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: November 29, 2022

Subject: Monthly Monitoring Report – Upham East Gypsum Quarry – October 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 October 2022, in accordance with conditions of the Approval to Operate I-10936. Activities included surface water monitoring, air monitoring, and blasting. Details of public complaints are also provided. For previous monthly activities, refer to the monthly reports provided from December 2019 through September 2022.

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

- Week 1: October 6, 2022
- Week 2: October 14, 2022
- Week 3: October 17, 2022
- Week 4: October 26, 2022

There was one additional sampling event conducted on October 20, 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). Two duplicate samples were collected during the October water sampling program. The RPD results could not be calculated due to both the results being below the laboratory detection limit. Therefore, the data satisfies the quality objectives for the monitoring program.

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 October, there were 5 air quality monitoring events, October 4, 10, 16, 22, and 28, 2022. The results are provided in Table 3. There were no exceedances of the 120 µg/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

Six blasts occurred during the October 2022 monitoring period, occurring on October 3, 6, 13, 19, 20 and 25, 2022. On October 25, 2022 there were two exceedances of the Approval to Operate sound pressure limits. At the Civic No. 2341 Route 820 (PW-05) and Civic No. 86 Myron Road (PW-16), both locations recorded a sound pressure level of 129(dB(L)), exceeding the 128 (dB(L)) Approval to Operate limit. This was reported via email on October 26, 2022. Blast reports are attached.

Public Complaints

There were two public complaints during the October 2022 monitoring period.

The first complaint occurred on October 18 when a resident of the area left a voicemail in regards to drivers using their Jake Brakes on Route 865. In response, Hammond River Holdings followed up with the truck drivers directing them to not use their Jake Brakes. The resident who left the complaint was notified by Hammond River Holding's response.

The second complaint occurred on October 25. A resident called to indicate that the October 25 blast was very loud. In response to the October 25 blasting event, further information on the sound pressure level exceedances were published to the Hammond River Holdings website and community Facebook page.

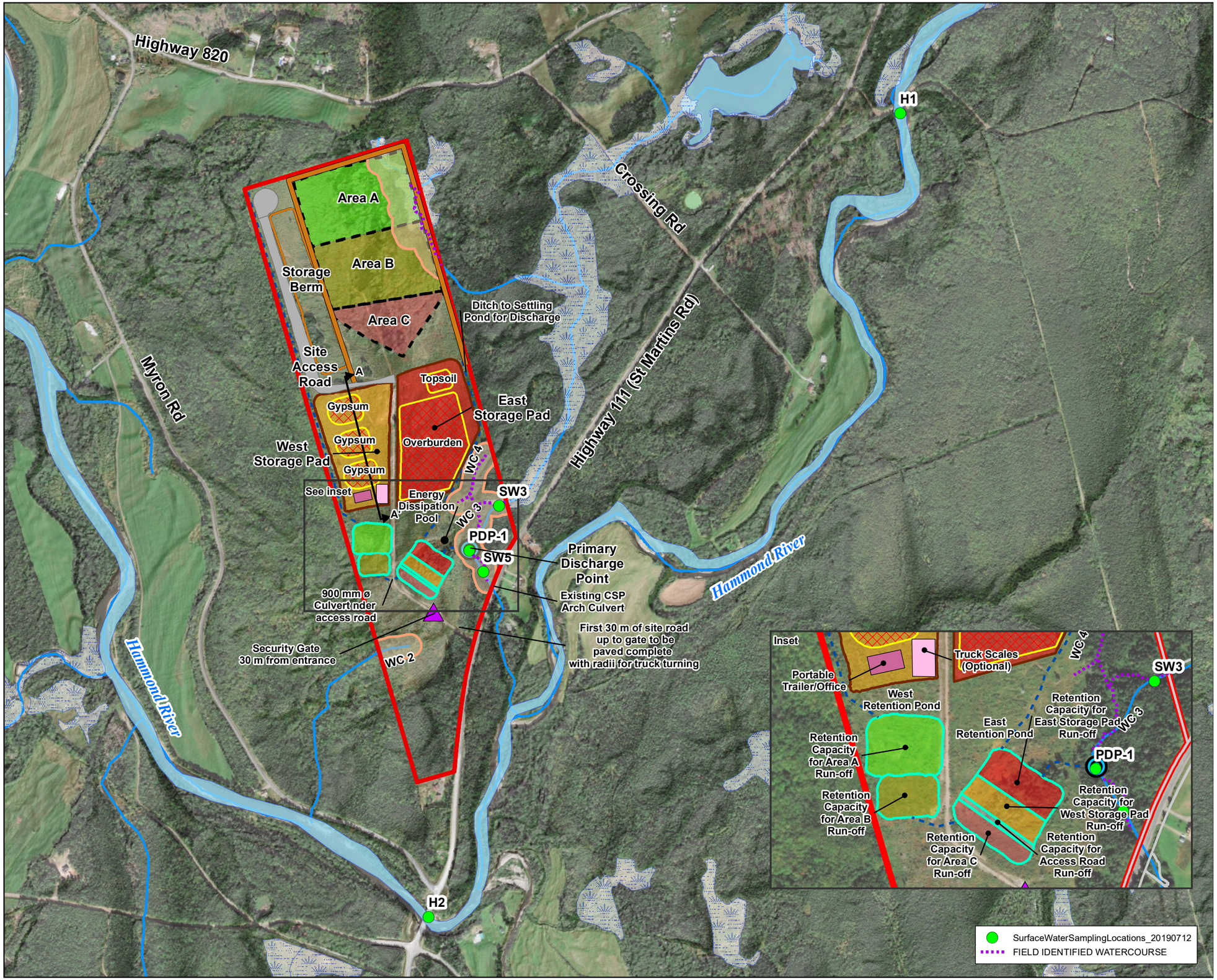
Summary

Since extraction activities began in September 2020 at the Upham East Gypsum Quarry, the water chemistry at the discharge point into the unnamed tributary has remained comparable to background, groundwater measured in the perimeter monitoring wells remains comparable to pre-operation conditions, air quality monitoring has remained below guidelines, and decibel levels have remained generally below guidelines, with the exception of the October 25, 2022 blast.

References

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

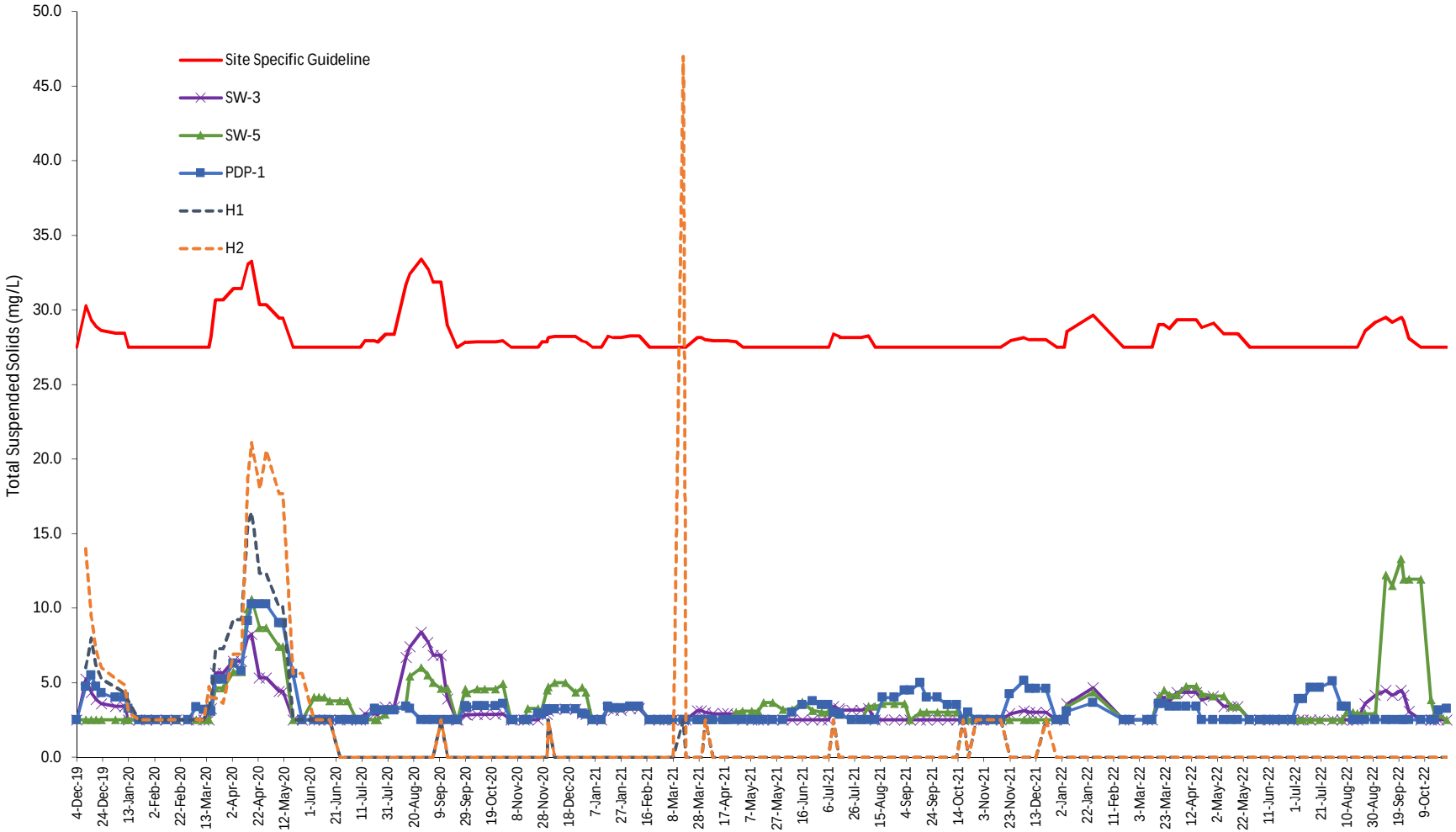
MAP CREATED BY: JH
MAP REVISED BY: JO
MAP CHECKED BY: GA
MAP PROJECTION: NAD_1983_CSRS_NEW_BRUNSWICK_STEREOGRAPHIC

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	6-Oct-22	17	0.0	10.6	589	2.00	<5
PDP-1	6-Oct-22			10.1	688	1.86	<5
SW5	6-Oct-22			10.0	687	1.25	<5
SW3	14-Oct-22	17.3	0.0	11.0	814	0.24	<5
PDP-1	14-Oct-22			11.3	910	1.62	<5
PDP-1 (F/D)	14-Oct-22			11.3	912	1.40	<5
SW5	14-Oct-22			11.5	899	0.77	<5
SW3	17-Oct-22	10.7	36.4	12.1	357	2.46	<5
PDP-1	17-Oct-22			11.5	640	2.49	<5
SW5	17-Oct-22			11.3	725	2.09	<5
SW3	20-Oct-22	12.3	44.0	11.8	190	2.68	<5
PDP-1	20-Oct-22			11.6	364	2.94	7
SW5	20-Oct-22			11.3	490	2.91	<5
SW3	26-Oct-22	18.1	25.2	14.5	351	1.64	<5
PDP-1	26-Oct-22			14	427	2.03	<5
PDP-1 (F/D)	26-Oct-22			14.1	430	1.97	<5
SW5	26-Oct-22			14.3	439	1.61	<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.

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

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

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Upham East Gypsum Project
Upham, New Brunswick
Project No. 21-3049

Date	Site Specific Guideline	Monthly Average				
		H1	H2	SW3	PDP-1	SW5
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
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

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Date	Site Specific Guideline	Monthly Average				
		H1	H2	SW3	PDP-1	SW5
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
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

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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
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
4-Jun-22	27.5	-	-	2.5	2.5	2.5
10-Jun-22	27.5	-	-	2.5	2.5	2.5
15-Jun-22	27.5	-	-	2.5	2.5	2.5
22-Jun-22	27.5	-	-	2.5	2.5	2.5
29-Jun-22	27.5	-	-	2.5	2.5	2.5
04-Jul-22	27.5	2.5	2.5	2.5	2.5	3.9
7-Jul-22	27.5	-	-	2.5	2.5	3.9
13-Jul-22	27.5	-	-	2.5	2.5	4.7
20-Jul-22	27.5	-	-	2.5	2.5	4.7
30-Jul-22	27.5	-	-	2.5	2.5	5.1
6-Aug-22	27.5	-	-	2.5	3.4	2.5
10-Aug-22	27.5	-	-	2.5	3.4	3.0
15-Aug-22	27.5	-	-	2.5	2.5	3.0
18-Aug-22	27.5	-	-	2.5	2.5	2.9
24-Aug-22	28.6	-	-	3.6	2.5	2.9
1-Sep-22	29.2	-	-	4.2	2.5	2.9
9-Sep-22	29.5	-	-	4.5	2.5	12.2
14-Sep-22	29.2	2.5	2.5	4.2	2.5	11.5
21-Sep-22	29.5	-	-	4.5	2.5	13.3
23-Sep-22	29.2	-	-	4.2	2.5	11.9
27-Sep-22	28.1	-	-	3.1	2.5	11.9
06-Oct-22	27.5	-	-	2.5	2.5	11.9
14-Oct-22	27.5	-	-	2.5	2.5	3.8
17-Oct-22	27.5	-	-	2.5	2.5	2.9
20-Oct-22	27.5	-	-	2.5	3.1	2.9
26-Oct-22	27.5	-	-	2.5	3.3	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	16.70	24.05	752	20.3	14.842	14.865	23000	39.85	120
2020-07-28	24 hours	16.46	23.70	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	24.10	752	21.2	14.842	14.844	2200	3.80	120
2020-08-15	24 hours	16.88	24.30	754	19.8	14.824	14.836	11600	19.89	120
2020-08-21	24 hours	16.87	24.30	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	8.0	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	17.10	24.62	753	15.3	14.856	14.859	3300	5.59	120
2020-10-02	24 hours	14.43	25.10	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	7.0	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	25.90	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	18.00	24.73	744	-2.7	14.836	14.852	16300	27.46	120
2021-01-12	24 hours	16.70	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	16.70	24.03	737	-8.0	14.823	14.827	4200	7.28	120
2021-01-30	24 hours	16.70	24.03	750	-11.2	14.829	14.833	3600	6.24	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)
2021-02-05	24 hours	17.90	25.80	744	-0.9	14.850	14.866	15800	25.52	120
2021-02-11	24 hours	16.70	24.05	750	-12.6	14.829	14.834	5300	9.18	120
2021-02-17	24 hours	16.70	24.05	755	-9.9	14.818	14.821	2800	4.85	120
2021-02-23	24 hours	17.70	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	16.70	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	16.70	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	16.70	24.05	756	6.8	14.823	14.831	8600	14.90	120
2021-04-06	24 hours	16.70	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	16.70	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	16.70	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	17.30	24.91	746	9.3	14.866	14.868	1700	2.84	120
2021-07-12	24 hours	17.60	24.05	759	9.5	14.848	14.851	3000	5.20	120
2021-07-18	24 hours	16.70	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	25.10	742	5.6	14.830	14.840	10000	16.60	120
2021-08-05	24 hours	17.47	25.15	755	10.0	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

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)
2021-08-29	24 hours	17.49	25.18	755	9.8	14.824	14.830	6100	10.09	120
2021-09-04	24 hours	16.70	24.05	745	3.1	14.822	14.832	10600	18.36	120
2021-09-09	24 hours	17.15	24.70	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	18.30	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	24.70	747	12.1	14.815	14.822	6600	11.13	120
2021-10-22	24 hours	17.10	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	25.90	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
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	18.90	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	27.20	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	18.70	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	19.70	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	14.827	14.831	3300	5.23	120
2022-03-08	24 hours	18.37	26.45	748	-6.2	14.834	14.834	500	0.79	120
2022-03-14	24 hours	18.11	26.08	756	0.2	14.814	14.818	4300	6.87	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)
2022-03-20	24 hours	17.53	25.24	741	3.9	14.830	14.833	3800	6.27	120
2022-03-26	24 hours	17.51	25.22	735	2.0	14.839	14.847	7500	12.39	120
2022-04-01	24 hours	17.34	24.98	735	4.4	14.847	14.852	5200	8.67	120
2022-04-07	24 hours	17.77	25.59	753	4.4	14.848	14.849	200	0.33	120
2022-04-13	24 hours	17.59	25.53	752	6.6	14.855	14.856	600	0.98	120
2022-04-19	24 hours	17.69	25.47	746	3.4	14.840	14.872	31700	51.86	120
2022-04-25	24 hours	17.65	25.42	757	7.8	14.831	14.845	14800	24.26	120
2022-05-01	24 hours	17.84	25.70	754	3.7	14.825	14.848	22700	36.80	120
2022-05-07	24 hours	17.82	25.67	755	4.4	14.823	14.832	9600	15.58	120
2022-05-13	24 hours	17.06	24.57	754	16.3	14.821	14.857	36200	61.39	120
2022-05-19	24 hours	17.20	24.77	749	12.0	14.816	14.829	13300	22.37	120
2022-05-25	24 hours	17.44	25.11	760	12.4	14.828	14.829	700	1.16	120
2022-05-31	24 hours	17.46	25.14	751	8.8	14.850	14.851	900	1.49	120
2022-06-06	24 hours	17.39	25.04	753	10.5	14.813	14.826	13800	22.96	120
2022-06-12	24 hours	16.92	24.36	752	18.3	14.825	14.833	7200	12.32	120
2022-06-18	24 hours	16.81	24.21	739	15.2	14.843	14.848	5600	9.64	120
2022-06-24	24 hours	16.93	24.38	751	17.4	14.828	14.858	30300	51.78	120
2022-06-30	24 hours	16.95	24.41	752	18.0	14.826	14.839	12900	22.02	120
2022-07-06	24 hours	17.10	24.63	747	13.0	14.829	14.829	400	0.68	120
2022-07-12	24 hours	16.59	24.29	750	17.7	14.826	14.836	9200	15.78	120
2022-07-18	24 hours	16.57	23.85	746	22.1	14.821	14.840	18500	32.32	120
2022-07-24	24 hours	16.70	24.05	749	24.4	14.861	14.862	1500	2.60	120
2022-07-30	24 hours	16.73	24.10	749	20.4	14.831	14.832	1000	1.73	120
2022-08-05	24 hours	16.66	24	755	23.9	14.8283	14.8427	14400	25.0000	120
2022-08-11	24 hours	16.76	24.13	750	19.9	14.8321	14.8358	3700	6.3890	120
2022-08-17	24 hours	16.95	24.41	749	16.5	14.8601	14.8771	17000	29.0182	120
2022-08-23	24 hours	16.89	24.33	749	17.2	14.8649	14.8726	7700	13.1867	120
2022-08-29	24 hours	16.7	24.05	753	17.3	14.8706	14.8811	10500	18.1913	120
2022-09-04	24 hours	17.11	24.64	755	16.2	14.8635	14.8653	1800	3.0438	120
2022-09-10	24 hours	17.03	24.52	755	17.6	14.8454	14.8544	9000	15.2936	120
2022-09-16	24 hours	17.32	24.95	749	10.3	14.8614	14.8654	4000	6.6800	120
2022-09-22	24 hours	16.93	24.38	741	13.6	14.8603	14.8822	21900	37.4282	120
2022-09-28	24 hours	17.12	24.65	750	13.9	14.8503	14.8595	9200	15.5510	120
2022-10-04	24 hours	17.89	25.76	757	4.3	14.8573	14.8668	9500	15.3662	120
2022-10-10	24 hours	17.92	25.8	755	2.7	14.8456	14.8551	9500	15.3424	120
2022-10-16	24 hours	17.04	24.54	749	14.8	14.8455	14.8589	13400	22.7520	120
2022-10-22	24 hours	17.75	25.56	758	6.6	14.859	14.8611	2100	3.4233	120
2022-10-28	24 hours	18.17	26.17	762	1.6	14.8436	14.8609	17300	27.5443	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: 460530-IAS
Report Date: 17-Oct-22
Date Received: 07-Oct-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:			460530-1	460530-2	460530-3
Client Sample ID:			SW3	SW5	PDP-1
Date Sampled:			6-Oct-22	6-Oct-22	6-Oct-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: 460530-IAS
Report Date: 17-Oct-22
Date Received: 07-Oct-22

CERTIFICATE OF ANALYSIS

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

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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: 461386-IAS
Report Date: 21-Oct-22
Date Received: 17-Oct-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:			461386-1	461386-2	461386-3	461386-4
Client Sample ID:			SW3	SW5	PDP-1	PDP-1 duplicate
Date Sampled:			14-Oct-22	14-Oct-22	14-Oct-22	14-Oct-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: 461386-IAS
Report Date: 21-Oct-22
Date Received: 17-Oct-22

CERTIFICATE OF ANALYSIS

for
Hammond River Holdings Limited
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Methods

Analyte	RPC SOP #	Method Reference	Method Principle
Solids - Total Suspended	IAS-M05	APHA 2540 D	Filtration, Gravimetry

Report ID: 461659-IAS
Report Date: 21-Oct-22
Date Received: 18-Oct-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:			461659-1	461659-2	461659-3
Client Sample ID:			SW3	SW5	PDP-1
Date Sampled:			17-Oct-22	17-Oct-22	17-Oct-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: 461659-IAS
Report Date: 21-Oct-22
Date Received: 18-Oct-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: 462274-IAS
Report Date: 02-Nov-22
Date Received: 21-Oct-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:			462274-1	462274-2	462274-3
Client Sample ID:			SW3	SW5	PDP-1
Date Sampled:			20-Oct-22	20-Oct-22	20-Oct-22
Analytes	**Units**	**RL**			
Solids - Total Suspended	mg/L	5	< 5	< 5	7

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

RL = Reporting Limit

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

Brannen Burhoe
Supervisor
Inorganic Analytical Services

Report ID: 462274-IAS
Report Date: 02-Nov-22
Date Received: 21-Oct-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: 462953-IAS
Report Date: 04-Nov-22
Date Received: 27-Oct-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:			462953-1	462953-2	462953-3	462953-4
Client Sample ID:			SW3	SW5	PDP-1	PDP-1 Duplicate
Date Sampled:			26-Oct-22	26-Oct-22	26-Oct-22	26-Oct-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: 462953-IAS
Report Date: 04-Nov-22
Date Received: 27-Oct-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

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October 4, 2022

Project No.: 22S001.00

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

Re: Blast Vibration Monitoring – Blast No. 2022-34 – 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 14:17 on October 3, 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. 2022-34 – October 3, 2022

Seismograph Location	Time	Approx. dist. from shot to seismograph (m)	Maximum Velocity (mm/s)	Sound Pressure (dB(L))	Remarks
1. Civic No. 4126 Route 111 (PW-10)	14:17	1,020 m S	< 0.5 mm/s	<120	Units were not triggered
2. Civic No. 4150 Route 111 (PW-13)		860 m SE	< 0.5 mm/s	<120	
3. Civic No. 2447 Route 820 (PW-07)		880 m NE	< 0.5 mm/s	<120	
4. PW-03 - Cottage Route 820		550 m N	0.83 mm/s @ 43 Hz	112	-
5. Civic No. 2341 Route 820 (PW-05)		550 m N	1.49 mm/s @ 57 Hz	112	-
6. Civic No. 50 Myron Road (PW-15)		820 m NW	0.95 mm/s @ 47 Hz	112	-
7. Civic No. 86 Myron Road (PW-16)		800 m W	0.86 mm/s @ 39 Hz	111	-
8. Civic No. 220 Myron Road (PW-01)		1,450 m S	< 0.5 mm/s	<120	Units were not triggered
9. Civic No. 2337 Route 820 (PW-04)		635 m N	< 0.5 mm/s	<120	
10. Civic No. 4140 Route 111 (PW-12)		950 m S	< 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,
CBCL Limited

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

Attachments: Blast Record
Blast and Seismograph Location Plan
Blast Event Reports

Project No: 22S001.00

Attachment A

Blast Record

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 3, 2022
Project No.:	22S001.00	**Time of Blast:**	14:17
Inspector:	C. Buckley	**Blast No.:**	2022-34
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Gulf Operators Ltd.		
Blaster's Certification No.:	1318	**Blaster's Name:**	Daniel Blanchard
Blast Location:	N 45º28.937' W 65º38.045' (see attached sketch)		
Type of Rock:	Gypsum	**Est. Vol. or Tonnage:**	11,111 tonnes
Weather at time of Blast:	Sunny	**Air Temp.:**	18ºC
Est. Wind Speed :	≈10 km/h	**Wind Direction:**	NE
Cloud Cover:	No	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	119	**Hole Diameter:**	4.5"
Average Depth:	4.2 m to 5.8 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, 59 & 84 ms
Initiation Method:	Non-Electric		
Weight of Explosives per Delay:	Max.: 102 kg		
Type and weight of Explosives for Blast:	3,700 kg – Titan XL 1000		

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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 3, 2022
Project No.:	22S001.00	**Time of Blast:**	14:17
Inspector:	C. Buckley	**Blast No.:**	2022-34
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	550 m
Direction to the Nearest Structure:	N
Structure Type:	House
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	54.5

SAFETY:

Type of Warning Signal Used:	Siren
Blasting Mats Used (yes or no):	No
Airblast Measurement (yes or no):	Yes
Vibration Measurement (yes or no):	Yes
Warning Signs Posted (yes or no):	Yes
Accesses Guarded (yes or no):	Yes
Flyrock Damage (yes or no):	No

If Yes, Describe:

Misfire (yes or no):	No

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

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 3, 2022
Project No.:	22S001.00	**Time of Blast:**	14:17
Inspector:	C. Buckley	**Blast No.:**	2022-34
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #20203
Calibration Date:	May 31, 2022
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	1,020 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 #20205
Calibration Date:	May 31, 2022
Location of seismograph:	Civic Number 4150 Route 111 (PW-13)
Distance and Direction from Blast:	860 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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 3, 2022
Project No.:	22S001.00	**Time of Blast:**	14:17
Inspector:	C. Buckley	**Blast No.:**	2022-34
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21348
Calibration Date:	July 23, 2022
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	880 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

Data Collection – Seismometer #4

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:	550 m North
Transverse Particle Velocity:	0.45 mm/s @ 34 Hz
Vertical Particle Velocity:	0.45 mm/s @ 51 Hz
Longitudinal Particle Velocity:	0.83 mm/s @ 43 Hz
Peak Particle Velocity:	0.83 mm/s @ 43 Hz
Maximum Airblast:	112 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 3, 2022
Project No.:	22S001.00	**Time of Blast:**	14:17
Inspector:	C. Buckley	**Blast No.:**	2022-34
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #18193
Calibration Date:	April 11, 2022
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	550 m North
Transverse Particle Velocity:	1.27 mm/s @ 27 Hz
Vertical Particle Velocity:	1.49 mm/s @ 57 Hz
Longitudinal Particle Velocity:	1.14 mm/s @ 34 Hz
Peak Particle Velocity:	1.49 mm/s @ 57 Hz
Maximum Airblast:	112 dB(L)

Data Collection – Seismometer #6

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:	820 m Northwest
Transverse Particle Velocity:	0.95 mm/s @ 51 Hz
Vertical Particle Velocity:	0.95 mm/s @ 47 Hz
Longitudinal Particle Velocity:	0.83 mm/s @ 47 Hz
Peak Particle Velocity:	0.95 mm/s @ 47 Hz
Maximum Airblast:	112 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 3, 2022
Project No.:	22S001.00	**Time of Blast:**	14:17
Inspector:	C. Buckley	**Blast No.:**	2022-34
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #20204
Calibration Date:	May 31, 2022, 2022
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	800 m West
Transverse Particle Velocity:	0.73 mm/s @ 27 Hz
Vertical Particle Velocity:	0.57 mm/s @ 28 Hz
Longitudinal Particle Velocity:	0.86 mm/s @ 39 Hz
Peak Particle Velocity:	0.86 mm/s @ 39 Hz
Maximum Airblast:	111 dB(L)

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #20206
Calibration Date:	May 31, 2022
Location of seismograph:	Civic Number 220 Myron Road (PW-01)
Distance and Direction from Blast:	1,450 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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 3, 2022
Project No.:	22S001.00	**Time of Blast:**	14:17
Inspector:	C. Buckley	**Blast No.:**	2022-34
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit	Instantel Mini Mate, Serial #21349
Calibration Date:	July 20, 2022
Location of seismograph:	Civic Number 2337 Route 820 (PW-04)
Distance and Direction from Blast:	635 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 #10

Make, Model and Serial # of unit	Instantel Mini Mate, Serial #18187
Calibration Date:	May 5, 2022
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	950 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

Attachment B

Blast and Seismograph Location Plan

Blast and Seismograph Location Plan
Blast No: 2022-34
Upham East Gypsum Quarry
Upham, NB

Date: October 3, 2022
Project No.: 22S001.00

Attachment C

Blast Event Reports

Event Report

Date/Time Long at 14:17:25 October 3, 2022
Trigger Source Geo: 0.492 mm/s
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
Converted: October 3, 2022 17:03:20 (V10.72.1)

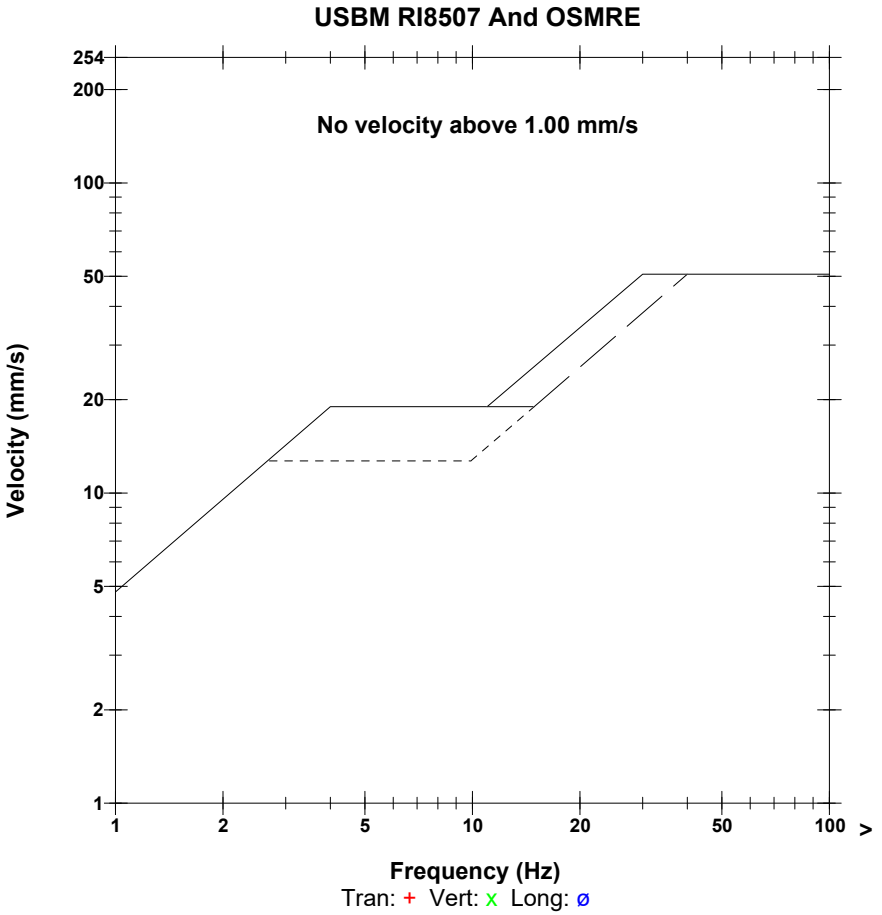
Extended Notes

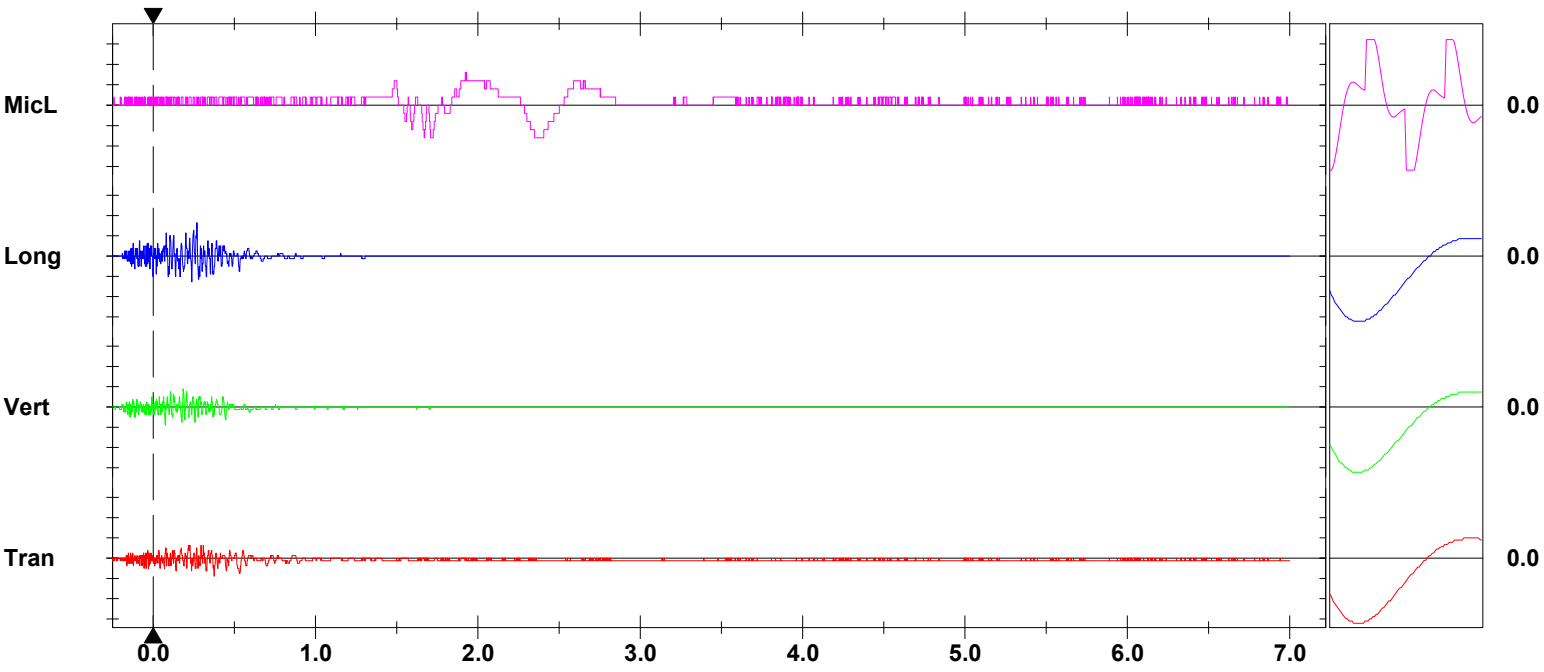
Microphone Linear Weighting
PSPL 112.0 dB(L) 8.000 pa.(L) at 1.670 sec
ZC Freq 17 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 286 mv)

