Memo

HAMMOND RIVER HOLDINGS

То:	Mike Cormier, P.Eng. – Director, Authorizations Branch, New Brunswick Department of Environment and Local Government
From:	Dan Guest, Hammond River Holdings Ltd.
Cc:	Paul Vanderlaan, P.Eng. – Director, Environmental Impact Assessment Branch, New Brunswick Department of Environment and Local Government
Date:	December 18, 2020
Subject:	Monthly Report – Upham East Gypsum Quarry, Surface Water Sampling –November 2020
Our File:	File # 18-8346

Introduction

This monthly report details activities associated with the operation of the Upham East Gypsum Quarry for the month of **November 2020**, in accordance with conditions of the Approval to Operate I-10936. As required by the Approval to Operate, surface water sampling of the watercourse that crosses the site and in the Hammond River began immediately. Refer to the December 2019, and January through October 2020 reports for previous water quality results.

Weekly compliance monitoring in November was conducted as per the following:

- Week 1: November 5, 2020;
- Week 2: November 13, 2020;
- Week 3: November 16, 2020;
- Week 4: November 27, 2020

In November there were two additional samples collected within a day of a heavy rain events where there was 25mm or more of rain over a 24-hour period. These samples were collected on November 3, 2020 and November 24, 2020.

Surface Water Sampling - Field Methods

Field parameters were measured using a calibrated turbidity meter and probe. Field parameters are temperature, conductivity and turbidity. These parameters were measured at three sampling locations as per the Environmental Management Plan (EMP) for Operation (Dillon 2020). All samples were submitted for lab analysis of total suspended solids (TSS).

Surface water samples were collected from three locations (Figure 1). They are as follows:

- PDP-1 was collected at the discharge point from the site, which is located before the confluence with the unnamed tributary to the Hammond River. This is the point of compliance;
- SW3 was the background sample. It was collected within the unnamed tributary approximately 100 m upstream from the PDP-1; and
- SW5 was collected within the unnamed tributary approximately 100m downstream from PDP-1

In addition, surface water samples were collected using laboratory supplied bottles. The bottles were rinsed three times in the watercourse and then submerged below the water surface. The samples were submitted to the Research Productivity Council (RPC) in Fredericton, NB. RPC is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for each of the laboratory analytical methods utilized and have in-house QA/QC programs to govern sample analysis and analytical data quality assurance.

Surface Water Sampling - Compliance Monitoring Results

Results of the surface water monitoring are provided in **Table 1**. Analytical certificates are attached. The monthly average of grab samples for TSS was calculated for each site, presented in **Table 2**. The monthly averages for TSS were all well below the site-specific guideline for each site laid out in the Approval to Operate.

A QA/QC program was implemented to evaluate whether the data collected was of suitable quality to characterize the surface water conditions observed. This program required the collection of field duplicates and the calculation of the relative percent difference (RPD). The calculation method and acceptance level of 40% are discussed in CCME (2016). Two duplicate samples were collected during the November water sampling program on November 3 and 13, 2020. The RPD results were 0%. (Table 3). Therefore, the data satisfies the quality objectives for the monitoring program.

Environmental Accidents and Malfunctions

During the November 2020 monitoring period there were no spills or environmental accidents on site.

Ambient Air Quality Monitoring – Total Suspended Particulate

Once the quarry moved into the operational stage, a 24-hour air sample had to be collected every 6 days in accordance with the National Air Pollution Surveillance (NAPS) schedule. The air quality monitor used to conduct the monitoring is a BGI PQ100 air sampler, a high-volume sampler for total suspended particulate matter. In November there were 5 air quality monitoring events, November 1, 7, 13, 19 and 25; the results are provided in **Table 4**. None of the air samples collected in November exceed the 120 μ g/m³ maximum permissible ground level concentration of total suspended particulate that is specified in Schedule B of the New Brunswick *Air Quality Regulation – Clean Air Act*.

Blasting

In November there were two blasts, the first occurred on November 5, 2020 and the second on November 18, 2020. There were no exceedances of Approval to Operate limits for maximum velocity and sound pressure. Blast reports are attached.

Public Complaints

Hammond River Holdings did not receive any public complaints during the November 2020 monitoring period.

Summary

The water chemistry at the discharge point into WC3 is comparable to background. Based on the results provided in **Table 1**, the gypsum extraction activities being conducted on site have not had a negative impact on WC3 and subsequently the Hammond River. All air quality monitoring and blast monitoring returned results below the guidelines for each.

References

Canadian Council of Ministers of the Environment (CCME). 2015. Canadian environmental quality guidelines. Available online at: <u>http://ceqg-rcqe.ccme.ca/en/index.html#void</u>

Canadian Council of Ministers of the Environment (CCME). 2016. Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment: Volume 1 Guidance Manual. Canadian environmental quality guidelines. ISBN 978-1-77202-026-7.

Dillon (Dillon Consulting Limited). 2020 Environmental Management Plan (EMP) for Operation. Upham East Gypsum Quarry Project, Upham New Brunswick. Prepared for Hammond River Holdings Limited by Dillon Consulting Limited, Fredericton, New Brunswick. Project 18-8346. June 2020.

New Brunswick Regulation 97-133, (1997). Clean Air Act, O.C 97-923.



HAMMOND RIVER HOLDINGS LIMITED PROPOSED UPHAM EAST GYPSUM QUARRY

SURFACE WATER SAMPLING LOCATIONS FIGURE 1

 PROJECT DEVELOPMENT A WATERBODY WATERCOURSE REGULATED WETLAND 30 METRE WETLAND/WATEF PROPOSED SITE FEATURES DITCH TRUCK SCALE (OPTIONAL) SITE AREAS DISCHARGE POINT SECURITY GATE PORTABLE TRAILER/OFFICE ACCESS ROAD STOCKPILE CROSS SECTION QUARRY BERM CONSTRUC AND OVERBURDEN (OFFSE FROM PROPERTY BOUNDAH MATCHING INDICATES MATE ON TOP OF STORAGE PAD 	RCOURSE BUFFER
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Figure 2: TSS Monthly Average

Notes:

The detection limit for TSS is 5 mg/L; for results <5 mg/L, half the detection limit was used. Monthly average is calculated based on results from the previous 30 days. Site specific guideline is 25 mg/L above the monthly average.

