

HUNTER VALLEY OPERATIONS

Environment Protection Licence 640 Monitoring Data – September 2020

Published 19 October 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 – 30th September 2020.

Monitoring in this report includes:

- Air quality monitoring;
- Surface water monitoring including mine water discharge; and
- Blast 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 and 17) 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

Results of Particulates (PM₁₀) monitoring (EPA Monitoring Points 13, 14, 15, 16 and 17) 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 30th September 2020; the data was obtained on 1st October 2020.

From 30 May 2020, the existing 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 has temporarily relocated this monitoring location as shown on Figure 1. Monitoring at this location is also using an alternate method (PM₁₀ ESampler) as an interim measure, with a similar monitor installation at the upwind Howick monitoring location for comparative purposes, as per Condition M2.3 of the EPL.

Table 1: Particulate Matter <10µm M Monitoring

| Date | Unit of Measure | Monitoring Frequency & Capture | Monitoring Point | | | | |
|------------|-------------------|--------------------------------|------------------|------|----------|----------|----------------|
| | | | Howick | HC1* | Wandewoi | Knodlers | Golden Highway |
| 1/09/2020 | µg/m ³ | Continuous | 41.2 | 34.5 | 21.9 | 23.6 | # |
| 2/09/2020 | µg/m ³ | | 35.5 | 49.1 | 41.0 | 35.8 | # |
| 3/09/2020 | µg/m ³ | | 38.3 | 34.8 | 27.7 | 60.3 | 49.9 |
| 4/09/2020 | µg/m ³ | | 24.4 | 29.8 | 22.0 | 49.2 | 33.4 |
| 5/09/2020 | µg/m ³ | | 15.6 | 16.9 | 10.7 | 15.6 | 14.5 |
| 6/09/2020 | µg/m ³ | | 36.1 | 28.8 | 22.5 | 18.8 | 21.2 |
| 7/09/2020 | µg/m ³ | | 35.2 | 20.2 | 23.2 | 13.3 | 15.6 |
| 8/09/2020 | µg/m ³ | | 26.2 | 29.4 | 32.4 | 29.8 | 46.1 |
| 9/09/2020 | µg/m ³ | | 24.1 | 23.2 | 15.4 | 23.6 | 30.6 |
| 10/09/2020 | µg/m ³ | | 16.2 | 18.4 | 10.2 | 11.3 | 15.0 |
| 11/09/2020 | µg/m ³ | | 17.2 | 14.8 | 12.5 | 9.2 | 10.7 |
| 12/09/2020 | µg/m ³ | | 15.2 | 25.5 | 21.8 | 13.4 | 29.2 |
| 13/09/2020 | µg/m ³ | | 17.6 | 16.5 | 9.0 | 28.9 | 19.2 |
| 14/09/2020 | µg/m ³ | | 21.2 | 20 | 15.2 | 26.4 | 19.9 |
| 15/09/2020 | µg/m ³ | | 32.0 | 26.4 | 25.9 | 17.1 | 17.7 |
| 16/09/2020 | µg/m ³ | | 22.2 | 15.6 | 17.1 | 25.0 | 26.0 |
| 17/09/2020 | µg/m ³ | | 45.8 | 31.4 | 21.6 | 39.7 | 38.1 |
| 18/09/2020 | µg/m ³ | | 33.9 | 33.1 | 20.7 | 23.2 | 22.4 |
| 19/09/2020 | µg/m ³ | | 33.9 | 25.5 | 21.5 | 19.3 | 15.5 |
| 20/09/2020 | µg/m ³ | | 18.3 | 18.2 | 12.9 | 13.6 | 17.0 |
| 21/09/2020 | µg/m ³ | | 15.4 | 18.9 | 8.9 | 14.2 | 14.0 |
| 22/09/2020 | µg/m ³ | | 16.9 | 13.2 | 11.3 | 23.1 | 17.8 |

