALCULATION
₋angelier Index (@20C)	CALCULATION	CALCULATION	CALCULATION
₋angelier Index (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 20C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Anion Sum	CALCULATION	SM 1030E	CALCULATION
Cation sum	CALCULATION	SM 1030E	CALCULATION
% Difference/ Ion Balance	CALCULATION	SM 1030E	CALCULATION
Total Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Antimony	MET121-6104 & MET-121-6105	SM 3125	ICP-MS
Total Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 Horizon Maritime

SAMPLING SITE:

AGAT WORK ORDER: 22K950750

ATTENTION TO: John Gale SAMPLED BY:

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Total Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Phosphorous	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Suspended Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC
Total Dissolved Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC

Chain of Custo	dy Record		Labora	woodartii				.8 • F:				4	Hold	l Tim T Job	ne: o Nu	mber	r: 🚄	22	K	750	270	50	С
Report Information			Report	Information (Please print):				R	epor	t Fo	rma	t	Not	es:									
Company: Fracflow Con	sultants Inc. (NL)		1. Nam	e: John Gale (john_ffc@nfld.net)				- ק Sin		molo												
Contact: John Gale			— Emai	: Devin Northcott (devin_ffc@be	lalian	t.con	1)			page		Ĩ	Turn	aro	und	Tim	e R	ean	ired	(TAT)		_	-
Address: 154 Major's P	ath			Karen Andrews (karen_ffc@n	fld.ne	t)			Mu per	Itiple	Samp	le											
St. John's, NL			— Emai	Ohde Diana Alt to the of the	aliant.	com)	115				- 11							rking	-			
Phone: 709-739-7270		3-5101	Decided	Bendremente (Oberda)				믝	Exe Inc	luded	mat		Rusł	1 TAI	Г				/ [
Client Project #: 3168 H				cory Requirements (Check): uidelines on Report Do not lis	Guida	lnon o	n Dona	лII г	Exp	ort:						$\square 2$	2 day	/S	C]3d	ays		
AGAT Quotation: S/O					. Guidei	nies C	п керо	" [_]					Date	Req	uirec	:		_	_				
Please Note: If quotation number is	not provided client will be billed fu	Il price for analy	sis. 🗌 Tie	r 1 🗌 Res 🗌 Pot			arse		_		_	_11.	_	_	_	_				_	_	_	_
Invoice To	Same	Yes 🗹 / No		r 2 □ Com	: [] Fir	e		Inking g. No.		er Sa	mple	»: 🗆	Yes	1	No	Salt	Wat	er San	nple:		Yes	;
Company:						T	T	TT	T	T	T		1	T	1	1	Τ		1	T			Г
Contact: Karen Andrew	/s (karen ffc@nfld.net)		- Ind				lable						-										
A sheline a su	(_ 0		── Cor	nmercial HRM 101			Available			2			w leve	5							M I		
				icultural 🗌 Storm Water					()	[] []	alent		0	onati						2	1 1		
Phone:	Fax:			AL	serve	Ialys	SiO		se/fine)	asP	lexav		PIRI)	년 년 년	<u>1</u>		8		choc		NPM D		0
PO/Credit Card#:			C Sec	liment 🗍 Other	d/Pres	ater A	ta a	CBO	coarse	(total	Lri & F	3	STEX (DH/B	14/B	TOG	25 - M			ans			TDS &TSS
	1	-		r	litere	ž			Mice (ates	- un		I/Hd		SM	ease	PA 6		- index	& Fu	olifo	ğl	E C
Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standa	Metals: S Total S Diss Mercury		Grain Size (coarse/fine)	Phosphates (total as P205)	Chromium (Tri & Hexavalent)	Phenols	Tier 1: TPH/BTEX (PIRI) IS low level	COME.C	VOC	Oil & Grease (TOG)	BNAE EPA 625 - Miss	PAH	PCB Marine Sediment Parkade	Dioxins & Furans	Fecal Coliform	Other: DOC	Other
3168-GP03-WS1-220923	Sept. 23, 2022 / 13:20	Water	16 🖍	Total Metals+Hg & Dissolved Metals+Hg	1		11			1			1						-	1	+-+	1	1
3168-GP03-WS2-220923	Sept. 23, 2022 / 13:55	Water	11,~	Total Metals+Hg & Dissolved Metals+Hg	1	1	11															1	1
3168-GP02-WS1-220923	Sept. 23, 2022 / 14:30	Water	19	Total Metals+Hg & Dissolved Metals+Hg	1	1	11						1		1	1		1				1	1
3168-GP02-WS2-220923	Sept. 23, 2022 / 15:00	Water	11 1	Total Metals+Hg & Dissolved Metals+Hg	1	1	11	2														1	1
3168-GP01-WS1-220923 3168-MP01-WS1-220925	Sept. 23, 2022 / 15:30	Water	16	Total Metals+Hg & Dissolved Metals+Hg	1	1	11						1									1	1
3168-MP02-WS1-220925	Sept. 25, 2022 / 10:50	Water	16	Total Metals+Hg & Dissolved Metals+Hg		_	11						1									1	1
3168-MP02-WS2-220925	Sept. 25, 2022 / 11;45 Sept. 25, 2022 / 12:25	Water	16	Total Metals+Hg & Dissolved Metals+Hg			11						1.		1							1	1
3168-MP03-W\$1-220925	Sept. 25, 2022 / 12:25 Sept. 25, 2022 / 13:40	Water	11	Total Metals+Hg & Dissolved Metals+Hg		1			_	-		_		_									1
0.00 Mil 00 MOT-220020	50pt. 20, 2022 / 13:40	Water	16	Total Metals+Hg & Dissolved Metals+Hg	1	-	10		+	-		-	✓	-	-	-		_		-		1	1
	1			Dissolved Metals+Mercury						-		-		+	-	-			-		-	-	-

G	GA		abora	tories webearth.a	agat	labs		122	Da	rtmo Bi	outh 3B 1	, NS LM2	A A	rriva rriva	l Ten Timo	nditi npei	on: ratur	re: L	Good F · I	co,	3	(see	L	4
Chain of Custod	y Record			P	902	2.46	8.87	18 =	F: 90	2.46	68.8	924	A	GAT	Job I	Num	ber:	6	221	≤ 9	50	75	50)
Report Information			Report I	nformation (Please print):					Rep	ort F	Form	nat	יוור	lote	s:									
Company: Fracflow Consi	illants Inc. (NL)		1. Name	John Gale (john_ffc@nfld.net)										_										
Contact: John Gale			Email	Davin Northaatt (davin fa Chal	laliar	nt.co	m)			Single per pa	ige		T	urna	arou	nd '	Tim	Re	quir	ed (1	'ΔΤ)	_		_
	th		- 2. Name	Karen Andrews (karen_ffc@n	fld.ne	et)			\checkmark	Multip ber pa	ole Sa	mple	11											
Address: 154 Major's Pa St. John's, NL			Email	Chris Distant (shris ffe@hell-	-	•	ר)				-	at	R	egu	iar I				work	_	ays			
700 700 7070	- 700 751	5101	-							Incluc	ded	at	R	ush	TAT		□s	ame	day		1 da	У		
Phone: 709-739-7270	Fax: 709-753	5-5101	2 1 1	ory Requirements (Check):					m	Expor	t.		1				2	days	6		3 da	ys		
Client Project #: 3168 He	onzon waritime		- I I List Gu □ PIRI	idelines on Report 🛛 🗆 Do not list	Guide	elines	on Rep	ort					D	ate F	Requi	ired:	-			_	_			
AGAT Quotation: S/O Please Note: If quotation number is n	ot provided client will be billed ful	price for analysis		1 🗌 Res 🗌 Pot		✓C	oarse	-		_						_								_
			Tier			🗋 Fi					Vatei	' San	ple:		/es	٧N	0	Salt \	Vater	Sam	ple:		Yes	
nvoice To	Same	Yes 🗹 / No 🕻] Gas	Fuel 🗆 Lube	-				Reg. I	No.:						_			_	_				_
Company:			CCME	CDWQ																				
	(karen_ffc@nfld.net)		- Indi				Available						-	U I										
Address:	/		— ☐ Con □ Res	nmercial HRM 101			□ Ava			SS		÷										∎ MF		
			-11	icultural 🗌 Storm Water	7	<u>.v</u>	1 1		(i)	FOC - Miss	205)	valen								ge		2		
Phone:	Fax:		- FW/	AL .	serve	nalys	Diss	0	e/fin	E FO	as P	Hexa		Fract	TEX			liss		acka		MPN		&TCC
PO/Credit Card#:	I dA		_ Sed	liment DOther	/Pre	ter A		CBOD	coars		(total	ri &	Y I L		PH/E		TOG	25 - N		lent F	rans			×.T
			-11		Itered/Preserved	d Wa	10 10		ze (Miss	ates	Ę		TPH/BTEX Fractionation	MS T		Grease (TOG)	EPA 625 - Miss		Sediment Package	& Furans	olifor		U U U U
Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Fil	Standard Water Analysis	Metals: 🛛 Total	Mercury	Grain Size (coarse/fine)	D TOC - Miss	Phosphates (total as P205)	Chromium (Tri & Hexavalent)	Thenois Tier 4. TPU/PTEV (PIDI) Theorem	Tier 2: T	; L	VOC	Oil & Gr	BNAE EI	PAH	le l	Dioxins	Fecal Coliform	Other:	Othor. 7
3168-NP03-WS1-220922	Sept. 22, 2022 / 10:15	Water	16	Total Metals+Hg & Dissolved Metals+Hg	1	1	1	1					v	1									\checkmark	v
3168-NP03-WS2-220922	Sept. 22, 2022 / 11:00	Water	11	Total Metals+Hg & Dissolved Metals+Hg	1	1	1	/															\checkmark	v
3168-NP02-WS1-220922	Sept. 22, 2022 / 11:45	Water	16	Total Metals+Hg & Dissolved Metals+Hg	1	1	1	/				_	v	1									1	v
3168-NP02-WS2-220922	Sept. 22, 2022 / 12:15	Water	11	Total Metals+Hg & Dissolved Metals+Hg	1	1	1	/	-		_	-	-	-		-						-	-	1
3168-NP01-WS1-220922 3168-NP01-WS2-220922	Sept. 22, 2022 / 13:45	Water	19 11	Total Metals+Hg & Dissolved Metals+Hg	V	1		/	-			-	•	4	-	1	-		-	-		_	-	V
5100-INPUT-W52-220922	Sept. 22, 2022 / 14:10	Water	11	Total Metals+Hg & Dissolved Metals+Hg	√	1	1	/	-		-	_	-	-	-	-	-		-	-		_	1	۷
				Dissolved Metals+Mercury	-	-	-	+			-	-	-	-	-	-	-	-	-	-		-	-	_
				DOC, TDS all field filtered	-	-		+	-	-	-	-	-	-	-	-	-	-	-			-	-	-
							-	-	-	-	-	-			-	-	-		-	-		-	-	-
											-		-	-	-	-	-		-	-		-	-	F
									13						1					+		-	-	F
mples Relinquished By (Print Name):		Date/Tin		Samples Received By (Print Name):	-						te/Time			-		-	-			,				-
Karen L. Andrew	IS		9/22 1.3:20	O. Attuns	S	pt	- 2	6, -	22		112	20					- Clie		P	age	2	of	2	
Amples Hull dished by (Sign):	ndreuts	Date/Tin	18	Samples Received By (Sign):		1		-			te/Time	1					oy - AG oy- AG		10. F	EC	210	8-C(20	



CLIENT NAME: FRACFLOW CONSULTANTS 154 MAJOR'S PATH ST. JOHN'S PATH, NL A1A5A1 (709) 739-7270 ATTENTION TO: John Gale **PROJECT: 3168 HORIZON MARITIME** AGAT WORK ORDER: 22K950371 TRACE ORGANICS REVIEWED BY: Dylan McCarthy, Trace Organics Lab Technician DATE REPORTED: Oct 11, 2022 PAGES (INCLUDING COVER): 14 VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

lotes_	
sclaimer:	

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

Iember of: Association of Professional Engineers and Geoscientists of Alberta	
(APEGA)	
Western Enviro-Agricultural Laboratory Association (WEALA)	
Environmental Services Association of Alberta (ESAA)	

Page 1 of 14

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

DATE RECEIVED: 2022-09-26

DATE RECEIVED: 2022-09-20							L	JATE REPORT	ED: 2022-10-11	
		SAMPLE DESCRIPTION:	3168-GP03-SS1	3168-GP02-SS1	3168-GP01-SS1	3168-NP03-SS1	3168-NP02-SS1	3168-NP01-SS1	3168-MP01-SS1	3168-MP02-SS1
		SAMPLE TYPE:	Soil							
		DATE SAMPLED:	2022-09-21 14:35	2022-09-21 14:35	2022-09-21 14:50	2022-09-21 16:38	2022-09-21 17:00	2022-09-21 17:12	2022-09-25 10:55	2022-09-25 11:20
Parameter	Unit	G / S RDL	4352945	4352946	4352947	4352948	4352949	4352950	4353078	4353079
Benzene	mg/kg	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	mg/kg	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Ethylbenzene	mg/kg	0.03	<0.03	< 0.03	<0.03	<0.03	<0.03	< 0.03	< 0.03	< 0.03
Xylene (Total)	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	< 0.05	<0.05	< 0.05
C6-C10 (less BTEX)	mg/kg	3	<3	<3	<3	<3	<3	<3	<3	<3
>C10-C16 Hydrocarbons	mg/kg	15	<15	<15	<15	<15	<15	<15	<15	<15
>C16-C21 Hydrocarbons	mg/kg	15	47	16	<15	26	<15	22	<15	30
>C21-C32 Hydrocarbons	mg/kg	15	149	110	42	83	61	107	75	188
Modified TPH (Tier 1)	mg/kg	15	196	126	42	109	61	129	75	218
Resemblance Comment			LOF, UC							
Return to Baseline at C32			Ν	Ν	Ν	Ν	Ν	Ν	Ν	N
Surrogate	Unit	Acceptable Limits								
Isobutylbenzene - EPH	%	60-140	93	92	93	93	95	95	95	94
Isobutylbenzene - VPH	%	60-140	70	71	68	65	121	121	117	118
n-Dotriacontane - EPH	%	60-140	89	90	87	89	88	91	90	92
4										

Certified By:

Julon Mant

DATE REPORTED: 2022-10-11



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

DATE RECEIVED: 2022-09-26

	0			BATE REFORTED.
	S	AMPLE DESCRIPTION:	3168-MP03-SS1	
		SAMPLE TYPE:	Soil	
		DATE SAMPLED:	2022-09-25 13:50	
Parameter	Unit	G/S RDL	4353080	
Benzene	mg/kg	0.02	<0.02	
Toluene	mg/kg	0.04	<0.04	
Ethylbenzene	mg/kg	0.03	<0.03	
Xylene (Total)	mg/kg	0.05	<0.05	
C6-C10 (less BTEX)	mg/kg	3	<3	
>C10-C16 Hydrocarbons	mg/kg	15	<15	
>C16-C21 Hydrocarbons	mg/kg	15	47	
>C21-C32 Hydrocarbons	mg/kg	15	145	
Modified TPH (Tier 1)	mg/kg	15	192	
Resemblance Comment			LOF, UC	
Return to Baseline at C32			Ν	
Surrogate	Unit	Acceptable Limits		
lsobutylbenzene - EPH	%	60-140	93	
lsobutylbenzene - VPH	%	60-140	115	
n-Dotriacontane - EPH	%	60-140	92	

Certified By:

Julon Mant

DATE REPORTED: 2022-10-11



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

DATE RECEIVED: 2022-09-26

DATE REPORTED: 2022-10-11

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

4352945-4353080 Modified TPH, Xylene(Total)and C6-C10(less BTEX) are calculated parameters. The calculated parameter is non-accredited. The component parameters of the calculation are accredited.

Results are based on the dry weight of the soil.

Resemblance Comment Key: GF - Gasoline Fraction WGF - Weathered Gasoline Fraction GR - Product in Gasoline Range FOF - Fuel Oil Fraction WFOF - Weathered Fuel Oil Fraction FR - Product in Fuel Oil Range LOF - Lube Oil Fraction LR - Lube Range UC - Unidentified Compounds NR - No Resemblance NA - Not Applicable

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

Julon Mants



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Moisture													
DATE RECEIVED: 2022-09-26								I	DATE REPORT	ED: 2022-10-11			
		SAMPLE DES	CRIPTION:	3168-GP03-SS1	3168-GP02-SS1	3168-GP01-SS1	3168-NP03-SS1	3168-NP02-SS1	3168-NP01-SS1	3168-MP01-SS1	3168-MP02-SS1		
		SAM	PLE TYPE:	Soil									
		DATES	SAMPLED:	2022-09-21 14:35	2022-09-21 14:35	2022-09-21 14:50	2022-09-21 16:38	2022-09-21 17:00	2022-09-21 17:12	2022-09-25 10:55	2022-09-25 11:20		
Parameter	Unit	G / S	RDL	4352945	4352946	4352947	4352948	4352949	4352950	4353078	4353079		
% Moisture	%		1	91	90	68	70	76	72	70	79		
		SAMPLE DES	CRIPTION:	3168-MP03-SS1									
		SAM	PLE TYPE:	Soil									
		DATES	SAMPLED:	2022-09-25 13:50									
Parameter	Unit	G / S	RDL	4353080									
% Moisture	%		1	88									

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

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

Julon Mant



AGAT WORK ORDER: 22K950371 **PROJECT: 3168 HORIZON MARITIME** 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

			Р	olycyclic Ar	omatic Hydi	rocarbons in	Soil				
DATE RECEIVED: 2022-09-26									DATE REPORTE	ED: 2022-10-11	
		SAMPLE DESCRIF	TION: 3	3168-GP03-SS1	3168-GP02-SS1	3168-GP01-SS1	3168-NP03-SS1	3168-NP02-SS1	3168-NP01-SS1	3168-MP01-SS1	3168-MP02-SS
		SAMPLE	TYPE:	Soil							
		DATE SAM	PLED:	2022-09-21 14:35	2022-09-21 14:35	2022-09-21 14:50	2022-09-21 16:38	2022-09-21 17:00	2022-09-21 17:12	2022-09-25 10:55	2022-09-25 11:20
Parameter	Unit	G/S F	RDL	4352945	4352946	4352947	4352948	4352949	4352950	4353078	4353079
1-Methylnaphthalene	mg/kg	C	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
2-Methylnaphthalene	mg/kg	(0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Acenaphthene	mg/kg	0.0	0671	<0.00671	<0.00671	<0.00671	<0.00671	< 0.00671	0.0549	<0.00671	<0.00671
Acenaphthylene	mg/kg	0	.004	0.010	< 0.004	<0.004	<0.004	< 0.004	< 0.004	<0.004	< 0.004
Acridine	mg/kg	C	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	mg/kg	(0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.13	<0.01	0.08
Benzo(a)anthracene	mg/kg	C).01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	mg/kg	(0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.20	<0.01	0.18
Benzo(b)fluoranthene	mg/kg	C	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.14
Benzo(j+k)fluoranthene	mg/kg	(0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.26
Benzo(e)pyrene	mg/kg	C	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.16	<0.01	0.13
Benzo(ghi)perylene	mg/kg	(0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	mg/kg	C	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.31	<0.01	<0.01
Dibenzo(a,h)anthracene	mg/kg	0	.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Fluoranthene	mg/kg	C	0.05	0.16	0.10	0.01	0.03	0.12	0.53	0.09	0.58
Fluorene	mg/kg	(0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	0.05
Indeno(1,2,3)pyrene	mg/kg	C).01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene	mg/kg	(0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perylene	mg/kg	C	0.05	17.8	8.61	0.82	1.05	3.92	3.65	1.15	1.02
Phenanthrene	mg/kg	(0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.46	<0.01	0.33
Pyrene	mg/kg	(0.05	<0.01	<0.01	<0.01	<0.01	0.10	0.40	0.08	0.50
Quinoline	mg/kg	(0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Lin	nits								
Naphthalene-d8	%	50-140		80	81	85	78	93	93	60	82
Terphenyl-d14	%	50-140		54	60	64	59	62	67	80	89
Pyrene-d10 (%)	%	50-140		57	61	57	66	63	65	74	84

Julon Mant



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

ATTENTION TO: John Gale

		F	olycyclic Aromatic Hydrocarbo	ons in Soil
DATE RECEIVED: 2022-09-2	6			DATE REPORTED: 2022-10-11
	s	CAMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED:	3168-MP03-SS1 Soil 2022-09-25 13:50	
Parameter	Unit	G/S RDL	4353080	
1-Methylnaphthalene	mg/kg	0.05	<0.01	
2-Methylnaphthalene	mg/kg	0.01	<0.01	
Acenaphthene	mg/kg	0.00671	<0.00671	
Acenaphthylene	mg/kg	0.004	<0.004	
Acridine	mg/kg	0.05	<0.01	
Anthracene	mg/kg	0.03	<0.01	
Benzo(a)anthracene	mg/kg	0.01	<0.01	
Benzo(a)pyrene	mg/kg	0.01	<0.01	
Benzo(b)fluoranthene	mg/kg	0.05	<0.01	
3enzo(j+k)fluoranthene	mg/kg	0.05	<0.01	
Benzo(e)pyrene	mg/kg	0.05	<0.01	
Benzo(ghi)perylene	mg/kg	0.01	<0.01	
Chrysene	mg/kg	0.01	<0.01	
Dibenzo(a,h)anthracene	mg/kg	0.006	<0.006	
Fluoranthene	mg/kg	0.05	0.09	
Fluorene	mg/kg	0.01	<0.01	
ndeno(1,2,3)pyrene	mg/kg	0.01	<0.01	
Naphthalene	mg/kg	0.01	<0.01	
Perylene	mg/kg	0.05	1.82	
Phenanthrene	mg/kg	0.03	<0.01	
^D yrene	mg/kg	0.05	<0.01	
Quinoline	mg/kg	0.05	<0.01	
Surrogate	Unit	Acceptable Limits		
Naphthalene-d8	%	50-140	75	
Terphenyl-d14	%	50-140	75	
Pyrene-d10 (%)	%	50-140	68	

Julon Mant



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Soil

DATE RECEIVED: 2022-09-26

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

 4352945-4353080
 Results are based on the dry weight of the soil.

Benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample. Benzo(j+k)fluoranthene is not an accredited parameter.

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

Julon Mantz

DATE REPORTED: 2022-10-11

11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com



Page 9 of 14

Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 HORIZON MARITIME

SAMPLING SITE:

AGAT WORK ORDER: 22K950371 ATTENTION TO: John Gale

SAMPLED BY:

Trace Organics Analysis

RPT Date: Oct 11, 2022			[DUPLICATI	E		REFEREN	ICE MA	TERIAL	METHOD	BLANK	SPIKE	MATRIX SPIKE		
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		otable nits	Recovery		ptable nits	Recovery		ptable nits
		ia					Value	Lower	Upper	-	Lower	Upper	-	Lower	Upper
Atlantic RBCA Tier 1 Hydrocarbor	s in Soil (V	ersion 3.1) ·	- Field Pre	served											
Benzene	1	4338883	< 0.02	< 0.02	NA	< 0.02	72%	60%	140%	80%	60%	140%			
Toluene	1	4338883	< 0.04	< 0.04	NA	< 0.04	73%	60%	140%	71%	60%	140%			
Ethylbenzene	1	4338883	0.29	0.28	3.5%	< 0.03	72%	60%	140%	73%	60%	140%			
Xylene (Total)	1	4338883	4.94	4.97	0.6%	< 0.05	72%	60%	140%	75%	60%	140%			
C6-C10 (less BTEX)	1	4338883	< 3	< 3	NA	< 3	77%	60%	140%	96%	60%	140%	104%	30%	130%
>C10-C16 Hydrocarbons	1	4352945	< 15	< 15	NA	< 15	109%	60%	140%	101%	60%	140%	116%	30%	130%
>C16-C21 Hydrocarbons	1	4352945	47	33	NA	< 15	111%	60%	140%	101%	60%	140%	116%	30%	130%
>C21-C32 Hydrocarbons	1	4352945	149	193	25.7%	< 15	110%	60%	140%	101%	60%	140%	116%	30%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Polycyclic Aromatic Hydrocarbons in Soil

Torycyclic Arolliatic Trydrocarbolia															
1-Methylnaphthalene	1	4352945	< 0.05	< 0.05	NA	< 0.05	135%	50%	140%	91%	50%	140%	98%	50%	140%
2-Methylnaphthalene	1	4352945	< 0.01	< 0.01	NA	< 0.01	113%	50%	140%	79%	50%	140%	86%	50%	140%
Acenaphthene	1	4352945	< 0.00671	< 0.00671	NA	< 0.00671	117%	50%	140%	84%	50%	140%	88%	50%	140%
Acenaphthylene	1	4352945	0.00520	0.00410	NA	< 0.004	100%	50%	140%	71%	50%	140%	76%	50%	140%
Acridine	1	4352945	< 0.05	< 0.05	NA	< 0.05	84%	50%	140%	69%	50%	140%	77%	50%	140%
Anthracene	1	4352945	< 0.03	< 0.03	NA	< 0.03	107%	50%	140%	71%	50%	140%	78%	50%	140%
Benzo(a)anthracene	1	4352945	< 0.01	< 0.01	NA	< 0.01	87%	50%	140%	63%	50%	140%	82%	50%	140%
Benzo(a)pyrene	1	4352945	< 0.01	< 0.01	NA	< 0.01	77%	50%	140%	71%	50%	140%	80%	50%	140%
Benzo(b)fluoranthene	1	4352945	< 0.05	< 0.05	NA	< 0.05	103%	50%	140%	56%	50%	140%	90%	50%	140%
Benzo(j+k)fluoranthene	1	4352945	< 0.05	< 0.05	NA	< 0.05	105%	50%	140%	104%	50%	140%	108%	50%	140%
Benzo(e)pyrene	1	4352945	< 0.05	< 0.05	NIA	< 0.05	93%	50%	140%	82%	50%	140%	86%	50%	140%
	1				NA	< 0.05									
Benzo(ghi)perylene	1	4352945	< 0.01	< 0.01	NA	< 0.01	81%	50%	140%	74%	50%	140%	87%	50%	140%
Chrysene	1	4352945	< 0.01	< 0.01	NA	< 0.01	137%	50%	140%	102%	50%	140%	98%	50%	140%
Dibenzo(a,h)anthracene	1	4352945	< 0.006	< 0.006	NA	< 0.006	69%	50%	140%	66%	50%	140%	79%	50%	140%
Fluoranthene	1	4352945	0.1626	0.1747	NA	< 0.05	98%	50%	140%	64%	50%	140%	86%	50%	140%
Fluorene	1	4352945	< 0.01	< 0.01	NA	< 0.01	104%	50%	140%	74%	50%	140%	79%	50%	140%
Indeno(1,2,3)pyrene	1	4352945	< 0.01	< 0.01	NA	< 0.01	75%	50%	140%	82%	50%	140%	102%	50%	140%
Naphthalene	1	4352945	< 0.01	< 0.01	NA	< 0.01	116%	50%	140%	80%	50%	140%	86%	50%	140%
Perylene	1	4352945	< 0.01 17.8314	17.7214	0.6%	< 0.01	94%	50%	140%	93%	50%	140%	NA	50%	140%
•	1														
Phenanthrene	1	4352945	< 0.03	< 0.03	NA	< 0.03	123%	50%	140%	90%	50%	140%	95%	50%	140%
Pyrene	1	4352945	< 0.05	< 0.05	NA	< 0.05	104%	50%	140%	67%	50%	140%	78%	50%	140%
Quinoline	1	4352945	< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	103%	50%	140%	104%	50%	140%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.

If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

	,	``	,										
Benzene		1	4374199	< 0.02	< 0.02	NA	< 0.02	69%	60%	140%	87%	60%	140%

AGAT QUALITY ASSURANCE REPORT (V1)



Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 HORIZON MARITIME

SAMPLING SITE:

AGAT WORK ORDER: 22K950371 ATTENTION TO: John Gale SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Oct 11, 2022 DUPLICATE							REFERENCE MATERIAL			METHOD	BLANK	SPIKE	MAT	RIX SPIKE	
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		otable nits	Recovery	Accer Lim	ptable nits	Recovery	Accer Lim	ptable nits
		Ia					Value	Lower	Upper		Lower	Upper		Lower	Upper
Toluene	1	4374199	< 0.04	< 0.04	NA	< 0.04	71%	60%	140%	82%	60%	140%			
Ethylbenzene	1	4374199	< 0.03	< 0.03	NA	< 0.03	74%	60%	140%	83%	60%	140%			
Xylene (Total)	1	4374199	< 0.05	< 0.05	NA	< 0.05	78%	60%	140%	91%	60%	140%			
C6-C10 (less BTEX)	1	4374199	< 3	< 3	NA	< 3	91%	60%	140%	117%	60%	140%	123%	30%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Polycyclic Aromatic Hydrocarbons in Soil

· oly of olio / a olina a o i f a o oa o oa o															
1-Methylnaphthalene	1	4352945	< 0.05	< 0.05	NA	< 0.05	135%	50%	140%	91%	50%	140%	98%	50%	140%
2-Methylnaphthalene	1	4352945	< 0.01	< 0.01	NA	< 0.01	113%	50%	140%	79%	50%	140%	86%	50%	140%
Acenaphthene	1	4352945	< 0.00671	< 0.00671	NA	< 0.00671	117%	50%	140%	84%	50%	140%	88%	50%	140%
Acenaphthylene	1	4352945	0.010	0.004	NA	< 0.004	100%	50%	140%	71%	50%	140%	76%	50%	140%
Acridine	1	4352945	< 0.05	< 0.05	NA	< 0.05	84%	50%	140%	69%	50%	140%	77%	50%	140%
Anthracene	4	4352945	< 0.03	< 0.02	NA	< 0.02	4070/	50%	140%	740/	50%	4 4 0 0 /	700/	F00/	140%
	1			< 0.03		< 0.03	107%			71%		140%	78%	50%	
Benzo(a)anthracene	1	4352945	< 0.01	< 0.01	NA	< 0.01	87%	50%	140%	63%	50%	140%	82%	50%	140%
Benzo(a)pyrene	1	4352945	< 0.01	< 0.01	NA	< 0.01	77%	50%	140%	71%	50%	140%	80%	50%	140%
Benzo(b)fluoranthene	1	4352945	< 0.05	< 0.05	NA	< 0.05	103%	50%	140%	56%	50%	140%	90%	50%	140%
Benzo(j+k)fluoranthene	1	4352945	< 0.05	< 0.05	NA	< 0.05	105%	50%	140%	104%	50%	140%	108%	50%	140%
Benzo(e)pyrene	1	4352945	< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	82%	50%	140%	86%	50%	140%
Benzo(ghi)perylene	1	4352945	< 0.01	< 0.01	NA	< 0.01	81%	50%	140%	74%	50%	140%	87%	50%	140%
Chrysene	1	4352945	< 0.01	< 0.01	NA	< 0.01	137%	50%	140%	102%	50%	140%	98%	50%	140%
Dibenzo(a,h)anthracene	1	4352945	< 0.006	< 0.006	NA	< 0.006	69%	50%	140%	66%	50%	140%	79%	50%	140%
Fluoranthene	1	4352945	0.16	0.17	NA	< 0.05	98%	50%	140%	64%	50%	140%	86%	50%	140%
Fluorene	1	4352945	< 0.01	< 0.01	NA	< 0.01	104%	50%	140%	74%	50%	140%	79%	50%	140%
Indeno(1,2,3)pyrene	1	4352945	< 0.01	< 0.01	NA	< 0.01	75%	50%	140%	82%	50%	140%	102%	50%	140%
Naphthalene	1	4352945	< 0.01	< 0.01	NA	< 0.01	116%	50%	140%	80%	50 %	140%	86%	50%	140%
1	1														
Perylene	1	4352945	17.8	17.7	0.6%	< 0.05	94%	50%	140%	93%	50%	140%	NA	50%	140%
Phenanthrene	1	4352945	< 0.03	< 0.03	NA	< 0.03	123%	50%	140%	90%	50%	140%	95%	50%	140%
Pyrene	1	4352945	< 0.05	< 0.05	NA	< 0.05	104%	50%	140%	67%	50%	140%	78%	50%	140%
Quinoline	1	4352945	< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	103%	50%	140%	104%	50%	140%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.

