

# Memo

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

**From:** Daniel Guest, Hammond River Holdings Ltd.

**Cc:** Justin Chase – Environmental Impact Assessment Branch, New Brunswick Department of Environment and Local Government

**Date:** February 15, 2023

**Subject:** Monthly Monitoring Report – Upham East Gypsum Quarry – January 2023

**Our File:** File # 21-3049

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## Introduction

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This monthly report details activities associated with the Upham East Gypsum Quarry operations for the month of January 2023, in accordance with the Approval to Operate I-10936 conditions. Activities included surface water monitoring, groundwater monitoring, air monitoring, and blasting. Details of environmental accidents are also provided. For previous monthly activities, refer to the monthly reports provided from December 2019 through December 2022.

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

- Week 1: January 2, 2023
- Week 2: January 11, 2023
- Week 3: January 17, 2023
- Week 4: January 25, 2023

There were two additional sampling events conducted on January 18 and January 27, 2023 due to a heavy rain events, defined as more than 25 mm of rain over a 24-hour period.

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## Surface Water Sampling

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### Field Methods

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

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

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

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

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

#### Compliance Monitoring Results

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

## **Groundwater Monitoring**

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### Methodology

Water levels were retrieved from the dataloggers installed in the 8 perimeter monitoring wells and 3 potable wells (**Figure 3**) via Solinst Levellogger Software 4.5 on January 31, 2023. The dataloggers were then reset to collect readings at 5 minute intervals.

### Results

Data for the perimeter monitoring wells (**Figure 4**) and potable wells (**Figure 5, 6 and 7**) are presented as time series plots. Data was not retrieved from perimeter wells MW20-03S and MW20-03D during the January 2023 monitoring visit, as these locations were inaccessible due to snow and ice. Total precipitation (mm) is also presented within each figure, representing periods of recharge. The overall trend in the perimeter monitoring wells has remained consistent with seasonal fluctuations. The potable wells 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 January

2023 monitoring period, there does not appear to be a negative impact on water levels in the perimeter and potable wells as a result of quarry operations.

### **Environmental Accidents and Malfunctions**

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On January 11, 2023 at 4:00 pm, 6 litres of hydraulic fluid leaked from a bucket cylinder hose. The source of the leak was found and ceased. Gulf Operators cleaned-up the spill with the use of a spill kit and spill response supplies. The spill was reported on January 12, 2023. No further action was required.

### **Ambient Air Quality Monitoring – Total Suspended Particulate**

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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 January, there were 5 air quality monitoring events, January 2, 8, 14, 20, and 26, 2023. The results are provided in **Table 3**. There were no exceedances of the 120 µg/m<sup>3</sup> 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**

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Three blasts occurred during the January 2023 monitoring period, occurring on January 9, 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**

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There were no complaints received during the January 2023 monitoring period.

### **Summary**

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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.

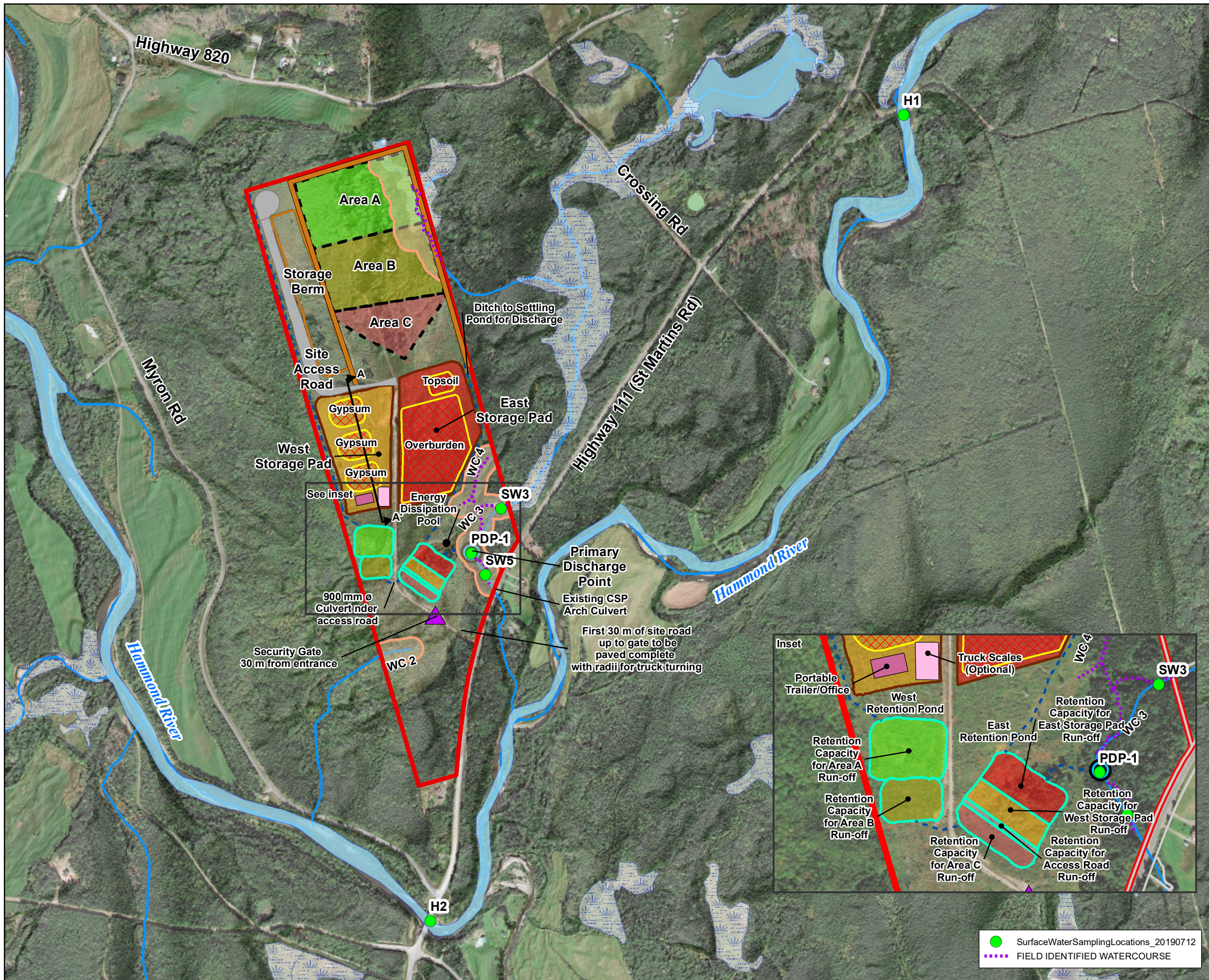
## References

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

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

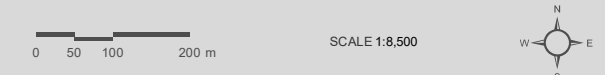




HAMMOND RIVER HOLDINGS LIMITED  
PROPOSED UPHAM EAST GYPSUM QUARRY

**SURFACE WATER SAMPLING LOCATIONS**  
FIGURE 1

- PROPERTY BOUNDARY
  - PROJECT DEVELOPMENT AREA
  - WATERBODY
  - WATERCOURSE
  - REGULATED WETLAND
  - 30 METRE WETLAND/WATERCOURSE BUFFER
- PROPOSED SITE FEATURES**
- DITCH
  - TRUCK SCALE (OPTIONAL)
  - SITE AREAS
  - DISCHARGE POINT
  - SECURITY GATE
  - PORTABLE TRAILER/OFFICE
  - ACCESS ROAD
  - STORAGE PAD
  - STOCKPILE
  - RETENTION POND
  - CROSS SECTION
  - QUARRY BERM CONSTRUCTED FROM TOPSOIL AND OVERBURDEN (OFFSET MINIMUM 7m FROM PROPERTY BOUNDARY)
  - HATCHING INDICATES MATERIAL STOCKPILE AREA ON TOP OF STORAGE PAD



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.CAD\DILLON\_DFS\FREDERICTON\FREDERICTON CAD\CAD\GIS\188346 UPHAM GYPSUM QUARRY\MXD

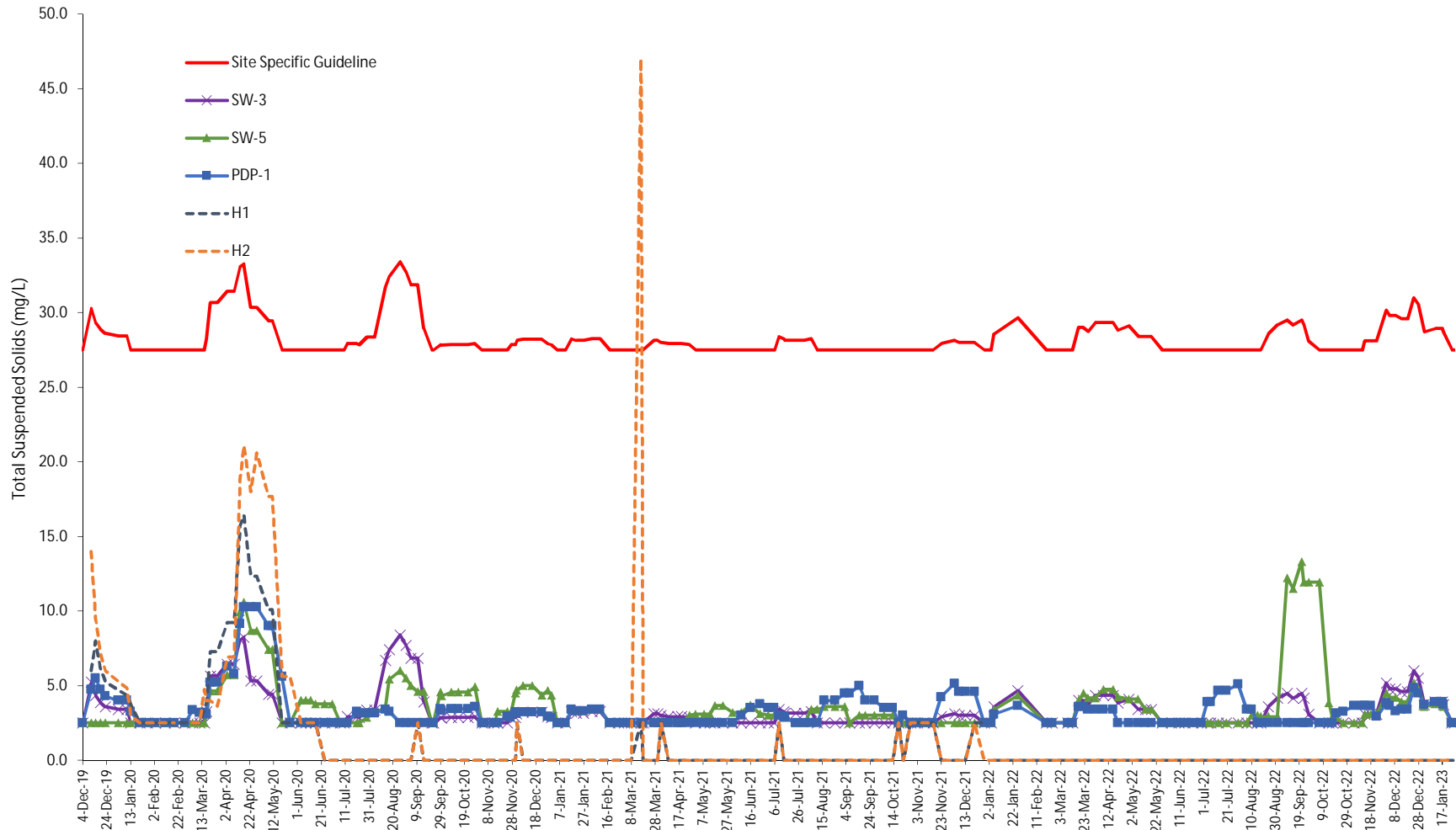


PROJECT: 18-8346  
STATUS: DRAFT  
DATE: 2020/01/06

- SurfaceWaterSamplingLocations\_20190712
- FIELD IDENTIFIED WATERCOURSE



Figure 2: TSS Monthly Average



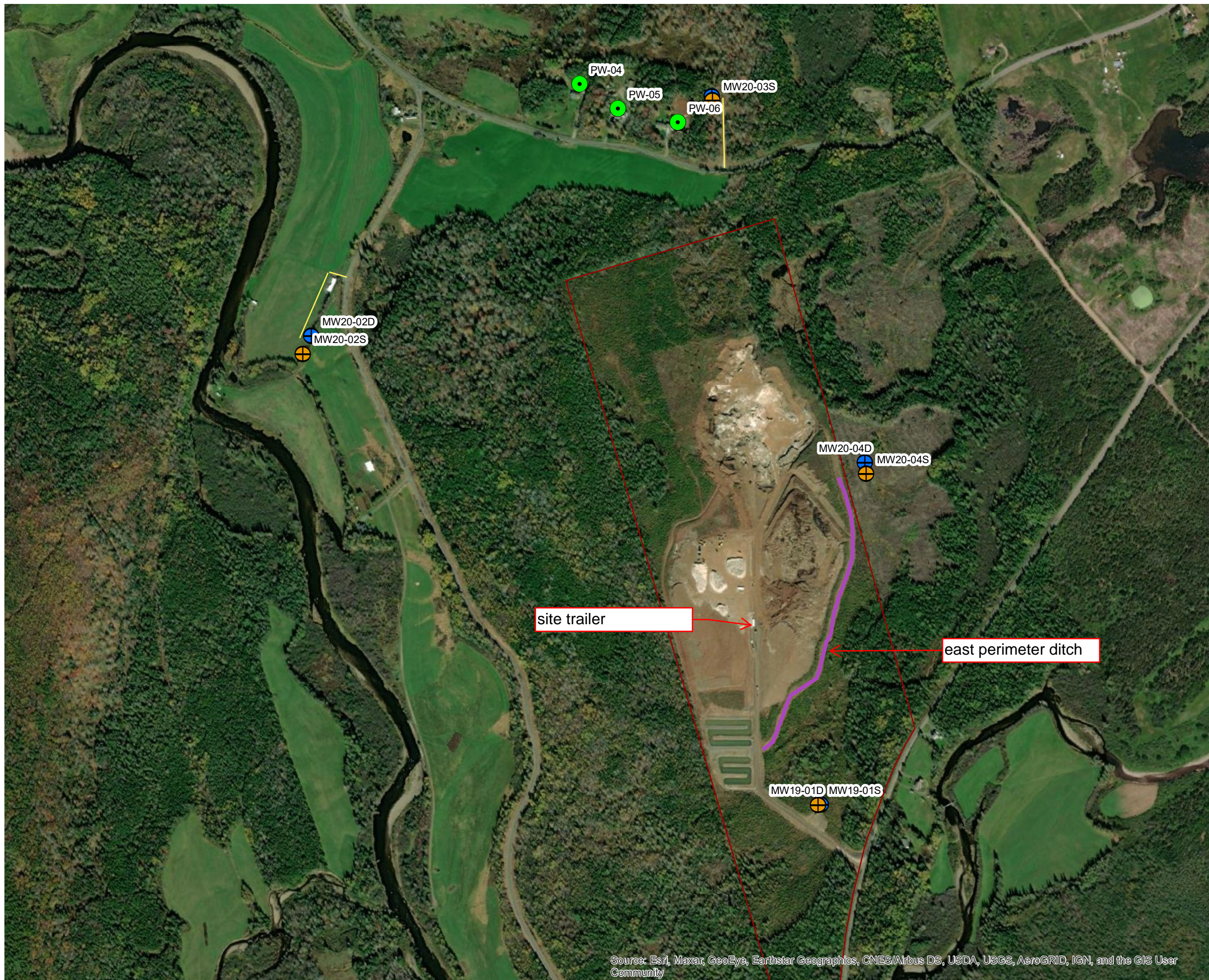
Notes:

