Hunter Valley Operations

Community Consultative Committee

Business Papers – May 2019

Materials ahead of meeting of the committee on **29 May 2019**

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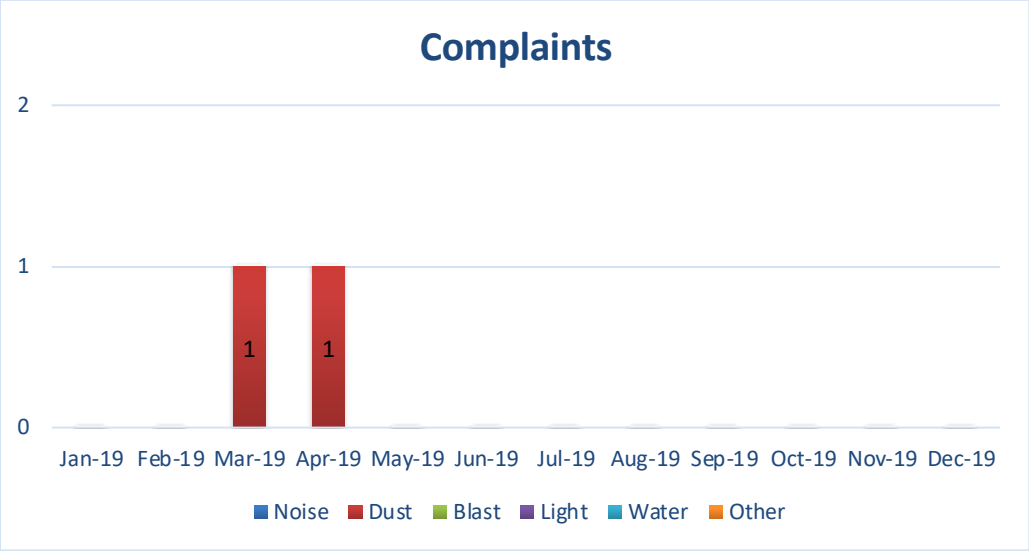
1.0 Complaints

Complaints overview for 2019

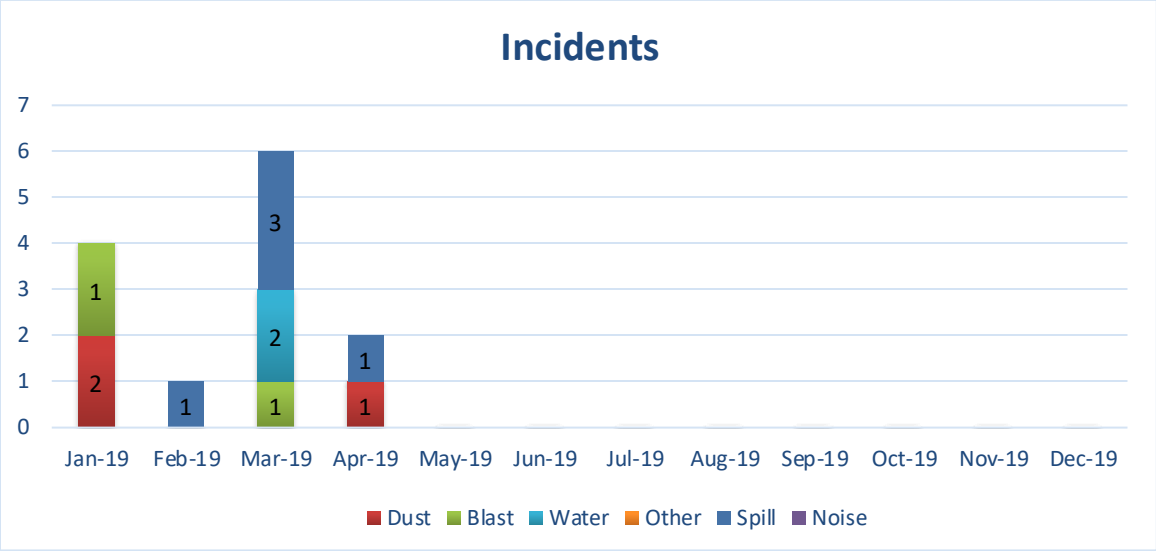


Complaint details 2019 YTD

Date	Time	Type	Location	Complaint details	Method Received	Monitoring Indicates Exceedance?
6/03/2019	18:58	Dust	Location not disclosed	Complaint received from duty EPA Officer who advised that a complaint had been received about HVO in relation to dust with the location described as being nearby to HVO. Dust levels were high throughout the Hunter region on the day. A number of actions were taken by HVO to mitigate dust including working lower in the pit, equipment shutdown and postponing a blast. In the late afternoon light rain fell and wind changed direction, blowing from the SE.	EPA	No
29/4/2019	11:44	Dust	Maison Dieu	Complainant stated that they had received an automated SMS notification from the OEH in regards to dust readings from the Upper Hunter Air Quality monitor at Maison Dieu which had recorded 104.2 ug/m3 at 10am. The complainant had requested information in regards to what HVO were doing to manage dust. A follow up call was made at 13:07 by HVO with details of current dust management practices on site and explained that wind direction placed the monitor upwind of HVO. The Environment and Community Officer also explained that hazard reduction burns were taking place in the area and the smoke would impact the monitors as identified on the OEH website.	Community member	No

2.0 Incidents

Incident overview for 2019 YTD



Incident details for the period 2019 YTD

Date	Details	Key Actions	Aspect
2/1/2019	**Category 3B Fume Event** West Pit North LED Blast WN45LED01A was fired at 13:10 and produced a Category 3 Fume Event which did not leave site.	An internal investigation found that the shot was fired in the reverse order (fired from the bottom up). Corrective actions to prevent reoccurrence in the blast design were developed and communicated.	Blasting
3/1/2019	**Faulty timer on High Volume Air Sampler** The Hunter Valley Glider Club High Volume Air Sampler (PM10) was identified as faulty by a contractor and had only run approximately 2 hours over the 24 hour sample time producing an invalid sample for the scheduled run day. The timer was identified to be faulty.	The timer was replaced as well as the installation of a temporary replacement unit to cover the repair period of the permanent unit. A review of HVAS timers on site was undertaken and timers replaced on all HVAS units to prevent a re-occurrence of this issue.	Dust
26/1/2019	**Warkworth PM10 monitor failure to run** The Warkworth PM10 High Volume Air Sampler unit was identified to have no power supply as it had tripped at the breaker in the local supply box. The PM10 unit returned a blockage error and could not run for one sample cycle.	A hire unit was calibrated and installed to temporarily replace the faulty unit and the faulty unit was removed and sent for repairs.	Dust
2/2/2019	**Blown hydraulic line at the Hunter Valley Load Point** A Hydraulic hose blew out and caused a loss of oil onto the rail tracks and bin at the load point.	Spill kits were used to contain and clean up the oil spill and the remainder of oily water was captured in the sump and cleaned out. The spill kits were replenished and the hose replaced.	Hydrocarbon

1/3/2019	**Minor diesel spill at north light vehicle bowser** A spill of 10 litres of diesel was found at the re-fueling area. All diesel was contained within the bunded area.	The spill was contained and cleaned up using the spill kit in area.	Hydrocarbon
2/3/2019	**Truck 712 engine failure oil spill** Truck 712 was driving up a pit ramp when the engine failed and dropped its oil on the ramp (approximately 200L).	The operator stopped the job and reported incident to supervisor. The area was contained and cleaned up once the truck was removed from the area. The contaminated material was delivered to the Lemington (HVO South) Bio-remediation area.	Hydrocarbon
18/3/2019	**Turbid water entering Farrells Creek from East TSF rehabilitation area** At approximately 14:00 on the 18 March, it was reported to the Environment and Community Coordinator by a sampling contractor that turbid water was identified in Farrell's Creek downstream from HVO. This followed 47.2mm of rainfall received over the weekend of 16th, 17th & 18th (up until 0700) March 2019	HVO conducted inspections and determined that a source of turbid water from HVO was due to rainfall runoff entraining sediment from an old rehabilitation slope. Water samples were taken, erosion and sediment controls put in place and PIRMP activated and relevant authorities notified. Rehabilitation work has been undertaken to repair erosion and redirect runoff water to a dam.	Water Management
19/3/2019	**Category 3C Blast Fume event** At 13:00, a blast in West Pit was fired and produced a Category 3C fume event. The fume particulates were observed to move in the direction of Ravensworth Open Cut before dispersing over mine land.	An additional check has been added to the Pre-blasting Environmental Checklist to review the weather forecast 48 hours in advance to reduce potential for blasting shots that have been exposed to rainfall producing fume.	Blasting
28/3/2019	**Excavator 306 leaking hydraulic hose** The operator of 306 excavator noticed a hydraulic leak under the machine caused by a failed hydraulic hose in pit.	The operator stopped operation and reported to supervisor. The spill was contained and cleaned up.	Hydrocarbon
30/3/2019	**Turbid water entered Farrells Creek from two dams** Turbid water entered Farrells Creek due to heavy rainfall (66 mm) causing the overflow of two dams. Neither dam was mine affected but contained turbid water from surface runoff. The rainfall event exceeded the design capacity used for construction of sediment dams.	PIRMP was activated and other regulatory notifications were made. Pumps were used to lower dam levels and water sampling undertaken. No indication was found of environmental impact.	Water Management
18/4/2019	**Hydraulic fluid spill from hydraulic line of Excavator 316** During operation of Excavator 316 the return line coupling to the hydraulic tank has failed, resulting in an approximate 500 L spill of hydraulic fluid in pit.	The spill was contained and cleaned up and contaminated material delivered to the south bioremediation area.	Hydrocarbon
25/4/2019	**HVGC PM10 monitor miss-capture** The E&C team were notified by the Hunter Valley Gliding Club that the PM10 High Volume Air Sampler (HVAS) at the site had been damaged by activities occurring at the club, subsequently resulting in the sample not being captured on 26 April 2019 in accordance with the Air Quality Monitoring Programme.	The power lead was removed from the unit on Friday 26 April for repair and returned to the unit on 30 April. The Department of Planning and Environment were notified once the missed sample was confirmed.	Dust

3.0 Community Sponsorship and Events

In April HVO opened Round One of the 2019 Community Grants Program and called for local community groups and organisations to apply for funding. To date 12 applications have been received which will be assessed over the coming weeks.

There were a number of HVO supported community events and mine site tours held between January and April 2019 including the following:

- HVO hosted students from Normanhurst Boys High School in Sydney on 12 March as part of their Year 9 Geography studies. Students were taken on a site tour of active mining areas and given presentations by HVO mining staff.
- HVO hosted 15 students from Rutherford Technology High School on 3 April as part of an initiative held with Youth Express to provide an opportunity for students to learn more about career pathways into mining. Students were given
- A working bee was held on Saturday 6 April at Jerrys Plains Public School with HVO apprentices, staff and members of the local community assisting in a number of jobs including the cubby house painted and carpeted, new sand and toys for the sandpit, rubber matting inserted around the basketball court, installation of a native plant garden at the entrance to the school and removal of a redundant fence.

Two community information sessions are planned for May at Jerrys Plains on Thursday 16 May and at Maison Dieu on Saturday 25 May 2019. A letter advertising these two sessions was mailed out to near neighbours along with the HVO newsletter. It is the intent to produce a quarterly newsletter following each CCC meeting.

4.0 Environmental monitoring

Monthly summaries of environmental monitoring; January – March 2019.

January 2019

Attached as **Appendix A**

February 2019

Attached as **Appendix B**

March 2019

Attached as **Appendix C**

5.0 Environmental Documents

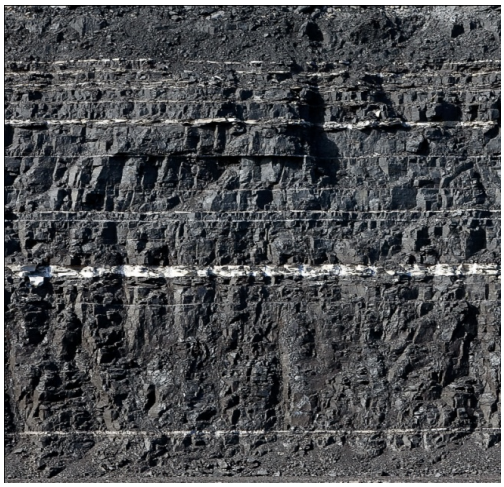
Environmental documents uploaded to the HVO Insite website since the last meeting (https://insite.hvo.com.au/)

12/02/2019	Hunter Valley Operations Environment Protection Licence 640 Monitoring Data January 2019
06/03/2019	Hunter Valley Operations Environment Protection Licence 640 Monitoring Data February 2019
19/03/2019	Hunter Valley Operations South Mining Operations Plan January 2019
19/03/2019	Hunter Valley North Mining Operations Plan January 2019
20/03/2019	Hunter Valley Operations Environmental Monitoring Report January 2019
03/04/2019	Hunter Valley Operations Blast Management Plan
10/04/2019	Hunter Valley Operations Environment Protection Licence 640 Monitoring Data March 2019
09/05/2019	Hunter Valley Operations Environmental Monitoring Report February 2019
09/05/2019	Hunter Valley Operations Environmental Monitoring Report March 2019

6.0 2018 Annual Report for Community Consultative Committee

Attached as **Appendix D**

HUNTER VALLEY
OPERATIONS



Monthly Environmental Monitoring Report

Hunter Valley Operations

January 2019

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	**Environment & Community Officer**	**Draft**	**19/3/2019**
1.1	**Environment & Community Coordinator**	**Final**	**20/03/2019**

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 2019.

2.0 AIR QUALITY

2.1 Meteorological Monitoring

HVO maintains two meteorological stations; '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 2019 trend and historical trend are shown in Figure 1.

Table 1: Monthly Rainfall HVO

2019	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
January	59.8	59.8

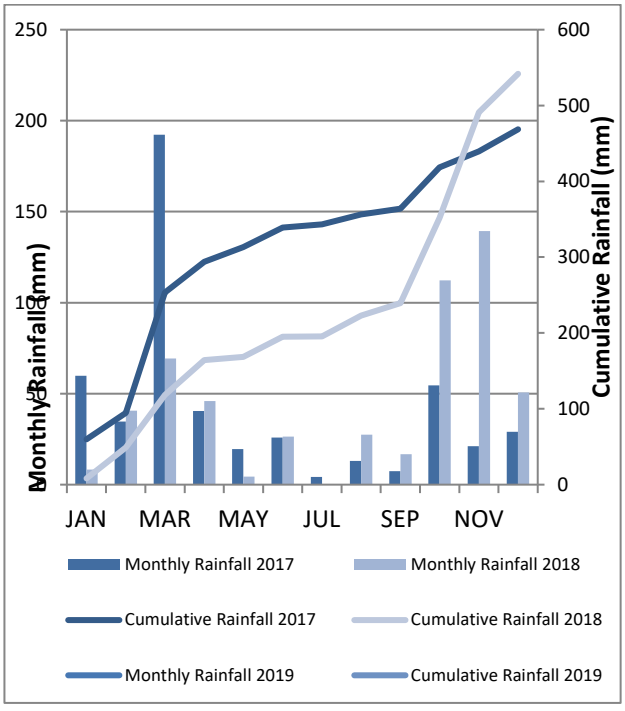

Figure 1: Rainfall Summary 2019

2.1.2 Wind Speed and Direction

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

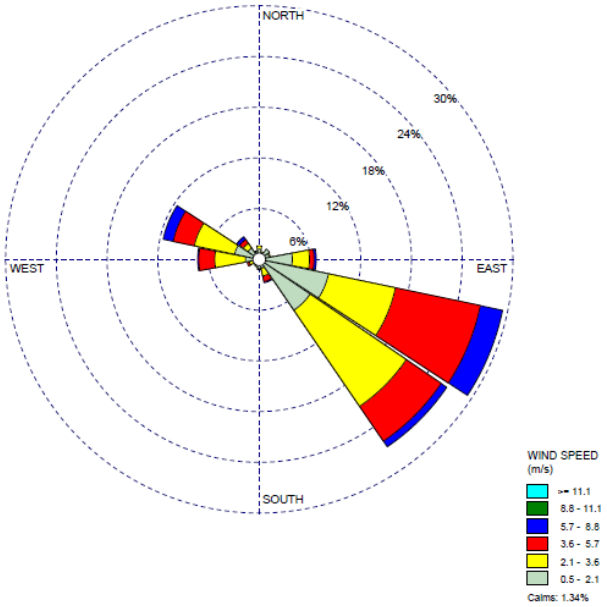

Figure 2: HVO Corporate Wind Rose – January 2019

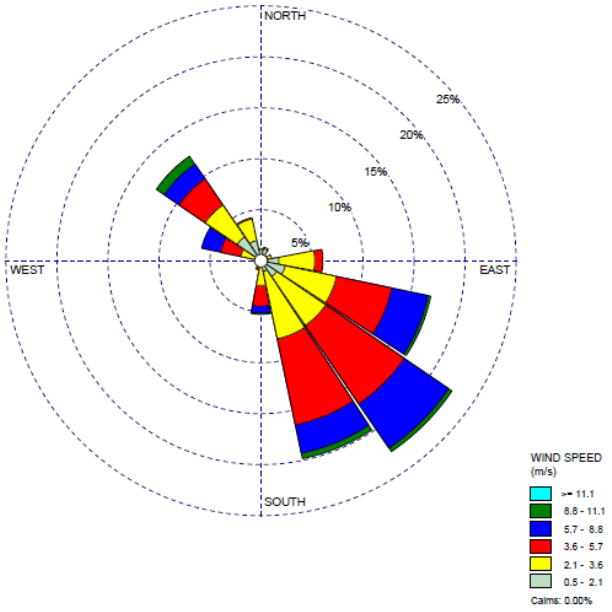

Figure 3: HVO Cheshunt Wind Rose – January 2019

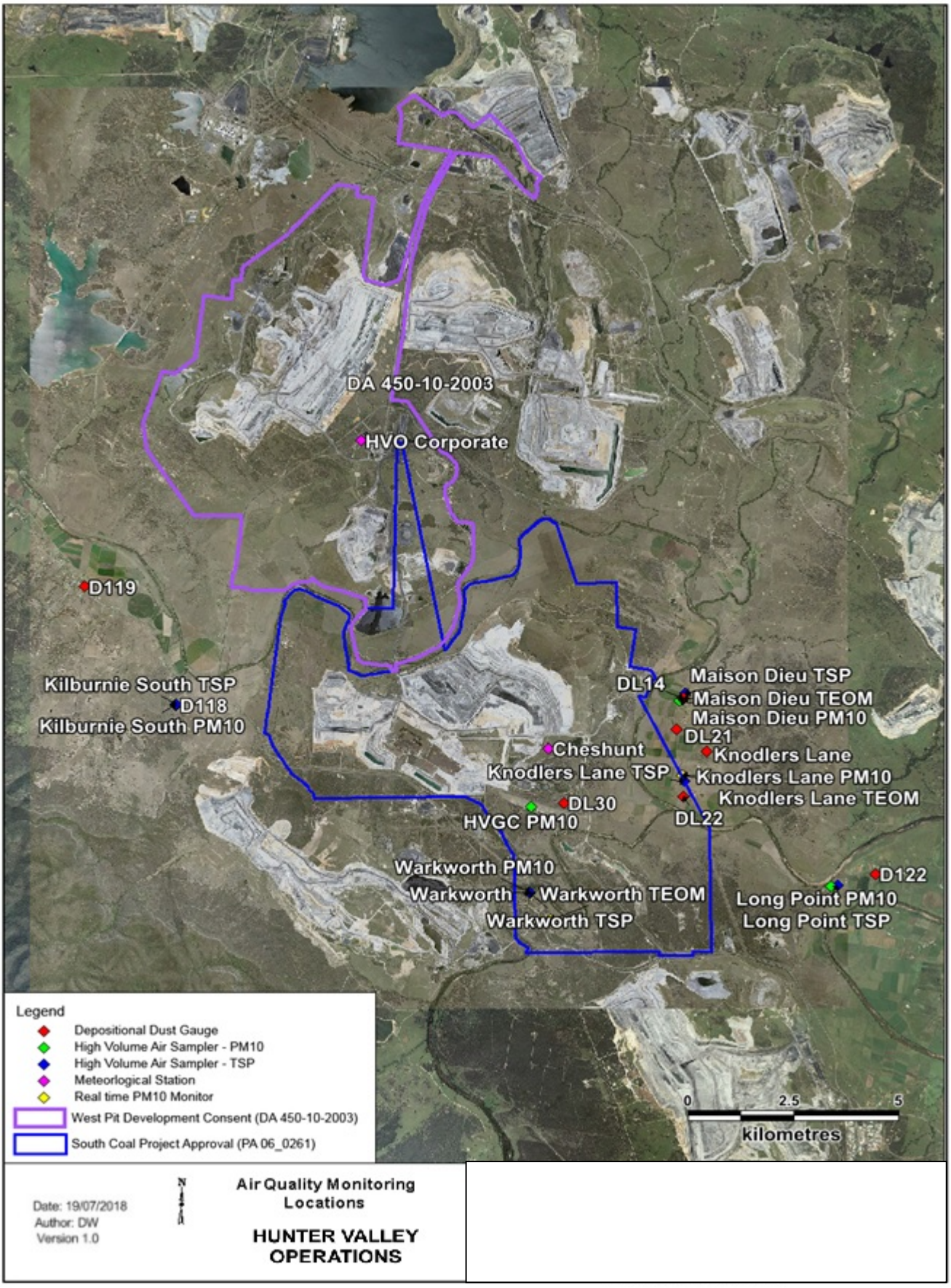

Figure 4: Air Quality Monitoring Location Plan

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 year-to-date average and the annual impact assessment criteria.

During the reporting period the D118, DL30, Knodlers Lane and Warkworth monitors recorded a monthly result above the long term impact assessment criteria of 4.0 g/m^2 per month. Both Knodlers Lane and Warkworth were deemed contaminated samples due to the presence of insects and spiders.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2019 Annual Review.

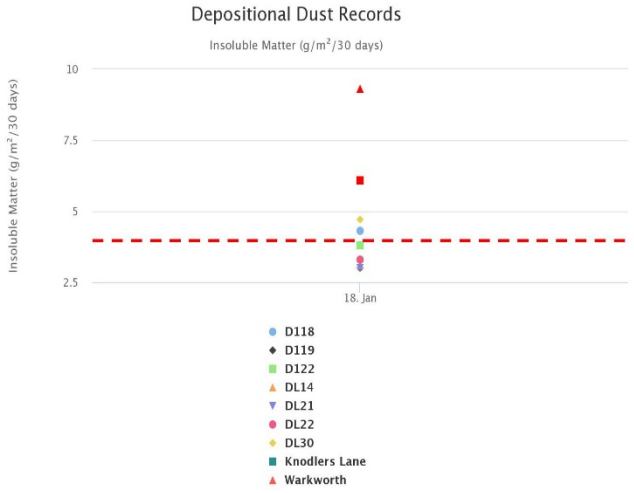

Figure 5: Depositional Dust Results – January 2019

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 (PM_{10}). 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 PM_{10} Results

Figure 6 shows individual PM_{10} results at each monitoring station against the short term impact assessment criteria of 50 µg/m^3.

On 2 January 2019, three HVAS units recorded elevated 24 hour averages, Kilburnie South (80µg/m^3), Warkworth (68µg/m^3) and Glider Club (51 µg/m^3). An assessment of HVO's maximum contribution concluded the following:

- Kilburnie South: 41.0 µg/m^3 or 51.3% of the total measured result.
- Warkworth: deemed to be minimal HVO contribution due to prevailing wind conditions.
- Glider Club: deemed to be minimal HVO contribution due to prevailing wind conditions.

On 8 January 2019, one HVAS unit Knodlers Lane recorded 59.0 µg/m^3 with HVO's maximum contribution was calculated to be 23.5 µg/m^3 or the 39.8% of the total measured result.

On 26 January 2019, two HVAS units recorded elevated 24 hour averages including Kilburnie South (57µg/m^3) and Knodlers Lane (56µg/m^3). An assessment of HVO's maximum contribution concluded the following:

- Kilburnie South: 14.5 µg/m^3 or 25.4% of the total measured result.
- Knodlers Lane: 20.6 µg/m^3 or 43.3% of the total measured result.

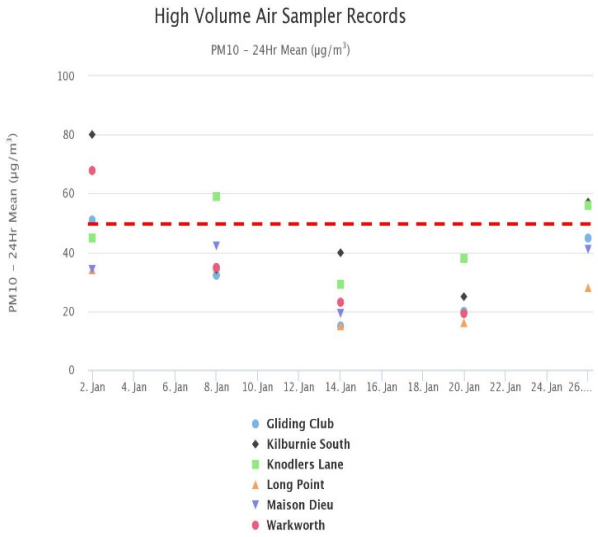

Figure 6: Individual PM_{10} Results – January 2019

Figure 7 shows the year to date annual average PM_{10} results.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2019 Annual Review.

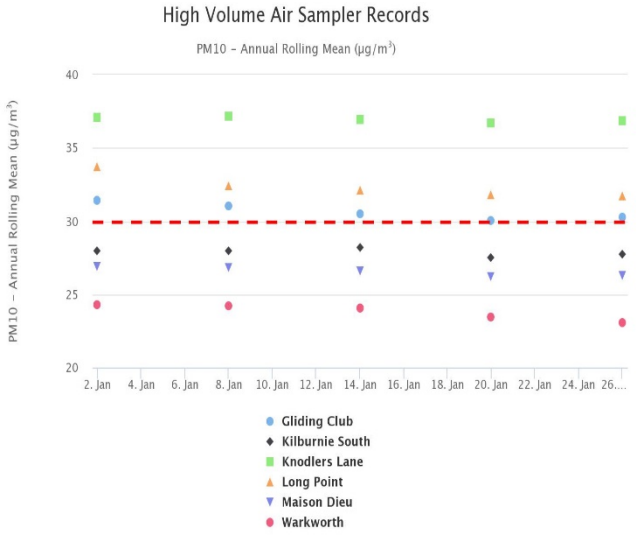

Figure 7: Year to Date Average PM_{10} – January 2019

2.3.2 TSP Results

Figure 8 shows the annual average TSP results compared against the long term impact assessment criteria of 90µg/m³.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2019 Annual Review.

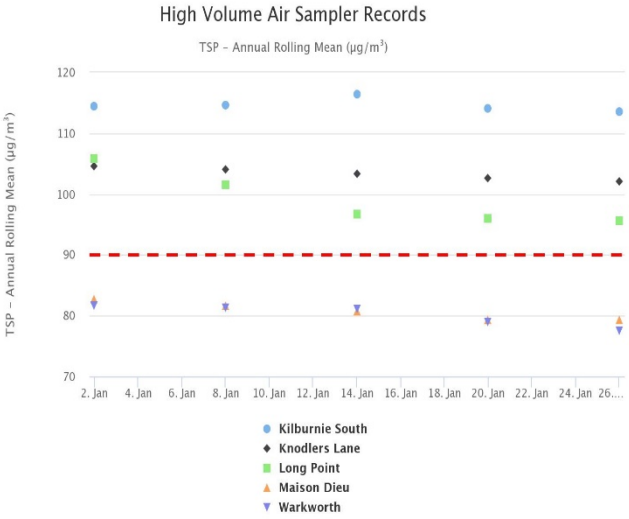

Figure 8: Year to Date Average Total Suspended Particulates – January 2019

2.3.3 Real Time PM_{10} Results

Hunter Valley Operations maintains a network of real time PM_{10} 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_{10} 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 9, including the daily 24 hour average PM_{10} result and the year to date 24 hour PM_{10} annual average.

Results from investigations of elevated results are presented in Table 2.

2.3.4 Real Time Alarms for Air Quality

During January the real time monitoring system generated 214 automated air quality related alarms. 75 were related to adverse weather conditions and 141 alarms relating to PM_{10}.

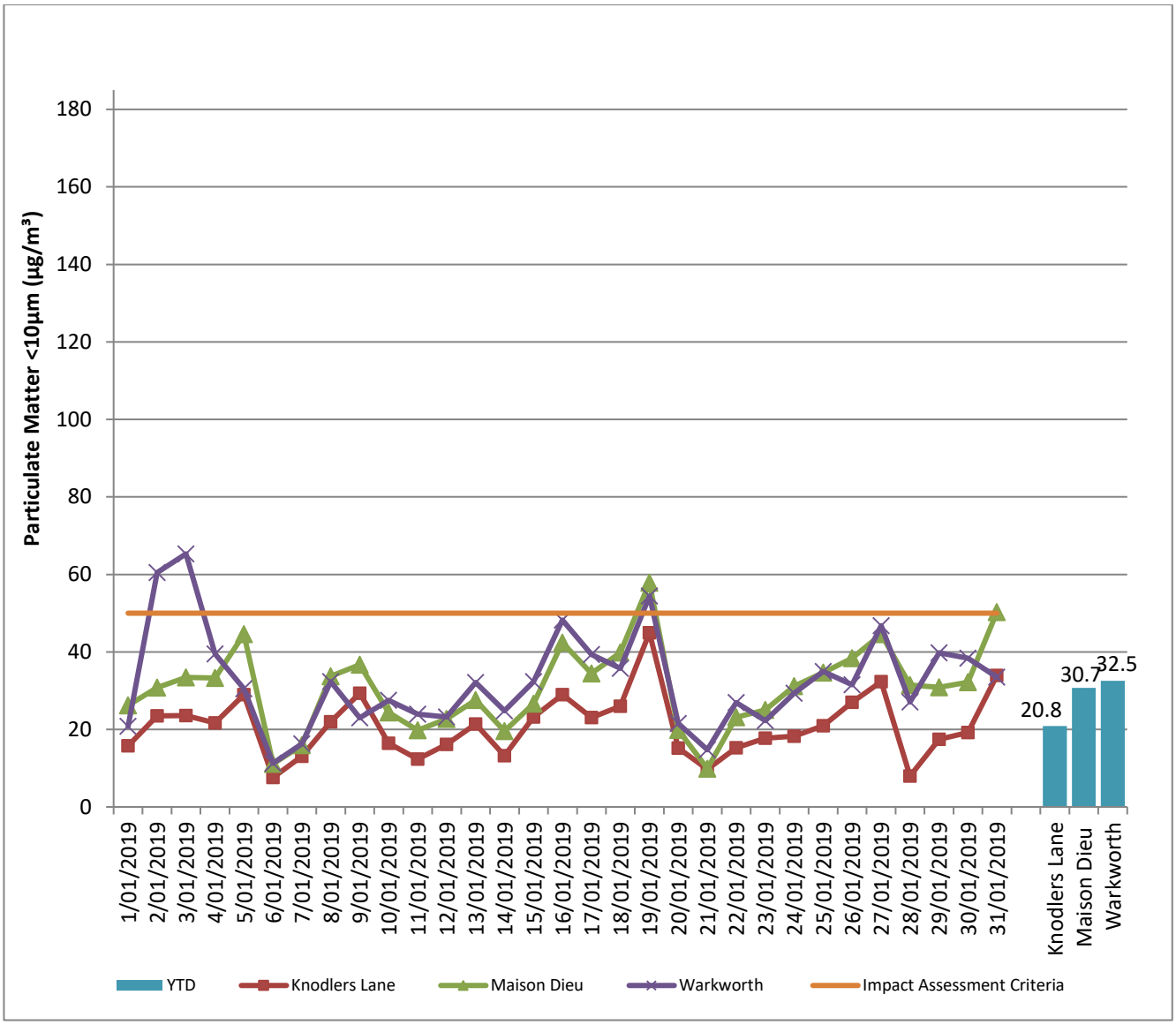

Figure 9: Real Time PM_{10} 24hr average and YTD average – January 2019

Table 2: Real-time PM10 Investigation Results

Date	Site	Total Measured Result (µg/m3)	Estimated contribution from HVO (µg/m3 / %)	Discussion
2/1/2019	Warkworth TEOM	60.5	30.8 µg/m3 Or 50.8%	An internal investigation determined HVO maximum potential contribution to be in the order of 30.8 ug/m3 or 50.8% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
3/1/2019	Warkworth TEOM	65.3	27.3 µg/m3 Or 41.8%	An internal investigation determined HVO maximum potential contribution to be in the order of 27.3 ug/m3 or 41.8% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
16/1/2019	Jerrys Plains TEOM	53.7	8.6 µg/m3 Or 15.9%	An internal investigation determined HVO maximum potential contribution to be in the order of 8.6 ug/m3 or 15.9% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
17/1/2019	Jerrys Plains TEOM	57.3	20.2 µg/m3 Or 35.3%	An internal investigation determined HVO maximum potential contribution to be in the order of 20.2 ug/m3 or 35.3% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
19/1/2019	Maison Dieu TEOM	57.8	20.3 µg/m3 Or 35.2%	An internal investigation determined HVO maximum potential contribution to be in the order of 20.3 ug/m3 or 35.2% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
19/1/2019	Warkworth TEOM	54.4	NA	An internal investigation revealed that when wind was blowing from the HVO arc of influence, upwind monitoring locations recorded significantly higher monitoring results. This could be due to local influences at the monitoring locations. However monitoring data indicates that air quality improved

				between the upwind and down wind monitoring locations. HVO's contribution would be considered minimal on this day.
31/1/2019	Maison Dieu TEOM	50.3	16.1 µg/m3 Or 31.9%	An internal investigation determined HVO maximum potential contribution to be in the order of 16.1 ug/m3 or 31.9% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.

3.0 WATER QUALITY

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

3.1.1 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 2019 report.

3.1.2 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 243.5ML of water from the Hunter River.

3.1.3 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.

3.2.1 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 2019 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 12.

Blasting criteria are summarised in Table 3.

Table 3: 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%

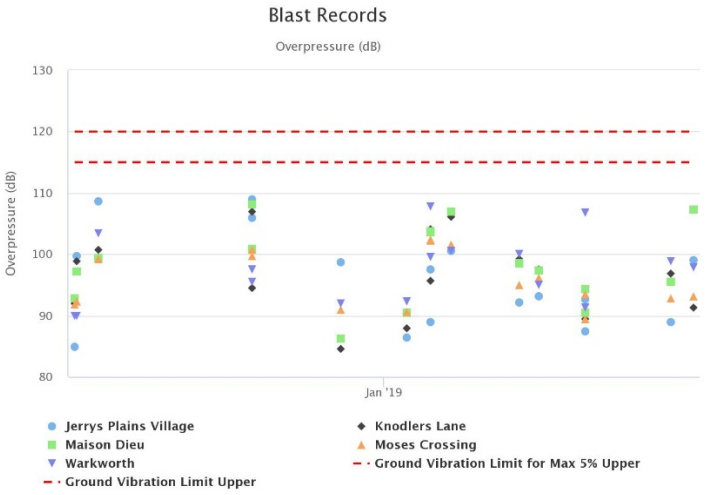

Figure 10: Overpressure Blast Monitoring Results – January 2019

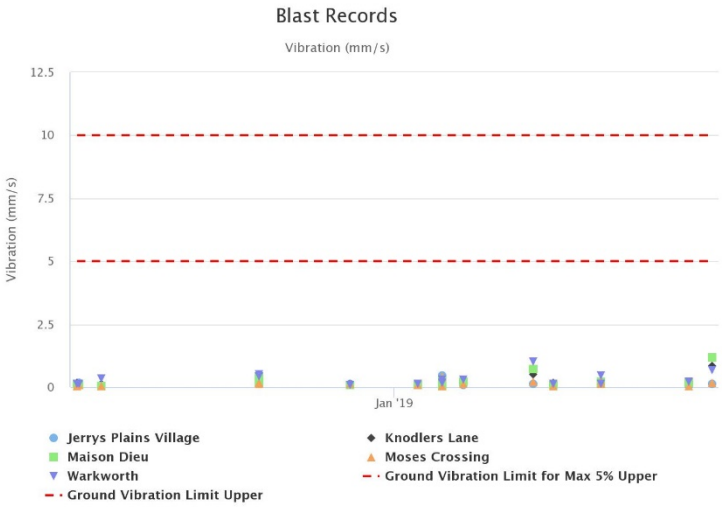

Figure 11: Ground Vibration Blast Monitoring Results – January 2019

4.1 Blast Monitoring Results

During January, 19 blasts were initiated at HVO Figure 10 and 11 show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in Table 3.

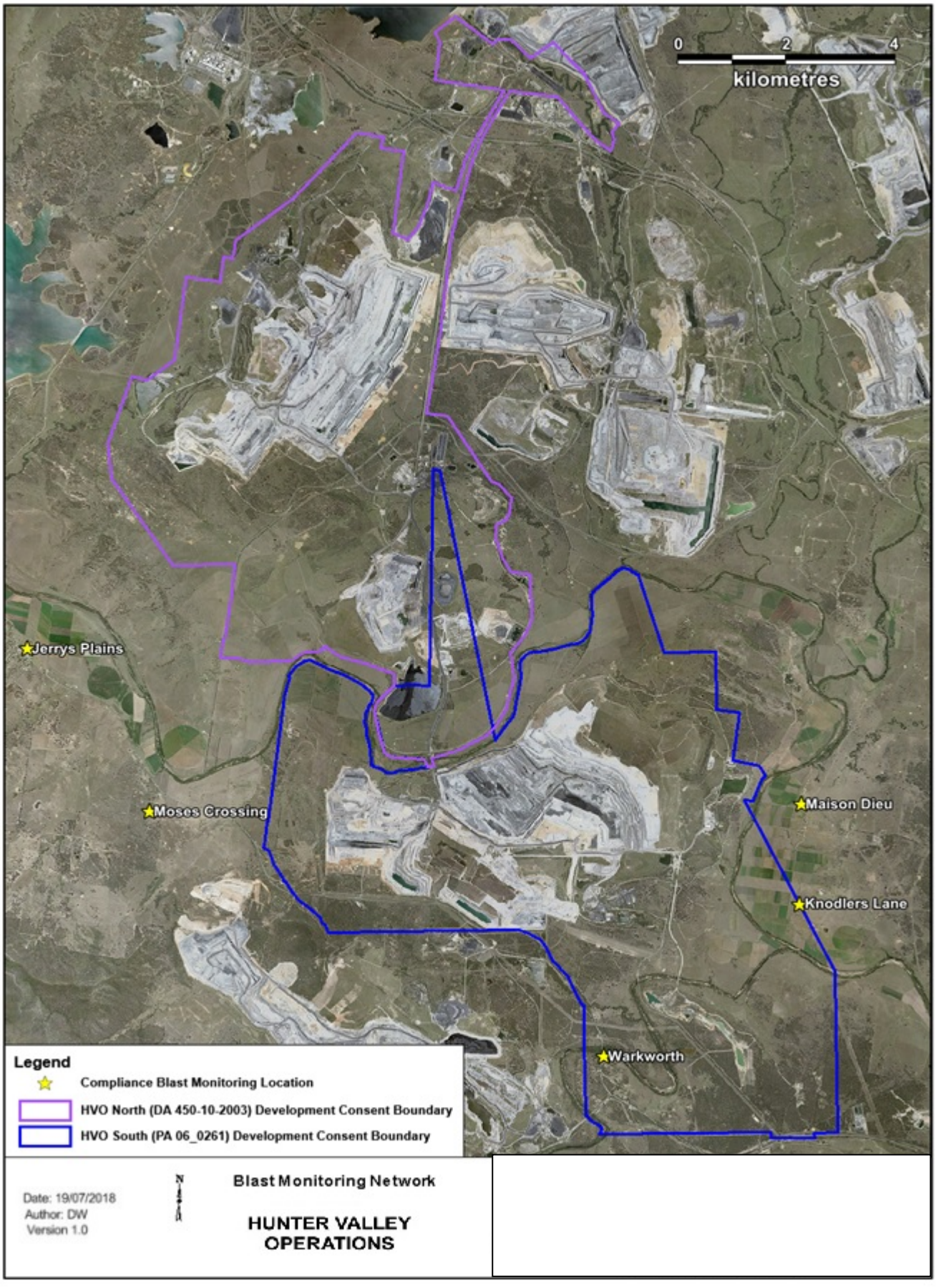

Figure 12: Blast Monitoring Location Plan

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 13.

5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding HVO on the night of 17-18 January 2019. Monitoring results are detailed in Table 4 to Table 9 . During January attended noise monitoring, noise levels complied with the relevant development consent noise limits at all monitoring locations.

Table 4: $L_{Aeq,\ 15\ minute}$ HVO South - Impact Assessment Criteria – January 2019

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO South L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	17/01/2019 21:00	4.1	0.5	37	No	IA	NA
Maison Dieu	17/01/2019 21:24	4.4	-1	37	No	IA	NA
Shearers Lane	17/01/2019 21:47	4.3	0.5	41	No	IA	NA
Kilburnie South	17/01/2019 23:20	3.7	0.5	36	No	IA	NA
Jerrys Plains	17/01/2019 21:43	4.3	0.5	35	No	IA	NA
Jerrys Plains East	17/01/2019 21:01	4.1	0.5	35	No	IA	NA
Long Point Road	17/01/2019 22:46	1.5	3	35	Yes	IA	Nil
HVGC	18/01/2019 0:02	3.2	0.5	55	No	33	NA

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt weather station(MTW Charlton Ridge for Long Point) using logged meteorological data;
2. Assumed noise emission limits apply for wind speeds up to 3 metres per second (at a height of 10m), or temperature inversion conditions of up to 3 degrees/100m (at a height of 10m). Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute attributed to HVO South Pit Area;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;

Table 5: $L_{A1,\ 1minute}$ HVO South - Impact Assessment Criteria – January 2019

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO South $L_{A1,\ 1min}$ dB[3,4]	Exceedance[4,5]
Knodlers Lane	17/01/2019 21:00	4.1	0.5	45	No	IA	NA
Maison Dieu	17/01/2019 21:24	4.4	-1	45	No	IA	NA
Shearers Lane	17/01/2019 21:47	4.3	0.5	45	No	IA	NA
Kilburnie South	17/01/2019 23:20	3.7	0.5	45	No	IA	NA
Jerrys Plains Village	17/01/2019 21:43	4.3	0.5	45	No	IA	NA
Jerrys Plains East	17/01/2019 21:01	4.1	0.5	45	No	IA	NA
Long Point Road	17/01/2019 22:46	1.5	3	45	Yes	IA	Nil
HVGC	18/01/2019 0:02	3.2	0.5	Nil	No	39	NA

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt weather station (or MTW Charlton Ridge for Long Point) using logged meteorological data;
2. Assumed noise emission limits (see Section 2.3 of this report for more information) apply for wind speeds up to 3 metres per second (at a height of 10m), or temperature inversion conditions of up to 3 degrees/100m (at a height of 10m). Criterion may or may not apply due to rounding of meteorological data values;
3. These are results for HVO South Pit Area in the absence of all other noise sources;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;

Table 6: $L_{Aeq,\ 15minute}$ HVO North – Impact Assessment Criteria – January 2019

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	17/01/2019 21:00	3.5	-1	35	No	IA	NA
Maison Dieu	17/01/2019 21:24	2.8	-1	35	Yes	IA	Nil
Shearers Lane	17/01/2019 21:47	2.5	-1	35	Yes	IA	Nil
Kilburnie South	17/01/2019 23:20	1.4	0.5	39	Yes	NM	Nil
Jerrys Plains	17/01/2019 21:43	2.5	-1	36	Yes	34	Nil
Jerrys Plains East	17/01/2019 21:01	3.5	-1	39	No	37[6]	NA
Long Point Road	17/01/2019 22:46	1.5	3	35	Yes	IA	Nil
HVGC	18/01/2019 0:02	2.1	0.5	Nil	Yes	IA	Nil

Notes:
1. Atmospheric data is sourced from the HVO Corp. weather station (or MTW Charlton Ridge for Long Point) using logged meteorological data;
2. Noise emission limits 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 temperature inversion conditions greater than 3 degrees C/100m. Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute attributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable and
6. LAeq includes a 2dB low frequency modifying factor

Table 7: $L_{Aeq,15minute}$ HVO North - Land Acquisition Criteria – January 2019

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	17/01/2019 21:00	3.5	-1	41	No	IA	NA
Maison Dieu	17/01/2019 21:24	2.8	-1	41	Yes	IA	Nil
Shearers Lane	17/01/2019 21:47	2.5	-1	41	Yes	IA	Nil
Kilburnie South	17/01/2019 23:20	1.4	0.5	41	Yes	NM	Nil
Jerrys Plains	17/01/2019 21:43	2.5	-1	41	Yes	34	Nil
Jerrys Plains East	17/01/2019 21:01	3.5	-1	41	No	37[6]	NA
Long Point Road	17/01/2019 22:46	1.5	3	41	Yes	IA	Nil
HVGC	18/01/2019 0:02	2.1	0.5	NA	Yes	IA	Nil

Notes:
1. Atmospheric data is sourced from the HVO Corp. weather station (or MTW Charlton Ridge for Long Point) using logged meteorological data;
2. Noise emission limits 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 temperature inversion conditions greater than 3 degrees C/100m. Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute attributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable and
6. LAeq includes a 2dB low frequency modifying factor

Table 8: $L_{A1,\ 1Minute}$ HVO North - Impact Assessment Criteria – January 2019

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North $L_{A1,\ 1min}$ dB[3,4]	Exceedance[4,5]
Knodlers Lane	17/01/2019 21:00	3.5	-1	46	No	IA	NA
Maison Dieu	17/01/2019 21:24	2.8	-1	46	Yes	IA	Nil
Shearers Lane	17/01/2019 21:47	2.5	-1	46	Yes	IA	Nil
Kilburnie South	17/01/2019 23:20	1.4	0.5	46	Yes	NM	Nil
Jerrys Plains Village	17/01/2019 21:43	2.5	-1	46	Yes	42	Nil
Jerrys Plains East	17/01/2019 21:01	3.5	-1	46	No	43	NA
Long Point Road	17/01/2019 22:46	1.5	3	46	Yes	IA	Nil
HVGC	18/01/2019 0:02	2.1	0.5	NA	Yes	IA	Nil

Notes:
1. Atmospheric data is sourced from the HVO Corp. (or MTW Charlton Ridge for Long Point) weather station using logged meteorological data;
2. Noise emission limits 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 temperature inversion conditions greater than 3 degrees C/100m. Criterion may or may not apply due to rounding of meteorological data values;
3. These are results for HVO North Pit Area in the absence of all other noise sources;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable
.

