

HUNTER VALLEY OPERATIONS

Monthly Environmental Monitoring Report

January 2020

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1.0 INTRODUCTION

This report has been compiled to provide a monthly summary of environmental monitoring results for Hunter Valley Operations (HVO). This report includes all monitoring data collected for the period 1 January to 31 January 2020.

2.0 AIR QUALITY

2.1 Meteorological Monitoring

HVO maintains two meteorological stations; 'HVO Corporate' and 'Cheshunt' (Refer to Figure 4: Air Quality Monitoring Location Plan).

2.1.1 Rainfall

Rainfall for the period is summarised in Table 1, the 2020 trend and historical trend are shown in Figure 1.

Table 1: Rainfall data – January 2020

2020	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
January	55.4	55.4

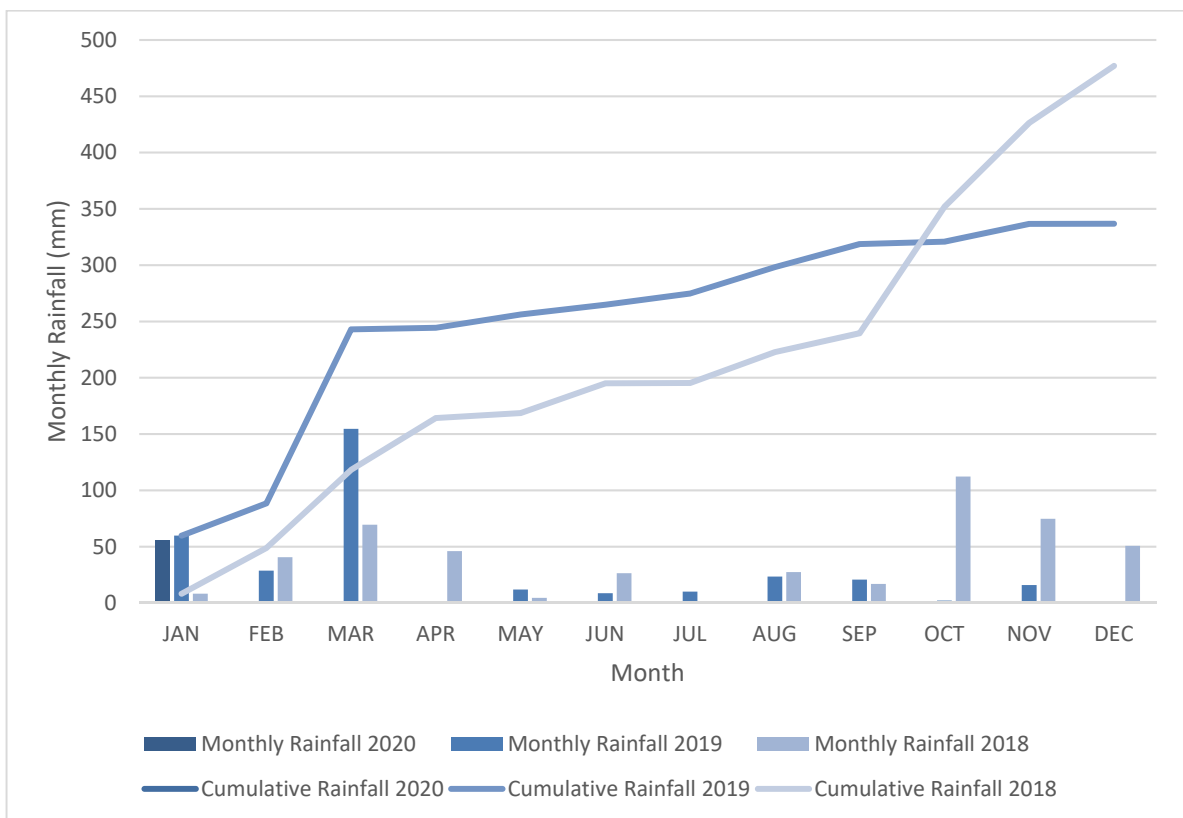


Figure 1: Rainfall Summary 2020

2.1.2 Wind Speed and Direction

Easterly and South Easterly winds were dominant during January as shown in Figure 2 (HVO Corporate) and Figure 3 (HVO Cheshunt).

