Memo

HAMMOND RIVER
HOLDINGS

To:	Mike Cormier, P.Eng. – Director, Authorizations Branch, New Brunswick Department of Environment and Local Government
From:	Daniel Guest, Hammond River Holdings Ltd.
Cc:	Justin Chase – Environmental Impact Assessment Branch, New Brunswick Department of Environment and Local Government
Date:	June 28, 2022
Subject:	Monthly Monitoring Report – Upham East Gypsum Quarry – May 2022
Our File:	File # 21-3049

Introduction

This monthly report details activities associated with the operation of the Upham East Gypsum Quarry for the month of May 2022, in accordance with conditions of the Approval to Operate I-10936. Activities included surface water monitoring, air monitoring, and blasting. Details of environmental malfunctions and public complaints are also provided. For previous monthly activities, refer to the monthly reports provided from December 2019 through April 2022.

Weekly compliance surface water monitoring in May was conducted as per the following:

- Week 1: May 7, 2022
- Week 2: May 13, 2022
- Week 3: May 18, 2022
- Week 4: May 27, 2022

There was no additional sampling events conducted in May 2022 due to a heavy rain event, defined as more than 25 mm of rain over a 24-hour period.

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;
- SW5 was collected within the unnamed tributary approximately 100m downstream from PDP-1

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.

Compliance Monitoring Results

Results of the surface water compliance 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 below the site-specific guideline for each site laid out in the Approval to Operate, displayed in Figure 2.

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). One duplicate samples was collected during the May water sampling program. The RPD result for the field duplicated could not be calculated due to both results being below the laboratory detection limit. Therefore, the data satisfies the quality objectives for the monitoring program.

Environmental Accidents and Malfunctions

There were no reported environmental accidents or malfunctions during the May 2022 monitoring period.

Ambient Air Quality Monitoring – Total Suspended Particulate

24-hour air samples are 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 May there were 5 air quality monitoring events, May 1, 7, 13, 19, 25, and 31 2022. The results are provided in Table 3. There were no exceedances of the 120 $\mu g/m^3$ 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

Four blasts occurred during the May 2022 monitoring period: May 11, May 13, May 24, and May 31 2022. There were no exceedances of the Approval to Operate limits for maximum velocity and sound pressure for both blasting events. Blast reports are attached.

Public Complaints

There was one complaint during the May 2022 monitoring period. A resident made a complaint on May 24, 2022 regarding dust coming from the site. Additional water was used to suppress the dust, which seems to have alleviated the issue.

Summary

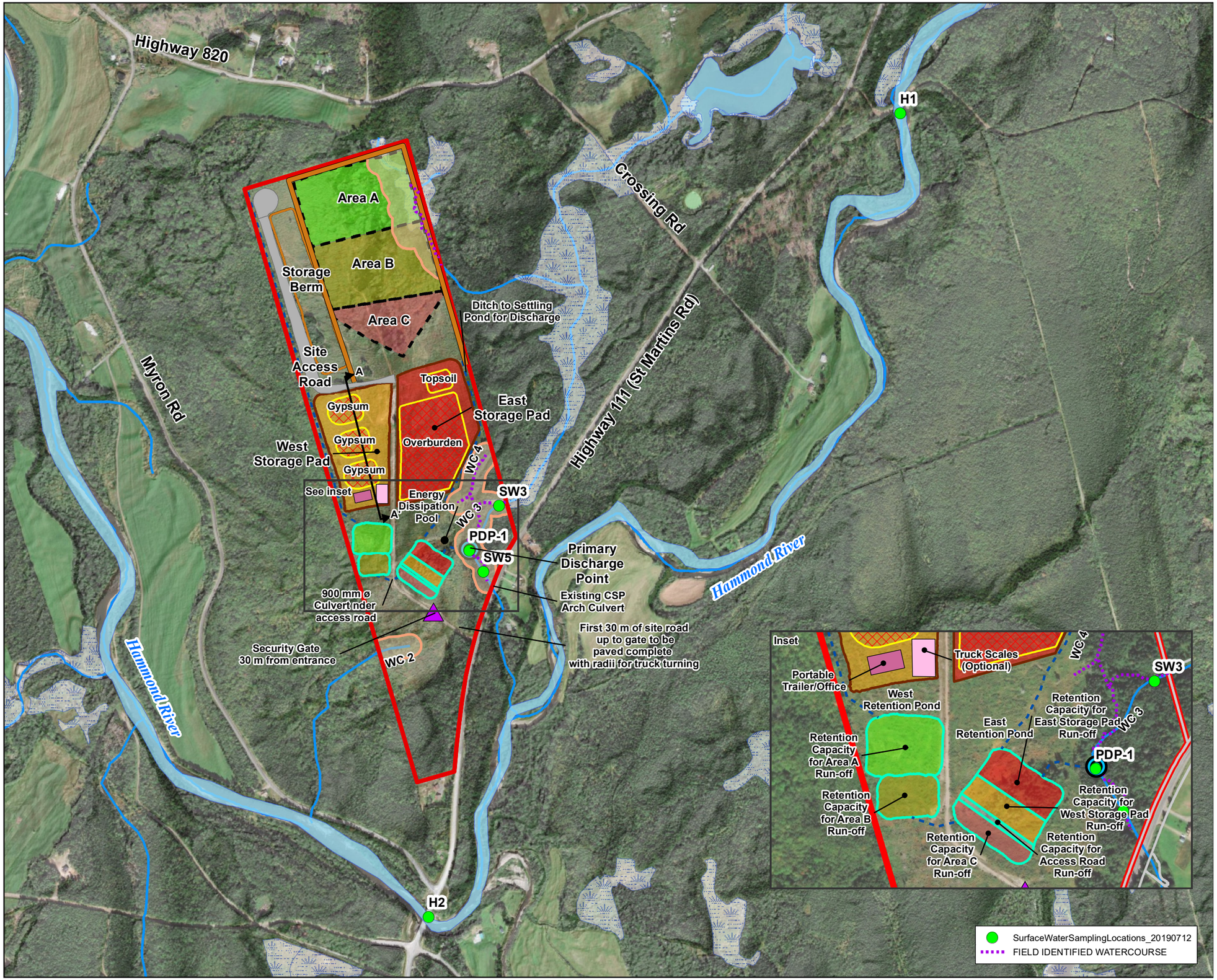
Since extraction activities began in July 2020 at the Upham East Gypsum Quarry, the water chemistry at the discharge point into the unnamed tributary has remained comparable to background, air quality monitoring has remained below guidelines, and decibel levels have remained below guidelines for blasting.

References

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

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.



HAMMOND RIVER HOLDINGS LIMITED
PROPOSED UPHAM EAST GYPSUM QUARRY

SURFACE WATER SAMPLING LOCATIONS
FIGURE 1

- PROPERTY BOUNDARY
- PROJECT DEVELOPMENT AREA
- WATERBODY
- WATERCOURSE
- REGULATED WETLAND
- 30 METRE WETLAND/WATERCOURSE BUFFER

PROPOSED SITE FEATURES

- DITCH
- TRUCK SCALE (OPTIONAL)
- SITE AREAS
- DISCHARGE POINT
- SECURITY GATE
- PORTABLE TRAILER/OFFICE
- ACCESS ROAD
- STORAGE PAD
- STOCKPILE
- RETENTION POND
- CROSS SECTION
- QUARRY BERM CONSTRUCTED FROM TOPSOIL AND OVERBURDEN (OFFSET MINIMUM 7m FROM PROPERTY BOUNDARY)
- HATCHING INDICATES MATERIAL STOCKPILE AREA ON TOP OF STORAGE PAD

0 50 100 200 m

SCALE 1:8,500

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY DILLON CONSULTING LIMITED, CANVEC
SERVICE LAYER CREDITS: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), SWISS TOPO, OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

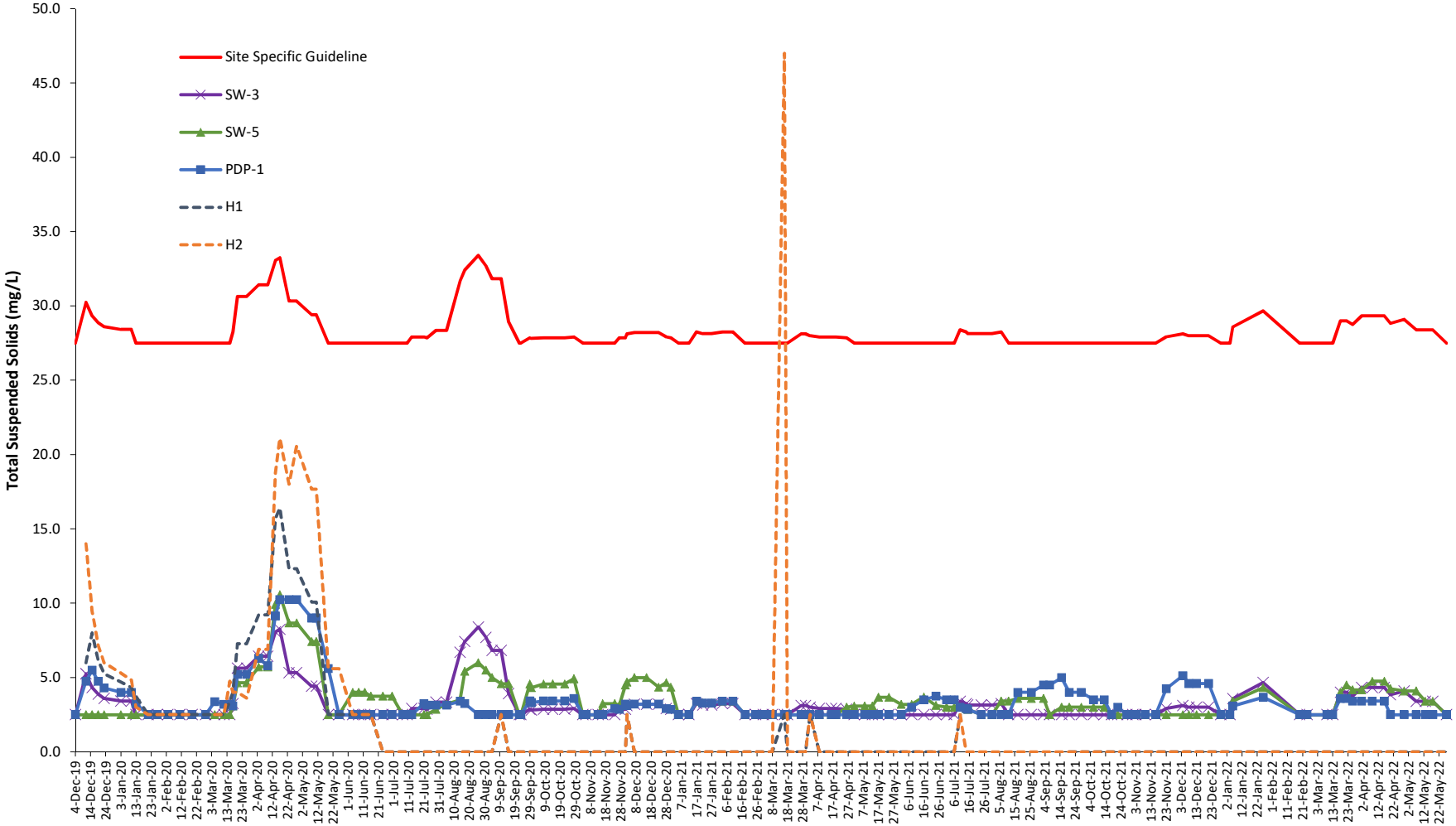
MAP CREATED BY: JH
MAP REVISED BY: JO
MAP CHECKED BY: GA
MAP PROJECTION: NAD_1983_CSRS_NEW_BRUNSWICK_STEREOGRAPHIC

FILE LOCATION: \\DILLON.CA\DILLON_DFS\FREDERICTON\FREDERICTON CAD\CAD\GIS\188346 UPHAM GYPSUM QUARRY\MXD

DILLON CONSULTING

PROJECT: 18-8346
STATUS: DRAFT
DATE: 2020/01/06

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. 21-3049

Parameter		Ambient Air Temperature[a]	Precipitation 48 hours prior to sample collection[b]	Water Temperature	Specific Conductivity	Turbidity	Total Suspended Solids[c]
Units		°C	mm	°C	mS/cm	NTU	mg/L
Sample ID	**Date**						
SW3	7-May-22	7	1.4	8.2	474	1.73	<5
PDP-1	7-May-22			7.4	528	0.54	<5
SW5	7-May-22			7.4	534	1.29	<5
SW3	13-May-22	17.5	0.0	16.1	616	0.71	<5
PDP-1	13-May-22			14.5	702	0.04	<5
PDP-1 (FD)	13-May-22			14.3	721	0.49	<5
SW5	13-May-22			14.6	713	0.12	<5
SW3	18-May-22	9.7	19.1	12.6	418	1.37	<5
PDP-1	18-May-22			11.4	495	0.80	<5
SW5	18-May-22			11.3	503	1.20	<5
SW3	27-May-22	12.2	4.1	14.3	832	0.84	<5
PDP-1	27-May-22			14.2	882	0.51	<5
SW5	27-May-22			13.8	893	0.36	<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.

SW3 is the background sample for Watercourse 3.

Table 2
Total Suspended Solids - Monthly Average
Upham East Gypsum Project
Upham, New Brunswick
Project No. 21-3049

Date	Site Specific Guideline	Monthly Average				
		H1	H2	SW3	PDP-1	SW5
04-Dec-19	27.5	-	-	2.5	43803.0	2.5
11-Dec-19	30.3	6.0	14.0	5.3	43810.0	2.5
15-Dec-19	29.3	8.0	9.5	4.3	43814.0	2.5
19-Dec-19	28.9	6.2	7.2	3.9	43818.0	2.5
23-Dec-20	28.6	5.3	6.0	3.6	43822.0	2.5
03-Jan-20	28.4	4.7	5.3	3.4	43833.0	2.5
10-Jan-20	28.4	4.3	4.8	3.4	43840.0	2.5
13-Jan-20	27.5	3.8	3.0	2.5	43843.0	2.5
21-Jan-20	27.5	2.5	2.5	2.5	43851.0	2.5
27-Jan-20	27.5	2.5	2.5	2.5	43857.0	2.5
03-Feb-20	27.5	2.5	2.5	2.5	43864.0	2.5
11-Feb-20	27.5	2.5	2.5	2.5	43872.0	2.5
19-Feb-20	27.5	2.5	2.5	2.5	43880.0	2.5
28-Feb-20	27.5	2.5	0.0	2.5	43889.0	2.5
05-Mar-20	27.5	2.5	2.5	2.5	43895.0	2.5
11-Mar-20	27.5	2.5	2.5	2.5	43901.0	2.5
15-Mar-20	27.5	3.4	4.8	2.5	43905.0	2.5
17-Mar-20	28.3	4.0	4.0	3.3	43907.0	3.1
20-Mar-20	30.6	7.3	4.0	5.6	43910.0	4.6
26-Mar-20	30.6	7.3	3.6	5.6	43916.0	4.6
03-Apr-20	31.4	9.2	6.9	6.4	43924.0	5.7
09-Apr-20	31.4	9.2	6.9	6.4	43930.0	5.7
14-Apr-20	33.1	15.7	18.8	8.1	43935.0	9.9
17-Apr-20	33.3	16.4	21.1	8.3	43938.0	10.6
23-Apr-20	30.3	12.3	18.0	5.3	43944.0	8.7
28-Apr-20	30.3	12.3	20.6	5.3	10.3	8.7
08-May-20	29.1	9.0	15.5	4.1	8.1	6.7
11-May-20	29.1	9.0	15.5	4.1	8.1	6.7
19-May-20	27.5	2.5	5.1	2.5	5.1	2.5
26-May-20	27.5	2.5	5.1	2.5	2.5	2.5
04-Jun-20	27.5	2.5	2.5	2.5	2.5	10.0
08-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
07-Jul-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	7.0	2.5
23-Jul-20	27.8	-	-	2.5	2.5	2.5
29-Jul-20	28.3	-	-	6	2.5	5
05-Aug-20	28.4	-	-	3.4	3.1	3.2
14-Aug-20	31.7	-	-	6.7	3.4	3.5
17-Aug-20	32.4	-	-	7.4	3.3	5.4
26-Aug-20	33.4	-	-	8.4	2.5	6.0
31-Aug-20	32.7	-	-	7.7	2.5	5.5
04-Sep-20	31.8	-	-	6.8	2.5	5.0
10-Sep-20	31.8	2.5	2.5	6.8	2.5	4.6
15-Sep-20	28.9	-	-	3.9	2.5	4.6
22-Sep-20	27.5	-	-	2.5	2.5	2.5

Table 2
Total Suspended Solids - Monthly Average
Upham East Gypsum Project
Upham, New Brunswick
Project No. 21-3049