5.2 NPfI Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfI), the applicability of the low frequency modification penalty has been assessed. During January 2019 one measurement at Jerrys Plains East required the penalty to be applied however remained compliant. The assessment for low frequency noise is shown in Table 10.

Table 9: Low Frequency Noise Assessment – January 2019

Location	Date and Time	Measured Site Only LA_{eq} dB (Sth/Nth)	Site Only LC_{eq} dB[1] (Sth/Nth)	Site-Only LCeq – LAeq $dB_{1,2}$ (Sth/Nth)	Result Max exceedance of ref spectrum dB[1,3] (Sth/Nth)	Penalty dB(A) [1] (Sth/Nth)
Knodlers Lane	17/01/2019 21:00	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Maison Dieu	17/01/2019 21:24	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Shearers Lane	17/01/2019 21:47	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Kilburnie South	17/01/2019 23:20	IA/IM	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains	17/01/2019 21:43	IA/34	NA/52	NA/17	NA/Nil	NA/Nil
Jerrys Plains East	17/01/2019 21:01	IA/35	NA/56	NA/21	NA/2.3 @ 80 Hrtz	NA/2
Long Point Road	17/01/2019 22:46	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
HVGC	18/01/2019 0:02	33/IA	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, this is noted as NA (not available) and no further assessment has been undertaken;
2. As per NPfI, if LCeq – LAeq ≥ 15 dB further assessment of low frequency noise required as detailed in Sections 2.4 and 3.3 of the attended noise report;
3. As per NPfI, compare measured spectrum against reference spectrum to determine if the low frequency modifying factor is triggered and application of penalty is required.

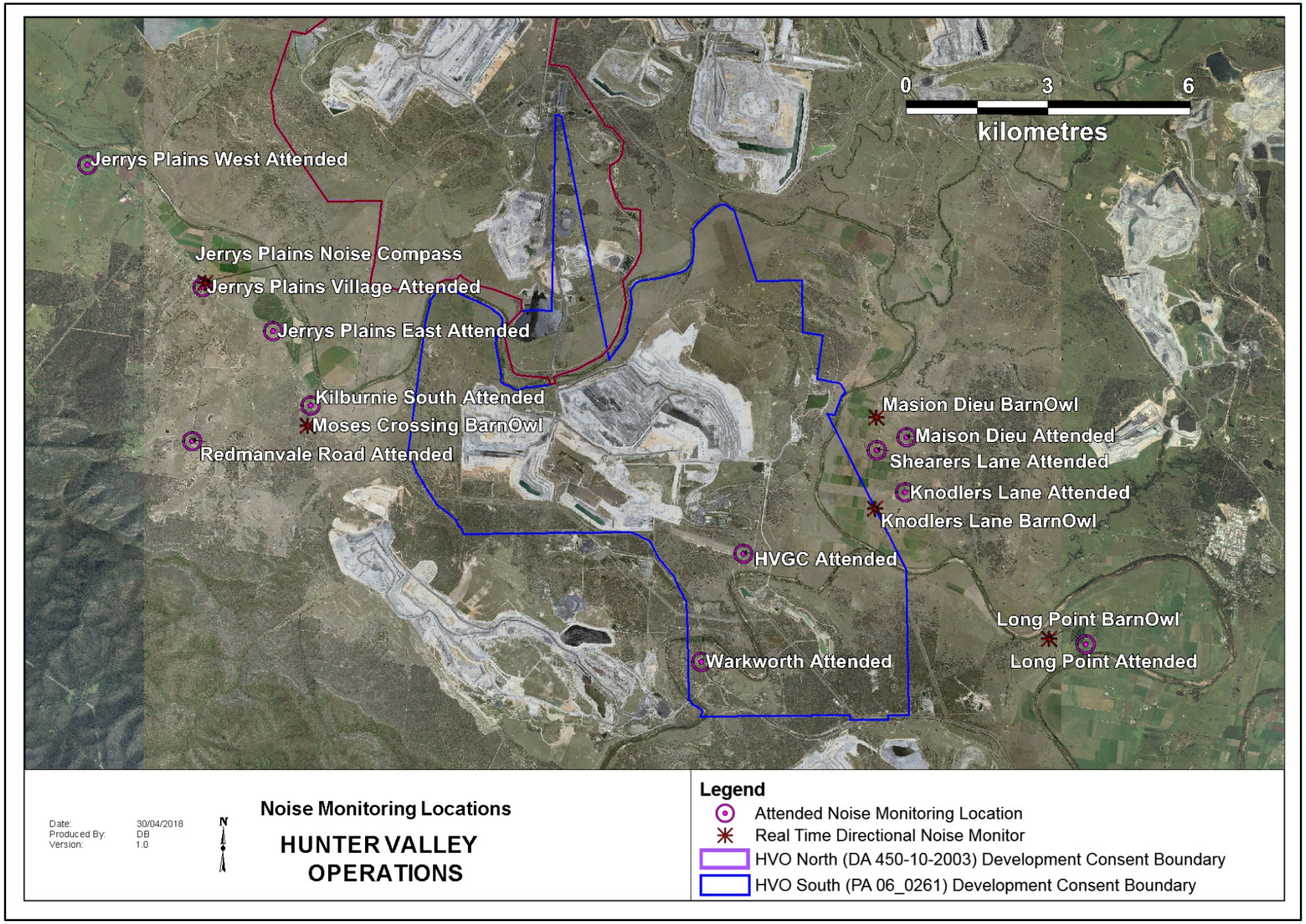

Figure 13: Noise Monitoring Location Plan

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.

6.0 OPERATIONAL DOWNTIME

During January, a total of 263 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 14.

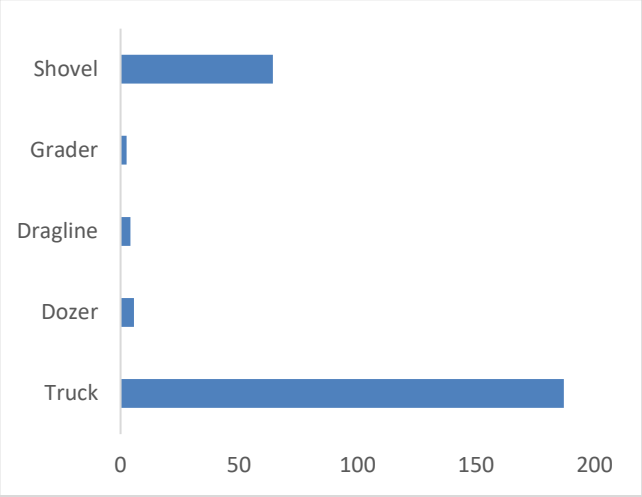

Figure 14: Operational Downtime by Equipment Type – January 2019

7.0 REHABILITATION

During January 0 Ha of land was released, 8.0 Ha of land was bulk shaped and 2.9 Ha of land was rehabilitated.

8.0 COMPLAINTS

No complaints were received during the reporting period. Details of complaints received YTD are shown in Table 11 below.

Table 10: Complaints Summary YTD

	Noise	Dust	Blast	Lighting	Other	Total
January	0	0	0	0	0	0
February						
March						
April						
May						
June						
July						
August						
September						
October						
January						
December						
Total	0	0	0	0	0	0

9.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were three recordable environmental incidents;

2 January 2019 – Class 3 Fume Event

West Pit North LED Blast WN45LED01A was fired at 13:10 and produced a Class 3 Fume Event that did not leave site. The fume event was investigated to determine the potential causes to assist in preventing reoccurance.

3 January 2019 – High Volume Air Sampler failed to run

The Hunter Valley Glider Club High Volume Air Sampler (PM10) was identified as faulty and had run approximately 2 hours over the 24 hour sample time and therefore was an invalid sample. The replacement sampler was installed whilst the fault was being repaired.

26 January 2019 – High Volume Air Sampler failed to run

The Warkworth TSP and PM10 HVAS units were identified to have no power supply as they had tripped due to a fault with the PM10 sampler. A replacement unit was calibrated and installed to temporarily replace the faulty unit whilst repairs were undertaken.

Appendix A: Meteorological Data

Table 11: Meteorological Data - HVO Corporate Meteorological Station – January 2019

Date	Air Temperature Maximum (°C)	Air Temperature Minimum (°C)	Relative Humidity Maximum (%)	Relative Humidity Minimum (%)	Solar Radiation Maximum (W/Sq. M)	Wind Direction Average (°)	Wind Speed Average (m/sec)	Rainfall(mm)
1/1/2019	37.2	15.0	91.2	12.2	1404	192.4	2.5	0.2
2/1/2019	38.1	16.2	74.3	5.1	1050	122.8	2.2	0
3/1/2019	34.7	15.9	77.97	13.7	1085	117.7	3	0
4/1/2019	39.2	14.7	97.9	5.8	1054	140.9	1.9	0
5/1/2019	39.5	15.8	90.8	12.0	1021	255	4.8	0.2
6/1/2019	21.8	12.8	98.8	63.7	418.6	125.7	3.8	0.2
7/1/2019	25.6	11.9	100	60.7	1300	125.2	3.8	0.6
8/1/2019	36.3	14.9	98.3	11.1	1162	-	2.4	0
9/1/2019	37.4	13.8	100	13.9	1122	203.7	3.3	16.2
10/1/2019	30.4	14.9	100	41.3	1389	124.1	3.2	18.6
11/1/2019	32.4	14.9	100	36.3	1557	125.9	2.9	9.4
12/1/2019	36.6	13.8	100	21.0	1064	222.5	2.4	0.2
13/1/2019	31.5	15.3	86.8	33.8	1304	111	4.0	0
14/1/2019	34	15.3	97.2	21.1	1286	122.7	2.4	0
15/1/2019	41.0	15.5	83.2	7.7	1037	167.6	1.8	0
16/1/2019	41.0	17.4	80.1	8.3	1034	139.6	2.1	0
17/1/2019	41.0	17.1	84.9	8.2	1036	118.1	2.1	0
18/1/2019	41.3	16.9	73.78	8.3	1044	196.1	2.0	0
19/1/2019	39.7	16.3	88.1	7.8	1403	200.6	3.8	0
20/11/2019	28.6	14.5	100	54.5	1337	120.7	3.7	0
21/1/2019	27.7	16.2	100	53.3	1127	139.6	1.7	2.2
22/1/2019	35.8	18.0	82.8	26.1	1422	171.5	2.0	0
23/1/2019	37.4	16.3	97.3	13.4	1413	211.3	3.1	6
24/1/2019	32.2	16.0	87.6	34.7	1376	122.3	3.7	0
25/1/2019	39.2	17.0	90.2	7.7	1013	149.2	1.6	0
26/1/2019	41.4	19.4	76.05	7.3	1016	215	2.8	0
27/1/2019	41.5	18.2	90.2	8.7	1323	176.9	2.9	6
28/1/2019	32.9	19.3	72.11	40.6	1075	123.8	4.4	0
29/1/2019	38.3	15.6	91.6	15.8	1013	147.7	2.2	0
30/1/2019	36.3	18.5	74.39	17.8	1440	175.6	1.8	0
31/1/2019	35.7	16.9	73.19	16.9	875	249.7	3.7	0

"-" Indicates that data was not available due to technical issues.

HUNTER VALLEY OPERATIONS

Monthly Environmental Monitoring Report

Hunter Valley Operations

February 2019

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	**Environment & Community Officer**	**Draft**	**13/03/2019**
1.1	**Environment & Community Coordinator**	**Final**	**9/05/2019**

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 February to 28 February 2019.

2.0 AIR QUALITY

2.1 Meteorological Monitoring

HVO maintains two meteorological stations; '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 2019 trend and historical trend are shown in Figure 1.

Table 1: Monthly Rainfall HVO

2019	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
February	28.6	88.4

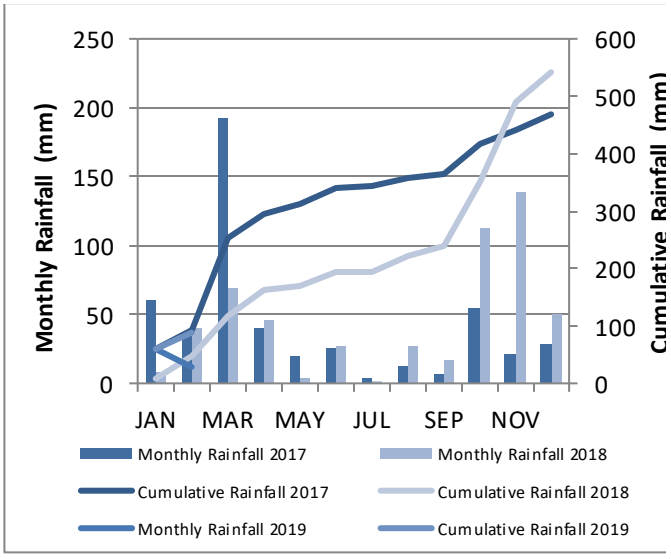

Figure 1: Rainfall Summary 2019

2.1.2 Wind Speed and Direction

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

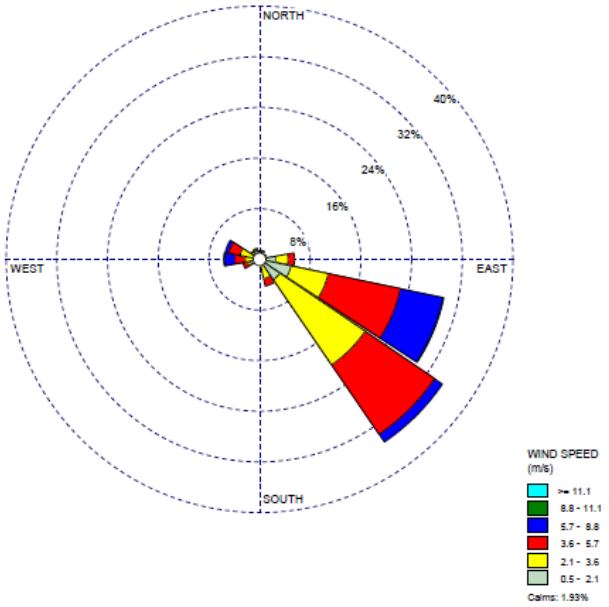

Figure 2: HVO Corporate Wind Rose – February 2019

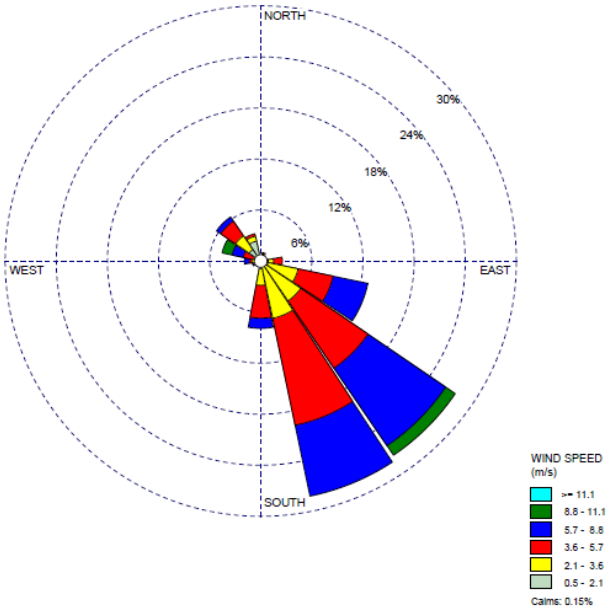

Figure 3: HVO Cheshunt Wind Rose – February 2019

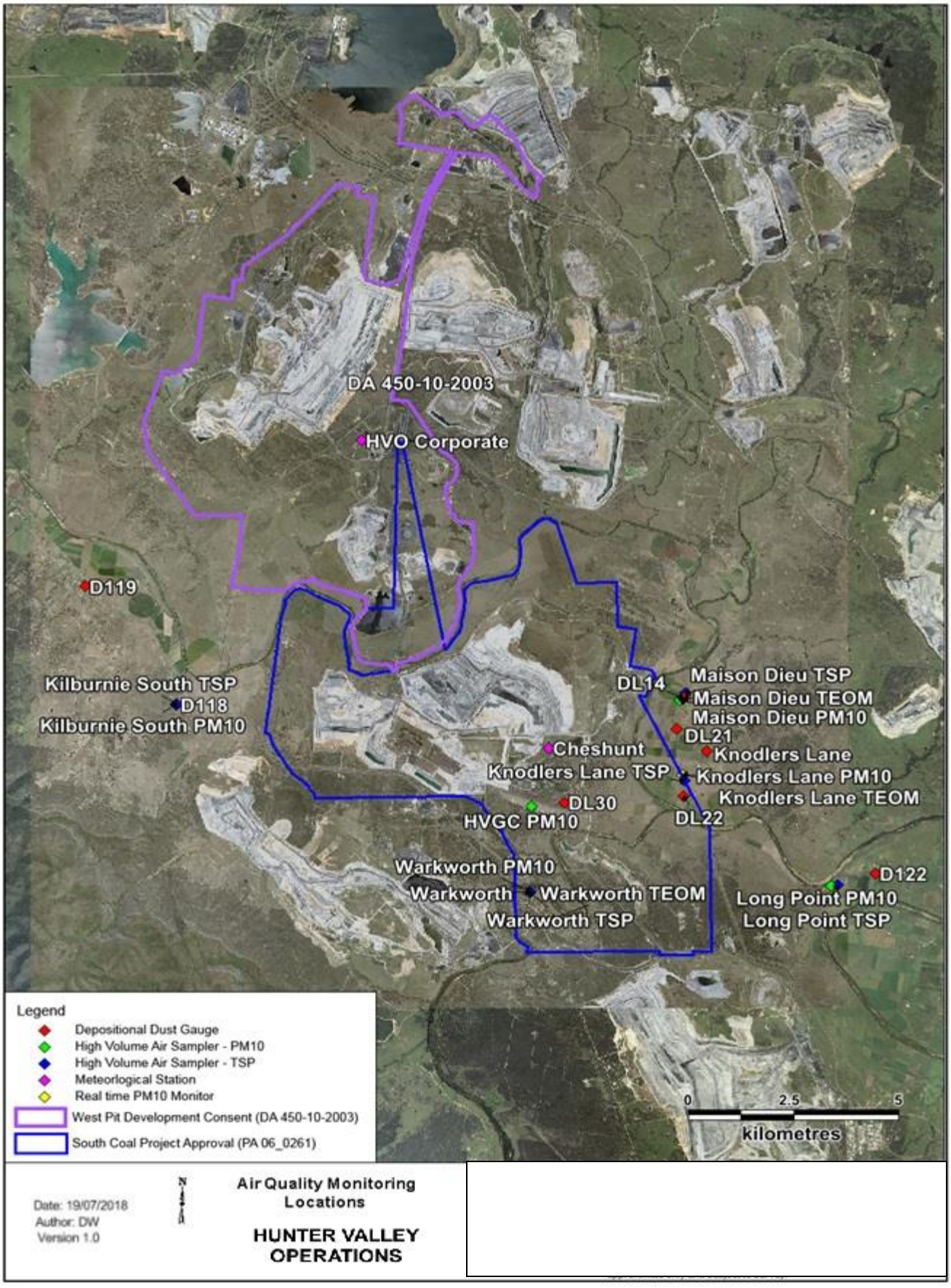

Figure 4: Air Quality Monitoring Location Plan

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 DL21, DL30, D118 and Warkworth monitors recorded a monthly result above the long term impact assessment criteria of 4.0 g/m^2 per month. The sample from DL30 was found to be contaminated with vegetation and insects.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2019 Annual Review.

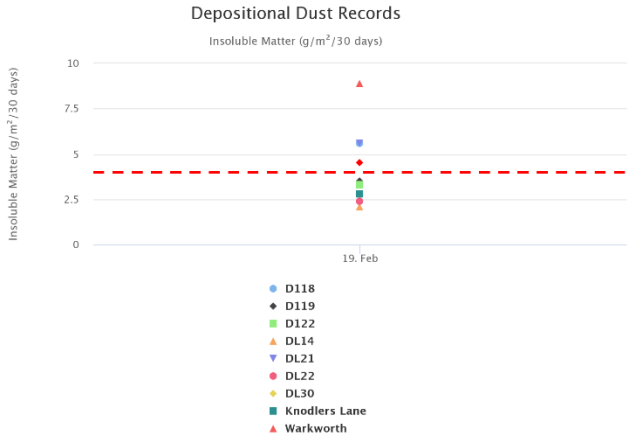

Figure 5: Depositional Dust Results – February 2019

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 (PM_{10}). 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 PM_{10} Results

Figure 6 shows individual PM_{10} results at each monitoring station against the short term impact assessment criteria of 50 µg/m^3.

On 13 February 2019, six HVAS units recorded elevated 24 hour averages, Glider Club (98.0µg/m^3), Kilburnie South (73.0µg/m^3), Maison Dieu (71µg/m^3), Knodlers Lane (118.0µg/m^3), Long Point (67µg/m^3) and Warkworth (62µg/m^3). Monitoring results on this day were considered to have been effected by a regional dust event which travelled from the States west. HVO's maximum contribution was calculated to be the following:

- Glider Club: 23 µg/m^3 or 19.5% of the total measured result.
- Kilburnie South: 2.5 µg/m^3 or 3.7% of the total measured result.
- Maison Dieu: deemed to be minimal HVO contribution due to prevailing wind conditions and high background levels.
- Knodlers Lane: 43 µg/m^3 or 36.4% of the total measured result. Higher Result considered to have been influenced by local sources to the monitor such as nearby livestock.
- Long Point: deemed to be minimal HVO contribution due to prevailing wind conditions and high background levels.
- Warkworth: deemed to be minimal HVO contribution due to prevailing wind conditions and high background levels.

On 19 February 2019, five HVAS units recorded elevated 24 hour averages, Glider Club (58.0 µg/m^3), Kilburnie South (64.0 µg/m^3), Knodlers Lane (113.0 µg/m^3), Long Point (56 µg/m^3) and Maison Dieu (73 µg/m^3) with HVO's maximum contribution was calculated to be the following:

- Glider Club: 2.0 µg/m^3 or 1.8% of the total measured result.
- Kilburnie South: deemed to be minimal HVO contribution due to prevailing wind conditions and background levels.
- Knodlers Lane: 57.0 µg/m^3 or 50.4% of the total measured result.
- Long Point: deemed to be minimal HVO contribution due to prevailing wind conditions and background levels

- Maison Dieu: 17.0 µg/m^3 or 23.3% of the total measured result.

On 25 February 2019, the Kilburnie South HVAS unit recorded an elevated 24 hour average (79 µg/m^3), upon investigation HVO's contribution was deemed to minimal due to prevailing wind conditions.

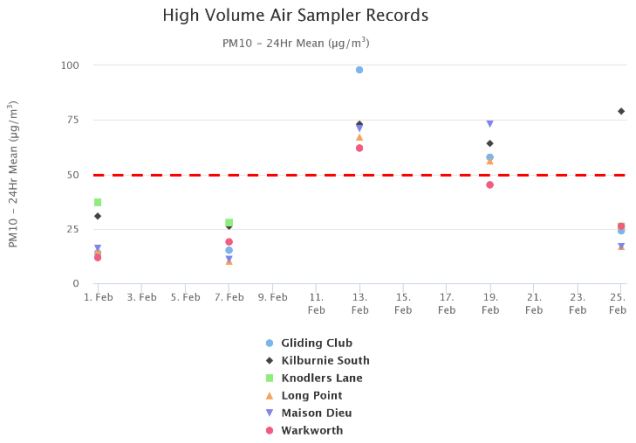

Figure 6: Individual PM_{10} Results – February 2019

Figure 7 shows the year to date annual average PM_{10} results.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2019 Annual Review.

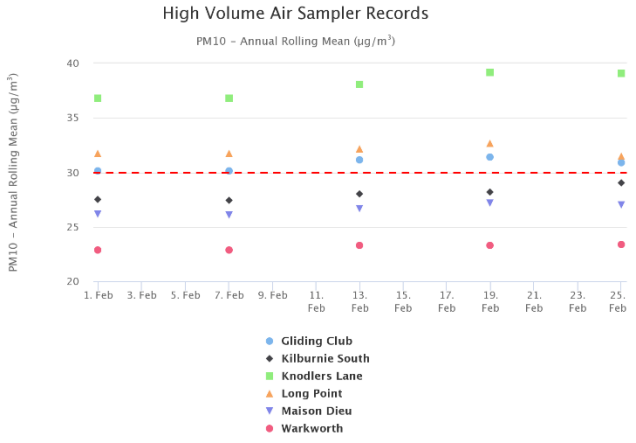

Figure 7: Year to Date Average PM_{10} – February 2019

2.3.2 TSP Results

Figure 8 shows the annual average TSP results compared against the long term impact assessment criteria of 90µg/m³.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2019 Annual Review.

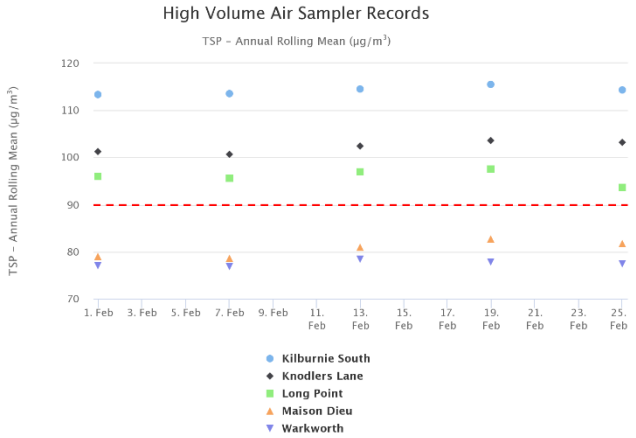

Figure 8: Year to Date Average Total Suspended Particulates – February 2019

2.3.3 Real Time PM_{10} Results

Hunter Valley Operations maintains a network of real time PM_{10} 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_{10} 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 9, including the daily 24 hour average PM_{10} result and the year to date 24 hour PM_{10} annual average.

Results from investigations of elevated results are presented in Table 2.

2.3.4 Real Time Alarms for Air Quality

During February the real time monitoring system generated 145 automated air quality related alarms. 68 alarms were related to adverse weather conditions and 77 alarms relating to PM_{10}.

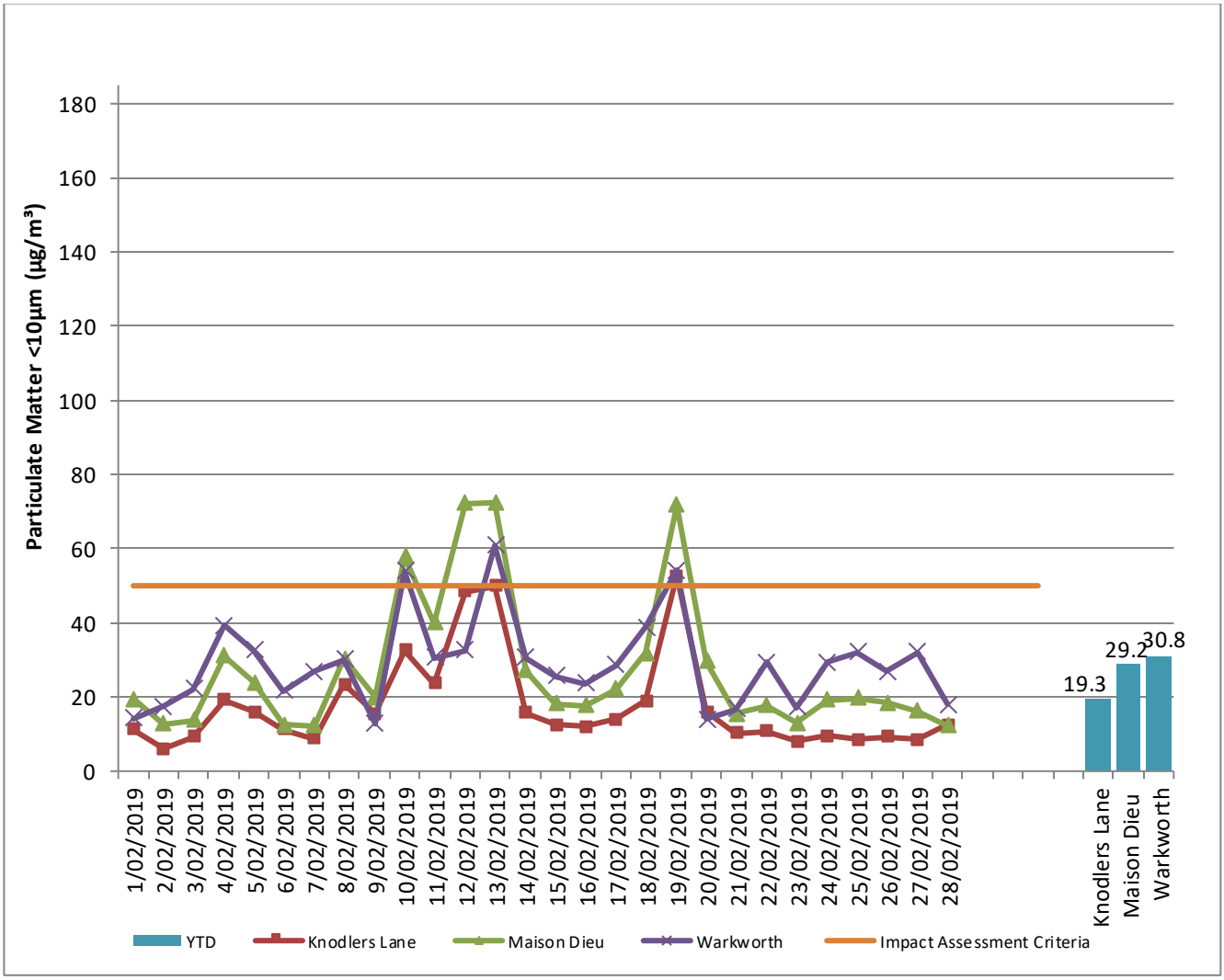

Figure 9: Real Time PM_{10} 24hr average and YTD average – February 2019

Table 2: Real-time PM10 Investigation Results

Date	Site	Total Measured Result (µg/m3)	Estimated contribution from HVO (µg/m3 / %)	Discussion
10/2/2019	Maison Dieu TEOM	57.8	14.6 µg/m3 Or 25.1%	An internal investigation determined HVO maximum potential contribution to be in the order of 14.6 ug/m3 or 25.1% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
10/2/2019	Warkworth TEOM	53.9	NA	An internal investigation determined HVO contribution to be minimal due to prevailing wind conditions and high Background levels.
12/2/2019	Maison Dieu TEOM	72.8	26.9 µg/m3 Or 37.2%	An internal investigation determined HVO maximum potential contribution to be in the order of 26.9 ug/m3 or 37.2% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
13/2/2019	Maison Dieu TEOM	72.4	7.5 µg/m3 Or 10.3%	Monitoring results on this day were considered to have been effected by a regional dust event which travelled from the States west. An internal investigation determined HVO maximum potential contribution to be in the order of 7.5 ug/m3 or 10.3% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
13/2/2019	Warworth TEOM	60.8	NA	Monitoring results on this day were considered to have been effected by a regional dust event which travelled from the States west. An internal investigation determined HVO contribution to be minimal due to prevailing wind conditions and high Background levels.

19/2/2019	Knodlers Lane TEOM	52.7	NA	An internal investigation determined HVO contribution to be minimal due to prevailing wind conditions and high Background levels.
19/2/2019	Maison Dieu TEOM	71.6	14.2 µg/m3 Or 19.8%	An internal investigation determined HVO maximum potential contribution to be in the order of 14.2 ug/m3 or 19.8% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
19/2/2019	Warkworth TEOM	54.2	NA	An internal investigation determined HVO contribution to be minimal due to prevailing wind conditions and high Background levels.

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 2019 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 219.0ML 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 2019 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 12.

Blasting criteria are summarised in Table 3.

Table 3: 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 February, 16 blasts were initiated at HVO

Figure 10 and 11 show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in Table 3.

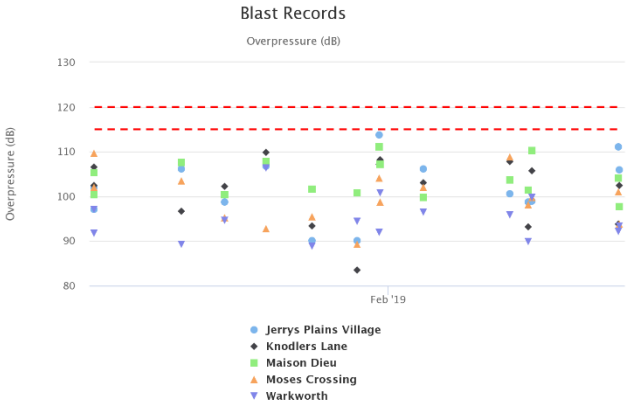

Figure 10: Overpressure Blast Monitoring Results – February 2019

Figure 11: Ground Vibration Blast Monitoring Results – February 2019

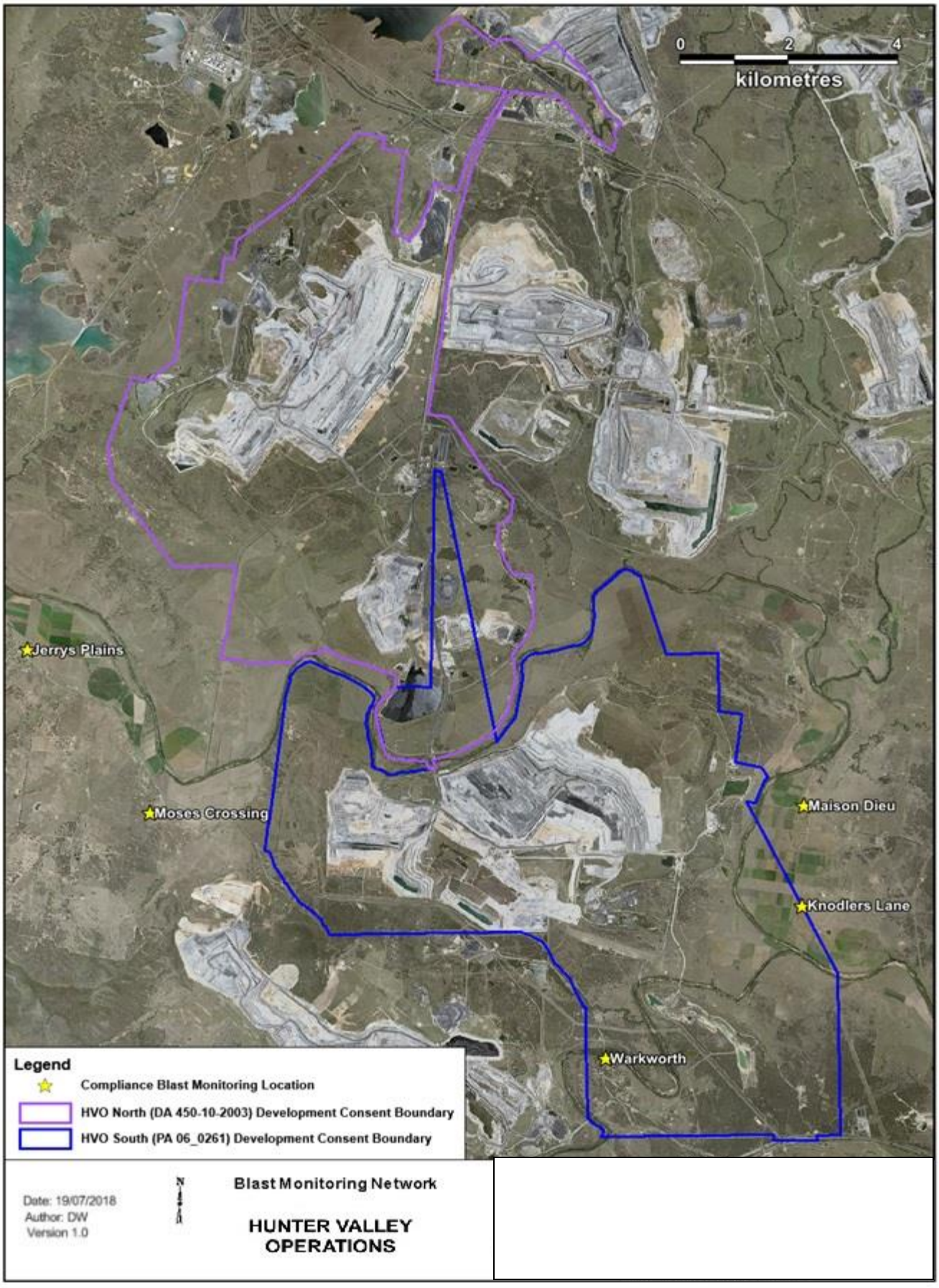

Figure 12: Blast Monitoring Location Plan

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 13.

5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding HVO on the night of 11 February 2019. Monitoring results are detailed in Table 4 to Table 8 . During February attended noise monitoring, noise levels complied with the relevant development consent noise limits at all monitoring locations.

Table 4: $L_{Aeq,\ 15\ minute}$ HVO South - Impact Assessment Criteria – February 2019

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m [1]	Criterion dB (A)	Criterion Applies?[2]	HVO South L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	11/02/2019 21:02	2.3	-1	37	Yes	27	Nil
Maison Dieu	11/02/2019 21:26	2.1	0.5	37	Yes	<30	Nil
Shearers Lane	11/02/2019 21:55	3.2	-1	41	No	38	NA
Kilburnie South	11/02/2019 22:53	2.8	0.5	36	Yes	IA	Nil
Jerrys Plains Village	11/02/2019 21:26	2.1	0.5	35	Yes	IA	Nil
Jerrys Plains East	11/02/2019 21:05	2.3	-1	35	Yes	IA	Nil
Long Point Road	11/02/2019 23:21	1.8	-1	35	Yes	IA	Nil
HVGC	11/02/2019 23:22	2.1	-1	55	Yes	<30	Nil

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt weather station(MTW Charlton Ridge for Long Point) using logged meteorological data;
2. Assumed noise emission limits apply for wind speeds up to 3 metres per second (at a height of 10m), or temperature inversion conditions of up to 3 degrees/100m (at a height of 10m). Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute attributed to HVO South Pit Area;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;

Table 5: $L_{A1,\ 1minute}$ HVO South - Impact Assessment Criteria – February 2019

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO South $L_{A1,\ 1min}$ dB[3,4]	Exceedance[4,5]
Knodlers Lane	11/02/2019 21:02	2.3	-1	45	Yes	39	Nil
Maison Dieu	11/02/2019 21:26	2.1	0.5	45	Yes	34	Nil
Shearers Lane	11/02/2019 21:55	3.2	-1	45	No	48	NA
Shearers Lane[6]	11/02/2019 22:26	2.9	0.5	45	Yes	37	Nil
Shearers Lane[6]	11/02/2019 22:28	2.9	0.5	45	Yes	32	Nil
Shearers Lane[6]	11/02/2019 22:29	3	0.5	45	No	33	NA
Shearers Lane[6]	11/02/2019 22:30	3	0.5	45	No	35	NA
Shearers Lane[6]	11/02/2019 22:31	3	0.5	45	No	33	NA
Kilburnie South	11/02/2019 22:53	2.8	0.5	45	Yes	IA	Nil
Jerrys Plains Village	11/02/2019 21:26	2.1	0.5	45	Yes	IA	Nil
Jerrys Plains East	11/02/2019 21:05	2.3	-1	45	Yes	IA	Nil
Long Point Road	11/02/2019 23:21	1.8	-1	45	Yes	IA	Nil
HVGC	11/02/2019 23:22	2.1	-1	Nil	NA	<30	NA

Notes:

1. Atmospheric data is sourced from the HVO Cheshunt weather station (or MTW Charlton Ridge for Long Point) using logged meteorological data;

2. Assumed noise emission limits (see Section 2.3 of this report for more information) apply for wind speeds up to 3 metres per second (at a height of 10m), or temperature inversion conditions of up to 3 degrees/100m (at a height of 10m). Criterion may or may not apply due to rounding of meteorological data values;

3. These are results for HVO South Pit Area in the absence of all other noise sources;

4. Bold results in red indicate exceedance of criteria; and

5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable; and

6. Remeasures

Table 6: $L_{Aeq,\ 15minute}$ HVO North – Impact Assessment Criteria – February 2019

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	11/02/2019 21:02	2.3	-1	35	Yes	IA	NA
Maison Dieu	11/02/2019 21:26	2.4	-1	35	Yes	IA	Nil
Shearers Lane	11/02/2019 21:55	2.3	0.5	35	Yes	IA	Nil
Kilburnie South	11/02/2019 22:53	1.1	0.5	39	Yes	IA	Nil
Jerrys Plains Village	11/02/2019 21:26	2.4	-1	36	Yes	IA	Nil
Jerrys Plains East	11/02/2019 21:05	2.3	-1	39	No	IA	Nil
Long Point Road	11/02/2019 23:21	1.8	-1	35	Yes	IA	Nil
HVGC	11/02/2019 23:22	2.1	-1	Nil	NA	IA	NA

Notes:
1. Atmospheric data is sourced from the HVO Corp. weather station (or MTW Charlton Ridge for Long Point) using logged meteorological data;
2. Noise emission limits 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 temperature inversion conditions greater than 3 degrees C/100m Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute attributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable.

Table 7: $L_{Aeq,15minute}$ HVO North - Land Acquisition Criteria – February 2019

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	11/02/2019 21:02	2.3	-1	35	Yes	IA	NA
Maison Dieu	11/02/2019 21:26	2.4	-1	35	Yes	IA	Nil
Shearers Lane	11/02/2019 21:55	2.3	0.5	35	Yes	IA	Nil
Kilburnie South	11/02/2019 22:53	1.1	0.5	39	Yes	IA	Nil
Jerrys Plains Village	11/02/2019 21:26	2.4	-1	36	Yes	IA	Nil
Jerrys Plains East	11/02/2019 21:05	2.3	-1	39	Yes	IA	Nil
Long Point Road	11/02/2019 23:21	1.8	-1	35	Yes	IA	Nil
HVGC	11/02/2019 23:22	2.1	-1	Nil	NA	IA	NA

Notes:
1. Atmospheric data is sourced from the HVO Corp. weather station (or MTW Charlton Ridge for Long Point) using logged meteorological data;
2. Noise emission limits 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 temperature inversion conditions greater than 3 degrees C/100m Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute attributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable.

Table 8: $L_{A1,\ 1Minute}$ HVO North - Impact Assessment Criteria – February 2019

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North $L_{A1,\ 1min}$ dB[3,4]	Exceedance[4,5]
Knodlers Lane	11/02/2019 21:02	2.3	-1	46	Yes	IA	Nil
Maison Dieu	11/02/2019 21:26	2.4	-1	46	Yes	IA	Nil
Shearers Lane	11/02/2019 21:55	2.3	0.5	46	Yes	IA	Nil
Kilburnie South	11/02/2019 22:53	1.1	0.5	46	Yes	IA	Nil
Jerrys Plains Village	11/02/2019 21:26	2.4	-1	46	Yes	IA	Nil
Jerrys Plains East	11/02/2019 21:05	2.3	-1	46	Yes	IA	Nil
Long Point Road	11/02/2019 23:21	1.8	-1	46	Yes	IA	Nil
HVGC	11/02/2019 23:22	2.1	-1	Nil	NA	IA	NA

Notes:
1. Atmospheric data is sourced from the HVO Corp. (or MTW Charlton Ridge for Long Point) weather station using logged meteorological data;
2. Noise emission limits 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 temperature inversion conditions greater than 3 degrees C/100m Criterion may or may not apply due to rounding of meteorological data values;
3. These are results for HVO North Pit Area in the absence of all other noise sources;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable
.