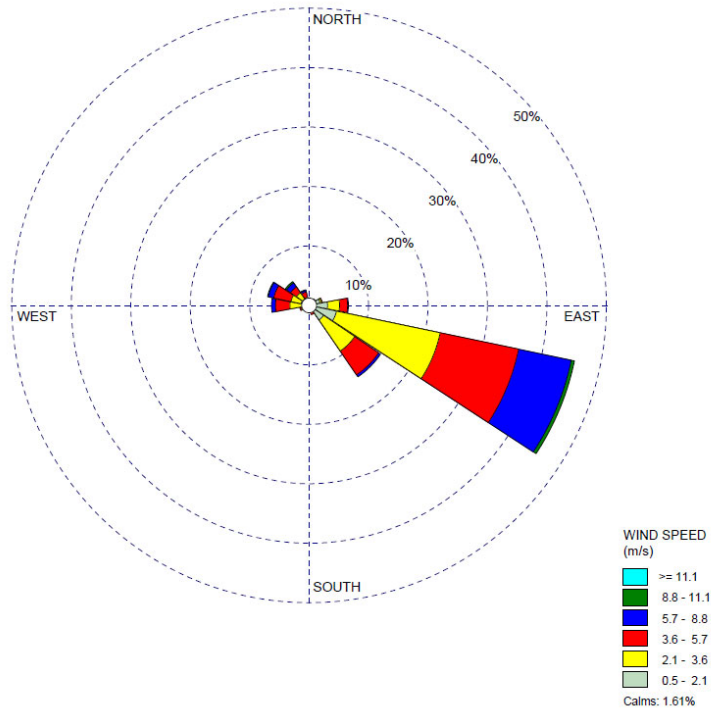


Figure 2: HVO Corporate Wind Rose – January 2020

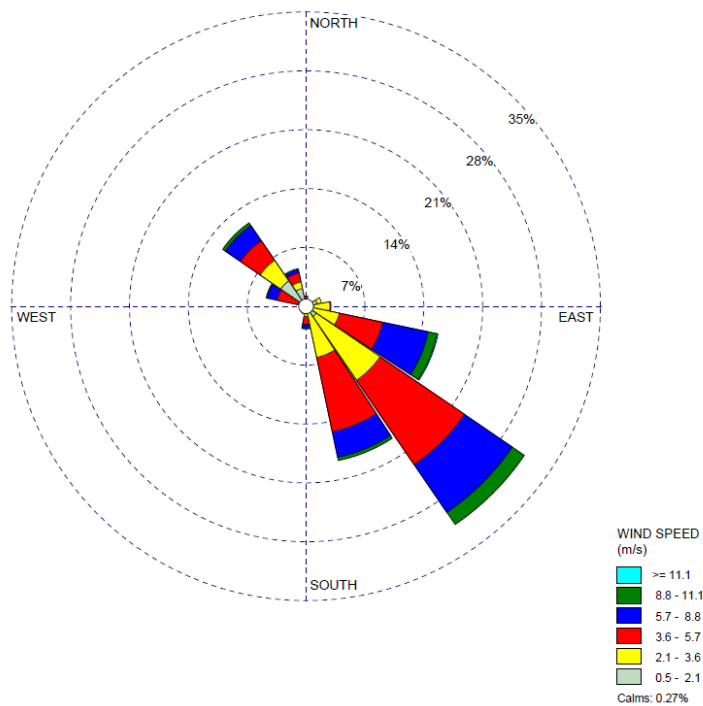


Figure 3: HVO Cheshunt Wind Rose – January 2020

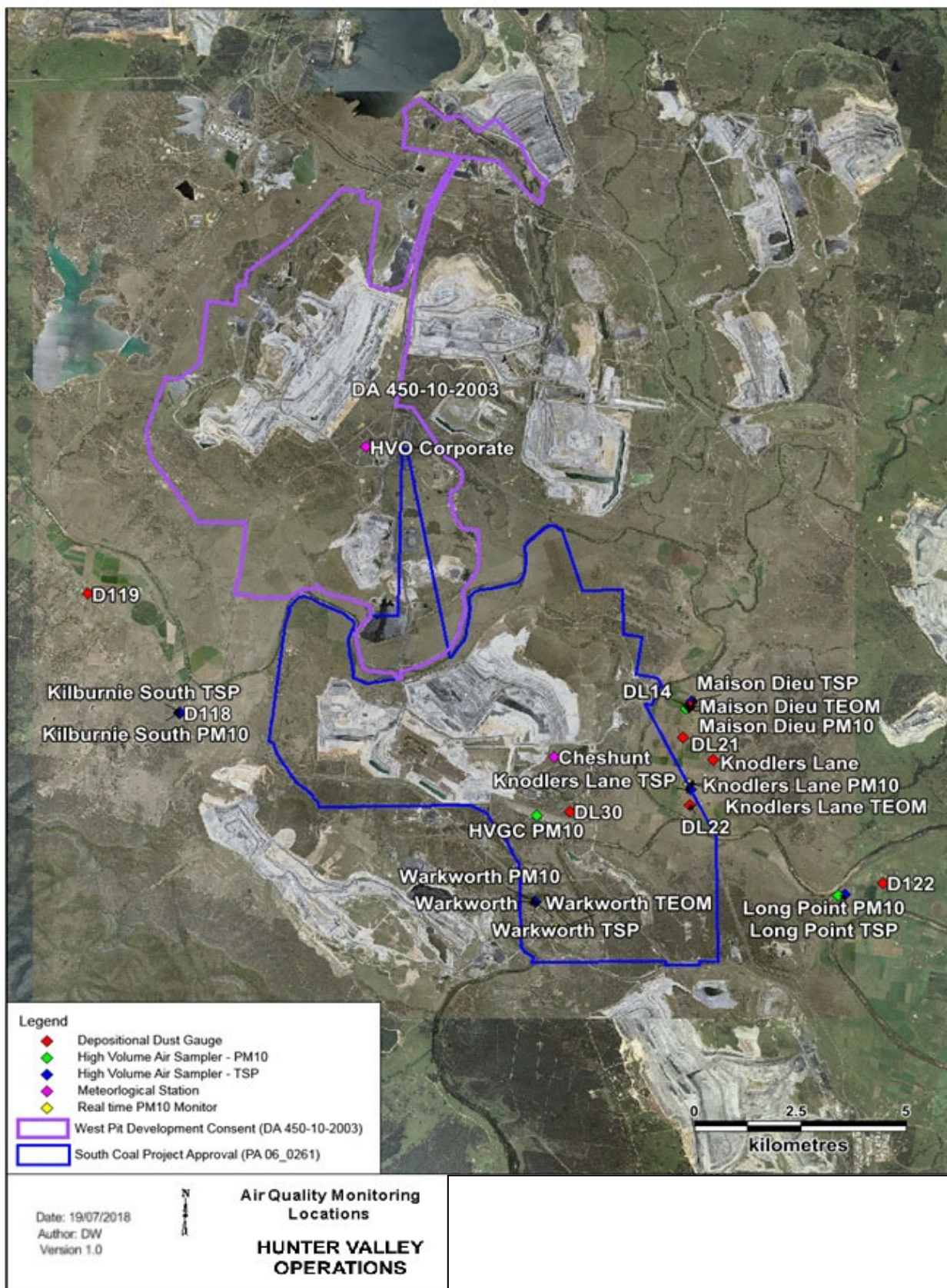


Figure 4: Air Quality Monitoring Location Plan

2.2 Depositional Dust

To monitor regional air quality, HVO operates and maintains a network of nine depositional dust gauges, situated on private and mine owned land surrounding HVO.

Figure 5 displays insoluble solids results from depositional dust gauges during the reporting period compared against the annual impact assessment criteria.

During the reporting period the DL30, D118, D119, DL21 and Warkworth monitors recorded a monthly result above the long term impact assessment criteria of 4.0 g/m² per month. Regional bushfire smoke haze and related ash deposition is likely to have contributed to elevated dust deposition results over the exposure period.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2020 Annual Review.

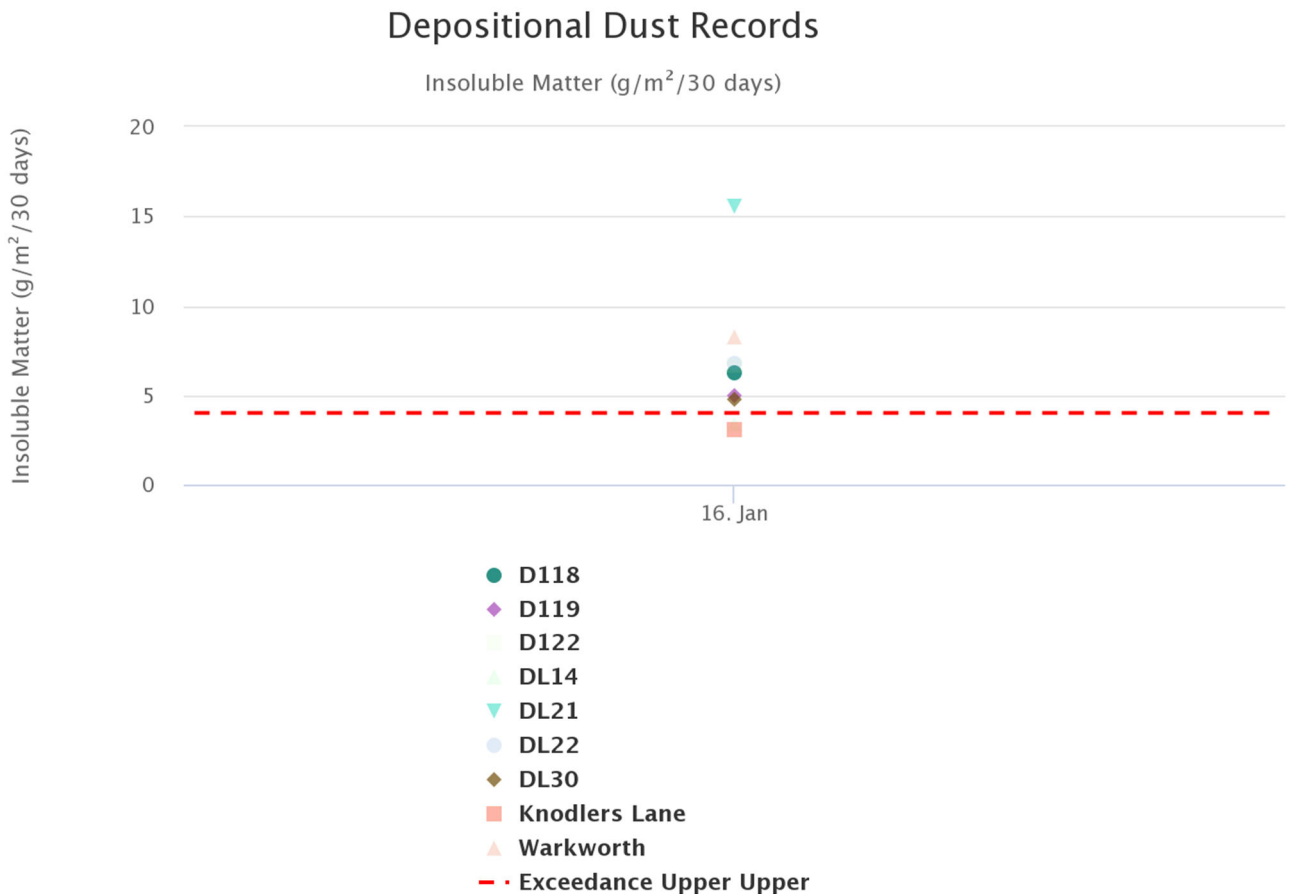


Figure 5: Depositional Dust Results – January 2020

2.3 Suspended Particulates

Suspended particulates are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM₁₀). The location of these monitors can be found in Figure 4. Each HVAS was run for 24 hours on a six-day cycle.

2.3.1 HVAS PM₁₀ Results

Figure 6 shows individual PM₁₀ results at each monitoring station against the short term impact assessment criteria of 50 µg/m³.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2020 Annual Review.

