

# HUNTER VALLEY OPERATIONS



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## Monthly Environmental Monitoring Report November 2020

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# 1 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<sup>st</sup> to 30<sup>th</sup> November 2020 (the 'Reporting Period').

## 2 Air Quality

### 2.1 Meteorological Monitoring

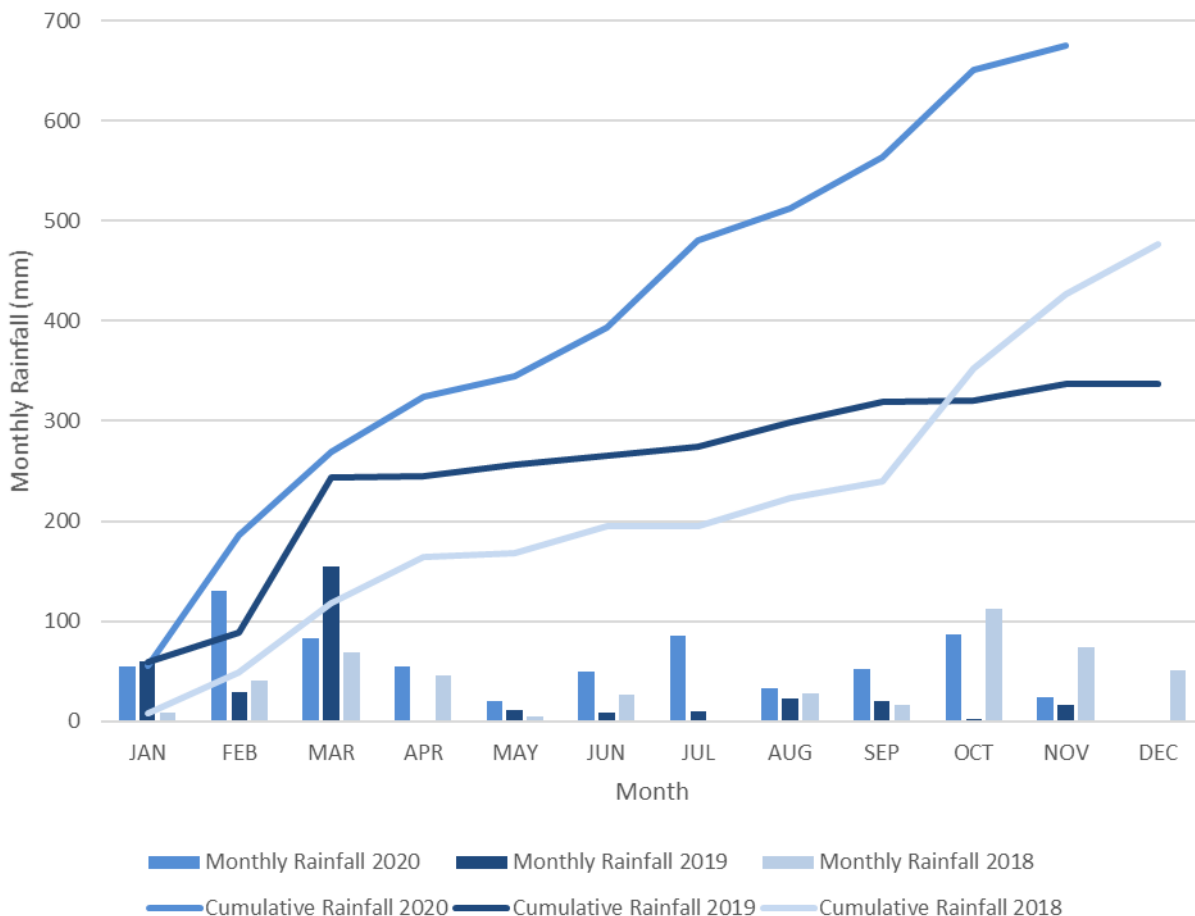
HVO maintains two meteorological stations: 'HVO Corporate' and 'Cheshunt' (refer to **Figure 4**)

#### 2.1.1 Rainfall

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

**Table 1 - Rainfall data - November 2020**

2020	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
November	24.4	675.6



**Figure 1 - Rainfall Summary 2020**

## 2.1.2 Wind Speed and Direction

South Easterly winds were prevailing during November, with North Westerly winds also common, as shown in **Figure 2** (HVO Corporate) and **Figure 3** (HVO Cheshunt).

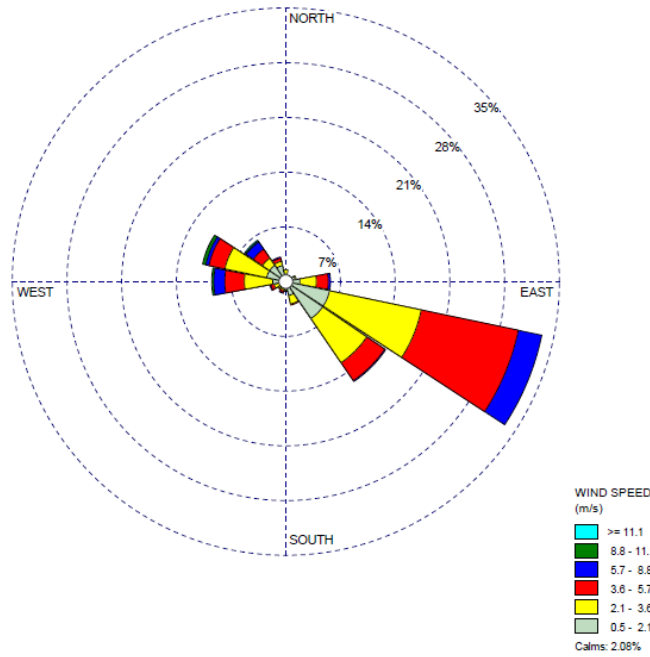


Figure 2 - HVO Corporate Wind Rose November 2020

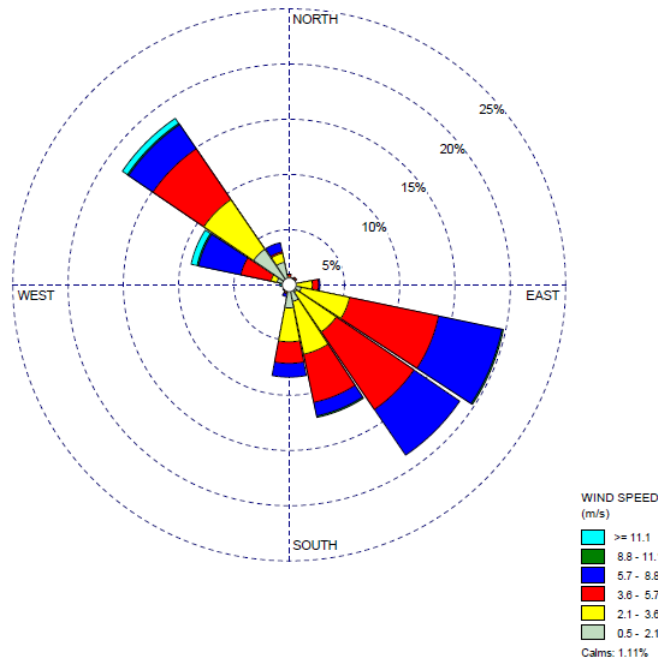


Figure 3 - HVO Cheshunt Wind Rose November 2020

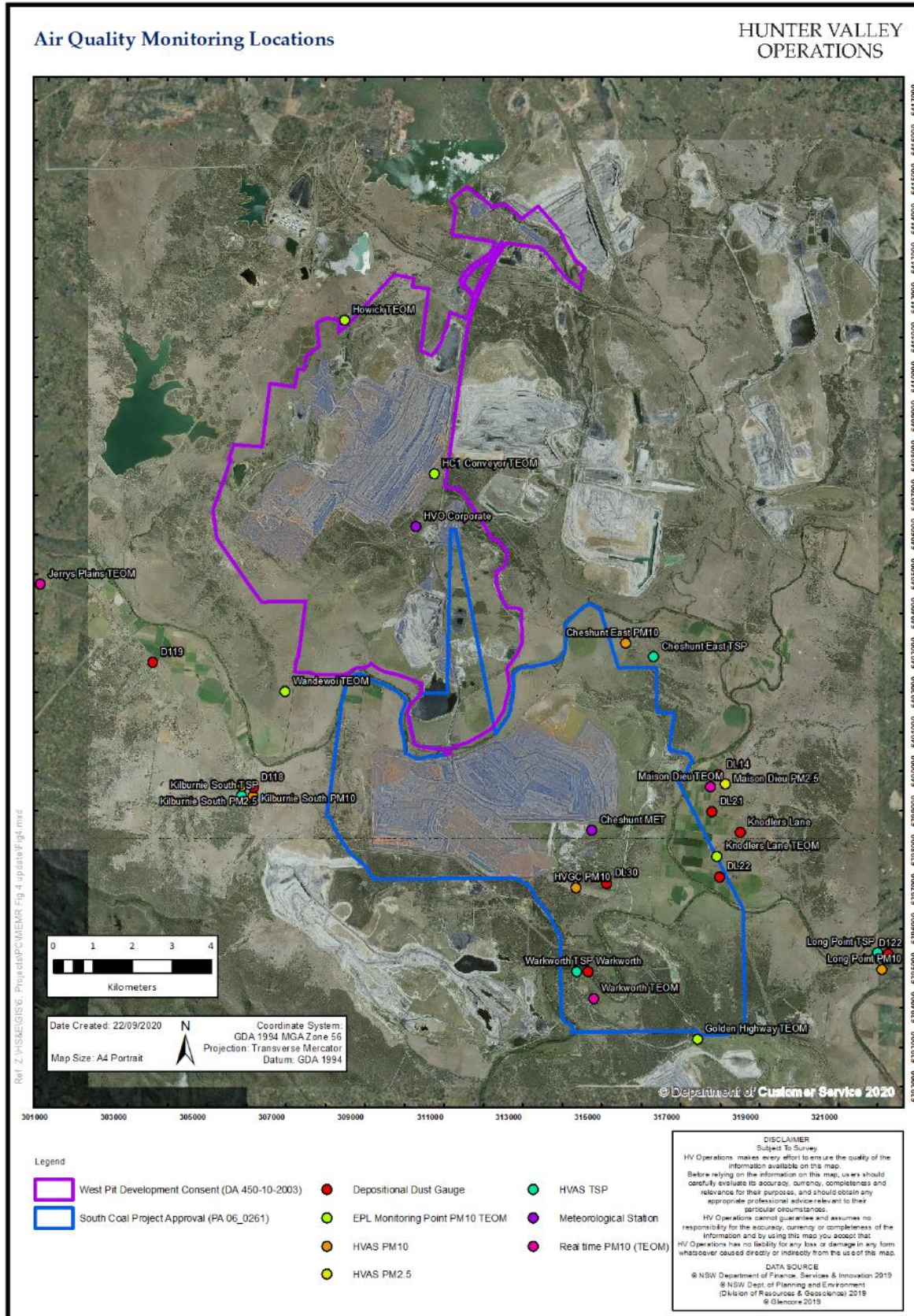


Figure 4 - Air Quality Monitoring Location Plan

## 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. Any monthly results deemed to be contaminated (due to presence of bird droppings, insects, etc.) are not displayed. During November, the results from DL21 and DL22 were deemed contaminated.

During the reporting period, the Warkworth, DL30 and D119 monitors recorded a monthly result above the long-term impact assessment criteria of 4.0 g/m<sup>2</sup> per month.