If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Certified By:

Julon Mant

AGAT QUALITY ASSURANCE REPORT (V1)

Page 10 of 14



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 HORIZON MARITIME SAMPLING SITE:

AGAT WORK ORDER: 22K950371

ATTENTION TO: John Gale

AGAT S.O.P /OL-120-5013/5031 /OL-120-5013/5031 /OL-120-5013/5031 /OL-120-5013/5031 /OL-120-5013/5031 ORG-120-5101 ORG-120-5101 ORG-120-5101 ORG-120-5101 ORG-120-5101	SAMPLED BY: LITERATURE REFERENCE Atlantic RBCA Guidelines for Laboratories Tier 1 Atlantic RBCA Guidelines for	ANALYTICAL TECHNIQUE GC/MS GC/MS GC/MS GC/MS/FID GC/FID GC/FID GC/FID CALCULATION							
/OL-120-5013/5031 /OL-120-5013/5031 /OL-120-5013/5031 /OL-120-5013/5031 /OL-120-5013/5031 /OL-120-5101 ORG-120-5101 ORG-120-5101 ORG-120-5101 ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1 Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS GC/MS GC/MS GC/MS GC/MS/FID GC/FID GC/FID GC/FID							
/OL-120-5013/5031 /OL-120-5013/5031 /OL-120-5013/5031 /OL-120-5013/5031 /ORG-120-5101 /ORG-120-5101 /ORG-120-5101 /ORG-120-5101	Laboratories Tier 1 Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS GC/MS GC/MS/FID GC/FID GC/FID							
/OL-120-5013/5031 /OL-120-5013/5031 /OL-120-5013/5031 DRG-120-5101 DRG-120-5101 DRG-120-5101 DRG-120-5101 DRG-120-5101	Laboratories Tier 1 Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS GC/MS GC/MS/FID GC/FID GC/FID							
/OL-120-5013/5031 /OL-120-5013/5031 DRG-120-5101 DRG-120-5101 DRG-120-5101 DRG-120-5101 DRG-120-5101	Laboratories Tier 1 Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS GC/MS/FID GC/FID GC/FID							
/OL-120-5013/5031 DRG-120-5101 DRG-120-5101 DRG-120-5101 DRG-120-5101 DRG-120-5101	Laboratories Tier 1 Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID GC/FID GC/FID							
DRG-120-5101 DRG-120-5101 DRG-120-5101 DRG-120-5101 DRG-120-5101	Laboratories Tier 1 Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID GC/FID GC/FID							
DRG-120-5101 DRG-120-5101 DRG-120-5101 DRG-120-5101	Laboratories Tier 1 Atlantic RBCA Guidelines for Laboratories Tier 1 Atlantic RBCA Guidelines for Laboratories Tier 1 Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID GC/FID							
DRG-120-5101 DRG-120-5101 DRG-120-5101	Laboratories Tier 1 Atlantic RBCA Guidelines for Laboratories Tier 1 Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID							
DRG-120-5101 DRG-120-5101	Laboratories Tier 1 Atlantic RBCA Guidelines for Laboratories Tier 1								
DRG-120-5101	Laboratories Tier 1	CALCULATION							
	Atlantic RBCA Guidelines for								
DC 120 5101	Laboratories Tier 1	GC/MS/FID							
0.00-120-0101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID							
DRG-120-5101	Laboratories Tier 1	GC/FID							
/OL-120-5013	Laboratories Tier 1	GC/MS							
DRG-120-5101	Laboratories Tier 1	GC/FID							
		GRAVIMETRIC							
		GC/MS							
		GC/MS							
DRG-120-5119	EPA 3570/8270E	GC/MS							
DRG-120-5119	EPA 3570/8270E	GC/MS							
DRG-120-5119	EPA 3570/8270E	GC/MS							
DRG-120-5119	EPA 3570/8270E	GC/MS							
DRG-120-5119	EPA 3570/8270E	GC/MS							
DRG-120-5119	EPA 3570/8270E	GC/MS							
DRG-120-5119	EPA 3570/8270E	GC/MS							
DRG-120-5119	EPA 3570/8270E	GC/MS							
DRG-120-5119	EPA 3570/8270E	GC/MS							
DRG-120-5119	EPA 3570/8270E	GC/MS							
DRG-120-5119	EPA 3570/8270E	GC/MS							
DRG-120-5119	EPA 3570/8270E	GC/MS							
DRG-120-5119		GC/MS							
	EPA 3570/8270E	GC/MS							
		GC/MS							
		GC/MS							
		GC/MS							
		GC/MS							
		GC/MS							
		GC/MS							
	EPA 3570/8270E EPA 3570/8270E	GC/MS GC/MS							
	OL-120-5013 PRG-120-5101 AB-131-4024 PRG-120-5119	PRG-120-5101Atlantic RBCA Guidelines for Laboratories Tier 1PRG-120-5101Atlantic RBCA Guidelines for Laboratories Tier 1PRG-120-5013Atlantic RBCA Guidelines for Laboratories Tier 1PRG-120-5013Atlantic RBCA Guidelines for Laboratories Tier 1PRG-120-5101Atlantic RBCA Guidelines for Laboratories Tier 1PRG-120-5101Atlantic RBCA Guidelines for Laboratories Tier 1AB-131-4024CSSS 70.2PRG-120-5119EPA 3570/8270EPRG-120-5119EPA 3570/8270EPRG-12							



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 HORIZON MARITIME SAMPLING SITE: AGAT WORK ORDER: 22K950371

ATTENTION TO: John Gale

SAMPLING SITE:		SAMPLED BY:								
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE							
Terphenyl-d14	ORG-120-5119	EPA 3570/8270E	GC/MS							
Pyrene-d10 (%)	ORG-120-5119	EPA 3570/8270E	GC/MS							

A and C		1					Unit 1	22	11	Mori	ris D	rive		ab	ora	tory	/ U	se (Only	1							
	GA	Γı	Labora	tories webearth.a	igat	labs	.com •	ww			3B 1	.M2		Arriv Hold	al Te I Tim	emp ne:	bera	atur	e: <u> </u>	1.9	L., !	5.	2,	see 5	5.5	5)	
Chain of Custody Record			P: 902.468.8718 = F: 902.468.8924								24 AGAT Job Number: 2-2-K950371																
Report Information			Report I	Report Information (Please print): Report Fo						orn	nat	nat Notes:															
Company: Fracflow Consultants Inc. (NL)				1. Name: John Gale (john_ffc@nfld.net)						Single	Sam	nle					_				_						
Contact: John Gale			— Email	Email: Devin Northcott (devin_ffc@bellaliant.com)						per pa	Ī	Furr	narc	oun	d T	ime	e Re	ani	red	(TA	T	_					
Address: 154 Major's F	Path			Karen Andrews (karen_ffc@nf	ld.ne	et)				Multiple Sample						Turnaround Time Required (TAT)Regular TATImage: State of the state of											
St. John's, NI	-		- 11	Email. Chris Piercey (chris_ffc@bellaliant.com)																							
Phone: 709-739-7270) Fax: 709-753	3-5101	Pogulat	ory Doguiromonte (Charle)				믭		Includ			Rush TAT Same day 1 day														
Client Project #: 3168 H				Regulatory Requirements (Check): Ist Guidelines on Report Do not list Guidelines on Report							□ 2 days □ 3 days																
AGAT Quotation: S/O					Guide	11162	un nepu	1					1	Date	Red	quire	ed:			-							
	not provided client will be billed full	price for analys		1 Res Dot			barse	F	_		_																
Invoice To	Same	Yes ☑ / No	Tier			🗌 Fi	ne		Drink Reg. I		Vater	r Sar	mple: 🗌 Yes 🗹 No Salt Water Sample: 🗋 Yes 🗹 No														
	Game		-		-	1		11	1	1		-	-	-	- 1	-	-	-	-	_	-	_			-1-		
Company:			- CCME				ole																				
	vs (karen_ffc@nfld.net)			nmercial HRM 101			Available							evel										MF			
Address:			Res	Park Storm Water						Miss	2)	ent)		low	ation												
			──	icultural Waste Water	ved	ysis	Diss		ine)	FOC - Miss	P20	caval			ction	\times						kage		MPN			
	Fax:		🗆 Sec		reser	. Analysis		CBOD	rse/1	Ë	tal as	& He)		X (PII	X Fra	/BTE		0	- Miss			t Pac		Z			
PO/Credit Card#:			_		Filtered/Preserved	Water	Total		(coa	SS	es (tot	(Tri é		I/BTE	TPH/BTEX Fractionation	HdTS		Grease (TOG)	625			Sediment Package	& Furans	orm		W/W	
Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments - Site/Sample Info. Sample Containment	Field Filte	Standard \	Metals: S Total Mercury	DOB	Grain Size (coarse/fine)	TOC - Miss	Phosphates (total as P205)	Chromium (Tri & Hexavalent)	Phenois	H	Tier 2: TPH	CCME-CWS TPH/BTEX	VOC	Oil & Grea	BNAE EPA 625 -	PAH	PCB	Marine Sed	0	Fecal Coliform	Other: Other	Hazardous (Y/N)	
3168-GP03-SS1	Sept. 21, 2022 / 14:15	Soil	4		1			-			Pin 1	-		1	-	-	-		-	1	-	~				· · ·	
3168-GP02-SS1	Sept. 21, 2022 / 14:35	Soil	4								-			1				-	-	1	-			+	+	-	
3168-GP01-SS1	Sept. 21, 2022 / 14:50	Soil	4		1				1					1					-	1				t	-	-	
3168-NP03-SS1	Sept. 21, 2022 / 16:38	Soil	4										181	1					1	1	-			-	-	-	
3168-NP02-SS1	Sept. 21, 2022 / 17:00	Soil	4										1	1						1						1	
3168-NP01-SS1	Sept. 21, 2022 / 17:12	Soil	4											1						1							
												-						1									
																_		-									
					-	-			-																		
				· · · · · · · · · · · · · · · · · · ·	-			-	-	-				_													
	-				-	-	-	1	-	-	-	-	-		_		-	-		-	-			_	_		
Samples Relinquished By (Print Name):		Date/	Time	Samples Received By (Print Name):			-	4		10	ale/Tim	10	_			1	-			1		1					
Karen L. Andre	WS	26/	109/22 13:20	O.A-IKINS	S	eb	+26	. ว	2	1		12	0		F	Pink	Сору	y - Cli	ient	5	Pa	ige F	1	of	2	7	
Samples Relifquished By (Sign)	1 1	Date/	Time	Samples Received By (Sign):	-	F	20	12	e	D	ate/Tim		_	-	-Y	ellow	/ Coj	py - A	GAT	-		_	-				
harm har	nareus														1	White	e Co	ру- А	GAT	Nº:	FF	-C-(316	8-C(0C-	01	

and the second s	GA'	L I	_abora	tories webearth.a	ıgatl		Unit 1 .com ·		Da	rtmo Bi	uth, 3B 1	NS .M2		Arriv Arriv	val (val ⁻	Con Tem	nditi nper	on: atui	re:	160	2,	3.4	oor ربط	1.1	-		
Chain of Custo	dy Record			P:	902	2.46	8.871	8 = 1	F: 90	2.4	58.8	924		AGA	T Jo	b N	Num	ber	:	0	9×	- 9	57	53	7	1	
Report Information			Report	nformation (Please print):					Rep	ort I	orn	nat	-11	Not													
Company: Fracflow Con	sultants Inc. (NL)		1. Name	John Gale (john_ffc@nfld.net)						Single																	
Contact: John Gale			— Emai	Devin Northcott (devin_ffc@bell	alian	t.cor	n)	211		per pa	ge		F	Furn	nar	ou	nd	Tim	e R	eau	lirer	d (T/	AT)			-	-
Address: 154 Major's F	Path			Karen Andrews (karen_ffc@nf	ld.ne	et)			\checkmark	Multip per pa	le Sa	mple										ng da					
St. John's, NL			Emai	Chris Piercey (chris_ffc@bella	liant.	.com	1)			Excel		at	11														
Phone: 709-739-7270	Fax: 709-75	3-5101	Regulat	ory Requirements (Check):		-		-		Inclu			11	Rus	h T	AT							1 dag	-			
Client Project #: 3168 H				idelines on Report Do not list	Guide	lines	on Rena	rt		Expor	t							□2	2 day	/S			3 dag	/S			
AGAT Quotation: S/O			🛛 🗹 PIRI		Gialdo	11100	оптеро	<u>" </u>					10	Date	e Re	qui	red	+					_				_
Please Note: If quotation number is	not provided client will be billed ful	I price for analys		1 Res Pot			oarse	F		_			16	_				-	_				_		_		_
Invoice To	Same	Yes ☑ / No		2 □ Com	ĺ	🗍 FI	ne		Drink Reg. I		Vater	Sai	nple	: L] Ye	S	MV	10	Salt	Wat	ter S	amp	le:	•	Yes	4	IN
		,,,,,		1	-		* 1	1	T	1	1	-	Т	1	-	T	T	T	T	-		-	_	-		_	
Company:			11	ustrial SEQS-Cont Sites			e	1									Ľ										
Contact: Karen Andrev	vs (karen_ffc@nfld.net)			nmercial			Available							evel										D MF			
Address:			- Res	/Park Storm Water			Ā			Miss	<u>ي</u>	ent)		Ilow	ation									ē			1
				Cultural 🛛 Waste Water	rved	lysis	Diss		fine)	C FOC - Miss	5 P20	kaval		RI)	Iction	×			6			kage		MPN			
Phone:			Sec		resei	r Ana		L CBOD	irse/i	Б	tal as	& He		Id) X	X Fra	/BTE		9	- Mis			t Pac	2	₽			
PO/Credit Card#:			_		red/F	Wate	Total			18	s (to	(Tri		VBTE	I/BTE	TPH		E es	625			imen	Furar	E			N N
Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info, Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: I Total Mercury	L BOD	Grain Size (coarse/fine)	D TOC - Miss	Phosphates (total as P205)	Chromium (Tri & Hexavalent)	henols	Tier 1: TPH/BTEX (PIRI) 🗆 low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	0il & Grease (T0G)	BNAE EPA 625 - Miss	PAH	PCB	Marine Sediment Package	Dioxins & Furans	Fecal Coliform	Other:	Other:	Hazardous (Y/N)
3168-MP01-SS1	Sept. 25, 2022 / 10:55	Soil	4							1		-	EL.	-	-	1	-		-	-	-	2		-	-	0	-
3168-MP02-SS1	Sept. 25, 2022 / 11:20	Soil	4											~		1	1	-	+	1	-	1		\uparrow	-	-	-
3168-MP03-SS1	Sept. 25, 2022 / 13:50	Soil	4											1		T	T	T	1	1	-	-				-	-
														1													-
	1																										
		-						-	-	-	_			1													
					-			_	-	-							-		-								
		-	1		-	-	-	-	-	-	_	_		-	-	-	-	-	-	-	-	1	-		_		
					-	-	-	-	-	-	-	-	-	_	-	-	1	-	+-	+	+	-	\vdash	-	-	_	-
					1	-		-	-		-			-	-	-	+	+	+	+	+	+	-	-	_	-	-
					1	-	-	-	-					-	-	-	-	-	+	+	+	-	+		-	-	-
Samples Relinquished By (Print Name): KAREW LAN Samples Relinquished By (Siron)	MEWS	Dete/	Time Sep 22 8/45 Time	Samples Roceived By (Print Name):	. حر)	4			1		ta/Tim		- 2.	7/-	2	1.00		by - Cl		T	P	age	2	of	2		
Town for	redeances	Dato/	line	Samples Received By (Bign):						D			P					ару - л ару- А	AGAT	NC	: F	FC-	-316	8-C	:00	2-02	2

Date revised January 2016



CLIENT NAME: FRACFLOW CONSULTANTS 154 MAJOR'S PATH ST. JOHN'S PATH, NL A1A5A1 (709) 739-7270 ATTENTION TO: John Gale **PROJECT: 3168 HORIZON MARITIME** AGAT WORK ORDER: 22K950371 TRACE ORGANICS REVIEWED BY: Dylan McCarthy, Trace Organics Lab Technician DATE REPORTED: Oct 21, 2022 PAGES (INCLUDING COVER): 19 VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*Notes_		
Disclaimer:		

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

AGAT Laboratories (V1)

lember of: Association of Professional Engineers and Geoscientists of Alberta	
(APEGA)	
Western Enviro-Agricultural Laboratory Association (WEALA)	
Environmental Services Association of Alberta (ESAA)	

Page 1 of 19

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.



AGAT WORK ORDER: 22K950371 **PROJECT: 3168 HORIZON MARITIME**

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

http://www.agatlabs.com ATTENTION TO: John Gale

11 Morris Drive, Unit 122

Dartmouth, Nova Scotia

CANADA B3B 1M2

TEL (902)468-8718 FAX (902)468-8924

SAMPLED BY:

		Atlantic RBCA	Tier 1 Hydrocarbons	Soil (Version 3.0) - Low Level + 1X Silica Gel
DATE RECEIVED: 2022-09-26				DATE REPORTED: 2022-10-21
		SAMPLE DESCRIPTIO	N: 3168-MP01-SS1	
		SAMPLE TYP	E: Soil	
		DATE SAMPLE	D: 2022-09-25 10:55	
Parameter	Unit	G/S RDL	4353078	
Benzene	mg/kg	0.02	<0.02	
Toluene	mg/kg	0.04	<0.04	
Ethylbenzene	mg/kg	0.01	<0.01	
Xylene (Total)	mg/kg	0.05	<0.05	
C6-C10 (less BTEX)	mg/kg	3	<3	
>C10-C16 Hydrocarbons	mg/kg	15	<15	
>C16-C21 Hydrocarbons	mg/kg	15	<15	
>C21-C32 Hydrocarbons	mg/kg	15	44	
Modified TPH (Tier 1)	mg/kg	15	44	
Resemblance Comment			LOF, UC	
Return to Baseline at C32			Y	
Silica Gel Cleanup			Y	
Surrogate	Unit	Acceptable Limits		
Isobutylbenzene - EPH	%	60-140	108	
Isobutylbenzene - VPH	%	60-140	117	
n-Dotriacontane - EPH	%	60-140	111	

Julon Mant



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME

ATTENTION TO: John Gale

SAMPLED BY:

11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.0) - Low Level + 1X Silica Gel DATE RECEIVED: 2022-09-26 DATE REPORTED: 2022-10-21 Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard 4353078 Modified TPH, Xylene(Total)and C6-C10(less BTEX) are calculated parameters. The calculated parameter is non-accredited. The component parameters of the calculation are accredited. Sample was not field preserved for VPH when received at the laboratory. Analytical results for VPH parameters should be regarded as minimum values. Results are based on the dry weight of the soil. Resemblance Comment Key: GF - Gasoline Fraction WGF - Weathered Gasoline Fraction GR - Product in Gasoline Range FOF - Fuel Oil Fraction WFOF - Weathered Fuel Oil Fraction FR - Product in Fuel Oil Range LOF - Lube Oil Fraction LR - Lube Range UC - Unidentified Compounds NR - No Resemblance NA - Not Applicable Analysis performed at AGAT Halifax (unless marked by *)

Julon Mants



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

DATE RECEIVED: 2022-09-26

DATE RECEIVED: 2022-09-26							L	JATE REPORT	ED. 2022-10-21	
		SAMPLE DESCRIPTION:	3168-GP03-SS1	3168-GP02-SS1	3168-GP01-SS1	3168-NP03-SS1	3168-NP02-SS1	3168-NP01-SS1	3168-MP01-SS1	3168-MP02-SS1
		SAMPLE TYPE:	Soil							
		DATE SAMPLED:	2022-09-21 14:35	2022-09-21 14:35	2022-09-21 14:50	2022-09-21 16:38	2022-09-21 17:00	2022-09-21 17:12	2022-09-25 10:55	2022-09-25 11:20
Parameter	Unit	G / S RDL	4352945	4352946	4352947	4352948	4352949	4352950	4353078	4353079
Benzene	mg/kg	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	mg/kg	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Ethylbenzene	mg/kg	0.03	<0.03	< 0.03	< 0.03	<0.03	<0.03	<0.03	<0.03	< 0.03
Xylene (Total)	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
C6-C10 (less BTEX)	mg/kg	3	<3	<3	<3	<3	<3	<3	<3	<3
>C10-C16 Hydrocarbons	mg/kg	15	<15	<15	<15	<15	<15	<15	<15	<15
>C16-C21 Hydrocarbons	mg/kg	15	47	16	<15	26	<15	22	<15	30
>C21-C32 Hydrocarbons	mg/kg	15	149	110	42	83	61	107	75	188
Modified TPH (Tier 1)	mg/kg	15	196	126	42	109	61	129	75	218
Resemblance Comment			LOF, UC							
Return to Baseline at C32			Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν
Surrogate	Unit	Acceptable Limits								
Isobutylbenzene - EPH	%	60-140	93	92	93	93	95	95	95	94
Isobutylbenzene - VPH	%	60-140	70	71	68	65	121	121	117	118
n-Dotriacontane - EPH	%	60-140	89	90	87	89	88	91	90	92

Certified By:

Julon Mant

DATE REPORTED: 2022-10-21



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

DATE RECEIVED: 2022-09-26

	0			DA	
	S	AMPLE DESCRIPTION:	3168-MP03-SS1		
		SAMPLE TYPE:	Soil		
		DATE SAMPLED:	2022-09-25 13:50		
Parameter	Unit	G/S RDL	4353080		
Benzene	mg/kg	0.02	<0.02		
Toluene	mg/kg	0.04	<0.04		
Ethylbenzene	mg/kg	0.03	<0.03		
Xylene (Total)	mg/kg	0.05	<0.05		
C6-C10 (less BTEX)	mg/kg	3	<3		
>C10-C16 Hydrocarbons	mg/kg	15	<15		
>C16-C21 Hydrocarbons	mg/kg	15	47		
>C21-C32 Hydrocarbons	mg/kg	15	145		
Modified TPH (Tier 1)	mg/kg	15	192		
Resemblance Comment			LOF, UC		
Return to Baseline at C32			Ν		
Surrogate	Unit	Acceptable Limits			
Isobutylbenzene - EPH	%	60-140	93		
Isobutylbenzene - VPH	%	60-140	115		
n-Dotriacontane - EPH	%	60-140	92		

Certified By:

Julon Mant

DATE REPORTED: 2022-10-21



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

DATE RECEIVED: 2022-09-26

DATE REPORTED: 2022-10-21

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

4352945-4353080 Modified TPH, Xylene(Total)and C6-C10(less BTEX) are calculated parameters. The calculated parameter is non-accredited. The component parameters of the calculation are accredited.

Results are based on the dry weight of the soil.

Resemblance Comment Key: GF - Gasoline Fraction WGF - Weathered Gasoline Fraction GR - Product in Gasoline Range FOF - Fuel Oil Fraction WFOF - Weathered Fuel Oil Fraction FR - Product in Fuel Oil Range LOF - Lube Oil Fraction LR - Lube Range UC - Unidentified Compounds NR - No Resemblance NA - Not Applicable

Analysis performed at AGAT Halifax (unless marked by *)

Julon Mants



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME

ATTENTION TO: John Gale

SAMPLED BY:

11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

		Atlantic RBCA	Tier 1	I Hydrocarbon	s in Soil (Versi	on 3.1) - Field I	Preserved + 1X	Silica Gel			
DATE RECEIVED: 2022-09-26								[DATE REPORT	ED: 2022-10-21	
		SAMPLE DESCRIP	TION:	3168-GP03-SS1	3168-GP02-SS1	3168-GP01-SS1	3168-NP03-SS1	3168-NP02-SS1	3168-NP01-SS1	3168-MP02-SS1	3168-MP03-SS1
		SAMPLE 1	TYPE:	Soil							
		DATE SAMF	PLED:	2022-09-21 14:35	2022-09-21 14:35	2022-09-21 14:50	2022-09-21 16:38	2022-09-21 17:00	2022-09-21 17:12	2022-09-25 11:20	2022-09-25 13:50
Parameter	Unit	G/S R	DL	4352945	4352946	4352947	4352948	4352949	4352950	4353079	4353080
Benzene	mg/kg	0	.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	mg/kg	0	.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Ethylbenzene	mg/kg	0	.03	< 0.03	<0.03	< 0.03	<0.03	< 0.03	< 0.03	< 0.03	<0.03
Xylene (Total)	mg/kg	0	.05	<0.05	<0.05	<0.05	<0.05	< 0.05	<0.05	<0.05	<0.05
C6-C10 (less BTEX)	mg/kg		3	<3	<3	<3	<3	<3	<3	<3	<3
>C10-C16 Hydrocarbons - 1X silica gel	mg/kg		15	<15	<15	<15	<15	<15	<15	<15	<15
>C16-C21 Hydrocarbons - 1X silica gel	mg/kg		15	39	<15	<15	<15	<15	18	22	26
>C21-C32 Hydrocarbons - 1X silica gel	mg/kg		15	97	44	17	30	27	80	109	71
Modified TPH (Tier 1) - 1X silica gel	mg/kg		15	136	44	17	30	27	98	131	97
Resemblance Comment				UC	UC	UC	UC	UC	LOF, UC	LOF, UC	UC
Return to Baseline at C32				Y	Y	Y	Y	Y	Y	Y	Y
Silica Gel Cleanup				Y	Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Lim	its								
Isobutylbenzene - EPH	%	60-140		110	109	111	109	109	112	110	108
Isobutylbenzene - VPH	%	60-140		70	71	68	65	121	121	118	115
n-Dotriacontane - EPH	%	60-140		113	112	112	110	108	114	116	110

Julon Mant



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved + 1X Silica Gel

DATE RECEIVED: 2022-09-26

DATE REPORTED: 2022-10-21

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

4352945-4353080 Modified TPH, Xylene(Total)and C6-C10(less BTEX) are calculated parameters. The calculated parameter is non-accredited. The component parameters of the calculation are accredited.

Results are based on the dry weight of the soil.