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

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

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

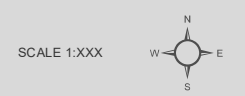




HAMMOND RIVER HOLDINGS  
UPHAM EAST GYPSUM QUARRY

**GROUNDWATER MONITORING LOCATIONS**  
FIGURE 3

- Potable Well Levelloggers
- Deep
- Shallow
- Upham Outline



MAP DRAWING INFORMATION:  
DATA PROVIDED BY MNR

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

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



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



Figure 4: Upham East - Perimeter Monitoring Water Levels

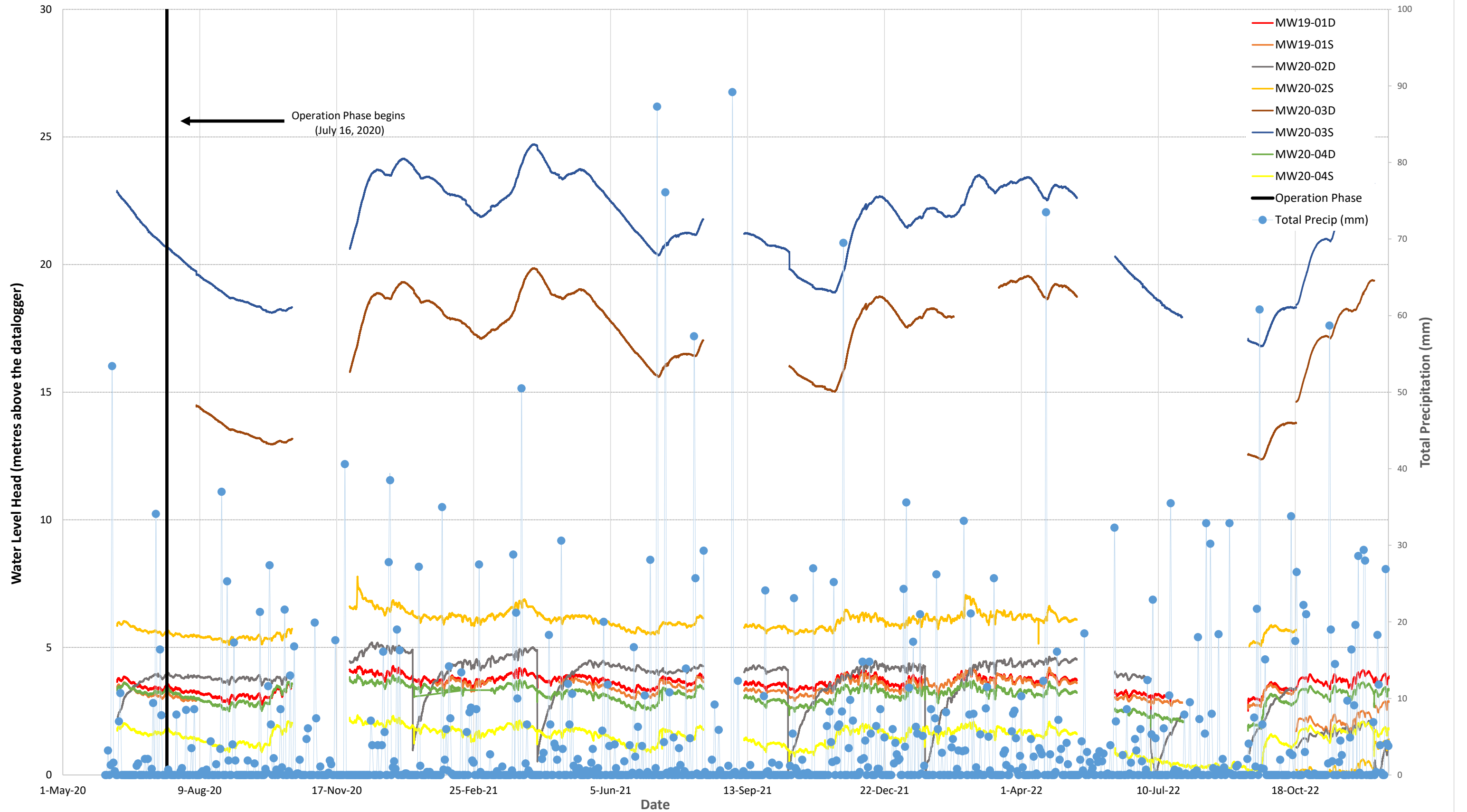


Figure 5: PW-04 Water Levels

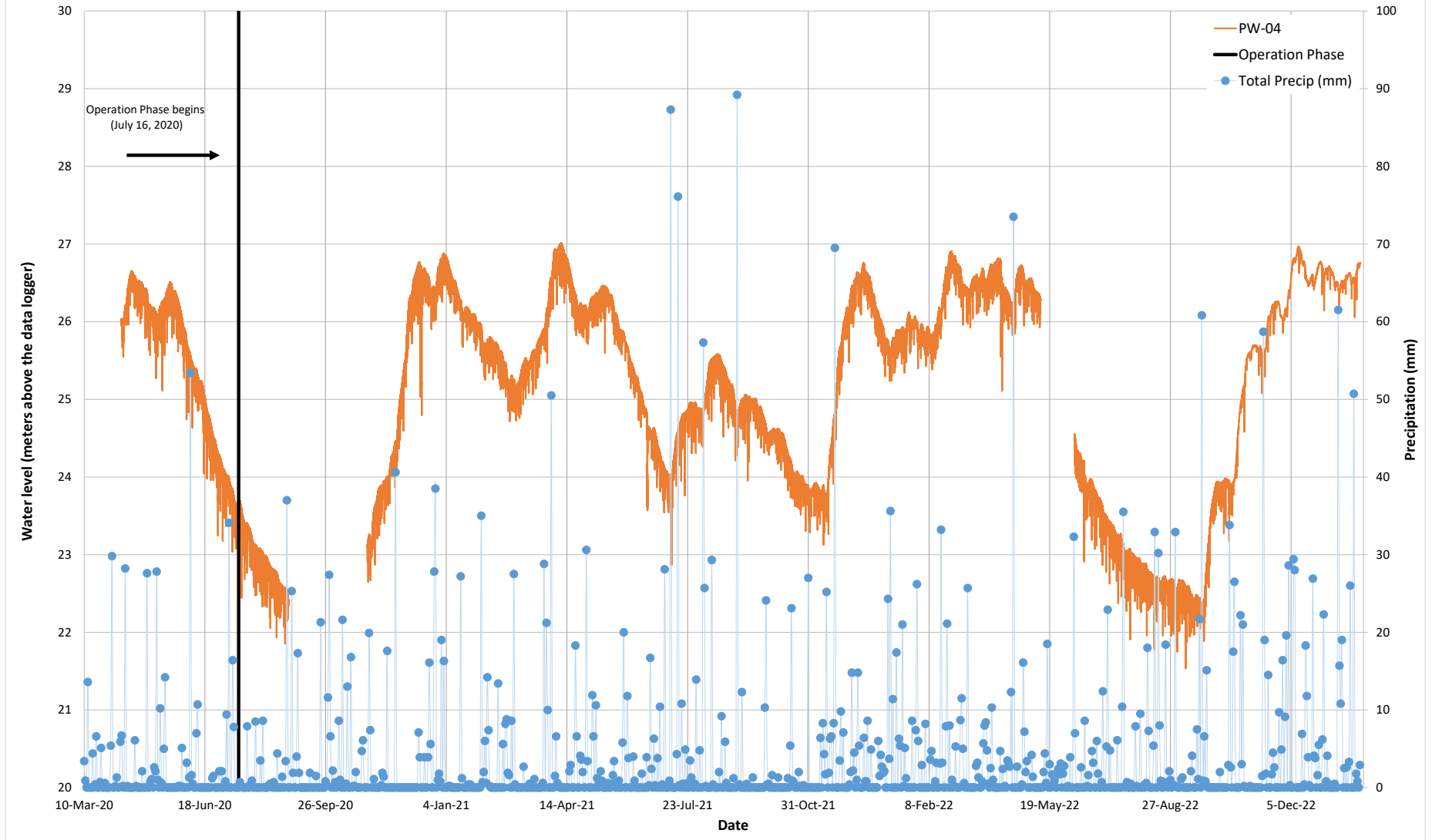


Figure 6: PW-06 Water Levels

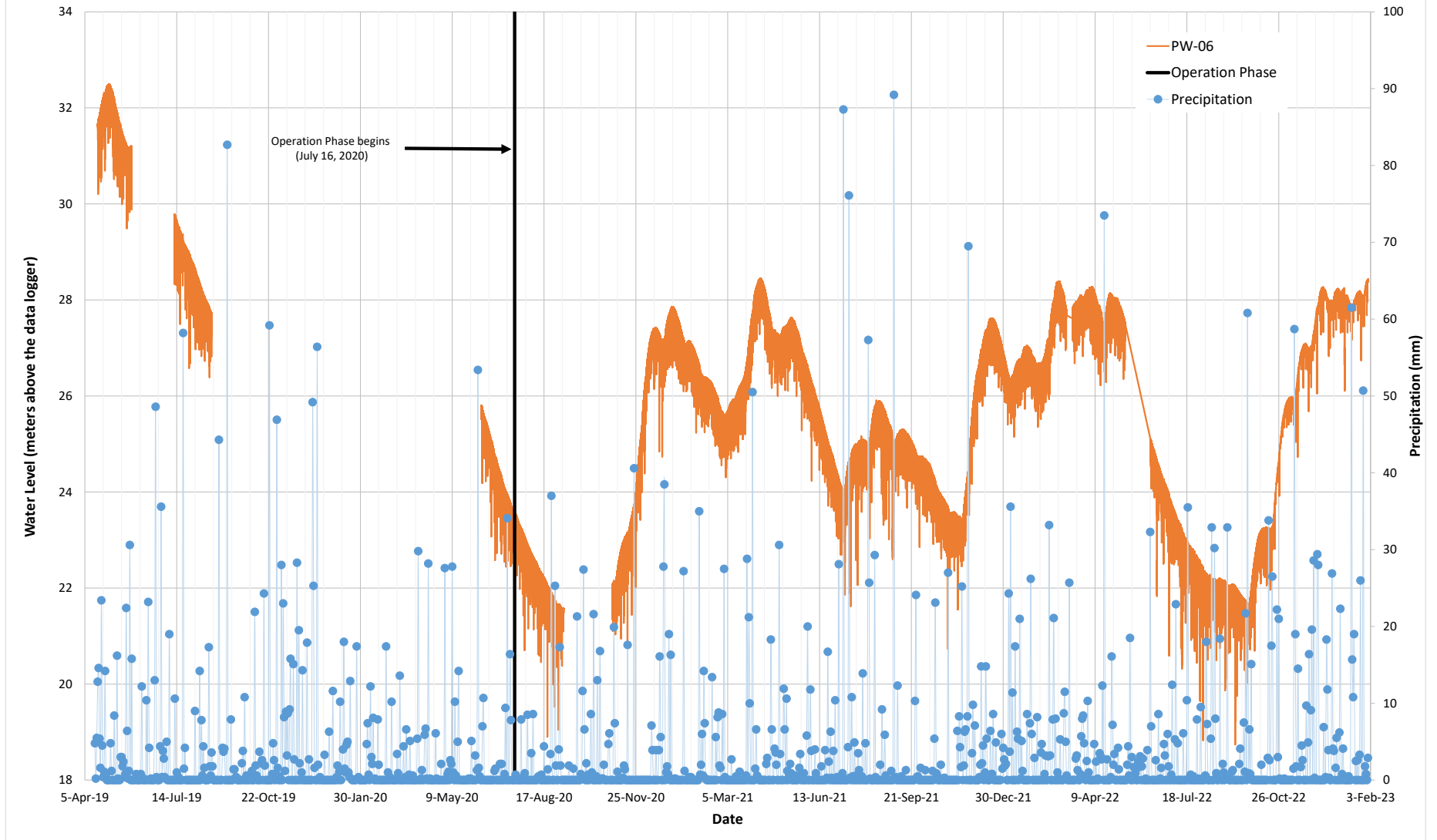


Figure 7: PW-05 Water Levels

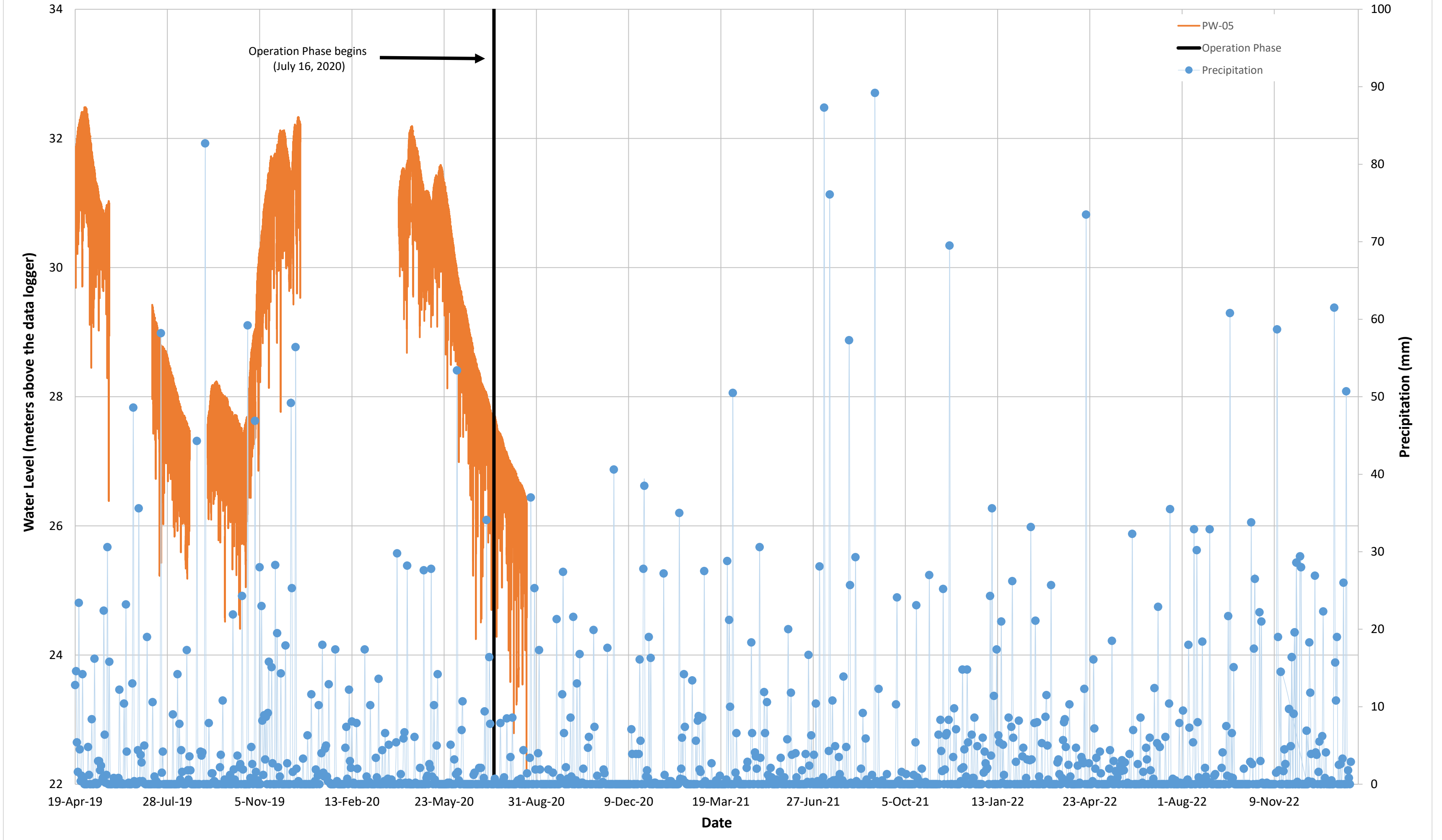


Table 1  
January Surface Water Monitoring  
Upham East Gypsum Project  
Upham, New Brunswick  
Project No. 21-3049

Parameter		Ambient Air Temperature <sup>a</sup>	Precipitation 48 hours prior to sample collection <sup>b</sup>	Water Temperature	Specific Conductivity	Turbidity	Total Suspended Solids <sup>c</sup>
Units		°C	mm	°C	mS/cm	NTU	mg/L
Sample ID	Date						
SW3	1/02/2023	-0.4	28.5	3	174	3	<5
PDP-1	1/02/2023	-0.4	28.5	2.3	255	5.07	<5
PDP-1 duplicate	1/02/2023	-0.4	28.5	2.4	254	5.02	<5
SW5	1/02/2023	-0.4	28.5	2.2	256	3.26	<5
SW3	1/11/2023/10:41	-7.9	0.5	1.8	529	1.61	<5
PDP-1	1/11/2023/10:52			0.6	575	1.76	<5
SW5	1/11/2023/10:57			0.3	571	2.08	<5
SW3	01/17/2023/08:47	-3.2	77.2	2.1	254	3.83	<5
PDP-1	01/17/2023/08:58			0.8	349	3.07	<5
SW5	01/17/2023/09:03			0.3	358	3.00	<5
SW3	01/18/2023/12:36	2.4	29.8	1.6	258	2.97	<5
PDP-1	01/18/2023/12:42			1.4	334	6.16	<5
SW5	01/18/2023/12:57			1.1	335	4.04	<5
PDP-1 dup	01/18/2023/12:44			1.4	333	6.11	<5
SW3	01/25/2023/12:50	-8.5	26.0	1.6	426	1.47	<5
PDP-1	01/25/2023/12:58			1.5	463	1.80	<5
SW5	01/25/2023/13:10			1.9	436	1.68	<5
SW3	01/27/2023/11:35	-6.7	50.7	1.5	97	5.18	<5
PDP-1	01/27/2023/11:47			0.5	151	4.87	<5
SW5	01/27/2023/11:57			0.2	156	5.82	<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](https://climate.weather.gc.ca/historical_data/search_historic_data_e.html)

b) Precipitation 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](https://climate.weather.gc.ca/historical_data/search_historic_data_e.html)

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

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

SW3 is the background sample for Watercourse 3.

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



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

Date	Site Specific Guideline	Monthly Average				
		H1	H2	SW3	PDP-1	SW5
04-Dec-19	27.5	-	-	2.5	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

Table 2  
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 Upham East Gypsum Project  
 Upham, New Brunswick  
 Project No. 21-3049

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

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
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

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  
Project 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 <sup>3</sup> )	(mm Hg)	(°C)	(g)	(g)	(µg)	(µg/m <sup>3</sup> )	(µg/m <sup>3</sup> )
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 <sup>a</sup>	22.82 <sup>a</sup>	753 <sup>a</sup>	12.3 <sup>a</sup>	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
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 <sup>b</sup>	21:08	17.42	21.08	750	8.8	14.840	14.850	10100	19.96	120
2021-05-12 <sup>b</sup>	-	17.49	25.19	748	7.1	14.822	14.830	7800	12.90	120
2021-05-18 <sup>b</sup>	19:21	17.53	20.35	757	9.8	14.830	14.838	8700	17.81	120
2021-05-27 <sup>c</sup>	-	-	-	-	-	-	-	-	-	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 <sup>d</sup>	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

Table 3  
Air Quality Reporting  
Upham East Gypsum Quarry  
Upham, New Brunswick  
Project 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 <sup>3</sup> )	(mm Hg)	(°C)	(g)	(g)	(µg)	(µg/m <sup>3</sup> )	(µg/m <sup>3</sup> )
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 <sup>a</sup>	120
2021-12-17	24 hours	17.98	25.89	748	-0.6	14.819	14.829	9600	15.45	120
2021-12-23	24 hours	18.90	27.22	747	-14.2	14.835	14.839	3800	5.82	120
2021-12-29	24 hours	18.23	26.25	750	-3.6	14.842	14.850	7700	12.22	120
2022-01-04	24 hours	18.89	27.20	755	-11.2	14.843	14.853	10300	15.78	120
2022-01-10	24 hours	19.19	27.63	749	-17.2	14.825	14.831	6600	9.95	120
2022-01-16	24 hours	18.70	26.08	755	-19.9	14.842	14.865	23300	37.23	120
2022-01-22	24 hours	19.18	25.97	752	-15.5	14.829	14.851	21300	34.17	120
2022-01-28	24 hours	18.59	26.78	753	-7.8	14.833	14.861	28600	44.50	120
2022-02-03	24 hours	18.24	26.26	755	-1.7	14.894	14.940	45300	71.88	120
2022-02-09	24 hours	18.11	26.07	748	-2.5	14.856	14.858	2100	3.36	120
2022-02-15	24 hours	19.70	28.37	762	-19.5	14.843	14.844	1700	2.50	120
2022-02-21 <sup>c</sup>	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
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	24 hours	17.76	25.57	740	-0.2	14.8216	14.8254	3800	6.1922	120

Notes

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

- a) Values were not recorded; temperature and pressure calculated based on Environment Canada data recorded at the Saint John airport weather station. Flow rate and Air Volume were approximated based on a previous day's recording with similar temperature and pressure.
- b) Battery was low in machine, full run was not completed.
- c) Run was not completed. Battery was replaced.
- d) 24 hour air sample recorded at 2349 Route 820, Upham, NB.
- e) Result was above the maximum allowable limit due to operator error. The sample was recollected on December 17, 2021.

Report ID: 469979-IAS  
Report Date: 12-Jan-23  
Date Received: 04-Jan-23

## CERTIFICATE OF ANALYSIS

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



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

Attention: Daniel Guest

**Project #: 17-5121**

Location: Upham

### Analysis of Water

RPC Sample ID:	469979-1	469979-2	469979-3	469979-4
Client Sample ID:	SW3	SW5	PDP-1	PDP-1 Duplicate
Date Sampled:	2-Jan-23	2-Jan-23	2-Jan-23	2-Jan-23
<b>Analytes</b>	<b>Units</b>	<b>RL</b>		
Solids - Total Suspended	mg/L	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: 469979-IAS  
Report Date: 12-Jan-23  
Date Received: 04-Jan-23

## CERTIFICATE OF ANALYSIS

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



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Tel: 506.452.1212  
Fax: 506.452.0594  
www.rpc.ca

### Methods

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

Report ID: 470958-IAS  
Report Date: 23-Jan-23  
Date Received: 12-Jan-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**

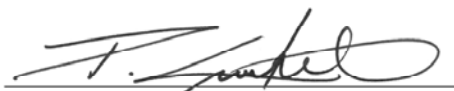
Location: Upham

### Analysis of Water

RPC Sample ID:	470958-1	470958-2	470958-3
Client Sample ID:	SW3	SW5	PDP-1
Date Sampled:	11-Jan-23	11-Jan-23	11-Jan-23
<b>Analytes</b>	<b>Units</b>	<b>RL</b>	
Solids - Total Suspended	mg/L	5	< 5

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

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



Matthew Norman  
Senior Chemist  
Inorganic Analytical Chemistry

Report ID: 470958-IAS  
Report Date: 23-Jan-23  
Date Received: 12-Jan-23

## CERTIFICATE OF ANALYSIS

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



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Canada E3B 6Z9  
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Fax: 506.452.0594  
www.rpc.ca

### Methods

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

Report ID: 471383-IAS  
Report Date: 25-Jan-23  
Date Received: 18-Jan-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**

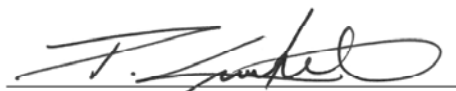
Location: Upham

### Analysis of Water

RPC Sample ID:	471383-1	471383-2	471383-3
Client Sample ID:	SW3	SW5	PDP-1
Date Sampled:	17-Jan-23	17-Jan-23	17-Jan-23
<b>Analytes</b>	<b>Units</b>	<b>RL</b>	
Solids - Total Suspended	mg/L	5	< 5

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

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



Matthew Norman  
Senior Chemist  
Inorganic Analytical Chemistry

Report ID: 471383-IAS  
Report Date: 25-Jan-23  
Date Received: 18-Jan-23

## CERTIFICATE OF ANALYSIS

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



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www.rpc.ca

### Methods

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

Report ID: 471651-IAS  
Report Date: 25-Jan-23  
Date Received: 20-Jan-23

## CERTIFICATE OF ANALYSIS

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



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

Attention: Daniel Guest

**Project #: 17-5121**

Location: Upham

### Analysis of Water

RPC Sample ID:	471651-1	471651-2	471651-3	471651-4		
Client Sample ID:	SW3	SW5	PDP-1	PDP-1 Duplicate		
Date Sampled:	18-Jan-23	18-Jan-23	18-Jan-23	18-Jan-23		
<b>Analytes</b>	<b>Units</b>	<b>RL</b>				
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: 471651-IAS  
Report Date: 25-Jan-23  
Date Received: 20-Jan-23

