

HUNTER VALLEY OPERATIONS



Environment Protection Licence 640 Monitoring Data – November 2021

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1 Overview

Environmental Protection Licence Number:	640
Licence Holder:	HV Operations Pty Ltd (HVO)
Address of Premises:	Hunter Valley Operations, Lemington Road, Singleton, NSW, 2330
Licence Holder Postal Address:	PO Box 315, Singleton, NSW, 2330
EPA Public Register Link:	https://apps.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=640&id=640&option=licence&searchrange=licence&range=POEO%20licence&prp=no&status=Issued

The locations of each sampling or monitoring point number identified in EPL 640 are displayed in **Figure 1**.

2 Definitions

Abbreviation	Explanation
DNR	Data Not Received
mm/s	Millimetres per Second
dB	Decibels
g/m ² /month	Grams per Metre Square per Month
µg/m ³	Micrograms per Cubic Meter of Air
µS/cm	Microsiemens per Centimetre
pH	A measure of the acidity or alkalinity of a solution
mg/L	Milligrams per Litre
NTU	Nephelometric Turbidity Units
ML/day	Megalitres per Day (1ML = 1,000,000L)
KL/day	Kilolitres per Day
PM11	Particulate Matter of 11 Microns in diameter or smaller
HVAS	High Volume Air Sampler
TEOM	Tapered Element Oscillating Microbalance
TSP	Total Suspended Particles
TSS	Total Suspended Solids
t	Tonnes
YTD	Year To Date - rolling 12 month average

