Memo

HAMMOND RIVER HOLDINGS

To: Mike Cormier, P.Eng. – Director, Authorizations Branch, New Brunswick Department of Environment and Local Covernment

From: Daniel Guest, Hammond River Holdings Ltd.

Date: October 3, 2023

Subject: Monthly Monitoring Report – Upham East Gypsum Quarry – August 2023

Our File: 21-3049

Introduction

This monthly report details activities associated with the Upham East Gypsum Quarry operations for the month of August 2023, in accordance with the Approval to Operate I-10936 conditions. Activities included surface water monitoring, water level monitoring, air quality monitoring, and blasting. For previous monthly activities, refer to the monthly reports provided from December 2019 through July 2023.

Surface Water Sampling

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

- Week 1: August 4, 2023
- Week 2: August 10, 2023
- Week 3: August 16, 2023
- Week 4: August 27, 2023

Three additional monitoring events were conducted on August 12, August 20, and August 30, 2023, due to heavy rain events, defined as 25 mm of rain or more within 24 hours.

Field Methods

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

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

- PDP-1 was collected at the discharge point from the site, which is located before the confluence with the unnamed tributary to the Hammond River. This is the point of compliance;

- SW3 was the background sample. It was collected within the unnamed tributary approximately 100 m upstream from the PDP-1; and
- SW5 was collected within the unnamed tributary approximately 100m downstream from PDP-1.

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 has in-house QA/QC programs to govern sample analysis and analytical data quality assurance.

Compliance Monitoring Results

Surface water compliance monitoring results 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 sample was collected during the August water sampling program. The RPD results could not be calculated due to both of the results being below the laboratory detection limit. Therefore, the data satisfies the quality objectives of the monitoring program.

Water Level Monitoring

Water levels were downloaded on August 21, 2023. The data retrieved from the dataloggers are depicted on a time series plot in **Figure 3**. The dataloggers allow for continuous coverage of water levels in the wells.

Methodology

Data loggers were retrieved via Solinst Levelogger Software 4.6.1 the dataloggers were then reset to continue to record the water level every 5 minutes.

Water Level Results

The data for perimeter monitoring wells (**Figure 4**) and potable monitoring wells (**Figures 5, 6,** and **7**) are presented as time series plots. Total precipitation (mm) is also presented within each figure, representing periods of recharge. The overall trend in almost all of the perimeter monitoring wells has remained consistent with seasonal fluctuations. The potable wells all experienced short-term

fluctuations, as is expected with normal well use, and predictable longer-term fluctuations typical of seasonal variations. Based on the available data as described for the August monitoring period, there does not appear to be a negative impact on water levels in perimeter and potable wells as a result of quarry operations.

Environmental Accidents and Malfunctions

There were no reported environmental accidents or malfunctions during the August 2023 monitoring period.

Ambient Air Quality Monitoring – Total Suspended Particulate

24-hour air samples are collected every 6 days in accordance with the National Air Pollution Surveillance (NAPS) schedule. The air quality monitor used to conduct the monitoring is a BGI PQ100 air sampler, a high-volume sampler for total suspended particulate matter. In August, there were 5 air quality monitoring events, August 6, 12, 18, 24, and 30, 2023. 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

Four blasts occurred during the August 2023 monitoring period, occurring on August 3, 10, 17, and 25, 2023. There were no exceedances of the Approval to Operate limits for maximum velocity and sound pressure for the blasting events. Blast reports are attached.

Public Complaints

There were no public complaints during the August 2023 monitoring period.

Summary

Since extraction activities began in July 2020 at the Upham East Gypsum Quarry, the water chemistry at the discharge point into the unnamed tributary has remained comparable to background, 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.

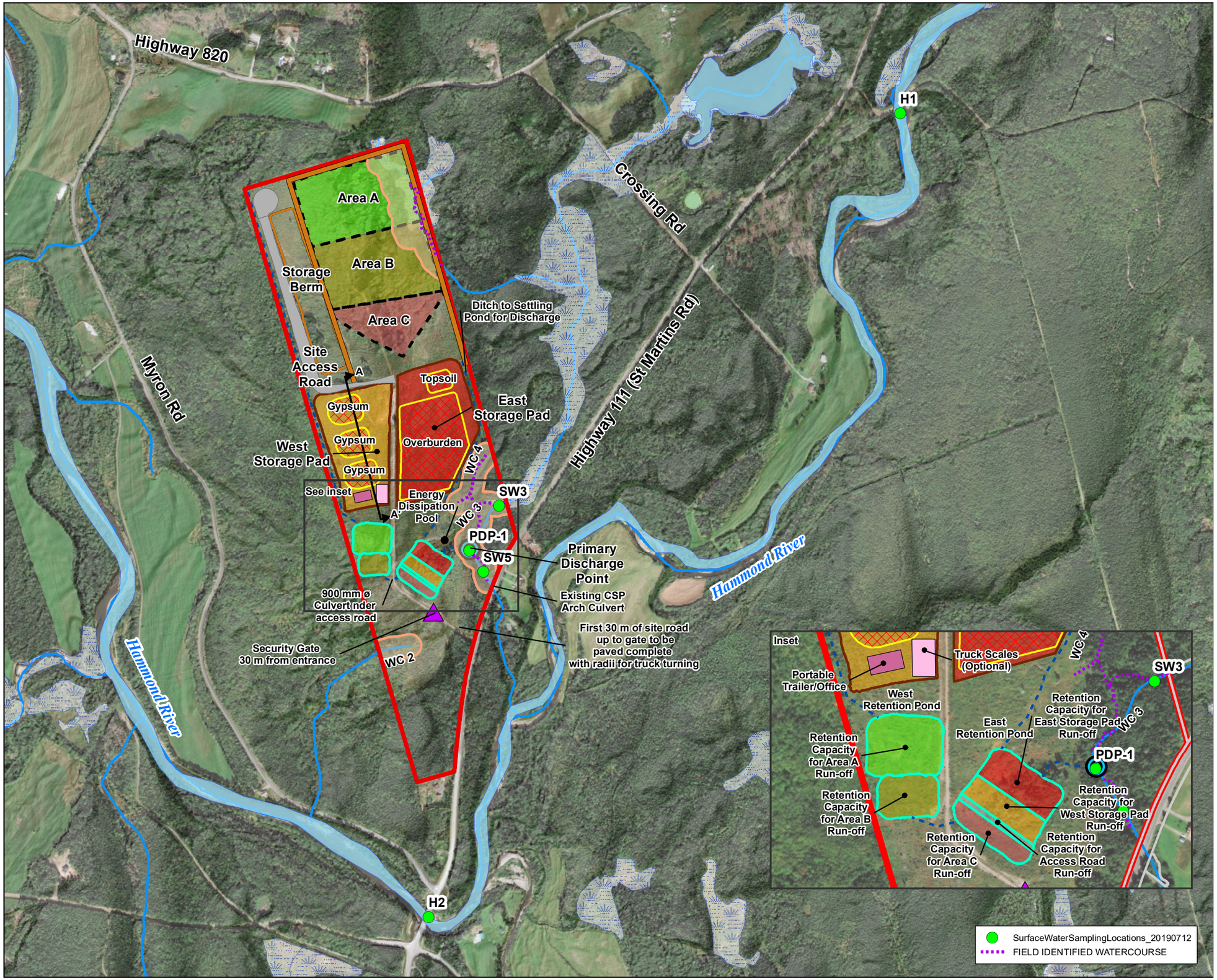
References

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.

Attachment A

Figures



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

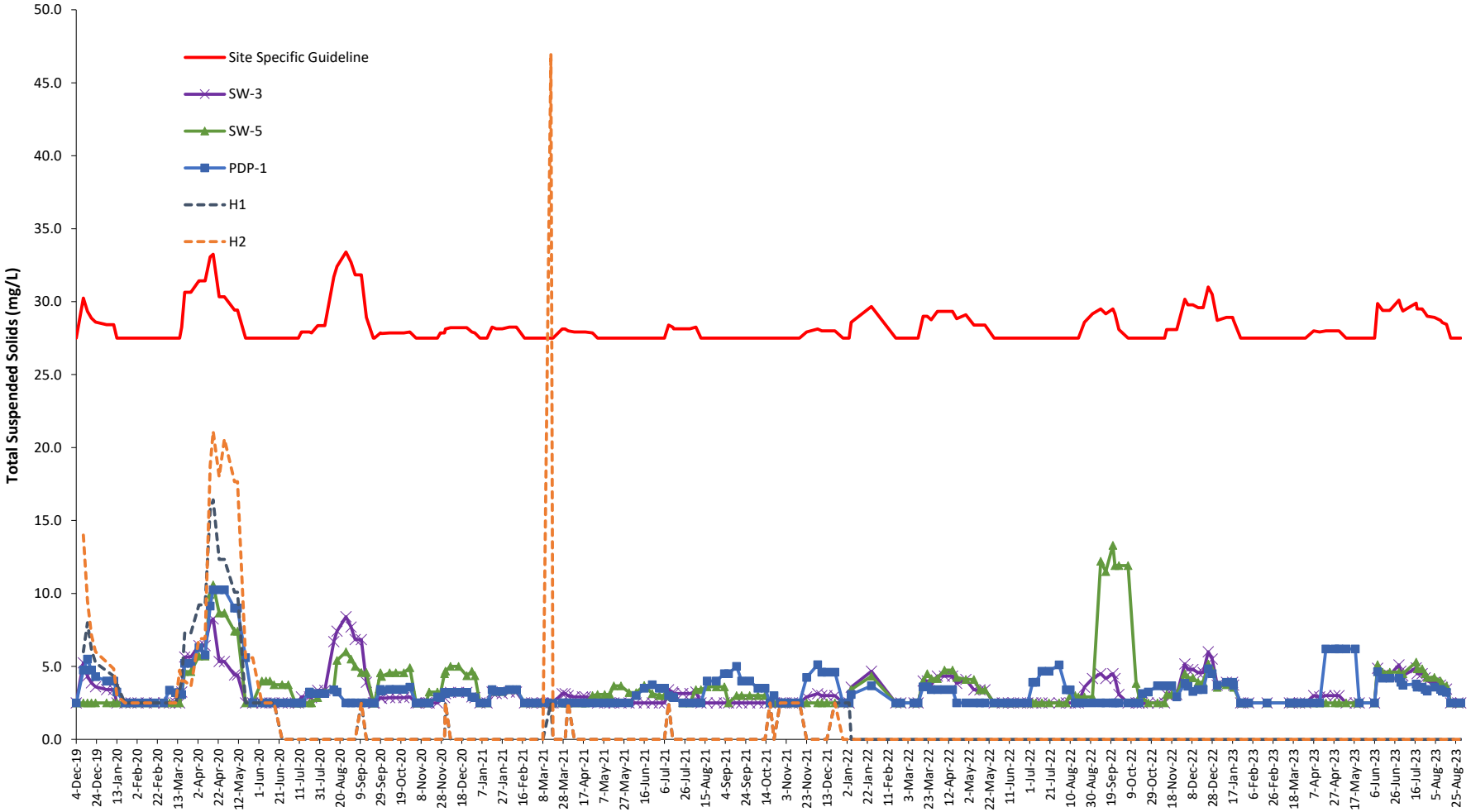
MAP CREATED BY: JH
MAP REVISED BY: JO
MAP CHECKED BY: GA
MAP PROJECTION: NAD_1983_CSRS_NEW_BRUNSWICK_STEREOGRAPHIC

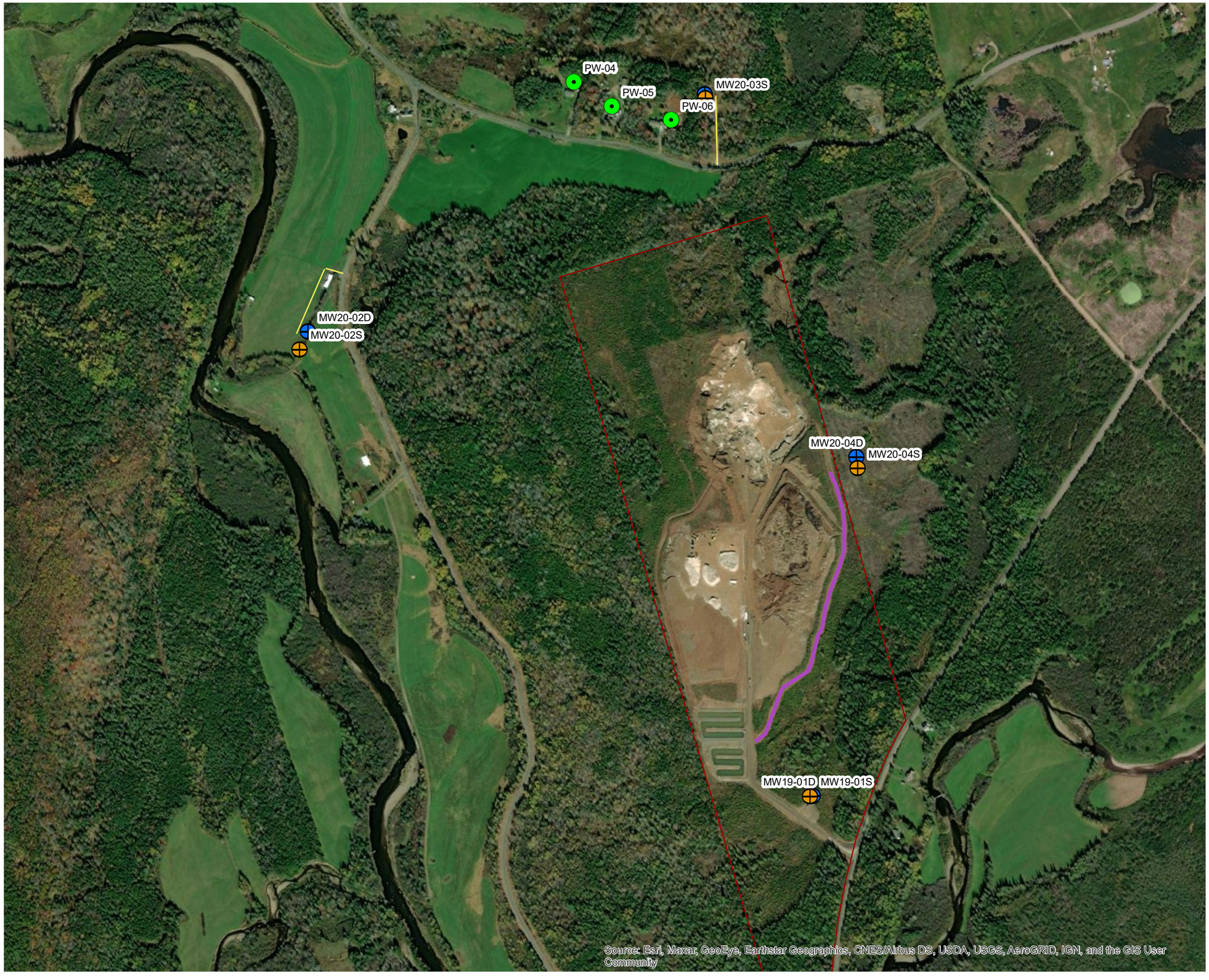
FILE LOCATION: \\DILLON.CA\DILLON_DFS\FREDERICTON\FREDERICTON CAD\CAD\GIS\188346 UPHAM GYPSUM QUARRY\MXD

DILLON CONSULTING

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

Figure 2: TSS Monthly Average





HAMMOND RIVER HOLDINGS
UPHAM EAST GYPSUM QUARRY

GROUNDWATER MONITORING LOCATIONS
FIGURE 3

- Potable Well Leveloggers
- Deep
- Shallow
- Upham Outline

SCALE 1:XXX

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: JTO
MAP CHECKED BY: GA
MAP PROJECTION: NB DOUBLE STEROGRAPHIC

FILE LOCATION: \\DILLON.CA\DILLON_DFS\LONDON\LONDON CAD\GIS\
VISUAL COMMUNICATIONS DI\MXD TEMPLATES\
BEIGE - 11X17 LANDSCAPE - LEGEND RIGHT.MXD

DILLON CONSULTING

PROJECT: 18-8346
STATUS: DRAFT
DATE: 06/15/2021

Figure 4: Upham East - Perimeter Monitoring Water Levels

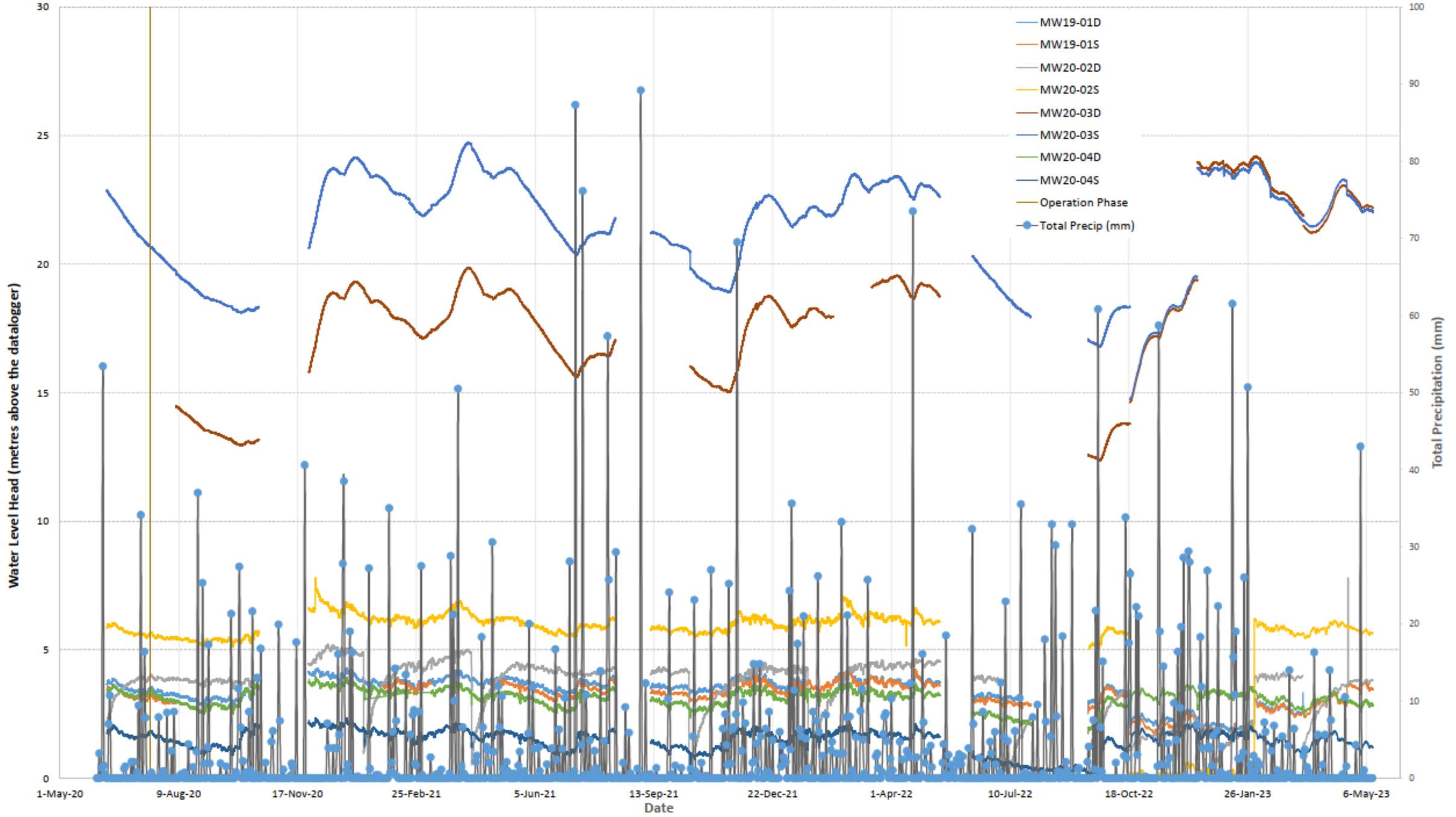


Figure 5: PW-04 Water Levels

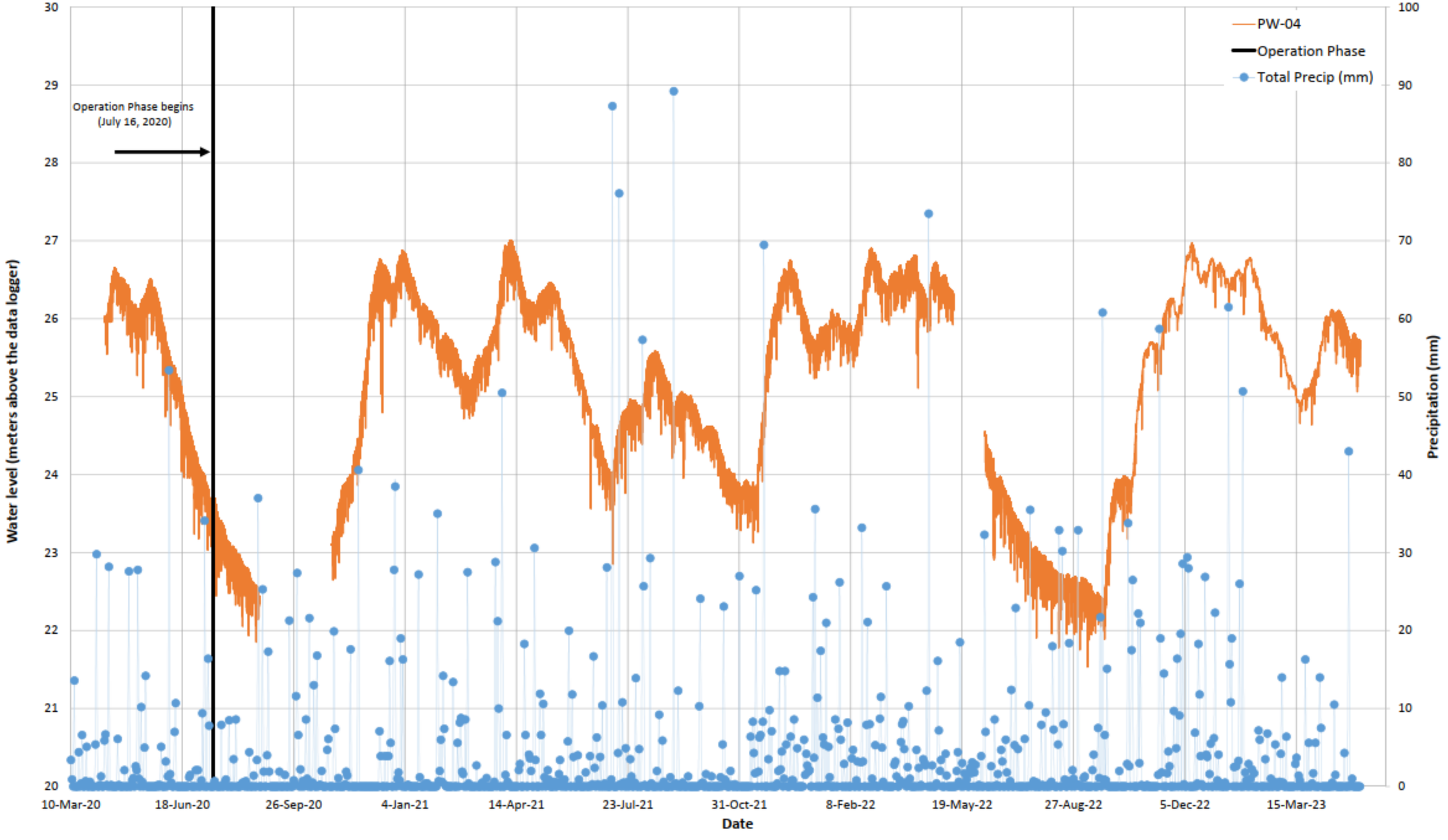


Figure 6: PW-06 Water Levels

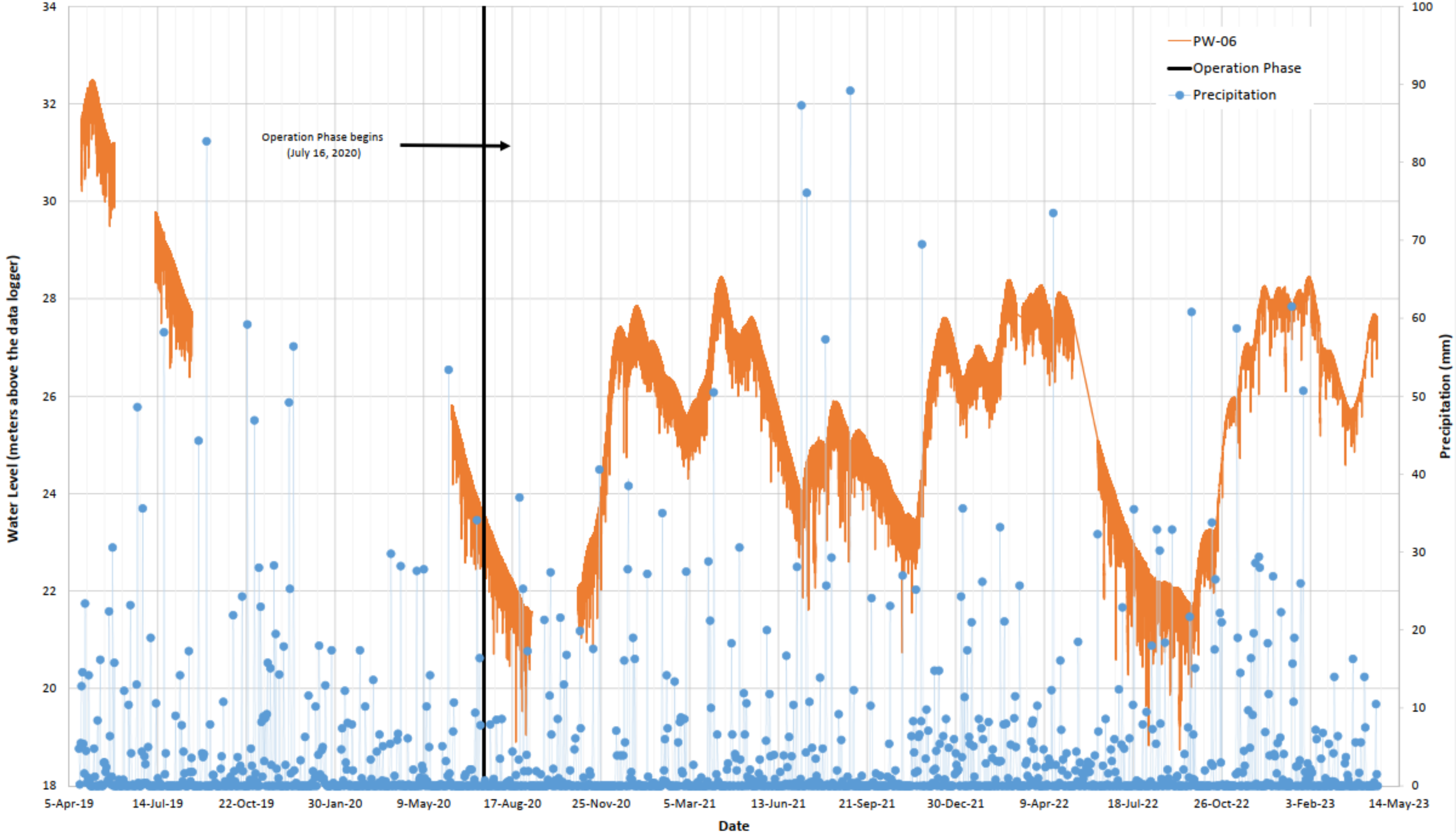
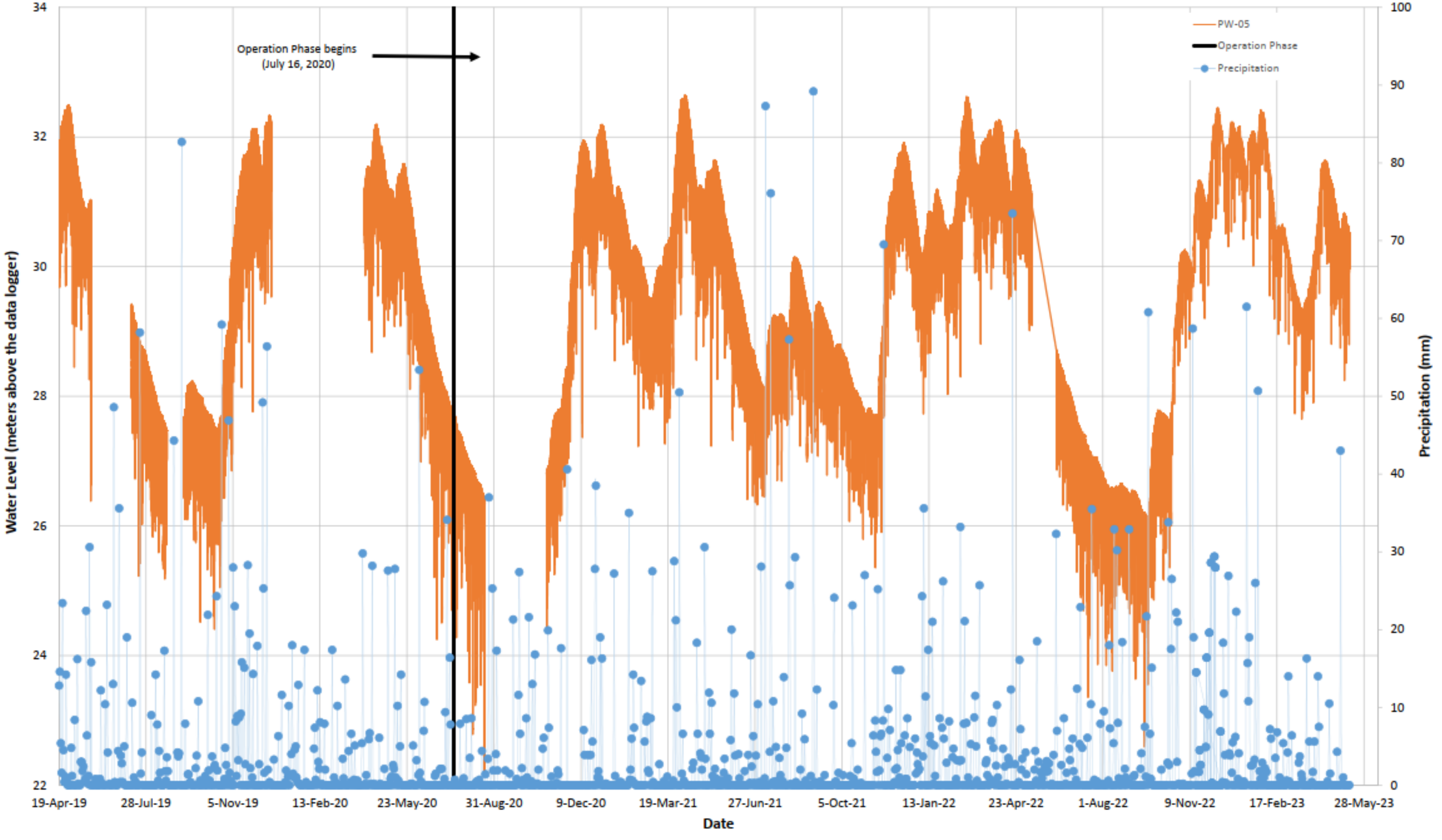


Figure 7: PW-05 Water Levels



Attachment B

Tables

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
SW3	4-Aug-2023	21.2	0.0	16.0	675	0.02	<5
PDP-1	4-Aug-2023			15.8	886	0.48	<5
SW5	4-Aug-2023			15.5	888	0.17	<5
SW3	10-Aug-2023	23.4	33.1	19.1	981	0.83	<5
PDP-1	10-Aug-2023			19.1	1220	1.13	<5
PDP-1 D	10-Aug-2023			19.2	1224	1.21	<5
SW5	10-Aug-2023			19.5	1250	1.14	<5
SW3	12-Aug-2023	21.6	42.6	16.6	154	2.99	<5
PDP-1	12-Aug-2023			16.3	267	6.03	<5
SW5	12-Aug-2023			16.4	269	4.16	<5
SW3	16-Aug-2023	22.4	0.0	18.7	859	0.25	<5
PDP-1	16-Aug-2023			18.7	1051	0.35	<5
SW5	16-Aug-2023			18.6	1063	0.49	<5
SW3	20-Aug-2023	18.8	24.6	18.9	551	0.75	<5
PDP-1	20-Aug-2023			19.0	568	5.82	<5
PDP-1 D	20-Aug-2023			19.1	549	5.87	<5
SW5	20-Aug-2023			19.0	571	0.32	<5
SW3	27-Aug-2023	19.3	80.7	16.9	199	2.44	<5
PDP-1	27-Aug-2023			17.0	649	4.22	<5
SW5	27-Aug-2023			17.0	684	4.20	<5
SW3	31-Aug-2023	16.7	42.2	16.9	214	2.75	<5
PDP-1	31-Aug-2023			16.6	540	4.64	<5
SW5	31-Aug-2023			16.7	560	4.84	<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

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	2.5	2.5
11-Dec-19	30.3	6.0	14.0	5.3	4.8	2.5
15-Dec-19	29.3	8.0	9.5	4.3	5.5	2.5
19-Dec-19	28.9	6.2	7.2	3.9	4.8	2.5
23-Dec-20	28.6	5.3	6.0	3.6	4.3	2.5
03-Jan-20	28.4	4.7	5.3	3.4	4.0	2.5
10-Jan-20	28.4	4.3	4.8	3.4	4.0	2.5
13-Jan-20	27.5	3.8	3.0	2.5	3.3	2.5
21-Jan-20	27.5	2.5	2.5	2.5	2.5	2.5
27-Jan-20	27.5	2.5	2.5	2.5	2.5	2.5
03-Feb-20	27.5	2.5	2.5	2.5	2.5	2.5
11-Feb-20	27.5	2.5	2.5	2.5	2.5	2.5
19-Feb-20	27.5	2.5	2.5	2.5	2.5	2.5
28-Feb-20	27.5	2.5	0.0	2.5	2.5	2.5
05-Mar-20	27.5	2.5	2.5	2.5	3.4	2.5
11-Mar-20	27.5	2.5	2.5	2.5	3.2	2.5
15-Mar-20	27.5	3.4	4.8	2.5	3.2	2.5
17-Mar-20	28.3	4.0	4.0	3.3	3.1	3.1
20-Mar-20	30.6	7.3	4.0	5.6	5.2	4.6
26-Mar-20	30.6	7.3	3.6	5.6	5.2	4.6
03-Apr-20	31.4	9.2	6.9	6.4	6.3	5.7
09-Apr-20	31.4	9.2	6.9	6.4	5.8	5.7
14-Apr-20	33.1	15.7	18.8	8.1	9.1	9.9
17-Apr-20	33.3	16.4	21.1	8.3	10.3	10.6
23-Apr-20	30.3	12.3	18.0	5.3	10.3	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	9.0	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

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
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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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
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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Upham East Gypsum Project
Upham, New Brunswick
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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

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
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
4-Nov-22	27.5	-	-	2.5	5.0	2.5
11-Nov-22	27.5	-	-	2.5	2.5	2.5
13-Nov-22	28.1	-	-	3.1	2.5	3.1
18-Nov-22	28.1	-	-	3.1	2.5	3.1
23-Nov-22	28.1	-	-	3.1	2.5	3.1
1-Dec-22	30.2	-	-	5.2	3.8	4.5
4-Dec-22	29.8	-	-	4.8	3.6	4.2
9-Dec-22	29.8	2.5	-	4.8	3.3	4.2
14-Dec-22	29.6	-	-	4.6	3.4	3.9
19-Dec-22	29.6	-	-	4.6	3.4	3.9
24-Dec-22	31.0	-	-	6.0	4.8	5.2
28-Dec-22	30.5	-	-	5.5	4.5	4.8
2-Jan-23	28.7	-	-	3.7	3.7	3.6
11-Jan-23	28.9	-	-	3.9	3.9	3.8
17-Jan-23	28.9	-	-	3.9	3.9	3.8
18-Jan-23	28.7	-	-	3.7	3.7	3.6
25-Jan-23	27.5	-	-	2.5	2.5	2.5
27-Jan-23	27.5	-	-	2.5	2.5	2.5
2-Feb-23	27.5	-	-	2.5	2.5	2.5
20-Feb-23	27.5	-	-	2.5	2.5	2.5
14-Mar-23	27.5	2.5	-	2.5	2.5	2.5
17-Mar-23	27.5	-	-	2.5	2.5	2.5
24-Mar-23	27.5	-	-	2.5	2.5	2.5
30-Mar-23	27.5	-	-	2.5	2.5	2.5
7-Apr-23	28.0	-	-	3.0	2.5	2.5
13-Apr-23	27.9	-	-	2.9	2.5	2.5
19-Apr-23	28.0	-	-	3.0	6.2	2.5
28-Apr-23	28.0	-	-	3.0	6.2	2.5
2-May-23	28.0	-	-	3.0	6.2	2.5
9-May-23	27.5	-	-	2.5	6.2	2.5
18-May-23	27.5	-	-	2.5	6.2	2.5
22-May-23	27.5	-	-	2.5	2.5	2.5
6-Jun-23	30.1	-	-	2.5	2.5	2.5
9-Jun-23	30.1	-	-	12.0	11	13.0
14-Jun-23	30.1	-	-	2.5	2.5	2.5
21-Jun-23	30.1	-	-	2.5	2.5	2.5
30-Jun-23	30.1	-	-	6.0	2.5	2.5

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

Date	Site Specific Guideline	Monthly Average				
		H1	H2	SW3	PDP-1	SW5
2-Jul-23	29.7	-	-	4.7	3.9	4.3
4-Jul-23	29.4	-	-	4.4	3.7	4.5
17-Jul-23	29.9	-	-	4.9	3.8	5.3
18-Jul-23	29.5	-	-	4.5	3.6	4.8
23-Jul-23	29.5	-	-	4.5	3.6	4.8
26-Jul-23	29.2	-	-	4.2	3.4	4.5
28-Jul-23	29.0	-	-	4.0	3.3	4.3
4-Aug-23	27.5	-	-	2.5	2.5	2.5
10-Aug-23	27.5	-	-	2.5	2.5	2.5
12-Aug-23	27.5	-	-	2.5	2.5	2.5
16-Aug-23	27.5	-	-	2.5	2.5	2.5
20-Aug-23	27.5	-	-	2.5	2.5	2.5
27-Aug-23	27.5	-	-	2.5	2.5	2.5
30-Aug-23	27.5	-	-	2.5	2.5	2.5

Notes:

The detection limit for TSS is 5 mg/L; for results <5 mg/L, half the detection limit was used.