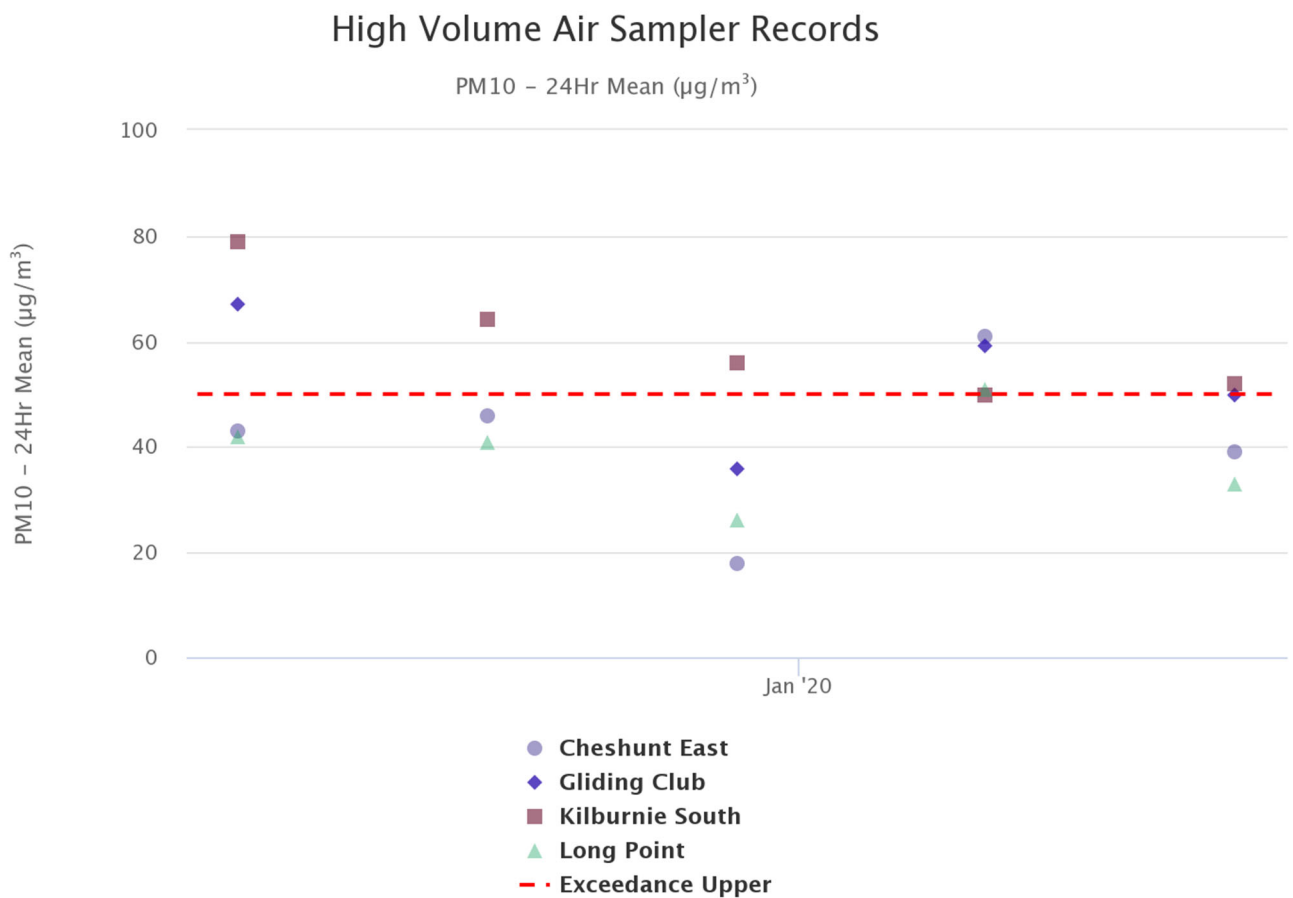


Figure 6: Individual PM₁₀ Results – January 2020

During the reporting period all monitors recorded an exceedance above the short term impact assessment criteria of 50 µg/m³. Results of the investigations are presented in

Table 2.

Table 2: PM10 HVAS Investigation Results

Date	Site	Consent	Total Measured Result (µg/m3)	Estimated contribution from HVO (µg/m3)	Discussion
3/01/2020	Kilburnie South	North	79	12	An investigation determined HVO North's maximum potential contribution to be in the order of 12.0µg/m3 based on prevailing wind conditions. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke.
3/01/2020	Kilburnie South	South	79	NA	HVO South was not a significant contributor given that wind direction during the 24 hour period was only within the arc of influence for 13.9% of the period. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke.
3/01/2020	Gliding Club	South	67	25	An investigation determined HVO South's maximum potential contribution to be in the order of 25.0µg/m3 based on prevailing wind conditions. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke.
9/01/2020	Kilburnie South	North	64	N/A	HVO North was not a significant contributor given that wind direction during the 24 hour period was only within the arc of influence for 0.0% of the period.
9/01/2020	Kilburnie South	South	64	N/A	HVO South was not a significant contributor given that wind direction during the 24 hour period was only within the arc of influence for 1.4% of the period.
15/01/2020	Kilburnie South	North	56	N/A	HVO North was not a significant contributor given that wind direction during the 24 hour period was only within the arc of influence for 8.3% of the period. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke.
15/01/2020	Kilburnie South	South	56	N/A	HVO South was not a significant contributor given that wind direction during the 24 hour period was only within the arc of influence for 15.3% of the period. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke.
21/01/2020	Glider Club	South	59	9	An investigation determined HVO South's maximum potential contribution to be in the order of 9.0µg/m3 based on prevailing wind conditions. This day was

Date	Site	Consent	Total Measured Result (µg/m ³)	Estimated contribution from HVO (µg/m ³)	Discussion
					deemed to be an 'extraordinary event', affected by regional bushfire smoke.
21/01/2020	Long Point	South	51	1	An investigation determined HVO South's maximum potential contribution to be in the order of 1.0µg/m ³ based on prevailing wind conditions. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke.
21/01/2020	Cheshunt East	North	61	11	An investigation determined HVO North's maximum potential contribution to be in the order of 11.0µg/m ³ based on prevailing wind conditions. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke.
21/01/2020	Cheshunt East	South	61	N/A	HVO South was not a significant contributor given that wind direction during the 24 hour period was only within the arc of influence for 6.3% of the period. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke.
27/01/2020	Kilburnie South	North	52	NA	HVO North was not a significant contributor given that wind direction during the 24 hour period was only within the arc of influence for 0.0% of the period.
27/01/2020	Kilburnie South	South	52	NA	HVO South was not a significant contributor given that wind direction during the 24 hour period was only within the arc of influence for 11.1% of the period.

2.3.3 Real Time PM10 Results

Hunter Valley Operations maintains a network of real time PM₁₀ monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits. Results from real time PM₁₀ monitoring are used as a reactive measure to guide mining operations to help achieve compliance with the relevant conditions of the project approval.

Results for real time dust sampling is shown in Figure 7 including the daily 24 hour average PM₁₀ result and the year to date 24 hour PM₁₀ annual average.