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

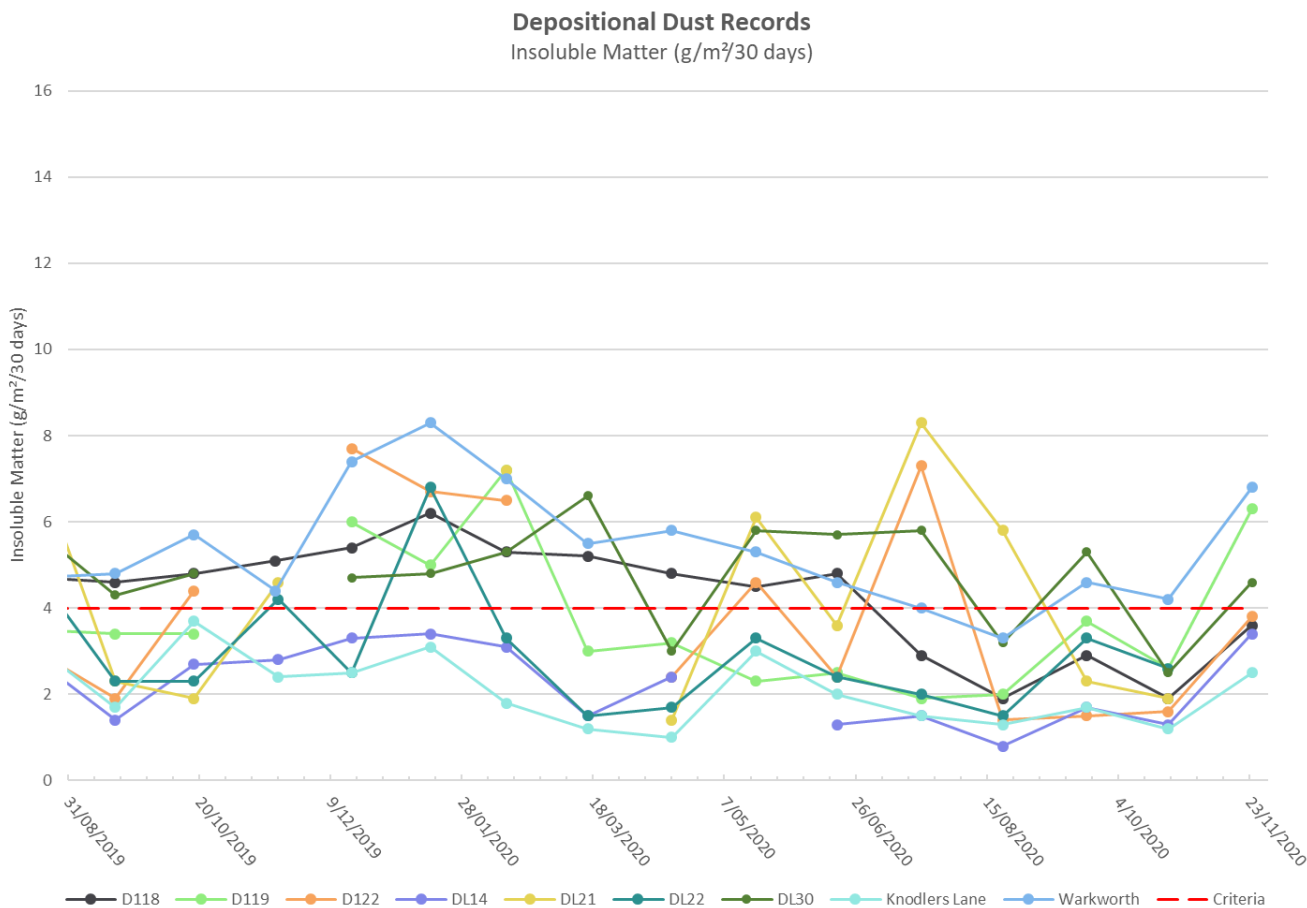


Figure 5 - Depositional Dust Results November 2020

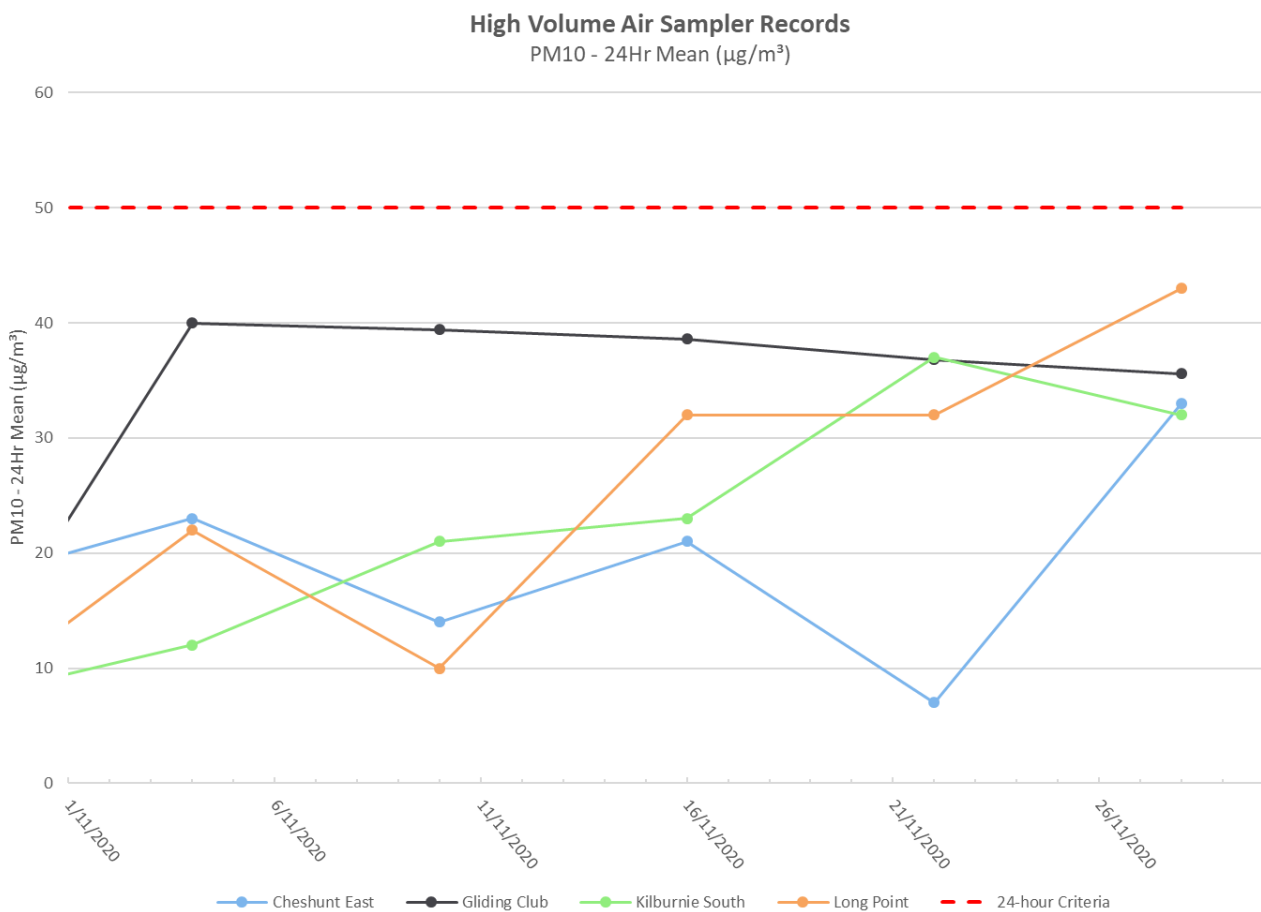
## 2.3 Suspended Particles

Suspended particles are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM<sub>10</sub>). The Kilburnie South and Maison Dieu HVAS also monitor Particulate Matter <2.5µm (PM<sub>2.5</sub>). The location of these monitors can be seen in **Figure 4**. Each HVAS runs for 24-hours on a six-day cycle.

### 2.3.1 HVAS PM<sub>10</sub> Results

#### 2.3.1.1 Performance against short term impact assessment criteria

**Figure 6** shows individual PM<sub>10</sub> results at each monitoring station against the short-term impact assessment criteria of 50µg/m<sup>3</sup>. During the reporting period, no monitors recorded an exceedance above the short-term impact assessment criteria of 50µg/m<sup>3</sup>.



**Figure 6 - Individual PM<sub>10</sub> Results November 2020**



### 2.3.1.2 Performance against long term impact assessment criteria

Figure 7 shows the year to date annual average PM<sub>10</sub> results. During the reporting period, the Gliding Club monitor recorded an annual average above the PM<sub>10</sub> Annual Rolling Mean criteria of 25µg/m<sup>3</sup> for HVO South. All monitors recorded an annual average below the 30µg/m<sup>3</sup> criteria for HVO North.

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

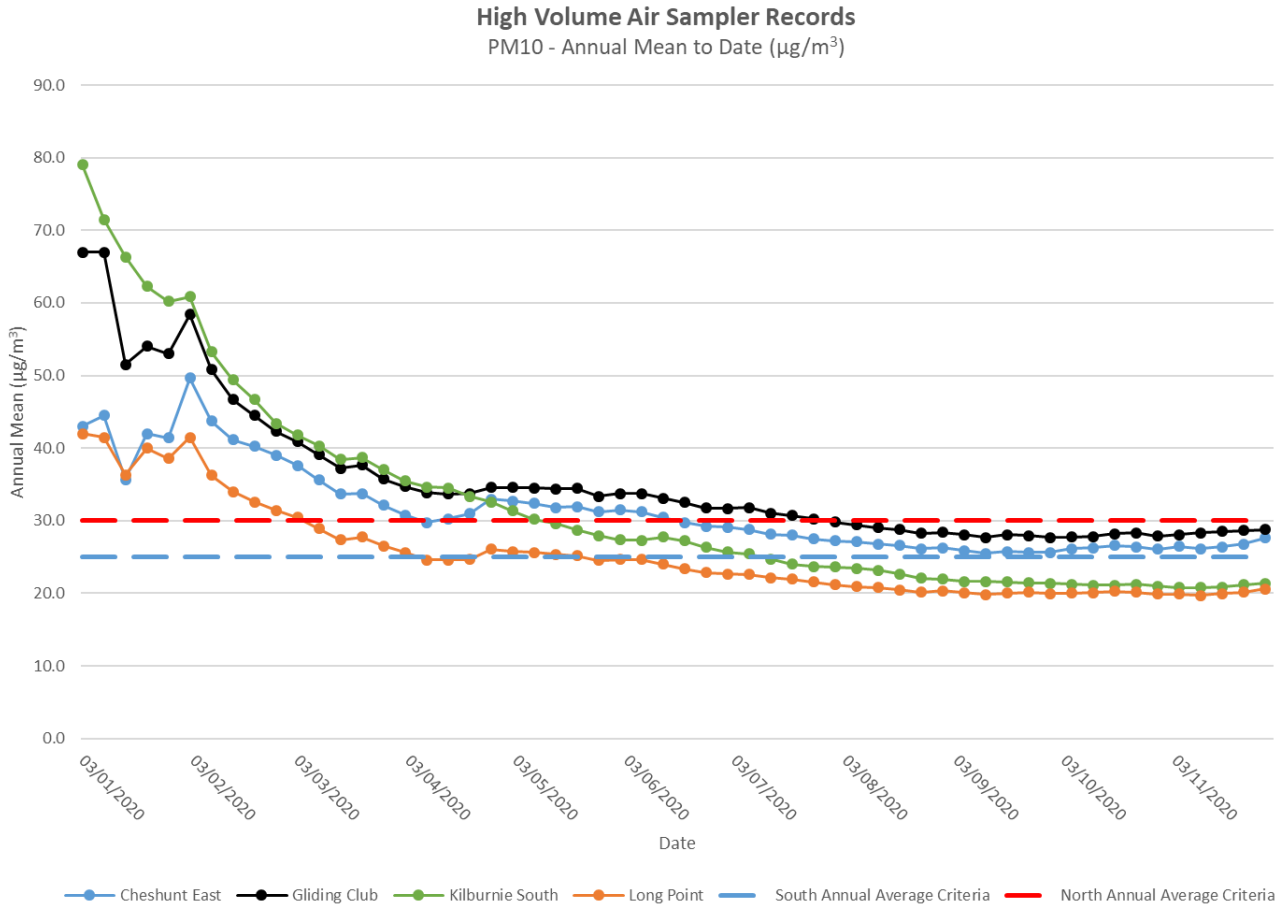


Figure 7 - Year to Date Average PM<sub>10</sub> as at end of November 2020

## 2.3.2 HVAS PM<sub>2.5</sub> Results

HVO monitors PM<sub>2.5</sub> at two HVAS locations, Kilburnie South and Maison Dieu.