Resemblance Comment Key: GF - Gasoline Fraction WGF - Weathered Gasoline Fraction GR - Product in Gasoline Range FOF - Fuel Oil Fraction WFOF - Weathered Fuel Oil Fraction FR - Product in Fuel Oil Range LOF - Lube Oil Fraction LR - Lube Range UC - Unidentified Compounds NR - No Resemblance NA - Not Applicable

Analysis performed at AGAT Halifax (unless marked by *)

Julon Mant



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Moisture													
DATE RECEIVED: 2022-09-26									DATE REPORT	ED: 2022-10-21			
		SAMPLE DESC	CRIPTION:	3168-GP03-SS1	3168-GP02-SS1	3168-GP01-SS1	3168-NP03-SS1	3168-NP02-SS1	3168-NP01-SS1	3168-MP01-SS1	3168-MP02-SS1		
		SAME	PLE TYPE:	Soil									
		DATE S	SAMPLED:	2022-09-21 14:35	2022-09-21 14:35	2022-09-21 14:50	2022-09-21 16:38	2022-09-21 17:00	2022-09-21 17:12	2022-09-25 10:55	2022-09-25 11:20		
Parameter	Unit	G / S	RDL	4352945	4352946	4352947	4352948	4352949	4352950	4353078	4353079		
% Moisture	%		1	91	90	68	70	76	72	70	79		
		SAMPLE DESC	CRIPTION:	3168-MP03-SS1									
		SAME	PLE TYPE:	Soil									
		DATE S	SAMPLED:	2022-09-25 13:50									
Parameter	Unit	G/S	RDL	4353080									
% Moisture	%		1	88									

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

Analysis performed at AGAT Halifax (unless marked by *)

Julon Mant



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME 11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale SAMPLED BY: Polycyclic Aromatic Hydrocarbons in Soil DATE REPORTED: 2022-10-21

DATE RECEIVED: 2022-09-26							I	DATE REPORTI	ED: 2022-10-21	
		SAMPLE DESCRIPTION:	3168-GP03-SS1	3168-GP02-SS1	3168-GP01-SS1	3168-NP03-SS1	3168-NP02-SS1	3168-NP01-SS1	3168-MP01-SS1	3168-MP02-SS1
		SAMPLE TYPE:	Soil							
		DATE SAMPLED:	2022-09-21 14:35	2022-09-21 14:35	2022-09-21 14:50	2022-09-21 16:38	2022-09-21 17:00	2022-09-21 17:12	2022-09-25 10:55	2022-09-25 11:20
Parameter	Unit	G/S RDL	4352945	4352946	4352947	4352948	4352949	4352950	4353078	4353079
1-Methylnaphthalene	mg/kg	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
2-Methylnaphthalene	mg/kg	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Acenaphthene	mg/kg	0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	0.0549	<0.00671	< 0.00671
Acenaphthylene	mg/kg	0.004	0.010	<0.004	<0.004	<0.004	<0.004	< 0.004	<0.004	< 0.004
Acridine	mg/kg	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	mg/kg	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.13	<0.01	0.08
Benzo(a)anthracene	mg/kg	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	mg/kg	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.20	<0.01	0.18
Benzo(b)fluoranthene	mg/kg	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.14
Benzo(j+k)fluoranthene	mg/kg	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.26
Benzo(e)pyrene	mg/kg	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.16	<0.01	0.13
Benzo(ghi)perylene	mg/kg	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	mg/kg	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.31	<0.01	<0.01
Dibenzo(a,h)anthracene	mg/kg	0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Fluoranthene	mg/kg	0.05	0.16	0.10	0.01	0.03	0.12	0.53	0.09	0.58
Fluorene	mg/kg	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	0.05
Indeno(1,2,3)pyrene	mg/kg	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene	mg/kg	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perylene	mg/kg	0.05	17.8	8.61	0.82	1.05	3.92	3.65	1.15	1.02
Phenanthrene	mg/kg	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.46	<0.01	0.33
Pyrene	mg/kg	0.05	<0.01	<0.01	<0.01	<0.01	0.10	0.40	0.08	0.50
Quinoline	mg/kg	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Limits								
Naphthalene-d8	%	50-140	80	81	85	78	93	93	60	82
Terphenyl-d14	%	50-140	54	60	64	59	62	67	80	89
Pyrene-d10 (%)	%	50-140	57	61	57	66	63	65	74	84

Julon Mant



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com

ATTENTION TO: John Gale

SAMPLED BY:

		F	olycyclic Aromatic Hydrocarbons	in Soil
DATE RECEIVED: 2022-09-2	6			DATE REPORTED: 2022-10-21
	S	SAMPLE DESCRIPTION:	3168-MP03-SS1	
		SAMPLE TYPE:	Soil	
		DATE SAMPLED:	2022-09-25 13:50	
Parameter	Unit	G/S RDL	4353080	
1-Methylnaphthalene	mg/kg	0.05	<0.01	
2-Methylnaphthalene	mg/kg	0.01	<0.01	
Acenaphthene	mg/kg	0.00671	<0.00671	
Acenaphthylene	mg/kg	0.004	<0.004	
Acridine	mg/kg	0.05	<0.01	
Anthracene	mg/kg	0.03	<0.01	
Benzo(a)anthracene	mg/kg	0.01	<0.01	
Benzo(a)pyrene	mg/kg	0.01	<0.01	
Benzo(b)fluoranthene	mg/kg	0.05	<0.01	
Benzo(j+k)fluoranthene	mg/kg	0.05	<0.01	
Benzo(e)pyrene	mg/kg	0.05	<0.01	
Benzo(ghi)perylene	mg/kg	0.01	<0.01	
Chrysene	mg/kg	0.01	<0.01	
Dibenzo(a,h)anthracene	mg/kg	0.006	<0.006	
Fluoranthene	mg/kg	0.05	0.09	
Fluorene	mg/kg	0.01	<0.01	
Indeno(1,2,3)pyrene	mg/kg	0.01	<0.01	
Naphthalene	mg/kg	0.01	<0.01	
Perylene	mg/kg	0.05	1.82	
Phenanthrene	mg/kg	0.03	<0.01	
Pyrene	mg/kg	0.05	<0.01	
Quinoline	mg/kg	0.05	<0.01	
Surrogate	Unit	Acceptable Limits		
Naphthalene-d8	%	50-140	75	
Terphenyl-d14	%	50-140	75	
Pyrene-d10 (%)	%	50-140	68	

Julon Mantz



AGAT WORK ORDER: 22K950371 PROJECT: 3168 HORIZON MARITIME

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Soil

DATE RECEIVED: 2022-09-26

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

 4352945-4353080
 Results are based on the dry weight of the soil.

Benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample. Benzo(j+k)fluoranthene is not an accredited parameter.

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

Julon Mantz

DATE REPORTED: 2022-10-21

11 Morris Drive, Unit 122 Dartmouth, Nova Scotia CANADA B3B 1M2 TEL (902)468-8718 FAX (902)468-8924 http://www.agatlabs.com



Page 13 of 19

Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 HORIZON MARITIME

SAMPLING SITE:

AGAT WORK ORDER: 22K950371 ATTENTION TO: John Gale

SAMPLED BY:

Trace Organics Analysis

RPT Date: Oct 21, 2022			[DUPLICATI	E		REFEREN	ICE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Blank Measured		Acceptable Limits			otable nits	Recovery	1 1 1 1 1 1 1 1 1	ptable nits
		ld					Value	Lower	Upper		Lower	Upper	,	Lower	Upper
Atlantic RBCA Tier 1 Hydrocarbor	s in Soil (V	ersion 3.1) ·	- Field Pre	served											
Benzene	1	4338883	< 0.02	< 0.02	NA	< 0.02	72%	60%	140%	80%	60%	140%			
Toluene	1	4338883	< 0.04	< 0.04	NA	< 0.04	73%	60%	140%	71%	60%	140%			
Ethylbenzene	1	4338883	0.29	0.28	3.5%	< 0.03	72%	60%	140%	73%	60%	140%			
Xylene (Total)	1	4338883	4.94	4.97	0.6%	< 0.05	72%	60%	140%	75%	60%	140%			
C6-C10 (less BTEX)	1	4338883	< 3	< 3	NA	< 3	77%	60%	140%	96%	60%	140%	104%	30%	130%
>C10-C16 Hydrocarbons	1	4352945	< 15	< 15	NA	< 15	81%	60%	140%	129%	60%	140%	112%	30%	130%
>C16-C21 Hydrocarbons	1	4352945	39	15	NA	< 15	86%	60%	140%	129%	60%	140%	112%	30%	130%
>C21-C32 Hydrocarbons	1	4352945	97	126	26.0%	< 15	87%	60%	140%	129%	60%	140%	112%	30%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Polycyclic Aromatic Hydrocarbons in Soil

Polycyclic Alomatic Hydrocal																
1-Methylnaphthalene	1	4352945	< 0.05	< 0.05	NA	< 0.05	135%	50%	140%	91%	50%	140%	98%	50%	140%	
2-Methylnaphthalene	1	4352945	< 0.01	< 0.01	NA	< 0.01	113%	50%	140%	79%	50%	140%	86%	50%	140%	
Acenaphthene	1	4352945	< 0.00671	< 0.00671	NA	< 0.00671	117%	50%	140%	84%	50%	140%	88%	50%	140%	
Acenaphthylene	1	4352945	0.00520	0.00410	NA	< 0.004	100%	50%	140%	71%	50%	140%	76%	50%	140%	
Acridine	1	4352945	< 0.05	< 0.05	NA	< 0.05	84%	50%	140%	69%	50%	140%	77%	50%	140%	
Anthracene	1	4352945	< 0.03	< 0.03	NA	< 0.03	107%	50%	140%	71%	50%	140%	78%	50%	140%	
Benzo(a)anthracene	1	4352945	< 0.01	< 0.01	NA	< 0.01	87%	50%	140%	63%	50%	140%	82%	50%	140%	
Benzo(a)pyrene	1	4352945	< 0.01	< 0.01	NA	< 0.01	77%	50%	140%	71%	50%	140%	80%	50%	140%	
Benzo(b)fluoranthene	1	4352945	< 0.05	< 0.05	NA	< 0.05	103%	50%	140%	56%	50%	140%	90%	50%	140%	
Benzo(j+k)fluoranthene	1	4352945	< 0.05	< 0.05	NA	< 0.05	105%	50%	140%	104%	50%	140%	108%	50%	140%	
Benzo(e)pyrene	1	4352945	< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	82%	50%	140%	86%	50%	140%	
Benzo(ghi)perylene	1	4352945	< 0.01	< 0.01	NA	< 0.01	81%	50%	140%	74%	50%	140%	87%	50%	140%	
Chrysene	1	4352945	< 0.01	< 0.01	NA	< 0.01	137%	50%	140%	102%	50%	140%	98%	50%	140%	
Dibenzo(a,h)anthracene	1	4352945	< 0.006	< 0.006	NA	< 0.006	69%	50%	140%	66%	50%	140%	79%	50%	140%	
Fluoranthene	1	4352945	0.1626	0.1747	NA	< 0.05	98%	50%	140%	64%	50%	140%	86%	50%	140%	
Fluorene	1	4352945	< 0.01	< 0.01	NA	< 0.01	104%	50%	140%	74%	50%	140%	79%	50%	140%	
Indeno(1,2,3)pyrene	1	4352945	< 0.01	< 0.01	NA	< 0.01	75%	50%	140%	82%	50%	140%	102%	50%	140%	
Naphthalene	1	4352945	< 0.01	< 0.01	NA	< 0.01	116%	50%	140%	80%	50%	140%	86%	50%	140%	
Perylene	1	4352945	17.8314	17.7214	0.6%	< 0.05	94%	50%	140%	93%	50%	140%	NA	50%	140%	
Phenanthrene	1	4352945	< 0.03	< 0.03	NA	< 0.03	123%	50%	140%	90%	50%	140%	95%	50%	140%	
															4.400	
Pyrene	1	4352945	< 0.05	< 0.05	NA	< 0.05	104%	50%	140%	67%	50%	140%	78%	50%	140%	
Quinoline	1	4352945	< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	103%	50%	140%	104%	50%	140%	

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.

If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

- ,	``	- /										
Benzene	1	4374199	< 0.02	< 0.02	NA	< 0.02	69%	60%	140%	87%	60%	140%
201120110			0.02	0.02		0.02	00/0	00/0		0.70	00/0	

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific tests tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 HORIZON MARITIME

SAMPLING SITE:

AGAT WORK ORDER: 22K950371 ATTENTION TO: John Gale SAMPLED BY:

Trace Organics Analysis (Continued)

		C	UPLICATI	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	KE				
Batch	Sample	Sample Dup #1 Dup #2 RPD Blank Measured Limits		Acceptable Limits		Limite		Limite		Limite		Recovery			Recovery	Accer Lim	ptable nits
	Ia		Va		value	Lower	Upper		Lower	Upper		Lower	Upper				
1	4374199	< 0.04	< 0.04	NA	< 0.04	71%	60%	140%	82%	60%	140%						
1	4374199	< 0.03	< 0.03	NA	< 0.03	74%	60%	140%	83%	60%	140%						
1	4374199	< 0.05	< 0.05	NA	< 0.05	78%	60%	140%	91%	60%	140%						
1	4374199	< 3	< 3	NA	< 3	91%	60%	140%	117%	60%	140%	123%	30%	130%			
	Batch 1 1 1 1	Batch Id 1 4374199 1 4374199 1 4374199 1 4374199	Batch Sample Id Dup #1 1 4374199 < 0.04	Batch Sample Id Dup #1 Dup #2 1 4374199 < 0.04	Batch Id' Dup #1 Dup #2 RPD 1 4374199 < 0.04	Batch Sample Id Dup #1 Dup #2 RPD Method Blank 1 4374199 < 0.04	Batch Sample Id Dup #1 Dup #2 RPD Method Blank Measured Value 1 4374199 < 0.04	Batch Sample Id Dup #1 Dup #2 RPD Method Blank Measured Value Accel Lin 1 4374199 < 0.04	Batch Sample Id Dup #1 Dup #2 RPD Method Blank Method Blank Measured Value Acceptable Limits 1 4374199 < 0.04	Batch Sample Id Dup #1 Dup #2 RPD Method Blank Method Blank Method Value Acceptable Limits Recovery 1 4374199 < 0.04	Batch Sample Id Dup #1 Dup #2 RPD Method Blank Method Blank Measured Value Acceptable Limits Recovery Acce Lin 1 4374199 < 0.04	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Batch Sample Id Dup #1 Dup #2 RPD Method Blank Measured Value Acceptable Limits Recovery Acceptable Recovery	Batch Sample Id Dup #1 Dup #2 RPD Method Blank Measured Value Acceptable Limits Recovery Acceptable L			

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Polycyclic Aromatic Hydrocarbons in Soil

• • • • • • • • • • • • • • • • • • • •															
1-Methylnaphthalene	1	4352945	< 0.05	< 0.05	NA	< 0.05	135%	50%	140%	91%	50%	140%	98%	50%	140%
2-Methylnaphthalene	1	4352945	< 0.01	< 0.01	NA	< 0.01	113%	50%	140%	79%	50%	140%	86%	50%	140%
Acenaphthene	1	4352945	< 0.00671	< 0.00671	NA	< 0.00671	117%	50%	140%	84%	50%	140%	88%	50%	140%
Acenaphthylene	1	4352945	0.010	0.004	NA	< 0.004	100%	50%	140%	71%	50%	140%	76%	50%	140%
Acridine	1	4352945	< 0.05	< 0.05	NA	< 0.05	84%	50%	140%	69%	50%	140%	77%	50%	140%
Anthracene	1	4352945	< 0.03	< 0.03	NA	< 0.03	107%	50%	140%	71%	50%	140%	78%	50%	140%
Benzo(a)anthracene	1	4352945	< 0.01	< 0.01	NA	< 0.01	87%	50%	140%	63%	50%	140%	82%	50%	140%
Benzo(a)pyrene	1	4352945	< 0.01	< 0.01	NA	< 0.01	77%	50%	140%	71%	50%	140%	80%	50%	140%
Benzo(b)fluoranthene	1	4352945	< 0.05	< 0.05	NA	< 0.05	103%	50%	140%	56%	50%	140%	90%	50%	140%
Benzo(j+k)fluoranthene	1	4352945	< 0.05	< 0.05	NA	< 0.05	105%	50%	140%	104%	50%	140%	108%	50%	140%
Panza (a) ny rana	4	4352945	< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	82%	50%	140%	86%	50%	140%
Benzo(e)pyrene	1														
Benzo(ghi)perylene	1	4352945	< 0.01	< 0.01	NA	< 0.01	81%	50%	140%	74%	50%	140%	87%	50%	140%
Chrysene	1	4352945	< 0.01	< 0.01	NA	< 0.01	137%	50%	140%	102%	50%	140%	98%	50%	140%
Dibenzo(a,h)anthracene	1	4352945	< 0.006	< 0.006	NA	< 0.006	69%	50%	140%	66%	50%	140%	79%	50%	140%
Fluoranthene	1	4352945	0.16	0.17	NA	< 0.05	98%	50%	140%	64%	50%	140%	86%	50%	140%
Fluorene	1	4352945	< 0.01	< 0.01	NA	< 0.01	104%	50%	140%	74%	50%	140%	79%	50%	140%
Indeno(1,2,3)pyrene	1	4352945	< 0.01	< 0.01	NA	< 0.01	75%	50%	140%	82%	50%	140%	102%	50%	140%
Naphthalene	1	4352945	< 0.01	< 0.01	NA	< 0.01	116%	50%	140%	80%	50%	140%	86%	50%	140%
Perylene	1	4352945	17.8	17.7	0.6%	< 0.01	94%	50%	140%	93%	50%	140%	NA	50%	140%
	1														
Phenanthrene	1	4352945	< 0.03	< 0.03	NA	< 0.03	123%	50%	140%	90%	50%	140%	95%	50%	140%
Pyrene	1	4352945	< 0.05	< 0.05	NA	< 0.05	104%	50%	140%	67%	50%	140%	78%	50%	140%
Quinoline	1	4352945	< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	103%	50%	140%	104%	50%	140%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved + 1X Silica Gel >C10-C16 Hydrocarbons - 1X silica 1 4352945 < 15 < 15 NA < 15 81% 60% 140% 129% 60% 140% 112% 30% 130% gel >C16-C21 Hydrocarbons - 1X silica 4352945 39 15 NA 86% 140% 129% 60% 140% 112% 30% 130% 1 < 15 60% gel >C21-C32 Hydrocarbons - 1X silica 4352945 26.0% 87% 60% 140% 129% 30% 130% 1 97 126 < 15 60% 140% 112% gel

AGAT QUALITY ASSURANCE REPORT (V1)

Page 14 of 19

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 HORIZON MARITIME

SAMPLING SITE:

AGAT WORK ORDER: 22K950371

ATTENTION TO: John Gale

SAMPLED BY:

	٦	race	Orga	anics	Analy	ysis (Conti	nue	d)								
RPT Date: Oct 21, 2022			C	UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPII	KE		
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured	Acceptable Limits				Recoverv	Acce Lin	otable nits	Recoverv		ptable nits
		Id					Value	Lower	Upper		Lower	Upper	,	Lower	Upper		

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Certified By:

Julon Mant

AGAT QUALITY ASSURANCE REPORT (V1)

Page 15 of 19

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 HORIZON MARITIME SAMPLING SITE:

AGAT WORK ORDER: 22K950371

ATTENTION TO: John Gale

SAMPLING SITE:		SAMPLED BY:							
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE						
Trace Organics Analysis									
Benzene	VOL-120-5013/5031	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS						
Toluene	VOL-120-5013/5031	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS						
Ethylbenzene	VOL-120-5013/5031	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS						
Xylene (Total)	VOL-120-5013/5031	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS						
C6-C10 (less BTEX)	VOL-120-5013/5031	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID						
>C10-C16 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID						
>C16-C21 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID						
>C21-C32 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID						
Modified TPH (Tier 1)	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION						
Resemblance Comment	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID						
Return to Baseline at C32	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID						
Isobutylbenzene - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID						
Isobutylbenzene - VPH	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS						
n-Dotriacontane - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID						
Silica Gel Cleanup			GC/FID						
>C16-C21 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID						
>C10-C16 Hydrocarbons - 1X silica gel	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID						
>C16-C21 Hydrocarbons - 1X silica gel	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID						
>C21-C32 Hydrocarbons - 1X silica gel	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID						
Modified TPH (Tier 1) - 1X silica gel	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION						
% Moisture	LAB-131-4024	CSSS 70.2	GRAVIMETRIC						
1-Methylnaphthalene	ORG-120-5119	EPA 3570/8270E	GC/MS						
2-Methylnaphthalene	ORG-120-5119	EPA 3570/8270E	GC/MS						
Acenaphthene	ORG-120-5119	EPA 3570/8270E	GC/MS						
Acenaphthylene	ORG-120-5119	EPA 3570/8270E	GC/MS						
Acridine	ORG-120-5119	EPA 3570/8270E	GC/MS						
Anthracene	ORG-120-5119	EPA 3570/8270E	GC/MS						
Benzo(a)anthracene	ORG-120-5119	EPA 3570/8270E	GC/MS						
Benzo(a)pyrene	ORG-120-5119	EPA 3570/8270E	GC/MS						
Benzo(b)fluoranthene	ORG-120-5119	EPA 3570/8270E	GC/MS						
Benzo(j+k)fluoranthene	ORG-120-5119	EPA 3570/8270E	GC/MS						
Benzo(e)pyrene	ORG-120-5119	EPA 3570/8270E	GC/MS						
Benzo(ghi)perylene	ORG-120-5119	EPA 3570/8270E	GC/MS						
Chrysene	ORG-120-5119	EPA 3570/8270E	GC/MS						



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 HORIZON MARITIME

SAMPLING SITE

AGAT WORK ORDER: 22K950371 ATTENTION TO: John Gale

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Dibenzo(a,h)anthracene	ORG-120-5119	EPA 3570/8270E	GC/MS
Fluoranthene	ORG-120-5119	EPA 3570/8270E	GC/MS
Fluorene	ORG-120-5119	EPA 3570/8270E	GC/MS
Indeno(1,2,3)pyrene	ORG-120-5119	EPA 3570/8270E	GC/MS
Naphthalene	ORG-120-5119	EPA 3570/8270E	GC/MS
Perylene	ORG-120-5119	EPA 3570/8270E	GC/MS
Phenanthrene	ORG-120-5119	EPA 3570/8270E	GC/MS
Pyrene	ORG-120-5119	EPA 3570/8270E	GC/MS
Quinoline	ORG-120-5119	EPA 3570/8270E	GC/MS
Naphthalene-d8	ORG-120-5119	EPA 3570/8270E	GC/MS
Terphenyl-d14	ORG-120-5119	EPA 3570/8270E	GC/MS
Pyrene-d10 (%)	ORG-120-5119	EPA 3570/8270E	GC/MS

A and C		1					Unit 1	.22	11	Mori	ris D	rive		Lab	ora	tor	y U	se	Only	y						
	GA	Γı	Labora	tories webearth.a	igati	labs	.com •	ww			3B 1	M2		Arriv Holo	/al T I Tin	em ne:	pera	atur	e: <u>L</u>	ţ.9	1.,	5.	2	15	notes	3)
Chain of Custo	dy Record			Р:	902	.46	8.871	8 = 1	F: 90	2.46	68.8	924		AGA	T Jo	b N	uml	ber:	1	23	XX	29	25	> 3-	H	
Report Information			Report I	nformation (Please print):	-			7	Rep	ort f	orn	nat	וור	Not	es:											
Company: Fracflow Con	sultants Inc. (NL)		1. Name	John Gale (john_ffc@nfld.net)						Single	Sam	nle					_									
Contact: John Gale			— Email	Devin Northcott (devin_ffc@bell	aliar	it.cor	n)			per pa	ge		Ī	Turi	naro	oun	d T	ime	e Re	equi	ired		T	_		
Address: 154 Major's F	Path			Karen Andrews (karen ffo@nfld net)																			-			
St. John's, N			Email		liant	.com)			Excel	-	at	Regular TAT 25 to 7 working days													
Phone: 709-739-727	Fax: 709-753	3-5101	Regulat	Regulatory Requirements (Check):									Rush TAT Same day 1 day													
Client Project #: 3168				idelines on Report	Guide	lines	on Renou	r+		Expor	t:		2 days 3 days													
AGAT Quotation: S/O				□ PIRI							Date Required;															
	not provided client will be billed full	price for analys		□ Tier 1 □ Res □ Pot □ Coarse □ Tier 2 □ Com □ N/Pot □ Fine □ Drinking Water S								-											_			
Invoice To	Same	Yes ☑ / No				🗌 Fi	ne		Drink Reg.		Vate	r Sai	nple	e: L	Yes	Yes INo Salt Water Sample: Yes INo										
	0.110				-				1	10		-	-	1	- 1	-	-	1	1	=	-		-			_
Company:	0			LISTIAL CDWQ			ple														\square		64			
	ws (karen_ffc@nfld.net)			Commercial										evel										ЧĽ		
Address:			Res	/Park Storm Water			Ā			Miss	2)	ent)		low	ation											
			- Agri	cultural 🗌 Waste Water	Ned	Analysis	Diss		fine)	□ FOC - Miss	s P2C	xaval		RI) C	action	×			6			kage		MPN		
	Fax:		Sed		reser	r Ana		CBOD	Irse/1		tal as	& He		IN (PI	X Fra	/BTE		(9)	- Miss			t Pac		≥		
PO/Credit Card#:			_		Filtered/Preserved	Water	Total			ss	es (to	1 (Tri		I/BTE	TPH/BTEX Fractionation	S TPH		Grease (TOG)	625			Sediment Package	& Furans	Coliform		W/N
Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments - Site/Sample Info. Sample Containment	Field Filte	Standard \	Metals: S Total Mercury		Grain Size (coarse/fine)	TOC - Miss	Phosphates (total as P205)	Chromium (Tri & Hexavalent)	Phenols	Tier 1: TPH/BTEX (PIRI) I low level	Tier 2: TPł	CCME-CWS TPH/BTEX	VOC	Oil & Grea	BNAE EPA 625 -	PAH	PCB	Marine Sec	0	Fecal Colif	Other: Other:	Hazardous (Y/N)
3168-GP03-SS1	Sept. 21, 2022 / 14:15	Soil	4		1	07						-		-	-	0	-		ш	-	<u> </u>	2	-			+
3168-GP02-SS1	Sept. 21, 2022 / 14:35	Soil	4									-		1	-			-	-	1	-	-		-	-	-
3168-GP01-SS1	Sept. 21, 2022 / 14:50	Soil	4											1			1		1	1	-			-	-	-
3168-NP03-SS1	Sept. 21, 2022 / 16:38	Soil	4										171	1						V	1					1
3168-NP02-SS1	Sept. 21, 2022 / 17:00	Soil	4										100	1						V						1
3168-NP01-SS1	Sept. 21, 2022 / 17:12	Soil	4											1						1						
												-														
															_											
					-		_			-																
					-			-	-	-	1	_	_			-			-	-						
					-	-		-	-	-	-	-	-		-	-	-	-	-	-	-	-			_	-
Samples Relinquished By (Print Name):		Date/	Time	Samples Received By (Print Name):	1			4		10	ato/Tin	ne	_				-			1						_
Karen L. Andre	ws	09/22 13:20	O.A-IKINS	S	ep	+26	. 5	2			1:2	0			Pink	Cop	y - Cl	ient		Pε	ige [1	of	2	7	
Samples Religionshed By (Sign)	1 1	Date/	Time	Samples Received By (Sign):		1.	~0	1-	24	0	ate/Tin		-	-				ру - А		-			-			_
paron har	ndreus					-								ľ	Whit	e Co	ру- А	GAT	Nº:	F	=C-:	316	8-C	OC-I	J1	

agat (Labora	tories webearth.a	ıgatl		Unit 1 .com ·		Da	rtmc B:	outh, 3B 1	NS .M2	A	rriva rriva	al Co al Te	ndit mpe	ion: eratu	ire:_	3.	2,	3.0	2007 (1	-	
Chain of Custody Record		P:	902	.46	8.871	8 = 1	F: 90	2.46	58.8	924	A	GAT	Job	Nur	nbe	r: _	ò	9 V	- 9	57	23	7	1
Report Information	Report	Information (Please print):					Rep	ort I	orn	nat	-111	Note											
Company: Fracflow Consultants Inc. (NL)	1. Nam	e; John Gale (john_ffc@nfld.net)						Single							~	-							
Contact: John Gale	Ema	Devin Northcott (devin_ffc@bell	alian	t.con	n)	21		per pa	ge		T	urn	aro	und	Tin	ne R	mes	lirer	1 (1)	AT)			
Address: 154 Major's Path		e: Karen Andrews (karen_ffc@nfi	ld.ne	et)				Multip per pa	le Sa	mple	. 11												
St. John's, NL	Ema	Ohute Dian (1) to the of the	liant.	com)	-		Excel		at	11					5 to							
Phone: 709-739-7270 Fax: 709-753-5101	Bogula					듹		Includ		α,	R	ush	TAT							1 day			
Cllent Project #: 3168 Horizon Maritime		tory Requirements (Check): uidelines on Report 🛛 Do not list	Guida	linor	on Bono	-		Expor	t							2 da	ys			3 day	/S		
AGAT Quotation: S/O	2 PIRI		Guide	11162 (оп керо		_				D	ate	Requ	uirec	l:								
Please Note: If quotation number is not provided client will be billed full price for a		r 1 🗌 Res 🗍 Pot			oarse	-	_					_				-	_			_			-
Invoice To Same Yes 🗹 /		r 2 □ Com		🗍 Fli	ne		Drink Reg. I		Vater	Sar	nple:		Yes	\checkmark	No	Sal	t Wa	ter S	amp	le:	٦Y	'es	ØN
		1	-			11	T T	vo	-	-	- 1	T	-		T	7	-	-	-	_		_	
Company:		L CDWQ Iustrial SEQS-Cont Sites			<u>e</u>	1								T.									
Contact: Karen Andrews (karen_ffc@nfld.net)		m ve o vote l			Available							se									ų		
Address:	🗆 Re	s/Park Storm Water			P			Aiss	<u>ه</u>	aut)			ation								D MF		
		ricultural Waste Water	ved	/sis	Diss		ine)	C FOC - Miss	P20	avale			ction						age		MPN		
Phone: Fax:		diment 🗌 Other	esen	Analy		8	rse/fi	D	al as	K Hex			K Frac		1	Miss			Pact		Σ		
PO/Credit Card#:			ed/PI	Vater	fotal	L CBOD	(coal	122	s (tot	(Tri 8			/BTE		DE 0	625-			ment	nran	E		
Sample Identification Date/Time Sampled Samp. Matri	# (Containare	Comments – Site/Sample Info, Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: S Total Mercury	L BOD	Grain Size (coarse/fine)	D TOC - Miss	Phosphates (total as P205)	Chromium (Tri & Hexavalent)	henols	Tier 1: IPH/BLEX (PIRI) LIOW level	Tier 2: TPH/BTEX Fractionation		VUU	BNAE EPA 625 - Miss	PAH	PCB	Marine Sediment Package	Dioxins & Furans	Fecal Coliform	Other:	Other:
3168-MP01-SS1 Sept. 25, 2022 / 10:55 Soil	4		-	0,						0								-	Z			5 0	
3168-MP02-SS1 Sept. 25, 2022 / 11:20 Soil	4				-	-					-	~		-	-	+	1	-	-		+	-	-
3168-MP03-SS1 Sept. 25, 2022 / 13:50 Soi	4											1		+	+	1	1	-	-		-	-	-
					11()											1	Ť						1
																					T		-
						-	-																
	-					_	1																
	-		-		-	-	-	-	_	_		_		_	-	-	_	-					
	1/10		-	-	-	-	-	-			_	_	-	1	-	-	-	-	-			_	-
	-		-	-		-	-	-			-	-	-	-	-	-	+	-	1		-	-	-
						-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-
Samples Relinguished By (Print Nation):	eta/Time 7 Sep 22 08:45 ato/Time	Samples Roceived By (Print Name):	1	1			-	Di	sta/Tim				Plu	nk Co	py - (Client	t	Pi	age	2	of	2	1
Samples Religionated by (Sign)	ato/Time	Samples Received By (Bign):	, حی	4			-	Di	ite/Tim	Ø	Pr	1	The			AGAT			-	- 316	-	-	-02

Date revised January 2016

APPENDIX 1.2

Report FFC-NL-3168-012

Water Quality, July 2023, in Industrial Water Supply Ponds Noels Pond, Muddy Pond, and Gull (Mine) Pond Stephenville, NL





Water Quality, July 2023, in Industrial Water Supply Ponds Noels Pond, Muddy Pond, and Gull (Mine) Pond Stephenville, NL

(FFC File 3168)

Prepared by:

Fracflow Consultants Inc. 154 Majors Path St. John's, NL A1A 5A1

Submitted to:

World Energy GH2 LP 87 Water Street St. John's, NL A1C 1A5



PROVINCE OF NEWFOUNDLAND PERMIT HOLDER CLASS "A" This Permit Allows FRACFLOW CONSULTANTS INC.

To practice Professional Engineering in Newfoundland and Labrador. Permit No. as issued by APEGN_D0169 which is valid for the year _2023_.