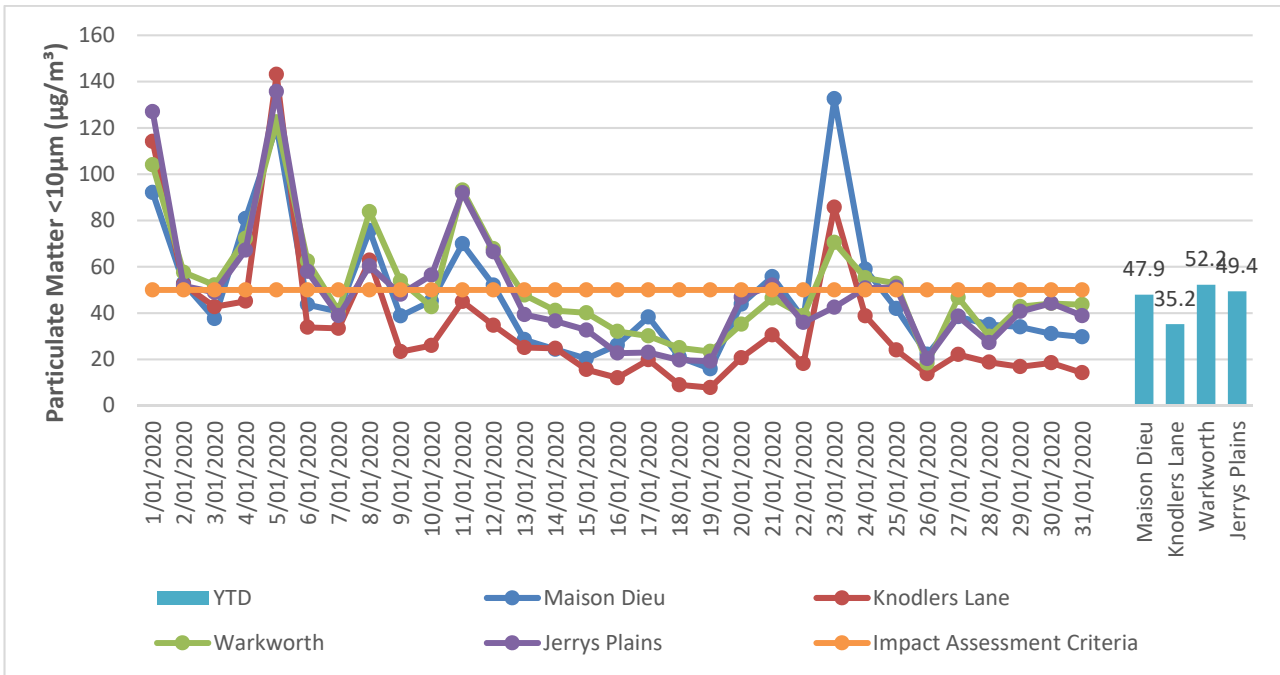


Figure 7: Real Time PM10 24Hr Average and YTD Average – January 2020

During the reporting period, the Maison Dieu, Knodlers Lane, Jerrys Plains and Warkworth monitors exceeded the daily 24 hour average PM10 result (50µg/m³). Results of the investigations are presented in Table 3.

Table 3: Real-time PM10 TEOM Investigation Results

Date	Site	Total Measured Result (µg/m ³)	Estimated contribution from HVO (µg/m ³)	Discussion
01/01/2020	Jerrys Plains South	126.9	23.8	An investigation determined HVO maximum potential contribution to be in the order of 23.8ug/m ³ based on prevailing wind conditions. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke.
01/01/2020	Jerrys Plains North	126.9	14.7	An investigation determined HVO maximum potential contribution to be in the order of 14.7ug/m ³ based on prevailing wind conditions. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke.
01/01/2020	Knodlers Lane	114.1	-19.2	An investigation determined HVO maximum potential contribution to be in the order of -19.2ug/m ³ based on prevailing wind conditions. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke.
01/01/2020	Maison Dieu	92.1	0	HVO was not a significant contributor given that wind direction during the 24 hour period was not within the arc of influence. This day was deemed

Date	Site	Total Measured Result (µg/m ³)	Estimated contribution from HVO (µg/m ³)	Discussion
				to be an 'extraordinary event', affected by regional bushfire smoke.
01/01/2020	Wandewoi	113.4	10	An investigation determined HVO maximum potential contribution to be in the order of 10.0ug/m ³ based on prevailing wind conditions. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke.
01/01/2020	Warkworth	104	0	HVO was not a significant contributor given that wind direction during the 24 hour period was not within the arc of influence. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke.
02/01/2020	Jerrys Plains South	51.7	-2.6	An investigation determined HVO maximum potential contribution to be in the order of -2.6ug/m ³ based on prevailing wind conditions. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke
02/01/2020	Jerrys Plain North	51.7	8.1	An investigation determined HVO maximum potential contribution to be in the order of 8.1ug/m ³ based on prevailing wind conditions. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke
02/01/2020	Knodlers Lane	52.2	0.5	An investigation determined HVO maximum potential contribution to be in the order of 0.5ug/m ³ based on prevailing wind conditions. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke.
02/01/2020	Maison Dieu	52.9	0	HVO was not a significant contributor given that wind direction during the 24 hour period was not within the arc of influence. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke
02/01/2020	Wandewoi	40.3	-13.9	An investigation determined HVO maximum potential contribution to be in the order of -13.9ug/m ³ based on prevailing wind conditions. This day was deemed to be an 'extraordinary event', affected by regional bushfire smoke
02/01/2020	Warkworth	57.6	0	HVO was not a significant contributor given that wind direction during the 24 hour period was not within the arc of influence. 2 January appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.
03/01/2020	Warkworth	54.4	0.4	An investigation determined HVO maximum potential contribution to be in the order of 0.4ug/m ³ based on prevailing wind conditions.

Date	Site	Total Measured Result (µg/m ³)	Estimated contribution from HVO (µg/m ³)	Discussion
04/01/2020	Jerrys Plain South	66.9	0.6	An investigation determined HVO maximum potential contribution to be in the order of 0.6ug/m ³ based on prevailing wind conditions.
04/01/2020	Jerrys Plain North	66.9	8.3	An investigation determined HVO maximum potential contribution to be in the order of 8.3ug/m ³ based on prevailing wind conditions.
04/01/2020	Maison Dieu	80.8	20.8	An investigation determined HVO maximum potential contribution to be in the order of 20.8ug/m ³ based on prevailing wind conditions.
04/01/2020	Warkworth	70.9	41.1	An investigation determined HVO maximum potential contribution to be in the order of 41.1ug/m ³ based on prevailing wind conditions.
05/01/2020	Jerrys Plains South	136.5	53.5	An investigation determined HVO maximum potential contribution to be in the order of 53.5ug/m ³ based on prevailing wind conditions. No upwind monitors available for investigation due to average wind direction.
05/01/2020	Jerrys Plain North	136.5	24.8	An investigation determined HVO maximum potential contribution to be in the order of 24.8ug/m ³ based on prevailing wind conditions. No upwind monitors available for investigation due to average wind direction.
05/01/2020	Knodlers Lane	144.1	3.7	An investigation determined HVO maximum potential contribution to be in the order of 3.7ug/m ³ based on prevailing wind conditions.
05/01/2020	Maison Dieu	120.6	2.6	An investigation determined HVO maximum potential contribution to be in the order of 2.6ug/m ³ based on prevailing wind conditions.
05/01/2020	Warkworth	123.7	2.2	An investigation determined HVO maximum potential contribution to be in the order of 2.2ug/m ³ based on prevailing wind conditions.
06/01/2020	Jerrys Plains South	57.5	4.6	An investigation determined HVO maximum potential contribution to be in the order of 4.6ug/m ³ based on prevailing wind conditions.
06/01/2020	Jerrys Plain North	57.5	0.3	An investigation determined HVO maximum potential contribution to be in the order of 0.3ug/m ³ based on prevailing wind conditions. No upwind monitors available for investigation due to average wind direction.
06/01/2020	Warkworth	53.4	0	HVO was not a significant contributor given that wind direction during the 24 hour period was not within the arc of influence.

Date	Site	Total Measured Result (µg/m ³)	Estimated contribution from HVO (µg/m ³)	Discussion
				6 January appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.
08/01/2020	Jerrys Plains South	60.3	25.8	An investigation determined HVO maximum potential contribution to be in the order of 25.8ug/m ³ based on prevailing wind conditions. 08 January appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.
08/01/2020	Jerrys Plains North	60.3	6.9	An investigation determined HVO maximum potential contribution to be in the order of 6.9ug/m ³ based on prevailing wind conditions. 08 January appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.
08/01/2020	Knodlers Lane	62.8	1.0	An investigation determined HVO maximum potential contribution to be in the order of 1.0ug/m ³ based on prevailing wind conditions. 08 January appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.
08/01/2020	Maison Dieu	75.6	3.4	An investigation determined HVO maximum potential contribution to be in the order of 3.4ug/m ³ based on prevailing wind conditions. 08 January appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.
08/01/2020	Warkworth	83.8	6.0	An investigation determined HVO maximum potential contribution to be in the order of 6.0ug/m ³ based on prevailing wind conditions. 08 January appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.
09/01/2020	Warkworth	53.9	0	HVO was not a significant contributor given that wind direction during the 24 hour period was not within the arc of influence.
10/01/2020	Jerrys Plains South	56.4	29.3	An investigation determined HVO maximum potential contribution to be in the order of 29.3ug/m ³ based on prevailing wind conditions. This day appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.
10/01/2020	Jerrys Plains North	56.4	2.6	An investigation determined HVO maximum potential contribution to be in the order of 2.6ug/m ³ based on prevailing wind conditions. This day appeared to be affected by regional

Date	Site	Total Measured Result (µg/m ³)	Estimated contribution from HVO (µg/m ³)	Discussion
				bushfire smoke, the results are deemed affected by an extraordinary event.
11/01/2020	Jerrys Plains South	91.9	30.8	An investigation determined HVO maximum potential contribution to be in the order of 30.8ug/m ³ based on prevailing wind conditions. This day appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.
11/01/2020	Jerrys Plains North	91.9	16.8	An investigation determined HVO maximum potential contribution to be in the order of 16.8ug/m ³ based on prevailing wind conditions. This day appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.
11/01/2020	Maison Dieu	69.9	13.3	An investigation determined HVO maximum potential contribution to be in the order of 13.3ug/m ³ based on prevailing wind conditions. This day appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.
11/01/2020	Warkworth	93.1	3.8	An investigation determined HVO maximum potential contribution to be in the order of 3.8ug/m ³ based on prevailing wind conditions. This day appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.
12/01/2020	Jerrys Plains South	66.4	52.9	An investigation determined HVO maximum potential contribution to be in the order of 52.9ug/m ³ based on prevailing wind conditions. 12 January appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.
12/01/2020	Jerrys Plains North	66.4	17.1	An investigation determined HVO maximum potential contribution to be in the order of 17.1ug/m ³ based on prevailing wind conditions. 12 January appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.
12/01/2020	Maison Dieu	52.1	0	HVO was not a significant contributor given that wind direction during the 24 hour period was not within the arc of influence. 12 January appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.