## CERTIFICATE OF ANALYSIS

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



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www.rpc.ca

### Methods

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

Report ID: 472328-IAS  
Report Date: 03-Feb-23  
Date Received: 30-Jan-23

## CERTIFICATE OF ANALYSIS

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

**rpc**

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www.rpc.ca

Attention: Daniel Guest

**Project #: 17-5121**

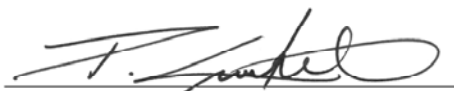
Location: Upham

### Analysis of Water

RPC Sample ID:	472328-1	472328-2	472328-3
Client Sample ID:	SW3	SW5	PDP-1
Date Sampled:	27-Jan-23	27-Jan-23	27-Jan-23
<b>Analytes</b>	<b>Units</b>	<b>RL</b>	
Solids - Total Suspended	mg/L	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: 472328-IAS  
Report Date: 03-Feb-23  
Date Received: 30-Jan-23

## CERTIFICATE OF ANALYSIS

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



921 College Hill Rd  
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www.rpc.ca

### Methods

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

Report ID: 472329-IAS  
Report Date: 03-Feb-23  
Date Received: 30-Jan-23

## CERTIFICATE OF ANALYSIS

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

**rpc**

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Canada E3B 6Z9  
Tel: 506.452.1212  
Fax: 506.452.0594  
www.rpc.ca

Attention: Daniel Guest

**Project #: 17-5121**

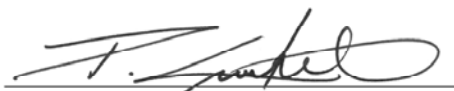
Location: Upham

### Analysis of Water

RPC Sample ID:	472329-1	472329-2	472329-3
Client Sample ID:	SW3	SW5	PDP-1
Date Sampled:	25-Jan-23	25-Jan-23	25-Jan-23
<b>Analytes</b>	<b>Units</b>	<b>RL</b>	
Solids - Total Suspended	mg/L	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: 472329-IAS  
Report Date: 03-Feb-23  
Date Received: 30-Jan-23

## CERTIFICATE OF ANALYSIS

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



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Fredericton NB  
Canada E3B 6Z9  
Tel: 506.452.1212  
Fax: 506.452.0594  
www.rpc.ca

### Methods

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

## SPILL REPORT FORM

### IDENTIFICATION

Spill Date: January 11, 2023	Time: 4:00pm
Location: Upham East Quarry	:
Civic Address of Incident: 4119 route 111 Upperton NB	
Field Contact: Rick Hatty	Phone Number: (506) 647-3730

### SPILL NOTIFICATION

<input checked="" type="checkbox"/> Supervisor (During working hours) - Name (specify): Daniel Guest
<input checked="" type="checkbox"/> Department of Environment (During working hours) Saint John Region – 506.658.2558
<input type="checkbox"/> Coast Guard – 800.565.1633

### SPILL INFORMATION

<b>Product Spilled:</b>	<input type="checkbox"/> Transformer Oil <input checked="" type="checkbox"/> Hydraulic Fluid <input type="checkbox"/> Other (specify):	Quantity (L): Quantity (L): 6 L Quantity (L):
<b>Equipment:</b>	<input type="checkbox"/> Pole-top transformer	<b>Serial / ID1 Number:</b>
	<input checked="" type="checkbox"/> Heavy Equipment	<b>BH759</b>
	<input type="checkbox"/> Vehicle	<b>*Year of Manufacture:</b>
	<input type="checkbox"/> Other (specify):	
<b>Environmental Impact:</b>		<b>YES</b> <b>NO</b>
	Watercourse within 100 m	<input type="checkbox"/> <input checked="" type="checkbox"/>
	Domestic well within 100 m	<input type="checkbox"/> <input checked="" type="checkbox"/>
<b>Cause and additional detail:</b>	Small leak on bucket cylinder hose.	
<b>Samples sent to RPC laboratory for analysis (Address: 921 College Hill Rd, Fredericton, 506.452.1212) N/A</b>		
<input type="checkbox"/> Oil (from equipment): _____ ppm		
<input type="checkbox"/> Soil (unable to sample equipment): _____ ppm		
<input type="checkbox"/> Other (watercourse): _____ ppm		

**ADDITIONAL INFORMATION**

	YES	NO
Is source of spill stopped?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is spill contained?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is spill cleaned-up?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**EXTERNAL RESOURCES / INSPECTORS (if applicable)**

	YES	NO	If "yes", indicate Name, Date and Time
Environment Inspector on-site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Contractor used for clean-up	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Gulf Operators
Site Professional used for remediation support	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

**APPROVAL AND REVIEW**

Initiator	Signature: Rick Hatty	Date Prepared: 01/12/2023
Supervisor/Manager	Signature: Daniel Guest  Comments:  Spill kit and spill response supplies replenished?	Date Reviewed: 01/12/2023  <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
EMS Coordinator	Signature:	Date Completed:

January 10, 2023

Project No.: 234601.00

Mr. Daniel Guest

**Hammond River Holdings**

Via email: [Guest.Daniel@AtlanticWallboard.com](mailto:Guest.Daniel@AtlanticWallboard.com)

**Re: Blast Vibration Monitoring – Blast No. 2023-01 – 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 at 14:05 on January 9, 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. 2023-01 – January 9, 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)	14:05	1,337 m S	< 0.5 mm/s	<120	Units were not triggered
2. Civic No. 4126 Route 111 (PW-10)		928 m S	< 0.5 mm/s	<120	
3. Civic No. 4150 Route 111 (PW-13)		813 m SE	< 0.5 mm/s	<120	
4. Civic No. 2447 Route 820 (PW-07)		982 m NE	< 0.5 mm/s	<120	
5. PW-03 - Cottage Route 820		653 m N	< 0.5 mm/s	<120	
6. Civic No. 2341 Route 820 (PW-05)		629 m N	< 0.5 mm/s	<120	
7. Civic No. 50 Myron Road (PW-15)		837 m NW	< 0.5 mm/s	<120	
8. Civic No. 86 Myron Road (PW-16)		732 m W	0.62 mm/s @ >100 Hz	99	-
9. Civic No. 220 Myron Road (PW-01)		1,338 m S	< 0.5 mm/s	<120	Units were not triggered
10. Civic No. 2337 Route 820 (PW-04)		737 m N	< 0.5 mm/s	<120	
11. Civic No. 4140 Route 111 (PW-12)		870 m SE	0.69 mm/s @ 51 Hz	103	-
<b>maximum limits as per Approval to Operate</b>			<b>12.5 mm/s</b>	<b>128 dB</b>	

*Mr. Daniel Guest – Hammond River Holdings*

*January 10, 2023*

*Project No.: 234601.00 – Blast No.: 2023-01*

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**

A handwritten signature in blue ink, appearing to read 'Robert Y. Cyr', with a stylized flourish at the end.

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

This document was prepared for the party indicated herein. The material and information in the document reflects CBCL Limited's opinion and best judgment based on the information available at the time of preparation. Any use of this document or reliance on its content by third parties is the responsibility of the third party. CBCL Limited accepts no responsibility for any damages suffered as a result of third party use of this document.

## Attachment A

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### *Blast Record*



## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 9, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>14:05</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-01</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### IDENTIFICATION:

<b>Blasting Contractor:</b>	<u>Gulf Operators</u>		
<b>Blaster's Certification No.:</b>	<u>1318</u>	<b>Blaster's Name:</b>	<u>Daniel Blanchard</u>
<b>Blast Location:</b>	<u>N 45.481414° W 65.634765° (see attached sketch)</u>		
<b>Type of Rock:</b>	<u>Anhydrate/Gypsum</u>	<b>Est. Vol. or Tonnage:</b>	<u>10,924 tonnes</u>
<b>Weather at time of Blast:</b>	<u>Sunny with few clouds</u>	<b>Air Temp.:</b>	<u>-2°C</u>
<b>Est. Wind Speed :</b>	<u>≈10 km/h</u>	<b>Wind Direction:</b>	<u>E</u>
<b>Cloud Cover:</b>	<u>Few</u>	<b>Precipitation:</b>	<u>No</u>

### BLAST DESIGN:

<b>Total No. Holes:</b>	<u>101</u>	<b>Hole Diameter:</b>	<u>4.5"</u>
<b>Average Depth:</b>	<u>4.7 m to 7.2 m</u>	<b>Spacing:</b>	<u>10 ft x 10 ft</u>
<b>No. Holes per Delay:</b>	<u>3</u>	<b>Collar Length:</b>	<u>7 ft</u>
<b>Delay between Holes:</b>	<u>25 ms</u>	<b>Delay between Rows:</b>	<u>42, 59, 67 &amp; 84 ms</u>
<b>Initiation Method:</b>	<u>Non-Electric</u>		
<b>Weight of Explosives per Delay:</b>	<u>Max.: 129 kg</u>		
<b>Type and weight of Explosives for Blast:</b>	<u>4,253 kg – Titan XL-1000</u>		

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



### BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 9, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>14:05</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-01</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### BLAST MONITORING

<b>Distance to the Nearest Structure:</b>	<u>629 m</u>
<b>Direction to the Nearest Structure:</b>	<u>N</u>
<b>Structure Type:</b>	<u>House</u>
<b>Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):</b>	<u>55.4</u>

### SAFETY:

<b>Type of Warning Signal Used:</b>	<u>Siren</u>
<b>Blasting Mats Used (yes or no):</b>	<u>No</u>
<b>Airblast Measurement ( yes or no ):</b>	<u>Yes</u>
<b>Vibration Measurement ( yes or no ):</b>	<u>Yes</u>
<b>Warning Signs Posted ( yes or no ):</b>	<u>Yes</u>
<b>Accesses Guarded ( yes or no ):</b>	<u>Yes</u>
<b>Flyrock Damage ( yes or no ):</b>	<u>No</u>
<b>If Yes, Describe:</b>	<u></u>
<hr/>	
<b>Misfire ( yes or no ):</b>	<u>No</u>

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

## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 9, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>14:05</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-01</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #1

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #20205</u>
Calibration Date:	<u>May 31, 2022</u>
Location of seismograph:	<u>Civic Number 4079 Route 111 (PW-09)</u>
Distance and Direction from Blast:	<u>1,337 m South</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

### Data Collection – Seismometer #2

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #20206</u>
Calibration Date:	<u>May 31, 2022</u>
Location of seismograph:	<u>Civic Number 4126 Route 111 (PW-10)</u>
Distance and Direction from Blast:	<u>928 m South</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 9, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>14:05</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-01</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #3

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #18193</u>
Calibration Date:	<u>April 11, 2022</u>
Location of seismograph:	<u>Civic Number 4150 Route 111 (PW-13)</u>
Distance and Direction from Blast:	<u>813 m Southeast</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

### Data Collection – Seismometer #4

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5371</u>
Calibration Date:	<u>July 27, 2022</u>
Location of seismograph:	<u>Civic Number 2447 Route 820 (PW-07)</u>
Distance and Direction from Blast:	<u>982 m Northeast</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 9, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>14:05</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-01</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #5

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5673</u>
Calibration Date:	<u>April 8, 2022</u>
Location of seismograph:	<u>Cottage - PW-03 - Route 820</u>
Distance and Direction from Blast:	<u>653 m North</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

### Data Collection – Seismometer #6

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5489</u>
Calibration Date:	<u>April 25, 2022</u>
Location of seismograph:	<u>Civic Number 2341 Route 820 (PW-05)</u>
Distance and Direction from Blast:	<u>629 m North</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 9, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>14:05</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-01</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #7

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #20203</u>
Calibration Date:	<u>May 31, 2022</u>
Location of seismograph:	<u>Civic Number 50 Myron Road (PW-15)</u>
Distance and Direction from Blast:	<u>837 m Northwest</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

### Data Collection – Seismometer #8

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #21349</u>
Calibration Date:	<u>July 20, 2022</u>
Location of seismograph:	<u>Civic Number 86 Myron Road (PW-16)</u>
Distance and Direction from Blast:	<u>732 m West</u>
Transverse Particle Velocity:	<u>0.89 mm/s @ 24 Hz</u>
Vertical Particle Velocity:	<u>0.76 mm/s @ 28 Hz</u>
Longitudinal Particle Velocity:	<u>0.76 mm/s @ 16 Hz</u>
Peak Particle Velocity:	<u>0.89 mm/s @ 24 Hz</u>
Maximum Airblast:	<u>112 dB(L)</u>

## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 9, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>14:05</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-01</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #9

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #18187</u>
Calibration Date:	<u>May 5, 2022</u>
Location of seismograph:	<u>Civic Number 220 Myron Road (PW-01)</u>
Distance and Direction from Blast:	<u>1,338 m South</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

### Data Collection – Seismometer #10

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #21348</u>
Calibration Date:	<u>July 32, 2022</u>
Location of seismograph:	<u>Civic Number 2337 Route 820 (PW-04)</u>
Distance and Direction from Blast:	<u>737 m Southeast</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>



## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 9, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>14:05</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-01</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #11

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #20204</u>
Calibration Date:	<u>May 31, 2022</u>
Location of seismograph:	<u>Civic Number 4140 Route 111 (PW-12)</u>
Distance and Direction from Blast:	<u>870 m North</u>
Transverse Particle Velocity:	<u>0.29 mm/s @ 51 Hz</u>
Vertical Particle Velocity:	<u>0.69 mm/s @ 51 Hz</u>
Longitudinal Particle Velocity:	<u>0.50 mm/s @ 43 Hz</u>
Peak Particle Velocity:	<u>0.69 mm/s @ 51 Hz</u>
Maximum Airblast:	<u>103 dB(L)</u>



## Attachment B

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### *Blast and Seismograph Location Plan*



# Blast and Seismograph Location Plan

Blast No: 2023-01

Upham East Gypsum Quarry

Upham, NB



Date: January 9, 2023  
Project No.: 234601.00





## Attachment C

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### *Blast Event Reports*

**Date/Time** Vert at 14:02:38 January 9, 2023  
**Trigger Source** Geo: 0.510 mm/s, Mic: 120.0 dB(L)  
**Range** Geo: 254.0 mm/s  
**Record Time** 7.0 sec at 1024 sps

**Serial Number** BE21349 V 10.72-1.1 Minimate Blaster  
**Battery Level** 6.3 Volts  
**Unit Calibration** July 20, 2022 by InstanTel  
**File Name** W349JUDR.0E0  
**Post Event Notes**  
 Location: Civic Number 86 Myron Road (PW-16)  
 Blast No.: 2023-01  
 Project No: 234601.00

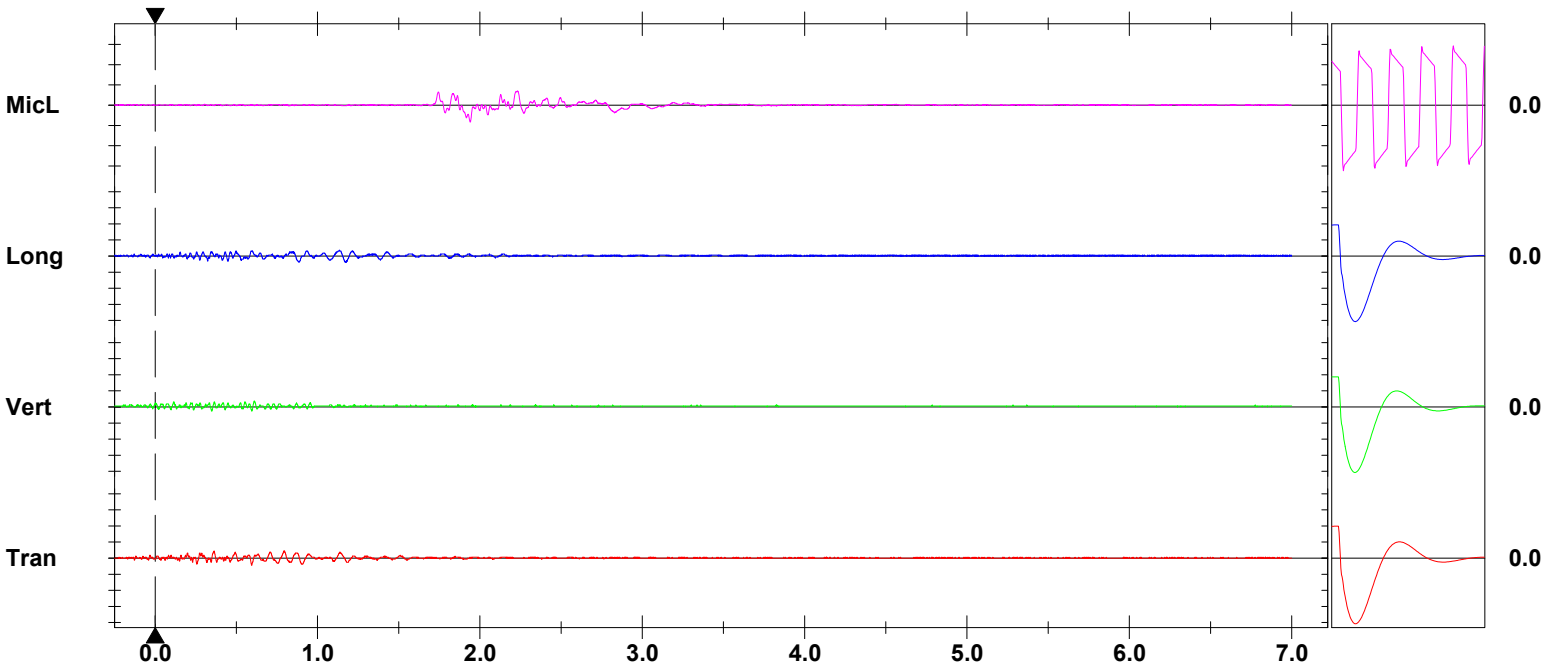
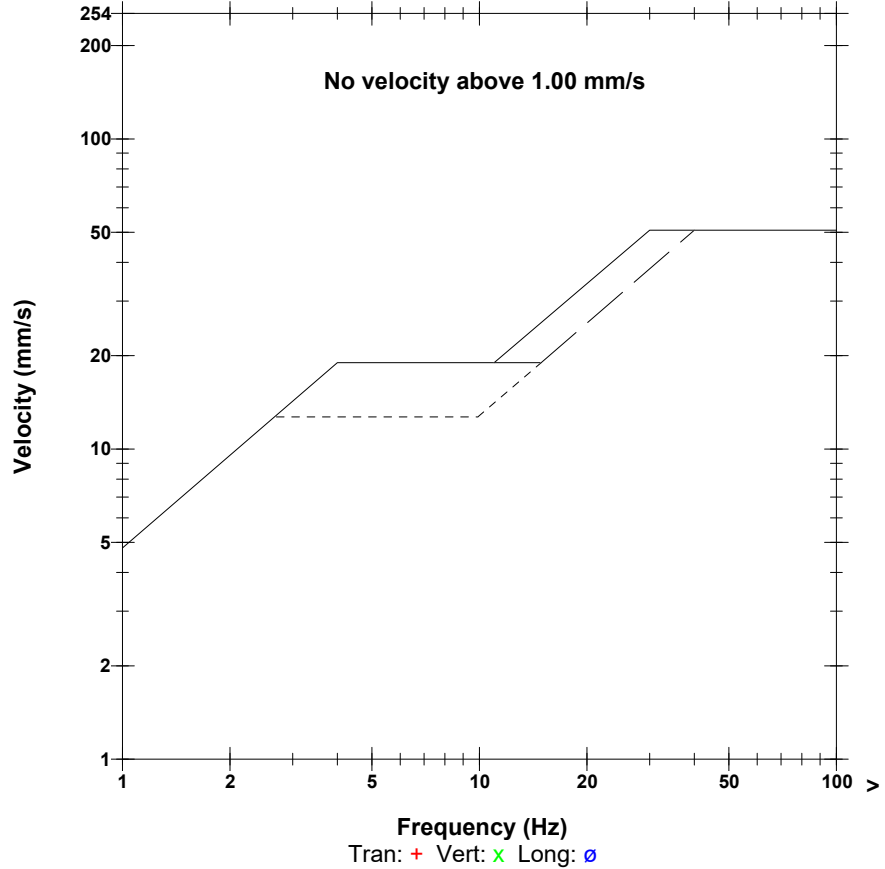
**Notes**