	Tran	Vert	Long	
PPV	0.445	0.445	0.826	mm/s
PPV	43.96	43.96	49.33	dB
ZC Freq	34	51	43	Hz
Time (Rel. to Trig)	0.377	0.075	0.271	sec
Peak Acceleration	0.020	0.020	0.033	g
Peak Displacement	0.003	0.001	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.0	7.7	7.7	Hz
Overswing Ratio	3.4	4.1	3.8	

Peak Vector Sum 0.857 mm/s at 0.271 sec

Serial Number 5487 V 2.61 MiniMate
Battery Level 5.9 Volts
Unit Calibration February 18, 2022 by Instantel
File Name G487JPE5.110
Post Event Notes
Location: Cottage on Route 820 (PW-03)
Blast No.: 2022-34
Project No: 22S001.00





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

Event Report

Date/Time Vert at 14:17:19 October 3, 2022
Trigger Source Geo: 0.500 mm/s, Mic: 120.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 7.0 sec at 1024 sps
Operator/Setup: Operator/CARVER.MMB

Notes
Location:
Client:
User Name:
General:

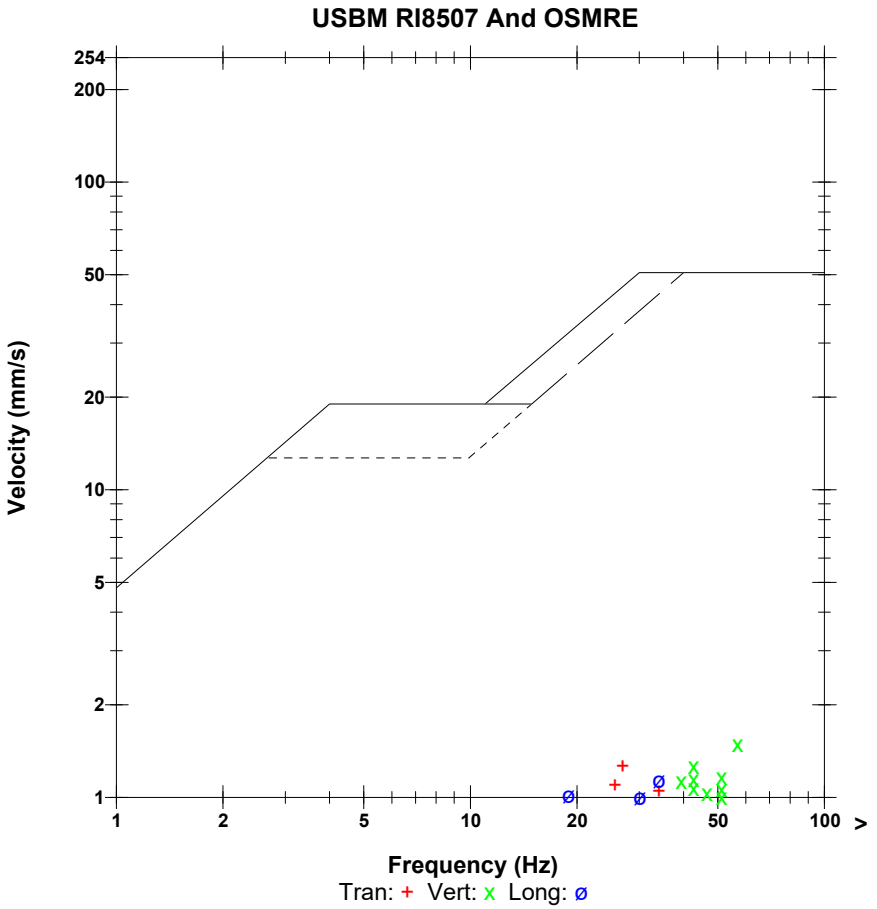
Serial Number UM18193 V 10-90GC Micromate ISEE
Battery Level 3.7 Volts
Unit Calibration April 11, 2022 by Instantel
File Name UM18193_20221003141719.IDFW

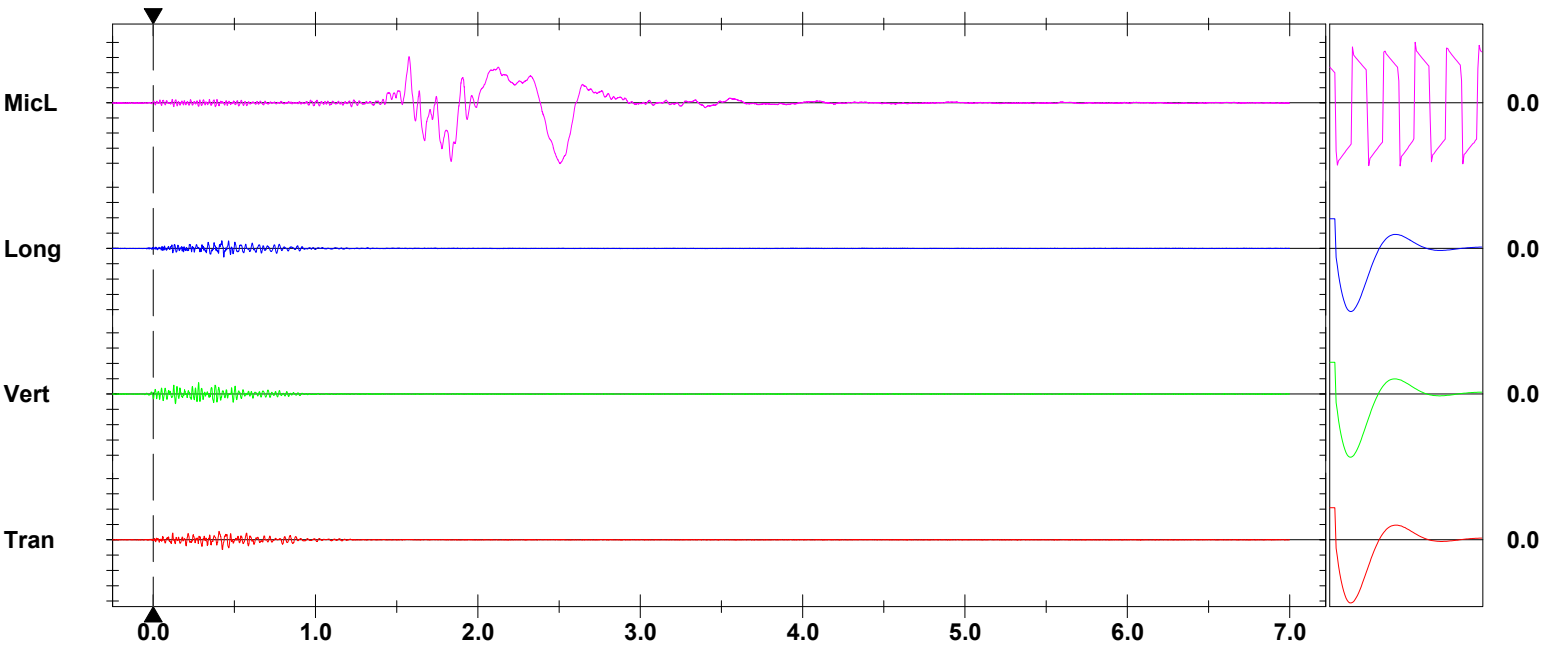
Post Event Notes
Location: 2341 Route 820 (PW-05)
Blast No.: 2022-34
Project No: 22S001.00

Microphone Linear Weighting
PSPL 112.1 dB(L) 8.052 pa.(L) at 2.505 sec
ZC Freq 2.3 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1491 mv)

	Tran	Vert	Long	
PPV	1.269	1.490	1.135	mm/s
PPV	53.07	54.46	52.10	dB
ZC Freq	27	57	34	Hz
Time (Rel. to Trig)	0.426	0.280	0.435	sec
Peak Acceleration	0.049	0.063	0.055	g
Peak Displacement	0.006	0.005	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.3	Hz
Overswing Ratio	4.3	4.2	4.5	

Peak Vector Sum 1.496 mm/s at 0.280 sec





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

Event Report

Date/Time Vert at 14:17:17 October 3, 2022
Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L)
Range Geo: 127.0 mm/s
Record Time 5.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
Converted: October 3, 2022 16:55:44 (V10.72.1)

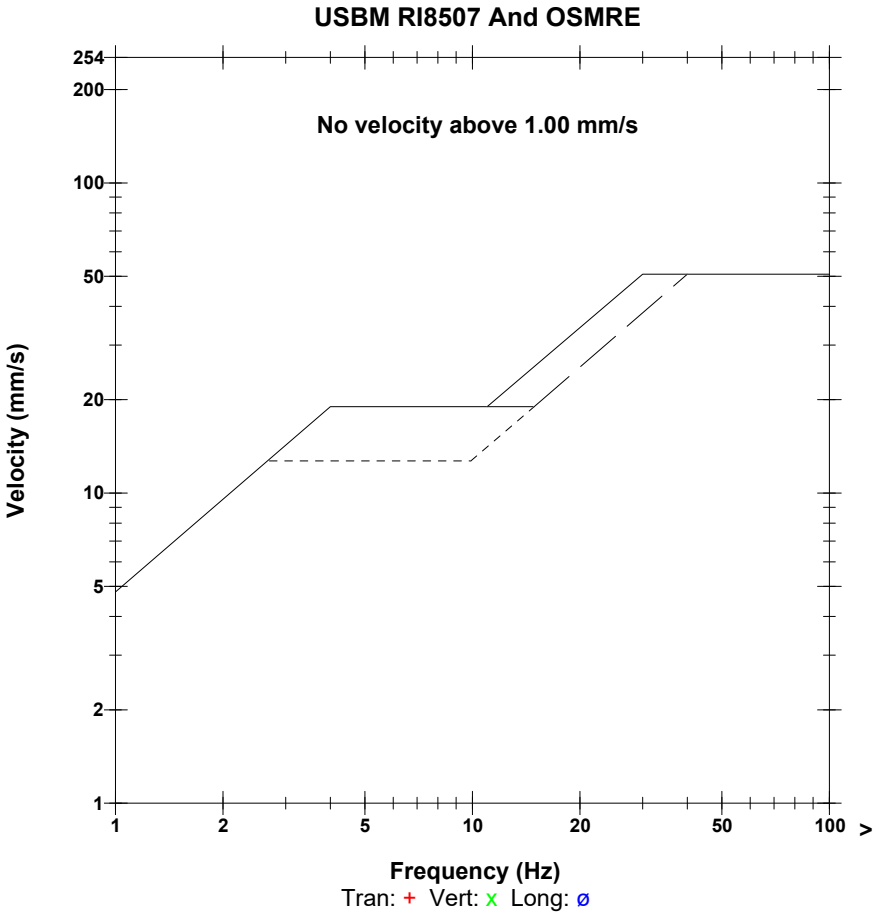
Extended Notes

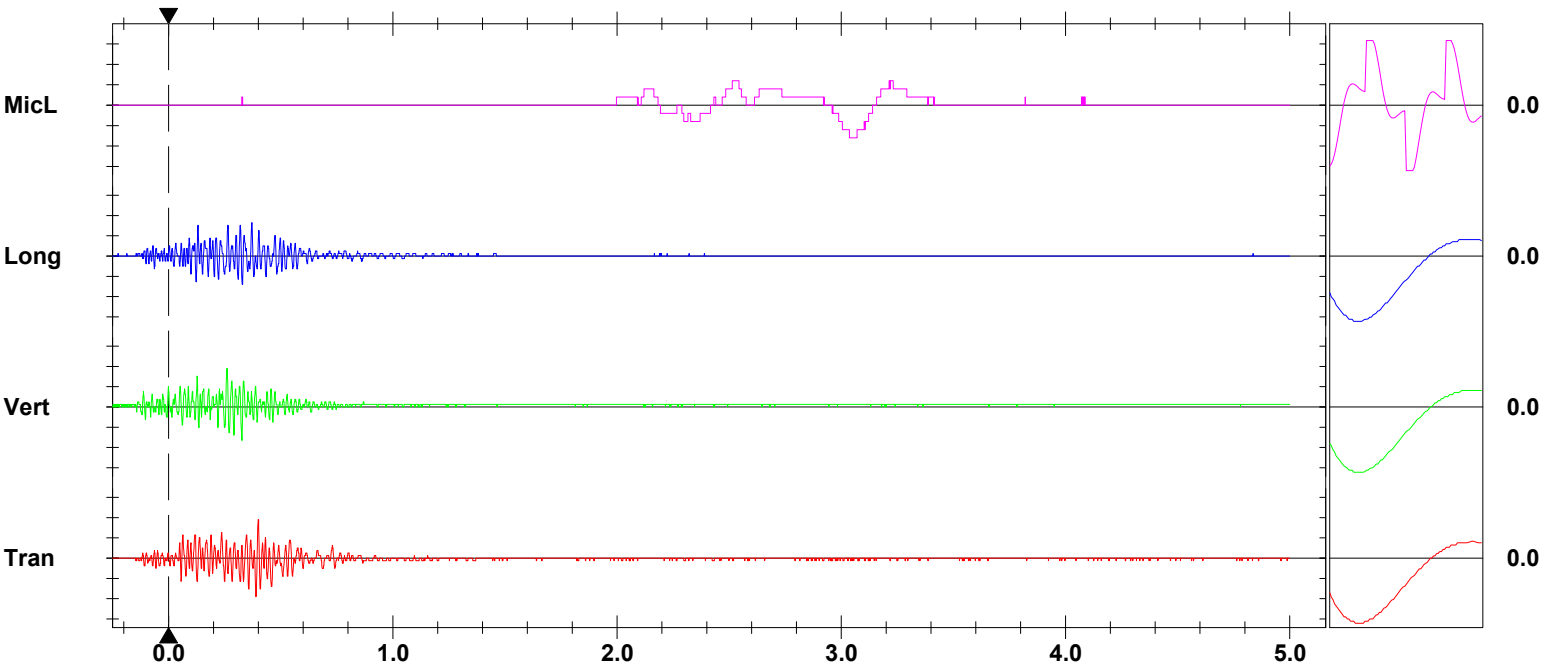
Microphone Linear Weighting
PSPL 112.0 dB(L) 8.000 pa.(L) at 3.037 sec
ZC Freq 3.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 272 mv)

	Tran	Vert	Long	
PPV	0.953	0.953	0.826	mm/s
PPV	50.58	50.58	49.33	dB
ZC Freq	51	47	47	Hz
Time (Rel. to Trig)	0.391	0.261	0.371	sec
Peak Acceleration	0.033	0.040	0.033	g
Peak Displacement	0.003	0.003	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.7	7.8	Hz
Overswing Ratio	3.8	4.0	4.0	

Peak Vector Sum 1.095 mm/s at 0.328 sec

Serial Number 5489 V 2.61 MiniMate
Battery Level 6.0 Volts
Unit Calibration April 25, 2022 by Instantel
File Name G489JPE5.0T0
Post Event Notes
Location: 50 Myron Road (PW-15)
Blast No.: 2022-34
Project No: 22S001.00





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Long at 14:17:21 October 3, 2022
Trigger Source Geo: 0.500 mm/s, Mic: 120.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 7.0 sec at 1024 sps
Operator/Setup: Operator/GAYTON.MMB

Notes
Location:
Client:
User Name:
General:

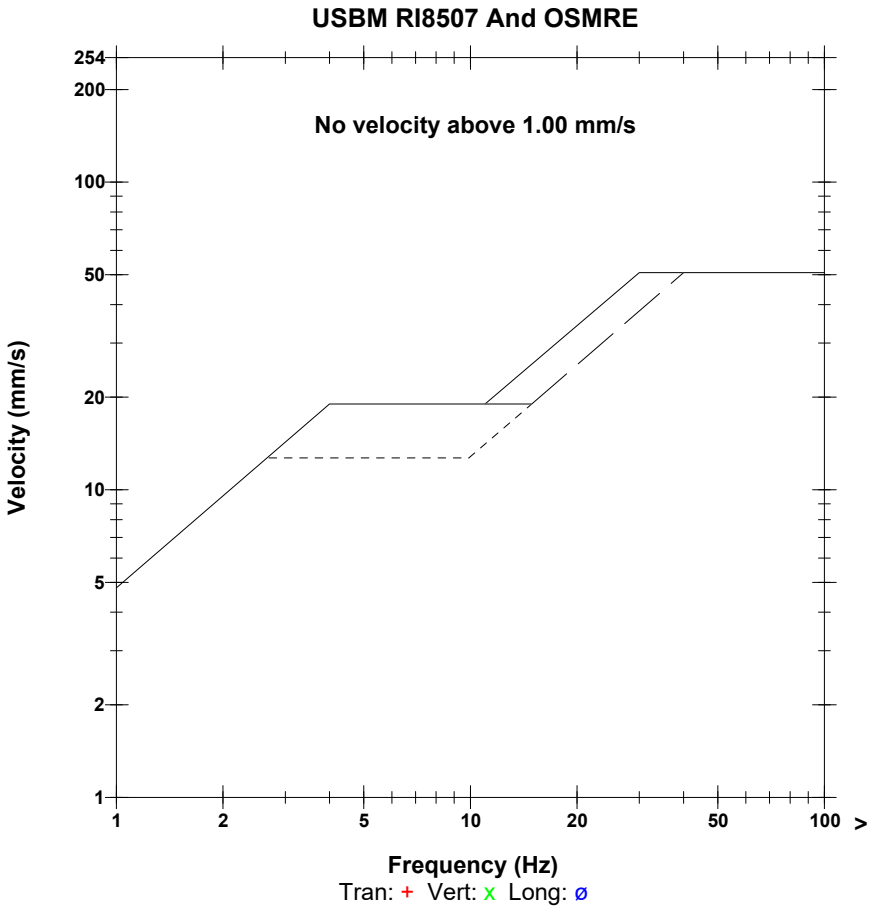
Serial Number UM20204 V 10-90GC Micromate ISEE
Battery Level 3.4 Volts
Unit Calibration May 31, 2022 by Instantel
File Name UM20204_20221003141721.IDFW

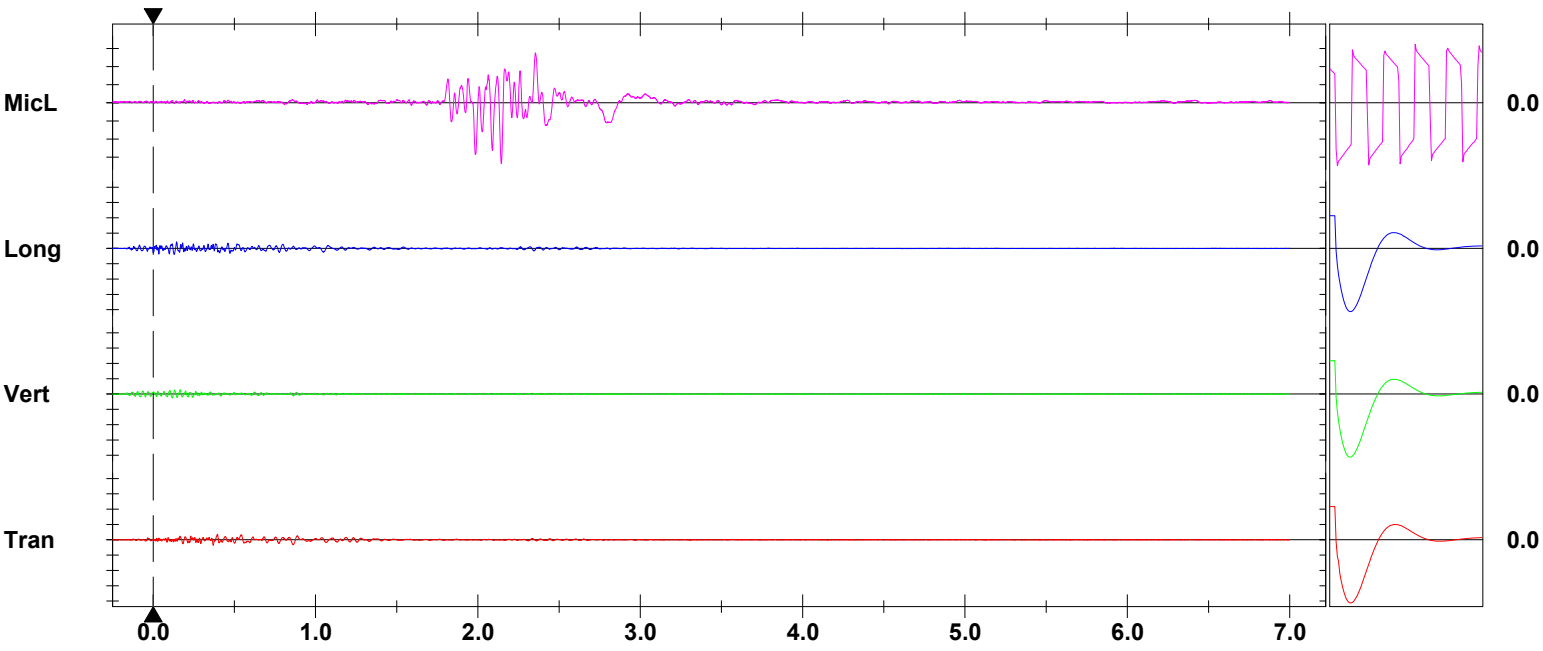
Post Event Notes
Location: 86 Myron Road (PW-16)
Blast No.: 2022-34
Project No: 22S001.00

Microphone Linear Weighting
PSPL 110.5 dB(L) 6.718 pa.(L) at 2.145 sec
ZC Freq 20 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1414 mv)

	Tran	Vert	Long	
PPV	0.725	0.567	0.859	mm/s
PPV	48.21	46.08	49.68	dB
ZC Freq	27	28	39	Hz
Time (Rel. to Trig)	0.396	0.166	0.145	sec
Peak Acceleration	0.037	0.017	0.047	g
Peak Displacement	0.007	0.002	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.5	7.5	Hz
Overswing Ratio	4.1	4.3	4.0	

Peak Vector Sum 0.932 mm/s at 0.146 sec





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

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October 7, 2022

Project No.: 22S001.00

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

Re: Blast Vibration Monitoring – Blast No. 2022-35 – 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 Archibald Drilling & Blasting at 15:09 on October 6, 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. 2022-35 – October 6, 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)	15:09	1,306 m S	< 0.5 mm/s	<120	Units were not triggered
2. Civic No. 4126 Route 111 (PW-10)		884 m S	< 0.5 mm/s	<120	
3. Civic No. 4150 Route 111 (PW-13)		750 m SE	< 0.5 mm/s	<120	
4. Civic No. 2447 Route 820 (PW-07)		945 m NE	< 0.5 mm/s	<120	
5. PW-03 - Cottage Route 820		658 m N	0.64 mm/s @ 43 Hz	110	-
6. Civic No. 2341 Route 820 (PW-05)		669 m N	1.34 mm/s @ 43 Hz	102	-
7. Civic No. 50 Myron Road (PW-15)		911 m NW	0.76 mm/s @ 57 Hz	106	-
8. Civic No. 86 Myron Road (PW-16)		814 m W	1.91 mm/s @ 20 Hz	110	-
9. Civic No. 220 Myron Road (PW-01)		1,336 m S	< 0.5 mm/s	<120	Units were not triggered
10. Civic No. 4140 Route 111 (PW-12)		812 m SE	< 0.5 mm/s	<120	
11. Civic No. 2337 Route 820 (PW-04)		757 m N	0.51 mm/s @ 28 Hz	106	-
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,
CBCL Limited

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

Attachments: Blast Record
Blast and Seismograph Location Plan
Blast Event Reports

Project No: 22S001.00

Attachment A

Blast Record

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 6, 2022
Project No.:	22S001.00	**Time of Blast:**	15:09
Inspector:	C. Buckley	**Blast No.:**	2022-35
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Archibald Drilling & Blasting		
Blaster's Certification No.:	1297	**Blaster's Name:**	Anthony Wallace
Blast Location:	N 45.481747º W 65.633815º (see attached sketch)		
Type of Rock:	Anhydrate/Gypsum	**Est. Vol. or Tonnage:**	27,031 tonnes
Weather at time of Blast:	Clear	**Air Temp.:**	17ºC
Est. Wind Speed :	≈10 km/h	**Wind Direction:**	N
Cloud Cover:	Few	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	153	**Hole Diameter:**	4.5"
Average Depth:	23 ft	**Spacing:**	10 ft x 10 ft
No. Holes per Delay:	1	**Collar Length:**	10 ft - 14 ft
Delay between Holes:	25 ms	**Delay between Rows:**	59 & 84 ms
Initiation Method:	Non-Electric		
Weight of Explosives per Delay:	Max.: 81 kg		
Type and weight of Explosives for Blast:	8,364 kg Fortex – Emulsion		

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

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 6, 2022
Project No.:	22S001.00	**Time of Blast:**	15:09
Inspector:	C. Buckley	**Blast No.:**	2022-35
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	658 m
Direction to the Nearest Structure:	N
Structure Type:	House
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	73.1

SAFETY:

Type of Warning Signal Used:	Siren
Blasting Mats Used (yes or no):	No
Airblast Measurement (yes or no):	Yes
Vibration Measurement (yes or no):	Yes
Warning Signs Posted (yes or no):	Yes
Accesses Guarded (yes or no):	Yes
Flyrock Damage (yes or no):	No

If Yes, Describe:

Misfire (yes or no):	No

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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 6, 2022
Project No.:	22S001.00	**Time of Blast:**	15:09
Inspector:	C. Buckley	**Blast No.:**	2022-35
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5489
Calibration Date:	April 25, 2022
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1,306 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 #5676
Calibration Date:	February 28, 2022
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	884 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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 6, 2022
Project No.:	22S001.00	**Time of Blast:**	15:09
Inspector:	C. Buckley	**Blast No.:**	2022-35
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:	750 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 #20206
Calibration Date:	May 31, 2022
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	945 m Northeast
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 6, 2022
Project No.:	22S001.00	**Time of Blast:**	15:09
Inspector:	C. Buckley	**Blast No.:**	2022-35
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:	658 m North
Transverse Particle Velocity:	0.45 mm/s @ 85 Hz
Vertical Particle Velocity:	0.51 mm/s @ 47 Hz
Longitudinal Particle Velocity:	0.64 mm/s @ 43 Hz
Peak Particle Velocity:	0.64 mm/s @ 43 Hz
Maximum Airblast:	110 dB(L)

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #20204
Calibration Date:	May 31, 2022
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	669 m North
Transverse Particle Velocity:	0.91 mm/s @ 32 Hz
Vertical Particle Velocity:	1.34 mm/s @ 43 Hz
Longitudinal Particle Velocity:	1.05 mm/s @ 43 Hz
Peak Particle Velocity:	1.34 mm/s @ 43 Hz
Maximum Airblast:	102 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 6, 2022
Project No.:	22S001.00	**Time of Blast:**	15:09
Inspector:	C. Buckley	**Blast No.:**	2022-35
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21348
Calibration Date:	July 23, 2022
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	911 m Northwest
Transverse Particle Velocity:	0.64 mm/s @ 73 Hz
Vertical Particle Velocity:	0.64 mm/s @ 73 Hz
Longitudinal Particle Velocity:	0.76 mm/s @ 57 Hz
Peak Particle Velocity:	0.76 mm/s @ 57 Hz
Maximum Airblast:	106 dB(L)

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21349
Calibration Date:	July 20, 2022
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	814 m West
Transverse Particle Velocity:	1.27 mm/s @ 32 Hz
Vertical Particle Velocity:	0.76 mm/s @ 51 Hz
Longitudinal Particle Velocity:	1.91 mm/s @ 20 Hz
Peak Particle Velocity:	1.91 mm/s @ 20 Hz
Maximum Airblast:	110 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 6, 2022
Project No.:	22S001.00	**Time of Blast:**	15:09
Inspector:	C. Buckley	**Blast No.:**	2022-35
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #18187
Calibration Date:	May 5, 2022
Location of seismograph:	Civic Number 220 Myron Road (PW-01)
Distance and Direction from Blast:	1,336 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:	812 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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 6, 2022
Project No.:	22S001.00	**Time of Blast:**	15:09
Inspector:	C. Buckley	**Blast No.:**	2022-35
Client:	Hammond River Holdings		

Data Collection – Seismometer #11

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5632
Calibration Date:	November 15, 2021
Location of seismograph:	Civic Number 2337 Route 820 (PW-04)
Distance and Direction from Blast:	757 m North
Transverse Particle Velocity:	0.32 mm/s @ 30 Hz
Vertical Particle Velocity:	0.38 mm/s @ 57 Hz
Longitudinal Particle Velocity:	0.51 mm/s @ 28 Hz
Peak Particle Velocity:	0.51 mm/s @ 28 Hz
Maximum Airblast:	106 dB(L)

Attachment B

Blast and Seismograph Location Plan

Blast and Seismograph Location Plan
Blast No: 2022-35
Upham East Gypsum Quarry
Upham, NB

Date: October 6, 2022
Project No.: 22S001.00

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Attachment C

Blast Event Reports

Event Report

Date/Time Long at 15:09:46 October 6, 2022
Trigger Source Geo: 0.492 mm/s
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
Converted: October 6, 2022 18:32:10 (V10.72.1)