Date	Site Specific Guideline	Monthly Average				
		H1	H2	SW3	PDP-1	SW5
23-Sep-20	27.5	-	-	2.5	2.5	2.5
29-Sep-20	27.9	-	-	2.9	3.4	4.6
30-Sep-20	27.8	-	-	2.8	3.3	4.3
08-Oct-20	27.9	-	-	2.5	2.5	2.5
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
03-Nov-20	27.5	-	-	2.5	2.5	2.5
05-Nov-20	27.5	-	-	2.5	2.5	2.5
13-Nov-20	27.5	-	-	2.5	2.5	2.5
16-Nov-20	27.5	-	-	2.5	2.5	7.0
24-Nov-20	27.5	-	-	2.5	5.0	2.5
27-Nov-20	27.9	-	-	5	2.5	2.5
01-Dec-20	27.9	-	-	2.9	3.2	4.5
02-Dec-20	28.1	2.5	2.5	3.1	3.1	4.7
07-Dec-20	28.2	-	-	3.2	3.2	5.0
15-Dec-20	28.2	-	-	3.2	3.2	5.0
23-Dec-20	28.2	-	-	3.2	3.2	4.4
28-Dec-20	27.9	-	-	2.9	2.9	4.7
31-Dec-20	27.9	-	-	2.9	2.9	4.4
05-Jan-21	27.5	-	-	2.5	2.5	2.5
12-Jan-21	27.5	-	-	2.5	2.5	2.5
17-Jan-21	28.3	-	-	3.3	3.4	3.4
21-Jan-21	28.1	-	-	3.1	3.3	3.3
27-Jan-21	28.1	-	-	3.1	3.3	3.3
03-Feb-21	28.3	-	-	3.3	3.4	3.4
10-Feb-21	28.3	-	-	3.3	3.4	3.4
18-Feb-21	27.5	-	-	2.5	2.5	2.5
25-Feb-21	27.5	-	-	2.5	2.5	2.5
02-Mar-21	27.5	-	-	2.5	2.5	2.5
08-Mar-21	27.5	-	-	2.5	2.5	2.5
16-Mar-21	27.5	-	-	2.5	2.5	2.5
18-Mar-21	27.5	2.5	-	2.5	-	2.5
26-Mar-21	27.5	-	**47.0**	-	2.5	-
27-Mar-21	28.1	-	-	3.1	2.5	2.5
30-Mar-21	28.1	-	-	3.1	2.5	2.5
02-Apr-21	28.0	-	-	3.0	2.5	2.5
08-Apr-21	27.9	-	-	2.9	2.5	2.5
16-Apr-21	27.9	-	-	2.9	2.5	2.5
19-Apr-21	27.9	-	-	2.9	2.5	2.5
26-Apr-21	27.9	-	-	2.9	2.5	3.0
01-May-21	27.5	-	-	2.5	2.5	3.1
08-May-21	27.5	-	-	2.5	2.5	3.1
13-May-21	27.5	-	-	2.5	2.5	3.1
17-May-21	27.5	-	-	2.5	2.5	3.7
24-May-21	27.5	-	-	2.5	2.5	3.7
01-Jun-21	27.5	-	-	2.5	2.5	3.2
08-Jun-21	27.5	-	-	2.5	3.0	3.2
16-Jun-21	27.5	-	-	2.5	3.5	3.7
24-Jun-21	27.5	-	-	2.5	3.8	3.1

Table 2
Total Suspended Solids - Monthly Average
Upham East Gypsum Project
Upham, New Brunswick
Project No. 21-3049

Date	Site Specific Guideline	Monthly Average				
		H1	H2	SW3	PDP-1	SW5
01-Jul-21	27.5	-	-	2.5	3.5	3.0
06-Jul-21	27.5	-	-	2.5	3.5	3.0
10-Jul-21	28.4	-	-	3.4	3.0	3.0
14-Jul-21	28.3	-	-	3.3	2.9	2.9
15-Jul-21	28.1	-	-	3.1	2.9	2.9
24-Jul-21	28.1	-	-	3.1	2.5	2.5
31-Jul-21	28.1	-	-	3.1	2.5	2.5
6-Aug-21	28.3	-	-	3.3	2.5	2.5
11-Aug-21	27.5	-	-	2.5	2.5	2.5
17-Aug-21	27.5	-	-	2.5	4.0	10.0
26-Aug-21	27.5	-	-	2.5	4.0	2.5
3-Sep-21	27.5	-	-	2.5	4.5	5.0
7-Sep-21	27.5	-	-	2.5	4.5	2.5
15-Sep-21	27.5	-	-	2.5	5.0	5.0
20-Sep-21	27.5	-	-	2.5	4.0	5.0
28-Sep-21	27.5	-	-	2.5	4.0	2.5
6-Oct-21	27.5	-	-	2.5	3.5	2.5
13-Oct-21	27.5	2.5	2.5	2.5	3.5	2.5
18-Oct-21	27.5	-	-	2.5	3.0	2.5
22-Oct-21	27.5	-	-	2.5	2.5	2.5
28-Oct-21	27.5	-	-	2.5	2.5	2.5
01-Nov-21	27.5	-	-	2.5	2.5	2.5
03-Nov-21	27.5	-	-	2.5	2.5	2.5
09-Nov-21	27.5	-	-	2.5	2.5	2.5
16-Nov-21	27.5	-	-	2.5	2.5	2.5
23-Nov-21	27.9	-	-	2.9	4.3	2.5
4-Dec-21	28.1	-	-	3.1	5.1	2.5
8-Dec-21	28.0	-	-	3.0	4.6	2.5
13-Dec-21	28.0	-	-	3.0	4.6	2.5
21-Dec-21	28.0	-	-	3.0	4.6	2.5
29-Dec-21	27.5	-	-	2.5	2.5	2.5
4-Jan-22	27.5	-	-	2.5	2.5	2.5
6-Jan-22	28.6	-	-	9.0	6.0	8.0
26-Jan-22	29.7	2.5	2.5	-	-	-
19-Feb-22	27.5	-	-	2.5	2.5	2.5
24-Feb-22	27.5	-	-	2.5	2.5	2.5
9-Mar-22	27.5	-	-	2.5	2.5	2.5
13-Mar-22	27.5	-	-	2.5	2.5	2.5
18-Mar-22	29.0	-	-	4.0	4.0	3.6
22-Mar-22	29.0	-	-	4.0	4.5	3.6
26-Mar-22	28.8	-	-	3.8	4.2	3.4
1-Apr-22	29.3	-	-	4.3	3.4	4.2
8-Apr-22	29.3	-	-	4.3	3.4	4.8
16-Apr-22	29.3	-	-	4.3	3.4	4.8
20-Apr-22	28.8	-	-	3.8	2.5	4.3
29-Apr-22	29.1	-	-	4.1	2.5	4.1
7-May-22	28.4	-	-	2.5	2.5	2.5
13-May-22	28.4	-	-	2.5	2.5	2.5
18-May-22	28.4	-	-	2.5	2.5	2.5
27-May-22	27.5	-	-	2.5	2.5	2.5

Notes:
The detection limit for TSS is 5 mg/L; for results <5 mg/L, half the detection limit was used.
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
Air Quality Reporting
Upham East Gypsum Quarry
Upham, New Brunswick
Proejct No. 21-3049

Test Start	Duration	Flow Rate	Air Volume	Pressure	Temperature	Initial Filter Weight	Final Filter Weight	TSP Mass	TSP	Site Guideline
		(L/min)	(m^3)	(mm Hg)	(°C)	(g)	(g)	(µg)	(µg/m3)	(µg/m^3)
2020-07-22	24 hours	16.7	24.05	752	20.3	14.842	14.865	23000	39.85	120
2020-07-28	24 hours	16.46	23.7	747	24.4	14.826	14.828	1700	2.99	120
2020-08-04	24 hours	16.66	23.99	753	22.8	14.826	14.830	3100	5.38	120
2020-08-09	24 hours	16.74	24.1	752	21.2	14.842	14.844	2200	3.80	120
2020-08-15	24 hours	16.88	24.3	754	19.8	14.824	14.836	11600	19.89	120
2020-08-21	24 hours	16.87	24.3	749	17.9	14.839	14.842	2100	3.60	120
2020-08-27	24 hours	17.06	24.57	743	12.4	14.823	14.845	21700	36.80	120
2020-09-02	24 hours	16.75	24.12	747	18.8	14.842	14.861	19700	34.03	120
2020-09-08	24 hours	17.02	24.51	759	19.1	14.859	14.871	12100	20.57	120
2020-09-14	24 hours	17.62	25.37	756	8	14.828	14.837	9300	15.27	120
2020-09-20	24 hours	18.03	25.97	764	4.8	14.835	14.852	17100	27.44	120
2020-09-26	24 hours	17.1	24.62	753	15.3	14.856	14.859	3300	5.59	120
2020-10-02	24 hours	14.43	25.1	753	9.6	14.972	14.959	-12800	-21.25	120
2020-10-08	24 hours	17.69	25.48	748	3.8	14.861	14.889	28800	47.10	120
2020-10-14	24 hours	17.56	25.29	753	7.8	14.883	14.891	8300	13.68	120
2020-10-20	19:31	17.63	20.66	760	9.1	14.875	14.858	-17100	-34.49	120
2020-10-23	21:55	17.34	22.82	750	10.1	14.859	14.865	5600	11.20	120
2020-10-26	21:02	17.71	22.35	752	4.8	14.854	14.864	10100	21.52	120
2020-11-01	24 hours	17.19	24.75	732	5.9	14.873	14.880	7300	12.29	120
2020-11-07	24 hours	17.84	25.68	759	5.9	14.869	14.872	3100	5.03	120
2020-11-13	24 hours	17.79	25.62	748	1.9	14.860	14.861	600	0.98	120
2020-11-19	24 hours	17.63	25.22	756	7.3	14.848	14.850	2200	3.64	120
2020-11-25	24 hours	17.83	25.68	756	4.4	14.850	14.856	6700	10.87	120
2020-12-01	24 hours	17.48	25.18	748	7	14.843	14.861	18300	30.28	120
2020-12-07	24 hours	17.88	25.75	740	-2.1	14.834	14.836	1900	3.07	120
2020-12-13	24 hours	17.98	25.9	746	-1.3	14.831	14.839	8300	13.35	120
2020-12-19	24 hours	18.37	26.45	756	-3.6	14.837	14.843	5700	8.98	120
2020-12-25	24 hours	17.34[a]	22.82[a]	753[a]	12.3[a]	14.840	14.850	10000	18.26	120
2020-12-31	24 hours	18.58	26.76	759	-5.8	14.845	14.850	4800	7.47	120
2021-01-06	24 hours	18	24.73	744	-2.7	14.836	14.852	16300	27.46	120
2021-01-12	24 hours	16.7	24.74	749	-6.7	14.854	14.872	18200	30.65	120
2021-01-18	24 hours	17.52	25.52	737	-0.8	14.868	14.877	8600	14.04	120
2021-01-24	24 hours	16.7	24.03	737	-8	14.823	14.827	4200	7.28	120
2021-01-30	24 hours	16.7	24.03	750	-11.2	14.829	14.833	3600	6.24	120
2021-02-05	24 hours	17.9	25.8	744	-0.9	14.850	14.866	15800	25.52	120
2021-02-11	24 hours	16.7	24.05	750	-12.6	14.829	14.834	5300	9.18	120
2021-02-17	24 hours	16.7	24.05	755	-9.9	14.818	14.821	2800	4.85	120
2021-02-23	24 hours	17.7	25.49	737	-0.6	14.891	14.897	6000	9.81	120
2021-03-01	24 hours	17.87	25.74	741	-1.6	14.858	14.866	7700	12.46	120
2021-03-07	24 hours	16.7	24.05	753	-8.9	14.840	14.851	11800	20.44	120
2021-03-13	24 hours	17.92	25.81	743	-1.3	14.828	14.835	6900	11.14	120
2021-03-19	24 hours	16.7	24.05	750	-5.3	14.819	14.823	4600	7.97	120
2021-03-25	24 hours	17.52	24.23	754	8.9	14.820	14.826	6100	10.49	120
2021-03-31	24 hours	16.7	24.05	756	6.8	14.823	14.831	8600	14.90	120

Table 3
Air Quality Reporting
Upham East Gypsum Quarry
Upham, New Brunswick
Proejct No. 21-3049

Test Start	Duration	Flow Rate	Air Volume	Pressure	Temperature	Initial Filter Weight	Final Filter Weight	TSP Mass	TSP	Site Guideline
		(L/min)	(m^3)	(mm Hg)	(°C)	(g)	(g)	(µg)	(µg/m3)	(µg/m^3)
2021-04-06	24 hours	16.7	24.05	746	4.1	14.822	14.835	13400	23.22	120
2021-04-12	24 hours	17.64	25.55	749	5.2	14.812	14.817	5100	8.32	120
2021-04-18	24 hours	16.7	24.05	742	2.6	14.815	14.825	10000	17.33	120
2021-04-24	24 hours	17.27	24.05	743	8.8	14.815	14.826	10400	18.02	120
2021-04-30	24 hours	17.24	24.82	735	6.4	14.814	14.921	107000	11.75	120
2021-05-06[b]	21.08	17.42	21.08	750	8.8	14.840	14.850	10100	19.96	120
2021-05-12[b]	-	17.49	25.19	748	7.1	14.822	14.830	7800	12.90	120
2021-05-18[b]	19.21	17.53	20.35	757	9.8	14.830	14.838	8700	17.81	120
2021-05-27[c]	-	-	-	-	-	-	-	-	-	120
2021-05-31	24 hours	16.7	24.05	753	14.2	14.829	14.835	5800	10.05	120
2021-06-04	33.46	16.79	34.02	746	18.1	14.831	14.839	7900	9.68	120
2021-06-10	24 hours	17.42	25.09	754	10.4	14.840	14.844	4300	7.14	120
2021-06-16	24 hours	17.48	25.18	743	5.6	14.849	14.854	5600	9.27	120
2021-06-22[d]	24 hours	17.23	24.82	744	9.7	14.870	14.879	9100	15.28	120
2021-06-24	24 hours	17.94	25.83	762	5.4	14.846	14.847	1200	1.94	120
2021-06-30	24 hours	17.01	24.29	746	14.4	14.885	14.889	4200	7.20	120
2021-07-06	24 hours	17.3	24.91	746	9.3	14.866	14.868	1700	2.84	120
2021-07-12	24 hours	17.6	24.05	759	9.5	14.848	14.851	3000	5.20	120
2021-07-18	24 hours	16.7	24.05	753	11.8	14.847	14.852	5200	9.01	120
2021-07-24	24 hours	17.51	25.21	753	8.8	14.831	14.838	6900	11.40	120
2021-07-30	24 hours	17.43	25.1	742	5.6	14.830	14.840	10000	16.60	120
2021-08-05	24 hours	17.47	25.15	755	10	14.821	14.835	13900	23.03	120
2021-08-10	24 hours	17.21	24.78	753	13.5	14.822	14.830	8100	13.62	120
2021-08-11	24 hours	17.18	23.42	752	13.6	14.878	14.890	12000	21.35	120
2021-08-17	24 hours	17.43	24.05	756	11.2	14.825	14.836	10200	17.67	120
2021-08-23	24 hours	17.19	24.75	750	12.4	14.844	14.859	14500	24.41	120
2021-08-29	24 hours	17.49	25.18	755	9.8	14.824	14.830	6100	10.09	120
2021-09-04	24 hours	16.7	24.05	745	3.1	14.822	14.832	10600	18.36	120
2021-09-09	24 hours	17.15	24.7	747	11.9	14.818	14.824	5600	9.45	120
2021-09-16	24 hours	18.05	24.05	759	2.7	14.844	14.859	15700	27.20	120
2021-09-22	24 hours	18.68	25.46	757	7.4	14.821	14.832	11700	19.15	120
2021-09-28	24 hours	17.45	25.13	746	7.2	14.821	14.830	9100	15.09	120
2021-10-04	24 hours	18.3	26.35	755	-2.6	14.820	14.824	3700	5.85	120
2021-10-10	24 hours	17.98	25.89	757	2.7	14.818	14.823	5000	8.05	120
2021-10-16	24 hours	17.16	24.7	747	12.1	14.815	14.822	6600	11.13	120
2021-10-22	24 hours	17.1	24.63	747	13.2	14.816	14.820	3200	5.41	120
2021-10-28	24 hours	17.61	25.36	749	5.8	14.837	14.838	1200	1.97	120
2021-11-03	24 hours	18.17	26.17	754	-1.1	14.825	14.835	10000	15.92	120
2021-11-09	24 hours	17.76	25.58	751	3.6	14.821	14.836	14400	23.46	120
2021-11-15	24 hours	17.67	25.45	739	0.8	14.831	14.837	5700	9.33	120
2021-11-21	24 hours	17.06	25.72	756	3.9	14.834	14.838	3800	6.16	120
2021-11-27	24 hours	17.98	25.9	737	-4.7	14.839	14.846	7400	11.90	120
2021-12-03	24 hours	18.26	26.29	742	-6.8	14.840	14.849	9800	15.53	120

Table 3
Air Quality Reporting
Upham East Gypsum Quarry
Upham, New Brunswick
Proejct No. 21-3049

Test Start	Duration	Flow Rate	Air Volume	Pressure	Temperature	Initial Filter Weight	Final Filter Weight	TSP Mass	TSP	Site Guideline
		(L/min)	(m^3)	(mm Hg)	(°C)	(g)	(g)	(µg)	(µg/m3)	(µg/m^3)
2021-12-09	24 hours	19.23	27.69	755	-15.9	14.823	14.824	1000	1.50	120
2021-12-15	24 hours	18.55	26.72	760	-4.7	14.626	14.841	215300	**335.73**[e]	120
2021-12-17	24 hours	17.98	25.89	748	-0.6	14.819	14.829	9600	15.45	120
2021-12-23	24 hours	18.9	27.22	747	-14.2	14.835	14.839	3800	5.82	120
2021-12-29	24 hours	18.23	26.25	750	-3.6	14.842	14.850	7700	12.22	120
2022-01-04	24 hours	18.89	27.2	755	-11.2	14.843	14.853	10300	15.78	120
2022-01-10	24 hours	19.19	27.63	749	-17.2	14.825	14.831	6600	9.95	120
2022-01-16	24 hours	18.7	26.08	755	-19.9	14.842	14.865	23300	37.23	120
2022-01-22	24 hours	19.18	25.97	752	-15.5	14.829	14.851	21300	34.17	120
2022-01-28	24 hours	18.59	26.78	753	-7.8	14.833	14.861	28600	44.50	120
2022-02-03	24 hours	18.24	26.26	755	-1.7	14.894	14.940	45300	71.88	120
2022-02-09	24 hours	18.11	26.07	748	-2.5	14.856	14.858	2100	3.36	120
2022-02-15	24 hours	19.7	28.37	762	-19.5	14.843	14.844	1700	2.50	120
2022-02-21[c]	9.5 hours	-	-	-	-	-	-	-	-	120
2022-02-23	24 hours	18.41	26.51	749	-6.4	14.837	14.844	7100	11.16	120
2022-03-01	24 hours	18.43	26.28	751	-5.9	14.8272	14.8305	3300	5.23	120
2022-03-08	24 hours	18.37	26.45	748	-6.2	14.8339	14.8344	500	0.79	120
2022-03-14	24 hours	18.11	26.08	756	0.2	14.8135	14.8178	4300	6.87	120
2022-03-20	24 hours	17.53	25.24	741	3.9	14.8296	14.8334	3800	6.27	120
2022-03-26	24 hours	17.51	25.22	735	2	14.839	14.8465	7500	12.39	120
2022-04-01	24 hours	17.34	24.98	735	4.4	14.8469	14.8521	5200	8.67	120
2022-04-07	24 hours	17.77	25.59	753	4.4	14.8484	14.8486	200	0.33	120
2022-04-13	24 hours	17.59	25.53	752	6.6	14.8551	14.8557	600	0.98	120
2022-04-19	24 hours	17.69	25.47	746	3.4	14.8403	14.872	31700	51.86	120
2022-04-25	24 hours	17.65	25.42	757	7.8	14.8305	14.8453	14800	24.26	120
2022-05-01	24 hours	17.84	25.7	754	3.7	14.8251	14.8478	22700	36.80	120
2022-05-07	24 hours	17.82	25.67	755	4.4	14.8228	14.8324	9600	15.58	120
2022-05-13	24 hours	17.06	24.57	754	16.3	14.8208	14.857	36200	61.39	120
2022-05-19	24 hours	17.2	24.77	749	12	14.8158	14.8291	13300	22.37	120
2022-05-25	24 hours	17.44	25.11	760	12.4	14.8283	14.829	700	1.16	120
2022-05-31	24 hours	17.46	25.14	751	8.8	14.8504	14.8513	900	1.49	120

Notes

24 hour sample collected by BGI PQ-100 air sampler every sixth day for the duration of the quarry operation each year.

a) Values were not recorded; temperature and pressure calculated based on Environment Canada data recorded at the Saint John airport weather station. Flow rate and Air Volume were approximated based on a previous day's recording with similar temperature and pressure.

b) Battery was low in machine, full run was not completed.

c) Run was not completed. Battery was replaced.

d) 24 hour air sample recorded at 2349 Route 820, Upham, NB.

e) Result was above the maximum allowable limit due to operator error. The sample was recollected on December 17, 2021.