Dashed line indicates monthly average could not be calculated.

Site specific guideline is 25 mg/L above the monthly average.

Monthly average is calculated based on results from the previous 30 days.

The background sample is SW3.

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

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

Test Start	Duration	Flow Rate	Air Volume	Pressure	Temperature	Initial Filter Weight	Final Filter Weight	TSP Mass	TSP	Site Guideline
		(L/min)	(m^3)	(mm Hg)	(°C)	(g)	(g)	(µg)	(µg/m3)	(µg/m^3)
2020-07-22	24 hours	16.70	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
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

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

Test Start	Duration	Flow Rate	Air Volume	Pressure	Temperature	Initial Filter Weight	Final Filter Weight	TSP Mass	TSP	Site Guideline
		(L/min)	(m^3)	(mm Hg)	(°C)	(g)	(g)	(µg)	(µg/m3)	(µg/m^3)
2021-04-06	24 hours	16.70	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
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

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)
2022-01-04	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
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	25.00	120
2022-08-11	24 hours	16.76	24.13	750	19.9	14.8321	14.8358	3700	6.39	120
2022-08-17	24 hours	16.95	24.41	749	16.5	14.8601	14.8771	17000	29.02	120
2022-08-23	24 hours	16.89	24.33	749	17.2	14.8649	14.8726	7700	13.19	120
2022-08-29	24 hours	16.7	24.05	753	17.3	14.8706	14.8811	10500	18.19	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)
2022-09-04	24 hours	17.11	24.64	755	16.2	14.8635	14.8653	1800	3.04	120
2022-09-10	24 hours	17.03	24.52	755	17.6	14.8454	14.8544	9000	15.29	120
2022-09-16	24 hours	17.32	24.95	749	10.3	14.8614	14.8654	4000	6.68	120
2022-09-22	24 hours	16.93	24.38	741	13.6	14.8603	14.8822	21900	37.43	120
2022-09-28	24 hours	17.12	24.65	750	13.9	14.8503	14.8595	9200	15.55	120
2022-10-04	24 hours	17.89	25.76	757	4.3	14.8573	14.8668	9500	15.37	120
2022-10-10	24 hours	17.92	25.8	755	2.7	14.8456	14.8551	9500	15.34	120
2022-10-16	24 hours	17.04	24.54	749	14.8	14.8455	14.8589	13400	22.75	120
2022-10-22	24 hours	17.75	25.56	758	6.6	14.859	14.8611	2100	3.42	120
2022-10-28	24 hours	18.17	26.17	762	1.6	14.8436	14.8609	17300	27.54	120
2022-11-03	24 hours	17.95	25.85	758	3.8	14.8588	14.8684	9600	15.47	120
2022-11-09	24 hours	18.24	26.27	762	0.7	14.8484	14.857	8600	13.64	120
2022-11-15	24 hours	18.38	26.42	759	-2	14.8242	14.8295	5300	8.36	120
2022-11-21	24 hours	18.51	26.66	752	-7.2	14.8173	14.8216	4300	6.72	120
2022-11-27	24 hours	17.89	25.66	743	0.1	14.8212	14.8304	9200	14.94	120
2022-12-03	24 hours	18.02	25.95	756	1.9	14.8070	14.8185	11500	18.46	120
2022-12-09	24 hours	18.36	26.16	753	-1.5	14.8096	14.8232	13600	21.66	120
2022-12-15	24 hours	18.25	26.36	752	-3.2	14.8244	14.8284	4000	6.32	120
2022-12-21	24 hours	18.65	26.86	763	-5.4	14.8111	14.8211	10000	15.51	120
2022-12-27	24 hours	18.5	26.05	752	-8.1	14.8281	14.838	9900	15.83	120
2023-01-02	24 hours	18.14	26.12	749	-2.5	14.8257	14.8346	8900	14.1973	120
2023-01-08	24 hours	18.65	26.85	752	-9.2	14.8261	14.8401	14000	21.7256	120
2023-01-14	24 hours	18	25.05	745	-2.3	14.8136	14.8289	15300	25.4491	120
2023-01-20	24 hours	18.1	26.05	743	-4.2	14.8156	14.8251	9500	15.1951	120
2023-01-26	25 hours	17.76	25.57	740	-0.2	14.8216	14.8254	3800	6.1922	120
2023-02-01	26 hours	17.93	25.83	742	-17	14.8256	14.8318	6200	10.0013	120
2023-02-07	27 hours	18.05	26.86	756	-7.5	14.8227	14.8464	23700	36.7647	120
2023-02-13	28 hours	18.2	26.05	744	-5.3	14.8097	14.8137	4000	6.3980	120
2023-02-19	29 hours	18.43	26.53	757	-4	14.8066	14.8448	38200	59.9950	120
2022-02-25	30 hours	19.29	27.77	757	-15.8	14.8061	14.8096	3500	5.2515	120
2022-03-03	31 hours	18.29	26.33	745	-5.8	14.8121	14.8128	700	1.1077	120
2022-03-09	32 hours	18.15	26.13	750	-2.4	14.8113	14.8218	10500	16.7432	120
2022-03-15	33 hours	17.75	25.56	736	-1.1	14.8158	14.8232	7400	12.0631	120
2022-03-21	34 hours	18.14	26.12	755	-0.1	14.8191	14.821	1900	3.0309	120
2023-03-27	35 hours	17.97	25.87	750	0	14.8189	14.8275	8600	13.8513	120
2023-04-02	24 hours	16.7	26.05	739	0.9	14.8275	14.8327	5200	8.3173	120
2023-04-08	24 hours	18.27	26.34	756	-1.8	14.8468	14.8785	31700	50.1455	120
2023-04-14	24 hours	17.34	24.97	747	9.4	14.8419	14.8581	16200	27.0324	120
2023-04-20	24 hours	17.61	25.36	751	6.3	14.8514	14.8526	1200	1.9716	120
2023-04-26	24 hours	17.73	25.54	757	6.6	14.8493	14.8509	1600	2.6103	120
2023-05-02	24 hours	17.23	24.81	743	9.2	14.8552	14.8613	6100	10.2445	120
2023-05-08	24 hours	17.32	24.94	741	7.5	14.8542	14.8562	2000	3.3414	120
2023-05-14	24 hours	17.48	25.16	750	8.2	14.8438	14.8484	4600	7.6179	120
2023-05-20	24 hours	17.13	24.67	747	12.7	14.8406	14.8449	4300	7.2625	120
2023-05-26	24 hours	17.64	25.4	754	6.7	14.8725	14.8796	7100	11.6470	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)
2023-06-01	24 hours	16.67	24	751	22.9	14.8674	14.8721	4700	8.1597	120
2023-06-07	24 hours	17.05	24.55	738	10.4	14.8511	14.8617	10600	17.9905	120
2023-06-13	24 hours	16.48	23.74	746	23.7	14.8591	14.8636	4500	7.8981	120
2023-06-19	24 hours	17.31	24.92	752	17.6	14.8597	14.8645	4800	8.0257	120
2023-06-25	24 hours	16.59	23.85	747	21.9	14.8469	14.8647	17800	31.0971	120
2023-07-01	24 hours	16.87	24.29	756	20.1	14.8862	14.8999	13700	23.5008	120
2023-07-07	24 hours	16.53	23.81	749	23.9	14.8988	14.9014	2600	4.5499	120
2023-07-13	24 hours	16.58	23.07	751	23.9	14.8734	14.877	3600	6.5020	120
2023-07-19	24 hours	16.67	24	751	21.8	14.8770	14.8823	5300	9.2014	120
2023-07-25	24 hours	16.79	24.18	753	21	14.8780	14.8801	2100	3.6187	120
2023-07-31	24 hours	16.92	24.36	748	17	14.8673	14.8698	2500	4.2761	120
2023-08-06	24 hours	16.76	24.14	748	19.5	14.8652	14.8662	1000	1.726	120
2023-08-12	24 hours	16.87	24.29	748	17.5	14.852	14.877	25000	42.8846	120
2023-08-18	24 hours	16.73	24.09	748	19.5	14.845	14.873	28000	48.4295	120
2023-08-24	24 hours	17.06	24.56	753	16.6	14.828	14.862	34000	57.6819	120
2023-08-30	24 hours	16.75	24.12	744	17.8	14.832	14.854	22000	38.0044	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.

Attachment C

Analytical Certificates

Report ID: 493401-IAS
Report Date: 14-Aug-23
Date Received: 08-Aug-23

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:			493401-1	493401-2	493401-3
Client Sample ID:			SW-3	SW-5	PDP-1
Date Sampled:			4-Aug-23	4-Aug-23	4-Aug-23
Analytes	**Units**	**RL**			
Solids - Total Suspended	mg/L	5	< 5	< 5	< 5

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

RL = Reporting Limit

Matthew Norman
Senior Chemist
Inorganic Analytical Chemistry

Brannen Burhoe
Supervisor
Inorganic Analytical Services

Report ID: 493401-IAS
Report Date: 14-Aug-23
Date Received: 08-Aug-23

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: 494108-IAS
Report Date: 21-Aug-23
Date Received: 11-Aug-23

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:			494108-1	494108-2	494108-3	494108-4
Client Sample ID:			SW-3	SW-5	PDP-1	PDP-1 Duplicate
Date Sampled:			10-Aug-23	10-Aug-23	10-Aug-23	10-Aug-23
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

Matthew Norman
Senior Chemist
Inorganic Analytical Chemistry

Brannen Burhoe
Supervisor
Inorganic Analytical Services

Report ID: 494108-IAS
Report Date: 21-Aug-23
Date Received: 11-Aug-23

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: 494661-IAS
Report Date: 23-Aug-23
Date Received: 16-Aug-23

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:			494661-1	494661-2	494661-3
Client Sample ID:			SW-3	SW-5	PDP-1
Date Sampled:			12-Aug-23	12-Aug-23	12-Aug-23
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: 494661-IAS
Report Date: 23-Aug-23
Date Received: 16-Aug-23

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: 494792-IAS
Report Date: 24-Aug-23
Date Received: 17-Aug-23

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:			494792-1	494792-2	494792-3
Client Sample ID:			SW-3	SW-5	PDP-1
Date Sampled:			16-Aug-23	16-Aug-23	16-Aug-23
Analytes	**Units**	**RL**			
Solids - Total Suspended	mg/L	5	< 5	< 5	< 5

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

RL = Reporting Limit

Matthew Norman
Senior Chemist
Inorganic Analytical Chemistry

Brannen Burhoe
Supervisor
Inorganic Analytical Services

Report ID: 494792-IAS
Report Date: 24-Aug-23
Date Received: 17-Aug-23

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: 495610-IAS
Report Date: 05-Sep-23
Date Received: 23-Aug-23

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:			495610-1	495610-2	495610-3	495610-4
Client Sample ID:			SW3	SW5	PDP-1	PDP-1 duplicate
Date Sampled:			20-Aug-23	20-Aug-23	20-Aug-23	20-Aug-23
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

Matthew Norman
Senior Chemist
Inorganic Analytical Chemistry

Brannen Burhoe
Supervisor
Inorganic Analytical Services

Report ID: 495610-IAS
Report Date: 05-Sep-23
Date Received: 23-Aug-23

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: 496287-IAS
Report Date: 07-Sep-23
Date Received: 29-Aug-23

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:			496287-1	496287-2	496287-3
Client Sample ID:			SW-3	SW-5	PDP-1
Date Sampled:			27-Aug-23	27-Aug-23	27-Aug-23
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: 496287-IAS
Report Date: 07-Sep-23
Date Received: 29-Aug-23

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: 496891-IAS
Report Date: 08-Sep-23
Date Received: 01-Sep-23

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:			496891-1	496891-2	496891-3
Client Sample ID:			SW-3	SW-5	PDP-1
Date Sampled:			30-Aug-23	31-Aug-23	31-Aug-23
Analytes	**Units**	**RL**			
Solids - Total Suspended	mg/L	5	< 5	< 5	< 5

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

RL = Reporting Limit

Matthew Norman
Senior Chemist
Inorganic Analytical Chemistry

Brannen Burhoe
Supervisor
Inorganic Analytical Services

Report ID: 496891-IAS
Report Date: 08-Sep-23
Date Received: 01-Sep-23

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

Attachment D

Blast Reports

CBCL
Solutions today | Tomorrow IN mind
575 Crown Street, Saint John, NB E2L 5E9
506-635-7565 | CBCL.ca | info@CBCL.ca

August 4, 2023

Project No.: 234601.00

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

Re: Blast Vibration Monitoring – Blast No. 2023-25 – 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 14:25 on August 3, 2023. 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. 2023-25 – August 3, 2023

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)	14:25	1,280 m S	< 0.5 mm/s	<120	Units were not triggered
2. Civic No. 4126 Route 111 (PW-10)		853 m SE	< 0.5 mm/s	<120	
3. Civic No. 4150 Route 111 (PW-13)		684 m SE	1.21 mm/s @ 73 Hz	116	
4. Civic No. 2447 Route 820 (PW-07)		842 m NE	1.92 mm/s @ 27 Hz	117	-
5. PW-03 - Cottage Route 820		674 m N	0.57 mm/s @ 20 Hz	122	-
6. Civic No. 2341 Route 820 (PW-05)		704 m N	0.73 mm/s @ 14 Hz	117	-
7. Civic No. 50 Myron Road (PW-15)		993 m NW	< 0.5 mm/s	<120	Unit was not triggered
8. Civic No. 86 Myron Road (PW-16)		843 m W	0.88 mm/s @ 10 Hz	105	-
9. Civic No. 220 Myron Road (PW-01)		1,350 m S	< 0.5 mm/s	<120	Unit was not triggered
10. Civic No. 2337 Route 820 (PW-04)		765 m NW	0.76 mm/s @ 10 Hz	106	-
11. Civic No. 4140 Route 111 (PW-12)		765 m SE	0.83 mm/s @ 10 Hz	112	-
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

Kris LeClair, P.Eng.
Senior Geotechnical Engineer

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

Project No: 234601.00

Attachment A

Blast Record

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 3, 2023
Project No.:	234601.00	**Time of Blast:**	14:25
Inspector:	S. Carroll	**Blast No.:**	2023-25
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Gulf Operators Ltd.		
Blaster's Certification No.:	1318	**Blaster's Name:**	Daniel Blanchard
Blast Location:	N 45º28'52.66" W 65º37'55.74"		
Type of Rock:	Anhydrate/Gypsum	**Est. Vol. or Tonnage:**	12 549 tonnes
Weather at time of Blast:	Partly Cloudy	**Air Temp.:**	22 ºC
Est. Wind Speed :	18km/h	**Wind Direction:**	NE
Cloud Cover:	70%	**Precipitation:**	none

BLAST DESIGN:

Total No. Holes:	99	**Hole Diameter:**	4.5"
Average Depth:	4.6m-8.2m	**Spacing:**	12 x 12' 12 x 10'
No. Holes per Delay:	2	**Collar Length:**	7'
Delay between Holes:	25 ms	**Delay between Rows:**	17, 67, 84 ms
Initiation Method:	Non-Electric		
Weight of Explosives per Delay:	Max.: 100 kg		
Type and weight of Explosives for Blast:	3807 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:**	August 3, 2023
Project No.:	234601.00	**Time of Blast:**	14:25
Inspector:	S. Carroll	**Blast No.:**	2023-25
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	674m
Direction to the Nearest Structure:	North
Structure Type:	Cottage
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	67.4

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: Kris LeClair, P.Eng.

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 3, 2023
Project No.:	234601.00	**Time of Blast:**	14:25
Inspector:	S. Carroll	**Blast No.:**	2023-25
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Minimate, Serial # 5676
Calibration Date:	March 8, 2023
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1.28 km 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 Micromate, Serial # 5673
Calibration Date:	April 25, 2023
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	853 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:**	August 3, 2023
Project No.:	234601.00	**Time of Blast:**	14:25
Inspector:	S. Carroll	**Blast No.:**	2023-25
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	Instantel Minimate, Serial # 5487
Calibration Date:	January 16, 2023
Location of seismograph:	Civic Number 4150 Route 111 (PW-13)
Distance and Direction from Blast:	684 m Southeast
Transverse Particle Velocity:	0.699 mm/s @ 43 Hz
Vertical Particle Velocity:	1.207 mm/s @ 73 Hz
Longitudinal Particle Velocity:	1.016 mm/s @ 47 Hz
Peak Particle Velocity:	1.207 mm/s @ 73 Hz
Maximum Airblast:	116 dB(L)

Data Collection – Seismometer #4

Make, Model and Serial # of unit:	Instantel Minimate, Serial # 18193
Calibration Date:	May 12, 2023
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	842 m Northeast
Transverse Particle Velocity:	1.356 mm/s @ 18 Hz
Vertical Particle Velocity:	0.449 mm/s @ 22 Hz
Longitudinal Particle Velocity:	1.923 mm/s @ 27 Hz
Peak Particle Velocity:	1.923 mm/s @ 27 Hz
Maximum Airblast:	117.3 dB(L)

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 3, 2023
Project No.:	234601.00	**Time of Blast:**	14:25
Inspector:	S. Carroll	**Blast No.:**	2023-25
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Minimate, Serial # 5489
Calibration Date:	May 5, 2023
Location of seismograph:	Cottage - PW-03 - Route 820
Distance and Direction from Blast:	674 m North
Transverse Particle Velocity:	0.508 mm/s @ 21 Hz
Vertical Particle Velocity:	0.508 mm/s @ 27 Hz
Longitudinal Particle Velocity:	0.572 mm/s @ 20 Hz
Peak Particle Velocity:	0.572 mm/s @ 20 Hz
Maximum Airblast:	122 dB(L)

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	Instantel Minimate, Serial # 20206
Calibration Date:	June 9, 2023
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	704 m Northwest
Transverse Particle Velocity:	0.725 mm/s @ 14 Hz
Vertical Particle Velocity:	0.355 mm/s @ 10 Hz
Longitudinal Particle Velocity:	0.686 mm/s @ 6.5 Hz
Peak Particle Velocity:	0.725 mm/s @ 14 Hz
Maximum Airblast:	116.9 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 3, 2023
Project No.:	234601.00	**Time of Blast:**	14:25
Inspector:	S. Carroll	**Blast No.:**	2023-25
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Minimate, Serial # 20204
Calibration Date:	June 12, 2023
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	993 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 Micromate, Serial # 18187
Calibration Date:	May 12, 2023
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	843 m West
Transverse Particle Velocity:	0.883 mm/s @ 10 Hz
Vertical Particle Velocity:	0.520 mm/s @ 43 Hz
Longitudinal Particle Velocity:	0.686 mm/s @ 14 Hz
Peak Particle Velocity:	0.883 mm/s @ 10 Hz
Maximum Airblast:	105.2 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 3, 2023
Project No.:	234601.00	**Time of Blast:**	14:25
Inspector:	S. Carroll	**Blast No.:**	2023-25
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	Instantel Micromate, Serial # 5635
Calibration Date:	March 8, 2023
Location of seismograph:	Civic Number 220 Myron Road (PW-01)
Distance and Direction from Blast:	1.35 km 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 Micromate, Serial # 5632
Calibration Date:	November 16, 2023
Location of seismograph:	Civic Number 2337 Route 820 (PW-04)
Distance and Direction from Blast:	765 m Northwest
Transverse Particle Velocity:	0.318 mm/s @ 6.0 Hz
Vertical Particle Velocity:	0.318 mm/s @ 7.0 Hz
Longitudinal Particle Velocity:	0.762 mm/s @ 10 Hz
Peak Particle Velocity:	0.762 mm/s @ 10 Hz
Maximum Airblast:	106 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 3, 2023
Project No.:	234601.00	**Time of Blast:**	14:25
Inspector:	S. Carroll	**Blast No.:**	2023-25
Client:	Hammond River Holdings		

Data Collection – Seismometer #11

Make, Model and Serial # of unit:	Instantel Minimate, Serial # 5372
Calibration Date:	February 28, 2023
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	765 m South
Transverse Particle Velocity:	0.699 mm/s @ 64 Hz
Vertical Particle Velocity:	0.572 mm/s @ 73 Hz
Longitudinal Particle Velocity:	0.826 mm/s @ 10 Hz
Peak Particle Velocity:	0.826 mm/s @ 10 Hz
Maximum Airblast:	112 dB(L)

Attachment B

Blast and Seismograph Location Plan


Blast and Seismograph Locations
Blast No: 2023-25
Upham East Gypsum Quarry, Upham, NB
Date August 3, 2023
Project No: 234601.00
Legend
Blast 2023-25
111
2447 Route 820 (PW-07)
4150 Route 111 (PW-13)
4140 Route 111 (PW-12)
4126 Route 111 (PW-10)
St Martins Rd
Blast 2023-25
4079 Route 111 (PW-09)
Hanford Brook
Cottage Route 820 (PW-03)
820
2341 Route 820 (PW-05)
2337 Route 820 (PW-04)
220 Myron Road (PW-01)
50 Myron Road (PW-15)
86 Myron Road (PW-16)
oogle Earth
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800 m

Attachment C

Blast Event Reports

Event Report

Date/Time Vert at 14:25:15 August 3, 2023
Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Serial Number 5487 V 2.61 MiniMate
Battery Level 6.4 Volts
Unit Calibration January 16, 2023 by Instantel
File Name G487K514.230

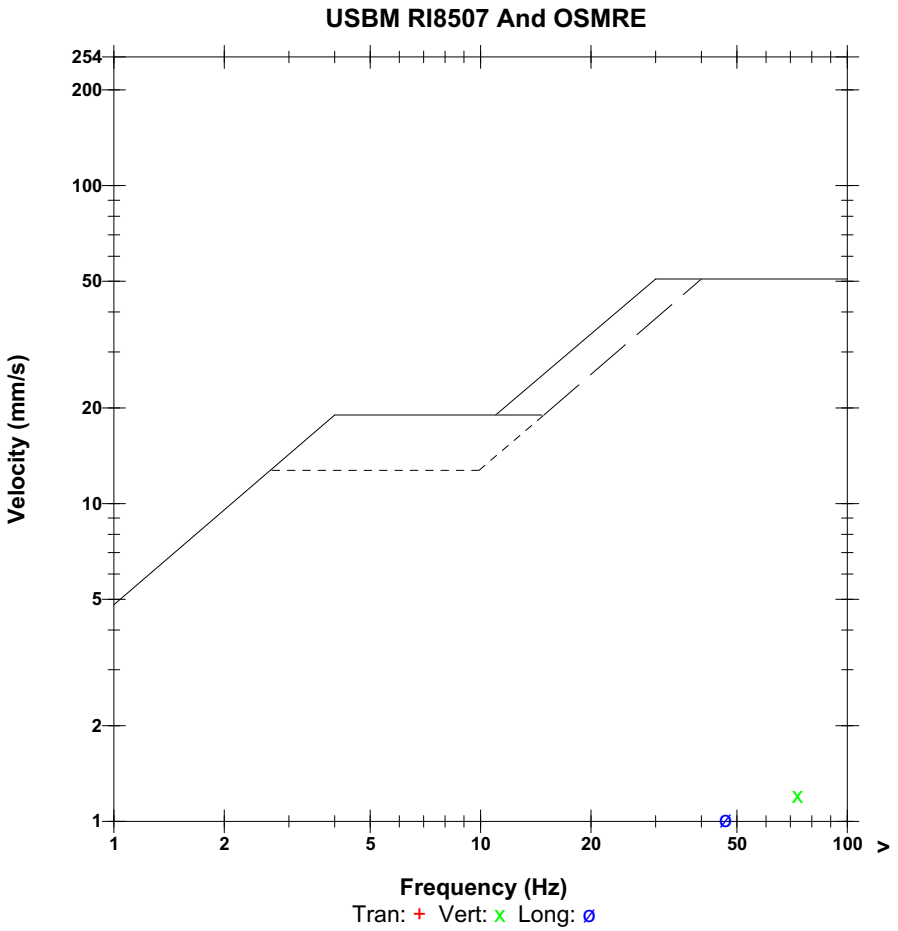
Notes
Location:
Client:
User Name:
Converted: August 3, 2023 16:14:41 (V10.72.1)

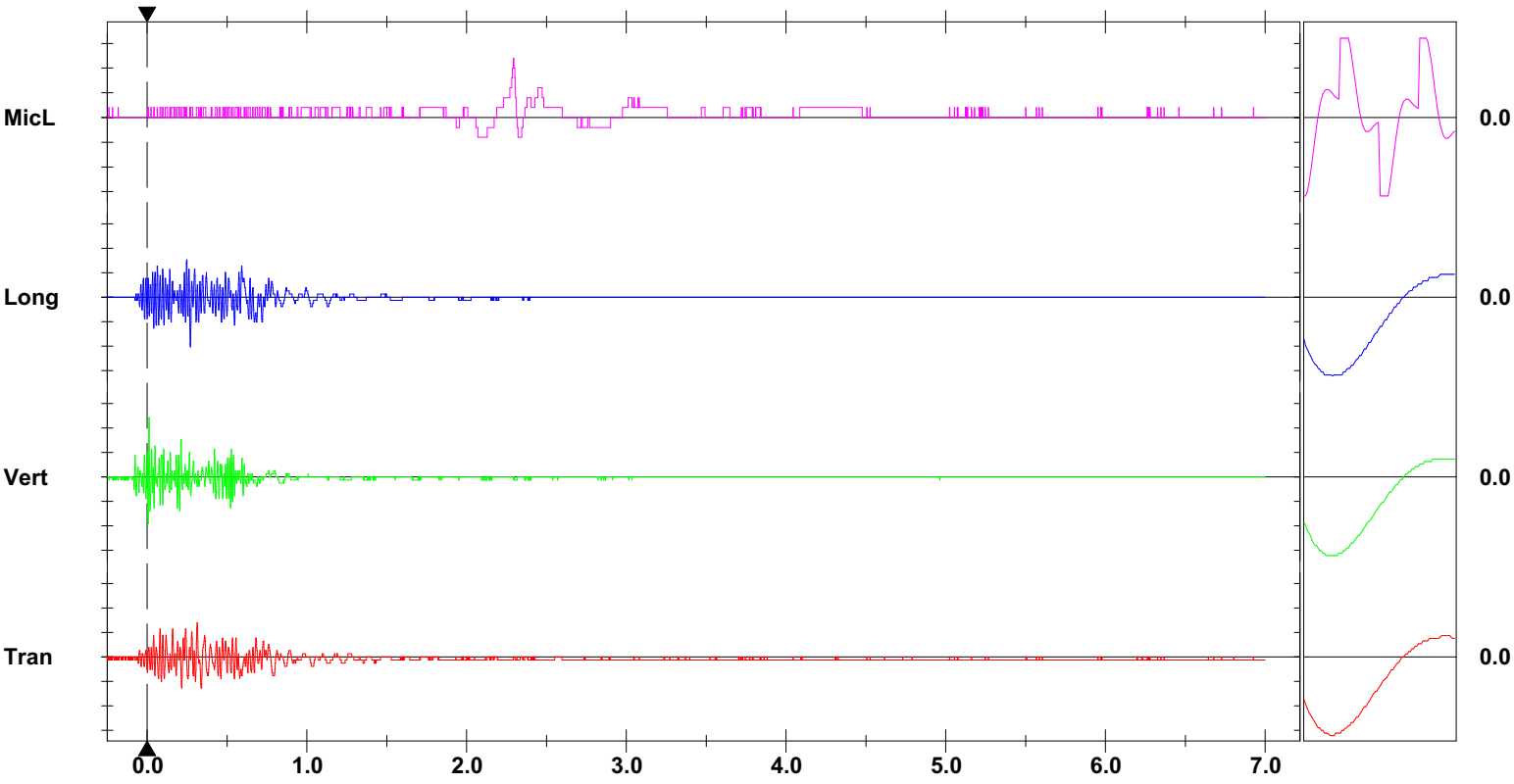
Extended Notes

Microphone Linear Weighting
PSPL 115.6 dB(L) 12.00 pa.(L) at 2.293 sec
ZC Freq 4.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 286 mv)

	Tran	Vert	Long	
PPV	0.699	1.207	1.016	mm/s
ZC Freq	43	73	47	Hz
Time (Rel. to Trig)	0.313	0.012	0.271	sec
Peak Acceleration	0.020	0.060	0.033	g
Peak Displacement	0.004	0.003	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	7.7	7.7	Hz
Overswing Ratio	3.4	4.1	3.9	

Peak Vector Sum 1.254 mm/s at 0.013 sec





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

Sensor Check

Event Report

Date/Time Long at 14:25:10 August 3, 2023
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/factory.MMB

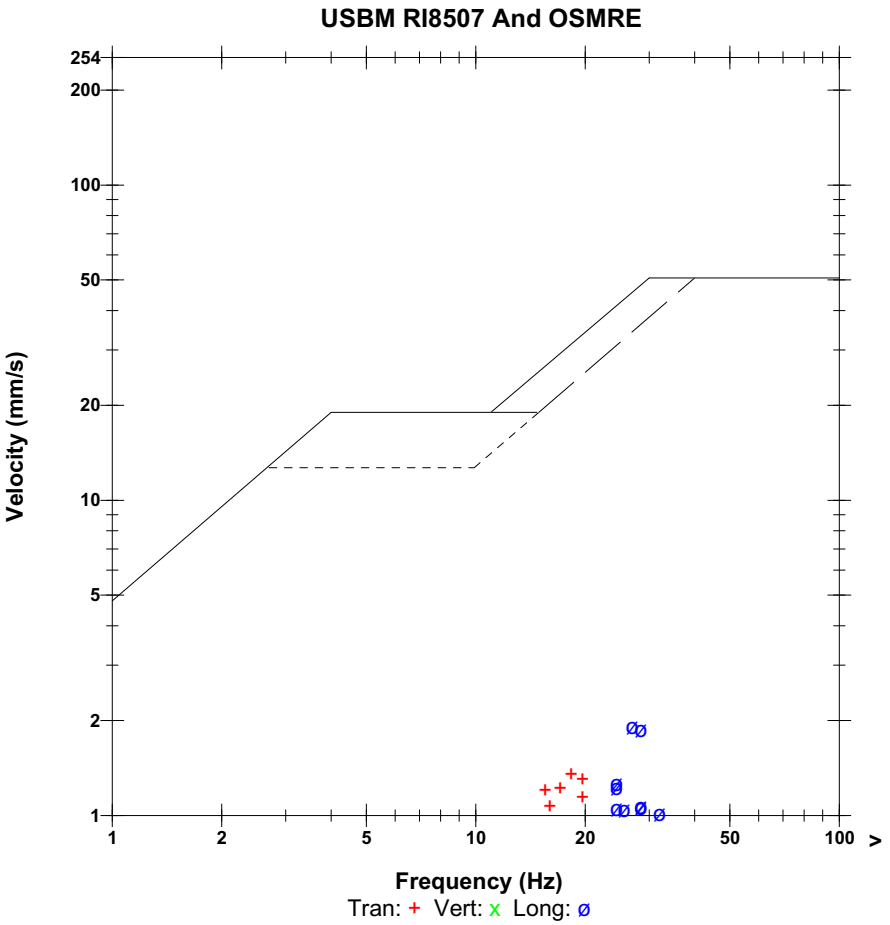
Serial Number UM18193 V 10-90GC Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration May 12, 2023 by Instantel
File Name UM18193_20230803142510.IDFW