### 2.3.2.1 Performance against short term impact assessment criteria

Figure 8 shows individual PM<sub>2.5</sub> results at each monitoring station against the HVO South short-term impact assessment criteria of 25µg/m<sup>3</sup>.

The Maison Dieu monitor recorded three exceedances above the short-term impact assessment criteria of 25µg/m<sup>3</sup> during the reporting period. Internal investigations into these exceedances deemed HVO’s contribution to be below the short-term impact assessment criteria of 25µg/m<sup>3</sup>

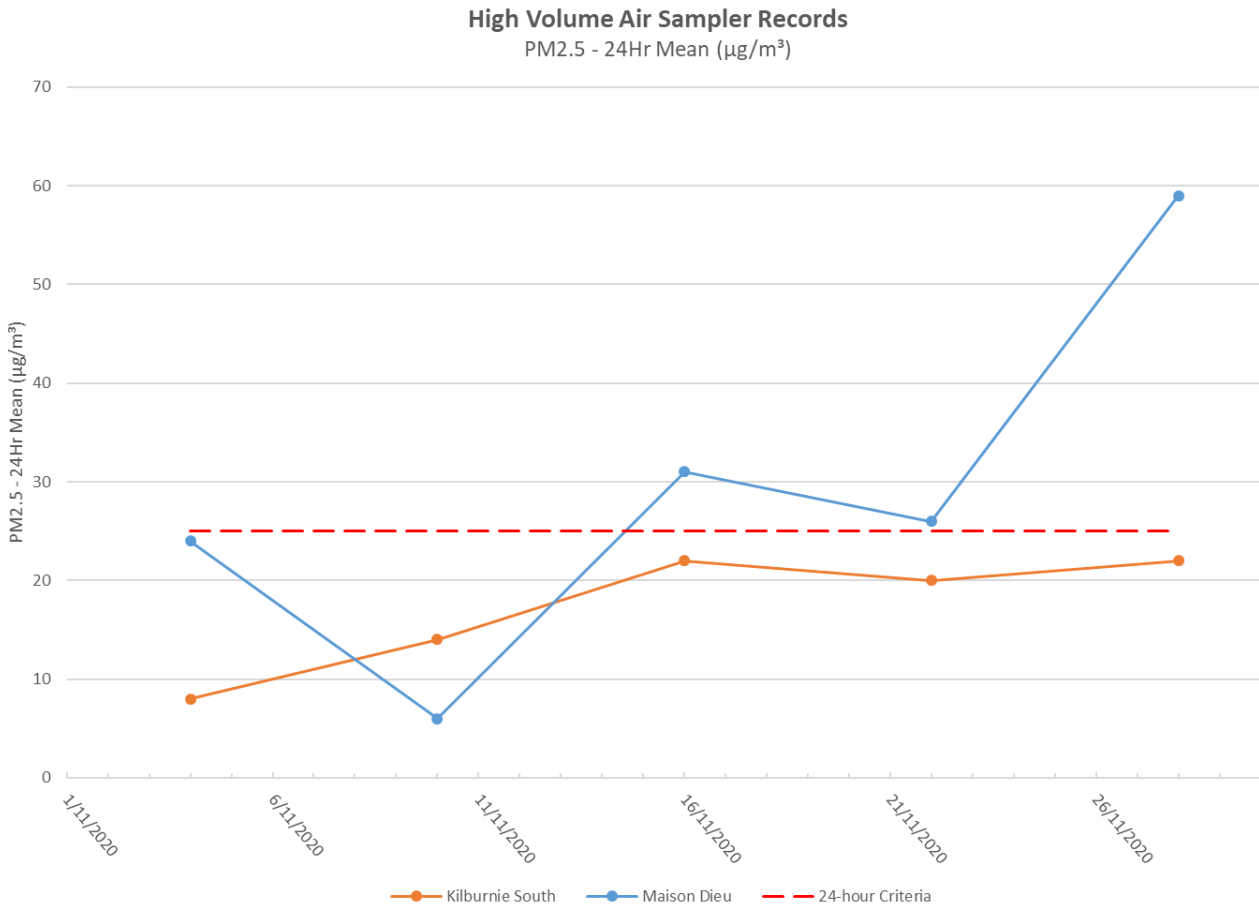


Figure 8 - Individual PM<sub>2.5</sub> Results November 2020

### 2.3.2.2 Performance against long term impact assessment criteria

Figure 9 shows the year to date annual average PM<sub>2.5</sub> results. During the reporting period, both monitors recorded an annual average above the PM<sub>2.5</sub> Annual Rolling Mean criteria of 8µg/m<sup>3</sup>.

This is likely due to the impact of bushfire smoke and regional air quality in the first months of the year. An assessment of HVO’s contribution against the long term impact assessment criteria will be provided in the 2020 Annual Review.

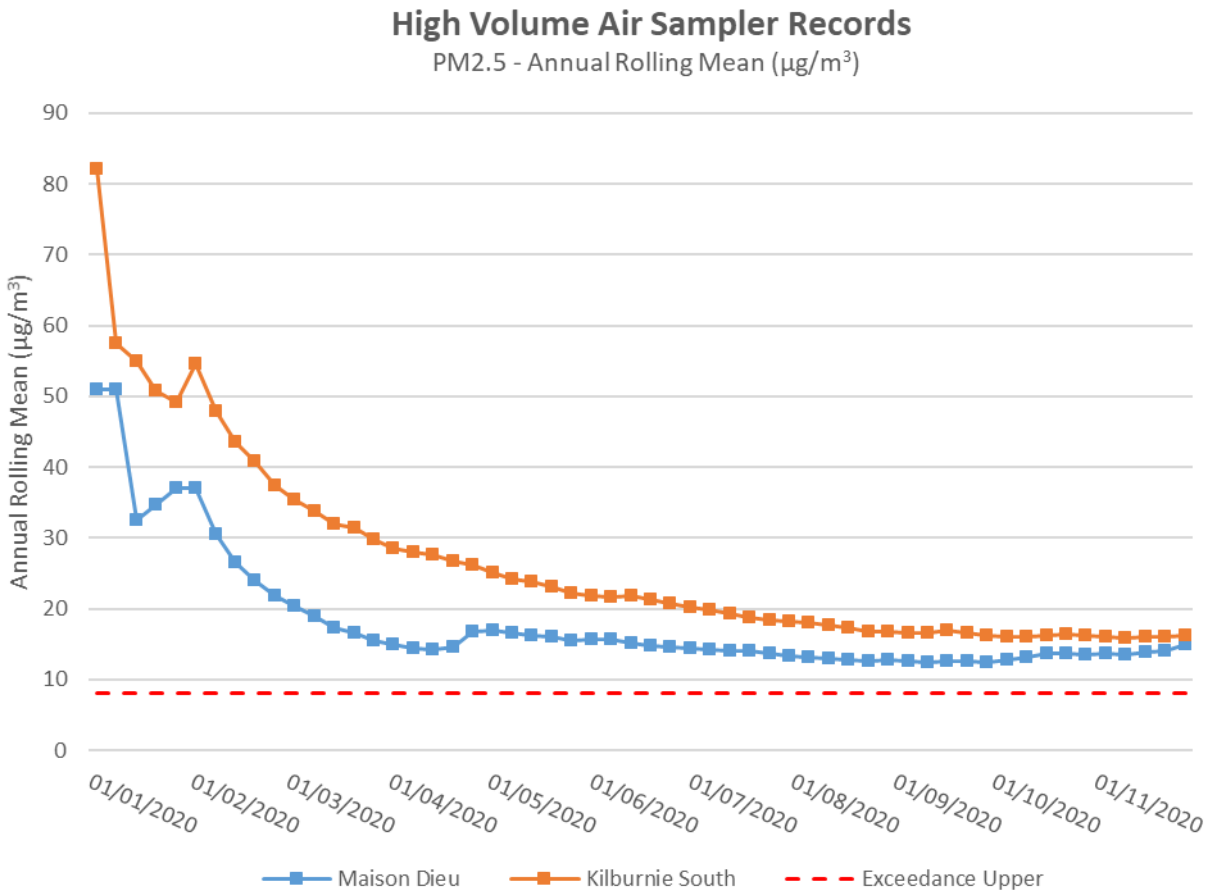


Figure 9 - Year to Date Average PM<sub>2.5</sub> as at end of November 2020

## 2.3.3 TSP Results

### 2.3.3.1 Performance against long term impact assessment criteria

Figure 10 shows the annual average TSP results compared against the long-term impact assessment criteria of 90µg/m<sup>3</sup>.

No monitors recorded an annual average above the long-term impact assessment criteria of 90µg/m<sup>3</sup> during the reporting period.