Report ID: 439999-IAS
Report Date: 16-May-22
Date Received: 10-May-22

CERTIFICATE OF ANALYSIS

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

rpc
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:			439999-1	439999-2	439999-3
Client Sample ID:			SW3	SW5	PDP-1
Date Sampled:			7-May-22	7-May-22	7-May-22
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 Burhoe
Supervisor
Inorganic Analytical Services

Report ID: 439999-IAS
Report Date: 16-May-22
Date Received: 10-May-22

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	IAS-M05	APHA 2540 D	Filtration, Gravimetry

Report ID: 440745-IAS
Report Date: 18-May-22
Date Received: 16-May-22

CERTIFICATE OF ANALYSIS

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

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

Attention: Daniel Guest
Project #: 17-5121
Location: Upham

Analysis of Water

RPC Sample ID:			440745-1	440745-2	440745-3	440745-4
Client Sample ID:			SW3	SW5	PDP-1	PDP-1 Duplicate
Date Sampled:			13-May-22	13-May-22	13-May-22	13-May-22
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 Burhoe
Supervisor
Inorganic Analytical Services

Report ID: 440745-IAS
Report Date: 18-May-22
Date Received: 16-May-22

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	IAS-M05	APHA 2540 D	Filtration, Gravimetry

Report ID: 441437-IAS
Report Date: 31-May-22
Date Received: 19-May-22

CERTIFICATE OF ANALYSIS

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

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

Attention: Daniel Guest
Project #: 17-5121
Location: Upham

Analysis of Water

RPC Sample ID:			441437-1	441437-2	441437-3
Client Sample ID:			SW3	SW5	PDP-1
Date Sampled:			18-May-22	18-May-22	18-May-22
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

Matthew Norman
Senior Chemist
Inorganic Analytical Chemistry

Report ID: 441437-IAS
Report Date: 31-May-22
Date Received: 19-May-22

CERTIFICATE OF ANALYSIS

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

rpc
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	IAS-M05	APHA 2540 D	Filtration, Gravimetry

Report ID: 442859-IAS
Report Date: 09-Jun-22
Date Received: 31-May-22

CERTIFICATE OF ANALYSIS

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

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

Attention: Daniel Guest
Project #: 17-5121
Location: Upham

Analysis of Water

RPC Sample ID:			442859-1	442859-2	442859-3
Client Sample ID:			SW3	SW5	PDP-1
Date Sampled:			27-May-22	27-May-22	27-May-22
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

Matthew Norman
Senior Chemist
Inorganic Analytical Chemistry

Brannen Burhoe
Supervisor
Inorganic Analytical Services

Report ID: 442859-IAS
Report Date: 09-Jun-22
Date Received: 31-May-22

CERTIFICATE OF ANALYSIS

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

rpc
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	IAS-M05	APHA 2540 D	Filtration, Gravimetry

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

May 10, 2022

Project No.: 22S001.00

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

Re: Blast Vibration Monitoring – Blast No. 2022-11 – 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 last detonated at 14:00 on May 9, 2022. For the monitoring we positioned ten (10) digital seismographs in the area. The location of each monitoring point is noted in the following table.

Blast No. 2022-11 – May 9, 2022

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)	14:00	1,405 m S	< 0.5 mm/s	<120	Units were not triggered
2. Civic No. 4126 Route 111 (PW-10)		995 m S	< 0.5 mm/s	<120	
3. Civic No. 4150 Route 111 (PW-13)		873 m SE	< 0.5 mm/s	<120	
4. Civic No. 2447 Route 820 (PW-07)		987 m NE	< 0.5 mm/s	<120	
5. PW-03 - Route 820		629 m N	0.70 mm/s @ 43 Hz	112	-
6. Civic No. 2341 Route 820 (PW-05)		572 m N	< 0.5 mm/s	<120	Unit was not triggered
7. Civic No. 50 Myron Road (PW-15)		750 m NW	1.08 mm/s @ 73 Hz	112	-
8. Civic No. 86 Myron Road (PW-16)		743 m W	0.76 mm/s @ 47 Hz	114	-
9. Civic No. 220 Myron Road (PW-01)		1,370 m S	< 0.5 mm/s	<120	Units were not triggered
10. Civic No. 2337 Route 820 (PW-04)		646 m N	< 0.5 mm/s	<120	
maximum limits as per Approval to Operate			**12.5 mm/s**	**128 dB**	

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
A division of CBCL Limited

Robert Y. Cyr, M.A.Sc., P.Eng.
Senior Technical Specialist

Attachments: Blast Record
Blast and Seismograph Location Plan
Event Reports

Blast Record
Blast No. 2022-11

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 9, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	H. Awada	**Blast No.:**	2022-11
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Gulf Operators Ltd.		
Blaster's Certification No.:	1318	**Blaster's Name:**	Daniel Blanchard
Blast Location:	N 45º28'54.7" W 65º38'07.9" (see attached sketch)		
Type of Rock:	Gypsum	**Est. Vol. or Tonnage:**	14,633 tonnes
Weather at time of Blast:	Sunny – Clear	**Air Temp.:**	19ºC
Est. Wind Speed :	≈20 km/h	**Wind Direction:**	West
Cloud Cover:	No	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	189	**Hole Diameter:**	4.5"
Average Depth:	3.6 – 4.9 m	**Spacing:**	10 ft x 10 ft
No. Holes per Delay:	4	**Collar Length:**	7 ft
Delay between Holes:	25 ms	**Delay between Rows:**	17 & 42 ms
Initiation Method:	Non-Electric		
Weight of Explosives per Delay:	Max.: 98 kg		
Type and weight of Explosives for Blast:	4,349 kg – Titan XL 1000		

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

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 9, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	H. Awada	**Blast No.:**	2022-11
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	572 m
Direction to the Nearest Structure:	North
Structure Type:	House
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	57.8

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.

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 9, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	H. Awada	**Blast No.:**	2022-11
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21349
Calibration Date:	June 23, 2021
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1,405 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

Data Collection – Seismometer #2

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #18187
Calibration Date:	May 5, 2022
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	995 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

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 9, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	H. Awada	**Blast No.:**	2022-11
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #18193
Calibration Date:	April 11, 2022
Location of seismograph:	Civic Number 4150 Route 111 (PW-13)
Distance and Direction from Blast:	873 m Southeast
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

Data Collection – Seismometer #4

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5635
Calibration Date:	March 1, 2022
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	987 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

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 9, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	H. Awada	**Blast No.:**	2022-11
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5371
Calibration Date:	July 13, 2021
Location of seismograph:	PW-03 - Route 820
Distance and Direction from Blast:	629 m North
Transverse Particle Velocity:	0.64 mm/s @ >100 Hz
Vertical Particle Velocity:	0.45 mm/s @ >100 Hz
Longitudinal Particle Velocity:	0.70 mm/s @ 43 Hz
Peak Particle Velocity:	0.70 mm/s @ 43 Hz
Maximum Airblast:	112 dB(L)

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5487
Calibration Date:	February 18, 2022
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	572 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

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 9, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	H. Awada	**Blast No.:**	2022-11
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5489
Calibration Date:	April 25, 2022
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	750 m Northwest
Transverse Particle Velocity:	0.83 mm/s @ 51 Hz
Vertical Particle Velocity:	1.08 mm/s @ 73 Hz
Longitudinal Particle Velocity:	1.02 mm/s @ 43 Hz
Peak Particle Velocity:	1.08 mm/s @ 73 Hz
Maximum Airblast:	112 dB(L)

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5632
Calibration Date:	November 15, 2021
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	743 m West
Transverse Particle Velocity:	0.76 mm/s @ 47 Hz
Vertical Particle Velocity:	0.51 mm/s @ 73 Hz
Longitudinal Particle Velocity:	0.64 mm/s @ 47 Hz
Peak Particle Velocity:	0.76 mm/s @ 47 Hz
Maximum Airblast:	114 dB(L)

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 9, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	H. Awada	**Blast No.:**	2022-11
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5372
Calibration Date:	February 18, 2022
Location of seismograph:	Civic Number 220 Myron Road (PW-01)
Distance and Direction from Blast:	1,370 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

Data Collection – Seismometer #10

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21348
Calibration Date:	June 23, 2021
Location of seismograph:	Civic Number 2337 Route 820 (PW-04)
Distance and Direction from Blast:	646 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

Blast and Seismograph Location Plan
Blast No. 2022-11

Blast and Seismograph Location Plan
Blast No: 2022-11
Upham East Gypsum Quarry
Upham, NB

Date: May 9, 2022
CE Project No.: 22S001.00

Conquest Engineering
Experience commitment.
A division of CBCL Limited

Blast Event Reports
Blast No. 2022-11

Event Report

Date/Time	Tran at 14:01:00 May 9, 2022
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

Serial Number	5371 V 2.61 MiniMate
Battery Level	5.9 Volts
Unit Calibration	July 13, 2021 by Instantel
File Name	G371JHTW.9O0

Post Event Notes
Location: Cottage - Route 820 (PW-03)
Blast No.: 2022-11
CE Project No: 22S001.00

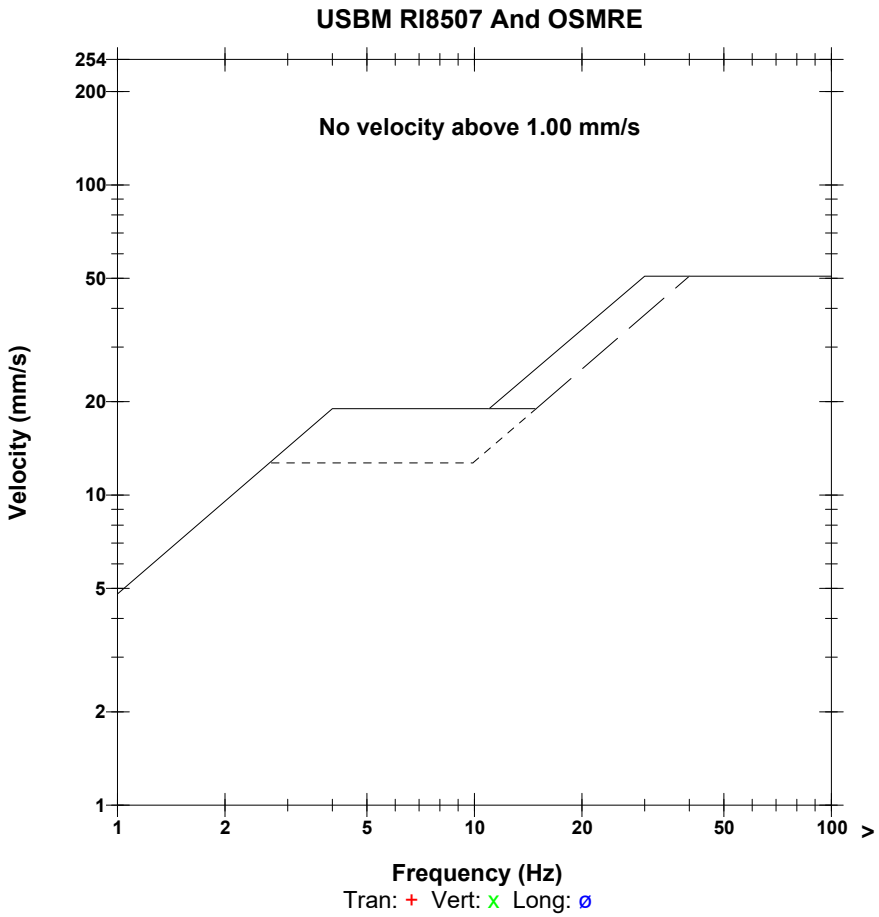
Notes
Location:
Client:
User Name:
Converted: May 9, 2022 15:48:56 (V10.72.1)

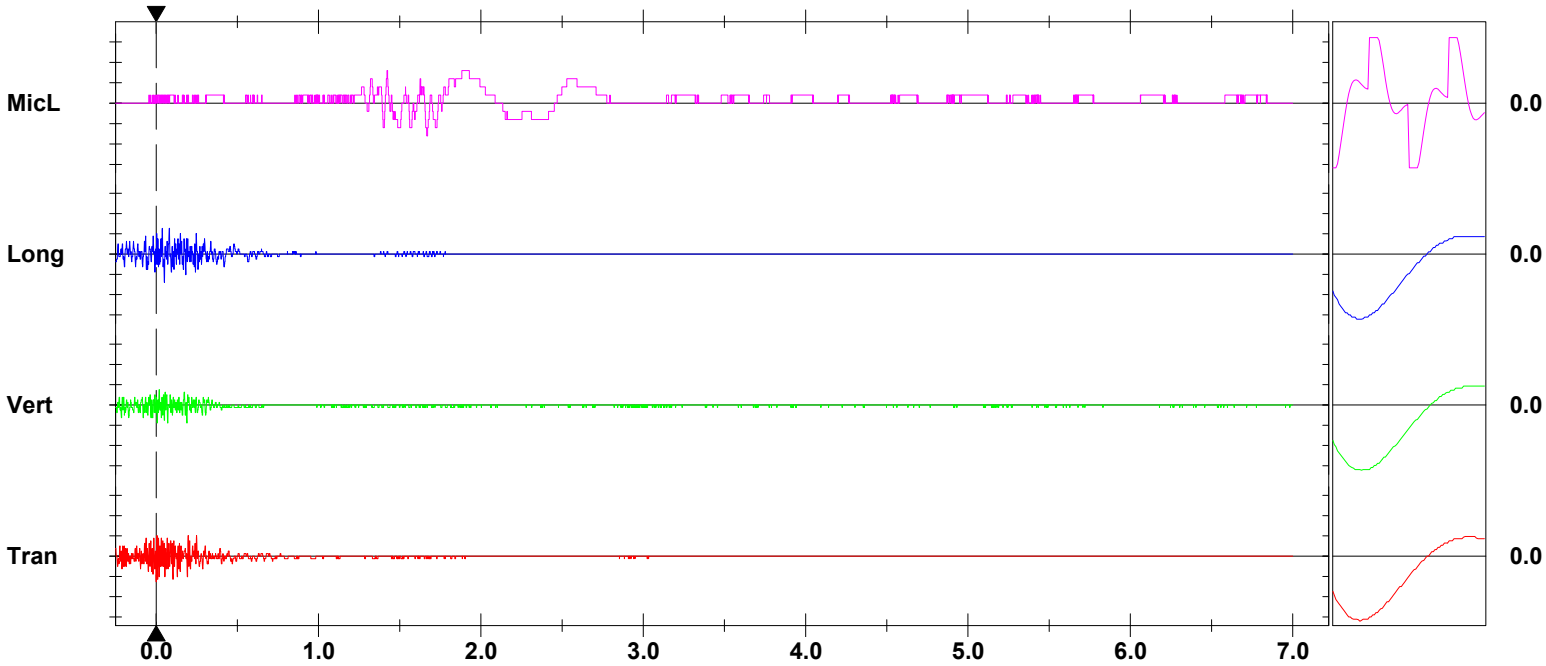
Extended Notes

Microphone	Linear Weighting
PSPL	112.0 dB(L) 8.000 pa.(L) at 1.422 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 20.0 Hz Amp = 305 mv)

	Tran	Vert	Long	
PPV	0.635	0.445	0.699	mm/s
PPV	47.06	43.96	47.88	dB
ZC Freq	>100	>100	43	Hz
Time (Rel. to Trig)	0.001	0.007	0.052	sec
Peak Acceleration	0.040	0.027	0.033	g
Peak Displacement	0.001	0.001	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	8.0	8.2	Hz
Overswing Ratio	3.5	3.6	3.8	

Peak Vector Sum 0.810 mm/s at 0.051 sec





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

Format © 1995-2015 Xmark Corporation

Event Report

Date/Time	Vert at 14:00:35 May 9, 2022
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