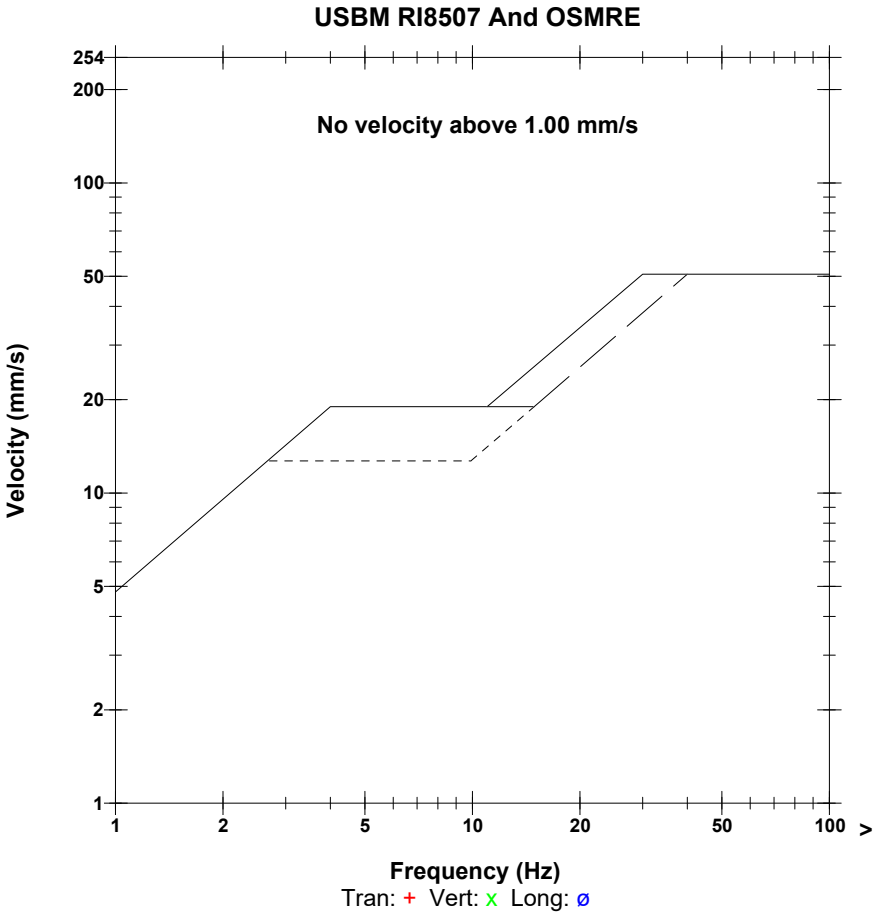
Extended Notes

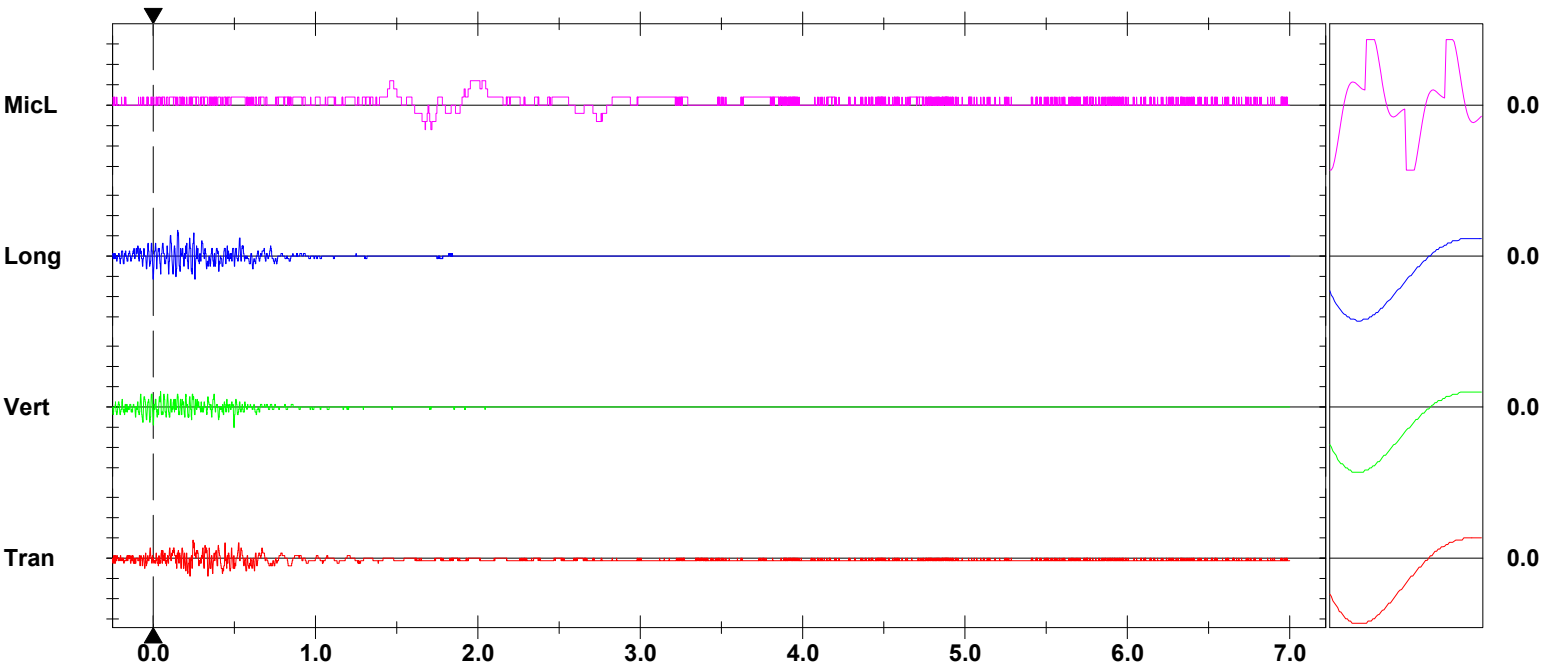
Microphone Linear Weighting
PSPL 109.5 dB(L) 6.000 pa.(L) at 1.458 sec
ZC Freq 4.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 286 mv)

	Tran	Vert	Long	
PPV	0.445	0.508	0.635	mm/s
PPV	43.96	45.12	47.06	dB
ZC Freq	85	47	43	Hz
Time (Rel. to Trig)	0.228	0.498	0.151	sec
Peak Acceleration	0.020	0.020	0.027	g
Peak Displacement	0.002	0.001	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	7.7	Hz
Overswing Ratio	3.4	3.8	3.8	

Peak Vector Sum 0.730 mm/s at 0.001 sec

Serial Number 5487 V 2.61 MiniMate
Battery Level 6.1 Volts
Unit Calibration February 18, 2022 by Instantel
File Name G487JPJR.GA0
Post Event Notes
Location: Cottage on Route 820 (PW-03)
Blast No.: 2022-35
Project No: 22S001.00





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

Event Report

Date/Time Vert at 15:09:44 October 6, 2022
Trigger Source Geo: 0.500 mm/s, Mic: 120.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 7.0 sec at 1024 sps
Operator/Setup: Operator/GAYTON.MMB

Notes
Location:
Client:
User Name:
General:

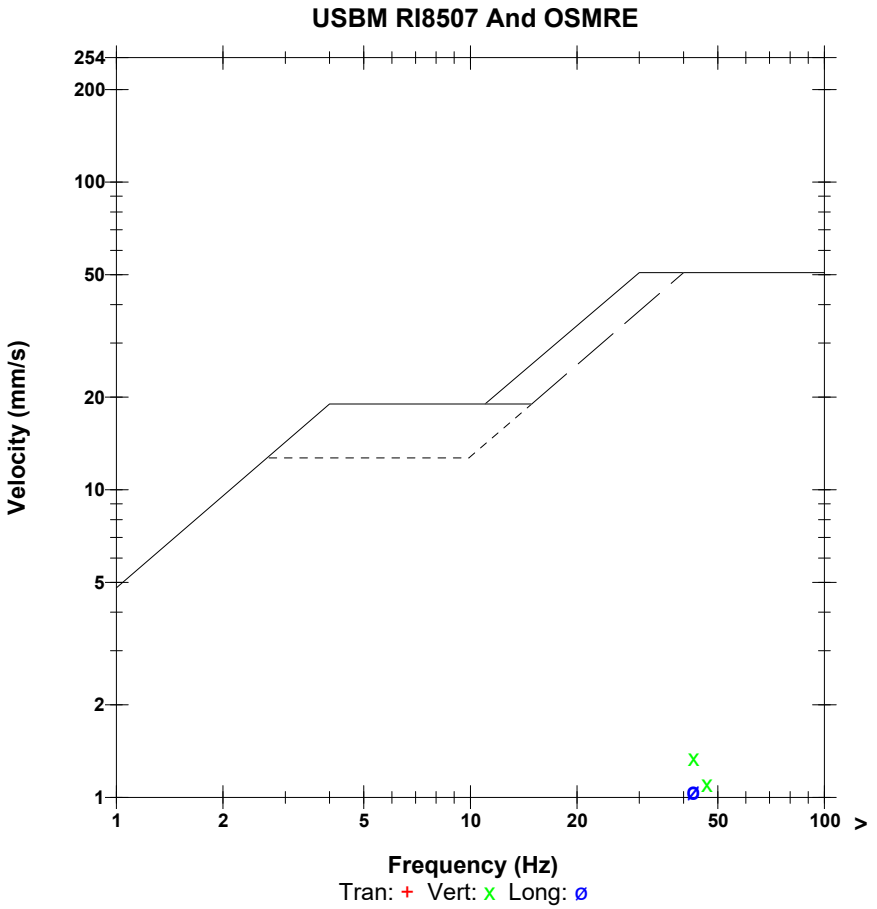
Serial Number UM20204 V 10-90GC Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration May 31, 2022 by Instantel
File Name UM20204_20221006150944.IDFW

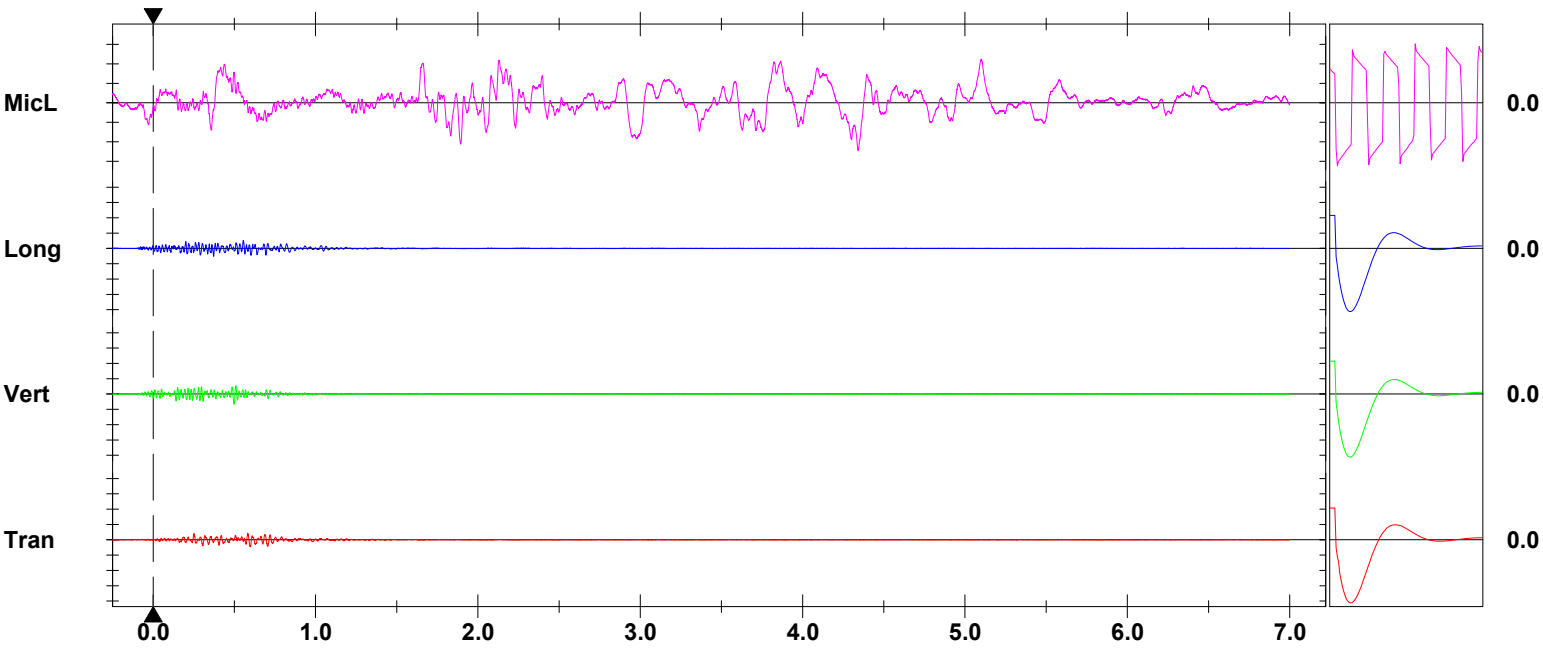
Post Event Notes
Location: 2341 Route 820 (PW-05)
Blast No.: 2022-35
Project No: 22S001.00

Microphone Linear Weighting
PSPL 101.8 dB(L) 2.451 pa.(L) at 4.343 sec
ZC Freq 3.2 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1402 mv)

	Tran	Vert	Long	
PPV	0.914	1.340	1.048	mm/s
PPV	50.22	53.54	51.41	dB
ZC Freq	32	43	43	Hz
Time (Rel. to Trig)	0.598	0.498	0.555	sec
Peak Acceleration	0.039	0.073	0.060	g
Peak Displacement	0.005	0.005	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.7	Hz
Overswing Ratio	4.2	4.3	4.0	

Peak Vector Sum 1.374 mm/s at 0.510 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 1.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Vert at 15:05:29 October 6, 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

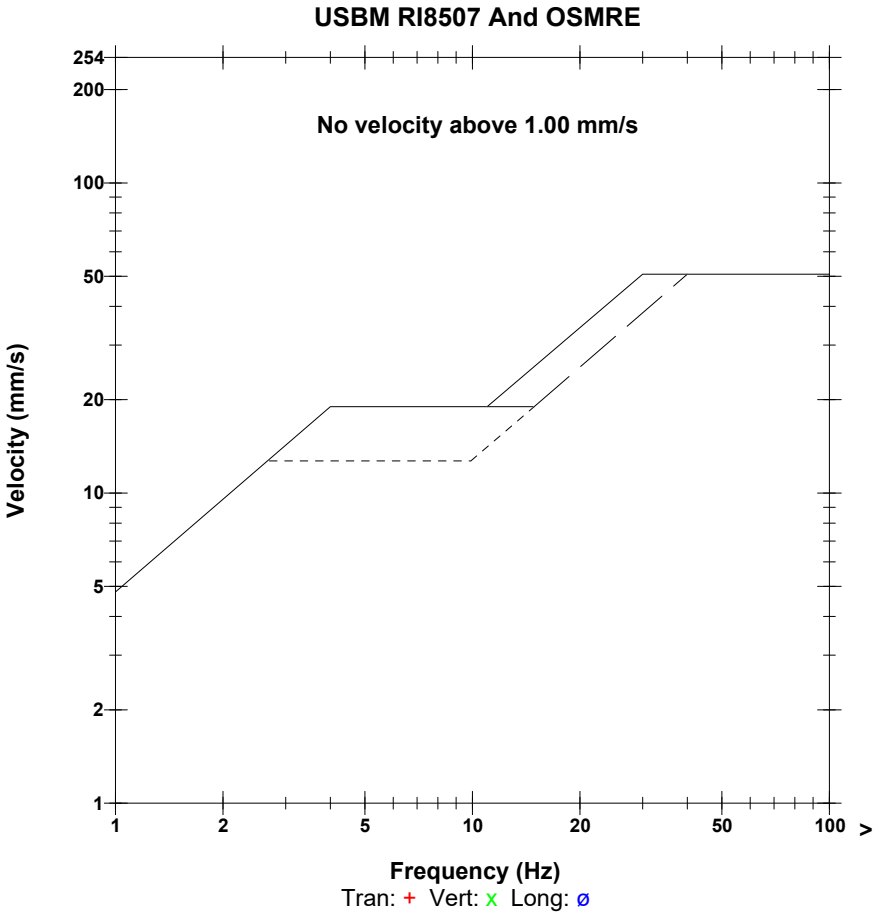
Notes

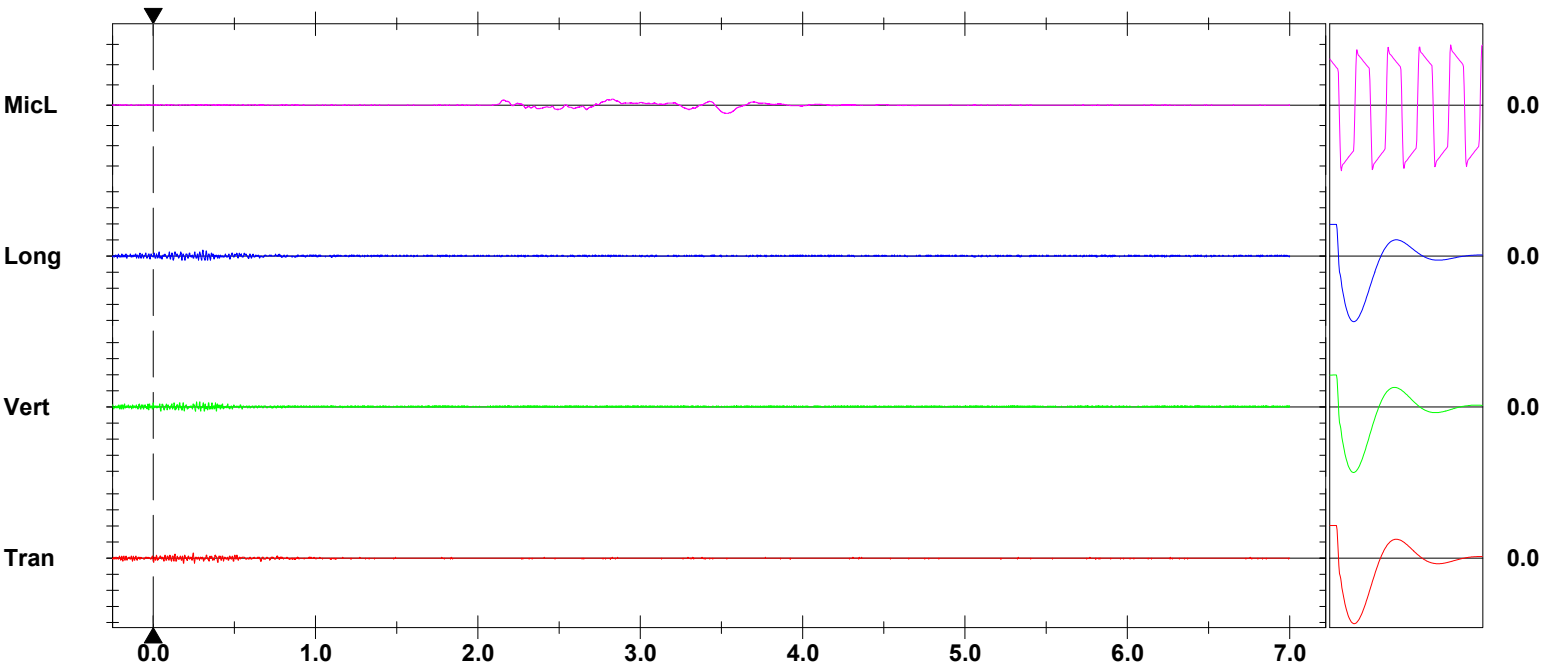
Serial Number BE21348 V 10.72-1.1 Minimate Blaster
Battery Level 6.4 Volts
Unit Calibration July 21, 2022 by Instantel
File Name W348JPHW.L50
Post Event Notes
Location: 50 Myron Road (PW-15)
Blast No.: 2022-35
Project No: 22S001.00

Microphone Linear Weighting
PSPL 106.0 dB(L) 4.000 pa.(L) at 3.521 sec
ZC Freq 3.0 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 541 mv)

	Tran	Vert	Long	
PPV	0.635	0.635	0.762	mm/s
PPV	47.06	47.06	48.64	dB
ZC Freq	73	73	57	Hz
Time (Rel. to Trig)	0.187	0.268	0.306	sec
Peak Acceleration	0.027	0.040	0.040	g
Peak Displacement	0.002	0.001	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.7	7.3	Hz
Overswing Ratio	3.5	3.4	4.1	

Peak Vector Sum 0.823 mm/s at 0.286 sec





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

Event Report

Date/Time	Long at 15:09:40 October 6, 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
Job Number:	1

Serial Number	BE21349 V 10.72-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	July 20, 2022 by Instantel
File Name	W349JPHW.S40

Notes
Location:
Client:
User Name:
General:

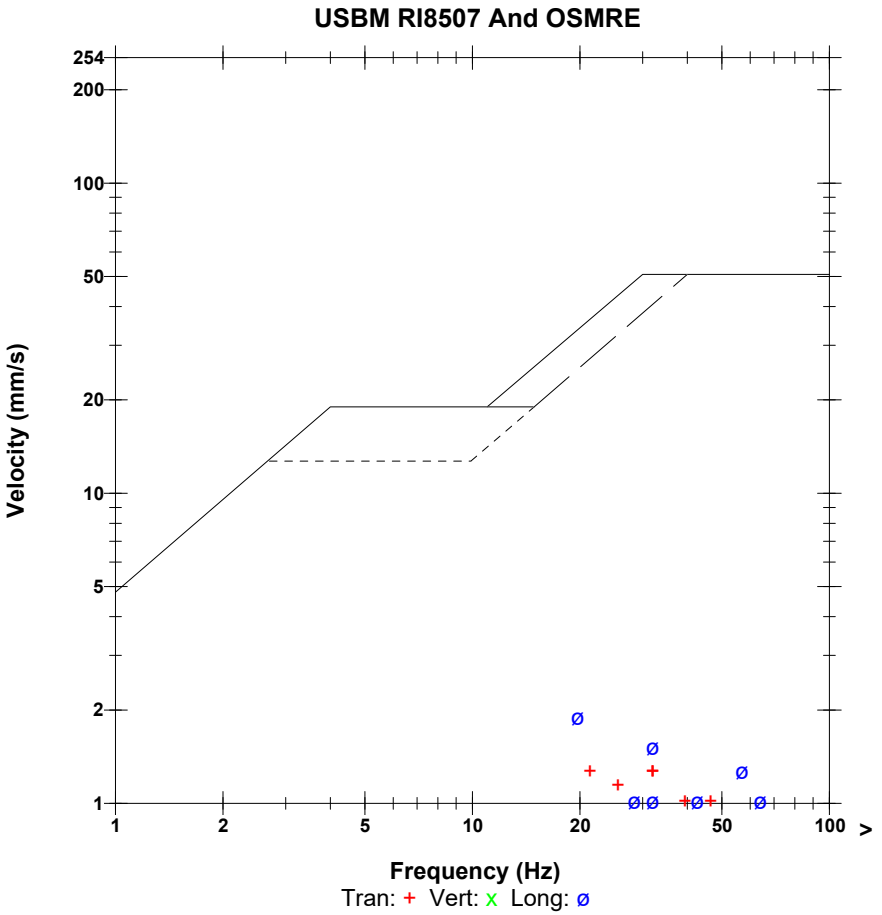
Post Event Notes
Location: 86 Myron Road (PW-16)
Blast No.: 2022-35
Project No: 22S001.00

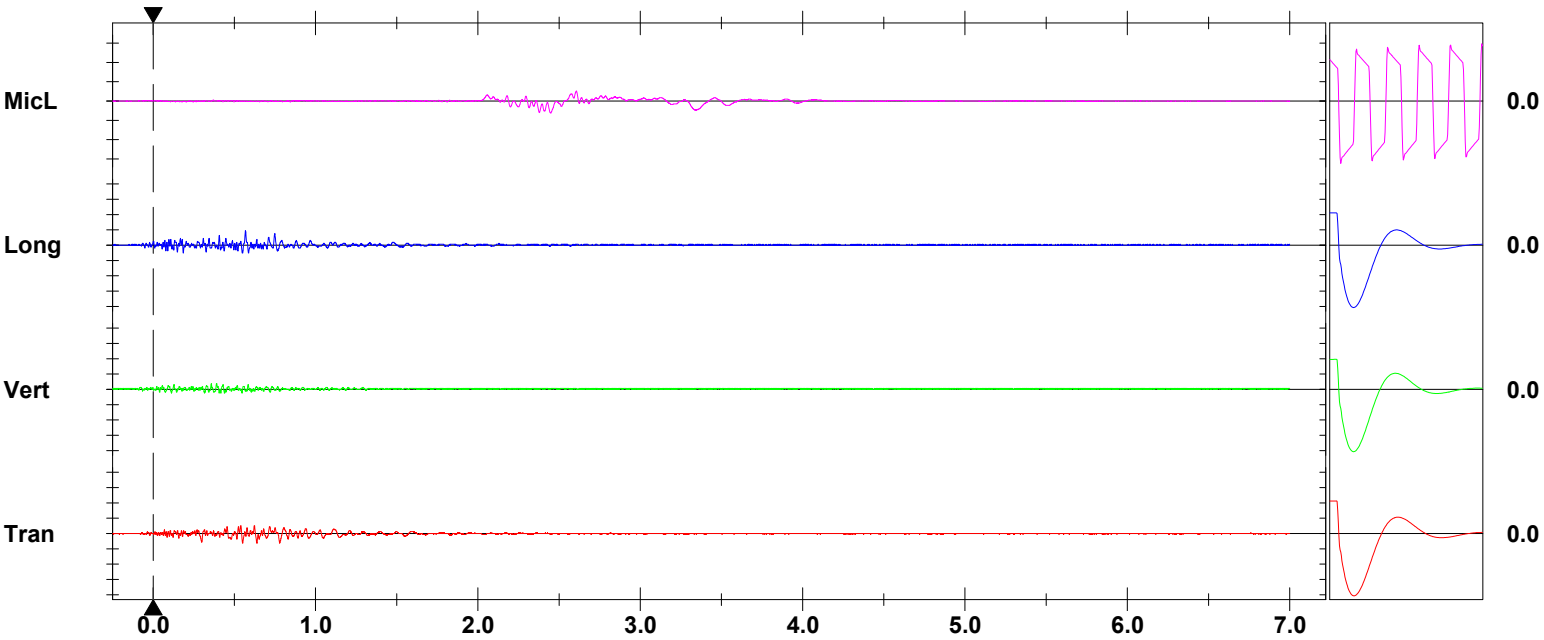
Extended Notes

Microphone	Linear Weighting
PSPL	109.9 dB(L) 6.250 pa.(L) at 2.446 sec
ZC Freq	4.3 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 599 mv)

	Tran	Vert	Long	
PPV	1.270	0.762	1.905	mm/s
PPV	53.08	48.64	56.60	dB
ZC Freq	32	51	20	Hz
Time (Rel. to Trig)	0.551	0.358	0.568	sec
Peak Acceleration	0.040	0.027	0.053	g
Peak Displacement	0.008	0.004	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.5	7.4	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 1.922 mm/s at 0.568 sec





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

Event Report

Date/Time Long at 15:08:54 October 6, 2022
Trigger Source Geo: 0.508 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: October 6, 2022 18:27:22 (V10.72.1)

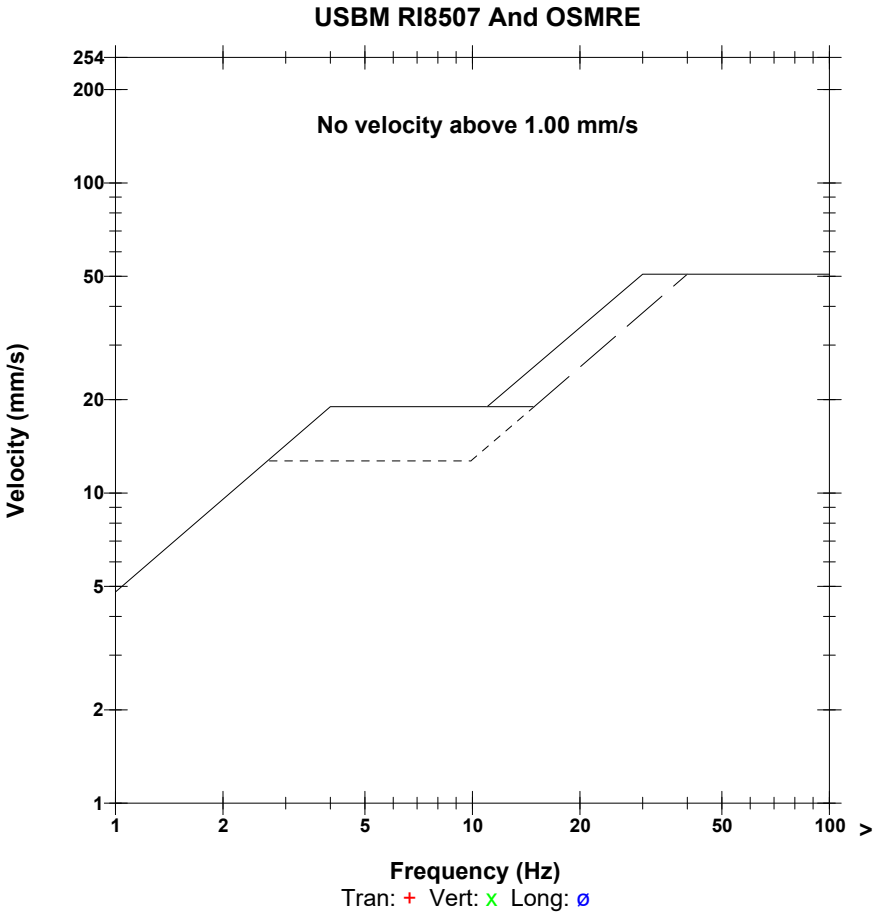
Serial Number 5632 V 2.61 MiniMate
Battery Level 6.1 Volts
Unit Calibration November 15, 2021 by Instantel
File Name G632JPJR.EU0
Post Event Notes
Location: 2337 Route 820 (PW-04)
Blast No.: 2022-35
Project No: 22S001.00

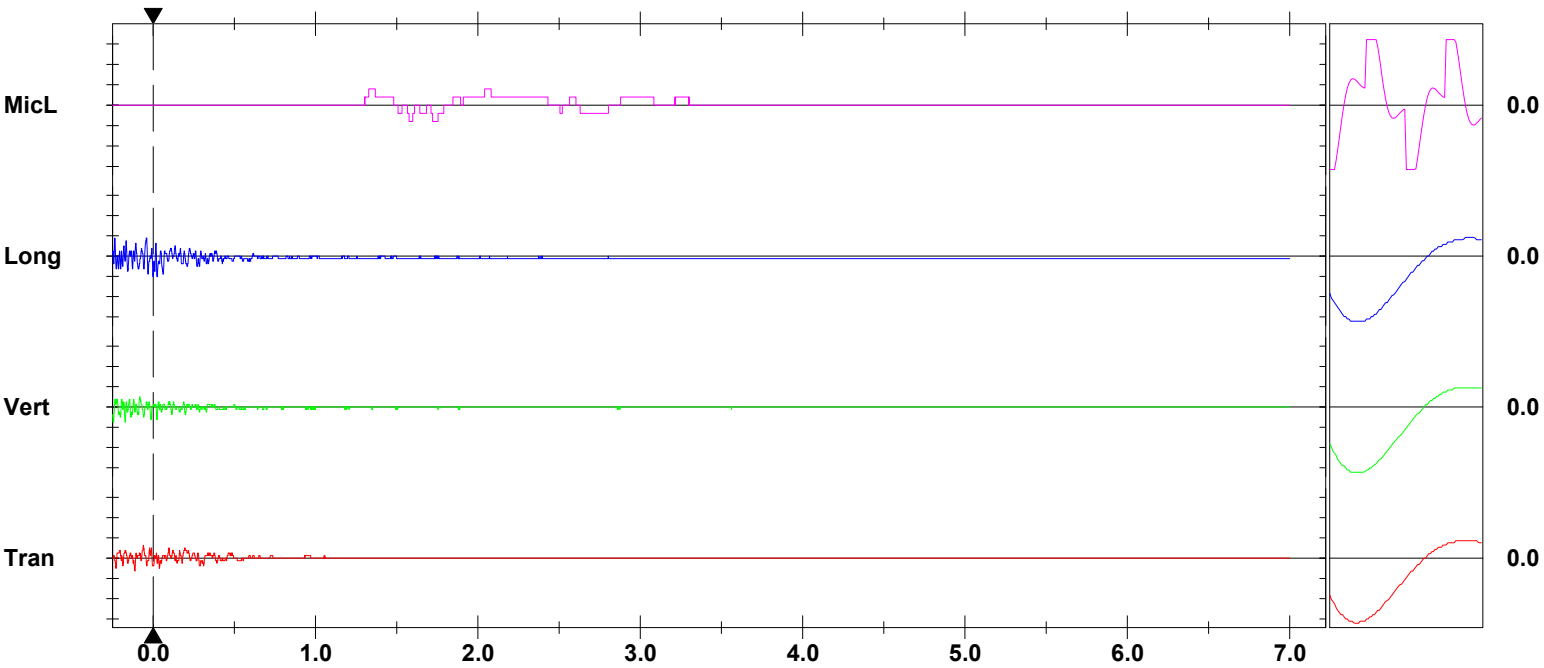
Extended Notes

Microphone Linear Weighting
PSPL 106.0 dB(L) 4.000 pa.(L) at 1.329 sec
ZC Freq 3.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 297 mv)