| Date | Unit of Measure | Monitoring Frequency & Capture | Monitoring Point | | | | |
|-------------------------|-------------------|--------------------------------|------------------|------|----------|----------|----------------|
| | | | Howick | HC1* | Wandewoi | Knodlers | Golden Highway |
| 23/09/2020 | µg/m ³ | Continuous | 21.5 | 15.6 | 13.2 | 34.1 | 21.7 |
| 24/09/2020 | µg/m ³ | | 15.3 | 11.2 | 6.4 | 19.1 | 14.7 |
| 25/09/2020 | µg/m ³ | | 26.8 | 14.8 | 13.3 | 36.6 | 29.1 |
| 26/09/2020 | µg/m ³ | | 8.8 | 6.3 | 6.7 | 15.2 | 8.6 |
| 27/09/2020 | µg/m ³ | | 18.9 | 12.3 | 13.3 | 16.5 | 16.5 |
| 28/09/2020 | µg/m ³ | | 28.4 | 19.9 | 20.6 | 18.8 | 25.7 |
| 29/09/2020 | µg/m ³ | | 25.2 | 15.3 | 16.4 | 17.2 | 16.6 |
| 30/09/2020 | µg/m ³ | | 24.8 | 19.4 | 13.0 | 17.0 | 19.3 |
| Monthly Meaningful Data | | | | | | | |
| September | µg/m ³ | Minimum | 8.8 | 6.3 | 6.4 | 9.2 | 8.6 |
| | µg/m ³ | Mean | 25.1 | 22.0 | 17.6 | 23.6 | 22.4 |
| | µg/m ³ | Maximum | 45.8 | 49.1 | 41.0 | 60.3 | 49.9 |
| | µg/m ³ | Median | 24.3 | 19.7 | 15.9 | 19.2 | 19.3 |

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

* Data from 30 May 2020 at HC1 was recorded using an ESampler at the "HVS" monitoring 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 no discharge opportunities in the reporting period and no water was discharged, therefore no sample collection at Monitoring Points 3, 4, 5, 6, 7 and 8 during the reporting period was required (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, 12, 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 12 – Maison Dieu
- EPA Identification Number 18 – Moses Crossing
- EPA Identification Number 21 – TBA (not yet installed)

The location of these monitors can be found in Figure 1. The last date sampled was 25th September 2020. The data was obtained on 14th October 2020.

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 |
| P123BAC01C_P1 23BR603A | 1/09/2020 9:54 | dB(L) | All Blasts 100% | 115 | 120 | 94.0 | 97.3 | 94.7 | 93.0 |
| P124BF403B | 1/09/2020 9:56 | dB(L) | | 115 | 120 | 92.4 | 101.6 | 103.3 | 96.9 |
| WN43ULP04A | 4/09/2020 9:22 | dB(L) | | 115 | 120 | 90.4 | 81.9 | 101.2 | 100.9 |
| WN45UAA02A | 4/09/2020 9:24 | dB(L) | | 115 | 120 | 106.6 | 99.6 | 103.0 | 98.3 |
| P207PF405A_P2 07VA103A | 5/09/2020 13:11 | dB(L) | | 115 | 120 | 85.9 | 109.0 | 102.5 | 92.7 |
| RW3611501A | 7/09/2020 13:05 | dB(L) | | 115 | 120 | 101.1 | 103.9 | 93.8 | 93.6 |
| WS45LAR01A | 8/09/2020 12:59 | dB(L) | | 115 | 120 | 87.8 | 93.0 | 92.1 | 99.7 |
| WS42BAR03A | 9/09/2020 13:23 | dB(L) | | 115 | 120 | 96.9 | 98.3 | 101.5 | 92.5 |
| WN49BAY02A | 9/09/2020 13:24 | dB(L) | | 115 | 120 | 91.1 | 100.0 | 99.4 | 89.0 |
| P209062010A | 9/09/2020 15:11 | dB(L) | | 115 | 120 | 110.2 | 106.9 | 103.2 | 101.7 |
| WN43LBA01A | 10/09/2020 13:22 | dB(L) | | 115 | 120 | 108.1 | 101.7 | 107.3 | 94.8 |
| P123BR507A | 14/09/2020 13:45 | dB(L) | | 115 | 120 | 98.9 | 93.9 | 93.2 | 96.5 |
| P124WK201A | 14/09/2020 13:48 | dB(L) | | 115 | 120 | 91.7 | 102.5 | 90.8 | 94.6 |
| P20802002A | 15/09/2020 9:41 | dB(L) | | 115 | 120 | 93.3 | 97.5 | 94.1 | 93.5 |
| P209WK201A | 16/09/2020 14:04 | dB(L) | | 115 | 120 | 98.8 | 104.7 | 98.4 | 105.9 |