Serial Number	5489 V 2.61 MiniMate
Battery Level	6.1 Volts
Unit Calibration	April 25, 2022 by Instantel
File Name	G489JHTW.8Z0

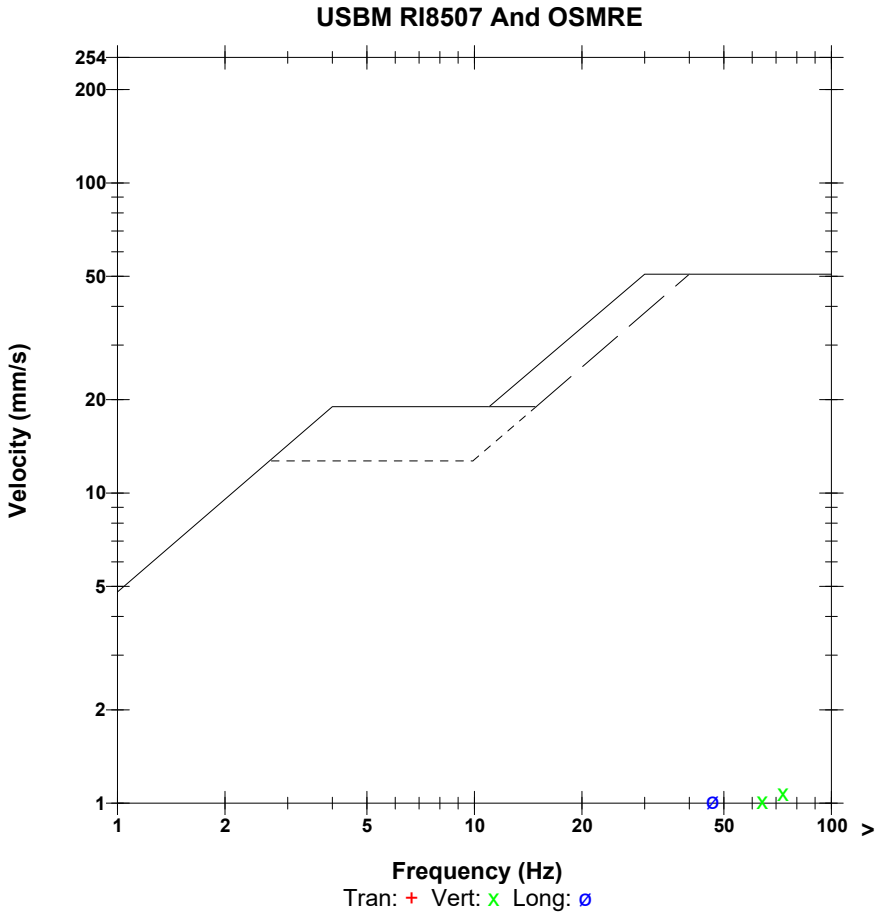
Notes
Location:
Client: WUUUUUUUUUUUUU
User Name: UUUUU
Converted: May 9, 2022 15:52:33 (V10.72.1)

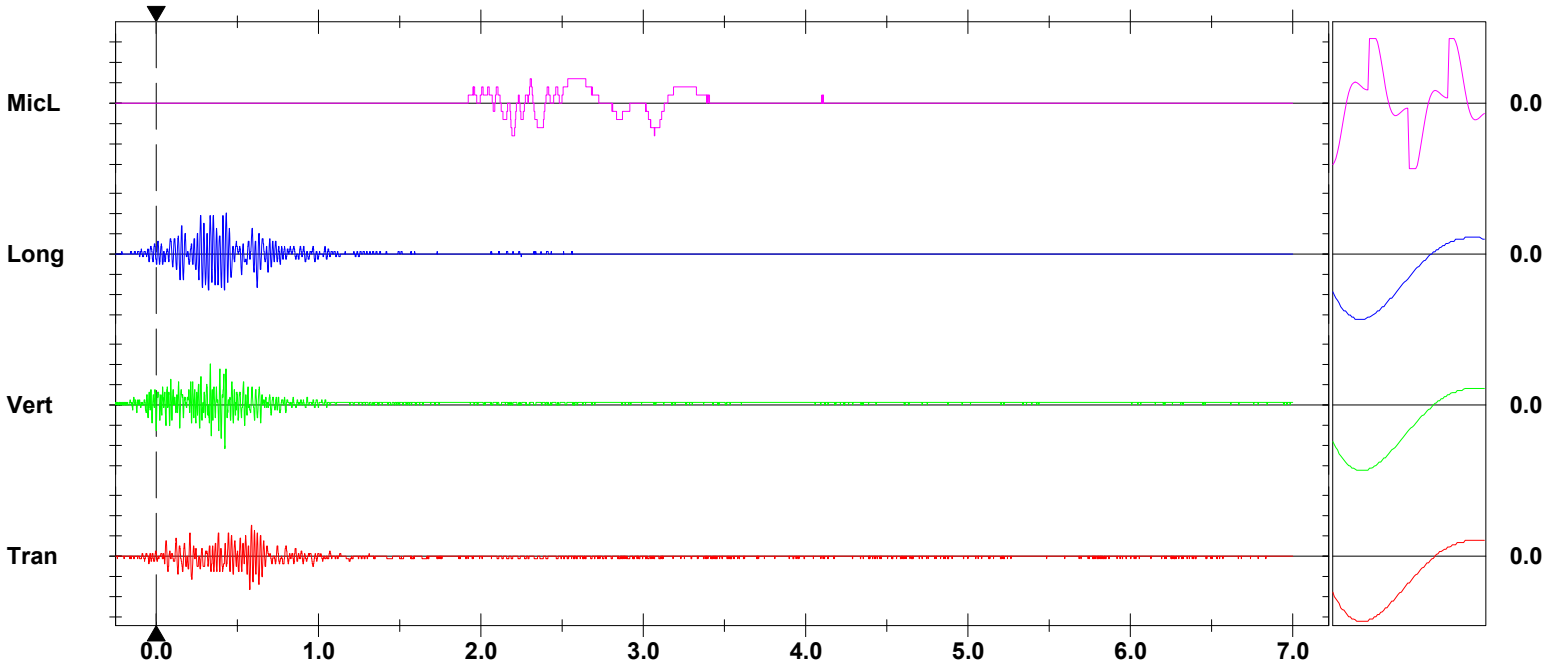
Post Event Notes
Location: 50 Myron Road (PW-15)
Blast No.: 2022-11
CE Project No: 22S001.00

Microphone	Linear Weighting
PSPL	112.0 dB(L) 8.000 pa.(L) at 2.192 sec
ZC Freq	12 Hz
Channel Test	Passed (Freq = 20.0 Hz Amp = 274 mv)

	Tran	Vert	Long	
PPV	0.826	1.080	1.016	mm/s
PPV	49.33	51.66	51.14	dB
ZC Freq	51	73	43	Hz
Time (Rel. to Trig)	0.578	0.424	0.432	sec
Peak Acceleration	0.027	0.060	0.040	g
Peak Displacement	0.003	0.003	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.7	7.8	Hz
Overswing Ratio	4.0	4.0	3.9	

Peak Vector Sum 1.349 mm/s at 0.334 sec





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

Format © 1995-2015 Xmark Corporation

Event Report

Date/Time	Long at 14:00:34 May 9, 2022
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: May 9, 2022 15:56:49 (V10.72.1)

Serial Number	5632 V 2.61 MiniMate
Battery Level	5.9 Volts
Unit Calibration	November 15, 2021 by Instantel
File Name	G632JHTW.8Y0

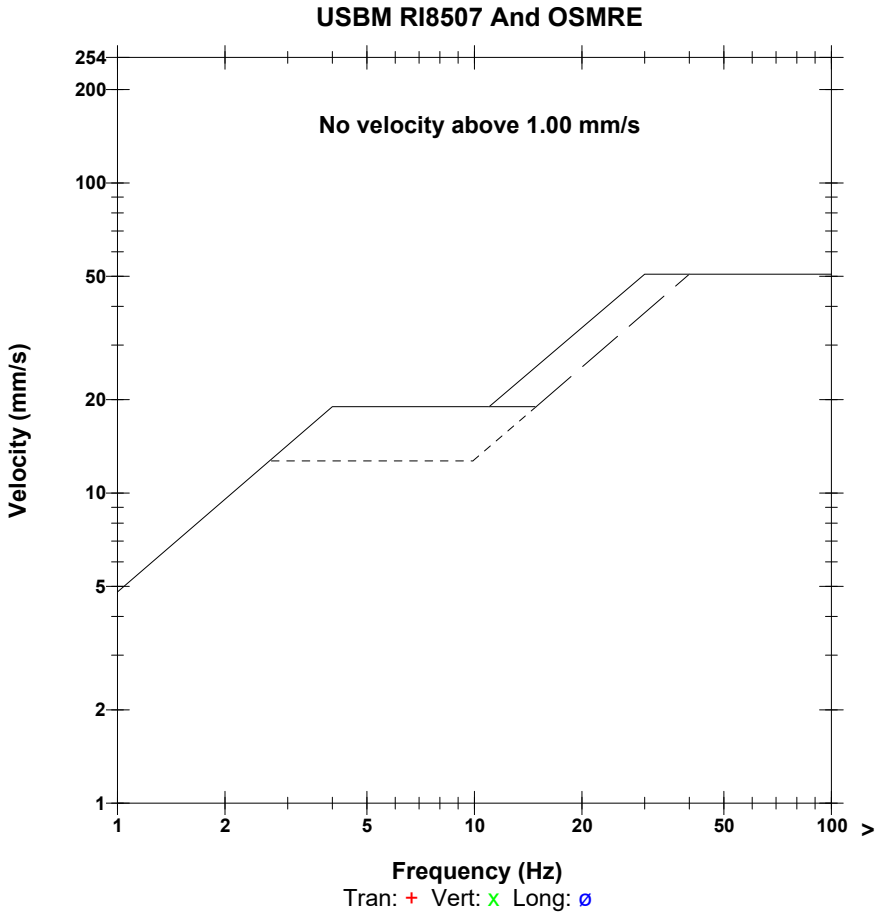
Post Event Notes
Location: 86 Myron Road (PW-16)
Blast No.: 2022-11
CE Project No: 22S001.00

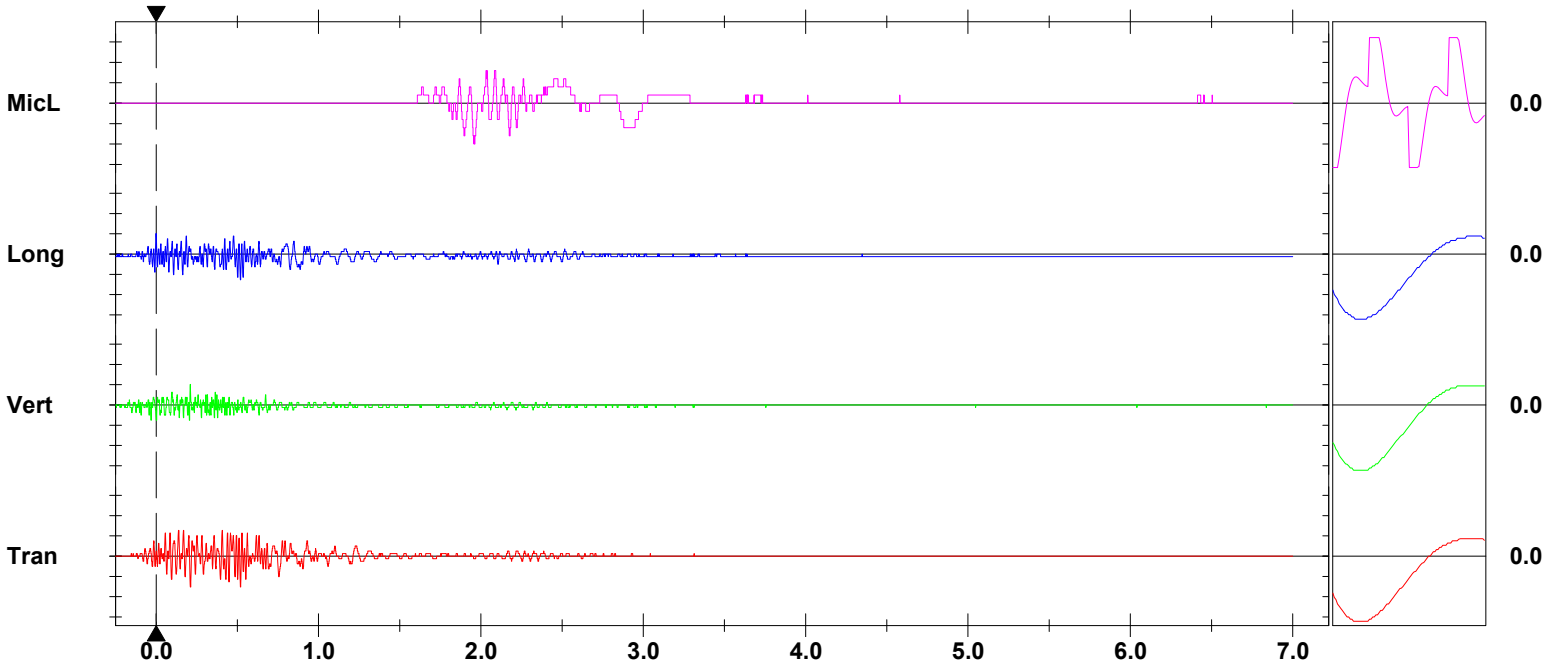
Extended Notes

Microphone	Linear Weighting
PSPL	114.0 dB(L) 10.000 pa.(L) at 1.957 sec
ZC Freq	14 Hz
Channel Test	Passed (Freq = 20.0 Hz Amp = 298 mv)

	Tran	Vert	Long	
PPV	0.762	0.508	0.635	mm/s
PPV	48.64	45.12	47.06	dB
ZC Freq	47	73	47	Hz
Time (Rel. to Trig)	0.211	0.211	0.520	sec
Peak Acceleration	0.027	0.027	0.020	g
Peak Displacement	0.004	0.001	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.0	8.2	7.8	Hz
Overswing Ratio	3.8	3.3	3.7	

Peak Vector Sum 1.000 mm/s at 0.520 sec





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

Format © 1995-2015 Xmark Corporation

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

May 16, 2022

Project No.: 22S001.00

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

Re: Blast Vibration Monitoring – Blast No. 2022-12 – 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 last detonated at 12:00 on May 13, 2022. For the monitoring we positioned nine (9) digital seismographs in the area. The location of each monitoring point is noted in the following table.

Blast No. 2022-12 – May 13, 2022

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)	14:00	1,330 m S	< 0.5 mm/s	<120	Units were not triggered
2. Civic No. 4126 Route 111 (PW-10)		949 m S	< 0.5 mm/s	<120	
3. Civic No. 4150 Route 111 (PW-13)		832 m SE	< 0.5 mm/s	<120	
4. Civic No. 2447 Route 820 (PW-07)		1,020 m NE	< 0.5 mm/s	<120	
5. PW-03 - Route 820		677 m N	< 0.5 mm/s	<120	
6. Civic No. 2341 Route 820 (PW-05)		621 m N	0.70 mm/s @ 64 Hz	112	-
7. Civic No. 50 Myron Road (PW-15)		790 m NW	0.95 mm/s @ 47 Hz	110	-
8. Civic No. 86 Myron Road (PW-16)		729 m W	0.76 mm/s @ 64 Hz	110	-
9. Civic No. 220 Myron Road (PW-01)		1,330 m S	< 0.5 mm/s	<120	Unit was not triggered
maximum limits as per Approval to Operate			**12.5 mm/s**	**128 dB**	

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
A division of CBCL Limited

Robert Y. Cyr, M.A.Sc., P.Eng.
Senior Technical Specialist

Attachments: Blast Record
Blast and Seismograph Location Plan
Event Reports

Blast Record
Blast No. 2022-12

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 13, 2022
Project No.:	22S001.00	**Time of Blast:**	12:00
Inspector:	H. Awada	**Blast No.:**	2022-12
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Gulf Operators Ltd.		
Blaster's Certification No.:	1318	**Blaster's Name:**	Daniel Blanchard
Blast Location:	N 45º28'52.7" W 65º38'07.8" (see attached sketch)		
Type of Rock:	Gypsum	**Est. Vol. or Tonnage:**	7,491 tonnes
Weather at time of Blast:	Sunny – Clear	**Air Temp.:**	21ºC
Est. Wind Speed :	≈20 km/h	**Wind Direction:**	North
Cloud Cover:	No	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	91	**Hole Diameter:**	4.5"
Average Depth:	3.6 – 5.6 m	**Spacing:**	10 ft x 10 ft
No. Holes per Delay:	3	**Collar Length:**	7 ft
Delay between Holes:	25 ms	**Delay between Rows:**	42 ms
Initiation Method:	Non-Electric		
Weight of Explosives per Delay:	Max.: 85 kg		
Type and weight of Explosives for Blast:	1,902 kg – Titan XL 1000		

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

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 13, 2022
Project No.:	22S001.00	**Time of Blast:**	12:00
Inspector:	H. Awada	**Blast No.:**	2022-12
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	621 m
Direction to the Nearest Structure:	North
Structure Type:	House
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	67.4

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.