	Tran	Vert	Long	
PPV	0.318	0.381	0.508	mm/s
PPV	41.03	42.62	45.12	dB
ZC Freq	30	57	28	Hz
Time (Rel. to Trig)	-0.060	-0.171	0.000	sec
Peak Acceleration	0.013	0.013	0.020	g
Peak Displacement	0.001	0.001	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	8.2	7.8	Hz
Overswing Ratio	3.8	3.4	3.6	

Peak Vector Sum 0.619 mm/s at 0.025 sec





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

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October 13, 2022

Project No.: 22S001.00

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

Re: Blast Vibration Monitoring – Blast No. 2022-36 – 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 Archibald Drilling & Blasting at 14:05 on October 13, 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. 2022-36 – October 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)	14:05	1,500 m S	< 0.5 mm/s	<120	Unit was not triggered
2. Civic No. 4126 Route 111 (PW-10)		1,100 m S	0.51 mm/s @ >100 Hz	101	-
3. Civic No. 4150 Route 111 (PW-13)		990 m SE	< 0.5 mm/s	<120	Units were not triggered
4. Civic No. 2447 Route 820 (PW-07)		960 m NE	< 0.5 mm/s	<120	
5. PW-03 - Cottage Route 820		530 m N	< 0.5 mm/s	<120	
6. Civic No. 2341 Route 820 (PW-05)		475 m N	2.48 mm/s @ 47 Hz	116	-
7. Civic No. 50 Myron Road (PW-15)		675 m NW	< 0.5 mm/s	<120	Unit was not triggered
8. Civic No. 86 Myron Road (PW-16)		675 m W	0.89 mm/s @ 39 Hz	112	-
9. Civic No. 220 Myron Road (PW-01)		1,480 m S	< 0.5 mm/s	<120	Units were not triggered
10. Civic No. 4140 Route 111 (PW-12)		1,050 m S	< 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,
CBCL Limited

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

Attachments: Blast Record
Blast and Seismograph Location Plan
Blast Event Reports

Project No: 22S001.00

Attachment A

Blast Record

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 13, 2022
Project No.:	22S001.00	**Time of Blast:**	14:05
Inspector:	C. Buckley	**Blast No.:**	2022-36
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Archibald Drilling & Blasting		
Blaster's Certification No.:	1318	**Blaster's Name:**	Daniel Blanchard
Blast Location:	N 45º28.959' W 65º38.161' (see attached sketch)		
Type of Rock:	Anhydrate/Gypsum	**Est. Vol. or Tonnage:**	11,845 tonnes
Weather at time of Blast:	Clear	**Air Temp.:**	17ºC
Est. Wind Speed :	≈20 km/h	**Wind Direction:**	NW
Cloud Cover:	No	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	112	**Hole Diameter:**	4.5"
Average Depth:	4.7 m – 8.5 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, 59, 67 & 84 ms
Initiation Method:	Non-Electric		
Weight of Explosives per Delay:	Max.: 101 kg		
Type and weight of Explosives for Blast:	4,303 kg Titan XL-1000		

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

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 13, 2022
Project No.:	22S001.00	**Time of Blast:**	14:05
Inspector:	C. Buckley	**Blast No.:**	2022-36
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	475 m
Direction to the Nearest Structure:	N
Structure Type:	House
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	47.3

SAFETY:

Type of Warning Signal Used:	Siren
Blasting Mats Used (yes or no):	No
Airblast Measurement (yes or no):	Yes
Vibration Measurement (yes or no):	Yes
Warning Signs Posted (yes or no):	Yes
Accesses Guarded (yes or no):	Yes
Flyrock Damage (yes or no):	No

If Yes, Describe:

Misfire (yes or no):	No

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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 13, 2022
Project No.:	22S001.00	**Time of Blast:**	14:05
Inspector:	C. Buckley	**Blast No.:**	2022-36
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5489
Calibration Date:	April 25, 2022
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1,500 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 #21348
Calibration Date:	July 23, 2022
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	1,100 m South
Transverse Particle Velocity:	0.25 mm/s @ >100 Hz
Vertical Particle Velocity:	0.38 mm/s @ 73 Hz
Longitudinal Particle Velocity:	0.51 mm/s @ >100 Hz
Peak Particle Velocity:	0.51 mm/s @ >100 Hz
Maximum Airblast:	101 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 13, 2022
Project No.:	22S001.00	**Time of Blast:**	14:05
Inspector:	C. Buckley	**Blast No.:**	2022-36
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:	990 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 #5632
Calibration Date:	November 15, 2021
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	960 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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 13, 2022
Project No.:	22S001.00	**Time of Blast:**	14:05
Inspector:	C. Buckley	**Blast No.:**	2022-36
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:	Cottage - PW-03 - Route 820
Distance and Direction from Blast:	530 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:	475 m North
Transverse Particle Velocity:	1.14 mm/s @ 27 Hz
Vertical Particle Velocity:	2.48 mm/s @ 47 Hz
Longitudinal Particle Velocity:	1.91 mm/s @ 51 Hz
Peak Particle Velocity:	2.48 mm/s @ 47 Hz
Maximum Airblast:	116 dB(L)

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 13, 2022
Project No.:	22S001.00	**Time of Blast:**	14:05
Inspector:	C. Buckley	**Blast No.:**	2022-36
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5372
Calibration Date:	February 18, 2022
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	675 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 #21349
Calibration Date:	July 20, 2022
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	675 m West
Transverse Particle Velocity:	0.64 mm/s @ 32 Hz
Vertical Particle Velocity:	0.64 mm/s @ 51 Hz
Longitudinal Particle Velocity:	0.89 mm/s @ 20 Hz
Peak Particle Velocity:	0.89 mm/s @ 20 Hz
Maximum Airblast:	112 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 13, 2022
Project No.:	22S001.00	**Time of Blast:**	14:05
Inspector:	C. Buckley	**Blast No.:**	2022-36
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:	1,480 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 #20206
Calibration Date:	May 31, 2022
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	1.050 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

Attachment B

Blast and Seismograph Location Plan

Blast and Seismograph Location Plan
Blast No: 2022-36
Upham East Gypsum Quarry
Upham, NB

Date: October 13, 2022
Project No.: 22S001.00

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Attachment C

Blast Event Reports

Event Report

Date/Time Long at 14:01:49 October 13, 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

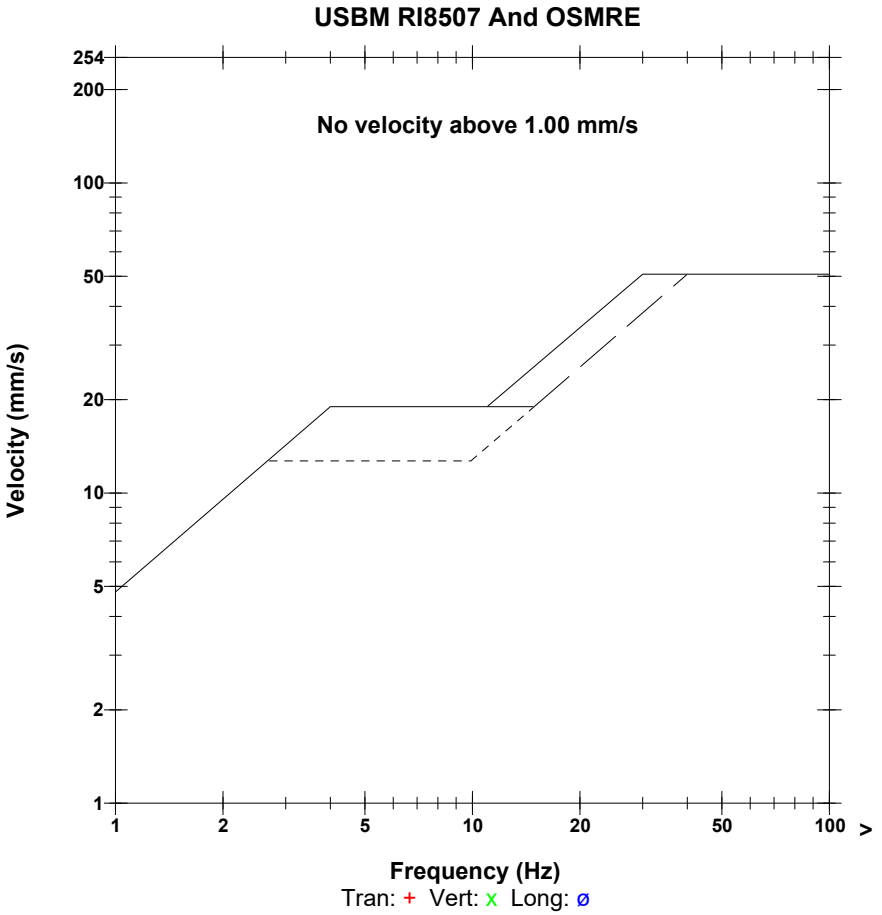
Notes

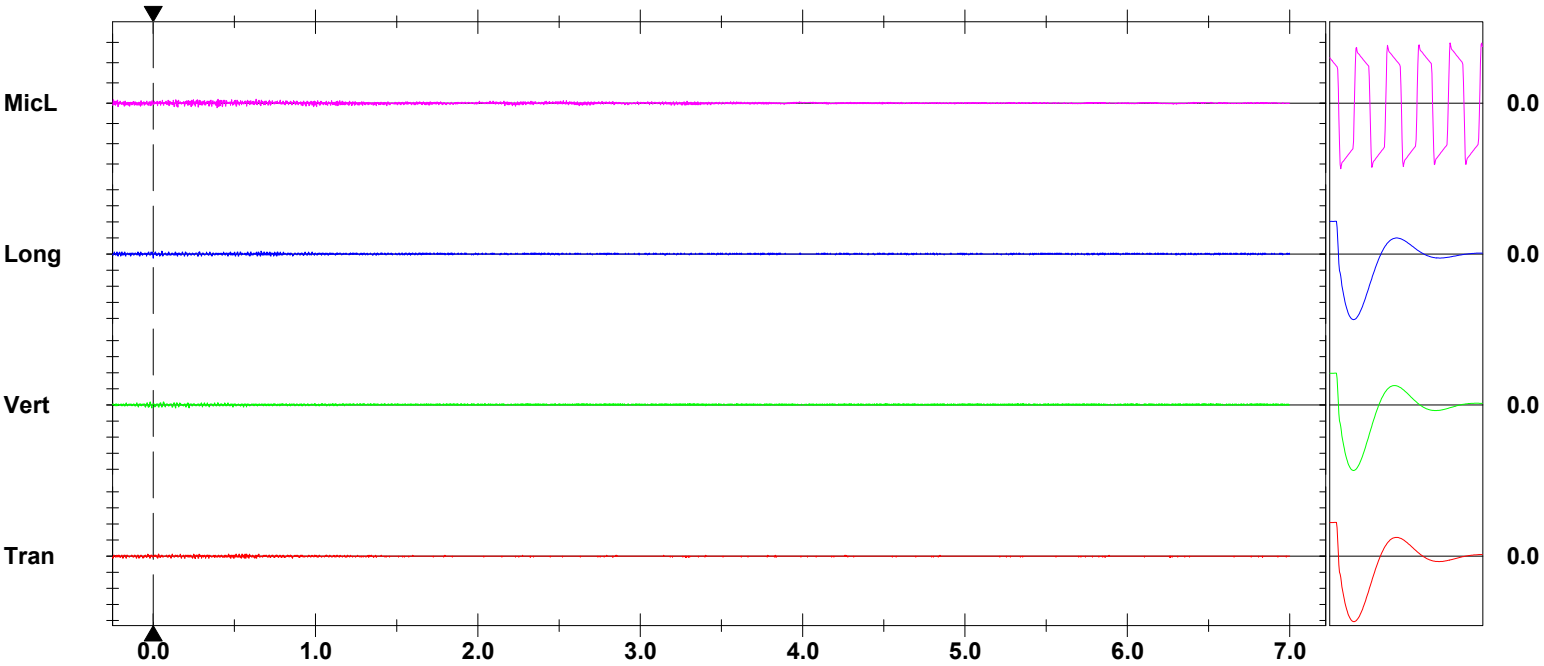
Serial Number BE21348 V 10.72-1.1 Minimate Blaster
Battery Level 6.3 Volts
Unit Calibration July 21, 2022 by Instantel
File Name W348JPUS.B10
Post Event Notes
Location: 4126 Route 111 (PW-10)
Blast No.: 2022-36
Project No: 22S001.00

Microphone Linear Weighting
PSPL 101.0 dB(L) 2.250 pa.(L) at 0.394 sec
ZC Freq >100 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 530 mv)

	Tran	Vert	Long	
PPV	0.254	0.381	0.508	mm/s
PPV	39.10	42.62	45.12	dB
ZC Freq	>100	73	>100	Hz
Time (Rel. to Trig)	-0.248	-0.020	0.000	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.000	0.001	0.001	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.7	7.3	Hz
Overswing Ratio	3.5	3.4	4.1	

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 =

Event Report

Date/Time Vert at 14:05:46 October 13, 2022
Trigger Source Geo: 0.492 mm/s
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
Converted: October 13, 2022 16:36:52 (V10.72.1)

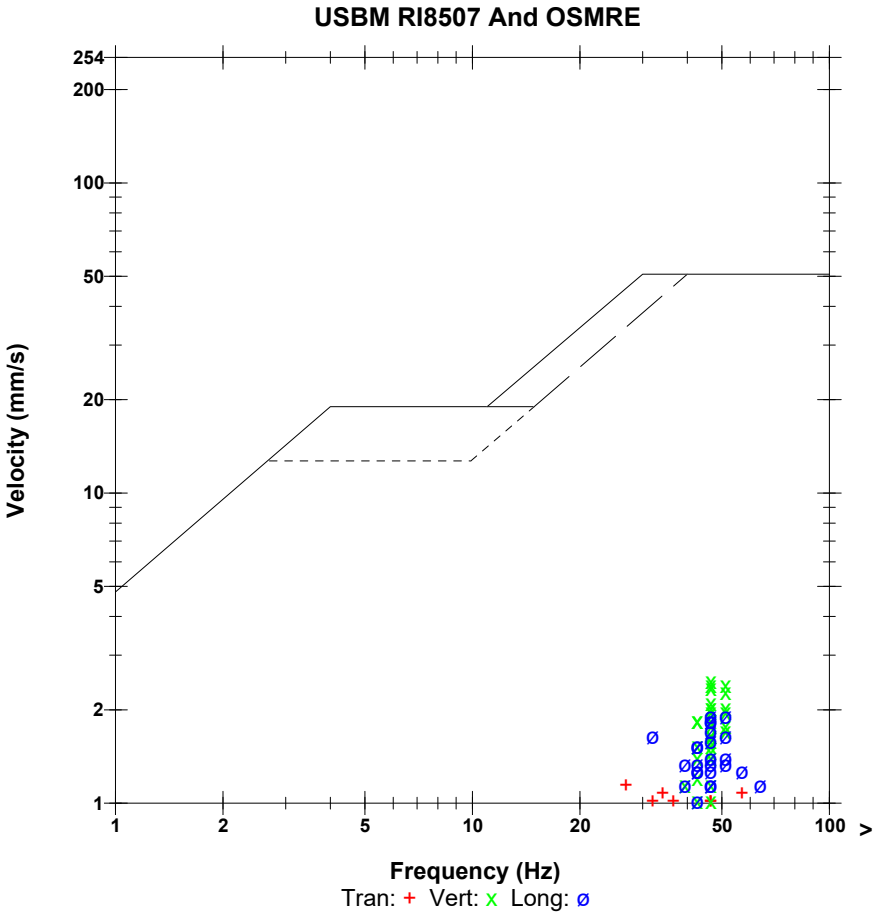
Serial Number 5487 V 2.61 MiniMate
Battery Level 5.8 Volts
Unit Calibration February 18, 2022 by Instantel
File Name G487JPWN.5M0
Post Event Notes
Location: 2341 Route 820 (PW-05)
Blast No.: 2022-36
Project No: 22S001.00

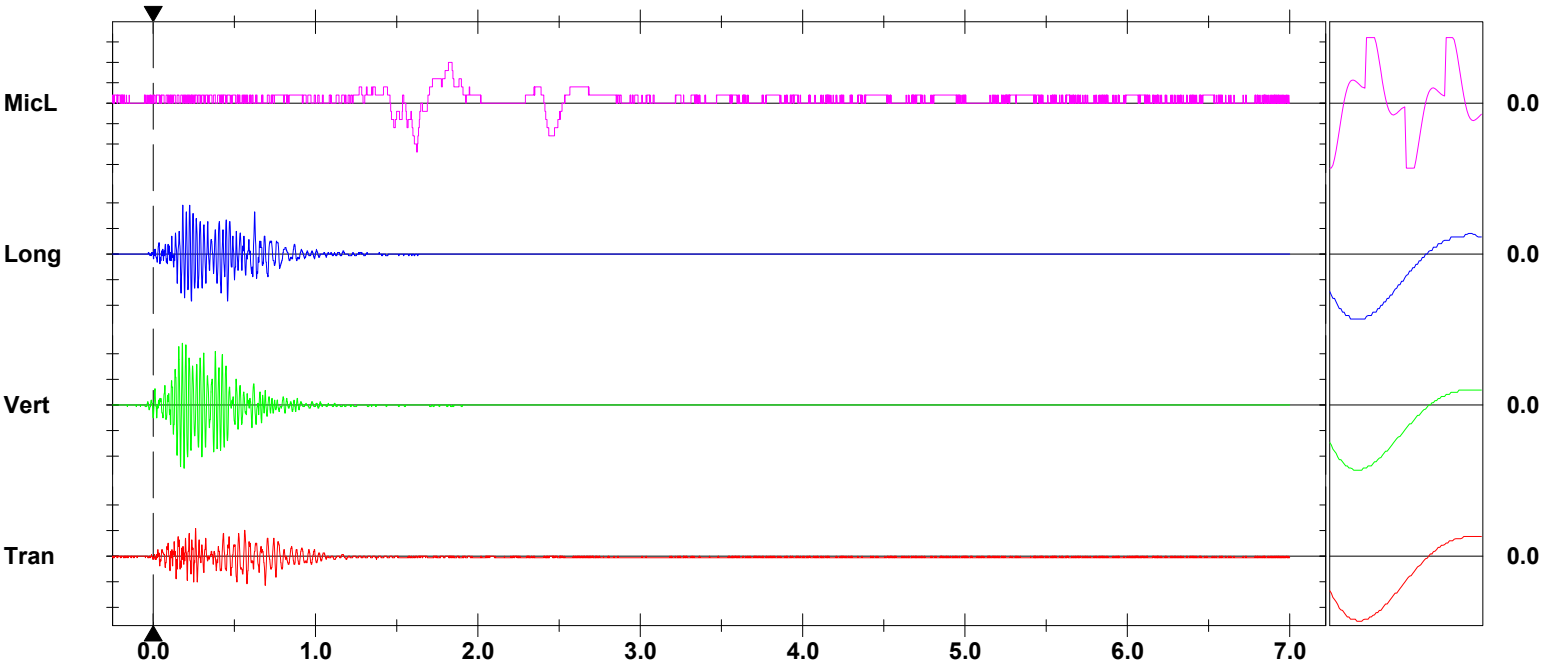
Extended Notes

Microphone Linear Weighting
PSPL 115.6 dB(L) 12.00 pa.(L) at 1.624 sec
ZC Freq 5.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 286 mv)

	Tran	Vert	Long	
PPV	1.143	2.477	1.905	mm/s
PPV	52.16	58.88	56.60	dB
ZC Freq	27	47	51	Hz
Time (Rel. to Trig)	0.691	0.191	0.183	sec
Peak Acceleration	0.040	0.093	0.066	g
Peak Displacement	0.005	0.008	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.0	Hz
Overswing Ratio	3.5	4.2	3.5	

Peak Vector Sum 2.699 mm/s at 0.182 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Long at 14:05:15 October 13, 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
Job Number:	1

Serial Number	BE21349 V 10.72-1.1 Minimate Blaster
Battery Level	6.1 Volts
Unit Calibration	July 20, 2022 by Instantel
File Name	W349JPUS.GR0

Notes
Location:
Client:
User Name:
General:

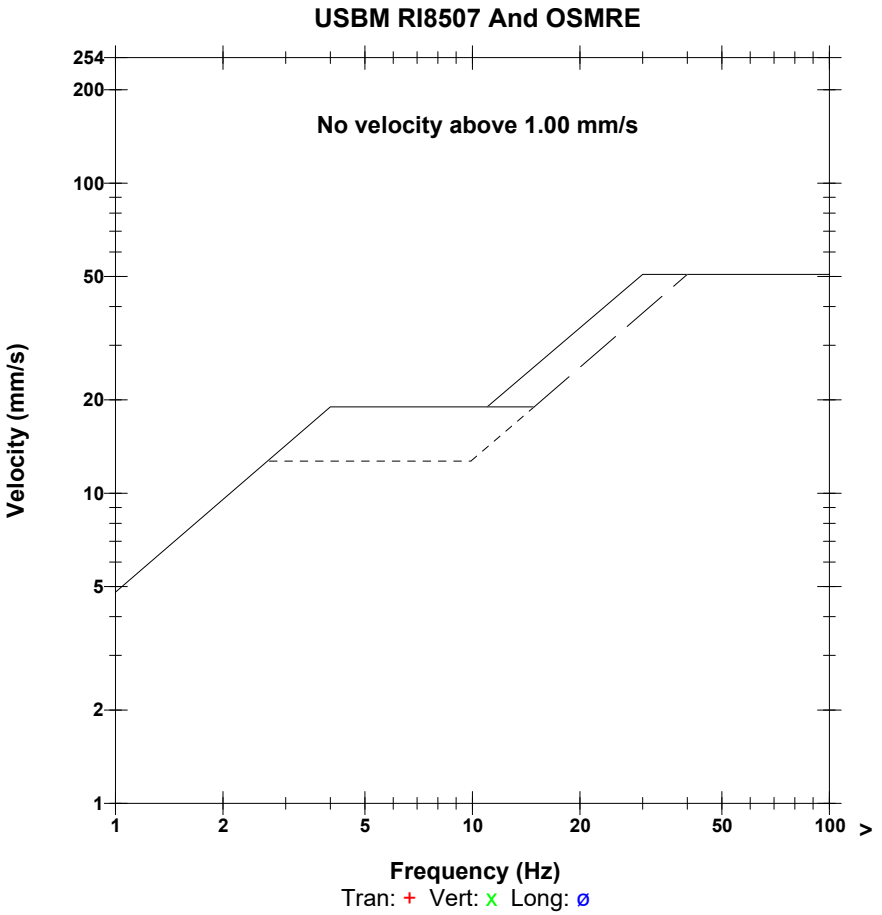
Post Event Notes
Location: 86 Myron Road (PW-16)
Blast No.: 2022-36
Project No: 22S001.00

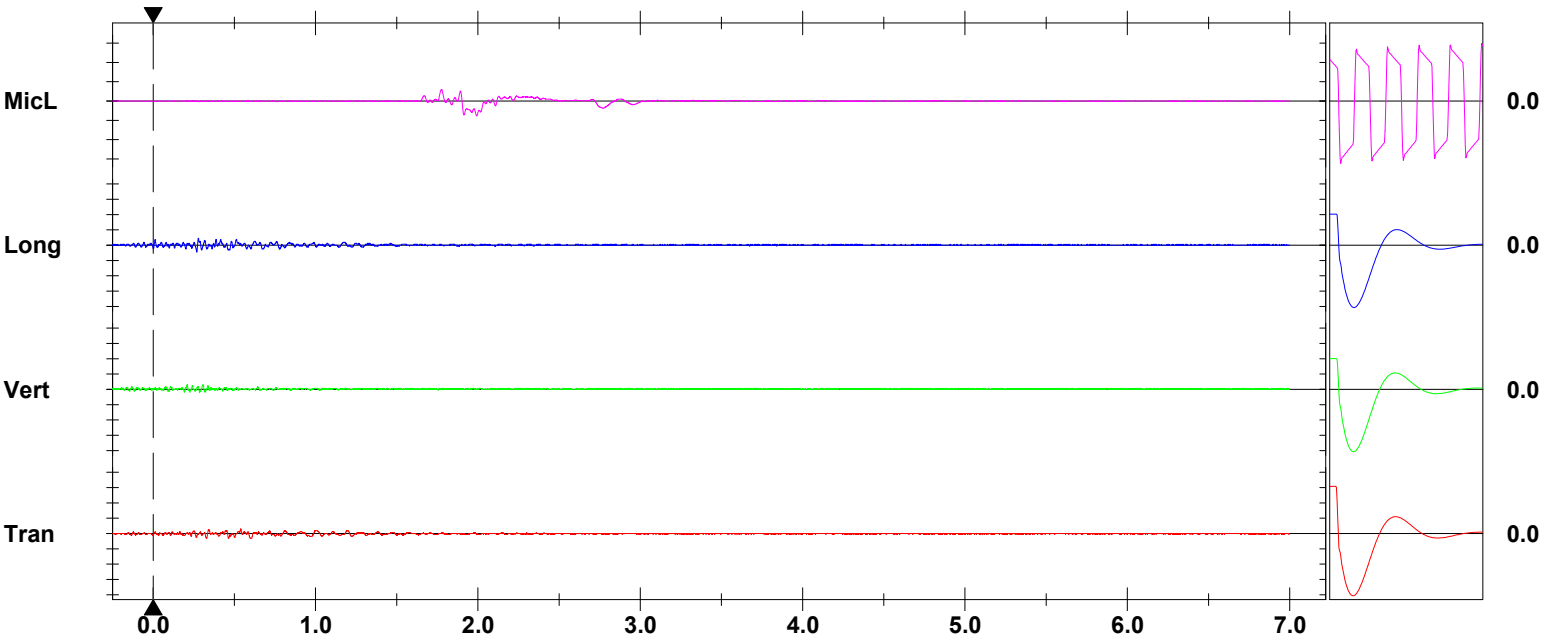
Extended Notes

Microphone	Linear Weighting
PSPL	111.8 dB(L) 7.750 pa.(L) at 1.991 sec
ZC Freq	3.3 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 557 mv)

	Tran	Vert	Long	
PPV	0.635	0.635	0.889	mm/s
PPV	47.06	47.06	49.98	dB
ZC Freq	37	43	39	Hz
Time (Rel. to Trig)	0.326	0.208	0.268	sec
Peak Acceleration	0.027	0.027	0.040	g
Peak Displacement	0.006	0.003	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.5	7.3	Hz
Overswing Ratio	3.7	3.8	4.0	

Peak Vector Sum 1.055 mm/s at 0.269 sec





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

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October 19, 2022

Project No.: 22S001.00

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

Re: Blast Vibration Monitoring – Blast No. 2022-37 A&B (at once)
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 October 19, 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. 2022-37 A&B (shot at once) – October 19, 2022

Seismograph Location	Time	Approx. dist. from shot to seismograph (m)	Maximum Velocity (mm/s)	Sound Pressure (dB(L))	Remarks
1. Civic # 4079 Route 111 (PW-09)	14:00	1,450 m / 1,500 m S	< 0.5 mm/s	<120	Unit was not triggered
2. Civic # 4126 Route 111 (PW-10)		1,040 m / 1,010 S	< 0.5 mm/s	<120	
3. Civic # 4150 Route 111 (PW-13)		800 m / 750 m SE	< 0.5 mm/s	<120	
4. Civic # 2447 Route 820 (PW-07)		540 m / 600 m NE	< 0.5 mm/s	<120	
5. PW-03 - Cottage Route 820		525 m / 545 m N	0.76 mm/s @ 73 Hz	114	-
6. Civic # 2341 Route 820 (PW-05)		515 m / 495 m N	1.01 mm/s @ 57 Hz	116	-
7. Civic # 50 Myron Road (PW-15)		750 m / 670 m NW	0.95 mm/s @ 49 Hz	108	-
8. Civic # 86 Myron Road (PW-16)		740 m / 650 m W	0.76 mm/s @ 37 Hz	112	-
9. Civic # 220 Myron Road (PW-01)		1,461 m / 1,457 m S	< 0.5 mm/s	<120	Units were not triggered
10. Civic # 4140 Route 111 (PW-12)		987 m / 1,045 m S	< 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,
CBCL Limited

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

Attachments: Blast Record
Blast and Seismograph Location Plan
Blast Event Reports

Project No: 22S001.00

Attachment A

Blast Record

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 19, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	C. Buckley	**Blast No.:**	2022-37 A&B (at once)
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Archibald Drilling & Blasting		
Blaster's Certification No.:	1318	**Blaster's Name:**	Daniel Blanchard
Blast Location:	N 45°28.950' W 65°38.098' / N 45°28.954' W 65°38.178' (see attached sketch)		
Type of Rock:	Anhydrate/Gypsum	**Est. Vol. or Tonnage:**	10,889 tonnes
Weather at time of Blast:	Overcast	**Air Temp.:**	17°C
Est. Wind Speed :	≈15 km/h	**Wind Direction:**	E
Cloud Cover:	Yes – overcast	**Precipitation:**	Yes - light

BLAST DESIGN:

Total No. Holes:	32 & 78	**Hole Diameter:**	4.5"
Average Depth:	3.6 m – 6.7 m	**Spacing:**	10 ft x 10 ft
No. Holes per Delay:	3	**Collar Length:**	7 ft
Delay between Holes:	25 ms	**Delay between Rows:**	17, 25 & 42 ms
Initiation Method:	Non-Electric		
Weight of Explosives per Delay:	Max.: 65 kg		
Type and weight of Explosives for Blast:	3,356 kg Titan XL-1000		

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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 19, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	C. Buckley	**Blast No.:**	2022-37 A&B (at once)
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	495 m
Direction to the Nearest Structure:	N
Structure Type:	House
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	61.4

SAFETY:

Type of Warning Signal Used:	Siren
Blasting Mats Used (yes or no):	No
Airblast Measurement (yes or no):	Yes
Vibration Measurement (yes or no):	Yes
Warning Signs Posted (yes or no):	Yes
Accesses Guarded (yes or no):	Yes
Flyrock Damage (yes or no):	No

If Yes, Describe:

Misfire (yes or no):	No

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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 19, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	C. Buckley	**Blast No.:**	2022-37 A&B (at once)
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:	1,450 m / 1,500 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 #5372
Calibration Date:	February 18, 2022
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	1,040 m / 1,010 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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 19, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	C. Buckley	**Blast No.:**	2022-37 A&B (at once)
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:	800 m / 750 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 #5487
Calibration Date:	February 18, 2022
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	540 m / 600 m Northeast
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 19, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	C. Buckley	**Blast No.:**	2022-37 A&B (at once)
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21349
Calibration Date:	July 20, 2022
Location of seismograph:	Cottage - PW-03 - Route 820
Distance and Direction from Blast:	525 m / 545 m North
Transverse Particle Velocity:	0.76 mm/s @ 51 Hz
Vertical Particle Velocity:	0.76 mm/s @ 73 Hz
Longitudinal Particle Velocity:	0.64 mm/s @ 47 Hz
Peak Particle Velocity:	0.76 mm/s @ 73 Hz
Maximum Airblast:	114 dB(L)

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #18193
Calibration Date:	April 11, 2022
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	515 m / 495 m North
Transverse Particle Velocity:	0.69 mm/s @ 37 Hz
Vertical Particle Velocity:	1.01 mm/s @ 57 Hz
Longitudinal Particle Velocity:	0.84 mm/s @ 27 Hz
Peak Particle Velocity:	1.01 mm/s @ 57 Hz
Maximum Airblast:	116 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 19, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	C. Buckley	**Blast No.:**	2022-37 A&B (at once)
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #18187
Calibration Date:	May 5, 2022
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	750 m / 670 m Northwest
Transverse Particle Velocity:	0.73 mm/s @ 43 Hz
Vertical Particle Velocity:	0.95 mm/s @ 49 Hz
Longitudinal Particle Velocity:	0.71 mm/s @ 43 Hz
Peak Particle Velocity:	0.95 mm/s @ 49 Hz
Maximum Airblast:	108 dB(L)

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21348
Calibration Date:	July 23, 2022
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	740 m / 650 m West
Transverse Particle Velocity:	0.64 mm/s @ 34 Hz
Vertical Particle Velocity:	0.38 mm/s @ 64 Hz
Longitudinal Particle Velocity:	0.76 mm/s @ 37 Hz
Peak Particle Velocity:	0.76 mm/s @ 37 Hz
Maximum Airblast:	112 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 19, 2022
Project No.:	22S001.00	**Time of Blast:**	14:00
Inspector:	C. Buckley	**Blast No.:**	2022-37 A&B (at once)
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #20206
Calibration Date:	May 31, 2022
Location of seismograph:	Civic Number 220 Myron Road (PW-01)
Distance and Direction from Blast:	1,461 m / 1,457 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 #5371
Calibration Date:	July 27, 2022
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	790 m / 745 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