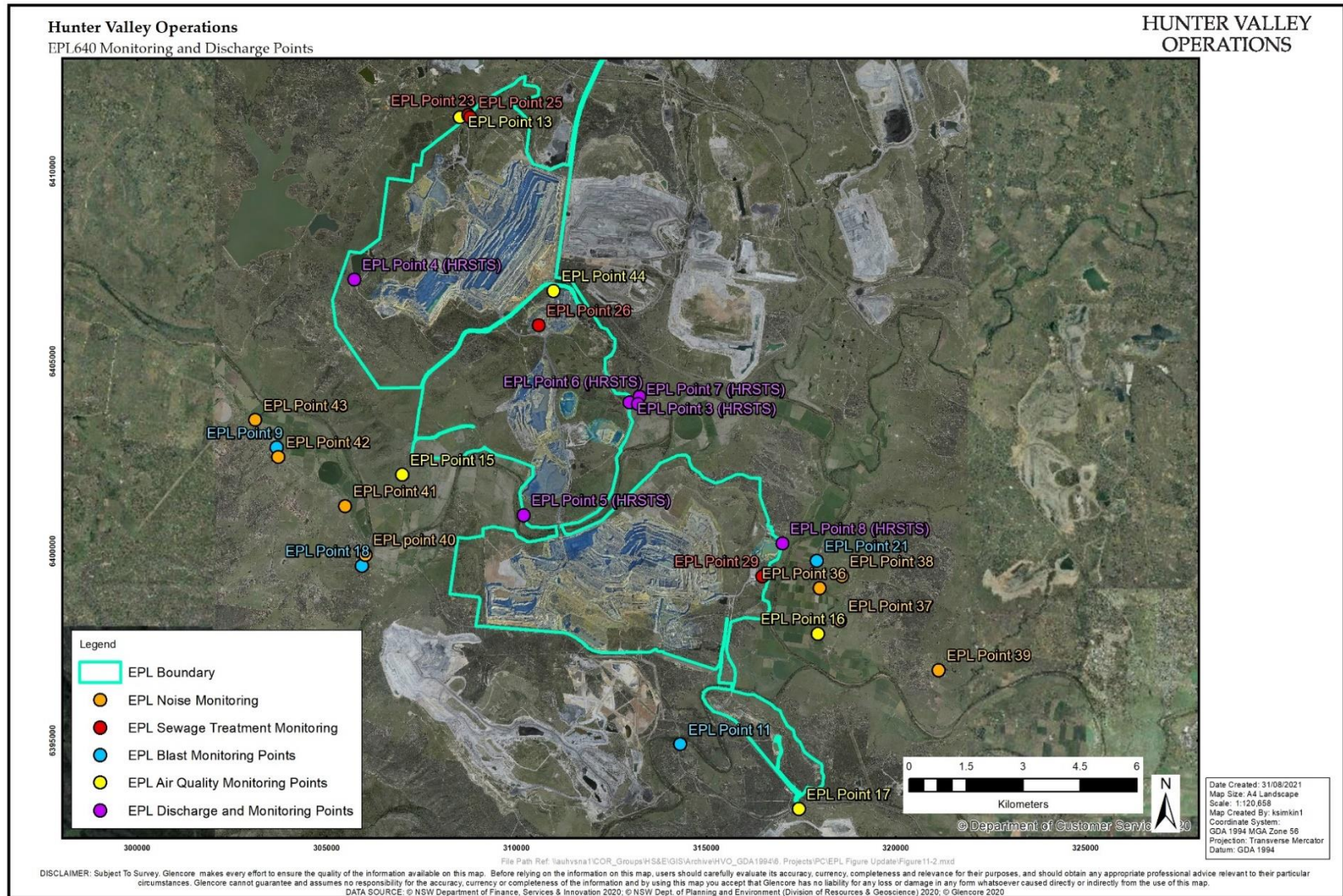


Figure 1 - EPL 640 Monitoring, Sampling and Discharge Point Locations

3 Air Quality

Date Last Sampled: 30/11/2021

Date Obtained: 01/12/2021

Table 1 – Particulate Matter <10µm Monitoring

Date	Unit of Measure	Monitoring Frequency & Capture	Monitoring Point				
			EPL ID 13 (Howick)	EPL ID 15 (Wandewoi)	EPL ID 16 (Knodlers Lane)	EPL ID 17 (Golden Highway)	EPL ID 44 (North CHPP)
1/11/2021	µg/m ³	Continuous	50.2	30.1	25.7	32.2	26.1
2/11/2021	µg/m ³		39.5	30.7	21.8	20.1	12.0
3/11/2021	µg/m ³		40.2	24.4	19.1	15.0	13.4
4/11/2021	µg/m ³		33.0	26.9	17.8	19.0	16.8
5/11/2021	µg/m ³		12.2	11.2	8.3	11.1	10.5
6/11/2021	µg/m ³		17.9	14.6	14.1	14.0	18.1
7/11/2021	µg/m ³		25.2	19.8	19.1	19.0	16.0
8/11/2021	µg/m ³		15.5	16.0	15.0	14.0	49.3
9/11/2021	µg/m ³		23.9	20.8	16.3	17.6	24.7
11/11/2021	µg/m ³		22.4	16.7	12.6	17.8	22.7
11/11/2021	µg/m ³		7.6	7.5	10.5	8.9	12.8
12/11/2021	µg/m ³		21.4	19.6	35.7	27.7	15.4
13/11/2021	µg/m ³		11.7	8.7	30.6	14.7	6.8
14/11/2021	µg/m ³		10.2	9.1	23.0	10.9	10.2
15/11/2021	µg/m ³		14.6	9.3	35.4	15.7	13.1
16/11/2021	µg/m ³		24.3	14.3	17.7	15.0	10.7
17/11/2021	µg/m ³		66.0	23.0	15.2	20.0	16.0
18/11/2021	µg/m ³		34.7	21.7	24.8	21.9	26.3
19/11/2021	µg/m ³		27.0	21.8	38.8	31.2	22.4
20/11/2021	µg/m ³		22.8	21.7	26.7	24.6	36.6
21/11/2021	µg/m ³		6.7	3.9	6.1	6.6	13.0
22/11/2021	µg/m ³		11.1	10.2	11.2	10.9	18.4

Date	Unit of Measure	Monitoring Frequency & Capture	Monitoring Point				
			EPL ID 13 (Howick)	EPL ID 15 (Wandewoi)	EPL ID 16 (Knodlers Lane)	EPL ID 17 (Golden Highway)	EPL ID 44 (North CHPP)
23/11/2021	µg/m ³		18.3	8.0	9.7	9.8	15.0
24/11/2021	µg/m ³		24.1	15.9	10.9	13.9	18.4
25/11/2021	µg/m ³		14.0	9.4	10.3	10.0	16.9
26/11/2021	µg/m ³		3.8	*	5.9	5.3	7.7
27/11/2021	µg/m ³		7.1	*	8.4	8.4	14.5
28/11/2021	µg/m ³		15.9	*	16.5	19.8	32.1
29/11/2021	µg/m ³		25.7	*	20.1	23.9	35.9
30/11/2021	µg/m ³		16.3	16.2	14.8	18.4	24.8
Monthly Meaningful Data							
November	µg/m ³	Minimum	3.8	3.9	5.9	5.3	6.8
	µg/m ³	Mean	22.1	16.6	18.1	16.6	19.2
	µg/m ³	Maximum	66.0	30.7	38.8	32.2	49.3
	µg/m ³	Median	19.8	16.1	16.4	15.3	16.4