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 13, 2022
Project No.:	22S001.00	**Time of Blast:**	12:00
Inspector:	H. Awada	**Blast No.:**	2022-12
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5632
Calibration Date:	November 15, 2021
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1,330 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

Data Collection – Seismometer #2

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #18193
Calibration Date:	April 11, 2022
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	949 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

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 13, 2022
Project No.:	22S001.00	**Time of Blast:**	12:00
Inspector:	H. Awada	**Blast No.:**	2022-12
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21348
Calibration Date:	June 23, 2021
Location of seismograph:	Civic Number 4150 Route 111 (PW-13)
Distance and Direction from Blast:	832 m Southeast
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

Data Collection – Seismometer #4

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5489
Calibration Date:	April 25, 2022
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	1,020 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

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 13, 2022
Project No.:	22S001.00	**Time of Blast:**	12:00
Inspector:	H. Awada	**Blast No.:**	2022-12
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #18187
Calibration Date:	May 5, 2022
Location of seismograph:	PW-03 - Route 820
Distance and Direction from Blast:	677 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

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5487
Calibration Date:	February 18, 2022
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	621 m North
Transverse Particle Velocity:	0.64 mm/s @ 51 Hz
Vertical Particle Velocity:	0.70 mm/s @ 64 Hz
Longitudinal Particle Velocity:	0.57 mm/s @ 19 Hz
Peak Particle Velocity:	0.70 mm/s @ 64 Hz
Maximum Airblast:	112 dB(L)

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 13, 2022
Project No.:	22S001.00	**Time of Blast:**	12:00
Inspector:	H. Awada	**Blast No.:**	2022-12
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5673
Calibration Date:	April 8, 2022
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	790 m Northwest
Transverse Particle Velocity:	0.76 mm/s @ 30 Hz
Vertical Particle Velocity:	0.57 mm/s @ 73 Hz
Longitudinal Particle Velocity:	0.95 mm/s @ 47 Hz
Peak Particle Velocity:	0.95 mm/s @ 47 Hz
Maximum Airblast:	110 dB(L)

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5371
Calibration Date:	July 13, 2021
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	729 m West
Transverse Particle Velocity:	0.70 mm/s @ 11 Hz
Vertical Particle Velocity:	0.38 mm/s @ 32 Hz
Longitudinal Particle Velocity:	0.76 mm/s @ 64 Hz
Peak Particle Velocity:	0.76 mm/s @ 64 Hz
Maximum Airblast:	110 dB(L)

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 13, 2022
Project No.:	22S001.00	**Time of Blast:**	12:00
Inspector:	H. Awada	**Blast No.:**	2022-12
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5372
Calibration Date:	February 18, 2022
Location of seismograph:	Civic Number 220 Myron Road (PW-01)
Distance and Direction from Blast:	1,330 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

Blast and Seismograph Location Plan
Blast No. 2022-12

Blast and Seismograph Location Plan
Blast No: 2022-12
Upham East Gypsum Quarry
Upham, NB

Date: May 13, 2022
CE Project No.: 22S001.00

Conquest Engineering
Experience commitment.
A division of CBCL Limited

Blast Event Reports
Blast No. 2022-12

Event Report

Date/Time	Vert at 12:00:21 May 13, 2022
Trigger Source	Geo: 0.492 mm/s
Range	Geo: 127.0 mm/s
Record Time	7.0 sec at 1024 sps

Serial Number	5487 V 2.61 MiniMate
Battery Level	6.0 Volts
Unit Calibration	February 18, 2022 by Instantel
File Name	G487JI15.CL0

Post Event Notes
Location: 2341 Route 820 (PW-05)
Blast No.: 2022-12
CE Project No: 22S001.00

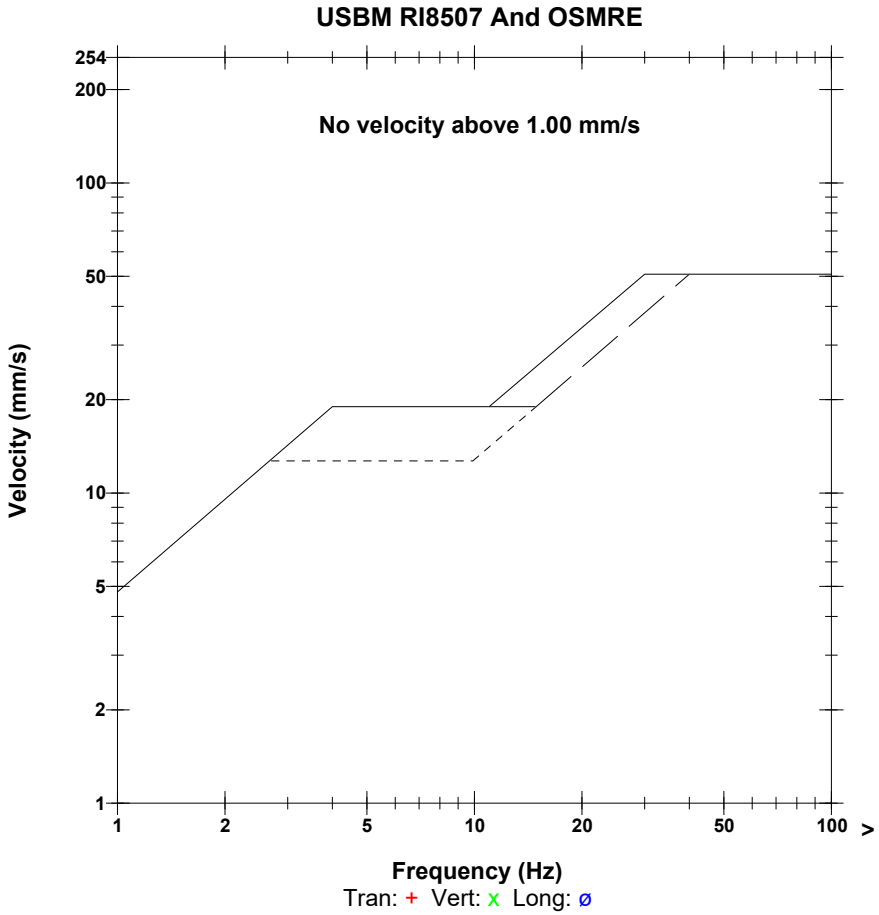
Notes
Location: JOB # 0000
Client:
User Name:
Converted: May 13, 2022 13:44:17 (V10.72.1)

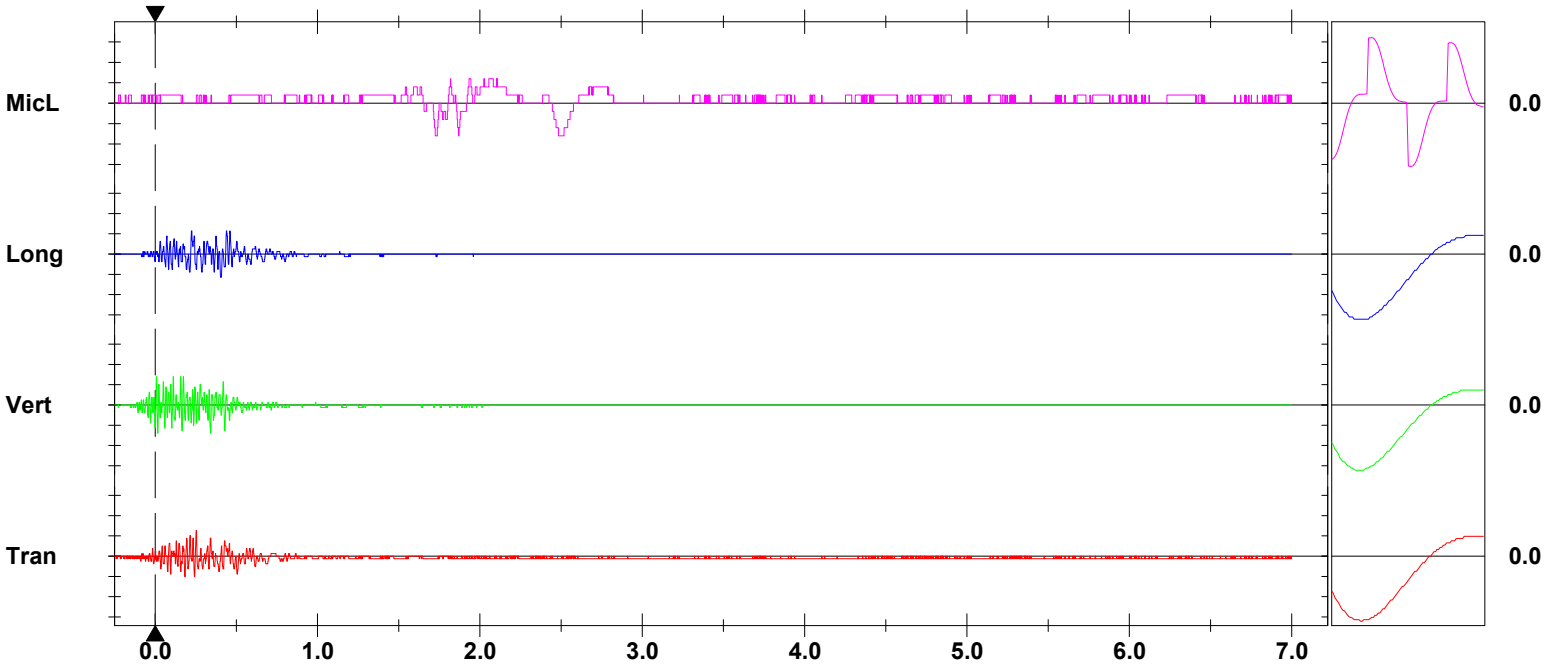
Extended Notes

Microphone	Linear Weighting
PSPL	112.0 dB(L) 8.000 pa.(L) at 1.726 sec
ZC Freq	14 Hz
Channel Test	Passed (Freq = 20.0 Hz Amp = 351 mv)

	Tran	Vert	Long	
PPV	0.635	0.699	0.572	mm/s
PPV	47.06	47.88	46.14	dB
ZC Freq	51	64	19	Hz
Time (Rel. to Trig)	0.254	0.008	0.224	sec
Peak Acceleration	0.020	0.033	0.020	g
Peak Displacement	0.002	0.002	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	7.7	Hz
Overswing Ratio	3.5	4.1	3.6	

Peak Vector Sum 0.857 mm/s at 0.255 sec





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

Format © 1995-2015 Xmark Corporation

Event Report

Date/Time	Long at 12:00:10 May 13, 2022
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: May 13, 2022 13:46:00 (V10.72.1)

Extended Notes

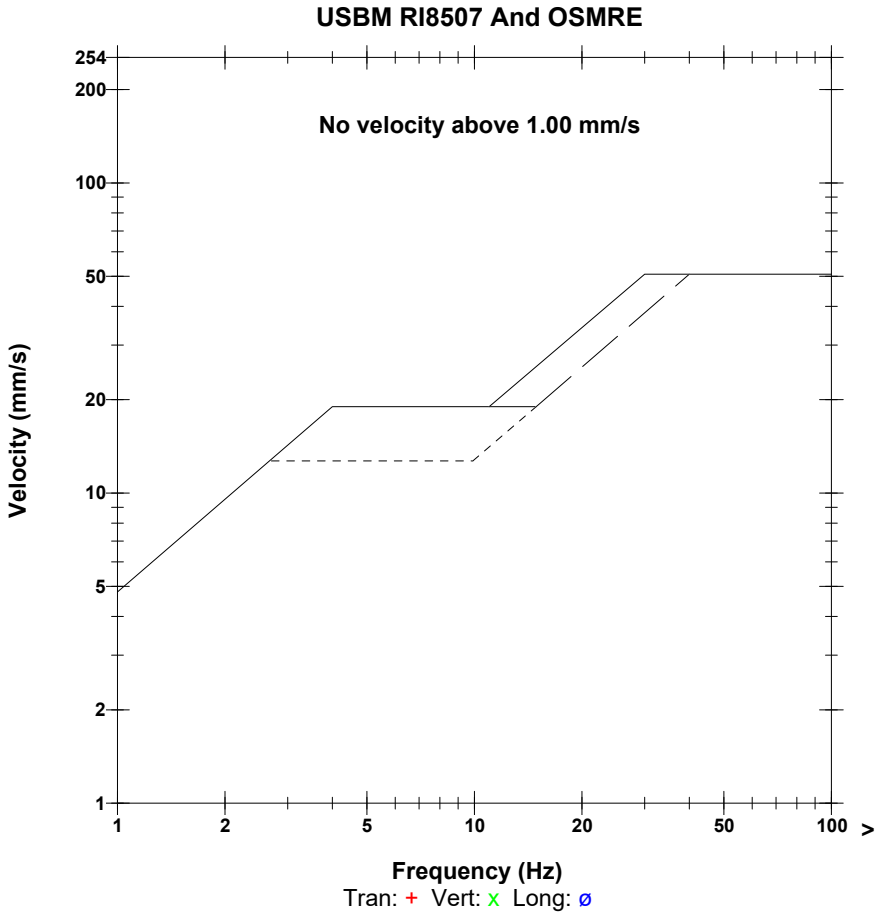
Serial Number	5673 V 2.61 MiniMate
Battery Level	6.3 Volts
Unit Calibration	April 8, 2022 by Instantel
File Name	G673JI15.CA0

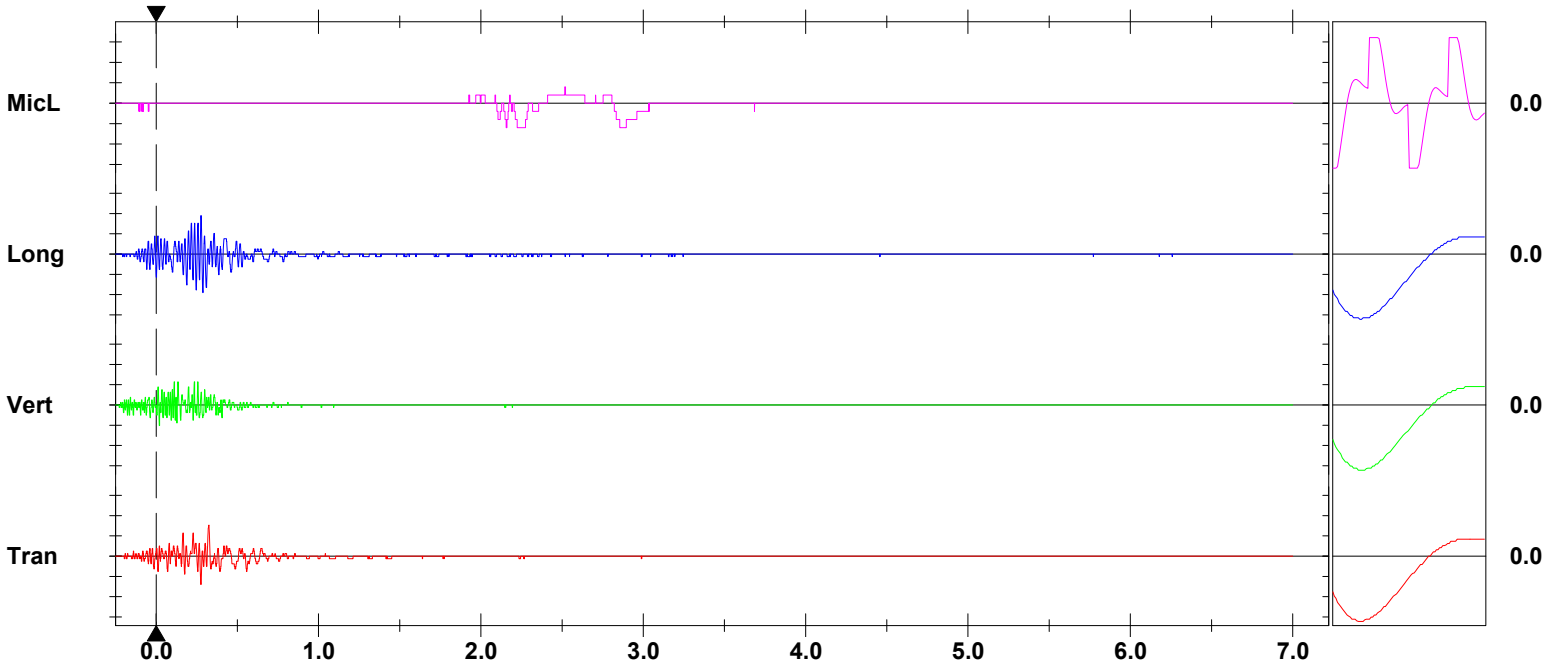
Post Event Notes
Location: 50 Myron Road (PW-15)
Blast No.: 2022-12
CE Project No: 22S001.00

Microphone	Linear Weighting
PSPL	109.5 dB(L) 6.000 pa.(L) at 2.156 sec
ZC Freq	17 Hz
Channel Test	Passed (Freq = 20.0 Hz Amp = 308 mv)

	Tran	Vert	Long	
PPV	0.762	0.572	0.953	mm/s
PPV	48.64	46.14	50.58	dB
ZC Freq	30	73	47	Hz
Time (Rel. to Trig)	0.323	0.111	0.277	sec
Peak Acceleration	0.020	0.027	0.027	g
Peak Displacement	0.004	0.001	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.0	7.8	7.8	Hz
Overswing Ratio	3.9	3.7	3.8	

Peak Vector Sum 1.222 mm/s at 0.277 sec





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

Format © 1995-2015 Xmark Corporation

Event Report

Date/Time	Long at 12:00:28 May 13, 2022
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: May 13, 2022 13:47:28 (V10.72.1)