**Microphone** Linear Weighting  
**PSPL** 112.3 dB(L) 8.250 pa.(L) at 1.938 sec  
**ZC Freq** 5.6 Hz  
**Channel Test** Passed (Freq = 19.7 Hz Amp = 730 mv)

	Tran	Vert	Long	
PPV	0.889	0.762	0.762	mm/s
PPV	49.98	48.64	48.64	dB
ZC Freq	24	28	16	Hz
Time (Rel. to Trig)	0.362	0.610	0.882	sec
Peak Acceleration	0.027	0.027	0.027	g
Peak Displacement	0.009	0.004	0.011	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.6	7.3	Hz
Overswing Ratio	4.1	4.1	4.4	

**Peak Vector Sum** 1.205 mm/s at 0.595 sec

**USBM RI8507 And OSMRE**



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

Sensor Check

**Date/Time** Vert at 14:05:09 January 9, 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

**Serial Number** UM20204 V 10-90GC Micromate ISEE  
**Battery Level** 3.6 Volts  
**Unit Calibration** May 31, 2022 by InstanTel  
**File Name** UM20204\_20230109140509.IDFW

**Notes**  
 Location:  
 Client:  
 User Name:  
 General:

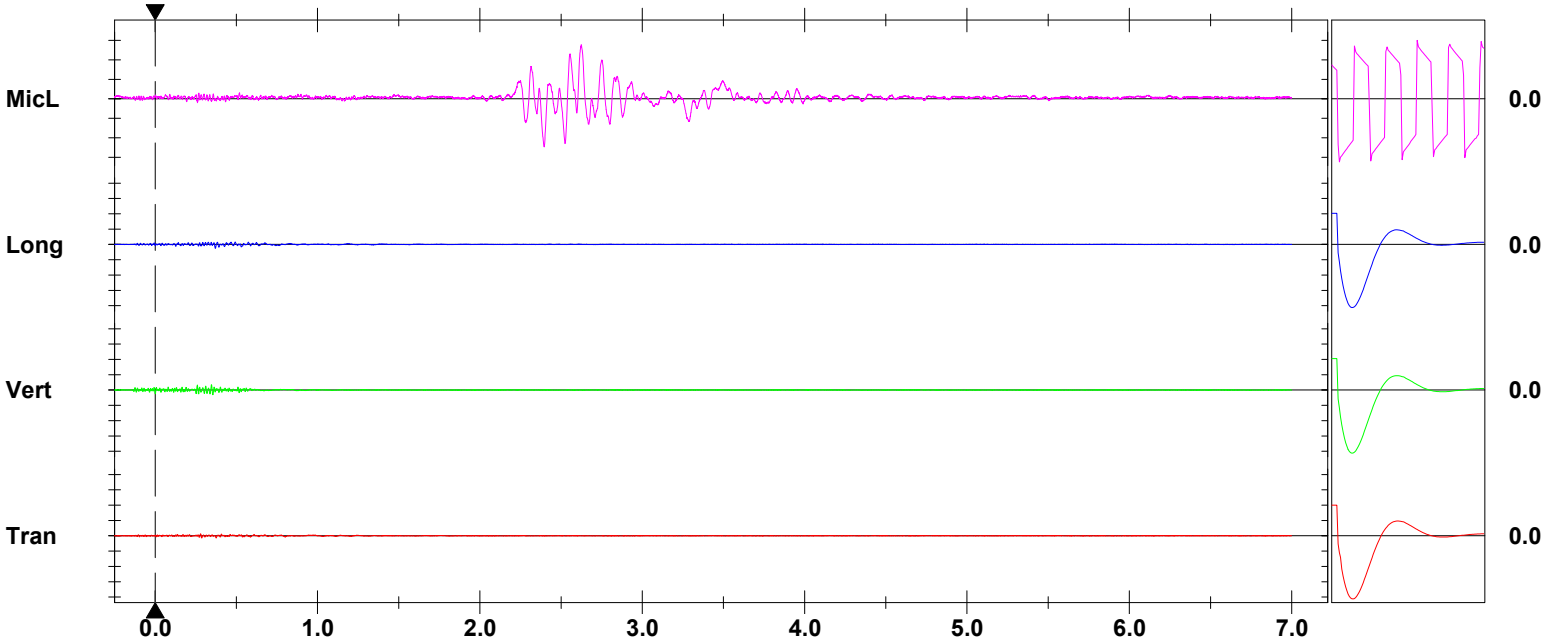
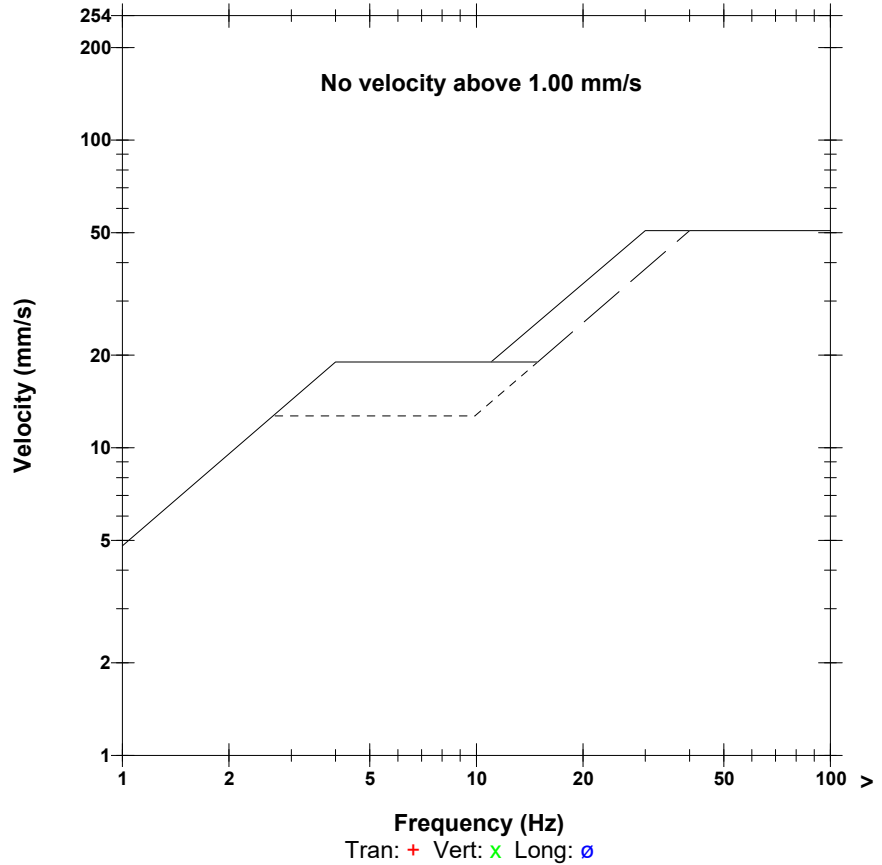
**Post Event Notes**  
 Location: Civic Number 4140 Route 111 (PW-12)  
 Blast No.: 2023-01  
 Project No: 234601.00

**Microphone** Linear Weighting  
**PSPL** 102.9 dB(L) 2.777 pa.(L) at 2.625 sec  
**ZC Freq** 11 Hz  
**Channel Test** Passed (Freq = 20.5 Hz Amp = 1699 mv )

	Tran	Vert	Long	
PPV	0.292	0.694	0.504	mm/s
PPV	40.30	47.82	45.06	dB
ZC Freq	51	51	43	Hz
Time (Rel. to Trig)	0.287	0.347	0.370	sec
Peak Acceleration	0.024	0.039	0.015	g
Peak Displacement	0.002	0.002	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	4.3	4.4	4.3	

**Peak Vector Sum** 0.738 mm/s at 0.347 sec

**USBM RI8507 And OSMRE**



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

Sensor Check

January 18, 2023

Project No.: 234601.00

Mr. Daniel Guest

**Hammond River Holdings**

Via email: [Guest.Daniel@AtlanticWallboard.com](mailto:Guest.Daniel@AtlanticWallboard.com)

**Re: Blast Vibration Monitoring – Blast No. 2023-02 – 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 at 15:26 on January 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. 2023-02 – January 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)	15:26	1,380 m S	< 0.5 mm/s	<120	Unit was not triggered
2. Civic No. 4126 Route 111 (PW-10)		990 m S	0.73 mm/s @ 57 Hz	113	-
3. Civic No. 4150 Route 111 (PW-13)		845 m SE	< 0.5 mm/s	<120	Units were not triggered
4. Civic No. 2447 Route 820 (PW-07)		960 m NE	< 0.5 mm/s	<120	
5. PW-03 - Cottage Route 820		615 m N	1.58 mm/s @ 43 Hz	111	-
6. Civic No. 2341 Route 820 (PW-05)		600 m N	2.41 mm/s @ 43 Hz	113	-
7. Civic No. 50 Myron Road (PW-15)		800 m NW	< 0.5 mm/s	<120	Unit was not triggered
8. Civic No. 86 Myron Road (PW-16)		700 m W	1.17 mm/s @ 34 Hz	108	-
9. Civic No. 220 Myron Road (PW-01)		1,350 m S	< 0.5 mm/s	<120	Units were not triggered
10. Civic No. 2337 Route 820 (PW-04)		665 m N	< 0.5 mm/s	<120	
11. Civic No. 4140 Route 111 (PW-12)			940 m SE	0.64 mm/s @ 57 Hz	113
<b>maximum limits as per Approval to Operate</b>			<b>12.5 mm/s</b>	<b>128 dB</b>	

*Mr. Daniel Guest – Hammond River Holdings*

*January 18, 2023*

*Project No.: 234601.00 – Blast No.: 2023-02*

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**

A handwritten signature in blue ink, appearing to read 'Robert Y. Cyr', with a stylized flourish at the end.

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

This document was prepared for the party indicated herein. The material and information in the document reflects CBCL Limited's opinion and best judgment based on the information available at the time of preparation. Any use of this document or reliance on its content by third parties is the responsibility of the third party. CBCL Limited accepts no responsibility for any damages suffered as a result of third party use of this document.

## Attachment A

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### *Blast Record*



## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 17, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>15:26</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-02</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### IDENTIFICATION:

<b>Blasting Contractor:</b>	<u>Gulf Operators</u>		
<b>Blaster's Certification No.:</b>	<u>1318</u>	<b>Blaster's Name:</b>	<u>Daniel Blanchard</u>
<b>Blast Location:</b>	<u>N 45°28.902' W 65°38.099' (see attached sketch)</u>		
<b>Type of Rock:</b>	<u>Anhydrate/Gypsum</u>	<b>Est. Vol. or Tonnage:</b>	<u>23,138 tonnes</u>
<b>Weather at time of Blast:</b>	<u>Cloudy</u>	<b>Air Temp.:</b>	<u>1°C</u>
<b>Est. Wind Speed :</b>	<u>≈10 km/h</u>	<b>Wind Direction:</b>	<u>W</u>
<b>Cloud Cover:</b>	<u>Yes</u>	<b>Precipitation:</b>	<u>No</u>

### BLAST DESIGN:

<b>Total No. Holes:</b>	<u>218</u>	<b>Hole Diameter:</b>	<u>4.5"</u>
<b>Average Depth:</b>	<u>4.8 m to 7.1 m</u>	<b>Spacing:</b>	<u>10 ft x 10 ft</u>
<b>No. Holes per Delay:</b>	<u>12</u>	<b>Collar Length:</b>	<u>7 ft</u>
<b>Delay between Holes:</b>	<u>25 ms</u>	<b>Delay between Rows:</b>	<u>42 &amp; 84 ms</u>
<b>Initiation Method:</b>	<u>Non-Electric</u>		
<b>Weight of Explosives per Delay:</b>	<u>Max.: 460 kg</u>		
<b>Type and weight of Explosives for Blast:</b>	<u>9,157 kg – Titan XL-1000</u>		

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



### BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 17, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>15:26</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-02</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### BLAST MONITORING

<b>Distance to the Nearest Structure:</b>	<u>600 m</u>
<b>Direction to the Nearest Structure:</b>	<u>N</u>
<b>Structure Type:</b>	<u>House</u>
<b>Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):</b>	<u>28.0</u>

### SAFETY:

<b>Type of Warning Signal Used:</b>	<u>Siren</u>
<b>Blasting Mats Used (yes or no):</b>	<u>No</u>
<b>Airblast Measurement ( yes or no ):</b>	<u>Yes</u>
<b>Vibration Measurement ( yes or no ):</b>	<u>Yes</u>
<b>Warning Signs Posted ( yes or no ):</b>	<u>Yes</u>
<b>Accesses Guarded ( yes or no ):</b>	<u>Yes</u>
<b>Flyrock Damage ( yes or no ):</b>	<u>No</u>
<b>If Yes, Describe:</b>	<u></u>
<hr/>	
<b>Misfire ( yes or no ):</b>	<u>No</u>

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

## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 17, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>15:26</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-02</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #1

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #20206</u>
Calibration Date:	<u>May 31, 2022</u>
Location of seismograph:	<u>Civic Number 4079 Route 111 (PW-09)</u>
Distance and Direction from Blast:	<u>1,380 m South</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

### Data Collection – Seismometer #2

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #18193</u>
Calibration Date:	<u>April 11, 2022</u>
Location of seismograph:	<u>Civic Number 4126 Route 111 (PW-10)</u>
Distance and Direction from Blast:	<u>990 m South</u>
Transverse Particle Velocity:	<u>0.51 mm/s @ 47 Hz</u>
Vertical Particle Velocity:	<u>0.73 mm/s @ 57 Hz</u>
Longitudinal Particle Velocity:	<u>0.37 mm/s @ 20 Hz</u>
Peak Particle Velocity:	<u>0.73 mm/s @ 57 Hz</u>
Maximum Airblast:	<u>113 dB(L)</u>

## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 17, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>15:26</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-02</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #3

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #21349</u>
Calibration Date:	<u>July 20, 2022</u>
Location of seismograph:	<u>Civic Number 4150 Route 111 (PW-13)</u>
Distance and Direction from Blast:	<u>845 m Southeast</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

### Data Collection – Seismometer #4

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #18187</u>
Calibration Date:	<u>May 5, 2022</u>
Location of seismograph:	<u>Civic Number 2447 Route 820 (PW-07)</u>
Distance and Direction from Blast:	<u>960 m Northeast</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>



## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 17, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>15:26</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-02</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #5

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #20203</u>
Calibration Date:	<u>April 8, 2022</u>
Location of seismograph:	<u>Cottage - PW-03 - Route 820</u>
Distance and Direction from Blast:	<u>615 m North</u>
Transverse Particle Velocity:	<u>0.91 mm/s @ 47 Hz</u>
Vertical Particle Velocity:	<u>1.58 mm/s @ 43 Hz</u>
Longitudinal Particle Velocity:	<u>1.37 mm/s @ 34 Hz</u>
Peak Particle Velocity:	<u>1.58 mm/s @ 43 Hz</u>
Maximum Airblast:	<u>111 dB(L)</u>

### Data Collection – Seismometer #6

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #21348</u>
Calibration Date:	<u>July 23, 2022</u>
Location of seismograph:	<u>Civic Number 2341 Route 820 (PW-05)</u>
Distance and Direction from Blast:	<u>600 m North</u>
Transverse Particle Velocity:	<u>1.52 mm/s @ 37 Hz</u>
Vertical Particle Velocity:	<u>2.41 mm/s @ 43 Hz</u>
Longitudinal Particle Velocity:	<u>1.52 mm/s @ 32 Hz</u>
Peak Particle Velocity:	<u>2.41 mm/s @ 43 Hz</u>
Maximum Airblast:	<u>113 dB(L)</u>

## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 17, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>15:26</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-02</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #7

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5489</u>
Calibration Date:	<u>April 25, 2022</u>
Location of seismograph:	<u>Civic Number 50 Myron Road (PW-15)</u>
Distance and Direction from Blast:	<u>800 m Northwest</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

### Data Collection – Seismometer #8

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #20204</u>
Calibration Date:	<u>May 31, 2022</u>
Location of seismograph:	<u>Civic Number 86 Myron Road (PW-16)</u>
Distance and Direction from Blast:	<u>700 m West</u>
Transverse Particle Velocity:	<u>1.03 mm/s @ 10 Hz</u>
Vertical Particle Velocity:	<u>1.17 mm/s @ 34 Hz</u>
Longitudinal Particle Velocity:	<u>1.10 mm/s @ 10 Hz</u>
Peak Particle Velocity:	<u>1.17 mm/s @ 34 Hz</u>
Maximum Airblast:	<u>108 dB(L)</u>

## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 17, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>15:26</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-02</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #9

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5371</u>
Calibration Date:	<u>July 27, 2022</u>
Location of seismograph:	<u>Civic Number 220 Myron Road (PW-01)</u>
Distance and Direction from Blast:	<u>1,350 m South</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

### Data Collection – Seismometer #10

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5632</u>
Calibration Date:	<u>November 16, 2022</u>
Location of seismograph:	<u>Civic Number 2337 Route 820 (PW-04)</u>
Distance and Direction from Blast:	<u>665 m Southeast</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>



## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 17, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>15:26</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-02</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #11

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #20205</u>
Calibration Date:	<u>May 31, 2022</u>
Location of seismograph:	<u>Civic Number 4140 Route 111 (PW-12)</u>
Distance and Direction from Blast:	<u>940 m North</u>
Transverse Particle Velocity:	<u>0.32 mm/s @ 51 Hz</u>
Vertical Particle Velocity:	<u>0.64 mm/s @ 57 Hz</u>
Longitudinal Particle Velocity:	<u>0.35 mm/s @ 51 Hz</u>
Peak Particle Velocity:	<u>0.64 mm/s @ 57 Hz</u>
Maximum Airblast:	<u>113 dB(L)</u>



## Attachment B

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### *Blast and Seismograph Location Plan*



# Blast and Seismograph Location Plan

**Blast No:** 2023-02

Upham East Gypsum Quarry

Upham, NB

PLS-CADD Overlay



## Legend

- ★ Blast 2023-02
- Seismograph Location

**Date:** January 17, 2023  
**Project No.:** 234601.00





## Attachment C

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### *Blast Event Reports*

**Date/Time** Vert at 15:26:42 January 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/CARVER.MMB

**Serial Number** UM18193 V 10-90GC Micromate ISEE  
**Battery Level** 3.8 Volts  
**Unit Calibration** April 11, 2022 by InstanTel  
**File Name** UM18193\_20230117152642.IDFW

**Post Event Notes**

Location: Civic Number 4126 Route 111 (PW-10)  
 Blast No.: 2023-02  
 Project No: 234601.00