	Table 1								
Surface Water Monitoring									
Upham East Gypsum Project									
Upham, New Brunswick									
	Project No. 18-8346								
		Ambient Air	Precipitation 48 hours prior to						
Para	meter	Temperature ^a		Water	Specific	Turbidity	Total		
			sample collection ^o	Temperature	Conductivity		Suspended Solids ^c		
Ur	nits	°C	mm	°C	mS/cm	NTU	mg/L		
CCM	E PAL ^a			-	-	-	-		
Sample ID	Date								
SW3	3-Nov-20			3.80	0.236	1.78	<5		
SW13 (FD)	3-Nov-20	-1.30	27 30	3.80	0.236	1.78	<5		
PDP-1	3-Nov-20		27.50	3.80	0.305	1.95	<5		
SW5	3-Nov-20			3.70	0.321	1.49	<5		
SW3	5-Nov-20			5.30	0.415	0.21	<5		
PDP-1	5-Nov-20	11.10	1.10	5.40	0.441	1.21	<5		
SW5	5-Nov-20			5.40	0.465	1.92	<5		
SW3	13-Nov-20			6.70	0.529	0.27	<5		
PDP-1	13-Nov-20	5 50	0.00	6.50	0.627	0.20	<5		
SW5	13-Nov-20	5.50	0.00	6.40	0.637	0.79	<5		
SW15 (FD)	13-Nov-20			6.40	0.637	0.79	<5		
SW3	16-Nov-20			5.90	0.360	3.46	<5		
PDP-1	16-Nov-20	9.40	17.60	6.00	0.340	3.99	<5		
SW5	16-Nov-20			6.00	0.367	4.17	7		
SW3	24-Nov-20			4.70	0.129	6.64	<5		
PDP-1	24-Nov-20	0.10	40.60	4.60	0.163	6.94	5		
SW5	24-Nov-20			4.60	0.266	7.41	<5		
SW3	27-Nov-20			5.70	0.166	3.820	5		
PDP-1	27-Nov-20	10.60	Missing Data ^e	5.80	0.232	4.91	<5		
SW5	27-Nov-20			5.80	0.359	4.07	<5		

a) Temperature based on data from the climate station at the Saint John airport. Temperature is the value recorded at 12:00pm on the day

 $of \ sampling. \ Data \ available \ at: \ https://climate.weather.gc.ca/historical_data/search_historic_data_e.html$

b) Preciptitation based on data from the climate station at the Saint John airport. Data available at:

 $https://climate.weather.gc.ca/historical_data/search_historic_data_e.html$

c) Site specific guideline, TSS cannot exceed 25 mg/L above the background monthly average.

d) Canadian Council of Ministers of Environment (CCME) for the Protection of Aquatic Life.

e) Precipitation data from the government of Canada cliamte station in Saint John is missing

SW3 is the background sample for Watercourse 3.

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' - ' denotes no guideline, not analyzed, or not applicable; FD = field duplicate.

75 bold/shaded value denotes concentration exceeds CCME criteria or TSS background.

Table 2 Total Suspended Solids - Monthly Average Upham East Gypsum Project Upham, New Brunswick Project No. 18-8346						
Date	Site Specific Guideline	H1	H2	Monthly Average	SW5	PDP-1
4-Dec-19	27.5	-	-	2.5	2.5	2.5
11/Dec/19	30.3	6.0	14.0	5.3	2.5	4.8
15/Dec/19	29.3	8.0	9.5	4.3	2.5	5.5
19/Dec/19	28.9	6.2	7.2	3.9	2.5	4.8
3/lan/20	28.4	4.7	5.3	3.4	2.5	4.5
10/Jan/20	28.4	4.3	4.8	3.4	2.5	4.0
13/Jan/20	27.5	3.8	3.0	2.5	2.5	3.3
21/Jan/20	27.5	2.5	2.5	2.5	2.5	2.5
27/Jan/20	27.5	2.5	2.5	2.5	2.5	2.5
3/Feb/20	27.5	2.5	2.5	2.5	2.5	2.5
19/Feb/20	27.5	2.5	2.5	2.5	2.5	2.5
28/Feb/20	27.5	2.5	0.0	2.5	2.5	2.5
5/Mar/20	27.5	2.5	2.5	2.5	2.5	3.4
11/Mar/20	27.5	2.5	2.5	2.5	2.5	3.2
15/Mar/20 17/Mar/20	27.5	3.4	4.8	2.5	2.5	3.2
20/Mar/20	30.6	7.3	4.0	5.6	4.6	5.2
26/Mar/20	30.6	7.3	3.6	5.6	4.6	5.2
3/Apr/20	31.4	9.2	6.9	6.4	5.7	6.3
9/Apr/20	31.4	9.2	6.9	6.4	5.7	5.8
14/Apr/20	33.1	15.7	18.8	8.1	9.9	9.1
23/Apr/20	30.3	10.4	18.0	6.5 5.3	8.7	10.3
28/Apr/20	30.3	12.3	20.6	5.3	8.7	10.3
8/May/20	29.1	9.0	15.5	4.1	6.7	8.1
11/May/20	29.1	9.0	15.5	4.1	6.7	8.1
19/May/20	27.5	2.5	5.1	2.5	2.5	5.1
26/May/20 4/lun/20	27.5	2.5	5.1	2.5	2.5	2.5
4/Jun/20 8/Jun/20	27.5	2.5	2.5	2.5	2.5	2.5
12/Jun/20	27.5	2.5	2.5	2.5	2.5	2.5
16/Jun/20	27.5	2.5	2.5	2.5	2.5	2.5
24/Jun/20	27.5			2.5	2.5	2.5
30/Jun/20	27.5			2.5	2.5	2.5
10/Jul/20	27.5			2.5	2.5	2.5
13/Jul/20	27.9			5.0	2.5	2.5
21/Jul/20	27.9			2.5	2.5	7.0
23/Jul/20	27.8			2.5	2.5	2.5
29/Jul/20	28.3			6 3 4	5	2.5
14/Aug/20	31.7			6.7	3.5	3.4
17/Aug/20	32.4			7.4	5.4	3.3
26/Aug/20	33.4			8.4	6.0	2.5
31/Aug/20	32.7			7.7	5.5	2.5
4/Sep/20	31.8	25	2.5	6.8	5.0	2.5
15/Sep/20	28.9	2.5	2.5	0.8	4.0	2.5
22/Sep/20	27.5			2.5	2.5	2.5
23/Sep/20	27.5			2.5	2.5	2.5
29/Sep/20	27.9			2.9	4.6	3.4
30/Sep/20	27.8			2.8	4.3	3.3
14/Oct/20	27.9			2.5	2.5	2.5
22/Oct/20	27.9			2.5	2.5	2.5
28/Oct/20	27.9			2.5	2.5	2.5
3/Nov/20	27.5			2.5	2.5	2.5
5/Nov/20	27.5			2.5	2.5	2.5
13/Nov/20 16/Nov/20	27.5			2.5	2.5	2.5
24/Nov/20	27.5			2.5	2.5	5.0
27/Nov/20	27.9			5	2.5	2.5