Date	Site	Total Measured Result (µg/m ³)	Estimated contribution from HVO (µg/m ³)	Discussion
12/01/2020	Warkworth	67.8	0	HVO was not a significant contributor given that wind direction during the 24 hour period was not within the arc of influence. 12 January appeared to be affected by regional bushfire smoke, the results are deemed affected by an extraordinary event.
21/01/2020	Jerrys Plains South	52.1	3.5	An investigation determined HVO maximum potential contribution to be in the order of 3.5ug/m ³ based on prevailing wind conditions.
21/01/2020	Jerrys Plain North	52.1	0	HVO was not a significant contributor given that wind direction during the 24 hour period was not within the arc of influence.
21/01/2020	Maison Dieu	55.7	14.5	An investigation determined HVO maximum potential contribution to be in the order of 14.5ug/m ³ based on prevailing wind conditions.
23/01/2020	Knodlers Lane	85.7	17.7	An investigation determined HVO maximum potential contribution to be in the order of 17.7ug/m ³ based on prevailing wind conditions.
23/01/2020	Maison Dieu	316.7	17.8	An investigation determined HVO maximum potential contribution to be in the order of 17.8ug/m ³ based on prevailing wind conditions.
23/01/2020	Warkworth	70.5	2.5	An investigation determined HVO maximum potential contribution to be in the order of 2.5ug/m ³ based on prevailing wind conditions.
24/01/2020	Jerrys Plain South	50.8	22.1	An investigation determined HVO maximum potential contribution to be in the order of 22.1ug/m ³ based on prevailing wind conditions.
24/01/2020	Jerrys Plain North	50.8	18.9	An investigation determined HVO maximum potential contribution to be in the order of 18.9ug/m ³ based on prevailing wind conditions.
24/01/2020	Maison Dieu	58.9	10.5	An investigation determined HVO maximum potential contribution to be in the order of 10.5ug/m ³ based on prevailing wind conditions.
24/01/2020	Warkworth	55.2	5.3	An internal investigation determined HVO maximum potential contribution to be in the order of 5.3ug/m ³ based on prevailing wind conditions.
25/01/2020	Jerrys Plains South	51.1	13.4	An internal investigation determined HVO maximum potential contribution to be in the order of 13.4ug/m ³ based on prevailing wind conditions.

Date	Site	Total Measured Result (µg/m3)	Estimated contribution from HVO (µg/m3)	Discussion
25/01/2020	Jerrys Plain North	51.1	4.2	An internal investigation determined HVO maximum potential contribution to be in the order of 4.2ug/m3 based on prevailing wind conditions.
25/01/2020	Warkworth	52.8	0.3	An internal investigation determined HVO maximum potential contribution to be in the order of 0.3ug/m3 based on prevailing wind conditions.

2.3.4 Real Time Alarms for Air Quality

During January the real time monitoring system generated 377 automated air quality related alarms. 148 alarms were related to adverse weather conditions and 229 alarms relating to PM₁₀.

3.0 WATER QUALITY

HVO maintains a network of surface water and groundwater monitoring sites.

3.1 Surface Water

Surface water courses are sampled on a quarterly sampling regime. Water quality is evaluated through the parameters of pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS). Results of monitoring on Site Dams and the Hunter River as well as other natural tributaries are provided on a quarterly basis, results will appear in the March 2020 report.

3.2 Site Water Use

Under water allocation licences issued by the Water NSW, HVO is permitted to extract water from the Hunter River. During the reporting period, HVO extracted 856.7 ML of water from the Hunter River.

3.3 HRSTS Discharge

HVO participates in the Hunter River Salinity Trading Scheme (HRSTS), allowing discharge from licensed discharge points Dam 11N (to Farrell's Creek), Lake James (to the Hunter River) and Parnell's Dam (to Parnell's Creek). Discharges can only take place subject to HRSTS regulations.

During the reporting period no water was discharged under the HRSTS.

3.4 Groundwater Monitoring Results

Groundwater monitoring is undertaken on a quarterly basis in accordance with the HVO Water Management Plan and Ground Water Monitoring Programme. Results of groundwater monitoring are reported quarterly and as such will be reported in the March 2020 monthly report.

4.0 BLASTING

HVO have a network of five blast monitoring units. These are located at nearby privately owned residences and function as regulatory compliance monitors. The location of these monitors can be found in Figure 10. Blasting criteria are summarised in Table 4.

Table 4: Blasting Criteria

Airblast Overpressure (dB(L))	Comments
115	5% of the total number of blasts in a 12 month period
120	0%
Ground Vibration (mm/s)	Comments
5	5% of the total number of blasts in a 12 month period
10	0%

4.1 Blast Monitoring Results

During January, there were 22 blasts fired from HVO. Figure 8 and Figure 9 show the blast monitoring results for the reporting period against the impact assessment criteria.



Figure 8: Overpressure Blast Monitoring Results – January 2020

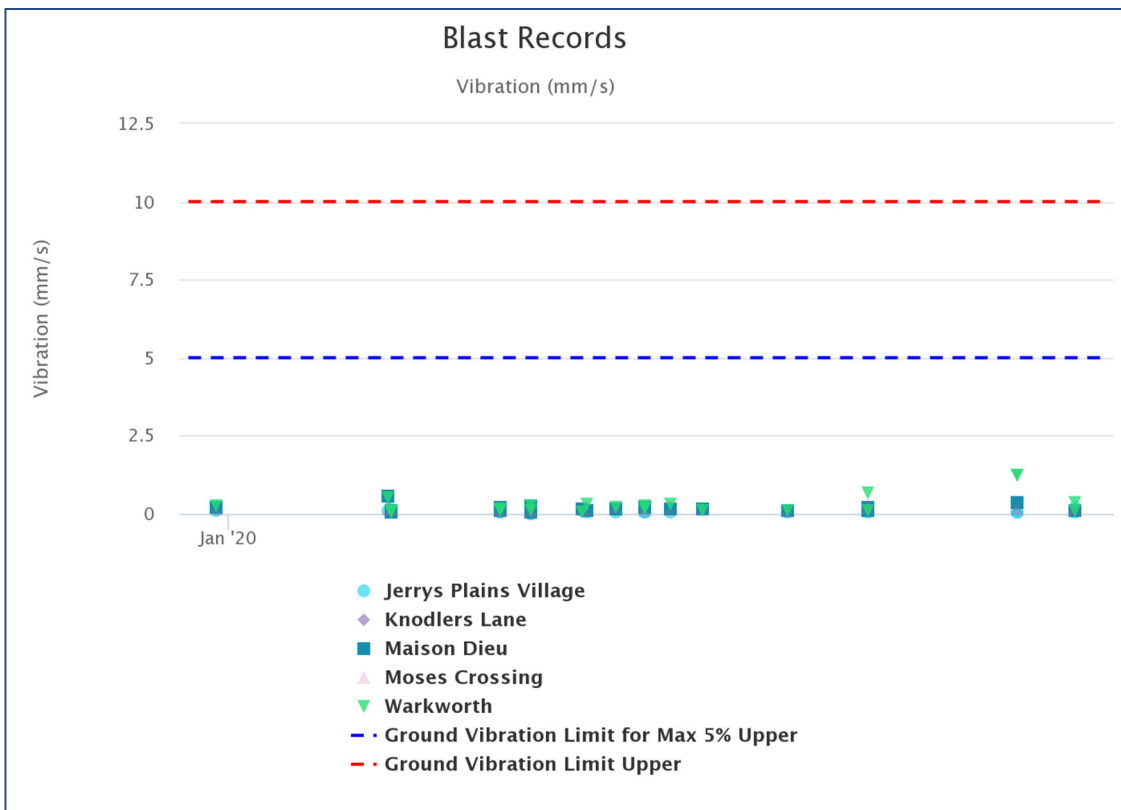


Figure 9: Ground Vibration Blast Monitoring Results – January 2020



Figure 10: Blast Monitoring Location Plan

5.0 NOISE

Routine attended noise monitoring is carried out at defined locations around HVO as described in the HVO Noise Monitoring Programme. The purpose of the noise surveys is to quantify and describe the acoustic environment around the site and compare results with specified limits. Unattended monitoring (real time noise monitoring) also occurs at five sites surrounding HVO. The attended noise monitoring locations are displayed in Figure 11.