August 17, 2023

Executive Summary

Water samples and pond sediment samples were collected in July 2023 at three locations in each pond that were previously sampled in September 2022 at the same locations. The water samples were analyzed for a range of components that were considered to be relevant to the intake water for the proposed World Energy GH2 Limited Partnership Hydrogen plant. The locations were originally selected with adequate spacing to provide a representation of the overall water chemistry. The water sample data have been compared against CCME's Freshwater Aquatic Life (FWAL) guidelines based on the assumption that the ponds are fish habitats. The general water chemistry for the water samples from all three ponds met FWAL guidelines, except for the noted exceedances in laboratory reported pH values and Aluminum. The reported dissolved iron exceedance is considered to be a laboratory error and is being investigated. There was no detectable BTEX/TPH when using low-level detection analysis.

The recording devices (Leveloggers) installed in March 2023 have been recording water level, water temperature and fluid conductivity data on a continual 30-minute interval basis. These data were downloaded in July 2023 during the surface water sampling program. The Leveloggers were installed at the culvert immediately upstream of Noels Pond, and at the Noels Pond outflow weir. The recorded temperature and fluid conductivity readings show a gradual increase from winter conditions to summer conditions and these parameters are expected to decrease again sometime during fall 2023 or winter 2024. The trend in the fluid conductivity is presumed to reflect trends in TDS and TSS.

The Town of Stephenville was not able to provide any historical surface water chemistry data for Noels Pond. The 2001 water chemistry data that are available on the Town's server are for groundwater samples.

Table of Contents

Executive Summary	i
List of Figures	ii
List of Tables	iii
List of Appendices	iii
1.0 INTRODUCTION	1-1
1.1 Report Structure	1-1
2.0 INDUSTRIAL WATER SUPPLY STORAGE INFRASTRUCTURE	2-1
2.1 Gull (Mine) Pond	2-1
2.2 Noels Pond	2-1
2.3 Muddy Pond	2-1
3.0 WATER QUALITY AND CHEMISTRY DATA	3-1
3.1 Standard Water Analysis, Organic Carbon and Total Solids	3-1
3.2 Total Metals in Water	
3.3 Dissolved Metals in Water	
3.4 Petroleum Hydrocarbons in Water	
3.5 Volatile Organic Compounds in Water	3-3
4.0 CONCLUSIONS AND OBSERVATIONS	4-1
5.0 REFERENCES	

List of Figures

- Figure 1.1 General location map of the project site in Stephenville, NL.
- Figure 2.1 Gull (Mine) Pond related infrastructure and sampling locations.
- Figure 2.2 Noels Pond related infrastructure and sampling locations.
- Figure 2.3 Muddy Pond related infrastructure and sampling locations.
- Figure 3.1 Fluid conductivity and temperature recorded at the inflow culvert and discharge weir on Noels Pond, Stephenville, NL.

List of Tables

Table 3.1.1	Analytical results of standard water analysis in water samples from Gull (Mine)
	Pond, Stephenville, NL.
Table 3.1.2	Analytical results of standard water analysis in water samples from Noels Pond,
	Stephenville, NL.
Table 3.1.3	Analytical results of standard water analysis in water samples from Muddy Pond,
	Stephenville, NL.
Table 3.1.4	Analytical results from standard water analysis in duplicate water sample,
	Stephenville, NL.
Table 3.2.1	Analytical results of total metals in water samples for Gull (Mine) Pond,
	Stephenville, NL.
Table 3.2.2	Analytical results of total metals in water samples for Noels Pond, Stephenville,
	NL.
Table 3.2.3	Analytical results of total metals in water samples for Muddy Pond, Stephenville,
T 11 2 2 4	NL.
Table 3.3.4	Analytical results of total metals in duplicate water sample, Stephenville, NL.
Table 3.3.1	Analytical results of dissolved metals in water samples for Gull (Mine) Pond,
T 11 2 2 2	Stephenville, NL.
Table 3.3.2	Analytical results of dissolved metals in water samples for Noels Pond,
T 11 2 2 2	Stephenville, NL.
Table 3.3.3	Analytical results of dissolved metals in water samples for Muddy Pond,
T 11 2 2 4	Stephenville, NL.
Table 3.3.4	Analytical results of dissolved metals in duplicate water sample, Stephenville,
T 11 0 4 1	
Table 3.4.1	Analytical results of BTEX/TPH in water samples for Gull (Mine) Pond,
T 11 2 4 2	Stephenville, NL.
Table 3.4.2	Analytical results of BTEX/TPH in water samples for Noels Pond, Stephenville,
T 11 2 4 2	
Table 3.4.3	Analytical results of BTEX/TPH in water samples for Muddy Pond, Stephenville,
T 11 2 5	
Table 3.5	Analytical results of Volatile Organic Compounds in water samples from Gull
	(Mine) Pond, Muddy Pond and Noels Pond, Stephenville, NL.

List of Appendices

Appendix A Water Chemistry Data and Laboratory Certifications

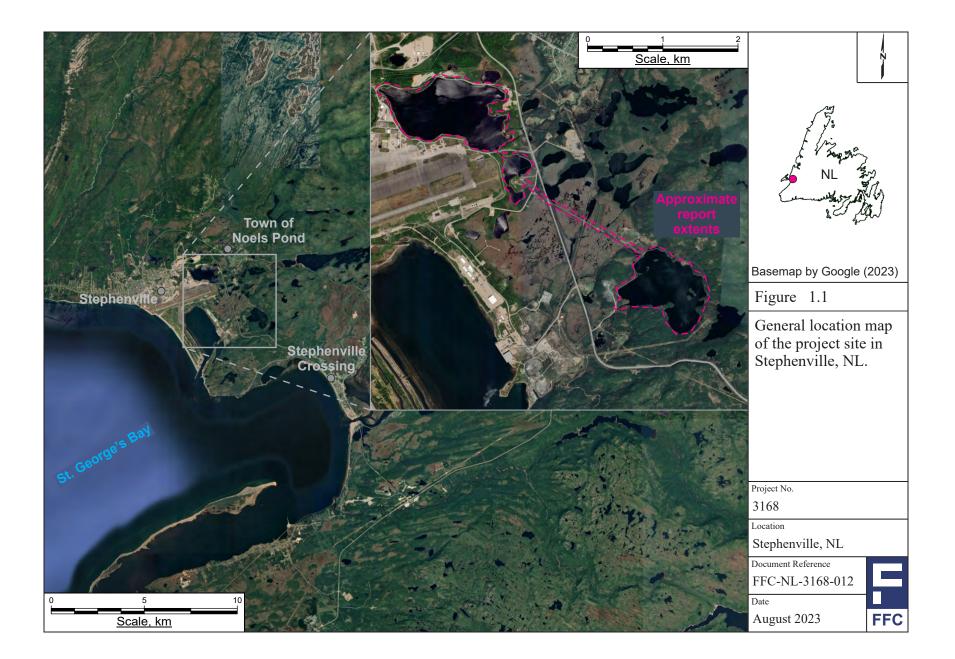
1.0 INTRODUCTION

World Energy GH2 Limited Partnership (WEGH2 LP) is planning to develop a plant for hydrogen production within the municipal boundaries of the Town of Stephenville (**Figure 1.1**). WEGH2 LP is considering obtaining the required supply of industrial water from two sources; Gull (Mine) Pond (the primary source) and from Muddy Pond-Noels Pond (the secondary source). Two of the three ponds are located within the Warm Creek drainage basin.

Muddy Pond and Noels Pond are fed by the Warm Creek drainage basin. Muddy Pond is connected to Noels Pond via two large culverts that extend under Carolina Avenue. Gull (Mine) Pond is another pond east of the Warm Creek drainage basin that is not part of Muddy Pond-Noels Pond surface drainage and capture area (Fracflow, 2022a). A large diameter pipeline was constructed in the 1970s between Muddy Pond-Noels Pond and Gull (Mine) Pond, allowing water to be pumped from Muddy Pond-Noels Pond to Gull (Mine) Pond. This pipeline was used to provide additional industrial water to the original Linerboard Mill and subsequently to the Abitibi Mill operations. The overall system is thoroughly described in another report (Fracflow, 2022b).

1.1 Report Structure

This Report has been structured with a brief overview of each laboratory analysis for a series of samples taken from each pond from July 11 to 13, 2023. The report also comments on changes in water chemistry from the previous (fall 2022) sampling event (Fracflow, 2022c).



2.0 INDUSTRIAL WATER SUPPLY STORAGE INFRASTRUCTURE

2.1 Gull (Mine) Pond

The primary industrial water source area, Gull (Mine) Pond, which has a small drainage basin capture area, contains the main components (**Figure 2.1**) of the industrial water supply system. Fracflow conducted a preliminary assessment in 2022 (Fracflow, 2022a) using historical records and climate data that estimated the volume of industrial water that could be supplied by Gull (Mine) Pond after refurbishing the existing infrastructure.

Gull (Mine) Pond has a number of deep zones, up to 20 and 28 m in water depth, but is shallower towards the west near the outflow structure. The outflow structure to Gull (Mine) Pond (**Figure 2.1**) is a wooden benched structure, with a wide rectangular shape, constructed integrally with the berm and captures any flow from Gull (Mine) Pond and directs it into a small watercourse. The downstream watercourse starts as a small pool surrounded by the outflow structure and is directed beneath Mine Pond Road by three culverts. Recent activities by others have compromised the beaver dam and caused the water level in the outflow structure to drop about 1 m in the area. This watercourse ultimately flows through streams that cross under Route 490, and through culverts across and through the former Abitibi Mill property.

2.2 Noels Pond

Figure 2.2 shows the location of the outflow control structure on Noels Pond, the culvert connection between Noels Pond and Muddy Pond, and the location of the Warm Creek discharge into Noels Pond. The main water outflow control structure in Noels Pond is the two broad crested weir sections on either side of the three former flow control gates. This control structure is located on the downstream or western reach of Noels Pond.

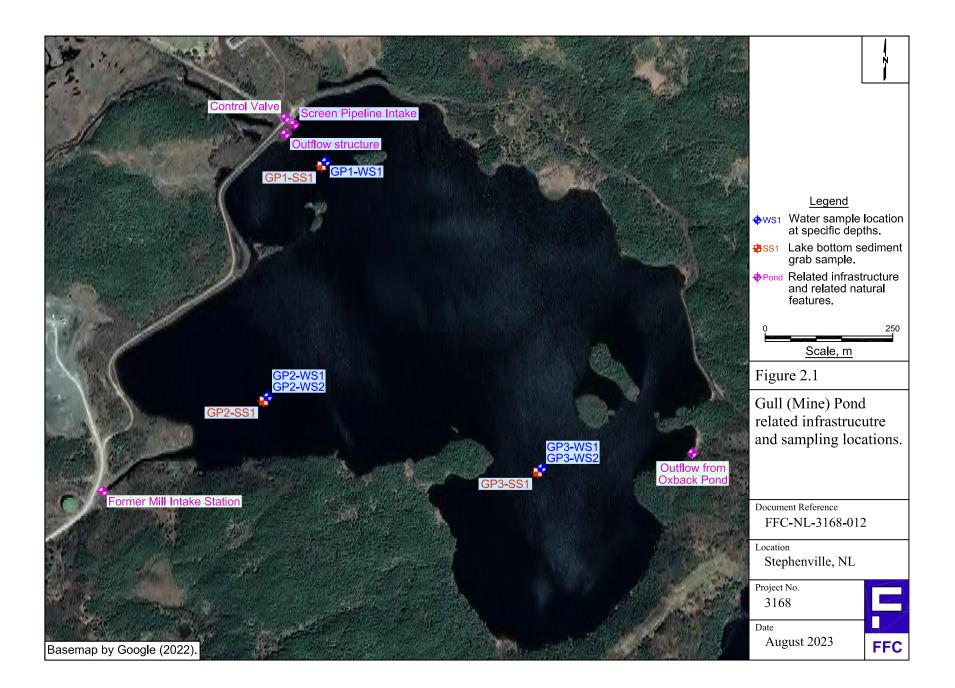
The upstream and downstream faces of the weir extend as a continuous concrete base across the outflow channel. The gates on the control structure have been removed, leaving a nylon sealing strip on the east-most and west-most gates. Some granular materials have also been deposited downstream of these strips.

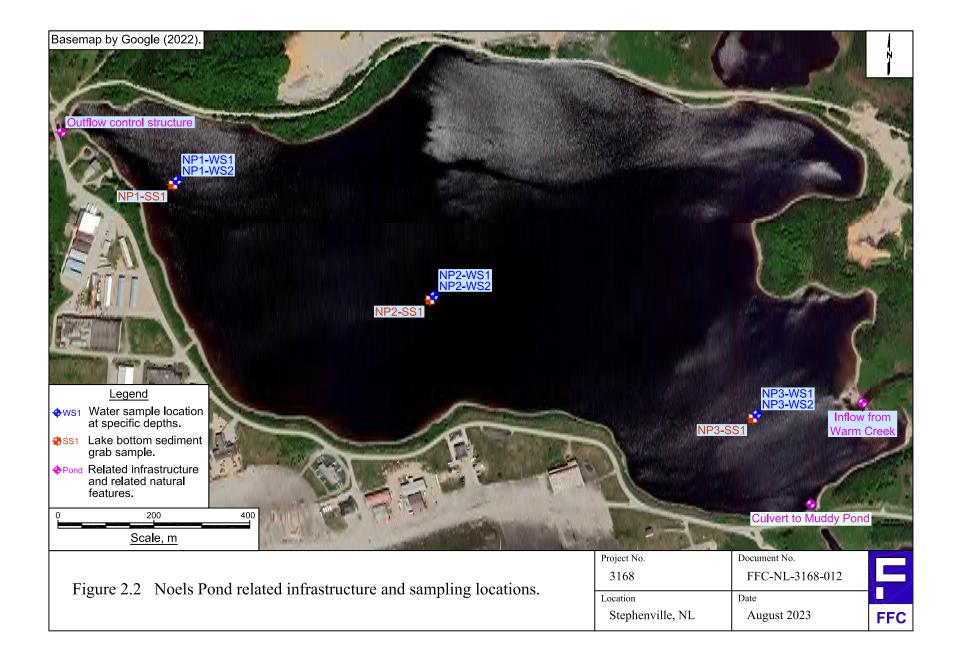
2.3 Muddy Pond

Carolina Avenue, known more commonly as "the Ramp access," crosses over a narrow 40 m section between Noels Pond and Muddy Pond. Beneath this section of the paved highway there are two large culverts that cross beneath the road which connect Noels Pond and Muddy Pond (**Figure 2.3**). The water level in Muddy Pond is controlled by the water level in Noels Pond

since the ponds are connected. The top of the culverts was approximately 3 m below the water level on September 21, 2022.

The southern portion of Muddy Pond is a very shallow area with a gentle sloping bottom that was difficult to navigate with a flat bottomed boat during the sonar survey. Large portions of shoreline are exposed with small changes in water levels during the summer months.







3.0 WATER QUALITY AND CHEMISTRY DATA

Water samples and pond sediment samples were collected in each pond that was sampled at each of the three locations in September 2022 (Fracflow, 2022c). The locations were originally selected with adequate spacing to provide a representation of the overall water chemistry. The water sample data have been compared against CCME's Freshwater Aquatic Life (FWAL) guidelines based on the assumption that the ponds are fish habitats.

At each location, the water was sampled at 1.5 m below the water surface, and 1.5 m above the pond bottom. The exception was for three locations (GP01, MP01, and MP03) where the water depths were 4.1 m or less, therefore only one water sample, at 1.5 m of depth, was collected at each of those three locations.

Pond sediment samples were not collected from the pond bottom during this sampling event. The September soil sample data are presented in a previous report (Fracflow, 2022c).

Leveloggers were installed at the upstream and downstream ends of Noels Pond in March 2023, and have been recording water level, temperature and fluid conductivity on a continual 30-minute interval basis. The recorded temperature and fluid conductivity readings have been plotted in **Figure 3.1**. The graph shows the gradual increase in temperature from winter conditions in March, to summer conditions in July. The fluid conductivity also shows a gradual increase, which are assumed to be related to increases in the Total Dissolved Solids and/or suspended particles in the water.

3.1 Standard Water Analysis, Organic Carbon and Total Solids

A total of nine water samples were collected at the shallow water depths, and six water samples were collected from the deeper water levels at locations shown in **Figures 2.1 to 2.3**. The samples were analyzed for typical parameters in the standard water analysis package offered by the laboratory, plus total and dissolved organic carbon, and total suspended solids (TSS) and total dissolved solids (TDS). The results are reported in **Tables 3.1.1 to 3.1.4**. The parameters that exceeded guidelines are identified below. pH values were below guideline values for Gull (Mine) Pond and Muddy Pond. Two parameters were identified in the duplicate sample that was well outside the acceptable 30% error reported by the laboratory for a duplicate sample. No other parameters were identified that exceeded FWAL guidelines (**Appendix A**).

Gull (Mine) Pond

• All samples – Laboratory **pH** values ranged from 6.15 to 6.24 relative to the guideline value of 6.5. All field measured pH values were above guideline values of 6.5 with an average pH of 6.90.

Noels Pond

• AP01-WS1 (Duplicate of N02-WS1) – **Fluoride** was 0.53 mg/L relative to the guideline value of 0.13 mg/L and **Nitrite as N** was 0.66 mg/L relative to the guidelines value of 0.05 mg/L. These duplicate sample parameters are greater than 30% of the actual sample, and other similar samples from the pond. Noels Pond had an average field measured pH of 7.20.

Muddy Pond

• MP03-WS1 – Laboratory **pH** value was 6.43 relative to the guideline value of 6.5. The field measured pH was above the guideline value of 6.5 with an average pH of 7.05.

3.2 Total Metals in Water

Water samples for total metal analysis were collected and acidified at each sampling location. A total of 15 samples were taken at shallow and deep water intervals at the locations shown in **Figures 2.1 to 2.3**. The total metals data were compared against FWAL guidelines. The results are reported in **Tables 3.2.1 to 3.2.4**.

The exceedances for FWAL guidelines are all related to aluminum concentrations. The exceedances are discussed below. No other parameters were identified outside FWAL guidelines (**Appendix A**). The duplicate shown in **Table 3.2.4** shows no variance when compared to the actual water sample taken at the same time (NP02-WS1) in **Table 3.2.2**.

Gull (Mine) Pond

• All samples – **Total aluminum** ranged from 55 to 73 μ g/L relative to the guideline value of 5 μ g/L when the laboratory reported pH was less than 6.5.

Muddy Pond

• MP03-WS1 – **Total aluminum** was 96 μ g/L relative to the guideline value of 5 μ g/L when the laboratory reported pH was less than 6.5.

3.3 Dissolved Metals in Water

Dissolved metal samples were also collected and filtered and preserved in the field. A total of 15 samples were taken at shallow and deep water intervals at the locations shown in **Figures 2.1 to 2.3**. The samples were compared against FWAL guidelines. The results are reported in **Tables 3.3.1 to 3.3.4**.

The exceedances for FWAL guidelines are all related to aluminum concentrations when the pH was less than 6.5. The exceedances are discussed below. One dissolved metal sample (MP02-WS2) exceeded guidance values for dissolved iron. The total metal value reported for selenium did not exceed guidelines. No other parameters were identified that plot outside the FWAL guidelines (**Appendix A**). The duplicate data shown in **Table 3.3.4** show no variance when compared to the data for the sample taken at the same time (NP02-WS1) in **Table 3.3.2**.

Gull (Mine) Pond

• All samples – **Total aluminum** ranged from 41 to 61 μ g/L relative to the guideline value of 5 μ g/L when the laboratory reported pH was less than 6.5.

Muddy Pond

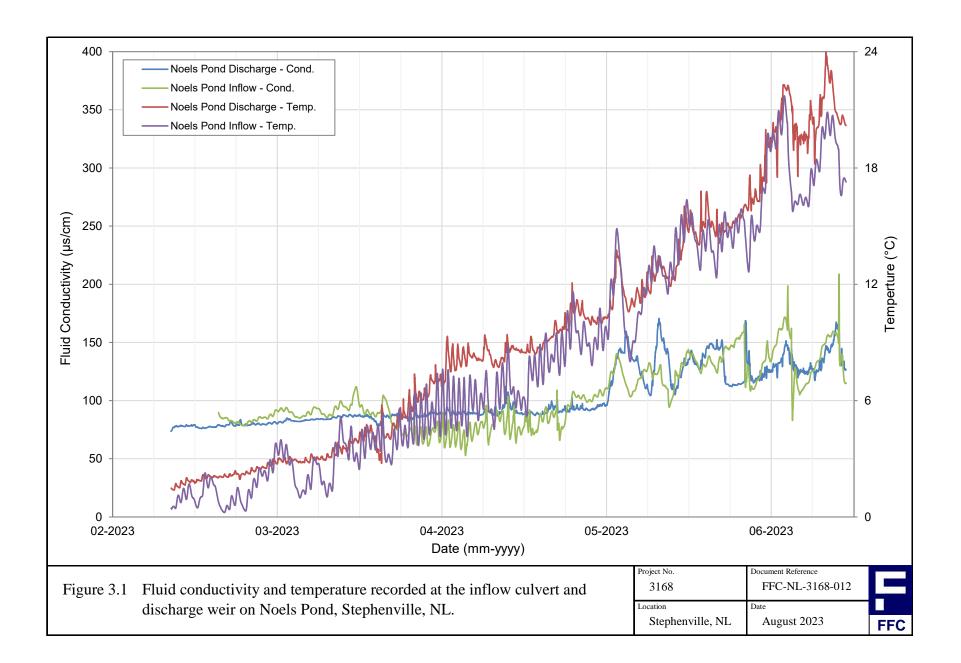
- MP03-WS1 **Dissolved aluminum** was 62 μ g/L relative to the guideline value of 5 μ g/L when the laboratory reported pH was less that 6.5; and
- MP02-WS2 **Dissolved iron** was 1,240 μ g/L relative to the guideline value of 300 μ g/L, which is an order of magnitude greater than total iron (109 μ g/L), indicating that that the result is a laboratory error which is being investigated.

3.4 Petroleum Hydrocarbons in Water

Three water samples were collected at the shallow sampling depth for each pond, as shown in **Figures 2.1 to 2.3**, for a total of nine samples. The samples were analyzed for total petroleum hydrocarbons (TPH) and BTEX (benzene, toluene, ethylbenzene, and xylene) using low-level detection limits. The results are reported in **Tables 3.4.1 to 3.4.3**. No BTEX/TPH components were identified above detection limits (**Appendix A**).

3.5 Volatile Organic Compounds in Water

One sample was collected at the shallow water sampling depth location for each pond, as shown in **Figures 2.1 to 2.3**, for a total of three samples. The sample locations were chosen based on potential historical impacts (Muddy and Gull (Mine) Pond) or the furthest sample downstream (Noels Pond). The samples were analyzed using the standard list of VOCs offered by the analytical laboratory. The results are reported in **Table 3.5**. No parameters were identified above reported detection limits (**Appendix A**).



4.0 CONCLUSIONS AND OBSERVATIONS

The general water chemistry for the water samples from all three ponds met FWAL guidelines, except for the noted exceedances, mostly either laboratory reported pH values and/or aluminum. Field measured pH values were above guideline. There was no detectable BTEX/TPH when using low-level detection analysis.

The seasonal variance between September 2022 and July 2023 for standard water analysis shows a slight reduction in laboratory measured pH during summer 2023 when compared to the fall 2022 pH data, which is best shown in Noels Pond. This reduction also changes the guideline values for aluminum which is otherwise relatively unchanged. The TDS varies 15-25% on a seasonal basis, and is likely influenced by an increase in precipitation runoff. Total iron, a good indicator for turbidity in the local geological setting, was higher during summer 2023 compared to fall 2022.

The field measurements of water temperature and fluid conductivity at the Noels Pond inflow and the outflow show a distinct seasonal pattern.

5.0 REFERENCES

- Fracflow Consultants Inc., 2022a. Technical Memorandum. Assessment of the Potential to Obtain an Industrial Water Supply, North of the Port of Stephenville, NL. Report No. FFC-NL-3168-001. June 1, 2022. 13p.
- Fracflow Consultants Inc., 2022b. Report. Evaluation of Industrial Water Supply. Stephenville, NL. Report No. FFC-NL-3168-004. 139p.
- Fracflow Consultants Inc., 2022c. Report. Marine Sediment and Groundwater Inflow Chemistry. Port Harmon, Stephenville, NL, Report FFC-NL-3168-008. December 22, 2022. Revised January 11, 2023. 209p.

APPENDIX A

Water and Pond Sediment Chemistry Data



CLIENT NAME: FRACFLOW CONSULTANTS 154 MAJOR'S PATH ST. JOHN'S PATH, NL A1A5A1 (709) 739-7270 ATTENTION TO: John Gale PROJECT: 3168 Work Energy GH2 AGAT WORK ORDER: 23K047262 TRACE ORGANICS REVIEWED BY: Dylan McCarthy, Trace Organics Lab Technician WATER ANALYSIS REVIEWED BY: Ashleigh Dussault, Inorganics Laboratory Supervisor DATE REPORTED: Jul 25, 2023 PAGES (INCLUDING COVER): 32 VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (709)747-8573

Disclaimer:

*Notes

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.
- For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.

AGAT Laboratories (V1)

Member of: Association of Professional Engineers and Geoscientists of Alberta	
(APEGA)	
Western Enviro-Agricultural Laboratory Association (WEALA)	

Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.

Page 1 of 32



AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

SAMPLED BY:

ATTENTION TO: John Gale

Atlantic RBCA Tier 1 Hydrocarbons in Water - Low Level (NB) Version 3.1

DATE RECEIVED: 2023-07-14

DATE RECEIVED: 2023-07-14							L		ED: 2023-07-25	
			3168-GP03-WS1	3168-GP02-WS1	3168-GP01-WS1	3168-MP03-WS1	3168-MP01-WS1	3168-MP02-WS1	3168-NP03-WS1	
	:	SAMPLE DESCRIPTION:	-230711	-230711	-230711	-230712	-230712	-230712	-230712	
		SAMPLE TYPE:	Water							
		DATE SAMPLED:	2023-07-11 14:50	2023-07-11 15:25	2023-07-11 16:15	2023-07-12 10:45	2023-07-12 11:05	2023-07-12 11:20	2023-07-12 14:20	
Parameter	Unit	G/S RDL	5143332	5143338	5143340	5143341	5143342	5143344	5143346	
Benzene	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Toluene	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Ethylbenzene	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Xylene (Total)	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
C6-C10 (less BTEX)	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
>C10-C16 Hydrocarbons	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
>C16-C21 Hydrocarbons	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
>C21-C32 Hydrocarbons	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Modified TPH (Tier 1)	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Sediment			NO							
Resemblance Comment			NR							
Return to Baseline at C32			Y	Y	Y	Y	Y	Y	Y	
Surrogate	Unit	Acceptable Limits								
lsobutylbenzene - EPH	%	70-130	103	102	103	79	102	108	108	
Isobutylbenzene - VPH	%	70-130	99	101	98	97	99	95	102	
n-Dotriacontane - EPH	%	70-130	114	102	110	79	103	108	113	

Certified By:

Julon Mant

DATE REPORTED: 2023-07-25



AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water - Low Level (NB) Version 3.1

DATE RECEIVED: 2023-07-14

DATE REPORTED: 2023-07-25

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

5143332-5143346 Modified TPH, Xylene(Total)and C6-C10(less BTEX) are calculated parameters. The calculated parameter is non-accredited. The component parameters of the calculation are accredited.

Sediment parameter is comment only based on visual inspection of the sample prior to extraction and is not an accredited test.

Resemblance Comment Key: GF - Gasoline Fraction WGF - Weathered Gasoline Fraction GR - Product in Gasoline Range FOF - Fuel Oil Fraction WFOF - Weathered Fuel Oil Fraction FR - Product in Fuel Oil Range LOF - Lube Oil Fraction LR - Lube Range UC - Unidentified Compounds NR - No Resemblance NA - Not Applicable

Analysis performed at AGAT Halifax (unless marked by *)

Julon Mants



AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

HALIFAX - Volatile Organic Compounds in Water (ug/L)

DATE RECEIVED: 2023-07-14

DATE RECEIVED: 2023-07-14					DATE REPORTED: 2023-07-25
			3168-GP02-WS1	3168-MP02-WS1	
	S	AMPLE DESCRIPTION:	-230711	-230712	
		SAMPLE TYPE:	Water	Water	
		DATE SAMPLED:	2023-07-11 15:25	2023-07-12 11:20	
Parameter	Unit	G/S RDL	5143338	5143344	
Chloromethane	µg/L	1	<1	<1	
Vinyl Chloride	µg/L	0.6	<0.6	<0.6	
Bromomethane	µg/L	0.89	<0.89	<0.89	
Chloroethane	µg/L	5	<5	<5	
Trichlorofluoromethane	µg/L	5	<5	<5	
Acetone	µg/L	10	<10	<10	
1,1-Dichloroethylene	µg/L	0.6	<0.6	<0.6	
Methylene Chloride	µg/L	2	<2	<2	
trans-1,2-Dichloroethylene	µg/L	2	<2	<2	
1,1-Dichloroethane	µg/L	1	<1	<1	
cis-1,2-Dichloroethylene	ug/L	2	<2	<2	
Chloroform	µg/L	1	<1	<1	
1,2-Dichloroethane	µg/L	2	<2	<2	
1,1,1-Trichloroethane	μg/L	1	<1	<1	
Carbon Tetrachloride	µg/L	0.56	<0.56	<0.56	
Benzene	µg/L	1	<1	<1	
1,2-Dichloropropane	µg/L	0.7	<0.7	<0.7	
Trichloroethylene	µg/L	1	<1	<1	
Bromodichloromethane	μg/L	1	<1	<1	
trans-1,3-Dichloropropene	μg/L	0.5	<0.5	<0.5	
cis-1,3-Dichloropropene	μg/L	0.5	<0.5	<0.5	
1,1,2-Trichloroethane	μg/L	1	<1	<1	
Toluene	μg/L	2	<2	<2	
2-Hexanone	µg/L	10.0	<10.0	<10.0	
Dibromochloromethane	µg/L	1	<1	<1	
1,2-Dibromoethane	µg/L	0.5	<0.5	<0.5	
Tetrachloroethylene	μg/L	2	<2	<2	
1,1,1,2-Tetrachloroethane	µg/L	0.5	<0.5	<0.5	

Certified By:

Julon Mant

DATE REPORTED: 2023-07-25



AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

HALIFAX - Volatile Organic Compounds in Water (ug/L)

DATE RECEIVED: 2023-07-14

			3168-GP02-WS1	3168-MP02-WS1	
		SAMPLE DESCRIPTION:	-230711	-230712	
		SAMPLE TYPE:	Water	Water	
		DATE SAMPLED:	2023-07-11 15:25	2023-07-12 11:20	
Parameter	Unit	G/S RDL	5143338	5143344	
Chlorobenzene	µg/L	1.0	<1.0	<1.0	
thylbenzene	µg/L	2	<2	<2	
n,p-Xylenes	µg/L	4	<4	<4	
romoform	µg/L	1	<1	<1	
tyrene	µg/L	1	<1	<1	
,1,2,2-Tetrachloroethane	µg/L	1	<1	<1	
-Xylene	µg/L	1	<1	<1	
,3-Dichlorobenzene	µg/L	1	<1	<1	
4-Dichlorobenzene	µg/L	1	<1	<1	
2-Dichlorobenzene	µg/L	0.7	<0.7	<0.7	
ylenes	µg/L	0.5	<0.5	<0.5	
Surrogate	Unit	Acceptable Limits			
oluene-d8	%	50-140	84	93	

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

5143338-5143344 1,1,2,2-Tetrachloroethane reported only for samples matrices which can be purged. Otherwise N/A.