Attachment B

Blast and Seismograph Location Plan

Blast and Seismograph Location Plan
Blast No: 2022-37 A&B
Upham East Gypsum Quarry
Upham, NB

Date: October 19, 2022
Project No.: 22S001.00

Attachment C

Blast Event Reports

Event Report

Date/Time Tran at 13:59:21 October 19, 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
Job Number: 1

Serial Number BE21349 V 10.72-1.1 Minimate Blaster
Battery Level 6.0 Volts
Unit Calibration July 20, 2022 by Instantel
File Name W349JQ5W.6X0

Notes
Location:
Client:
User Name:
General:

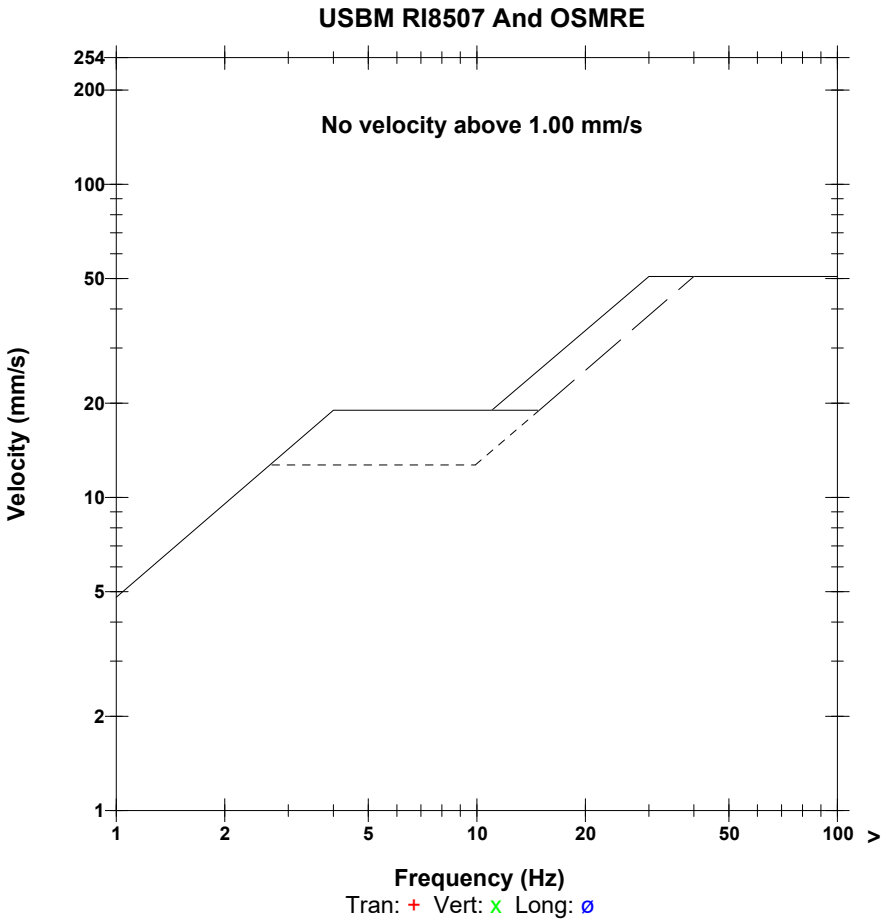
Post Event Notes
Location: Cottage - Route 820 (PW-03)
Blast No.: 2022-37 A&B
Project No: 22S001.00

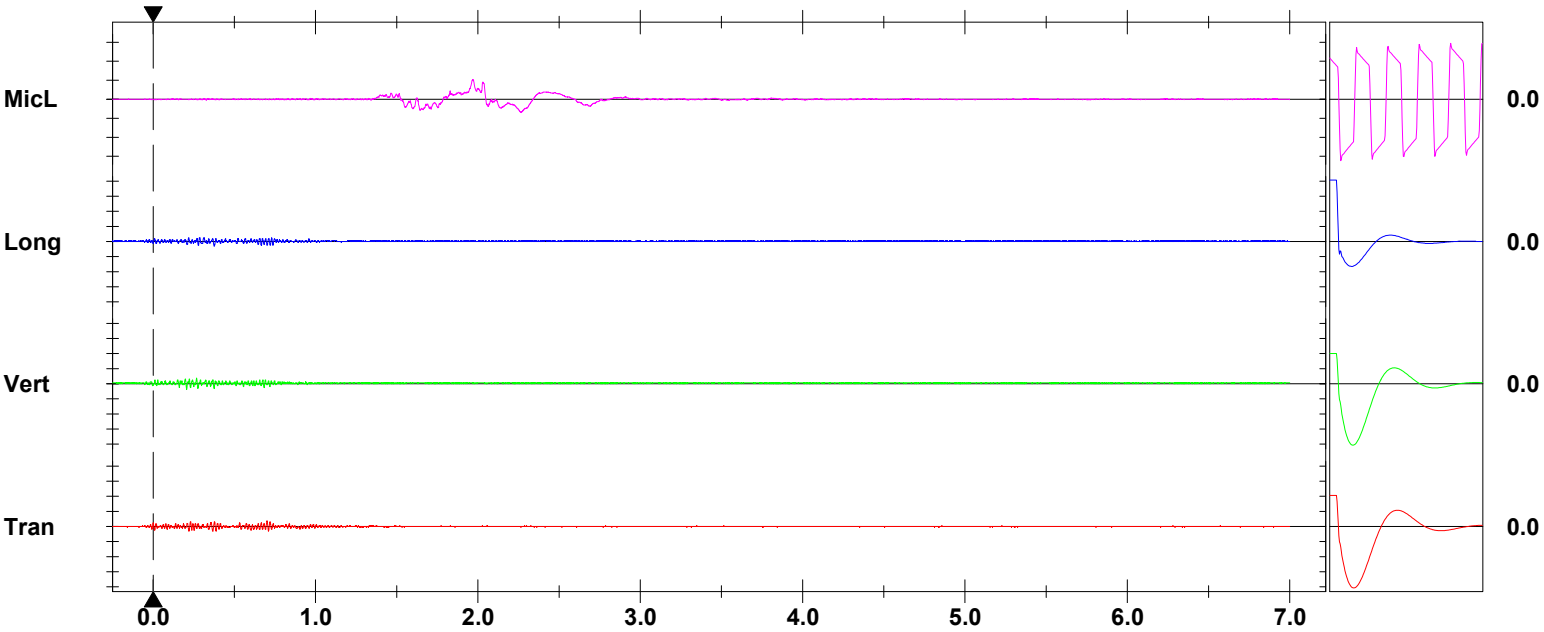
Extended Notes

Microphone Linear Weighting
PSPL 114.2 dB(L) 10.25 pa.(L) at 1.968 sec
ZC Freq 2.1 Hz
Channel Test Passed (Freq = 20.1 Hz Amp = 592 mv)

	Tran	Vert	Long	
PPV	0.762	0.762	0.635	mm/s
PPV	48.64	48.64	47.06	dB
ZC Freq	51	73	47	Hz
Time (Rel. to Trig)	0.701	0.206	0.376	sec
Peak Acceleration	0.027	0.040	0.040	g
Peak Displacement	0.002	0.002	0.002	mm
Sensor Check	Passed	Passed	Check	
Frequency	7.3	7.7	8.2	Hz
Overswing Ratio	3.8	3.9	3.9	

Peak Vector Sum 1.032 mm/s at 0.376 sec





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

Event Report

Date/Time	Vert at 14:00:04 October 19, 2022
Trigger Source	Geo: 0.500 mm/s, Mic: 120.0 dB(L)
Range	Geo: 254.0 mm/s
Record Time	7.0 sec at 1024 sps
Operator/Setup:	Operator/CARVER.MMB

Notes
Location:
Client:
User Name:
General:

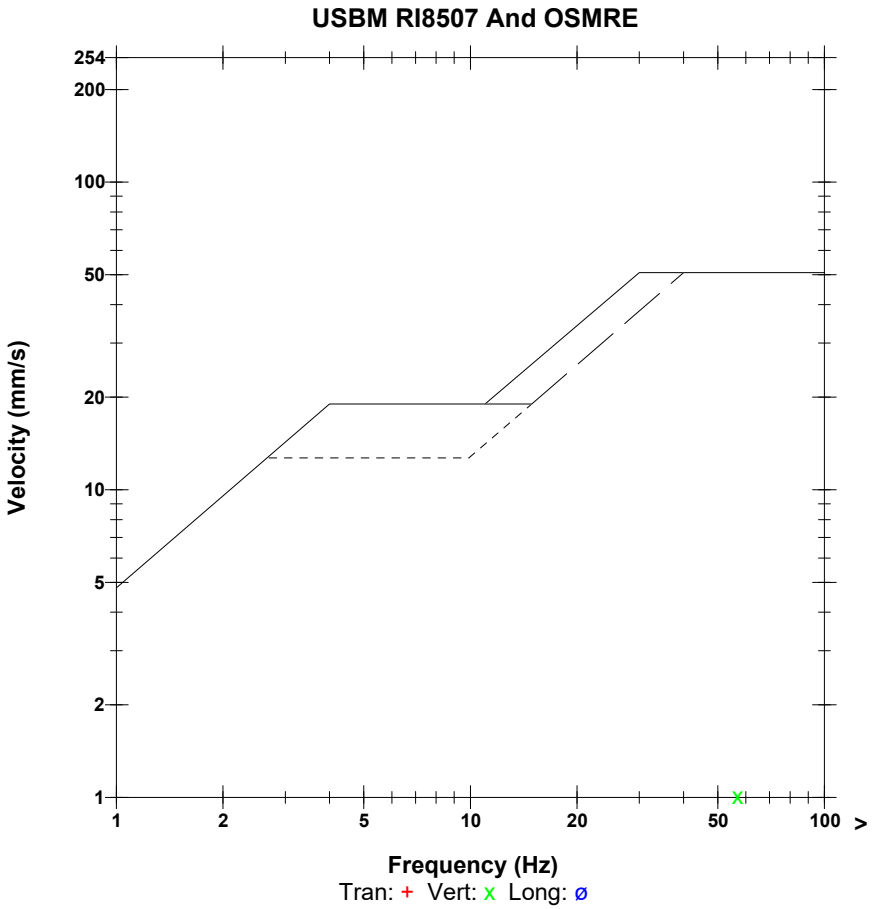
Serial Number	UM18193 V 10-90GC Micromate ISEE
Battery Level	3.6 Volts
Unit Calibration	April 11, 2022 by Instantel
File Name	UM18193_20221019140004.IDFW

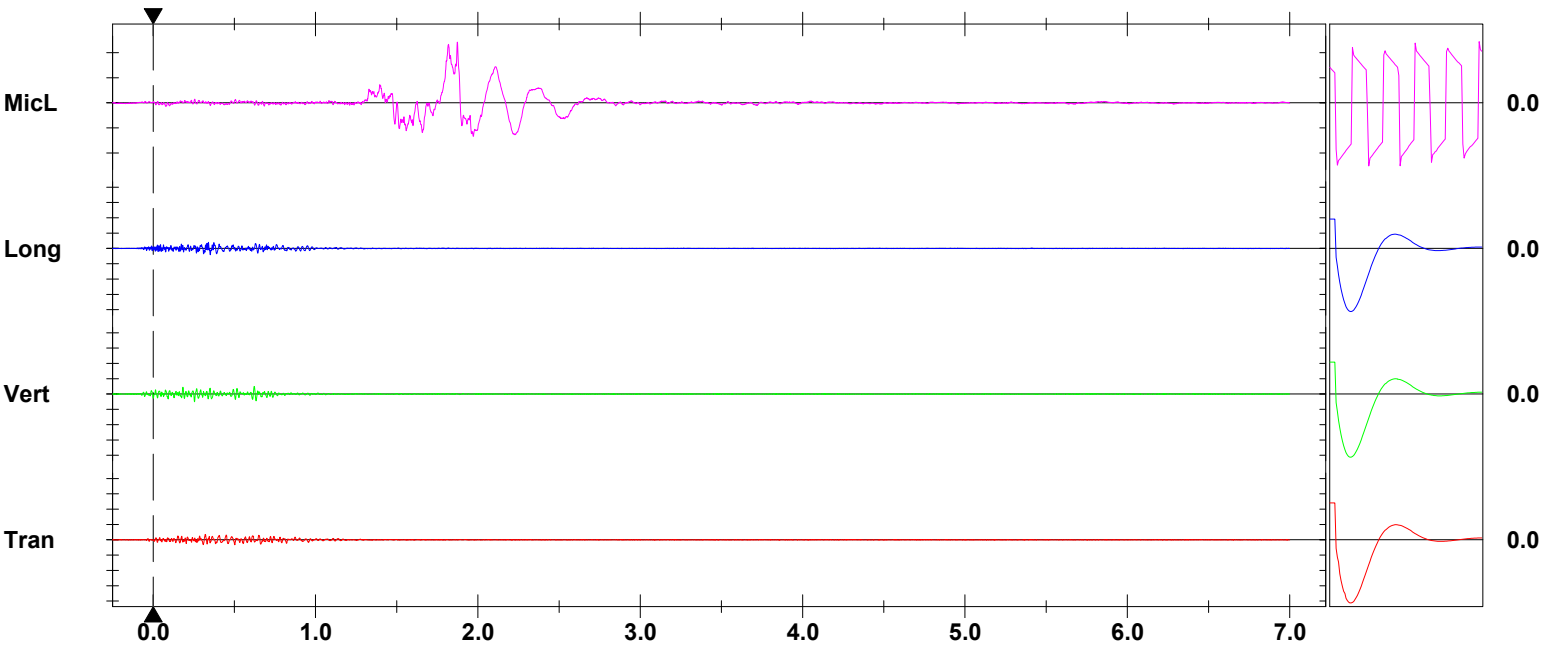
Post Event Notes
Location: 2341 Route 820 (PW-05)
Blast No.: 2022-37 A&B
Project No: 22S001.00

Microphone	Linear Weighting
PSPL	115.6 dB(L) 12.12 pa.(L) at 1.874 sec
ZC Freq	4.0 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 1434 mv)

	Tran	Vert	Long	
PPV	0.694	1.009	0.835	mm/s
PPV	47.82	51.08	49.44	dB
ZC Freq	37	57	27	Hz
Time (Rel. to Trig)	0.320	0.255	0.352	sec
Peak Acceleration	0.043	0.050	0.055	g
Peak Displacement	0.003	0.004	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.3	Hz
Overswing Ratio	4.2	4.2	4.4	

Peak Vector Sum 1.194 mm/s at 0.352 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Vert at 14:00:06 October 19, 2022
Trigger Source Geo: 0.500 mm/s, Mic: 120.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 3.62 sec (Auto=3Sec) at 2048 sps
Operator/Setup: Operator/factory.MMB

Notes
Location:
Client:
User Name:
General:

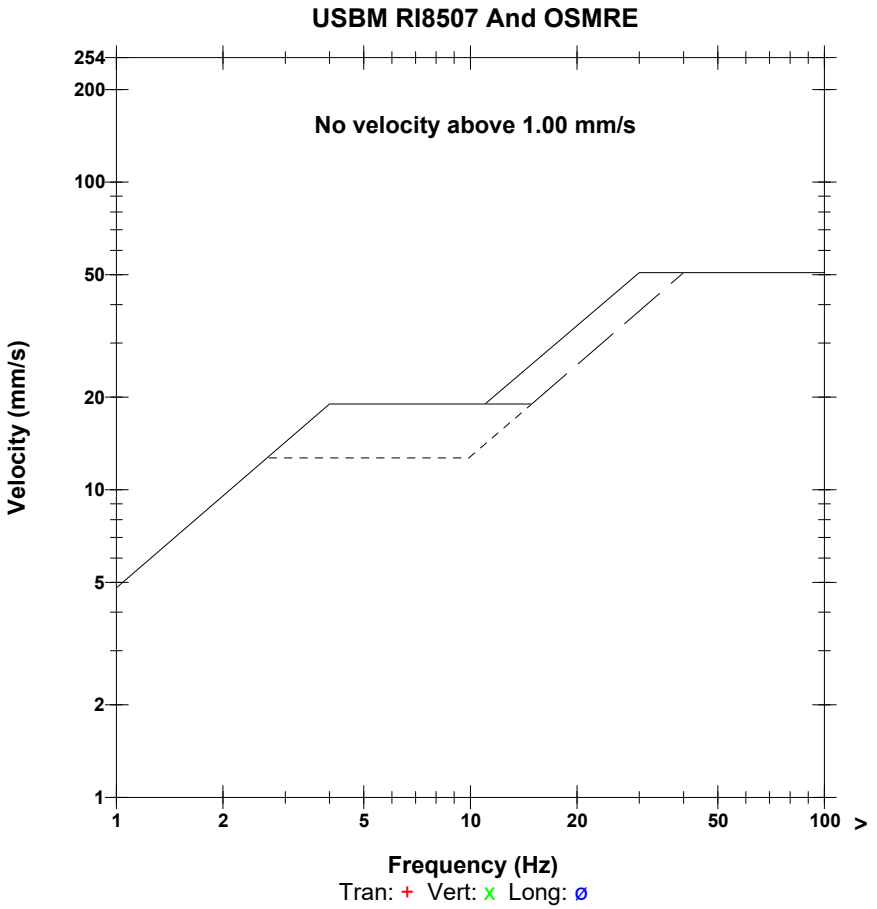
Serial Number UM18187 V 10-90GC Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration May 5, 2022 by Instantel
File Name UM18187_20221019140006.IDFW

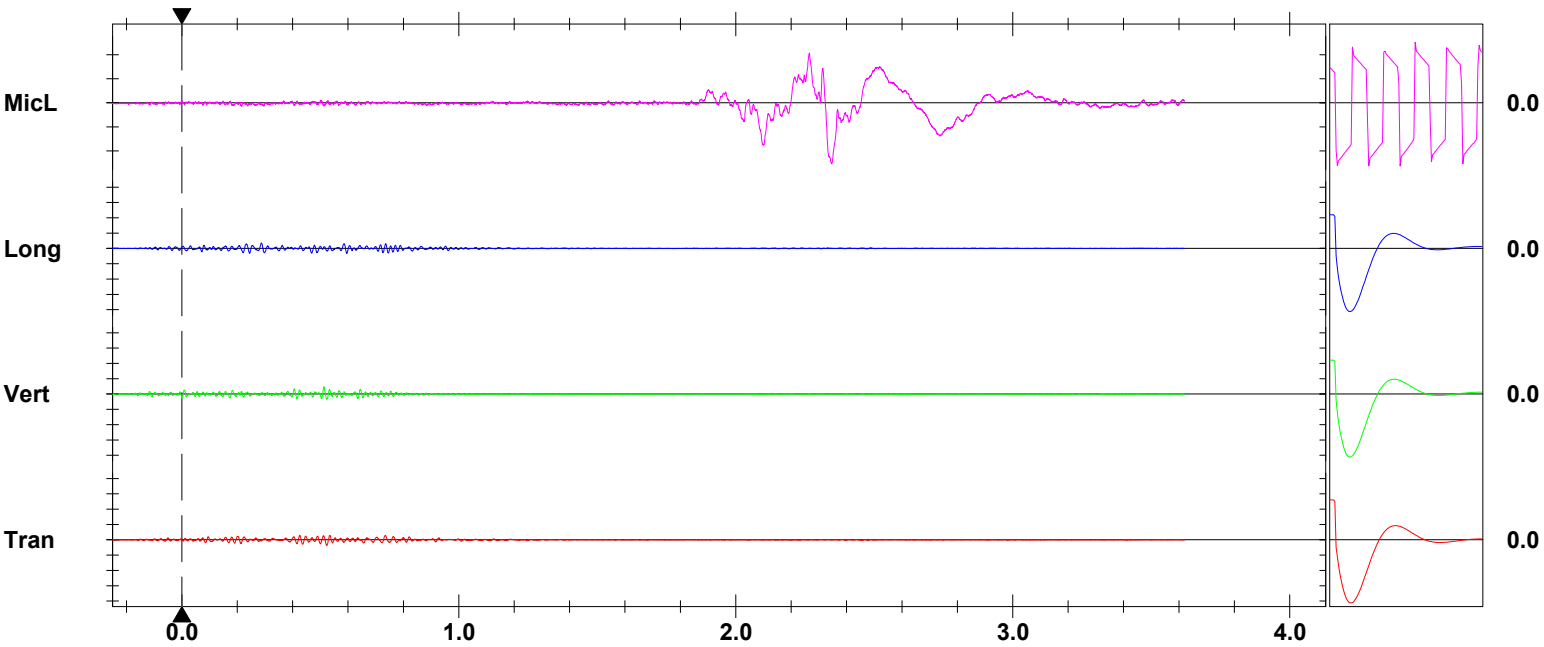
Post Event Notes
Location: 50 Myron Road (PW-15)
Blast No.: 2022-37 A&B
Project No: 22S001.00

Microphone Linear Weighting
PSPL 108.1 dB(L) 5.058 pa.(L) at 2.346 sec
ZC Freq 3.9 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1437 mv)

	Tran	Vert	Long	
PPV	0.733	0.954	0.709	mm/s
PPV	48.30	50.59	48.02	dB
ZC Freq	43	49	43	Hz
Time (Rel. to Trig)	0.523	0.513	0.287	sec
Peak Acceleration	0.025	0.041	0.033	g
Peak Displacement	0.003	0.003	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.7	Hz
Overswing Ratio	4.5	4.3	4.2	

Peak Vector Sum 1.088 mm/s at 0.513 sec





Time Scale: 0.20 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 2.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Tran at 13:54:19 October 19, 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

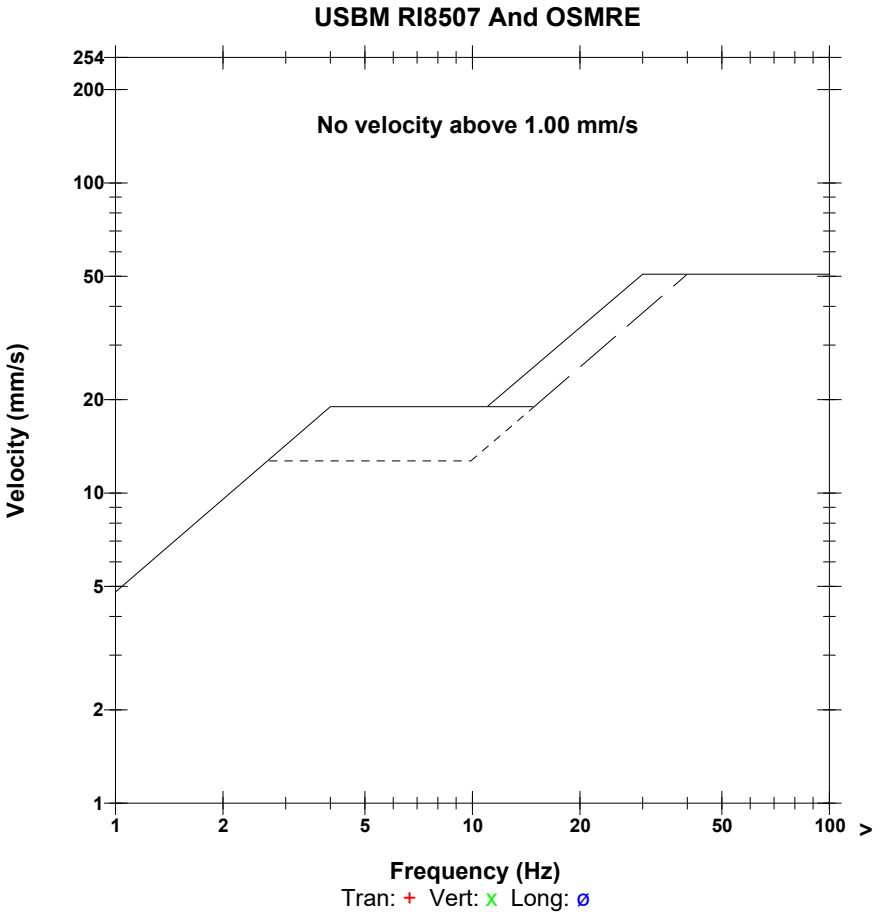
Notes

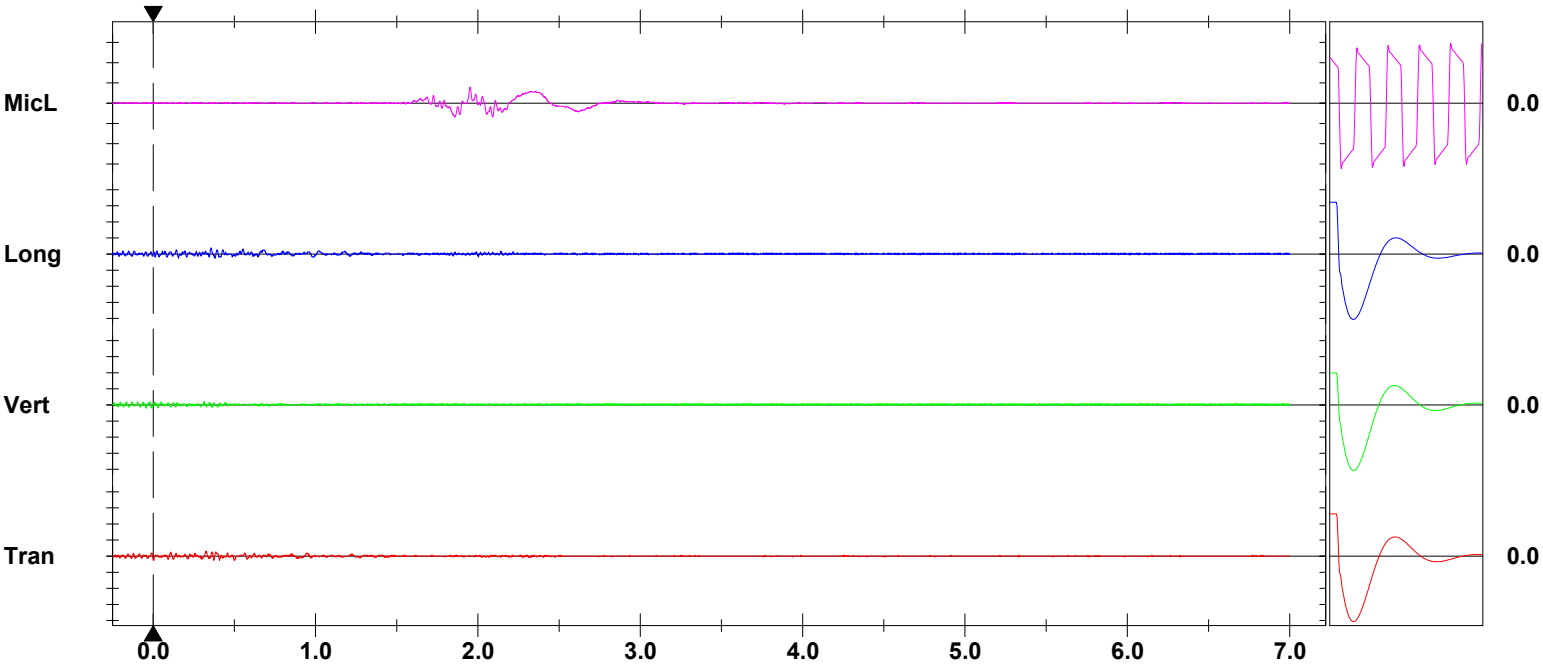
Serial Number BE21348 V 10.72-1.1 Minimate Blaster
Battery Level 6.2 Volts
Unit Calibration July 21, 2022 by Instantel
File Name W348JQ5V.YJ0
Post Event Notes
Location: 86 Myron Road (PW-16)
Blast No.: 2022-37 A&B
Project No: 22S001.00

Microphone Linear Weighting
PSPL 112.0 dB(L) 8.000 pa.(L) at 1.952 sec
ZC Freq 7.8 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 566 mv)

	Tran	Vert	Long	
PPV	0.635	0.381	0.762	mm/s
PPV	47.06	42.62	48.64	dB
ZC Freq	34	64	37	Hz
Time (Rel. to Trig)	0.324	-0.203	0.355	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.004	0.001	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.7	7.4	Hz
Overswing Ratio	3.4	3.4	4.0	

Peak Vector Sum 0.861 mm/s at 0.358 sec





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

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October 20, 2022

Project No.: 22S001.00

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

Re: Blast Vibration Monitoring – Blast No. 2022-38 – 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 Archibald Drilling & Blasting at 14:02 on October 20, 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. 2022-38 – October 20, 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)	14:02	1,400 m S	< 0.5 mm/s	<120	Units were not triggered
2. Civic No. 4126 Route 111 (PW-10)		950 m S	< 0.5 mm/s	<120	
3. Civic No. 4150 Route 111 (PW-13)		800 m SE	< 0.5 mm/s	<120	
4. Civic No. 2447 Route 820 (PW-07)		920 m NE	< 0.5 mm/s	<120	
5. PW-03 - Cottage Route 820		620 m N	2.48 mm/s @ 47 Hz	116	-
6. Civic No. 2341 Route 820 (PW-05)		620 m N	2.10 mm/s @ 47 Hz	110	-
7. Civic No. 50 Myron Road (PW-15)		860 m NW	< 0.5 mm/s	<120	Units were not triggered
8. Civic No. 86 Myron Road (PW-16)		775 m W	< 0.5 mm/s	<120	
9. Civic No. 220 Myron Road (PW-01)		1,4,00 m S	< 0.5 mm/s	<120	
10. Civic No. 4140 Route 111 (PW-12)		895 m SE	0.76 mm/s @ 64 Hz	108	-
11. Civic No. 2337 Route 820 (PW-04)		750 m N	< 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,
CBCL Limited

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

Attachments: Blast Record
Blast and Seismograph Location Plan
Blast Event Reports

Project No: 22S001.00

Attachment A

Blast Record

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 20, 2022
Project No.:	22S001.00	**Time of Blast:**	14:02
Inspector:	C. Buckley	**Blast No.:**	2022-38
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Archibald Drilling & Blasting		
Blaster's Certification No.:	1297	**Blaster's Name:**	Anthony Wallace
Blast Location:	N 45º28.901' W 65º38.044' (see attached sketch)		
Type of Rock:	Anhydrate/Gypsum	**Est. Vol. or Tonnage:**	22,813 tonnes
Weather at time of Blast:	Clear	**Air Temp.:**	12ºC
Est. Wind Speed :	≈20 km/h	**Wind Direction:**	E
Cloud Cover:	No	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	155	**Hole Diameter:**	4.5"
Average Depth:	6.1 m	**Spacing:**	10 ft x 10 ft
No. Holes per Delay:	1	**Collar Length:**	9 ft - 14 ft
Delay between Holes:	25 ms	**Delay between Rows:**	59 & 84 ms
Initiation Method:	Non-Electric		
Weight of Explosives per Delay:	Max.: 51 kg		
Type and weight of Explosives for Blast:	7,053 kg Titan XL-1000		

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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 20, 2022
Project No.:	22S001.00	**Time of Blast:**	14:02
Inspector:	C. Buckley	**Blast No.:**	2022-38
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	620 m
Direction to the Nearest Structure:	N
Structure Type:	House
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	86.8

SAFETY:

Type of Warning Signal Used:	Siren
Blasting Mats Used (yes or no):	No
Airblast Measurement (yes or no):	Yes
Vibration Measurement (yes or no):	Yes
Warning Signs Posted (yes or no):	Yes
Accesses Guarded (yes or no):	Yes
Flyrock Damage (yes or no):	No

If Yes, Describe:

Misfire (yes or no):	No

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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 20, 2022
Project No.:	22S001.00	**Time of Blast:**	14:02
Inspector:	C. Buckley	**Blast No.:**	2022-38
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:	1,400 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 #21348
Calibration Date:	July 23, 2022
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	950 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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 20, 2022
Project No.:	22S001.00	**Time of Blast:**	14:02
Inspector:	C. Buckley	**Blast No.:**	2022-38
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:	800 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 #5676
Calibration Date:	February 28, 2022
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	920 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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 20, 2022
Project No.:	22S001.00	**Time of Blast:**	14:02
Inspector:	C. Buckley	**Blast No.:**	2022-38
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:	620 m North
Transverse Particle Velocity:	1.14 mm/s @ 27 Hz
Vertical Particle Velocity:	2.48 mm/s @ 47 Hz
Longitudinal Particle Velocity:	1.91 mm/s @ 51 Hz
Peak Particle Velocity:	2.48 mm/s @ 47 Hz
Maximum Airblast:	116 dB(L)