5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding HVO on the night of 20 January 2020 with no non-compliances recorded. Monitoring results are detailed in Table 5 to Table 9.

Table 5: L_{Aeq, 15 minute} HVO South - Impact Assessment Criteria – January 2020

Location	Date and Time	Wind Speed (m/s) ¹	Stability Class ¹	Criterion dB (A)	Criterion Applies? ²	HVO South L _{Aeq} dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	20/01/2020 21:16	4.3	D	39	No	30	NA
Maison Dieu	20/01/2020 21:39	3.3	D	39	No	30	NA
Shearers Lane	20/01/2020 22:02	2.5	D	41	Yes	31	Nil
Kilburnie South	20/01/2020 23:11	3.2	E	39	No	<25	NA
Jerrys Plains Village	20/01/2020 21:26	4.0	D	35	No	IA	NA
Jerrys Plains East	20/01/2020 21:04	4.5	D	35	No	IA	NA
Long Point Road	20/01/2020 21:00	3.6	D	35	No	IA	NA
HVGC	20/01/2020 23:44	1.7	F	55	Yes	36	Nil

Notes:

1. Atmospheric data is sourced from the HVO Cheshunt (or MTW Charlton Ridge for Long Point) AWS using logged meteorological data;
2. Noise criteria apply for wind speeds up to 3 metres per second (at a height of 10m), or during stability class G conditions. Criterion may or may not apply due to rounding of meteorological data values. Refer to Sections 2.3 and 3.3 for more information;
3. Site-only L_{Aeq, 15minute} attributed to HVO South Pit Area, including modifying factors if applicable;
4. Bold results in red indicate exceedance of criterion; and
5. NA in exceedance column means atmospheric conditions outside specified in approval, therefore criterion was not applicable.

Table 6: LA1, 1 minute HVO South - Impact Assessment Criteria – January 2020

Location	Date Time and	Wind Speed (m/s) ¹	Stability Class	Criterion dB (A)	Criterion Applies? ²	HVO South LA1, 1min dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	20/01/2020 21:16	4.3	D	45	No	39	NA
Maison Dieu	20/01/2020 21:39	3.3	D	45	No	32	NA
Shearers Lane	20/01/2020 22:02	2.5	D	45	Yes	35	Nil
Kilburnie South	20/01/2020 23:11	3.2	E	45	No	<25	NA
Jerrys Plains Village	20/01/2020 21:26	4.0	D	45	No	IA	NA
Jerrys Plains East	20/01/2020 21:04	4.5	D	45	No	IA	NA
Long Point Road	20/01/2020 21:00	3.6	D	45	No	IA	NA
HVGC	20/01/2020 23:44	1.7	F	NA	NA	47	NA

Notes:

1. Atmospheric data is sourced from the HVO Cheshunt (or MTW Charlton Ridge for Long Point) AWS using logged meteorological data;
2. Noise criteria apply for wind speeds up to 3 metres per second (at a height of 10m), or during stability class G conditions. Criterion may or may not apply due to rounding of meteorological data values. Refer to Sections 2.3 and 3.3 for more information;
3. Site-only LA1, 1minute attributed to HVO South Pit Area;
4. Bold results in red indicate exceedance of criterion; and
5. NA in criterion column indicates no criterion is applicable at this location. NA in exceedance column means atmospheric conditions outside specified in approval, therefore criterion was not applicable.

Table 7: LAeq, 15 minute HVO North – Impact Assessment Criteria – January 2020

Location	Date and Time	Wind Speed (m/s) ¹	Stability Class ¹	Criterion dB (A)	Criterion Applies? ²	HVO North LAeq dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	20/01/2020 21:16	4.7	D	35	No	IA	NA
Maison Dieu	20/01/2020 21:39	1.7	F	35	Yes	IA	Nil
Shearers Lane	20/01/2020 22:02	1.3	F	35	Yes	IA	Nil
Kilburnie South	20/01/2020 23:11	2.1	E	39	Yes	IA	Nil
Jerrys Plains Village	20/01/2020 21:26	3.1	D	36	No	IA	NA
Jerrys Plains East	20/01/2020 21:04	5.1	D	39	No	IA	NA
Long Point Road	20/01/2020 21:00	3.6	D	35	No	IA	NA
HVGC	29/01/2020 23:44	1.9	D	NA	NA	IA	NA

Notes:

1. Atmospheric data is sourced from the HVO Corporate (or MTW Charlton Ridge for Long Point) AWS using logged meteorological data;
2. Noise criteria apply under all meteorological conditions, except during periods of rain or hail, when average winds speed at microphone heights exceeds 5 metres per second, when wind speeds greater than 3 metres per second are measured at 10m above ground level, or during stability class G conditions. Criterion may or may not apply due to rounding of meteorological data values;
3. Site-only LAeq, 15minute attributed to HVO North Pit Area, including modifying factors if applicable;
4. Bold results in red indicate exceedance of criterion; and
5. NA in criterion column indicates no criterion is applicable at this location. NA in exceedance column means atmospheric conditions outside specified in approval, therefore criterion was not applicable.

Table 8: LAeq,15 minute HVO North - Land Acquisition Criteria – January 2020

Location	Date and Time	Wind Speed (m/s) ¹	Stability Class ¹	Criterion dB (A)	Criterion Applies? ²	HVO North LAeq dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	20/01/2020 21:16	4.7	D	41	No	IA	NA
Maison Dieu	20/01/2020 21:39	1.7	F	41	Yes	IA	Nil
Shearers Lane	20/01/2020 22:02	1.3	F	41	Yes	IA	Nil
Kilburnie South	20/01/2020 23:11	2.1	E	41	Yes	IA	Nil
Jerrys Plains Village	20/01/2020 21:26	3.1	D	41	No	IA	NA
Jerrys Plains East	20/01/2020 21:04	5.1	D	41	No	IA	NA
Long Point Road	20/01/2020 21:00	3.6	D	41	No	IA	NA
HVGC	20/01/2020	1.9	D	NA	NA	IA	NA

Notes:

1. Atmospheric data is sourced from the HVO Corporate (or MTW Charlton Ridge for Long Point) AWS using logged meteorological data;
2. Noise criteria apply under all meteorological conditions, except during periods of rain or hail, when average winds speed at microphone heights exceeds 5 metres per second, when wind speeds greater than 3 metres per second are measured at 10m above ground level, or during stability class G conditions. Criterion may or may not apply due to rounding of meteorological data values;
3. Site-only LAeq,15minute attributed to HVO North Pit Area, including modifying factors if applicable;
4. Bold results in red indicate exceedance of criterion; and
5. NA in criterion column indicates no criterion is applicable at this location. NA in exceedance column means atmospheric conditions outside specified in approval, therefore criterion was not applicable.