Extended Notes

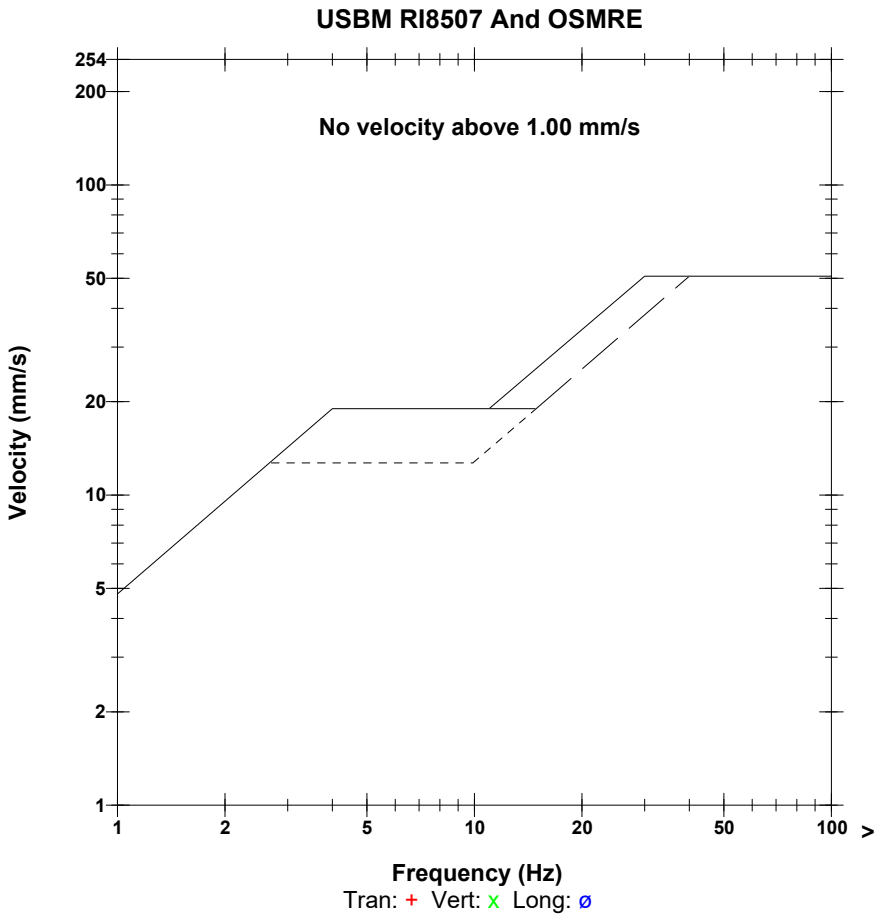
Serial Number	5371 V 2.61 MiniMate
Battery Level	5.7 Volts
Unit Calibration	July 13, 2021 by Instantel
File Name	G371JI15.CS0

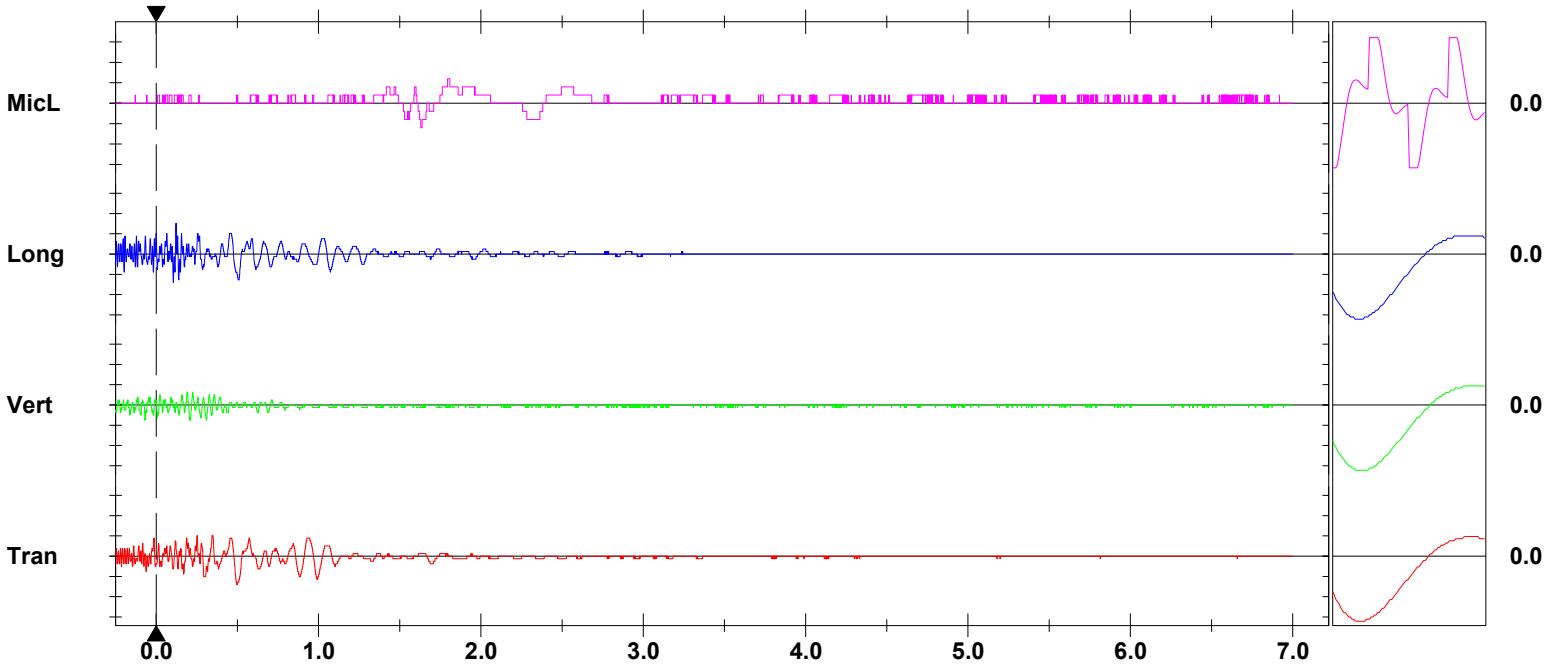
Post Event Notes
Location: 86 Myron Road (PW-16)
Blast No.: 2022-12
CE Project No: 22S001.00

Microphone	Linear Weighting
PSPL	109.5 dB(L) 6.000 pa.(L) at 1.630 sec
ZC Freq	9.1 Hz
Channel Test	Passed (Freq = 20.0 Hz Amp = 305 mv)

	Tran	Vert	Long	
PPV	0.699	0.381	0.762	mm/s
PPV	47.88	42.62	48.64	dB
ZC Freq	11	32	64	Hz
Time (Rel. to Trig)	0.496	-0.067	0.123	sec
Peak Acceleration	0.013	0.013	0.027	g
Peak Displacement	0.011	0.002	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	8.0	8.3	Hz
Overswing Ratio	3.5	3.6	3.7	

Peak Vector Sum 0.905 mm/s at 0.502 sec





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

Format © 1995-2015 Xmark Corporation

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

May 25, 2022

Project No.: 22S001.00

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

Re: Blast Vibration Monitoring – Blast No. 2022-13 – 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 by Gulf Operators Ltd. at 14:00 on May 24, 2022. For the monitoring we positioned eleven (11) digital seismographs in the area. The location of each monitoring point is noted in the following table.

Blast No. 2022-13 – May 24, 2022

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)	14:00	1,420 m S	< 0.5 mm/s	<120	Units were not triggered
2. Civic No. 4126 Route 111 (PW-10)		1,040 m S	< 0.5 mm/s	<120	
3. Civic No. 4150 Route 111 (PW-13)		923 m SE	< 0.5 mm/s	<120	
4. Civic No. 2447 Route 820 (PW-07)		984 m NE	< 0.5 mm/s	<120	
5. PW-03 - Route 820		598 m N	0.51 mm/s @ 73 Hz	108	-
6. Civic No. 2341 Route 820 (PW-05)		531 m N	1.40 mm/s @ 57 Hz	112	-
7. Civic No. 50 Myron Road (PW-15)		700 m NW	< 0.5 mm/s	<120	Unit was not triggered
8. Civic No. 86 Myron Road (PW-16)		729 m W	0.51 mm/s @ 22 Hz	116	-
9. Civic No. 220 Myron Road (PW-01)		1,410 m S	< 0.5 mm/s	<120	Units were not triggered
10. Civic No. 4140 Route 111 (PW-12)		998 m SE	< 0.5 mm/s	<120	
11. Civic No. 2337 Route 820 (PW-04)		600 m N	< 0.5 mm/s	<120	
maximum limits as per Approval to Operate			**12.5 mm/s**	**128 dB**	

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
A division of CBCL Limited

Robert Y. Cyr, M.A.Sc., P.Eng.
Senior Technical Specialist

Attachments: Blast Record
Blast and Seismograph Location Plan
Event Reports

Blast Record
Blast No. 2022-13

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 24, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	H. Awada	**Blast No.:**	2022-13
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Gulf Operators Ltd.		
Blaster's Certification No.:	1318	**Blaster's Name:**	Daniel Blanchard
Blast Location:	N 45º28'55.7" W 65º38'09.8" (see attached sketch)		
Type of Rock:	Gypsum	**Est. Vol. or Tonnage:**	8,367 tonnes
Weather at time of Blast:	Sunny	**Air Temp.:**	19ºC
Est. Wind Speed :	≈15 km/h	**Wind Direction:**	SW
Cloud Cover:	No	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	97	**Hole Diameter:**	4.5"
Average Depth:	3.6 – 6.7 m	**Spacing:**	10 ft x 10 ft
No. Holes per Delay:	2	**Collar Length:**	7 ft
Delay between Holes:	25 ms	**Delay between Rows:**	42 ms
Initiation Method:	Non-Electric		
Weight of Explosives per Delay:	Max.: 48 kg		
Type and weight of Explosives for Blast:	1,828 kg – Titan XL 1000		

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

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 24, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	H. Awada	**Blast No.:**	2022-13
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	531 m
Direction to the Nearest Structure:	North
Structure Type:	House
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	69.7

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.

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 24, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	H. Awada	**Blast No.:**	2022-13
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21349
Calibration Date:	June 23, 2021
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1,420 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

Data Collection – Seismometer #2

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #18193
Calibration Date:	April 11, 2022
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	1,040 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

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 24, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	H. Awada	**Blast No.:**	2022-13
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #18187
Calibration Date:	May 5, 2022
Location of seismograph:	Civic Number 4150 Route 111 (PW-13)
Distance and Direction from Blast:	923 m Southeast
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

Data Collection – Seismometer #4

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5489
Calibration Date:	April 25, 2022
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	984 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

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 24, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	H. Awada	**Blast No.:**	2022-13
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21348
Calibration Date:	June 23, 2021
Location of seismograph:	PW-03 - Route 820
Distance and Direction from Blast:	598 m North
Transverse Particle Velocity:	0.38 mm/s @ 64 Hz
Vertical Particle Velocity:	0.51 mm/s @ 73 Hz
Longitudinal Particle Velocity:	0.38 mm/s @ >100 Hz
Peak Particle Velocity:	0.51 mm/s @ 73 Hz
Maximum Airblast:	108 dB(L)

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5632
Calibration Date:	November 15, 2021
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	531 m North
Transverse Particle Velocity:	0.64 mm/s @ 73 Hz
Vertical Particle Velocity:	1.40 mm/s @ 57 Hz
Longitudinal Particle Velocity:	1.27 mm/s @ 47 Hz
Peak Particle Velocity:	1.40. mm/s @ 57 Hz
Maximum Airblast:	112 dB(L)

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 24, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	H. Awada	**Blast No.:**	2022-13
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5635
Calibration Date:	March 1, 2022
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	700 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

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5487
Calibration Date:	February 18, 2022
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	729 m West
Transverse Particle Velocity:	0.51 mm/s @ 22 Hz
Vertical Particle Velocity:	0.25 mm/s @ 37 Hz
Longitudinal Particle Velocity:	0.51 mm/s @ 30 Hz
Peak Particle Velocity:	0.51 mm/s @ 22 Hz
Maximum Airblast:	116 dB(L)

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 24, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	H. Awada	**Blast No.:**	2022-13
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5676
Calibration Date:	February 28, 2022
Location of seismograph:	Civic Number 220 Myron Road (PW-01)
Distance and Direction from Blast:	1,410 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

Data Collection – Seismometer #10

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5372
Calibration Date:	February 18, 2022
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	998 m Southeast
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

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 24, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	H. Awada	**Blast No.:**	2022-13
Client:	Hammond River Holdings		

Data Collection – Seismometer #11

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5371
Calibration Date:	July 13, 2021
Location of seismograph:	Civic Number 2337 Route 820 (PW-04)
Distance and Direction from Blast:	600 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

Blast and Seismograph Location Plan
Blast No. 2022-13

Blast and Seismograph Location Plan
Blast No: 2022-13
Upham East Gypsum Quarry
Upham, NB

Date: May 24, 2022
CE Project No.: 22S001.00

Conquest Engineering
Experience commitment.
A division of CBCL Limited

Blast Event Reports
Blast No. 2022-13

Event Report

Date/Time	Vert at 14:00:39 May 24, 2022
Trigger Source	Geo: 0.510 mm/s, Mic: 120.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	7.0 sec at 1024 sps

Notes

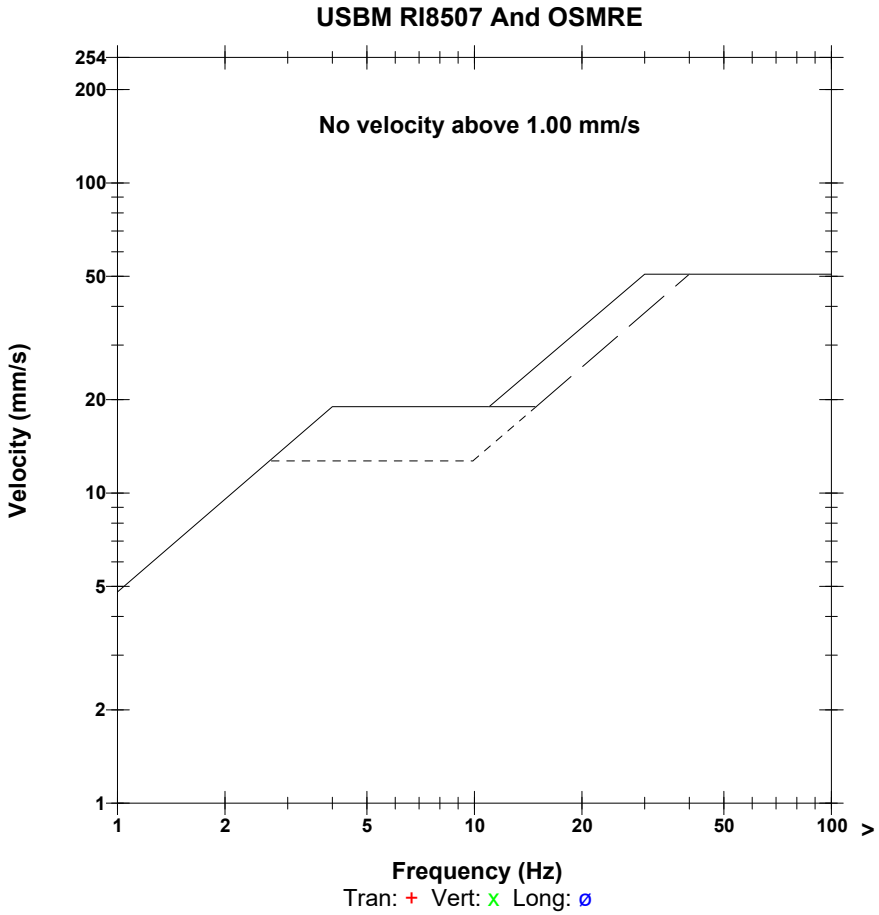
Serial Number	BE21348 V 10.72-1.1 Minimate Blaster
Battery Level	6.5 Volts
Unit Calibration	June 23, 2021 by Instantel
File Name	W348JIJT.L30

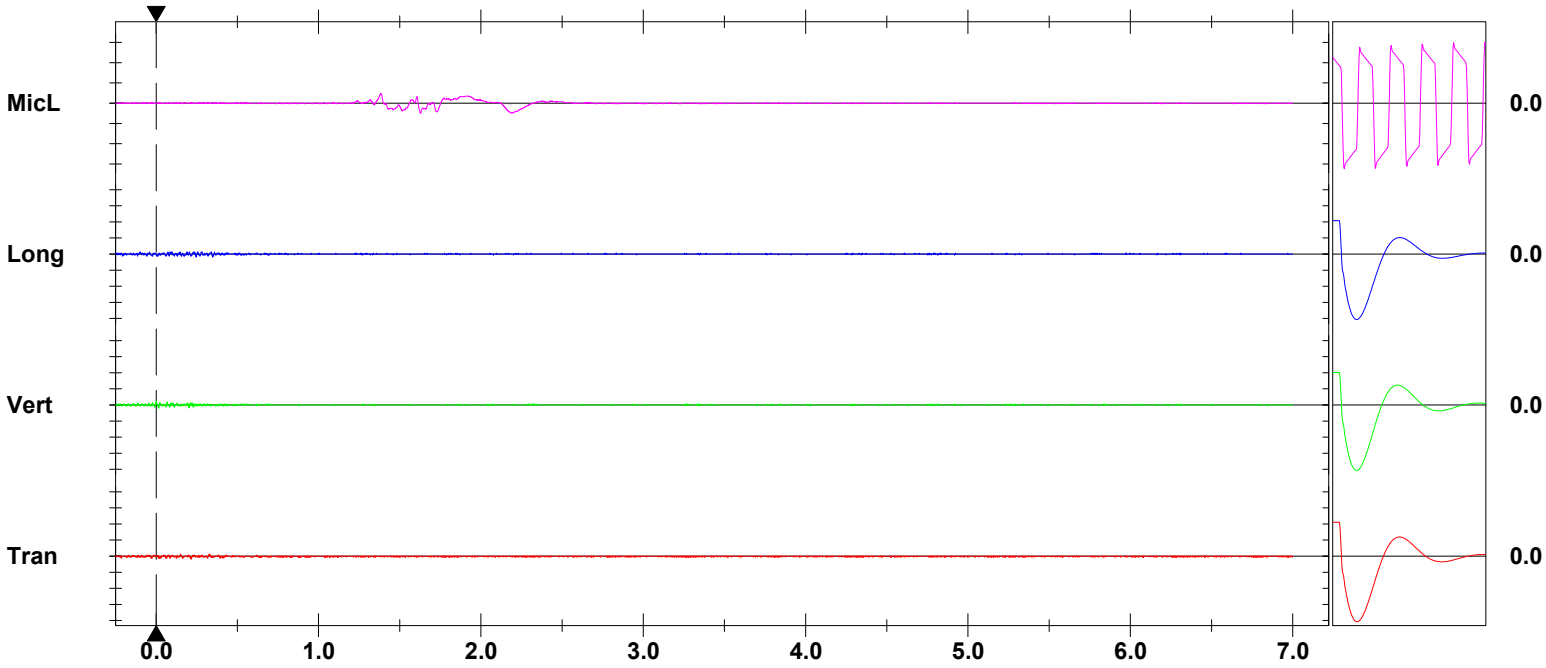
Post Event Notes
Location: Cottage - Route 820 (PW-03)
Blast No.: 2022-13
CE Project No: 22S001.00