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

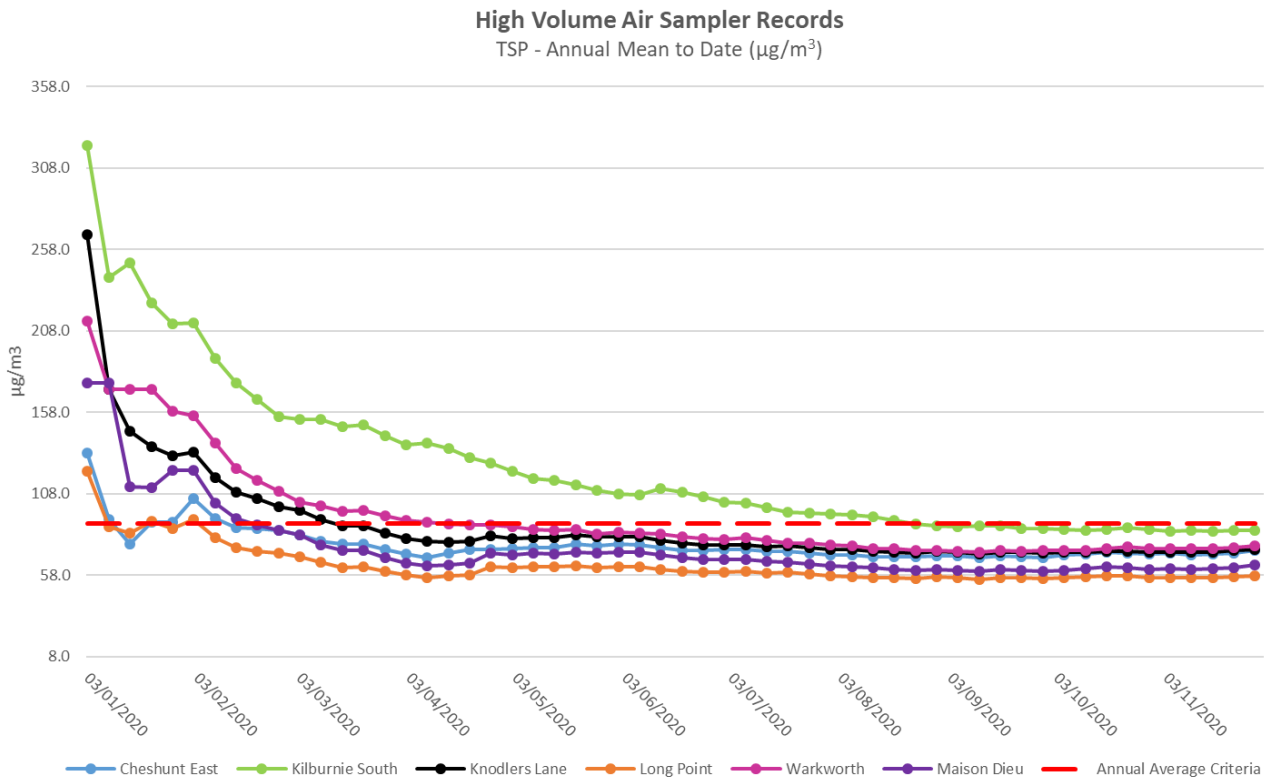


Figure 10 - Year to Date Average Total Suspended Particulates as at end of November 2020

## 2.3.4 Real Time PM<sub>10</sub> Results

HVO maintains a network of real time PM<sub>10</sub> 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 PM<sub>10</sub> monitoring are used as a reactive measure to guide mining operations to help achieve compliance with the relevant conditions of the project approval.

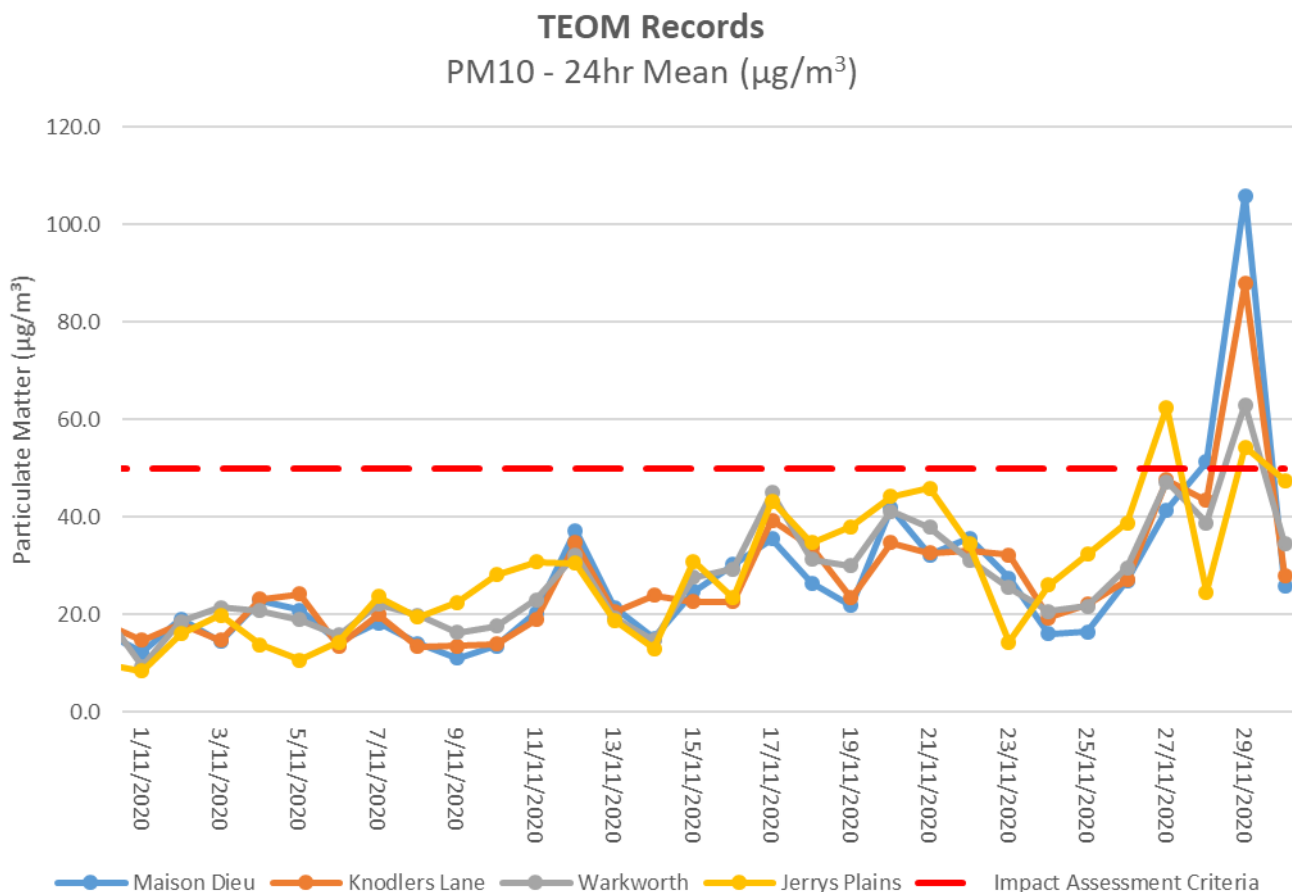
**Figure 11** shows the daily 24-hour average PM<sub>10</sub> result from the real time monitoring sites. The year to date annual averages for each monitoring site are shown in **Figure 12**.

On the 27<sup>th</sup> and 29<sup>th</sup> November the Jerrys Plains monitor exceeded the 24-hour average PM<sub>10</sub> result limit, investigations occurred and the incidents were reported.

On the 28<sup>th</sup> November the Maison Dieu monitor exceeded the 24-hour average PM<sub>10</sub> result limit, an investigation determined HVO's contribution to be below the criteria value. The Maison Dieu monitor also recorded an exceedance of the PM<sub>10</sub> result limit on the 29<sup>th</sup> November, an investigation occurred and the incident was reported.

The Knodlers Lane and Warkworth monitors also recorded exceedances of the PM<sub>10</sub> result limit on the 29<sup>th</sup> November; investigations determined HVO's contribution to be below the criteria value.

No monitors recorded an annual average above the long-term impact criteria.



**Figure 11 - Real Time PM<sub>10</sub> 24hr average and YTD average November 2020**

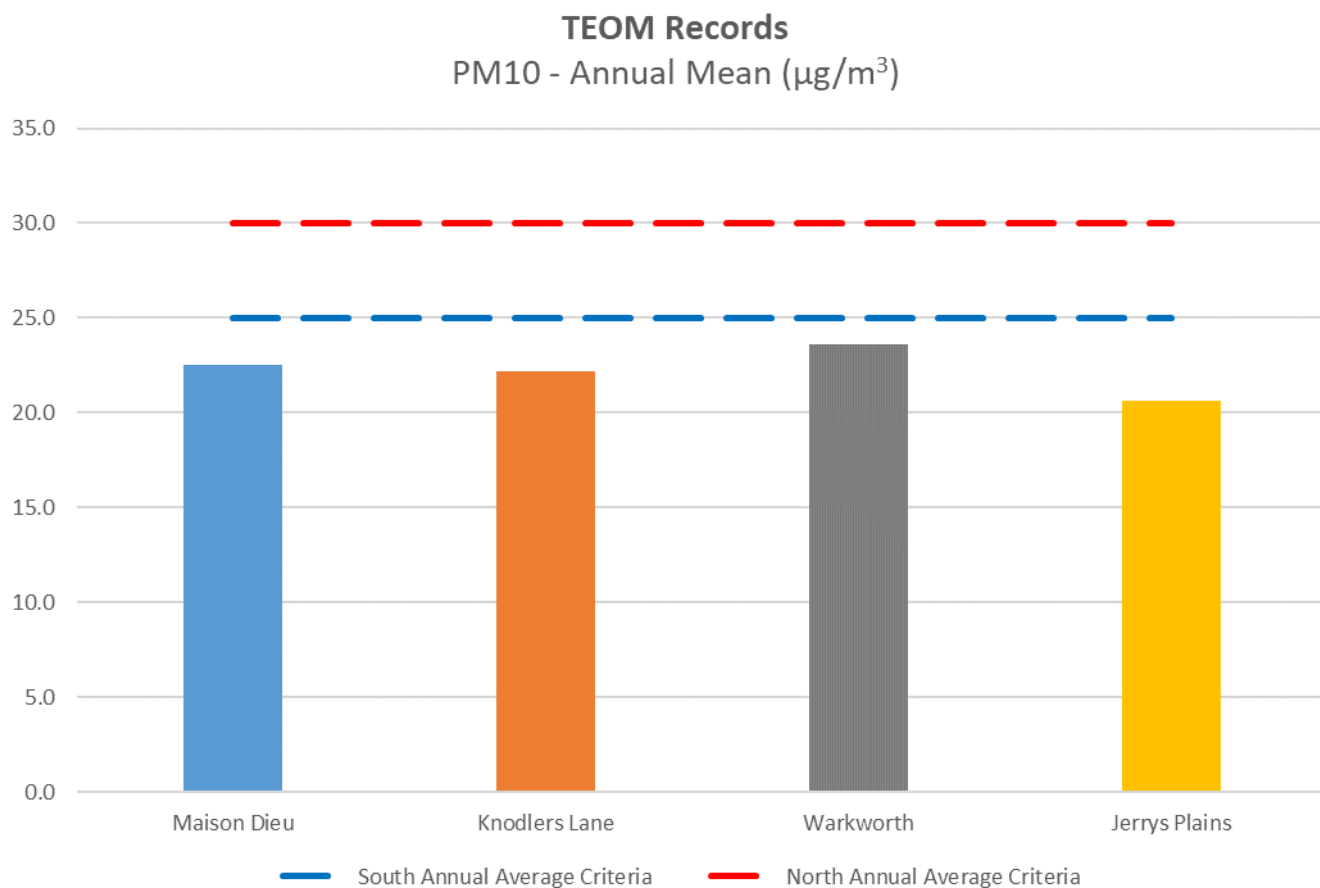


Figure 12 - Real Time PM<sub>10</sub> Annual Average November 2020

## 2.3.5 Real Time Alarms for Air Quality

During November, the real time monitoring system generated 141 automated air quality related alarms; of these alarms, 107 related to adverse weather conditions and 34 related to dust conditions.

## 3 Water Quality

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

### 3.1 Surface Water

Surface watercourses are sampled on a quarterly sampling regime. Water quality is assessed through the parameters of pH, electrical conductivity (EC) and Total Suspended Solids (TSS). The location of surface water monitoring points across HVO are shown in **Figure 13**

Results from monitoring on site dams, the Hunter River and other natural tributaries are provided on a quarterly basis; results will appear in the December 2020 report.