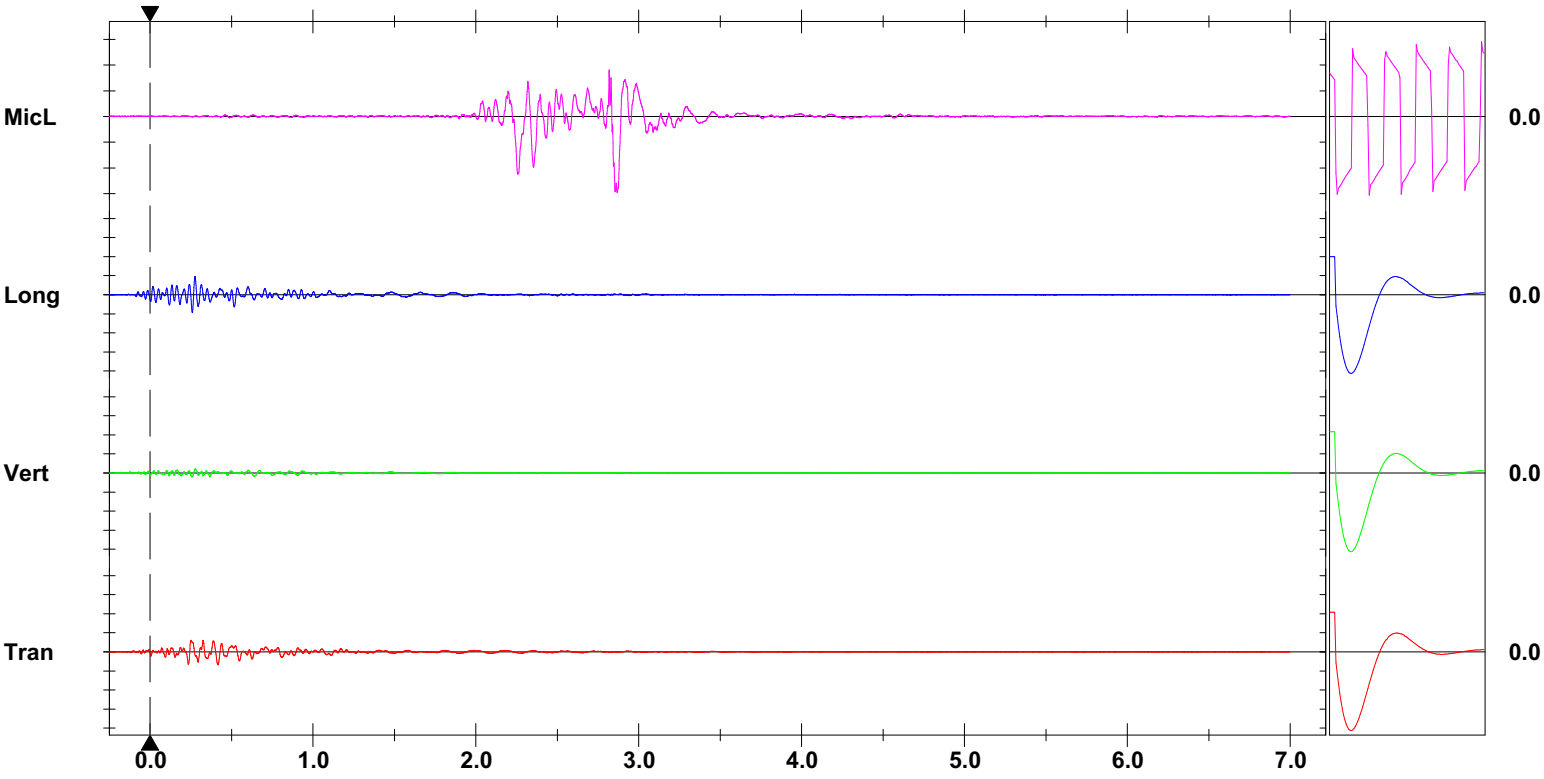
Notes
Location:
Client:
User Name:
General:

Microphone Linear Weighting
PSPL 117.3 dB(L) 14.71 pa.(L) at 2.867 sec
ZC Freq 8.8 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1264 mv)

	Tran	Vert	Long	
PPV	1.356	0.449	1.923	mm/s
ZC Freq	18	22	27	Hz
Time (Rel. to Trig)	0.416	0.277	0.276	sec
Peak Acceleration	0.043	0.013	0.039	g
Peak Displacement	0.013	0.004	0.011	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.3	Hz
Overswing Ratio	4.2	4.0	4.3	

Peak Vector Sum 2.157 mm/s at 0.260 sec





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

Sensor Check

Event Report

Date/Time Vert at 14:25:20 August 3, 2023
Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Serial Number 5489 V 2.61 MiniMate
Battery Level 6.4 Volts
Unit Calibration May 5, 2023 by Instantel
File Name G489K514.280

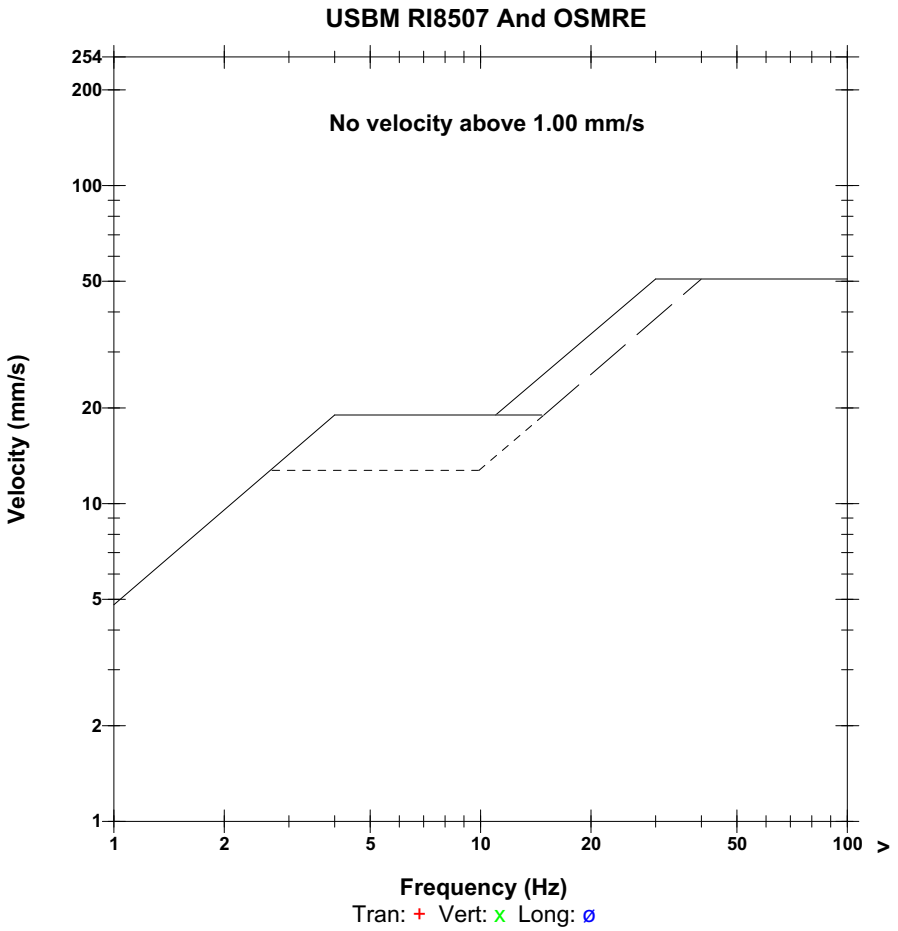
Notes
Location:
Client:
User Name:
Converted: August 3, 2023 16:22:23 (V10.72.1)

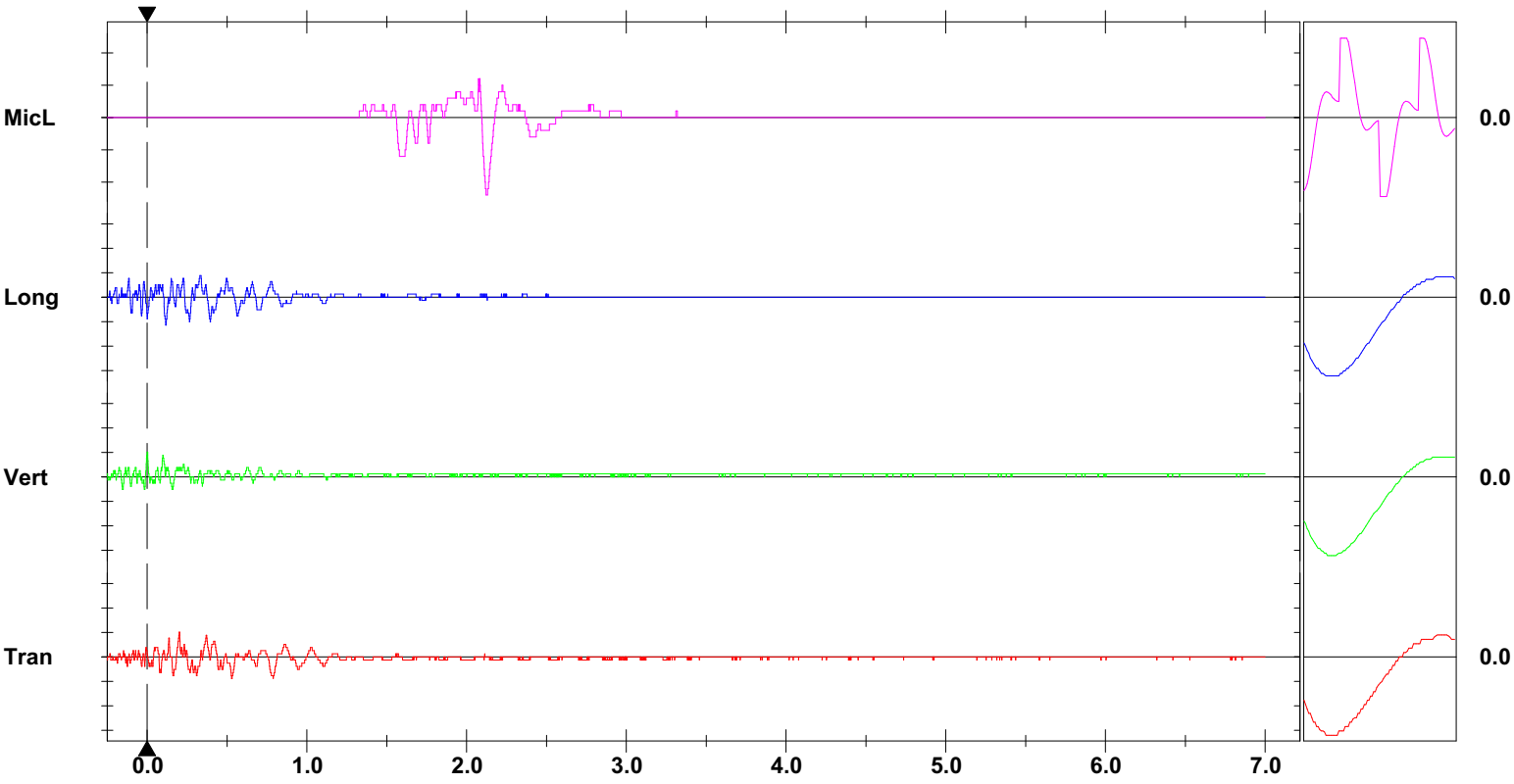
Extended Notes

Microphone Linear Weighting
PSPL 121.6 dB(L) 24.00 pa.(L) at 2.122 sec
ZC Freq 6.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 283 mv)

	Tran	Vert	Long	
PPV	0.508	0.508	0.572	mm/s
ZC Freq	21	27	20	Hz
Time (Rel. to Trig)	0.200	0.003	0.117	sec
Peak Acceleration	0.013	0.007	0.013	g
Peak Displacement	0.006	0.003	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.8	7.8	Hz
Overswing Ratio	3.8	4.0	3.9	

Peak Vector Sum 0.683 mm/s at 0.001 sec





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

Sensor Check

Event Report

Date/Time Long at 14:25:16 August 3, 2023
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/factory.MMB

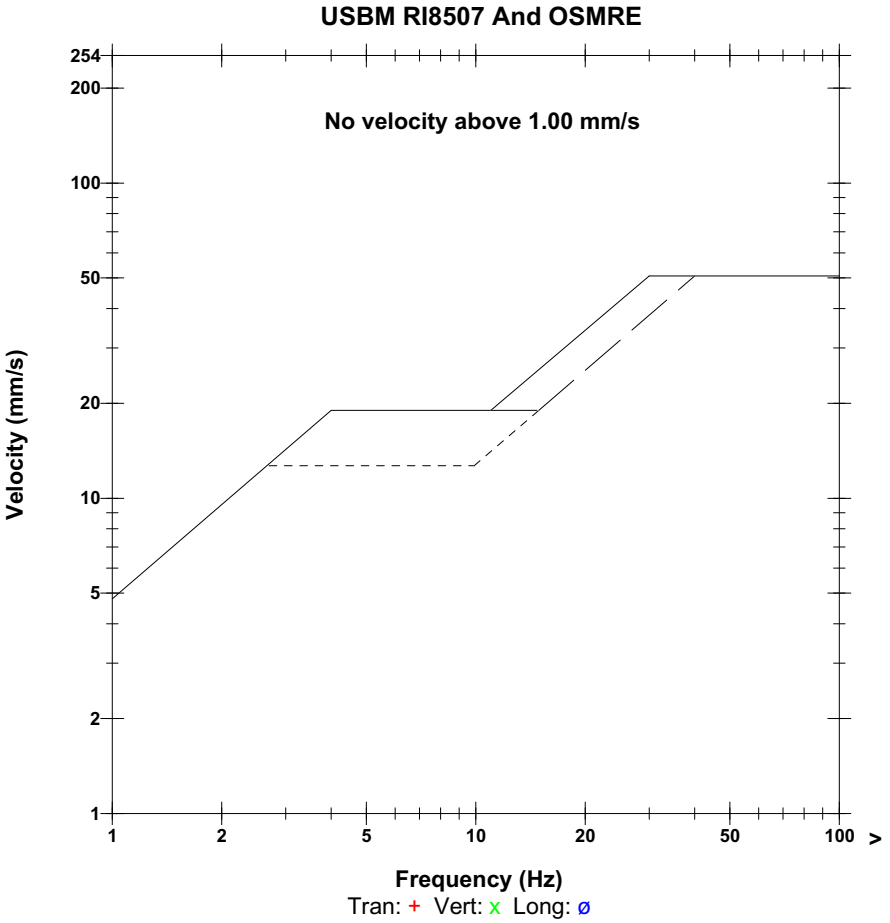
Serial Number UM20206 V 10-90GC Micromate ISEE
Battery Level 3.7 Volts
Unit Calibration June 9, 2023 by Instantel
File Name UM20206_20230803142516.IDFW

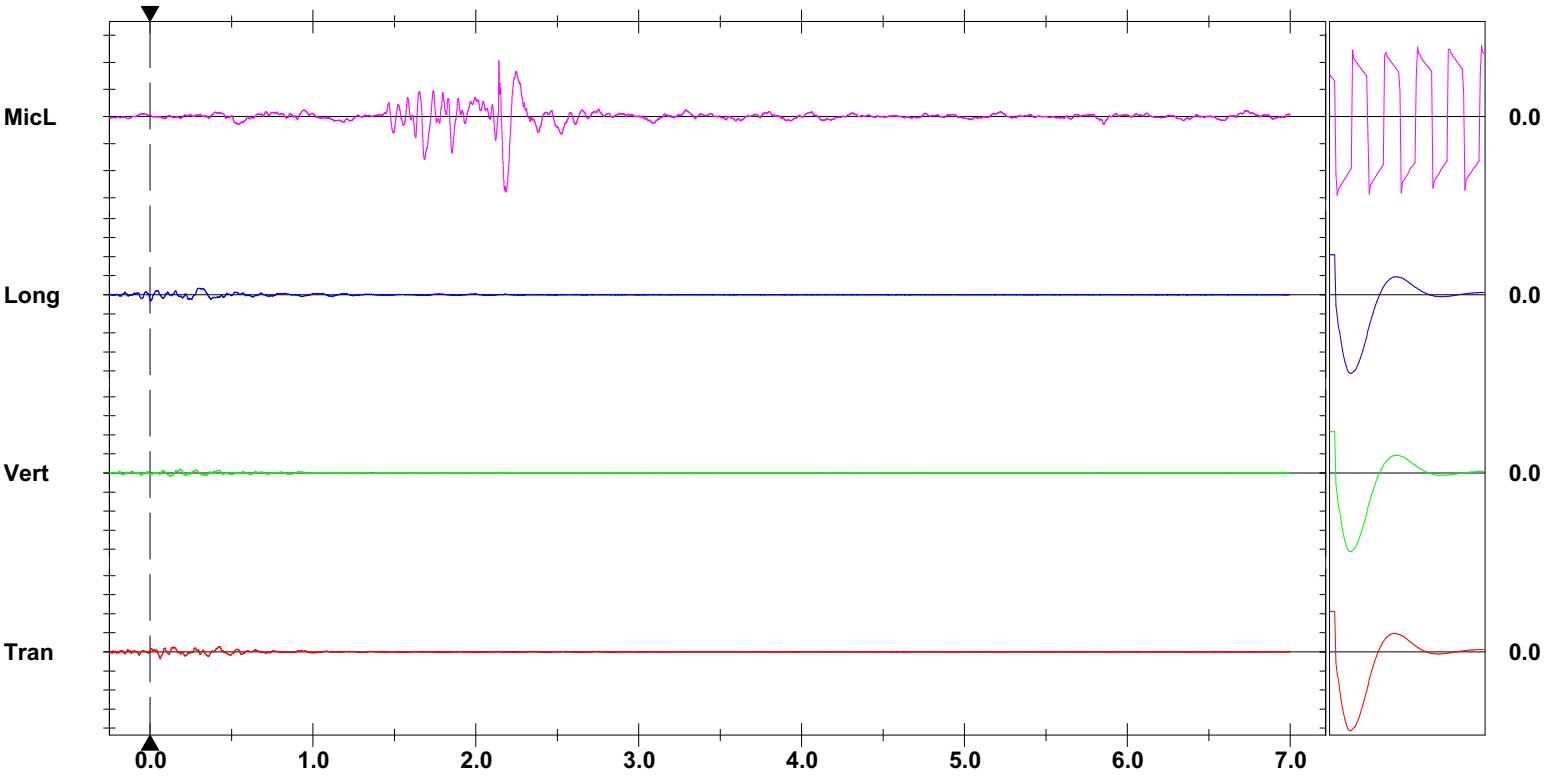
Notes
Location:
Client:
User Name:
General:

Microphone Linear Weighting
PSPL 116.9 dB(L) 13.98 pa.(L) at 2.185 sec
ZC Freq 8.4 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1364 mv)

	Tran	Vert	Long	
PPV	0.725	0.355	0.686	mm/s
ZC Freq	14	10	6.5	Hz
Time (Rel. to Trig)	0.062	0.123	0.300	sec
Peak Acceleration	0.014	0.009	0.010	g
Peak Displacement	0.009	0.006	0.018	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.3	7.3	Hz
Overswing Ratio	4.3	4.4	4.4	

Peak Vector Sum 0.731 mm/s at 0.062 sec





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

Sensor Check

Event Report

Date/Time	Long at 14:25:15 August 3, 2023
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/factory.MMB

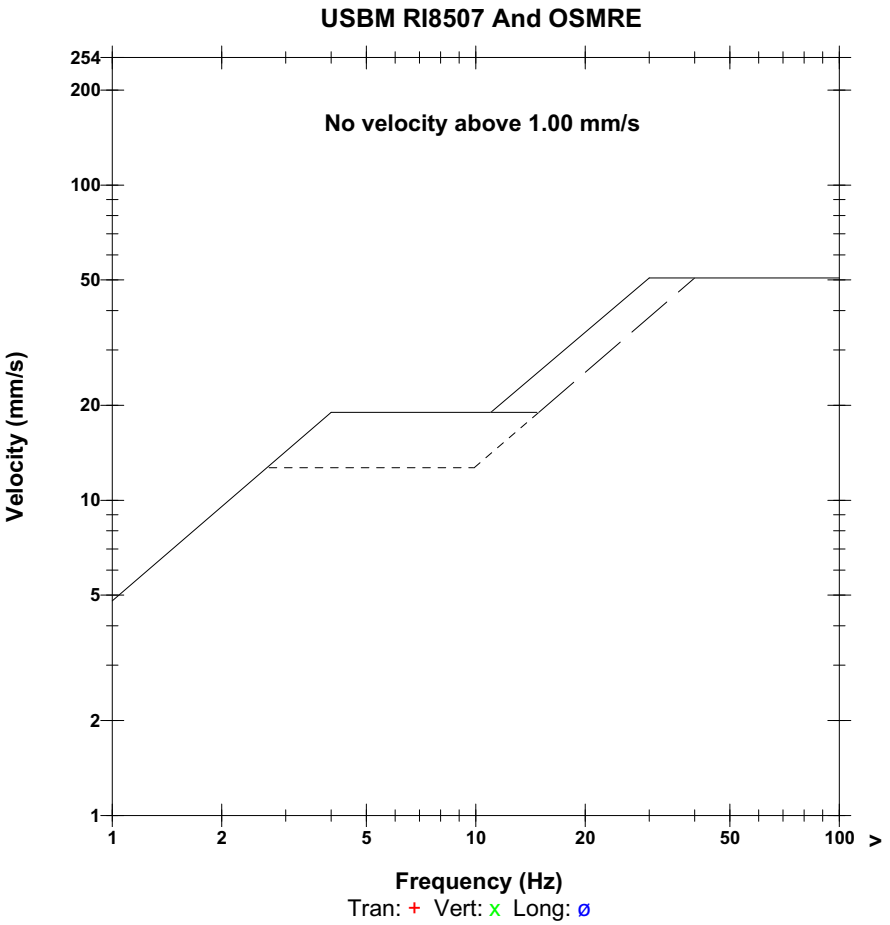
Serial Number	UM18187 V 10-90GC Micromate ISEE
Battery Level	3.6 Volts
Unit Calibration	May 12, 2023 by Instantel
File Name	UM18187_20230803142515.IDFW

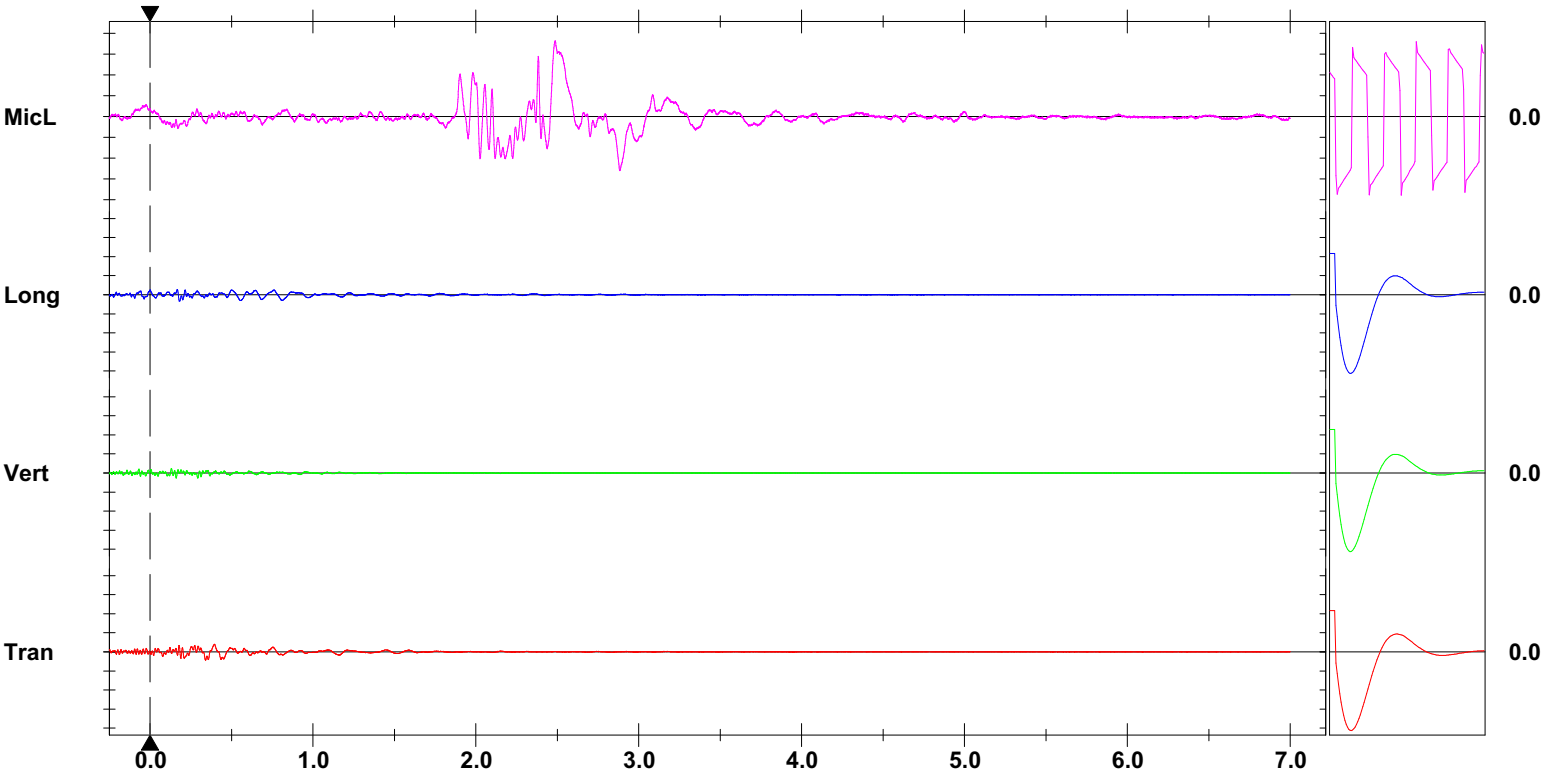
Notes
Location:
Client:
User Name:
General:

Microphone	Linear Weighting
PSPL	105.2 dB(L) 3.646 pa.(L) at 2.487 sec
ZC Freq	3.4 Hz
Channel Test	Passed (Freq = 20.5 Hz Amp = 1324 mv)

	Tran	Vert	Long	
PPV	0.883	0.520	0.686	mm/s
ZC Freq	10	43	14	Hz
Time (Rel. to Trig)	0.340	0.160	0.179	sec
Peak Acceleration	0.035	0.014	0.024	g
Peak Displacement	0.012	0.003	0.011	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	4.4	4.2	4.1	

Peak Vector Sum 0.927 mm/s at 0.179 sec





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

Sensor Check

Event Report

Date/Time Long at 14:25:03 August 3, 2023
Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Serial Number 5632 V 2.61 MiniMate
Battery Level 6.4 Volts
Unit Calibration November 16, 2022 by Instantel
File Name G632K514.1R0

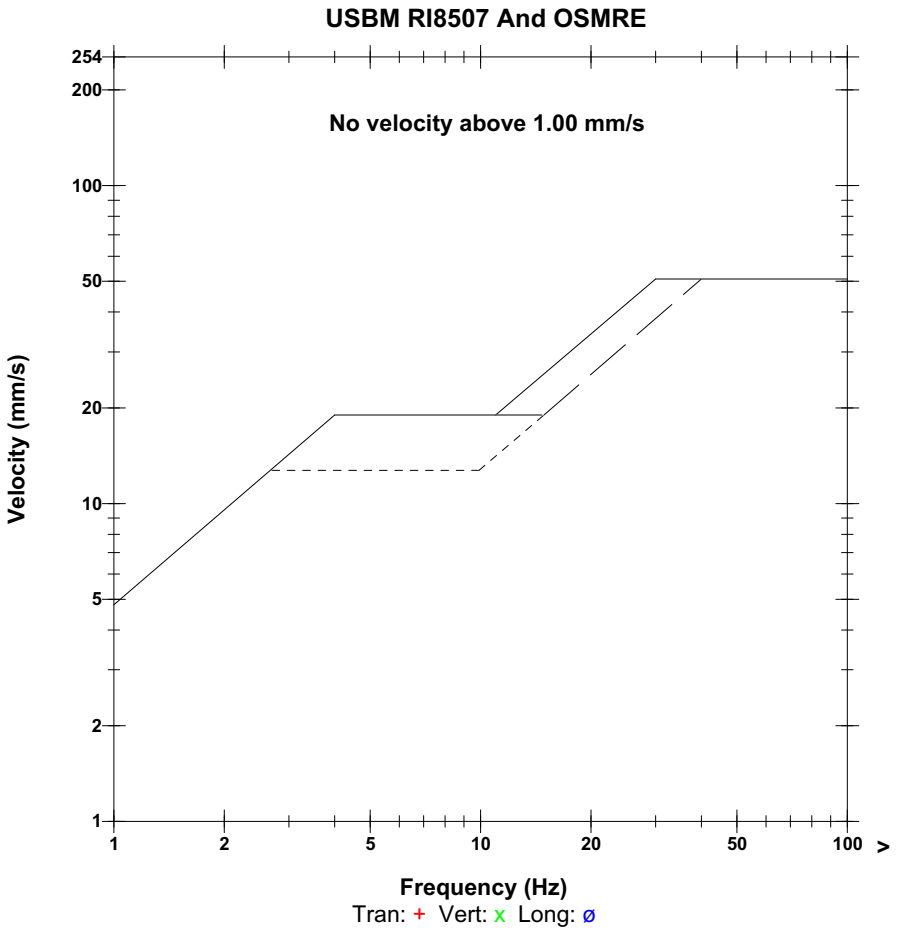
Notes
Location:
Client:
User Name:
Converted: August 3, 2023 16:31:40 (V10.72.1)

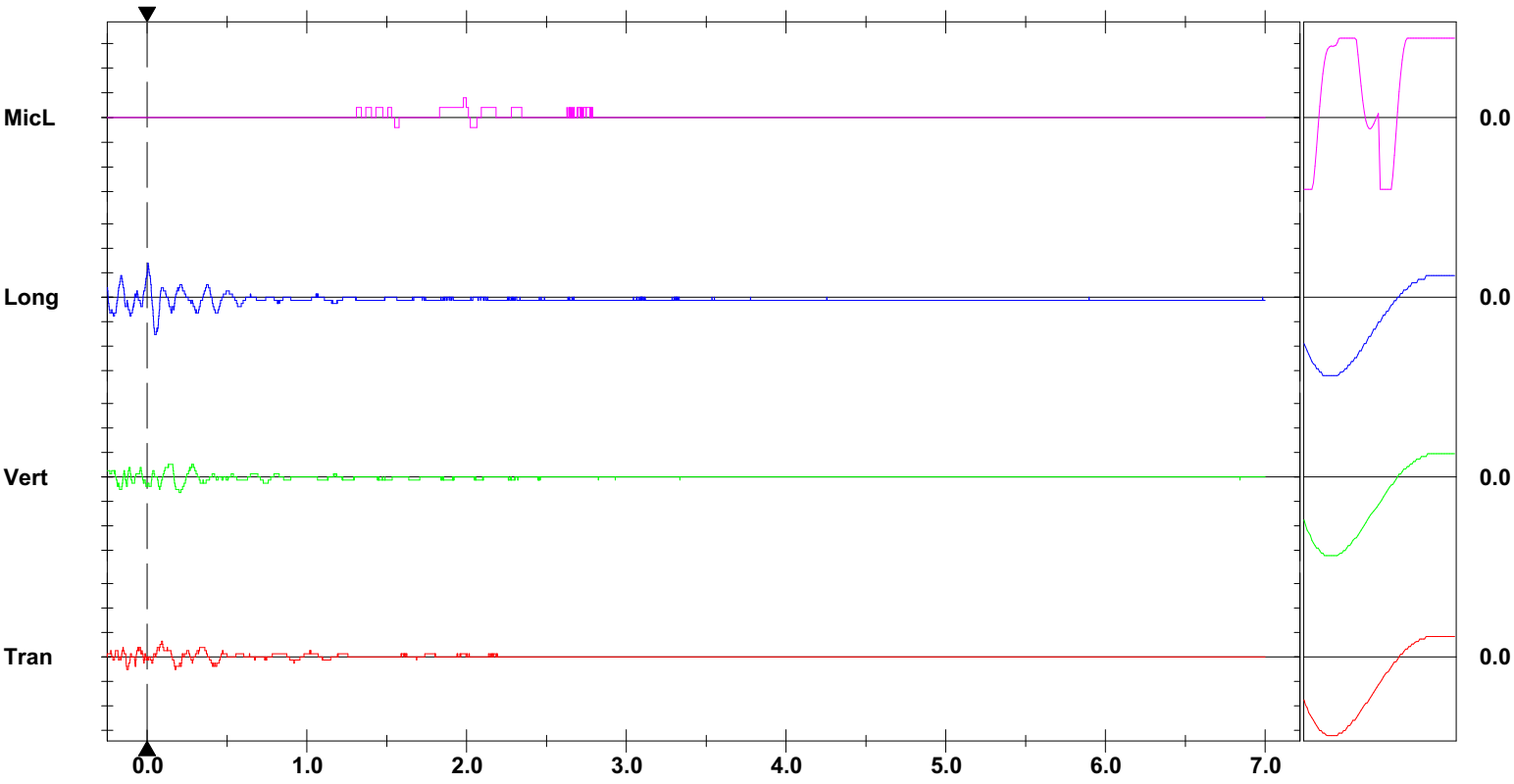
Extended Notes

Microphone Linear Weighting
PSPL 106.0 dB(L) 4.000 pa.(L) at 1.981 sec
ZC Freq 3.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 473 mv)