Notes:

Dashed line indicates monthly average could not be calculated. Site specific guideline is 25 mg/l above the monthly average. Monthly average is calculated based on results from the previous 30 days. The background sample is SW3.

Samples above the site specific guideline are **bolded in red**.

Table 3 Surface Water Monitoring - QA/QC Results Upham East Gypsum Project Upham, New Brunswick Project No. 18-8346				
Paran	neter	Total Suspended Solids		
Uni	its	mg/L		
Sample ID	Date			
SW3	3-Nov-20	<5		
SW13	3-Nov-20	<5		
RPD value		0%		
SW5	13-Nov-20	<5		
SW15	13-Nov-20	<5		
RPD value		0%		
RPD calculations and acceptance criteria based on CCME (2016).				

' - ' denotes RPD could not be calculated because one or more parameters was below detection limit.

75 bold/shaded value denotes RPD above criteria of 40%.

	Table 4 Air Quality Reporting Upham East Gypsum Quarry										
Test Start	Time	Duration	Flow Rate (L/min)	Air Volume (m ³)	Pressure (mm Hg)	Temperature (°C)	Initial Filter Weight (g)	Final Filter Weight (g)	TSP Mass (µg)	TSP (µg/m ³)	Site Guideline (µg/m3)
11/1/2020	23:59	24 hours	17.19	24.75	732	5.9	14.8729	14.8802	7300	12.2896	120
11/7/2020	23:59	24 hours	17.84	25.68	759	5.9	14.8692	14.8723	3100	5.0299	120
11/13/2020	23:59	24 hours	17.79	25.62	748	1.9	14.86	14.8606	600	0.9758	120
11/19/2020	23:59	24 hours	17.63	25.22	756	7.3	14.8476	14.8498	2200	3.6347	120
11/25/2020	23:59	24 hours	17.83	25.68	756	4.4	14.8496	14.8563	6700	10.8710	120



Geotechnical and Materials Engineers

Saint John Moncton Fredericton Bedford 575 Crown Street Saint John New Brunswick E2L 5E9 Phone: 506 635-7565 Fax: 506 635-8866 www.conquest-eng.com

November 5, 2020

Project No.: 20S072.00

Mr. Daniel Guest Hammond River Holdings Via email: Guest.Daniel@AtlanticWallboard.com

Re: Blast Vibration Monitoring – Blast No. 2020-07 – Upham East Gypsum Quarry, Upham, N.B.

Following are the results of the vibration monitoring carried out on behalf of Hammond River Holdings for the blast detonated at 14:30 on November 5, 2020.

For the monitoring we positioned eleven (11) digital seismographs in the area. The location of each monitoring point is noted in the following table.

Seismograph Location	Time	Approx. dist. from shot to seismograph (m)	Maximum Velocity (mm/s)	Sound Pressure (dB(L))	Remarks
1. Civic No. 4079 Route 111 (PW-09)		1,309 m S	< 0.5 mm/s	< 120	
2. Civic No. 4126 Route 111 (PW-10)		887 m S	< 0.5 mm/s	< 120	
3. Civic No. 4150 Route 111 (PW-13)		722 m S	< 0.5 mm/s	< 120	Units were not triggered
4. Civic No. 2447 Route 820 (PW-07)		975 m NE	< 0.5 mm/s	< 120	
5. PW-03 - Route 820		668 m N	< 0.5 mm/s	< 120	
6. Civic No. 2341 Route 820 (PW-05)	14:30	677 m NW	0.76 mm/s @ 51 Hz	112	-
7. Civic No. 50 Myron Road (PW-15)		906 m NW	< 0.5 mm/s	< 120	Unit was not triggered
8. Civic No. 86 Myron Road (PW-16)		782 m W	0.70 mm/s @ 22 Hz	100	-
9. Civic No. 220 Myron Road (PW-01)		1,302 m S	< 0.5 mm/s	< 120	
10. Civic No. 4140 Route 111 (PW-12)		809 m S	< 0.5 mm/s	< 120	Units were not triggered
10. Civic No. 2337 Route 820 (PW-04)		750 m NW	< 0.5 mm/s	< 120	
maximum limits as per App	oroval to	Operate	12.5 mm/s	128 dB	

Blast No. 2020-10 - November 5, 2020

The monitors did not detect any vibrations that exceeded the maximum allowable peak particle velocity of 12.5 mm/s (1.25 cm/s) or the maximum air overpressure of 128 dB(L) as established in the Approval to Operate (I-10936).

We trust this information is sufficient at this time. If you have any questions, please do not hesitate to contact us.