Xylenes is a calculated parameter. The calculated value is the sum of m&p-Xylenes + o-Xylene. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.

Analysis performed at AGAT Calgary (unless marked by *)

Certified By:

Julon Mantz

DATE REPORTED: 2023-07-25



AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

					Ammonia
DATE RECEIVED: 2023-07-14					DATE REPORTED: 2023-07-25
				3168-GP02-WS2	
	5	SAMPLE DESC	RIPTION:	-230711	
		SAMF	LE TYPE:	Water	
		DATE S	AMPLED:	2023-07-11 15:45	
Parameter	Unit	G/S	RDL	5143339	
Ammonia as N	mg/L		0.02	<0.02	

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

Analysis performed at AGAT Toronto (unless marked by *)

Ashligh Dussald



ATTENTION TO: John Gale

SAMPLED BY:

AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

					Dissolved N	/letals					
DATE RECEIVED: 2023-07-14								[DATE REPORTE	ED: 2023-07-25	
			;	3168-GP03-WS2	3168-GP03-WS1	3168-GP02-WS1	3168-GP02-WS2	3168-GP01-WS1	3168-MP03-WS1	3168-MP01-WS1	3168-MP02-WS1
		SAMPLE DESC	RIPTION:	-230711	-230711	-230711	-230711	-230711	-230712	-230712	-230712
		SAMF	LE TYPE:	Water							
		DATE S	AMPLED:	2023-07-11	2023-07-11	2023-07-11	2023-07-11	2023-07-11	2023-07-12	2023-07-12	2023-07-12
Parameter	Unit	G/S	RDL	14:20 5143293	14:50 5143332	15:25 5143338	15:45 5143339	16:15 5143340	10:45 5143341	11:05 5143342	11:20 5143344
Dissolved Aluminum	÷	Variable	RDL 8	61	47	47	43	41	62	5143342	5143344
	ug/L	variable							<5	52 <5	-
Dissolved Antimony	ug/L	5	5	<5	<5	<5	<5	<5		-	<5
Dissolved Arsenic	ug/L	5	2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Barium	ug/L		5	7	7	6	6	7	8	10	10
Dissolved Beryllium	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Bismuth	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L	29000,	8	10	10	10	8	8	<8	<8	<8
Dissolved Cadmium	ug/L	1.0, 0.09	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Chromium	ug/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Dissolved Cobalt	ug/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Dissolved Copper	ug/L	Equation	4	<4	<4	<4	<4	<4	<4	<4	<4
Dissolved Iron	ug/L	300	57	<57	<57	<57	<57	<57	144	<57	<57
Dissolved Lead	ug/L	Equation	0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9
Dissolved Manganese	ug/L		2	<2	<2	<2	<2	3	4	<2	<2
Dissolved Molybdenum	ug/L	73	2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Nickel	ug/L	Equation	3	<3	<3	<3	<3	<3	<3	<3	<3
Dissolved Selenium	ug/L	1.0	1	<1	<1	<1	<1	<1	<1	<1	<1
Dissolved Silver	ug/L	0.25	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Dissolved Strontium	ug/L		5	27	28	27	27	27	20	24	24
Dissolved Thallium	ug/L	0.8	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dissolved Tin	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Titanium	ug/L		5	<5	<5	<5	<5	<5	<5	<5	<5
Dissolved Uranium	ug/L	33, 15	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Dissolved Vanadium	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Zinc	ug/L	30	5	12	<5	<5	<5	<5	<5	<5	<5

Ashligh Dussall



AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

SAMELING SITE.							SAMFLED BT.
					Dissolved N	<i>A</i> etals	
DATE RECEIVED: 2023-07-14							DATE REPORTED: 2023-07-25
			;	3168-MP02-WS2	3168-NP03-WS1	3168-NP03-WS2	
		SAMPLE DESC	RIPTION:	-230712	-230712	-230712	
		SAMF	LE TYPE:	Water	Water	Water	
		DATE S	AMPLED:	2023-07-12 11:50	2023-07-12 14:20	2023-07-12 14:40	
Parameter	Unit	G/S	RDL	5143345	5143346	5143347	
Dissolved Aluminum	ug/L	Variable	8	54	39	27	
Dissolved Antimony	ug/L		5	<5	<5	<5	
Dissolved Arsenic	ug/L	5	2	<2	<2	<2	
Dissolved Barium	ug/L		5	9	17	18	
Dissolved Beryllium	ug/L		2	<2	<2	<2	
Dissolved Bismuth	ug/L		2	<2	<2	<2	
Dissolved Boron	ug/L	29000,	8	<8	<8	<8	
Dissolved Cadmium	ug/L	1.0, 0.09	0.10	<0.10	<0.10	<0.10	
Dissolved Chromium	ug/L		1	1	<1	<1	
Dissolved Cobalt	ug/L		1	<1	<1	<1	
Dissolved Copper	ug/L	Equation	4	<4	<4	<4	
Dissolved Iron	ug/L	300	57	1240	89	121	
Dissolved Lead	ug/L	Equation	0.9	<0.9	<0.9	<0.9	
Dissolved Manganese	ug/L		2	8	<2	138	
Dissolved Molybdenum	ug/L	73	2	<2	<2	<2	
Dissolved Nickel	ug/L	Equation	3	<3	<3	<3	
Dissolved Selenium	ug/L	1.0	1	<1	<1	<1	
Dissolved Silver	ug/L	0.25	0.4	<0.4	<0.4	<0.4	
Dissolved Strontium	ug/L		5	21	35	35	
Dissolved Thallium	ug/L	0.8	0.2	<0.2	<0.2	<0.2	
Dissolved Tin	ug/L		2	<2	<2	<2	
Dissolved Titanium	ug/L		5	<5	<5	<5	
Dissolved Uranium	ug/L	33, 15	0.3	<0.3	<0.3	<0.3	
Dissolved Vanadium	ug/L		2	<2	<2	<2	
Dissolved Zinc	ug/L	30	5	<5	<5	<5	
	-						

SAMPLED BY:

Certified By:

Ashleigh Dussab



AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

DATE RECEIVED: 2023-07-14

Dissolved Metals

DATE REPORTED: 2023-07-25

ATTENTION TO: John Gale

SAMPLED BY:

Comments:

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to CCME FWAL - update 2015 Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

5143293-5143347 Metals analysis completed on a filtered sample.

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.agatlabs.com



AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

				Mercury A	nalysis in W	ater (Dissol	ved)				
DATE RECEIVED: 2023-07-14									DATE REPORT	ED: 2023-07-25	
				3168-GP03-WS2	3168-GP03-WS1	3168-GP02-WS1	3168-GP02-WS2	3168-GP01-WS	1 3168-MP03-WS1	3168-MP01-WS1	3168-MP02-WS
		SAMPLE DES	CRIPTION:	-230711	-230711	-230711	-230711	-230711	-230712	-230712	-230712
		SAM	PLE TYPE:	Water							
		DATE	SAMPLED:	2023-07-11 14:20	2023-07-11 14:50	2023-07-11 15:25	2023-07-11 15:45	2023-07-11 16:15	2023-07-12 10:45	2023-07-12 11:05	2023-07-12 11:20
Parameter	Unit	G/S	RDL	5143293	5143332	5143338	5143339	5143340	5143341	5143342	5143344
Dissolved Mercury	ug/L	0.026	0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026
				3168-MP02-WS2	3168-NP03-WS1	3168-NP03-WS2	2				
		SAMPLE DES	CRIPTION:	-230712	-230712	-230712					
		SAM	PLE TYPE:	Water	Water	Water					
		DATE	SAMPLED:	2023-07-12 11:50	2023-07-12 14:20	2023-07-12 14:40					
Parameter	Unit	G/S	RDL	5143345	5143346	5143347					
Dissolved Mercury	ug/L	0.026	0.026	<0.026	<0.026	<0.026					

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to CCME FWAL - update 2015

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Halifax (unless marked by *)



AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

				Mercury	y Analysis in	Water (Tota	al)				
DATE RECEIVED: 2023-07-14									DATE REPORT	ED: 2023-07-25	
				3168-GP03-WS2	2 3168-GP03-WS1	3168-GP02-WS1	3168-GP02-WS2	3168-GP01-WS	1 3168-MP03-WS1	3168-MP01-WS1	3168-MP02-WS1
		SAMPLE DES	CRIPTION:	-230711	-230711	-230711	-230711	-230711	-230712	-230712	-230712
		SAM	PLE TYPE:	Water							
		DATES	SAMPLED:	2023-07-11 14:20	2023-07-11 14:50	2023-07-11 15:25	2023-07-11 15:45	2023-07-11 16:15	2023-07-12 10:45	2023-07-12 11:05	2023-07-12 11:20
Parameter	Unit	G/S	RDL	5143293	5143332	5143338	5143339	5143340	5143341	5143342	5143344
Total Mercury	ug/L	0.026	0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026
				3168-MP02-WS2	2 3168-NP03-WS1	3168-NP03-WS2					
		SAMPLE DES	CRIPTION:	-230712	-230712	-230712					
		SAM	PLE TYPE:	Water	Water	Water					
		DATES	SAMPLED:	2023-07-12 11:50	2023-07-12 14:20	2023-07-12 14:40					
Parameter	Unit	G/S	RDL	5143345	5143346	5143347					
Total Mercury	ug/L	0.026	0.026	<0.026	<0.026	<0.026					

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to CCME FWAL - update 2015

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Halifax (unless marked by *)



ATTENTION TO: John Gale

SAMPLED BY:

AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

Ortho Phosphate, Reactive Silica, Ammonia & Colour

DATE RECEIVED: 2023-07-14	

				3168-GP03-WS2	3168-GP03-WS1	3168-GP02-WS1	1 3168-GP01-WS1	3168-MP03-WS1	3168-MP01-WS1	3168-MP02-WS1	3168-MP02-WS2
		SAMPLE DESC	RIPTION:	-230711	-230711	-230711	-230711	-230712	-230712	-230712	-230712
		SAMF	LE TYPE:	Water							
		DATE S	AMPLED:	2023-07-11 14:20	2023-07-11 14:50	2023-07-11 15:25	2023-07-11 16:15	2023-07-12 10:45	2023-07-12 11:05	2023-07-12 11:20	2023-07-12 11:50
Parameter	Unit	G/S	RDL	5143293	5143332	5143338	5143340	5143341	5143342	5143344	5143345
Reactive Silica	mg/L		0.05	2.95	2.29	2.30	2.27	0.93	0.95	0.97	1.83
Ammonia as N	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
True Colour	TCU		2.50	33.4	32.4	31.1	31.5	47.2	33.9	33.7	45.3
Ortho Phosphate as P	mg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

				3168-NP03-WS1	3168-NP03-WS2
	5	SAMPLE DESC	CRIPTION:	-230712	-230712
		SAMF	PLE TYPE:	Water	Water
		DATE S	SAMPLED:	2023-07-12 14:20	2023-07-12 14:40
Parameter	Unit	G/S	RDL	5143346	5143347
Reactive Silica	mg/L		0.05	2.00	2.42
Ammonia as N	mg/L		0.02	<0.02	<0.02
True Colour	TCU		2.50	34.8	30.6
Ortho Phosphate as P	mg/L		0.10	<0.10	<0.10

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

Analysis performed at AGAT Toronto (unless marked by *)

Ashligh Dussald

DATE REPORTED: 2023-07-25



AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

ATTENTION TO: John Gale

SAMPLED BY:

				Reactive Silica, Ortho-P & Col	our
DATE RECEIVED: 2023-07-14					DATE REPORTED: 2023-07-25
			;	3168-GP02-WS2	
	S	SAMPLE DESC	CRIPTION:	-230711	
		SAMF	PLE TYPE:	Water	
		DATE S	SAMPLED:	2023-07-11 15:45	
Parameter	Unit	G/S	RDL	5143339	
Reactive Silica	mg/L		0.05	2.42	
True Colour	TCU		2.50	27.5	
Ortho Phosphate as P	mg/L		0.10	<0.10	

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

Analysis performed at AGAT Toronto (unless marked by *)

Ashligh Dussald



AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

				Standard V	Vater Analys	is + Total M	etals				
DATE RECEIVED: 2023-07-14								I	DATE REPORT	ED: 2023-07-25	
	:			3168-GP03-WS2 -230711 Water 2023-07-11 14:20	3168-GP03-WS1 -230711 Water 2023-07-11 14:50	3168-GP02-WS1 -230711 Water 2023-07-11 15:25	3168-GP02-WS2 -230711 Water 2023-07-11 15:45	3168-GP01-WS1 -230711 Water 2023-07-11 16:15	3168-MP03-WS1 -230712 Water 2023-07-12 10:45	3168-MP01-WS1 -230712 Water 2023-07-12 11:05	3168-MP02-WS1 -230712 Water 2023-07-12 11:20
Parameter	Unit	G / S	RDL	5143293	5143332	5143338	5143339	5143340	5143341	5143342	5143344
рН		6.5-9.0		6.15	6.21	6.23	6.23	6.24	6.43	6.53	6.57
Chloride	mg/L	640, 120	1	24	24	24	24	24	8	9	8
Fluoride	mg/L	0.12	0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Sulphate	mg/L		2	3	3	3	3	3	<2	<2	<2
Alkalinity	mg/L		5	11	11	11	11	11	23	35	35
Turbidity	NTU	Narrative	0.50	1.57	2.11	1.69	1.03	1.61	1.44	0.99	0.95
Electrical Conductivity	umho/cm		1	120	119	118	119	117	86	106	106
Nitrate + Nitrite as N	mg/L		0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	mg/L	550, 13	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L	0.06	0.05	<0.05	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L	Fact Sheet	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Organic Carbon	mg/L		0.5	6.8	7.5	7.2	6.7	7.5	9.7	5.8	5.8
Total Sodium	mg/L		0.1	15.0	15.2	15.1	15.3	16.2	5.6	5.7	5.6
Total Potassium	mg/L		0.1	0.5	0.5	0.5	0.5	0.6	0.1	0.4	0.4
Total Calcium	mg/L		0.1	4.6	4.7	4.6	4.5	4.9	9.1	12.2	11.6
Total Magnesium	mg/L		0.1	1.8	1.8	1.8	1.8	1.9	2.0	2.3	2.3
Bicarb. Alkalinity (as CaCO3)	mg/L		5	11	11	11	11	11	23	35	35
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		1	56	56	56	56	57	39	51	49
Hardness	mg/L			18.9	19.1	18.9	18.6	20.1	31.0	39.9	38.4
Langelier Index (@20C)	NA			-3.71	-3.64	-3.63	-3.64	-3.59	-2.80	-2.40	-2.38
Langelier Index (@ 4C)	NA			-4.03	-3.96	-3.95	-3.96	-3.91	-3.12	-2.72	-2.70
Saturation pH (@ 20C)	NA			9.86	9.85	9.86	9.87	9.83	9.23	8.93	8.95
Saturation pH (@ 4C)	NA			10.2	10.2	10.2	10.2	10.2	9.55	9.25	9.27
Anion Sum	me/L			0.96	0.96	0.96	0.96	0.96	0.69	0.95	0.93
Cation sum	me/L			1.05	1.07	1.06	1.06	1.13	0.88	1.07	1.03
% Difference/ Ion Balance	%			4.4	5.3	4.9	5.0	8.3	12.7	5.6	5.5

Certified By:

Page 14 of 32

Ashleigh Dussall



AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

				Standard W	Vater Analys	is + Total M	etals				
DATE RECEIVED: 2023-07-14								[DATE REPORTE	ED: 2023-07-25	
				3168-GP03-WS2	3168-GP03-WS1	3168-GP02-WS1	3168-GP02-WS2	3168-GP01-WS1	3168-MP03-WS1	3168-MP01-WS1	3168-MP02-WS
		SAMPLE DESC	RIPTION:	-230711	-230711	-230711	-230711	-230711	-230712	-230712	-230712
		SAMP	LE TYPE:	Water							
		DATE S	AMPLED:	2023-07-11	2023-07-11	2023-07-11	2023-07-11	2023-07-11	2023-07-12	2023-07-12	2023-07-12
Parameter	Unit	G/S	RDL	14:20 5143293	14:50 5143332	15:25 5143338	15:45 5143339	16:15 5143340	10:45 5143341	11:05 5143342	11:20 5143344
Total Aluminum	ug/L	Variable	5	59	55	60	62	73	96	69	71
Total Antimony	ug/L	Valiable	2	<2	<2	<2	<2	<2	<2	<2	<2
Total Arsenic	ug/L	5	2	<2	<2	<2	<2	<2	<2	<2	<2
Total Barium	ug/L	5	5	6	7	7	6	7	8	11	11
Total Beryllium	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Bismuth	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Boron	ug/L	29000,	5	9	9	9	8	9	7	7	7
Total Cadmium	ug/L	1.0, 0.09	0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09
Total Chromium	ug/L	1.0, 0.00	2	<2	<2	<2	<2	<2	<2	<2	<2
Total Cobalt	ug/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Total Copper	ug/L	Equation	2	<2	<2	<2	<2	<2	<2	<2	<2
Total Iron	ug/L	300	50	72	74	98	54	92	220	78	69
Total Lead	ug/L	Equation	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Manganese	ug/L	-1	2	6	10	10	5	13	15	5	4
Total Molybdenum	ug/L	73	2	<2	<2	<2	<2	<2	<2	<2	<2
Total Nickel	ug/L	Equation	2	<2	<2	<2	<2	<2	<2	<2	<2
Total Phosphorous	mg/L	Fact Sheet	0.07	0.50	0.39	0.44	0.44	0.39	0.15	0.18	0.19
Total Selenium	ug/L	1	1	<1	<1	<1	<1	<1	<1	<1	<1
Total Silver	ug/L	0.25	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Strontium	ug/L		5	27	28	27	28	30	21	26	25
Total Thallium	ug/L	0.8	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Tin	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Titanium	ug/L		3	<3	<3	<3	<3	<3	<3	<3	<3
Total Uranium	ug/L	33, 15	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total Vanadium	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Zinc	ug/L	30	5	<5	<5	<5	<5	<5	<5	<5	<5

Ashligh Dussall



ATTENTION TO: John Gale

SAMPLED BY:

AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

				Standard V	Vater Analys	is + Total Meta	als
DATE RECEIVED: 2023-07-14							DATE REPORTED: 2023-07-25
			;	3168-MP02-WS2	3168-NP03-WS1	3168-NP03-WS2	
	:	SAMPLE DESC	RIPTION:	-230712	-230712	-230712	
			LE TYPE:	Water	Water	Water	
		DATE S	AMPLED:	2023-07-12 11:50	2023-07-12 14:20	2023-07-12 14:40	
Parameter	Unit	G/S	RDL	5143345	5143346	5143347	
рН		6.5-9.0		6.50	6.73	6.71	
Chloride	mg/L	640, 120	1	8	9	9	
Fluoride	mg/L	0.12	0.12	<0.12	<0.12	<0.12	
Sulphate	mg/L		2	<2	2	2	
Alkalinity	mg/L		5	30	51	52	
Turbidity	NTU	Narrative	0.50	0.78	0.75	1.15	
Electrical Conductivity	umho/cm		1	100	142	144	
Nitrate + Nitrite as N	mg/L		0.05	0.14	0.11	0.11	
Nitrate as N	mg/L	550, 13	0.05	0.14	0.11	0.11	
Nitrite as N	mg/L	0.06	0.05	<0.05	< 0.05	<0.05	
Ammonia as N	mg/L	Fact Sheet	0.02	<0.02	<0.02	<0.02	
Total Organic Carbon	mg/L		0.5	6.1	5.1	4.4	
Total Sodium	mg/L		0.1	5.6	5.7	5.8	
Total Potassium	mg/L		0.1	0.4	0.4	0.4	
Total Calcium	mg/L		0.1	10.8	17.5	17.6	
Total Magnesium	mg/L		0.1	2.2	3.1	3.2	
Bicarb. Alkalinity (as CaCO3)	mg/L		5	30	51	52	
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	
Hydroxide	mg/L		5	<5	<5	<5	
Calculated TDS	mg/L		1	46	69	70	
Hardness	mg/L			36.0	56.5	57.1	
Langelier Index (@20C)	NA			-2.54	-1.89	-1.90	
Langelier Index (@ 4C)	NA			-2.86	-2.21	-2.22	
Saturation pH (@ 20C)	NA			9.04	8.62	8.61	
Saturation pH (@ 4C)	NA			9.36	8.94	8.93	
Anion Sum	me/L			0.84	1.32	1.34	
Cation sum	me/L			0.99	1.40	1.42	
% Difference/ Ion Balance	%			8.3	2.8	2.9	

Certified By:

Page 16 of 32

Dussab



ATTENTION TO: John Gale

SAMPLED BY:

AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

				Standard V	Vater Analys	is + Total Me	tals
DATE RECEIVED: 2023-07-14							DATE REPORTED: 2023-07-25
			;	3168-MP02-WS2	3168-NP03-WS1	3168-NP03-WS2	
		SAMPLE DESC	RIPTION:	-230712	-230712	-230712	
		SAMP	LE TYPE:	Water	Water	Water	
		DATE S	AMPLED:	2023-07-12	2023-07-12	2023-07-12	
				11:50	14:20	14:40	
Parameter	Unit	G/S	RDL	5143345	5143346	5143347	
Total Aluminum	ug/L	Variable	5	74	53	55	
Total Antimony	ug/L		2	<2	<2	<2	
Total Arsenic	ug/L	5	2	<2	<2	<2	
Total Barium	ug/L		5	10	18	19	
Total Beryllium	ug/L		2	<2	<2	<2	
Total Bismuth	ug/L		2	<2	<2	<2	
Total Boron	ug/L	29000,	5	7	7	9	
Total Cadmium	ug/L	1.0, 0.09	0.09	<0.09	<0.09	<0.09	
Total Chromium	ug/L		2	<2	<2	<2	
Total Cobalt	ug/L		1	<1	<1	<1	
Total Copper	ug/L	Equation	2	<2	<2	<2	
Total Iron	ug/L	300	50	109	134	210	
Total Lead	ug/L	Equation	0.5	<0.5	<0.5	<0.5	
Total Manganese	ug/L		2	6	10	163	
Total Molybdenum	ug/L	73	2	<2	<2	<2	
Total Nickel	ug/L	Equation	2	<2	<2	<2	
Total Phosphorous	mg/L	Fact Sheet	0.07	0.32	0.37	0.41	
Total Selenium	ug/L	1	1	<1	<1	<1	
Total Silver	ug/L	0.25	0.1	<0.1	<0.1	<0.1	
Total Strontium	ug/L		5	23	35	37	
Total Thallium	ug/L	0.8	0.1	<0.1	<0.1	<0.1	
Total Tin	ug/L		2	<2	<2	<2	
Total Titanium	ug/L		3	<3	<3	<3	
Total Uranium	ug/L	33, 15	0.2	<0.2	<0.2	<0.2	
Total Vanadium	ug/L	00, 10	2	<2	<2	<2	
Total Zinc	ug/L	30	5	<5	<5	<5	
	uy/L	50	0	-0	~~	-0	

Ashleigh Dussab



AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

http://www.agatlabs.com

DATE REPORTED: 2023-07-25

57 Old Pennywell Road, Unit I

St. John's, NL

CANADA A1E 6A8

TEL (709)747-8573 FAX (709 747-2139

ATTENTION TO: John Gale

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-07-14

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to CCME FWAL - update 2015 Comments:

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

5143293-5143347 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.

pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result

Analysis performed at AGAT Halifax (unless marked by *)



AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

					,	,					
DATE RECEIVED: 2023-07-14								I	DATE REPORTI	ED: 2023-07-25	
				3168-GP03-WS2	3168-GP03-WS1	3168-GP02-WS1	3168-GP02-WS2	3168-GP01-WS1	3168-MP03-WS1	3168-MP01-WS1	3168-MP02-WS1
		SAMPLE DESC	RIPTION:	-230711	-230711	-230711	-230711	-230711	-230712	-230712	-230712
		SAMF	PLE TYPE:	Water							
		DATE S	SAMPLED:	2023-07-11 14:20	2023-07-11 14:50	2023-07-11 15:25	2023-07-11 15:45	2023-07-11 16:15	2023-07-12 10:45	2023-07-12 11:05	2023-07-12 11:20
Parameter	Unit	G/S	RDL	5143293	5143332	5143338	5143339	5143340	5143341	5143342	5143344
Dissolved Organic Carbon	mg/L		0.5	7.0	7.4	7.2	6.6	7.0	8.9	5.7	5.9
Total Suspended Solids	mg/L	Narrative	5	<5	<5	<5	<5	<5	<5	<5	<5
Total Dissolved Solids	mg/L		5	66	58	54	64	72	62	70	62
						3168-NP03-WS2					
		SAMPLE DESC		-230712	-230712	-230712					
			PLE TYPE:	Water	Water	Water					
		DATE S	SAMPLED:	2023-07-12 11:50	2023-07-12 14:20	2023-07-12 14:40					
Parameter	Unit	G/S	RDL	5143345	5143346	5143347					
Dissolved Organic Carbon	mg/L		0.5	6.1	5.2	4.4					
Total Suspended Solids	mg/L	Narrative	5	<5	<5	<5					
Total Dissolved Solids	mg/L		5	66	82	82					

TSS, DOC, TDS

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to CCME FWAL - update 2015

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Halifax (unless marked by *)



Exceedance Summary

AGAT WORK ORDER: 23K047262 PROJECT: 3168 Work Energy GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

ATTENTION TO: John Gale

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT (GUIDEVALUE	RESULT
5143293	3168-GP03-WS2-230711	NS-CCME FWAL	Standard Water Analysis + Total Metals	pН		6.5-9.0	6.15
5143332	3168-GP03-WS1-230711	NS-CCME FWAL	Standard Water Analysis + Total Metals	pН		6.5-9.0	6.21
5143338	3168-GP02-WS1-230711	NS-CCME FWAL	Standard Water Analysis + Total Metals	pH		6.5-9.0	6.23
5143339	3168-GP02-WS2-230711	NS-CCME FWAL	Standard Water Analysis + Total Metals	pH		6.5-9.0	6.23
5143340	3168-GP01-WS1-230711	NS-CCME FWAL	Standard Water Analysis + Total Metals	pH		6.5-9.0	6.24
5143341	3168-MP03-WS1-230712	NS-CCME FWAL	Standard Water Analysis + Total Metals	pH		6.5-9.0	6.43
5143345	3168-MP02-WS2-230712	NS-CCME FWAL	Dissolved Metals	Dissolved Iron	ug/L	300	1240



Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 Work Energy GH2

SAMPLING SITE:

AGAT WORK ORDER: 23K047262

ATTENTION TO: John Gale

SAMPLED BY:

Trace	Organics	Analysis
-------	----------	----------

RPT Date: Jul 25, 2023			C	UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		otable nits	Recovery		ptable nits	Recovery	Lie	ptable nits
		ld					Value	Lower	Upper		Lower	Upper		Lower	Upper
Atlantic RBCA Tier 1 Hydrocarbons	in Water -	Low Level	(NB) Vers	sion 3.1											
Benzene	1	5143332	< 0.001	< 0.001	NA	< 0.001	109%	70%	130%	109%	70%	130%			
Toluene	1	5143332	< 0.001	< 0.001	NA	< 0.001	111%	70%	130%	109%	70%	130%			
Ethylbenzene	1	5143332	< 0.001	< 0.001	NA	< 0.001	112%	70%	130%	109%	70%	130%			
Xylene (Total)	1	5143332	< 0.002	< 0.002	NA	< 0.002	111%	70%	130%	107%	70%	130%			
C6-C10 (less BTEX)	1	5143332	< 0.01	< 0.01	NA	< 0.01	102%	70%	130%	98%	70%	130%	102%	70%	130%
>C10-C16 Hydrocarbons	1	5143332	< 0.02	< 0.02	NA	< 0.02	89%	70%	130%	106%	70%	130%	101%	70%	130%
>C16-C21 Hydrocarbons	1	5143332	< 0.02	< 0.02	NA	< 0.02	89%	70%	130%	106%	70%	130%	101%	70%	130%
>C21-C32 Hydrocarbons	1	5143332	< 0.02	< 0.02	NA	< 0.02	103%	70%	130%	106%	70%	130%	101%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. Matrix spike performed on a different sample than the duplicate.