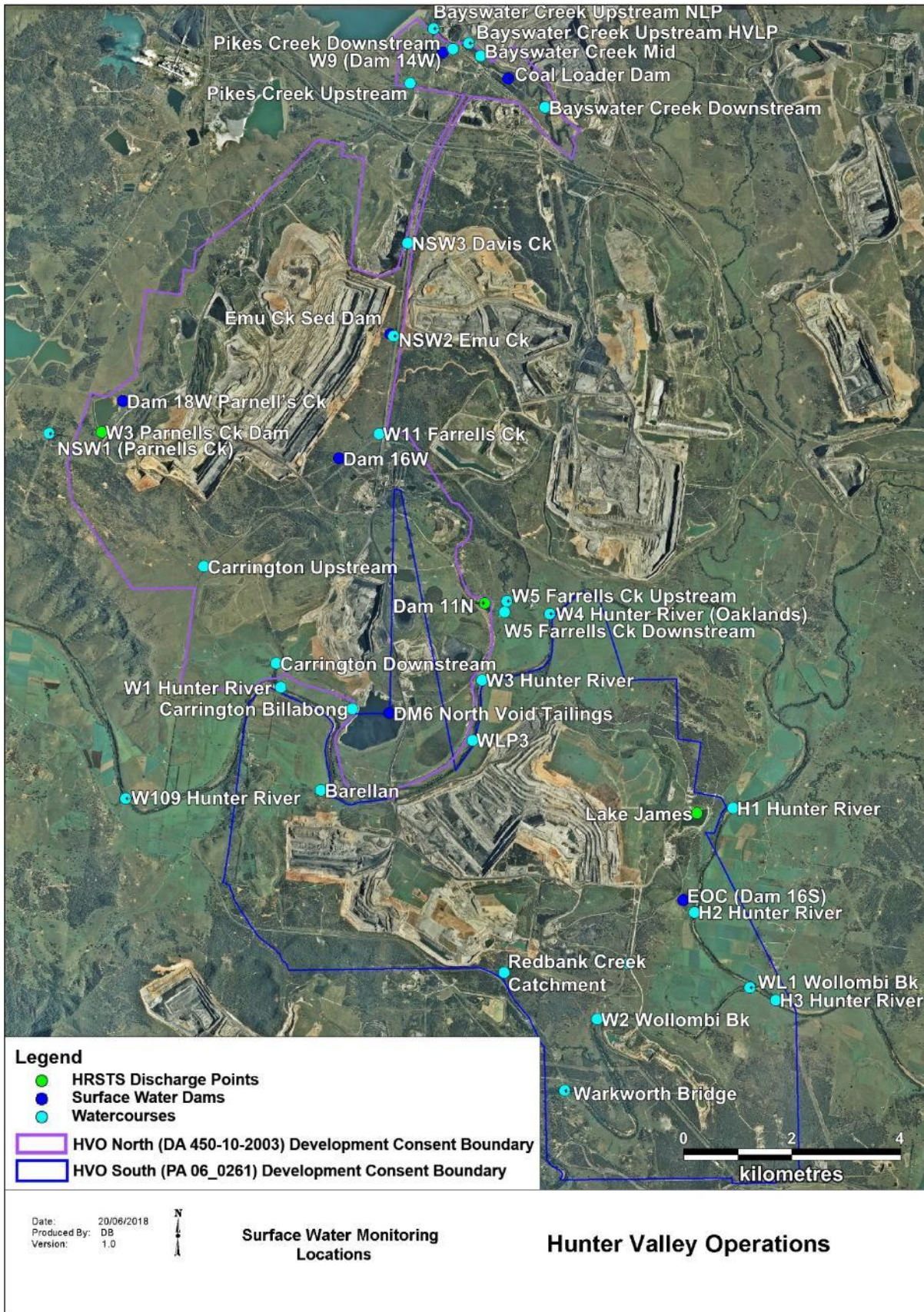


Figure 13 - HVO Surface Water Monitoring Locations



### 3.1.1 Surface Water Trigger Tracking

Internal trigger limits have been developed to assess monitoring data on an on-going basis and to highlight potentially adverse surface water impacts. The process for evaluating monitoring results against the internal triggers and subsequent responses are outlined in the HVO Water Management Plan.

Surface water trigger tracking results are provided on a quarterly basis; results will appear in the December 2020 report.

### 3.2 Site Water Use

Under water allocation licenses issued by Water NSW, HVO is permitted to extract water from the Hunter River. During the reporting period, HVO extracted 66.0 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, HVO discharged 0ML of water 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 Groundwater Monitoring Programme. The location of groundwater monitoring points across HVO are show in **Figure 14**

Groundwater monitoring results are provided on a quarterly basis; results will appear in the December 2020 report.

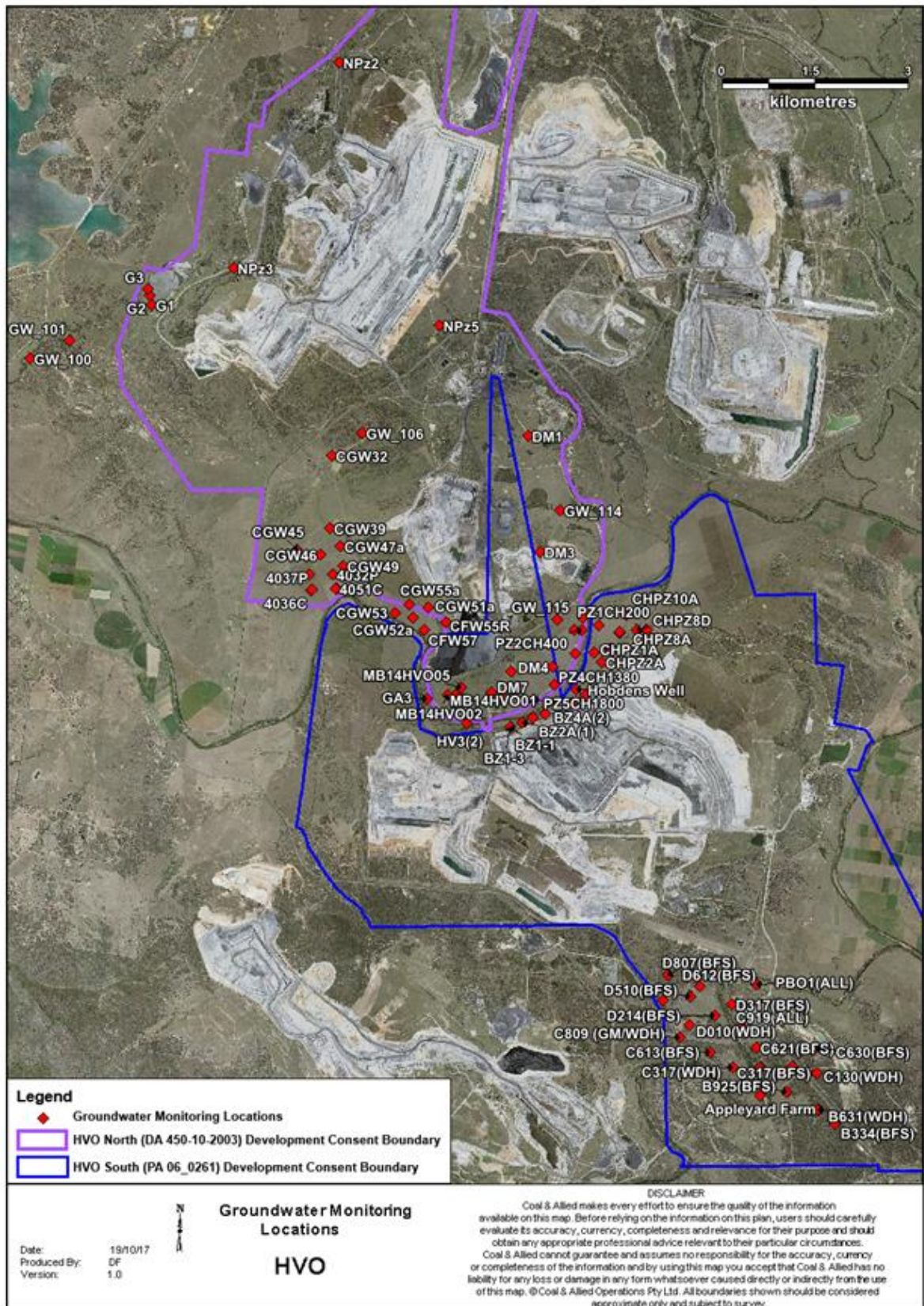


Figure 14 Groundwater monitoring Locations at HVO

### 3.4.1 Groundwater Trigger Tracking

Internal trigger limits have been developed to assess monitoring data on an on-going basis and to highlight potentially adverse groundwater impacts. The process for evaluating monitoring results against the internal triggers and subsequent responses are outlined in the HVO Water Management Plan.

Groundwater trigger tracking results are provided on a quarterly basis; results will appear in the December 2020 report.

## 4 Blasting

HVO maintains a network of blast monitoring units located at nearby privately owned residences and function as regulatory compliance monitors. The location of these monitors can be found in **Figure 15**. Blasting criteria for HVO are summarised in **Table 2**.

**Table 2 - Blasting Criteria**

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

## 4.1 Blast Monitoring Results

During November, fourteen blasts were initiated at HVO. **Table 3** and

Table 4 show the blast monitoring results for the reporting period.

**Table 3 - Overpressure Blast Monitoring Results November 2020**

Date and Time	Moses Crossing (dB)	Jerrys Plains Village (dB)	Maison Dieu (dB)	Warkworth (dB)	Knodlers Lane (dB)
3/11/2020 14:00	96.5	106.5	98.9	97.8	97.3
4/11/2020 14:29	92.4	91.3	84.8	94.9	92.2
4/11/2020 15:22	97.7	96.4	99.1	103.4	102.5
4/11/2020 15:23	99.0	99.0	94.6	103.4	97.2
7/11/2020 12:39	91.0	93.8	91.9	97.2	93.0
11/11/2020 13:25	93.9	88.7	96.1	100.2	96.4
17/11/2020 13:57	95.9	105.6	99.7	101.6	97.1
18/11/2020 13:11	107.4	106.4	108.2	105.4	111.0
21/11/2020 13:00	88.3	97.1	94.5	100.0	100.8
24/11/2020 09:09	105.6	107.3	96.3	101.2	98.0
25/11/2020 13:20	84.9	108.8	89.0	98.8	94.0
27/11/2020 13:14	93.2	91.2	88.4	91.0	93.2
28/11/2020 13:12	89.0	104.0	103.9	100.9	106.9
30/11/2020 13:03	106.2	109.0	104.7	91.1	98.5

**Table 4 - Ground Vibration Blast Monitoring Results November 2020**

Date and Time	Moses Crossing (mm/s)	Jerrys Plains Village (mm/s)	Maison Dieu (mm/s)	Warkworth (mm/s)	Knodlers Lane (mm/s)
3/11/2020 14:00	0.29	0.13	0.25	0.72	0.2
4/11/2020 14:29	0.13	0.07	0.09	0.19	0.1
4/11/2020 15:22	0.13	0.07	0.14	0.2	0.13
4/11/2020 15:23	0.16	0.1	0.43	0.2	0.76
7/11/2020 12:39	0.13	0.07	0.18	0.59	0.22
11/11/2020 13:25	0.11	0.07	0.18	0.26	0.17
17/11/2020 13:57	0.27	0.1	0.19	0.75	0.16
18/11/2020 13:11	0.12	0.06	0.05	0.75	0.08
21/11/2020 13:00	0.21	0.1	0.11	0.13	0.09
24/11/2020 09:09	0.46	0.11	0.14	0.47	0.15
25/11/2020 13:20	0.28	0.13	0.14	0.21	0.12
27/11/2020 13:14	0.15	0.07	0.11	0.11	0.09
28/11/2020 13:12	0.25	0.12	0.23	0.86	0.32
30/11/2020 13:03	0.16	0.12	0.1	0.16	0.09