5.2 NPfI Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfI), the applicability of the low frequency modification penalty has been assessed. During February 2019 all measurements were compliant. The assessment for low frequency noise is shown in Table 9.

Table 9: Low Frequency Noise Assessment – February 2019

Location	Date and Time	Measured Site Only LA_{eq} dB (Sth/Nth)	Site Only LC_{eq} dB[1] (Sth/Nth)	Site-Only LCeq – LAeq $dB_{1,2}$ (Sth/Nth)	Result Max exceedance of ref spectrum dB[1,3] (Sth/Nth)	Penalty dB(A) [1] (Sth/Nth)
Knodlers Lane	11/02/2019 21:02	27/IA	NA/NA	NA/NA	NA/NA	NA/NA
Maison Dieu	11/02/2019 21:26	<30/IA	NA/NA	NA/NA	NA/NA	NA/NA
Shearers Lane	11/02/2019 21:55	38/IA	NA/NA	NA/NA	NA/NA	NA/NA
Kilburnie South	11/02/2019 22:53	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains Village	11/02/2019 21:26	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains East	11/02/2019 21:05	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Long Point Road	11/02/2019 23:21	LA/IA	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, this is noted as NA (not available) and no further assessment has been undertaken;
2. As per NPfI, if LCeq – LAeq ≥ 15 dB further assessment of low frequency noise required as detailed in Sections 2.4 and 3.3 of the attended noise report;
3. As per NPfI, compare measured spectrum against reference spectrum to determine if the low frequency modifying factor is triggered and application of penalty is required.

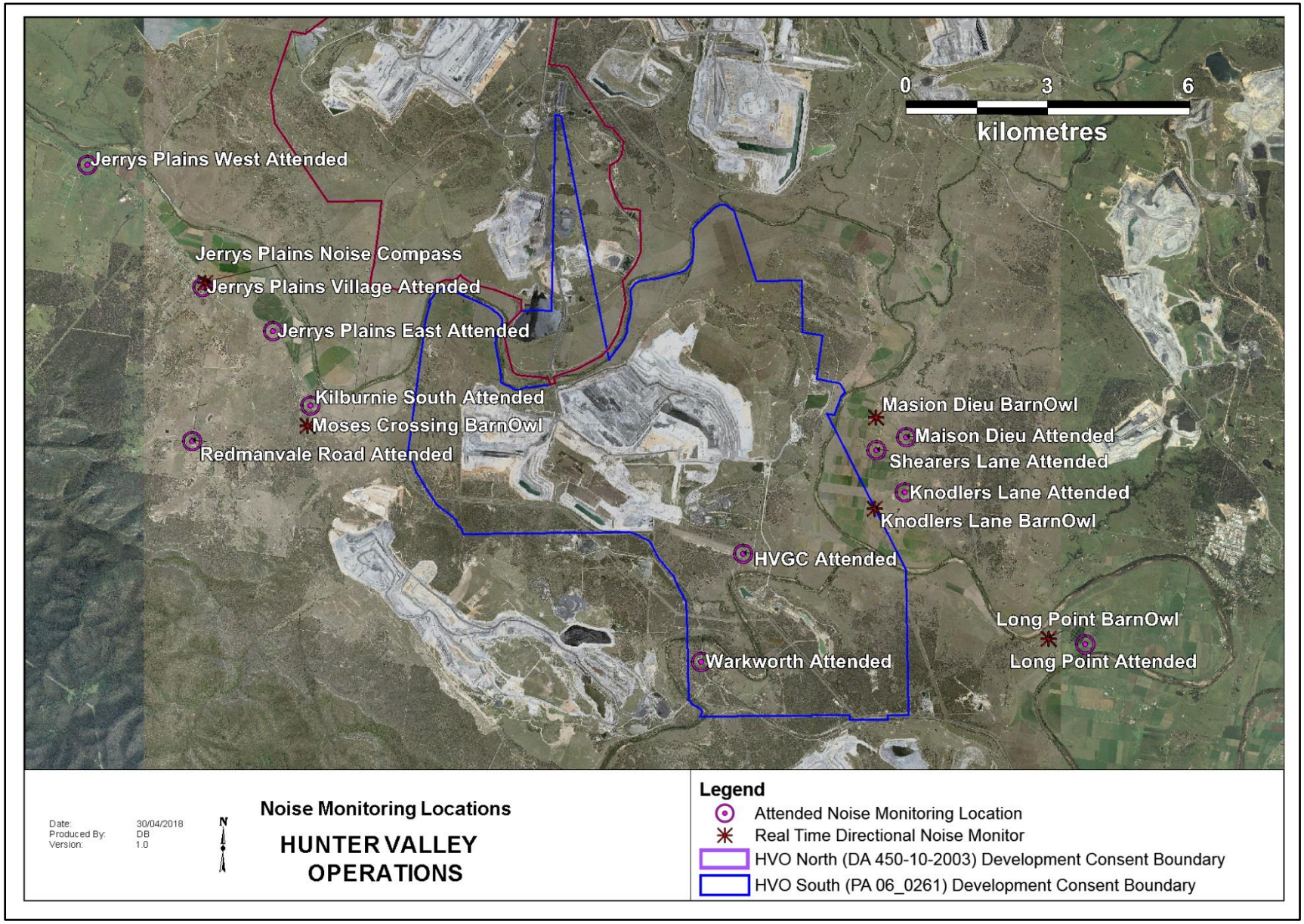

Figure 13: Noise Monitoring Location Plan

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.

6.0 OPERATIONAL DOWNTIME

During February, a total of 157 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 14.

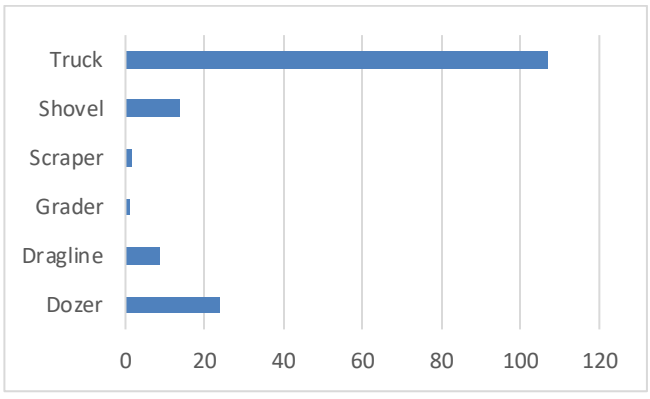

Figure 14: Operational Downtime by Equipment Type – February 2019

7.0 REHABILITATION

During February 0 Ha of land was released, 8.0 Ha of land was bulk shaped and 2.2 Ha of land was rehabilitated.

8.0 COMPLAINTS

No complaints were received during the reporting period. Details of complaints received YTD are shown in Table 10 below.

Table 10: Complaints Summary YTD

	Noise	Dust	Blast	Lighting	Other	Total
January	0	0	0	0	0	0
February	0	0	0	0	0	0
March						
April						
May						
June						
July						
August						
September						
October						
February						
December						
Total	0	0	0	0	0	0

9.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were three recordable environmental incidents;

2 February 2019 – Blown hydraulic line at HVLP
Hydraulic hose failed and caused a loss of oil onto rail tracks and bin at Hunter Valley load point. Spill kits were used to contain and clean up oil spill and remainder of oil/oily water was captured in the sump and cleaned up appropriately. The failed hose was repaired.

Appendix A: Meteorological Data

Table 11: Meteorological Data - HVO Corporate Meteorological Station – February 2019

Date	Air Temperature Maximum (°C)	Air Temperature Minimum (°C)	Relative Humidity Maximum (%)	Relative Humidity Minimum (%)	Solar Radiation Maximum (W/Sq. M)	Wind Direction Average (°)	Wind Speed Average (m/sec)	Rainfall(mm)
1/2/2019	24	13	98	51	657	134	4	0
2/2/2019	29	13	100	50	1541	137	4	1.2
3/2/2019	35	14	99	19	1034	126	3	0
4/2/2019	38	17	80	7	1016	204	3	0
5/2/2019	35	17	78	19	1226	113	4	0
6/2/2019	33	14	91	24	1350	119	4	0
7/2/2019	34	14	89	16	1085	128	3	0
8/2/2019	35	14	100	20	1468	181	2	19.4
9/2/2019	33	14	100	20	1247	274	5	2.4
10/2/2019	30	11	67	10	1053	185	2	0
11/2/2019	35	11	87	1	1046	220	2	0
12/2/2019	36	14	73	0	1048	246	4	0
13/2/2019	31	14	76	11	863	148	4	0
14/2/2019	26	12	69	30	1431	113	4	0
15/2/2019	29	10	79	22	1023	120	5	0
16/2/2019	30	15	71	27	805	127	4	0
17/2/2019	34	11	92	8	990	160	2	0
18/2/2019	39	13	86	5	964	163	2	0
19/2/2019	40	16	84	5	1304	195	4	0
20/2/2019	29	15	86	42	1235	138	4	0
21/2/2019	24	15	100	51	1309	132	4	1.8
22/2/2019	25	12	98	39	1447	129	4	0.2
23/2/2019	26	11	100	33	1525	133	4	2.8
24/2/2019	24	10	100	40	1461	131	4	0.8
25/2/2019	27	9	98	29	1485	120	4	0
26/2/2019	30	16	70	18	991	127	3	0
27/2/2019	30	11	88	26	1310	114	4	0
28/2/2019	30	10	97	22	1253	108	3	0

"-" Indicates that data w as not available due to technical issues.

HUNTER VALLEY
OPERATIONS

Monthly Environmental Monitoring Report

Hunter Valley Operations

March 2019

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Figures

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	**Environment & Community Officer**	**Draft**	**25/01/2019**

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 1st March to 31st March 2019.

2.0 AIR QUALITY

2.1 Meteorological Monitoring

HVO maintains two meteorological stations; '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 2019 trend and historical trend are shown in Figure 1.

Table 1: Monthly Rainfall HVO

2019	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
March	154.6	243

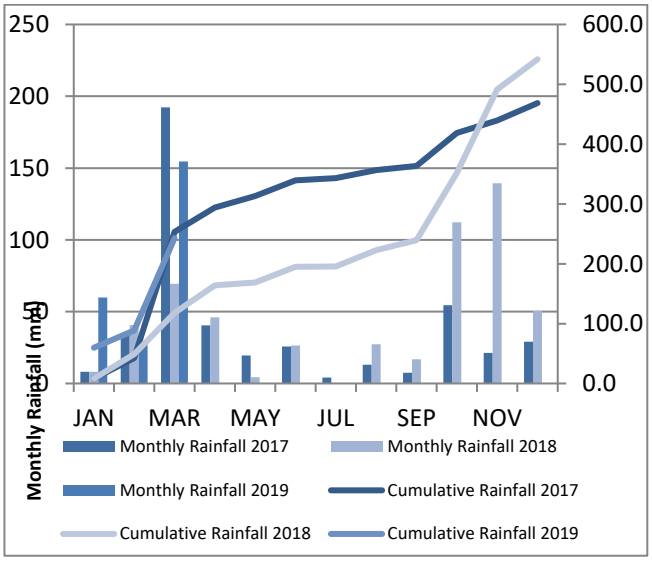

Figure 1: Rainfall Summary 2019

2.1.2 Wind Speed and Direction

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

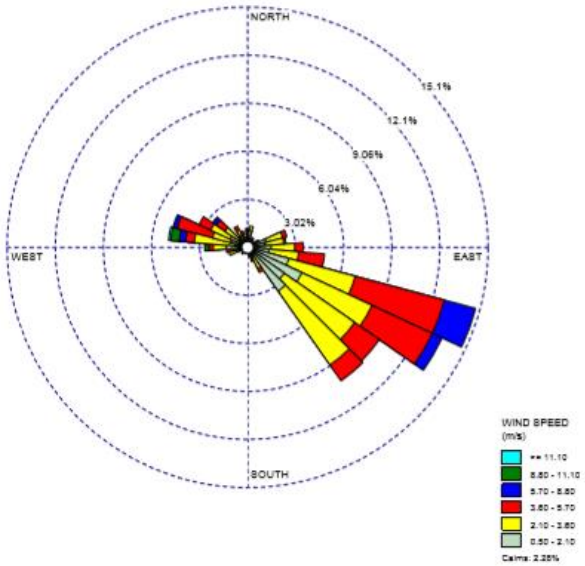

Figure 2: HVO Corporate Wind Rose – March 2019

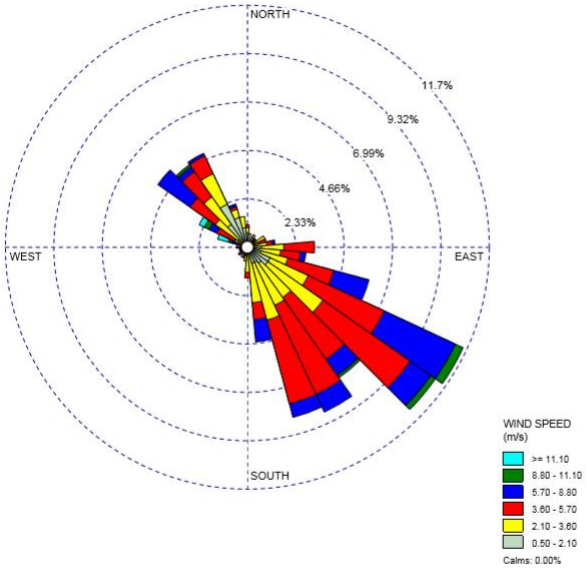

Figure 3: HVO Cheshunt Wind Rose – March 2019

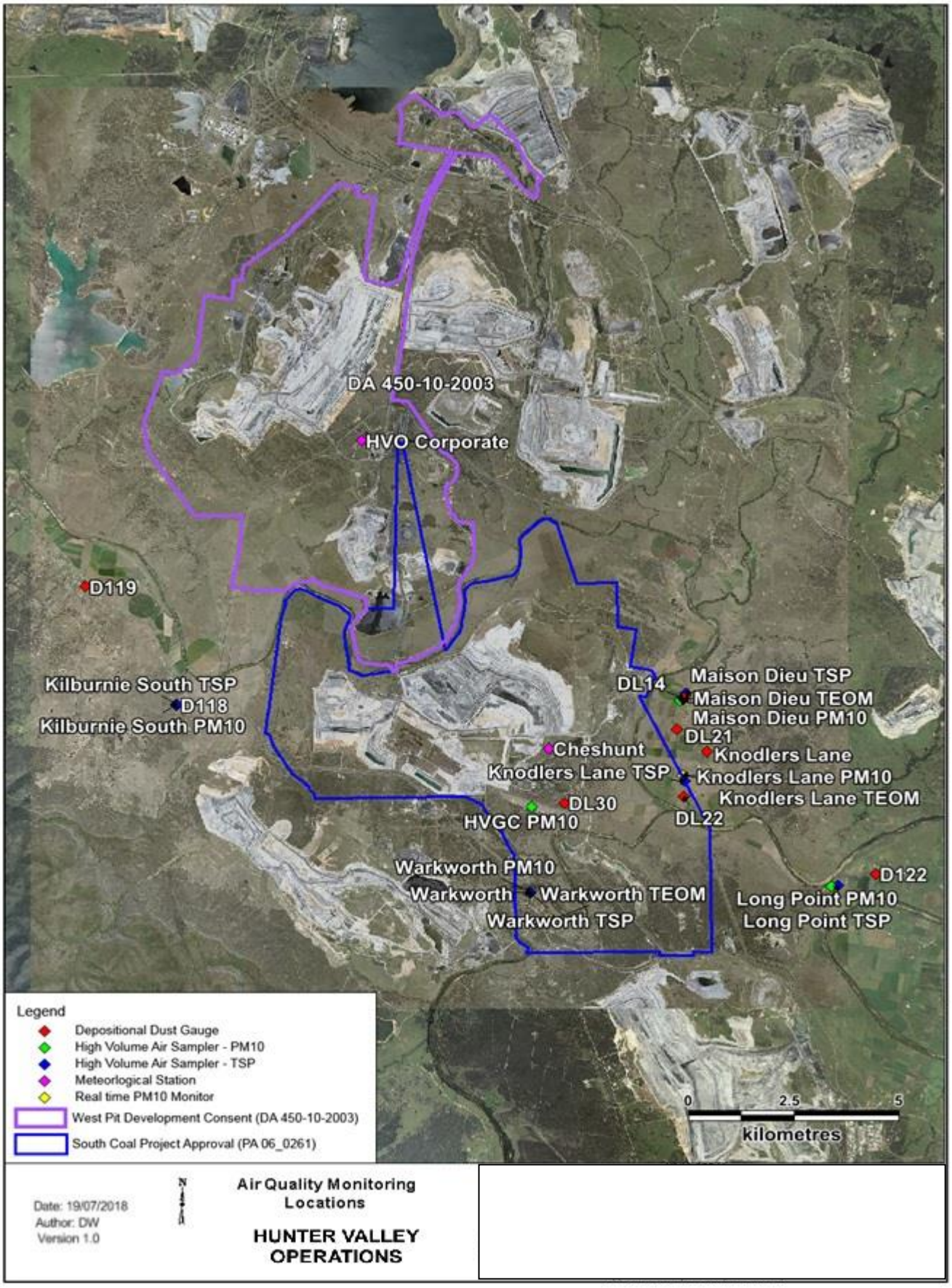

Figure 4: Air Quality Monitoring Location Plan

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 year-to-date average and the annual impact assessment criteria.

During the reporting period the D118, D119, Warkworth and DL22 monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m^2 per month.

The field notes associated with the D118, D119 and Warkworth monitor's results indicates no evidence to suggest that these result were contaminated and will be included in the annual average calculation.

Field notes for DL22 state that the sample was contaminated with insects and was brown and turbid.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2019 Annual Review.

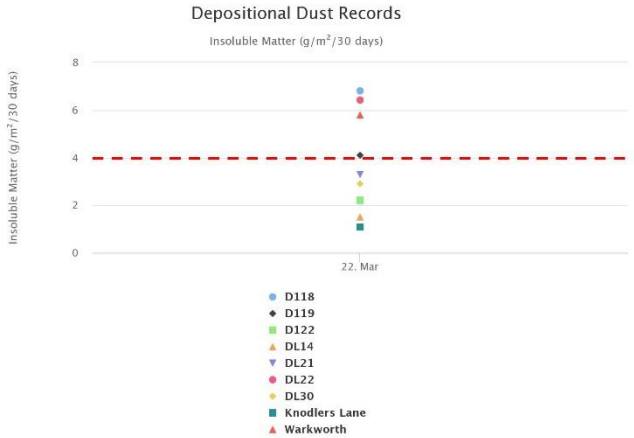

Figure 5: Depositional Dust Results – March 2019

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 (PM_{10}). 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 PM_{10} Results

Figure 6 shows individual PM_{10} results at each monitoring station against the short term impact assessment criteria of 50 µg/m3.

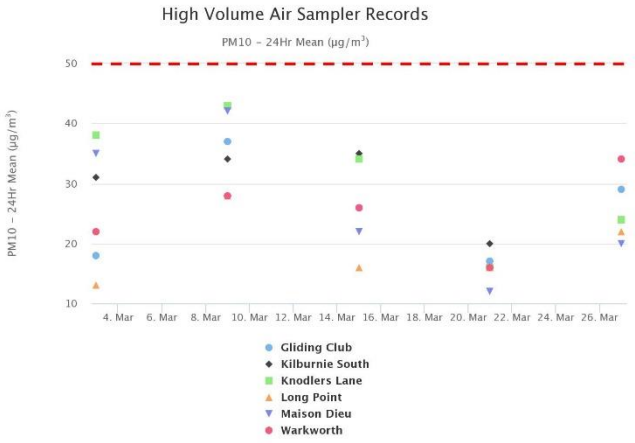

Figure 6: Individual PM_{10} Results – March 2019

Figure 7 shows the year to date annual average PM_{10} results. An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2019 Annual Review.

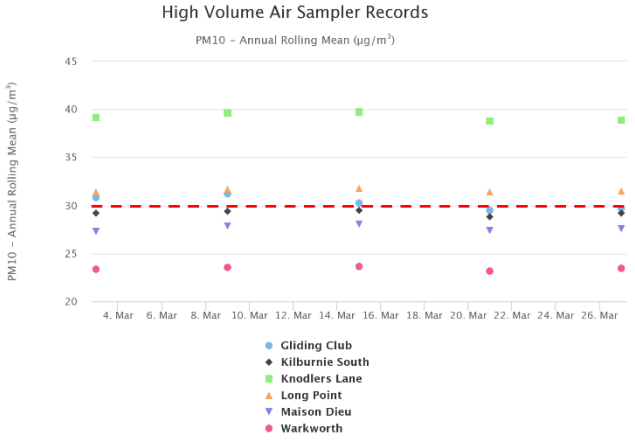

Figure 7: Year to Date Average PM_{10} – March 2019

2.3.2 TSP Results

Figure 8 shows the annual average TSP results compared against the long term impact assessment criteria of 90µg/m^3.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2019 Annual Review.

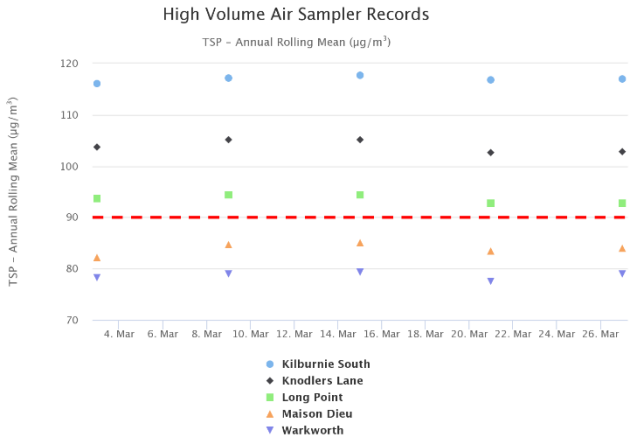

Figure 8: Year to Date Average Total Suspended Particulates – March 2019

2.3.3 Real Time PM_{10} Results

Hunter Valley Operations maintains a network of real time PM_{10} 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_{10} monitoring are used as a reactive measure to guide mining operations to ensure compliance with the relevant conditions of the project approval.

Results for real time dust sampling is shown in Figure 9**,** including the daily 24 hour average PM_{10} result and the year to date 24 hour PM_{10} annual average.

Table 2 shows the exceedances for real time PM_{10} monitoring for March.

2.3.4 Real Time Alarms for Air Quality

During March the real time monitoring system generated 140 automated air quality related alarms. 24 were related to adverse weather conditions and 116 alarms relating to PM_{10}.

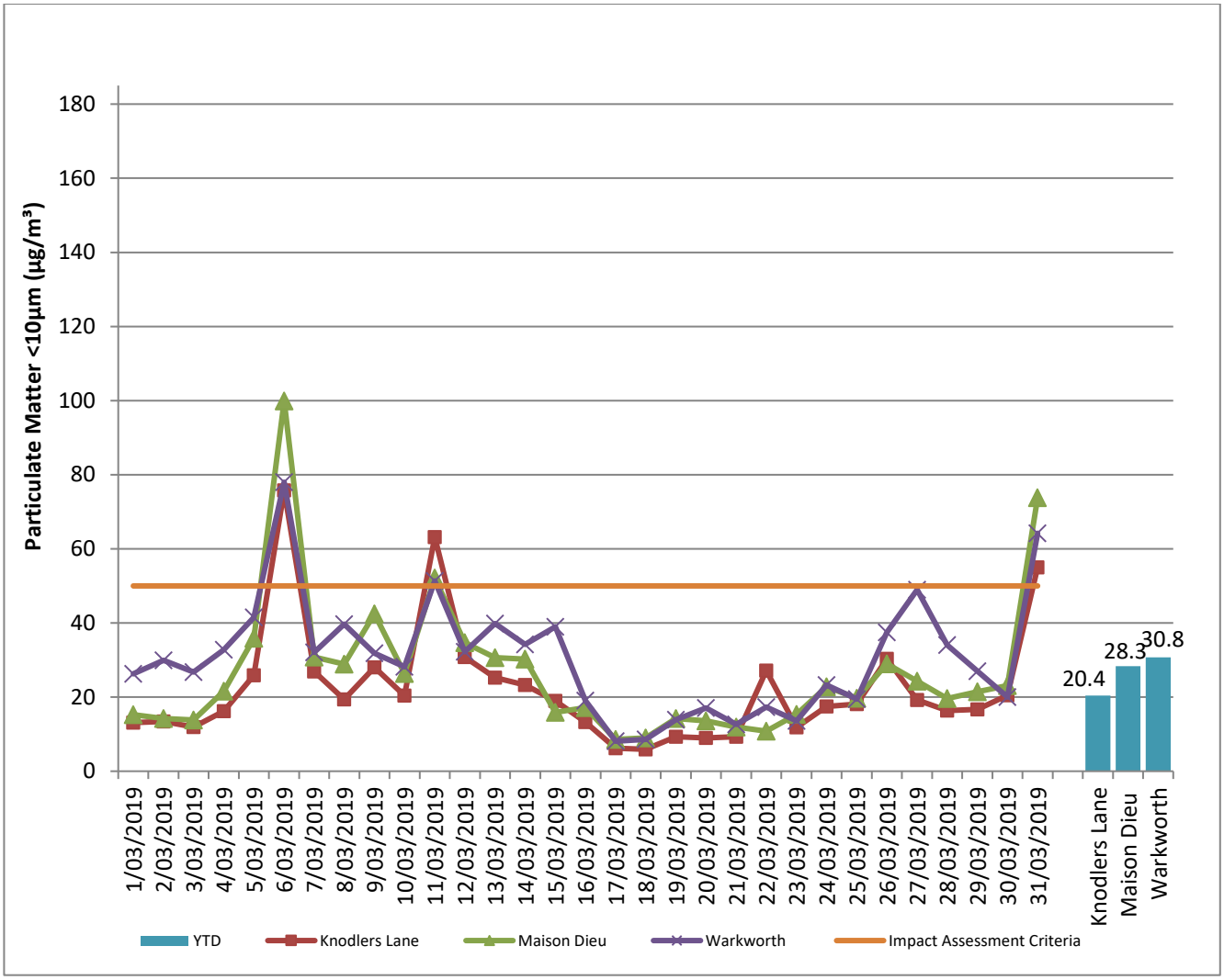

Figure 9: Real Time PM_{10} 24hr average and YTD average – March 2019

Table 2: Real-time PM10 Investigation Results

Date	Site	Total Measured Result (µg/m3)	Estimated contribution from HVO (µg/m3 / %)	Discussion
6/03/2019	Knodlers Lane TEOM	75.8	0.7µg/m3 Or 0.9%	An internal investigation determined HVO maximum potential contribution to be in the order of 0.7ug/m3 or 0.9% of the total measured based on prevailing wind conditions and upwind monitoring results.
6/03/2019	Maison Dieu TEOM	99.9	24.8µg/m3 Or 24.8%	An internal investigation determined HVO maximum potential contribution to be in the order of 24.8ug/m3 or 24.8% of the total measured based on prevailing wind conditions and upwind monitoring results.
6/03/2019	Warkworth TEOM	78.0	2.9µg/m3 Or 3.6%	An internal investigation determined HVO maximum potential contribution to be in the order of 2.9ug/m3 or 3.6% of the total measured based on prevailing wind conditions and upwind monitoring results.
11/03/2019	Maison Dieu TEOM	52.1	9.5µg/m3 Or 18.2%	An internal investigation determined HVO maximum potential contribution to be in the order of 9.5ug/m3 or 18.2% of the total measured based on prevailing wind conditions.
11/03/2019	Knodlers Lane	63.2	15.8 µg/m3 Or 25.1%	An internal investigation determined HVO maximum potential contribution to be in the order of 15.8ug/m3 or 25.1% of the total measured based on prevailing wind conditions.
11/03/2019	Warkworth TEOM	51.4	19.0 µg/m3 Or 36.9%	An internal investigation determined HVO maximum potential contribution to be in the order of 19.0 ug/m3 or 36.9% of the total measured based on prevailing wind conditions.

31/03/2019	Knodlers Lane TEOM	55.0	2.1µg/m3 Or 3.7%	An internal investigation determined HVO contribution to be minimal based on prevailing wind conditions and high background levels.
31/03/2019	Maison Dieu TEOM	73.8	16.8µg/m3 Or 22.7%	An internal investigation determined HVO maximum potential contribution to be in the order of 16.8ug/m3 or 22.7% of the total measured based on prevailing wind conditions and upwind monitoring results.
31/03/2019	Warkworth TEOM	64.2	7.1µg/m3 Or 11.1%	An internal investigation determined HVO maximum potential contribution to be in the order of 19ug/m3 or 29.5% of the total measured based on prevailing wind conditions and upwind monitoring results.

3.0 SURFACE WATER

3.1.1 Surface Water Monitoring

Surface water courses are sampled on a quarterly or rain event sampling regime. Water quality is evaluated through the parameters of pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS).

In the absence of licence or applicable ANZECC criteria, the 5th / 95th percentile of the available validated data record for a monitoring station are adopted as the basis for a water quality management guideline trigger as outlined in the Water Management Plan for Electrical Conductivity and pH. The 50mg/L ANZECC criteria has been adopted for TSS. Exceedances of these triggers for Quarter 4 2019 are detailed in Table 3

The location of Surface Water monitoring locations is shown in Figure 22**.**

Figure 10 to Figure 12 show the long term surface water trend (2016- current) within HVO mine dams.

Figures 13 to 21 show the long term surface water trend (2016 – current) in surrounding watercourses