Table 9: LA1, 1 Minute HVO North - Impact Assessment Criteria – January 2020

Location	Date and Time	Wind Speed (m/s)¹	Stability Class¹	Criterion dB (A)	Criterion Applies?²	HVO North LA1, 1min dB^{3,4}	Exceedance^{4,5}
Knodlers Lane	20/01/2020 21:16	4.7	D	46	No	IA	NA
Maison Dieu	20/01/2020 21:39	1.7	F	46	Yes	IA	Nil
Shearers Lane	20/01/2020 22:02	1.3	F	46	Yes	IA	Nil
Kilburnie South	20/01/2020 23:11	2.1	E	46	Yes	IA	Nil
Jerrys Plains Village	20/01/2020 21:26	3.1	D	46	No	IA	NA
Jerrys Plains East	20/01/2020 21:04	5.1	D	46	No	IA	NA
Long Point Road	20/01/2020 21:00	3.6	D	46	No	IA	NA
HVGC	20/01/2020 23:44	1.9	D	NA	NA	38	NA

Notes:

1. Atmospheric data is sourced from the HVO Corporate (or MTW Charlton Ridge for Long Point) AWS using logged meteorological data;
2. Noise criteria apply under all meteorological conditions, except during periods of rain or hail, when average winds speed at microphone heights exceeds 5 metres per second, when wind speeds greater than 3 metres per second are measured at 10m above ground level, or during stability class G conditions. Criterion may or may not apply due to rounding of meteorological data values;
3. Site-only LA1, 1minute attributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of criterion; and
5. NA in criterion column indicates no criterion is applicable at this location. NA in exceedance column means atmospheric conditions outside specified in approval, therefore criterion was not applicable.

5.2 NPfl Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfl), the applicability of the low frequency modification penalty has been assessed. During January 2020 no penalties were applied. The assessment for low frequency noise is shown in Table 10.

Table 10: Low Frequency Noise Assessment – January 2020

Location	Date and Time	Measured Site Only LA_{eq} dB (Sth/Nth)	Site Only LC_{eq} dB¹ (Sth/Nth)	Site-Only LC_{eq} – LA_{eq} dB² (Sth/Nth)	Result Max exceedance of ref spectrum dB³ (Sth/Nth)	Penalty dB(A)⁴ (Sth/Nth)
Knodlers Lane	20/01/2020 21:16	IA/30	NA/NA	NA/NA	NA/NA	NA/NA
Maison Dieu	20/01/2020 21:39	IA/30	NA/NA	NA/NA	NA/NA	NA/NA
Shearers Lane	20/01/2020 22:02	IA/31	NA/NA	NA/NA	NA/NA	NA/NA
Kilburnie South	20/01/2020 23:11	IA/<25	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains Village	20/01/2020 21:26	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains East	20/01/2020 21:04	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Long Point Road	20/01/2020 21:00	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
HVGC	20/01/2020 23:44	IA/36	NA/NA	NA/NA	NA/NA	NA/NA

Notes:

1. Where it is not possible to determine the site-only result due to the presence of other low-frequency noise sources occurring during the measurement, or where criteria were not applicable due to meteorological conditions, or where site-only contributions were more than 5 dB less than the relevant LA_{eq} criterion this is noted as NA (not available) and no further assessment has been undertaken;
2. As per NPfl, if LC_{eq} – LA_{eq} ≥ 15 dB further assessment of low-frequency noise required;
3. As per NPfl, compare measured spectrum against reference spectrum to determine if the low-frequency modifying factor is triggered and application of penalty is required; and
4. Bold results indicate that NPfl low-frequency modifying factor has been triggered and application of correction is required.

5.2.1 Real Time Noise Monitoring

HVO utilises a network of real-time directional noise monitors to manage noise impacts on a continuous basis. Noise alarms are in place at five monitoring locations (Knodlers Lane, Maison Dieu, Jerrys Plains, Moses Crossing, and Long Point), which alert HVO staff to elevated noise levels likely to be attributable to HVO. Noise alarms are investigated and responded to with the appropriate level of operational modification. Changes in response to a noise alarm can include replacing equipment with quieter (noise attenuated) units, changing or relocating tasks, and shutting down equipment. It should be noted that this assessment does not compliment or conflict with attended noise monitoring detailed in Section 5.1, and that real time monitoring data includes non-mine noise sources such as dogs, cows, or more commonly, road traffic.

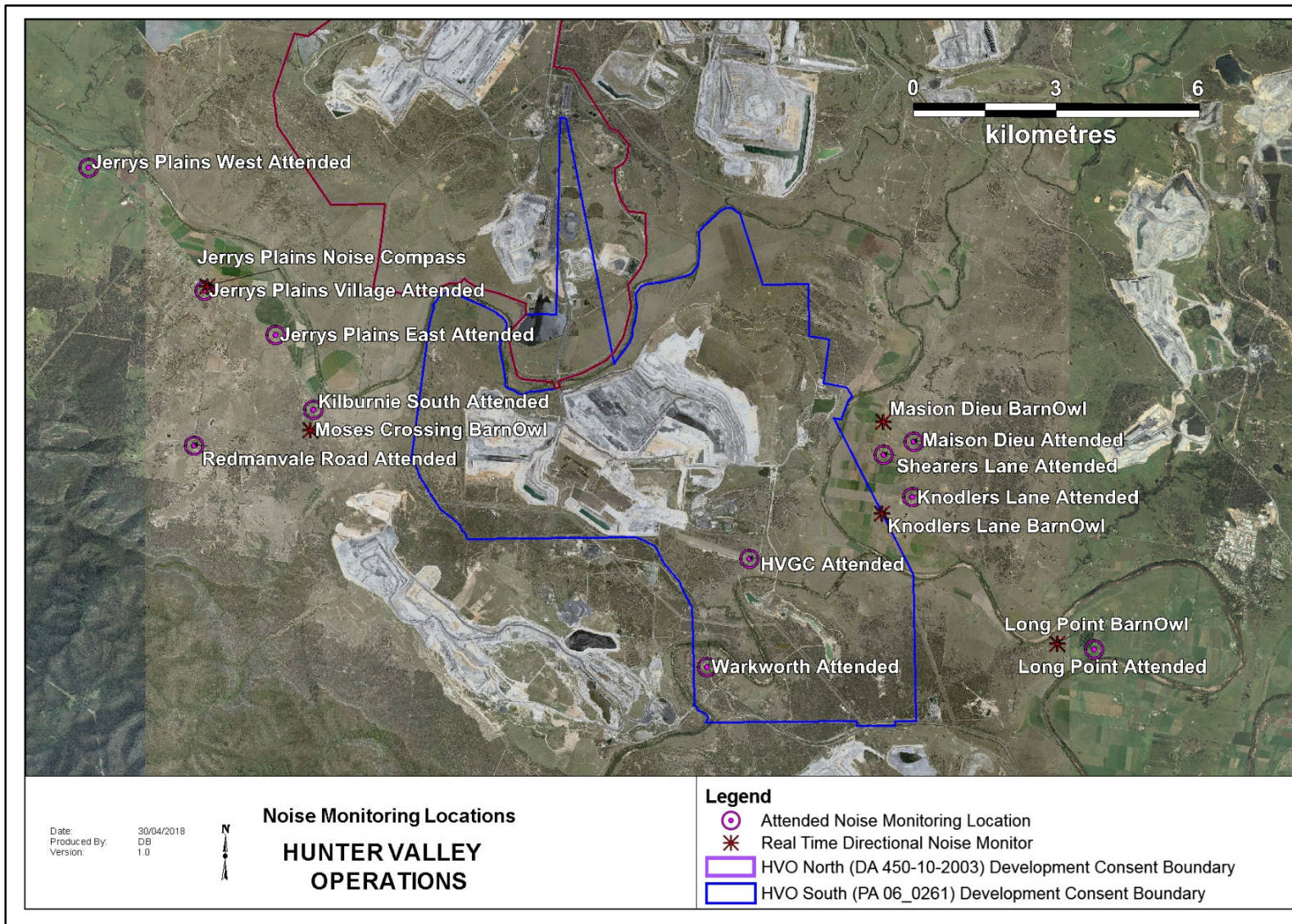


Figure 11: Noise Monitoring Location Plan

6.0 OPERATIONAL DOWNTIME

During January, a total of 369.6 hours of equipment downtime was logged in response to real time monitoring and visual inspections for environmental reasons such as dust, noise and meteorological conditions. Operational downtime by equipment type is shown in Figure 12.