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5632
Calibration Date:	Fenbruary 18, 2022
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	620 m North
Transverse Particle Velocity:	1.40 mm/s @ 64 Hz
Vertical Particle Velocity:	1.59 mm/s @ 47 Hz
Longitudinal Particle Velocity:	2.10 mm/s @ 47 Hz
Peak Particle Velocity:	2.10 mm/s @ 47 Hz
Maximum Airblast:	110 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 20, 2022
Project No.:	22S001.00	**Time of Blast:**	14:02
Inspector:	C. Buckley	**Blast No.:**	2022-38
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:	860 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 #5371
Calibration Date:	July 27, 2022
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	775 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:	<120 dB(L) – Unit was not triggered

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 20, 2022
Project No.:	22S001.00	**Time of Blast:**	14:02
Inspector:	C. Buckley	**Blast No.:**	2022-38
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:	1,400 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 #21349
Calibration Date:	July 2, 2022
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	895 m Southeast
Transverse Particle Velocity:	0.63 mm/s @ 64 Hz
Vertical Particle Velocity:	0.76 mm/s @ 64 Hz
Longitudinal Particle Velocity:	0.63 mm/s @ 57 Hz
Peak Particle Velocity:	0.76 mm/s @ 64 Hz
Maximum Airblast:	108 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 20, 2022
Project No.:	22S001.00	**Time of Blast:**	14:02
Inspector:	C. Buckley	**Blast No.:**	2022-38
Client:	Hammond River Holdings		

Data Collection – Seismometer #11

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #20206
Calibration Date:	May 31, 2022
Location of seismograph:	Civic Number 2337 Route 820 (PW-04)
Distance and Direction from Blast:	750 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

Attachment B

Blast and Seismograph Location Plan

Blast and Seismograph Location Plan
Blast No: 2022-38
Upham East Gypsum Quarry
Upham, NB

Date: October 20, 2022
Project No.: 22S001.00

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Attachment C

Blast Event Reports

Event Report

Date/Time Vert at 14:05:46 October 13, 2022
Trigger Source Geo: 0.492 mm/s
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Notes
Location:
Client:
User Name:
Converted: October 20, 2022 16:17:15 (V10.72.1)

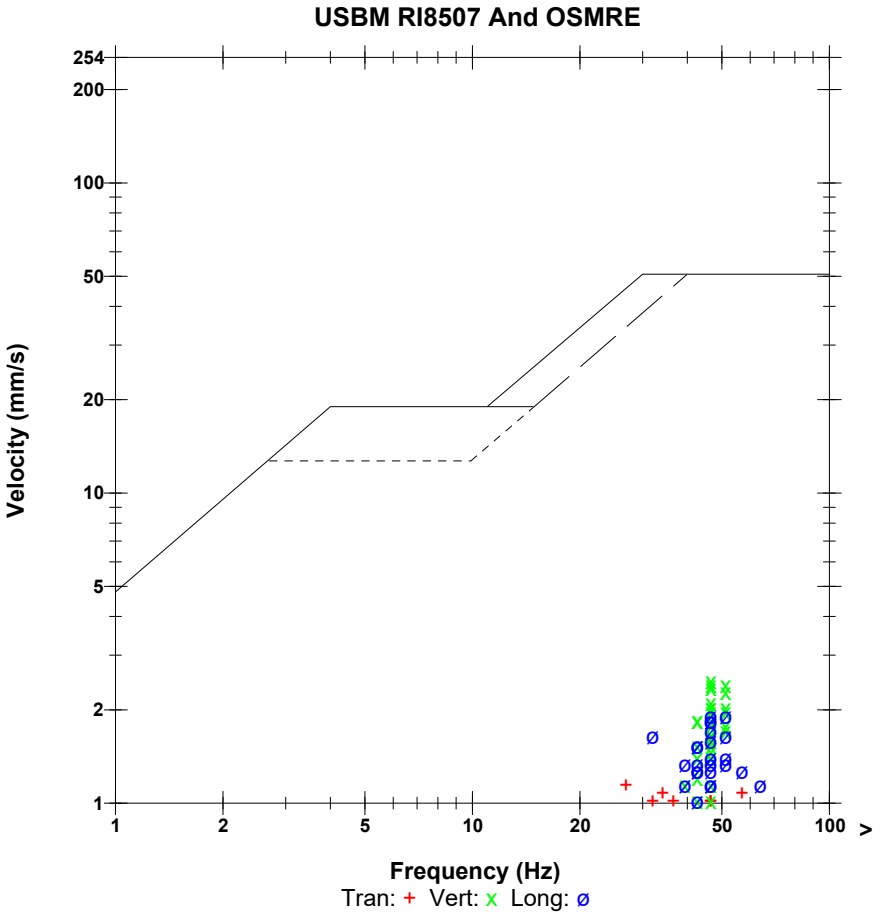
Serial Number 5487 V 2.61 MiniMate
Battery Level 5.8 Volts
Unit Calibration February 18, 2022 by Instantel
File Name G487JPWN.5M0
Post Event Notes
Location: Cottage - Route 820 (PW-03)
Blast No.: 2022-38
Project No: 22S001.00

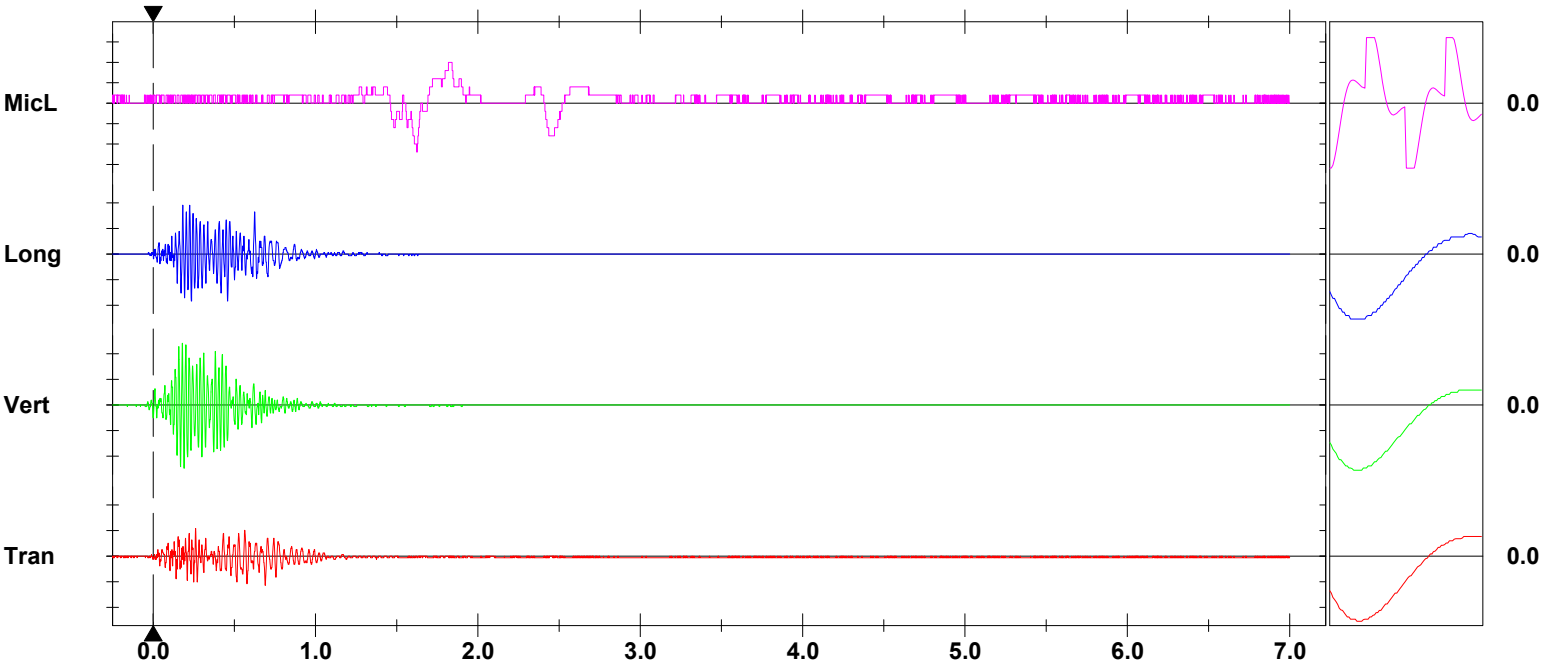
Extended Notes

Microphone Linear Weighting
PSPL 115.6 dB(L) 12.00 pa.(L) at 1.624 sec
ZC Freq 5.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 286 mv)

	Tran	Vert	Long	
PPV	1.143	2.477	1.905	mm/s
PPV	52.16	58.88	56.60	dB
ZC Freq	27	47	51	Hz
Time (Rel. to Trig)	0.691	0.191	0.183	sec
Peak Acceleration	0.040	0.093	0.066	g
Peak Displacement	0.005	0.008	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.7	8.0	Hz
Overswing Ratio	3.5	4.2	3.5	

Peak Vector Sum 2.699 mm/s at 0.182 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 1.000 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Long at 14:02:21 October 20, 2022
Trigger Source Geo: 0.508 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: October 20, 2022 16:05:37 (V10.72.1)

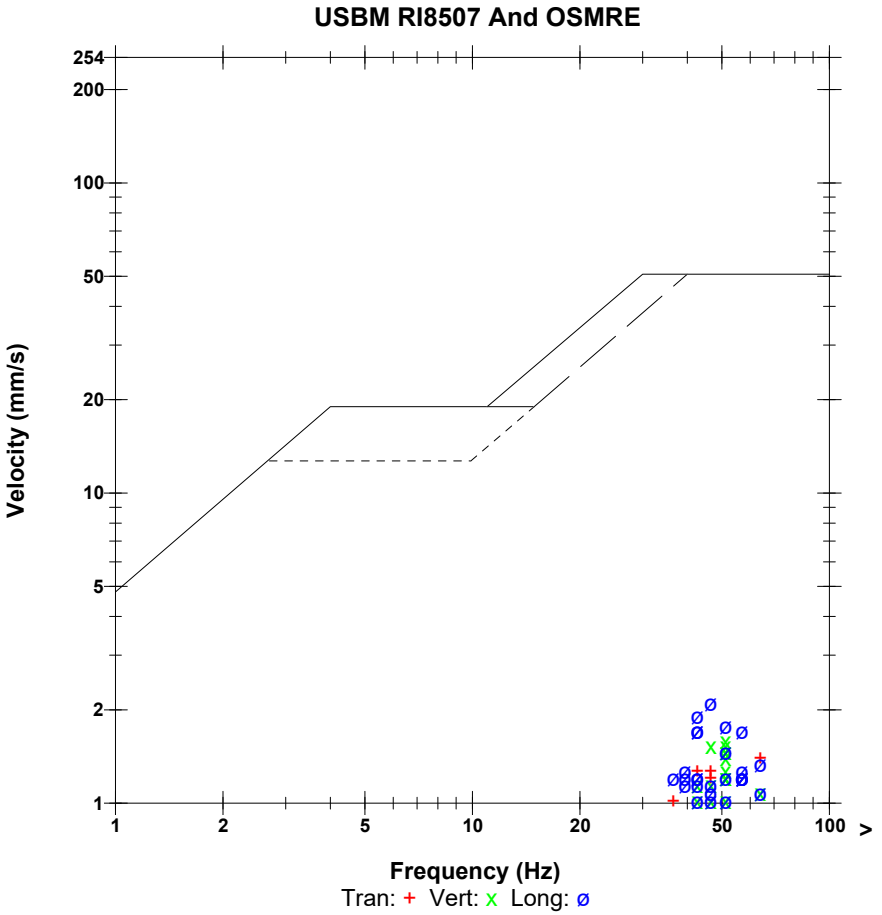
Extended Notes

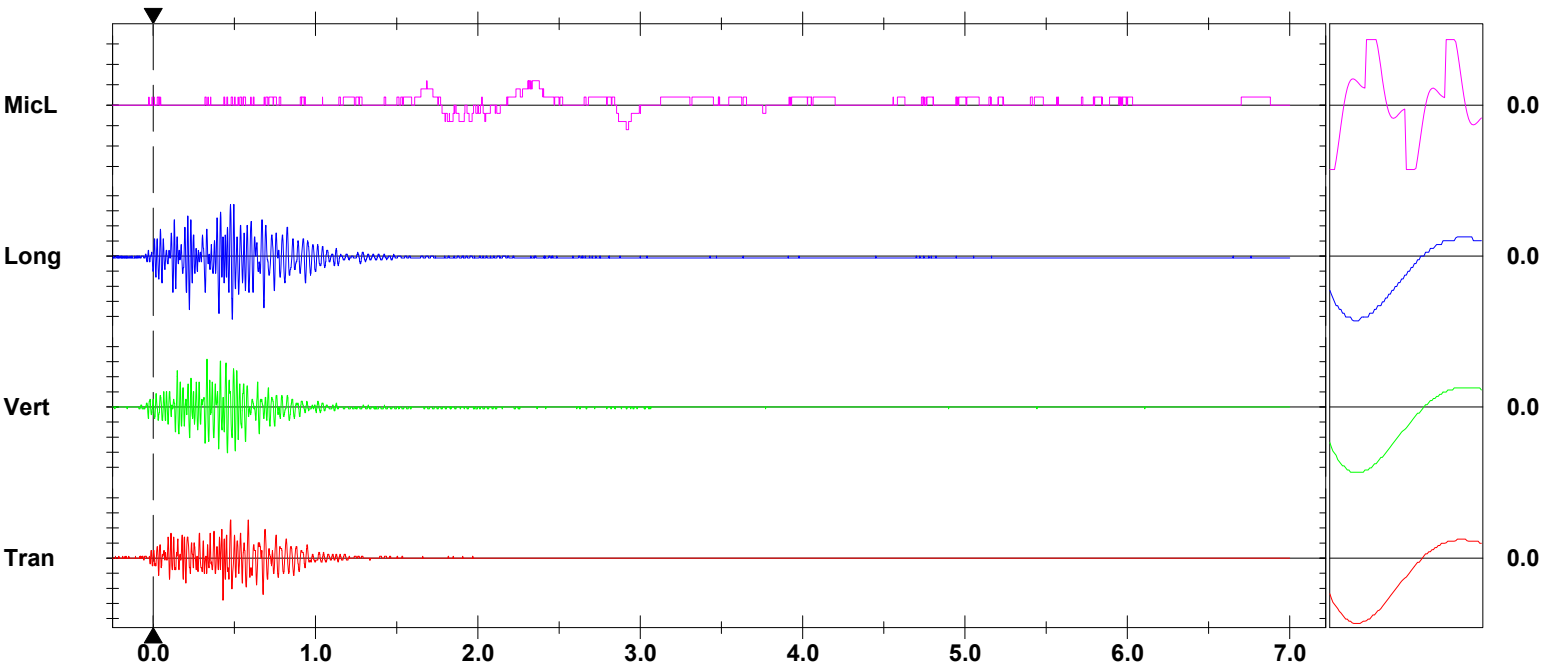
Microphone Linear Weighting
PSPL 109.5 dB(L) 6.000 pa.(L) at 1.687 sec
ZC Freq 3.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 297 mv)

	Tran	Vert	Long	
PPV	1.397	1.588	2.096	mm/s
PPV	53.90	55.01	57.43	dB
ZC Freq	64	47	47	Hz
Time (Rel. to Trig)	0.431	0.332	0.488	sec
Peak Acceleration	0.053	0.060	0.073	g
Peak Displacement	0.005	0.006	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.3	8.2	8.2	Hz
Overswing Ratio	3.6	3.5	3.6	

Peak Vector Sum 2.445 mm/s at 0.488 sec

Serial Number 5632 V 2.61 MiniMate
Battery Level 6.3 Volts
Unit Calibration November 15, 2021 by Instantel
File Name G632JQ9L.NX0
Post Event Notes
Location: 2341 Route 820 (PW-05)
Blast No.: 2022-38
Project No: 22S001.00





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

Event Report

Date/Time	Vert at 14:01:32 October 20, 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
Job Number:	1

Serial Number	BE21349 V 10.72-1.1 Minimate Blaster
Battery Level	6.0 Volts
Unit Calibration	July 20, 2022 by Instantel
File Name	W349JQ7Q.YK0

Notes
Location:
Client:
User Name:
General:

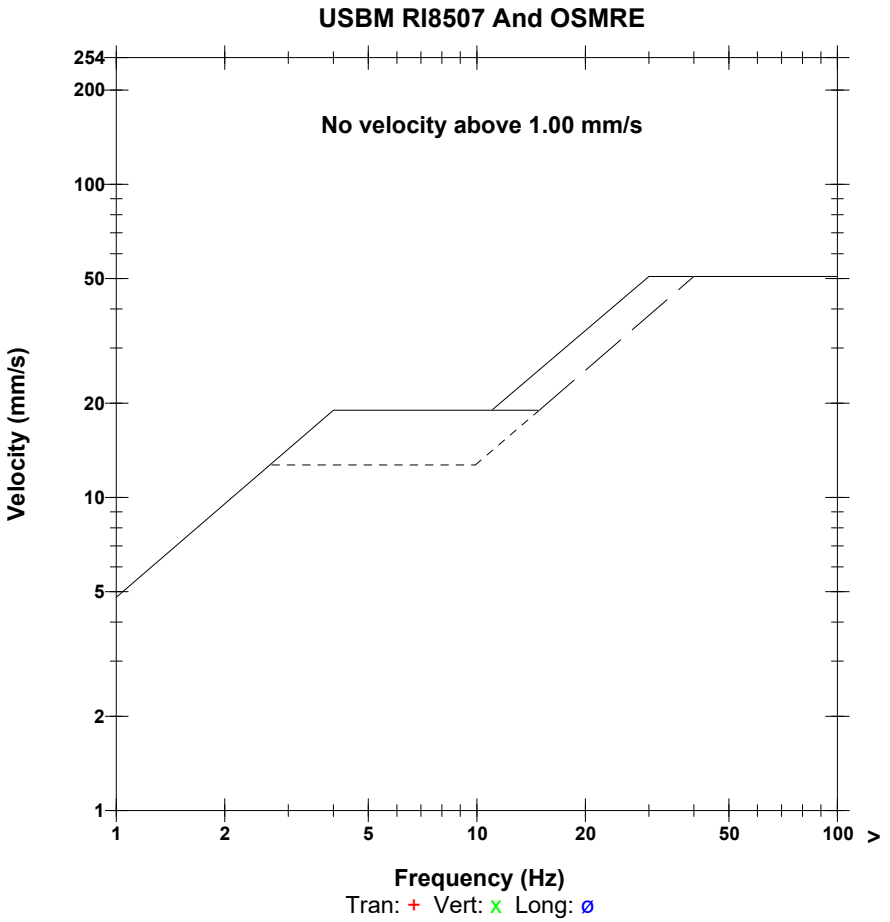
Post Event Notes
Location: 4140 Route 111 (PW-12)
Blast No.: 2022-38
Project No: 22S001.00

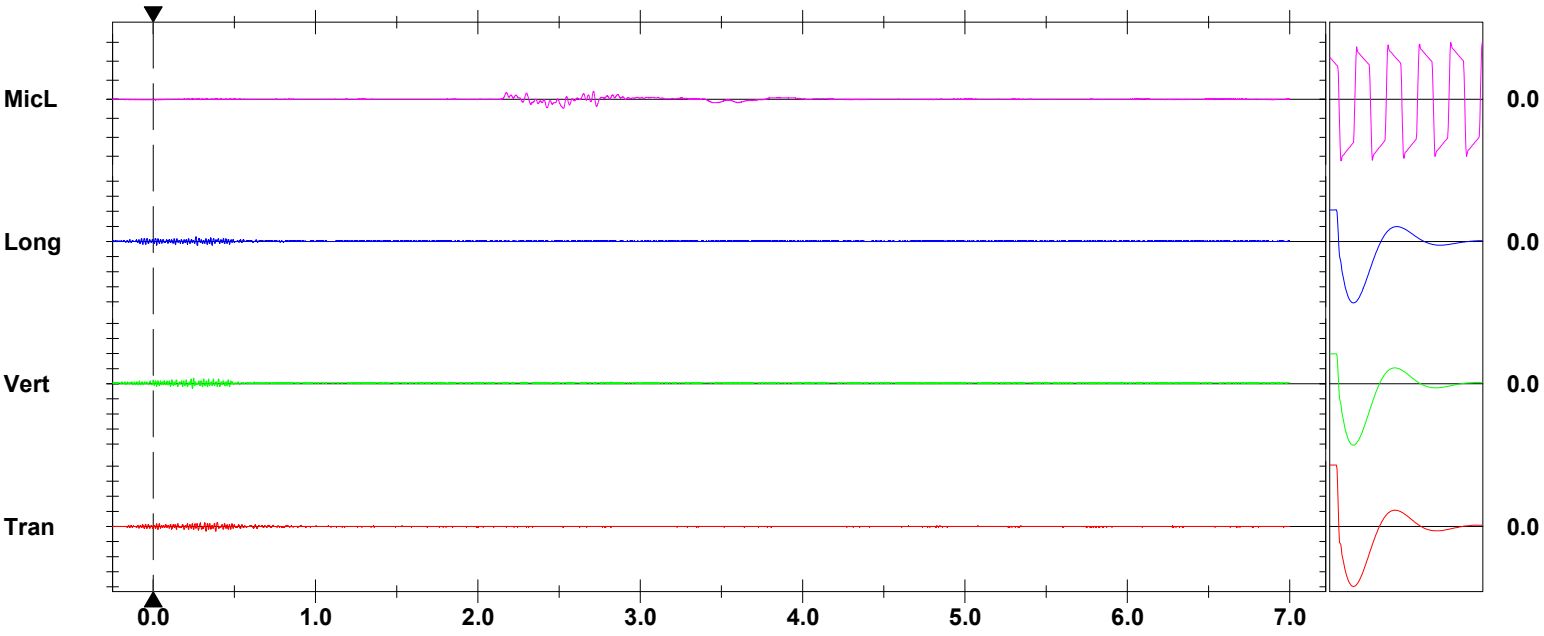
Extended Notes

Microphone	Linear Weighting
PSPL	107.5 dB(L) 4.750 pa.(L) at 2.522 sec
ZC Freq	11 Hz
Channel Test	Passed (Freq = 20.1 Hz Amp = 630 mv)

	Tran	Vert	Long	
PPV	0.635	0.762	0.635	mm/s
PPV	47.06	48.64	47.06	dB
ZC Freq	64	64	57	Hz
Time (Rel. to Trig)	0.325	0.250	0.263	sec
Peak Acceleration	0.027	0.040	0.027	g
Peak Displacement	0.002	0.002	0.002	mm
Sensor Check	Check	Passed	Passed	
Frequency	7.6	7.6	7.3	Hz
Overswing Ratio	3.7	3.9	4.1	

Peak Vector Sum 0.861 mm/s at 0.250 sec





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

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October 26, 2022

Project No.: 22S001.00

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

Re: Blast Vibration Monitoring – Blast No. 2022-39 – 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 Archibald Drilling & Blasting at 14:01 on October 25, 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. 2022-39 – October 25, 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)	14:01	1,310 m S	< 0.5 mm/s	<120	Unit was not triggered
2. Civic No. 4126 Route 111 (PW-10)		929 m S	0.74 mm/s @ 73 Hz	118	-
3. Civic No. 4150 Route 111 (PW-13)		806 m SE	0.25 mm/s @ 32 Hz	124	Triggered from airblast
4. Civic No. 2447 Route 820 (PW-07)		1,010 m NE	0.64 mm/s @ 32 Hz	128	-
5. PW-03 - Cottage Route 820		680 m N	0.70 mm/s @ 30 Hz	128	-
6. Civic No. 2341 Route 820 (PW-05)		633 m N	2.16 mm/s @ 64 Hz	129	>128
7. Civic No. 50 Myron Road (PW-15)		817 m NW	1.52 mm/s @ 39 Hz	126	-
8. Civic No. 86 Myron Road (PW-16)		757 m W	1.29 mm/s @ 43 Hz	129	>128
9. Civic No. 220 Myron Road (PW-01)		1,320 m S	< 0.5 mm/s	<120	Unit was not triggered
10. Civic No. 2337 Route 820 (PW-04)		711 m N	0.70 mm/s @ 32 Hz	127	-
11. Civic No. 4140 Route 111 (PW-12)		881 m SE	0.76 mm/s @ 73 Hz	125	-
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) as established in the Approval to Operate (I-10936).

A maximum air overpressure (airblast or sound pressure) of 129 dB(L) was recorded at 2341 Route 820 and 86 Myron Road. The air overpressure recorded at both locations slightly exceeds the limit 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,
CBCL Limited

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

Attachments: Blast Record
Blast and Seismograph Location Plan
Blast Event Reports

Project No: 22S001.00

Attachment A

Blast Record

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 25, 2022
Project No.:	22S001.00	**Time of Blast:**	14:01
Inspector:	H. Awada	**Blast No.:**	2022-39
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Archibald Drilling & Blasting		
Blaster's Certification No.:	1297	**Blaster's Name:**	Anthony Wallace
Blast Location:	N 45º28'52" W 65º38'05" (see attached sketch)		
Type of Rock:	Anhydrate/Gypsum	**Est. Vol. or Tonnage:**	12,595 tonnes
Weather at time of Blast:	Cloudy – overcast	**Air Temp.:**	18ºC
Est. Wind Speed :	≈10 km/h	**Wind Direction:**	N
Cloud Cover:	Yes	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	100	**Hole Diameter:**	4.5"
Average Depth:	5.3 m	**Spacing:**	10 ft x 10 ft
No. Holes per Delay:	2	**Collar Length:**	7 ft - 8 ft
Delay between Holes:	25 ms	**Delay between Rows:**	17 & 67 ms
Initiation Method:	Non-Electric		
Weight of Explosives per Delay:	Max.: 110 kg		
Type and weight of Explosives for Blast:	4,910 kg - Fortis ANE		

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

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 25, 2022
Project No.:	22S001.00	**Time of Blast:**	14:01
Inspector:	H. Awada	**Blast No.:**	2022-39
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	633 m
Direction to the Nearest Structure:	N
Structure Type:	House
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	60.4

SAFETY:

Type of Warning Signal Used:	Siren
Blasting Mats Used (yes or no):	No
Airblast Measurement (yes or no):	Yes
Vibration Measurement (yes or no):	Yes
Warning Signs Posted (yes or no):	Yes
Accesses Guarded (yes or no):	Yes
Flyrock Damage (yes or no):	No

If Yes, Describe:

Misfire (yes or no):	No

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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 25, 2022
Project No.:	22S001.00	**Time of Blast:**	14:01
Inspector:	H. Awada	**Blast No.:**	2022-39
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21348
Calibration Date:	July 23, 2022
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1,310 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 #20204
Calibration Date:	May 31, 2022
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	929 m South
Transverse Particle Velocity:	0.37 mm/s @ 34 Hz
Vertical Particle Velocity:	0.74 mm/s @ 73 Hz
Longitudinal Particle Velocity:	0.44 mm/s @ 57 Hz
Peak Particle Velocity:	0.74 mm/s @ 73 Hz
Maximum Airblast:	118 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 25, 2022
Project No.:	22S001.00	**Time of Blast:**	14:01
Inspector:	H. Awada	**Blast No.:**	2022-39
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5371
Calibration Date:	July 27, 2022
Location of seismograph:	Civic Number 4150 Route 111 (PW-13)
Distance and Direction from Blast:	806 m Southeast
Transverse Particle Velocity:	0.06 mm/s @ N/A Hz
Vertical Particle Velocity:	0.19 mm/s @ 43 Hz
Longitudinal Particle Velocity:	0.25 mm/s @ 32 Hz
Peak Particle Velocity:	0.25 mm/s @ 32 Hz
Maximum Airblast:	124 dB(L)

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:	1,010 m Northeast
Transverse Particle Velocity:	0.64 mm/s @ 32 Hz
Vertical Particle Velocity:	0.51 mm/s @ 28 Hz
Longitudinal Particle Velocity:	0.51 mm/s @ 37 Hz
Peak Particle Velocity:	0.64 mm/s @ 32 Hz
Maximum Airblast:	128 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 25, 2022
Project No.:	22S001.00	**Time of Blast:**	14:01
Inspector:	H. Awada	**Blast No.:**	2022-39
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5635
Calibration Date:	March 1, 2022
Location of seismograph:	Cottage - PW-03 - Route 820
Distance and Direction from Blast:	680 m North
Transverse Particle Velocity:	0.64 mm/s @ 47 Hz
Vertical Particle Velocity:	0.57 mm/s @ 39 Hz
Longitudinal Particle Velocity:	0.70 mm/s @ 30 Hz
Peak Particle Velocity:	0.70 mm/s @ 30 Hz
Maximum Airblast:	128 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:	633 m North
Transverse Particle Velocity:	2.10 mm/s @ 51 Hz
Vertical Particle Velocity:	2.16 mm/s @ 64 Hz
Longitudinal Particle Velocity:	1.91 mm/s @ 57 Hz
Peak Particle Velocity:	2.16 mm/s @ 64 Hz
Maximum Airblast:	129 dB(L) (>128 dB(L))

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 25, 2022
Project No.:	22S001.00	**Time of Blast:**	14:01
Inspector:	H. Awada	**Blast No.:**	2022-39
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #5487
Calibration Date:	February 18, 2022
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	817 m Northwest
Transverse Particle Velocity:	1.52 mm/s @ 39 Hz
Vertical Particle Velocity:	0.83 mm/s @ 39 Hz
Longitudinal Particle Velocity:	1.46 mm/s @ 37 Hz
Peak Particle Velocity:	1.52 mm/s @ 39 Hz
Maximum Airblast:	126 dB(L)

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #20205
Calibration Date:	May 31, 2022
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	757 m West
Transverse Particle Velocity:	1.28 mm/s @ 17 Hz
Vertical Particle Velocity:	0.91 mm/s @ 39 Hz
Longitudinal Particle Velocity:	1.29 mm/s @ 43 Hz
Peak Particle Velocity:	1.29 mm/s @ 43 Hz
Maximum Airblast:	129 dB(L) (>128 dB(L))

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 25, 2022
Project No.:	22S001.00	**Time of Blast:**	14:01
Inspector:	H. Awada	**Blast No.:**	2022-39
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:	1,320 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 2337 Route 820 (PW-04)
Distance and Direction from Blast:	711 m North
Transverse Particle Velocity:	0.45 mm/s @ 57 Hz
Vertical Particle Velocity:	0.51 mm/s @ 51 Hz
Longitudinal Particle Velocity:	0.70 mm/s @ 32 Hz
Peak Particle Velocity:	0.70 mm/s @ 32 Hz
Maximum Airblast:	127 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	October 25, 2022
Project No.:	22S001.00	**Time of Blast:**	14:01
Inspector:	H. Awada	**Blast No.:**	2022-39
Client:	Hammond River Holdings		