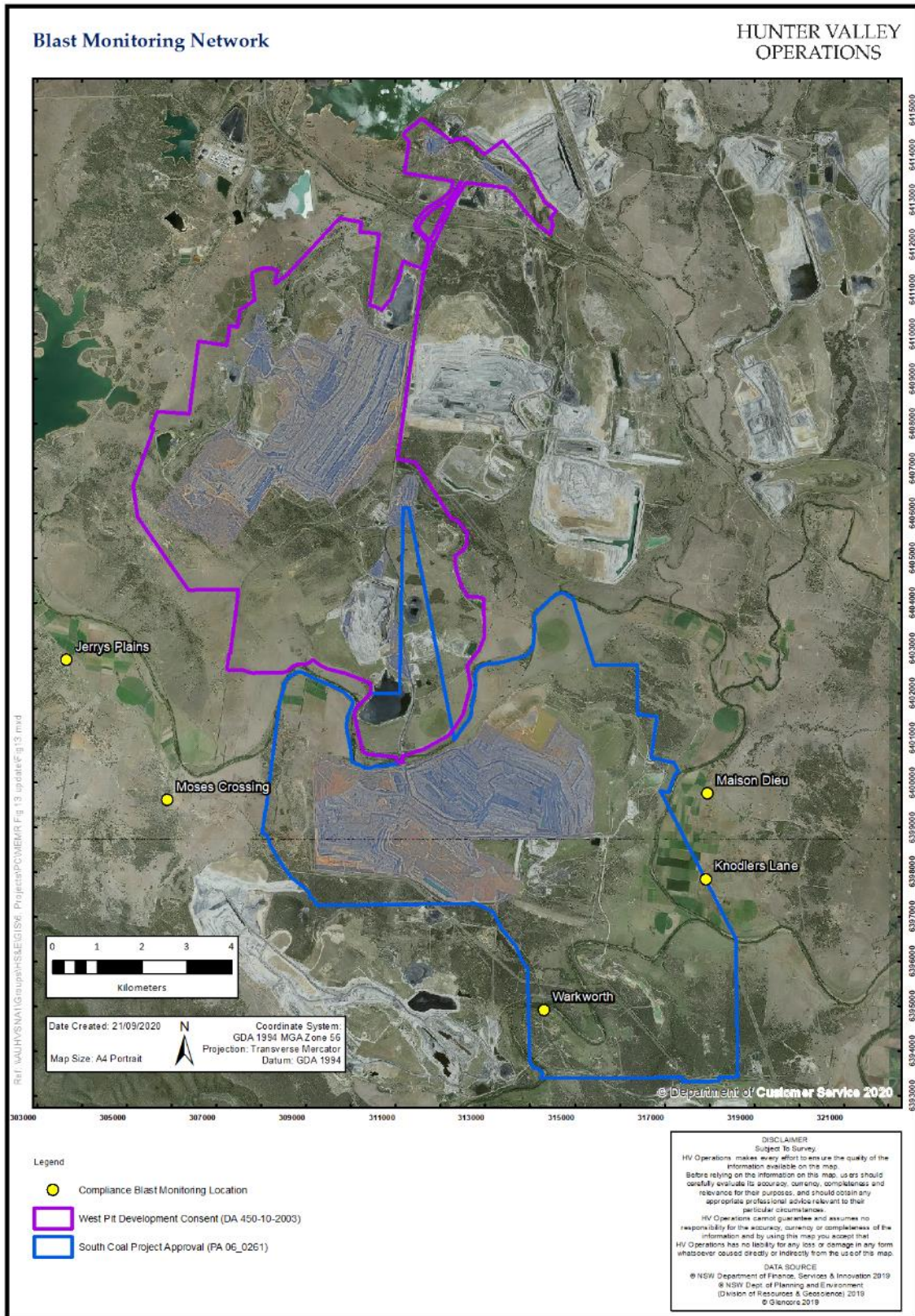


Figure 15 - Blast Monitoring Location Plan

## 5 Noise

Routine attended noise monitoring occurs at defined locations around HVO, as described in the HVO Noise Monitoring Programme. The noise monitoring aims to quantify and describe the acoustic environment around the site and compare results with specified limits. The attended noise monitoring locations are displayed in **Figure 16**.

### 5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations around HVO on the nights of the 4<sup>th</sup> and 23<sup>rd</sup> November 2020, with no non-compliances recorded. Monitoring results are detailed in **Table 7** to **Table 11**.



**Table 5 - LAeq,15minute HVO North Against Impact Assessment Criteria November 2020**

Location	Date and Time	Wind Speed (m/s) <sup>1</sup>	Stability Class	Criterion dB(A)	Criterion Applies <sup>2</sup>	HVO North LAeq dB <sup>3,4,5,6,7</sup>	Exceedance <sup>4,5</sup>
Shearers Lane	04/11/2020 21:00	3.8	D	35	No	IA	NA
Knodlers Lane	04/11/2020 21:43	3.6	D	35	No	IA	NA
Maison Dieu	04/11/2020 21:22	4.1	D	35	No	IA	NA
Long Point	04/11/2020 22:32	3.5	D	35	No	IA	NA
Kilburnie South	04/11/2020 23:14	2.9	D	39	Yes	IA	Nil
Jerrys Plains East	04/11/2020 22:52	3.7	D	39	No	<25	NA
Jerrys Plains Village	04/11/2020 21:20	4.1	D	40	No	IA	NA
Jerrys Plains West	04/11/2020 21:00	3.8	D	40	No	IA	NA
HVGC	04/11/2020 23:44	3.0	E	NA	Yes	IA	Nil
Kilburnie South	23/11/2020 21:00	4.0	D	39	No	IA	NA
Jerrys Plains East	23/11/2020 21:21	4.7	D	39	No	IA	NA
Jerrys Plains Village	23/11/2020 21:43	5.5	D	40	No	IA	NA

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 3m/s (at a height of 10m), or during stability class G conditions. Criterion may or may not apply due to rounding of meteorological data values;
3. Site-only LAeq 15 minute attributed to HVO South Pit Area, including modifying factors if applicable;
4. Bold results in red indicated exceedance of relevant criterion;
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 not applicable;
6. IA means inaudible, there was no site noise at the monitoring location; and
7. NM means not measureable, noise was audible but could not be quantified.

**Table 6 - LAeq,15minute HVO North Against Land Acquisition Criteria November 2020**

Location	Date and Time	Wind Speed (m/s) <sup>1</sup>	Stability Class	Criterion dB(A)	Criterion Applies <sup>2</sup>	HVO North LAeq dB <sup>3,4,6,7</sup>	Exceedance <sup>4,5</sup>
Shearers Lane	04/11/2020 21:00	3.8	D	41	No	IA	NA
Knodlers Lane	04/11/2020 21:43	3.6	D	41	No	IA	NA
Maison Dieu	04/11/2020 21:22	4.1	D	41	No	IA	NA
Long Point	04/11/2020 22:32	3.5	D	41	No	IA	NA
Kilburnie South	04/11/2020 23:14	2.9	D	41	Yes	IA	Nil
Jerrys Plains East	04/11/2020 22:52	3.7	D	41	No	<25	Na
Jerrys Plains Village	04/11/2020 21:20	4.1	D	41	No	IA	NA
Jerrys Plains West	04/11/2020 21:00	3.8	D	41	No	IA	NA
HVGC	04/11/2020 23:44	3.0	E	NA	Yes	IA	Nil
Kilburnie South	23/11/2020 21:00	4.0	D	41	No	IA	NA
Jerrys Plains East	23/11/2020 21:21	4.7	D	41	No	IA	NA
Jerrys Plains Village	23/11/2020 21:43	5.5	D	41	No	IA	NA

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 3m/s (at a height of 10m), or during stability class G conditions. Criterion may or may not apply due to rounding of meteorological data values;
3. Site-only LAeq 15 minute attributed to HVO South Pit Area, including modifying factors if applicable;
4. Bold results in red indicated exceedance of relevant criterion;
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 not applicable;
6. IA means inaudible, there was no site noise at the monitoring location; and
7. NM means not measureable, noise was audible but could not be quantified.

**Table 7 - LA1,1minute HVO North Against Impact Assessment Criteria November 2020**

Location	Date and Time	Wind Speed (m/s) <sup>1</sup>	Stability Class	Criterion dB(A)	Criterion Applies <sup>2</sup>	HVO North L <sub>Aeq</sub> dB <sup>3,4,6,7</sup>	Exceedance <sup>4,5</sup>
Shearers Lane	04/11/2020 21:00	3.8	D	46	No	IA	NA
Knodlers Lane	04/11/2020 21:43	3.6	D	46	No	IA	NA
Maison Dieu	04/11/2020 21:22	4.1	D	46	No	IA	NA
Long Point	04/11/2020 22:32	3.5	D	46	No	IA	NA
Kilburnie South	04/11/2020 23:14	2.9	D	46	Yes	IA	Nil
Jerrys Plains East	04/11/2020 22:52	3.7	D	46	No	<25	NA
Jerrys Plains Village	04/11/2020 21:20	4.1	D	46	No	IA	NA
Jerrys Plains West	04/11/2020 21:00	3.8	D	46	No	IA	NA
HVGC	04/11/2020 23:44	3.0	E	NA	Yes	IA	Nil
Kilburnie South	23/11/2020 21:00	4.0	D	46	No	IA	NA
Jerrys Plains East	23/11/2020 21:21	4.7	D	46	No	IA	NA
Jerrys Plains Village	23/11/2020 21:43	5.5	D	46	No	IA	NA

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 3m/s (at a height of 10m), or during stability class G conditions. Criterion may or may not apply due to rounding of meteorological data values;

3. Site-only L<sub>Aeq</sub> 15 minute attributed to HVO South Pit Area, including modifying factors if applicable;

4. Bold results in red indicated exceedance of relevant criterion;

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 not applicable;

6. IA means inaudible, there was no site noise at the monitoring location; and

7. NM means not measureable, noise was audible but could not be quantified.

**Table 8 - LAeq,15minute HVO South Against Impact Assessment Criteria November 2020**

Location	Date and Time	Wind Speed (m/s) <sup>1</sup>	Stability Class	Criterion dB(A)	Criterion Applies <sup>2</sup>	HVO South LAeq dB <sup>3,4,6,7</sup>	Exceedance <sup>4,5</sup>
Shearers Lane	04/11/2020 21:00	4.9	E	41	No	32	NA
Knodlers Lane	04/11/2020 21:43	4.5	E	40	No	30	NA
Maison Dieu	04/11/2020 21:22	4.7	E	39	No	33	NA
Long Point	04/11/2020 22:32	1.3	F	37	Yes	<25	Nil
Kilburnie South	04/11/2020 23:14	3.0	E	39	No	IA	NA
Jerrys Plains East	04/11/2020 22:52	2.4	E	38	Yes	IA	Nil
Jerrys Plains Village	04/11/2020 21:20	4.7	E	35	No	IA	NA
Jerrys Plains West	04/11/2020 21:00	4.9	E	35	No	IA	NA
HVGC	04/11/2020 23:44	1.9	F	55	Yes	38	Nil