Best regards, **CONQUEST ENGINEERING LTD.**

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Robert Y. Cyr, M.A.Sc., P.Eng. Senior Geotechnical Engineer

Attachments: Blast Record Blast and Seismograph Location Plan Event Reports



Geotechnical and Materials Engineers

BLAST RECORD

Project Name:	Upham Gypsum Quarry	Date of Blast:	Nov. 5, 2020
Project No.:	20S072.00	Time of Blast:	14:30
Inspector:	K. Harris	Blast No.:	2020-10
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Gulf Operators Ltd.					
Blaster's Certification No.:	1318	_ Blaster's Name:	Daniel Blanchard			
Blast Location:	N 45°28'52.2" E 6	55°38'01.7"				
Type of Rock:	Gypsum	_ Est. Vol. or Tonnage:	14,784 tonnes			
Weather at time of Blast:	Overcast	_ Air Temp.:	12°C			
Est. Wind Speed :	≈ 30 km/h	Wind Direction:	SSW			
Cloud Cover:	Overcast	Precipitation:	No			

BLAST DESIGN:

Total No. Holes:	122	Hole Diameter:	4.5"
Average Depth:	3.6 m to 7.2 m	Spacing:	10 ft x 10 ft
No. Holes per Delay:	4	_ Collar Length:	8 ft
Delay between Holes:	25 ms	_ Delay between Rows:	42, 59 & 84 ms
Initiation Method:	Non-electric		
Weight of Explosives per Delay: Type and weight of Explosives for Blast:	Max.: 250 kg 5,083 kg Titan XI	_1000	

Sketch of shot location, hole layout, timing sequence, free face etc. if available.



Geotechnical and Materials Engineers

BLAST RECORD

Project Name:	Upham Gypsum Quarry	Date of Blast:	Nov. 5, 2020			
Project No.:	20\$072.00	Time of Blast:	14:30			
Inspector:	K. Harris	Blast No.:	2020-10			
Client:	Hammond River Holdings					
BLAST MONITORING						
Distance to the N	loonost Structures		669 m			

Distance to the Nearest Structure:	668 m
Direction to the Nearest Structure:	North
Structure Type:	House
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	42.2

SAFETY:

Type of Warning Signal Used:	Air horn
Blasting Mats Used (yes or no):	No
Airblast Measurement (yes or no):	Yes
Vibration Measurement (yes or no):	Yes
Warning Signs Posted (yes or no):	Yes
Accesses Guarded (yes or no):	Yes
Flyrock Damage (yes or no):	No
If Yes, Describe:	
Misfire (yes or no):	No

Reviewed By: Robert Y. Cyr, M.A.Sc., P.Eng.



Geotechnical and Materials Engineers

BLAST RECORD

Project Name:	Upham Gypsum Quarry	Date of Blast:	Nov. 5, 2020
Project No.:	20\$072.00	Time of Blast:	14:30
Inspector:	K. Harris	Blast No.:	2020-10
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5632
Calibration Date:	October 22, 2020
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1,309 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Make, Model and Serial # of unit:
Calibration Date:
Location of seismograph:
Distance and Direction from Blast:
Transverse Particle Velocity:
Vertical Particle Velocity:
Longitudinal Particle Velocity:
Peak Particle Velocity:
Maximum Airblast:

Instantel Mini Mate, Serial # 5676
February 26, 2020
Civic Number 4126 Route 111 (PW-10)
887 m South
<0.5 mm/s – Unit was not triggered
<0.5 mm/s – Unit was not triggered
<0.5 mm/s – Unit was not triggered
 N/A
<120 dB(L) – Unit was not triggered



Geotechnical and Materials Engineers

BLAST RECORD

Project Name:	Upham Gypsum Quarry	Date of Blast:	Nov. 5, 2020
Project No.:	20\$072.00	Time of Blast:	14:30
Inspector:	K. Harris	Blast No.:	2020-10
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Instantel Mini Mate, Serial #5673
February 28, 2020
Civic Number 4150 Route 111 (PW-13)
722 m South
<0.5 mm/s – Unit was not triggered
<0.5 mm/s – Unit was not triggered
<0.5 mm/s – Unit was not triggered
N/A
<120 dB(L) – Unit was not triggered

Make, Model and Serial # of unit:
Calibration Date:
Location of seismograph:
Distance and Direction from Blast:
Transverse Particle Velocity:
Vertical Particle Velocity:
Longitudinal Particle Velocity:
Peak Particle Velocity:
Maximum Airblast:

Instantel Mini Mate, Serial # 21349
June 12, 2020
Civic Number 2447 Route 820 (PW-07)
975 m Northeast
<0.5 mm/s – Unit was not triggered
<0.5 mm/s – Unit was not triggered
<0.5 mm/s – Unit was not triggered
N/A
<120 dB(L) – Unit was not triggered



Geotechnical and Materials Engineers

BLAST RECORD

Project Name:	Upham Gypsum Quarry	Date of Blast:	Nov. 5, 2020
Project No.:	20\$072.00	Time of Blast:	14:30
Inspector:	K. Harris	Blast No.:	2020-10
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial # 5960
Calibration Date:	May 15, 2020
Location of seismograph:	PW-03 - Route 820
Distance and Direction from Blast:	668 m North
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5371
Calibration Date:	June 24, 2020
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	677 m Northwest
Transverse Particle Velocity:	0.64 mm/s @ 73 Hz
Vertical Particle Velocity:	0.76 mm/s @ 51 Hz
Longitudinal Particle Velocity:	0.76 mm/s @ 73 Hz
Peak Particle Velocity:	0.76 mm/s @ 51 Hz
Maximum Airblast:	112 dB(L)
	~ /



Geotechnical and Materials Engineers

BLAST RECORD

Project Name:	Upham Gypsum Quarry	Date of Blast:	Nov. 5, 2020
Project No.:	20\$072.00	Time of Blast:	14:30
Inspector:	K. Harris	Blast No.:	2020-10
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial # 5487
Calibration Date:	March 26, 2020
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	906 m Northwest
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Make, Model and Serial # of unit:
Calibration Date:
Location of seismograph:
Distance and Direction from Blast:
Transverse Particle Velocity:
Vertical Particle Velocity:
Longitudinal Particle Velocity:
Peak Particle Velocity:
Maximum Airblast:

Instantel Mini Mate, Serial # 5489
May 15, 2020
Civic Number 86 Myron Road (PW-16)
782 m West
0.70 mm/s @ 22 Hz
0.52 mm/s @ 28 Hz
0.70 mm/s @ 43 Hz
0.70 mm/s @ 22 Hz
100 dB(L)