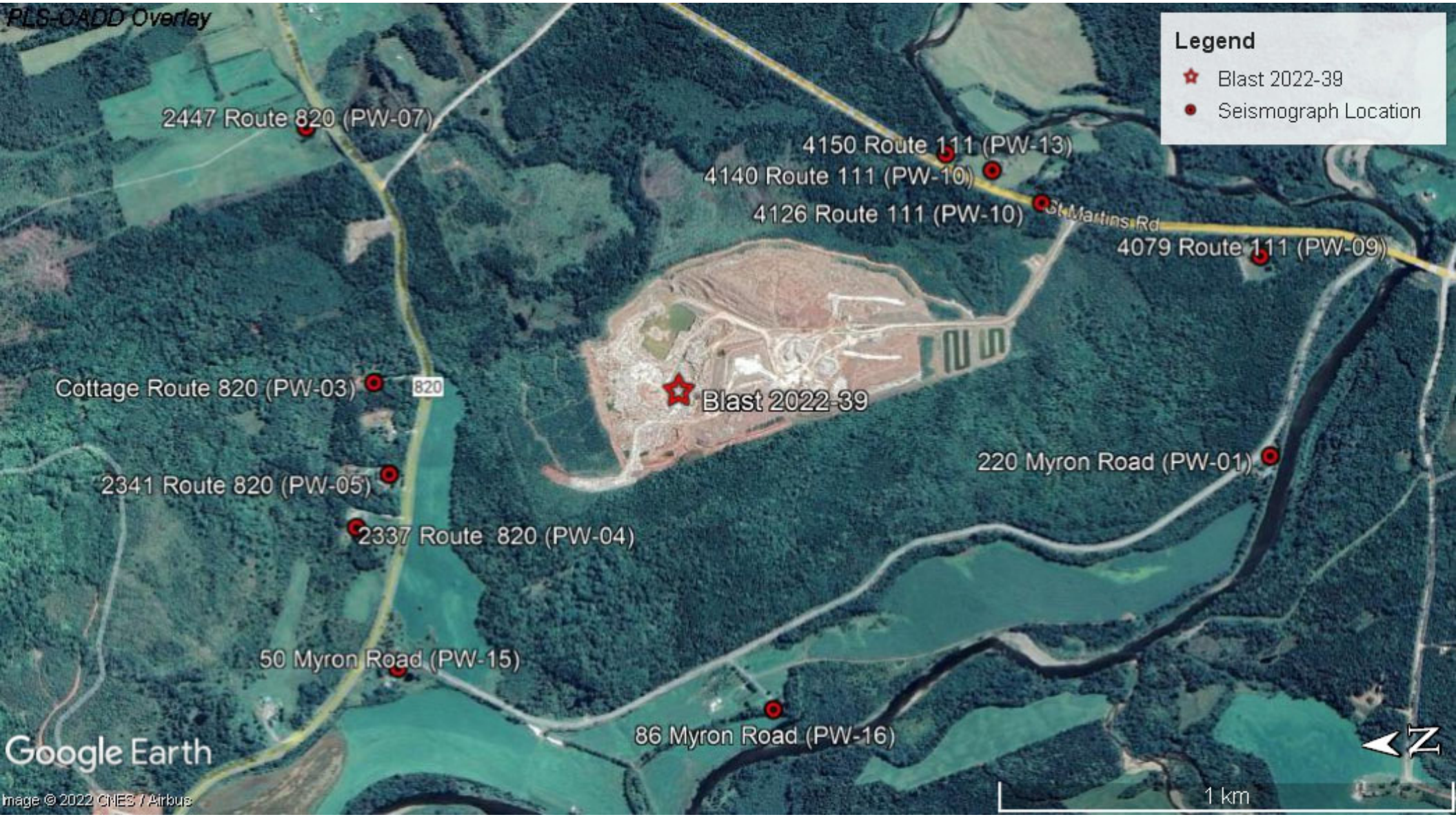
Data Collection – Seismometer #11

Make, Model and Serial # of unit:	Instantel Mini Mate, Serial #21349
Calibration Date:	July 20, 2022
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	881 m Southeast
Transverse Particle Velocity:	0.64 mm/s @ 64 Hz
Vertical Particle Velocity:	0.76 mm/s @ 73 Hz
Longitudinal Particle Velocity:	0.76 mm/s @ 73 Hz
Peak Particle Velocity:	0.76 mm/s @ 73 Hz
Maximum Airblast:	125 dB(L)

Attachment B

Blast and Seismograph Location Plan

Blast and Seismograph Location Plan
Blast No: 2022-39
Upham East Gypsum Quarry
Upham, NB



Date: October 25, 2022
Project No.: 22S001.00

CBCL

Attachment C

Blast Event Reports

Event Report

Date/Time Vert at 14:01:11 October 25, 2022
Trigger Source Geo: 0.500 mm/s, Mic: 120.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 7.0 sec at 1024 sps
Operator/Setup: Operator/GAYTON.MMB

Notes
Location:
Client:
User Name:
General:

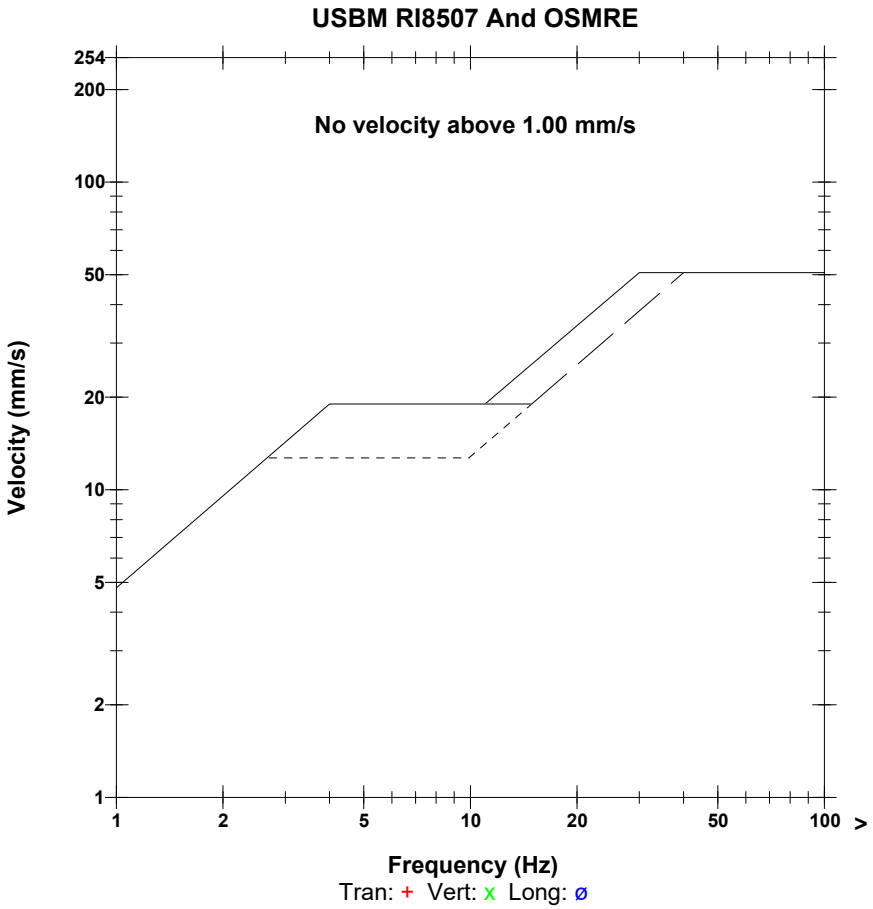
Serial Number UM20204 V 10-90GC Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration May 31, 2022 by Instantel
File Name UM20204_20221025140111.IDFW

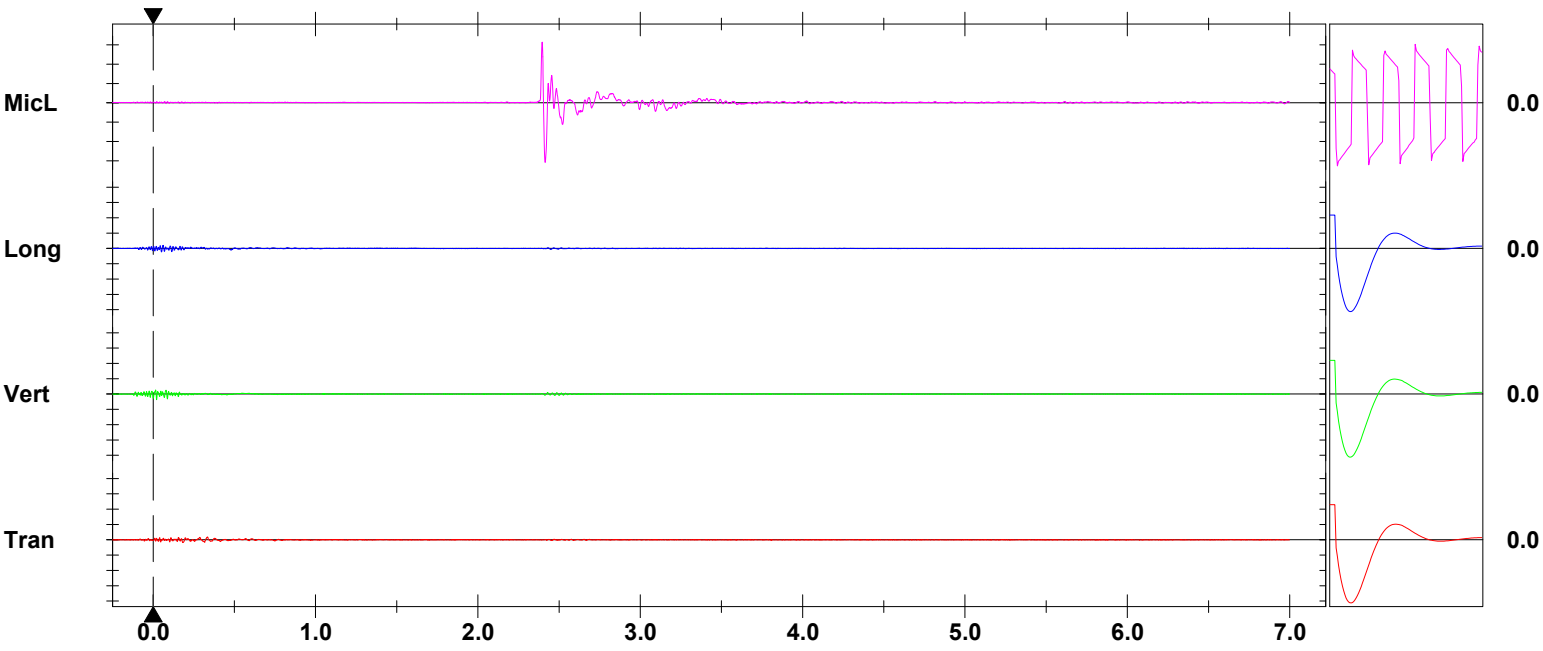
Post Event Notes
Location: 4126 Route 111 (PW-10)
Blast No.: 2022-39
Project No: 22S001.00

Microphone Linear Weighting
PSPL 117.9 dB(L) 15.73 pa.(L) at 2.396 sec
ZC Freq 4.7 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1385 mv)

	Tran	Vert	Long	
PPV	0.370	0.741	0.441	mm/s
PPV	42.37	48.40	43.90	dB
ZC Freq	34	73	57	Hz
Time (Rel. to Trig)	0.183	0.021	0.051	sec
Peak Acceleration	0.021	0.032	0.027	g
Peak Displacement	0.002	0.004	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	4.0	4.2	4.1	

Peak Vector Sum 0.774 mm/s at 0.021 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 5.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time MicL at 14:01:15 October 25, 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: October 25, 2022 16:45:08 (V10.72.1)

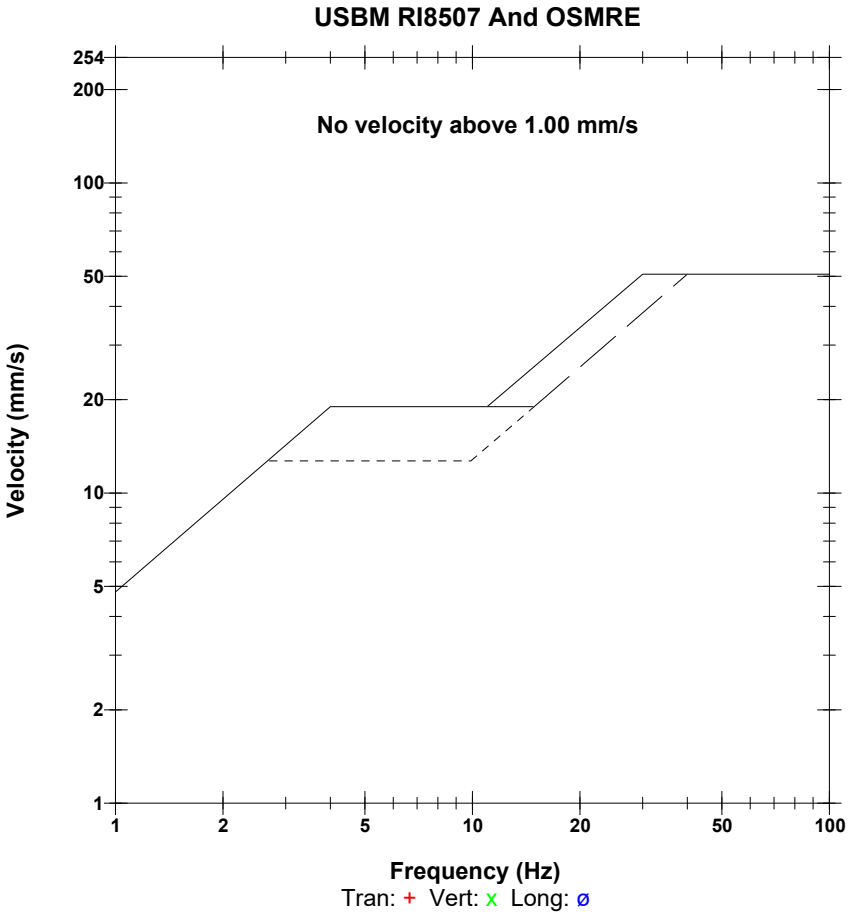
Extended Notes

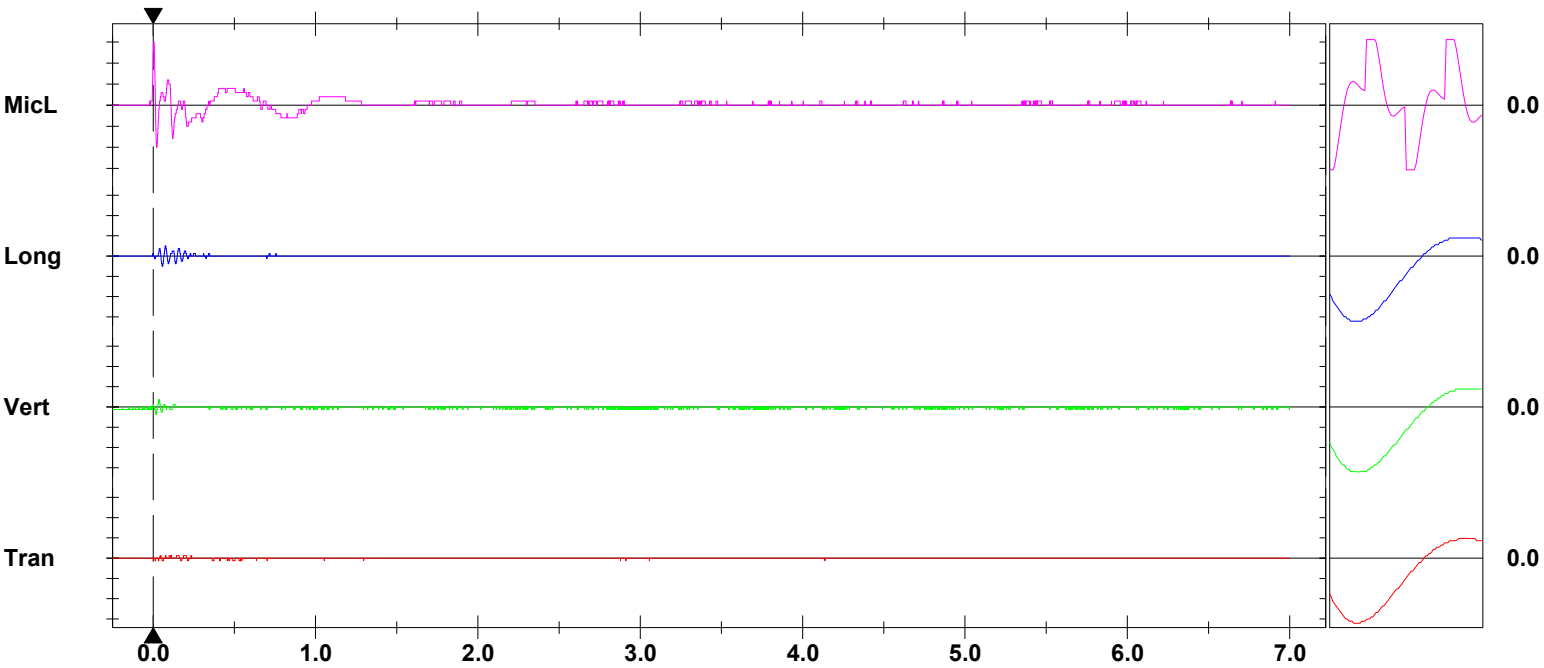
Microphone Linear Weighting
PSPL 123.5 dB(L) 30.00 pa.(L) at 0.005 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 302 mv)

	Tran	Vert	Long	
PPV	0.064	0.191	0.254	mm/s
PPV	27.06	36.60	39.10	dB
ZC Freq	N/A	43	32	Hz
Time (Rel. to Trig)	0.002	0.018	0.056	sec
Peak Acceleration	0.007	0.007	0.007	g
Peak Displacement	0.000	0.000	0.001	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.2	7.8	8.3	Hz
Overswing Ratio	3.5	3.7	3.7	

Peak Vector Sum 0.286 mm/s at 0.056 sec
N/A: Not Applicable

Serial Number 5371 V 2.61 MiniMate
Battery Level 5.9 Volts
Unit Calibration July 27, 2022 by Instantel
File Name G371JQIU.Y30
Post Event Notes
Location: 4150 Route 111 (PW-13)
Blast No.: 2022-39
Project No: 22S001.00





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Tran at 14:01:13 October 25, 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: October 25, 2022 16:47:56 (V10.72.1)

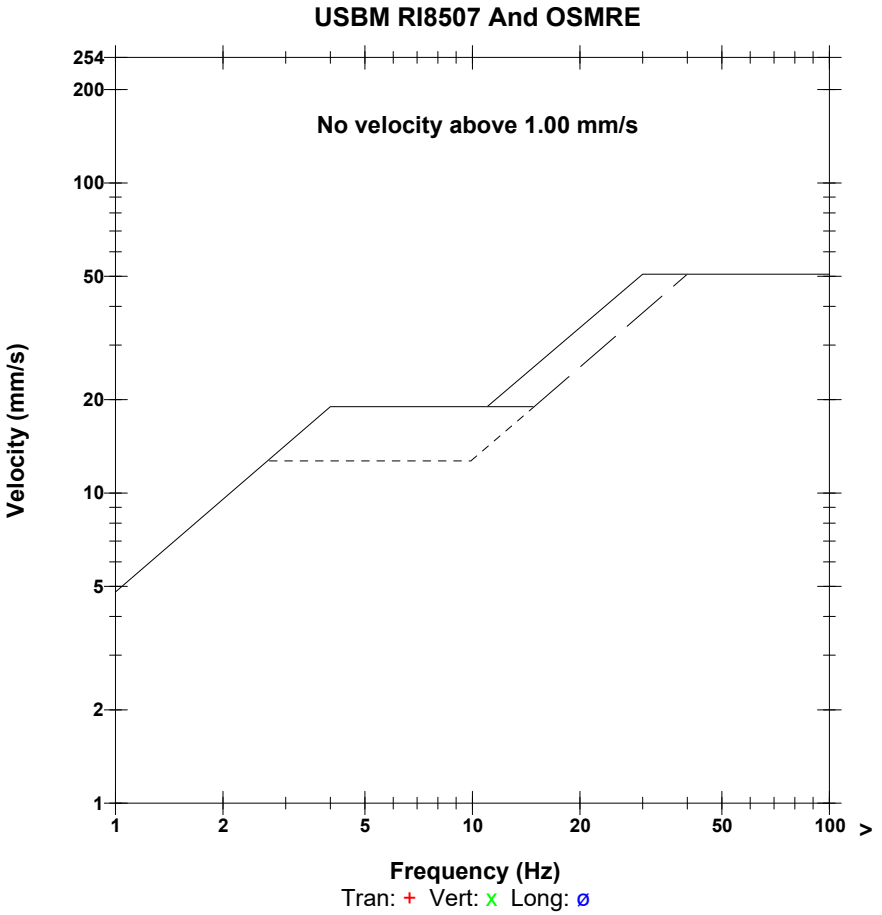
Extended Notes

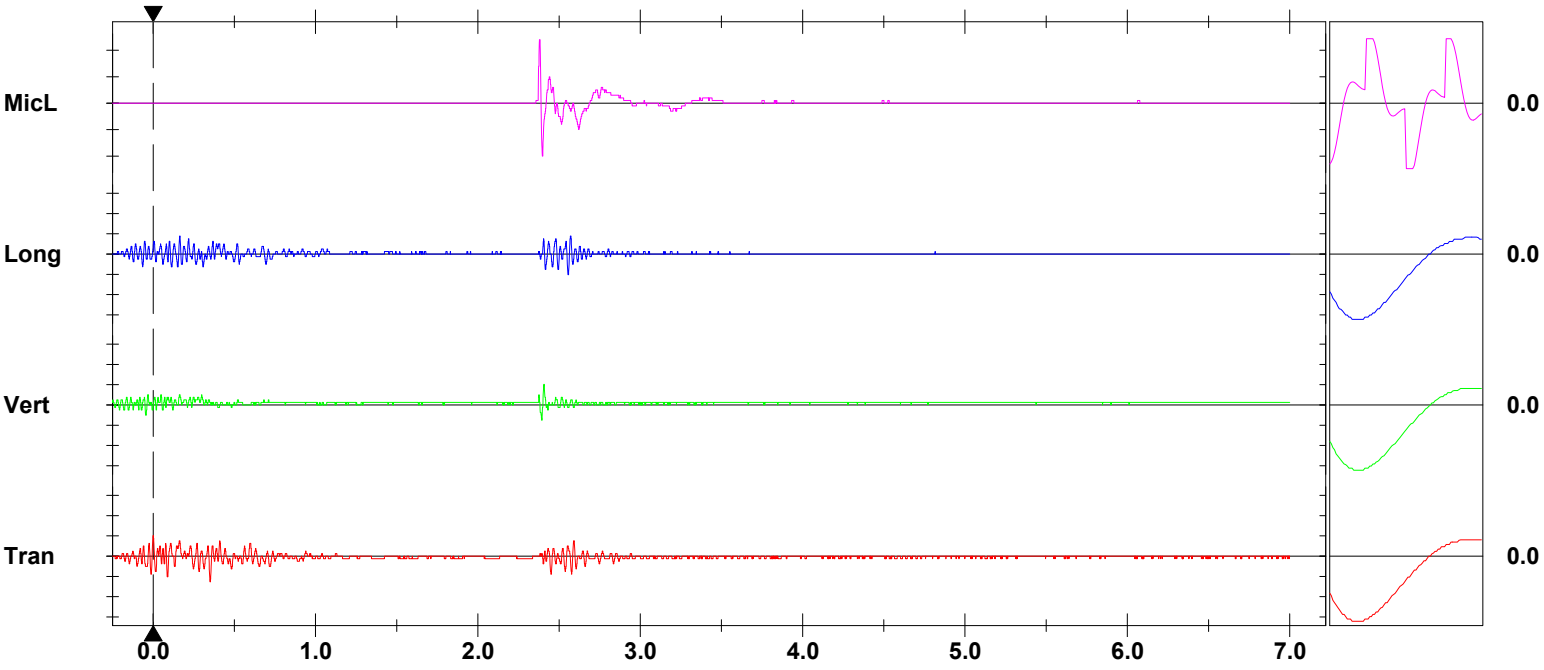
Microphone Linear Weighting
PSPL 127.6 dB(L) 48.00 pa.(L) at 2.380 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 272 mv)

	Tran	Vert	Long	
PPV	0.635	0.508	0.508	mm/s
PPV	47.06	45.12	45.12	dB
ZC Freq	32	28	37	Hz
Time (Rel. to Trig)	0.352	2.407	2.556	sec
Peak Acceleration	0.013	0.013	0.013	g
Peak Displacement	0.003	0.002	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.7	7.7	Hz
Overswing Ratio	3.8	4.0	3.9	

Peak Vector Sum 0.635 mm/s at 0.352 sec

Serial Number 5489 V 2.61 MiniMate
Battery Level 6.3 Volts
Unit Calibration April 25, 2022 by Instantel
File Name G489JQIU.Y10
Post Event Notes
Location: 2447 Route 820 (PW-07)
Blast No.: 2022-39
Project No: 22S001.00





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 20.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Long at 14:01:14 October 25, 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: October 25, 2022 16:54:16 (V10.72.1)

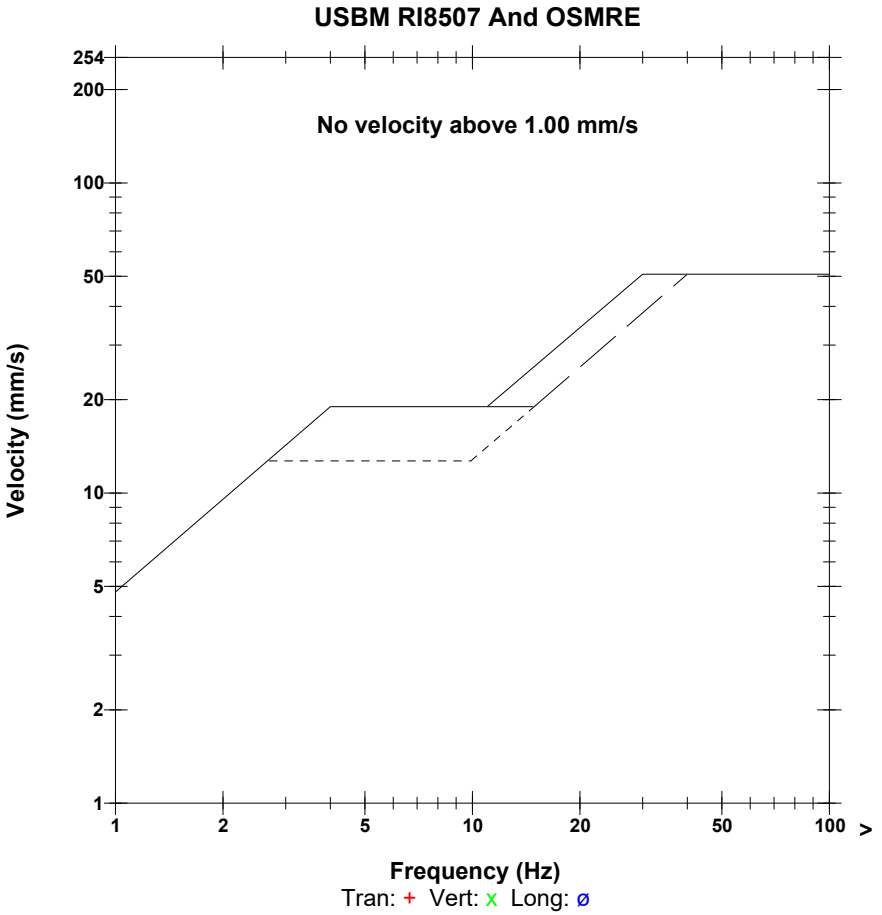
Extended Notes

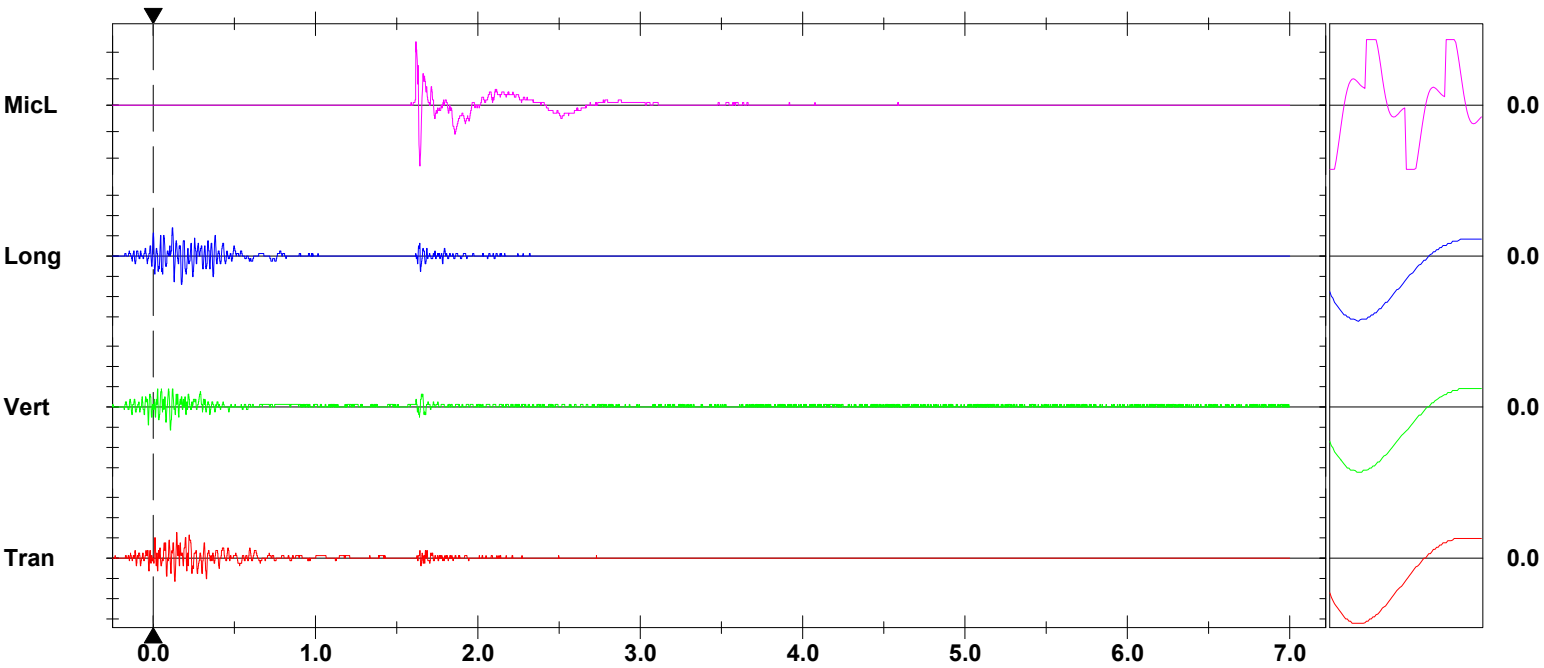
Microphone Linear Weighting
PSPL 127.6 dB(L) 48.00 pa.(L) at 1.619 sec
ZC Freq 15 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 297 mv)

	Tran	Vert	Long	
PPV	0.635	0.572	0.699	mm/s
PPV	47.06	46.14	47.88	dB
ZC Freq	47	39	30	Hz
Time (Rel. to Trig)	0.146	0.106	0.118	sec
Peak Acceleration	0.020	0.020	0.027	g
Peak Displacement	0.003	0.002	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	7.8	7.8	Hz
Overswing Ratio	3.2	3.7	3.9	

Peak Vector Sum 0.857 mm/s at 0.119 sec

Serial Number 5635 V 2.61 MiniMate
Battery Level 6.4 Volts
Unit Calibration March 1, 2022 by Instantel
File Name G635JQIU.Y20
Post Event Notes
Location: Cottage - Route 820 (PW-03)
Blast No.: 2022-39
Project No: 22S001.00





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 20.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Vert at 14:01:12 October 25, 2022
Trigger Source Geo: 0.508 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: October 25, 2022 16:50:04 (V10.72.1)