*Data not available at Wandewoi TEOM found to be related to a thermal sensor that kept tripping off the unit between 26-29 November

4 Surface Water Monitoring Data

Date Sampled: 12, 13, 14, 16, 17, 23, 24 November 2021 from Dam 15S

12, 16, 30 November 2021 from Dam 11N

13,14,15,29,30 November 2021 from Dam 9W

Date Obtained: 13, 14, 15, 17, 18, 24, 25 November 2021

13, 17 November 2021 & 1 Dec 2021

14, 15, 16, 30 Nov 2021 and 1 Dec 2021

Table 2 – Mine Water Discharge Monitoring

Discharge Point	Pollutant	Unit of Measure	Licence Limits	No. Samples Required by Licence	No. Samples Collected and Analysed
EPL ID 3 (Dam 11N)	pH	pH	6.5-9.5	3	3
	Total Suspended Solids	Milligrams per Litre	120	3	3
EPL ID 4 (Dam 9W)	pH	pH	6.5-9.5	5	5
	Total Suspended Solids	Milligrams per Litre	120	5	5
EPL ID 8 (Dam 15S)	pH	pH	6.5-9.5	7	7
	Total Suspended Solids	Milligrams per Litre	120	7	7

5 Blast Monitoring Data

Date Last Sampled: 30/11/2021

Date Obtained: 01/12/2021

Table 3 – Blast Monitoring (Air Blast Overpressure and Ground Vibration))

Blast ID	Date & Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits		Monitoring Point			
				95% of Blasts	100% of Blasts	EPL ID 18 (Moses Crossing)	EPL ID 9 (Jerrys Plains)	EPL ID 12 (Maison Dieu)	EPL ID 11 (Warkworth)
RW3713001A	1/11/2021 11:58	dB(L)	All blasts 100%	115	120	93.87	82.91	85.73	90.86
RW34WHP03A	1/11/2021 11:59	dB(L)		115	120	87.02	80.8	79.72	88.07
P124WK902B	1/11/2021 12:59	dB(L)		115	120	97.03	91.81	95.9	100.51
WN45BAP04A	4/11/2021 13:24	dB(L)		115	120	84.7	84.87	88.12	91.54
WS44LLD01A	4/11/2021 13:26	dB(L)		115	120	88.56	92.88	88.78	88.21
RW32BFA02A	5/11/2021 13:06	dB(L)		115	120	89.86	84.05	83.22	80.94
P208VA101C	6/11/2021 13:01	dB(L)		115	120	92.97	81.29	92.81	97.35

Blast ID	Date & Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits		Monitoring Point			
				95% of Blasts	100% of Blasts	EPL ID 18 (Moses Crossing)	EPL ID 9 (Jerrys Plains)	EPL ID 12 (Maison Dieu)	EPL ID 11 (Warkworth)
P208MA304A	6/11/2021 13:03	dB(L)	All blasts 100%	115	120	86.71	79.36	95.9	101.15
WN45ULD07A	8/11/2021 10:07	dB(L)		115	120	86.89	89.35	80.6	91.88
RW32BFA02B	9/11/2021 10:00	dB(L)		115	120	89.87	86.53	81.82	91.23
P208FCL06A	10/11/2021 13:18	dB(L)		115	120	95.66	102.87	88.85	100.09
WN45BAR01A	11/11/2021 13:06	dB(L)		115	120	91.78	95.08	99.14	97.11
P209W6P01A	16/11/2021 9:39	dB(L)		115	120	94.27	99.1	104.42	92.59
WN49BAY04A	16/11/2021 13:09	dB(L)		115	120	99.2	105.86	90.27	84.04
WS44BAP03A	16/11/2021 13:10	dB(L)		115	120	97.58	98.24	85.03	97.01
P123BR616A	18/11/2021 12:58	dB(L)		115	120	87.59	101.61	98.15	98.21
P20903501A	18/11/2021 12:58	dB(L)		115	120	89.48	91.41	97.84	97.64