Microphone	Linear Weighting
PSPL	108.0 dB(L) 5.000 pa.(L) at 1.626 sec
ZC Freq	8.1 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 509 mv)

	Tran	Vert	Long	
PPV	0.381	0.508	0.381	mm/s
PPV	42.62	45.12	42.62	dB
ZC Freq	64	73	>100	Hz
Time (Rel. to Trig)	0.214	0.000	0.246	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.001	0.001	0.001	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.7	7.3	Hz
Overswing Ratio	3.4	3.3	4.0	

Peak Vector Sum 0.524 mm/s at 0.000 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Format © 1995-2015 Xmark Corporation

Event Report

Date/Time	Vert at 14:00:43 May 24, 2022
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: May 24, 2022 15:45:21 (V10.72.1)

Extended Notes

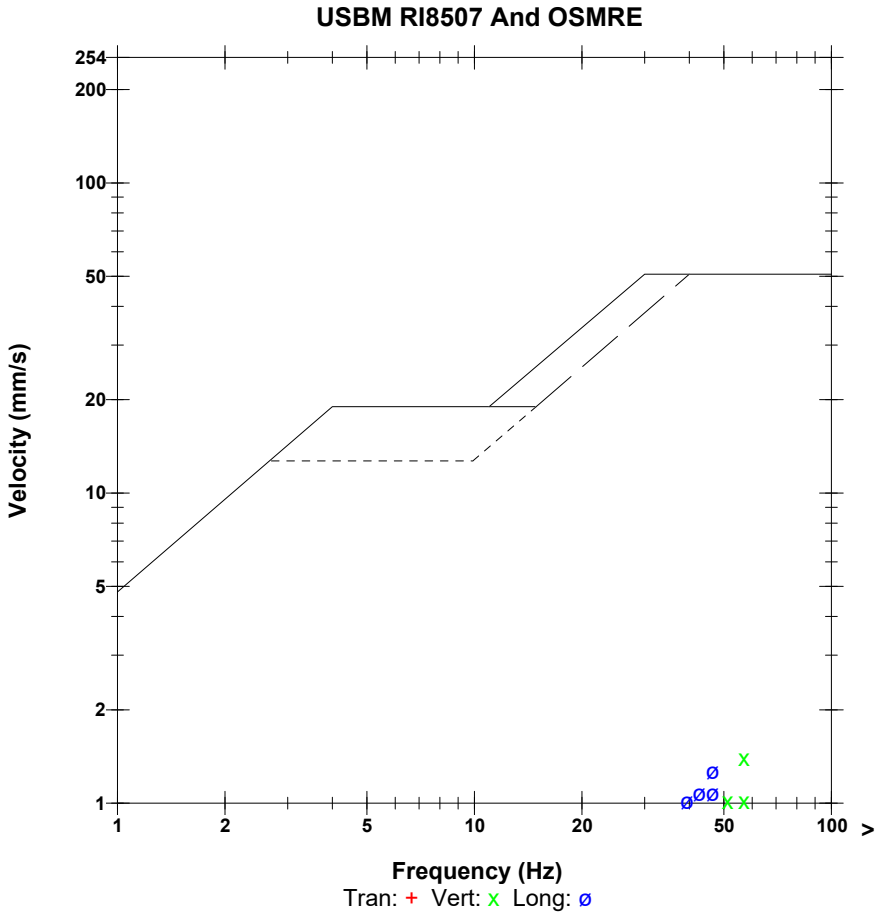
Serial Number	5632 V 2.61 MiniMate
Battery Level	6.2 Volts
Unit Calibration	November 15, 2021 by Instantel
File Name	G632JILO.970

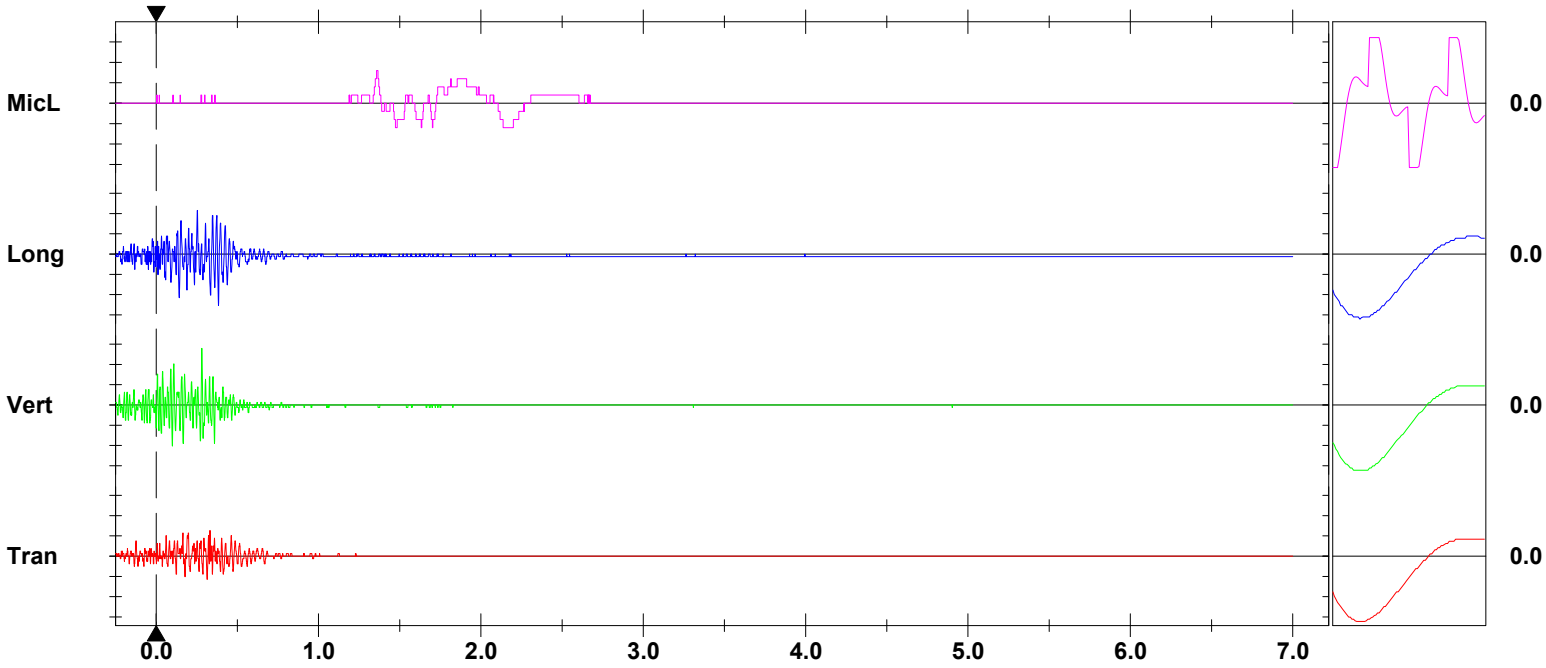
Post Event Notes
Location: 2341 Route 820 (PW-05)
Blast No.: 2022-13
CE Project No: 22S001.00

Microphone	Linear Weighting
PSPL	112.0 dB(L) 8.000 pa.(L) at 1.358 sec
ZC Freq	10 Hz
Channel Test	Passed (Freq = 20.0 Hz Amp = 298 mv)

	Tran	Vert	Long	
PPV	0.635	1.397	1.270	mm/s
PPV	47.06	53.90	53.08	dB
ZC Freq	73	57	47	Hz
Time (Rel. to Trig)	0.332	0.282	0.385	sec
Peak Acceleration	0.033	0.046	0.040	g
Peak Displacement	0.003	0.004	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	8.2	7.8	Hz
Overswing Ratio	3.9	3.3	3.7	

Peak Vector Sum 1.413 mm/s at 0.282 sec





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

Format © 1995-2015 Xmark Corporation

Event Report

Date/Time	Long at 14:00:43 May 24, 2022
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: May 24, 2022 15:47:36 (V10.72.1)

Serial Number	5487 V 2.61 MiniMate
Battery Level	5.7 Volts
Unit Calibration	February 18, 2022 by Instantel
File Name	G487JILO.970

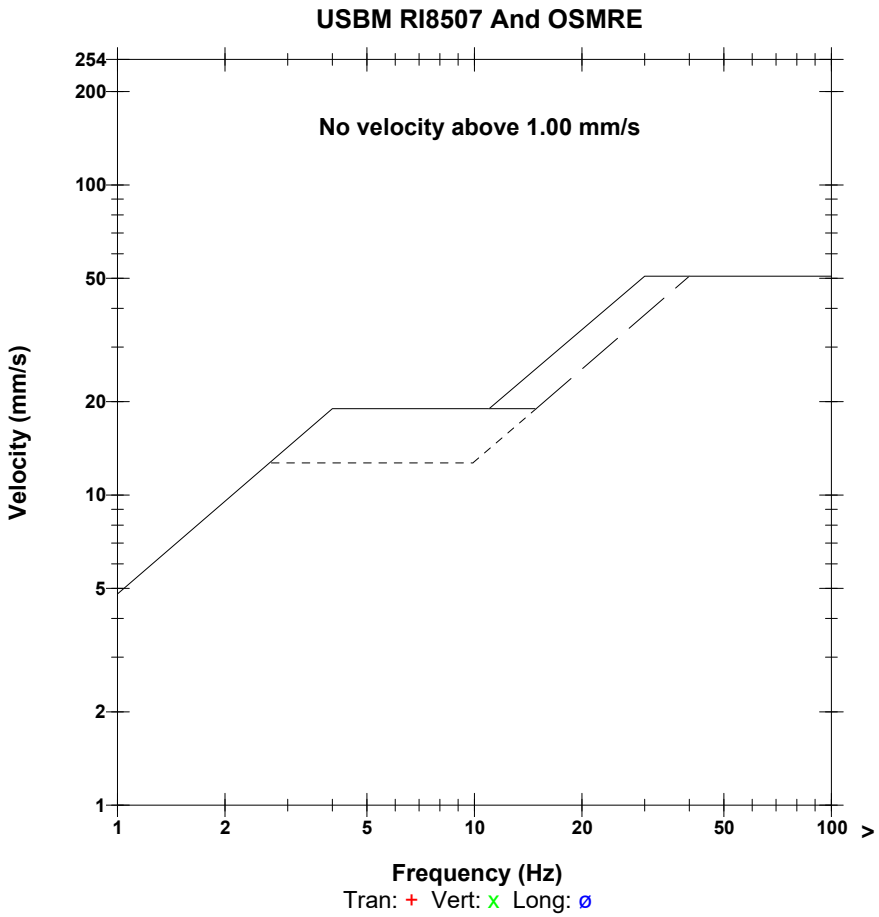
Post Event Notes
Location: 86 Myron Road (PW-16)
Blast No.: 2022-13
CE Project No: 22S001.00

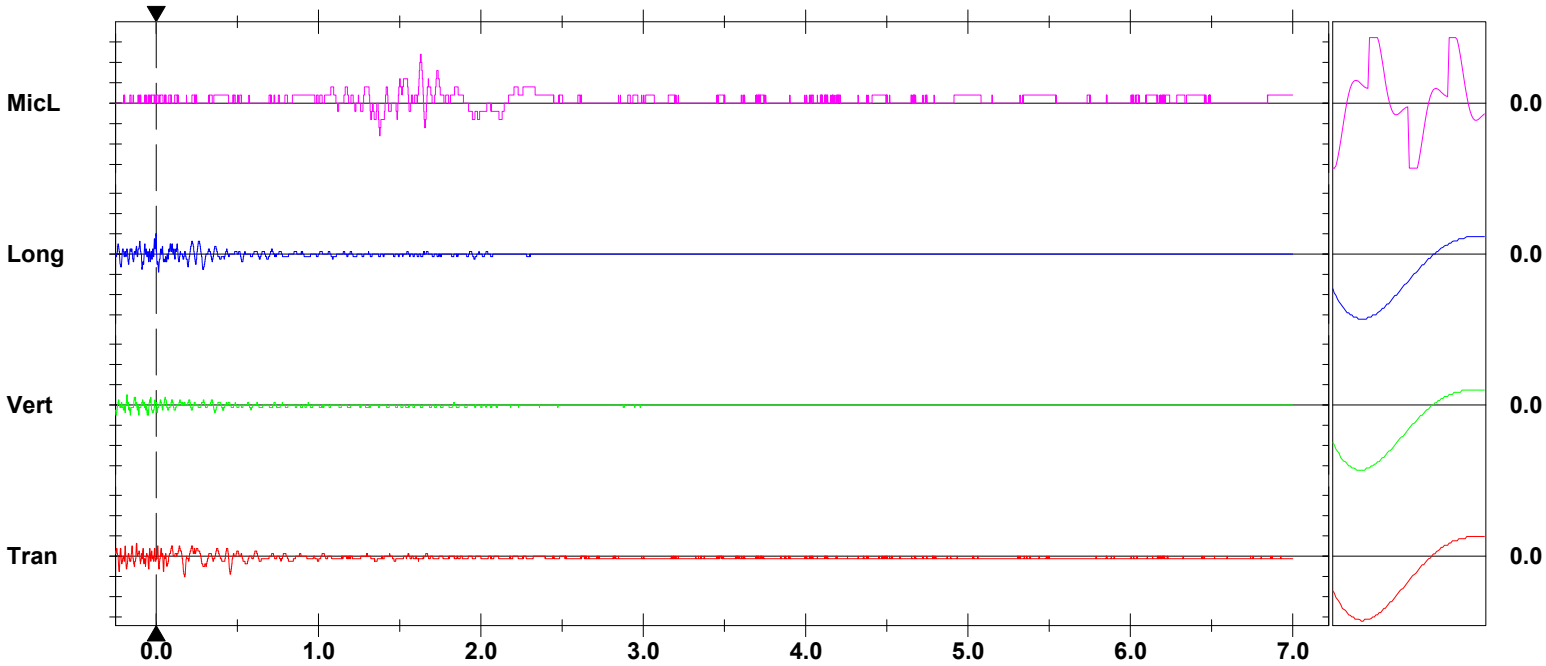
Extended Notes

Microphone	Linear Weighting
PSPL	115.6 dB(L) 12.00 pa.(L) at 1.628 sec
ZC Freq	13 Hz
Channel Test	Passed (Freq = 20.0 Hz Amp = 289 mv)

	Tran	Vert	Long	
PPV	0.508	0.254	0.508	mm/s
PPV	45.12	39.10	45.12	dB
ZC Freq	22	37	30	Hz
Time (Rel. to Trig)	0.175	-0.047	0.000	sec
Peak Acceleration	0.020	0.013	0.020	g
Peak Displacement	0.003	0.000	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	7.6	Hz
Overswing Ratio	3.5	4.2	3.8	

Peak Vector Sum 0.524 mm/s at 0.176 sec





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

Format © 1995-2015 Xmark Corporation

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

May 31, 2022

Project No.: 22S001.00

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

Re: Blast Vibration Monitoring – Blast No. 2022-14 – 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 by Gulf Operators Ltd. at 14:00 on May 31, 2022. For the monitoring we positioned eleven (11) digital seismographs in the area. The location of each monitoring point is noted in the following table.

Blast No. 2022-14 – May 31, 2022

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)	14:00	1,370 m S	< 0.5 mm/s	<124	Units were not triggered
2. Civic No. 4126 Route 111 (PW-10)		985 m S	< 0.5 mm/s	<124	
3. Civic No. 4150 Route 111 (PW-13)		865 m SE	< 0.5 mm/s	<124	
4. Civic No. 2447 Route 820 (PW-07)		1,040 m NE	< 0.5 mm/s	<124	
5. PW-03 - Route 820		573 m N	0.51 mm/s @ 73 Hz	108	-
6. Civic No. 2341 Route 820 (PW-05)		603 m N	1.40 mm/s @ 57 Hz	112	-
7. Civic No. 50 Myron Road (PW-15)		775 m NW	< 0.5 mm/s	<124	Units were not triggered
8. Civic No. 86 Myron Road (PW-16)		636 m W	< 0.5 mm/s	<124	
9. Civic No. 220 Myron Road (PW-01)		1,340 m S	< 0.5 mm/s	<124	
10. Civic No. 4140 Route 111 (PW-12)		934 m SE	< 0.5 mm/s	<124	
11. Civic No. 2337 Route 820 (PW-04)		660 m N	< 0.5 mm/s	<124	
maximum limits as per Approval to Operate			**12.5 mm/s**	**128 dB**	

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
A division of CBCL Limited

Robert Y. Cyr, M.A.Sc., P.Eng.
Senior Technical Specialist

Attachments: Blast Record
Blast and Seismograph Location Plan
Event Reports

Blast Record
Blast No. 2022-14

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 31, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	C. Costa	**Blast No.:**	2022-14
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Gulf Operators Ltd.		
Blaster's Certification No.:	1318	**Blaster's Name:**	Daniel Blanchard
Blast Location:	N 45º28'53.9" W 65º38'08.9" (see attached sketch)		
Type of Rock:	Gypsum	**Est. Vol. or Tonnage:**	9,373 tonnes
Weather at time of Blast:	Sunny with few clouds	**Air Temp.:**	17ºC
Est. Wind Speed :	≈15 km/h	**Wind Direction:**	S
Cloud Cover:	Few	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	106	**Hole Diameter:**	4.5"
Average Depth:	3.6 – 4.4 m	**Spacing:**	10 ft x 10 ft
No. Holes per Delay:	3	**Collar Length:**	7 ft
Delay between Holes:	25 ms	**Delay between Rows:**	42 ms
Initiation Method:	Non-Electric		
Weight of Explosives per Delay:	Max.: 52 kg		
Type and weight of Explosives for Blast:	2,218 kg – Titan XL 1000		

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

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 31, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	C. Costa	**Blast No.:**	2022-14
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	573 m
Direction to the Nearest Structure:	North
Structure Type:	Cottage
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	79.5

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.