	Tran	Vert	Long	
PPV	0.318	0.318	0.762	mm/s
ZC Freq	6.0	7.0	10	Hz
Time (Rel. to Trig)	0.091	0.201	0.047	sec
Peak Acceleration	0.007	0.007	0.007	g
Peak Displacement	0.003	0.006	0.012	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	8.2	8.1	Hz
Overswing Ratio	3.9	3.5	4.0	

Peak Vector Sum 0.762 mm/s at 0.047 sec





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

Sensor Check

Event Report

Date/Time Vert at 14:25:21 August 3, 2023
Trigger Source Geo: 0.492 mm/s, Mic: 119.6 dB(L)
Range Geo: 127.0 mm/s
Record Time 7.0 sec at 1024 sps

Serial Number 5372 V 2.61 MiniMate
Battery Level 6.1 Volts
Unit Calibration February 28, 2023 by Instantel
File Name G372K514.290

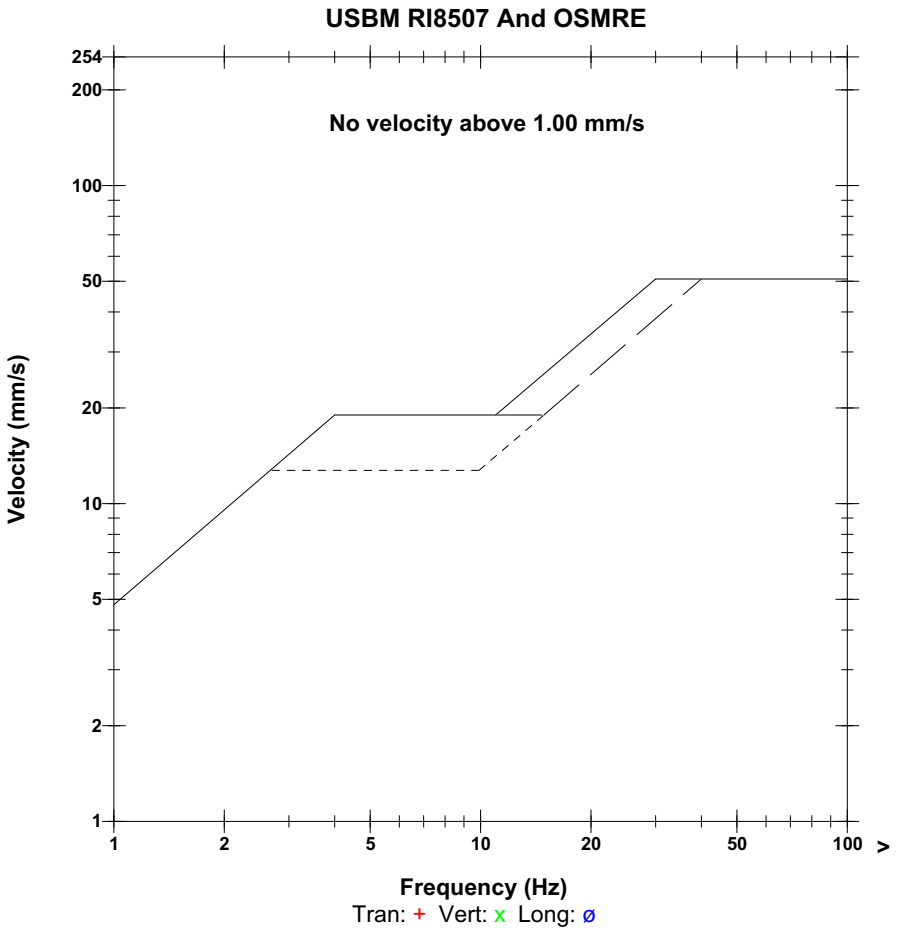
Notes
Location:
Client:
User Name:
Converted: August 3, 2023 16:35:57 (V10.72.1)

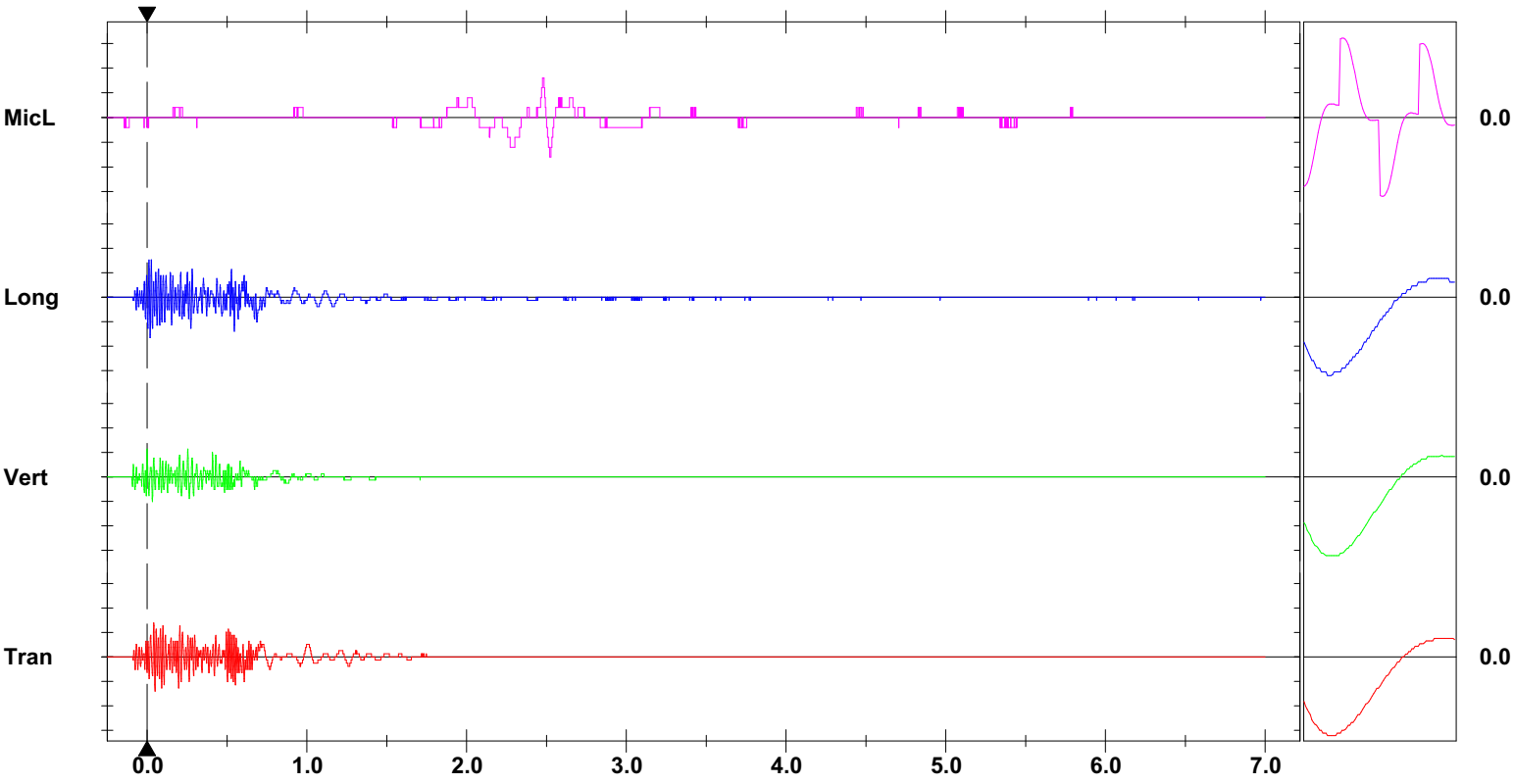
Extended Notes

Microphone Linear Weighting
PSPL 112.0 dB(L) 8.000 pa.(L) at 2.476 sec
ZC Freq 9.1 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 300 mv)

	Tran	Vert	Long	
PPV	0.699	0.572	0.826	mm/s
ZC Freq	64	73	73	Hz
Time (Rel. to Trig)	0.042	0.000	0.019	sec
Peak Acceleration	0.033	0.033	0.040	g
Peak Displacement	0.003	0.002	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	8.0	8.0	Hz
Overswing Ratio	3.7	3.4	3.7	

Peak Vector Sum 0.937 mm/s at 0.012 sec





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

Sensor Check

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August 10, 2023

Project No.: 234601.00

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

Re: Blast Vibration Monitoring – Blast No. 2023-26 – 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 13:37 on August 10, 2023. 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. 2023-26 – August 10, 2023

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)	13:37	1,330 m S	< 0.5 mm/s	<120	Unit was not triggered
2. Civic No. 4126 Route 111 (PW-10)		943 m SE	0.76 mm/s @ 51 Hz	112	-
3. Civic No. 4150 Route 111 (PW-13)		817 m SE	< 0.5 mm/s	<120	Unit was not triggered
4. Civic No. 2447 Route 820 (PW-07)		963 m NE	0.90 mm/s @ 26 Hz	107	-
5. PW-03 - Cottage Route 820		647 m N	1.72 mm/s @ >100 Hz	110	-
6. Civic No. 2341 Route 820 (PW-05)		600 m N	2.84 mm/s @ 64 Hz	109	-
7. Civic No. 50 Myron Road (PW-15)		816 m NW	1.63 mm/s @ >100 Hz	105	-
8. Civic No. 86 Myron Road (PW-16)		623 m W	1.36 mm/s @ 64 Hz	109	-
9. Civic No. 220 Myron Road (PW-01)		1,310 m S	< 0.5 mm/s	<120	Unit was not triggered
10. Civic No. 2337 Route 820 (PW-04)		640 m N	1.27 mm/s @ 73 Hz	112	-
11. Civic No. 4140 Route 111 (PW-12)		876 m SE	1.84 mm/s @ 57 Hz	110	-
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: 234601.00

Attachment A

Blast Record

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 10, 2023
Project No.:	234601.00	**Time of Blast:**	13:27
Inspector:	S. Carroll	**Blast No.:**	2023-26
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Gulf Operators Ltd.		
Blaster's Certification No.:	1318	**Blaster's Name:**	Daniel Blanchard
Blast Location:	N 45º28'53.08" W 65º38'7.03" (see attached sketch)		
Type of Rock:	Anhydrate/Gypsum	**Est. Vol. or Tonnage:**	11,327 tonnes
Weather at time of Blast:	Sunny	**Air Temp.:**	22ºC
Est. Wind Speed :	≈ 20 km/h	**Wind Direction:**	E
Cloud Cover:	60%	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	113	**Hole Diameter:**	4.5"
Average Depth:	5.3 m-6.5 m	**Spacing:**	10 ft x 10 ft
No. Holes per Delay:	2	**Collar Length:**	7 ft
Delay between Holes:	25 ms	**Delay between Rows:**	17, 34, 42, 67 ms
Initiation Method:	Non-Electric		
Weight of Explosives per Delay:	Max.: 100 kg		
Type and weight of Explosives for Blast:	4,192 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:**	August 10, 2023
Project No.:	234601.00	**Time of Blast:**	13:27
Inspector:	S. Carroll	**Blast No.:**	2023-26
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	600 m
Direction to the Nearest Structure:	North
Structure Type:	House
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	60.0

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:**	August 10, 2023
Project No.:	234601.00	**Time of Blast:**	13:27
Inspector:	S. Carroll	**Blast No.:**	2023-26
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Minimate, Serial #5487
Calibration Date:	January 16, 2023
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1,330 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #2

Make, Model and Serial # of unit:	Instantel Minimate, Serial #5489
Calibration Date:	May 5, 2023
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	943 m Southeast
Transverse Particle Velocity:	0.70 mm/s @ 64 Hz
Vertical Particle Velocity:	0.76 mm/s @ 51 Hz
Longitudinal Particle Velocity:	0.76 mm/s @ 57 Hz
Peak Particle Velocity:	0.76 mm/s @ 51 Hz
Maximum Airblast:	112 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 10, 2023
Project No.:	234601.00	**Time of Blast:**	13:27
Inspector:	S. Carroll	**Blast No.:**	2023-26
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	Instantel Minimate, Serial #5673
Calibration Date:	April 25, 2023
Location of seismograph:	Civic Number 4150 Route 111 (PW-13)
Distance and Direction from Blast:	817 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 Micromate, Serial #20206
Calibration Date:	June 9, 2023
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	963 m Northeast
Transverse Particle Velocity:	0.55 mm/s @ 20 Hz
Vertical Particle Velocity:	0.24 mm/s @ 39 Hz
Longitudinal Particle Velocity:	0.90 mm/s @ 26 Hz
Peak Particle Velocity:	0.90 mm/s @ 26 Hz
Maximum Airblast:	107 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 10, 2023
Project No.:	234601.00	**Time of Blast:**	13:27
Inspector:	S. Carroll	**Blast No.:**	2023-26
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Micromate, Serial #20204
Calibration Date:	June 12, 2023
Location of seismograph:	Cottage - PW-03 - Route 820
Distance and Direction from Blast:	647 m North
Transverse Particle Velocity:	1.72 mm/s @ >100 Hz
Vertical Particle Velocity:	1.49 mm/s @ >100 Hz
Longitudinal Particle Velocity:	1.55 mm/s @ 32 Hz
Peak Particle Velocity:	1.72 mm/s @ >100 Hz
Maximum Airblast:	110 dB(L)

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	Instantel Micromate, Serial #21696
Calibration Date:	July 10, 2023
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	600 m North
Transverse Particle Velocity:	2.45 mm/s @ 64 Hz
Vertical Particle Velocity:	1.84 mm/s @ 64 Hz
Longitudinal Particle Velocity:	2.84 mm/s @ 64 Hz
Peak Particle Velocity:	2.84 mm/s @ 64 Hz
Maximum Airblast:	109 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 10, 2023
Project No.:	234601.00	**Time of Blast:**	13:27
Inspector:	S. Carroll	**Blast No.:**	2023-26
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Micromate, Serial #18187
Calibration Date:	May 12, 2023
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	816 m Northwest
Transverse Particle Velocity:	1.30 mm/s @ 64 Hz
Vertical Particle Velocity:	1.63 mm/s @ >100 Hz
Longitudinal Particle Velocity:	1.09 mm/s @ 47 Hz
Peak Particle Velocity:	1.63 mm/s @ >100 Hz
Maximum Airblast:	105 dB(L)

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	Instantel Micromate, Serial # 18193
Calibration Date:	May 12, 2023
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	623 m West
Transverse Particle Velocity:	1.36 mm/s @ 64 Hz
Vertical Particle Velocity:	0.65 mm/s @ 47 Hz
Longitudinal Particle Velocity:	1.06 mm/s @ 47 Hz
Peak Particle Velocity:	1.36 mm/s @ 64 Hz
Maximum Airblast:	109 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 10, 2023
Project No.:	234601.00	**Time of Blast:**	13:27
Inspector:	S. Carroll	**Blast No.:**	2023-26
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	Instantel Micromate, Serial #21349
Calibration Date:	July 20, 2023
Location of seismograph:	Civic Number 220 Myron Road (PW-01)
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 #10

Make, Model and Serial # of unit:	Instantel Minimate, Serial # 5372
Calibration Date:	February 28, 2023
Location of seismograph:	Civic Number 2337 Route 820 (PW-04)
Distance and Direction from Blast:	640 m North
Transverse Particle Velocity:	1.02 mm/s @ 51 Hz
Vertical Particle Velocity:	1.27 mm/s @ 73 Hz
Longitudinal Particle Velocity:	1.21 mm/s @ 64 Hz
Peak Particle Velocity:	1.27 mm/s @ 73 Hz
Maximum Airblast:	112 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 10, 2023
Project No.:	234601.00	**Time of Blast:**	13:27
Inspector:	S. Carroll	**Blast No.:**	2023-26
Client:	Hammond River Holdings		

Data Collection – Seismometer #11

Make, Model and Serial # of unit:	Instantel Minimate, Serial # 5632
Calibration Date:	November 16, 2022
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	876 m Southeast
Transverse Particle Velocity:	1.27 mm/s @ 57 Hz
Vertical Particle Velocity:	0.64 mm/s @ 64 Hz
Longitudinal Particle Velocity:	1.84 mm/s @ 57 Hz
Peak Particle Velocity:	1.84 mm/s @ 57 Hz
Maximum Airblast:	110 dB(L)

Attachment B

Blast and Seismograph Location Plan

Blast and Seismograph Location Plan
Blast No: 2023-26
Upham East Gypsum Quarry, Upham, NB

Date: August 10, 2023
Project No.: 234601.00

Attachment C

Blast Event Reports

Event Report

Date/Time Tran at 13:27:05 August 10, 2023
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: August 10, 2023 15:32:45 (V10.72.1)

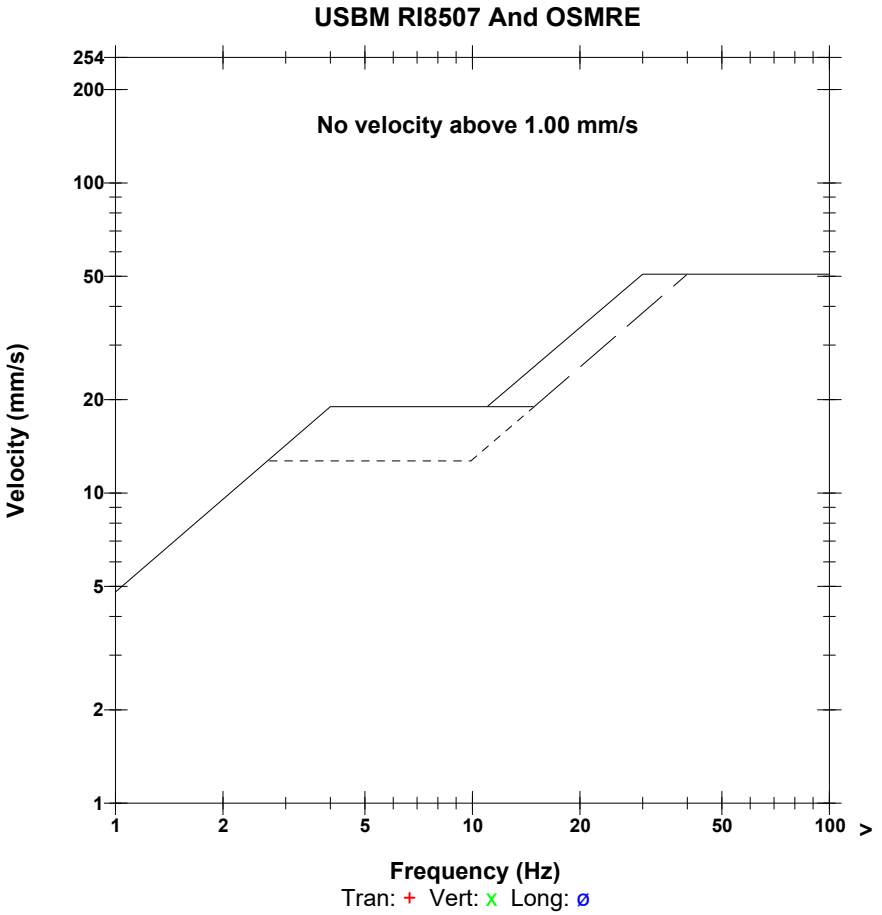
Extended Notes

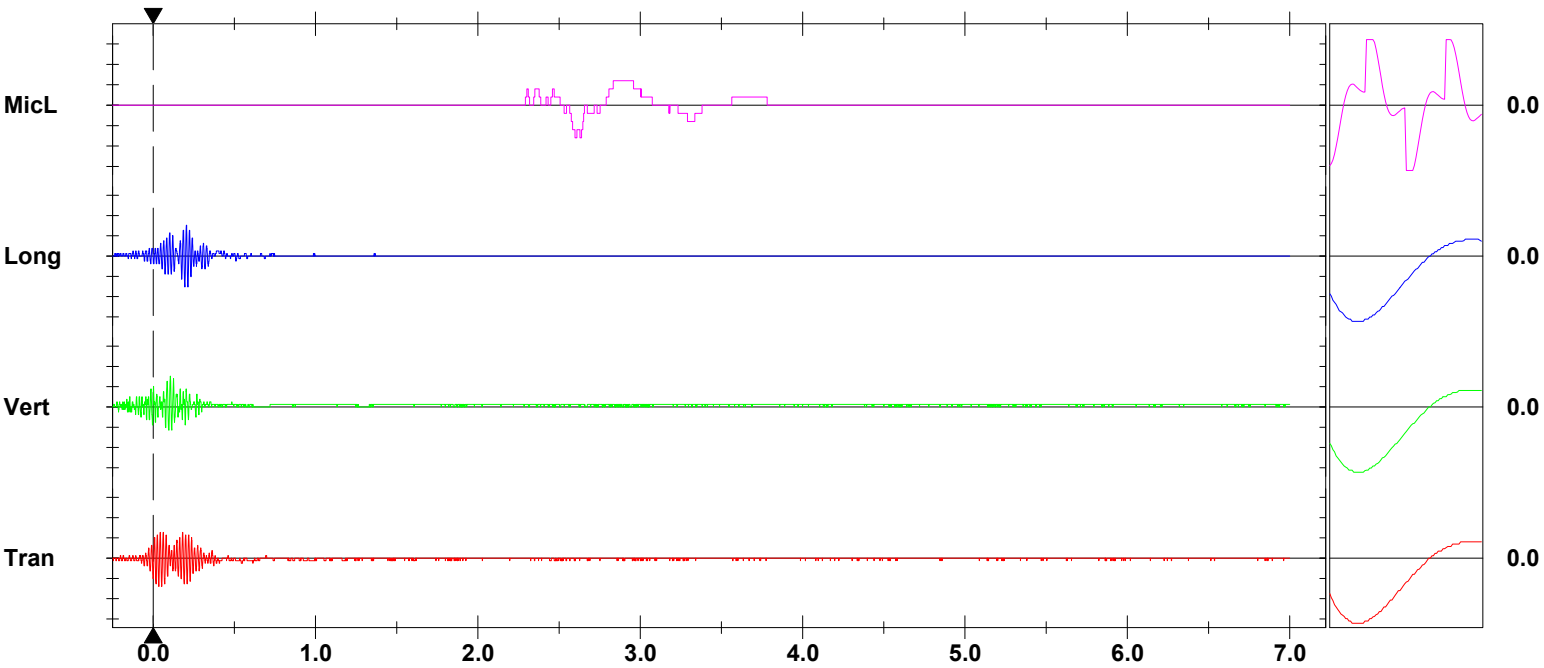
Microphone Linear Weighting
PSPL 112.0 dB(L) 8.000 pa.(L) at 2.599 sec
ZC Freq 6.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 283 mv)

	Tran	Vert	Long	
PPV	0.699	0.762	0.762	mm/s
PPV	47.88	48.64	48.64	dB
ZC Freq	64	51	57	Hz
Time (Rel. to Trig)	0.035	0.106	0.195	sec
Peak Acceleration	0.027	0.033	0.033	g
Peak Displacement	0.002	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 0.873 mm/s at 0.204 sec

Serial Number 5489 V 2.61 MiniMate
Battery Level 6.1 Volts
Unit Calibration May 5, 2023 by Instantel
File Name G489K5E0.150
Post Event Notes
Location: Civic Number 4126 Route 111 (PW-10)
Blast No.: 2023-26
Project No: 234601.00





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 Long at 13:27:04 August 10, 2023
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/factory.MMB

Notes
Location:
Client:
User Name:
General:

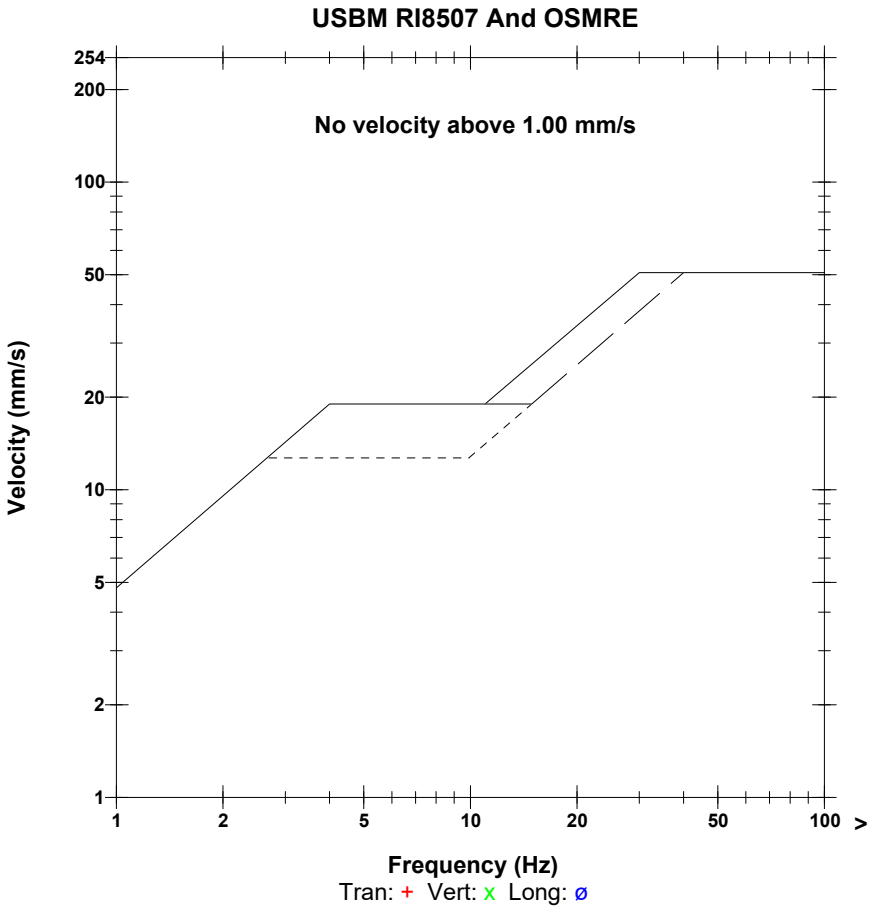
Serial Number UM20206 V 10-90GC Micromate ISEE
Battery Level 3.5 Volts
Unit Calibration June 9, 2023 by Instantel
File Name UM20206_20230810132704.IDFW

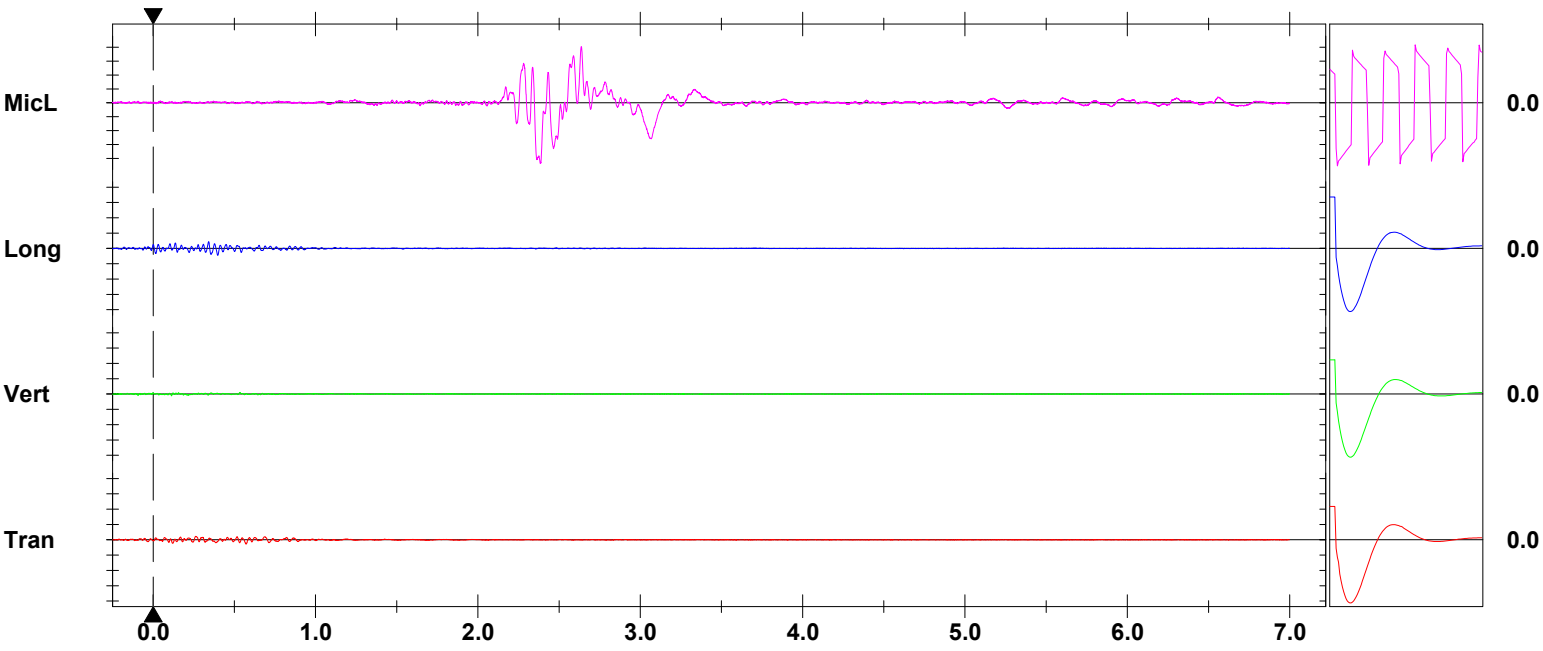
Post Event Notes
Location: Civic Number 2447 Route 820 (PW-07)
Blast No.: 2023-26
Project No: 234601.00

Microphone Linear Weighting
PSPL 106.8 dB(L) 4.375 pa.(L) at 2.384 sec
ZC Freq 6.8 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1269 mv)

	Tran	Vert	Long	
PPV	0.552	0.236	0.899	mm/s
PPV	45.83	38.47	50.07	dB
ZC Freq	20	39	26	Hz
Time (Rel. to Trig)	0.571	0.112	0.397	sec
Peak Acceleration	0.016	0.012	0.025	g
Peak Displacement	0.005	0.002	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.3	7.7	Hz
Overswing Ratio	4.2	4.4	3.9	

Peak Vector Sum 0.925 mm/s at 0.397 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 Tran at 13:27:04 August 10, 2023
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

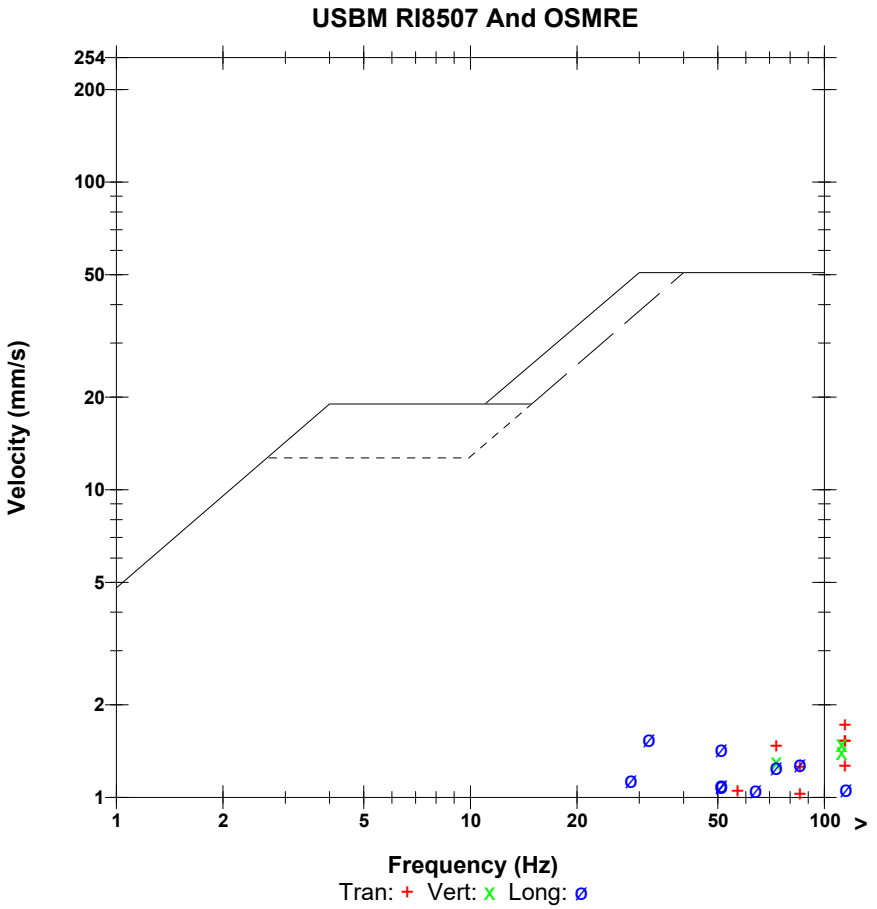
Serial Number UM20204 V 10-90GC Micromate ISEE
Battery Level 3.7 Volts
Unit Calibration June 12, 2023 by Instantel
File Name UM20204_20230810132704.IDFW