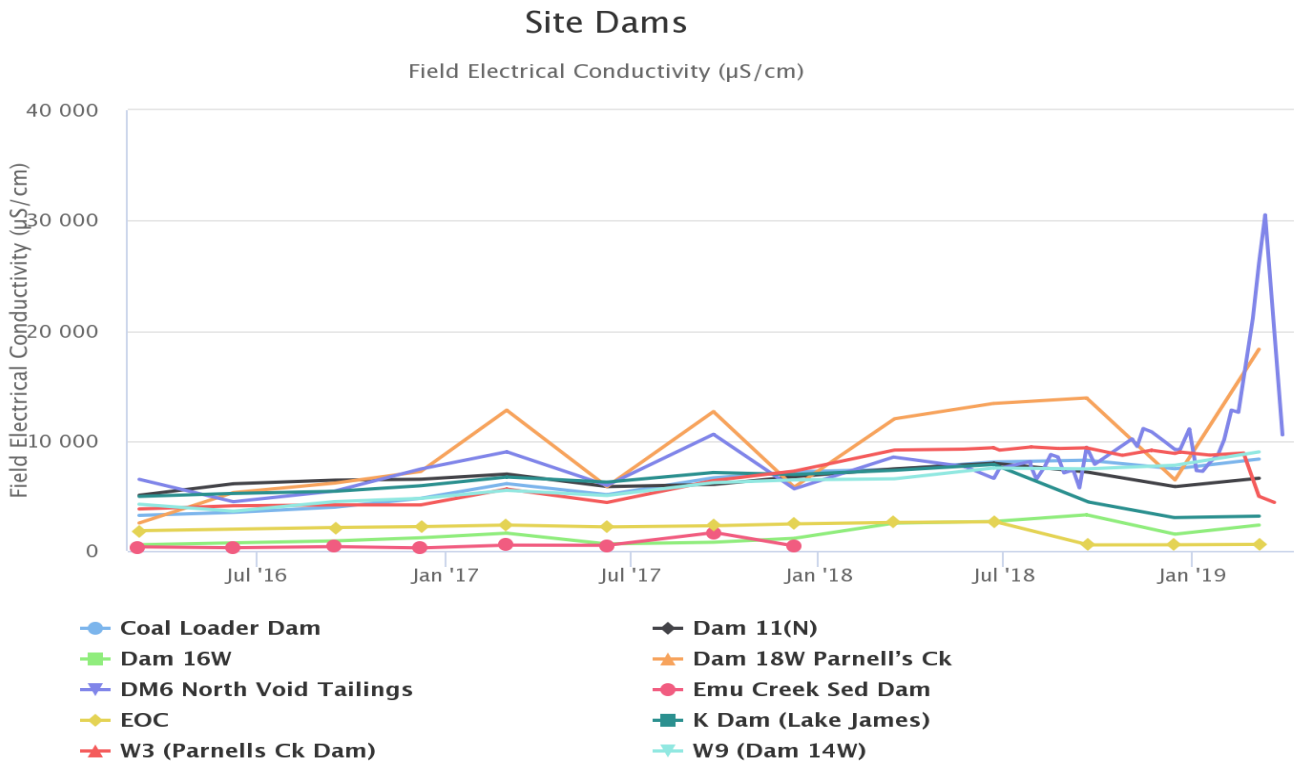

Figure 10: Site Dams Electrical Conductivity Trend – March 2019

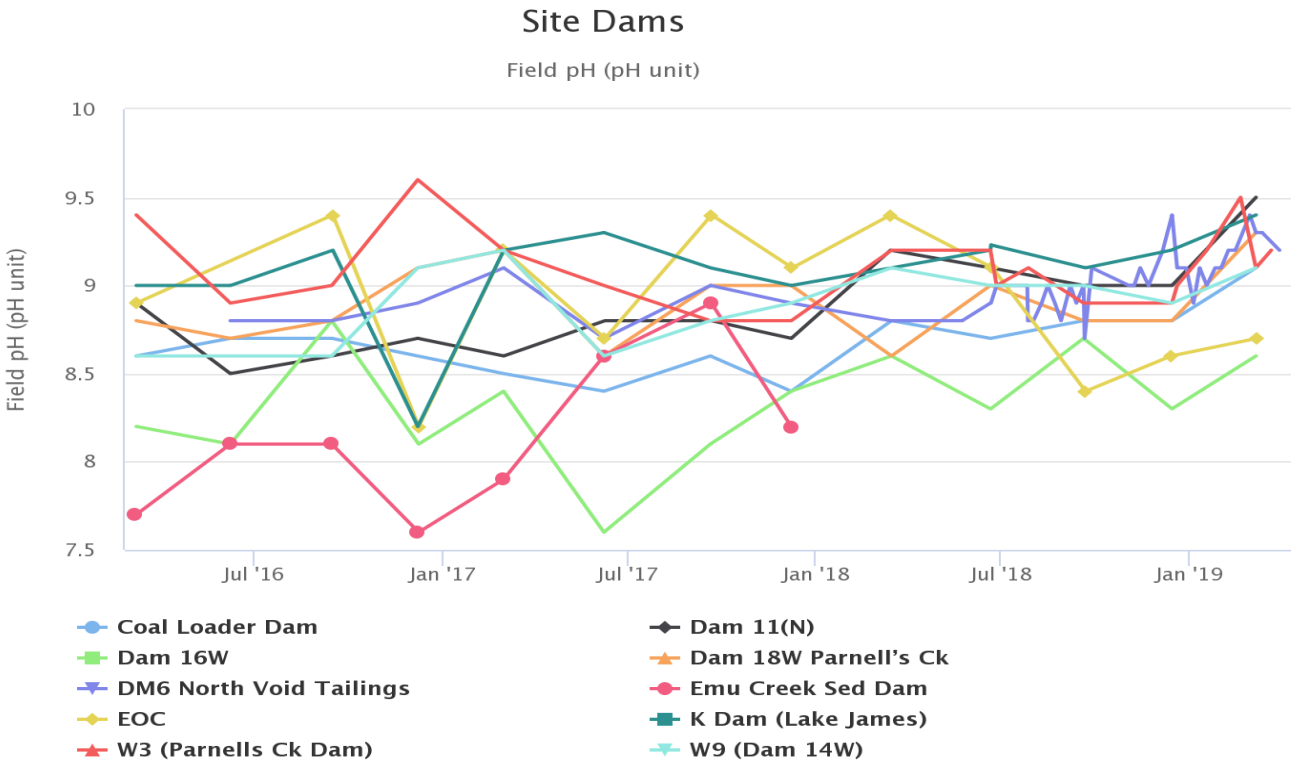

Figure 11: Site Dams pH Trend – March 2019

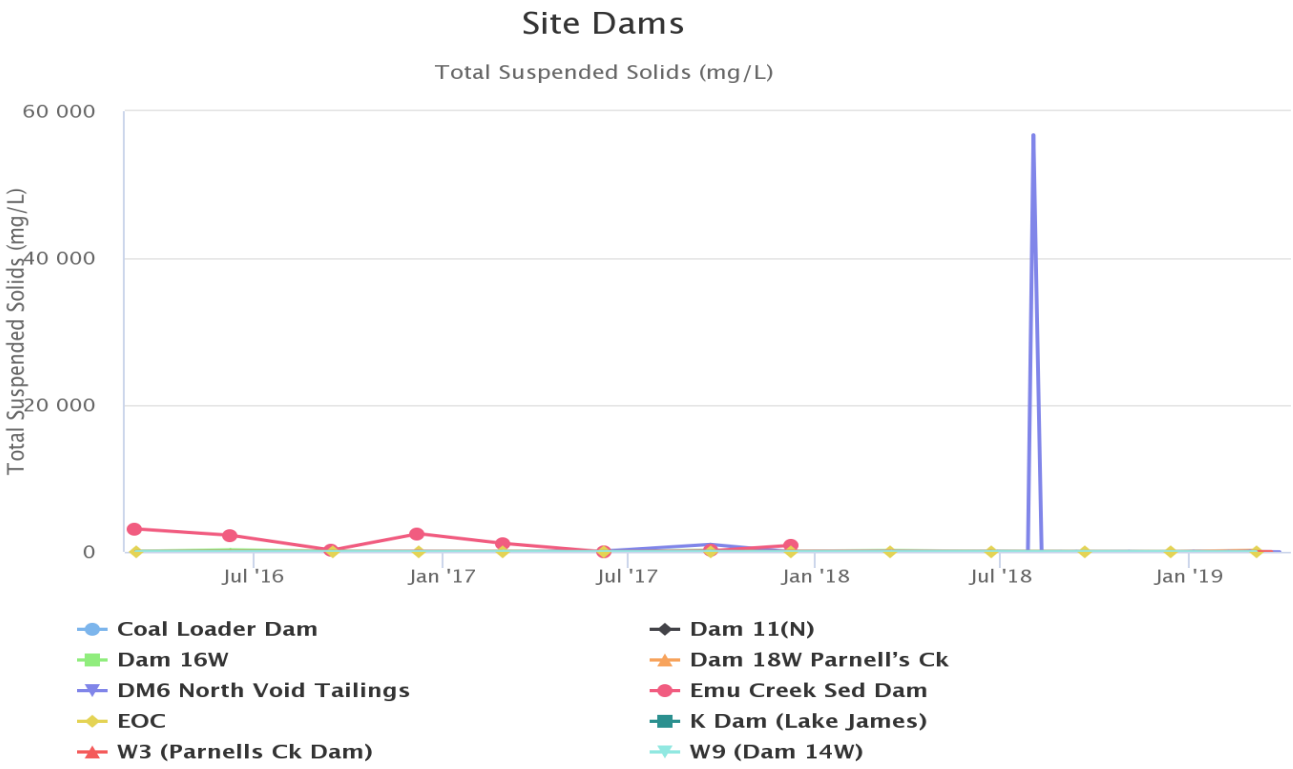

Figure 12: Site Dams Total Suspended Solids Trend – March 2019

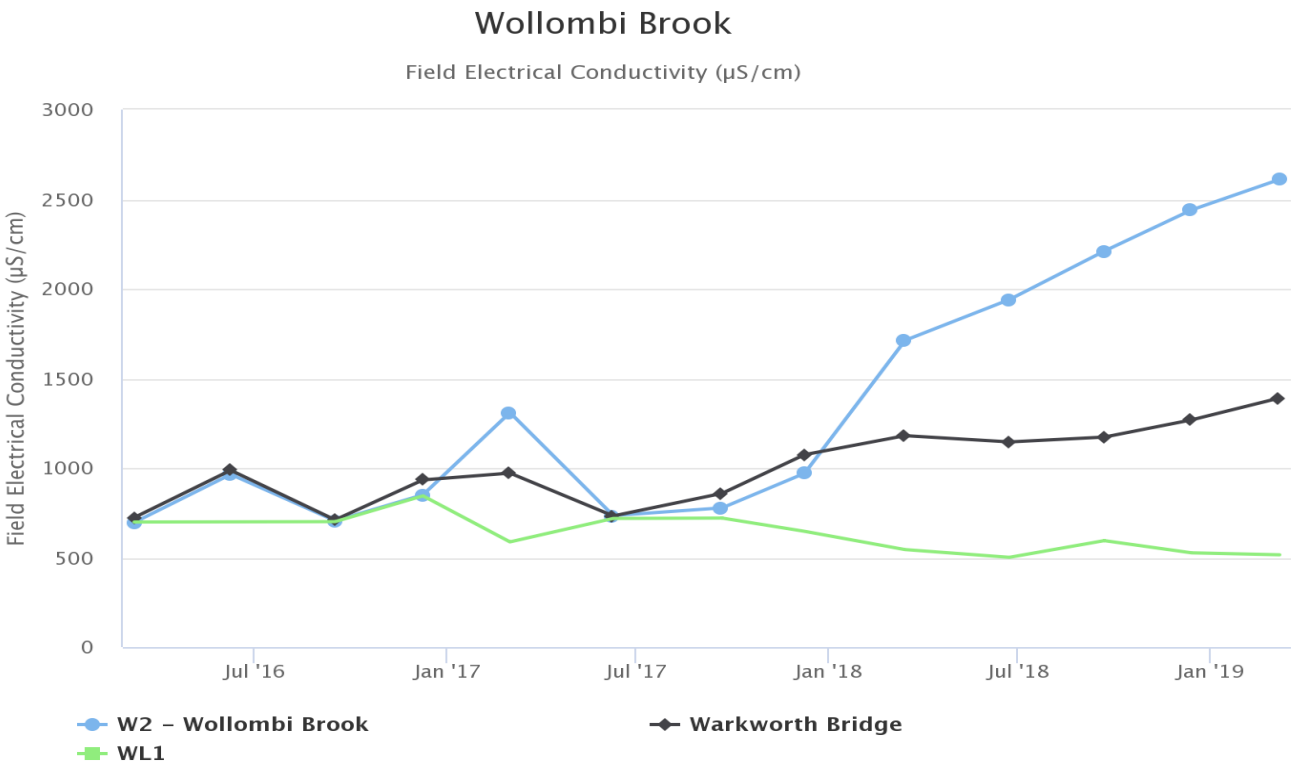

Figure 13: Wollombi Brook Electrical Conductivity Trend – March 2019

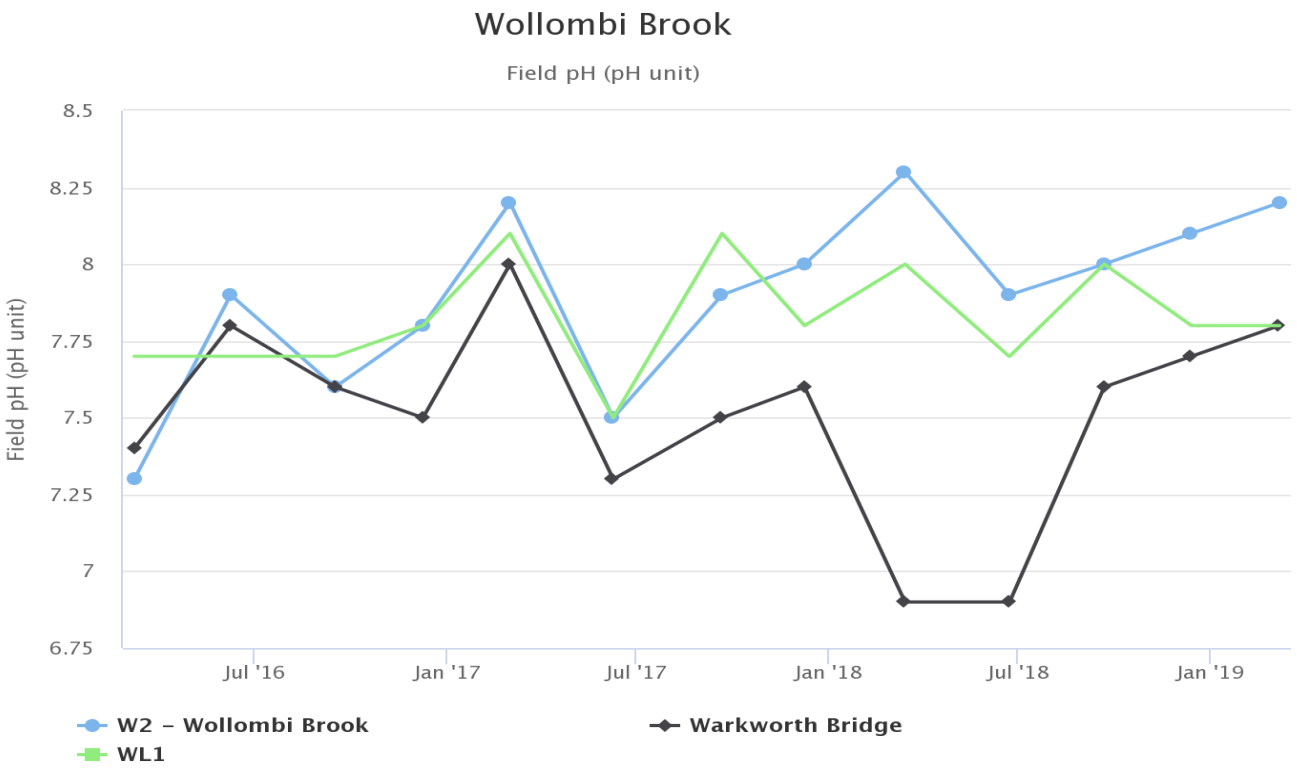

Figure 14: Wollombi Brook pH Trend – March 2019

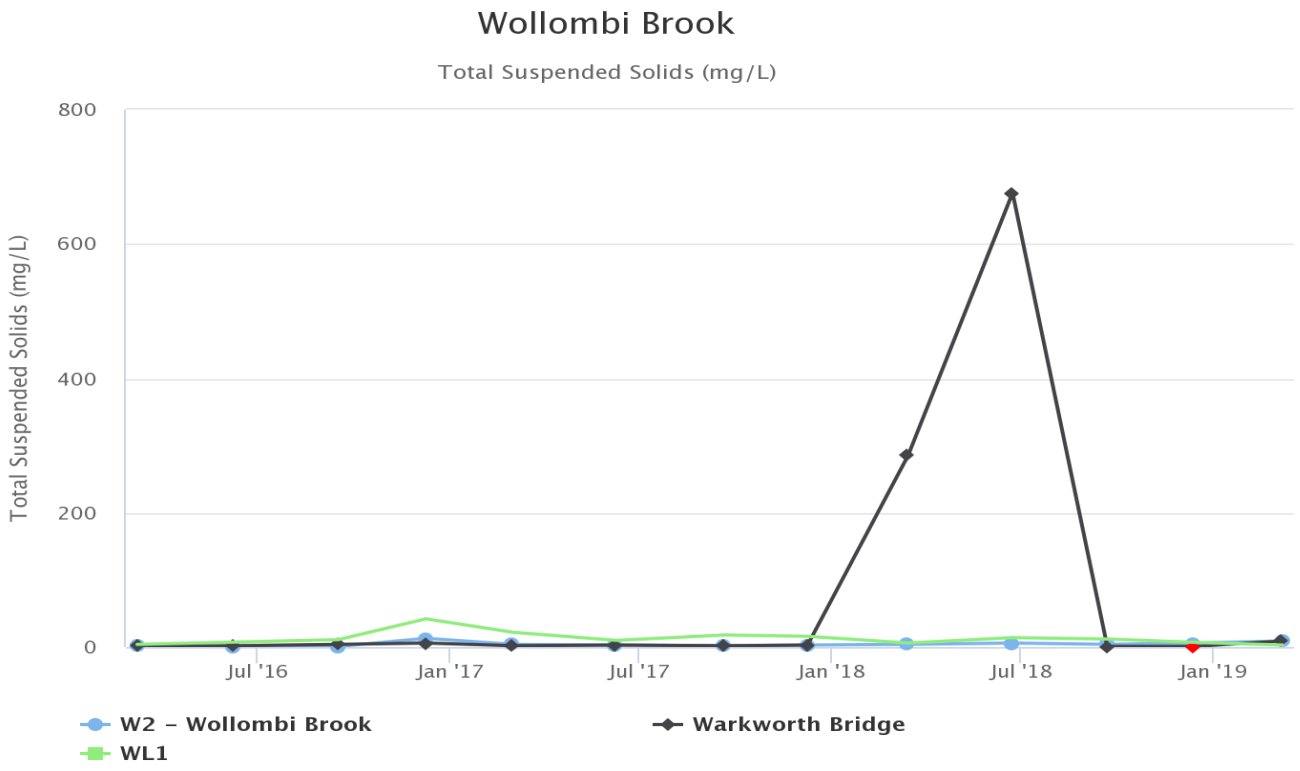

Figure 15: Wollombi Brook Total Suspended Solids Trend – March 2019

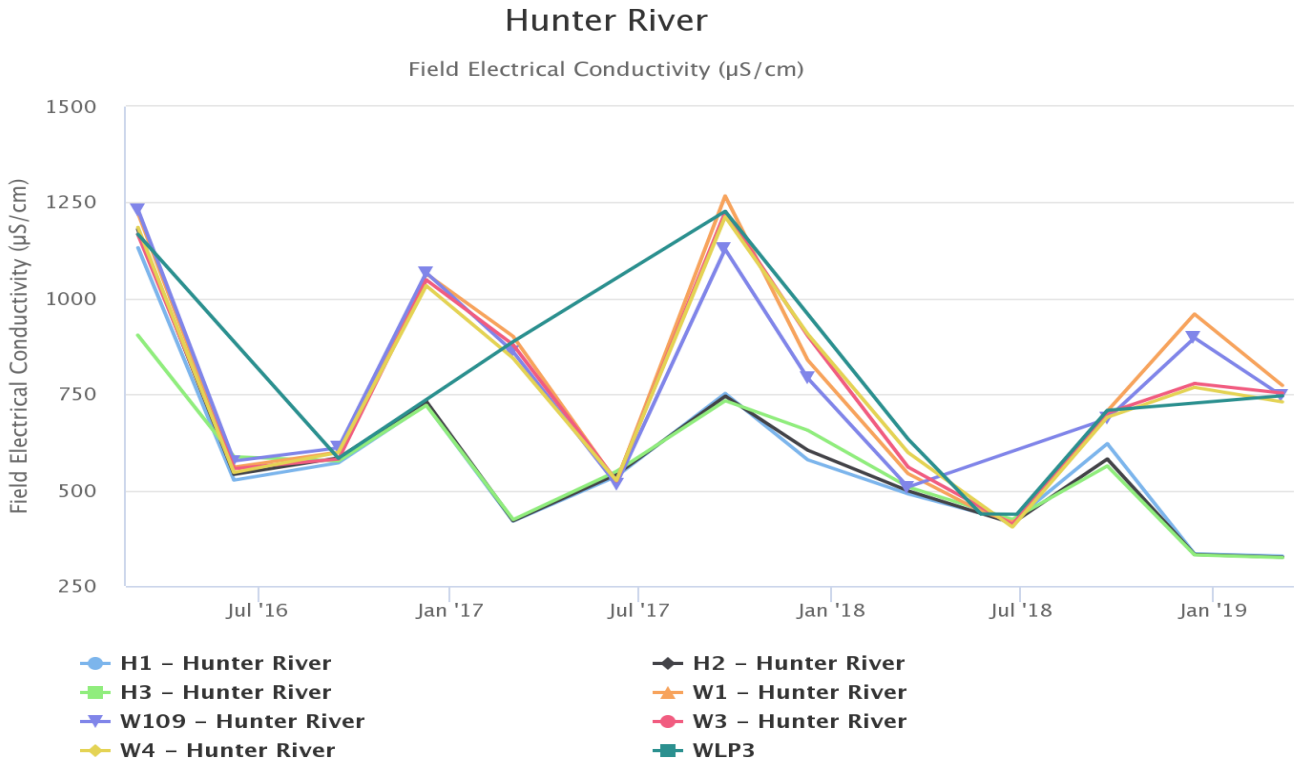

Figure 16: Hunter River Electrical Conductivity Trend – March 2019

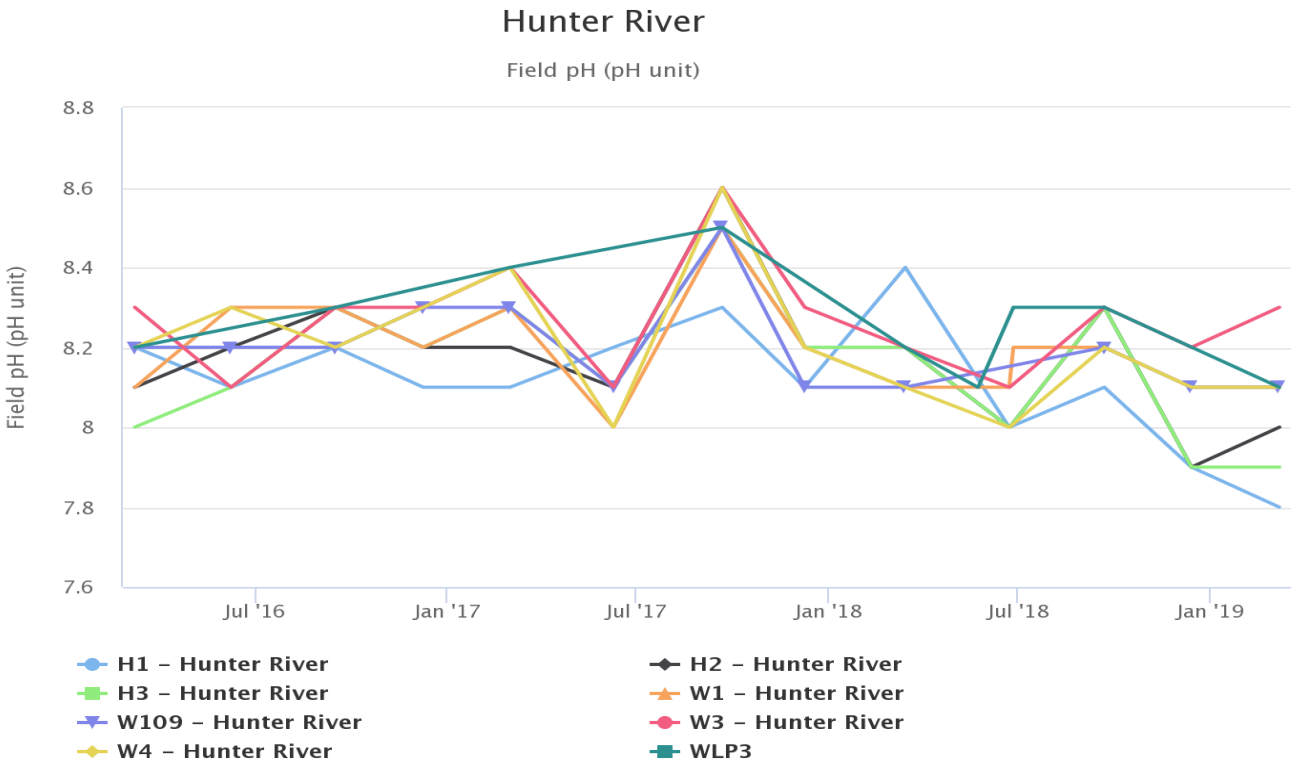

Figure 17: Hunter River pH Trend – March 2019

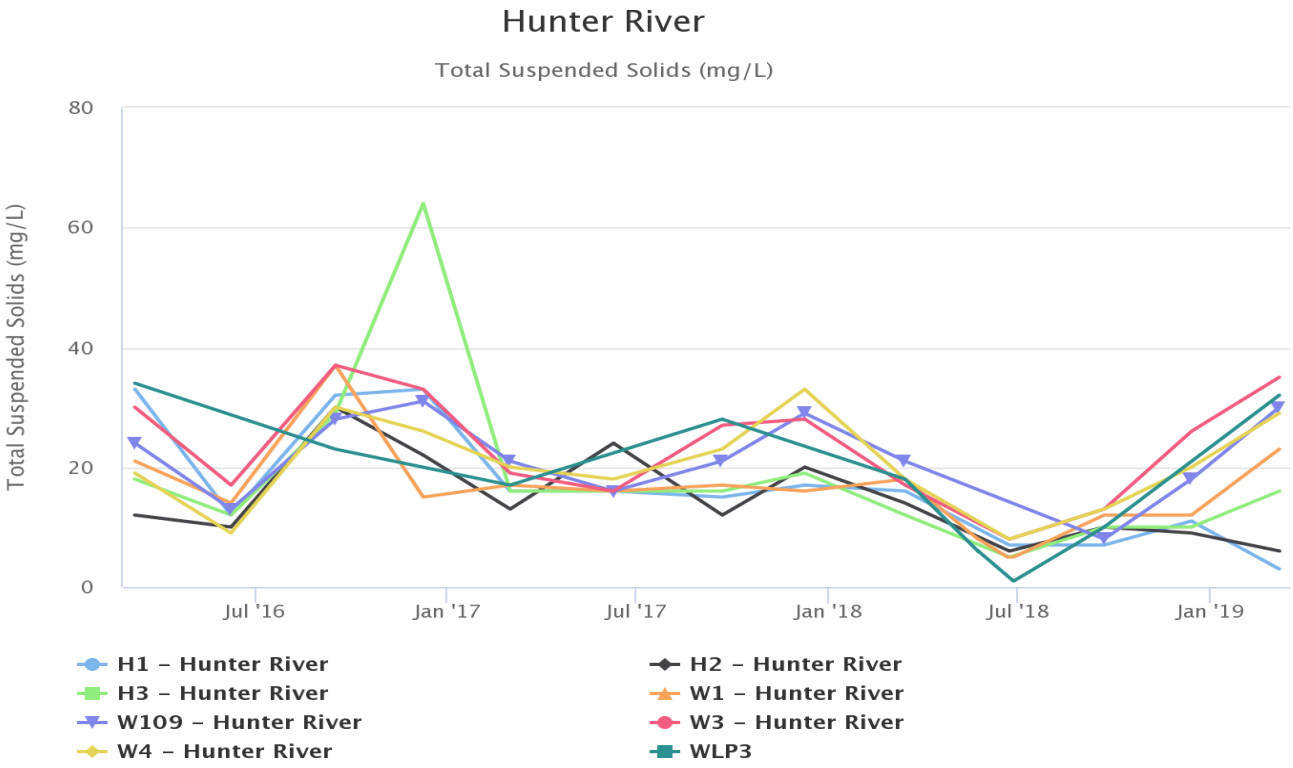

Figure 18: Hunter River Total Suspended Solids – March 2019

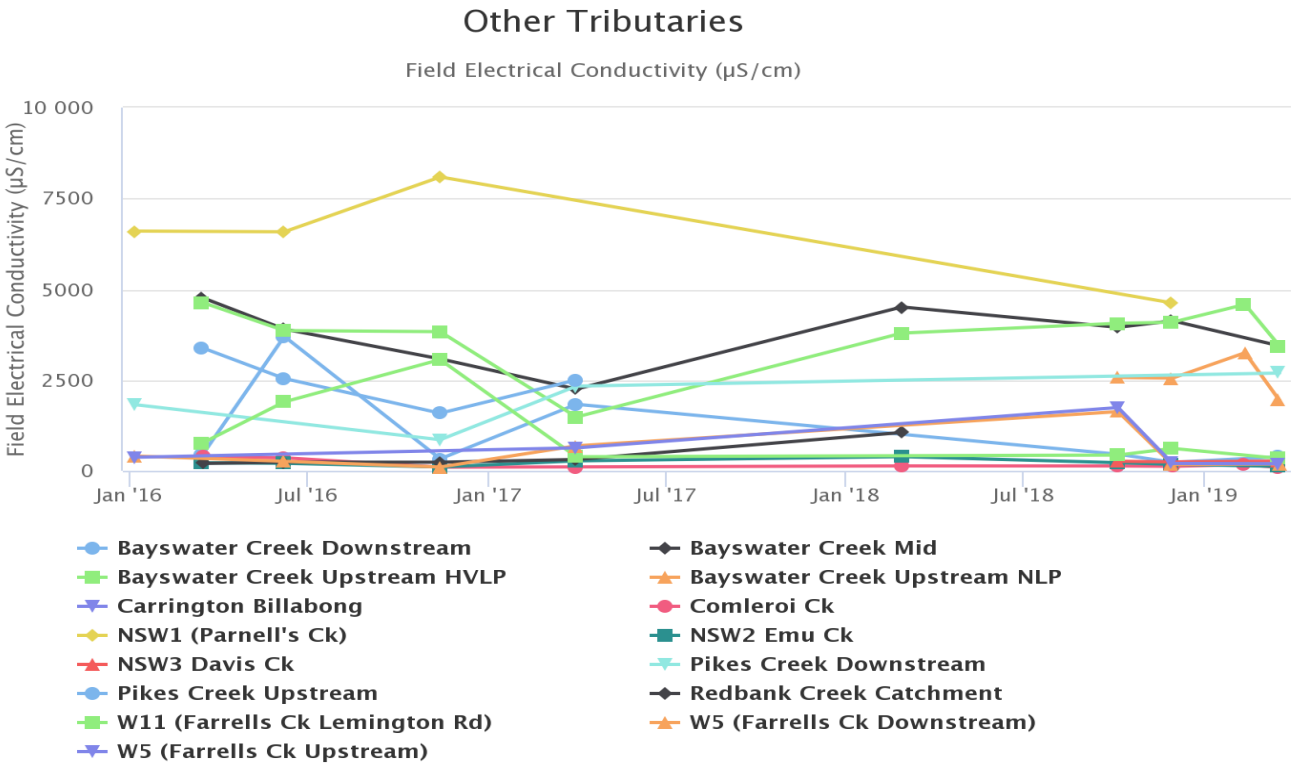

Figure 19: Other Tributaries Electrical Conductivity Trend – March 2019

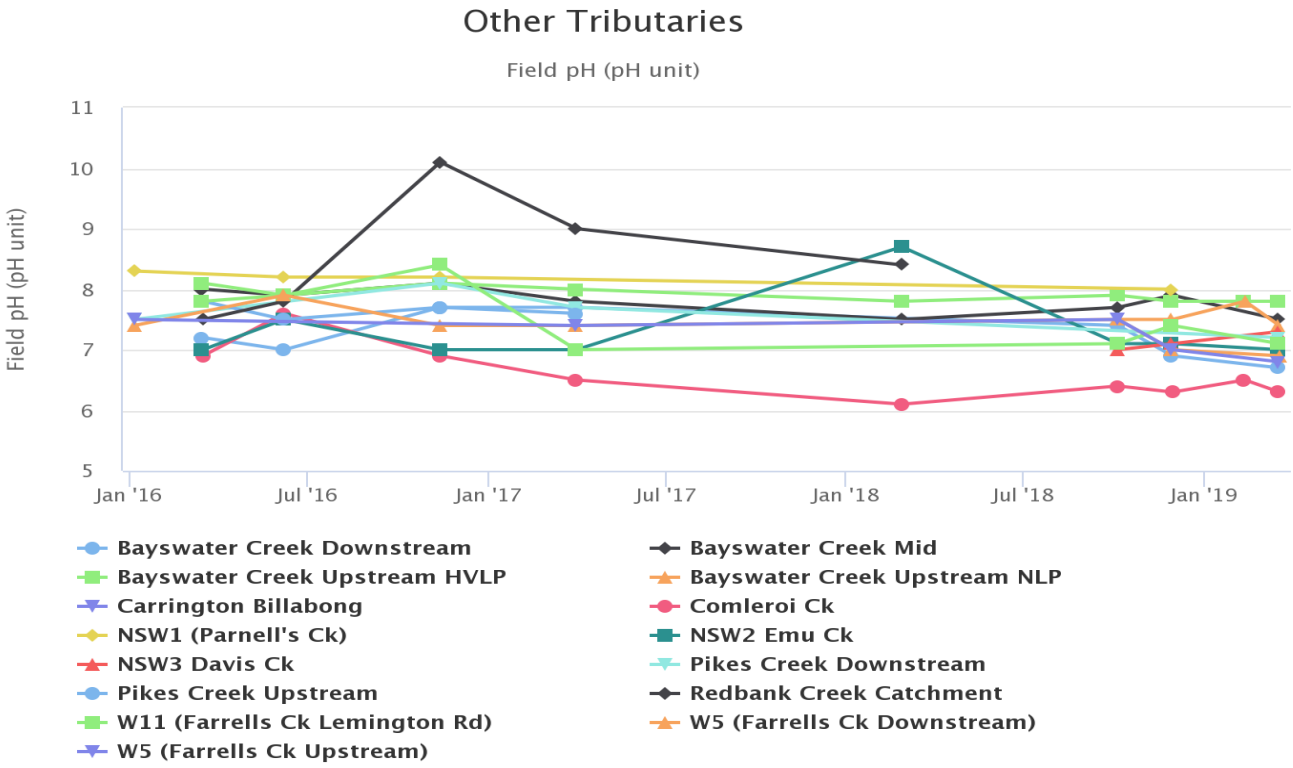

Figure 20: Other Tributaries pH Trend – March 2019

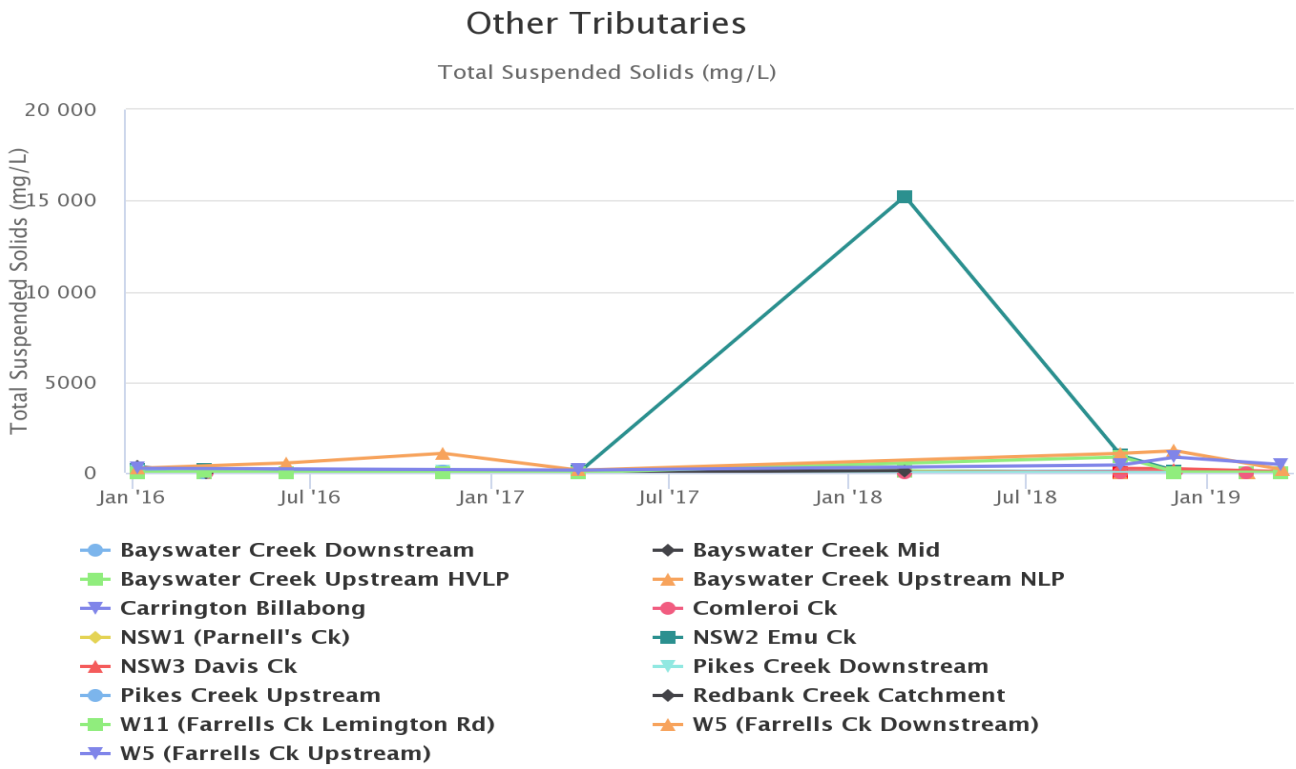

Figure 21: Other Tributaries Total Suspended Solids Trend – March 2019

3.1.2 Site Water Use

Under water allocation licences issued by the NSW Office of Water, HVO is permitted to extract water from the Hunter River. During the reporting period, HVO extracted approximately 393.2ML of water from the Hunter River.

3.1.3 HRSTS Discharge

HVO participates in the HRSTS, allowing it to 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.

3.1.4 Surface Water Trigger Limits

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.

Current internal trigger limits that have been breached are summarised in Table 3.

Table 3: Surface Water Trigger Limit Summary

Site	Date	Trigger Limit Breached	Action taken in response
H1 Hunter River	7/03/2019	pH 5th Percentile	First Breach of pH 5th Percentile trigger. Watching Brief*.
Warkworth Bridge	7/03/2019	EC 95th Percentile	Sixth exceedance of EC 95th Percentile trigger (1390us/cm). Field observations indicate that sample was taken from a pool of water as there was no flow in the Brook. Downstream monitoring (WL1) indicated a slow flow and lower EC level (515us/cm). Based on this it can be assumed that the sample taken is not representative of flows in the Brook and that there is no impact to suggest mining influence. Maintain watching Brief*.
W2 Wollombi Brook	7/03/2019	EC 95th Percentile	Fifth exceedance of EC 95th Percentile trigger (2610us/cm). Field observations indicate that sample was taken from a pool of water as there was no flow in the Brook. Downstream monitoring (WL1) indicated a slow flow and lower EC level (515us/cm). Based on this it can be assumed that the sample taken is not representative of flows in the Brook and that there is no impact to suggest mining influence. Maintain watching Brief*.
Bayswater Creek Downstream	18/03/2019	pH 5th Percentile	First exceedance of pH 5th Percentile trigger. Watching Brief*
Bayswater Creek Midstream	18/03/2019	pH 5th Percentile.	First exceedance of pH 5th Percentile trigger. Watching Brief*
Pikes Creek Downstream	18/03/2019	pH 5th Percentile.	Watching Brief*
NSW3 Davis Creek	18/03/2019	TSS 50mg/L (ANZECC Guideline)	First exceedance of TSS trigger (67mg/L). Field observations indicate that sample was taken from a pool of water as there was no flow in the creek line. EC (266us/cm) and pH (7.3) results indicate water quality is not affected by mine water. Maintain watching Brief*.
W11 (Farrells Creek Lemington Road)	18/03/2019	pH 5th Percentile	First exceedance of pH 5th Percentile trigger. Watching Brief*
W5 (Farrells Creek Upstream)	18/03/2019	TSS 50mg/L (ANZECC Guideline)	First exceedance of TSS trigger (450 mg/L). Field Observations indicated that there was flow in the creek. Refer to incident section for details.
W5 (Farrells Creek Downstream)	18/03/2019	TSS 50mg/L (ANZECC Guideline)	First exceedance of TSS trigger (177 mg/L). Field Observations indicated that there was flow in the creek. Refer to incident section for details

* = Watching Brief established pending outcomes of subsequent monitoring events. No further action required.

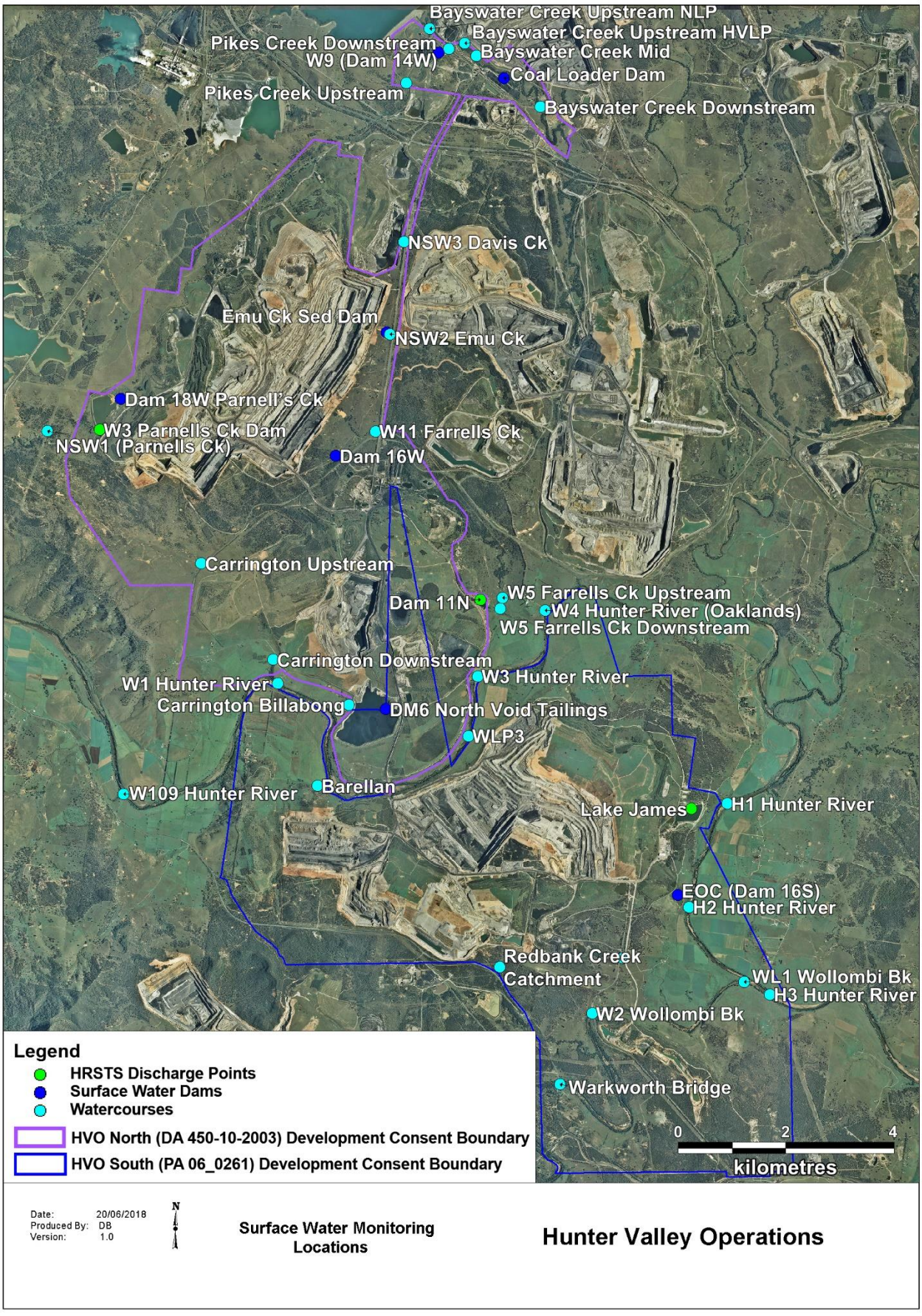

Figure 22: Surface Water Monitoring Location Plan

4.0 GROUNDWATER

4.1.1 Groundwater Monitoring

Groundwater monitoring is undertaken on a quarterly basis in accordance with the HVO Water Management Plan and Ground Water Monitoring Programme. Monitoring sites are shown in Figure 80.

Figure 23 to Figure 79 show the long term trends (2016 – current) for ground water bores monitored at HVO.