| 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 |
| RW31BFA02A | 18/09/2020 12:56 | dB(L) | All Blasts 100% | 115 | 120 | 99.5 | 99.4 | 95.9 | 95.6 |
| P123BAC02A | 19/09/2020 13:41 | dB(L) | | 115 | 120 | 96.9 | 94.9 | 103.9 | 93.0 |
| P123BR508A | 21/09/2020 13:41 | dB(L) | | 115 | 120 | 98.2 | 104.3 | 97.3 | 98.7 |
| P20802002B | 21/09/2020 13:43 | dB(L) | | 115 | 120 | 88.6 | 102.3 | 98.6 | 103.8 |
| P205BR602A_P2 05B6P02 | 25/09/2020 9:24 | dB(L) | | 115 | 120 | 93.4 | 100.6 | 101.6 | 102.3 |
| Monthly Meaningful Data | | | | | | | | | |
| | September | dB(L) | Minimum | 115 | 120 | 85.9 | 81.9 | 90.8 | 89.0 |
| | | dB(L) | Mean | 115 | 120 | 96.2 | 99.7 | 98.8 | 96.9 |
| | | dB(L) | Maximum | 115 | 120 | 110.2 | 109.0 | 107.3 | 105.9 |
| | | dB(L) | Median | 115 | 120 | 95.4 | 100.3 | 99.0 | 96.1 |

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 |
| P123BAC01C_P1 23BR603A | 1/09/2020 9:54 | mm/s | All Blasts 100% | 5 | 10 | 0.25 | 0.09 | 0.25 | 0.47 |
| P124BF403B | 1/09/2020 9:56 | mm/s | | 5 | 10 | 0.18 | 0.05 | 0.11 | 0.42 |
| WN43ULP04A | 4/09/2020 9:22 | mm/s | | 5 | 10 | 0.15 | 0.06 | 0.07 | 0.48 |
| WN45UAA02A | 4/09/2020 9:24 | mm/s | | 5 | 10 | 0.18 | 0.09 | 0.08 | 0.31 |
| P207PF405A_P2 07VA103A | 5/09/2020 13:11 | mm/s | | 5 | 10 | 0.11 | 0.04 | 0.14 | 0.17 |
| RW3611501A | 7/09/2020 13:05 | mm/s | | 5 | 10 | 0.22 | 0.07 | 0.08 | 0.21 |
| WS45LAR01A | 8/09/2020 12:59 | mm/s | | 5 | 10 | 0.14 | 0.10 | 0.08 | 0.29 |
| WS42BAR03A | 9/09/2020 13:23 | mm/s | | 5 | 10 | 0.14 | 0.04 | 0.07 | 0.96 |
| WN49BAY02A | 9/09/2020 13:24 | mm/s | | 5 | 10 | 0.11 | 0.04 | 0.06 | 0.15 |
| P209062010A | 9/09/2020 15:11 | mm/s | | 5 | 10 | 0.15 | 0.05 | 0.20 | 0.54 |
| WN43LBA01A | 10/09/2020 13:22 | mm/s | | 5 | 10 | 0.10 | 0.02 | 0.05 | 0.45 |
| P123BR507A | 14/09/2020 13:45 | mm/s | | 5 | 10 | 0.17 | 0.08 | 0.12 | 0.22 |
| P124WK201A | 14/09/2020 13:48 | mm/s | | 5 | 10 | 0.21 | 0.21 | 0.16 | 0.25 |
| P20802002A | 15/09/2020 9:41 | mm/s | | 5 | 10 | 0.14 | 0.03 | 0.47 | 0.69 |

| 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 |
| P209WK201A | 16/09/2020 14:04 | mm/s | All Blasts 100% | 5 | 10 | 0.14 | 0.08 | 0.18 | 0.72 |
| RW31BFA02A | 18/09/2020 12:56 | mm/s | | 5 | 10 | 0.24 | 0.05 | 0.08 | 0.29 |
| P123BAC02A | 19/09/2020 13:41 | mm/s | | 5 | 10 | 0.13 | 0.07 | 0.09 | 0.12 |
| P123BR508A | 21/09/2020 13:41 | mm/s | | 5 | 10 | 0.11 | 0.05 | 0.06 | 0.21 |
| P20802002B | 21/09/2020 13:43 | mm/s | | 5 | 10 | 0.17 | 0.06 | 0.7 | 0.89 |
| P205BR602A_P205B6P02 | 25/09/2020 9:24 | mm/s | | 5 | 10 | 0.27 | 0.16 | 1.58 | 0.86 |
| Monthly Meaningful Data | | | | | | | | | |
| | September | mm/s | Minimum | 5 | 10 | 0.10 | 0.02 | 0.05 | 0.12 |
| | | mm/s | Mean | 5 | 10 | 0.17 | 0.07 | 0.23 | 0.44 |
| | | mm/s | Maximum | 5 | 10 | 0.27 | 0.21 | 1.58 | 0.96 |
| | | mm/s | Median | 5 | 10 | 0.15 | 0.06 | 0.10 | 0.37 |

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 2020 occurred the week of 12th October, results will be published in the October 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

The attended monthly noise monitoring during September occurred prior to the publication of the most recent revision to EPL 640, as such it is not included in this report. Monthly noise monitoring for these locations as required by M10.1 will be reported in future EPL monitoring reports.