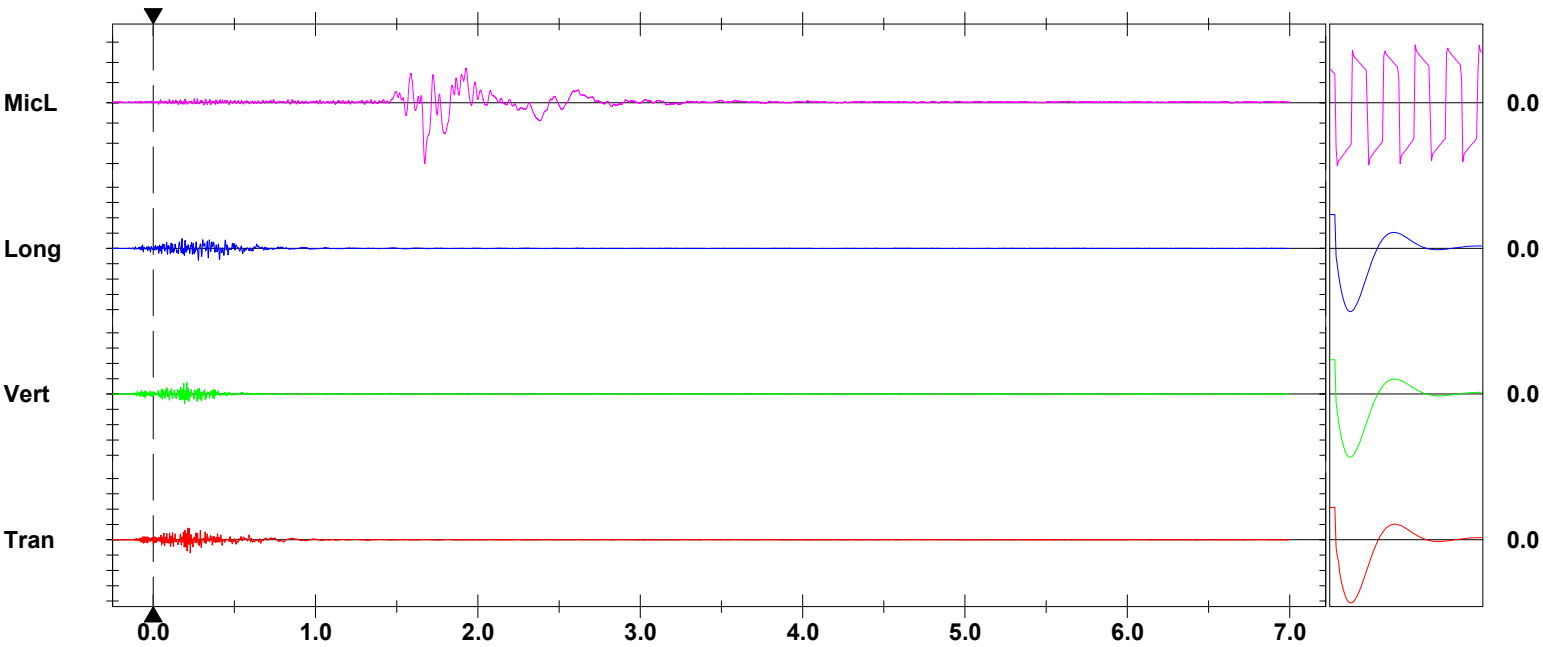
Post Event Notes
Location: Cottage off Route 820 (PW-03)
Blast No.: 2023-26
Project No: 234601.00

Microphone Linear Weighting
PSPL 109.6 dB(L) 6.020 pa.(L) at 1.673 sec
ZC Freq 9.0 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1324 mv)

	Tran	Vert	Long	
PPV	1.718	1.490	1.553	mm/s
PPV	55.70	54.46	54.82	dB
ZC Freq	>100	>100	32	Hz
Time (Rel. to Trig)	0.228	0.207	0.278	sec
Peak Acceleration	0.152	0.100	0.087	g
Peak Displacement	0.004	0.002	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.5	7.7	Hz
Overswing Ratio	4.1	4.2	3.9	

Peak Vector Sum 1.831 mm/s at 0.208 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 Long at 13:27:04 August 10, 2023
Trigger Source Geo: 0.500 mm/s, Mic: 100.00 dB(L)
Range Geo: 254.0 mm/s
Record Time 7.0 sec at 1024 sps
Operator/Setup: Operator/Micromate min trigger mmb.MMB

Notes
Location
Client
Company
General Notes

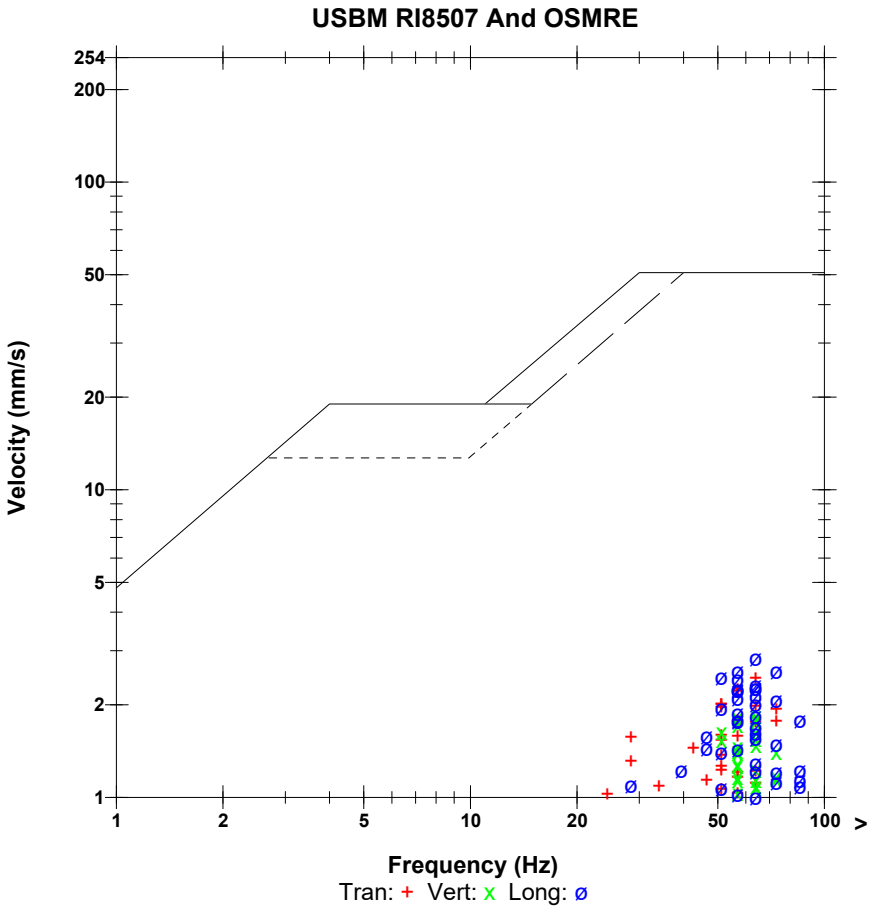
Serial Number UM21696 V 10-90GC Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration July 10, 2023 by Instantel
File Name UM21696_20230810132704.IDFW

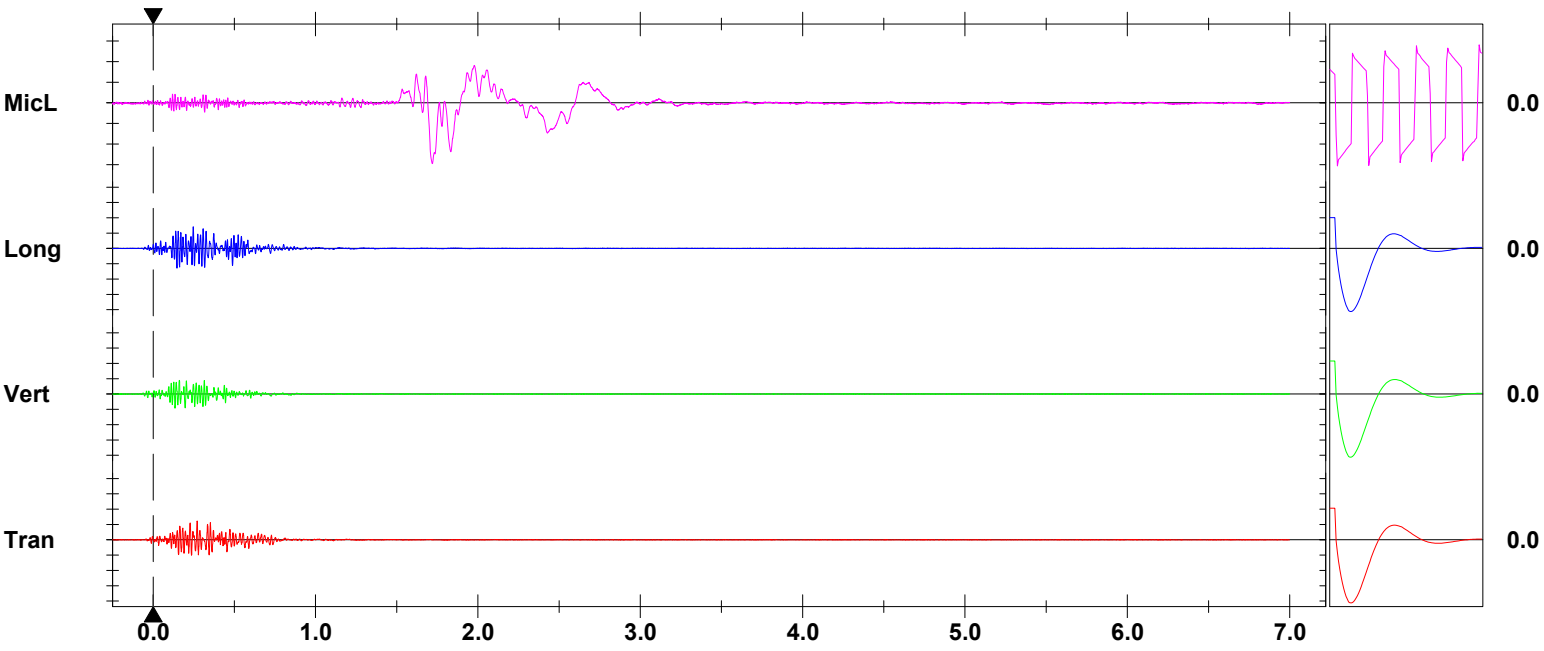
Post Event Notes
Location: Civic Number 2341 Route 820 (PW-05)
Blast No.: 2023-26
Project No: 234601.00

Microphone Linear Weighting
PSPL 109.4 dB(L) 5.896 pa.(L) at 1.719 sec
ZC Freq 7.2 Hz
Channel Test Passed (Freq = 19.7 Hz Amp = 1288 mv)

	Tran	Vert	Long	
PPV	2.451	1.844	2.837	mm/s
PPV	58.79	56.32	60.06	dB
ZC Freq	64	64	64	Hz
Time (Rel. to Trig)	0.271	0.135	0.247	sec
Peak Acceleration	0.145	0.145	0.212	g
Peak Displacement	0.007	0.006	0.008	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.5	7.5	Hz
Overswing Ratio	4.3	4.4	4.3	

Peak Vector Sum 3.258 mm/s at 0.247 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 13:27:02 August 10, 2023
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/factory.MMB

Notes
Location:
Client:
User Name:
General:

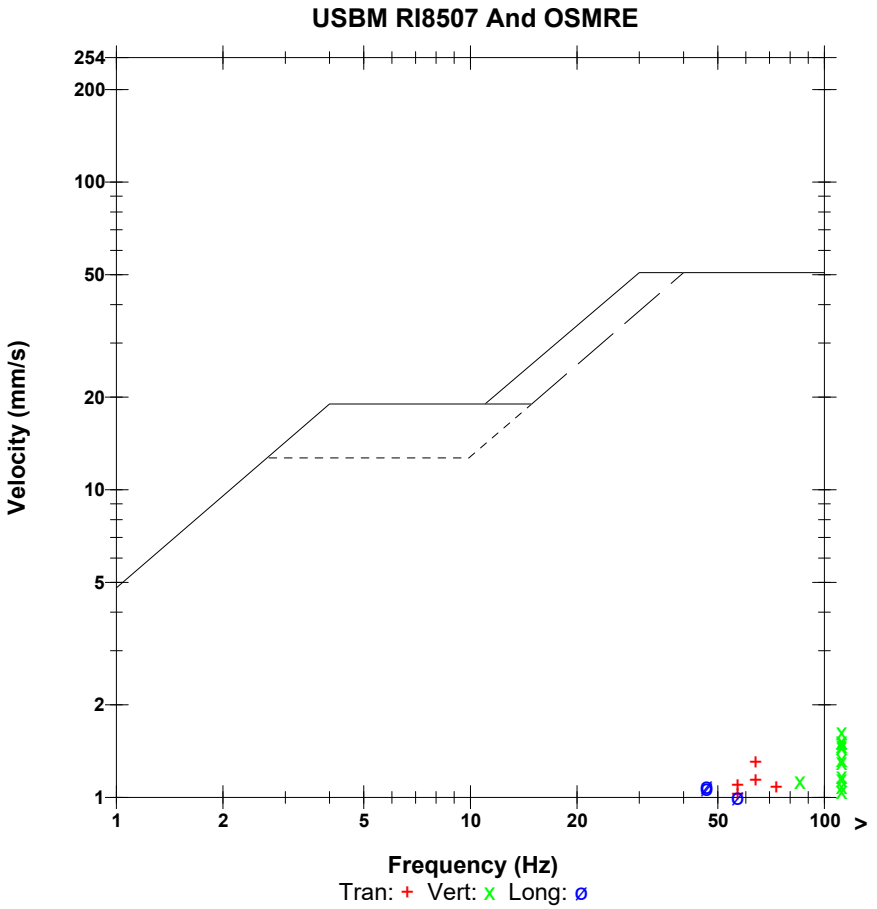
Serial Number UM18187 V 10-90GC Micromate ISEE
Battery Level 3.6 Volts
Unit Calibration May 12, 2023 by Instantel
File Name UM18187_20230810132702.IDFW

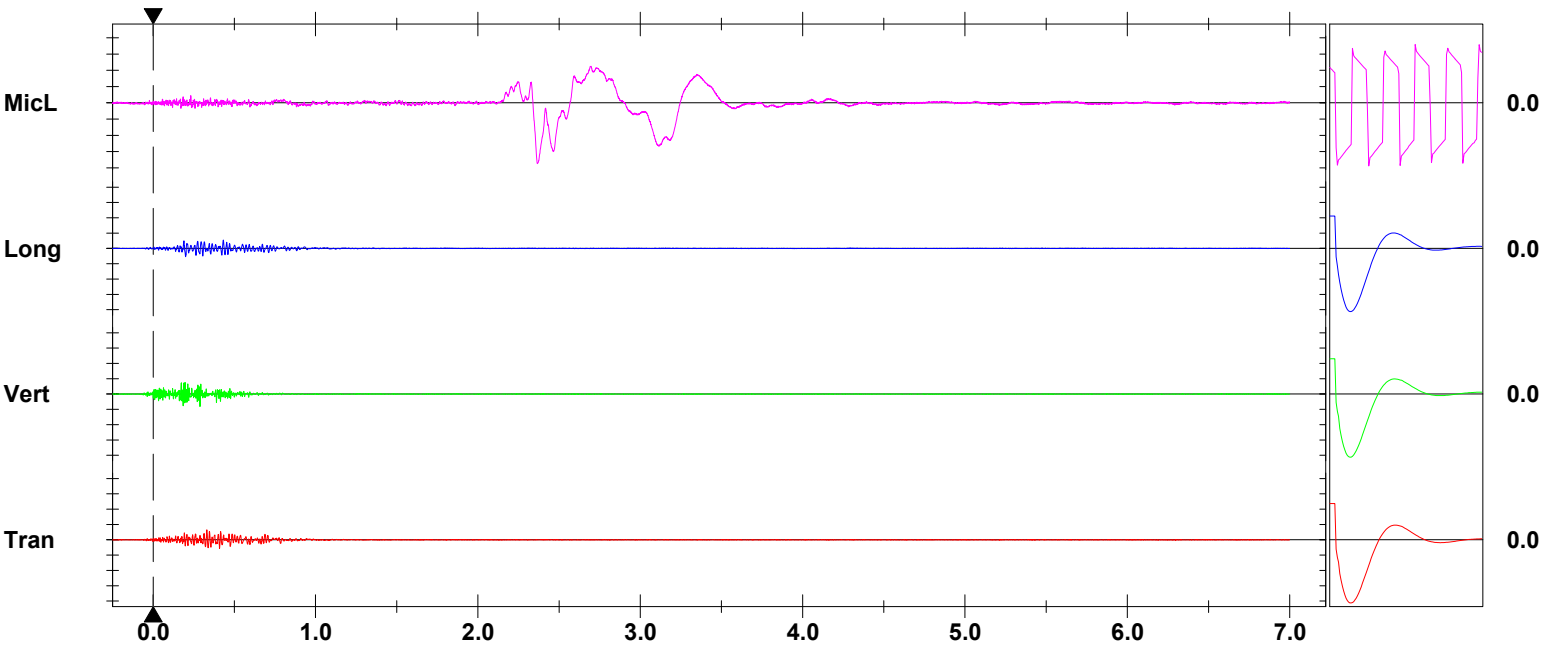
Post Event Notes
Location: Civic Number 50 Myron Road (PW-15)
Blast No.: 2023-26
Project No: 234601.00

Microphone Linear Weighting
PSPL 105.4 dB(L) 3.739 pa.(L) at 2.365 sec
ZC Freq 2.2 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1244 mv)

	Tran	Vert	Long	
PPV	1.301	1.632	1.088	mm/s
PPV	53.28	55.25	51.73	dB
ZC Freq	64	>100	47	Hz
Time (Rel. to Trig)	0.330	0.288	0.432	sec
Peak Acceleration	0.100	0.168	0.077	g
Peak Displacement	0.003	0.003	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	4.3	4.2	4.1	

Peak Vector Sum 1.858 mm/s at 0.288 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 Long at 13:26:58 August 10, 2023
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/factory.MMB

Notes
Location:
Client:
User Name:
General:

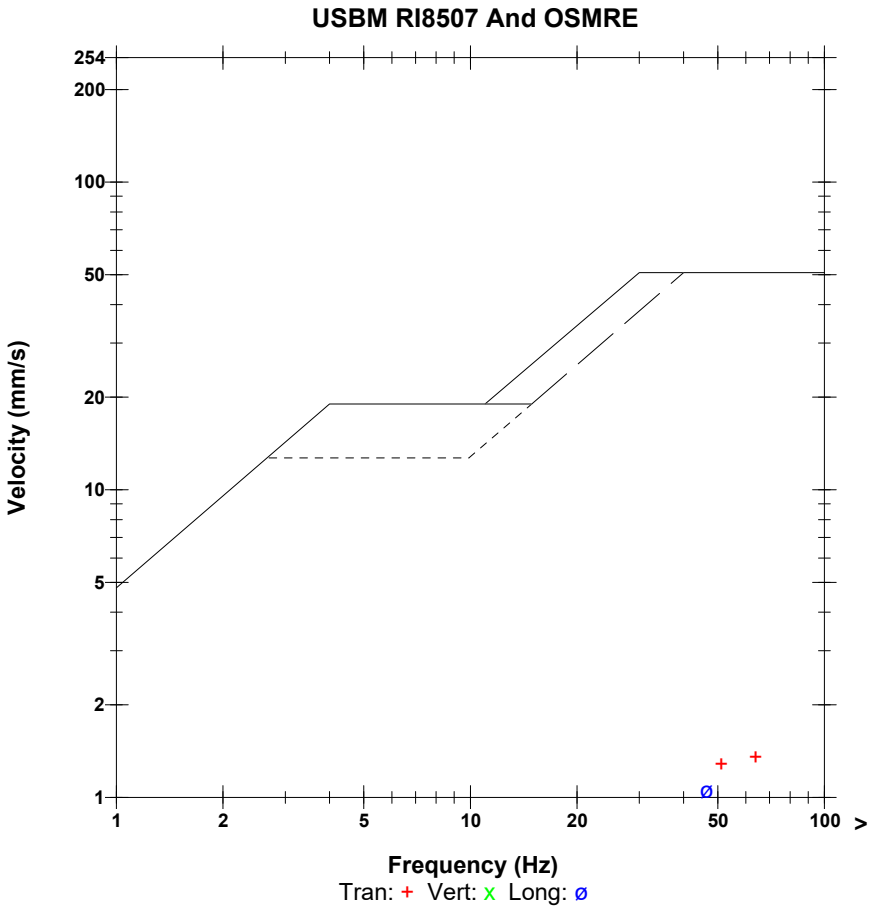
Serial Number UM18193 V 10-90GC Micromate ISEE
Battery Level 3.8 Volts
Unit Calibration May 12, 2023 by Instantel
File Name UM18193_20230810132658.IDFW

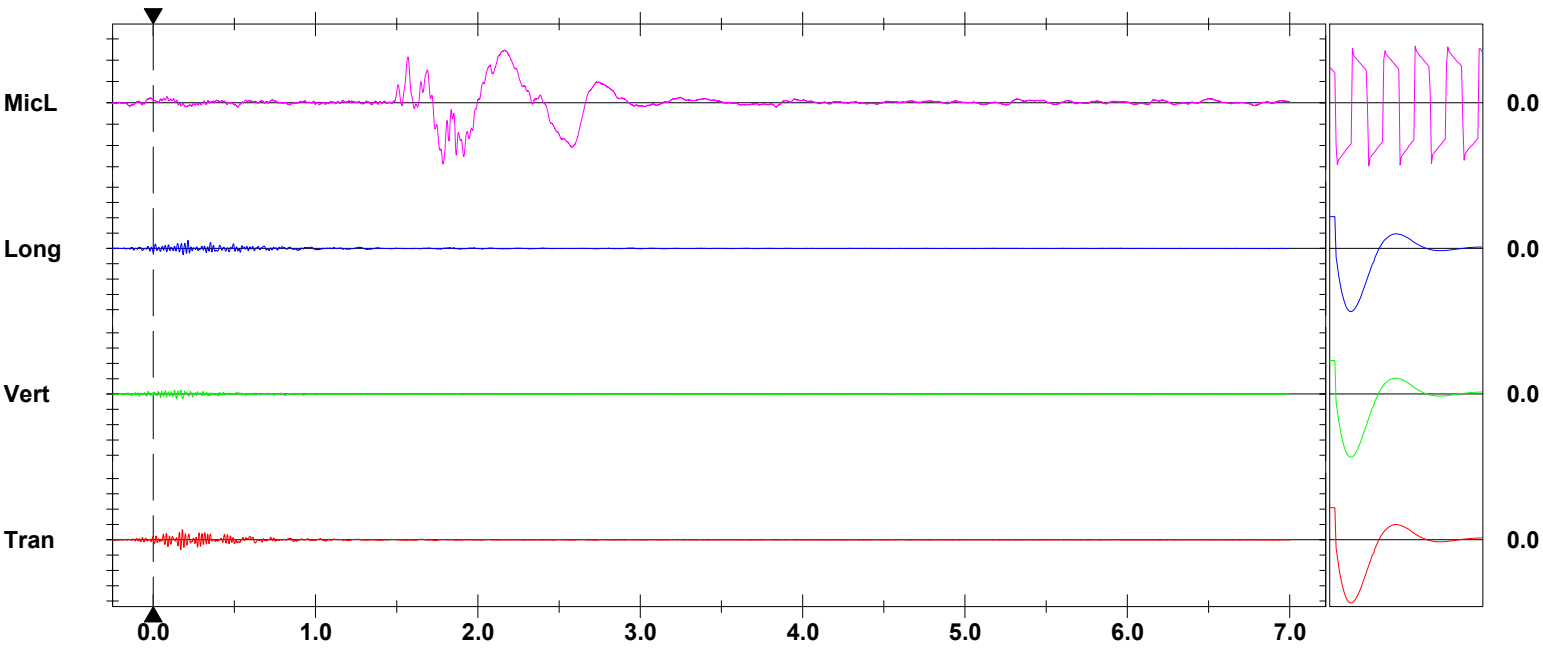
Post Event Notes
Location: Civic Number 86 Myron Road (PW-16)
Blast No.: 2023-26
Project No: 234601.00

Microphone Linear Weighting
PSPL 109.1 dB(L) 5.710 pa.(L) at 1.784 sec
ZC Freq 1.8 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1230 mv)

	Tran	Vert	Long	
PPV	1.356	0.646	1.056	mm/s
PPV	53.64	47.21	51.47	dB
ZC Freq	64	47	47	Hz
Time (Rel. to Trig)	0.180	0.146	0.214	sec
Peak Acceleration	0.084	0.030	0.041	g
Peak Displacement	0.006	0.003	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.3	Hz
Overswing Ratio	4.1	4.0	4.3	

Peak Vector Sum 1.529 mm/s at 0.181 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 13:27:18 August 10, 2023
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: August 10, 2023 16:36:03 (V10.72.1)

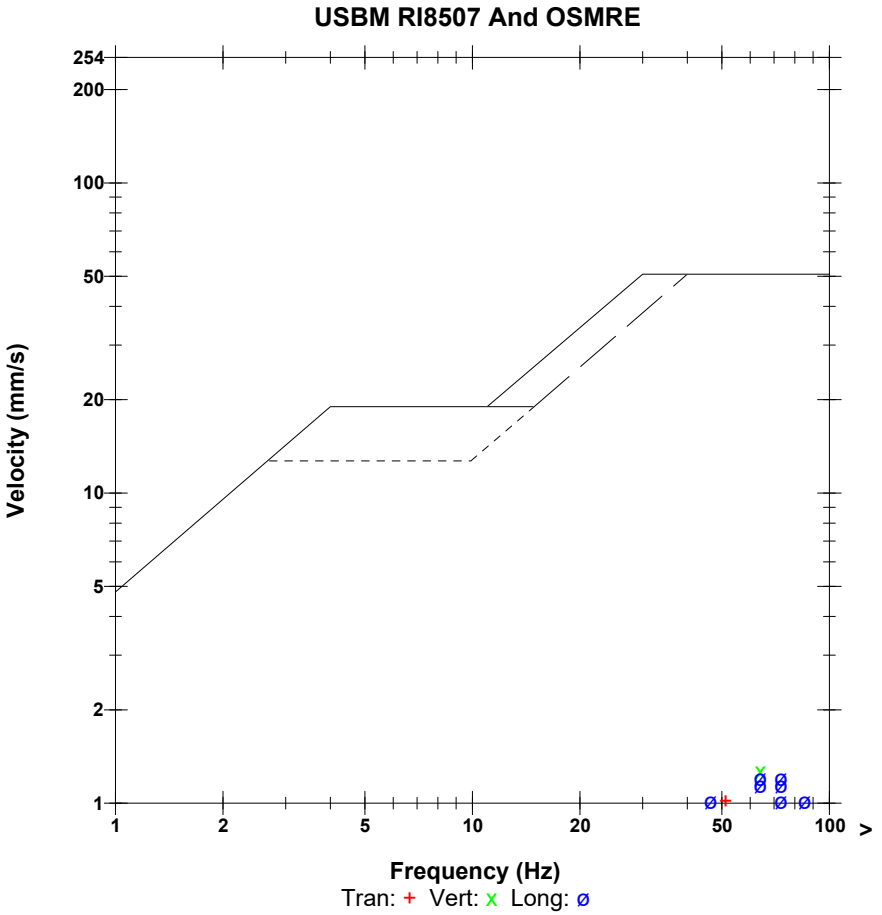
Extended Notes

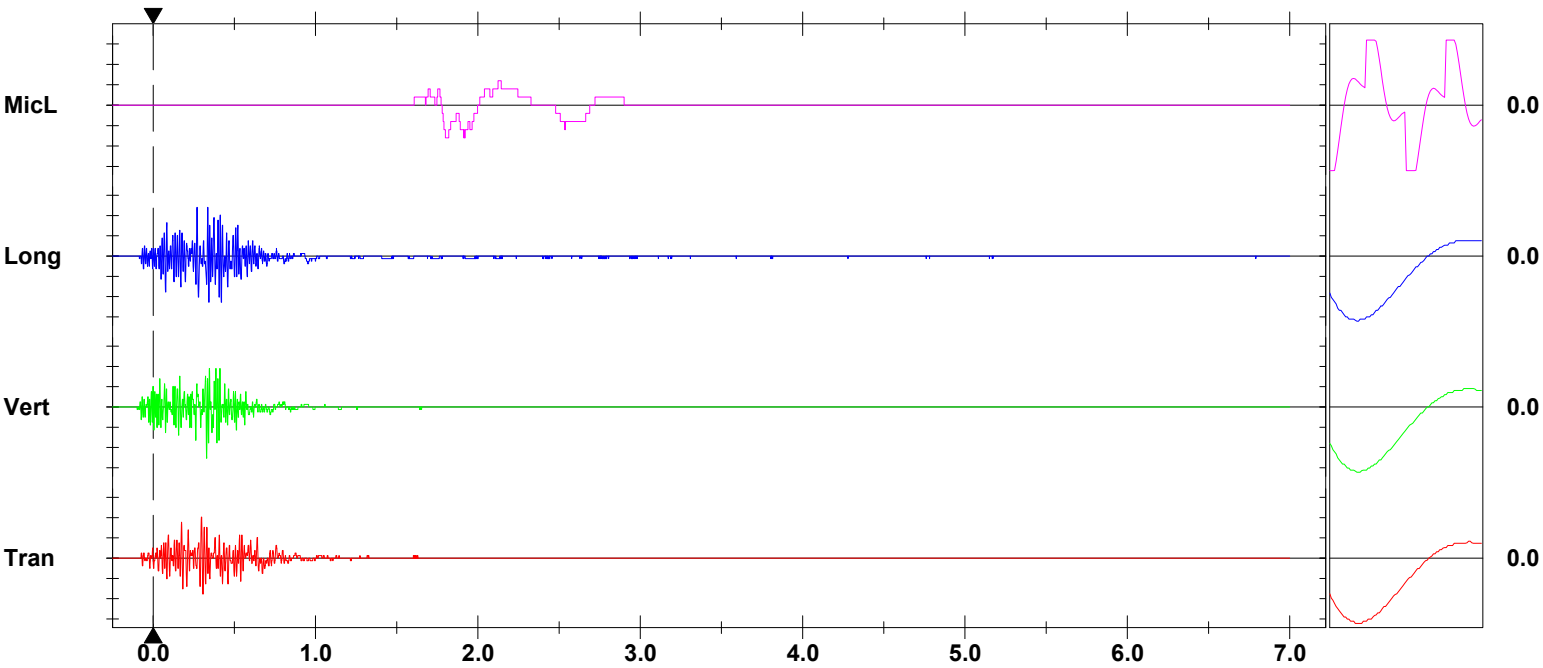
Microphone Linear Weighting
PSPL 112.0 dB(L) 8.000 pa.(L) at 1.801 sec
ZC Freq 2.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 291 mv)

	Tran	Vert	Long	
PPV	1.016	1.270	1.207	mm/s
PPV	51.14	53.08	52.63	dB
ZC Freq	51	73	64	Hz
Time (Rel. to Trig)	0.298	0.330	0.271	sec
Peak Acceleration	0.040	0.053	0.060	g
Peak Displacement	0.003	0.003	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	7.8	7.8	Hz
Overswing Ratio	3.5	3.4	3.7	

Peak Vector Sum 1.588 mm/s at 0.330 sec

Serial Number 5372 V 2.61 MiniMate
Battery Level 5.9 Volts
Unit Calibration February 28, 2023 by Instantel
File Name G372K5E0.1I0
Post Event Notes
Location: Civic Number 2337 Route 820 (PW-04)
Blast No.: 2023-26
Project No: 234601.00





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 Tran at 13:26:36 August 10, 2023
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: August 10, 2023 16:41:11 (V10.72.1)

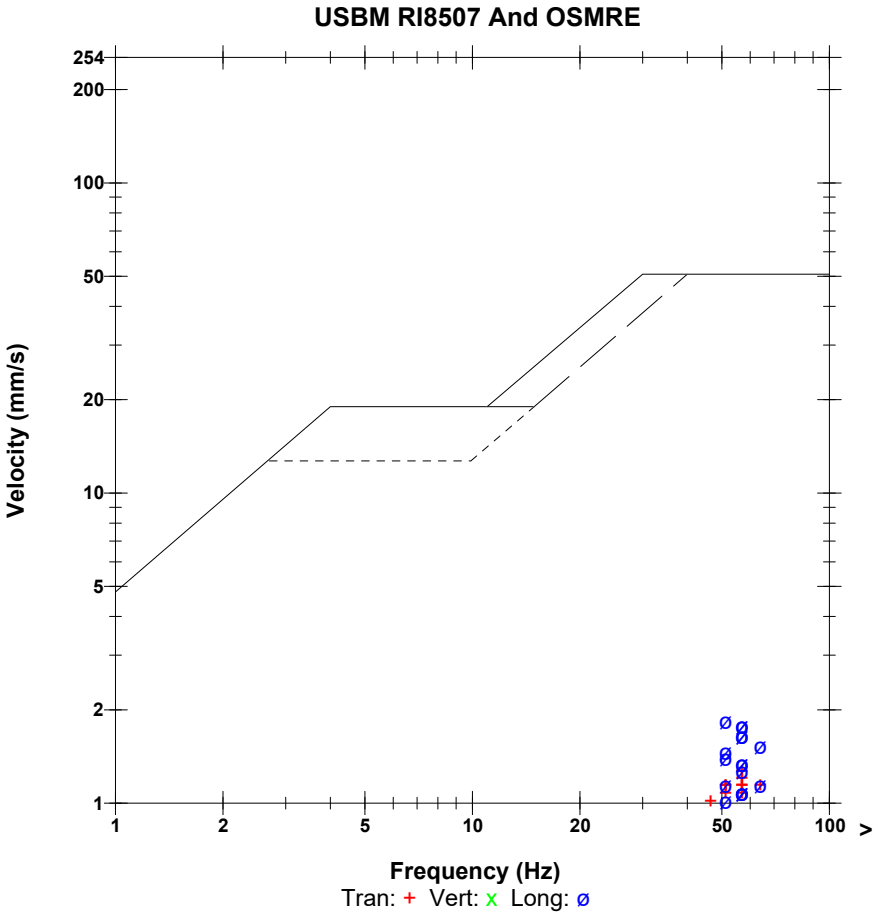
Extended Notes

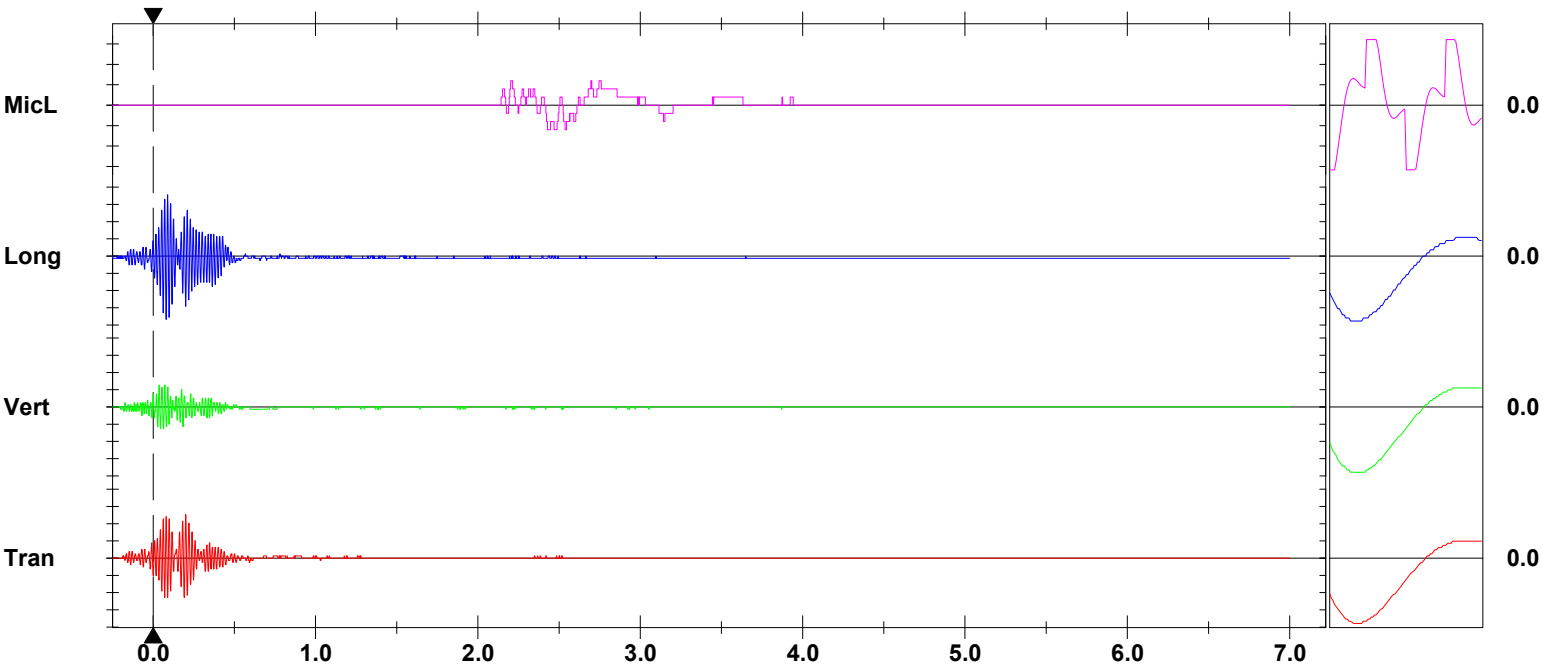
Microphone Linear Weighting
PSPL 109.5 dB(L) 6.000 pa.(L) at 2.203 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 298 mv)