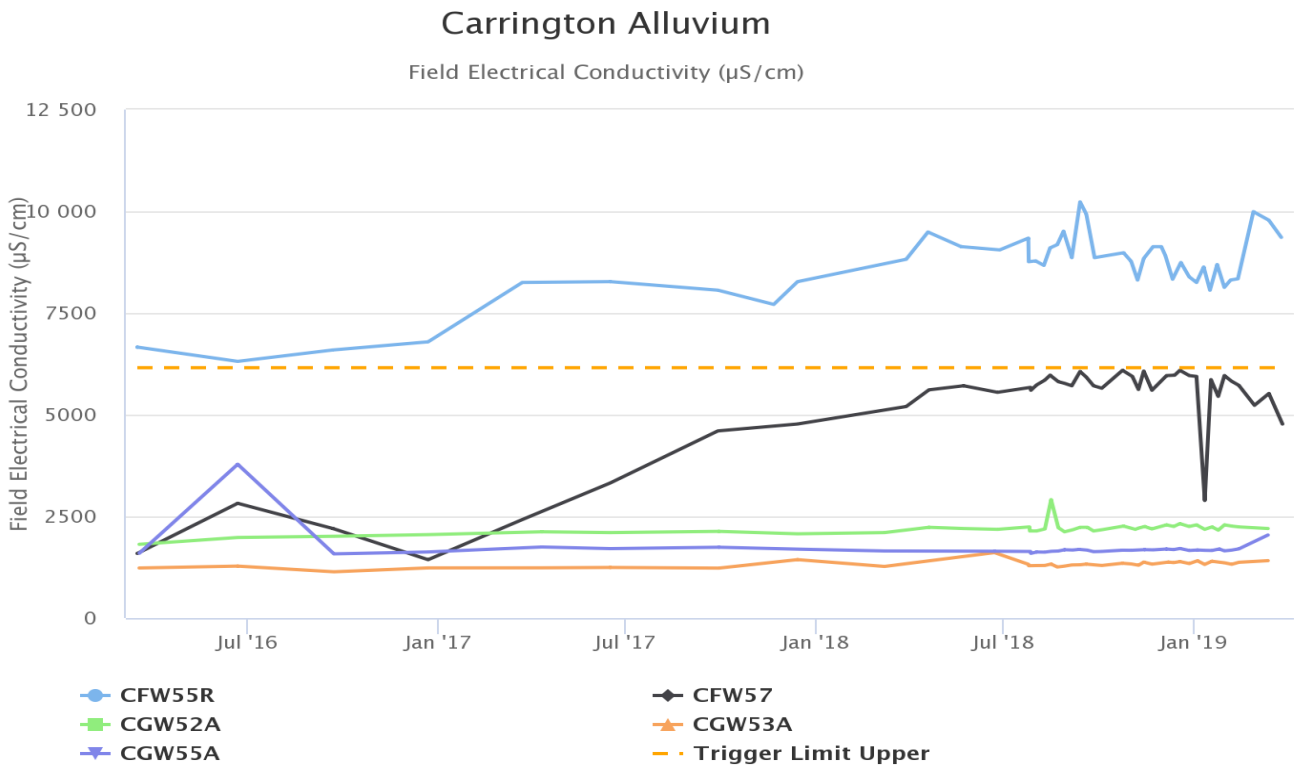

Figure 23: Carrington Alluvium Electrical Conductivity Trend – March 2019

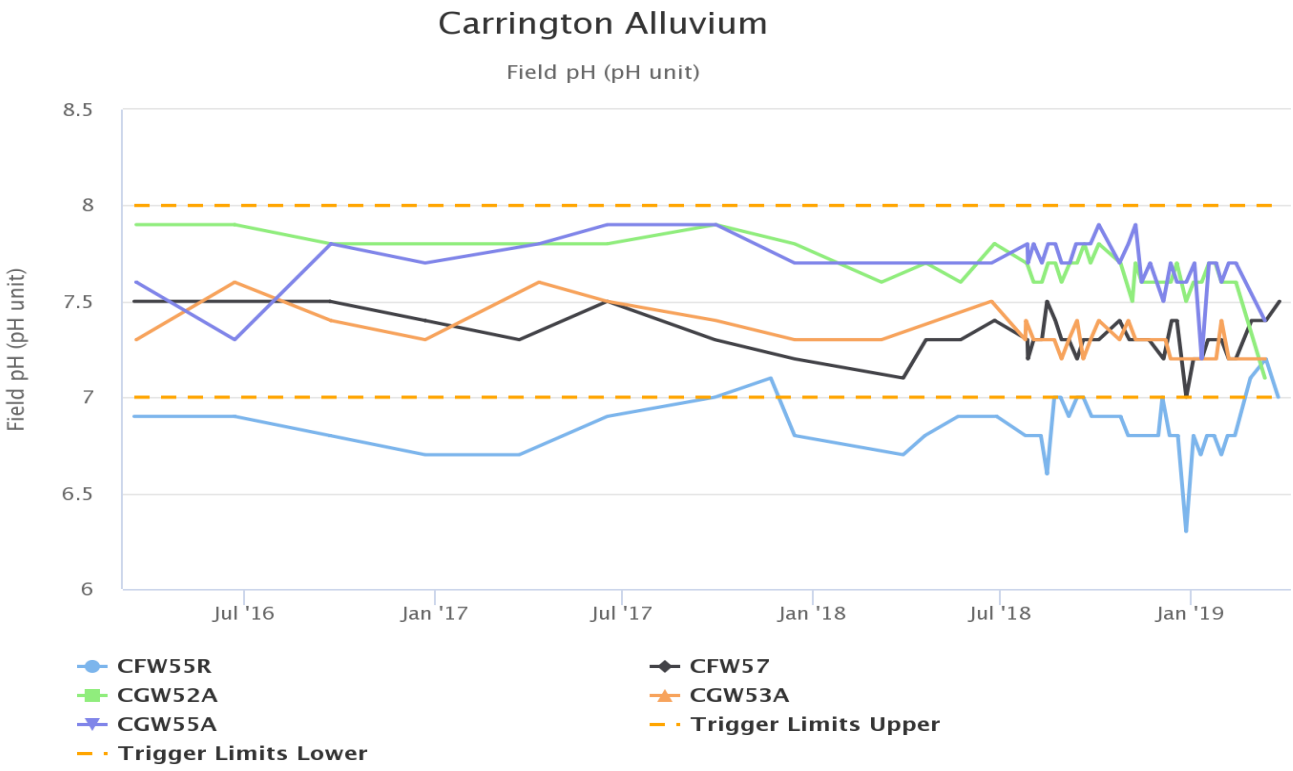

Figure 24: Carrington Alluvium pH Trend – March 2019

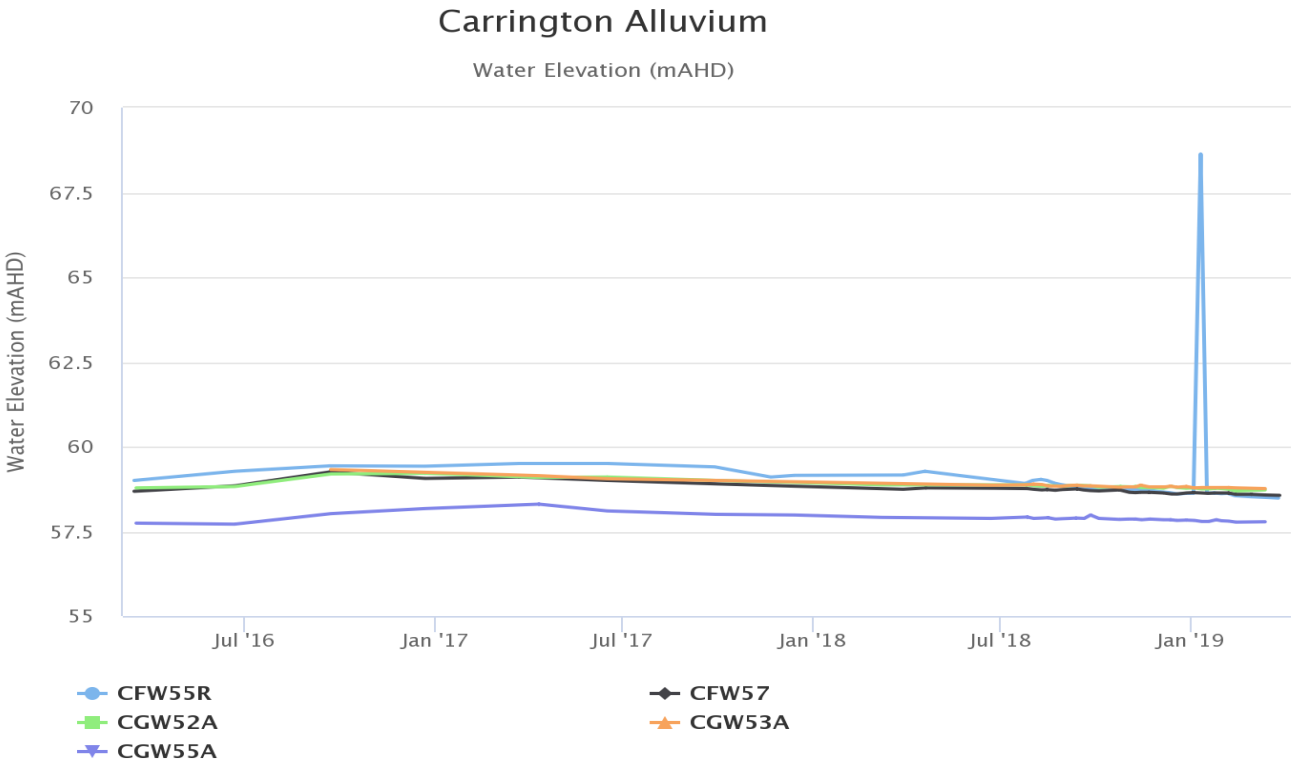

Figure 25: Carrington Alluvium Standing Water Level – March 2019

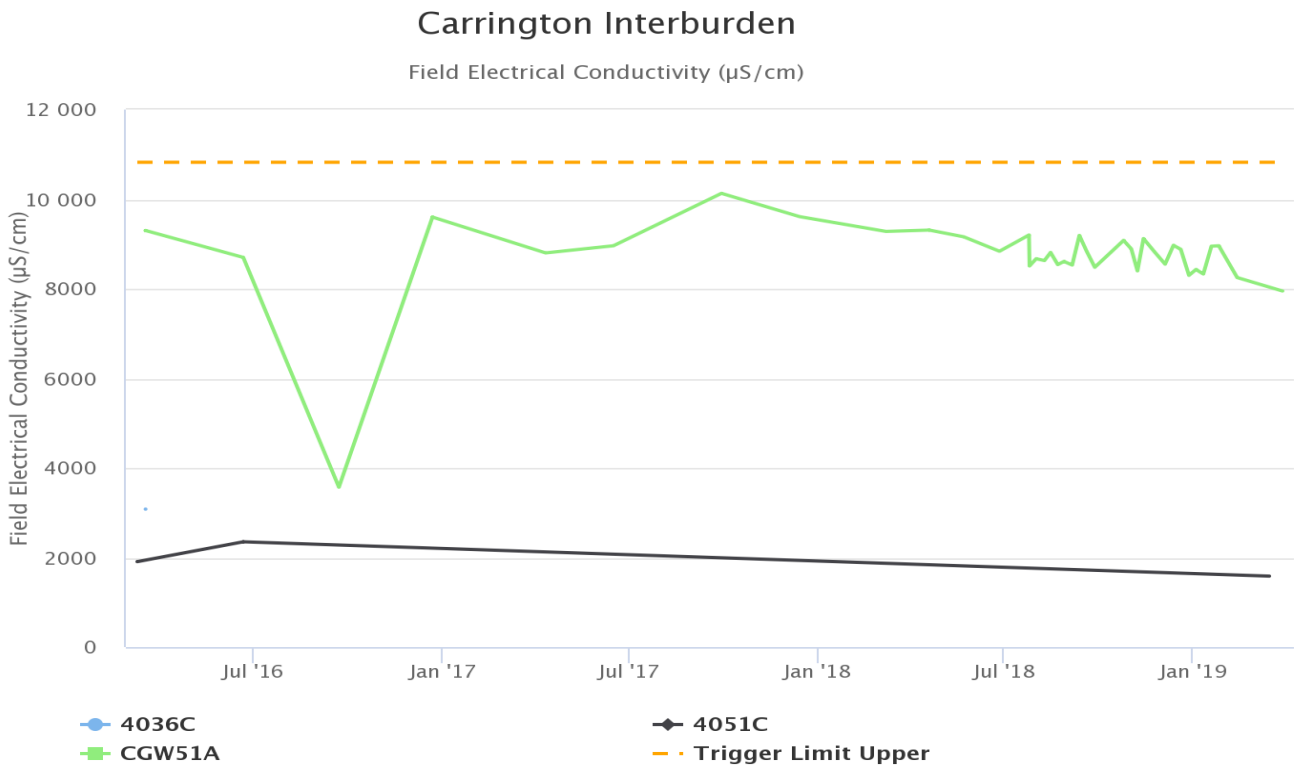

Figure 26: Carrington Interburden Electrical Conductivity Trend – March 2019

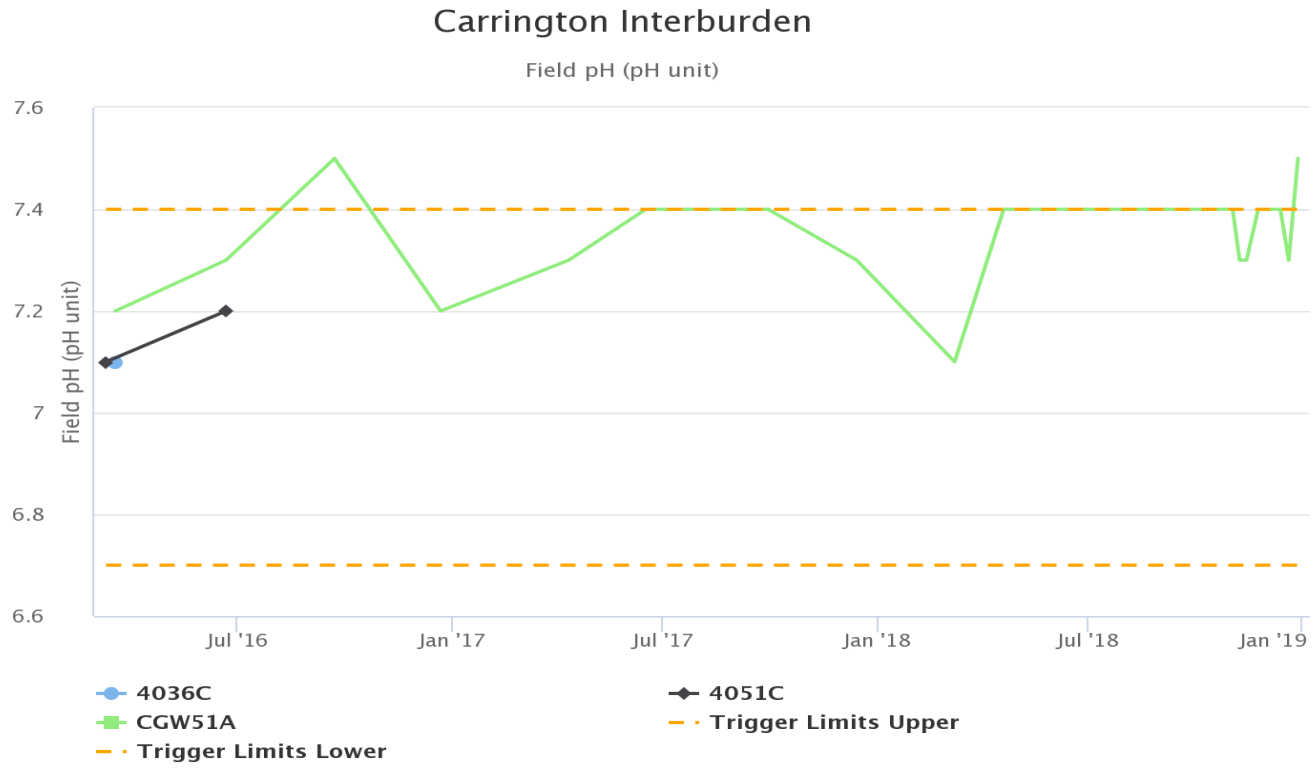

Figure 27: Carrington Interburden pH Trend – March 2019

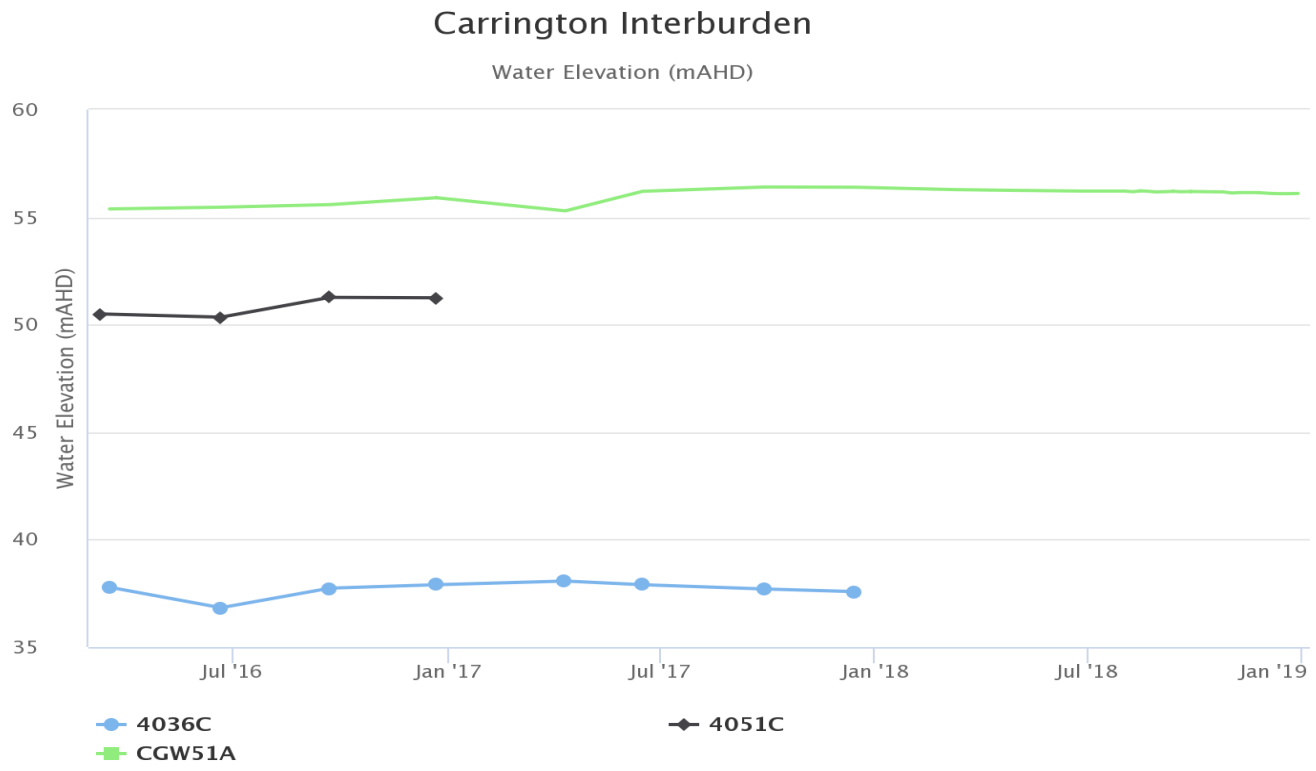

Figure 28: Carrington Interburden Standing Water Level – March 2019

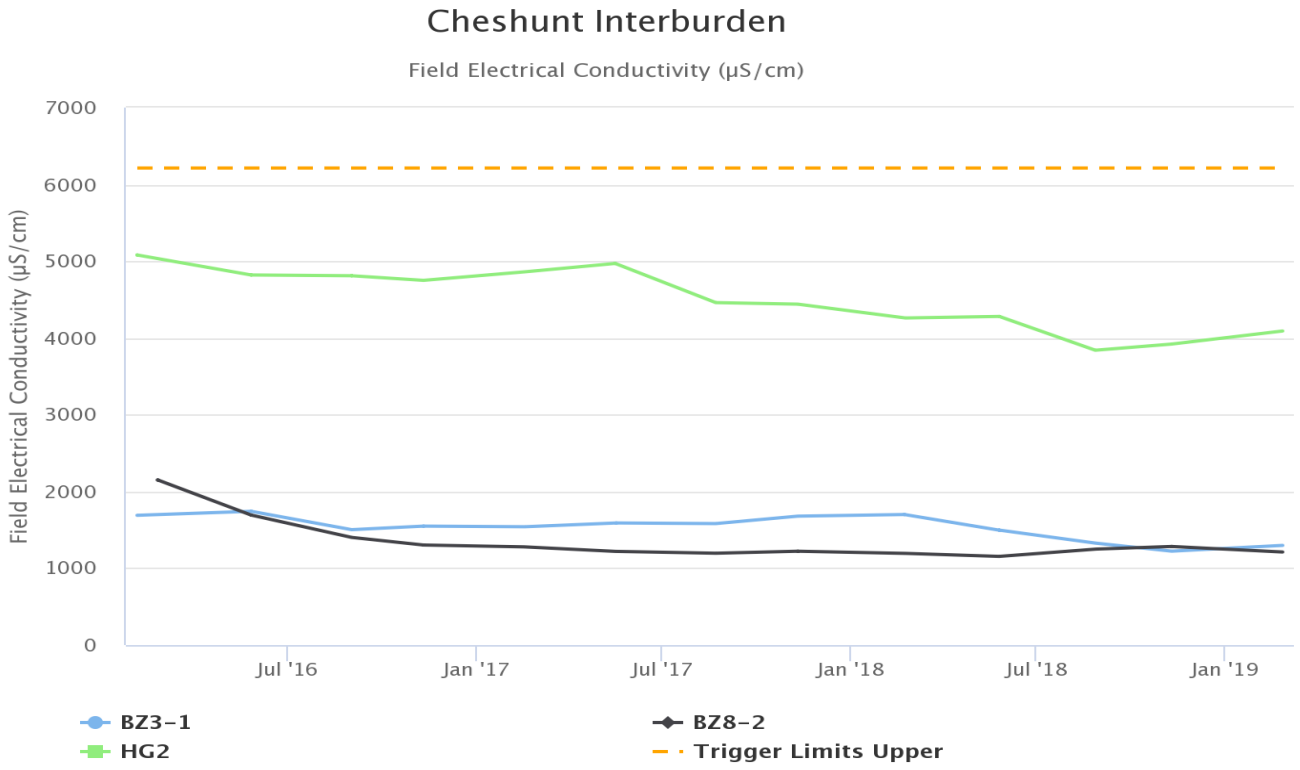

Figure 29: Cheshunt Interburden Electrical Conductivity Trend – March 2019

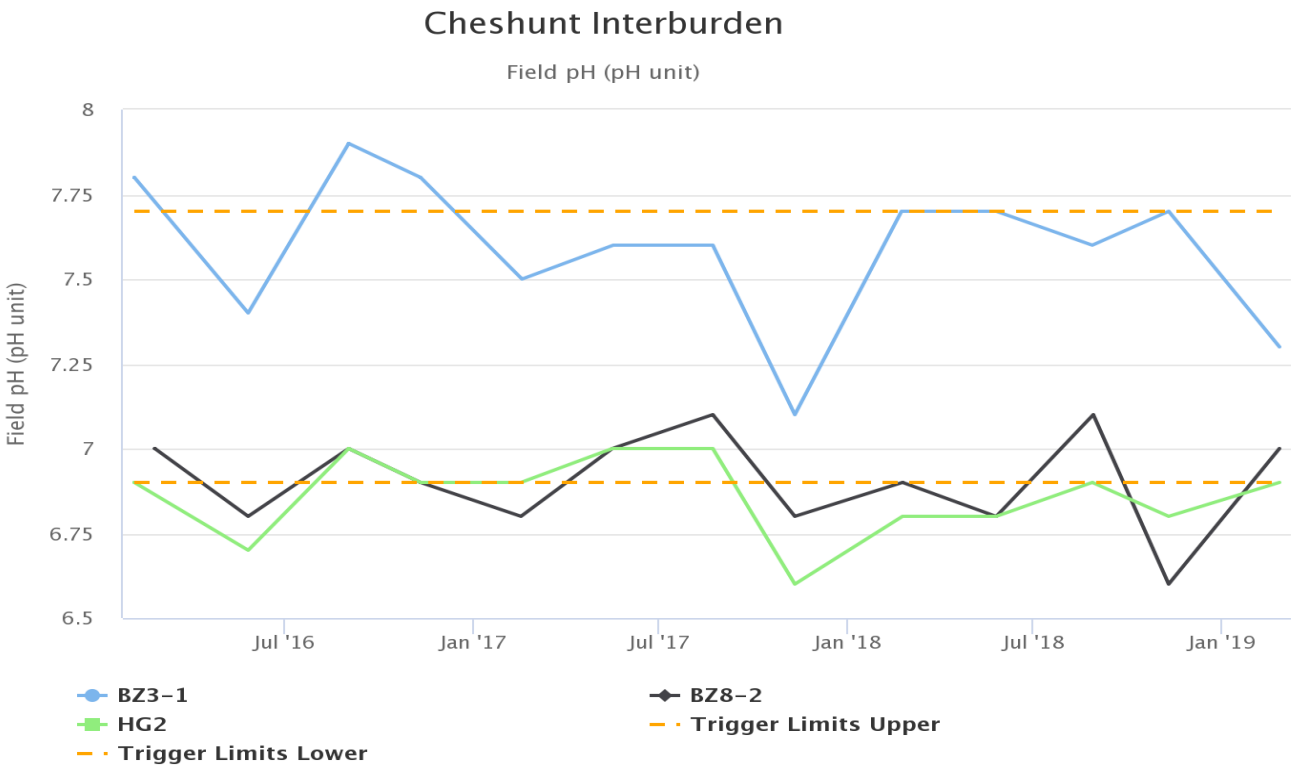

Figure 30: Cheshunt Interburden pH Trend – March 2019

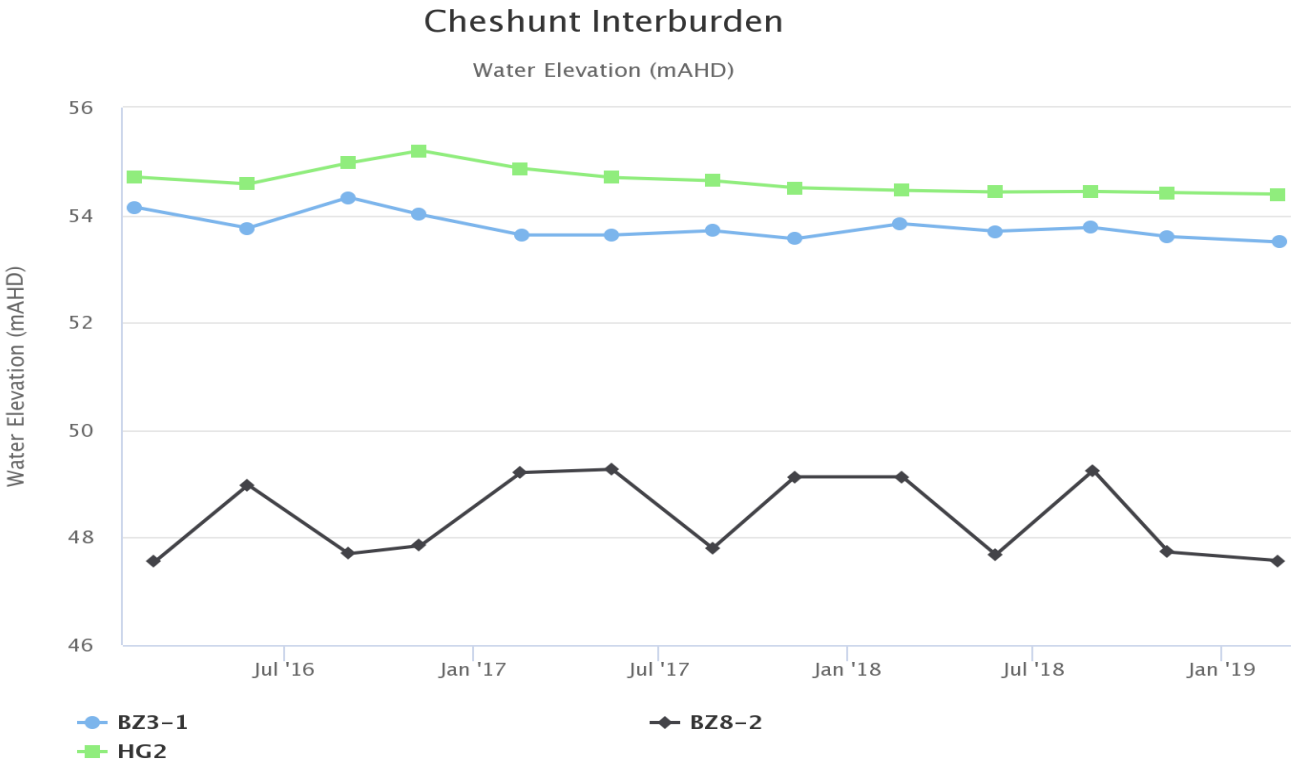

Figure 31: Cheshunt Interburden Standing Water Level – March 2019

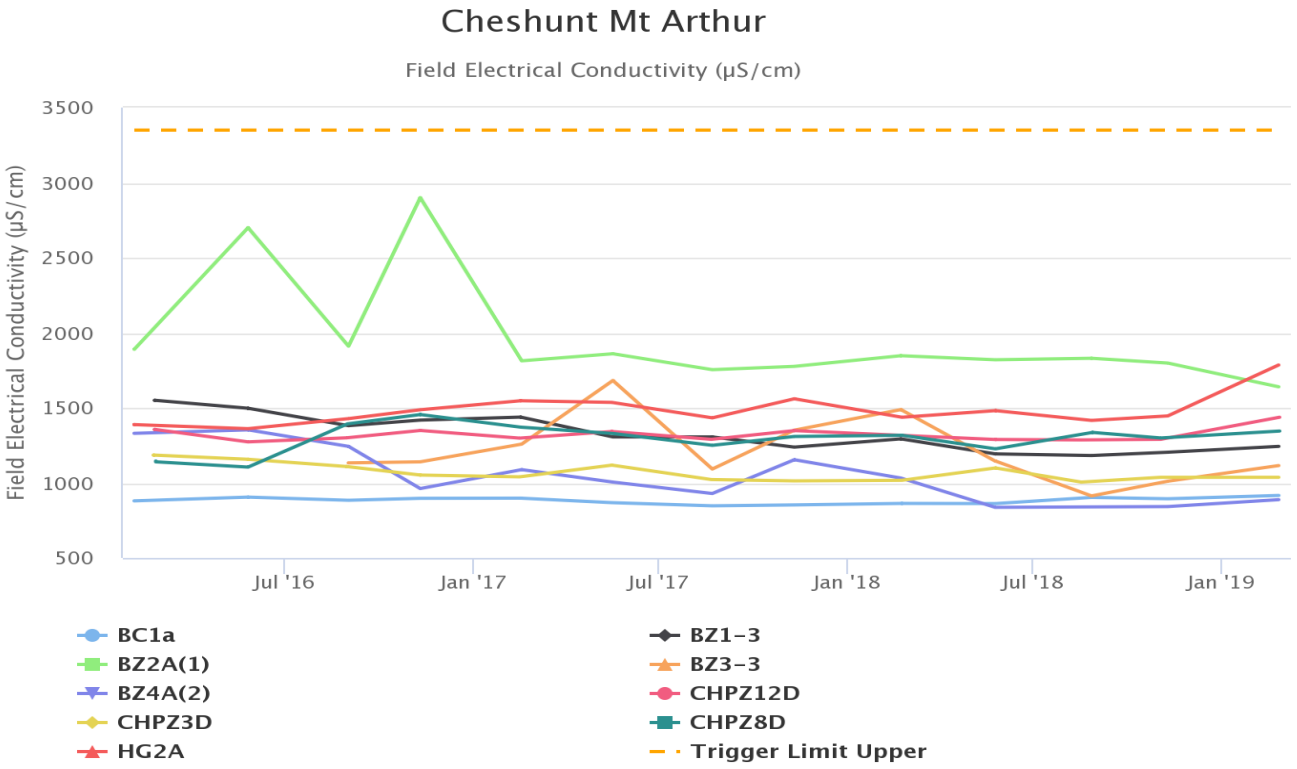

Figure 32: Cheshunt Mt Arthur Electrical Conductivity Trend – March 2019

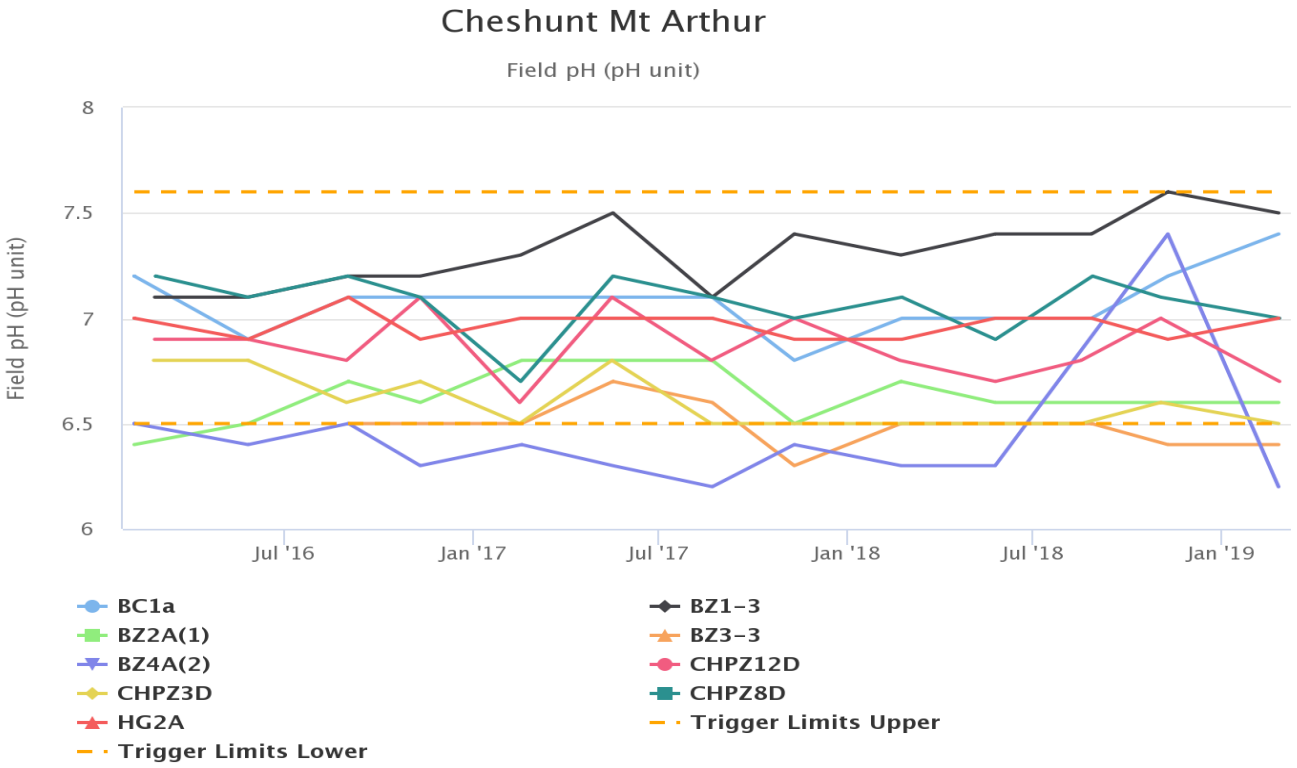

Figure 33: Cheshunt Mt Arthur pH Trend – March 2019

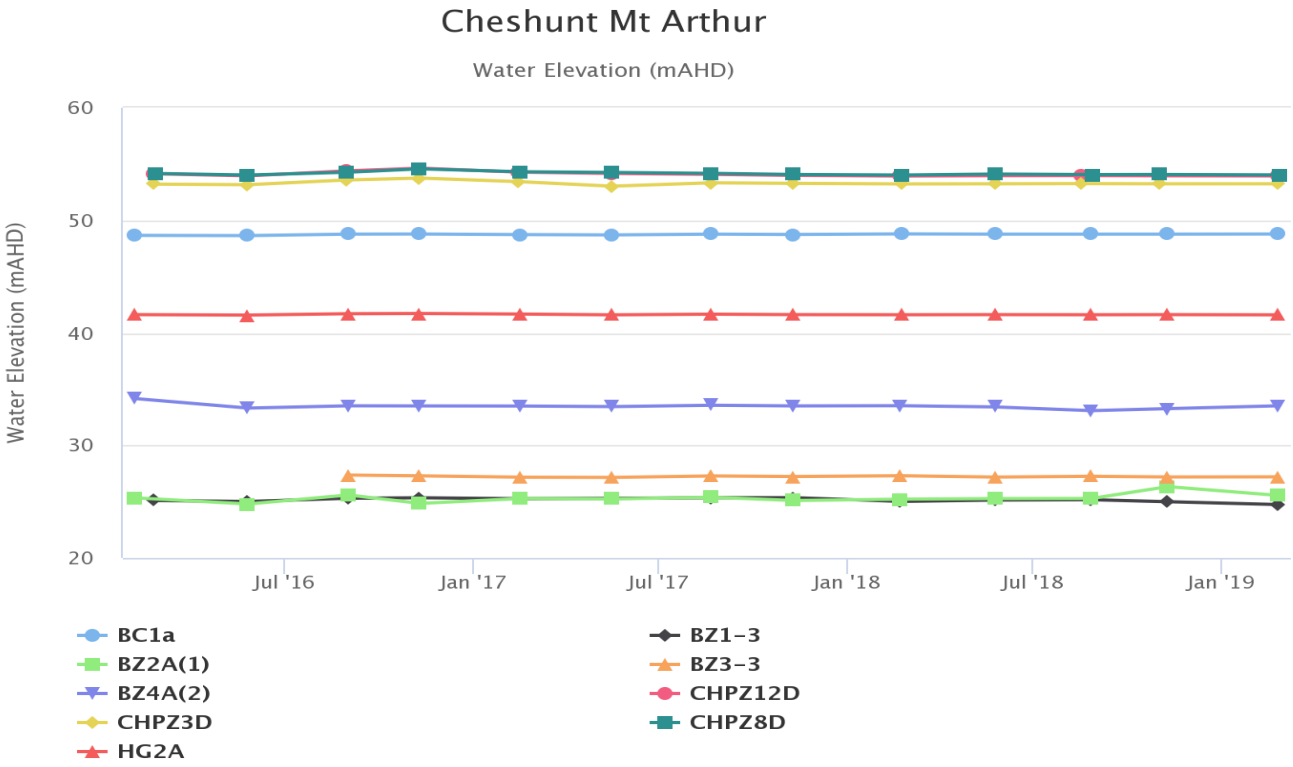

Figure 34: Cheshunt Mt Arthur Standing Water Level – March 2019

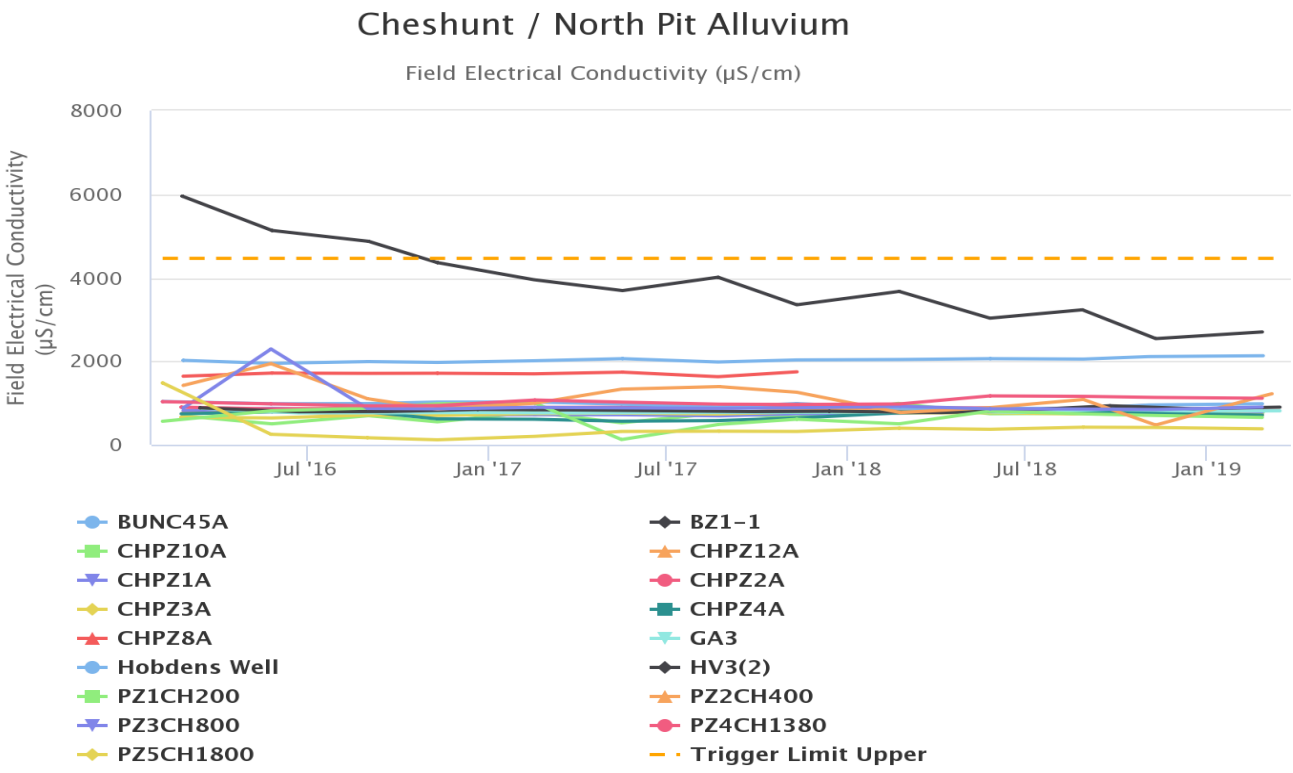

Figure 35: Cheshunt / North Pit Alluvium Electrical Conductivity Trend – March 2019

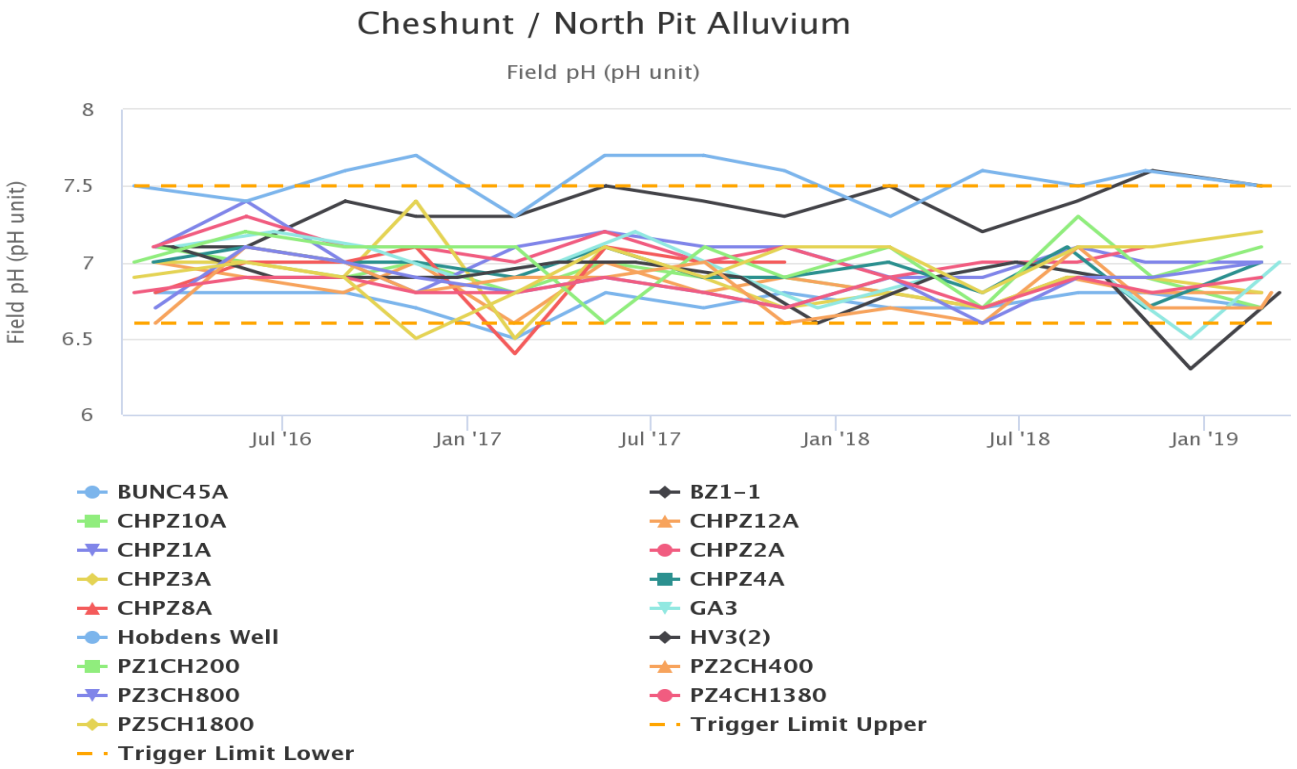

Figure 36: Cheshunt / North Pit Alluvium pH Trend – March 2019

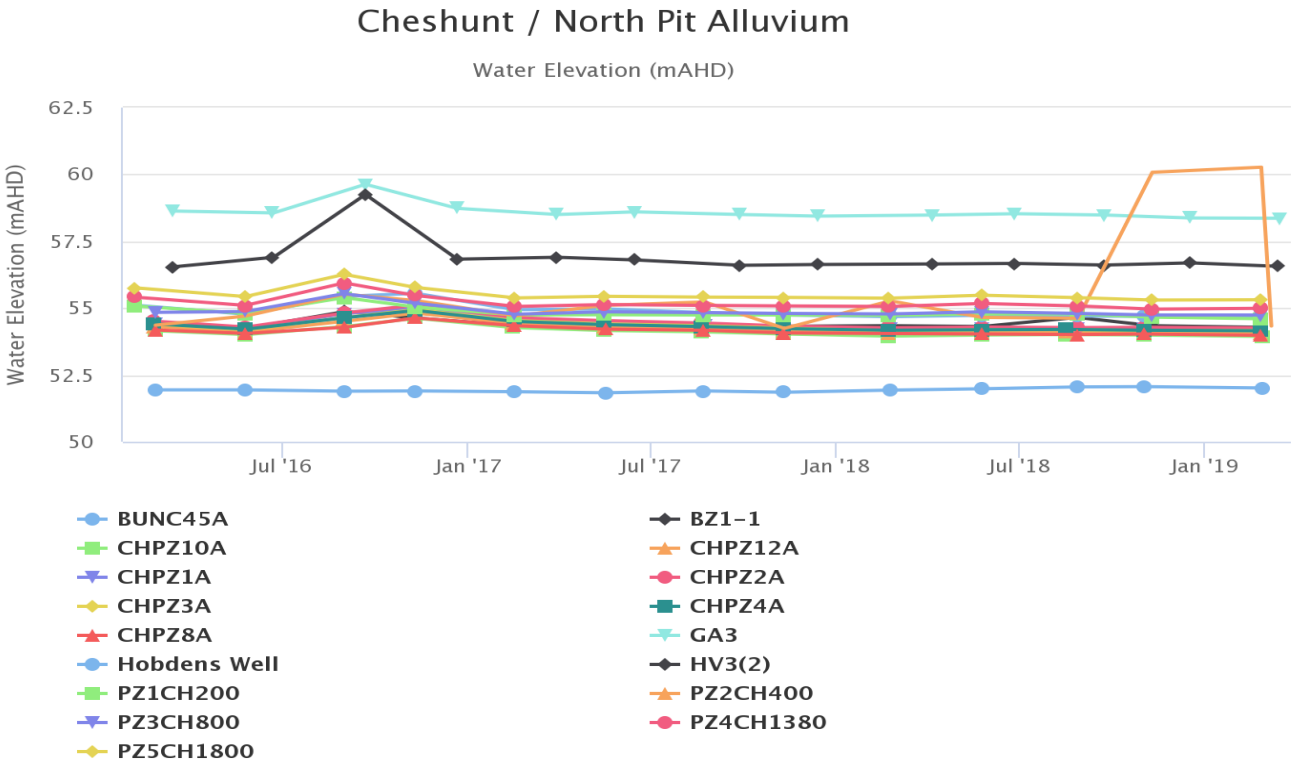

Figure 37: Cheshunt / North Pit Alluvium Standing Water Level – March 2019

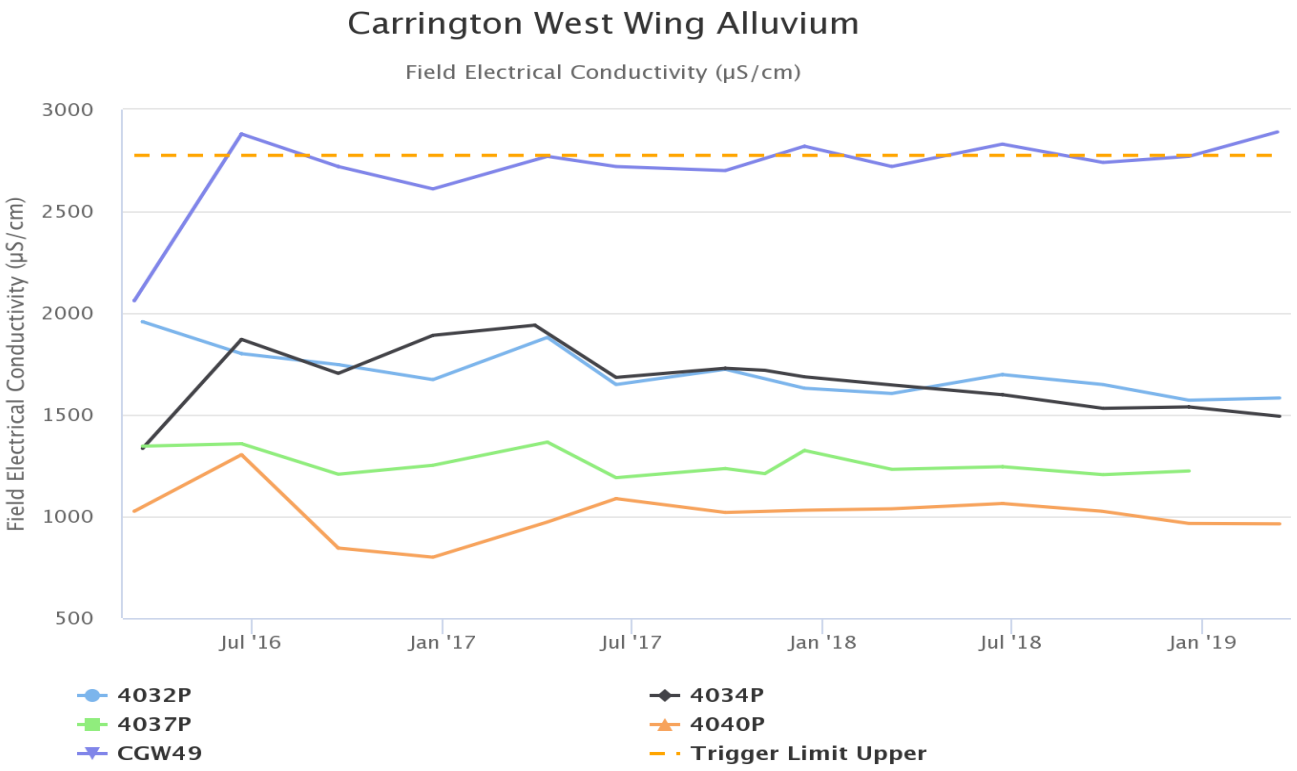

Figure 38: Carrington West Wing Alluvium Electrical Conductivity Trend – March 2019

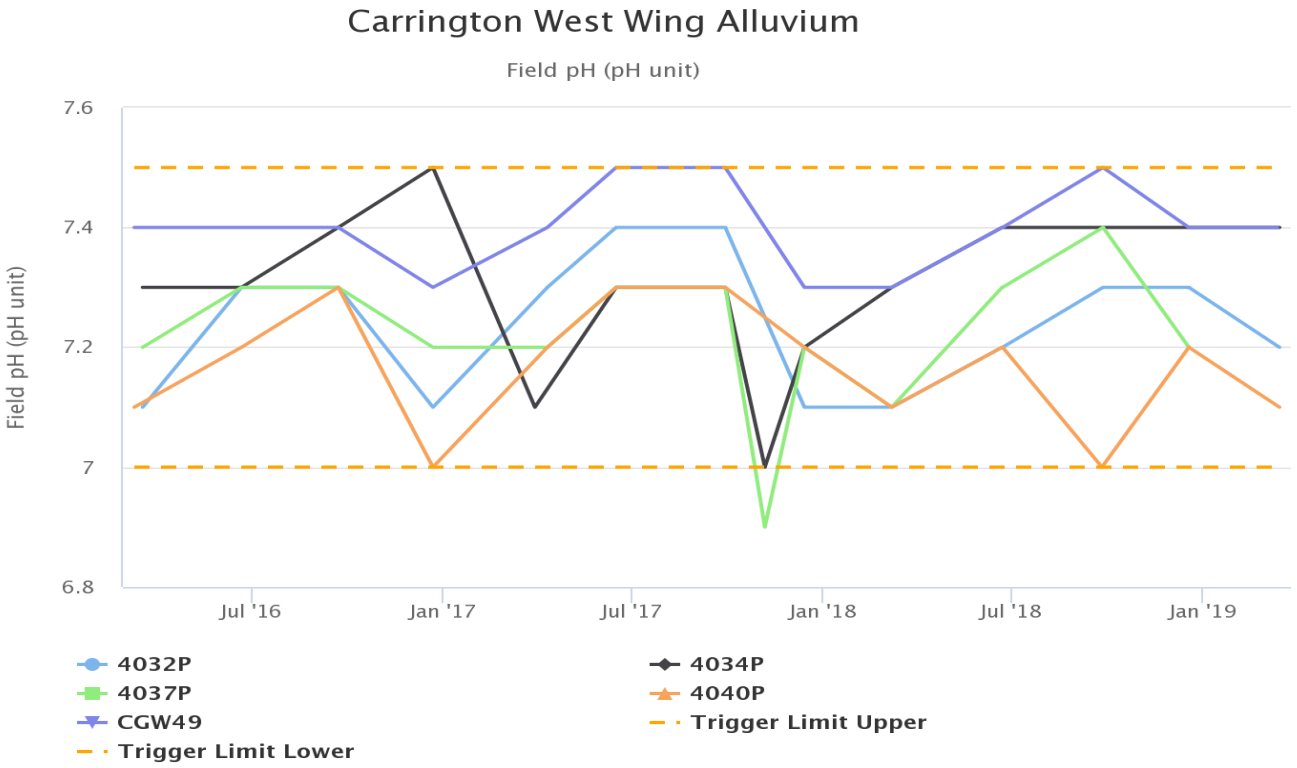

Figure 39: Carrington West Wing Alluvium pH Trend – March 2019

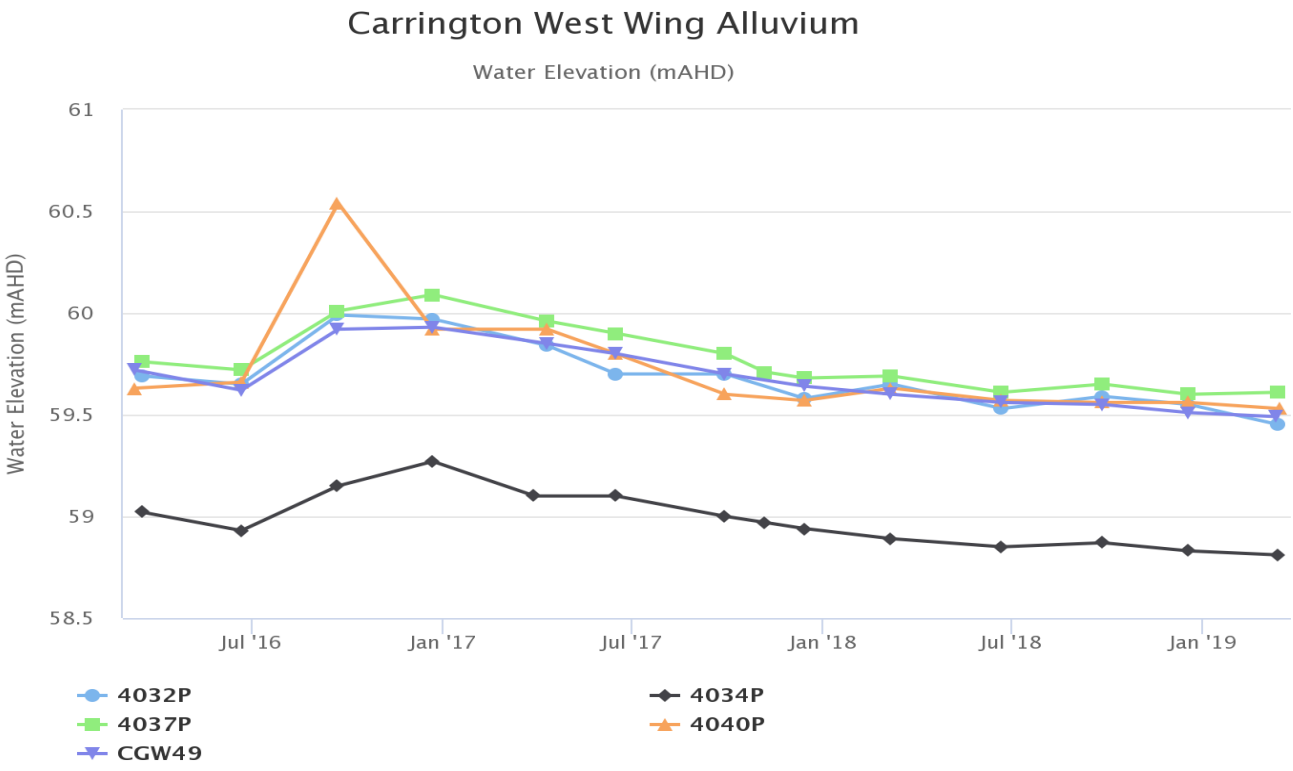

Figure 40: Carrington West Wing Alluvium Standing Water Level – March 2019

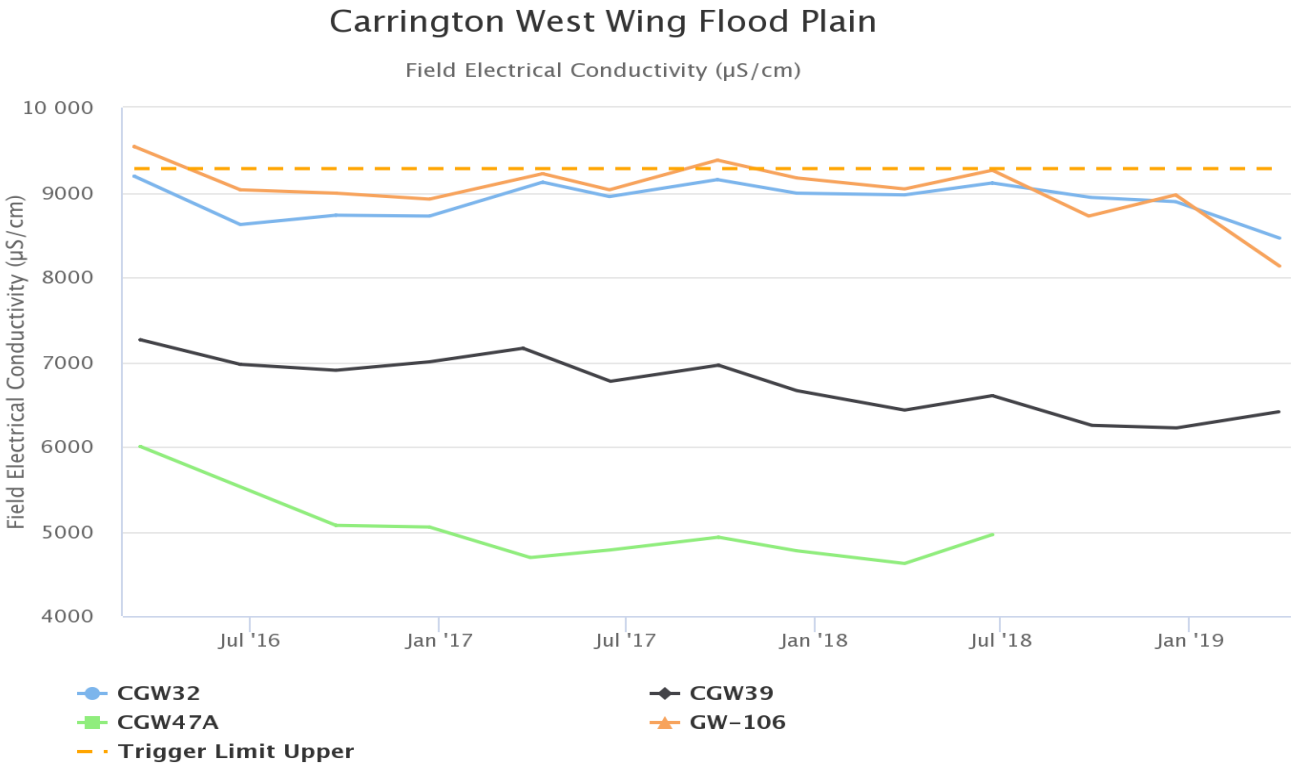

Figure 41: Carrington West Wing Flood Plain Electrical Conductivity Trend – March 2019