**Notes**

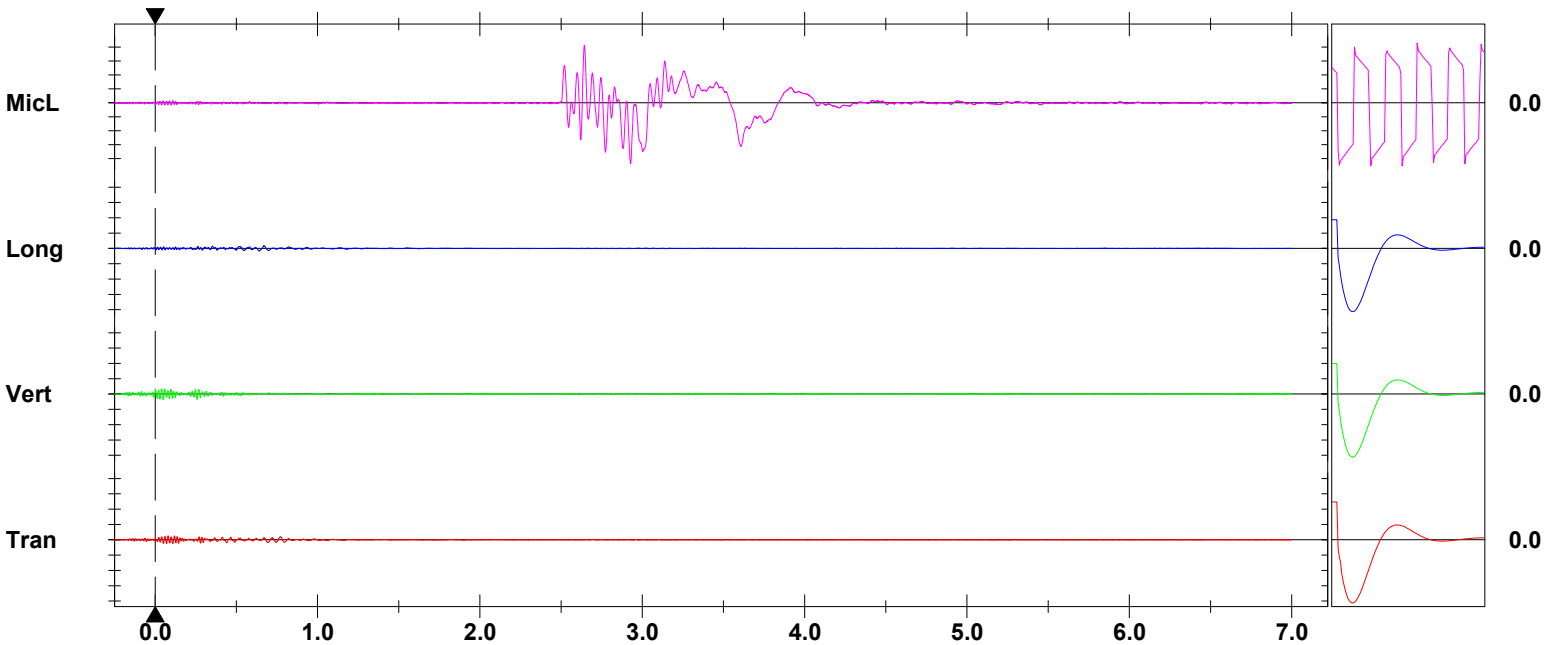
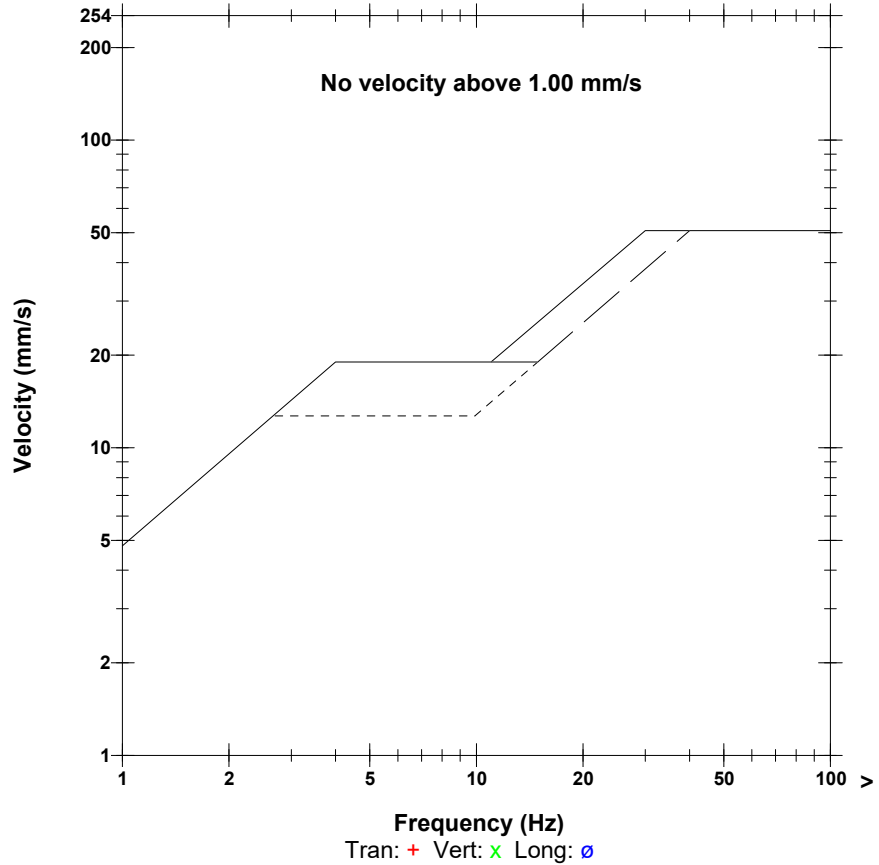
Location:  
 Client:  
 User Name:  
 General:

**Microphone** Linear Weighting  
**PSPL** 112.8 dB(L) 8.704 pa.(L) at 2.928 sec  
**ZC Freq** 3.9 Hz  
**Channel Test** Passed (Freq = 20.5 Hz Amp = 1675 mv )

	Tran	Vert	Long	
PPV	0.512	0.733	0.370	mm/s
PPV	45.19	48.30	42.37	dB
ZC Freq	47	57	20	Hz
Time (Rel. to Trig)	0.079	0.050	0.669	sec
Peak Acceleration	0.029	0.041	0.011	g
Peak Displacement	0.003	0.002	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.3	7.3	Hz
Overswing Ratio	4.3	4.5	4.7	

**Peak Vector Sum** 0.871 mm/s at 0.050 sec

**USBM RI8507 And OSMRE**



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

Sensor Check

**Date/Time** Vert at 15:26:47 January 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

**Serial Number** UM20203 V 10-90GC Micromate ISEE  
**Battery Level** 3.7 Volts  
**Unit Calibration** May 31, 2022 by InstanTel  
**File Name** UM20203\_20230117152647.IDFW

**Notes**

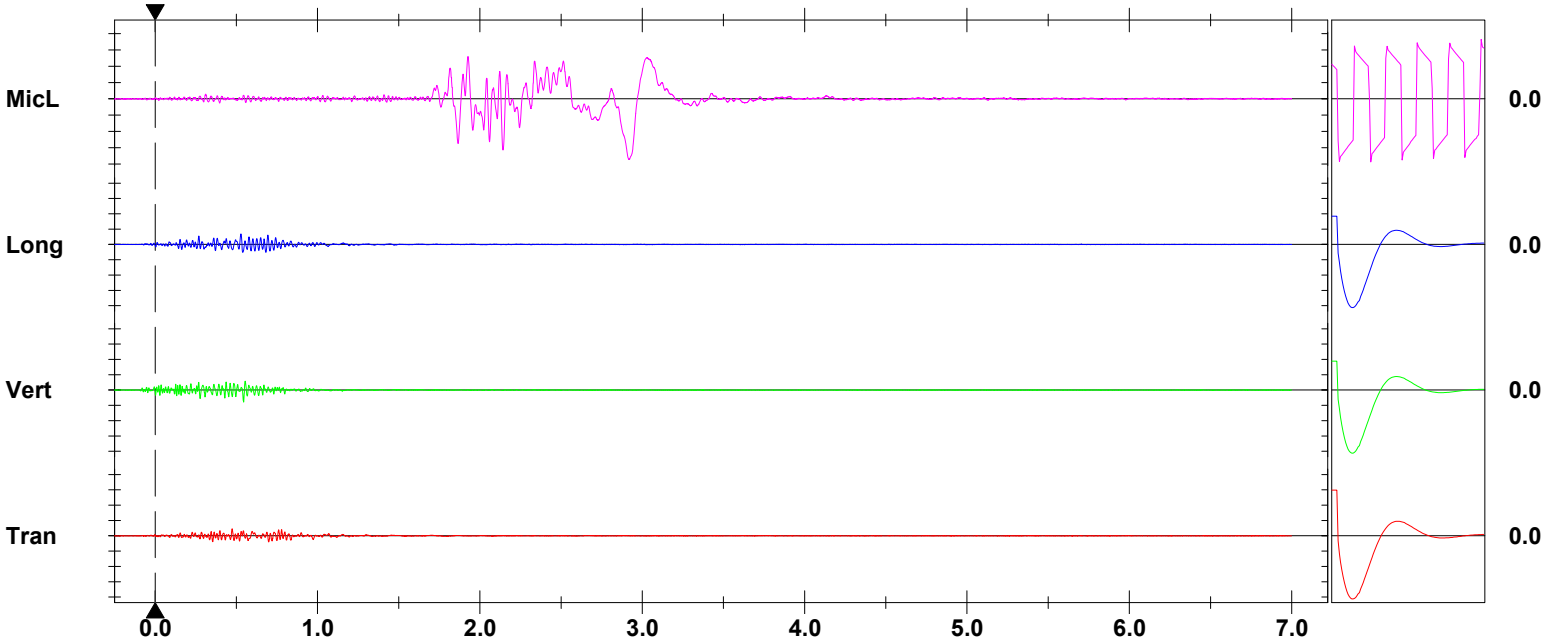
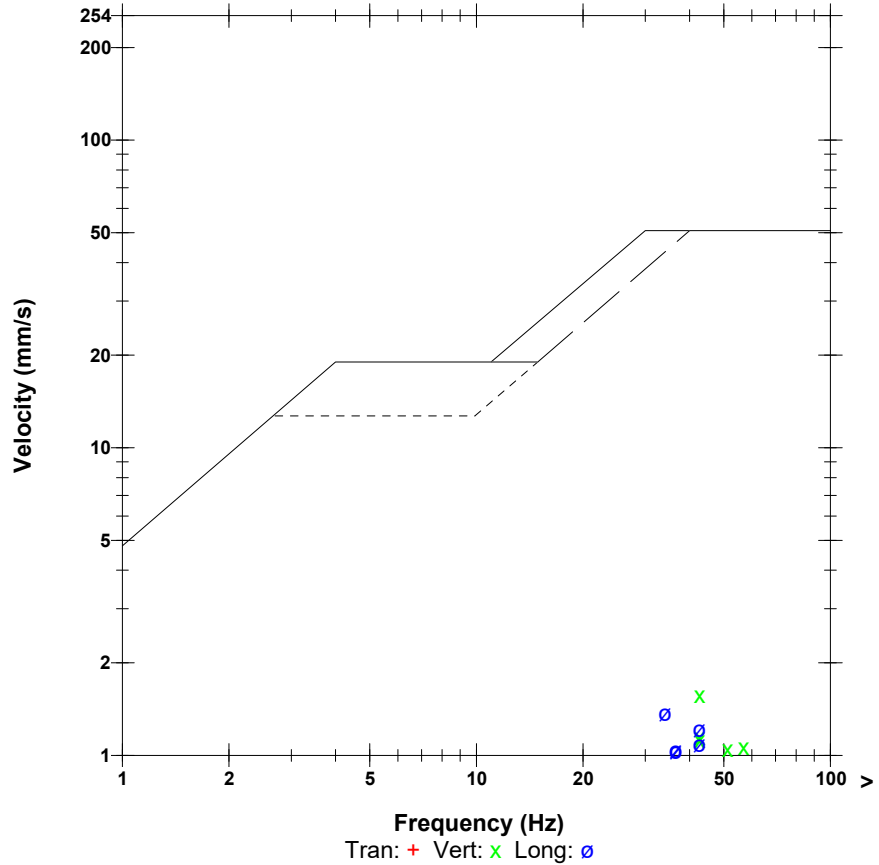
**Post Event Notes**  
 Location: Cottage - Route 820 (PW-03)  
 Blast No.: 2023-02  
 Project No: 234601.00

**Microphone** Linear Weighting  
**PSPL** 111.4 dB(L) 7.447 pa.(L) at 2.917 sec  
**ZC Freq** 3.5 Hz  
**Channel Test** Passed (Freq = 20.5 Hz Amp = 1615 mv )

	Tran	Vert	Long	
PPV	0.906	1.576	1.371	mm/s
PPV	50.15	54.95	53.74	dB
ZC Freq	47	43	34	Hz
Time (Rel. to Trig)	0.474	0.545	0.528	sec
Peak Acceleration	0.044	0.086	0.066	g
Peak Displacement	0.005	0.006	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	4.4	4.7	4.5	

**Peak Vector Sum** 1.839 mm/s at 0.544 sec

**USBM RI8507 And OSMRE**



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

Sensor Check

**Date/Time** Vert at 15:22:39 January 17, 2023  
**Trigger Source** Geo: 0.510 mm/s, Mic: 120.0 dB(L)  
**Range** Geo: 254.0 mm/s  
**Record Time** 7.0 sec at 1024 sps

**Serial Number** BE21348 V 10.72-1.1 Minimate Blaster  
**Battery Level** 6.1 Volts  
**Unit Calibration** July 21, 2022 by InstanTel  
**File Name** W348JUSO.1R0

**Notes**

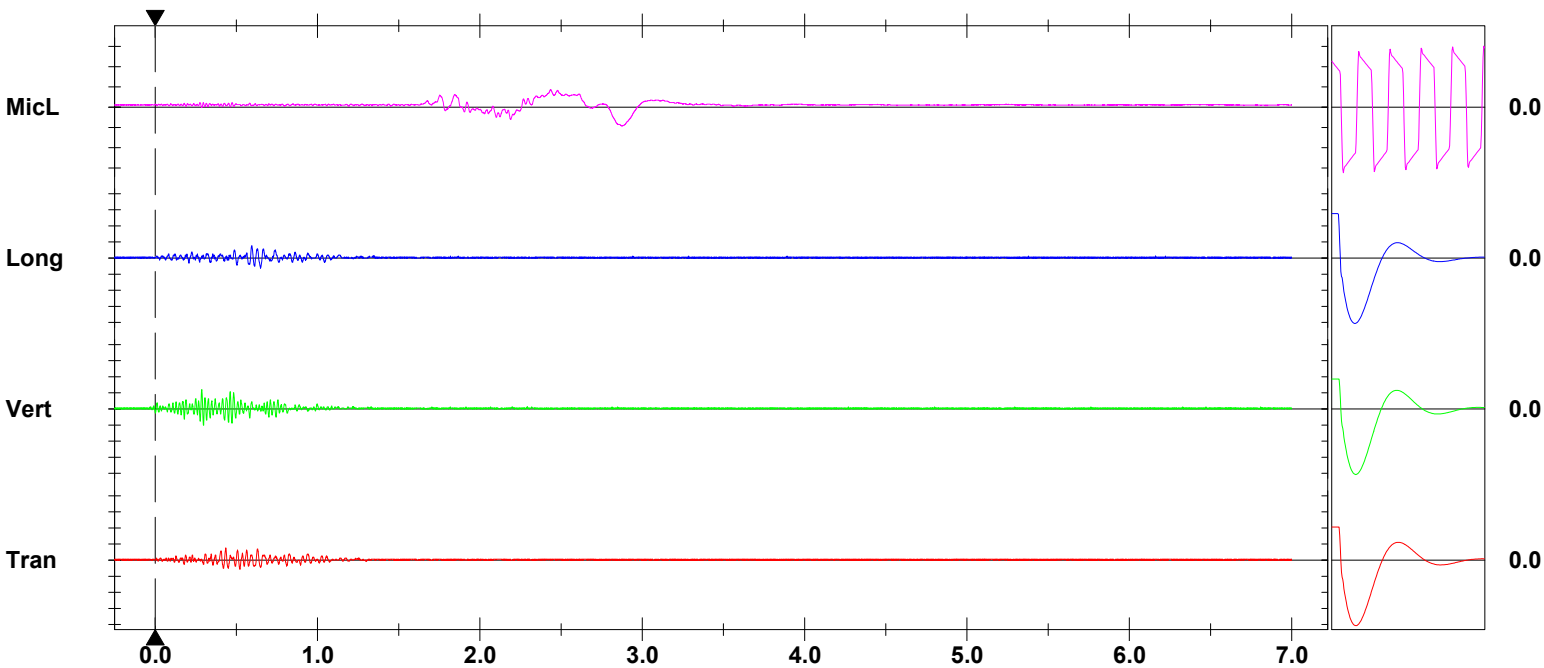
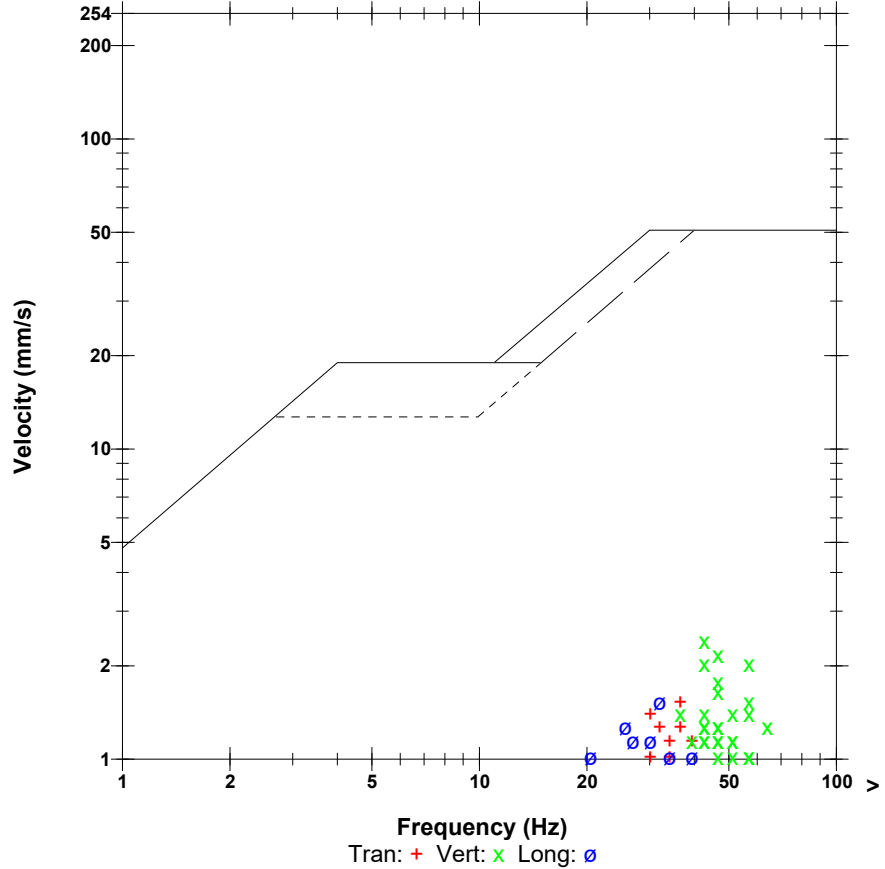
**Post Event Notes**  
 Location: Civic Number 2341 Route 820 (PW-05)  
 Blast No.: 2023-02  
 Project No: 234601.00

**Microphone** Linear Weighting  
**PSPL** 113.3 dB(L) 9.250 pa.(L) at 2.870 sec  
**ZC Freq** 2.8 Hz  
**Channel Test** Passed (Freq = 20.1 Hz Amp = 715 mv )

	Tran	Vert	Long	
PPV	1.524	2.413	1.524	mm/s
PPV	54.66	58.65	54.66	dB
ZC Freq	37	43	32	Hz
Time (Rel. to Trig)	0.435	0.286	0.594	sec
Peak Acceleration	0.040	0.080	0.040	g
Peak Displacement	0.007	0.008	0.008	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.6	7.5	Hz
Overswing Ratio	3.7	3.5	4.3	

Peak Vector Sum 2.430 mm/s at 0.286 sec

### USBM RI8507 And OSMRE



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

Sensor Check

**Date/Time** Vert at 15:26:47 January 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

**Serial Number** UM20204 V 10-90GC Micromate ISEE  
**Battery Level** 3.6 Volts  
**Unit Calibration** May 31, 2022 by InstanTel  
**File Name** UM20204\_20230117152647.IDFW

