

HUNTER VALLEY OPERATIONS

Environment Protection Licence 640 Monitoring Data – October 2020

Published 23 November 2020

Name of Operation	Hunter Valley Operations
<i>Environment Protection Licence</i>	<i>640</i>
<i>Licensee</i>	<i>HV Operations Pty Ltd</i>
<i>Premises</i>	<i>Hunter Valley Operations Lemington Road, Singleton NSW 2330 Australia</i>
<i>EPL Link</i>	https://apps.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=196102&SYSUID=1&LICID=640

1 INTRODUCTION

This report has been compiled to provide a summary of environmental monitoring results for Hunter Valley Operations (HVO) in accordance with Environment Protection Licence (EPL) 640. This report includes all monitoring data collected in accordance with the aforementioned Licence for the period 1st – 31st October 2020.

Monitoring in this report includes:

- Air quality monitoring;
- Surface water monitoring including mine water discharge;
- Blast monitoring;
- Sewage treatment plant monitoring ; and
- Noise monitoring

Monitoring locations are shown in Figure 1.

2 AIR QUALITY

In accordance with the requirements of Condition M2.2 (EPL 640), HVO maintains a network of five PM₁₀ monitors. The following monitoring locations (EPA Monitoring Points 13, 14, 15, 16, 17 and 20) are listed on the Licence for the purpose of monitoring:

- EPA Identification Number 13 – Howick
- EPA Identification Number 14 – HC1
- EPA Identification Number 15 – Wandewoi
- EPA Identification Number 16 – Knodlers
- EPA Identification Number 17 – Golden Highway
- EPA Identification Number 20 – HVS Proposed

Results of Particulates (PM₁₀) monitoring (EPA Monitoring Points 13, 14, 15, 16, 17, 20) are shown in Table 1. Results reported represent the 24hr average PM₁₀, derived from 10 minute average PM₁₀ values for the period midnight to midnight, for each calendar date during the reporting period. The last sampling date was 31st October 2020; the data was obtained on 2nd November 2020.

From 30th May 2020, the HC1 monitoring location was disconnected from its permanent power supply due to mine progression which placed the monitor and substation within blasting exclusion zones. In consultation with the EPA, HVO temporarily relocated this monitoring location prior to the commissioning of the new monitoring location: HVS Proposed (EPA Monitoring Point 20). The HVS Proposed TEOM location was commissioned on 20th October 2020, data recorded from both the temporary and new monitoring locations during the month of October are displayed in Table 1.

Table 1: Particulate Matter <10µm M Monitoring

Date	Unit of Measure	Monitoring Frequency & Capture	Monitoring Point				
			Howick	HVS Proposed	Wandewoi	Knodlers	Golden Highway
1/10/2020	µg/m ³	Continuous	15.7	6.9*	11.2	11.8	14.8
2/10/2020	µg/m ³		28.4	11.2*	20.8	21.9	30.7
3/10/2020	µg/m ³		36.2	22.7*	25.1	26.1	24.2
4/10/2020	µg/m ³		33.0	21.3*	24.5	23.2	22.6
5/10/2020	µg/m ³		27.2	19.9*	25.7	29.8	30.6
6/10/2020	µg/m ³		28.7	25.8*	20.7	22.2	32.0
7/10/2020	µg/m ³		28.0	27.6*	17.8	17.6	19.3
8/10/2020	µg/m ³		25.3	19.2*	17.3	15.6	25.0
9/10/2020	µg/m ³		16.7	2.7*	6.8	7.7	13.3
10/10/2020	µg/m ³		14.4	5.6*	8.3	21.8	27.0
11/10/2020	µg/m ³		21.6	12.8*	20.1	24.8	24.0
12/10/2020	µg/m ³		41.3	29.7*	32.1	32.7	38.6
13/10/2020	µg/m ³		41.1	27.6*	28.8	26.0	44.4
14/10/2020	µg/m ³		45.7	44.0*	36.0	33.9	49.1
15/10/2020	µg/m ³		29.5	38.6*	20.6	32.5	36.6
16/10/2020	µg/m ³		42.1	29.0*	35.0	50.4	33.1
17/10/2020	µg/m ³		28.1	28.1*	24.2	35.5	35.3
18/10/2020	µg/m ³		7.2	6.1*	7.2	19.6	16.4
19/10/2020	µg/m ³		13.9	20.7*	16.1	20.4	22.0
20/10/2020	µg/m ³		18.9	31.0	20.2	16.1	16.1
21/10/2020	µg/m ³		26.9	42.0	28.4	20.3	20.0
22/10/2020	µg/m ³		24.5	53.1	24.3	24.4	22.0