	Tran	Vert	Long	
PPV	1.270	0.635	1.842	mm/s
PPV	53.08	47.06	56.30	dB
ZC Freq	57	64	57	Hz
Time (Rel. to Trig)	0.201	0.038	0.080	sec
Peak Acceleration	0.046	0.027	0.066	g
Peak Displacement	0.004	0.002	0.005	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	8.2	8.1	Hz
Overswing Ratio	3.9	3.3	3.8	

Peak Vector Sum 2.254 mm/s at 0.081 sec

Serial Number 5632 V 2.61 MiniMate
Battery Level 6.4 Volts
Unit Calibration November 16, 2022 by Instantel
File Name G632K5E0.0C0
Post Event Notes
Location: Civic Number 4140 Route 111 (PW-12)
Blast No.: 2023-26
Project No: 234601.00





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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August 17, 2023

Project No.: 234601.00

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

Re: Blast Vibration Monitoring – Blast No. 2023-27 – 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 13:15 on August 17, 2023. 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. 2023-27 – August 17, 2023

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)	13:15	1,340 m S	< 0.5 mm/s	<120	Units were not triggered
2. Civic No. 4126 Route 111 (PW-10)		959 m SE	< 0.5 mm/s	<120	
3. Civic No. 4150 Route 111 (PW-13)		834 m SE	< 0.5 mm/s	<120	
4. Civic No. 2447 Route 820 (PW-07)		967 m NE	0.51 mm/s @ 26 Hz	102	-
5. PW-03 - Cottage Route 820		640 m N	0.57 mm/s @ 85 Hz	114	-
6. Civic No. 2341 Route 820 (PW-05)		586 m N	1.66 mm/s @ 73 Hz	110	-
7. Civic No. 50 Myron Road (PW-15)		797 m NW	1.21 mm/s @ 73 Hz	110	-
8. Civic No. 86 Myron Road (PW-16)		610 m W	0.56 mm/s @ 47 Hz	106	-
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)		627 m N	1.02 mm/s @ 73 Hz	110	-
11. Civic No. 4140 Route 111 (PW-12)		893 m SE	0.57 mm/s @ 64 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: 234601.00

Attachment A

Blast Record

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 17, 2023
Project No.:	234601.00	**Time of Blast:**	13:15
Inspector:	S. Carroll	**Blast No.:**	2023-27
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Gulf Operators Ltd.		
Blaster's Certification No.:	1318	**Blaster's Name:**	Daniel Blanchard
Blast Location:	N 45°28'53.61" W 65°38'7.05" (see attached sketch)		
Type of Rock:	Anhydrate/Gypsum	**Est. Vol. or Tonnage:**	10,860 tonnes
Weather at time of Blast:	Partly cloudy	**Air Temp.:**	22°C
Est. Wind Speed :	≈ 10 km/h	**Wind Direction:**	NW
Cloud Cover:	≈50%	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	88	**Hole Diameter:**	4.5"
Average Depth:	5.2 m-6.4 m	**Spacing:**	10 ft x 10 ft
No. Holes per Delay:	2	**Collar Length:**	7 ft
Delay between Holes:	25 ms	**Delay between Rows:**	42, 67 & 84 ms
Initiation Method:	Non-Electric		
Weight of Explosives per Delay:	Max.: 95 kg		
Type and weight of Explosives for Blast:	3,788 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:**	August 17, 2023
Project No.:	234601.00	**Time of Blast:**	13:15
Inspector:	S. Carroll	**Blast No.:**	2023-27
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	586 m
Direction to the Nearest Structure:	North
Structure Type:	House
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	60.1

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:**	August 17, 2023
Project No.:	234601.00	**Time of Blast:**	13:15
Inspector:	S. Carroll	**Blast No.:**	2023-27
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Micromate, Serial #21349
Calibration Date:	July 20, 2023
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1,340 m South
Transverse Particle Velocity:	<0.5 mm/s – Unit was not triggered
Vertical Particle Velocity:	<0.5 mm/s – Unit was not triggered
Longitudinal Particle Velocity:	<0.5 mm/s – Unit was not triggered
Peak Particle Velocity:	N/A
Maximum Airblast:	<120 dB(L) – Unit was not triggered

Data Collection – Seismometer #2

Make, Model and Serial # of unit:	Instantel Minimate, Serial #5632
Calibration Date:	November 16, 2022
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	959 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:**	August 17, 2023
Project No.:	234601.00	**Time of Blast:**	13:15
Inspector:	S. Carroll	**Blast No.:**	2023-27
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	Instantel Minimate, Serial #5635
Calibration Date:	March 8, 2023
Location of seismograph:	Civic Number 4150 Route 111 (PW-13)
Distance and Direction from Blast:	834 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 Micromate, Serial #20204
Calibration Date:	June 12, 2023
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	967 m Northeast
Transverse Particle Velocity:	0.50 mm/s @ 32 Hz
Vertical Particle Velocity:	0.13 mm/s @ 51 Hz
Longitudinal Particle Velocity:	0.51 mm/s @ 26 Hz
Peak Particle Velocity:	0.51 mm/s @ 26 Hz
Maximum Airblast:	102 dB(L)

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 17, 2023
Project No.:	234601.00	**Time of Blast:**	13:15
Inspector:	S. Carroll	**Blast No.:**	2023-27
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Minimate, Serial #5676
Calibration Date:	March 8, 2023
Location of seismograph:	Cottage - PW-03 - Route 820
Distance and Direction from Blast:	640 m North
Transverse Particle Velocity:	0.51 mm/s @ 32 Hz
Vertical Particle Velocity:	0.32 mm/s @ N/A Hz
Longitudinal Particle Velocity:	0.57 mm/s @ 85 Hz
Peak Particle Velocity:	0.57 mm/s @ 85 Hz
Maximum Airblast:	114 dB(L)

Data Collection – Seismometer #6

Make, Model and Serial # of unit:	Instantel Micromate, Serial #18187
Calibration Date:	May 12, 2023
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	586 m North
Transverse Particle Velocity:	1.66 mm/s @ 73 Hz
Vertical Particle Velocity:	1.21 mm/s @ 57 Hz
Longitudinal Particle Velocity:	1.56 mm/s @ 57 Hz
Peak Particle Velocity:	1.66 mm/s @ 74 Hz
Maximum Airblast:	110 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 17, 2023
Project No.:	234601.00	**Time of Blast:**	13:15
Inspector:	S. Carroll	**Blast No.:**	2023-27
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Minimate, Serial #5372
Calibration Date:	February 28, 2023
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	797 m Northwest
Transverse Particle Velocity:	1.21 mm/s @ 73 Hz
Vertical Particle Velocity:	1.14 mm/s @ 85 Hz
Longitudinal Particle Velocity:	0.83 mm/s @ 51 Hz
Peak Particle Velocity:	1.21 mm/s @ 73 Hz
Maximum Airblast:	110 dB(L)

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	Instantel Micromate, Serial #21696
Calibration Date:	July 10, 2023
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	610 m West
Transverse Particle Velocity:	0.50 mm/s @ 39 Hz
Vertical Particle Velocity:	0.35 mm/s @ 43 Hz
Longitudinal Particle Velocity:	0.56 mm/s @ 47 Hz
Peak Particle Velocity:	0.56 mm/s @ 47 Hz
Maximum Airblast:	105 dB(L)

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 17, 2023
Project No.:	234601.00	**Time of Blast:**	13:15
Inspector:	S. Carroll	**Blast No.:**	2023-27
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	Instantel Minimate, Serial #5673
Calibration Date:	April 25, 2023
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 Minimate, Serial # 5371
Calibration Date:	August 3, 2023
Location of seismograph:	Civic Number 2337 Route 820 (PW-04)
Distance and Direction from Blast:	627 m North
Transverse Particle Velocity:	0.83 mm/s @ 73 Hz
Vertical Particle Velocity:	0.70 mm/s @ >100 Hz
Longitudinal Particle Velocity:	1.02 mm/s @ 73Hz
Peak Particle Velocity:	1.02 mm/s @ 73 Hz
Maximum Airblast:	110 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 17, 2023
Project No.:	234601.00	**Time of Blast:**	13:15
Inspector:	S. Carroll	**Blast No.:**	2023-27
Client:	Hammond River Holdings		

Data Collection – Seismometer #11

Make, Model and Serial # of unit:	Instantel Minimate, Serial # 5487
Calibration Date:	January 16, 2023
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	893 m Southeast
Transverse Particle Velocity:	0.57 mm/s @ 64 Hz
Vertical Particle Velocity:	0.32 mm/s @ 64 Hz
Longitudinal Particle Velocity:	0.57 mm/s @ 64 Hz
Peak Particle Velocity:	0.57 mm/s @ 64 Hz
Maximum Airblast:	106 dB(L)

Attachment B

Blast and Seismograph Location Plan

Blast and Seismograph Location Plan
Blast No: 2023-27
Upham East Gypsum Quarry, Upham, NB

Date: August 17, 2023
Project No.: 234601.00

Attachment C

Blast Event Reports

Event Report

Date/Time Tran at 13:15:14 August 17, 2023
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

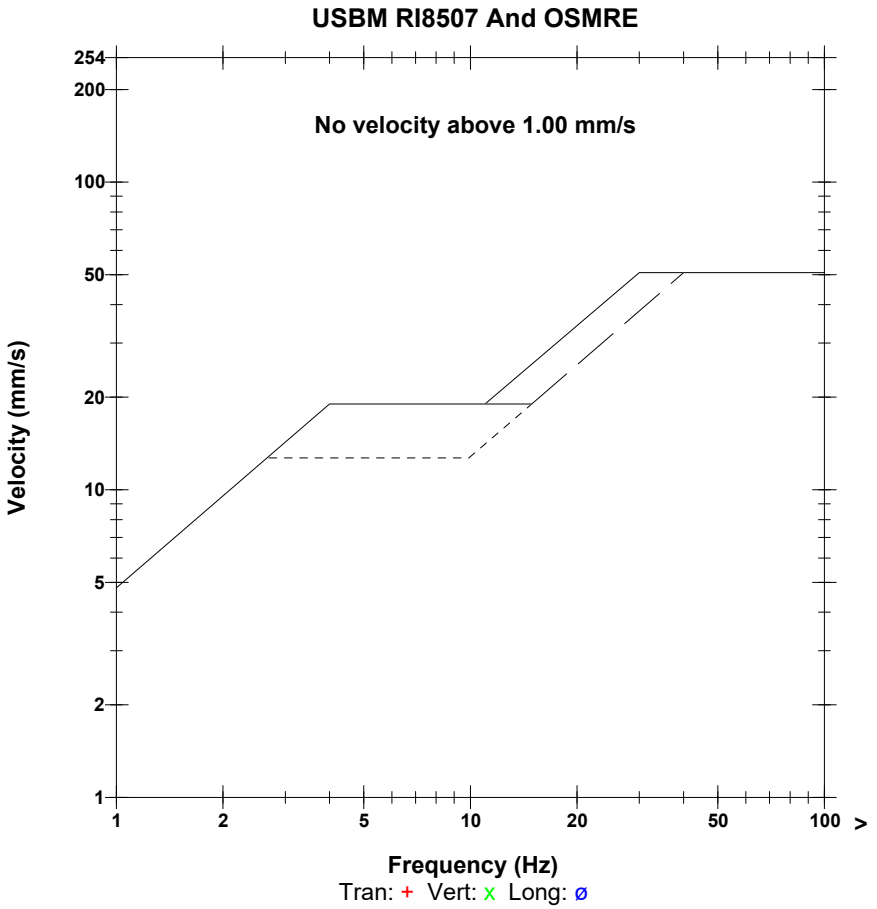
Serial Number UM20204 V 10-90GC Micromate ISEE
Battery Level 3.6 Volts
Unit Calibration June 12, 2023 by Instantel
File Name UM20204_20230817131514.IDFW

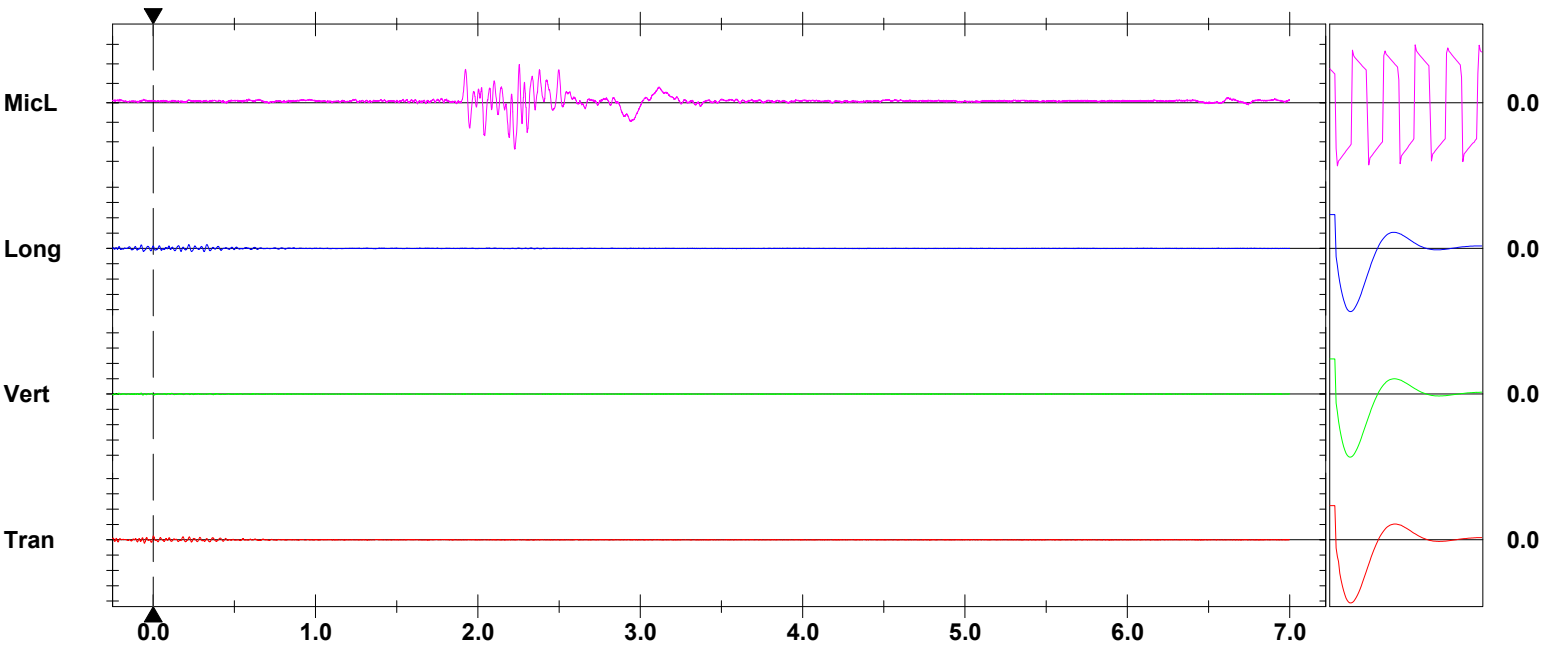
Post Event Notes
Location: Civic Number 2447 Route 820 (PW-07)
Blast No.: 2023-27
Project No: 234601.00

Microphone Linear Weighting
PSPL 101.5 dB(L) 2.374 pa.(L) at 2.227 sec
ZC Freq 16 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1256 mv)

	Tran	Vert	Long	
PPV	0.504	0.134	0.512	mm/s
PPV	45.06	33.54	45.19	dB
ZC Freq	32	51	26	Hz
Time (Rel. to Trig)	0.001	-0.246	0.331	sec
Peak Acceleration	0.017	0.006	0.015	g
Peak Displacement	0.002	0.001	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.5	7.5	Hz
Overswing Ratio	4.0	4.1	3.9	

Peak Vector Sum 0.610 mm/s at 0.221 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 Long at 13:15:17 August 17, 2023
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: August 17, 2023 15:22:23 (V10.72.1)

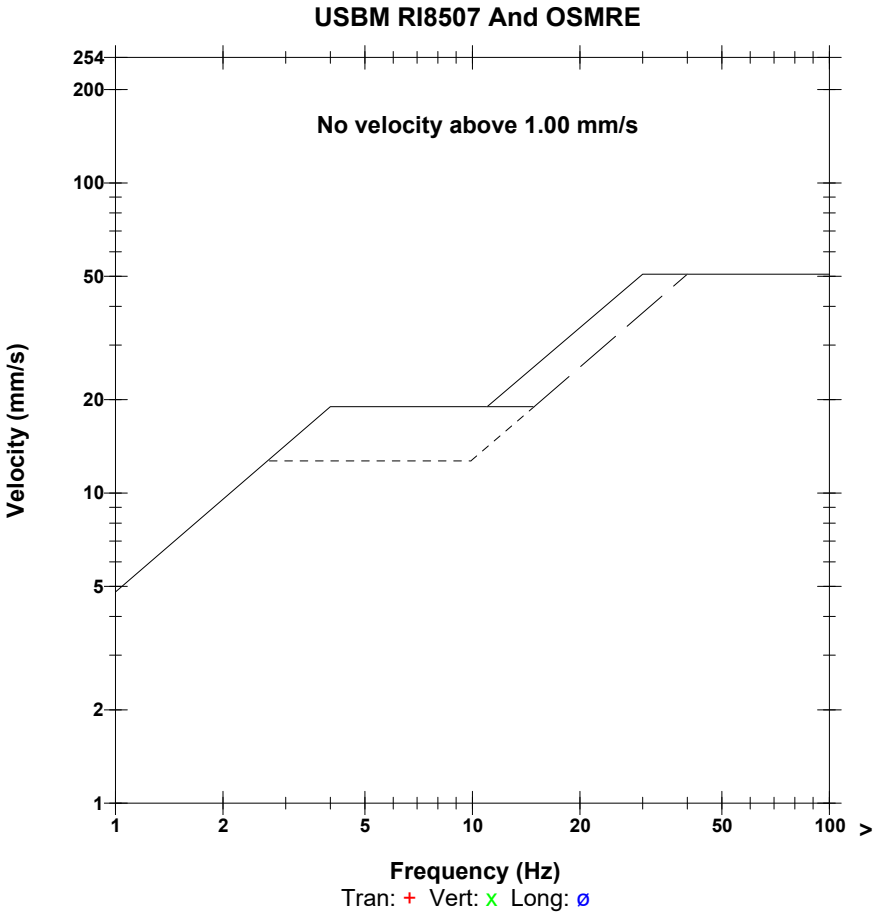
Extended Notes

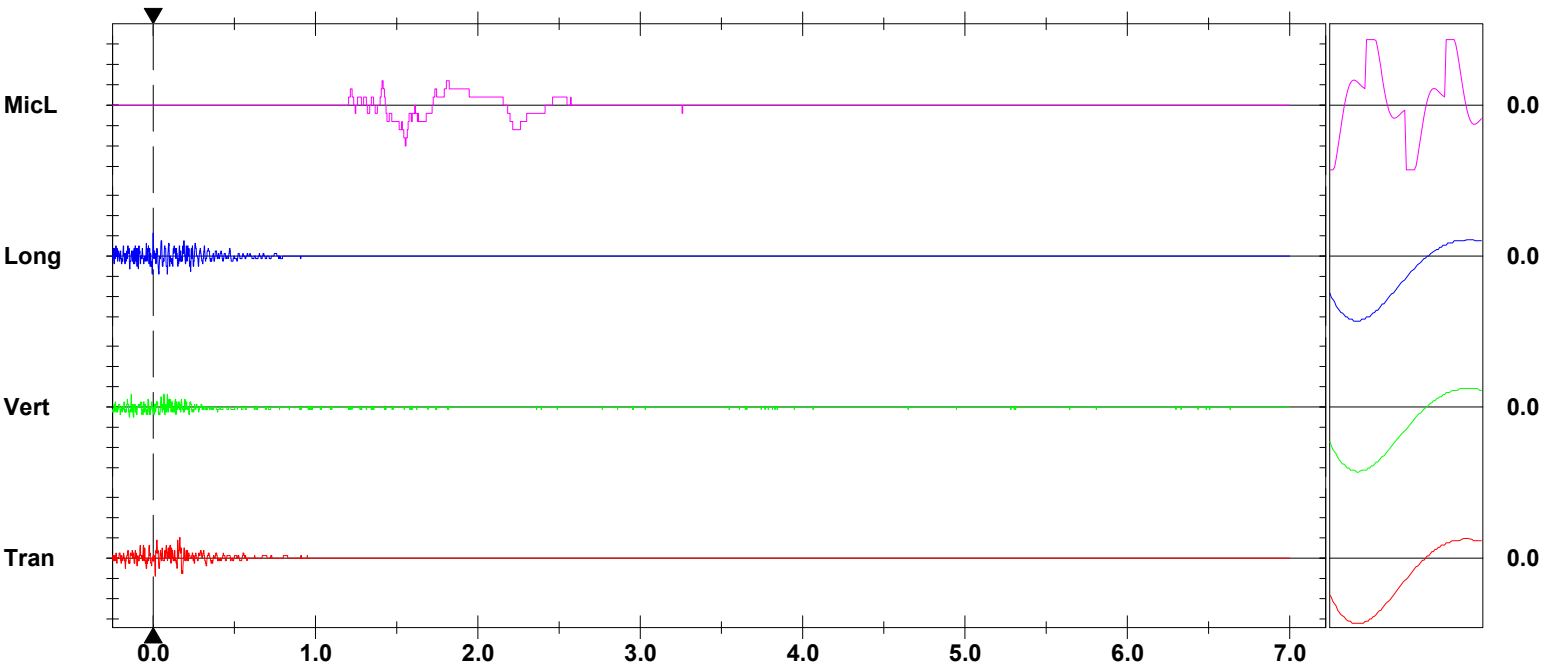
Microphone Linear Weighting
PSPL 114.0 dB(L) 10.000 pa.(L) at 1.554 sec
ZC Freq 3.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 301 mv)

	Tran	Vert	Long	
PPV	0.508	0.318	0.572	mm/s
PPV	45.12	41.03	46.14	dB
ZC Freq	32	N/A	85	Hz
Time (Rel. to Trig)	0.164	-0.134	0.001	sec
Peak Acceleration	0.027	0.020	0.027	g
Peak Displacement	0.002	0.001	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	8.0	7.8	Hz
Overswing Ratio	3.5	3.7	3.9	

Peak Vector Sum 0.587 mm/s at 0.001 sec
N/A: Not Applicable

Serial Number 5676 V 2.61 MiniMate
Battery Level 6.4 Volts
Unit Calibration March 8, 2023 by Instantel
File Name G676K5QY.5H0
Post Event Notes
Location: Cottage off Route 820 (PW-03)
Blast No.: 2023-27
Project No: 234601.00





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 13:15:12 August 17, 2023
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/factory.MMB

Notes
Location:
Client:
User Name:
General:

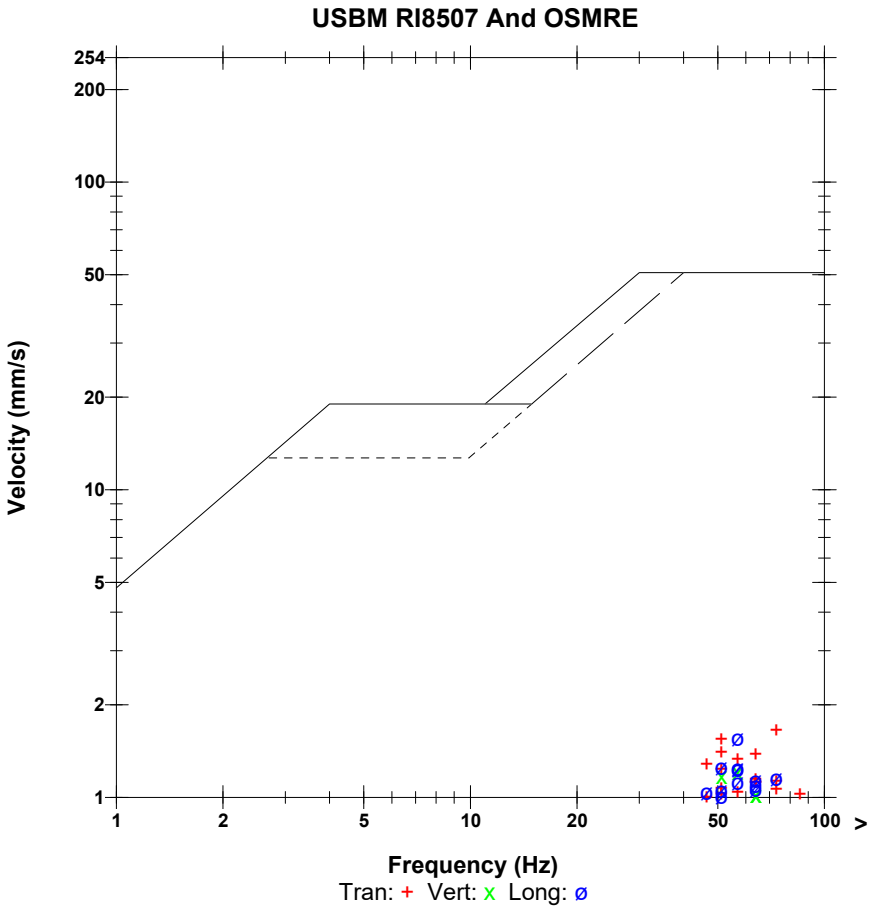
Serial Number UM18187 V 10-90GC Micromate ISEE
Battery Level 3.6 Volts
Unit Calibration May 12, 2023 by Instantel
File Name UM18187_20230817131512.IDFW

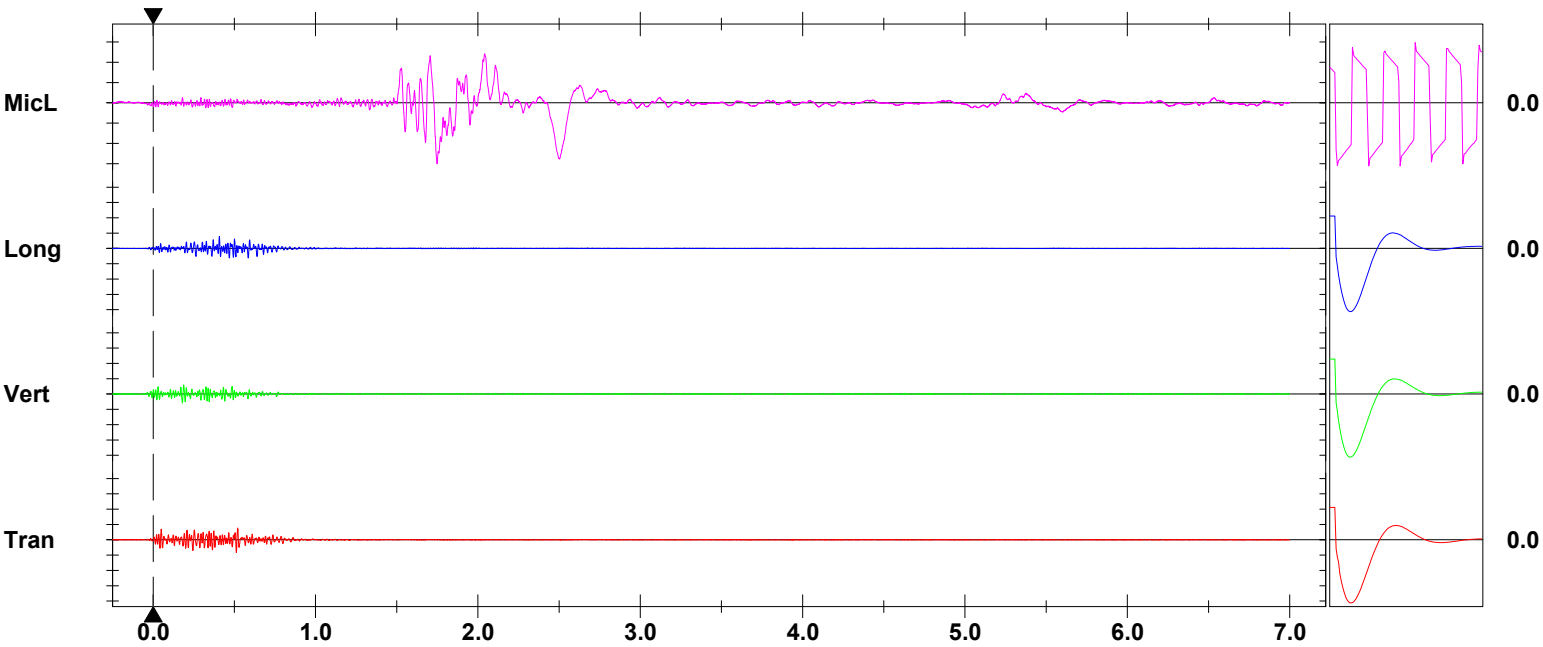
Post Event Notes
Location: Civic Number 2341 Route 820 (PW-05)
Blast No.: 2023-27
Project No: 234601.00

Microphone Linear Weighting
PSPL 109.5 dB(L) 5.989 pa.(L) at 1.748 sec
ZC Freq 3.6 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1313 mv)

	Tran	Vert	Long	
PPV	1.655	1.206	1.561	mm/s
PPV	55.38	52.63	54.87	dB
ZC Freq	73	57	57	Hz
Time (Rel. to Trig)	0.512	0.188	0.407	sec
Peak Acceleration	0.126	0.081	0.095	g
Peak Displacement	0.005	0.004	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.7	Hz
Overswing Ratio	4.4	4.2	4.1	

Peak Vector Sum 1.703 mm/s at 0.512 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 Tran at 13:15:31 August 17, 2023
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: August 17, 2023 15:40:34 (V10.72.1)