### Post Event Notes

Location: Civic Number 86 Myron Road (PW-016)  
 Blast No.: 2023-02  
 Project No: 234601.00

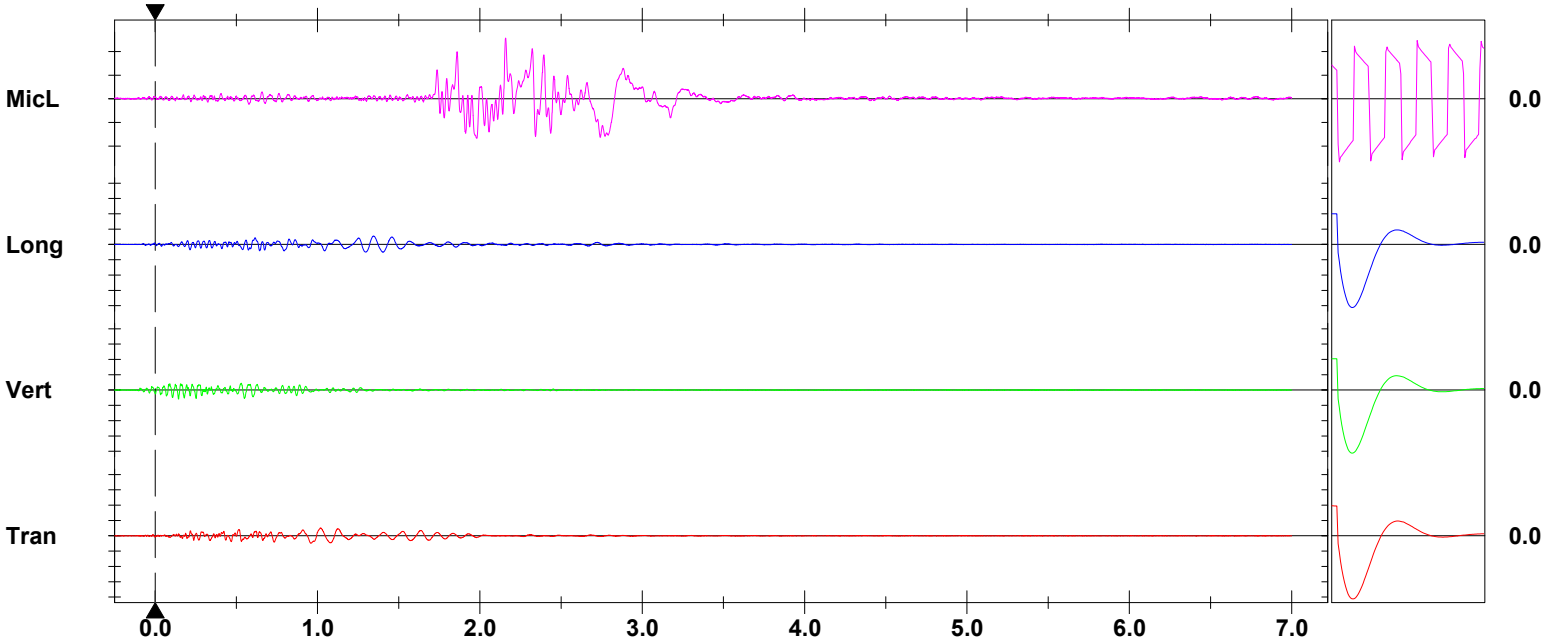
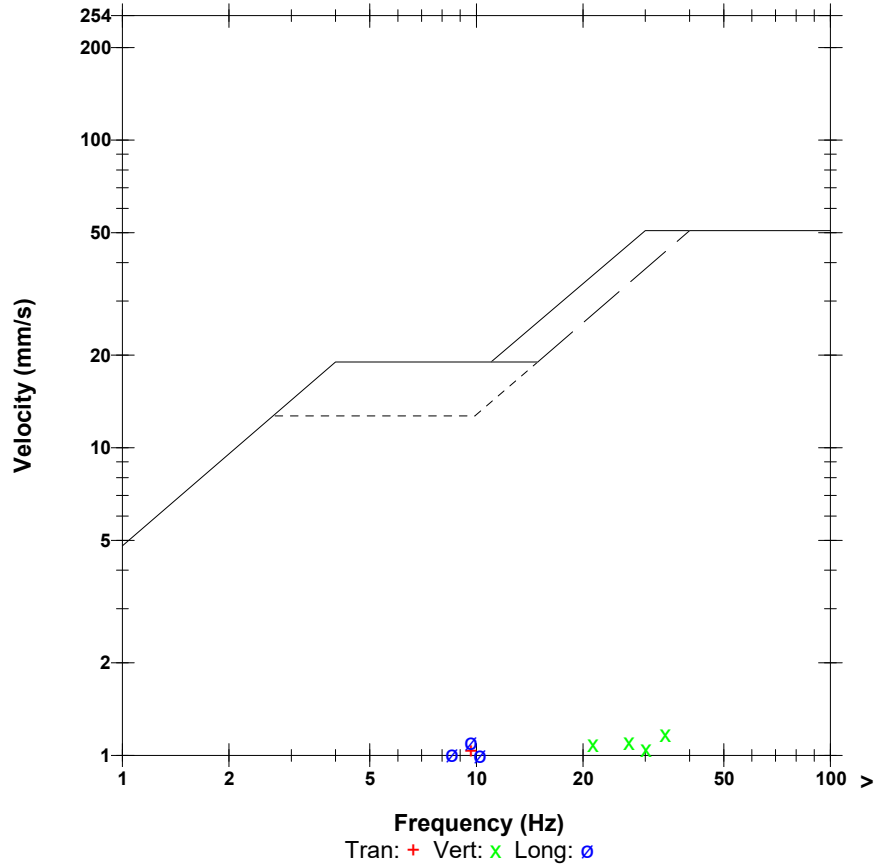
### Notes

**Microphone** Linear Weighting  
**PSPL** 108.2 dB(L) 5.136 pa.(L) at 2.157 sec  
**ZC Freq** 9.0 Hz  
**Channel Test** Passed (Freq = 20.5 Hz Amp = 1674 mv )

	Tran	Vert	Long	
PPV	1.033	1.174	1.103	mm/s
PPV	51.28	52.40	51.86	dB
ZC Freq	9.7	34	9.7	Hz
Time (Rel. to Trig)	1.021	0.144	1.344	sec
Peak Acceleration	0.038	0.039	0.028	g
Peak Displacement	0.018	0.008	0.018	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	4.3	4.4	4.4	

**Peak Vector Sum** 1.247 mm/s at 0.531 sec

### USBM RI8507 And OSMRE



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

Sensor Check

**Date/Time** Vert at 15:26:47 January 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

**Serial Number** UM20205 V 10-90GC Micromate ISEE  
**Battery Level** 3.6 Volts  
**Unit Calibration** May 31, 2022 by InstanTel  
**File Name** UM20205\_20230117152647.IDFW

**Notes**

**Post Event Notes**

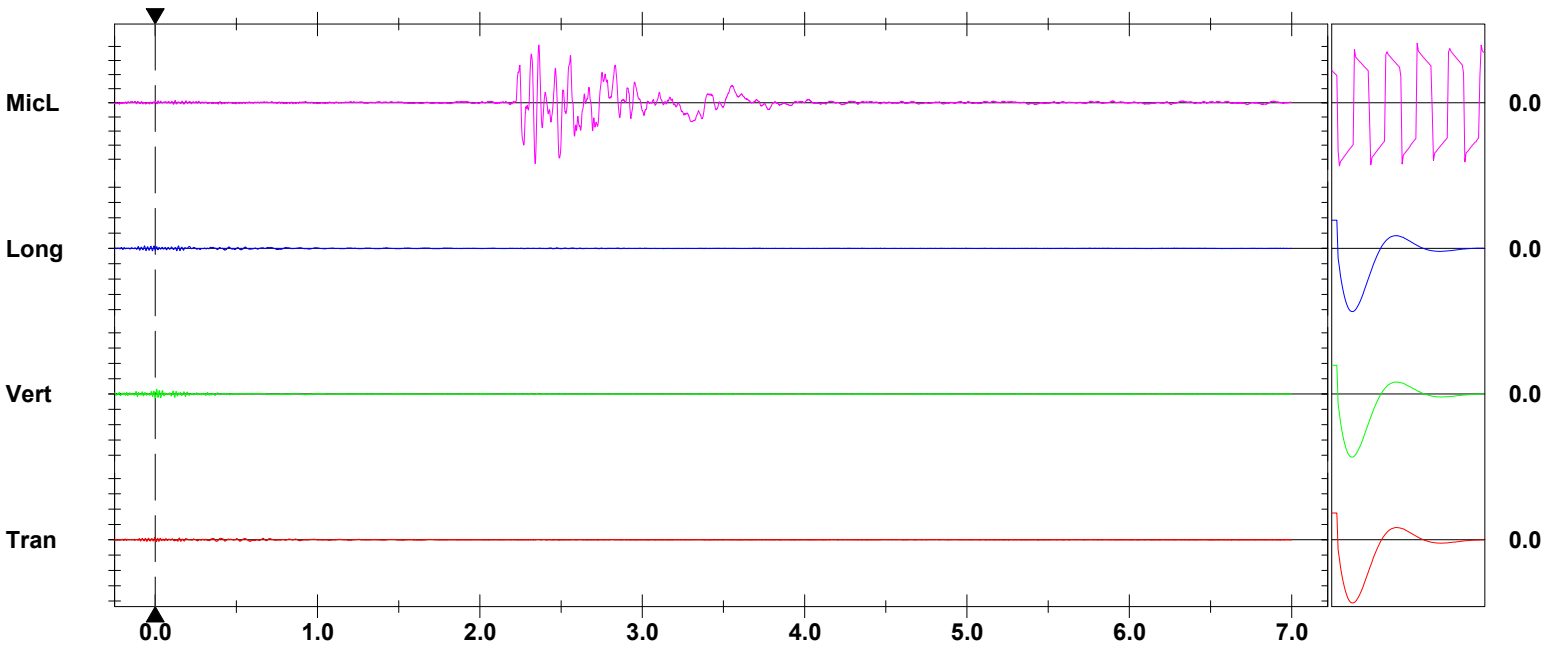
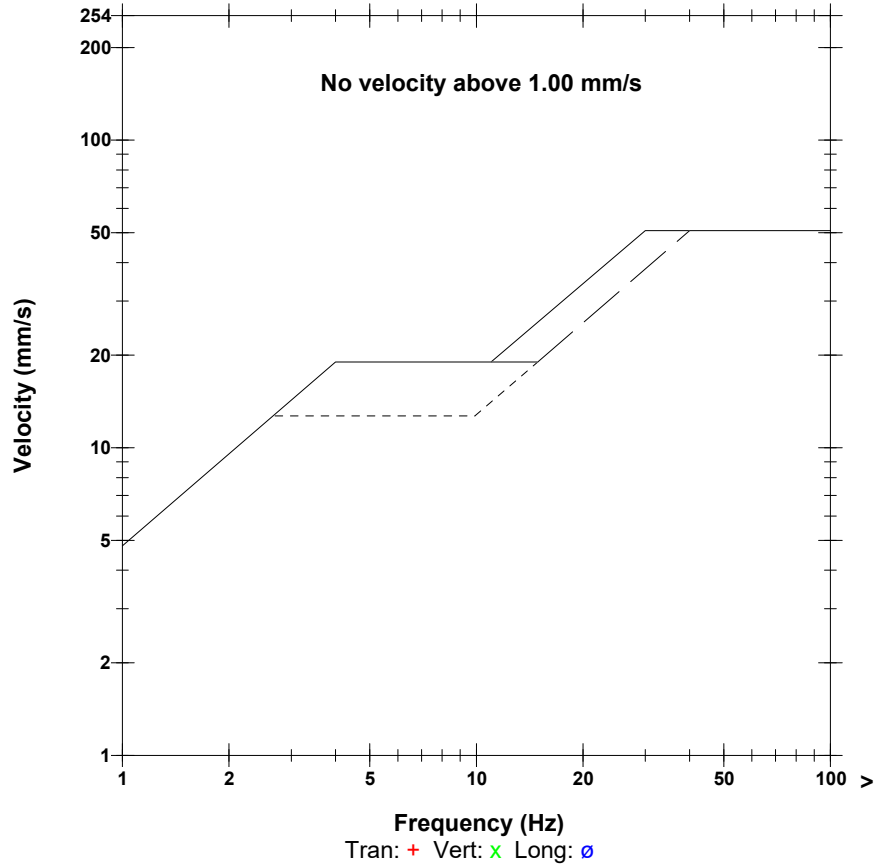
Location: Civic Number 4140 Route 111 (PW-12)  
 Blast No.: 2023-02  
 Project No: 234601.00

**Microphone** Linear Weighting  
**PSPL** 112.7 dB(L) 8.626 pa.(L) at 2.341 sec  
**ZC Freq** 22 Hz  
**Channel Test** Passed (Freq = 20.5 Hz Amp = 1744 mv )

	Tran	Vert	Long	
PPV	0.315	0.638	0.347	mm/s
PPV	40.97	47.10	41.80	dB
ZC Freq	51	57	51	Hz
Time (Rel. to Trig)	-0.003	0.009	-0.065	sec
Peak Acceleration	0.020	0.027	0.021	g
Peak Displacement	0.003	0.002	0.002	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.3	7.5	Hz
Overswing Ratio	5.2	5.3	5.0	

**Peak Vector Sum** 0.691 mm/s at 0.009 sec

**USBM RI8507 And OSMRE**



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

Sensor Check



January 26, 2023

Project No.: 234601.00

Mr. Daniel Guest

**Hammond River Holdings**

Via email: [Guest.Daniel@AtlanticWallboard.com](mailto:Guest.Daniel@AtlanticWallboard.com)

**Re: Blast Vibration Monitoring – Blast No. 2023-03 – 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 Dyno Nobel Canada at 12:20 on January 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. 2023-03 – January 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)	12:20	920 m S	< 0.5 mm/s	<120	Unit was not triggered
2. Civic No. 4126 Route 111 (PW-10)		515 m S	0.56 mm/s @ 51 Hz	103	-
3. Civic No. 4150 Route 111 (PW-13)		450 m SE	1.04 mm/s @ 73 Hz	103	-
4. Civic No. 2447 Route 820 (PW-07)		1,285 m NE	< 0.5 mm/s	<120	Units were not triggered
5. PW-03 - Cottage Route 820		1,030 m N	< 0.5 mm/s	<120	
6. Civic No. 2341 Route 820 (PW-05)		1,055 m N	0.89 mm/s @ 24 Hz	112	-
7. Civic No. 50 Myron Road (PW-15)		1,240 m NW	< 0.5 mm/s	<120	Unit was not triggered
8. Civic No. 86 Myron Road (PW-16)		830 m W	1.38 mm/s @ 28 Hz	101	-
9. Civic No. 220 Myron Road (PW-01)		975 m SW	< 0.5 mm/s	<120	Units were not triggered
10. Civic No. 2337 Route 820 (PW-04)		1,125 m NW	< 0.5 mm/s	<120	
11. Civic No. 4140 Route 111 (PW-12)		480 m SE	0.89 mm/s @ 57 Hz	108	-
<b>maximum limits as per Approval to Operate</b>			<b>12.5 mm/s</b>	<b>128 dB</b>	

*Mr. Daniel Guest – Hammond River Holdings*

*January 26, 2023*

*Project No.: 234601.00 – Blast No.: 2023-03*

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**

A handwritten signature in blue ink, appearing to read "Robert Y. Cyr", with a stylized flourish at the end.

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

This document was prepared for the party indicated herein. The material and information in the document reflects CBCL Limited's opinion and best judgment based on the information available at the time of preparation. Any use of this document or reliance on its content by third parties is the responsibility of the third party. CBCL Limited accepts no responsibility for any damages suffered as a result of third party use of this document.

## Attachment A

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### *Blast Record*

## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 25, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>12:20</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-03</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### IDENTIFICATION:

<b>Blasting Contractor:</b>	<u>Dyno Nobel c/o Gulf Operators Ltd.</u>		
<b>Blaster's Certification No.:</b>	<u>1349</u>	<b>Blaster's Name:</b>	<u>James Young</u>
<b>Blast Location:</b>	<u>N 45°28.660' W 65°38.000' (see attached sketch)</u>		
<b>Type of Rock:</b>	<u>Anhydrate/Gypsum</u>	<b>Est. Vol. or Tonnage:</b>	<u>15,000 tonnes</u>
<b>Weather at time of Blast:</b>	<u>Clear</u>	<b>Air Temp.:</b>	<u>-10°C</u>
<b>Est. Wind Speed :</b>	<u>≈5 km/h</u>	<b>Wind Direction:</b>	<u>S</u>
<b>Cloud Cover:</b>	<u>No</u>	<b>Precipitation:</b>	<u>No</u>

### BLAST DESIGN:

<b>Total No. Holes:</b>	<u>82</u>	<b>Hole Diameter:</b>	<u>4.5"</u>
<b>Average Depth:</b>	<u>7.3 m</u>	<b>Spacing:</b>	<u>10 ft x 10 ft</u>
<b>No. Holes per Delay:</b>	<u>2</u>	<b>Collar Length:</b>	<u>7 ft</u>
<b>Delay between Holes:</b>	<u>25 ms</u>	<b>Delay between Rows:</b>	<u>67 ms</u>
<b>Initiation Method:</b>	<u>Non-Electric</u>		
<b>Weight of Explosives per Delay:</b>	<u>Max.: 220 kg</u>		
<b>Type and weight of Explosives for Blast:</b>	<u>6,890 kg – Titan XL-1000</u>		

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



### BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 25, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>12:20</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-03</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### BLAST MONITORING

<b>Distance to the Nearest Structure:</b>	<u>450 m</u>
<b>Direction to the Nearest Structure:</b>	<u>SE</u>
<b>Structure Type:</b>	<u>House</u>
<b>Scaled Distance Factor: (distance / sq. rt. of max. wt. per delay):</b>	<u>30.3</u>

### SAFETY:

<b>Type of Warning Signal Used:</b>	<u>Siren</u>
<b>Blasting Mats Used (yes or no):</b>	<u>No</u>
<b>Airblast Measurement ( yes or no ):</b>	<u>Yes</u>
<b>Vibration Measurement ( yes or no ):</b>	<u>Yes</u>
<b>Warning Signs Posted ( yes or no ):</b>	<u>Yes</u>
<b>Accesses Guarded ( yes or no ):</b>	<u>Yes</u>
<b>Flyrock Damage ( yes or no ):</b>	<u>No</u>
<b>If Yes, Describe:</b>	<u></u>
<hr/>	
<b>Misfire ( yes or no ):</b>	<u>No</u>

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

## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 25, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>12:20</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-03</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #1

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5673</u>
Calibration Date:	<u>April 8, 2022</u>
Location of seismograph:	<u>Civic Number 4079 Route 111 (PW-09)</u>
Distance and Direction from Blast:	<u>920 m South</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

### Data Collection – Seismometer #2

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #20206</u>
Calibration Date:	<u>May 31, 2022</u>
Location of seismograph:	<u>Civic Number 4126 Route 111 (PW-10)</u>
Distance and Direction from Blast:	<u>515 m South</u>
Transverse Particle Velocity:	<u>0.36 mm/s @ 12 Hz</u>
Vertical Particle Velocity:	<u>0.56 mm/s @ 51 Hz</u>
Longitudinal Particle Velocity:	<u>0.25 mm/s @ 18 Hz</u>
Peak Particle Velocity:	<u>0.56 mm/s @ 51 Hz</u>
Maximum Airblast:	<u>103 dB(L)</u>

## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 25, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>12:20</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-03</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #3

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #20204</u>
Calibration Date:	<u>May 31, 2022</u>
Location of seismograph:	<u>Civic Number 4150 Route 111 (PW-13)</u>
Distance and Direction from Blast:	<u>450 m Southeast</u>
Transverse Particle Velocity:	<u>0.98 mm/s @ 20 Hz</u>
Vertical Particle Velocity:	<u>1.04 mm/s @ 73 Hz</u>
Longitudinal Particle Velocity:	<u>0.73 mm/s @ 17 Hz</u>
Peak Particle Velocity:	<u>1.04 mm/s @ 73 Hz</u>
Maximum Airblast:	<u>103 dB(L)</u>