Blast ID	Date & Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits		Monitoring Point			
				95% of Blasts	100% of Blasts	EPL ID 18 (Moses Crossing)	EPL ID 9 (Jerrys Plains)	EPL ID 12 (Maison Dieu)	EPL ID 11 (Warkworth)
P208BAC02A	19/11/2021 13:01	dB(L)		115	120	86.86	85.59	93.15	96.6
WS44LLD01B	20/11/2021 12:51	dB(L)		115	120	89.04	89.02	104.02	90.14
P209WK304A	22/11/2021 13:08	dB(L)		115	120	106.86	94.21	102.62	95.25
P123BR616B	25/11/2021 12:56	dB(L)		115	120	88.75	88.19	97.03	99.78
WS45LLP01A	30/11/2021 13:05	dB(L)		115	120	79.26	91.2	86.62	81.81
Monthly Meaningful Data									
November		dB(L)	Minimum	115	120	79.26	79.36	79.72	80.94
		dB(L)	Mean	115	120	91.08	90.74	91.81	93.27
		dB(L)	Maximum	115	120	106.86	105.86	104.42	101.15
		dB(L)	Median	115	120	89.67	90.28	91.54	93.92

Blast ID	Date & Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits			Monitoring Point		
				95% of Blasts	100% of Blasts	Moses Crossing EPL ID 18	Jerrys Plains EPL ID 9	Maison Dieu EPL ID 12	Warkworth EPL ID 11
RW3713001A	1/11/2021 11:58	mm/s	All Blasts 100%	5	10	0.13	0.04	0.07	0.13
RW34WHP03A	1/11/2021 11:59	mm/s		5	10	0.24	0.08	0.08	0.39
P124WK902B	1/11/2021 12:59	mm/s		5	10	0.22	0.08	0.1	0.85
WN45BAP04A	4/11/2021 13:24	mm/s		5	10	0.12	0.05	0.09	0.56
WS44LLD01A	4/11/2021 13:26	mm/s		5	10	0.22	0.12	0.09	0.19
RW32BFA02A	5/11/2021 13:06	mm/s		5	10	0.16	0.03	0.05	0.11
P208VA101C	6/11/2021 13:01	mm/s		5	10	0.1	0.05	0.12	0.22
P208MA304A	6/11/2021 13:03	mm/s		5	10	0.1	0.05	0.06	0.16
WN45ULD07A	8/11/2021 10:07	mm/s		5	10	0.12	0.17	0.08	0.55
RW32BFA02B	9/11/2021 10:00	mm/s		5	10	0.11	0.03	0.04	0.14
P208FCL06A	10/11/2021 13:18	mm/s		5	10	0.1	0.02	0.05	1.06

Blast ID	Date & Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits			Monitoring Point		
				95% of Blasts	100% of Blasts	Moses Crossing EPL ID 18	Jerrys Plains EPL ID 9	Maison Dieu EPL ID 12	Warkworth EPL ID 11
WN45BAR01A	11/11/2021 13:06	mm/s	All Blasts 100%	5	10	0.16	0.1	0.13	1.26
P209W6P01A	16/11/2021 9:39	mm/s		5	10	0.21	0.09	0.29	0.32
WN49BAY04A	16/11/2021 13:09	mm/s		5	10	0.13	0.07	0.08	0.31
WS44BAP03A	16/11/2021 13:10	mm/s		5	10	0.16	0.08	0.1	0.12
P123BR616A	18/11/2021 12:58	mm/s		5	10	0.18	0.1	0.2	0.4
P20903501A	18/11/2021 12:58	mm/s		5	10	0.15	0.09	0.17	0.56
P208BAC02A	19/11/2021 13:01	mm/s		5	10	0.11	0.03	0.14	0.65
WS44LLD01B	20/11/2021 12:51	mm/s		5	10	0.15	0.13	0.08	0.53
P209WK304A	22/11/2021 13:08	mm/s		5	10	0.1	0.02	0.05	0.3
P123BR616B	25/11/2021 12:56	mm/s		5	10	0.17	0.06	0.27	0.57
WS45LLP01A	30/11/2021 13:05	mm/s		5	10	0.12	0.06	0.05	0.21