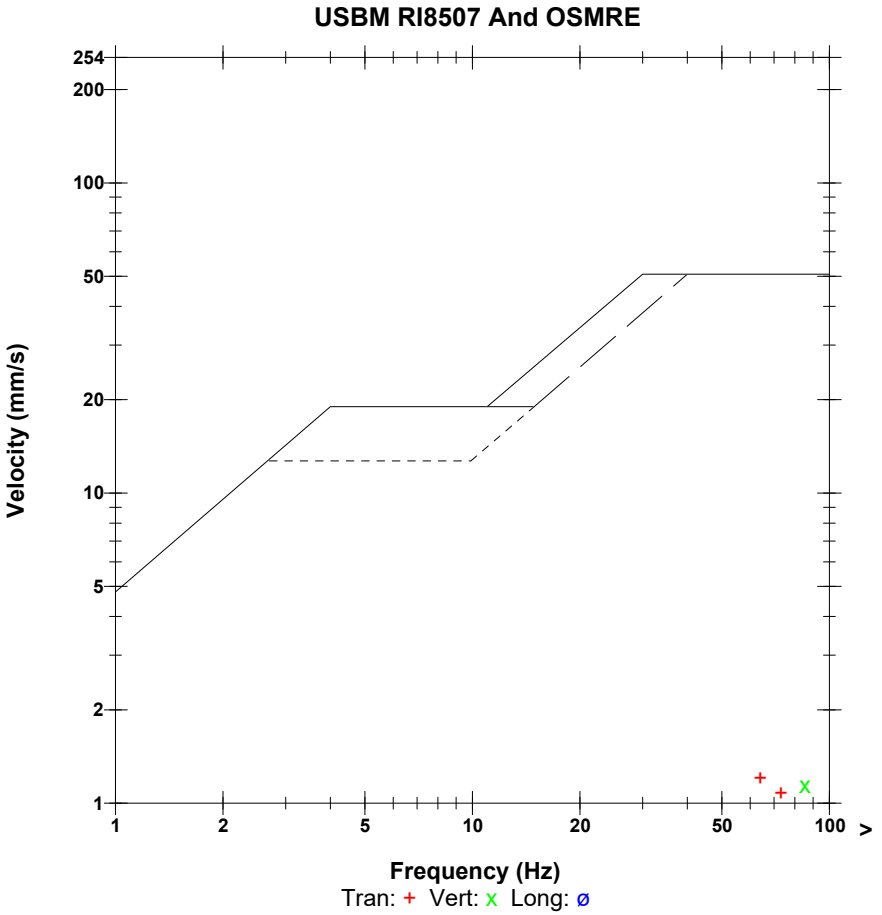
Extended Notes

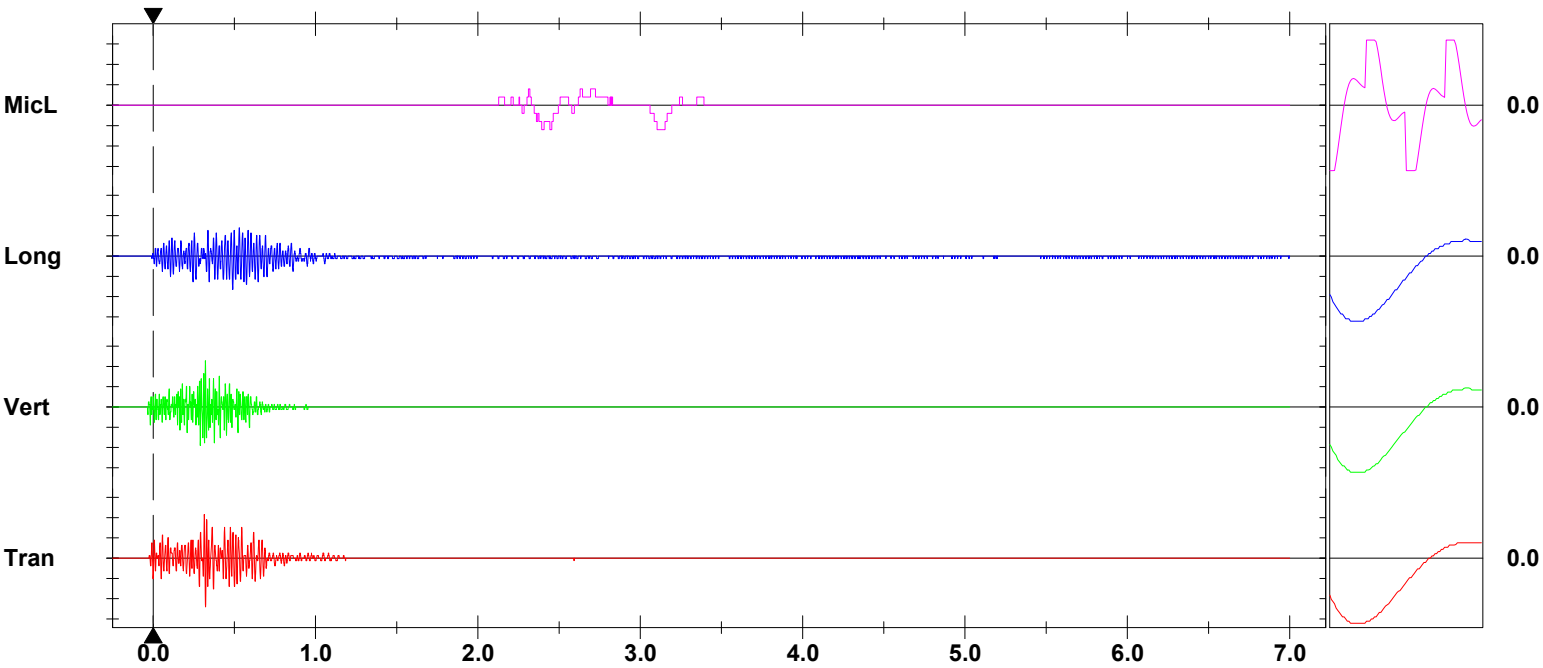
Microphone Linear Weighting
PSPL 109.5 dB(L) 6.000 pa.(L) at 2.394 sec
ZC Freq 3.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 291 mv)

	Tran	Vert	Long	
PPV	1.207	1.143	0.826	mm/s
PPV	52.63	52.16	49.33	dB
ZC Freq	73	85	51	Hz
Time (Rel. to Trig)	0.323	0.322	0.491	sec
Peak Acceleration	0.053	0.060	0.027	g
Peak Displacement	0.003	0.002	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.7	8.0	8.0	Hz
Overswing Ratio	3.7	3.3	3.4	

Peak Vector Sum 1.619 mm/s at 0.322 sec

Serial Number 5372 V 2.61 MiniMate
Battery Level 6.1 Volts
Unit Calibration February 28, 2023 by Instantel
File Name G372K5QY.5V0
Post Event Notes
Location: Civic Number 50 Myron Road (PW-15)
Blast No.: 2023-27
Project No: 234601.00





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 Long at 13:15:12 August 17, 2023
Trigger Source Geo: 0.500 mm/s, Mic: 100.00 dB(L)
Range Geo: 254.0 mm/s
Record Time 7.0 sec at 1024 sps
Operator/Setup: Operator/Micromate min trigger mmb.MMB

Notes
Location
Client
Company
General Notes

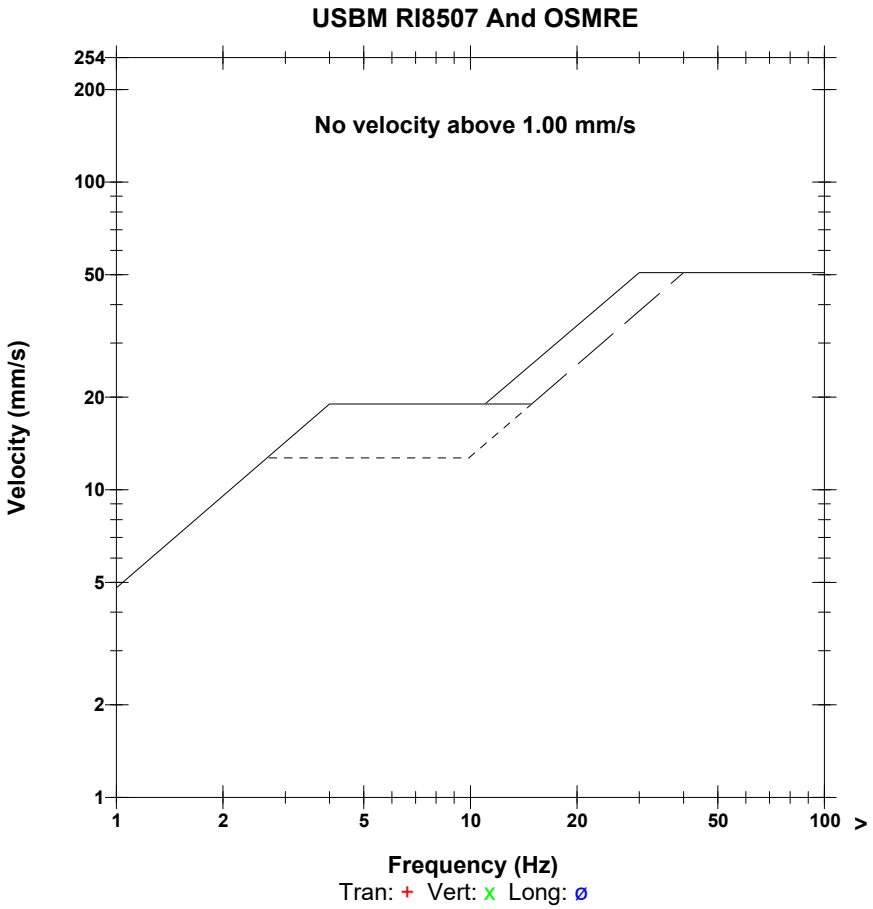
Serial Number UM21696 V 10-90GC Micromate ISEE
Battery Level 3.7 Volts
Unit Calibration July 10, 2023 by Instantel
File Name UM21696_20230817131512.IDFW

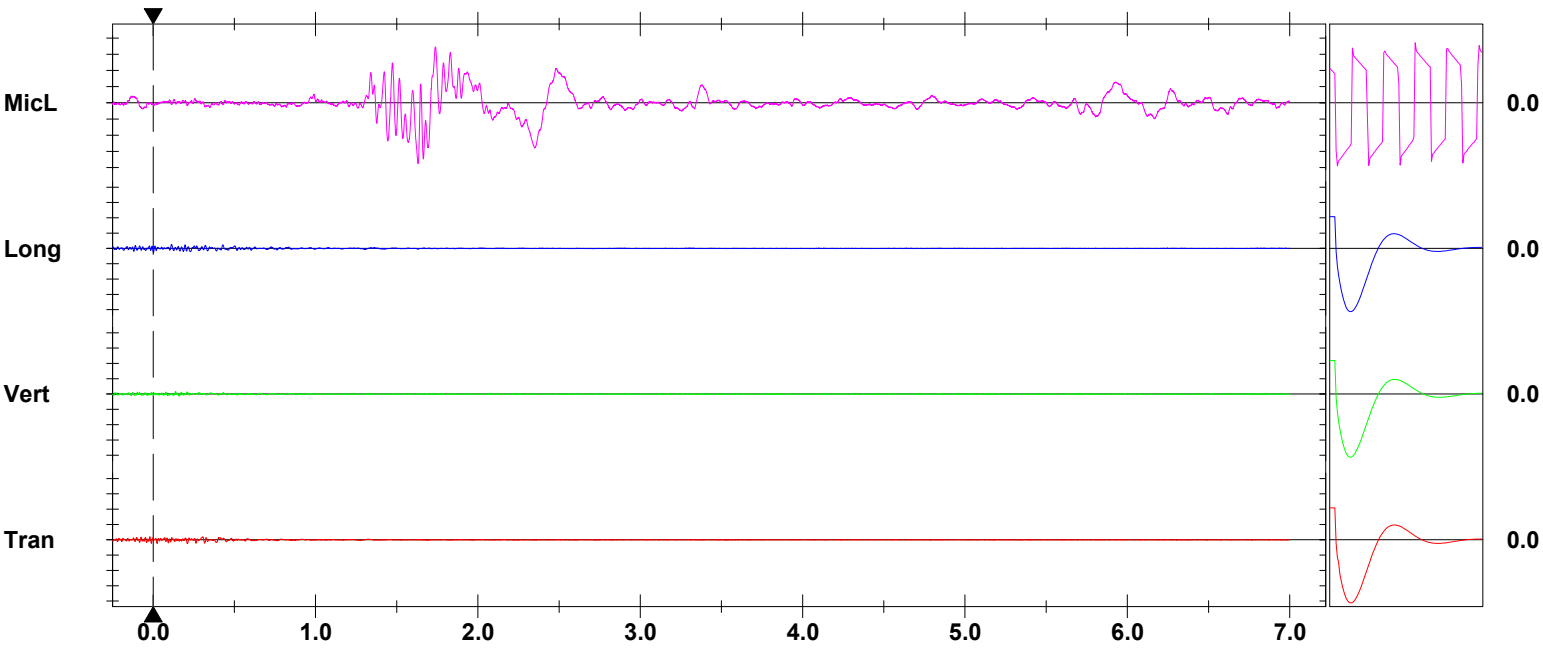
Post Event Notes
Location: Civic Number 86 Myron Road (PW-16)
Blast No.: 2023-27
Project No: 234601.00

Microphone Linear Weighting
PSPL 105.5 dB(L) 3.755 pa.(L) at 1.630 sec
ZC Freq 13 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1302 mv)

	Tran	Vert	Long	
PPV	0.504	0.347	0.560	mm/s
PPV	45.06	41.80	45.96	dB
ZC Freq	39	43	47	Hz
Time (Rel. to Trig)	0.211	0.139	0.001	sec
Peak Acceleration	0.026	0.012	0.026	g
Peak Displacement	0.004	0.001	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.5	7.5	Hz
Overswing Ratio	4.3	4.3	4.3	

Peak Vector Sum 0.607 mm/s at 0.113 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 Long at 13:15:23 August 17, 2023
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: August 17, 2023 15:29:57 (V10.72.1)

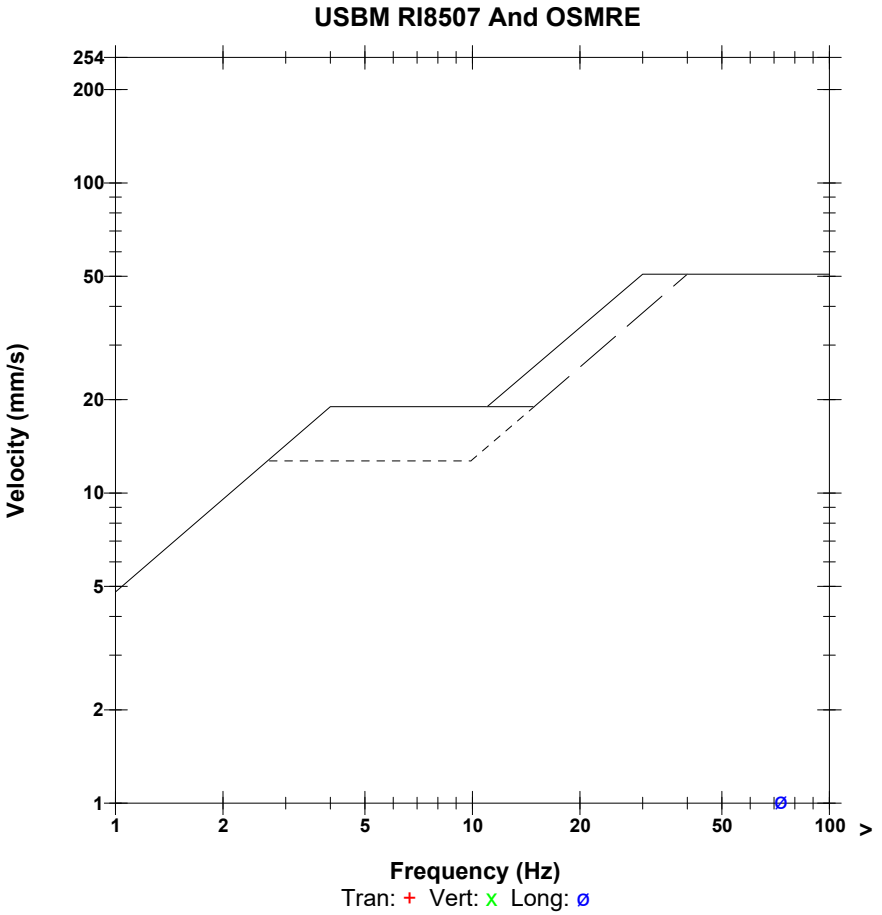
Extended Notes

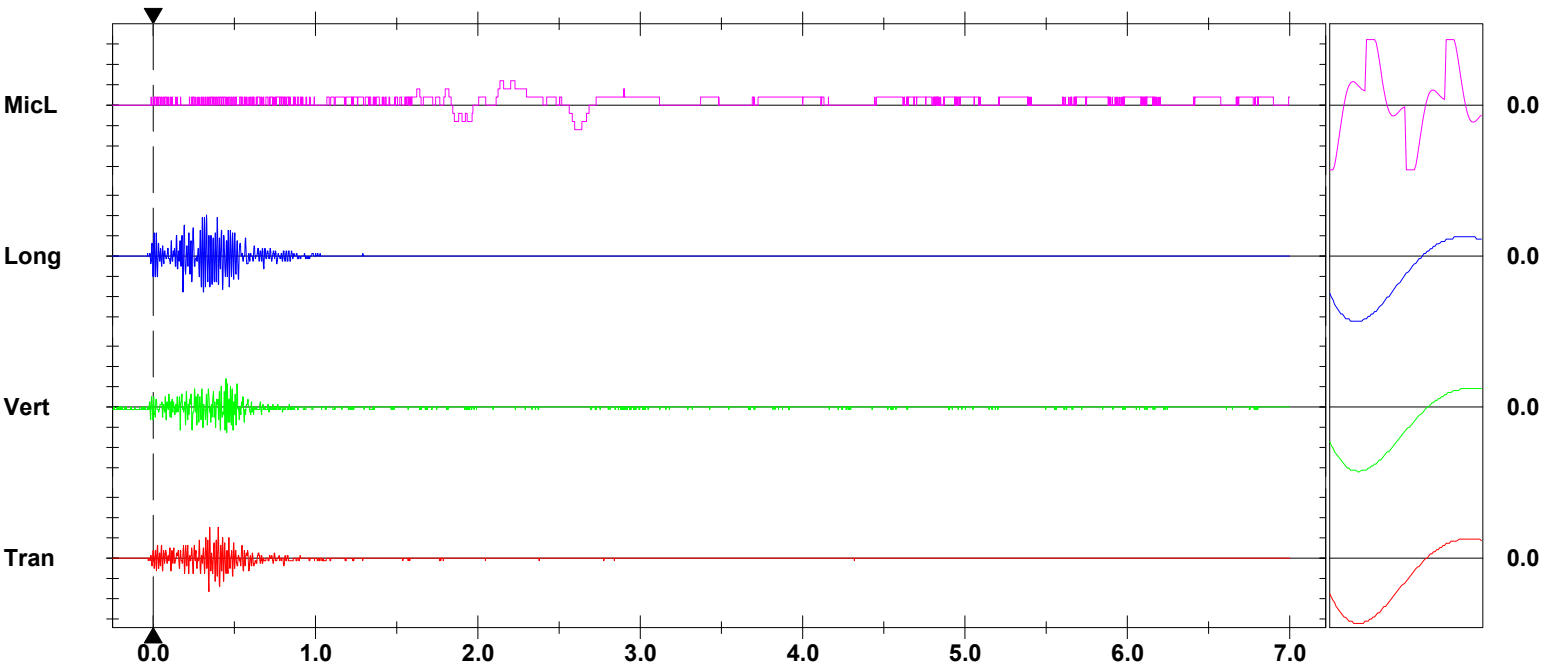
Microphone Linear Weighting
PSPL 109.5 dB(L) 6.000 pa.(L) at 2.137 sec
ZC Freq 2.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 303 mv)

	Tran	Vert	Long	
PPV	0.826	0.699	1.016	mm/s
PPV	49.33	47.88	51.14	dB
ZC Freq	73	>100	73	Hz
Time (Rel. to Trig)	0.343	0.448	0.329	sec
Peak Acceleration	0.040	0.040	0.046	g
Peak Displacement	0.002	0.002	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.0	7.8	8.3	Hz
Overswing Ratio	3.6	3.7	3.5	

Peak Vector Sum 1.064 mm/s at 0.329 sec

Serial Number 5371 V 2.61 MiniMate
Battery Level 6.4 Volts
Unit Calibration August 3, 2023 by Instantel
File Name G371K5QY.5N0
Post Event Notes
Location: Civic Number 2337 Route 820 (PW-04)
Blast No.: 2023-27
Project No: 234601.00





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 Long at 13:15:11 August 17, 2023
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: August 17, 2023 15:45:05 (V10.72.1)

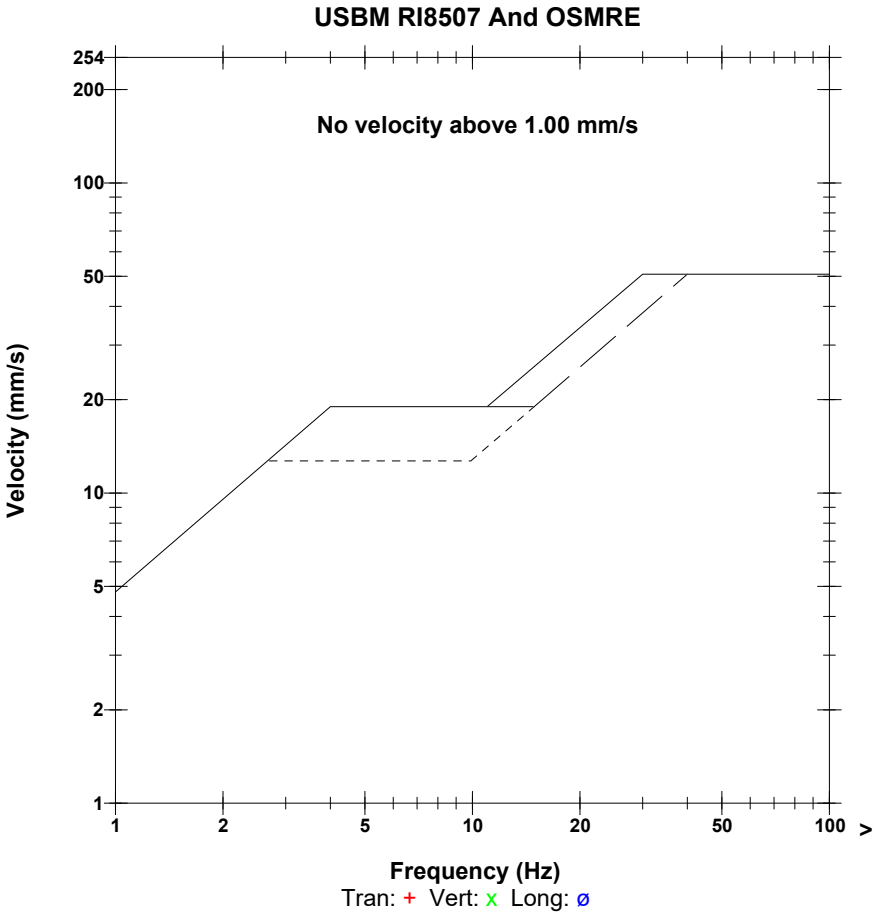
Extended Notes

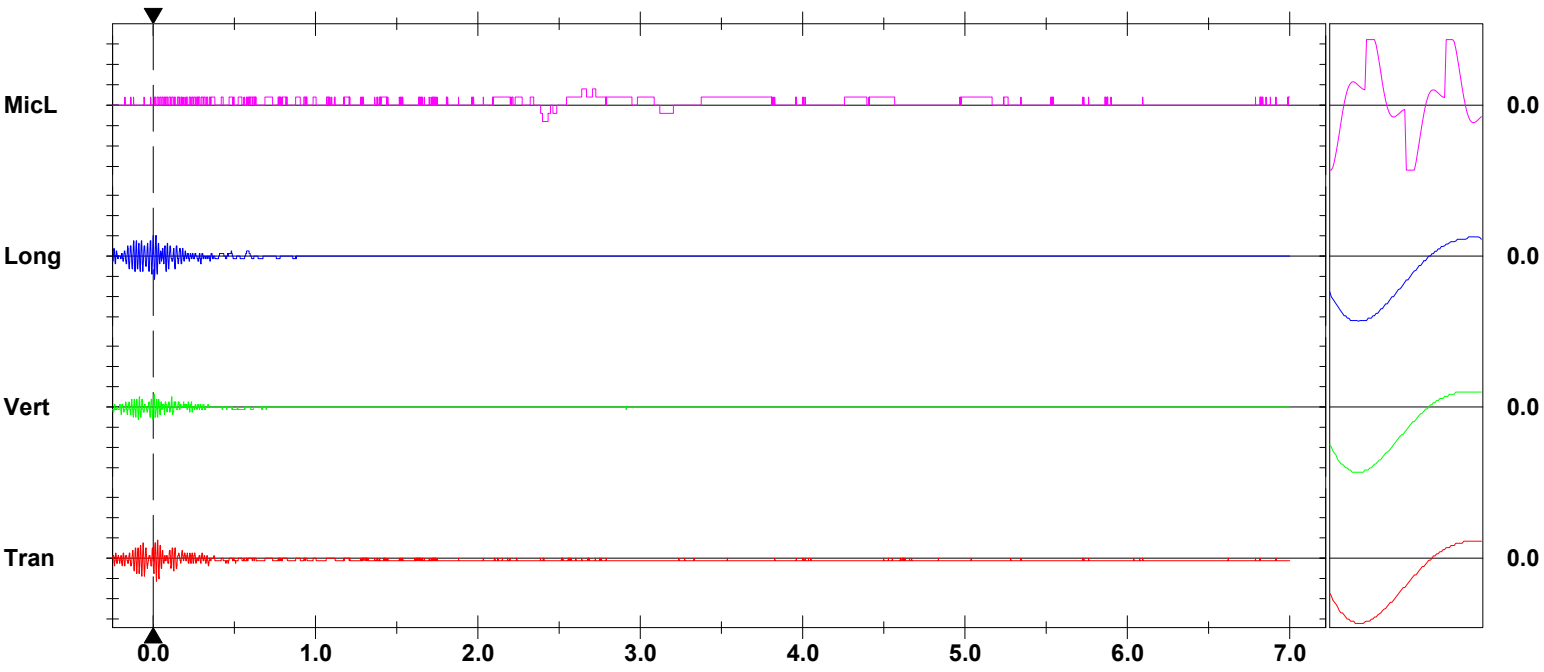
Microphone Linear Weighting
PSPL 106.0 dB(L) 4.000 pa.(L) at 2.398 sec
ZC Freq 8.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 287 mv)

	Tran	Vert	Long	
PPV	0.572	0.318	0.572	mm/s
PPV	46.14	41.03	46.14	dB
ZC Freq	64	64	64	Hz
Time (Rel. to Trig)	0.021	-0.001	0.009	sec
Peak Acceleration	0.020	0.013	0.020	g
Peak Displacement	0.001	0.001	0.001	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.6	7.8	7.7	Hz
Overswing Ratio	3.5	3.8	3.8	

Peak Vector Sum 0.635 mm/s at 0.020 sec

Serial Number 5487 V 2.61 MiniMate
Battery Level 6.1 Volts
Unit Calibration January 16, 2023 by Instantel
File Name G487K5QY.5B0
Post Event Notes
Location: Civic Number 4140 Route 111 (PW-12)
Blast No.: 2023-27
Project No: 234601.00





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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August 28, 2023

Project No.: 234601.00

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

Re: Blast Vibration Monitoring – Blast No. 2023-28 – 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 13:54 on August 25, 2023. 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. 2023-28 – August 25, 2023

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)	13:54	1,305 m S	< 0.5 mm/s	<120	Unit was not triggered
2. Civic No. 4126 Route 111 (PW-10)		924 m SE	0.58 mm/s @ 64 Hz	102	-
3. Civic No. 4150 Route 111 (PW-13)		789 m SE	< 0.5 mm/s	<120	Units were not triggered
4. Civic No. 2447 Route 820 (PW-07)		1,010 m NE	< 0.5 mm/s	<120	
5. PW-03 - Cottage Route 820		684 m N	< 0.5 mm/s	<120	
6. Civic No. 2341 Route 820 (PW-05)		656 m N	1.27 mm/s @ >100 Hz	115	-
7. Civic No. 50 Myron Road (PW-15)		854 m NW	0.57 mm/s @ 85 Hz	116	-
8. Civic No. 86 Myron Road (PW-16)		689 m W	0.70 mm/s @ 43 Hz	114	-
9. Civic No. 220 Myron Road (PW-01)		1,288 m S	< 0.5 mm/s	<120	Units were not triggered
10. Civic No. 2337 Route 820 (PW-04)		705 m N	< 0.5 mm/s	<120	
11. Civic No. 4140 Route 111 (PW-12)		849 m SE	0.57 mm/s @ 64 Hz	110	-
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: 234601.00

Attachment A

Blast Record

BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 25, 2023
Project No.:	234601.00	**Time of Blast:**	13:54
Inspector:	I. Villegas	**Blast No.:**	2023-28
Client:	Hammond River Holdings		

IDENTIFICATION:

Blasting Contractor:	Gulf Operators Ltd.		
Blaster's Certification No.:	1318	**Blaster's Name:**	Daniel Blanchard
Blast Location:	N 45º28'51.9" W 65º38'5.9" (see attached sketch)		
Type of Rock:	Anhydrate/Gypsum	**Est. Vol. or Tonnage:**	21,735 tonnes
Weather at time of Blast:	Partly cloudy	**Air Temp.:**	19ºC
Est. Wind Speed :	≈ 10 km/h	**Wind Direction:**	SE
Cloud Cover:	≈20%	**Precipitation:**	No

BLAST DESIGN:

Total No. Holes:	133	**Hole Diameter:**	4.5"
Average Depth:	4.7 m – 6.7 m	**Spacing:**	12 ft x 12 ft
No. Holes per Delay:	3	**Collar Length:**	7 ft
Delay between Holes:	25 ms	**Delay between Rows:**	34, 42 & 67 ms
Initiation Method:	Non-Electric		
Weight of Explosives per Delay:	Max.: 120 kg		
Type and weight of Explosives for Blast:	5,019 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:**	August 25, 2023
Project No.:	234601.00	**Time of Blast:**	13:54
Inspector:	I. Villegas	**Blast No.:**	2023-28
Client:	Hammond River Holdings		

BLAST MONITORING

Distance to the Nearest Structure:	656 m
Direction to the Nearest Structure:	North
Structure Type:	House
Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):	59.9

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:**	August 25, 2023
Project No.:	234601.00	**Time of Blast:**	13:54
Inspector:	I. Villegas	**Blast No.:**	2023-28
Client:	Hammond River Holdings		

Data Collection – Seismometer #1

Make, Model and Serial # of unit:	Instantel Minimate, Serial #5489
Calibration Date:	May 5, 2023
Location of seismograph:	Civic Number 4079 Route 111 (PW-09)
Distance and Direction from Blast:	1,305 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 Micromate, Serial #21696
Calibration Date:	July 10, 2023
Location of seismograph:	Civic Number 4126 Route 111 (PW-10)
Distance and Direction from Blast:	924 m Southeast
Transverse Particle Velocity:	0.45 mm/s @ 64 Hz
Vertical Particle Velocity:	0.58 mm/s @ 64 Hz
Longitudinal Particle Velocity:	0.47 mm/s @ 57 Hz
Peak Particle Velocity:	0.58 mm/s @ 64 Hz
Maximum Airblast:	102 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 25, 2023
Project No.:	234601.00	**Time of Blast:**	13:54
Inspector:	I. Villegas	**Blast No.:**	2023-28
Client:	Hammond River Holdings		

Data Collection – Seismometer #3

Make, Model and Serial # of unit:	Instantel Minimate, Serial #5371
Calibration Date:	August 3, 2023
Location of seismograph:	Civic Number 4150 Route 111 (PW-13)
Distance and Direction from Blast:	789 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 Micromate, Serial #20204
Calibration Date:	June 12, 2023
Location of seismograph:	Civic Number 2447 Route 820 (PW-07)
Distance and Direction from Blast:	1,010 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:**	August 25, 2023
Project No.:	234601.00	**Time of Blast:**	13:54
Inspector:	I. Villegas	**Blast No.:**	2023-28
Client:	Hammond River Holdings		

Data Collection – Seismometer #5

Make, Model and Serial # of unit:	Instantel Micromate, Serial #18187
Calibration Date:	May 12, 2023
Location of seismograph:	Cottage - PW-03 - Route 820
Distance and Direction from Blast:	684 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 Micromate, Serial #20203
Calibration Date:	May 30, 2023
Location of seismograph:	Civic Number 2341 Route 820 (PW-05)
Distance and Direction from Blast:	656 m North
Transverse Particle Velocity:	0.91 mm/s @ >100 Hz
Vertical Particle Velocity:	1.05 mm/s @ 85 Hz
Longitudinal Particle Velocity:	1.27 mm/s @ >100 Hz
Peak Particle Velocity:	1.27 mm/s @ >100 Hz
Maximum Airblast:	115 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 25, 2023
Project No.:	234601.00	**Time of Blast:**	13:54
Inspector:	I. Villegas	**Blast No.:**	2023-28
Client:	Hammond River Holdings		

Data Collection – Seismometer #7

Make, Model and Serial # of unit:	Instantel Minimate, Serial #5372
Calibration Date:	February 28, 2023
Location of seismograph:	Civic Number 50 Myron Road (PW-15)
Distance and Direction from Blast:	854 m Northwest
Transverse Particle Velocity:	0.45 mm/s @ 34 Hz
Vertical Particle Velocity:	0.57 mm/s @ 85 Hz
Longitudinal Particle Velocity:	0.57 mm/s @ 51 Hz
Peak Particle Velocity:	0.57 mm/s @ 85 Hz
Maximum Airblast:	116 dB(L)

Data Collection – Seismometer #8

Make, Model and Serial # of unit:	Instantel Minimate, Serial #5632
Calibration Date:	November 16, 2022
Location of seismograph:	Civic Number 86 Myron Road (PW-16)
Distance and Direction from Blast:	689 m West
Transverse Particle Velocity:	0.45 mm/s @ 27 Hz
Vertical Particle Velocity:	0.64 mm/s @ 39 Hz
Longitudinal Particle Velocity:	0.70 mm/s @ 43 Hz
Peak Particle Velocity:	0.70 mm/s @ 43 Hz
Maximum Airblast:	114 dB(L)

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 25, 2023
Project No.:	234601.00	**Time of Blast:**	13:54
Inspector:	I. Villegas	**Blast No.:**	2023-28
Client:	Hammond River Holdings		

Data Collection – Seismometer #9

Make, Model and Serial # of unit:	Instantel Minimate, Serial #5487
Calibration Date:	January 16, 2023
Location of seismograph:	Civic Number 220 Myron Road (PW-01)
Distance and Direction from Blast:	1,288 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 Micromate, Serial #21832
Calibration Date:	July 10, 2023
Location of seismograph:	Civic Number 2337 Route 820 (PW-04)
Distance and Direction from Blast:	705 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

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BLAST RECORD

Project Name:	Upham Gypsum Quarry	**Date of Blast:**	August 25, 2023
Project No.:	234601.00	**Time of Blast:**	13:54
Inspector:	I. Villegas	**Blast No.:**	2023-28
Client:	Hammond River Holdings		

Data Collection – Seismometer #11

Make, Model and Serial # of unit:	Instantel Minimate, Serial #5635
Calibration Date:	March 8, 2023
Location of seismograph:	Civic Number 4140 Route 111 (PW-12)
Distance and Direction from Blast:	849 m Southeast
Transverse Particle Velocity:	0.45 mm/s @ 64 Hz
Vertical Particle Velocity:	0.51 mm/s @ 51 Hz
Longitudinal Particle Velocity:	0.57 mm/s @ 64 Hz
Peak Particle Velocity:	0.57 mm/s @ 64 Hz
Maximum Airblast:	110 dB(L)

Attachment B

Blast and Seismograph Location Plan

Blast and Seismograph Location Plan
Blast No: 2023-28
Upham East Gypsum Quarry, Upham, NB

Date: August 25, 2023
Project No.: 234601.00

Attachment C

Blast Event Reports

Event Report

Date/Time Vert at 13:54:55 August 25, 2023
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/UPHAM.MMB