Date	Unit of Measure	Monitoring Frequency & Capture	Monitoring Point				
			Howick	HVS Proposed	Wandewoi	Knodlers	Golden Highway
23/10/2020	µg/m ³	Continuous	23.9	38.0	24.9	18.0	18.6
24/10/2020	µg/m ³		9.3	15.6	8.0	11.5	13.0
25/10/2020	µg/m ³		5.5	6.7	3.3	5.9	6.7
26/10/2020	µg/m ³		4.7	6.9	3.5	5.7	6.3
27/10/2020	µg/m ³		9.3	11.0	6.7	8.0	9.8
28/10/2020	µg/m ³		12.4	14.5	9.0	9.2	11.4
29/10/2020	µg/m ³		13.4	15.7	9.0	9.3	17.0
30/10/2020	µg/m ³		18.4	25.7	12.9	10.4	14.3
31/10/2020	µg/m ³		14.9	25.5	9.6	18.4	18.4
Monthly Meaningful Data							
September	µg/m ³	Minimum	4.7	2.7	3.3	5.7	6.3
	µg/m ³	Mean	22.8	22.1	18.0	20.3	23.0
	µg/m ³	Maximum	45.7	53.1	36.0	50.4	49.1
	µg/m ³	Median	23.9	21.3	20.1	20.3	22.0

24 hour data unavailable due to equipment or communications issue causing one or more missing 10 minute values

* Data from 30 May 2020 at HVS Proposed was recorded using an ESampler at the 'EPL Point 20' location shown on Figure 1, as per EPL Condition M2.3.

3 SURFACE WATER

3.1 Mine Water Discharge Monitoring

HVO participates in the Hunter River Salinity Trading Scheme (HRSTS), and maintains six monitoring locations associated with this scheme (EPA Monitoring Points 3, 4, 5, 6, 7 and 8, Condition M2.4) as follows:

- EPA Identification Number 3 – Discharge Pipe from Dam 11N
- EPA Identification Number 4 – Discharge end of outlet pipe on Parnell's Dam
- EPA Identification Number 5 – At the discharge end of the alluvial lands discharge pipeline
- EPA Identification Number 6 – In Farrell's Creek within 100m, and upstream of the confluence of flow from POINT 3
- EPA Identification Number 7 – In Farrell's Creek within 100m, and downstream of the confluence of flow from POINT 3
- EPA Identification Number 8 – Outlet of discharge pipe from Lake James storage dam

The location of these sampling points can be viewed in Figure 1.

There were discharge opportunities during the reporting period, however no water was discharged. As HVO did not discharge during the reporting period, no sample collection was required at Monitoring Points 3, 4, 5, 6, 7 and 8 (shown in Table 2).

Table 2: Mine Water Discharge Monitoring

Discharge Point	Date	Pollutant	unit of measure	Licence Limits	No. of samples required by licence	No. of samples you collected and analysed
Dam 11N Discharge /EPL Point 3	N/A	Electrical Conductivity	microsiemens per centimetre	-	0	0
		pH	pH	6.5 - 9.5	0	0
		Total Suspended Solids	milligrams per litre	120	0	0
Parnell's Dam Discharge / EPL Point 4	N/A	Electrical Conductivity	microsiemens per centimetre	-	0	0
		pH	pH	6.5 - 9.5	0	0
		Total Suspended Solids	milligrams per litre	120	0	0
Alluvial Lands Discharge / EPL Point 5	N/A	Electrical Conductivity	microsiemens per centimetre	400	0	0
		pH	pH	-	0	0
		Total Suspended Solids	milligrams per litre	-	0	0
Farrell's Creek Upstream / EPL Point 6	N/A	Electrical Conductivity	microsiemens per centimetre	-	0	0
		pH	pH	-	0	0
		Total Suspended Solids	milligrams per litre	-	0	0
Farrell's Creek Downstream / EPL Point 7	N/A	Electrical Conductivity	microsiemens per centimetre	-	0	0
		pH	pH	-	0	0
		Total Suspended Solids	milligrams per litre	-	0	0
Lake James Discharge / EPL Point 8	N/A	Electrical Conductivity	microsiemens per centimetre	-	0	0
		pH	pH	6.5 - 9.5	0	0
		Total Suspended Solids	milligrams per litre	120	0	0