If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

HALIFAX - Volatile Organic Compounds in Water (ug/L)

HALIFAX - Volatile Organic Compou		,													
Chloromethane	4689	5148745	< 1	< 1	NA	< 1	131%	50%	140%	119%	50%	140%	134%	50%	140%
Vinyl Chloride	4689	5148745	< 0.6	< 0.6	NA	< 0.6	96%	50%	140%	94%	50%	140%	81%	50%	140%
Bromomethane	4689	5148745	< 0.89	< 0.89	NA	< 0.89	96%	50%	140%	96%	50%	140%	80%	50%	140%
Chloroethane	4689	5148745	< 5	< 5	NA	< 5	97%	50%	140%	93%	50%	140%	82%	50%	140%
Trichlorofluoromethane	4689	5148745	< 5	< 5	NA	< 5	95%	50%	140%	94%	60%	130%	81%	50%	140%
Acetone	4689	5148745	< 10	< 10	NA	< 10	108%	50%	140%	93%	50%	140%	137%	50%	140%
1,1-Dichloroethylene	4689	5148745	< 0.6	< 0.6	NA	< 0.6	84%	50%	140%	94%	60%	130%	82%	50%	140%
Methylene Chloride	4689	5148745	< 2	< 2	NA	< 2	95%	50%	140%	97%	60%	130%	86%	50%	140%
trans-1,2-Dichloroethylene	4689	5148745	< 2	< 2	NA	< 2	87%	50%	140%	94%	60%	130%	84%	50%	140%
1,1-Dichloroethane	4689	5148745	< 1	< 1	NA	< 1	96%	50%	140%	89%	60%	130%	86%	50%	140%
cis-1,2-Dichloroethylene	4689	5148745	< 2	< 2	NA	< 2	80%	50%	140%	87%	60%	130%	93%	50%	140%
Chloroform	4689	5148745	< 1	< 1	NA	< 1	102%	50%	140%	103%	60%	130%	106%	50%	140%
1,2-Dichloroethane	4689	5148745	< 2	< 2	NA	< 2	90%	50%	140%	93%	60%	130%	96%	50%	140%
1,1,1-Trichloroethane	4689	5148745	< 1	< 1	NA	< 1	105%	50%	140%	103%	60%	130%	105%	50%	140%
Carbon Tetrachloride	4689	5148745	< 0.56	< 0.56	NA	< 0.56	114%	50%	140%	109%	60%	130%	93%	50%	140%
Benzene	4689	5148745	< 1	< 1	NA	< 1	92%	50%	140%	102%	60%	130%	97%	50%	140%
1,2-Dichloropropane	4689	5148745	< 0.7	< 0.7	NA	< 0.7	87%	50%	140%	93%	60%	130%	92%	50%	140%
Trichloroethylene	4689	5148745	< 1	< 1	NA	< 1	90%	50%	140%	97%	60%	130%	69%	50%	140%
Bromodichloromethane	4689	5148745	< 1	< 1	NA	< 1	99%	50%	140%	97%	60%	130%	97%	50%	140%
trans-1,3-Dichloropropene	4689	5148745	< 0.5	< 0.5	NA	< 0.5	74%	50%	140%	94%	60%	130%	86%	50%	140%
cis-1,3-Dichloropropene	4689	5148745	< 0.5	< 0.5	NA	< 0.5	72%	50%	140%	82%	60%	130%	82%	50%	140%
1,1,2-Trichloroethane	4689	5148745	< 1	< 1	NA	< 1	89%	50%	140%	95%	60%	130%	93%	50%	140%
Toluene	4689	5148745	< 2	< 2	NA	< 2	84%	50%	140%	98%	60%	130%	89%	50%	140%
2-Hexanone	4689	5148745	< 10.0	< 10.0	NA	< 10.0	81%	50%	140%	105%	50%	140%	87%	50%	140%
Dibromochloromethane	4689	5148745	< 1	< 1	NA	< 1	103%	50%	140%	103%	60%	130%	75%	50%	140%
1,2-Dibromoethane	4689	5148745	< 0.5	< 0.5	NA	< 0.5	96%	50%	140%	103%	60%	130%	80%	50%	140%
Tetrachloroethylene	4689	5148745	< 2	< 2	NA	< 2	121%	50%	140%	123%	60%	130%	99%	50%	140%

AGAT QUALITY ASSURANCE REPORT (V1)

Page 21 of 32



Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 Work Energy GH2

SAMPLING SITE:

AGAT WORK ORDER: 23K047262 ATTENTION TO: John Gale SAMPLED BY:

Trace Organics Analysis (Continued)

			U			· ·			'						
RPT Date: Jul 25, 2023			[DUPLICAT	E		REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	Lin	ptable nits	Recovery		ptable nits
		ld					Value	Lower	Upper	-	Lower	Upper		Lower	Upper
1,1,1,2-Tetrachloroethane	4689	5148745	< 0.5	< 0.5	NA	< 0.5	117%	50%	140%	114%	60%	130%	117%	50%	140%
Chlorobenzene	4689	5148745	< 1.0	< 1.0	NA	< 1.0	89%	50%	140%	104%	60%	130%	106%	50%	140%
Ethylbenzene	4689	5148745	< 2	< 2	NA	< 2	76%	50%	140%	107%	60%	130%	105%	50%	140%
m,p-Xylenes	4689	5148745	< 4	< 4	NA	< 4	94%	50%	140%	107%	60%	130%	105%	50%	140%
Bromoform	4689	5148745	< 1	< 1	NA	< 1	107%	50%	140%	106%	60%	130%	105%	50%	140%
Styrene	4689	5148745	< 1	< 1	NA	< 1	73%	50%	140%	99%	60%	130%	90%	50%	140%
o-Xylene	4689	5148745	< 1	< 1	NA	< 1	94%	50%	140%	109%	60%	130%	106%	50%	140%
1,3-Dichlorobenzene	4689	5148745	< 1	< 1	NA	< 1	94%	50%	140%	119%	60%	130%	114%	50%	140%
1,4-Dichlorobenzene	4689	5148745	< 1	< 1	NA	< 1	68%	50%	140%	114%	60%	130%	113%	50%	140%
1,2-Dichlorobenzene	4689	5148745	< 0.7	< 0.7	NA	< 0.7	97%	50%	140%	113%	60%	130%	115%	50%	140%

Comments: Duplicate NA: results are less than 5X the RDL and RDP will not be calculated. The sample spikes and dups are not from the same sample ID.

Certified By:

Julon Mant

Page 22 of 32

AGAT QUALITY ASSURANCE REPORT (V1)



Page 23 of 32

Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 Work Energy GH2

SAMPLING SITE:

AGAT WORK ORDER: 23K047262

ATTENTION TO: John Gale SAMPLED BY:

				Wate	er An	alysis	5								
RPT Date: Jul 25, 2023			C	UPLICATI	Ξ		REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SP	IKE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery		ptable nits	Recovery		ptable nits
		ld					Value	Lower	Upper		Lower	Upper	,	Lower	Upper
Standard Water Analysis + Total	Metals														
pH	5138308		7.31	6.99	4.5%	<	100%	80%	120%	NA			NA		
Chloride	5137459		26	28	7.9%	< 1	87%	80%	120%	NA	80%	120%	NA	70%	130%
Fluoride	5137459		<0.12	<0.12	NA	< 0.12	95%	80%	120%	NA	80%	120%	89%	70%	130%
Sulphate	5137459		4	4	NA	< 2	100%	80%	120%	NA	80%	120%	96%	70%	130%
Alkalinity	5138308		99	89	11.4%	< 5	91%	80%	120%	NA			NA		
Turbidity	5138308		4.51	4.33	3.9%	< 0.5	NA	80%	120%	NA			NA		
Electrical Conductivity	5138308		208	208	0%	< 1	98%	90%	110%	NA			NA		
Nitrate as N	5137459		0.08	0.07	NA	< 0.05	95%	80%	120%	NA	80%	120%	90%	70%	130%
Nitrite as N	5137459		<0.05	<0.05	NA	< 0.05	92%	80%	120%	NA	80%	120%	92%	70%	130%
Total Organic Carbon	5137294		9.2	9.4	2.1%	< 0.5	104%	80%	120%	NA	80%	120%	101%	80%	120%
Total Sodium	5143347 5	143347	5.8	5.7	1.1%	< 0.1	102%	80%	120%	97%	80%	120%	101%	70%	130%
Total Potassium	5143347 5		0.4	0.4	NA	< 0.1	102 %	80%	120%	100%	80%	120%	101%	70%	130%
Total Calcium	5143347 5		17.6	18.8	6.4%	< 0.1	104%	80%	120%	108%	80%	120%	NA	70%	130%
Total Magnesium	5143347 5		3.2	3.2	0.7%	< 0.1	104%	80%	120%	100%		120%	103%	70%	
Bicarb. Alkalinity (as CaCO3)	5138308		99	89	11.4%	< 5	NA	80%	120%	NA	0070	.2070	NA		
Carb. Alkalinity (as CaCO3)	5138308		<10	<10	NA	< 10	NA	80%	120%	NA			NA		
Hydroxide	5138308		<5	<5	NA	< 5	NA	80%	120%	NA			NA		
Total Aluminum	5143347 5	1/33/7	~5 55	<5 49	11.6%	< 5 < 5	103%	80%	120%	99%	80%	120%	102%	70%	130%
Total Antimony	5143347 5		<2	+3 <2	NA	< 2	98%	80%	120%	100%	80%	120%	102 %	70%	130%
Total Arsenic	5143347 5		<2	<2	NA	< 2	103%	80%	120%	99%	80%	120%	102%	70%	130%
Total Barium	5143347 5	112217	19	19	NA	< 5	102%	80%	120%	97%	80%	120%	102%	70%	130%
Total Beryllium	5143347 5		<2	<2	NA	< 2	102 %	80%	120%	97%	80%	120%	102 %	70%	130%
Total Bismuth	5143347 5		<2 <2	<2 <2	NA	< 2	102%	80%	120%	97% 102%	80%	120%	101%	70%	130%
Total Boron	5143347 5		~2 9	<2 16	NA	< 2 < 5	103%	80%	120%	99%	80%	120%	98%	70%	130%
Total Cadmium	5143347 5		9 <0.09	<0.09	NA	< 0.09	101%	80%	120%	99% 98%	80%	120%	90 <i>%</i> 100%	70%	130%
T () ()	5440047						4000/	000/	1000/	1000/	000/	1000/	4000/	700/	4000/
Total Chromium	5143347 5		<2	<2	NA	< 1	103%	80%	120%	100%	80%	120%	103%	70%	130%
Total Cobalt	5143347 5		<1	<1	NA	< 1	108%	80%	120%	104%	80%	120%	105%	70%	130%
Total Copper	5143347 5		<2	<2	NA	< 1	108%	80%	120%	101%	80%	120%	106%	70%	130%
Total Iron Total Lead	5143347 5 5143347 5		210 <0.5	205 <0.5	NA NA	< 50 < 0.5	105% 104%	80% 80%	120% 120%	100% 101%	80% 80%	120% 120%	104% 102%	70% 70%	130% 130%
	0140047 0	140047	-0.0	-0.0	11/1	- 0.0	10470	0070	12070	10170	0070	12070	10270	1070	100 /
Total Manganese	5143347 5		163	160	1.7%	< 2	103%		120%	100%		120%	NA		130%
Total Molybdenum	5143347 5		<2	<2	NA	< 2	98%	80%	120%	97%	80%		103%	70%	130%
Total Nickel	5143347 5		<2	<2	NA	< 2	107%		120%	103%		120%	105%	70%	
Total Phosphorous	5143347 5		0.41	0.49	19.3%	< 0.02	106%		120%	103%		120%	118%	70%	
Total Selenium	5143347 5	5143347	<1	<1	NA	< 1	106%	80%	120%	95%	80%	120%	105%	70%	130%
Total Silver	5143347 5	5143347	<0.1	<0.1	NA	< 0.1	100%	80%	120%	99%	80%	120%	100%	70%	130%
Total Strontium	5143347 5	5143347	37	37	0.9%	< 5	103%	80%	120%	100%	80%	120%	102%	70%	130%
Total Thallium	5143347 5	5143347	<0.1	<0.1	NA	< 0.1	103%	80%	120%	102%	80%	120%	101%	70%	130%
Total Tin	5143347 5	5143347	<2	<2	NA	< 2	97%	80%	120%	98%	80%	120%	102%	70%	130%

AGAT QUALITY ASSURANCE REPORT (V1)



Page 24 of 32

Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 Work Energy GH2

SAMPLING SITE:

AGAT WORK ORDER: 23K047262

ATTENTION TO: John Gale

SAMPLED BY:

		V	Vater	Anal	ysis	(Cont	inuec	1)							
RPT Date: Jul 25, 2023			C	UPLICATI	=		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	IKE
PARAMETER	Batch	ample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery		ptable nits	Recovery		ptable nits
		ld		• **			Value	Lower	Upper		Lower	Upper		Lower	Upper
Total Titanium	5143347 5143	347	<3	<3	NA	< 2	102%	80%	120%	98%	80%	120%	104%	70%	130%
Total Uranium	5143347 5143	347	<0.2	<0.2	NA	< 0.2	102%	80%	120%	100%	80%	120%	101%	70%	130%
Total Vanadium	5143347 5143	347	<2	<2	NA	< 2	103%	80%	120%	97%	80%	120%	100%	70%	130%
Total Zinc	5143347 5143	347	<5	<5	NA	< 5	104%	80%	120%	100%	80%	120%	104%	70%	130%
Comments: If RPD value is NA, the	results of the dup	licates	are less t	han 5x the	RDL and	the RPD	will not be	calcula	ited.						
Dissolved Metals															
Dissolved Aluminum	5140675		190	187	1.4%	< 5	105%	80%	120%	101%	80%	120%	92%	70%	130%
Dissolved Antimony	5140675		<5	<5	NA	< 2	99%	80%	120%	100%	80%	120%	92%	70%	130%
Dissolved Arsenic	5140675		<2	<2	NA	< 2	104%	80%	120%	98%	80%	120%	92%	70%	130%
Dissolved Barium	5140675		9	10	NA	< 5	102%	80%	120%	98%	80%	120%	92%	70%	130%
Dissolved Beryllium	5140675		<2	<2	NA	< 2	104%	80%	120%	101%	80%	120%	93%	70%	130%
Dissolved Bismuth	5140675		<2	<2	NA	< 2	105%	80%	120%	101%	80%	120%	93%	70%	130%
Dissolved Boron	5140675		17	16	NA	< 5	104%	80%	120%	101%	80%	120%	90%	70%	130%
Dissolved Cadmium	5140675		<0.10	<0.10	NA	< 0.09	101%	80%	120%	98%	80%	120%	92%	70%	130%
Dissolved Chromium	5140675		<1	<1	NA	< 1	104%	80%	120%	100%	80%	120%	92%	70%	130%
Dissolved Cobalt	5140675		<1	<1	NA	< 1	104%	80%	120%	102%	80%	120%	94%	70%	130%
Dissolved Copper	5140675		<4	<4	NA	< 2	107%	80%	120%	102%	80%	120%	95%	70%	130%
Dissolved Iron	5140675		341	318	7.0%	< 50	105%	80%	120%	101%	80%	120%	83%	70%	130%
Dissolved Lead	5140675		<0.9	<0.9	NA	< 0.5	104%	80%	120%	101%	80%	120%	95%	70%	130%
Dissolved Manganese	5140675		137	132	3.5%	< 2	104%	80%	120%	101%	80%	120%	NA	70%	130%
Dissolved Molybdenum	5140675		<2	<2	NA	< 2	102%	80%	120%	101%	80%	120%	93%	70%	130%
Dissolved Nickel	5140675		<3	<3	NA	< 2	108%	80%	120%	102%	80%	120%	94%	70%	130%
Dissolved Selenium	5140675		<1	<1	NA	< 1	107%	80%	120%	99%	80%	120%	91%	70%	130%
Dissolved Silver	5140675		<0.4	<0.4	NA	< 0.1	101%	80%	120%	101%	80%	120%	86%	70%	130%
Dissolved Strontium	5140675		24	23	NA	< 5	105%	80%	120%	101%	80%	120%	92%	70%	130%
Dissolved Thallium	5140675		<0.2	<0.2	NA	< 0.1	103%	80%	120%	100%	80%	120%	93%	70%	130%
Dissolved Tin	5140675		<2	<2	NA	< 2	102%	80%	120%	101%	80%	120%	95%	70%	130%
Dissolved Titanium	5140675		<5	<5	NA	< 2	102%	80%	120%	101%	80%	120%	92%	70%	130%
Dissolved Uranium	5140675		<0.3	<0.3	NA	< 0.1	102%	80%	120%	99%	80%	120%	93%	70%	130%
Dissolved Vanadium	5140675		<2	<2	NA	< 2	104%	80%	120%	101%	80%	120%	92%	70%	130%
Dissolved Zinc	5140675		5	11	NA	< 5	105%	80%	120%	99%	80%	120%	94%	70%	130%
Comments: If RPD value is NA, the	results of the dup	licates	are less t	han 5x the	RDL and	the RPD v	will not be	calcula	ited.						
Mercury Analysis in Water (Total)															
Total Mercury	5143347 5143	347	<0.026	<0.026	NA	< 0.026	103%	80%	120%	NA	80%	120%	109%	70%	130%
Comments: If RPD value is NA, the	results of the dup	licates	are less t	than 5x the	RDL and	the RPD \	will not be	calcula	ited.						
Mercury Analysis in Water (Dissolv	ved)														
Dissolved Mercury	51/3203 51/3	1203	<0.026	<0.026	NΙΔ	< 0.026	103%	80%	1200/	NΙΛ	80%	120%	115%	70%	1200/

Dissolved Mercury	5143293 5143293	<0.026	<0.026	NA	< 0.026	103%	80%	120%	NA	80%	120%	115%	70%	130%

AGAT QUALITY ASSURANCE REPORT (V1)



Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 Work Energy GH2

SAMPLING SITE:

AGAT WORK ORDER: 23K047262

ATTENTION TO: John Gale

SAMPLED BY:

		Wate	r Anal	lysis	(Con	tinue	d)							
RPT Date: Jul 25, 2023			DUPLICAT	E		REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SP	IKE
PARAMETER	Batch Id	e Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable nits	Acceptable Limits Re		Recovery		ptable nits	
	la					value	Lower	Upper		Lower	Upper		Lower	Uppe
Comments: If RPD value is NA, th	he results of the duplica	tes are less	than 5x the	e RDL and	the RPD	will not be	calcula	ited.						
TSS, DOC, TDS														
Dissolved Organic Carbon	5143293 5143293	3 7.0	7.1	1%	< 0.5	104%	80%	120%	NA	80%	120%	102%	80%	1209
Total Suspended Solids	5147432	<5	<5	NA	< 5	100%	80%	120%	NA			107%	80%	1209
Total Dissolved Solids	5143341 514334	1 62	62	0%	< 5	96%	80%	120%	NA			NA		
Comments: If RPD value is NA, the	he results of the duplica	tes are less	than 5x the	e RDL and	the RPD	will not be	calcula	ited.						
Standard Water Analysis + Total	l Metals													
Total Organic Carbon	5143347 5143347	7 4.4	4.4	0.1%	< 0.5	102%	80%	120%	NA	80%	120%	110%	80%	1209
Comments: If RPD value is NA, th	he results of the duplica	tes are less	than 5x the	e RDL and	I the RPD	will not be	calcula	ited.						
Standard Water Analysis + Total	l Metals													
Total Organic Carbon	1	4.4	4.4	0.0%	< 0.5		80%	120%		80%	120%		80%	1209
Comments: If RPD value is NA, th	he results of the duplica	tes are less	than 5x the	e RDL and	the RPD	will not be	calcula	ited.						
Ortho Phosphate, Reactive Silica	a, Ammonia & Colour													
Reactive Silica	5152708	10.8	11.3	4.5%	< 0.05	105%	90%	110%	108%	90%	110%	110%	80%	1209
Ammonia as N	5155114	<0.02	<0.02	NA	< 0.02	100%	70%	130%	98%	80%	120%	97%	70%	1309
True Colour	5152758	9.13	9.02	NA	< 2.5	100%	90%	110%						
Ortho Phosphate as P	5155113	<0.10	<0.10	NA	< 0.10	92%	70%	130%	99%	80%	120%	97%	70%	1309
Comments: If the RPD value is N	A, the results of the dup	licates are u	under 5X th	ie RDL an	d will not b	oe calculat	ed.							
Ortho Phosphate, Reactive Silica	a, Ammonia & Colour													
Ammonia as N	5143342 5143342	2 <0.02	<0.02	NA	< 0.02	99%	70%	130%	100%	80%	120%	95%	70%	1309
Ammonia														
Ammonia as N	5143339 5143339	9 <0.02	<0.02	NA	< 0.02	105%	70%	130%	98%	80%	120%	100%	70%	1309
Reactive Silica, Ortho-P & Colou	ır													
Reactive Silica	5154615	3.04	3.00	1.3%	< 0.05	107%	90%	110%	103%	90%	110%	103%	80%	1209
True Colour	5154067	20.9	21.1	1.0%	< 2.5	103%	90%	110%						
Ortho Phosphate as P	5152162	<0.13	<0.13	NA	< 0.10	96%	70%	130%	103%	80%	120%	98%	70%	1309

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Ashlig

Certified By:

AGAT QUALITY ASSURANCE REPORT (V1)

Page 25 of 32



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 Work Energy GH2 SAMPLING SITE:

AGAT WORK ORDER: 23K047262

ATTENTION TO: John Gale

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Benzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Toluene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Ethylbenzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Xylene (Total)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
C6-C10 (less BTEX)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
>C10-C16 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C16-C21 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C21-C32 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Modified TPH (Tier 1)	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION
Sediment			GC/MS/FID
Resemblance Comment	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
Return to Baseline at C32	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - VPH	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
n-Dotriacontane - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Chloromethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Vinyl Chloride	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Bromomethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Chloroethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Trichlorofluoromethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Acetone	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,1-Dichloroethylene	TO-0330	EPA SW-846 8260	GC/MS
Methylene Chloride	TO-0330	EPA SW-846 5030 & 8260	GC/MS
trans-1,2-Dichloroethylene	TO-0330	EPA SW-846 8260	GC/MS
1,1-Dichloroethane	TO-0330	EPA SW-846 8260	GC/MS
cis-1,2-Dichloroethylene	TO-0330	EPA SW-846 8260	GC/MS
Chloroform	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,2-Dichloroethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,1,1-Trichloroethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Carbon Tetrachloride	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Benzene	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,2-Dichloropropane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Trichloroethylene	TO-0330	EPA SW-846 8260	GC/MS
Bromodichloromethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
trans-1,3-Dichloropropene	TO-0330	EPA SW-846 5030 & 8260	GC/MS
cis-1,3-Dichloropropene	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,1,2-Trichloroethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Toluene	TO-0330	EPA SW-846 5030 & 8260	GC/MS



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 Work Energy GH2

SAMPLING SITE:

AGAT WORK ORDER: 23K047262 ATTENTION TO: John Gale SAMPI ED BY

SAMPLING SITE.	AMPLING STE: SAMPLED BT.						
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE				
2-Hexanone	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
Dibromochloromethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
1,2-Dibromoethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
Tetrachloroethylene	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
1,1,1,2-Tetrachloroethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
Chlorobenzene	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
Ethylbenzene	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
m,p-Xylenes	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
Bromoform	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
Styrene	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
1,1,2,2-Tetrachloroethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
o-Xylene	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
1,3-Dichlorobenzene	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
1,4-Dichlorobenzene	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
1,2-Dichlorobenzene	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
Xylenes	TO-0330	EPA SW-846 5030 & 8260	GC/MS				
Toluene-d8	TO-0330	EPA SW-846 5030 & 8260	GC/MS				



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 Work Energy GH2

SAMPLING SITE:

AGAT WORK ORDER: 23K047262

ATTENTION TO: John Gale

SAMPLED BY:

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			·
Ammonia as N	INOR-93-6059	modified from SM 4500-NH3 H	LACHAT FIA
Dissolved Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Antimony	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
Total Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 Work Energy GH2

AGAT WORK ORDER: 23K047262 ATTENTION TO: John Gale SAMPLED BY:

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Reactive Silica	INOR-93-6070	modified from SM 4500-SIO2 F	LACHAT FIA
True Colour	INOR-93-6074	modified from SM 2120 B	LACHAT FIA
Ortho Phosphate as P	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
pH	INOR-121-6001	SM 4500 H+B	PC TITRATE
Chloride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Fluoride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Alkalinity	INOR-121-6001	SM 2320 B	
Turbidity	INOR-121-6001	SM 2130 B	PC TITRATE
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC TITRATE
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-121-6047	SM 4500-NH3 H	COLORIMETER
Total Organic Carbon	INOR-121-6026	SM 5310 B	TOC ANALYZER
Total Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Potassium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Hydroxide	INORG-121-6001	SM 2320 B	PC-TITRATE
Calculated TDS	CALCULATION	SM 1030E	CALCULATION
Hardness	CALCULATION	SM 2340B	CALCULATION
Langelier Index (@20C)	CALCULATION	CALCULATION	CALCULATION
Langelier Index (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 20C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Anion Sum	CALCULATION	SM 1030E	CALCULATION
Cation sum	CALCULATION	SM 1030E	CALCULATION
% Difference/ Ion Balance	CALCULATION	SM 1030E	CALCULATION
Total Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Antimony	MET121-6104 & MET-121-6105	SM 3125	ICP-MS
Total Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 Work Energy GH2 SAMPLING SITE:

AGAT WORK ORDER: 23K047262

ATTENTION TO: John Gale

SAMPLING SITE:		SAMPLED BY:									
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE								
Total Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Phosphorous	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Dissolved Organic Carbon	INOR-121-6026	SM 5310 B	TOC ANALYZER								
Total Suspended Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC								
Total Dissolved Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC								

G	G A	I I	Labora	tories webearth.a	gat				C	Dart	mou B3B	Driv th, N 3 1M s.co	s 2	Hole	val (val 1 d Tir	Con Tem me:	ditic pera	on: atur	re:	God God	8,	6	2,1		note	:s)
Chain of Custod	ly Record			Р:	902	.46	8.87	18	F: 9	902	.468	.892	4	AGA	AT Jo	b N	um	ber:	_	2	3	KI	04	7.	26	2
Report Information			Report	nformation (Please print):					Re	ро	rt Fo	rma	t	No	tes:											
Company: Fracflow Cons	ultants Inc. (NL)		1. Name	John Gale (john_ffc@nfld.net)						n Sir	ngle S	ample														
Contact: John Gale			Emai	Devin Northcott (devin_ffc@bell	alian	t.cor	m)	_		μu	hage		- 11	Tur	nar	oun	nd T	ime	e Ro	equi	red	(TA	(T)			
Address: 154 Major's Pa	ath			. Karen Andrews (karen_ffc@nf	ld.ne	et)] Mi pe	ultiple r page	Samp	le	■ Regular TAT ☑ 5 to 7 working days												
St. John's, NL			Emai	Chris Piercey (chris_ffc@bella	liant	.com	1)			ן Ex	cel Fo	rmat	- 11	Rush TAT Same day 1 day												
Phone: 709-739-7270	Fax: 709-75	3-5101	Regulat	ory Requirements (Check):		_		-		l in	clude	1		Rus	50 17	41							•			
Client Project #: 3168 W				idelines on Report	Guide	lines	on Re	port] Ex	port:						l	□2	day	s			3 day	5		
AGAT Quotation: S/O			— II 🗆 PIRI											Date	e Re	quir	ed:	-	_	_	-					
Please Note: If quotation number is r	not provided client will be billed fu	Il price for analys	//0/	1 Res Pot			parse		Dut		~ 14/-				7.2	r	7.00	_	0-14				_		_	_
Invoice To	Same	Yes ☑ / No		2 □ Com		🗆 Fi	ne		Reg			ter Sa	ampi	e: L	JYes	S L	⊻ N¢	0 3	Sait	wat	er Sa	ampi	e:	□ Ye	es	✓ No
	Sumo				-				1	T	T	T	1	- 1		-	-	1	1		-		-	-	1	T
Company:				ustrial SEQS-Cont Sites			ple																			
Contact: Karen Andrews	s (karen_ffc@nfld.net)		Cor	nmercial HPM 101			Available							level										Ψ		
Address:			_ Res	Park Storm Water							Miss	ent)		S tow level	latior											
Phone: PO/Credit Card#: 4285	Fax:		— Agr		Field Filtered/Preserved	Standard Water Analysis	fotal 🖪 Diss		CBOD		Dhochates (notal as 0205)	Chromium (Tri & Hexavalent)		Tier 1: TPH/BTEX (PIRI)	2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX		se (TOG)	BNAE EPA 625 - Miss			Marine Sediment Package	urans		S &TSS	(N/N)
Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filter	Standard V	Metals: © Total	Mercury	D BOD	erain Size	Dhoenhatee (Chromium	Phenols	Ter 1: TPH	Tier 2: TPH	CME-CW8	VOC	Oil & Grease (TOG)	SNAE EPA	PAH	PCB	farine Sed	Dioxins & Furans	Fecal Coliform	Other: TD:S	Hazardous (Y/N)
3168-GP03-WS2-230711	July 11, 2023 / 14:20	Water	11	Total Metals+Hg & Dissolved Metals+Hg	V	~	-	1		+		- 10	1-	F	F	0	-		-	14	<u>a</u>	2			-	_
3168-GP03-WS1-230711	July 11, 2023 / 14:50	Water	16	Total Metals+Hg & Dissolved Metals+Hg	1	1	-	1		1		1	1	1			-					-	-		-	
3168-GP02-WS1-230711	July 11, 2023 / 15:25	Water	19	Total Metals+Hg & Dissolved Metals+Hg	1	1	-	1				1	1	1			1							-	11	-
3168-GP02-WS2-230711	July 11, 2023 / 15:45	Water	11	Total Metals+Hg & Dissolved Metals+Hg	1	1		1														-			11	
3168-GP01-WS1-230711	July 11, 2023 / 16:15	Water	16	Total Metals+Hg & Dissolved Metals+Hg	1	1	1	1	-	-	-	-		1			_						-		/ /	-
				Dissolved Metals+Mercury						-	-	-					_	-					1	+	+	+
				DOC, TDS all field filtered						1		1	-				-	-				-	-	-		1
amples Relinquished By (Print Name):				0																						
	g Spele	Date/T	ly 14/23	Samples Received By (Print Name):	l	7					Date/	ime IA.LA	31	1/2	2 34	ellow	Сор	- Clie y - A(GAT			ge [] of [2]
current ID DIV 133 1501 002			11:20	Mint	2	3	Iul	11	51			3	120	7	1,	white	Cop	iy- AG	iAI	Nº:	FF	C-31				nuney (201)