Geotechnical and Materials Engineers

BLAST RECORD

Project Name:	Upham Gypsum Quarry	Date of Blast:	Nov. 5, 2020
Project No.:	20\$072.00	Time of Blast:	14:30
Inspector:	K. Harris	Blast No.:	2020-10
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial # 5372
Calibration Date:	June 24, 2020
Location of seismograph:	Civic Number 220 Myron Road (PW-01)
Distance and Direction from Blast:	1,302 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Make, Model and Serial # of unit:	Instantel Mi
Calibration Date:	March 26, 20
Location of seismograph:	Civic Numb
Distance and Direction from Blast:	809 m Sout
Transverse Particle Velocity:	<0.5 mm/s –
Vertical Particle Velocity:	<0.5 mm/s –
Longitudinal Particle Velocity:	<0.5 mm/s –
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L)

Instantel Mini Mate, Serial # 5635
March 26, 2020
Civic Number 4140 Route 111 (PW-12)
809 m South
<0.5 mm/s – Unit was not triggered
<0.5 mm/s – Unit was not triggered
<0.5 mm/s – Unit was not triggered
N/A
<120 dB(L) – Unit was not triggered



Geotechnical and Materials Engineers

BLAST RECORD

Project Name:	Upham Gypsum Quarry	Date of Blast:	Nov. 5, 2020
Project No.:	20\$072.00	Time of Blast:	14:30
Inspector:	K. Harris	Blast No.:	2020-10
Client:	Hammond River Holdings		

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial # 21348
Calibration Date:	June 12, 2020
Location of seismograph:	Civic No. 2337 Route 820 (PW-04)
Distance and Direction from Blast:	750 m Northwest
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered





Date/Time Long at 14:30:24 November 5, 2020 Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L) Geo: 127.0 mm/s Range **Record Time** 7.0 sec at 1024 sps

Notes

MicL

Long

Vert

Tran

Location: Client: User Name: Converted: November 5, 2020 17:09:14 (V8.01)

Microphone Linear Weighting 112.0 dB(L) 8.000 pa.(L) at 1.909 sec PSPL **ZC Freq** 8.0 Hz Channel Test Passed (Freq = 20.0 Hz Amp = 302 mv)

	Tran	Vert	Long	
PPV	0.635	0.762	0.762	mm
ZC Freq	43	51	73	Hz
Time (Rel. to Trig)	0.056	0.345	0.131	sec
Peak Acceleration	0.027	0.027	0.033	g
Peak Displacement	0.003	0.002	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	7.8	8.3	Hz
Overswing Ratio	3.5	3.6	3.6	

Peak Vector Sum 0.857 mm/s at 0.132 sec

Serial Number 5371 V 2.61 MiniMate **Battery Level** 6.1 Volts Unit Calibration June 24, 2020 by Instantel **File Name** G371IPJE.YO0 **Post Event Notes** Location of Seismograph: Civic Number 2341 Route 820 (PW-05) Blast No.: 2020-10 CEL Project No.: 20S072.00

USBM RI8507 And OSMRE



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div Trigger = >



Velocity (mm/s)

 Date/Time
 Long at 14:30:16 November 5, 2020

 Trigger Source
 Geo: 0.492 mm/s, Mic: 119.6 dB(L)

 Range
 Geo: 127.0 mm/s

 Record Time
 7.0 sec at 1024 sps

Notes

Location: Client: User Name: Converted: November 5, 2020 17:23:40 (V8.01)

 Microphone
 Linear Weighting

 PSPL
 100.0 dB(L) 2.000 pa.(L) at 1.936 sec

 ZC Freq
 7.0 Hz

 Channel Test
 Passed (Freq = 20.0 Hz Amp = 270 mv)

	Tran	Vert	Long	
PPV	0.699	0.572	0.699	mm/s
ZC Freq	22	28	43	Hz
Time (Rel. to Trig)	0.864	0.356	0.275	sec
Peak Acceleration	0.020	0.020	0.027	g
Peak Displacement	0.005	0.002	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.7	7.7	Hz
Overswing Ratio	4.0	4.0	4.2	

Peak Vector Sum 0.794 mm/s at 0.411 sec

Serial Number5489 V 2.61 MiniMateBattery Level6.1 VoltsUnit CalibrationMay 15, 2020 by InstantelFile NameG489IPJE.YG0Post Event NotesLocation of Seismograph: Civic Number 86 Myron Road (PW-16)Blast No.: 2020-10CEL Project No.: 20S072.00





Printed: November 5, 2020 (V 10.74)

Trigger = >

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Geotechnical and Materials Engineers

Saint John Moncton Fredericton Bedford 575 Crown Street Saint John New Brunswick E2L 5E9 Phone: 506 635-7565 Fax: 506 635-8866 www.conquest-eng.com

November 18, 2020

Project No.: 20S072.00

Mr. Daniel Guest Hammond River Holdings Via email: Guest.Daniel@AtlanticWallboard.com

Re: Blast Vibration Monitoring – Blast No. 2020-11 – Upham East Gypsum Quarry, Upham, N.B.

Following are the results of the vibration monitoring carried out on behalf of Hammond River Holdings for the blast detonated at 14:01 on November 18, 2020.

For the monitoring we positioned five (5) digital seismographs in the area. The location of each monitoring point is noted in the following table.

Seismograph Location	Time	Approx. dist. from shot to seismograph (m)	Maximum Velocity (mm/s)	Sound Pressure (dB(L))	Remarks
1. Civic No. 4140 Route 111 (PW-12)		821 m SE	0.63 mm/s @ 47 Hz	117	-
2. Civic No. 4126 Route 111 (PW-10)		870 m SE	< 0.5 mm/s	< 120	Unit was not triggered
3. Civic No. 86 Myron Road (PW-16)	14:01	772 m S	2.16 mm/s @ 43 Hz	116	-
4. Civic No. 2341 Route 820 (PW-05)		683 m NW	0.76 mm/s @ 51 Hz	113	-
5. Civic No. 2447 Route 820 (PW-07)		929 m NE	< 0.5 mm/s	< 120	Unit was not triggered
maximum limits as per Approval to Operate			12.5 mm/s	128 dB	

Blast No. 2020-11 – November 18, 2020

The monitors did not detect any vibrations that exceeded the maximum allowable peak particle velocity of 12.5 mm/s (1.25 cm/s) or the maximum air overpressure of 128 dB(L) as established in the Approval to Operate (I-10936).