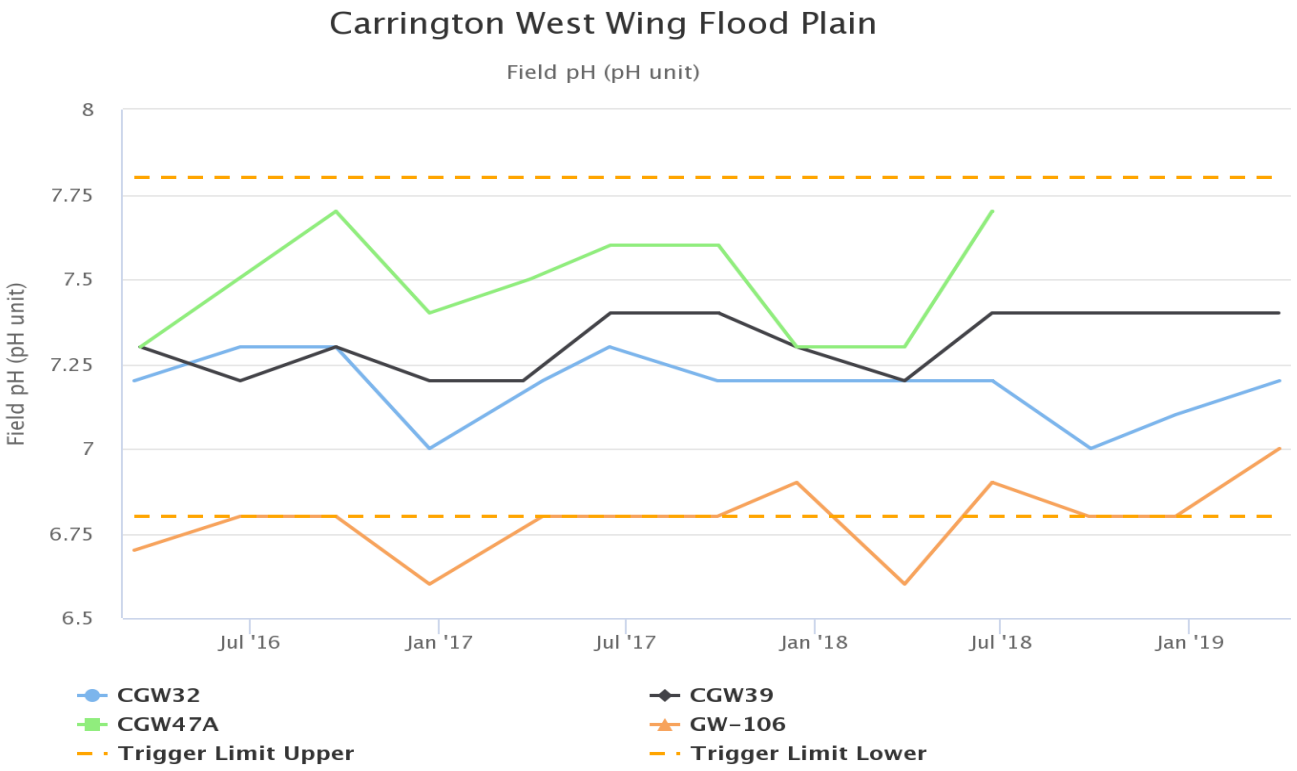

Figure 42: Carrington West Wing Flood Plain pH Trend – March 2019

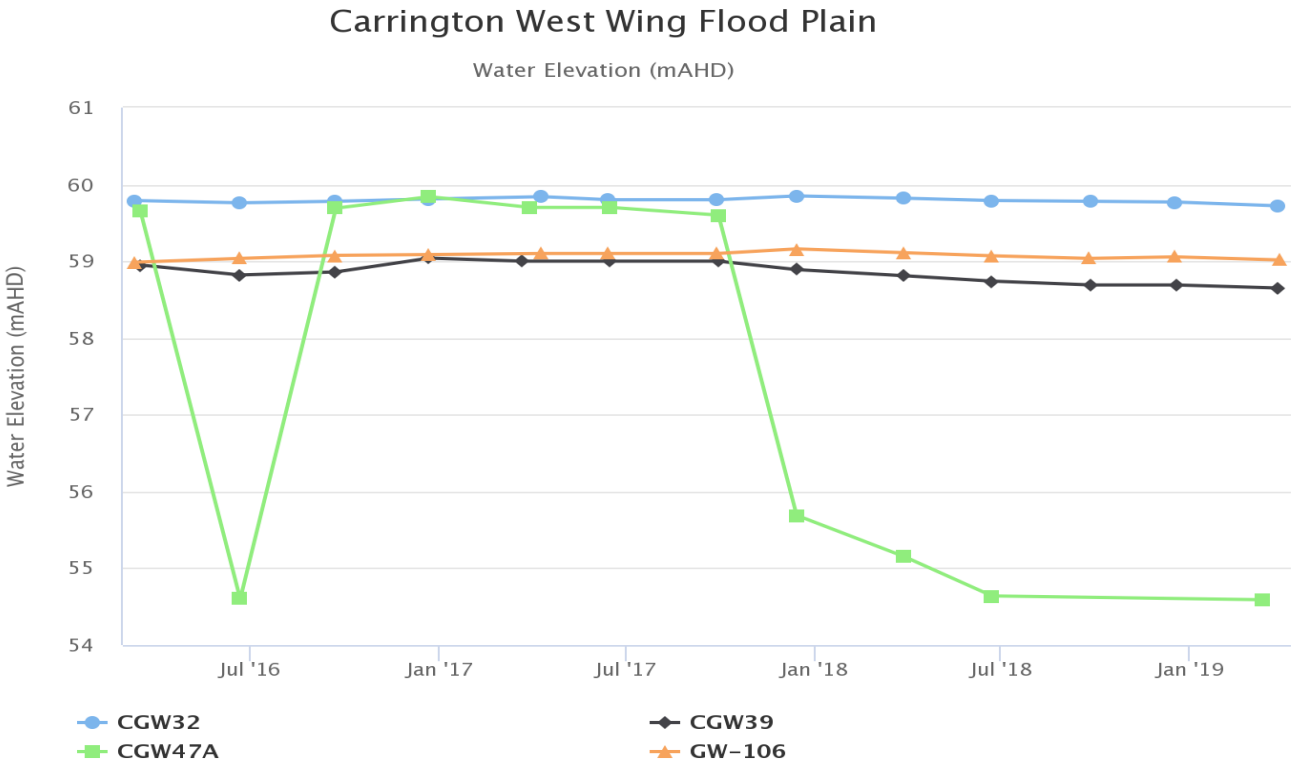

Figure 43: Carrington West Wing Flood Plain Standing Water Level – March 2019

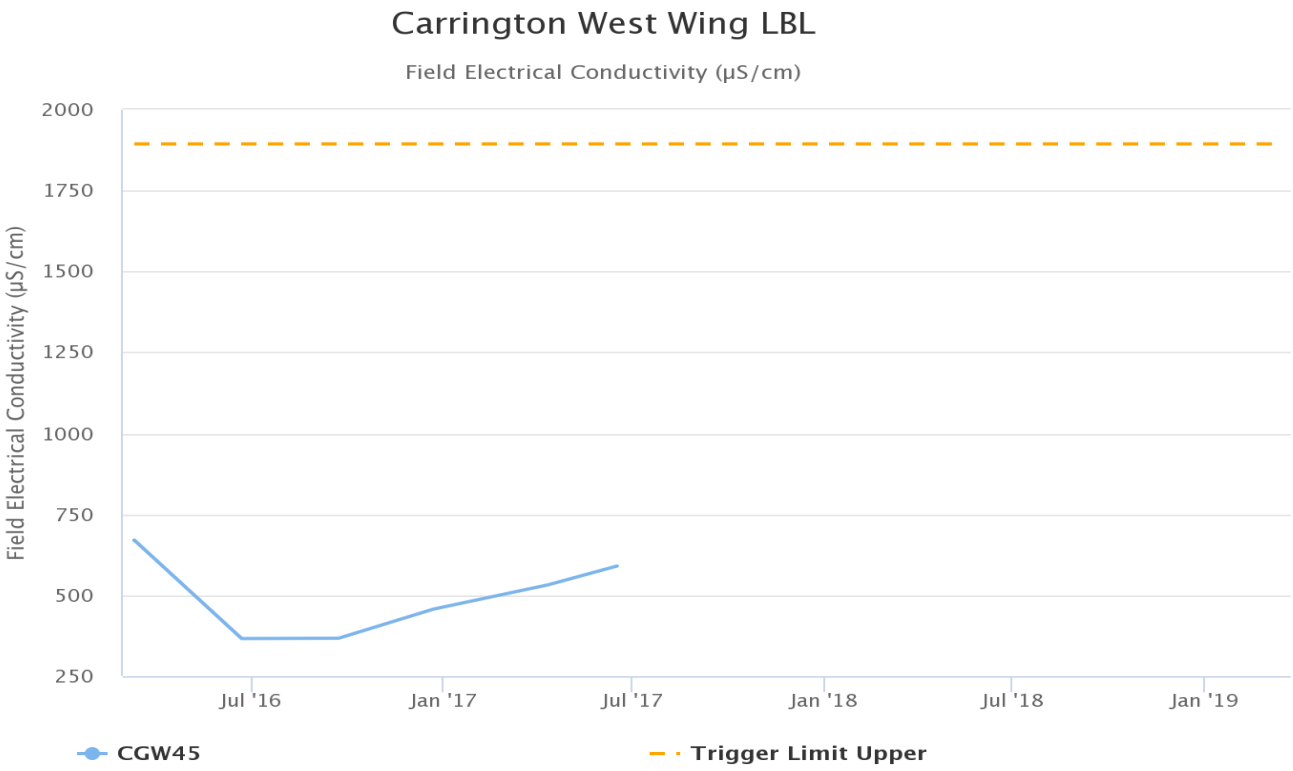

Figure 44: Carrington West Wing LBL Electrical Conductivity Trend – March 2019

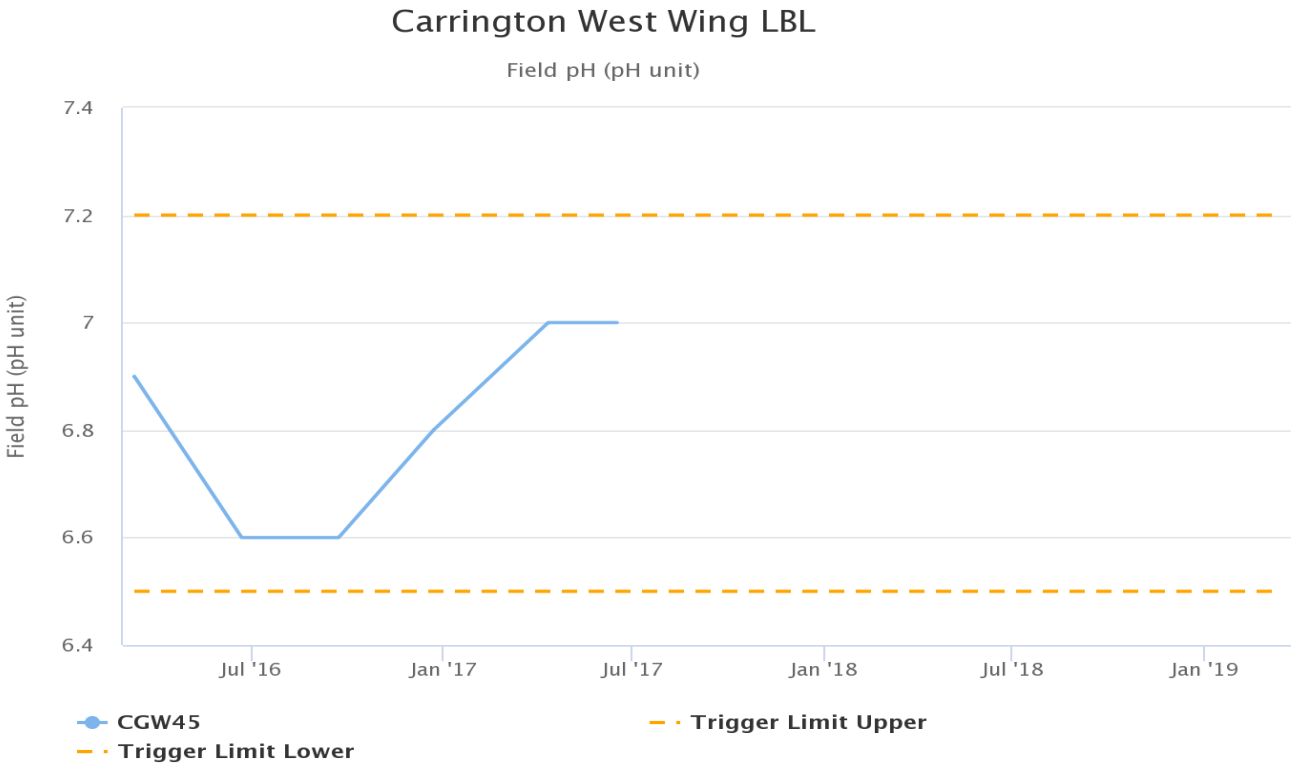

Figure 45: Carrington West Wing LBL pH Trend – March 2019

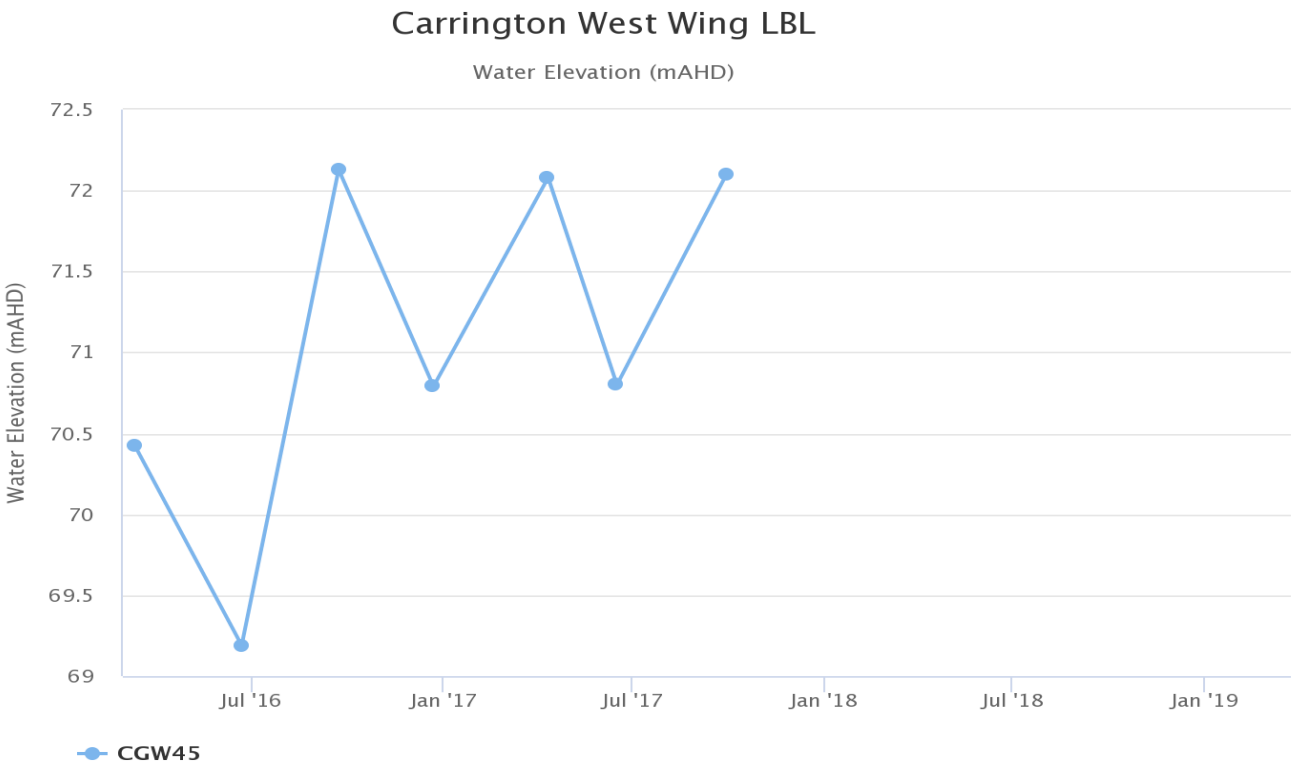

Figure 46: Carrington West Wing LBL Standing Water Level – March 2019

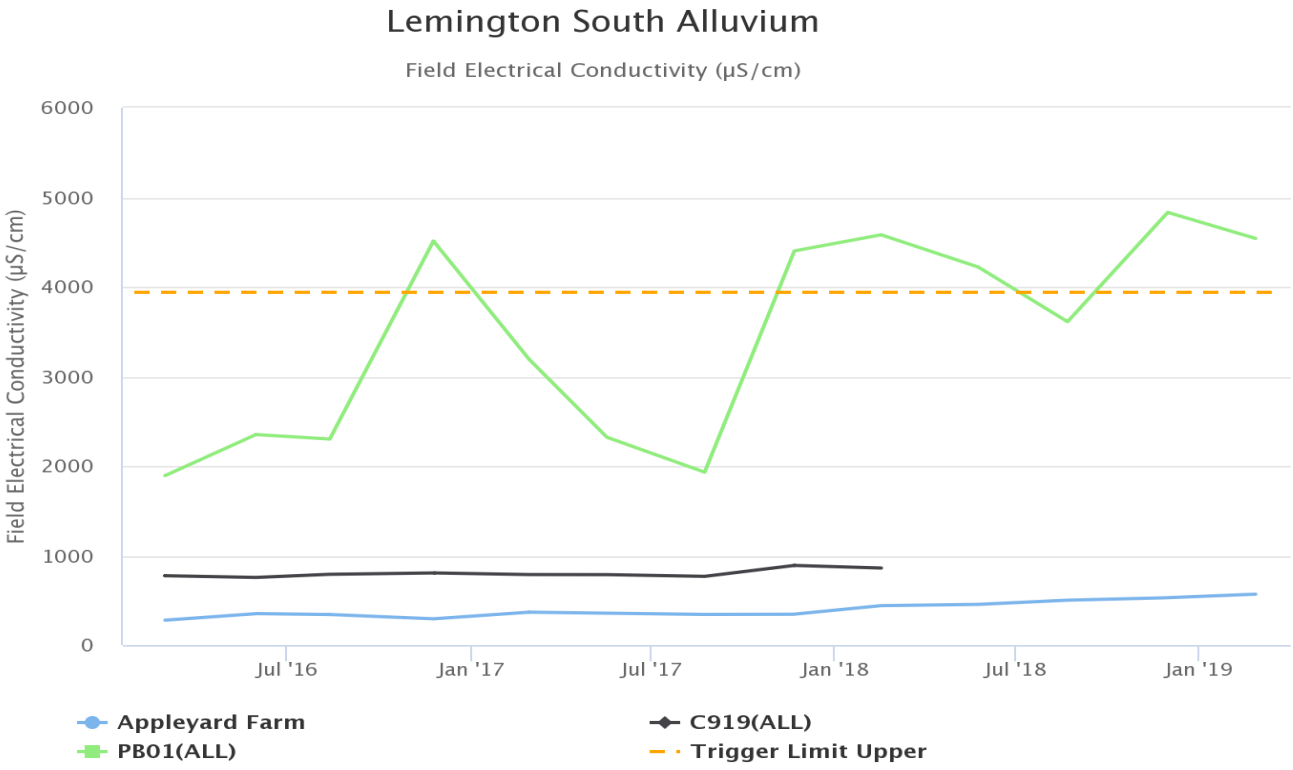

Figure 47: Lemington South Alluvium Electrical Conductivity Trend – March 2019

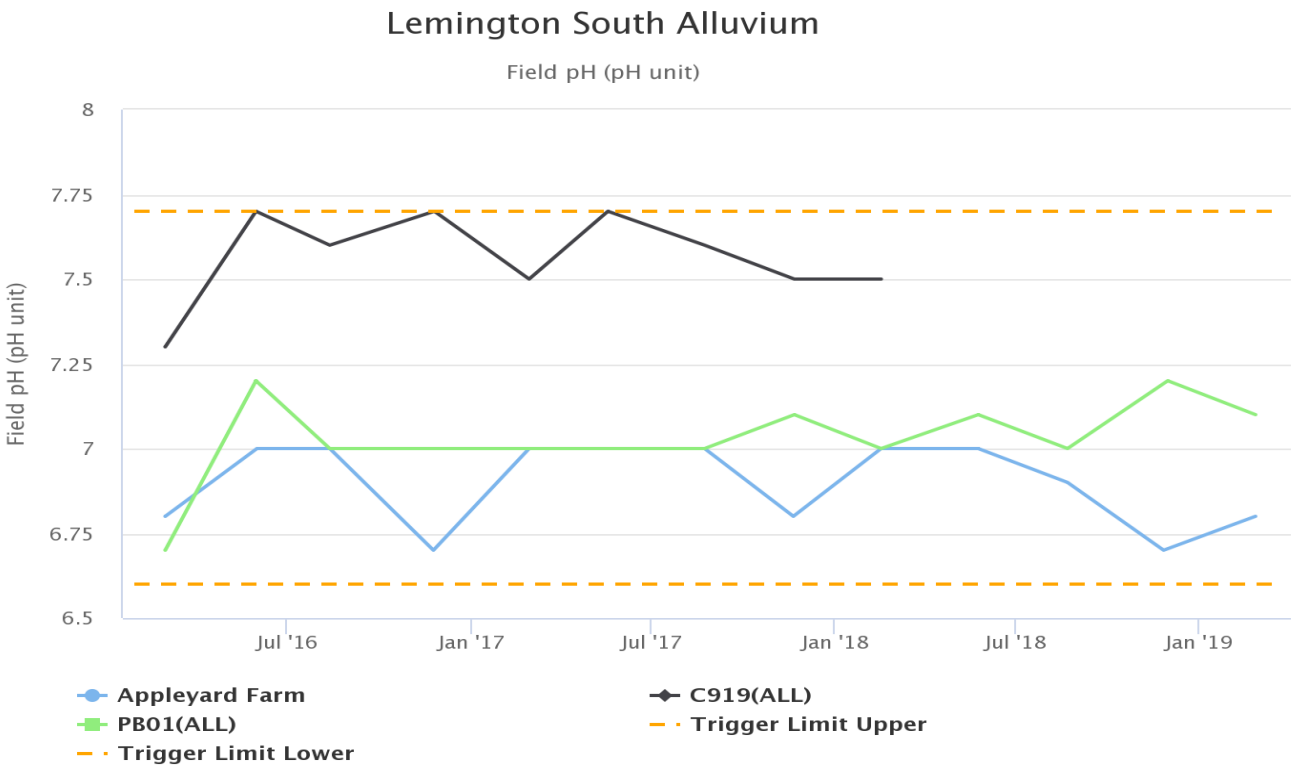

Figure 48: Lemington South Alluvium pH Trend – March 2019

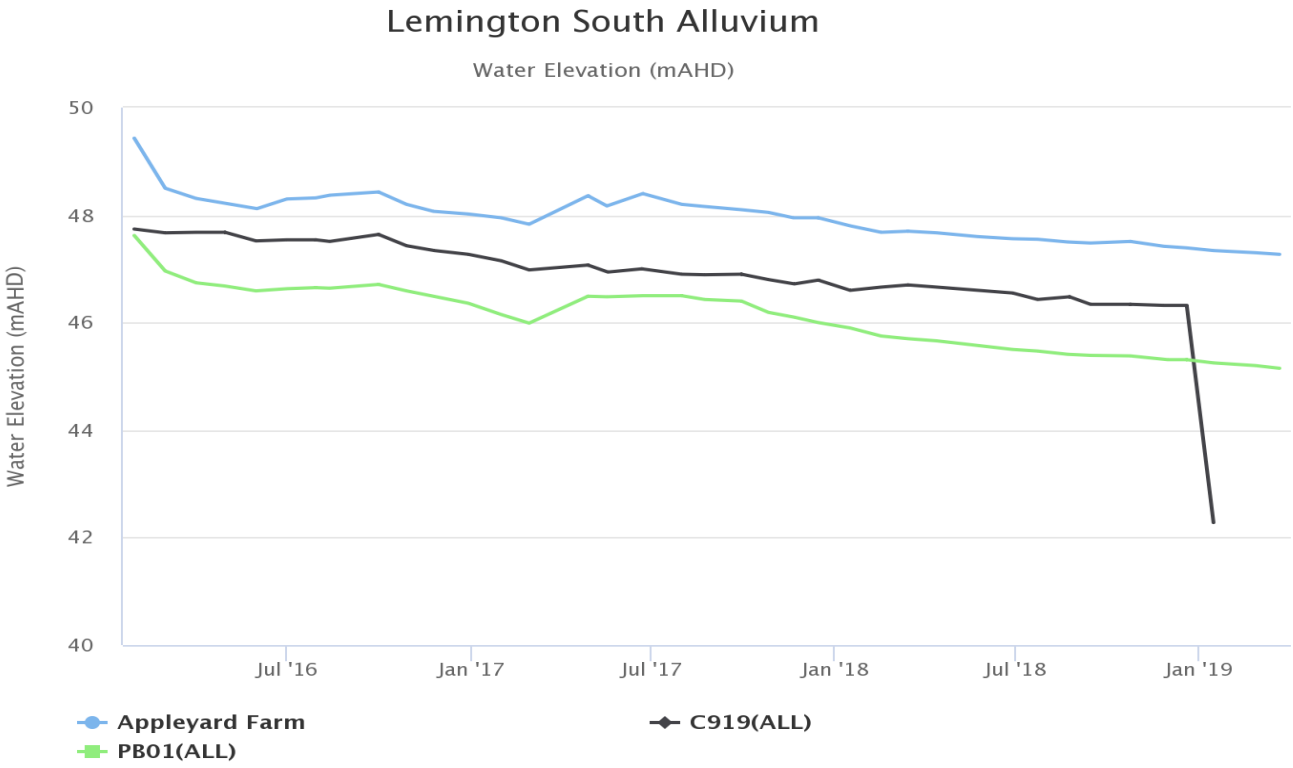

Figure 49: Lemington South Alluvium Standing Water Level Trend – March 2019

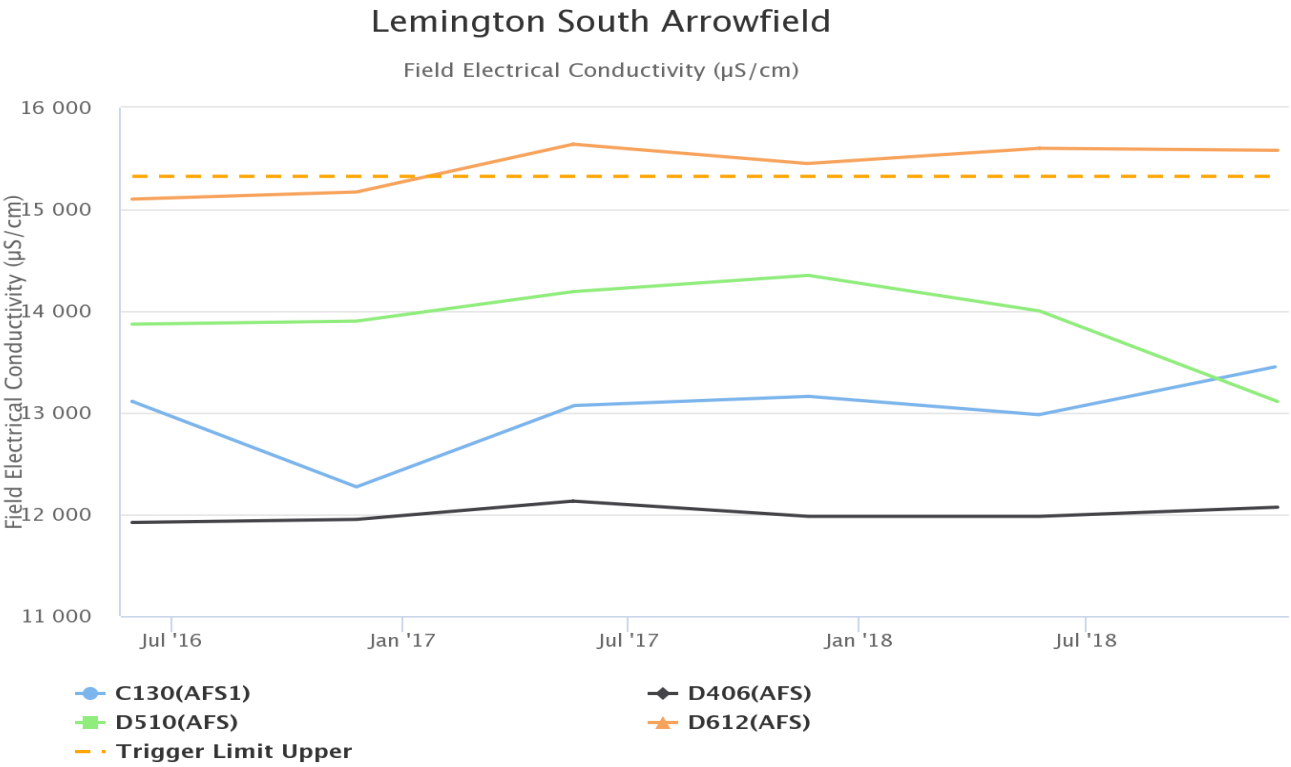

Figure 50: Lemington South Arrowfield Electrical Conductivity Trend – March 2019

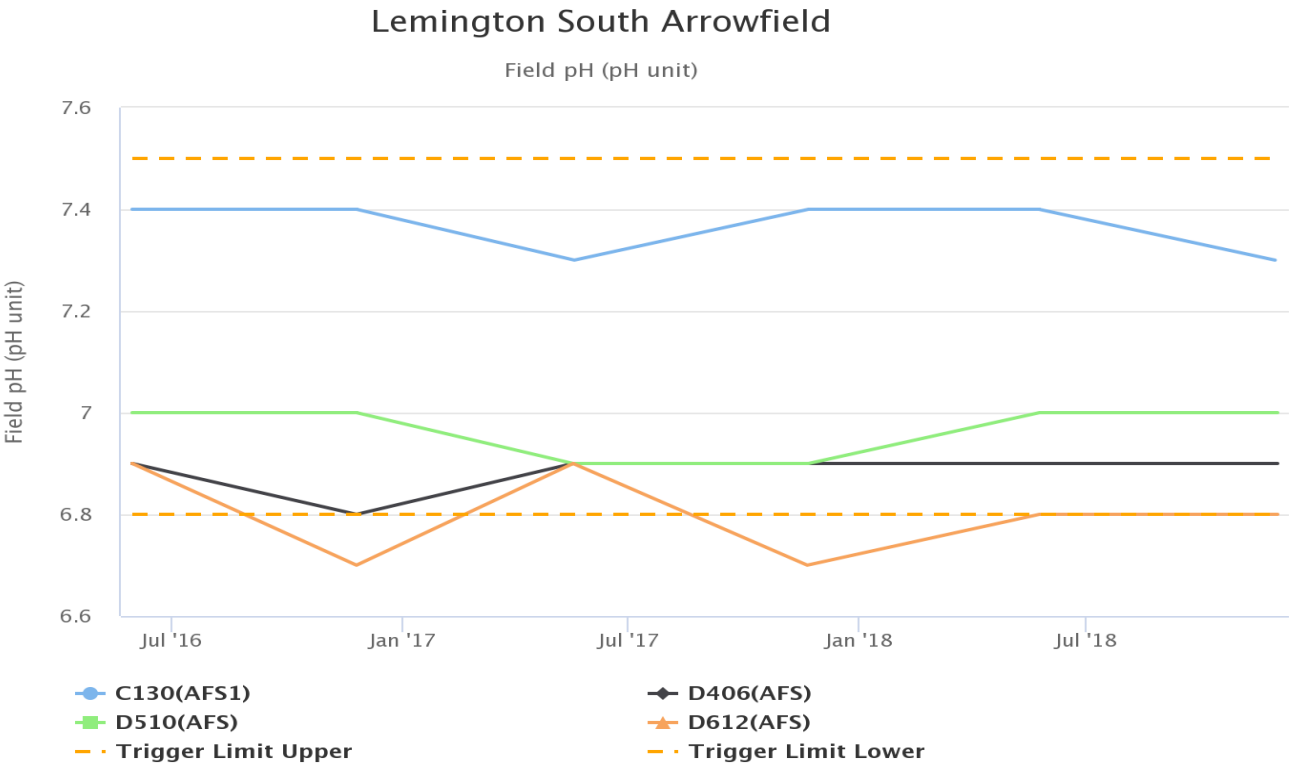

Figure 51: Lemington South Arrowfield pH Trend – March 2019

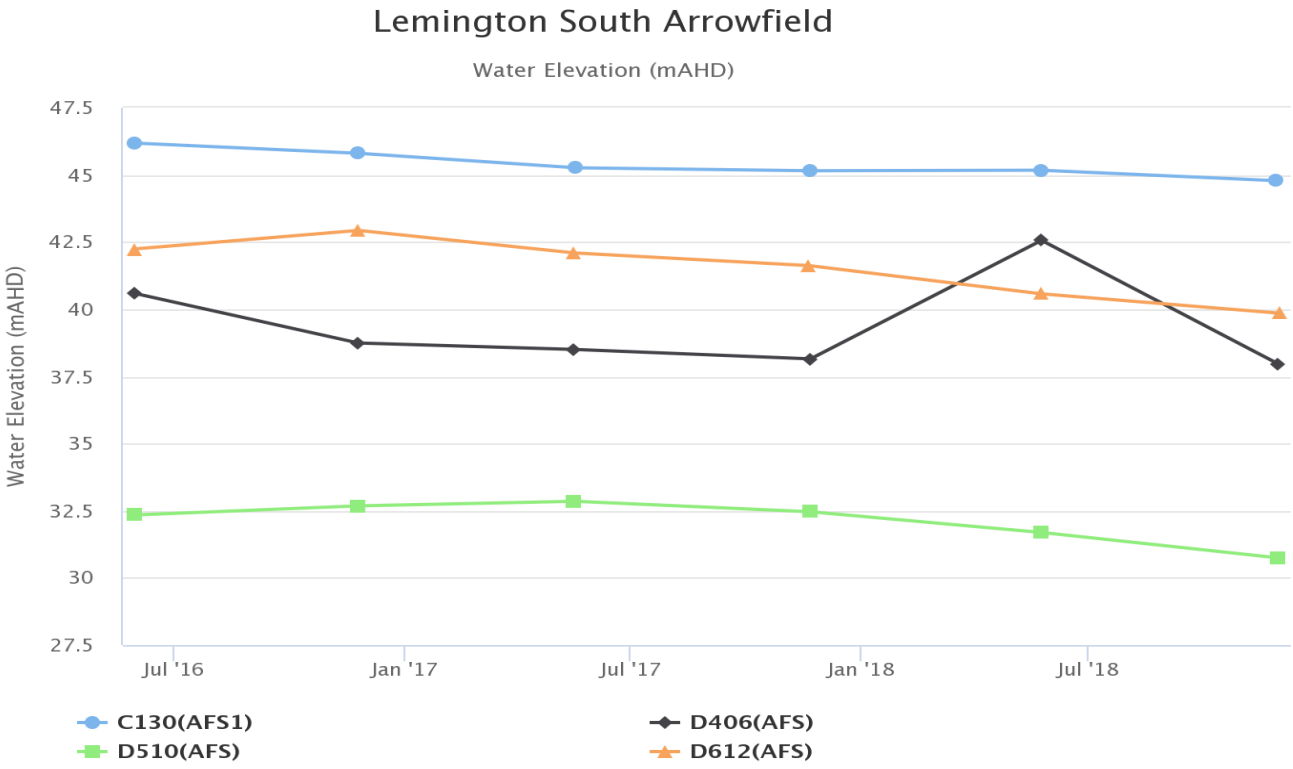

Figure 52: Lemington South Arrowfield Standing Water Level – March 2019

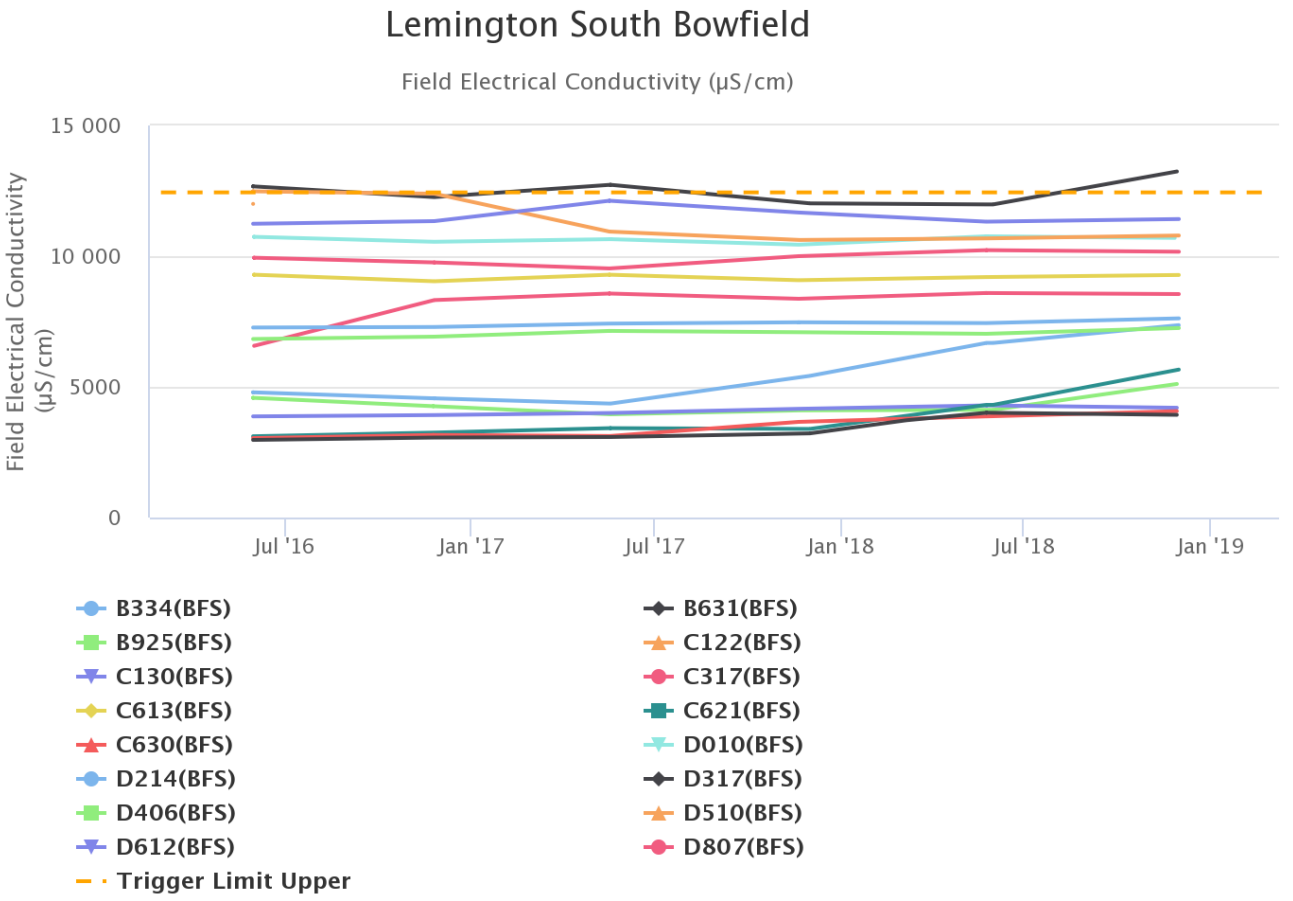

Figure 53: Lemington South Bowfield Electrical Conductivity Trend – March 2019

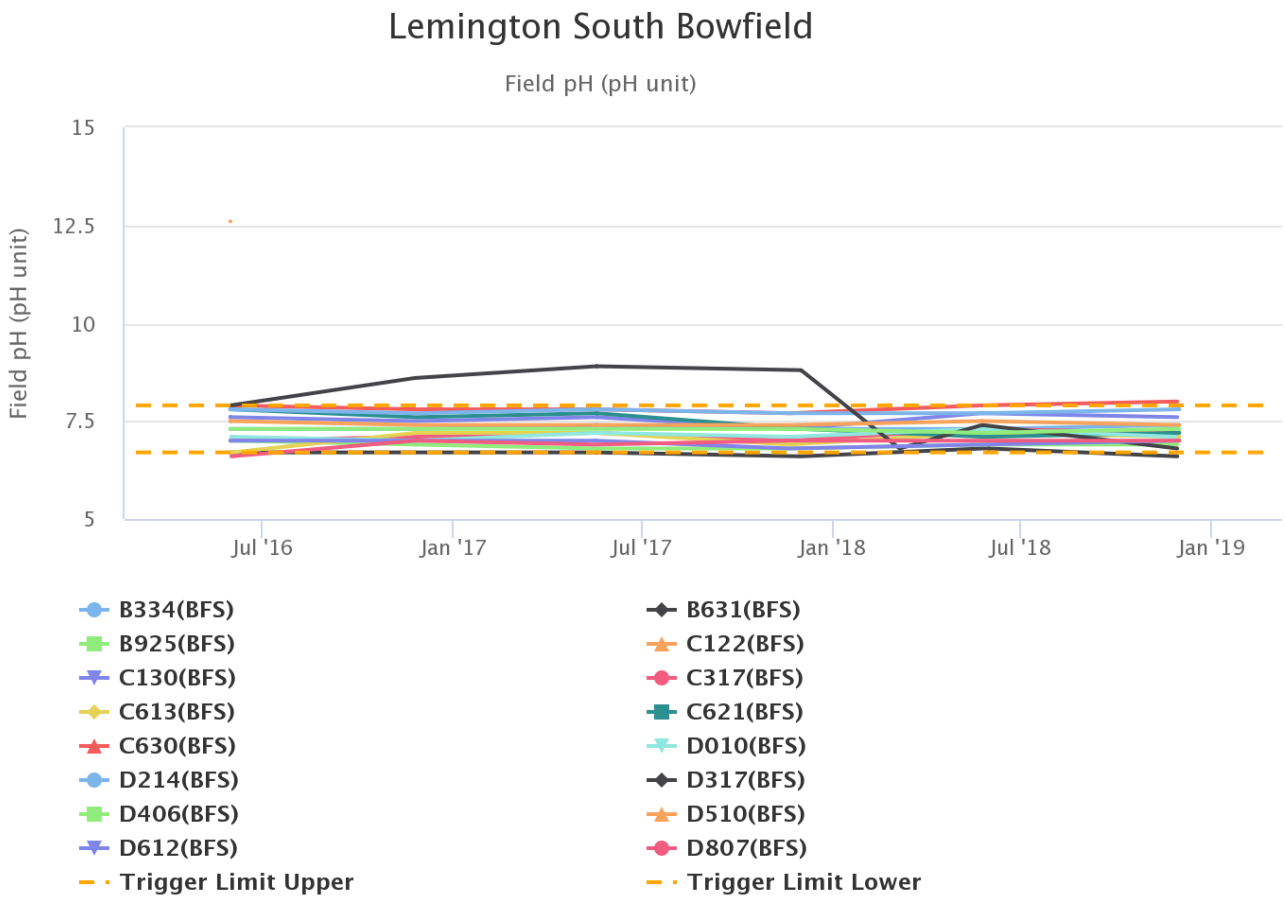

Figure 54: Lemington South Bowfield pH Trend – March 2019

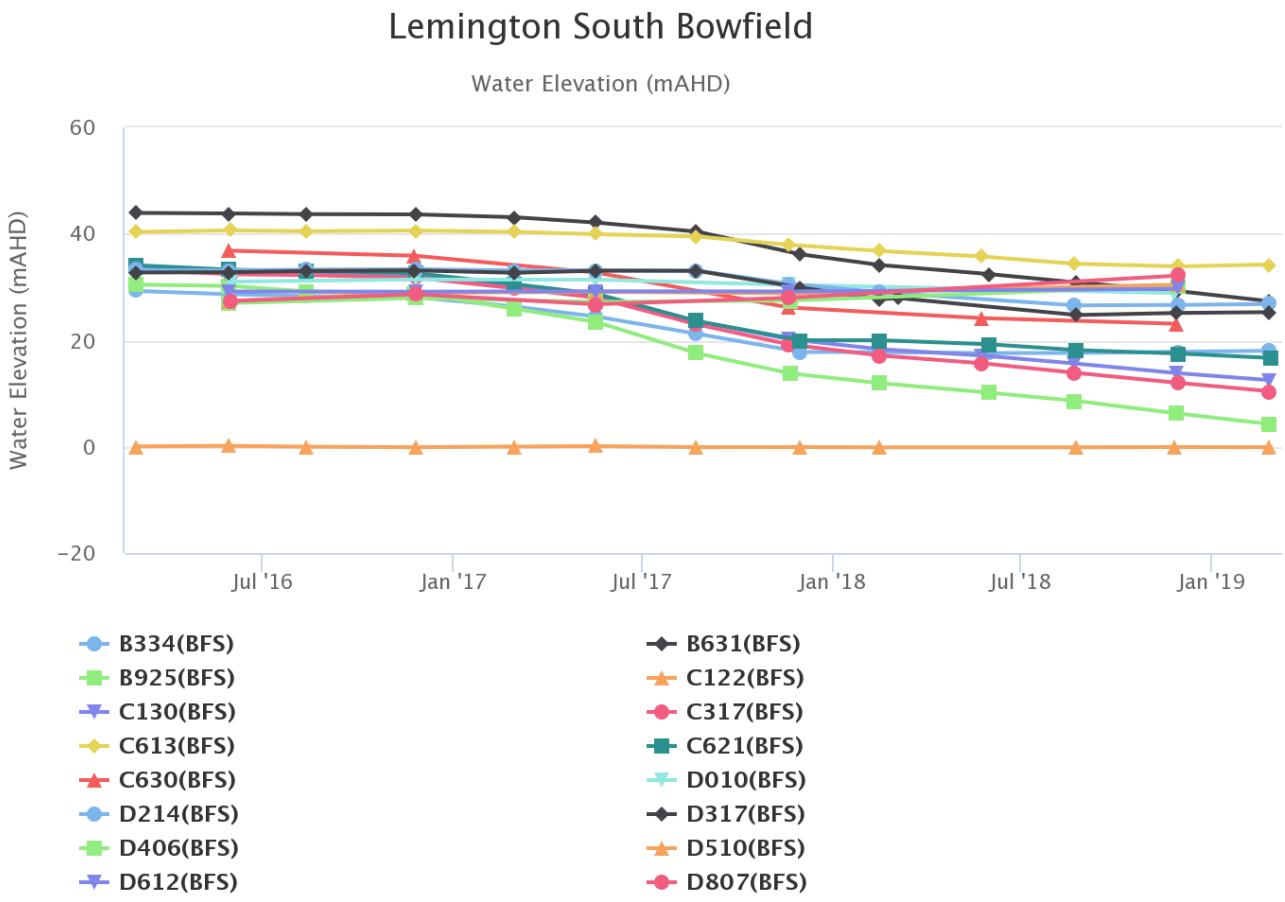

Figure 55: Lemington South Bowfield Standing Water Level – March 2019

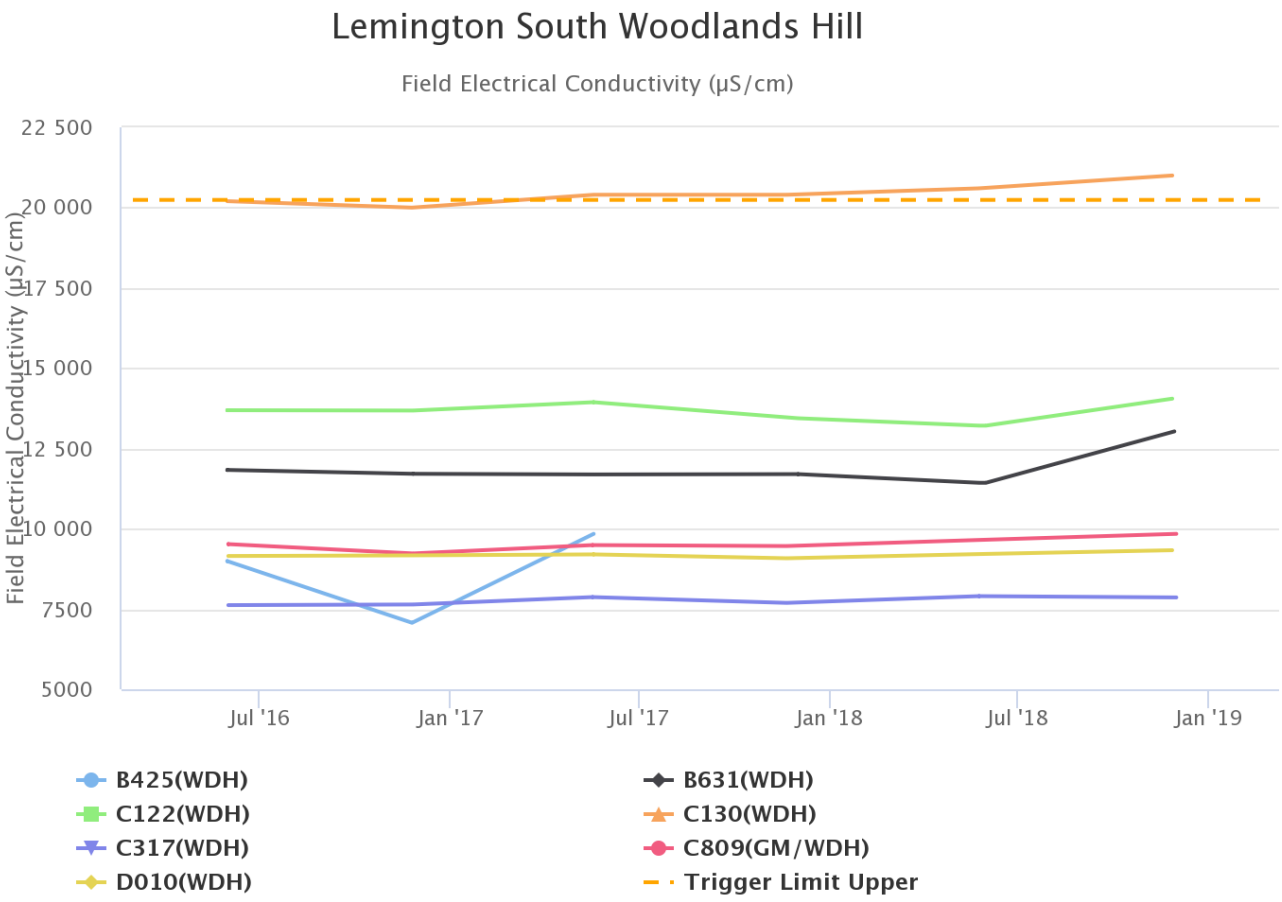

Figure 56: Lemington South Woodlands Hill Electrical Conductivity Trend – March 2019

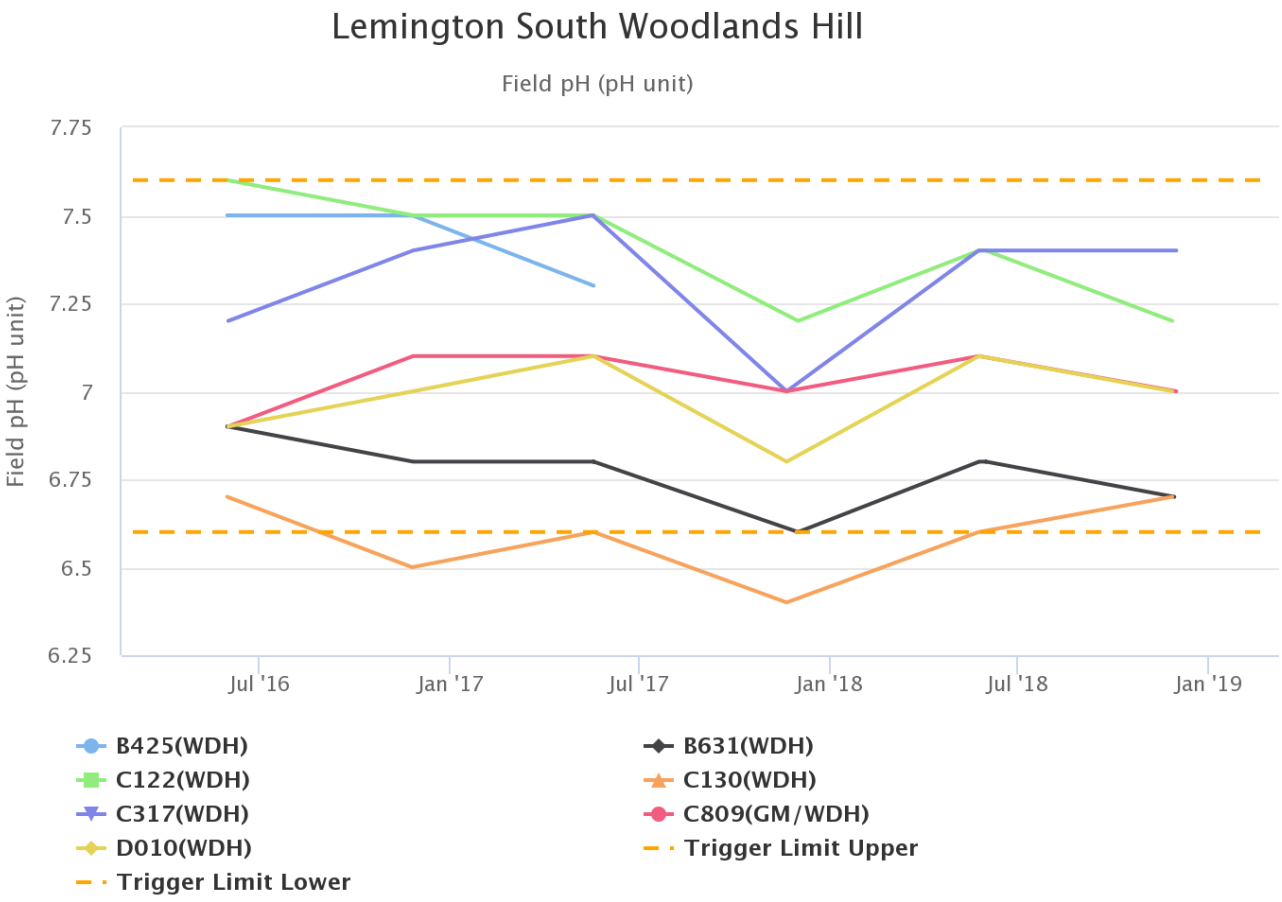

Figure 57: Lemington South Woodlands Hill pH Trend – March 2019

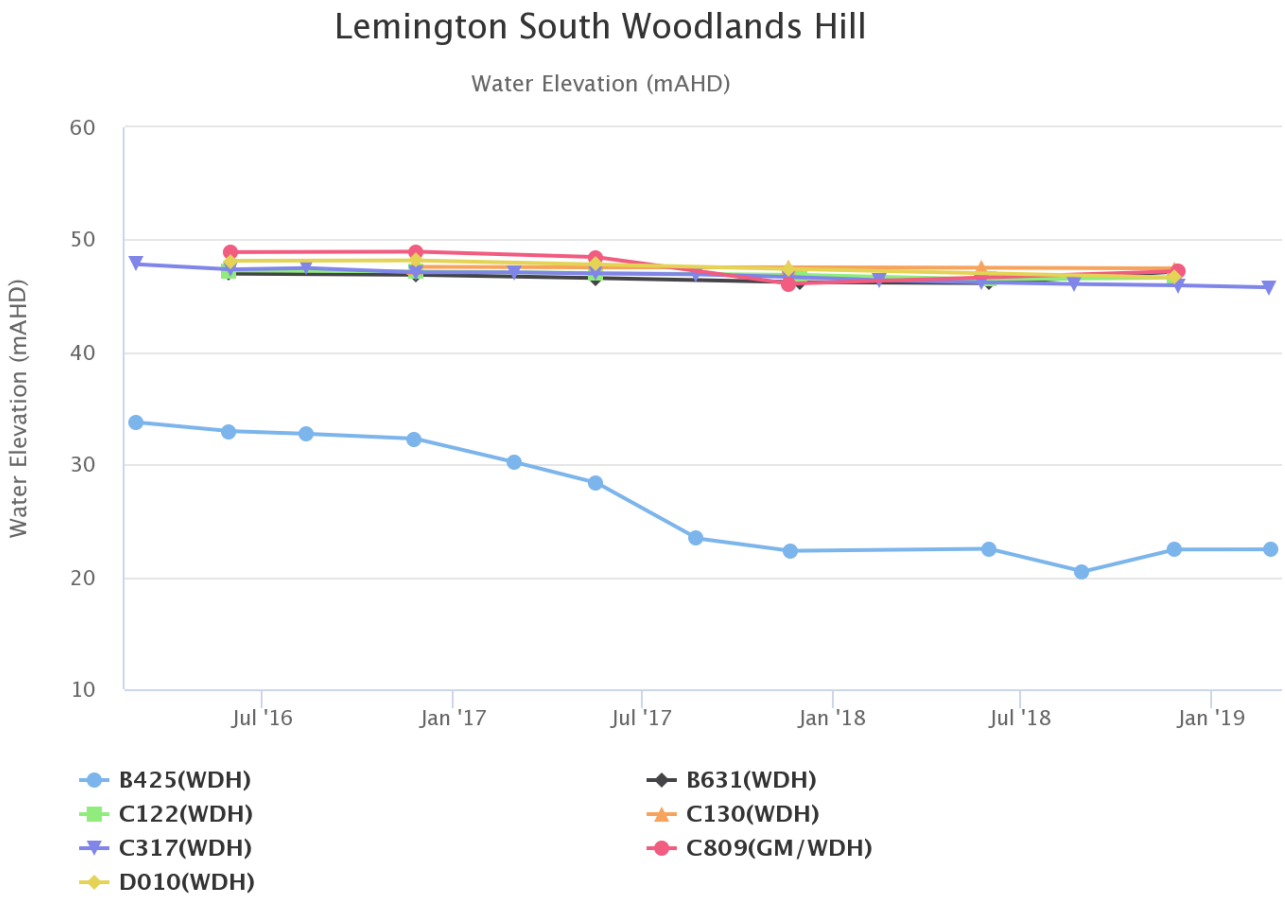

Figure 58: Lemington South Woodlands Hill Standing Water Level – March 2019

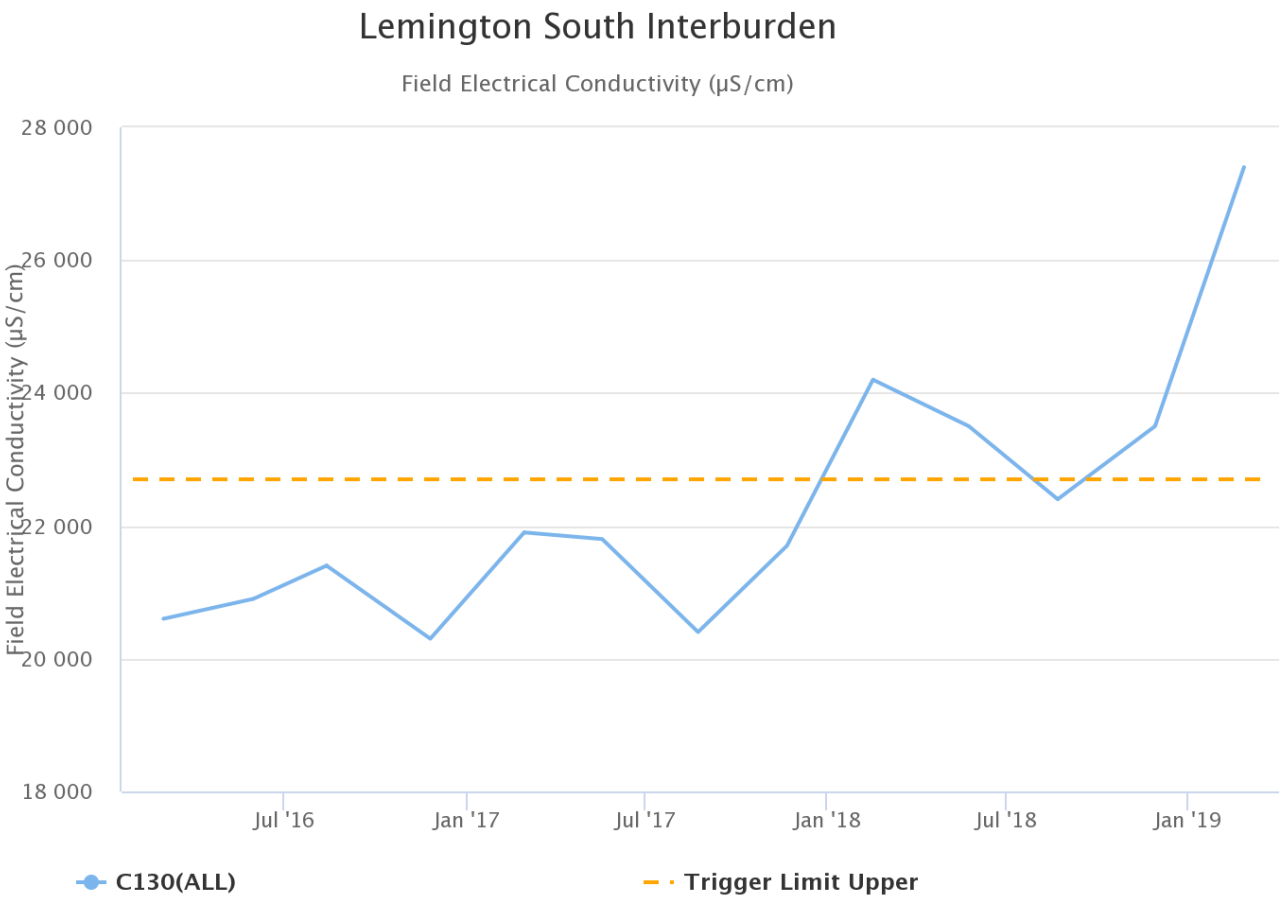

Figure 59: Lemington South Interburden Electrical Conductivity Trend – March 2019