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 31, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	C. Costa	**Blast No.:**	2022-14
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #18187
Calibration Date:	May 5, 2022
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1,370 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:	<124 dB(L) – Unit was not triggered

Data Collection – Seismometer #2

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5372
Calibration Date:	February 18, 2022
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	985 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:	<124 dB(L) – Unit was not triggered

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 31, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	C. Costa	**Blast No.:**	2022-14
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5635
Calibration Date:	March 1, 2022
Location of seismograph:	Civic Number 4150 Route 111 (PW-13)
Distance and Direction from Blast:	865 m Southeast
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:	<124 dB(L) – Unit was not triggered

Data Collection – Seismometer #4

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5676
Calibration Date:	February 28, 2022
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	1,040 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:	<124 dB(L) – Unit was not triggered

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 31, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	C. Costa	**Blast No.:**	2022-14
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5487
Calibration Date:	February 18, 2022
Location of seismograph:	Cottage - PW-03 - Route 820
Distance and Direction from Blast:	573 m North
Transverse Particle Velocity:	0.57 mm/s @ 37 Hz
Vertical Particle Velocity:	0.32 mm/s @ 73 Hz
Longitudinal Particle Velocity:	0.38 mm/s @ 47 Hz
Peak Particle Velocity:	0.57 mm/s @ 37 Hz
Maximum Airblast:	110 dB(L)

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5371
Calibration Date:	July 13, 2021
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	603 m North
Transverse Particle Velocity:	1.59 mm/s @ 43 Hz
Vertical Particle Velocity:	1.14 mm/s @ 43 Hz
Longitudinal Particle Velocity:	1.40 mm/s @ 34 Hz
Peak Particle Velocity:	1.59 mm/s @ 43 Hz
Maximum Airblast:	106 dB(L)

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 31, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	C. Costa	**Blast No.:**	2022-14
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #18193
Calibration Date:	April 11, 2022
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	775 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:	<124 dB(L) – Unit was not triggered

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5632
Calibration Date:	November 15, 2021
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	636 m West
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:	<124 dB(L) – Unit was not triggered

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 31, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	C. Costa	**Blast No.:**	2022-14
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21348
Calibration Date:	June 23, 2021
Location of seismograph:	Civic Number 220 Myron Road (PW-01)
Distance and Direction from Blast:	1,340 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:	<124 dB(L) – Unit was not triggered

Data Collection – Seismometer #10

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21349
Calibration Date:	June 28, 2021
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	934 m Southeast
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:	<124 dB(L) – Unit was not triggered

Conquest Engineering
Experience commitment.
A division of CBCL Limited

575 Crown Street
Saint John, New Brunswick
E2L 5E9
Phone: (506) 635-7565
Fax: (506) 635-8866
www.conquest-eng.com

Saint John
Moncton
Fredericton
Bedford

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	May 31, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	C. Costa	**Blast No.:**	2022-14
Client:	Hammond River Holdings		

Data Collection – Seismometer #11

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5489
Calibration Date:	April 25, 2022
Location of seismograph:	Civic Number 2337 Route 820 (PW-04)
Distance and Direction from Blast:	660 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:	<124 dB(L) – Unit was not triggered

Blast and Seismograph Location Plan
Blast No. 2022-14

Blast and Seismograph Location Plan
Blast No: 2022-14
Upham East Gypsum Quarry
Upham, NB

Date: May 31, 2022
CE Project No.: 22S001.00

Conquest Engineering
Experience commitment.
A division of CBCL Limited

Blast Event Reports
Blast No. 2022-14

Event Report

Date/Time	Tran at 14:00:06 May 31, 2022
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: May 31, 2022 16:35:58 (V10.72.1)

Serial Number	5487 V 2.61 MiniMate
Battery Level	5.8 Volts
Unit Calibration	February 18, 2022 by Instantel
File Name	G487JIYM.W60

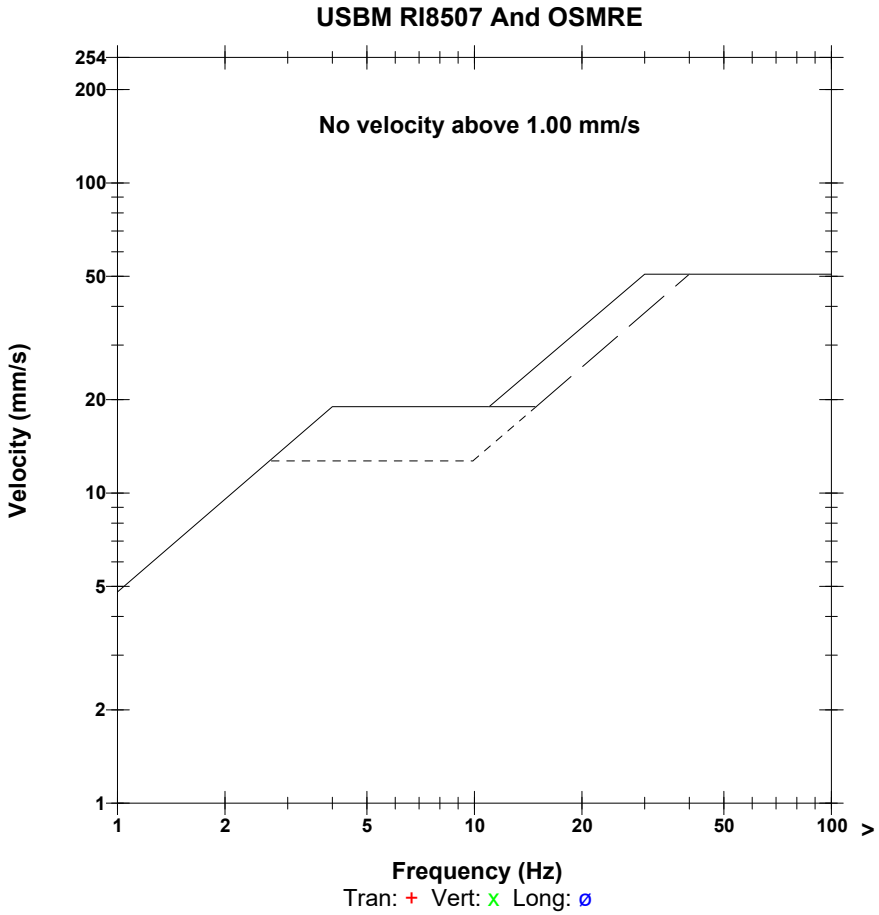
Post Event Notes
Location: Cottgae - Route 820 (PW-03)
Blast No.: 2022-14
CE Project No: 22S001.00

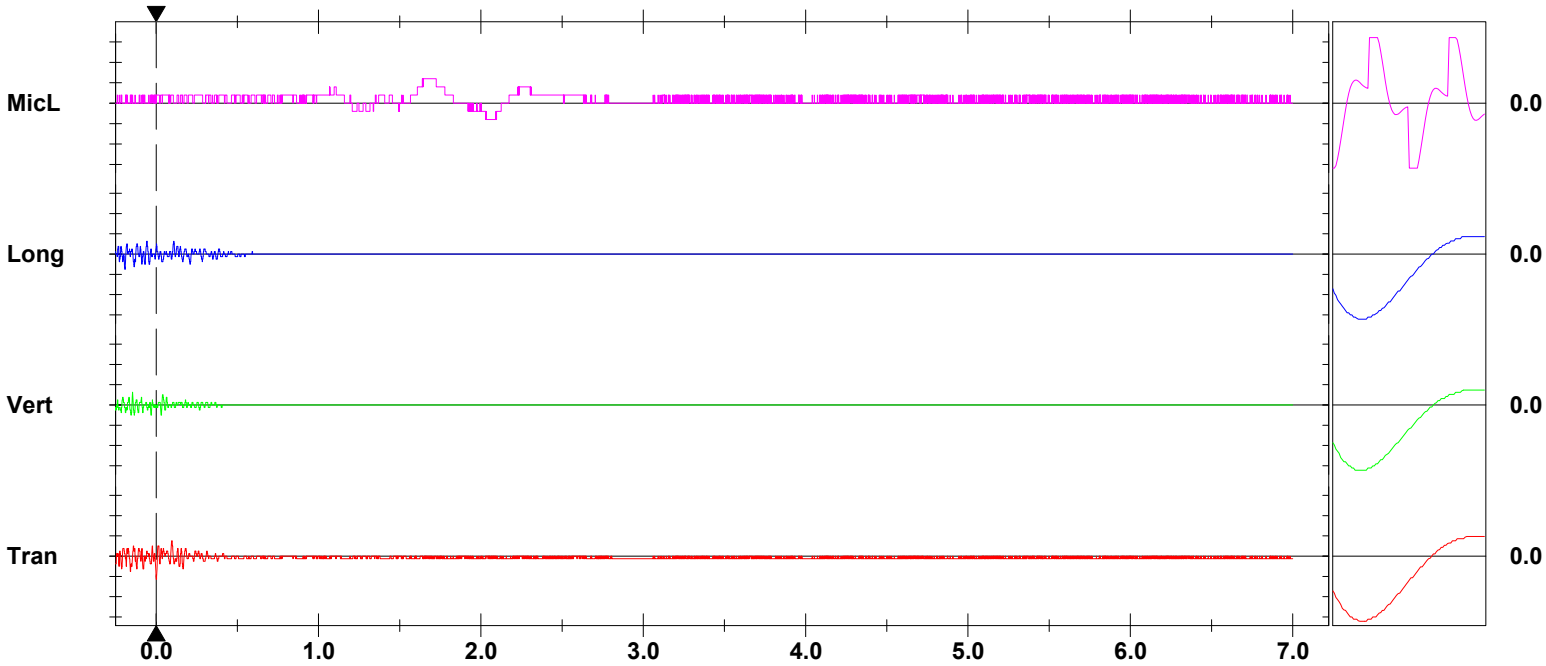
Extended Notes

Microphone	Linear Weighting
PSPL	109.5 dB(L) 6.000 pa.(L) at 1.640 sec
ZC Freq	2.0 Hz
Channel Test	Passed (Freq = 20.0 Hz Amp = 288 mv)

	Tran	Vert	Long	
PPV	0.572	0.318	0.381	mm/s
PPV	46.14	41.03	42.62	dB
ZC Freq	37	73	47	Hz
Time (Rel. to Trig)	0.002	-0.145	-0.190	sec
Peak Acceleration	0.020	0.013	0.013	g
Peak Displacement	0.002	0.000	0.001	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	7.7	Hz
Overswing Ratio	3.5	4.2	3.8	

Peak Vector Sum 0.603 mm/s at 0.001 sec





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

Format © 1995-2015 Xmark Corporation

Event Report

Date/Time	Long at 14:00:20 May 31, 2022
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: May 31, 2022 16:29:51 (V10.72.1)

Serial Number	5371 V 2.61 MiniMate
Battery Level	6.1 Volts
Unit Calibration	July 13, 2021 by Instantel
File Name	G371JIYM.WK0

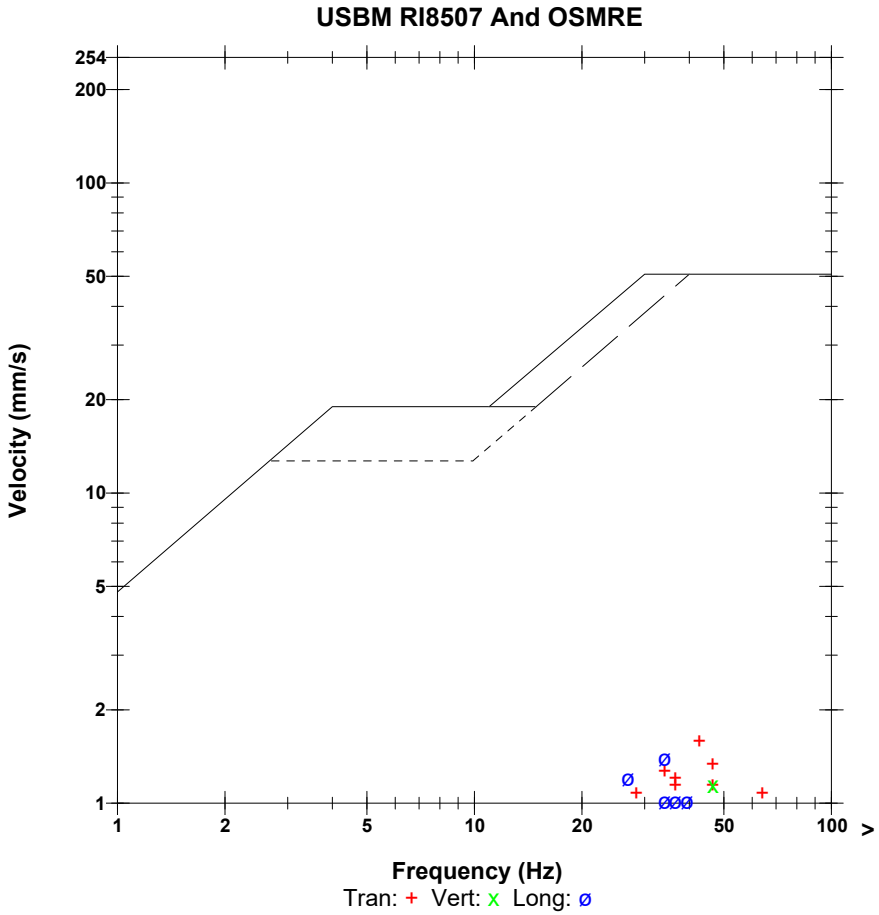
Post Event Notes
Location: 2341 Route 820 (PW-05)
Blast No.: 2022-14
CE Project No: 22S001.00

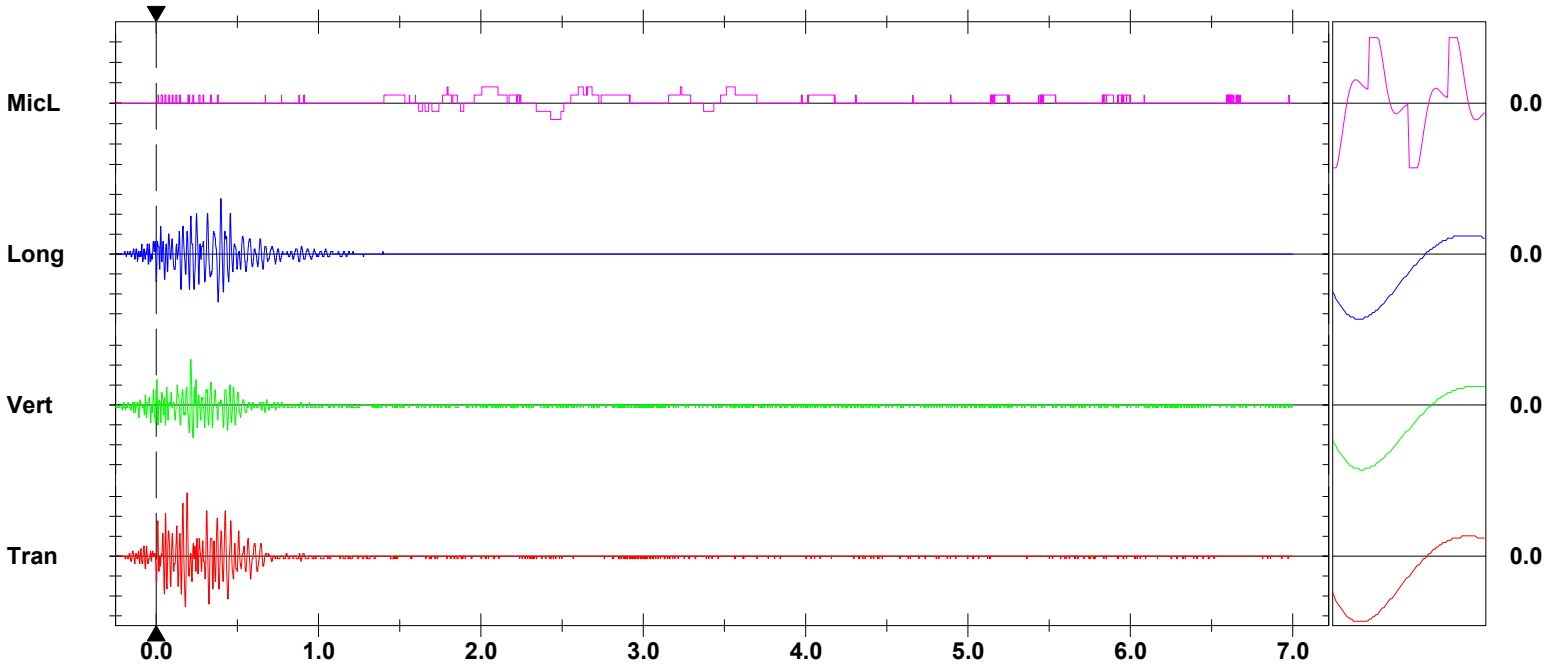
Extended Notes

Microphone	Linear Weighting
PSPL	106.0 dB(L) 4.000 pa.(L) at 1.793 sec
ZC Freq	9.1 Hz
Channel Test	Passed (Freq = 20.0 Hz Amp = 305 mv)

	Tran	Vert	Long	
PPV	1.588	1.143	1.397	mm/s
PPV	55.01	52.16	53.90	dB
ZC Freq	43	43	34	Hz
Time (Rel. to Trig)	0.190	0.213	0.399	sec
Peak Acceleration	0.046	0.040	0.040	g
Peak Displacement	0.006	0.004	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.2	7.8	8.3	Hz
Overswing Ratio	3.4	3.7	3.7	

Peak Vector Sum 1.699 mm/s at 0.191 sec





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

Format © 1995-2015 Xmark Corporation