4 BLAST MONITORING

In accordance with the requirements of Condition M8.1, HVO maintains a network of blast monitors to measure airblast overpressure and ground vibration for all blasts. The following monitoring locations (EPA Monitoring Points 9, 11, 18 and 21) are listed on the Licence for the purpose of assessing compliance with the airblast overpressure and ground vibration criteria as follows:

- EPA Identification Number 9 – Jerrys Plains
- EPA Identification Number 11 – Warkworth
- EPA Identification Number 18 – Moses Crossing
- EPA Identification Number 21 – TBA (Maison Dieu)

The location of these monitors can be found in Figure 1. The last date sampled was 29th October 2020. The data was obtained on 2nd November 2020.

EPA Identification Number 21 'TBA', was installed on 6th October 2020; replacing EPA Identification Number 12, 'Maison Dieu'.

Blast monitoring results are detailed in Table 3 (Airblast Overpressure) and Table 4 (Ground Vibration).

Table 3: Blast Monitoring (Airblast Overpressure)

Blast ID	Date and Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits		Monitoring Point			
				95% of Blasts	100% of Blasts	Moses Crossing	Jerrys Plains	Maison Dieu	Warkworth
P123BR604A_P1 23BR509A_P123 BR106A	14/10/2020 14:05	dB(L)	All Blasts 100%	115	120	90.0	107.3	103.0	100.5
P12506401A	16/10/2020 14:16	dB(L)		115	120	101.1	94.9	95.9	100.8
RW3412501A	19/10/2020 13:05	dB(L)		115	120	97.9	96.3	95.6	93.6
P123BR107A	21/10/2020 13:04	dB(L)		115	120	97.1	97.1	91.7	99.4
RW36GMA01A	23/10/2020 09:57	dB(L)		115	120	97.7	92.3	87.8	92.8
P205BR603A	24/10/2020 12:54	dB(L)		115	120	90.3	89.7	95.4	96.6
P123BAC03A	27/10/2020 14:10	dB(L)		115	120	92.1	104.4	94.5	97.8
P123BR605A	29/10/2020 14:57	dB(L)		115	120	90.3	92.2	93.7	93.9
Monthly Meaningful Data									
	October	dB(L)	Minimum	115	120	90.0	89.7	87.8	92.8
		dB(L)	Mean	115	120	94.6	96.8	94.7	96.9
		dB(L)	Maximum	115	120	101.1	107.3	103.0	100.8
		dB(L)	Median	115	120	94.6	95.6	95.0	97.2

Table 4: Blast Monitoring (Ground Vibration)

Blast ID	Date and Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits		Monitoring Point			
				95% of Blasts	100% of Blasts	Moses Crossing	Jerrys Plains	Maison Dieu	Warkworth
P123BR604A_P1 23BR509A_P123 BR106A	14/10/2020 14:05	mm/s	All Blasts 100%	5	10	0.21	0.14	0.19	0.32
P12506401A	16/10/2020 14:16	mm/s		5	10	0.23	0.09	0.15	0.65
RW3412501A	19/10/2020 13:05	mm/s		5	10	0.19	0.05	0.05	0.10
P123BR107A	21/10/2020 13:04	mm/s		5	10	0.26	0.11	0.24	0.69
RW36GMA01A	23/10/2020 09:57	mm/s		5	10	0.16	0.05	0.05	0.11
P205BR603A	24/10/2020 12:54	mm/s		5	10	0.17	0.09	0.92	1.10
P123BAC03A	27/10/2020 14:10	mm/s		5	10	0.12	0.04	0.07	0.90
P123BR605A	29/10/2020 14:57	mm/s		5	10	0.25	0.13	0.23	0.54
Monthly Meaningful Data									
	October	mm/s	Minimum	5	10	0.12	0.04	0.05	0.10
		mm/s	Mean	5	10	0.20	0.09	0.24	0.55
		mm/s	Maximum	5	10	0.26	0.14	0.92	1.10
		mm/s	Median	5	10	0.20	0.09	0.17	0.60

5 SEWAGE TREATMENT PLANT MONITORING

Condition M2.4 of the Licence requires that HVO monitor for Faecal Coliforms on a quarterly basis at the following monitoring locations:

- EPA Identification Number 23 – Howick STP
- EPA Identification Number 25 – Howick Secondary Lagoon
- EPA Identification Number 26 – HVO North STP
- EPA Identification Number 29 – HVO South Secondary Lagoon

Sampling for Q4 of 2020 occurred on the 12th October, the data was obtained on the 16th November.