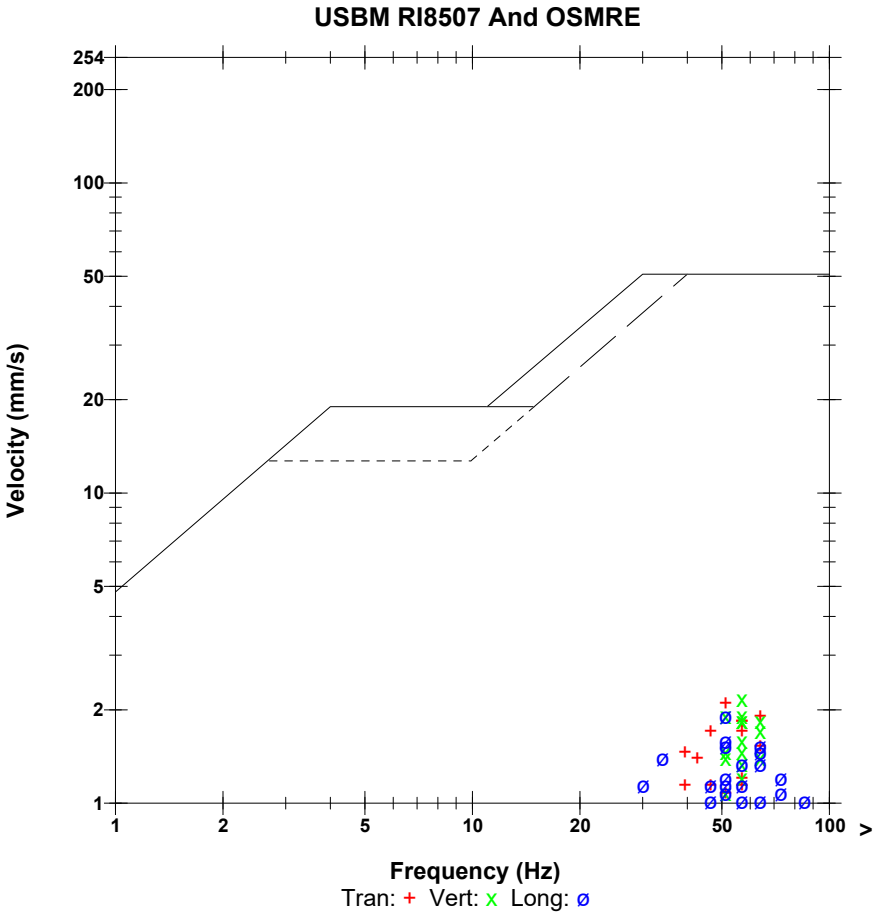
Extended Notes

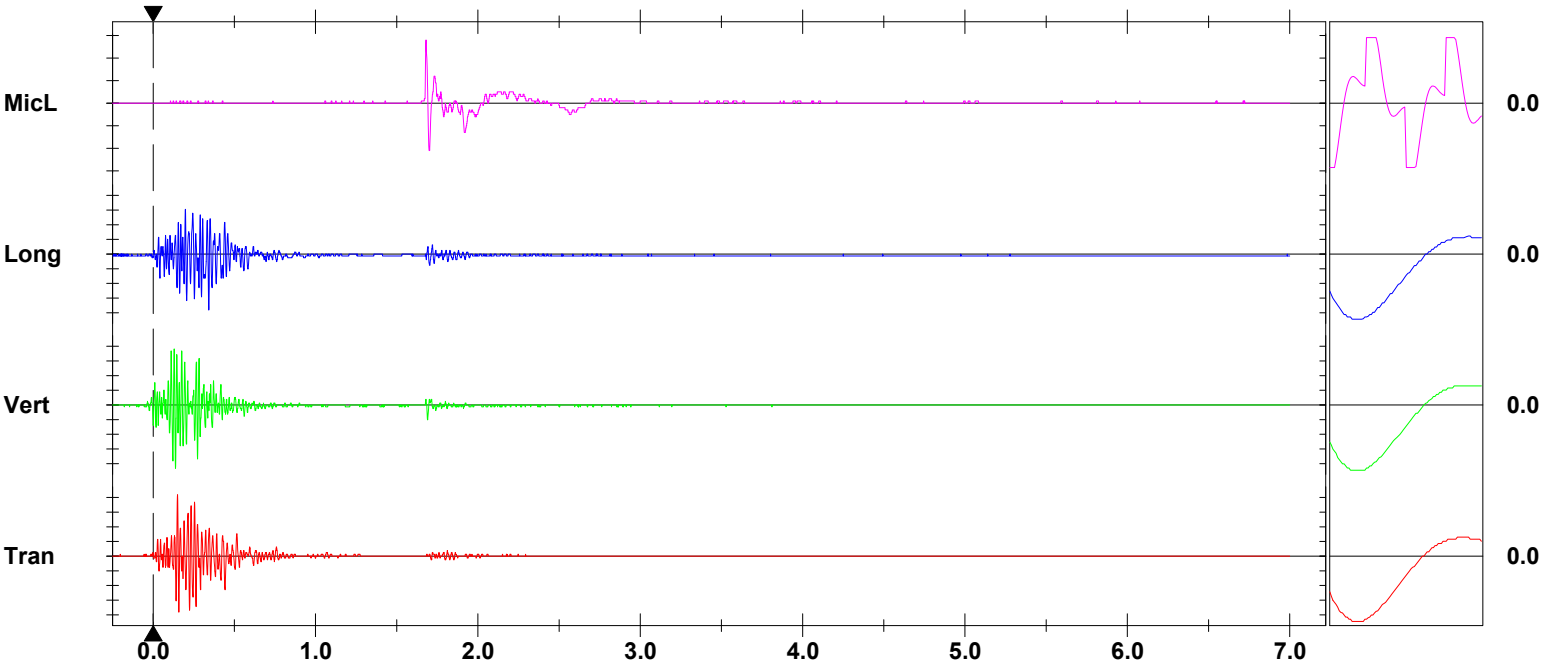
Microphone Linear Weighting
PSPL 128.9 dB(L) 56.00 pa.(L) at 1.681 sec
ZC Freq 12 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 296 mv)

	Tran	Vert	Long	
PPV	2.096	2.159	1.905	mm/s
PPV	57.43	57.69	56.60	dB
ZC Freq	51	64	57	Hz
Time (Rel. to Trig)	0.151	0.139	0.343	sec
Peak Acceleration	0.080	0.086	0.066	g
Peak Displacement	0.006	0.006	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.2	8.2	8.0	Hz
Overswing Ratio	3.6	3.3	3.6	

Peak Vector Sum 2.619 mm/s at 0.256 sec

Serial Number 5632 V 2.61 MiniMate
Battery Level 6.1 Volts
Unit Calibration November 15, 2021 by Instantel
File Name G632JQIU.Y00
Post Event Notes
Location: 2341 Route 820 (PW-05)
Blast No.: 2022-39
Project No: 22S001.00





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 20.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Vert at 14:01:10 October 25, 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: October 25, 2022 16:57:00 (V10.72.1)

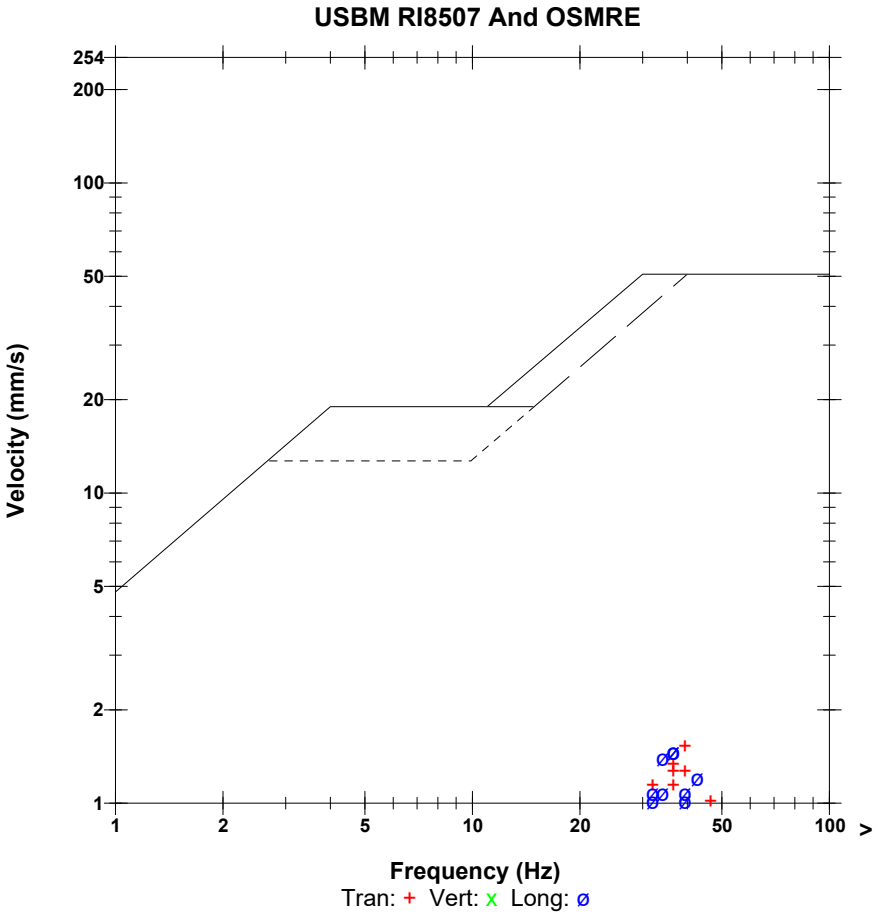
Extended Notes

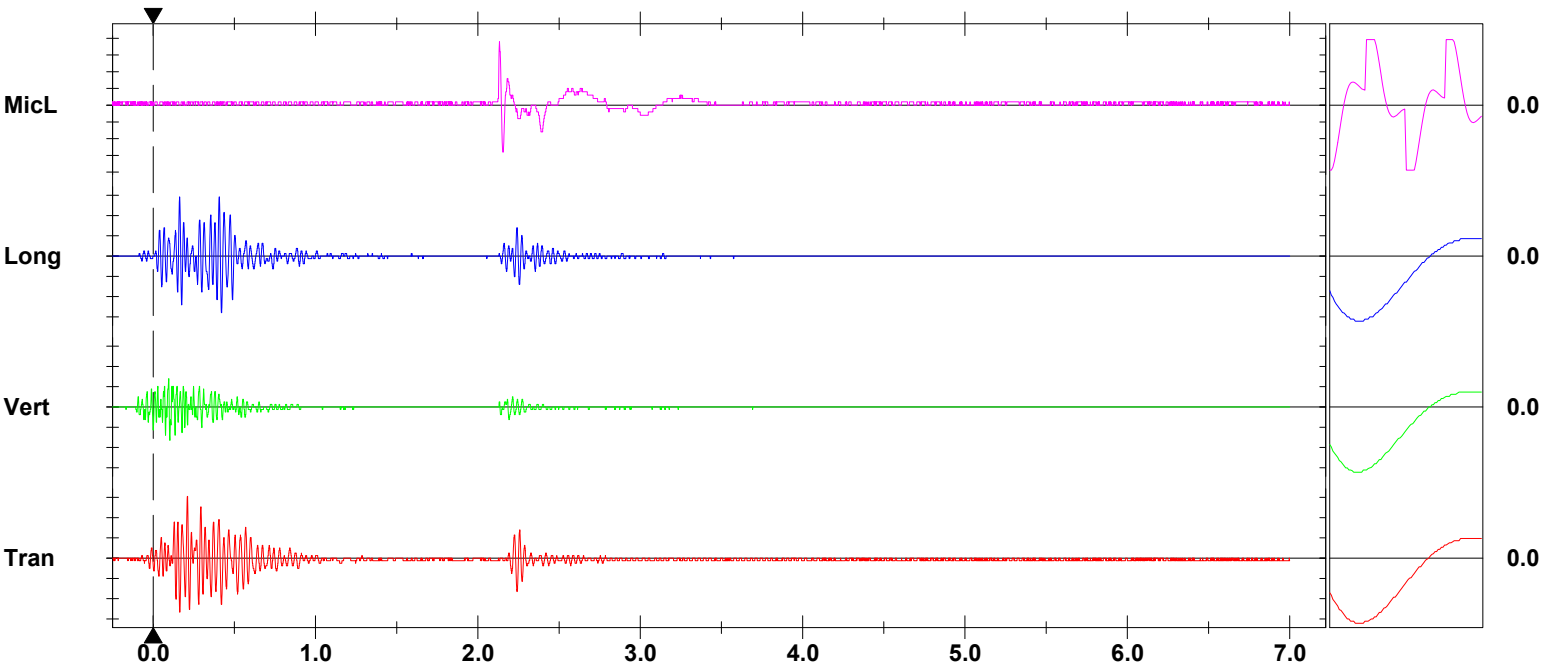
Microphone Linear Weighting
PSPL 125.6 dB(L) 38.00 pa.(L) at 2.134 sec
ZC Freq 9.1 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 286 mv)

	Tran	Vert	Long	
PPV	1.524	0.826	1.461	mm/s
PPV	54.66	49.33	54.29	dB
ZC Freq	39	39	37	Hz
Time (Rel. to Trig)	0.211	0.103	0.164	sec
Peak Acceleration	0.040	0.040	0.033	g
Peak Displacement	0.006	0.003	0.007	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 1.953 mm/s at 0.165 sec

Serial Number 5487 V 2.61 MiniMate
Battery Level 6.1 Volts
Unit Calibration February 18, 2022 by Instantel
File Name G487JQIU.XY0
Post Event Notes
Location: 50 Myron Road (PW-15)
Blast No.: 2022-39
Project No: 22S001.00





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Vert at 14:01:07 October 25, 2022
Trigger Source Geo: 0.500 mm/s, Mic: 120.0 dB(L)
Range Geo: 254.0 mm/s
Record Time 7.0 sec at 1024 sps
Operator/Setup: Operator/GAYTON.MMB

Notes
Location:
Client:
User Name:
General:

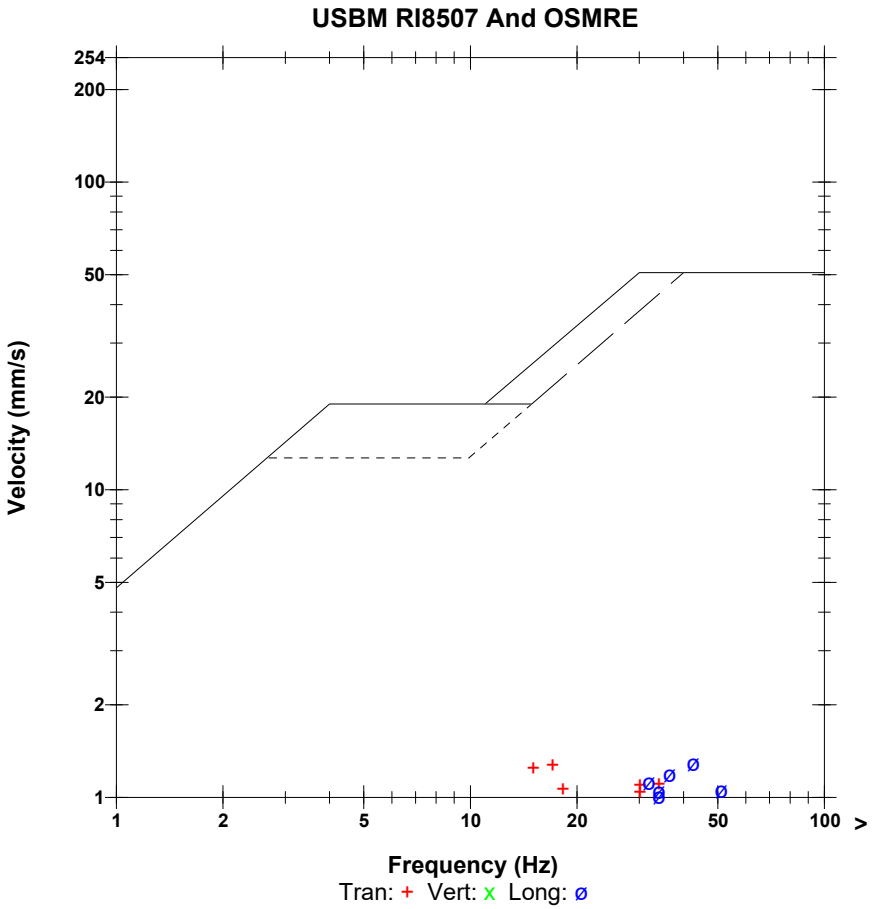
Serial Number UM20205 V 10-90GC Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration May 31, 2022 by Instantel
File Name UM20205_20221025140107.IDFW

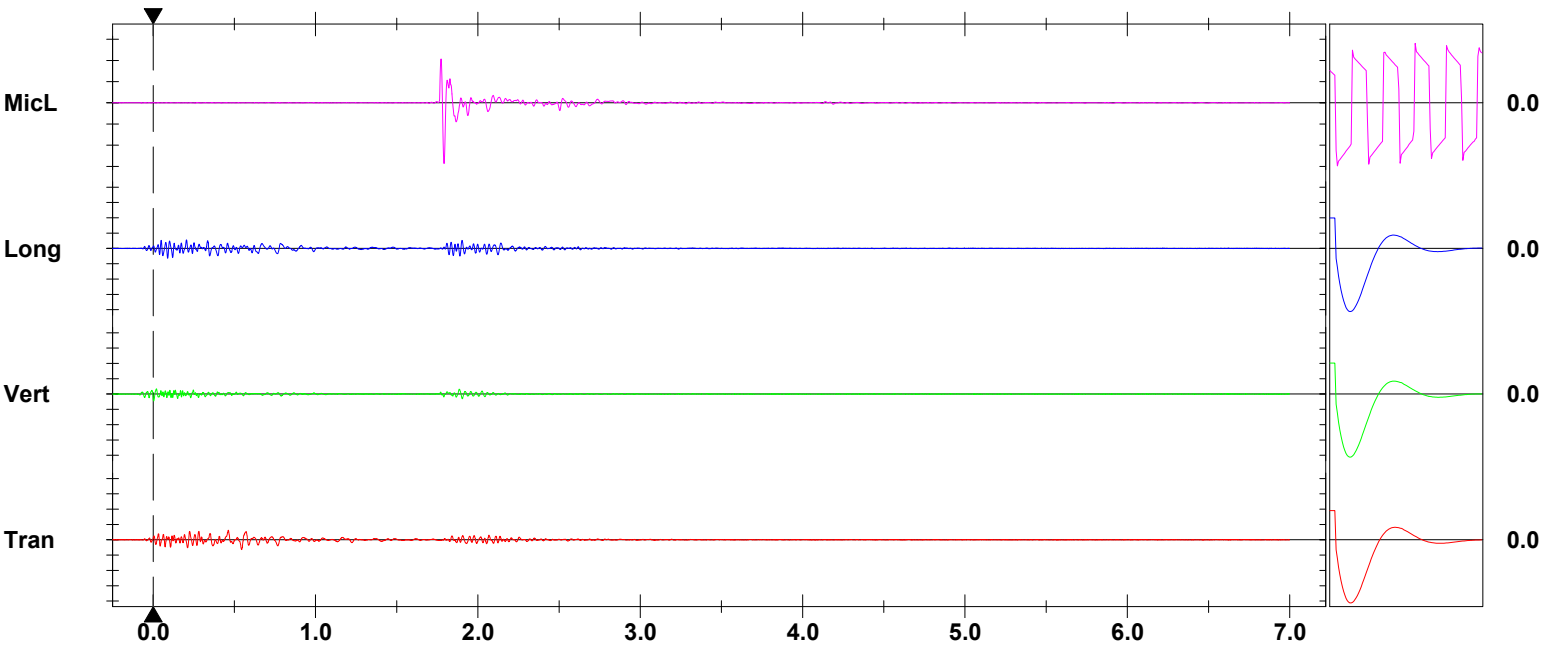
Post Event Notes
Location: 86 Myron Road (PW-16)
Blast No.: 2022-39
Project No: 22S001.00

Microphone Linear Weighting
PSPL 129.1 dB(L) 57.34 pa.(L) at 1.792 sec
ZC Freq 24 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1427 mv)

	Tran	Vert	Long	
PPV	1.277	0.906	1.293	mm/s
PPV	53.12	50.15	53.23	dB
ZC Freq	17	39	43	Hz
Time (Rel. to Trig)	0.545	0.003	0.089	sec
Peak Acceleration	0.047	0.029	0.039	g
Peak Displacement	0.010	0.004	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	5.1	4.9	4.8	

Peak Vector Sum 1.330 mm/s at 0.462 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 2.000 mm/s/div Mic: 20.00 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time Long at 14:01:18 October 25, 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

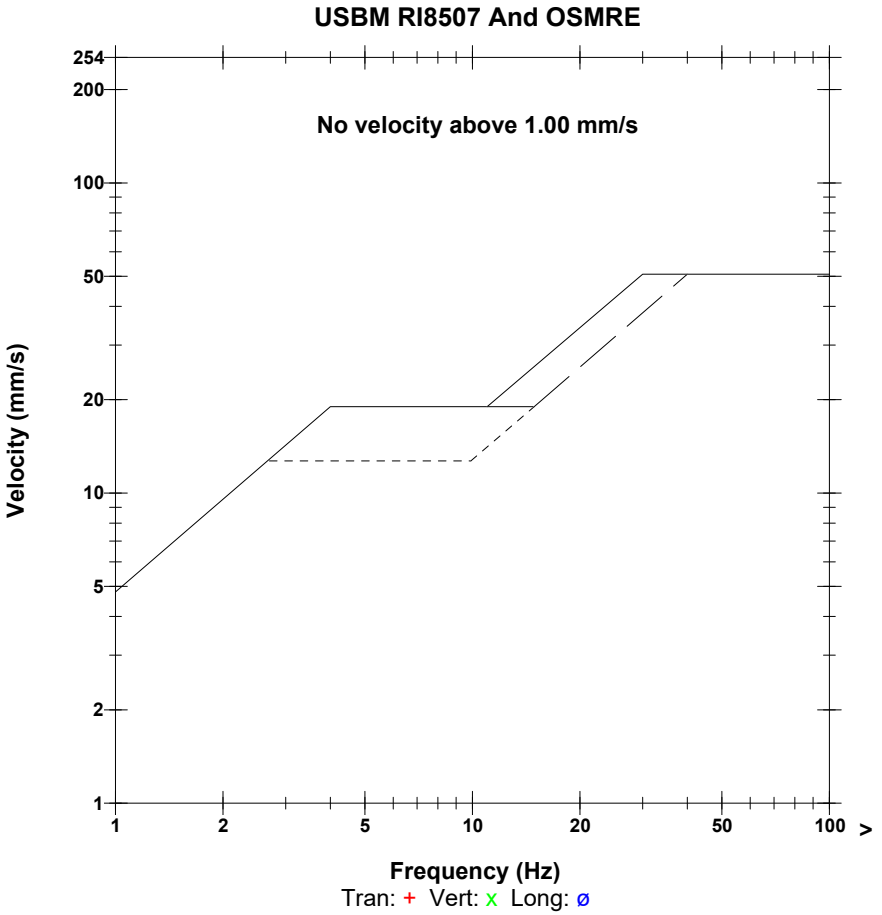
Notes
Location: .
Client: UUUTUUUUUUUUU
User Name: UUUUU
Converted: October 25, 2022 17:00:14 (V10.72.1)

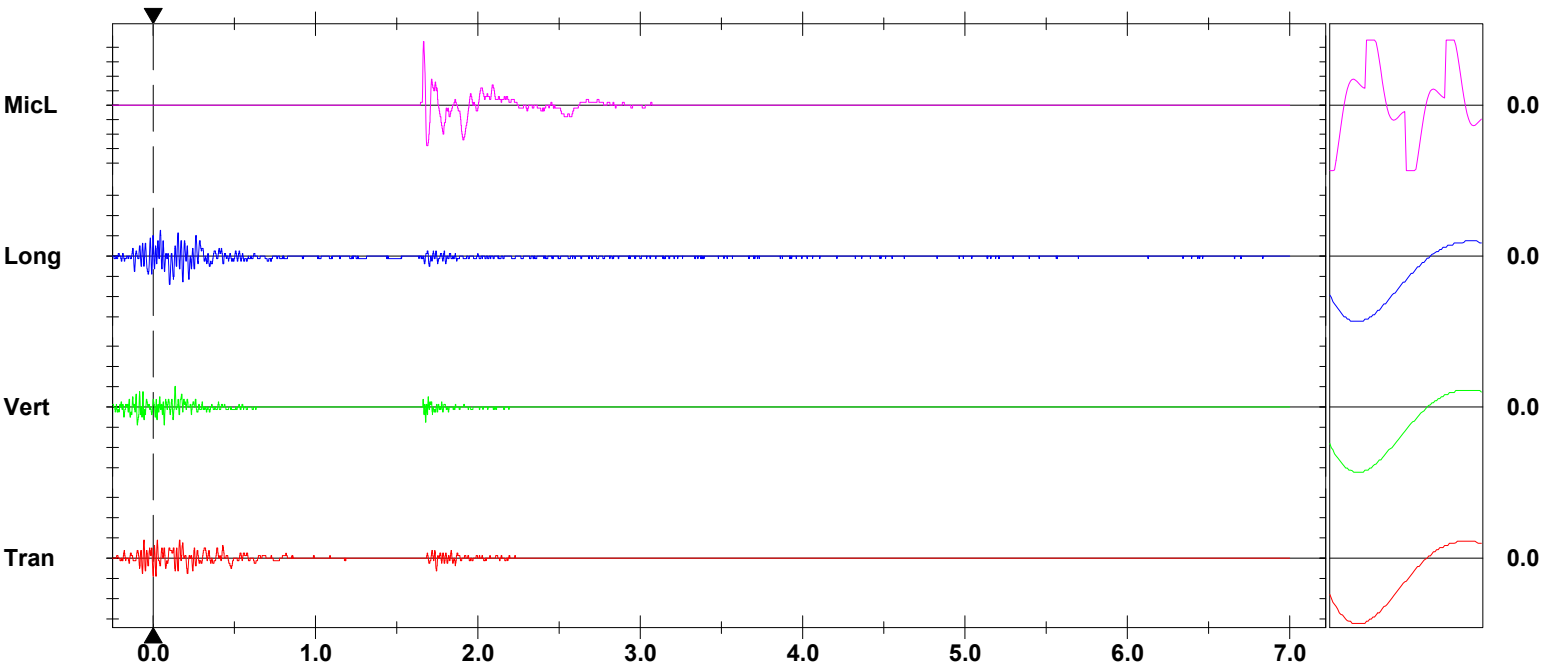
Serial Number 5372 V 2.61 MiniMate
Battery Level 6.2 Volts
Unit Calibration February 18, 2022 by Instantel
File Name G372JQIU.Y60
Post Event Notes
Location: 2337 Route 820 (PW-04)
Blast No.: 2022-39
Project No: 22S001.00

Microphone Linear Weighting
PSPL 126.8 dB(L) 44.00 pa.(L) at 1.666 sec
ZC Freq 15 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 292 mv)

	Tran	Vert	Long	
PPV	0.445	0.508	0.699	mm/s
PPV	43.96	45.12	47.88	dB
ZC Freq	57	51	32	Hz
Time (Rel. to Trig)	0.001	0.136	0.101	sec
Peak Acceleration	0.020	0.020	0.020	g
Peak Displacement	0.002	0.002	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.0	8.0	7.7	Hz
Overswing Ratio	3.5	3.6	4.1	

Peak Vector Sum 0.746 mm/s at 0.183 sec





Time Scale: 0.50 sec/div **Amplitude Scale:** Geo: 0.500 mm/s/div Mic: 10.000 pa.(L)/div Sensor Check
Trigger =

Event Report

Date/Time	Vert at 14:01:03 October 25, 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
Job Number:	1

Serial Number	BE21349 V 10.72-1.1 Minimate Blaster
Battery Level	6.0 Volts
Unit Calibration	July 20, 2022 by Instantel
File Name	W349JQH0.9R0

Notes
Location:
Client:
User Name:
General:

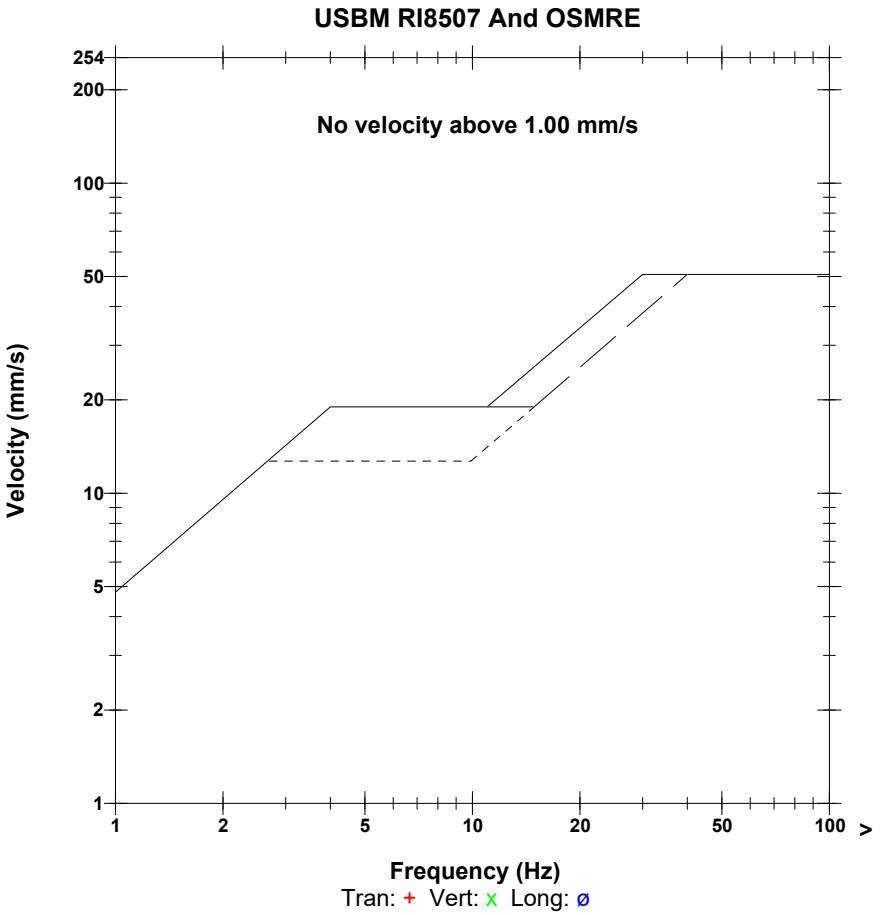
Post Event Notes
Location: 4140 Route 111 (PW-12)
Blast No.: 2022-39
Project No: 22S001.00

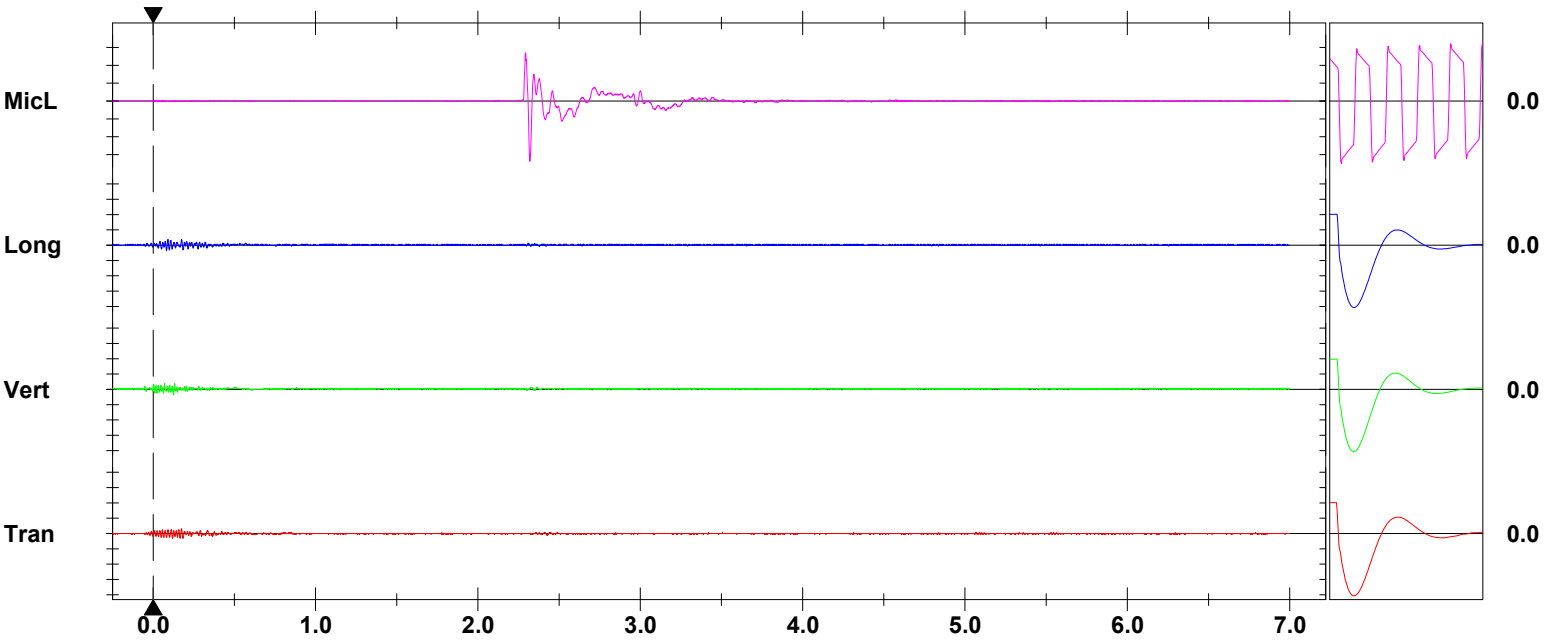
Extended Notes

Microphone	Linear Weighting
PSPL	124.5 dB(L) 33.75 pa.(L) at 2.320 sec
ZC Freq	20 Hz
Channel Test	Passed (Freq = 19.7 Hz Amp = 556 mv)

	Tran	Vert	Long	
PPV	0.635	0.762	0.762	mm/s
PPV	47.06	48.64	48.64	dB
ZC Freq	64	73	73	Hz
Time (Rel. to Trig)	0.119	0.070	0.082	sec
Peak Acceleration	0.027	0.040	0.040	g
Peak Displacement	0.002	0.002	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.2	7.6	7.2	Hz
Overswing Ratio	3.8	3.9	4.1	

Peak Vector Sum 0.992 mm/s at 0.175 sec





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