Notes
Location
Client
Company
General Notes

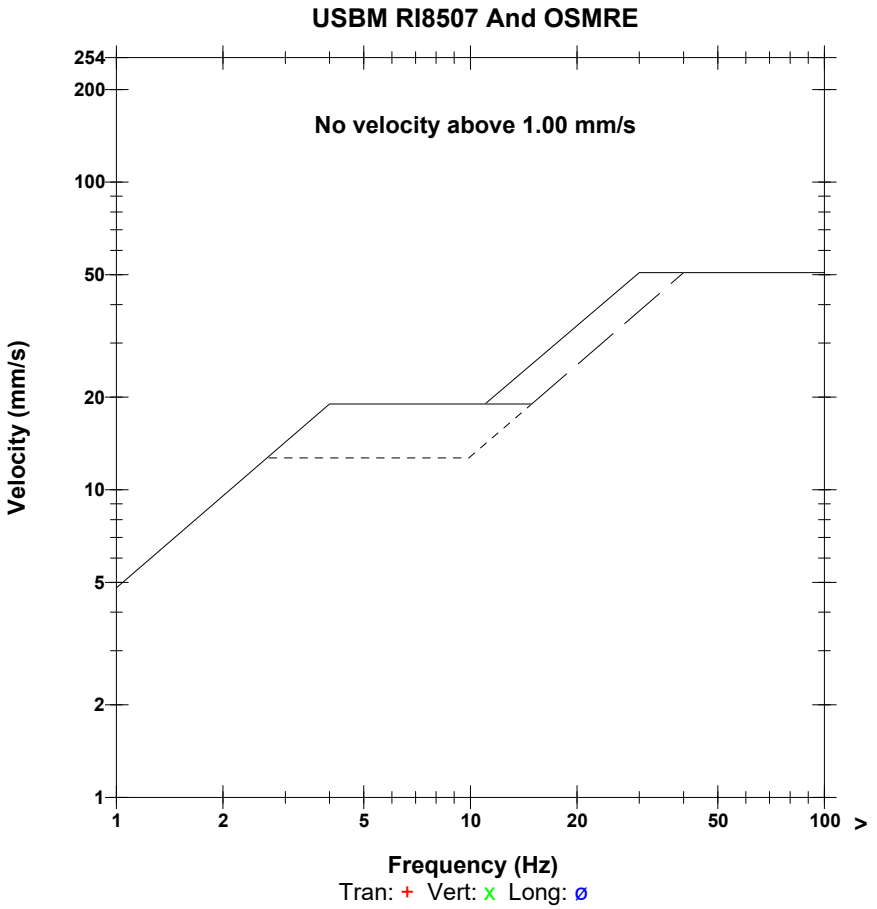
Serial Number UM21696 V 10-90GC Micromate ISEE
Battery Level 3.6 Volts
Unit Calibration July 10, 2023 by Instantel
File Name UM21696_20230825135455.IDFW

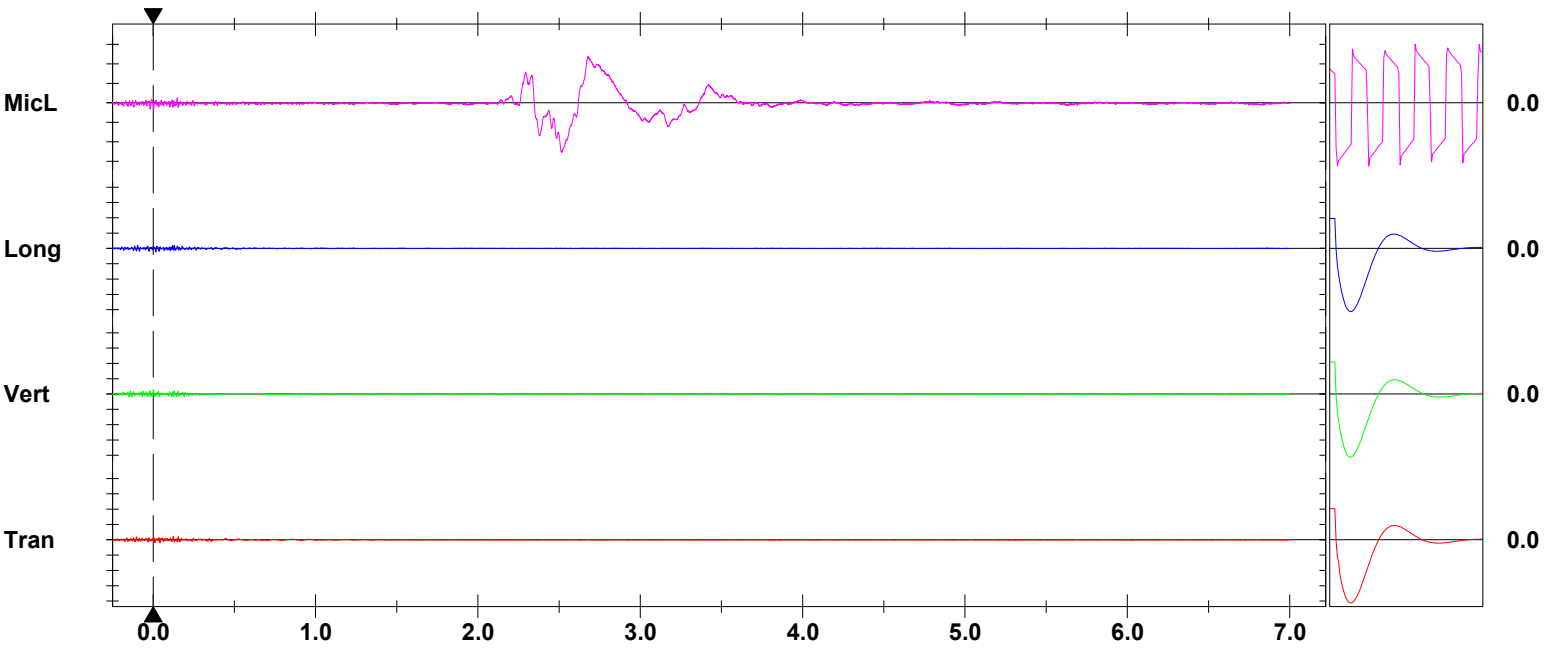
Post Event Notes
Location: Civic Number 4126 Route 111 (PW-09)
Blast No.: 2023-28
Project No: 234601.00

Microphone Linear Weighting
PSPL 102.1 dB(L) 2.544 pa.(L) at 2.517 sec
ZC Freq 1.8 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1380 mv)

	Tran	Vert	Long	
PPV	0.449	0.583	0.473	mm/s
PPV	44.05	46.32	44.50	dB
ZC Freq	64	64	57	Hz
Time (Rel. to Trig)	0.124	0.001	0.017	sec
Peak Acceleration	0.035	0.035	0.026	g
Peak Displacement	0.001	0.002	0.001	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.5	7.5	Hz
Overswing Ratio	4.5	4.5	4.4	

Peak Vector Sum 0.657 mm/s at 0.001 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 13:54:55 August 25, 2023
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

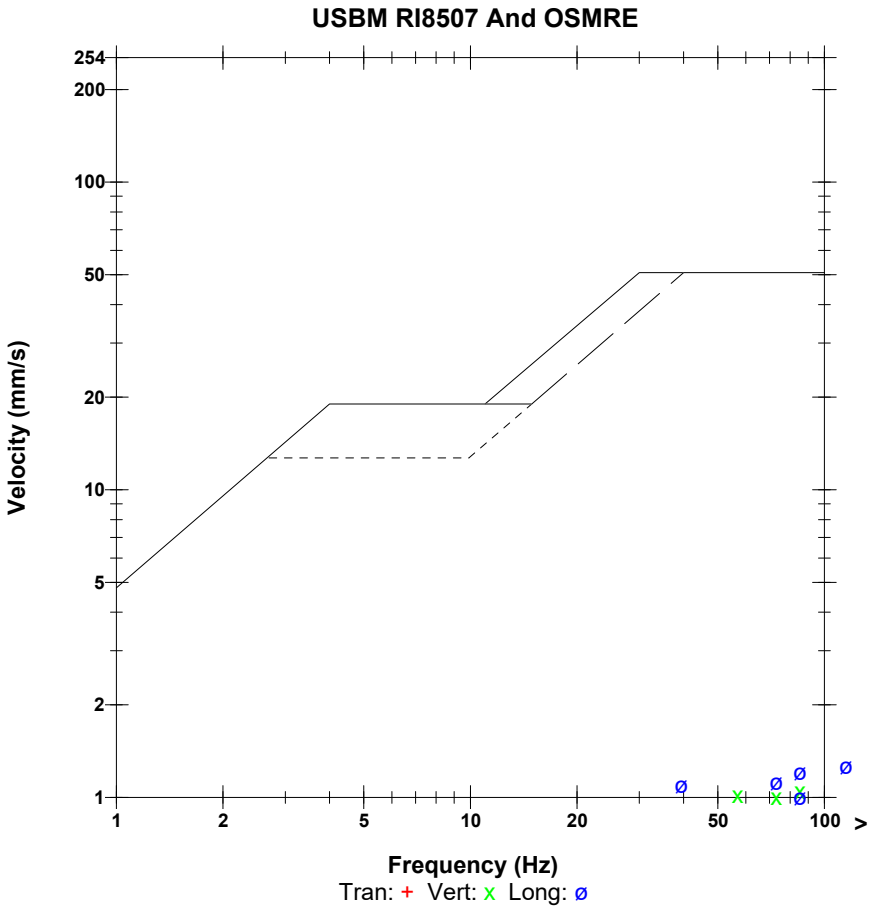
Serial Number UM20203 V 10-90GC Micromate ISEE
Battery Level 3.6 Volts
Unit Calibration May 30, 2023 by Instantel
File Name UM20203_20230825135455.IDFW

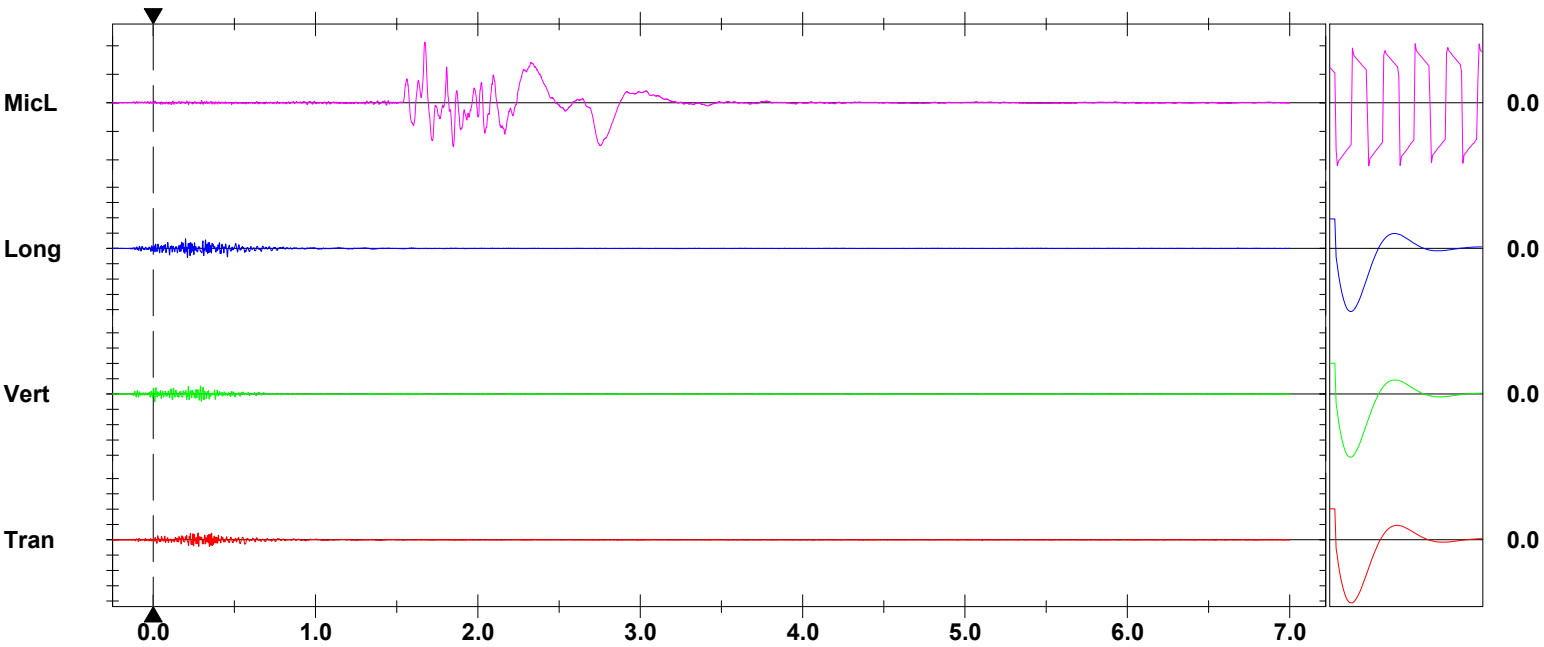
Post Event Notes
Location: Civic Number 2341 Route 820 (PW-05)
Blast No.: 2023-28
Project No: 234601.00

Microphone Linear Weighting
PSPL 114.5 dB(L) 10.64 pa.(L) at 1.673 sec
ZC Freq 6.5 Hz
Channel Test Passed (Freq = 20.5 Hz Amp = 1413 mv)

	Tran	Vert	Long	
PPV	0.914	1.048	1.269	mm/s
PPV	50.22	51.41	53.07	dB
ZC Freq	>100	85	>100	Hz
Time (Rel. to Trig)	0.276	0.292	0.199	sec
Peak Acceleration	0.120	0.068	0.074	g
Peak Displacement	0.003	0.002	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.1	7.5	7.5	Hz
Overswing Ratio	4.4	4.5	4.2	

Peak Vector Sum 1.352 mm/s at 0.216 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 13:55:11 August 25, 2023
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: August 25, 2023 16:49:19 (V10.72.1)

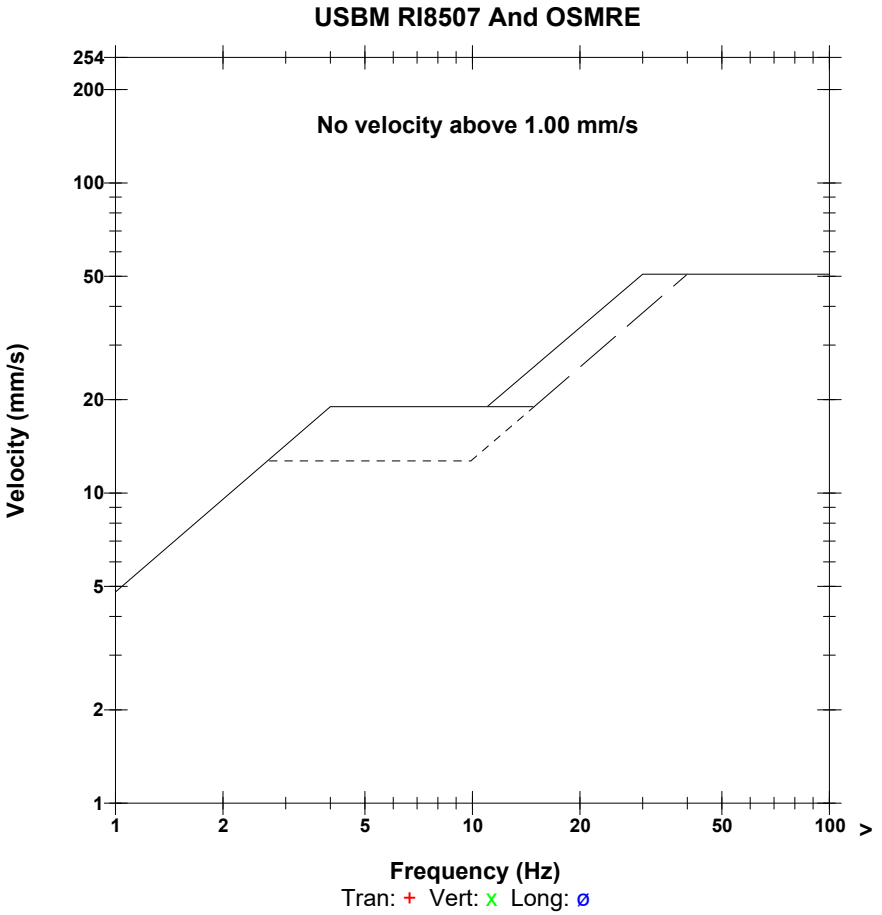
Extended Notes

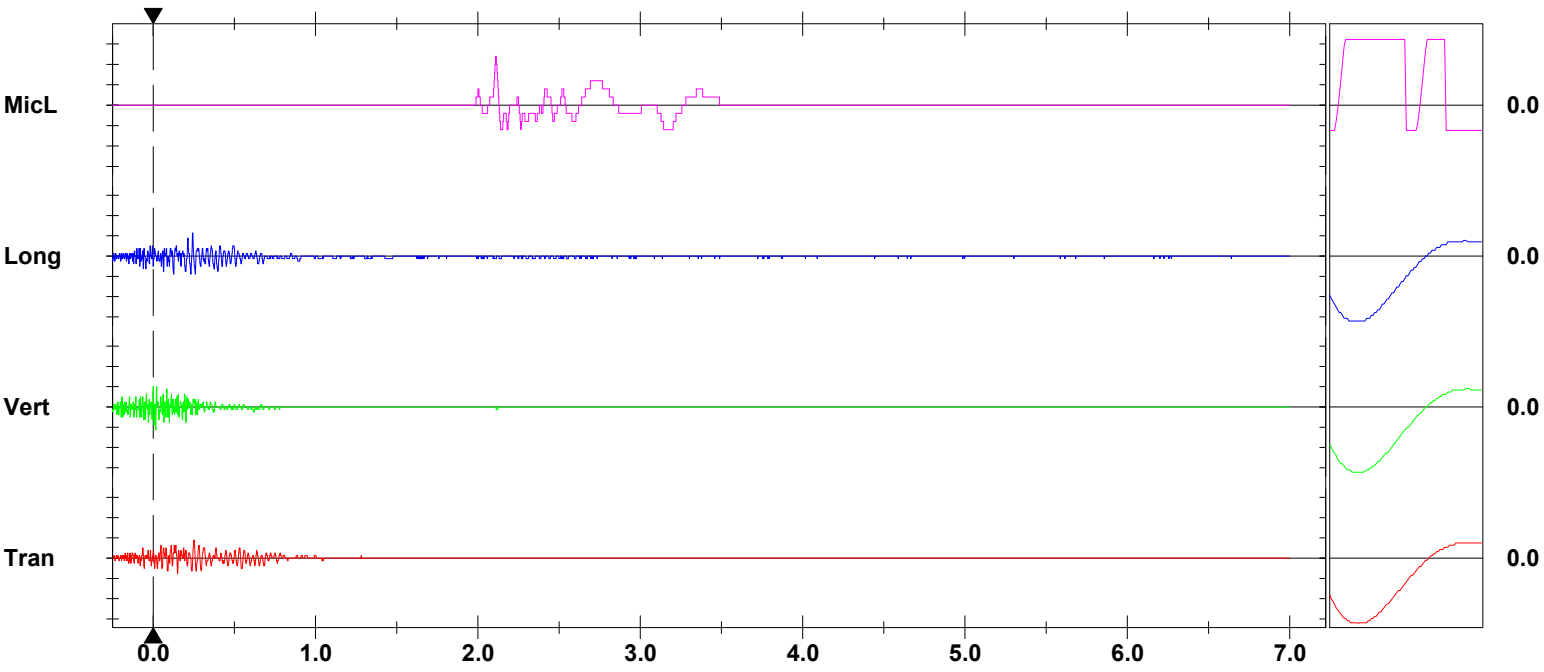
Microphone Linear Weighting
PSPL 115.6 dB(L) 12.00 pa.(L) at 2.111 sec
ZC Freq 9.1 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 601 mv)

	Tran	Vert	Long	
PPV	0.445	0.572	0.572	mm/s
PPV	43.96	46.14	46.14	dB
ZC Freq	34	85	51	Hz
Time (Rel. to Trig)	0.251	0.016	0.244	sec
Peak Acceleration	0.013	0.033	0.020	g
Peak Displacement	0.002	0.001	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.8	8.0	8.0	Hz
Overswing Ratio	3.7	3.3	3.8	

Peak Vector Sum 0.587 mm/s at 0.001 sec

Serial Number 5372 V 2.61 MiniMate
Battery Level 6.3 Volts
Unit Calibration February 28, 2023 by Instantel
File Name G372K65T.BZ0
Post Event Notes
Location: Civic Number 50 Myron Road (PW-15)
Blast No.: 2023-28
Project No: 234601.00





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 13:54:47 August 25, 2023
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: August 25, 2023 17:06:01 (V10.72.1)

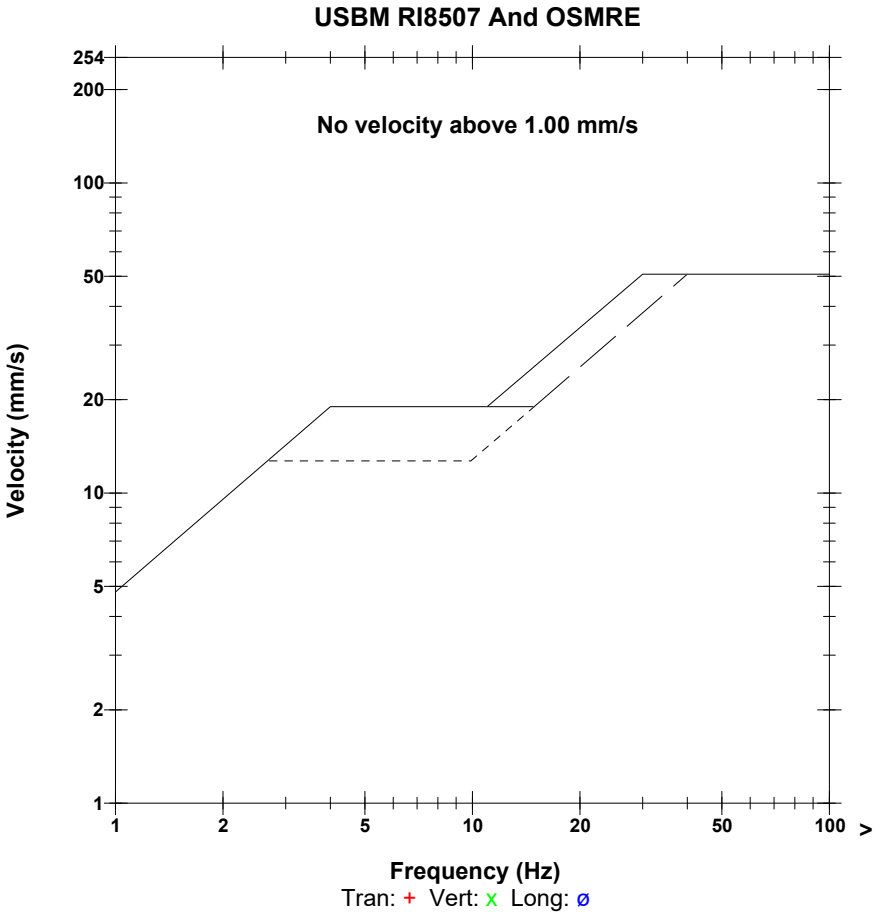
Extended Notes

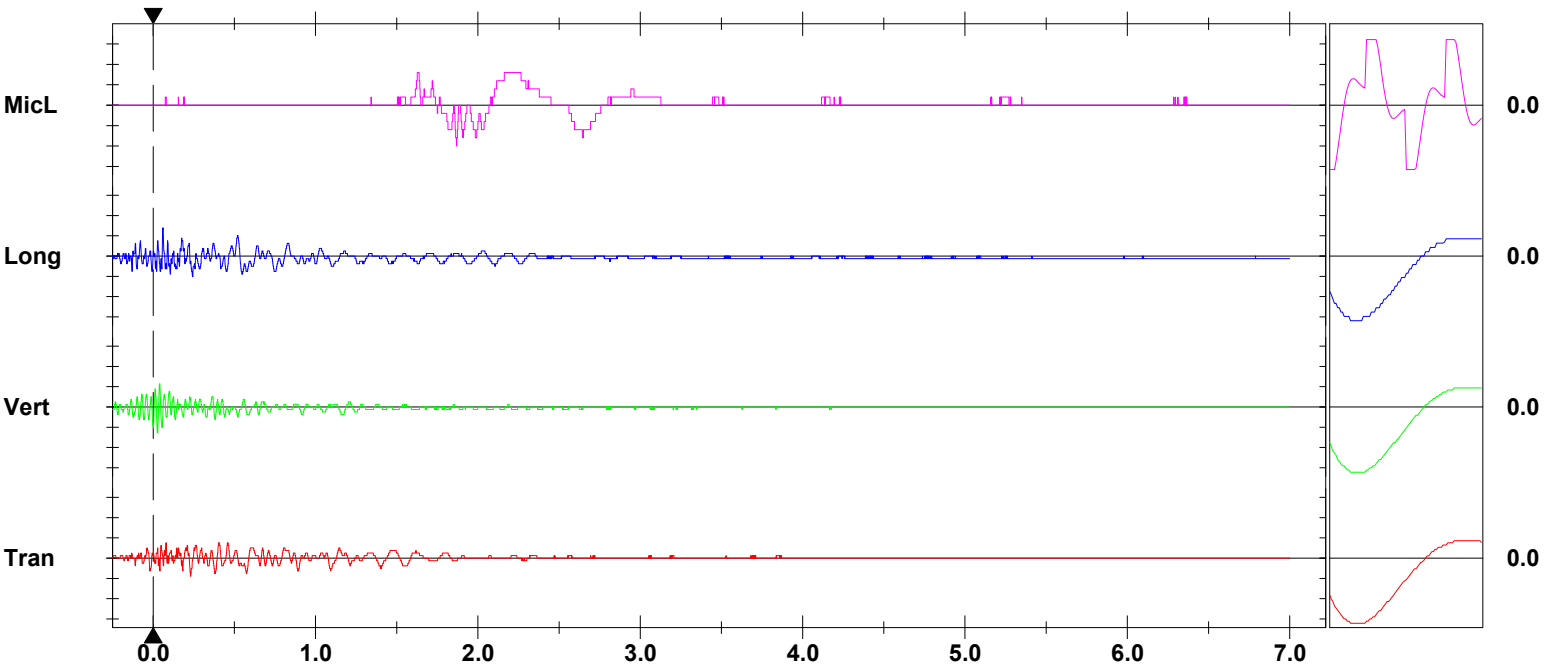
Microphone Linear Weighting
PSPL 114.0 dB(L) 10.000 pa.(L) at 1.869 sec
ZC Freq 20 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 297 mv)

	Tran	Vert	Long	
PPV	0.445	0.635	0.699	mm/s
PPV	43.96	47.06	47.88	dB
ZC Freq	27	39	43	Hz
Time (Rel. to Trig)	0.230	0.026	0.061	sec
Peak Acceleration	0.013	0.013	0.027	g
Peak Displacement	0.003	0.003	0.009	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.1	8.2	8.2	Hz
Overswing Ratio	3.8	3.4	3.8	

Peak Vector Sum 0.778 mm/s at 0.028 sec

Serial Number 5632 V 2.61 MiniMate
Battery Level 6.2 Volts
Unit Calibration November 16, 2022 by Instantel
File Name G632K65T.BB0
Post Event Notes
Location: Civic Number 86 Myorn Road (PW-16)
Blast No.: 2023-28
Project No: 234601.00





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 Long at 13:54:39 August 25, 2023
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: August 25, 2023 17:10:47 (V10.72.1)

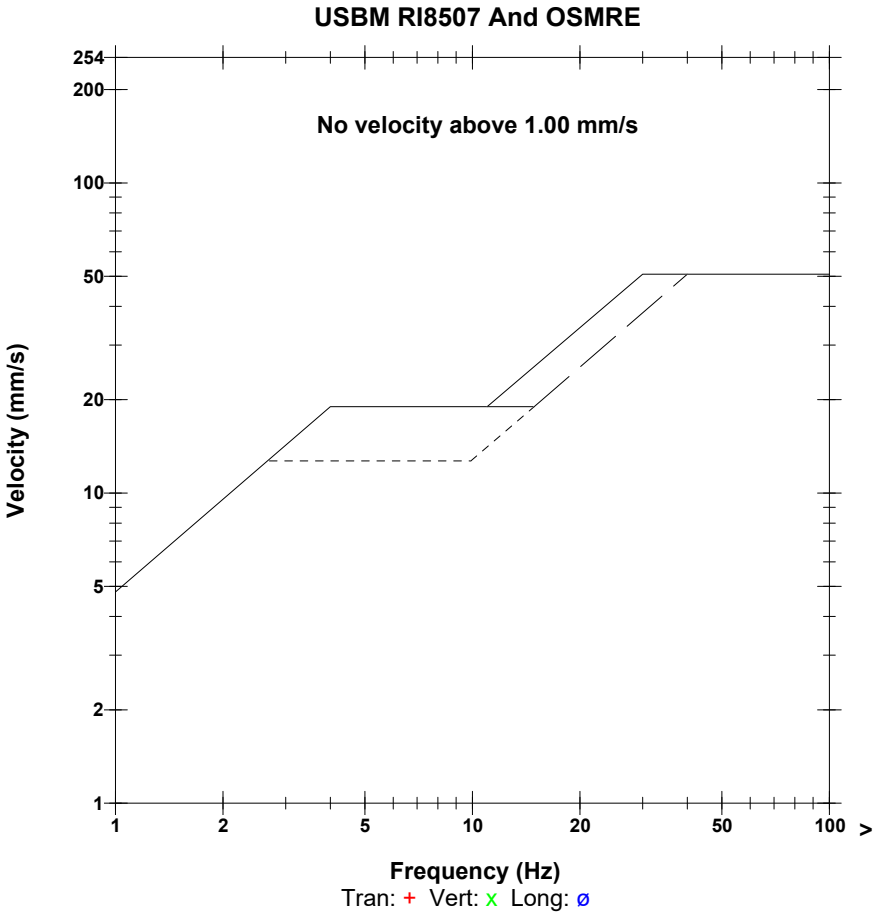
Extended Notes

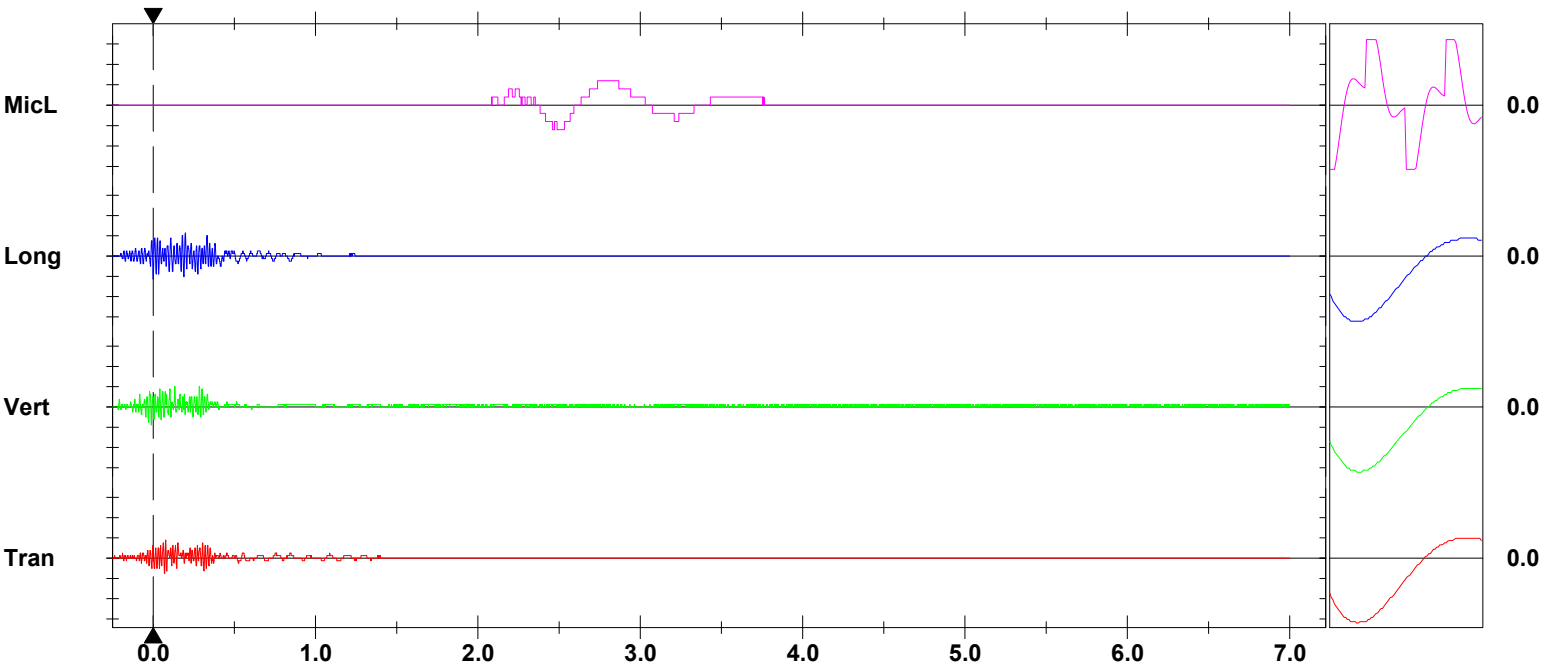
Microphone Linear Weighting
PSPL 109.5 dB(L) 6.000 pa.(L) at 2.461 sec
ZC Freq 2.0 Hz
Channel Test Passed (Freq = 20.0 Hz Amp = 297 mv)

	Tran	Vert	Long	
PPV	0.445	0.508	0.572	mm/s
PPV	43.96	45.12	46.14	dB
ZC Freq	64	51	64	Hz
Time (Rel. to Trig)	0.077	0.135	0.001	sec
Peak Acceleration	0.020	0.020	0.020	g
Peak Displacement	0.001	0.001	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8.2	7.8	8.0	Hz
Overswing Ratio	3.2	3.7	3.7	

Peak Vector Sum 0.635 mm/s at 0.001 sec

Serial Number 5635 V 2.61 MiniMate
Battery Level 6.4 Volts
Unit Calibration March 8, 2023 by Instantel
File Name G635K65T.B30
Post Event Notes
Location: Civic Number 4140 Route 111 (PW-12)
Blast No.: 2023-28
Project No: 234601.00





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