Table 5 Sewage Treatment Plant Monitoring

Monitoring Site	Date/Time	Pollutant	Unit of Measure	Monitoring Result
Howick STP	12/10/2020 12:10	Faecal Coliforms	Colony forming units per 100 millilitres	26000
		pH	pH	7.10
Howick Secondary Lagoon	12/10/2020 12:05	Faecal Coliforms	Colony forming units per 100 millilitres	-
		pH	pH	-
HVO North STP	12/10/2020 10:30	Faecal Coliforms	Colony forming units per 100 millilitres	1000
		pH	pH	7.06
HVO South Secondary Lagoon	12/10/2020 09:30	Faecal Coliforms	Colony forming units per 100 millilitres	91
		pH	pH	9.32

No results are reported for Howick Secondary Lagoon (EPA identification number 25) due to access limitations on the sampling date; quarterly results will be reported in the December EPL Monitoring report.

6 NOISE

Condition M10.1 of the Licence requires that HVO undertake operator attended noise monitoring on a monthly basis at the following monitoring locations:

- EPA Identification Number 36 – NM1A
- EPA Identification Number 37 – NM1B
- EPA Identification Number 38 – NM1C
- EPA Identification Number 39 – NM2
- EPA Identification Number 40 – NM3
- EPA Identification Number 41 – NM4
- EPA Identification Number 42 – NM5
- EPA Identification Number 43 – NM6

Monitoring for the month of October occurred on the 14th October; the data was obtained on the 19th November 2020.

Table 6 Night L_{Aeq,15minute} Generated by HVO Against EPL Criteria

Location	Date/Time	Wind Speed (m/s)	Stability Class ¹	Criterion dB	Criterion Applies? ²	HVO L _{Aeq} dB ^{3,4}	Exceedance dB ^{4,5}
EPA Point 36 in NMG 1A	14/10/2020 21:00	3.0	D	41	Yes	Inaudible	Nil
EPA Point 37 in NMG 1B	14/10/2020 21:44	3.4	D	41	No	Inaudible	NA
EPA Point 38 in NMG 1C	14/10/2020 21:21	2.6	D	39	Yes	Inaudible	Nil
EPA Point 39 in NMG 2	14/10/2020 22:35	3.0	D	37	Yes	Inaudible	Nil
EPA Point 40 in NMG 3	14/10/2020 23:41	2.7	D	39	Yes	36	Nil
EPA Point 41 in NMG 4	14/10/2020 23:14	3.2	D	39	No	34	NA
EPA Point 42 in NMG 5	14/10/2020 21:33	3.0	D	40	Yes	33	Nil
EPA Point 43 in NMG 6	14/10/2020 21:03	3.0	D	40	Yes	33	Nil

Notes:

1. Atmospheric data is sourced from HVO AWS.
2. Noise criteria apply under all meteorological conditions except during periods of rain or hail, wind speeds greater than 3m/s measured at 10 metres above ground level, stability category F conditions and wind speeds greater than 2m/s measured at 10m above ground level, or stability category G conditions.
3. Site-only L_{Aeq,15 minute} attributed to HVO, including modifying factors if applicable.
4. Bold results in red indicate exceedance of criterion.
5. NA in exceedance column means atmospheric conditions outside specified in approval, therefore criterion was not applicable.

Table 7 Night LA1,1minute Generated by HVO against EPL Criteria

Location	Date/Time	Wind Speed (m/s)	Stability Class ¹	Criterion dB	Criterion Applies? ²	HVO LAeq dB ^{3,4}	Exceedance dB ^{4,5}
EPA Point 36 in NMG 1A	14/10/2020 21:00	3.0	D	46	Yes	Inaudible	Nil
EPA Point 37 in NMG 1B	14/10/2020 21:44	3.4	D	46	No	Inaudible	NA
EPA Point 38 in NMG 1C	14/10/2020 21:21	2.6	D	46	Yes	Inaudible	Nil
EPA Point 39 in NMG 2	14/10/2020 22:35	3.0	D	46	Yes	Inaudible	Nil
EPA Point 40 in NMG 3	14/10/2020 23:41	2.7	D	46	Yes	39	Nil
EPA Point 41 in NMG 4	14/10/2020 23:14	3.2	D	46	No	38	NA
EPA Point 42 in NMG 5	14/10/2020 21:33	3.0	D	46	Yes	37	Nil
EPA Point 43 in NMG 6	14/10/2020 21:03	3.0	D	46	Yes	35	Nil

Notes:

1. Atmospheric data is sourced from HVO AWS.
2. Noise criteria apply under all meteorological conditions except during periods of rain or hail, wind speeds greater than 3m/s measured at 10 metres above ground level, stability category F conditions and wind speeds greater than 2m/s measured at 10m above ground level, or stability category G conditions.
3. Site-only LA1,1minute attributed to HVO.
4. Bold results in red indicate exceedance of 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 was not applicable.