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 3m/s (at a height of 10m), or during stability class G conditions. Criterion may or may not apply due to rounding of meteorological data values;

3. Site-only LAeq 15 minute attributed to HVO South Pit Area, including modifying factors if applicable;

4. Bold results in red indicated exceedance of relevant criterion;

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 not applicable;

6. IA means inaudible, there was no site noise at the monitoring location; and

7. NM means not measureable, noise was audible but could not be quantified.

**Table 9 - LA1,1minute HVO South Against Impact Assessment Criteria November 2020**

Location	Date and Time	Wind Speed (m/s) <sup>1</sup>	Stability Class	Criterion dB(A)	Criterion Applies <sup>2</sup>	HVO South L <sub>Aeq</sub> dB <sup>3,4,6,7</sup>	Exceedance <sup>4,5</sup>
Shearers Lane	04/11/2020 21:00	4.9	E	41	No	39	NA
Knodlers Lane	04/11/2020 21:43	4.5	E	40	No	33	NA
Maison Dieu	04/11/2020 21:22	4.7	E	39	No	40	NA
Long Point	04/11/2020 22:32	1.3	F	37	Yes	<25	Nil
Kilburnie South	04/11/2020 23:14	3.0	E	39	No	IA	NA
Jerrys Plains East	04/11/2020 22:52	2.4	E	38	Yes	IA	Nil
Jerrys Plains Village	04/11/2020 21:20	4.7	E	35	No	IA	NA
Jerrys Plains West	04/11/2020 21:00	4.9	E	35	No	IA	NA
HVGC	04/11/2020 23:44	1.9	F	55	Yes	NA	Nil

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 3m/s (at a height of 10m), or during stability class G conditions. Criterion may or may not apply due to rounding of meteorological data values;

3. Site-only L<sub>Aeq</sub> 15 minute attributed to HVO South Pit Area, including modifying factors if applicable;

4. Bold results in red indicated exceedance of relevant criterion;

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 not applicable;

6. IA means inaudible, there was no site noise at the monitoring location; and

7. NM means not measureable, noise was audible but could not be quantified.

## 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 November 2020 no penalties were applied. The assessments for the low frequency noise are shown in **Table 10** and **Table 11**.

**Table 10 - Modifying Factor Assessment HVO North November 2020**

Location	Date and Time	Measured HVO North $L_{Aeq}dB$	Criterion Applies?	Intermittency Modifying Factor?	Tonality Modifying Factor?	Frequency of Tonality <sup>1</sup>	Low-frequency Modifying Factor?	Maximum Exceedance of NPfl Reference Spectrum <sup>1,2</sup>	Total Penalty $dB^2$
Shearers Lane	04/11/2020 21:00	IA	No	No	No	NA	No	NA	Nil
Knodlers Lane	04/11/2020 21:43	IA	No	No	No	NA	No	NA	Nil
Maison Dieu	04/11/2020 21:22	IA	No	No	No	NA	No	NA	Nil
Long Point	04/11/2020 22:32	IA	No	No	No	NA	No	NA	Nil
Kilburnie South	04/11/2020 23:14	IA	Yes	No	No	NA	No	NA	Nil
Jerrys Plains East	04/11/2020 22:52	<25	No	No	No	NA	No	NA	Nil
Jerrys Plains Village	04/11/2020 21:20	IA	No	No	No	NA	No	NA	Nil
Jerrys Plains West	04/11/2020 21:00	IA	No	No	No	NA	No	NA	Nil
HVGC	04/11/2020 23:44	IA	Yes	No	No	NA	No	NA	Nil
Kilburnie South	23/11/2020 21:00	IA	No	No	No	NA	No	NA	Nil
Jerrys Plains East	23/11/2020 21:21	IA	No	No	No	NA	No	NA	Nil
Jerrys Plains Village	23/11/2020 21:43	IA	No	No	No	NA	No	NA	Nil

1. NA means not applicable;

2. Bold results indicate that NPfl low-frequency modifying factor has been triggered and application of correction is required.

**Table 11 - Modifying Factor Assessment HVO South November 2020**

Location	Date and Time	Measured HVO South $L_{Aeq}dB$	Criterion Applies?	Intermittency Modifying Factor?	Tonality Modifying Factor?	Frequency of Tonality <sup>1</sup>	Low-frequency Modifying Factor?	Maximum Exceedance of NPfl Reference Spectrum <sup>1,2</sup>	Total Penalty $dB^2$
Shearers Lane	04/11/2020 21:00	32	No	No	No	NA	No	No	Nil
Knodlers Lane	04/11/2020 21:43	30	No	No	No	NA	No	No	Nil
Maison Dieu	04/11/2020 21:22	33	No	No	No	NA	No	No	Nil
Long Point	04/11/2020 22:32	<25	Yes	No	No	NA	No	No	Nil
Kilburnie South	04/11/2020 23:14	IA	No	No	No	NA	No	No	Nil
Jerrys Plains East	04/11/2020 22:52	IA	Yes	No	No	NA	No	No	Nil
Jerrys Plains Village	04/11/2020 21:20	IA	No	No	No	NA	No	No	Nil
Jerrys Plains West	04/11/2020 21:00	IA	No	No	No	NA	No	No	Nil
HVGC	04/11/2020 23:44	38	Yes	No	No	NA	No	No	Nil

1. NA means not applicable;

2. Bold results indicate that NPfl low-frequency modifying factor has been triggered and application of correction is required.

## 5.3 Real Time Noise Monitoring

HVO utilises a network of real-time directional noise monitors to manage noise impacts on a continuous basis, shown in **Figure 16**. 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.

HVO investigates and responds to noise alarms with appropriate modification to operations. Changes in response to a noise alarm can include replacing equipment with quieter (noise attenuated) units, changing or relocating tasks, or shutting down equipment. It should be noted that this assessment does not compliment or conflict with attended noise monitoring detailed in **Section 5.1**. Real time monitoring data includes non-mine noise sources such as animals, road traffic and weather.

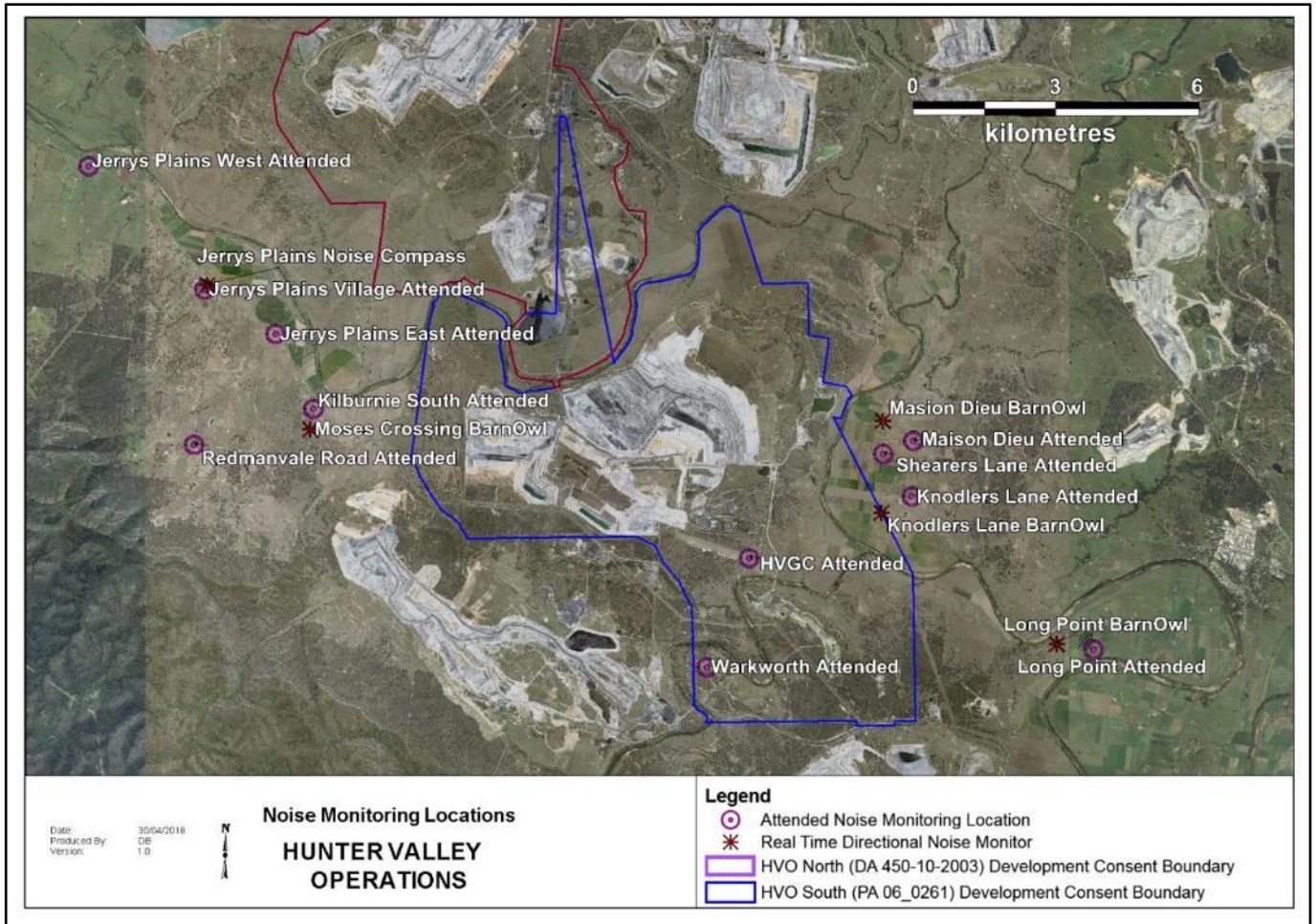
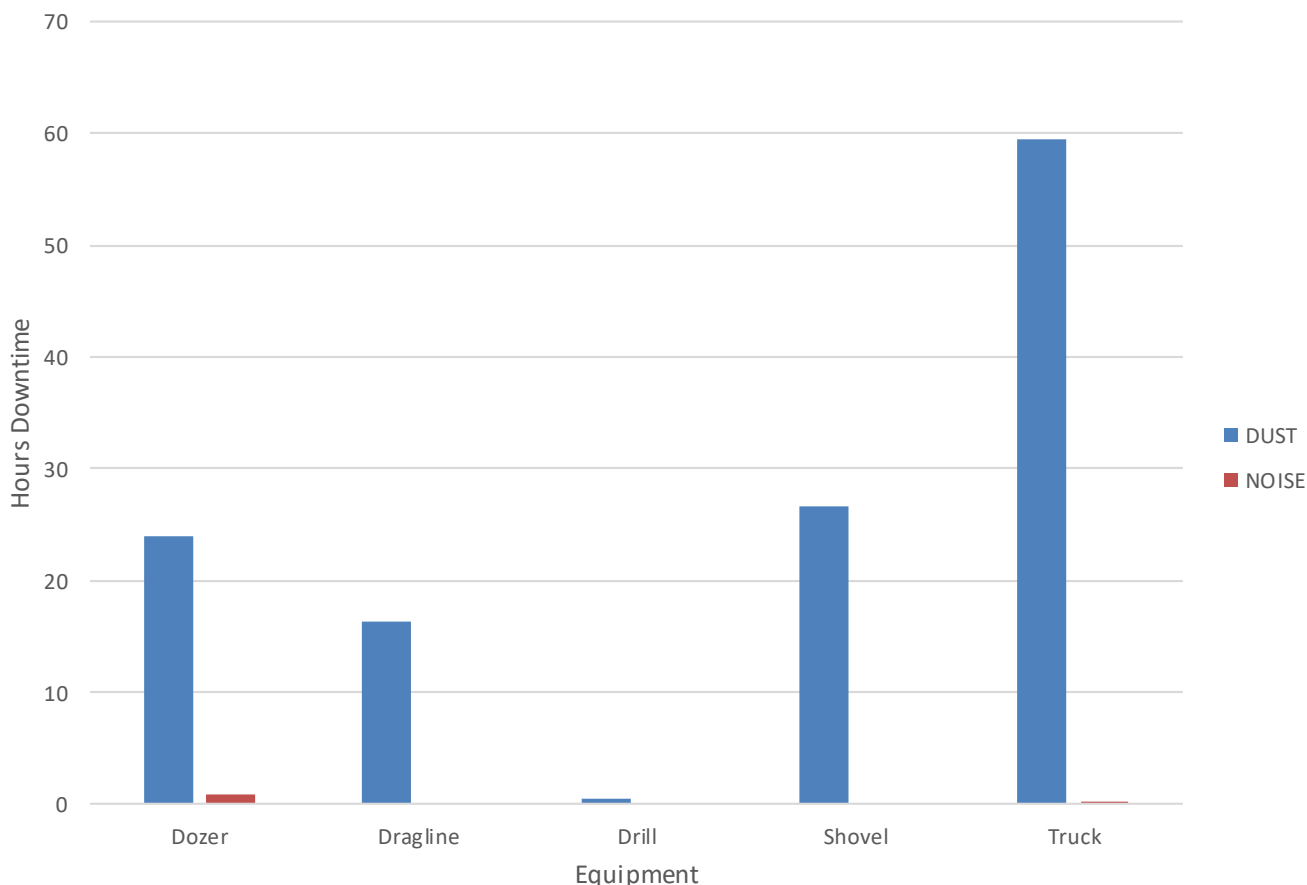