Blast ID	Date & Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits		Monitoring Point			
				95% of Blasts	100% of Blasts	Moses Crossing EPL ID 18	Jerrys Plains EPL ID 9	Maison Dieu EPL ID 12	Warkworth EPL ID 11
Monthly Meaningful Data									
November		mm/s	Minimum	5	10	0.10	0.02	0.04	0.11
		mm/s	Mean	5	10	0.15	0.07	0.11	0.44
		mm/s	Maximum	5	10	0.24	0.17	0.29	1.26
		mm/s	Median	5	10	0.14	0.07	0.09	0.36

6 Sewage Treatment Plant Monitoring Data

Date Sampled: 2/11/2021

Date Obtained: 13/11/2021

Table 4 - Sewage Treatment Plant Monitoring

Monitoring Site	Date & Time	Pollutant	Unit of Measure	Monitoring Result
EPA ID 23	2/11/2021 11.30am	Faecal Coliforms	Colony forming units/100ml	2400000
		pH	pH	6.96
EPA ID 25	No sample collected due to insufficient water and unsafe access	Faecal Coliforms	Colony forming units/100ml	-
		pH	pH	
EPA ID 26	2/11/2021 9.50am	Faecal Coliforms	Colony forming units/100ml	1800000
		pH	pH	7.72
EPA ID 29	2/11/2021 9.00am	Faecal Coliforms	Colony forming units/100ml	~<9
		pH	pH	9.6

7 Noise Monitoring Data

Date Sampled: 29/11/2021

Date Obtained: 9/12/2021

Table 5 - Night $L_{Aeq,15minute}$ Generated by HVO Against EPL Criteria

Location	Date & Time	Wind Speed (m/s) ¹	Stability Class ¹	Criterion dB	Criterion Applies? ²	HVO L_{Aeq} dB ^{3,4}	Exceedance dB ^{4,5}
EPA ID 36	29/11/2021 21:00	2.8	E	41	Yes	IA	Nil
EPA ID 37	29/11/2021 21:41	2.7	E	40	Yes	IA	Nil
EPA ID 38	29/11/2021 21:21	3	E	39	Yes	IA	NA
EPA ID 39	29/11/2021 22:31	3.1	E	37	No	IA	NA
EPA ID 40	29/11/2021 23:20	2.6	D	39	Yes	34	Nil
EPA ID 41	29/11/2021 22:56	2.8	E	39	Yes	33	Nil
EPA ID 42	29/11/2021 21:22	3	E	40	Yes	32	NA
EPA ID 43	29/11/2021 21:00	2.8	E	40	Yes	31	Nil

Notes:

1. Atmospheric data is sourced from the HVO Corporate AWS using logged meteorological data;
2. Noise criteria apply under all meteorological conditions except during periods of rain or hail, wind speeds greater than 3 m/s measured at 11 metres above ground level, stability category F conditions and wind speeds greater than 2 m/s measured at 11m above ground level, or stability category G conditions;
3. Site-only $L_{Aeq,15minute}$ attributed to HVO, 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 Night LA1,1minute Generated by HVO Against EPL Criteria

Location	Date & Time	Wind Speed (m/s) ¹	Stability Class ¹	Criterion dB	Criterion Applies? ²	HVO L _{Aeq} dB ^{3,4}	Exceedance dB ^{4,5}
EPA ID 36	29/11/2021 21:00	2.8	E	46	Yes	IA	Nil
EPA ID 37	29/11/2021 21:41	2.7	E	46	Yes	IA	Nil
EPA ID 38	29/11/2021 21:21	3	E	46	Yes	IA	NA
EPA ID 39	29/11/2021 22:31	3.1	E	46	No	IA	NA
EPA ID 40	29/11/2021 23:20	2.6	D	46	Yes	44	Nil
EPA ID 41	29/11/2021 22:56	2.8	E	46	Yes	33	Nil
EPA ID 42	29/11/2021 21:22	3	E	46	Yes	36	NA
EPA ID 43	29/11/2021 21:00	2.8	E	46	Yes	34	Nil

Notes:

1. Atmospheric data is sourced from the HVO Cheshunt AWS using logged meteorological data;
2. Noise criteria apply under all meteorological conditions except during periods of rain or hail, wind speeds greater than 3 m/s measured at 11 metres above ground level, stability category F conditions and wind speeds greater than 2 m/s measured at 11m 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; 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.