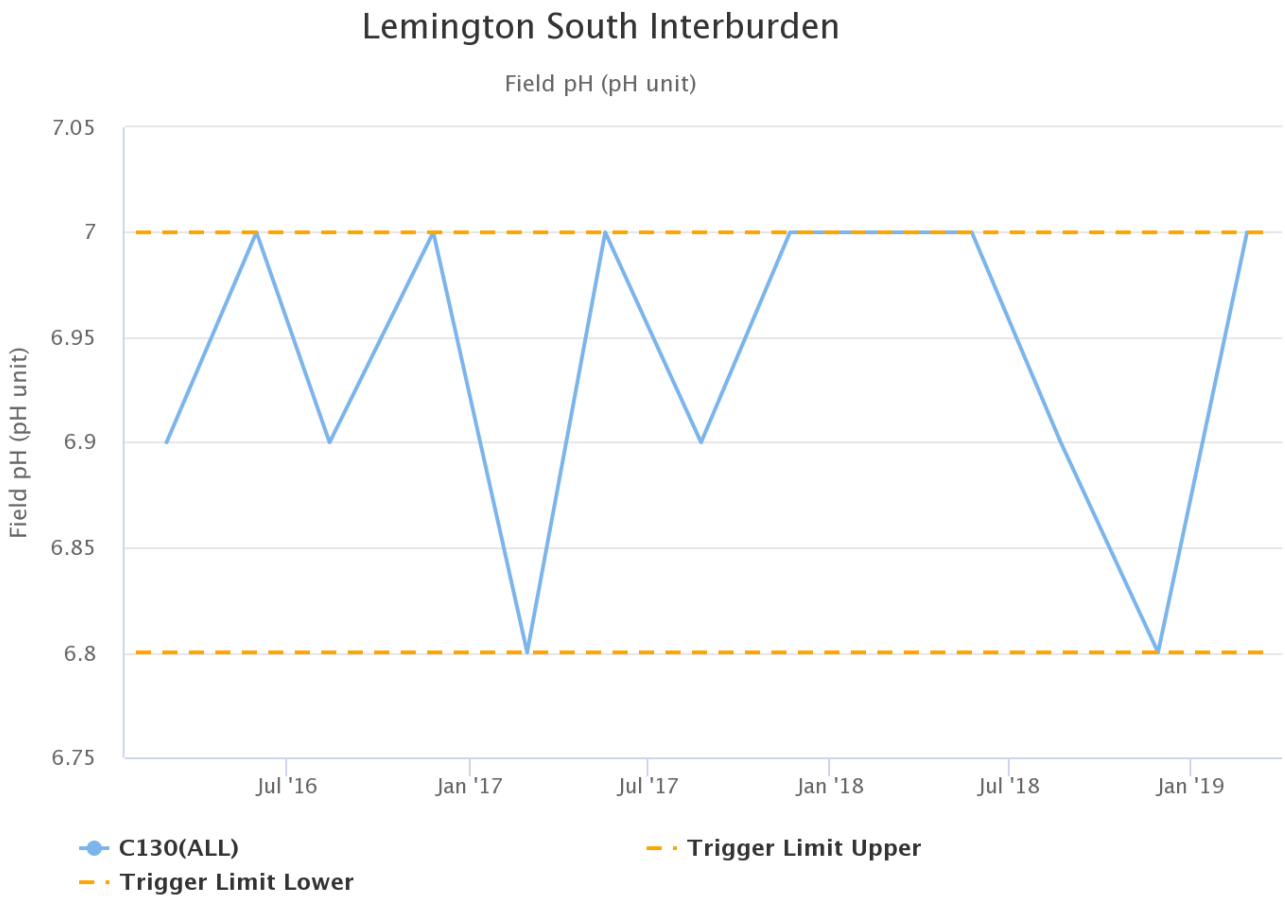

Figure 60: Lemington South Interburden pH Trend – March 2019

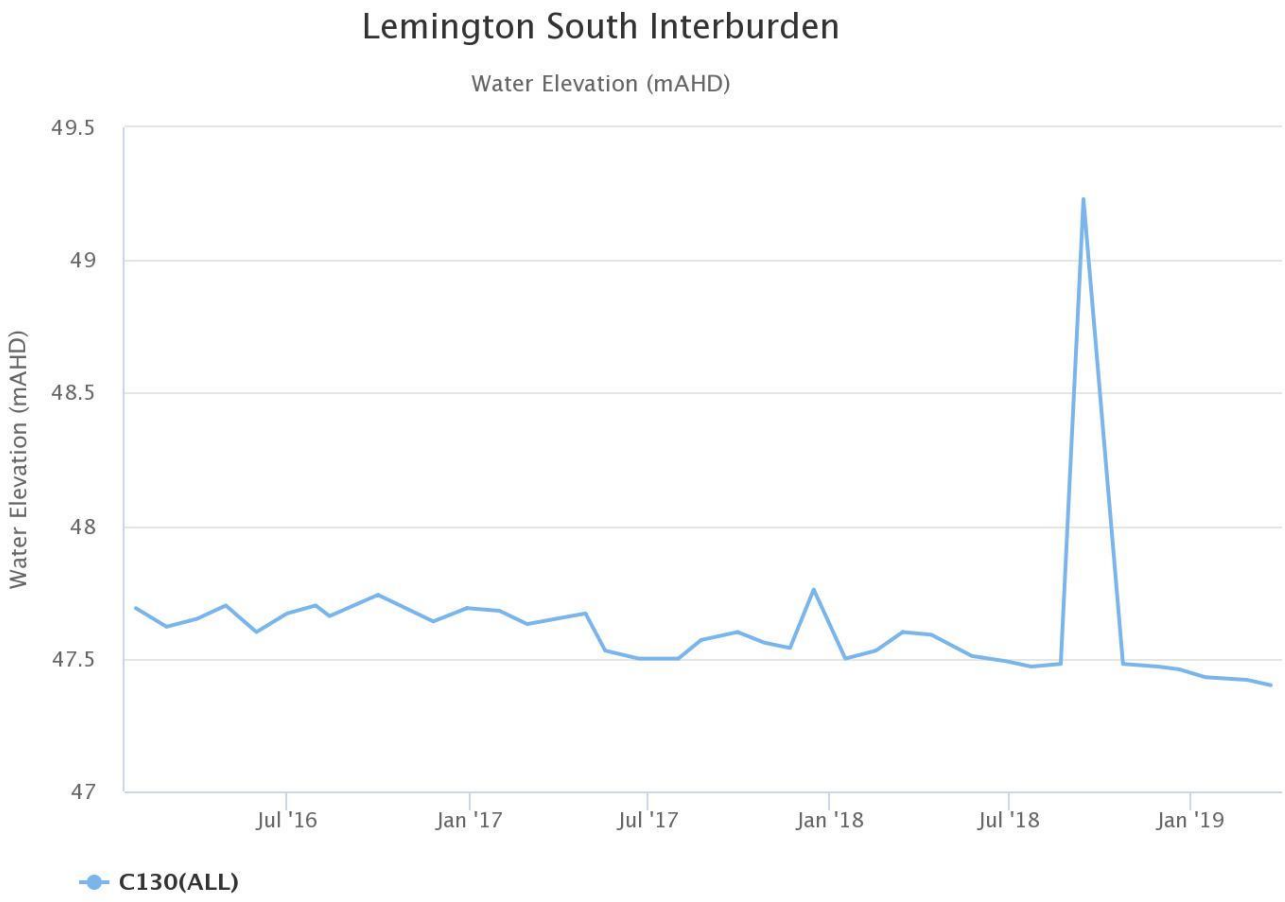

Figure 61: Lemington South Interburden Standing Water Level – March 2019

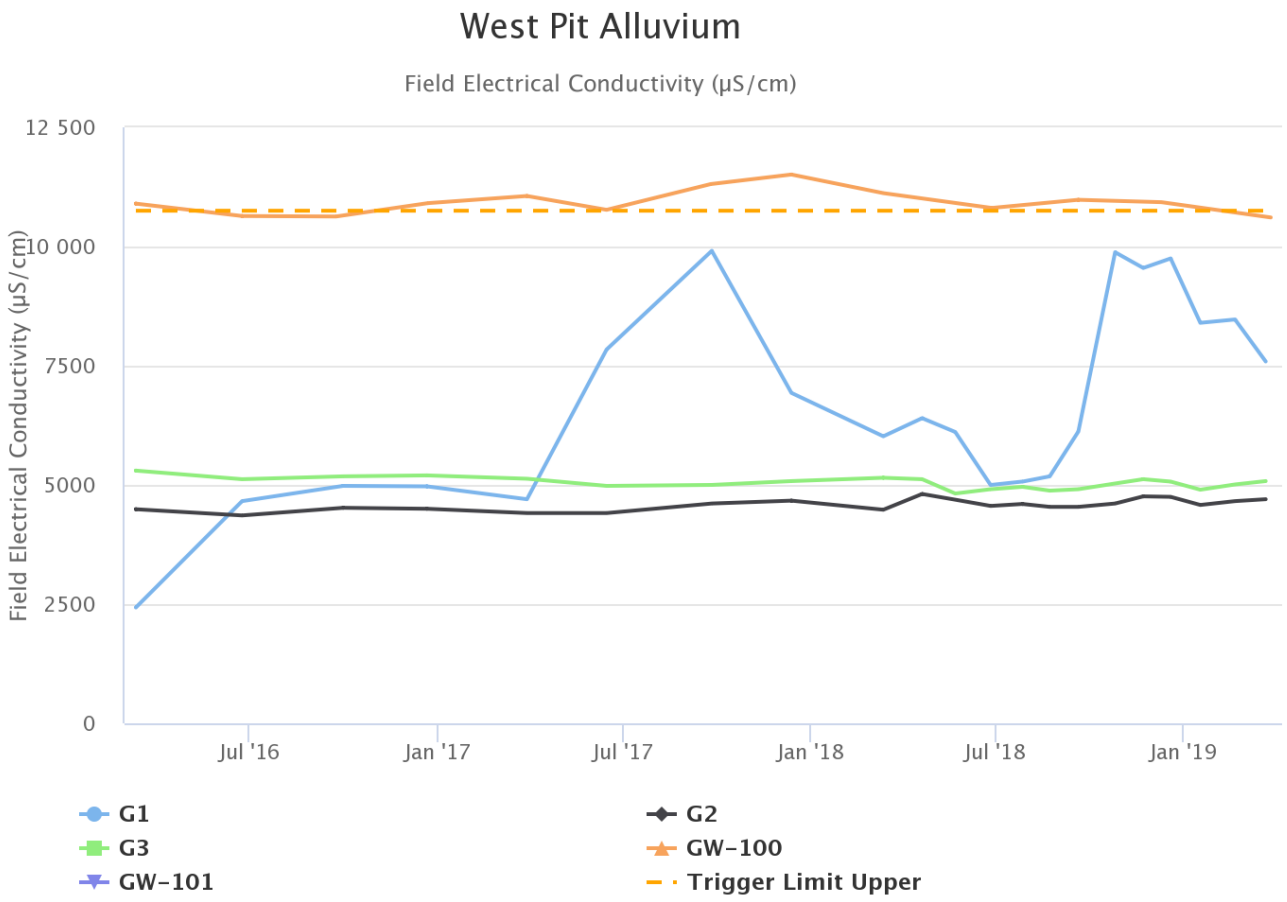

Figure 62: West Pit Alluvium Electrical Conductivity Trend – March 2019

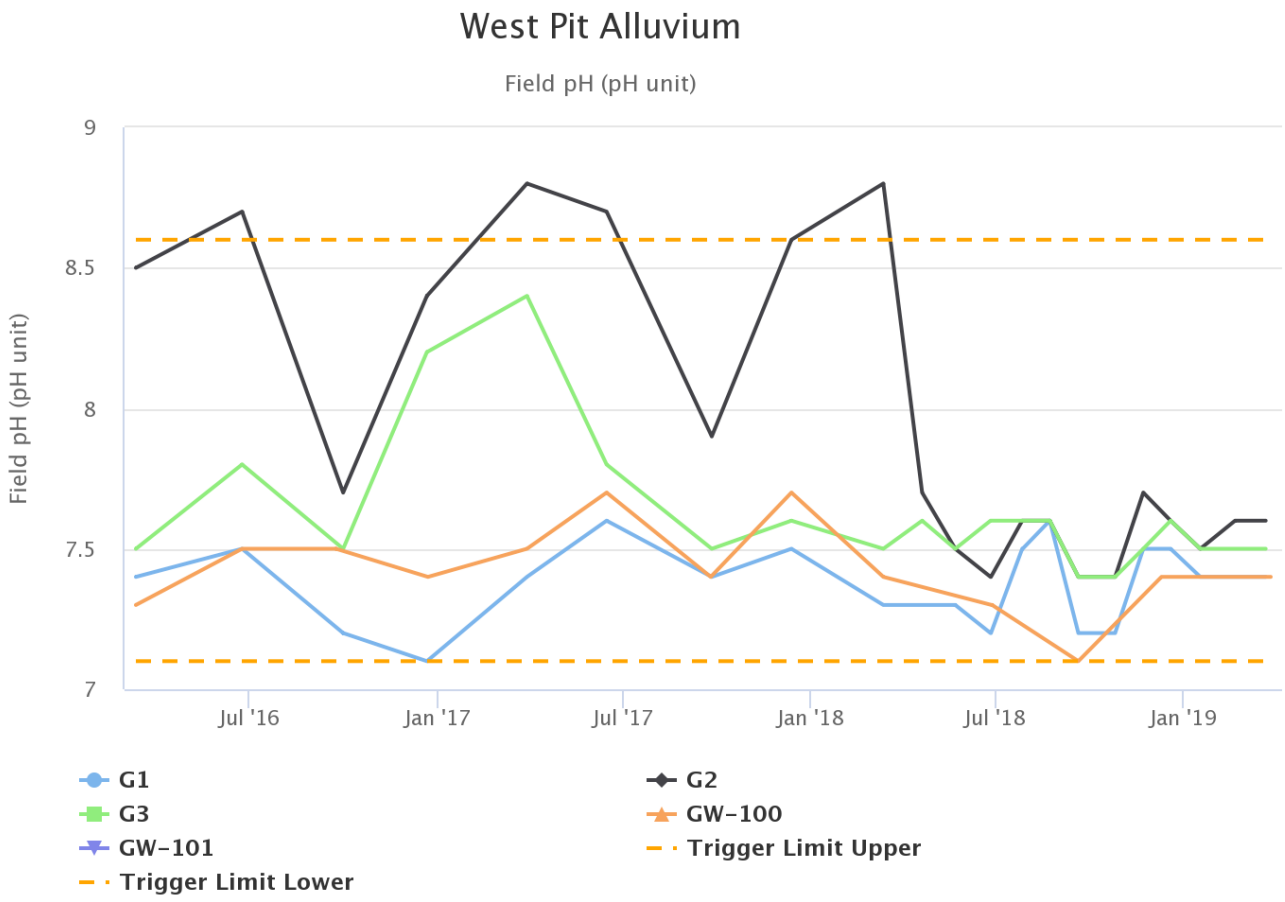

Figure 63: West Pit Alluvium pH Trend – March 2019

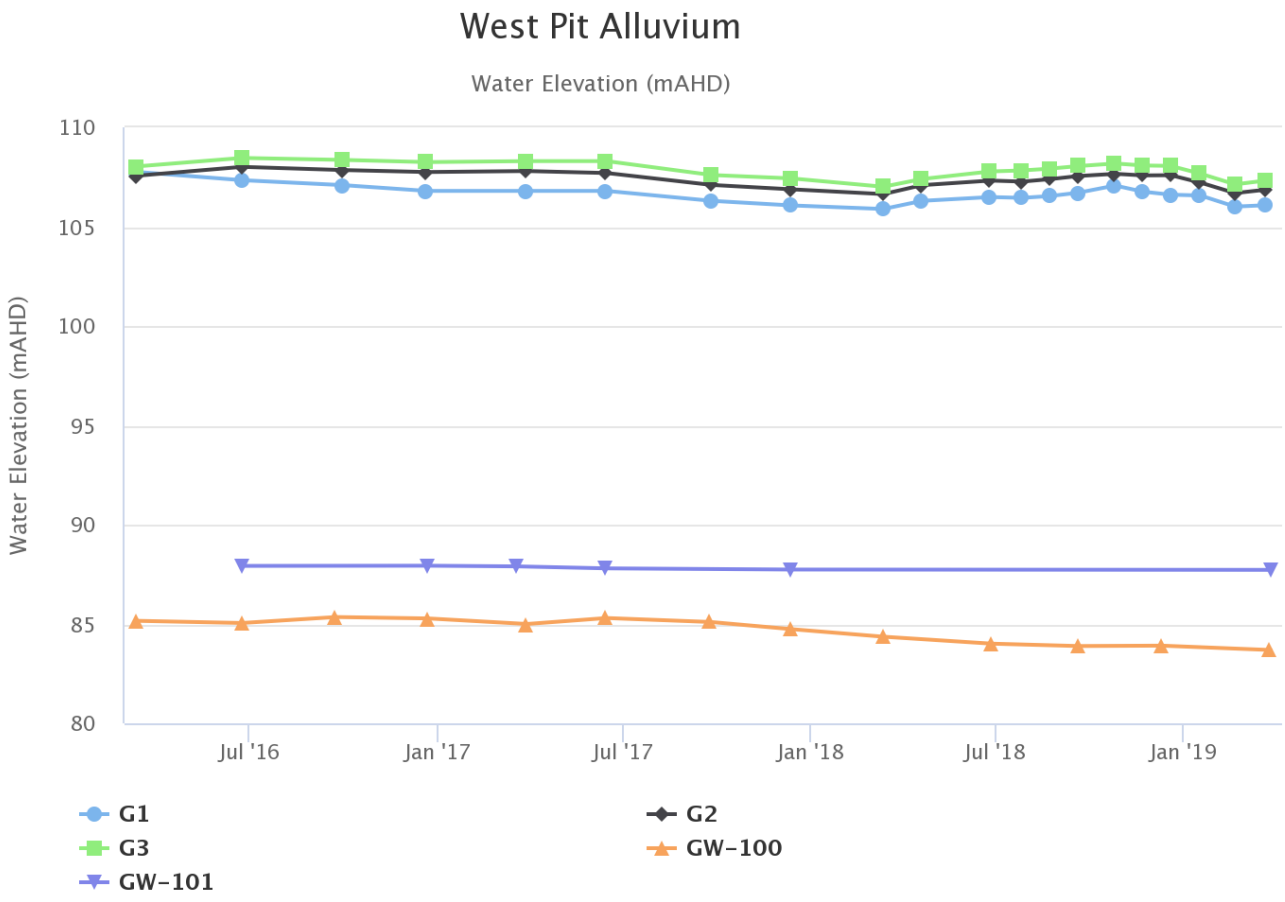

Figure 64: West Pit Alluvium Standing Water Level – March 2019

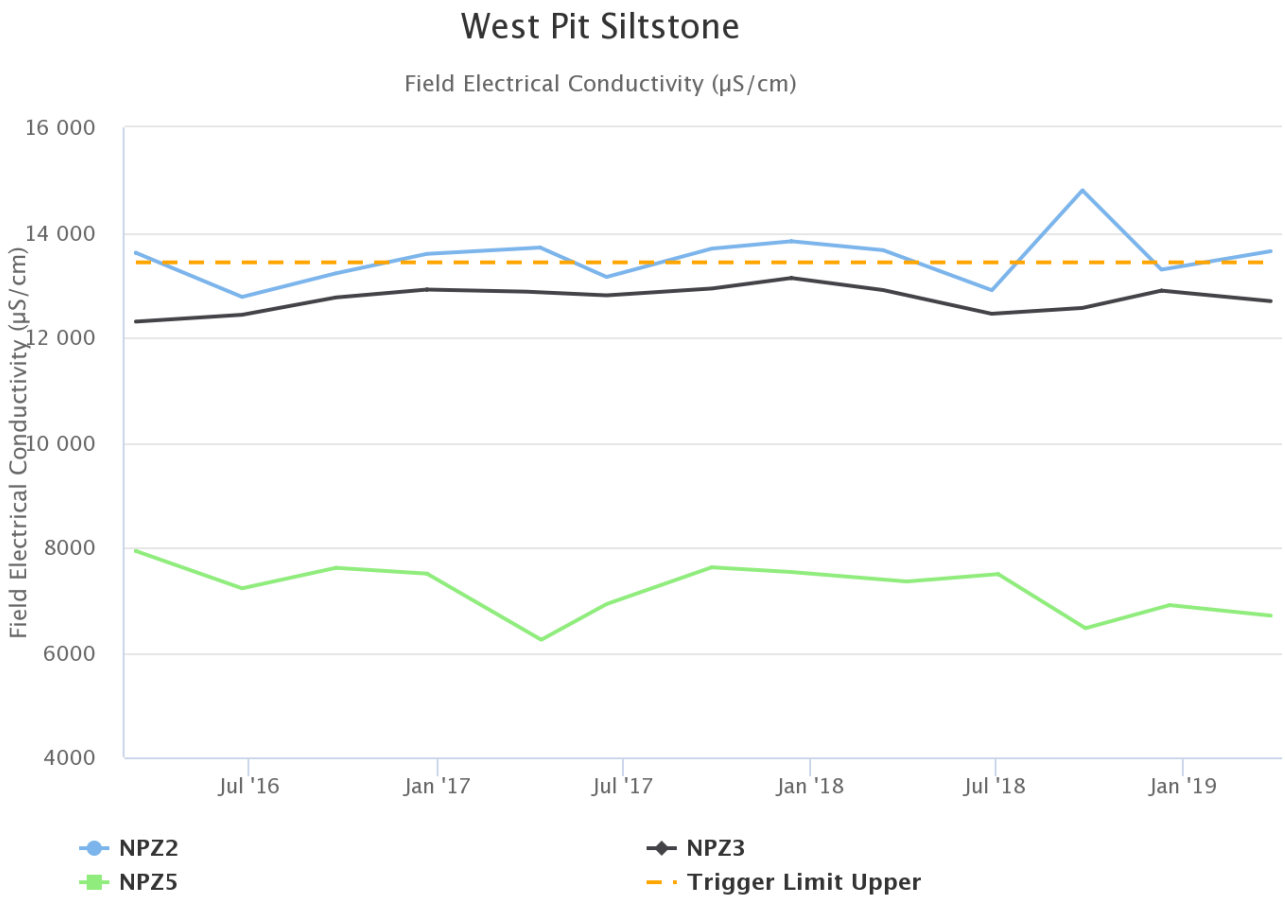

Figure 65: West Pit Siltstone Electrical Conductivity Trend – March 2019

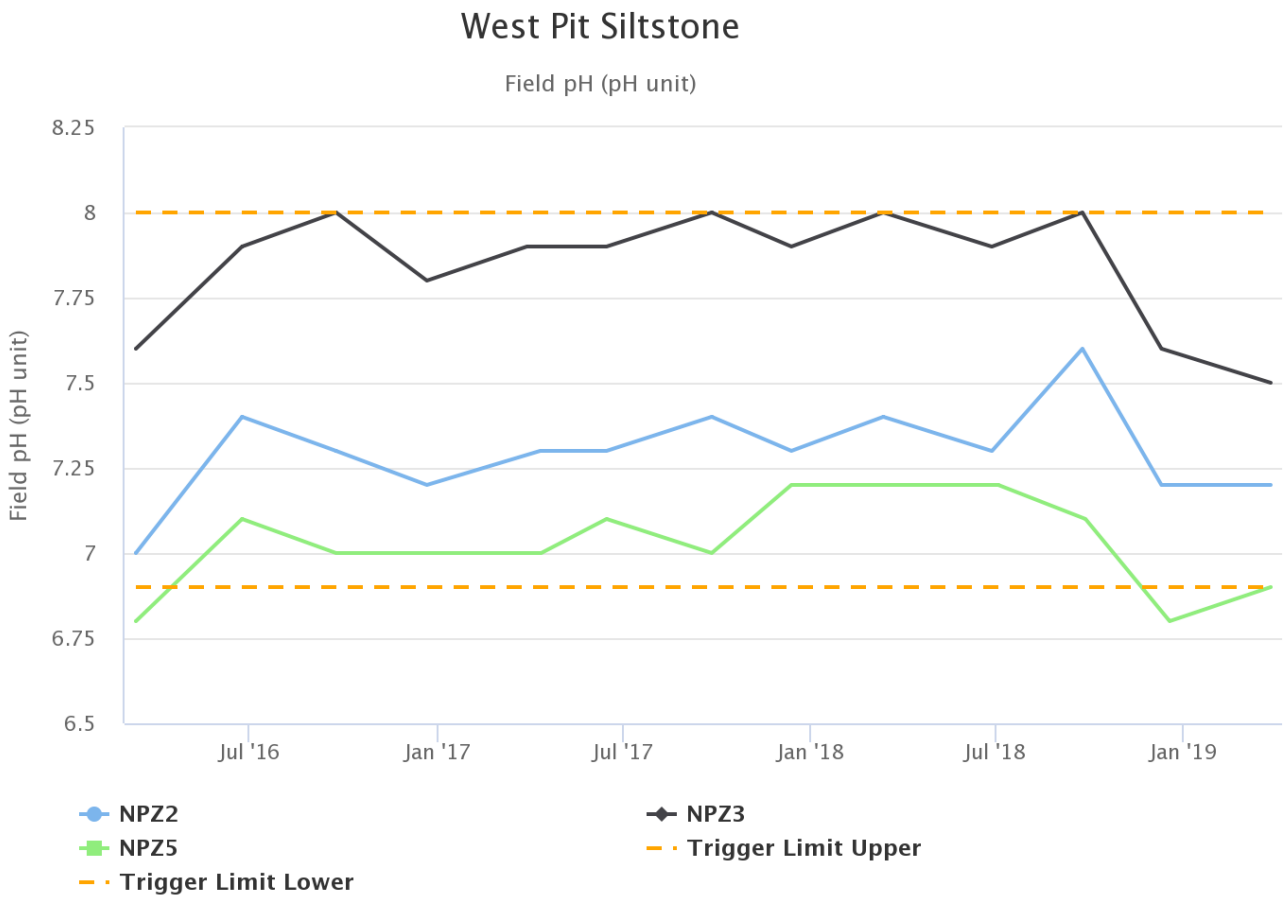

Figure 66: West Pit Siltstone pH Trend – March 2019

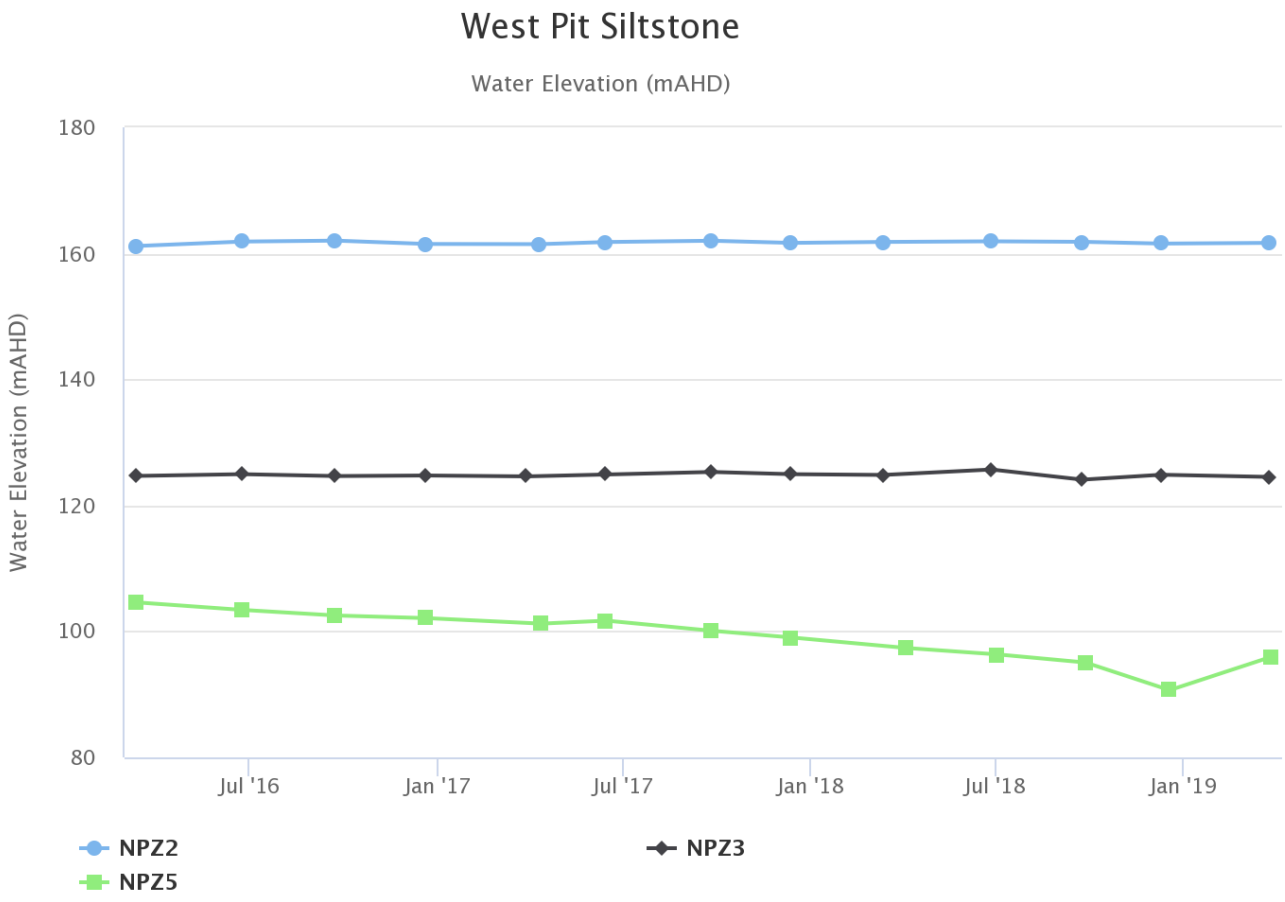

Figure 67: West Pit Siltstone Standing Water Level – March 2019

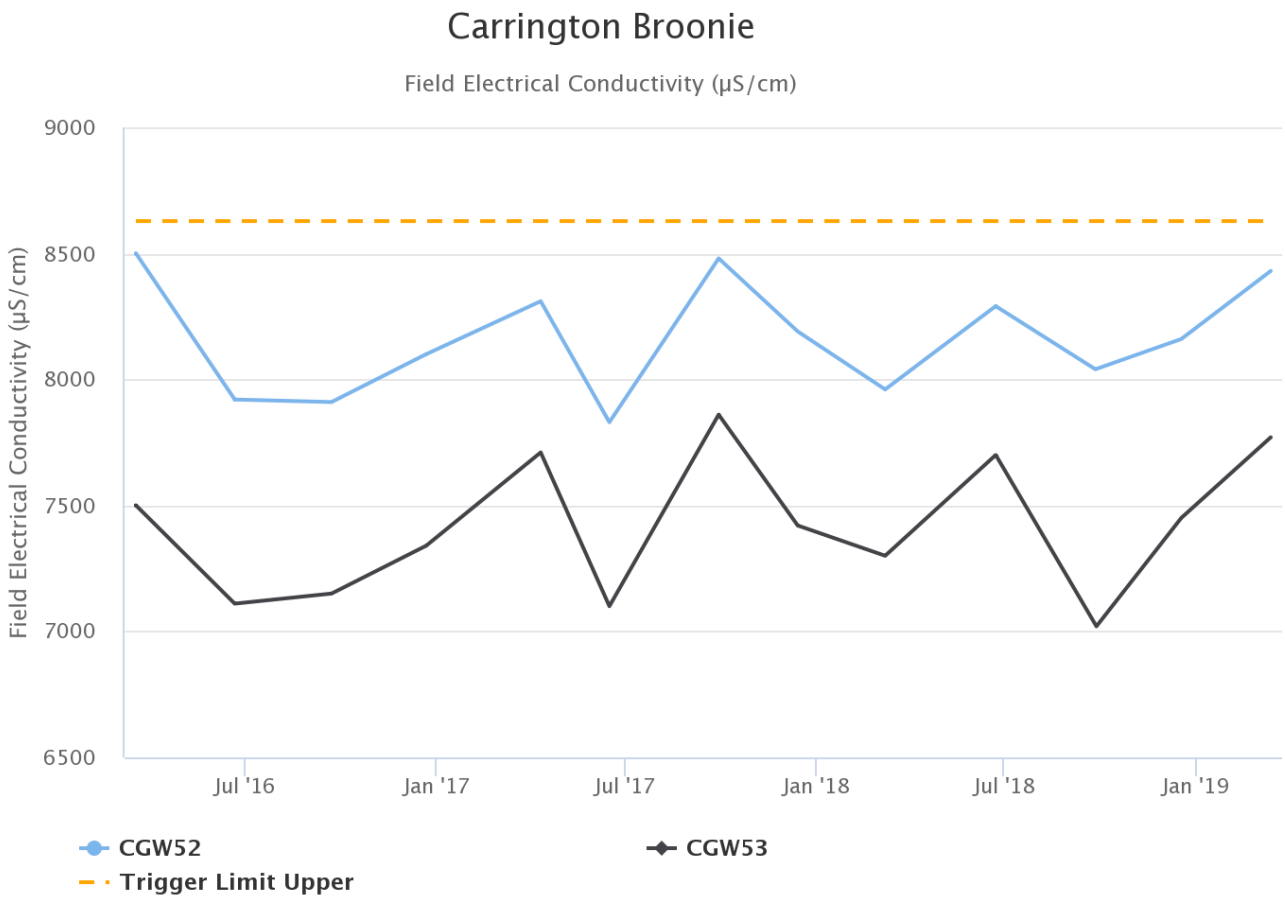

Figure 68: Carrington Broonie Electrical Conductivity Trend – March 2019

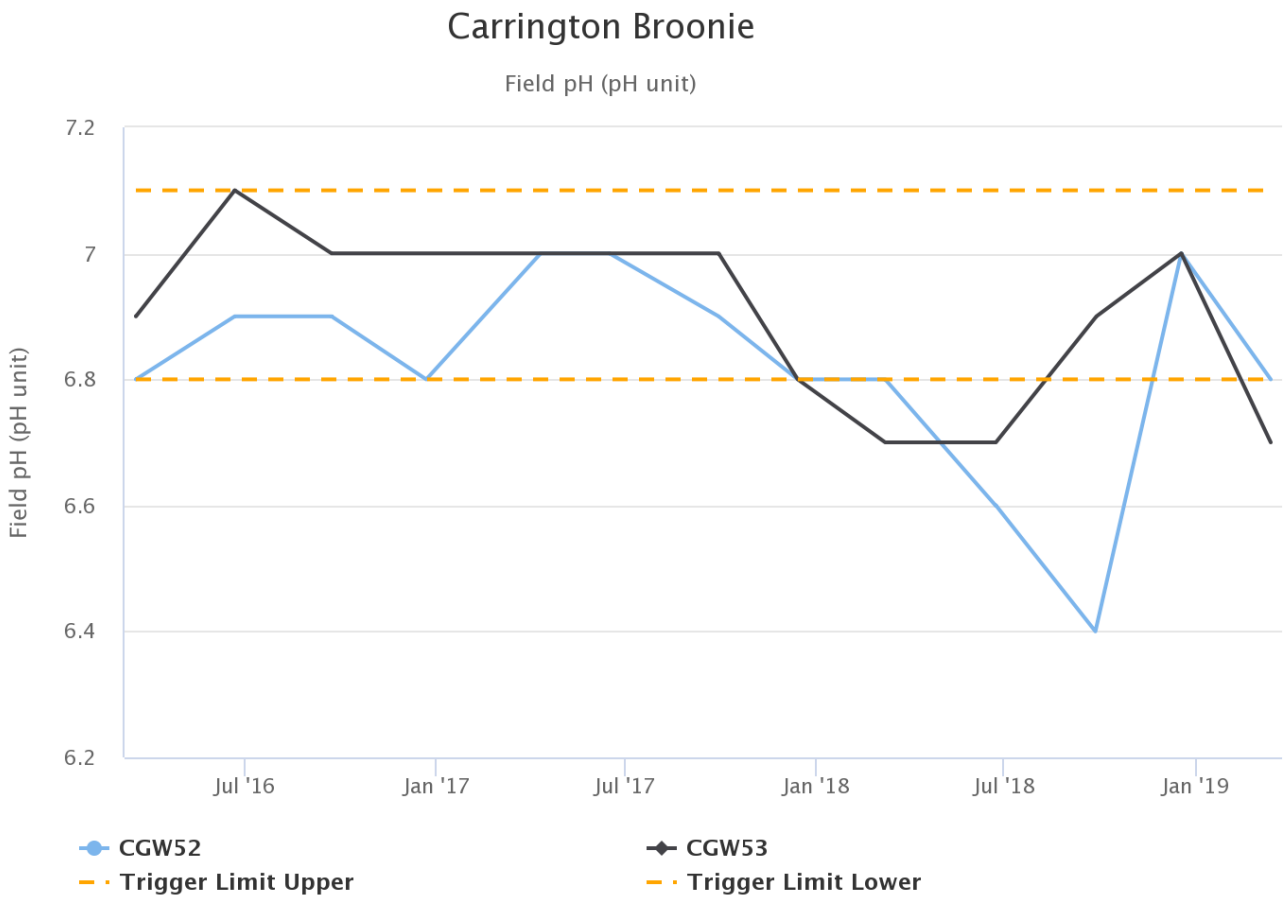