We trust this information is sufficient at this time. If you have any questions, please do not hesitate to contact us.

Best regards, **CONQUEST ENGINEERING LTD.**

K lout & 7

Robert Y. Cyr, M.A.Sc., P.Eng. Senior Geotechnical Engineer

Attachments: Blast Record Blast and Seismograph Location Plan Event Reports



Geotechnical and Materials Engineers

BLAST RECORD

Project Name:	Upham Gypsum Quarry	Date of Blast:	Nov. 18, 2020
Project No.:	20S072.00	Time of Blast:	14:01
Inspector:	K. Harris	Blast No.:	2020-11
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Gulf Operators Ltd.			
Blaster's Certification No.:	1318	_ Blaster's Name:	Daniel Blanchard	
Blast Location:	N 45°28'51.97" E	65°38'02.00"		
Type of Rock:	Gypsum	_ Est. Vol. or Tonnage:	17,962 tonnes	
Weather at time of Blast:	Partly cloudy	_ Air Temp.:	-1°C	
Est. Wind Speed :	$\approx 25 \text{ km/h}$	Wind Direction:	NW	
Cloud Cover:	Partially	Precipitation:	No	

BLAST DESIGN:

Total No. Holes:	85	Hole Diameter:	5.5"
Average Depth:	5.3 m to 7.6 m	Spacing:	12 ft x 12 ft
No. Holes per Delay:	2	Collar Length:	8 ft
Delay between Holes:	25 ms	_ Delay between Rows:	59 & 84 ms
Initiation Method:	Non-electric		
Weight of Explosives per Delay: Type and weight of Explosives for Blast:	Max.: 214 kg 6,550 kg Titan XI	_1000	

Sketch of shot location, hole layout, timing sequence, free face etc. if available.



Geotechnical and Materials Engineers

BLAST RECORD

Project Name:	Upham Gypsum Quarry	Date of Blast:	Nov. 18, 2020
Project No.:	20\$072.00	Time of Blast:	14:01
Inspector:	K. Harris	Blast No.:	2020-11
Client:	Hammond River Holdings		
BLAST MONITORING			
Distance to the N	earest Structure:		683 m
Direction to the Nearest Structure:			Northwest

 Structure Type:
 House

 Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):
 46.7

SAFETY:

Type of Warning Signal Used:	Siren
Blasting Mats Used (yes or no):	No
Airblast Measurement (yes or no):	Yes
Vibration Measurement (yes or no):	Yes
Warning Signs Posted (yes or no):	Yes
Accesses Guarded (yes or no):	Yes
Flyrock Damage (yes or no):	No
If Yes, Describe:	
Misfira (vas ar na).	No
	110

Reviewed By: Robert Y. Cyr, M.A.Sc., P.Eng.



Geotechnical and Materials Engineers

BLAST RECORD

Project Name:	Upham Gypsum Quarry	Date of Blast:	Nov. 18, 2020
Project No.:	20\$072.00	Time of Blast:	14:01
Inspector:	K. Harris	Blast No.:	2020-11
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21349
Calibration Date:	June 12, 2020
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	821 m Southeast
Transverse Particle Velocity:	0.51 mm/s @ 57 Hz
Vertical Particle Velocity:	0.64 mm/s @ 47 Hz
Longitudinal Particle Velocity:	0.64 mm/s @ 47 Hz
Peak Particle Velocity:	0.64 mm/s @ 47 Hz
Maximum Airblast:	117 dB(L)

Make, Model and Serial # of unit:
Calibration Date:
Location of seismograph:
Distance and Direction from Blast:
Transverse Particle Velocity:
Vertical Particle Velocity:
Longitudinal Particle Velocity:
Peak Particle Velocity:
Maximum Airblast:

Instantel Mini Mate, Serial # 5632
October 22, 2020
Civic Number 4126 Route 111 (PW-10)
870 m Southeast
<0.5 mm/s – Unit was not triggered
<0.5 mm/s – Unit was not triggered
<0.5 mm/s – Unit was not triggered
N/A
<120 dB(L) – Unit was not triggered



Geotechnical and Materials Engineers

BLAST RECORD

Project Name:	Upham Gypsum Quarry	Date of Blast:	Nov. 18, 2020
Project No.:	20\$072.00	Time of Blast:	14:01
Inspector:	K. Harris	Blast No.:	2020-11
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5673
Calibration Date:	February 28, 2020
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	772 m West
Transverse Particle Velocity:	2.16 mm/s @ 43 Hz
Vertical Particle Velocity:	1.46 mm/s @ 37 Hz
Longitudinal Particle Velocity:	1.91 mm/s @ 30 Hz
Peak Particle Velocity:	2.16 mm/s @ 43 Hz
Maximum Airblast:	116 dB(L)

Make, Model and Serial # of unit:
Calibration Date:
Location of seismograph:
Distance and Direction from Blast:
Transverse Particle Velocity:
Vertical Particle Velocity:
Longitudinal Particle Velocity:
Peak Particle Velocity:
Maximum Airblast:

Instantel Mini Mate, Serial # 21348
June 12, 2020
Civic Number 2341 Route 820 (PW-05)
683 m Northwest
0.51 mm/s @ 85 Hz
0.64 mm/s @ 64 Hz
0.76 mm/s @ 51 Hz
0.76 mm/s @ 51 Hz
113 dB(L)



Geotechnical and Materials Engineers

BLAST RECORD

Project Name:	Upham Gypsum Quarry	Date of Blast:	Nov. 18, 2020
Project No.:	20\$072.00	Time of Blast:	14:01
Inspector:	K. Harris	Blast No.:	2020-11
Client:	Hammond River Holdings		

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial # 5372
Calibration Date:	June 24, 2020
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	929 m Northeast
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Blast and Seismograph Location Plan Blast No: 2020-11 Upham East Gypsum Quarry, Upham, NB



Date: November 18, 2020 CEL Project No.: 20S072.00



Saint John Moncton Fredericton Bedford

Geotechnical and Materials Engineers



 Date/Time
 Vert at 14:01:24 November 18, 2020

 Trigger Source
 Geo: 0.510 mm/s, Mic: 124.0 dB(L)