### Data Collection – Seismometer #4

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5489</u>
Calibration Date:	<u>April 25, 2022</u>
Location of seismograph:	<u>Civic Number 2447 Route 820 (PW-07)</u>
Distance and Direction from Blast:	<u>1,285 m Northeast</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 25, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>12:20</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-03</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #5

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #21349</u>
Calibration Date:	<u>July 20, 2022</u>
Location of seismograph:	<u>Cottage - PW-03 - Route 820</u>
Distance and Direction from Blast:	<u>1,030 m North</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

### Data Collection – Seismometer #6

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #18193</u>
Calibration Date:	<u>April 11, 2022</u>
Location of seismograph:	<u>Civic Number 2341 Route 820 (PW-05)</u>
Distance and Direction from Blast:	<u>1,055 m North</u>
Transverse Particle Velocity:	<u>0.74 mm/s @ 37 Hz</u>
Vertical Particle Velocity:	<u>0.48 mm/s @ 39 Hz</u>
Longitudinal Particle Velocity:	<u>0.89 mm/s @ 24 Hz</u>
Peak Particle Velocity:	<u>0.89 mm/s @ 24 Hz</u>
Maximum Airblast:	<u>112 dB(L)</u>



## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 25, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>12:20</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-03</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #7

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #2023</u>
Calibration Date:	<u>May 31, 2022</u>
Location of seismograph:	<u>Civic Number 50 Myron Road (PW-15)</u>
Distance and Direction from Blast:	<u>1,240 m Northwest</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

### Data Collection – Seismometer #8

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #20205</u>
Calibration Date:	<u>May 31, 2022</u>
Location of seismograph:	<u>Civic Number 86 Myron Road (PW-16)</u>
Distance and Direction from Blast:	<u>830 m West</u>
Transverse Particle Velocity:	<u>0.82 mm/s @ 24 Hz</u>
Vertical Particle Velocity:	<u>1.38 mm/s @ 28 Hz</u>
Longitudinal Particle Velocity:	<u>1.24 mm/s @ 11 Hz</u>
Peak Particle Velocity:	<u>1.38 mm/s @ 28 Hz</u>
Maximum Airblast:	<u>101 dB(L)</u>

## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 25, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>12:20</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-03</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #9

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #5632</u>
Calibration Date:	<u>November 16, 2022</u>
Location of seismograph:	<u>Civic Number 220 Myron Road (PW-01)</u>
Distance and Direction from Blast:	<u>975 m Southwest</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>

### Data Collection – Seismometer #10

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #18187</u>
Calibration Date:	<u>May 5, 2022</u>
Location of seismograph:	<u>Civic Number 2337 Route 820 (PW-04)</u>
Distance and Direction from Blast:	<u>1,125 m Northwest</u>
Transverse Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Vertical Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Longitudinal Particle Velocity:	<u>&lt;0.5 mm/s – Unit was not triggered</u>
Peak Particle Velocity:	<u>N/A</u>
Maximum Airblast:	<u>&lt;120 dB(L) – Unit was not triggered</u>



## BLAST RECORD

<b>Project Name:</b>	<u>Upham Gypsum Quarry</u>	<b>Date of Blast:</b>	<u>January 25, 2023</u>
<b>Project No.:</b>	<u>234601.00</u>	<b>Time of Blast:</b>	<u>12:20</u>
<b>Inspector:</b>	<u>C. Buckley</u>	<b>Blast No.:</b>	<u>2023-03</u>
<b>Client:</b>	<u>Hammond River Holdings</u>		

### Data Collection – Seismometer #11

Make, Model and Serial # of unit:	<u>Instantel Mini Mate, Serial #21348</u>
Calibration Date:	<u>July 23, 2022</u>
Location of seismograph:	<u>Civic Number 4140 Route 111 (PW-12)</u>
Distance and Direction from Blast:	<u>480 m Southeast</u>
Transverse Particle Velocity:	<u>0.38 mm/s @ 64 Hz</u>
Vertical Particle Velocity:	<u>0.89 mm/s @ 57 Hz</u>
Longitudinal Particle Velocity:	<u>0.51 mm/s @ 57 Hz</u>
Peak Particle Velocity:	<u>0.89 mm/s @ 57 Hz</u>
Maximum Airblast:	<u>108 dB(L)</u>

## Attachment B

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### *Blast and Seismograph Location Plan*



# Blast and Seismograph Location Plan

**Blast No:** 2023-03

Upham East Gypsum Quarry

Upham, NB

PLS-CADD Overlay



## Legend

- ★ Blast 2023-03
- Seismograph Location

2447 Route 820 (PW-07)

4150 Route 111 (PW-13)  
4140 Route 111 (PW-12)

4126 Route 111 (PW-10)

4079 Route 111 (PW-09)

Cottage Route 820 (PW-03)

★ Blast 2023-03

2341 Route 820 (PW-05)

220 Myron Road (PW-01)

2337 Route 820 (PW-04)

50 Myron Road (PW-15)

86 Myron Road (PW-16)

Google Earth

Image © 2023 CHES / Airbus

500 m

**Date:** January 25, 2023  
**Project No.:** 234601.00





## Attachment C

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### *Blast Event Reports*

**Date/Time** Vert at 12:20:04 January 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

**Serial Number** UM20206 V 10-90GC Micromate ISEE  
**Battery Level** 3.5 Volts  
**Unit Calibration** May 31, 2022 by InstanTel  
**File Name** UM20206\_20230125122004.IDFW

**Notes**

**Post Event Notes**

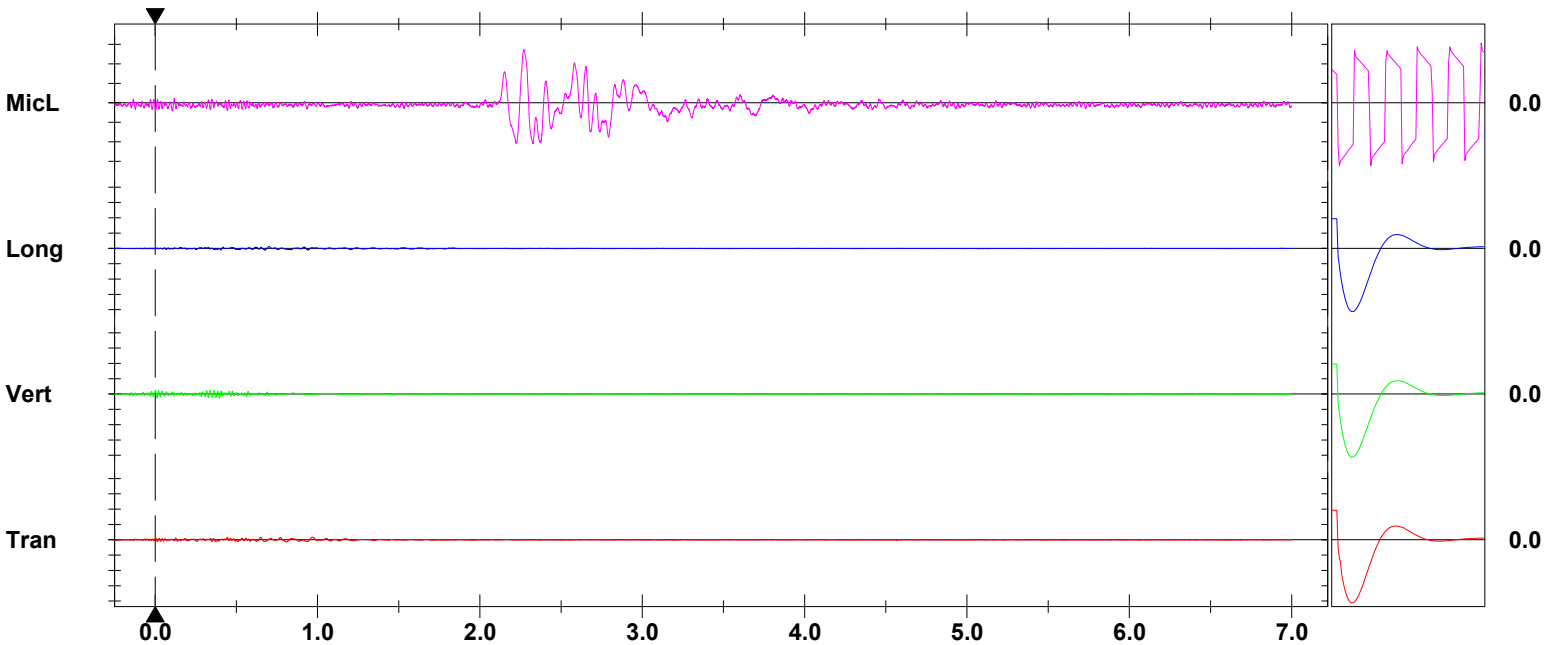
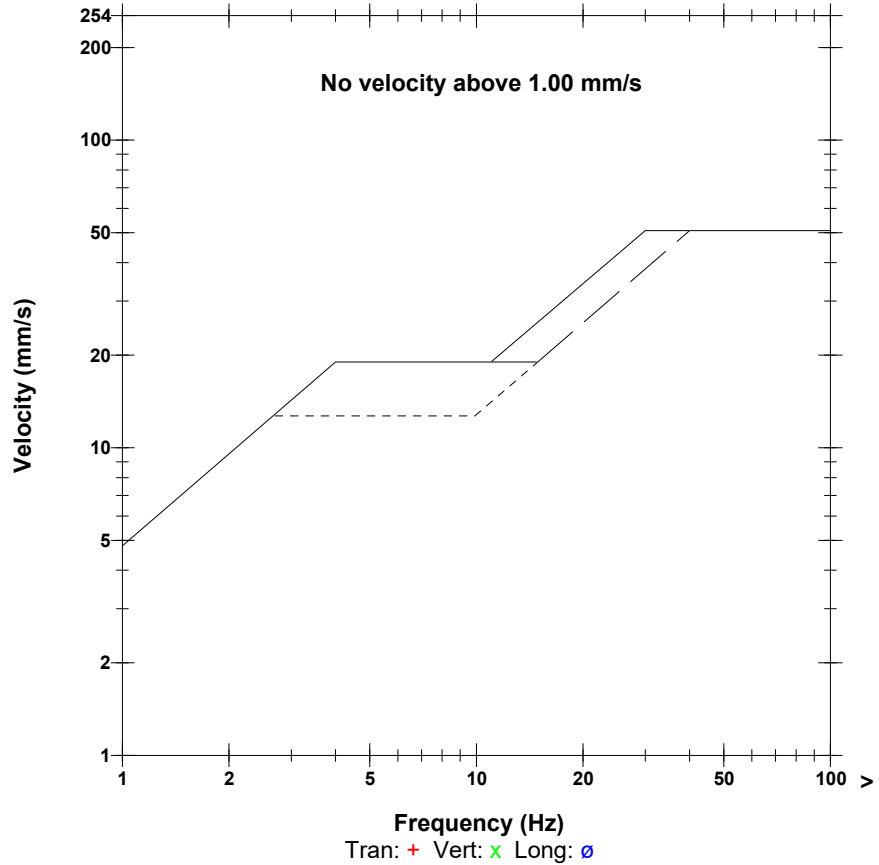
Location: Civic Number 4126 Route 111 (PW-10)  
 Blast No.: 2023-03  
 Project No: 234601.00

**Microphone** Linear Weighting  
**PSPL** 102.8 dB(L) 2.746 pa.(L) at 2.270 sec  
**ZC Freq** 9.1 Hz  
**Channel Test** Passed (Freq = 20.5 Hz Amp = 1681 mv )

	Tran	Vert	Long	
PPV	0.355	0.560	0.252	mm/s
PPV	42.00	45.96	39.04	dB
ZC Freq	12	51	18	Hz
Time (Rel. to Trig)	0.966	0.012	0.702	sec
Peak Acceleration	0.014	0.029	0.008	g
Peak Displacement	0.004	0.003	0.003	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.3	7.3	Hz
Overswing Ratio	4.6	4.8	4.6	

**Peak Vector Sum** 0.592 mm/s at 0.012 sec

**USBM RI8507 And OSMRE**



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

Sensor Check

**Date/Time** Vert at 12:20:04 January 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

**Serial Number** UM20204 V 10-90GC Micromate ISEE  
**Battery Level** 3.5 Volts  
**Unit Calibration** May 31, 2022 by InstanTel  
**File Name** UM20204\_20230125122004.IDFW

**Notes**

**Post Event Notes**

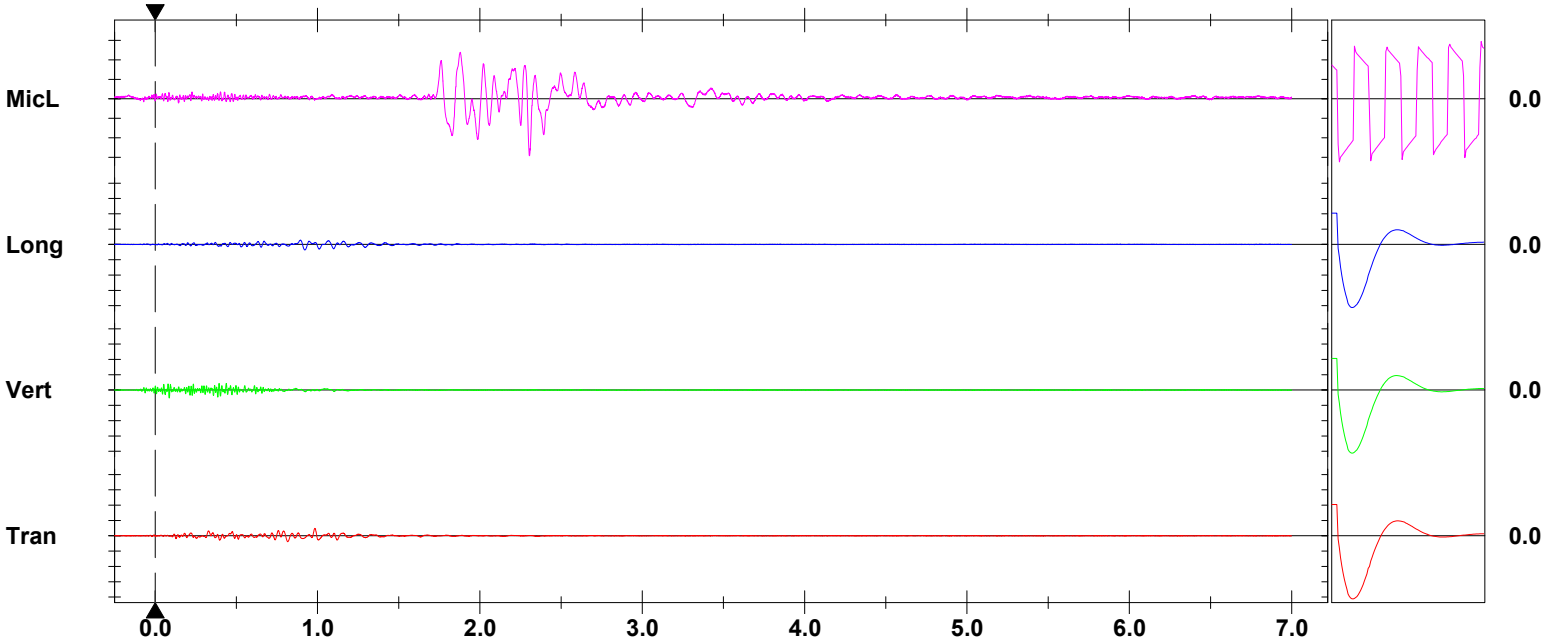
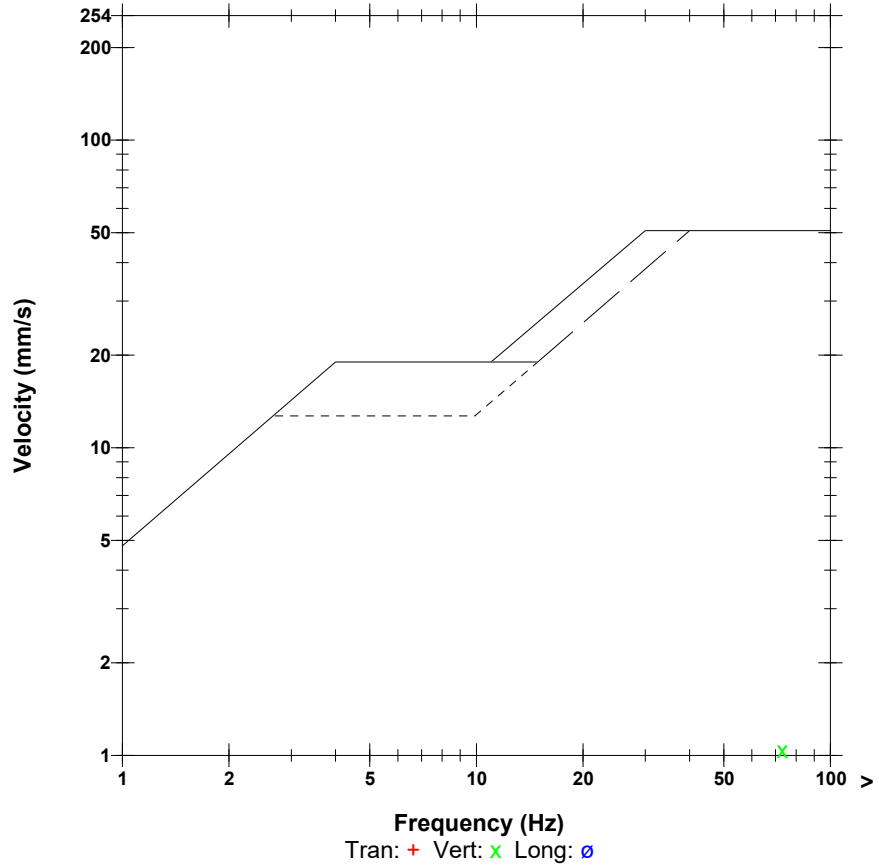
Location: Civic Number 4150 Route 111 (PW-13)  
 Blast No.: 2023-03  
 Project No: 234601.00

**Microphone** Linear Weighting  
**PSPL** 103.3 dB(L) 2.917 pa.(L) at 2.305 sec  
**ZC Freq** 16 Hz  
**Channel Test** Passed (Freq = 20.5 Hz Amp = 1684 mv )

	Tran	Vert	Long	
PPV	0.977	1.040	0.725	mm/s
PPV	50.80	51.34	48.21	dB
ZC Freq	20	73	17	Hz
Time (Rel. to Trig)	0.983	0.086	0.921	sec
Peak Acceleration	0.021	0.077	0.011	g
Peak Displacement	0.007	0.004	0.007	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.5	Hz
Overswing Ratio	4.2	4.4	4.3	

**Peak Vector Sum** 1.043 mm/s at 0.086 sec

**USBM RI8507 And OSMRE**



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

Sensor Check



**Date/Time** Tran at 12:20:00 January 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/CARVER.MMB

**Serial Number** UM18193 V 10-90GC Micromate ISEE  
**Battery Level** 3.5 Volts  
**Unit Calibration** April 11, 2022 by InstanTel  
**File Name** UM18193\_20230125122000.IDFW