Figure 16 - Noise Monitoring Location Plan



## 6 Operational Downtime

During November a total of 22 hours of equipment downtime were logged in response to real time monitoring and inspections for environmental factors such as noise and dust. Operational downtime by equipment type is show in **Figure 17**. Note that these delays are instances where operations were completely stopped and does not include occasions where operations were changed/modified but not stopped (e.g. changed from exposed dump to in-pit dump).



**Figure 17 - Operational Downtime by Equipment Type November 2020**

# 7 Rehabilitation

During November, 10.6 Ha of land was bulk shaped, 5.6 Ha of land was released, 26.9 Ha of land was topsoiled, and 33.7 Ha was rehabilitated. Year to date progress can be viewed in **Figure 18**.

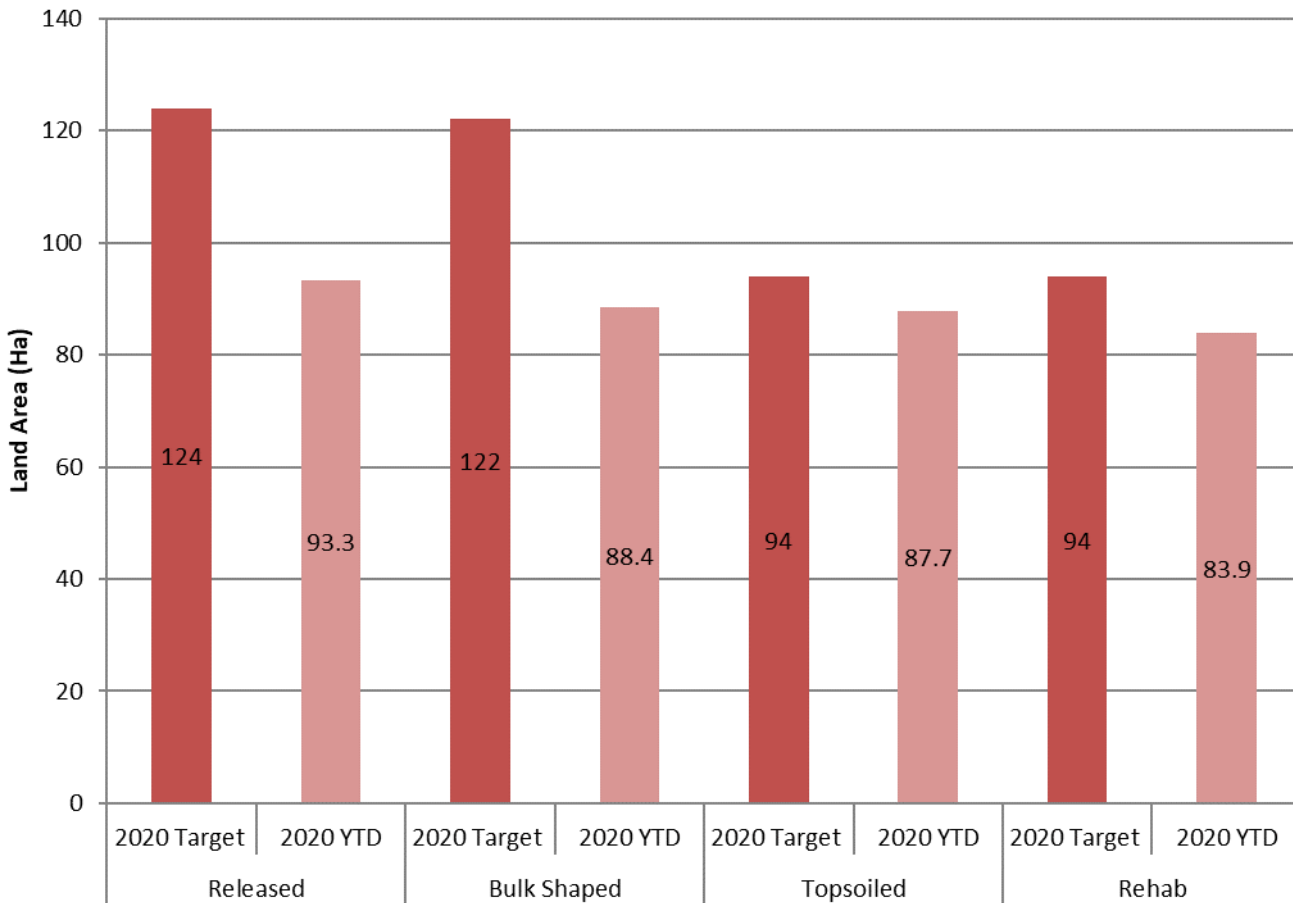


Figure 18 - Rehabilitation YTD November 2020

# 8 Complaints

One complaint was received during November 2020. Fifteen complaints have been received in 2020. Details of complaints received are shown in **Table 12**.

**Table 12 - Complaints Summary 2020**

Month	Noise	Dust	Blast	Lighting	Other	Total
January	-	-	-	-	-	-
February	-	-	-	-	-	-
March	-	-	-	-	-	-
April	-	-	-	-	-	-
May	3	-	-	-	-	3
June	2	-	-	-	-	2
July	-	-	-	-	-	-
August	-	-	1	-	-	1
September	-	-	1	3	1	5
October	-	1	-	1	1	3
November	1	-	-	-	-	-
December						
<b>Total</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>15</b>

## 9 Environmental Incidents

During November there were four reportable environmental incidents.

- 18/11/2020 – Missed Sample at Golden Highway TEOM

The Golden Highway TEOM failed to record data from 02:40 to 09:50 on the 18th November 2020, resulting in a data capture percentage of 70% which is below the 75% required to calculate a 24-hour average.

Environmental consequence: Nil Cat

- 27/11/2020 – Air Quality Exceedance – Jerry's Plains

PM10 exceedance recorded at Jerrys Plains Tapered Element Oscillating Microbalance (TEOM) monitoring station.

Environmental consequence: Cat 1

- 29/11/2020 – Air Quality Exceedance – Jerry's Plains

PM10 exceedance recorded at Jerrys Plains Tapered Element Oscillating Microbalance (TEOM) monitoring station.

Environmental consequence: Cat 1

- 29/11/2020 – Air Quality Exceedance – Maison Dieu

PM10 exceedance recorded at Maison Dieu Tapered Element Oscillating Microbalance (TEOM) monitoring station.

Environmental consequence: Cat 1

## Appendix A - Meteorological Data

Date	Air Temp Max (°C)	Air Temp Min (°C)	Relative Humidity (Max %)	Relative Humidity (Min %)	Solar Radiation Maximum (W/Sq. M)	Average Wind Direction (°)	Average Wind Speed (m/sec)	Rainfall (mm)
1/11/2020	21.2	1.0	100	48.4	482	212	2.8	1.8
2/11/2020	22.2	2.7	93.1	37.7	359.3	129	3.0	0
3/11/2020	22.8	-0.4	100	35.5	573.3	126	2.5	0
4/11/2020	28.4	-1.1	100	8.3	589.9	244	2.0	0
5/11/2020	22.3	0.8	109.5	36.1	616.8	220	2.9	10
6/11/2020	22.2	-0.2	100	27.5	579.8	133	2.3	0.8
7/11/2020	23.4	-0.8	100	34.8	535.5	130	3.0	0
8/11/2020	21.1	0.5	100	37.3	420.1	112	3.8	0
9/11/2020	21.7	-2.1	100	33.9	573.1	117	2.8	0
10/11/2020	24.3	-1.3	100	27.0	548.1	128	2.1	0
11/11/2020	29.5	0.3	108.7	13.8	616.7	177	1.5	0
12/11/2020	30.0	4.8	99.6	25.0	449.2	222	2.5	0
13/11/2020	27.5	3.7	108.1	35.9	656.9	229	2.9	8.6
14/11/2020	27.0	3.2	100	14.0	532.4	256	3.5	0
15/11/2020	33.9	2.9	108.9	9.2	614.9	180	1.4	0
16/11/2020	36.5	6.3	97.3	10.8	493.7	234	2.8	2.6
17/11/2020	25.5	5.6	92.1	42.2	325.8	117	4.0	0
18/11/2020	25.4	2.7	100	35.7	401.5	115	4.4	0
19/11/2020	29.5	-	83.9	-5.9	1126	122	2.6	0
20/11/2020	35.4	7.7	100	24.3	1256	195	2.2	0
21/11/2020	27.3	7.4	97.6	43.5	1022	115	3.6	0
22/11/2020	28.0	6.6	100	46.0	1153	195	1.9	0
23/11/2020	28.8	7.7	97.1	37.5	1510	267	4.0	0
24/11/2020	25.6	5.3	100	36.2	1486	121	3.3	0
25/11/2020	26.9	4.8	100	32.0	1157	115	3.1	0

Date	Air Temp Max (°C)	Air Temp Min (°C)	Relative Humidity (Max %)	Relative Humidity (Min %)	Solar Radiation Maximum (W/Sq. M)	Average Wind Direction (°)	Average Wind Speed (m/sec)	Rainfall (mm)
26/11/2020	33.9	4.4	99.1	17.6	1071	206	2.4	0
27/11/2020	32.6	8.6	92.6	30.1	1047	115	2.8	0
28/11/2020	38.4	10.6	98.3	8.1	1101	285	3.9	0
29/11/2020	39.8	3.7	84.2	7.7	1280	259	6.9	0
30/11/2020	22.8	2.6	100	44.4	1536	110	5.2	0.6

Note: '-' means data unavailable.