 Range
 Geo: 254.0 mm/s

 Record Time
 3.75 sec (Auto=3Sec) at 1024 sps

Notes

Serial NumberBE21349 V 10.72-1.1 Minimate BlasterBattery Level6.1 VoltsUnit CalibrationJune 12, 2020 by InstantelFile NameW349IQ5L.MC0Post Event NotesLocation of Seismograph: Civic Number 4140 Route 111 (PW-12)Blast No.: 2020-11CEL Project No.: 20S072.00





Printed: November 18, 2020 (V 10.74)



Velocity (mm/s)

 Date/Time
 Vert at 14:01:25 November 18, 2020

 Trigger Source
 Geo: 0.492 mm/s, Mic: 123.5 dB(L)

 Range
 Geo: 127.0 mm/s

 Record Time
 7.0 sec at 1024 sps

Notes

Location: Client: User Name: Converted: November 18, 2020 15:53:02 (V8.01)

Extended Notes

Microphone	Linear Weighting
PSPL	115.6 dB(L) 12.00 pa.(L) at 2.424 sec
ZC Freq	2.0 Hz
Channel Test	Passed (Freq = 20.0 Hz Amp = 305 mv)

	Tran	Vert	Long	
PPV	2.159	1.461	1.905	mm/s
ZC Freq	43	37	30	Hz
Time (Rel. to Trig)	0.344	0.376	0.401	sec
Peak Acceleration	0.073	0.053	0.066	g
Peak Displacement	0.013	0.006	0.010	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.2	7.8	8.0	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 2.270 mm/s at 0.402 sec

Serial Number5673 V 2.61 MiniMateBattery Level6.3 VoltsUnit CalibrationFebruary 28, 2020 by InstantelFile NameG673IQ7G.AD0Post Event NotesLocation of Seismograph: Civic Number 86 Myron Road (PW-16)Blast No.: 2020-11CEL Project No.: 20S072.00

USBM RI8507 And OSMRE 254 + + + + + + 200-100-50 20 10 2 10 100 > 20 50 Frequency (Hz) Tran: + Vert: x Long: ø



Printed: November 18, 2020 (V 10.74)

Trigger = >



 Date/Time
 Vert at 14:01:23 November 18, 2020

 Trigger Source
 Geo: 0.510 mm/s, Mic: 124.0 dB(L)

 Range
 Geo: 254.0 mm/s

 Record Time
 7.75 sec (Auto=7Sec) at 1024 sps

Notes

Serial NumberBE21348 V 10.72-1.1 Minimate BlasterBattery Level6.2 VoltsUnit CalibrationJune 12, 2020 by InstantelFile NameW348IQ5L.MB0Post Event NotesLocation of Seismograph: Civic Number 2341 Route 820 (PW-05)Blast No.: 2020-11CEL Project No.: 20S072.00

USBM RI8507 And OSMRE



Printed: November 18, 2020 (V 10.74)

Report ID:374974-IASReport Date:19-Nov-20Date Received:10-Nov-20

CERTIFICATE OF ANALYSIS

for Hammond River Holdings Limited 30 Jervis Lane Saint John, NB E2J 0A9



921 College Hill Rd Fredericton NB Canada E3B 6Z9 Tel: 506.452.1212 Fax: 506.452.0594 www.rpc.ca

Attention: Justin Ferguson

Project #: 17-5121

Location: Upham Analysis of Water

RPC Sample ID:			374974-1	374974-2	374974-3	374974-4
Client Sample ID:		SW3	SW13	PDP-1	SW5	
Date Sampled:			3-Nov-20	3-Nov-20	3-Nov-20	3-Nov-20
Analytes	Units	RL				
Solids - Total Suspended	mg/L	5	< 5	< 5	< 5	< 5

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit

Peter Crowhurst, B.Sc., C.Chem. Director Inorganic Analytical Chemistry Brannen Burba

Brannen Burhoe Supervisor Inorganic Analytical Services

WATER CHEMISTRY Page 1 of 2 Report ID:374974-IASReport Date:19-Nov-20Date Received:10-Nov-20

CERTIFICATE OF ANALYSIS

for Hammond River Holdings Limited 30 Jervis Lane Saint John, NB E2J 0A9



921 College Hill Rd Fredericton NB Canada E3B 6Z9 Tel: 506.452.1212 Fax: 506.452.0594 www.rpc.ca

Methods

Analyte

RPC SOP #

Method Reference

Solids - Total Suspended 4.M05

APHA 2540 D

Filtration, Gravimetry

Method Principle

Report ID:374967-IASReport Date:19-Nov-20Date Received:10-Nov-20

CERTIFICATE OF ANALYSIS

for Hammond River Holdings Limited 30 Jervis Lane Saint John, NB E2J 0A9



921 College Hill Rd Fredericton NB Canada E3B 6Z9 Tel: 506.452.1212 Fax: 506.452.0594 www.rpc.ca

Attention: Justin Ferguson **Project #: 17-5121**

Location: Upham Analysis of Water

RPC Sample ID:			374967-1	374967-2	374967-3
Client Sample ID:			SW3	SW5	PDP-1
Date Sampled:			5-Nov-20	5-Nov-20	5-Nov-20
Analytes	Units	RL			
Solids - Total Suspended	mg/L	5	< 5	< 5	< 5

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit

Peter Crowhurst, B.Sc., C.Chem. Director Inorganic Analytical Chemistry

Brannen Bute

Brannen Burhoe Supervisor Inorganic Analytical Services

WATER CHEMISTRY Page 1 of 2 Report ID:374967-IASReport Date:19-Nov-20Date Received:10-Nov-20

CERTIFICATE OF ANALYSIS

for Hammond River Holdings Limited 30 Jervis Lane Saint John, NB E2J 0A9



921 College Hill Rd Fredericton NB Canada E3B 6Z9 Tel: 506.452.1212 Fax: 506.452.0594 www.rpc.ca

Methods

Analyte

Solids - Total Suspended

RPC SOP #

Method Reference

4.M05

APHA 2540 D

Filtration, Gravimetry

Method Principle

Report ID:376255-IASReport Date:01-Dec-20Date Received:19-Nov-20

CERTIFICATE OF ANALYSIS

for Hammond River Holdings Limited 30 Jervis Lane Saint John, NB E2J 0A9



921 College Hill Rd Fredericton NB Canada E3B 6Z9 Tel: 506.452.1212 Fax: 506.452.0594 www.rpc.ca

Attention: Justin Ferguson

Project #: 17-5121

Location: Upham Analysis of Water

RPC Sample ID:			376255-1	376255-2	376255-3	376255-4
Client Sample ID:			SW3	SW5	SW15	PDP-1
Date Sampled:			13-Nov-20	13-Nov-20	13-Nov-20	13-Nov-20
Analytes	Units	RL				
Solids - Total Suspended	mg/L	5	< 5	< 5	< 5	< 5