	GA'	T I	Labora	tories webearth.a	ıgat	labs	Unit		l	Dart	mou B3	uth, I B 1N	NS /12	Ari Ari	ival ival	Con Terr	dition per	on: atui	'e:	Goo	8	¢	oor (: 	<u> </u>	· · (-
Chain of Custor	ly Record			P:	902	2.46	8.87	18	• F:	902	.468	8.89	24			_	lum	ber	-	2	31	5	OY	7-	26	2
Report Information			Report I	nformation (Please print):					Re	po	t Fe	orm	at		otes	:										
Company: Fracflow Cons	ultants Inc. (NL)		1. Name	John Gale (john_ffc@nfld.net)						- Sir	vøle S	Sampl	A													_
Contact: John Gale			— Email	Devin Northcott (devin_ffc@bel	aliar	nt.co	m)			_ pe	r pag	je		Tu	rna	rou	nd 1	<u>Fim</u>	e R	eani	ired		T)			
Address: 154 Major's Pa	ath		— 2. Name	. Karen Andrews (karen_ffc@nf	ld.ne	et)		1			ultiple r pag	e Sam	ple							-	rkin					
St. John's, NL			- Email		liant	.con	1)					orma		ne	gun	ar i <i>r</i>						_	•			
Phone: 709-739-7270	Fax: 709-75	3 5101						_	∎⊡		clude		L	Ru	sh 1	TAT			ame	e day	/	□1	. day			
		3-5101		ory Requirements (Check):			_		Г] Ex	port:			11				2	day	s		□3	day:	3		
Client Project #: 3168 W	ond Energy GHZ			idelines on Report 🛛 🗆 Do not list	GUIDE	elines	on Re	port		_				Da	te R	equi	red:	1							_	
AGAT Quotation: S/O Please Note: If quotation number is n	not provided client will be billed fu	Ill price for analys		1 🗌 Res 🗌 Pot		€c	oarse	,	-				_		_		_	_	_			_	_	_	_	_
			Tier	2 □ Com IN/Pot		🗆 Fi	ne					ater S	Sam	ple:	Ye	es	☑N	0	Salt	Wate	er Sa	ampl	e:	🗆 Ye	es	
Invoice To	Same	Yes ☑ / No	Gas Gas	Fuel 🗆 Lube	-	_	_	_	Re	g. No).:	_	_		_				_	_			_			
Company:			CCME				o																			
Contact: Karen Andrews	s (karen_ffc@nfld.net)			amanuation			ldabl							l le										ME	1	
Address:			□ Cor □ Res	/Park			Available				8		2	ow le	tion											
			— 🗌 🗆 Agri	cultural Waste Water	B	12				(j	⊻ .'	205			tiona							age		z		
Phone:	Fax:		── FW/	AL .	Serve	nalys	Diss		8	(coarse/fine)	EOC - Miss	l as l		(PIRI	Fract	١Щ.			Miss			Pack		NdW	&TSS	;
PO/Credit Card#: 4285				liment 🗌 Other	1/Pre	ter A				l 8		(tota	ž	Ĩ	1 E	H		1Ĕ	25-1			hent	Irans	_		
		-			tered	M p	₽ ☑			Size (Wiss Wiss	ates		, HA	H/Hd	L SM		Grease (TOG)	PA 6			çedin	& Fu) SI IC
Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: 🛛 Total	Mercury	D BOD	Grain S	TOC - Miss	Phosphates (total as P205)		Tier 1: TPH/BTEX (PIRI) S low level	Ter 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	Oil & Gr	BNAE EPA 625 - Miss	PAH	PCB	Marine Sediment Package	Dioxins & Furans	Pecal Coliform	Other:	Hazardous (Y/N)
3168-MP03-WS1-230712	July 12, 2023 / 10:45	Water	16	Total Metals+Hg & Dissolved Metals+Hg	1	1		1						1										-	11	-
3168-MP01-WS1-230712	July 12, 2023 / 11:05	Water	16	Total Metals+Hg & Dissolved Metals+Hg	1	1	1	1						1										V	11	
3168-MP02-WS1-230712	July 12, 2023 / 11:20	Water	19	Total Metals+Hg & Dissolved Metals+Hg	1	1	1	1						1			1								11	
3168-MP02-WS2-230712	July 12, 2023 / 11:50	Water	11	Total Metals+Hg & Dissolved Metals+Hg	1	1	1	1				-													11	
3168-NP03-WS1-230712	July 12, 2023 / 14:20	Water	16	Total Metals+Hg & Dissolved Metals+Hg	1	1	1	1						1												-
3168-NP03-WS2-230712	July 12, 2023 / 14:40	Water	11	Total Metals+Hg & Dissolved Metals+Hg	1	1	1	1	_	-	_	-	-		-										11	
						-		_	_	_	-	_	_	_	-		-	-	-	_			-	-		1
				Dissolved Metals+Mercury		-		-	-	-	-	-	-	+	-	-	-	-	-			_	-	_	-	+
				DOC, TDS all field filtered	-	-		-	-	-	+	-	-	-	-	-	-	-	-	-			-	+	-	+
					-			-	-+	-	-	-	+	-	-	-	+	-	-			-	-	+		+
					-	-		-	-	-	+	-	+	-	-	-	-	-	-	-			-	-	-	-
mples Relinquished By (Print Name):	ma L. I.	Date/T		Samples Received By (Print Name):	-	-	0	-			Date	/Time		-L		Pink	Con	/ - Cli	ent	-		ge 🛛		of 2	 >	<u>الے</u> ۲
mples Relinquished By (Sign):	mg Sech	Date/Ti	July 14/2	Samples Received By (Sign):	Le	~	X		_		Date	Alime	cy	14	2	Fillo					Pag	ge⊥∡		OT 2		
E1	al		11.20	Dut		T	alu	15	-1	30	D	11	2	0.						Nº:	FF	C-3′	168-0	COC	-05	
ument ID: DIV 133 1501 002				1			44	24	1	>		33	-	-	-				-				0	540 Kessi	and: her	nuary 20



CLIENT NAME: FRACFLOW CONSULTANTS 154 MAJOR'S PATH ST. JOHN'S PATH, NL A1A5A1 (709) 739-7270 ATTENTION TO: John Gale PROJECT: 3168 WORLD ENERGY GH2 AGAT WORK ORDER: 23K047728 TRACE ORGANICS REVIEWED BY: Dylan McCarthy, Trace Organics Lab Technician WATER ANALYSIS REVIEWED BY: Ashleigh Dussault, Inorganics Laboratory Supervisor DATE REPORTED: Jul 26, 2023 PAGES (INCLUDING COVER): 26 VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (709)747-8573

*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may
 incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of
 merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines
 contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.
- For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.

AGAT Laboratories (V1)

lember of: Association of Professional Engineers and Geoscientists of Alberta
(APEGA)
Mostern Envire Agricultural Laboratory Association (M/EALA)

Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA) AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. Measurement Uncertainty is not taken into consideration when stating conformity with a specified requirement.

Page 1 of 26



AGAT WORK ORDER: 23K047728 PROJECT: 3168 WORLD ENERGY GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water - Low Level Version 3.1

DATE RECEIVED: 2023-07-17

						DATE REFORTED. 2023-01-20
			:	3168-NP02-WS1	3168-NP01-WS1	
		SAMPLE DESCI	RIPTION:	-230713	-230713	
		SAMPL	E TYPE:	Water	Water	
		DATE SA	AMPLED:	2023-07-13 11:35	2023-07-13 12:05	
Parameter	Unit	G/S	RDL	5146025	5146032	
Benzene	mg/L	0.370	0.001	<0.001	<0.001	
Toluene	mg/L	0.002	0.001	<0.001	<0.001	
Ethylbenzene	mg/L	0.09	0.001	<0.001	<0.001	
Xylene (Total)	mg/L		0.002	<0.002	<0.002	
C6-C10 (less BTEX)	mg/L		0.01	<0.01	<0.01	
>C10-C16 Hydrocarbons	mg/L		0.05	<0.05	<0.05	
>C16-C21 Hydrocarbons	mg/L		0.05	<0.05	<0.05	
>C21-C32 Hydrocarbons	mg/L		0.01	<0.01	<0.01	
Modified TPH (Tier 1)	mg/L		0.05	<0.05	<0.05	
Sediment				NO	NO	
Resemblance Comment				NR	NR	
Return to Baseline at C32				Y	Y	
Surrogate	Unit	Acceptable	Limits			
sobutylbenzene - EPH	%	70-13	0	112	110	
lsobutylbenzene - VPH	%	70-13	0	92	92	
n-Dotriacontane - EPH	%	70-13	0	110	111	

Certified By:

Julon Mant

DATE REPORTED: 2023-07-26



AGAT WORK ORDER: 23K047728 PROJECT: 3168 WORLD ENERGY GH2

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water - Low Level Version 3.1

DATE RECEIVED: 2023-07-17

DATE REPORTED: 2023-07-26

57 Old Pennywell Road, Unit I

St. John's, NL

CANADA A1E 6A8

TEL (709)747-8573 FAX (709 747-2139

http://www.agatlabs.com

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to CCME FWAL - update 2015

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation. 5146025-5146032 Modified TPH, Xylene(Total)and C6-C10(less BTEX) are calculated parameters. The calculated parameter is non-accredited. The component parameters of the calculation are accredited.

Sediment parameter is comment only based on visual inspection of the sample prior to extraction and is not an accredited test.

Resemblance Comment Key: GF - Gasoline Fraction WGF - Weathered Gasoline Fraction GR - Product in Gasoline Range FOF - Fuel Oil Fraction WFOF - Weathered Fuel Oil Fraction FR - Product in Fuel Oil Range LOF - Lube Oil Fraction LR - Lube Range UC - Unidentified Compounds NR - No Resemblance NA - Not Applicable

Analysis performed at AGAT Halifax (unless marked by *)

Julon Mants



AGAT WORK ORDER: 23K047728 PROJECT: 3168 WORLD ENERGY GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

HALIFAX - Volatile Organic Compounds in Water (ug/L)

DATE RECEIVED: 2023-07-17

DATE RECEIVED: 2023-07-17				
			3168-NP01-WS1	
	S	SAMPLE DESCRIPTION:	-230713	
		SAMPLE TYPE:	Water	
		DATE SAMPLED:	2023-07-13	
Parameter	Unit	G/S RDL	12:05 5146032	
Chloromethane	μg/L	<u>1</u>	<1	
Vinyl Chloride	μg/L	0.6	<0.6	
Bromomethane	μg/L	0.89	<0.89	
Chloroethane		5	<5	
Trichlorofluoromethane	μg/L	5	<5	
Acetone	µg/L	10	<5 <10	
	µg/L	0.6	<0.6	
1,1-Dichloroethylene	µg/L		<0.6	
Methylene Chloride	μg/L	2		
trans-1,2-Dichloroethylene	µg/L	2	<2	
1,1-Dichloroethane	μg/L	1	<1	
cis-1,2-Dichloroethylene	ug/L	2	<2	
Chloroform	µg/L	1	<1	
1,2-Dichloroethane	µg/L	2	<2	
1,1,1-Trichloroethane	μg/L	1	<1	
Carbon Tetrachloride	μg/L	0.56	<0.56	
Benzene	μg/L	1	<1	
1,2-Dichloropropane	µg/L	0.7	<0.7	
Trichloroethylene	μg/L	1	<1	
Bromodichloromethane	μg/L	1	<1	
trans-1,3-Dichloropropene	µg/L	0.5	<0.5	
cis-1,3-Dichloropropene	µg/L	0.5	<0.5	
1,1,2-Trichloroethane	µg/L	1	<1	
Toluene	µg/L	0.002 2	<2	
2-Hexanone	µg/L	10.0	<10.0	
Dibromochloromethane	µg/L	1	<1	
1,2-Dibromoethane	µg/L	0.5	<0.5	
Tetrachloroethylene	µg/L	2	<2	
1,1,1,2-Tetrachloroethane	µg/L	0.5	<0.5	

Certified By:

Julon Mant

DATE REPORTED: 2023-07-26



AGAT WORK ORDER: 23K047728 PROJECT: 3168 WORLD ENERGY GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.aqatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

HALIFAX - Volatile Organic Compounds in Water (ug/L)

DATE RECEIVED: 2023-07-17

			3168-NP01-WS1	
	5	SAMPLE DESCRIPTION	-230713	
		SAMPLE TYPE	: Water	
		DATE SAMPLED	: 2023-07-13 12:05	
Parameter	Unit	G/S RDL	5146032	
Chlorobenzene	μg/L	1.0	<1.0	
Ethylbenzene	μg/L	0.09 2	<2	
m,p-Xylenes	μg/L	4	<4	
Bromoform	μg/L	1	<1	
Styrene	μg/L	0.09 1	<1	
1,1,2,2-Tetrachloroethane	μg/L	1	<1	
o-Xylene	μg/L	1	<1	
1,3-Dichlorobenzene	μg/L	1	<1	
1,4-Dichlorobenzene	μg/L	1	<1	
1,2-Dichlorobenzene	μg/L	0.7	<0.7	
Xylenes	μg/L	4	<4	
Surrogate	Unit	Acceptable Limits		
Toluene-d8	%	50-140	68	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to CCME FWAL - update 2015

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

5146032 1,1,2,2-Tetrachloroethane reported only for samples matrices which can be purged. Otherwise N/A. Xylenes is a calculated parameter. The calculated value is the sum of m&p-Xylenes + o-Xylene. The calculated parameter is non-accredited. The parameters that are components of the calculation are accredited.

Analysis performed at AGAT Calgary (unless marked by *)

Certified By:

Julon Mant

DATE REPORTED: 2023-07-26



AGAT WORK ORDER: 23K047728 PROJECT: 3168 WORLD ENERGY GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

					Dissolved	Metals			
DATE RECEIVED: 2023-07-17									DATE REPORTED: 2023-07-26
			3	3168-NP02-WS2	3168-NP02-WS1	3168-AP01-WS1	3168-NP01-WS1	3168-NP01-WS	2
		SAMPLE DESC	RIPTION:	-230713	-230713	-230713	-230713	-230713	
		SAMF	LE TYPE:	Water	Water	Water	Water	Water	
		DATE S	AMPLED:	2023-07-13 11:20	2023-07-13 11:35	2023-07-13 11:50	2023-07-13 12:05	2023-07-13 12:25	
Parameter	Unit	G/S	RDL	5146020	5146025	5146029	5146032	5146272	
Dissolved Aluminum	ug/L	Variable	8	27	41	43	40	32	
Dissolved Antimony	ug/L		5	<5	<5	<5	<5	<5	
Dissolved Arsenic	ug/L	5	2	<2	<2	<2	<2	<2	
Dissolved Barium	ug/L		5	18	56	57	20	17	
Dissolved Beryllium	ug/L		2	<2	<2	<2	<2	<2	
Dissolved Bismuth	ug/L		2	<2	<2	<2	<2	<2	
Dissolved Boron	ug/L	29000,	8	<8	9	9	10	9	
Dissolved Cadmium	ug/L	1.0, 0.09	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
issolved Chromium	ug/L		1	<1	<1	<1	<1	<1	
issolved Cobalt	ug/L		1	<1	<1	<1	<1	<1	
Dissolved Copper	ug/L	Equation	4	<4	<4	<4	<4	<4	
Dissolved Iron	ug/L	300	57	<57	104	107	96	<57	
Dissolved Lead	ug/L	Equation	0.9	<0.9	<0.9	<0.9	<0.9	<0.9	
Dissolved Manganese	ug/L		2	<2	<2	<2	<2	<2	
Dissolved Molybdenum	ug/L	73	2	<2	<2	<2	<2	<2	
Dissolved Nickel	ug/L	Equation	3	<3	<3	<3	<3	<3	
Dissolved Selenium	ug/L	1.0	1	<1	<1	<1	<1	<1	
Dissolved Silver	ug/L	0.25	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	
Dissolved Strontium	ug/L		5	39	41	42	41	37	
Dissolved Thallium	ug/L	0.8	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Dissolved Tin	ug/L		2	<2	<2	<2	<2	<2	
Dissolved Titanium	ug/L		5	<5	<5	<5	<5	<5	
Dissolved Uranium	ug/L	33, 15	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	
Dissolved Vanadium	ug/L		2	<2	<2	<2	<2	<2	
Dissolved Zinc	ug/L	30	5	<5	7	9	<5	<5	

Ashleig Dussal



AGAT WORK ORDER: 23K047728 PROJECT: 3168 WORLD ENERGY GH2

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

Dissolved Metals

DATE RECEIVED: 2023-07-17

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to CCME FWAL - update 2015 Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

5146020-5146272 Metals analysis completed on a filtered sample.

Analysis performed at AGAT Halifax (unless marked by *)

57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.agatlabs.com

ATTENTION TO: John Gale

SAMPLED BY:

DATE REPORTED: 2023-07-26



AGAT WORK ORDER: 23K047728 **PROJECT: 3168 WORLD ENERGY GH2** 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

DATE RECEIVED: 2023-07-17									DATE REPORTED: 2023-07-26
			:	3168-NP02-WS2	3168-NP02-WS1	3168-AP01-WS1	3168-NP01-WS1	3168-NP01-WS	2
		SAMPLE DES	CRIPTION:	-230713	-230713	-230713	-230713	-230713	
		SAM	PLE TYPE:	Water	Water	Water	Water	Water	
		DATE	SAMPLED:	2023-07-13 11:20	2023-07-13 11:35	2023-07-13 11:50	2023-07-13 12:05	2023-07-13 12:25	
Parameter	Unit	G/S	RDL	5146020	5146025	5146029	5146032	5146272	
Dissolved Mercury	ug/L	0.026	0.026	<0.026	<0.026	<0.026	<0.026	<0.026	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to CCME FWAL - update 2015

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation. Analysis performed at AGAT Halifax (unless marked by *)



AGAT WORK ORDER: 23K047728 **PROJECT: 3168 WORLD ENERGY GH2** 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

				Mercur	y Analysis i	in Water (To	otal)								
ATE RECEIVED: 2023-07-17 DATE REPORTED: 2023-07-26															
	3168-NP02-WS2 3168-NP02-WS1 3168-AP01-WS1 3168-NP01-WS1 3168-NP01-WS2														
		SAMPLE DESC	CRIPTION:	-230713	-230713	-230713	-230713	-230713							
		SAMP	PLE TYPE:	Water	Water	Water	Water	Water							
		DATE S	AMPLED:	2023-07-13 11:20	2023-07-13 11:35	2023-07-13 11:50	2023-07-13 12:05	2023-07-13 12:25							
Parameter	Unit	G/S	RDL	5146020	5146025	5146029	5146032	5146272							
Total Mercury	ug/L	0.026	0.026	<0.026	<0.026	<0.026	<0.026	<0.026							

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to CCME FWAL - update 2015 Comments:

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation. Analysis performed at AGAT Halifax (unless marked by *)



AGAT WORK ORDER: 23K047728 PROJECT: 3168 WORLD ENERGY GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Ortho Phosphate, Reactive Silica, Ammonia & Colour

DATE RECEIVED: 2023-07-17	
---------------------------	--

				3168-NP02-WS2	2 3168-NP02-WS1	3168-AP01-WS1	3168-NP01-WS1	3168-NP01-WS2	
		SAMPLE DES	CRIPTION:	-230713	-230713	-230713	-230713	-230713	
		SAM	PLE TYPE:	Water	Water	Water	Water	Water	
		DATES	SAMPLED:	2023-07-13 11:20	2023-07-13 11:35	2023-07-13 11:50	2023-07-13 12:05	2023-07-13 12:25	
Parameter	Unit	G/S	RDL	5146020	5146025	5146029	5146032	5146272	
Reactive Silica	mg/L		0.05	2.49	1.92	1.93	2.02	2.19	
Ammonia as N	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
True Colour	TCU		2.50	24.7	32.2	32.1	32.6	26.7	
Ortho Phosphate as P	mg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	

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

Analysis performed at AGAT Toronto (unless marked by *)

Dussal

DATE REPORTED: 2023-07-26



AGAT WORK ORDER: 23K047728 PROJECT: 3168 WORLD ENERGY GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale SAMPLED BY:

Standard Water Analysis + Total Metals

						313 + 10tai			
DATE RECEIVED: 2023-07-17								DAT	E REPORTED: 2023-07-26
			3	3168-NP02-WS2	3168-NP02-WS1	3168-AP01-WS1	3168-NP01-WS1	3168-NP01-WS2	
	:	SAMPLE DESC	RIPTION:	-230713	-230713	-230713	-230713	-230713	
		SAMP	LE TYPE:	Water	Water	Water	Water	Water	
		DATE S	AMPLED:	2023-07-13	2023-07-13	2023-07-13	2023-07-13	2023-07-13	
Parameter	Unit	G/S	RDL	11:20 5146020	11:35 5146025	11:50 5146029	12:05 5146032	12:25 5146272	
pH	Unit	6.5-9.0	RUL	6.52	6.63	6.66	6.66	6.64	
pn Chloride	ma/l	640, 120	1	0.52 11	10	19	9	8	
Fluoride	mg/L		0.12	<0.12	<0.12	0.53	9 <0.12	o <0.12	
	mg/L	0.12				11			
Sulphate	mg/L		2	2	2		<2	<2	
Alkalinity	mg/L	Nemetica	5	48	51	52	51	53	
Turbidity	NTU	Narrative	0.5	1.0	1.5	0.7	<0.5	<0.5	
Electrical Conductivity	umho/cm		1	132	134	139	140	140	
Nitrate + Nitrite as N	mg/L	550.40	0.05	0.24	0.15	1.33	0.11	0.12	
Nitrate as N	mg/L	550, 13	0.05	0.24	0.15	0.67	0.11	0.12	
Nitrite as N	mg/L	0.06	0.05	<0.05	<0.05	0.66	< 0.05	<0.05	
Ammonia as N	mg/L	Fact Sheet	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Total Organic Carbon	mg/L		0.5	3.9	4.7	5.4	5.1	4.2	
Total Sodium	mg/L		0.1	5.7	5.8	5.7	5.9	5.8	
Total Potassium	mg/L		0.1	0.4	0.4	0.4	0.4	0.4	
Total Calcium	mg/L		0.1	17.1	17.1	17.3	17.2	16.5	
Total Magnesium	mg/L		0.1	2.9	3.0	3.0	3.1	3.0	
Bicarb. Alkalinity (as CaCO3)	mg/L		5	48	51	52	51	53	
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	
Calculated TDS	mg/L		1	69	70	94	67	66	
Hardness	mg/L			54.6	55.1	55.6	55.7	53.6	
Langelier Index (@20C)	NA			-2.14	-2.00	-1.97	-1.97	-1.99	
Langelier Index (@ 4C)	NA			-2.46	-2.32	-2.29	-2.29	-2.31	
Saturation pH (@ 20C)	NA			8.66	8.63	8.63	8.63	8.63	
Saturation pH (@ 4C)	NA			8.98	8.95	8.95	8.95	8.95	
Anion Sum	me/L			1.33	1.35	1.90	1.28	1.29	
Cation sum	me/L			1.36	1.37	1.38	1.39	1.34	
% Difference/ Ion Balance	%			1.2	0.7	15.9	4.1	1.8	

Certified By:

Page 11 of 26

Dussal



Certificate of Analysis

AGAT WORK ORDER: 23K047728 **PROJECT: 3168 WORLD ENERGY GH2** 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

				Standard V	Vater Analy	vsis + Total	Metals		
DATE RECEIVED: 2023-07-17									DATE REPORTED: 2023-07-26
			3	3168-NP02-WS2	3168-NP02-WS1	3168-AP01-WS1	3168-NP01-WS1	3168-NP01-WS	2
		SAMPLE DESC	RIPTION:	-230713	-230713	-230713	-230713	-230713	
			LE TYPE:	Water	Water	Water	Water	Water	
		DATE S	AMPLED:	2023-07-13 11:20	2023-07-13 11:35	2023-07-13 11:50	2023-07-13 12:05	2023-07-13 12:25	
Parameter	Unit	G/S	RDL	5146020	5146025	5146029	5146032	5146272	
Total Aluminum	ug/L	Variable	5	58	48	44	48	41	
Total Antimony	ug/L		2	<2	<2	<2	<2	<2	
Total Arsenic	ug/L	5	2	<2	<2	<2	<2	<2	
Total Barium	ug/L		5	16	17	17	17	17	
Total Beryllium	ug/L		2	<2	<2	<2	<2	<2	
Total Bismuth	ug/L		2	<2	<2	<2	<2	<2	
otal Boron	ug/L	29000,	5	5	9	6	7	10	
Fotal Cadmium	ug/L	1.0, 0.09	0.09	<0.09	<0.09	<0.09	<0.09	<0.09	
Fotal Chromium	ug/L		2	<2	<2	<2	<2	<2	
Fotal Cobalt	ug/L		1	<1	<1	<1	<1	<1	
Fotal Copper	ug/L	Equation	2	<2	<2	<2	<2	<2	
Fotal Iron	ug/L	300	50	96	123	119	126	73	
Total Lead	ug/L	Equation	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Total Manganese	ug/L		2	26	7	8	8	9	
Fotal Molybdenum	ug/L	73	2	<2	<2	<2	<2	<2	
Total Nickel	ug/L	Equation	2	<2	<2	<2	<2	<2	
Total Phosphorous	mg/L	Fact Sheet	0.07	0.42	0.32	0.35	0.33	0.37	
Total Selenium	ug/L	1	1	<1	<1	<1	<1	<1	
Fotal Silver	ug/L	0.25	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Fotal Strontium	ug/L		5	33	35	35	36	34	
otal Thallium	ug/L	0.8	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
otal Tin	ug/L		2	<2	<2	<2	<2	<2	
otal Titanium	ug/L		3	<3	<3	<3	<3	<3	
otal Uranium	ug/L	33, 15	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Fotal Vanadium	ug/L		2	<2	<2	<2	<2	<2	
Total Zinc	ug/L	30	5	<5	7	<5	<5	<5	

Ashleig Dussalt

Page 12 of 26



AGAT WORK ORDER: 23K047728 PROJECT: 3168 WORLD ENERGY GH2

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

ATTENTION TO: John Gale

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-07-17 DATE REPORTED: 2023-07-26 Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to CCME FWAL - update 2015 Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation. 5146020-5146025 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited. pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited. pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited. pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result Ion Balance is biased high, contributing parameters have been confirmed.

5146032-5146272 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.

PH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result

Analysis performed at AGAT Halifax (unless marked by *)

Certified By:

57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.agatlabs.com



AGAT WORK ORDER: 23K047728 PROJECT: 3168 WORLD ENERGY GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

SAMPLING SITE:

SAMPLED BY:

ATTENTION TO: John Gale

TSS, DOC, TDS DATE RECEIVED: 2023-07-17 **DATE REPORTED: 2023-07-26** 3168-NP02-WS2 3168-NP02-WS1 3168-AP01-WS1 3168-NP01-WS1 3168-NP01-WS2 SAMPLE DESCRIPTION: -230713 -230713 -230713 -230713 -230713 SAMPLE TYPE: Water Water Water Water Water DATE SAMPLED: 2023-07-13 2023-07-13 2023-07-13 2023-07-13 2023-07-13 11:20 11:35 11:50 12:05 12:25 5146272 Unit G/S RDL 5146020 5146025 5146029 5146032 Parameter Dissolved Organic Carbon 0.5 3.9 5.0 5.0 4.9 4.2 mg/L Total Suspended Solids mg/L Narrative 5 <5 <5 <5 <5 <5 Total Dissolved Solids mg/L 5 54 70 66 56 56

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to CCME FWAL - update 2015

Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Analysis performed at AGAT Halifax (unless marked by *)



Exceedance Summary

AGAT WORK ORDER: 23K047728 PROJECT: 3168 WORLD ENERGY GH2 57 Old Pennywell Road, Unit I St. John's, NL CANADA A1E 6A8 TEL (709)747-8573 FAX (709 747-2139 http://www.agatlabs.com

CLIENT NAME: FRACFLOW CONSULTANTS

ATTENTION TO: John Gale

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
5146029	3168-AP01-WS1-230713	NS-CCME FWAL	Standard Water Analysis + Total Metals	Fluoride	mg/L	0.12	0.53
5146029	3168-AP01-WS1-230713	NS-CCME FWAL	Standard Water Analysis + Total Metals	Nitrite as N	mg/L	0.06	0.66



Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 WORLD ENERGY GH2

SAMPLING SITE:

AGAT WORK ORDER: 23K047728 ATTENTION TO: John Gale

SAMPLED BY:

Trace Organics Analysis

RPT Date: Jul 26, 2023			C	UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recoverv	Acceptable Limits		Recovery	Acceptable Limits	
		ld					Value	Lower	Upper		Lower	Upper	- ··· · ,	Lower	Upper
Atlantic RBCA Tier 1 Hydrocarbor	ns in Wate	er - Low Le	evel Versi	on 3.1											
Benzene	1	5143332	< 0.001	< 0.001	NA	< 0.001	109%	70%	130%	109%	70%	130%			
Toluene	1	5143332	< 0.001	< 0.001	NA	< 0.001	111%	70%	130%	109%	70%	130%			
Ethylbenzene	1	5143332	< 0.001	< 0.001	NA	< 0.001	112%	70%	130%	109%	70%	130%			
Xylene (Total)	1	5143332	< 0.002	< 0.002	NA	< 0.002	111%	70%	130%	107%	70%	130%			
C6-C10 (less BTEX)	1	5143332	< 0.01	< 0.01	NA	< 0.01	102%	70%	130%	98%	70%	130%	102%	70%	130%
>C10-C16 Hydrocarbons	1	5143332	< 0.05	< 0.05	NA	< 0.05	89%	70%	130%	106%	70%	130%	101%	70%	130%
>C16-C21 Hydrocarbons	1	5143332	< 0.05	< 0.05	NA	< 0.05	89%	70%	130%	106%	70%	130%	101%	70%	130%
>C21-C32 Hydrocarbons	1	5143332	< 0.01	< 0.01	NA	< 0.01	103%	70%	130%	106%	70%	130%	101%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. Matrix spike performed on a different sample than the duplicate.