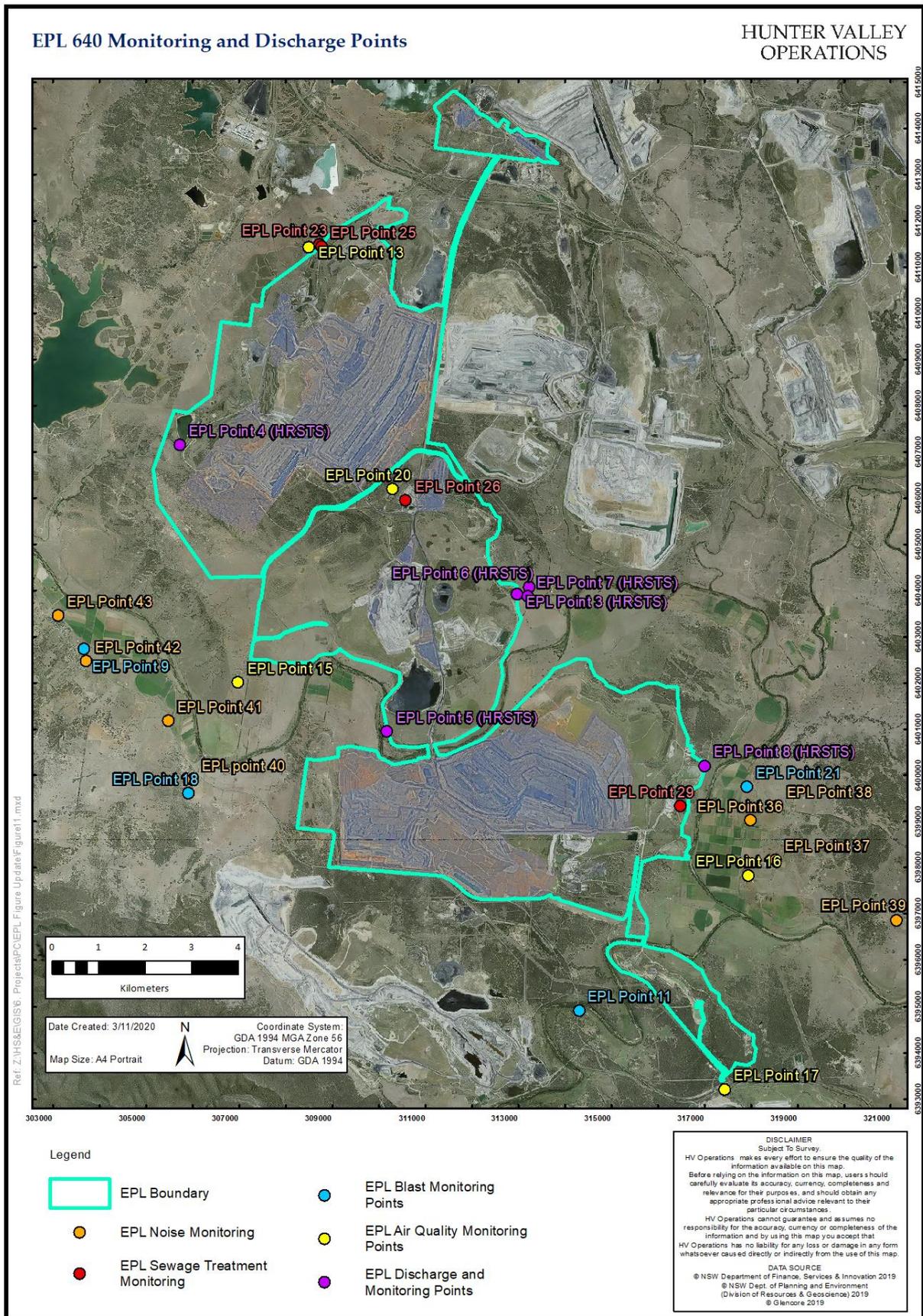


Figure 1 – HVO Environmental Monitoring Locations