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit

Peter Crowhurst, B.Sc., C.Chem. Director Inorganic Analytical Chemistry Brannen Burba

Brannen Burhoe Supervisor Inorganic Analytical Services

WATER CHEMISTRY Page 1 of 2 Report ID:376255-IASReport Date:01-Dec-20Date Received:19-Nov-20

CERTIFICATE OF ANALYSIS

for Hammond River Holdings Limited 30 Jervis Lane Saint John, NB E2J 0A9



921 College Hill Rd Fredericton NB Canada E3B 6Z9 Tel: 506.452.1212 Fax: 506.452.0594 www.rpc.ca

Methods

Analyte

RPC SOP #

Method Reference

Method Principle

Solids - Total Suspended 4.M05

APHA 2540 D

Filtration, Gravimetry

Report ID:376263-IASReport Date:01-Dec-20Date Received:19-Nov-20

CERTIFICATE OF ANALYSIS

for Hammond River Holdings Limited 30 Jervis Lane Saint John, NB E2J 0A9



921 College Hill Rd Fredericton NB Canada E3B 6Z9 Tel: 506.452.1212 Fax: 506.452.0594 www.rpc.ca

Attention: Justin Ferguson **Project #: 17-5121**

Location: Upham Analysis of Water

RPC Sample ID:			376263-1	376263-2	376263-3
Client Sample ID:			SW3	PDP-1	SW5
Date Sampled:			16-Nov-20	16-Nov-20	16-Nov-20
Analytes	Units	RL			
Solids - Total Suspended	mg/L	5	< 5	< 5	7

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit

Peter Crowhurst, B.Sc., C.Chem. Director Inorganic Analytical Chemistry

Brannen Bute

Brannen Burhoe Supervisor Inorganic Analytical Services

WATER CHEMISTRY Page 1 of 2 Report ID:376263-IASReport Date:01-Dec-20Date Received:19-Nov-20

CERTIFICATE OF ANALYSIS

for Hammond River Holdings Limited 30 Jervis Lane Saint John, NB E2J 0A9



921 College Hill Rd Fredericton NB Canada E3B 6Z9 Tel: 506.452.1212 Fax: 506.452.0594 www.rpc.ca

Methods

<u>Analyte</u>

RPC SOP #

Method Reference

Method Principle

Solids - Total Suspended 4.M05

APHA 2540 D

Filtration, Gravimetry

Report ID:377805-IASReport Date:11-Dec-20Date Received:02-Dec-20

CERTIFICATE OF ANALYSIS

for Hammond River Holdings Limited 30 Jervis Lane Saint John, NB E2J 0A9



921 College Hill Rd Fredericton NB Canada E3B 6Z9 Tel: 506.452.1212 Fax: 506.452.0594 www.rpc.ca

Attention: Justin Ferguson **Project #: 17-5121**

Location: Upham Analysis of Water

RPC Sample ID:			377805-1	377805-2	377805-3
Client Sample ID:			SW3	SW5	PDP-1
Date Sampled:			24-Nov-20	24-Nov-20	24-Nov-20
Analytes	Units	RL			
Solids - Total Suspended	mg/L	5	< 5	< 5	5

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit

Peter Crowhurst, B.Sc., C.Chem. Director Inorganic Analytical Chemistry

Brannen Bute

Brannen Burhoe Supervisor Inorganic Analytical Services

WATER CHEMISTRY Page 1 of 2 Report ID:377805-IASReport Date:11-Dec-20Date Received:02-Dec-20

CERTIFICATE OF ANALYSIS

for Hammond River Holdings Limited 30 Jervis Lane Saint John, NB E2J 0A9



921 College Hill Rd Fredericton NB Canada E3B 6Z9 Tel: 506.452.1212 Fax: 506.452.0594 www.rpc.ca

Methods

Analyte

RPC SOP #

Method Reference

Method Principle

Solids - Total Suspended 4.M05

APHA 2540 D

Filtration, Gravimetry

Report ID:377810-IASReport Date:11-Dec-20Date Received:02-Dec-20

CERTIFICATE OF ANALYSIS

for Hammond River Holdings Limited 30 Jervis Lane Saint John, NB E2J 0A9



921 College Hill Rd Fredericton NB Canada E3B 6Z9 Tel: 506.452.1212 Fax: 506.452.0594 www.rpc.ca

Attention: Justin Ferguson					
Project #: 17-5121					
Location: Upham					
Analysis of Water					
RPC Sample ID:			377810-1	377810-2	377810-3
Client Sample ID:			SW3	SW5	PDP-1
Date Sampled:			27-Nov-20	27-Nov-20	27-Nov-20
Analytes	Units	RL			
Solids - Total Suspended	mg/L	5	5	< 5	< 5

This report relates only to the sample(s) and information provided to the laboratory.

RL = Reporting Limit

Peter Crowhurst, B.Sc., C.Chem. Director Inorganic Analytical Chemistry

Brannen Burba

Brannen Burhoe Supervisor Inorganic Analytical Services

WATER CHEMISTRY Page 1 of 2 Report ID:377810-IASReport Date:11-Dec-20Date Received:02-Dec-20

CERTIFICATE OF ANALYSIS

for Hammond River Holdings Limited 30 Jervis Lane Saint John, NB E2J 0A9



921 College Hill Rd Fredericton NB Canada E3B 6Z9 Tel: 506.452.1212 Fax: 506.452.0594 www.rpc.ca

Methods

Analyte

RPC SOP #

Method Reference

Method Principle

Solids - Total Suspended 4.M05

APHA 2540 D

Filtration, Gravimetry