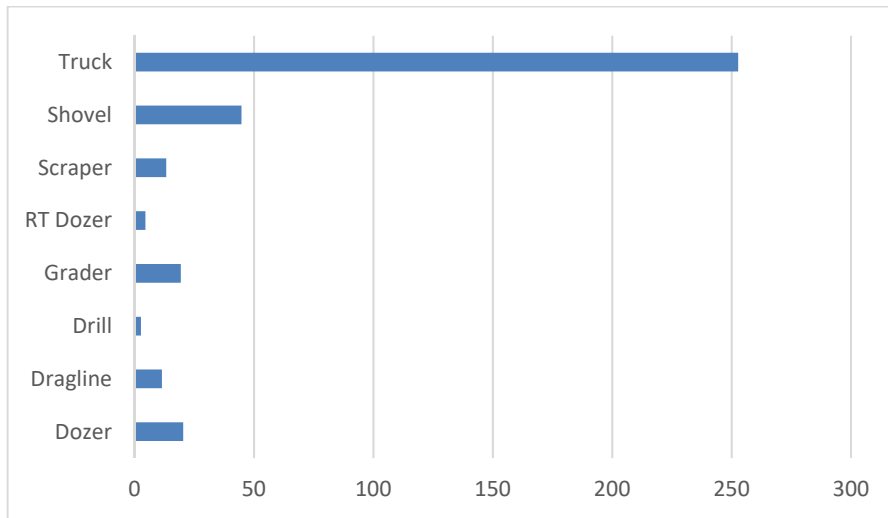


Figure 12: Operational Downtime by Equipment Type – January 2020

7.0 REHABILITATION

During January 0.32 Ha of land was released, 3.55 Ha of land was bulk shaped and 3.83 Ha of land was topsoiled. There was no land rehabilitated during January 2020. Year to date progress can be viewed in Figure 13.

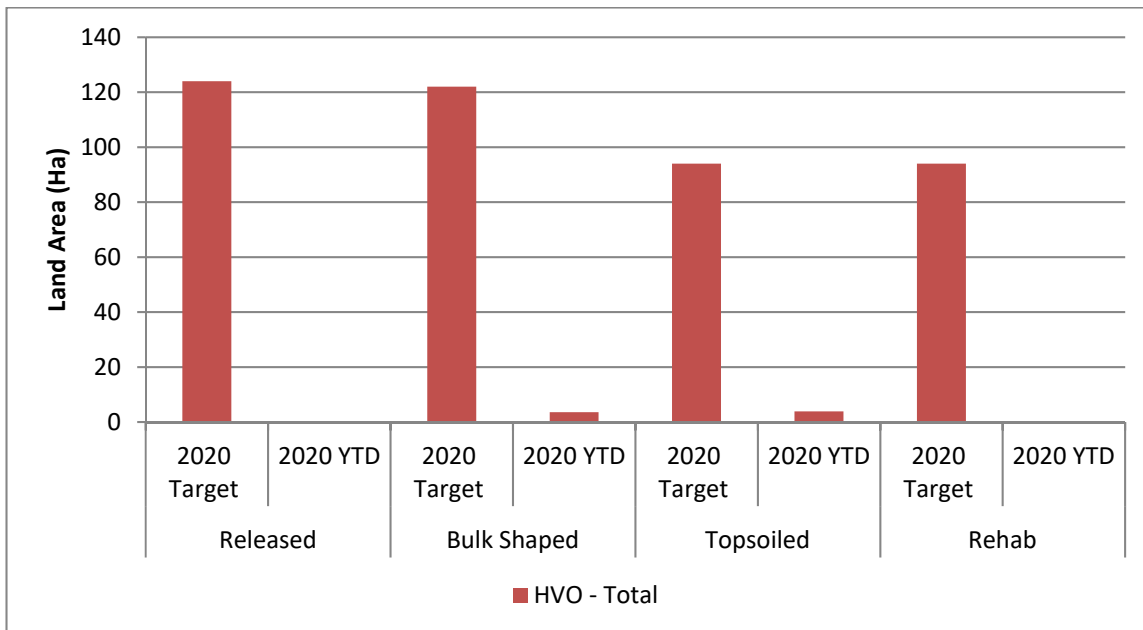


Figure 13: Rehabilitation YTD – January 2020

8.0 COMPLAINTS

No complaints were received during January 2020. Details of complaints received YTD are shown in Table 11 below.

Table 11: Complaints Summary YTD 2020

Month	Noise	Dust	Blast	Lighting	Other	Total
<i>January</i>	-	-	-	-	-	-
<i>Total</i>	-	-	-	-	-	-

9.0 ENVIRONMENTAL INCIDENTS

There were 3 reportable environmental incidents in January 2020:

- 09/01/2020 – Air Quality Monitor Mis-Capture Hunter Valley Glider Club**

The PM10 High Volume Air Sampler (HVAS) at the Hunter Valley Glider Club site failed to run for the full 24 hour period only recording for a total of 20 hours (less than the 23 hours recording required for a valid sample). The HVAS was investigated by HVO’s environmental contractor with no faults found with the unit. Further investigation found that the mis-capture was likely due to a local power outage. DPIE were notified in writing on 13 January with an incident report submitted on 5 February.

Environmental consequence: Cat 1 Negligible

- 15/01/2020 – Air Quality Monitor Mis-Capture Warkworth**

The TSP HVAS at the Warkworth site failed to run for the full 24 hour period only recording for a total of 18.6 hours (less than the 23 hours recording required for a valid sample). The HVAS was investigated by HVO’s environmental contractor with no faults found with the unit. Further investigation found that the mis-capture was likely due to a local power outage. DPIE were notified in writing on 15 January with an incident report submitted on 5 February.

Environmental consequence: Cat 1 Negligible

- 21/01/2020 – Air Quality Monitor Mis-Capture Warkworth**

The TSP HVAS at the Warkworth site failed to run for the full 24 hour period only recording for a total of 18.6 hours (less than the 23 hours recording required for a valid sample). The HVAS was investigated by HVO’s environmental contractor with no faults found with the unit. Further investigation found that the mis-capture was likely due to a local power outage. DPIE were notified in writing on 24 January with an incident report submitted on 5 February.

Environmental consequence: Cat 1 Negligible

APPENDIX A: METEOROLOGICAL DATA

Table 12: Meteorological Data - HVO Corporate Meteorological Station – January 2020

Date	Air Temp Max (°C)	Air Temp Min (°C)*	Relative Humidity Max (%)	Relative Humidity Min (%)*	Solar Radiation Maximum (W/Sq. M)	Wind Dir. Avg (°)	Wind Speed Avg (m/sec)	Rainfall (mm)
1/01/2020	36.49	-	84.7	-	313.9	123.1	3.665	0.2
2/01/2020	26.58	-	100	-	503.7	111.5	4.573	0.2
3/01/2020	34.97	-	97.6	-	460.9	124.1	2.716	0
4/01/2020	41.07	-	81.7	-	415.8	244.6	3.301	0
5/01/2020	33.90	-	77.97	-	190.8	112.9	8.4	0
6/01/2020	22.89	-	97.4	-	472.2	120	4.633	1.8
7/01/2020	33.91	-	100	-	828	161.3	2.564	0
8/01/2020	35.08	-	109.9	-	720.5	140.7	3.615	4.6
9/01/2020	21.58	-	109.6	-	714.1	112	4.035	0.2
10/01/2020	36.87	-	100	-	673.6	196	2.553	0
11/01/2020	31.70	-	88.2	-	283.6	109.4	4.909	0
12/01/2020	22.92	-	99.5	-	409.8	108.8	5.453	0
13/01/2020	25.99	-	89.9	-	357.2	113.1	4.537	0
14/01/2020	28.94	-	99	-	448.2	116.2	4.169	0
15/01/2020	28.83	-	97.7	-	398.5	114.3	2.75	0
16/01/2020	22.72	-	108.2	-	672.4	189.8	1.718	9.4
17/01/2020	21.83	-	100	-	643.3	131.6	3.052	0.2
18/01/2020	18.50	-	110.2	-	672.3	113.1	2.181	12.8
19/01/2020	24.20	-	109	-	762.7	112.1	2.557	0.6
20/01/2020	31.45	-	109.5	-	890	195.3	2.332	11.6
21/01/2020	30.98	-	84.5	-	409.8	255.1	3.655	0
22/01/2020	34.78	-	100	-	617	193.4	2.013	0
23/01/2020	37.99	-	100	-	758.8	283.7	5.731	2.8
24/01/2020	30.51	-	100	-	671.5	204.5	4.351	8.2
25/01/2020	28.60	-	100	-	725.8	117.3	3.016	0
26/01/2020	33.87	-	100	-	823	225.5	2.949	0
27/01/2020	30.74	-	96.2	-	441.2	137.7	2.58	0
28/01/2020	35.66	-	99.3	-	533	226.7	3.826	2.6
29/01/2020	26.25	-	96	-	592.9	111.9	4.167	0.2
30/01/2020	33.72	-	99.8	-	574.6	121	4.595	0
31/01/2020	41.53	-	109.8	-	667	159.6	2.279	0

* Data not recorded