**Notes**  
 Location:  
 Client:  
 User Name:  
 General:

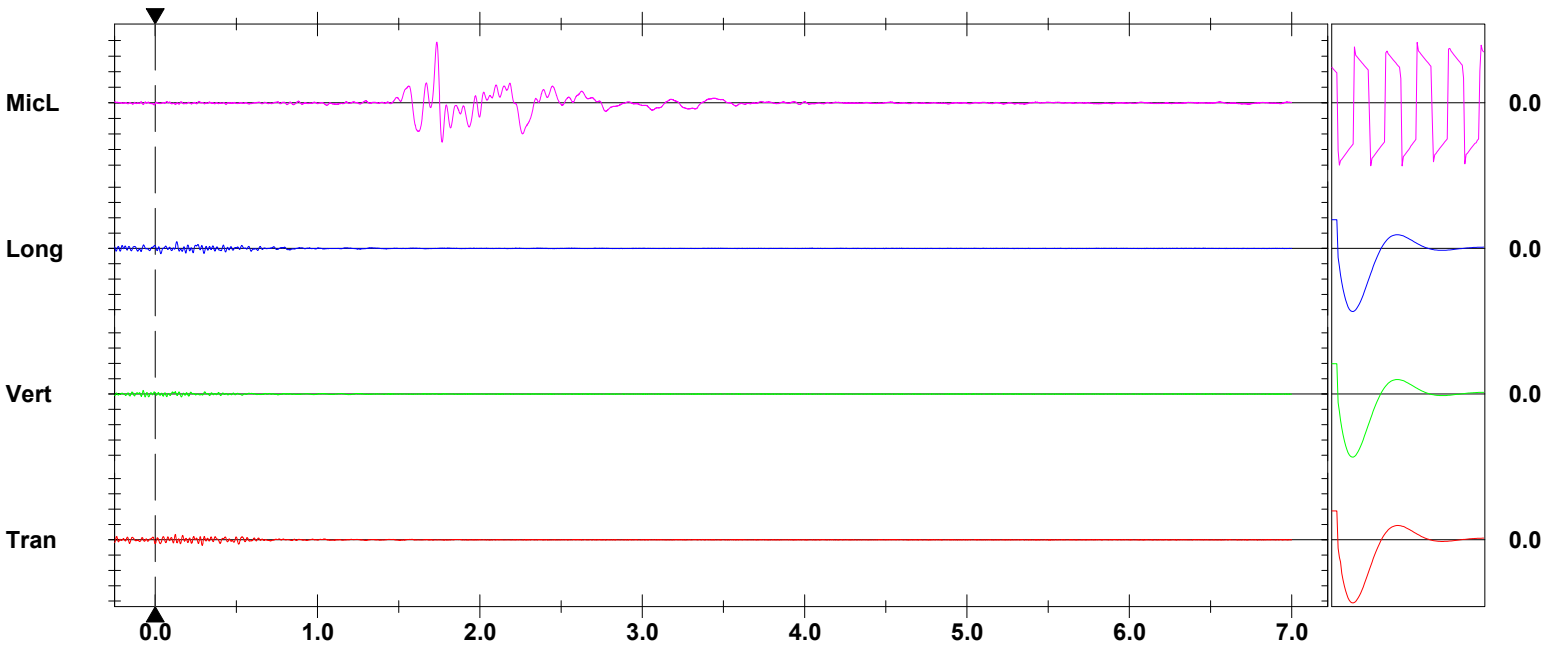
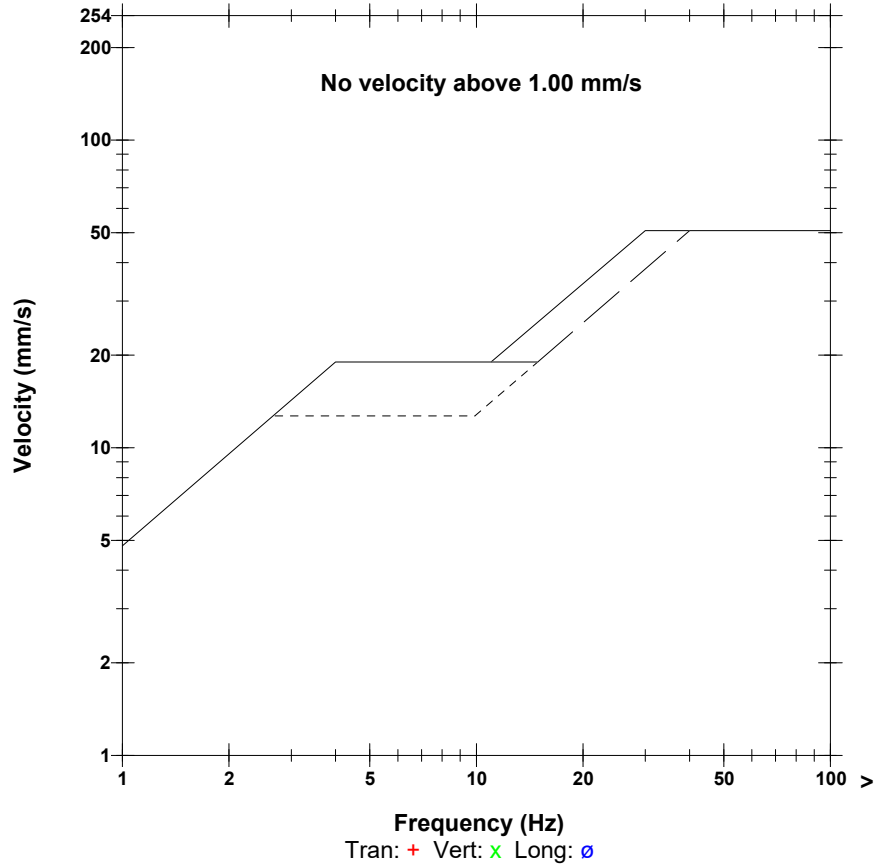
**Post Event Notes**  
 Location: Civic Number 2341 Route 820 (PW-05)  
 Blast No.: 2023-03  
 Project No: 234601.00

**Microphone** Linear Weighting  
**PSPL** 111.8 dB(L) 7.804 pa.(L) at 1.734 sec  
**ZC Freq** 10 Hz  
**Channel Test** Passed (Freq = 20.5 Hz Amp = 1725 mv )

	Tran	Vert	Long	
PPV	0.741	0.481	0.891	mm/s
PPV	48.40	44.64	49.99	dB
ZC Freq	37	39	24	Hz
Time (Rel. to Trig)	0.290	-0.073	0.133	sec
Peak Acceleration	0.030	0.012	0.026	g
Peak Displacement	0.003	0.003	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.5	7.3	Hz
Overswing Ratio	4.4	4.4	4.6	

**Peak Vector Sum** 0.964 mm/s at 0.133 sec

**USBM RI8507 And OSMRE**



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

Sensor Check

**Date/Time** Vert at 12:20:01 January 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

**Serial Number** UM20205 V 10-90GC Micromate ISEE  
**Battery Level** 3.5 Volts  
**Unit Calibration** May 31, 2022 by InstanTel  
**File Name** UM20205\_20230125122001.IDFW

**Post Event Notes**

Location: Civic Number 86 Myron Road (PW-16)  
 Blast No.: 2023-03  
 Project No: 234601.00

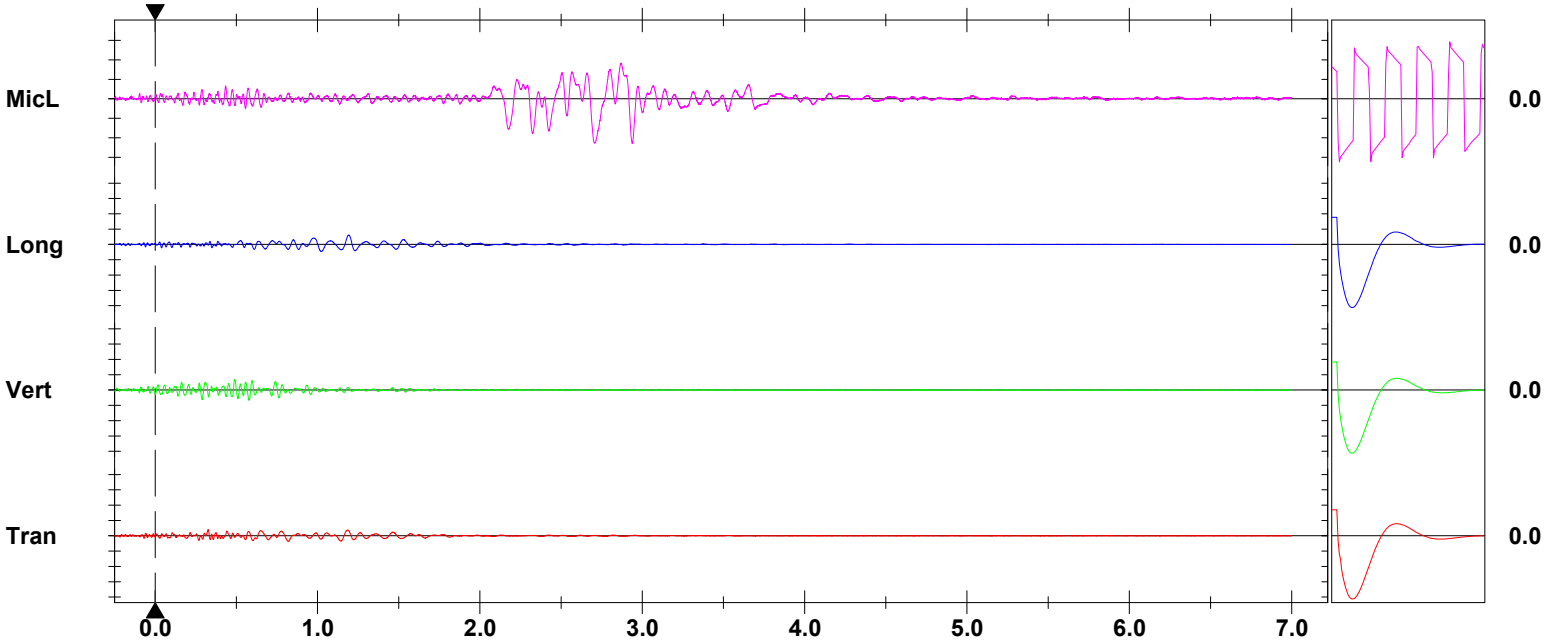
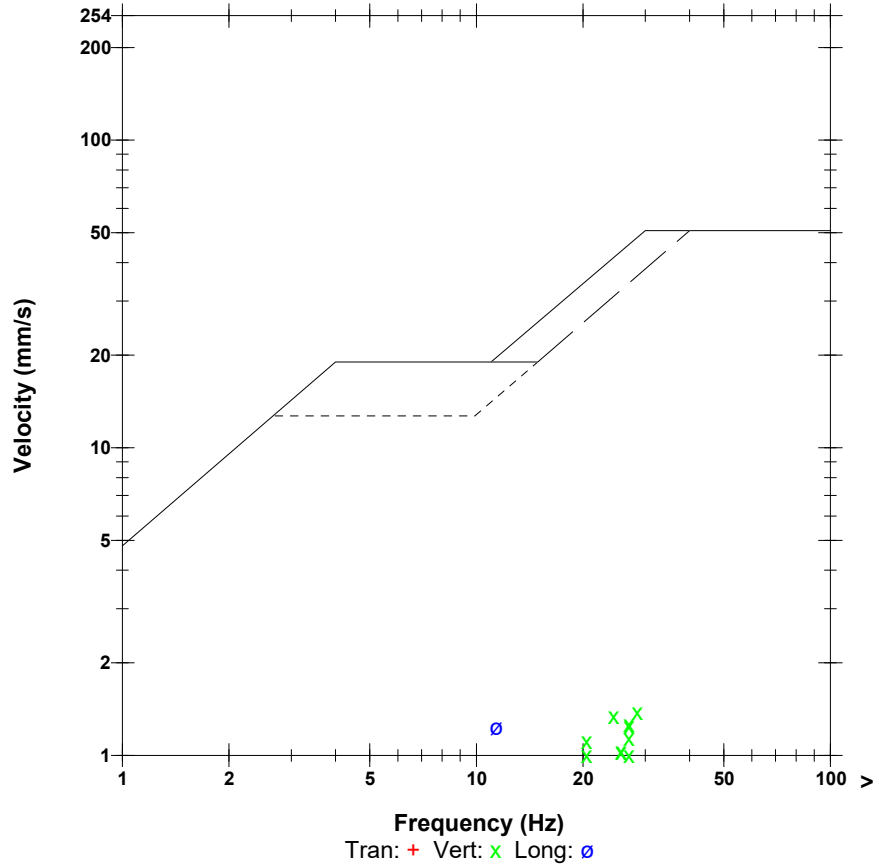
**Notes**

**Microphone** Linear Weighting  
**PSPL** 101.2 dB(L) 2.296 pa.(L) at 2.938 sec  
**ZC Freq** 11 Hz  
**Channel Test** Passed (Freq = 19.7 Hz Amp = 1805 mv )

	Tran	Vert	Long	
PPV	0.820	1.379	1.237	mm/s
PPV	49.27	53.79	52.85	dB
ZC Freq	24	28	11	Hz
Time (Rel. to Trig)	0.326	0.489	1.191	sec
Peak Acceleration	0.032	0.044	0.015	g
Peak Displacement	0.011	0.009	0.017	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.3	7.5	Hz
Overswing Ratio	5.3	5.4	5.1	

**Peak Vector Sum** 1.448 mm/s at 0.577 sec

**USBM RI8507 And OSMRE**



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

Sensor Check

**Date/Time** Vert at 12:19:23 January 25, 2023  
**Trigger Source** Geo: 0.510 mm/s, Mic: 120.0 dB(L)  
**Range** Geo: 254.0 mm/s  
**Record Time** 7.0 sec at 1024 sps

**Serial Number** BE21348 V 10.72-1.1 Minimate Blaster  
**Battery Level** 5.9 Volts (Battery Low)  
**Unit Calibration** July 21, 2022 by InstanTel  
**File Name** W348JV78.WB0  
**Post Event Notes**  
 Location: Civic Number 4140 Route 111 (PW-12)  
 Blast No.: 2023-03  
 Project No: 234601.00

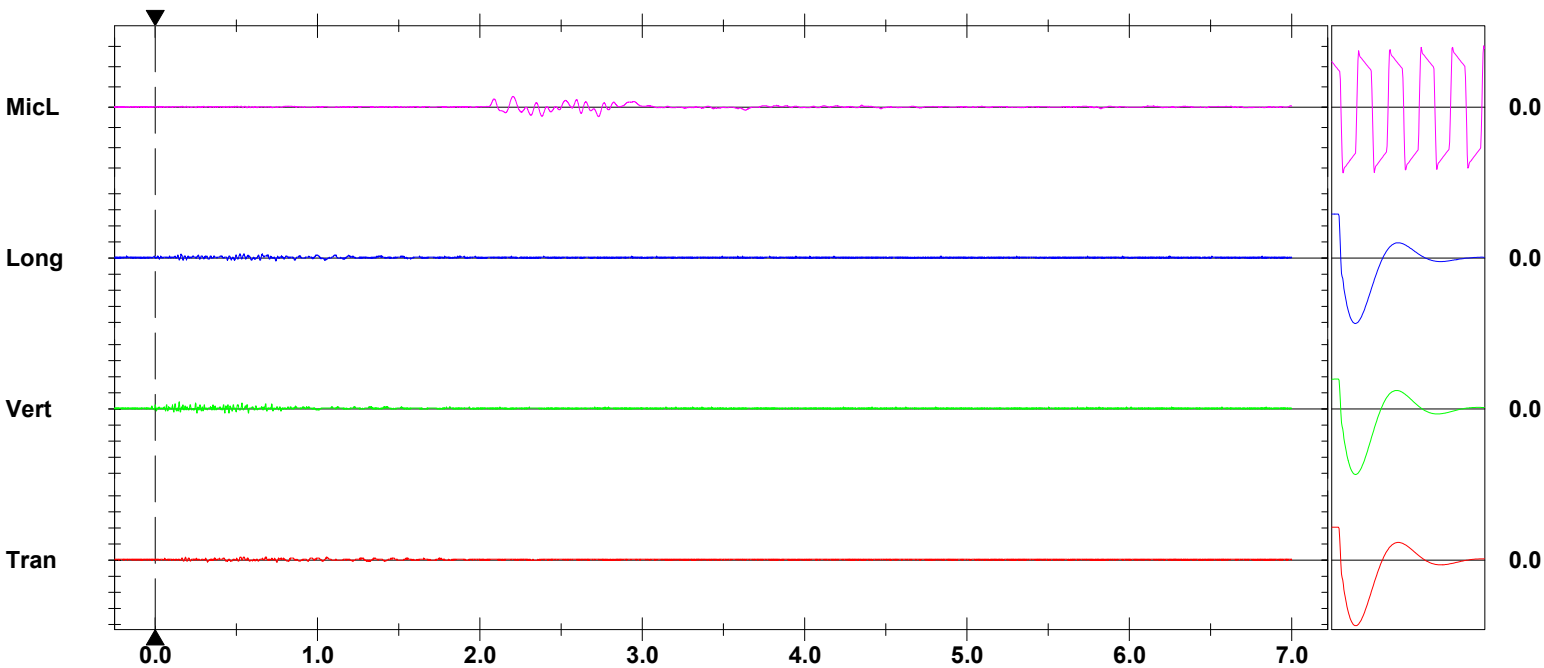
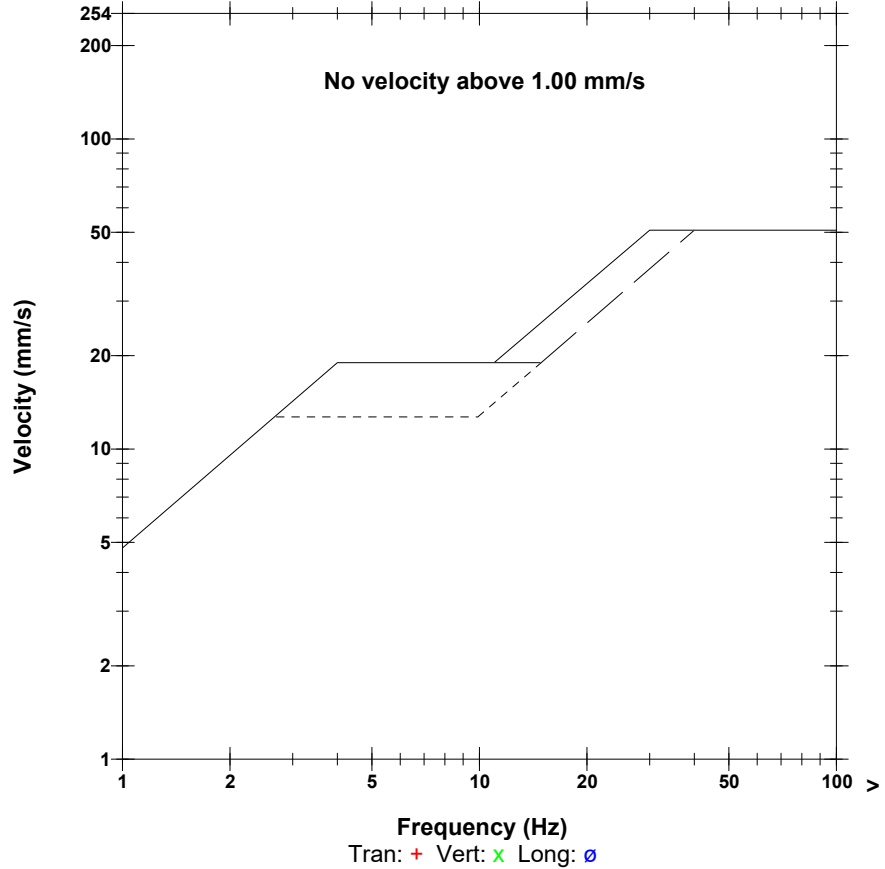
**Notes**

**Microphone** Linear Weighting  
**PSPL** 108.4 dB(L) 5.250 pa.(L) at 2.200 sec  
**ZC Freq** 9.1 Hz  
**Channel Test** Passed (Freq = 20.1 Hz Amp = 737 mv)

	Tran	Vert	Long	
PPV	0.381	0.889	0.508	mm/s
PPV	42.62	49.98	45.12	dB
ZC Freq	64	57	47	Hz
Time (Rel. to Trig)	0.186	0.148	0.159	sec
Peak Acceleration	0.013	0.040	0.027	g
Peak Displacement	0.003	0.002	0.004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.4	7.7	7.4	Hz
Overswing Ratio	3.7	3.6	4.3	

**Peak Vector Sum** 0.925 mm/s at 0.148 sec

**USBM RI8507 And OSMRE**



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

Sensor Check