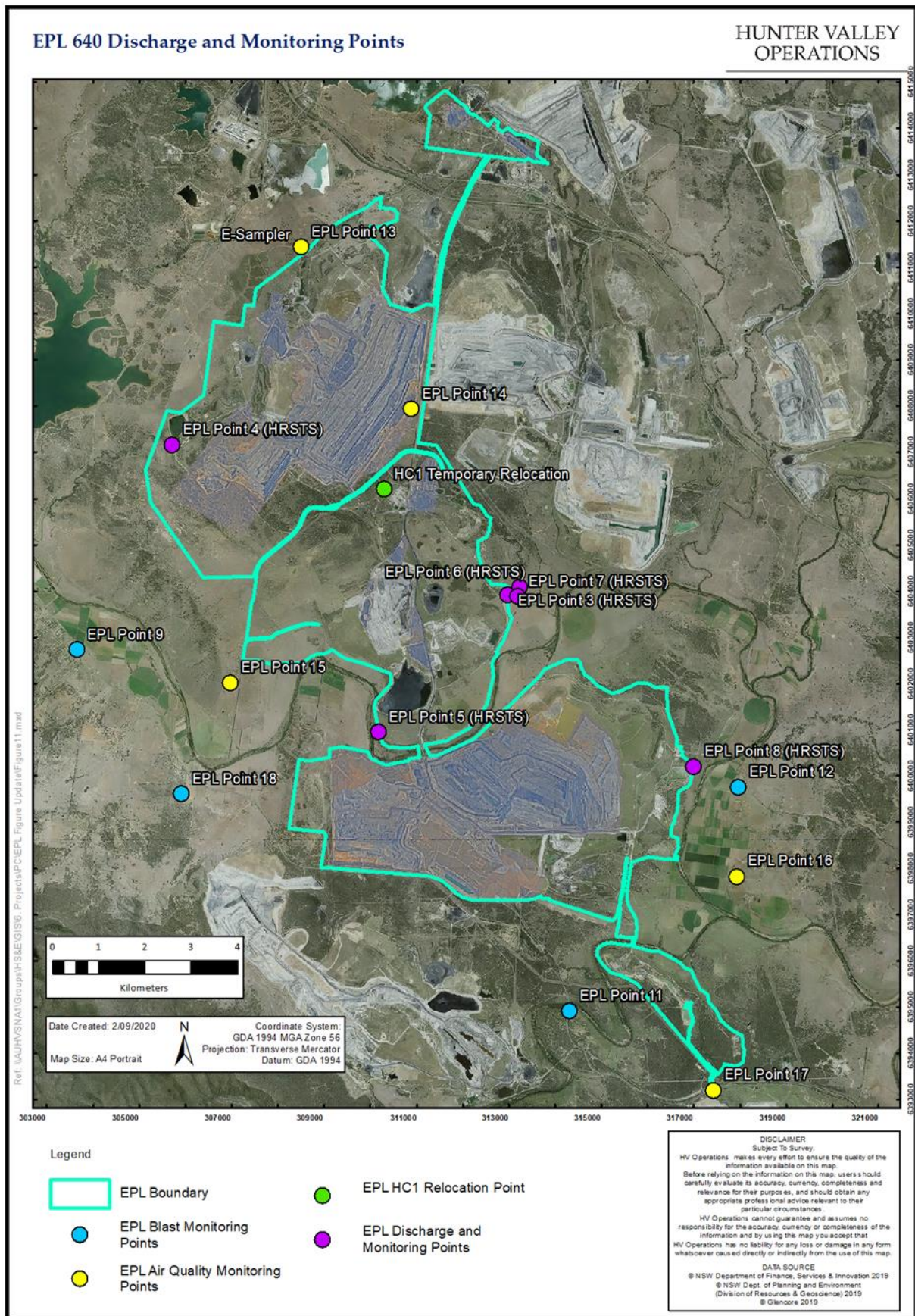


Figure 1 – HVO Environmental Monitoring Locations