If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

HALIFAX - Volatile Organic Compounds in Water (ug/L)

Chloremethone	-				NIA		4000/	E00/	4 4 0 0 /	4400/	F00/	4 4 0 0 /	4000/	F00/	1400/
Chloromethane	4690	5147565	< 1	< 1	NA	< 1	128%	50%	140%	116%	50%	140%	130%	50%	140%
Vinyl Chloride	4690	5147565	< 0.6	< 0.6	NA	< 0.6	80%	50%	140%	83%	50%	140%	98%	50%	140%
Bromomethane	4690	5147565	< 0.89	< 0.89	NA	< 0.89	67%	50%	140%	85%	50%	140%	85%	50%	140%
Chloroethane	4690	5147565	< 5	< 5	NA	< 5	90%	50%	140%	90%	50%	140%	100%	50%	140%
Trichlorofluoromethane	4690	5147565	< 5	< 5	NA	< 5	88%	50%	140%	90%	60%	130%	105%	50%	140%
Acetone	4690	5147565	< 10	< 10	NA	< 10	119%	50%	140%	98%	50%	140%	135%	50%	140%
1,1-Dichloroethylene	4690	5147565	< 0.6	< 0.6	NA	< 0.6	96%	50%	140%	93%	60%	130%	112%	50%	140%
Methylene Chloride	4690	5147565	< 2	< 2	NA	< 2	89%	50%	140%	87%	60%	130%	99%	50%	140%
trans-1,2-Dichloroethylene	4690	5147565	< 2	< 2	NA	< 2	98%	50%	140%	92%	60%	130%	89%	50%	140%
1,1-Dichloroethane	4690	5147565	< 1	< 1	NA	< 1	97%	50%	140%	92%	60%	130%	103%	50%	140%
cis-1,2-Dichloroethylene	4690	5147565	< 2	< 2	NA	< 2	95%	50%	140%	80%	60%	130%	107%	50%	140%
Chloroform	4690	5147565	31	33	6.3%	< 1	119%	50%	140%	107%	60%	130%	116%	50%	140%
1,2-Dichloroethane	4690	5147565	< 2	< 2	NA	< 2	91%	50%	140%	97%	60%	130%	105%	50%	140%
1,1,1-Trichloroethane	4690	5147565	< 1	< 1	NA	< 1	97%	50%	140%	99%	60%	130%	124%	50%	140%
Carbon Tetrachloride	4690	5147565	< 0.56	< 0.56	NA	< 0.56	101%	50%	140%	107%	60%	130%	131%	50%	140%
Benzene	4690	5147565	< 1	< 1	NA	< 1	95%	50%	140%	119%	60%	130%	106%	50%	140%
1,2-Dichloropropane	4690	5147565	< 0.7	< 0.7	NA	< 0.7	73%	50%	140%	92%	60%	130%	76%	50%	140%
Trichloroethylene	4690	5147565	< 1	< 1	NA	< 1	77%	50%	140%	94%	60%	130%	61%	50%	140%
Bromodichloromethane	4690	5147565	4	5	NA	< 1	72%	50%	140%	96%	60%	130%	74%	50%	140%
trans-1,3-Dichloropropene	4690	5147565	< 0.5	< 0.5	NA	< 0.5	85%	50%	140%	97%	60%	130%	66%	50%	140%
cis-1,3-Dichloropropene	4690	5147565	< 0.5	< 0.5	NA	< 0.5	81%	50%	140%	109%	60%	130%	82%	50%	140%
1,1,2-Trichloroethane	4690	5147565	< 1	< 1	NA	< 1	112%	50%	140%	113%	60%	130%	64%	50%	140%
Toluene	4690	5147565	< 2	< 2	NA	< 2	104%	50%	140%	115%	60%	130%	80%	50%	140%
2-Hexanone	4690	5147565	< 10.0	< 10.0	NA	< 10.0	96%	50%	140%	109%	50%	140%	84%	50%	140%
Dibromochloromethane	4690	5147565	< 1	< 1	NA	< 1	118%	50%	140%	116%	60%	130%	83%	50%	140%
1,2-Dibromoethane	4690	5147565	< 0.5	< 0.5	NA	< 0.5	110%	50%	140%	116%	60%	130%	69%	50%	140%
Tetrachloroethylene	4690	5147565	< 2	< 2	NA	< 2	105%	50%	140%	109%	60%	130%	78%	50%	140%
													,		- (0 0

AGAT QUALITY ASSURANCE REPORT (V1)

Page 16 of 26

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific tests tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 WORLD ENERGY GH2

SAMPLING SITE:

AGAT WORK ORDER: 23K047728 ATTENTION TO: John Gale SAMPLED BY:

Trace Organics Analysis (Continued)

						-	•			-					
RPT Date: Jul 26, 2023				DUPLICAT	E		REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	IKE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	Lin	ptable nits	Recovery	1.10	eptable mits
		ld					Value	Lower	Upper		Lower	Upper	-	Lower	Upper
1,1,1,2-Tetrachloroethane	4690	5147565	< 0.5	< 0.5	NA	< 0.5	116%	50%	140%	111%	60%	130%	101%	50%	140%
Chlorobenzene	4690	5147565	< 1.0	< 1.0	NA	< 1.0	104%	50%	140%	112%	60%	130%	104%	50%	140%
Ethylbenzene	4690	5147565	< 2	< 2	NA	< 2	76%	50%	140%	100%	60%	130%	93%	50%	140%
m,p-Xylenes	4690	5147565	< 4	< 4	NA	< 4	85%	50%	140%	94%	60%	130%	87%	50%	140%
Bromoform	4690	5147565	< 1	< 1	NA	< 1	111%	50%	140%	111%	60%	130%	94%	50%	140%
Styrene	4690	5147565	< 1	< 1	NA	< 1	74%	50%	140%	97%	60%	130%	82%	50%	140%
o-Xylene	4690	5147565	< 1	< 1	NA	< 1	74%	50%	140%	96%	60%	130%	85%	50%	140%
1,3-Dichlorobenzene	4690	5147565	< 1	< 1	NA	< 1	62%	50%	140%	98%	60%	130%	88%	50%	140%
1,4-Dichlorobenzene	4690	5147565	< 1	< 1	NA	< 1	71%	50%	140%	106%	60%	130%	98%	50%	140%
1,2-Dichlorobenzene	4690	5147565	< 0.7	< 0.7	NA	< 0.7	77%	50%	140%	94%	60%	130%	88%	50%	140%

Comments: Duplicate NA: results are less than 5X the RDL and RDP will not be calculated. The sample spikes and dups are not from the same sample ID.

Certified By:

Julon Mant

AGAT QUALITY ASSURANCE REPORT (V1)

Page 17 of 26

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



Quality Assurance

Water Analysia

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 WORLD ENERGY GH2

SAMPLING SITE:

AGAT WORK ORDER: 23K047728

ATTENTION TO: John Gale

SAMPLED BY:

			Wate	er Ar	nalys	is								
RPT Date: Jul 26, 2023		[DUPLICAT	E		REFEREI	NCE MA	TERIAL	METHOD	BLAN	SPIKE	MAT	RIX SPI	IKE
PARAMETER	Batch Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery		eptable nits	Recovery	1 1 10	eptable nits
	ld					Value	Lower	Upper		Lower	Upper		Lower	Upper
Standard Water Analysis + Tota	al Metals													
рН	5155134	6.58	6.50	1.2%	<	101%	80%	120%						
Chloride	5146020 5146020	11	11	0.3%	< 1	102%	80%	120%	NA	80%	120%	NA	70%	130%
Fluoride	5146020 5146020	<0.12	<0.12	NA	< 0.12	108%	80%	120%	NA	80%	120%	NA	70%	130%
Sulphate	5146020 5146020	2	2	NA	< 2	108%	80%	120%	NA	80%	120%	NA	70%	130%
Alkalinity	5155134	19	19	NA	< 5	91%	80%	120%						
Nitrate as N	5146020 5146020	0.24	0.24	NA	< 0.05	102%	80%	120%	NA	80%	120%	NA	70%	130%
Nitrite as N	5146020 5146020	<0.05	<0.05	NA	< 0.05	83%	80%	120%	NA	80%	120%	NA	70%	130%
Total Organic Carbon	5141212	4.2	4.2	1.4%	< 0.5	102%	80%	120%	NA	80%	120%	108%	80%	120%
Total Sodium	5146272 5146272	5.8	5.7	2.3%	< 0.1	105%	80%	120%	102%	80%	120%	98%	70%	130%
Total Potassium	5146272 5146272	0.4	0.4	NA	< 0.1	104%	80%	120%	102%	80%	120%	95%	70%	130%
Total Calcium	5146272 5146272	16.5	17.4	5.3%	< 0.1	99%	80%	120%	105%	80%	120%	NA	70%	130%
Total Magnesium	5146272 5146272	3.0	3.0	1.6%	< 0.1	105%	80%	120%	103%	80%	120%	97%	70%	130%
Bicarb. Alkalinity (as CaCO3)	5155134	19	19	NA	< 5	NA	80%	120%						
Carb. Alkalinity (as CaCO3)	5155134	< 10	< 10	0.0%	< 10	NA	80%	120%						
Total Aluminum	5146272 5146272	41	40	2.3%	< 5	105%	80%	120%	102%	80%	120%	96%	70%	130%
Total Antimony	5146272 5146272	<2	<2	NA	< 2	101%	80%	120%	101%	80%	120%	97%	70%	130%
Total Arsenic	5146272 5146272	<2	<2	NA	< 2	104%	80%	120%	101%	80%	120%	96%	70%	130%
Total Barium	5146272 5146272	17	16	NA	< 5	102%	80%	120%	99%	80%	120%	97%	70%	130%
Total Beryllium	5146272 5146272	<2	<2	NA	< 2	101%	80%	120%	99%	80%	120%	98%	70%	130%
Total Bismuth	5146272 5146272	<2	<2	NA	< 2	104%	80%	120%	100%	80%	120%	98%	70%	130%
Total Boron	5146272 5146272	10	8	NA	< 5	100%	80%	120%	101%	80%	120%	96%	70%	130%
Total Cadmium	5146272 5146272	<0.09	<0.09	NA	< 0.09	102%	80%	120%	102%	80%	120%	95%	70%	130%
Total Chromium	5146272 5146272	<2	<2	NA	< 1	103%	80%	120%	102%	80%	120%	97%	70%	130%
Total Cobalt	5146272 5146272	<1	<1	NA	< 1	106%	80%	120%	105%	80%	120%	98%	70%	130%
Total Copper	5146272 5146272	<2	<2	NA	< 1	109%	80%	120%	105%	80%	120%	100%	70%	130%
Total Iron	5146272 5146272	73	69	NA	< 50	105%	80%	120%	102%	80%	120%	98%	70%	130%
Total Lead	5146272 5146272	<0.5	< 0.5	NA	< 0.5	104%	80%	120%	100%	80%	120%	98%	70%	130%
Total Manganese	5146272 5146272	9	9	NA	< 2	104%	80%	120%	101%	80%	120%	97%	70%	130%
Total Molybdenum	5146272 5146272	<2	<2	NA	< 2	101%	80%	120%	103%	80%	120%	100%	70%	130%
Total Nickel	5146272 5146272	<2	<2	NA	< 2	106%	80%	120%	105%	80%	120%	99%	70%	130%
Total Phosphorous	5146272 5146272	0.37	0.35	5.3%	< 0.02	108%	80%	120%	111%	80%	120%	101%	70%	130%
Total Selenium	5146272 5146272	<1	<1	NA	< 1	111%	80%	120%	98%		120%	92%		130%
Total Silver	5146272 5146272	<0.1	<0.1	NA	< 0.1	103%	80%	120%	103%		120%	97%	70%	
Total Strontium	5146272 5146272	34	33	1.7%	< 5	103 %	80%	120%	103 %		120%	98%	70%	
Total Thallium	5146272 5146272	<0.1	<0.1	NA	< 0.1	104 %	80%	120%			120%	98%		130%
Total Tin	5146272 5146272	<2	<2	NA	< 2	102%	80%	120%	103%	80%	120%	99%	70%	130%
Total Titanium	5146272 5146272	<2	<2	NA	< 2	102 %	80%	120%	103 %		120%	99%	70%	130%
Total Uranium	5146272 5146272	<0.2	<0.2	NA	< 0.2	104 %	80%		99%		120%	99% 98%	70%	130%
Total Vanadium	5146272 5146272	<0.2 <2	<0.2	NA	< 0.2	102 %		120%			120%	96%		130%
	0170212 0140212	74	~2		~ 2	10070	0070	12070	10170	0070	12070	3070	1070	100 /0

AGAT QUALITY ASSURANCE REPORT (V1)

Page 18 of 26

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 WORLD ENERGY GH2

AGAT WORK ORDER: 23K047728

ATTENTION TO: John Gale

SAMPLED BY:

SAMPLING SITE:

Water Analysis (Continued)

RPT Date: Jul 26, 2023	RPT Date: Jul 26, 2023		0	UPLICAT	E		REFEREN	ICE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		Acceptable Limits Rec		Lin	ptable nits	Recoverv	Lin	ptable nits
		ld	•				Value	Lower	Upper		Lower	Upper		Lower	Upper
Total Zinc	5146272 5	5146272	<5	<5	NA	< 5	104%	80%	120%	102%	80%	120%	96%	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Dissolved Metals														
Dissolved Aluminum	5146272 5146272	32	34	NA	< 5	109%	80%	120%	104%	80%	120%	111%	70%	130%
Dissolved Antimony	5146272 5146272	<5	<5	NA	< 2	103%	80%	120%	104%	80%	120%	109%	70%	130%
Dissolved Arsenic	5146272 5146272	<2	<2	NA	< 2	108%	80%	120%	104%	80%	120%	111%	70%	130%
Dissolved Barium	5146272 5146272	17	17	NA	< 5	105%	80%	120%	101%	80%	120%	112%	70%	130%
Dissolved Beryllium	5146272 5146272	<2	<2	NA	< 2	108%	80%	120%	99%	80%	120%	105%	70%	130%
Dissolved Bismuth	5146272 5146272	<2	<2	NA	< 2	109%	80%	120%	104%	80%	120%	111%	70%	130%
Dissolved Boron	5146272 5146272	9	10	NA	< 5	108%	80%	120%	99%	80%	120%	111%	70%	130%
Dissolved Cadmium	5146272 5146272	<0.10	<0.10	NA	< 0.09	105%	80%	120%	104%	80%	120%	111%	70%	130%
Dissolved Chromium	5146272 5146272	<1	<1	NA	< 1	109%	80%	120%	105%	80%	120%	110%	70%	130%
Dissolved Cobalt	5146272 5146272	<1	<1	NA	< 1	111%	80%	120%	108%	80%	120%	110%	70%	130%
Dissolved Copper	5146272 5146272	<4	<4	NA	< 2	111%	80%	120%	105%	80%	120%	111%	70%	130%
Dissolved Iron	5146272 5146272	<57	<57	NA	< 50	110%	80%	120%	105%	80%	120%	110%	70%	130%
Dissolved Lead	5146272 5146272	<0.9	<0.9	NA	< 0.5	108%	80%	120%	104%	80%	120%	112%	70%	130%
Dissolved Manganese	5146272 5146272	<2	2	NA	< 2	110%	80%	120%	104%	80%	120%	109%	70%	130%
Dissolved Molybdenum	5146272 5146272	<2	<2	NA	< 2	105%	80%	120%	105%	80%	120%	113%	70%	130%
Dissolved Nickel	5146272 5146272	<3	<3	NA	< 2	112%	80%	120%	107%	80%	120%	111%	70%	130%
Dissolved Selenium	5146272 5146272	<1	<1	NA	< 1	118%	80%	120%	100%	80%	120%	121%	70%	130%
Dissolved Silver	5146272 5146272	<0.4	<0.4	NA	< 0.1	104%	80%	120%	103%	80%	120%	112%	70%	130%
Dissolved Strontium	5146272 5146272	37	36	3.2%	< 5	110%	80%	120%	105%	80%	120%	110%	70%	130%
Dissolved Thallium	5146272 5146272	<0.2	<0.2	NA	< 0.1	108%	80%	120%	103%	80%	120%	112%	70%	130%
Dissolved Tin	5146272 5146272	<2	<2	NA	< 2	106%	80%	120%	105%	80%	120%	113%	70%	130%
Dissolved Titanium	5146272 5146272	<5	<5	NA	< 2	109%	80%	120%	109%	80%	120%	113%	70%	130%
Dissolved Uranium	5146272 5146272	<0.3	<0.3	NA	< 0.1	106%	80%	120%	102%	80%	120%	110%	70%	130%
Dissolved Vanadium	5146272 5146272	<2	<2	NA	< 2	109%	80%	120%	102%	80%	120%	108%	70%	130%
Dissolved Zinc	5146272 5146272	<5	<5	NA	< 5	109%	80%	120%	105%	80%	120%	111%	70%	130%
Commente: If PDD value is NA the	regulta of the duplicator	o ara laga t	han Ev tha	PDI and	the BDD w	ill not bo	ooloula	tod						

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

AGAT QUALITY ASSU	RANCE REPORT (V1)										ŀ	Page 19) of 26
TSS, DOC, TDS Dissolved Organic Carbon	5145930	0.76	0.81	NA	< 0.5	103%	80%	120%	NA	80%	120%	107%	80%	120%
Comments: If RPD value is NA,	the results of the dupli	cates are less t	han 5x the	RDL and	the RPD w	ill not be	calcula	ited.						
Mercury Analysis in Water (D Dissolved Mercury	issolved) 5143293	<0.026	<0.026	NA	< 0.026	103%	80%	120%	NA	80%	120%	115%	70%	130%
Comments: If RPD value is NA,	the results of the dupli	cates are less t	han 5x the	RDL and	I the RPD w	ill not be	calcula	ited.						
Total Mercury	5140127	<0.026	<0.026	NA	< 0.026	103%	80%	120%	NA	80%	120%	115%	70%	130%
Mercury Analysis in Water (T	otal)													

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.



Quality Assurance

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 WORLD ENERGY GH2

AGAT WORK ORDER: 23K047728

ATTENTION TO: John Gale

SAMPLED BY:

SAMPLING SITE:

Water Analysis (Continued)

						•									
RPT Date: Jul 26, 2023				UPLICAT	E		REFEREN	ICE MA	TERIAL	METHOD	BLANK	SPIKE	МАТ	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	Lin	ptable nits	Recovery	Lin	ptable nits
		ld					Value	Lower	Upper		Lower	Upper		Lower	Upper
Total Suspended Solids	5148567		<5	<5	NA	< 5	100%	80%	120%	NA			98%	80%	120%
Total Dissolved Solids	5148559		176	180	2.2%	< 5	88%	80%	120%	NA			NA		

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Standard Water Analysis + Tota	al Metals													
Total Organic Carbon	5146025 5146025	4.7	4.8	1.9%	< 0.5	105%	80%	120%	NA	80%	120%	104%	80%	120%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Ortho Phosphate, Reactive Silica, Ammonia & Colour

Reactive Silica	5152708	10.8	11.3	4.7%	< 0.05	105%	90%	110%	108%	90%	110%	110%	80%	120%
Ammonia as N	5143342	<0.02	<0.02	NA	< 0.02	99%	70%	130%	100%	80%	120%	95%	70%	130%
True Colour	5152758	9.13	9.02	NA	< 2.5	100%	90%	110%						
Ortho Phosphate as P	5155113	<0.10	<0.10	NA	< 0.10	92%	70%	130%	99%	80%	120%	97%	70%	130%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

Ash Dus

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.

Certified By:

Page 20 of 26



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 WORLD ENERGY GH2

SAMPLING SITE:

AGAT WORK ORDER: 23K047728

ATTENTION TO: John Gale

SAMPLED BY:

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Benzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Toluene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Ethylbenzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Xylene (Total)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
C6-C10 (less BTEX)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
>C10-C16 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C16-C21 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C21-C32 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Modified TPH (Tier 1)	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION
Sediment			GC/MS/FID
Resemblance Comment	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
Return to Baseline at C32	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
lsobutylbenzene - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
lsobutylbenzene - VPH	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
n-Dotriacontane - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Chloromethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Vinyl Chloride	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Bromomethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Chloroethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Trichlorofluoromethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Acetone	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,1-Dichloroethylene	TO-0330	EPA SW-846 8260	GC/MS
Methylene Chloride	TO-0330	EPA SW-846 5030 & 8260	GC/MS
trans-1,2-Dichloroethylene	TO-0330	EPA SW-846 8260	GC/MS
1,1-Dichloroethane	TO-0330	EPA SW-846 8260	GC/MS
cis-1,2-Dichloroethylene	TO-0330	EPA SW-846 8260	GC/MS
Chloroform	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,2-Dichloroethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,1,1-Trichloroethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Carbon Tetrachloride	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Benzene	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,2-Dichloropropane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Trichloroethylene	TO-0330	EPA SW-846 8260	GC/MS
Bromodichloromethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
trans-1,3-Dichloropropene	TO-0330	EPA SW-846 5030 & 8260	GC/MS
cis-1,3-Dichloropropene	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,1,2-Trichloroethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Toluene	TO-0330	EPA SW-846 5030 & 8260	GC/MS



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS

PROJECT: 3168 WORLD ENERGY GH2

AGAT WORK ORDER: 23K047728 ATTENTION TO: John Gale

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
2-Hexanone	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Dibromochloromethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,2-Dibromoethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Tetrachloroethylene	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,1,1,2-Tetrachloroethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Chlorobenzene	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Ethylbenzene	TO-0330	EPA SW-846 5030 & 8260	GC/MS
m,p-Xylenes	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Bromoform	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Styrene	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,1,2,2-Tetrachloroethane	TO-0330	EPA SW-846 5030 & 8260	GC/MS
o-Xylene	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,3-Dichlorobenzene	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,4-Dichlorobenzene	TO-0330	EPA SW-846 5030 & 8260	GC/MS
1,2-Dichlorobenzene	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Xylenes	TO-0330	EPA SW-846 5030 & 8260	GC/MS
Toluene-d8	TO-0330	EPA SW-846 5030 & 8260	GC/MS



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 WORLD ENERGY GH2

AGAT WORK ORDER: 23K047728

ATTENTION TO: John Gale

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P		ANALYTICAL TECHNIQUE
Water Analysis			
Dissolved Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Antimony	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
Total Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
Reactive Silica	INOR-93-6070	modified from SM 4500-SIO2 F	LACHAT FIA



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 WORLD ENERGY GH2

AGAT WORK ORDER: 23K047728 ATTENTION TO: John Gale

CAMPLING OFF									
SAMPLING SITE:		SAMPLED BY:							
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE						
Ammonia as N	INOR-93-6059	modified from SM 4500-NH3 H	LACHAT FIA						
True Colour	INOR-93-6074	modified from SM 2120 B	LACHAT FIA						
Ortho Phosphate as P	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH						
pH	INOR-121-6001	SM 4500 H+B	PC TITRATE						
Chloride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH						
Fluoride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH						
Sulphate	INORG-121-6005 SM 4110 B		ION CHROMATOGRAPH						
Alkalinity	INOR-121-6001	SM 2320 B							
Turbidity	INOR-121-6001 SM 2130 B		PC TITRATE						
Electrical Conductivity	INOR-121-6001	SM 2510 B							
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION						
Nitrate as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH						
Nitrite as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH						
Ammonia as N	INOR-121-6047	SM 4500-NH3 H	COLORIMETER						
Total Organic Carbon	INOR-121-6026	SM 5310 B	TOC ANALYZER						
Total Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS						
Total Potassium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS						
Total Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS						
Total Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS						
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE						
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE						
Hydroxide	INORG-121-6001	SM 2320 B	PC-TITRATE						
Calculated TDS	CALCULATION	SM 1030E	CALCULATION						
Hardness	CALCULATION	SM 2340B	CALCULATION						
Langelier Index (@20C)	CALCULATION	CALCULATION	CALCULATION						
Langelier Index (@ 4C)	CALCULATION	CALCULATION	CALCULATION						
Saturation pH (@ 20C)	CALCULATION	CALCULATION	CALCULATION						
Saturation pH (@ 4C)	CALCULATION	CALCULATION	CALCULATION						
Anion Sum	CALCULATION	SM 1030E	CALCULATION						
Cation sum	CALCULATION	SM 1030E	CALCULATION						
% Difference/ Ion Balance	CALCULATION	SM 1030E	CALCULATION						
Total Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS						
Total Antimony	MET121-6104 & MET-121-6105	SM 3125	ICP-MS						
Total Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS						
Total Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS						
Total Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS						
Total Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS						
Total Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS						
Total Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS						
Total Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS						



Method Summary

CLIENT NAME: FRACFLOW CONSULTANTS PROJECT: 3168 WORLD ENERGY GH2

AGAT WORK ORDER: 23K047728

ATTENTION TO: John Gale

SAMPLING SITE:		SAMPLED BY:									
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE								
Total Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Phosphorous	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Total Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS								
Dissolved Organic Carbon	INOR-121-6026	SM 5310 B	TOC ANALYZER								
Total Suspended Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC								
Total Dissolved Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC								

eport Information	dy Record			tories webearth.a		labs.0							Ho	ld Ti		_		_		_		172	-	
			Report	Information (Please print):		_		-10						otes:										
Company: Fracflow Cons	sultants Inc. (NL)			John Gale (john_ffc@nfld.net)					Repo	ort i	Forn	nat			40	1	L2	cr so-	**	12-	- H	OL +	FILT	イン
Company: Fracflow Consultants Inc. (NL) Contact: John Gale			Email: Devin Northcott (devin_ffc@bellaliant.com)					Single Sample			Notes: 100 + UND +2 - THIS + DALS 40-1 HUCT +4 - HUL FULTER 100 H250 +2 - TOL + MAL													
Address: 154 Major's Pa			-						Multiple Sample			Turnaround Time Required (TAT)												
St. John's, NL				2. Name: Karen Andrews (karen_ffc@nfild.net)				-11	per page			Regular TAT 25 to 7 working days												
				Email: Chris Piercey (chris_ffc@bellaliant.com)					Excel Format			Rush TAT Same day 1 day												
	Tax. 700 Tex	3-5101		ory Requirements (Check):						noiue	160						2 da				days	•		
Client Project #: 3168 W	orid Energy GH2			lidelines on Report 🗌 Do not list	Guide	lines o	n Rep	ort	[E	Expor	t:										-	,		
AGAT Quotation: S/O Please Note: If quotation number is a	not provided client will be billed for	Il price for each		1 🗆 Res 🗔 Pot								_	Da	te Re	quire	d:		-	-					_
				2 □ Com I N/Pot		🗹 Coa		Ī	Drinkl	ng V	Vater	Sam	ole:		. 7	No	Sal	Wat	tor C	ampl				-
nvoice To	Same	Yes 🗹 / No	□ □ Gas						Reg. N			oun	NO ,		, L	NO	Jan	L VVCI	.61.96	ampro	9:	🗆 Yes	. 🗹	No
Company:			CCME	CDWO	-		T	T	T		T	T	T	T	-	T	T	T	-		- T		—	_
	s (karen_ffc@nfld.net)		— 🗌 🗆 Ind				gpie																	
ddress:	(internet)			nmercial HRM 101			LI Available						level	_							D ME	Ł		
			- Res	S Park Storm Water						Miss	ହ	lent)	Nol	atio							5	D		
Phone:			- 2 FW		ned	lysis	NISS IN		fine)	C FOC - Miss	s P2(RVBX	RI) E	action	×		6			kage	Ē	2		
Phone: PO/Credit Card#: 4286	Fax:		Sec	liment 🗌 Other	rese	r Ana			arse/	0	tala:	& He	N(PI	X Fra	/BTE	12	- Wis			t Pac		ž	&TSS	~
					red/I	Wate	lota		(CO	8	s (to	Ē	/BTB	I/BTE	Hait	E	625			imen	uran		00	ω/N
Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments - Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: 🗠 lotal		Grain Size (coarse/fine)	D TOC - Miss	Phosphates (total as P205)	Chromium (Tri & Hexavalent) Dhenols	Ter 1: TPH/BTEX (PIRI) IN IOW level	Ther 2: TPH/BTEX Fractionation	COME-OWS TPH/BTEX	VUC Dil & Greace (TDC)	BNAE EPA 625 - Miss	PAH	PCB	Marine Sediment Package	Dioxins & Furans	other: DOC	other: TDS	Hazardous (Y/N)
3168-NP02-WS2-230713	July 13, 2023 / 11:20	Water	11	Total Metals+Hg & Dissolved Metals+Hg	I			-	0		-	0 0		F	0	> 2		4	R	ž		- 8	-	Ť
168-NP02-WS1-230713	July 13, 2023 / 11:35	Water	16	Total Metals+Hg & Dissolved Metals+Hg	1			-	-	-	-	-	-	-	-		-	1	-	-	-		1	_
3168-AP01-WS1-230713	July 13, 2023 / 11:50	Water	11	Total Metals+Hg & Dissolved Metals+Hg	1		-	,	-		-	-	1	-	-	+	-	-	-	-	-	1	1	_
3168-NP01-WS1-230713	July 13, 2023 / 12:05	Water	19	Total Metals+Hg & Dissolved Metals+Hg	V			-	1		-	-	1	-		1	-	+	-	-		1	V	_
3168-NP01-WS2-230713	July 13, 2023 / 12:25	Water	11	Total Metals+Hg & Dissolved Metals+Hg	1		-	,				-	-	1	-	+		-	-	-		1	1	_
							1						-		-	-	-	-	-		+	1	1	-
													-			-	-	-	-			-	-	_
				Dissolved Metals+Mercury								F	1			-	-	-	12	-	+	-	-	-
				DOC, TDS all field filtered								1						1		-	-	-	-	-
																						-		-
					1													1				-		_
oles Relinquished By (Print Name):		There													1									_
	ng beek	Date/fit	417/23	Samples Received By (Print Name):		0				De	to/Time		-	1				T		-			<u></u>	-
	a reore	Ou	4112	12 00 14						11	1	1.14	11	1	Pink Co	py - C	lient		Par	ge 1		of 1		
plos Relinquished By (Sign):	A -	Date/Ti	140	Samples Received By (Sign):		1				125	tui	1	4/2	4.	ellow C	ane	ACAT	1.	1					

Date revised: January 2016

Project Nujio'qonik: Amendment to the Environmental Impact Statement

Appendix WRM42-A Water Usage for Industrial and Residential Users – Gull (Mine) Pond



Project Nujio'qonik: Amendment to the Environmental Impact Statement



Date		Davia			Average	e Usage	
From	То	Days	Start	Finish	Total	Gal/day	m³/day
	1 Feb 2017			656,774			
1 Feb 2017	12 Jul 2017	160.9	656,774	669,521	12,747	79.2	0.3
12 Jul 2017	15 Jan 2018	186.9	669,521	721,370	51,849	277.5	1.1
15 Jan 2018	16 Apr 2018	91.0	721,370	722,421	1,051	11.5	0.0
16 Apr 2018	16 Jul 2018	91.1	722,421	746,049	23,628	259.4	1.0
16 Jul 2018	28 Sep 2018	74.0	746,049	776,024	29,975	405.0	1.5
28 Sep 2018	10 Dec 2018	73.0	776,024	788,288	12,264	167.9	0.6
10 Dec 2018	1 Mar 2019	80.8	788,288	788,473	185	2.3	0.0
1 Mar 2019	23 Apr 2019	53.1	788,473	788,915	442	8.3	0.0
23 Apr 2019	4 Jul 2019	72.1	788,915	804,071	15,156	210.3	0.8
4 Jul 2019	24 Sep 2019	81.8	804,071	835,434	31,363	383.4	1.5
24 Sep 2019	14 Jan 2020	112.0	835,434	838,120	2,686	24.0	0.1
14 Jan 2020	6 Apr 2020	83.0	838,120	838,694	574	6.9	0.0
6 Apr 2020	30 Jun 2020	85.0	838,694	848,694	10,000	117.6	0.4
30 Jun 2020	9 Sep 2020	71.1	848,694	883,377	34,683	487.8	1.8
9 Sep 2020	11 Dec 2020	92.8	883,377	890,577	7,200	77.6	0.3
11 Dec 2020	5 Apr 2021	115.2	890,577	890,638	61	0.5	0.0
5 Apr 2021	30 Jun 2021	85.9	890,638	907,148	16,510	192.1	0.7
30 Jun 2021	4 Nov 2021	127.1	907,148	928,327	21,179	166.6	0.6
4 Nov 2021	28 Jun 2022	235.9	928,327	953,188	24,861	105.4	0.4
28 Jun 2022	29 Aug 2022	62.0	953,188	979,916	26,728	431.4	1.6

Table 4.1 Water usage for industrial and residential users, Gull (Mine) Pond, Stephenville, NL.