Figure 69: Carrington Broonie pH Trend – March 2019

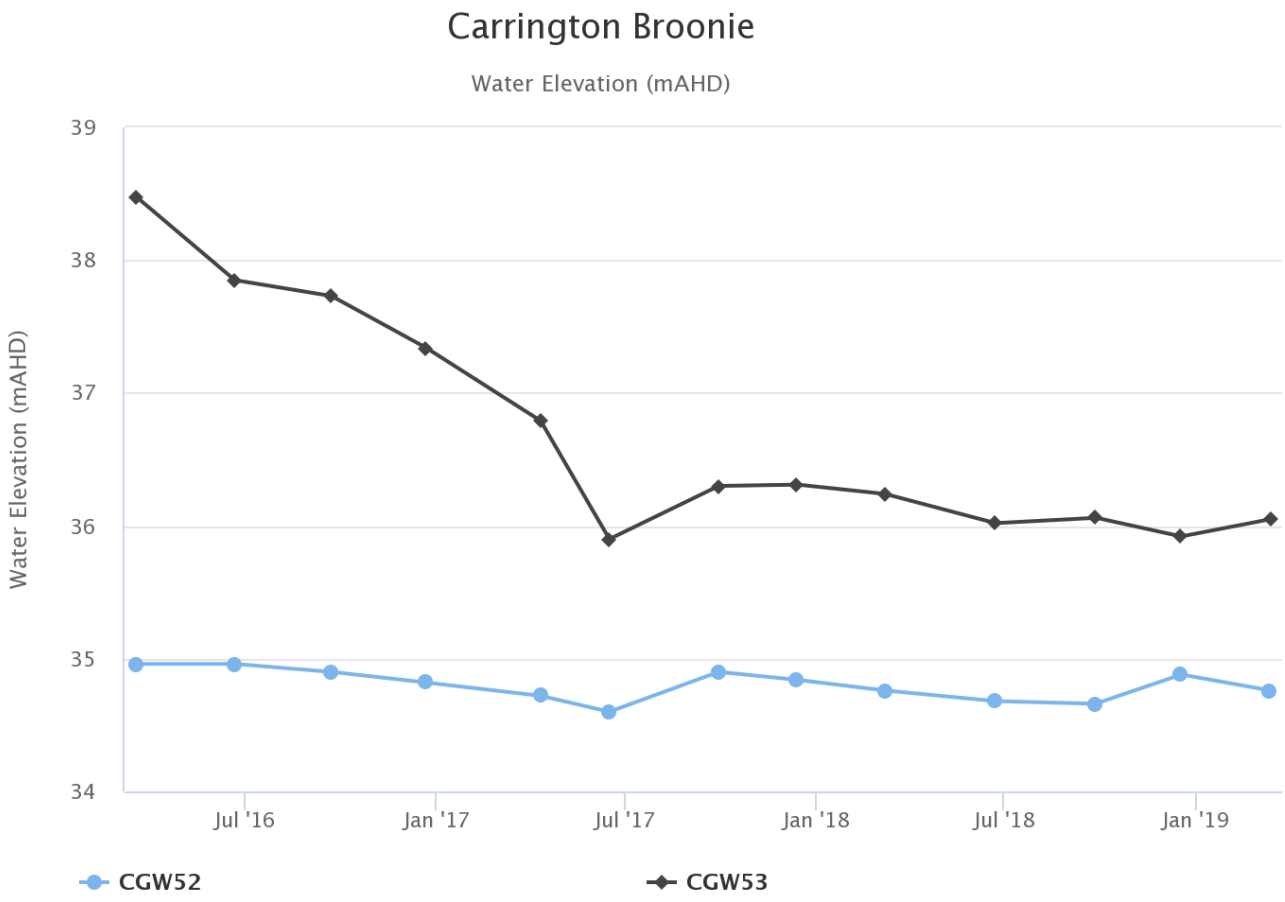

Figure 70: Carrington Broonie Standing Water Level – March 2019

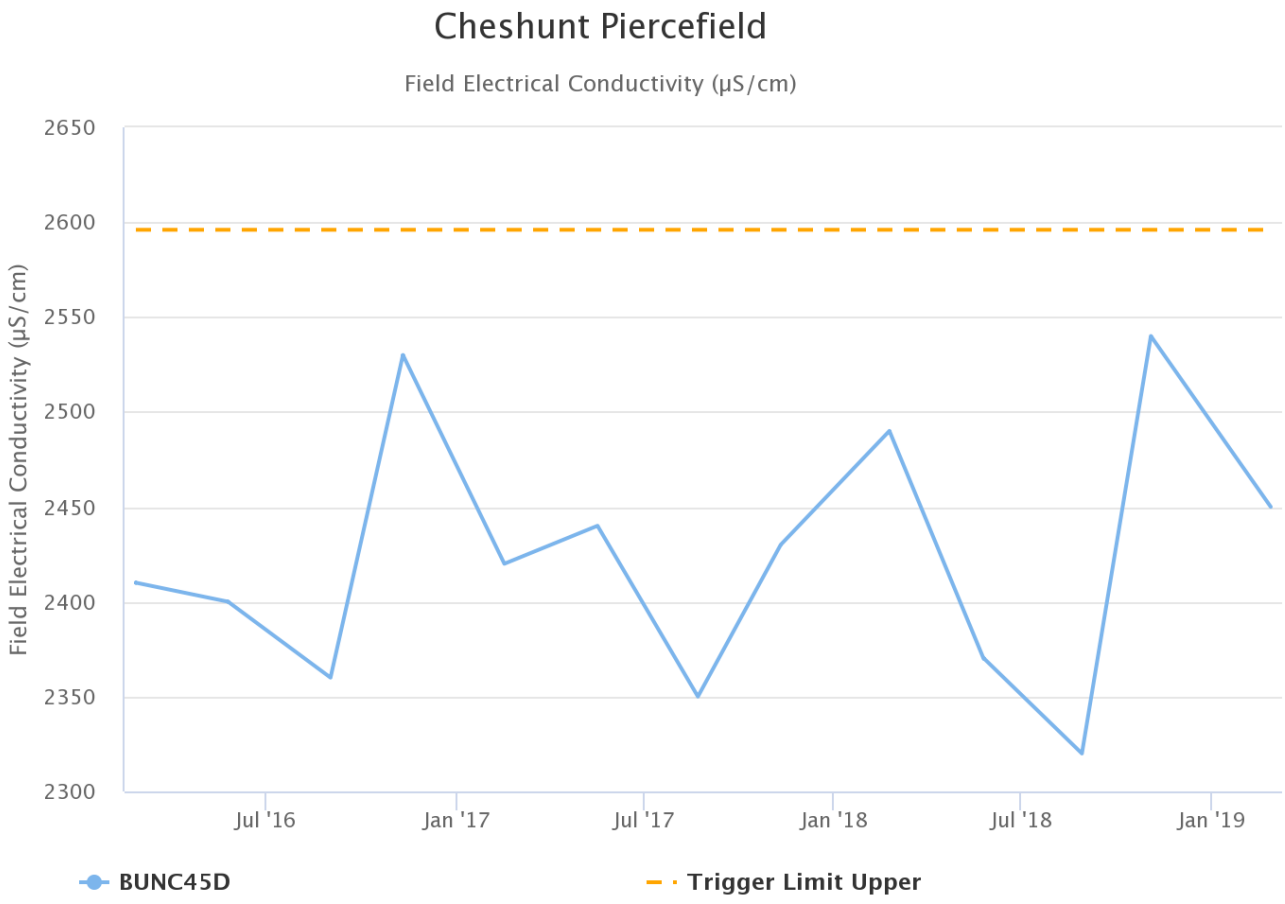

Figure 71: Cheshunt Piercefield Electrical Conductivity Trend – March 2019

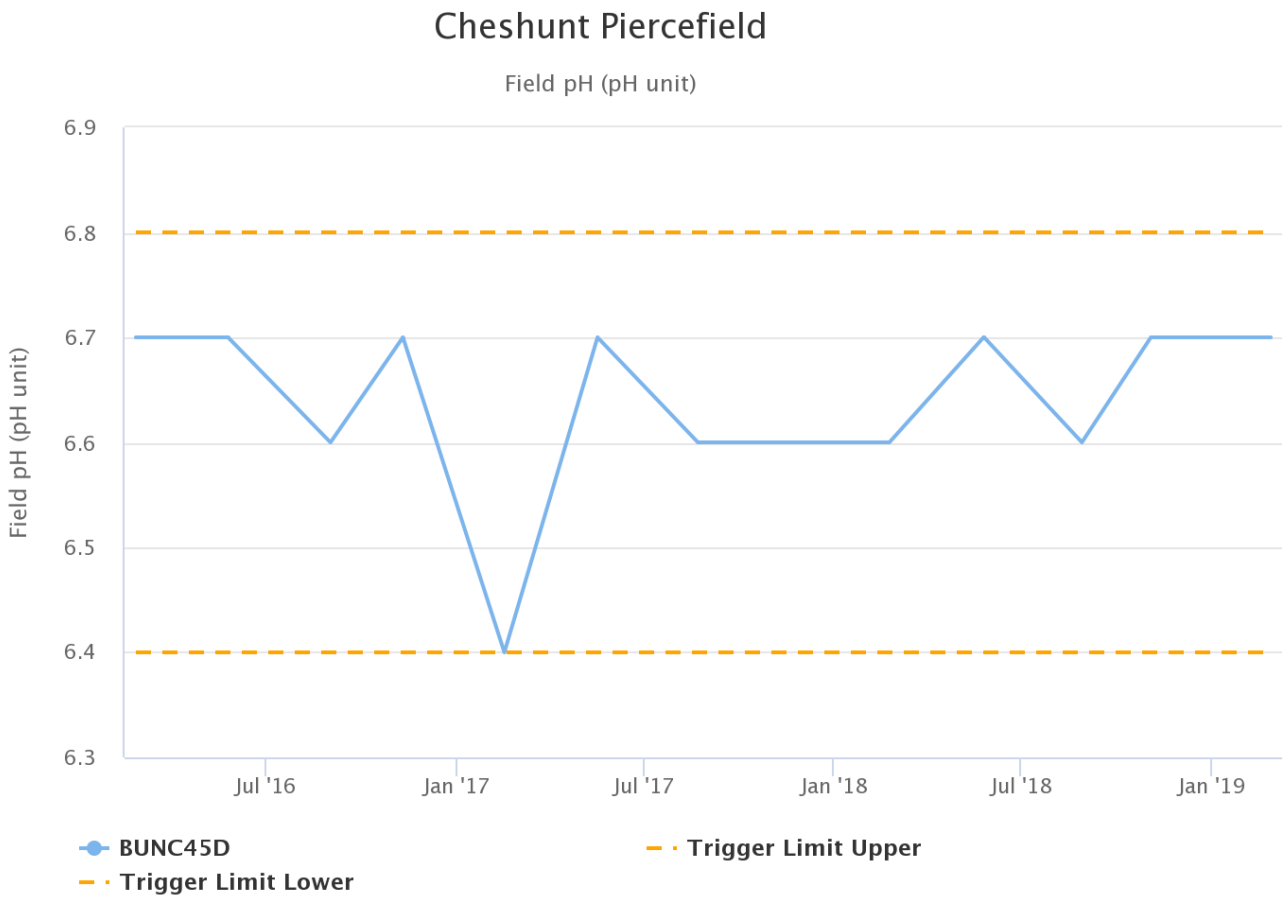

Figure 72: Cheshunt Piercefield pH Trend – March 2019

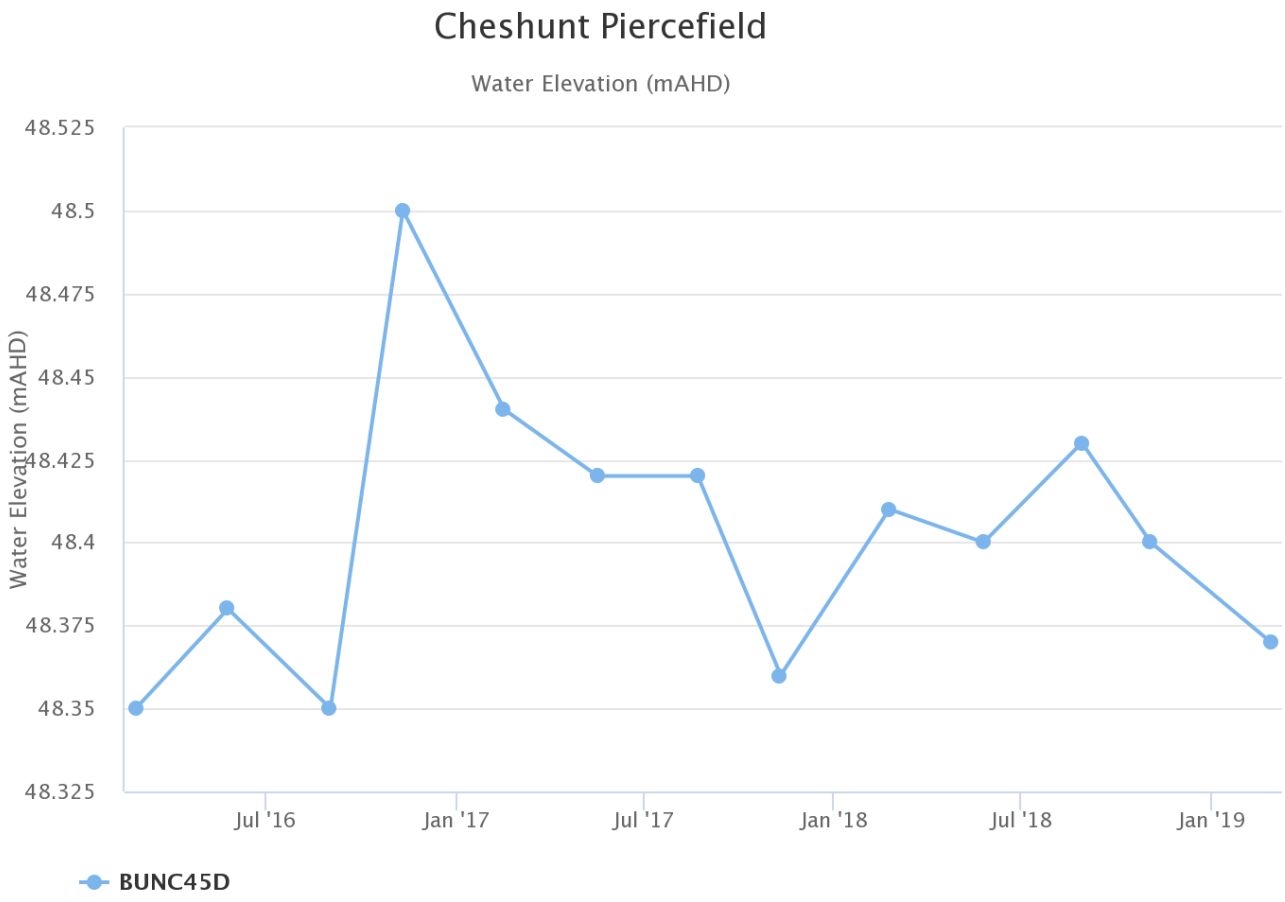

Figure 73: Cheshunt Piercefield Standing Water Level – March 2019

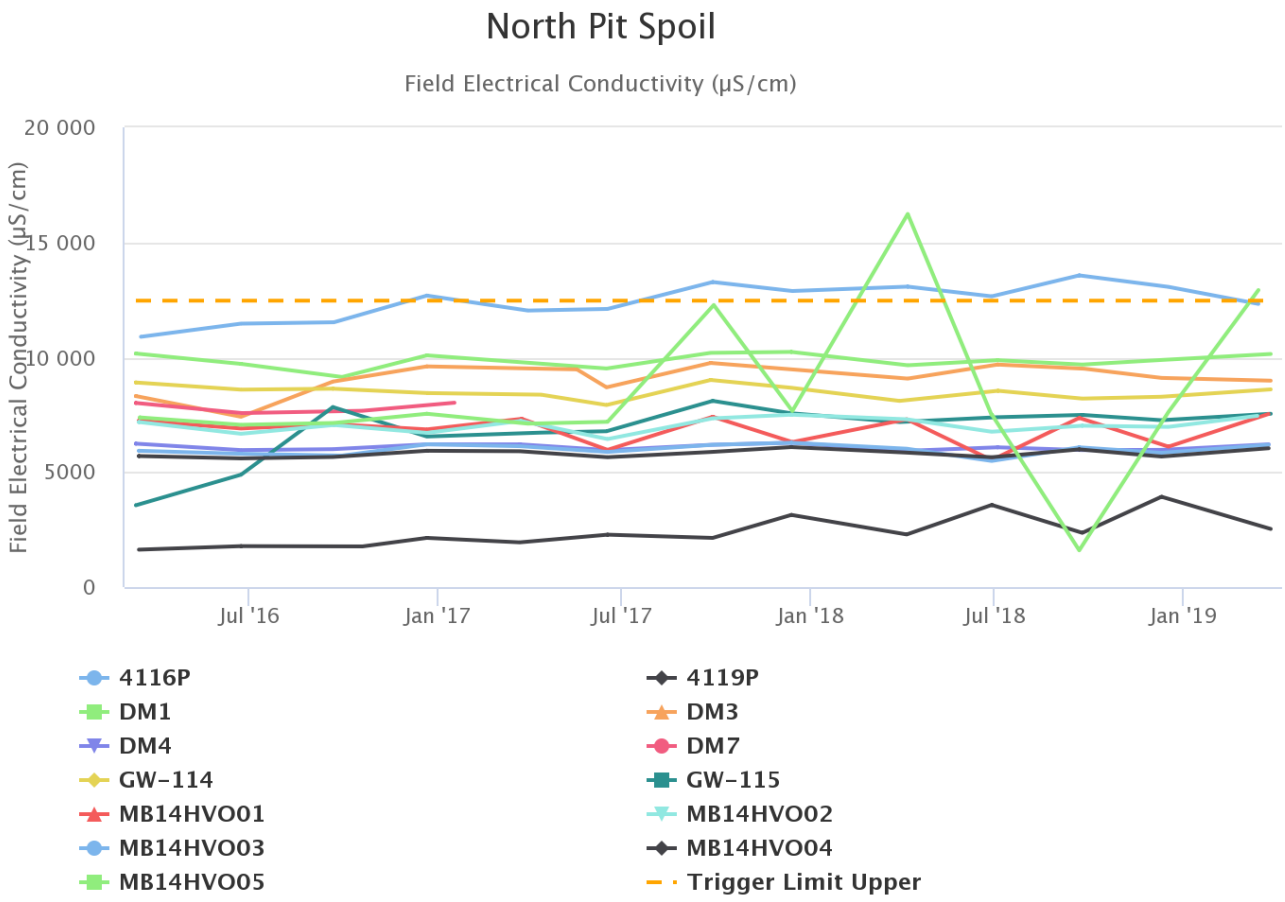

Figure 74: North Pit Spoil Electrical Conductivity Trend – March 2019

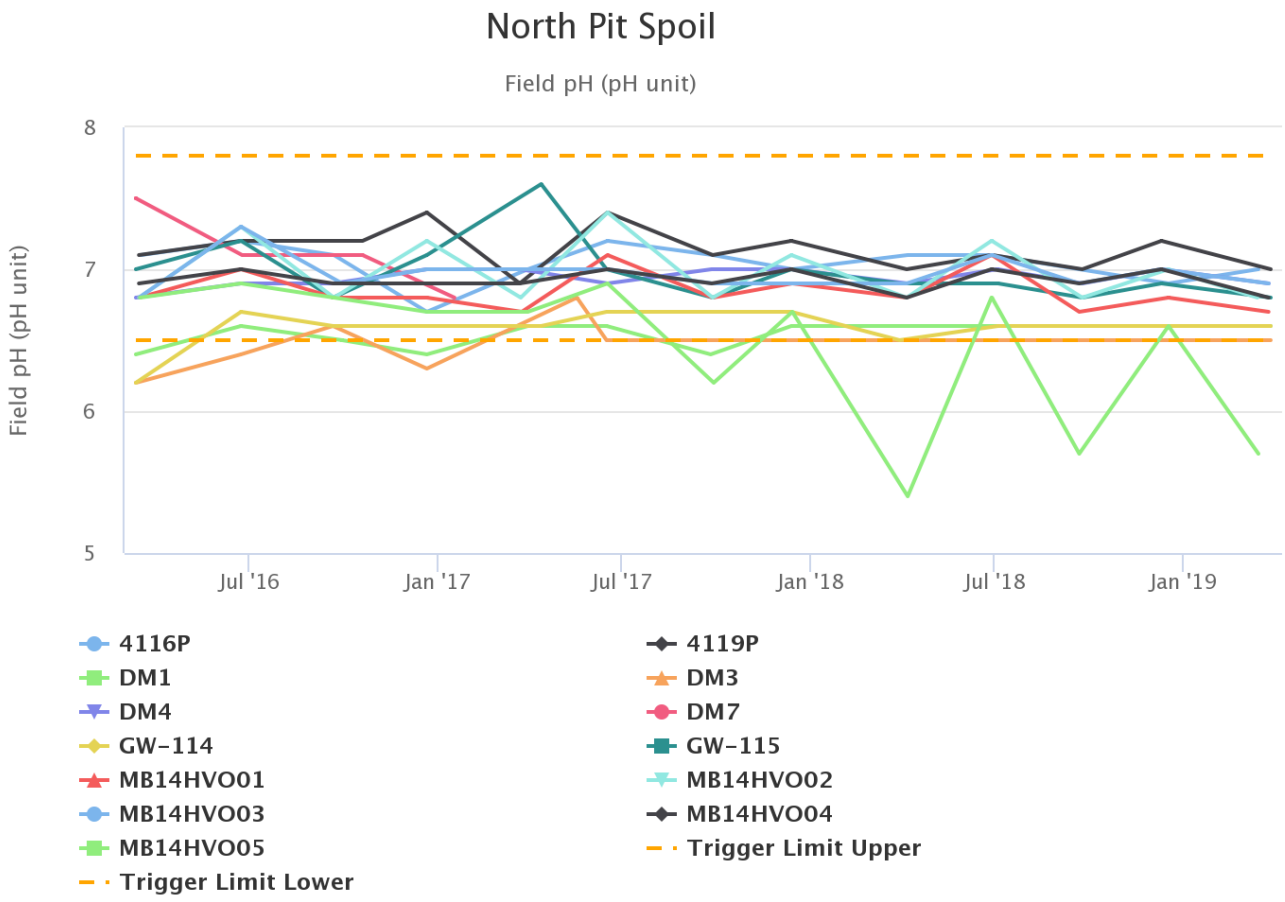

Figure 75: North Pit Spoil pH Trend – March 2019

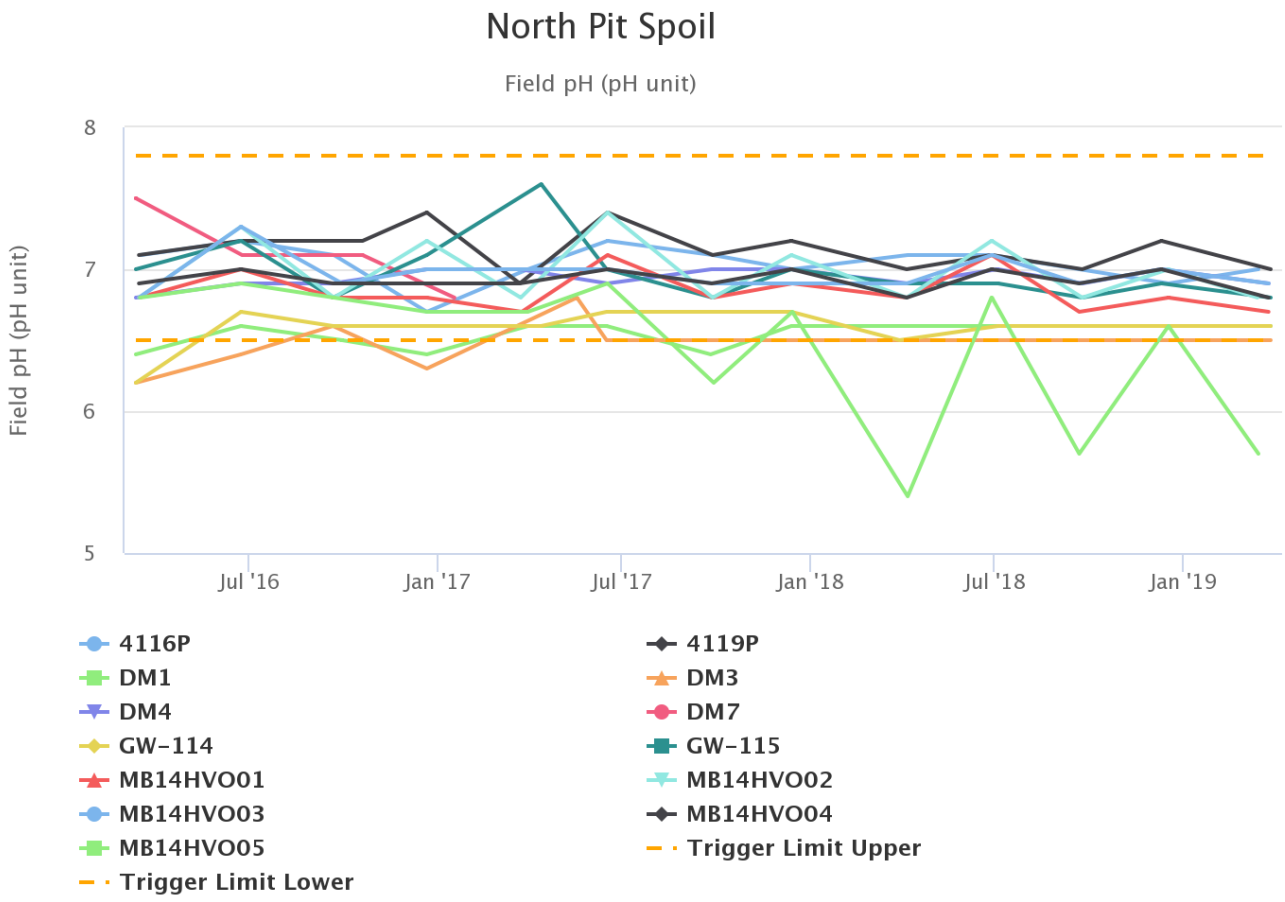

Figure 76: North Pit Spoil Standing Water Level – March 2019

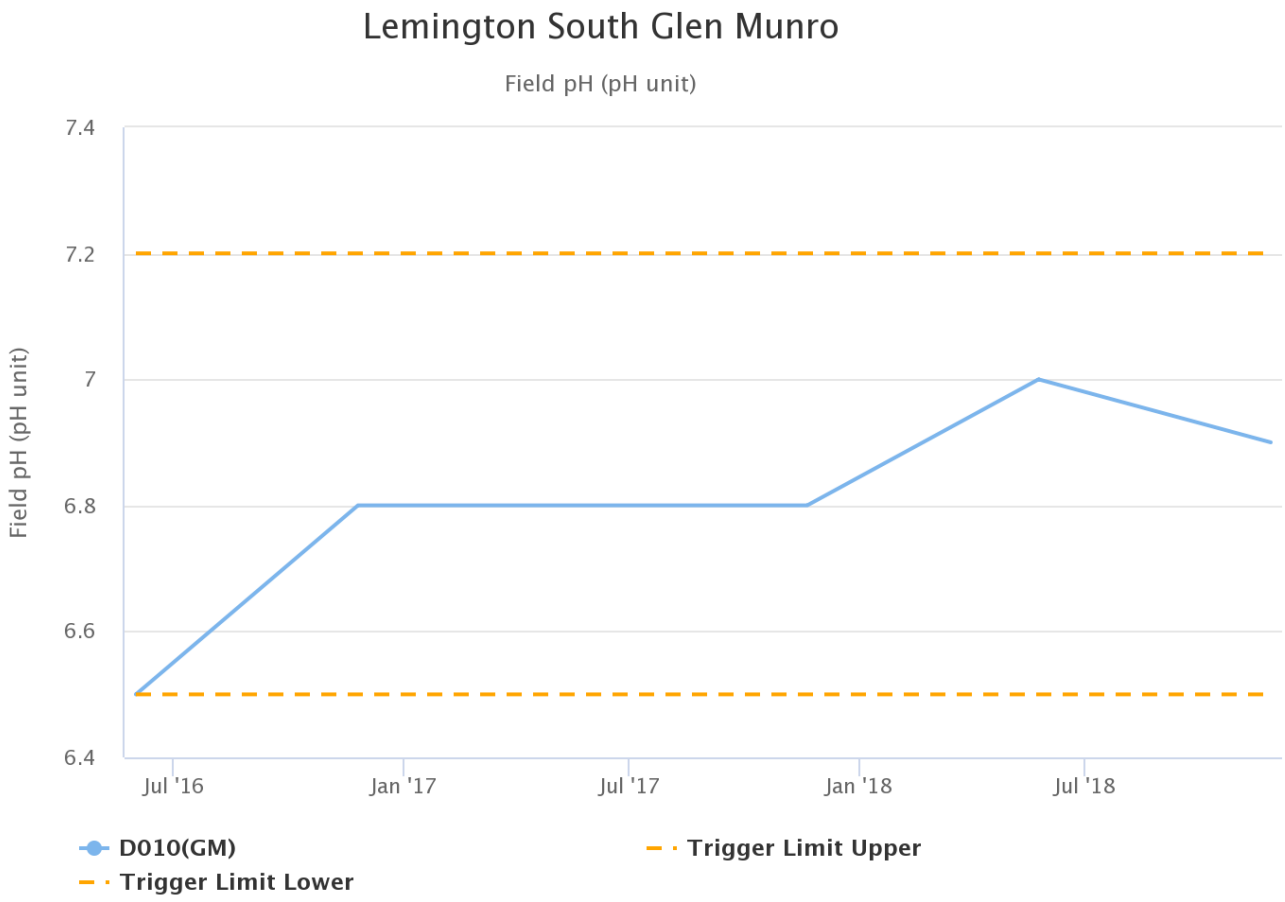

Figure 77: Lemington South Glen Munro pH Trend – March 2019

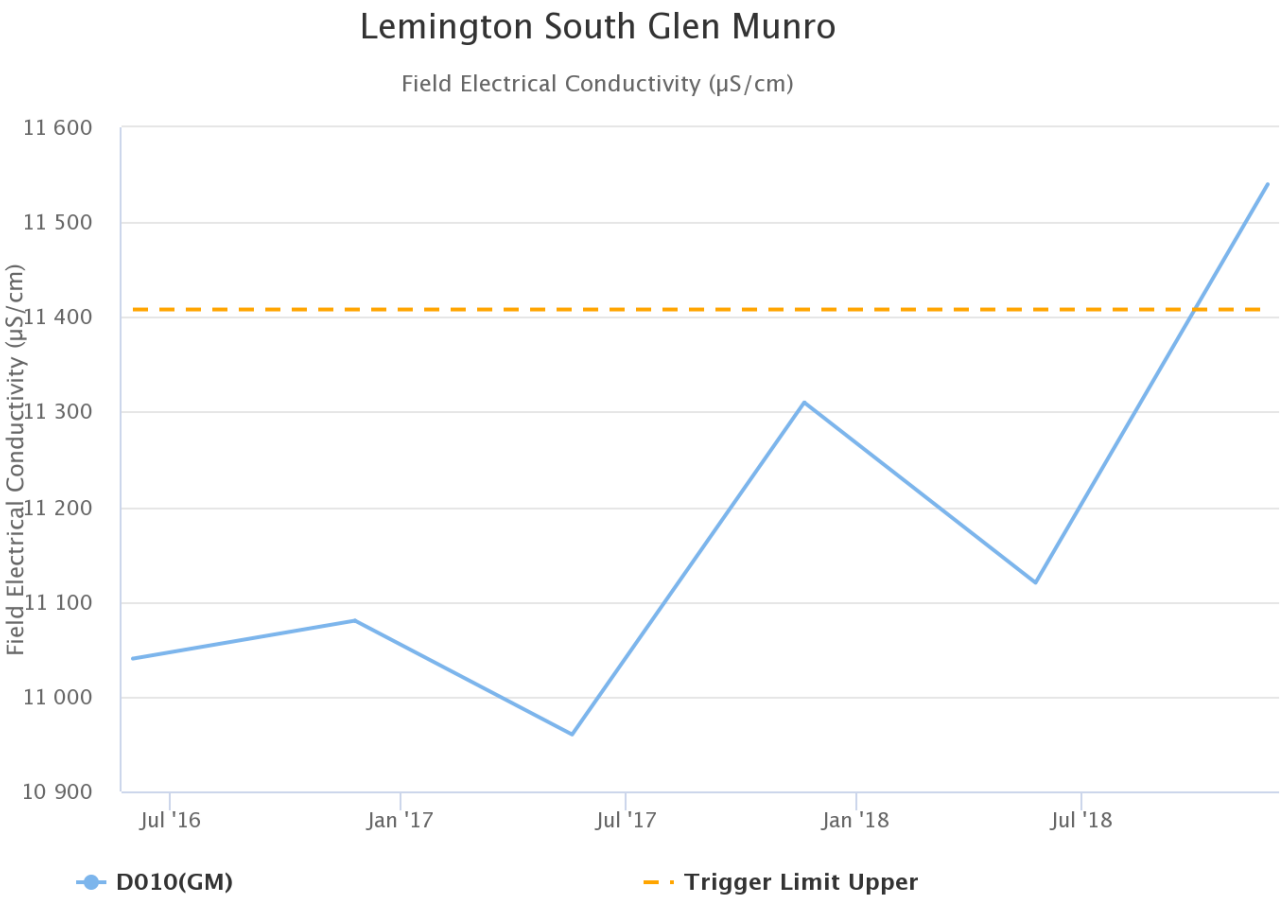

Figure 78: Lemington South Glen Munro Electrical Conductivity Trend – March 2019

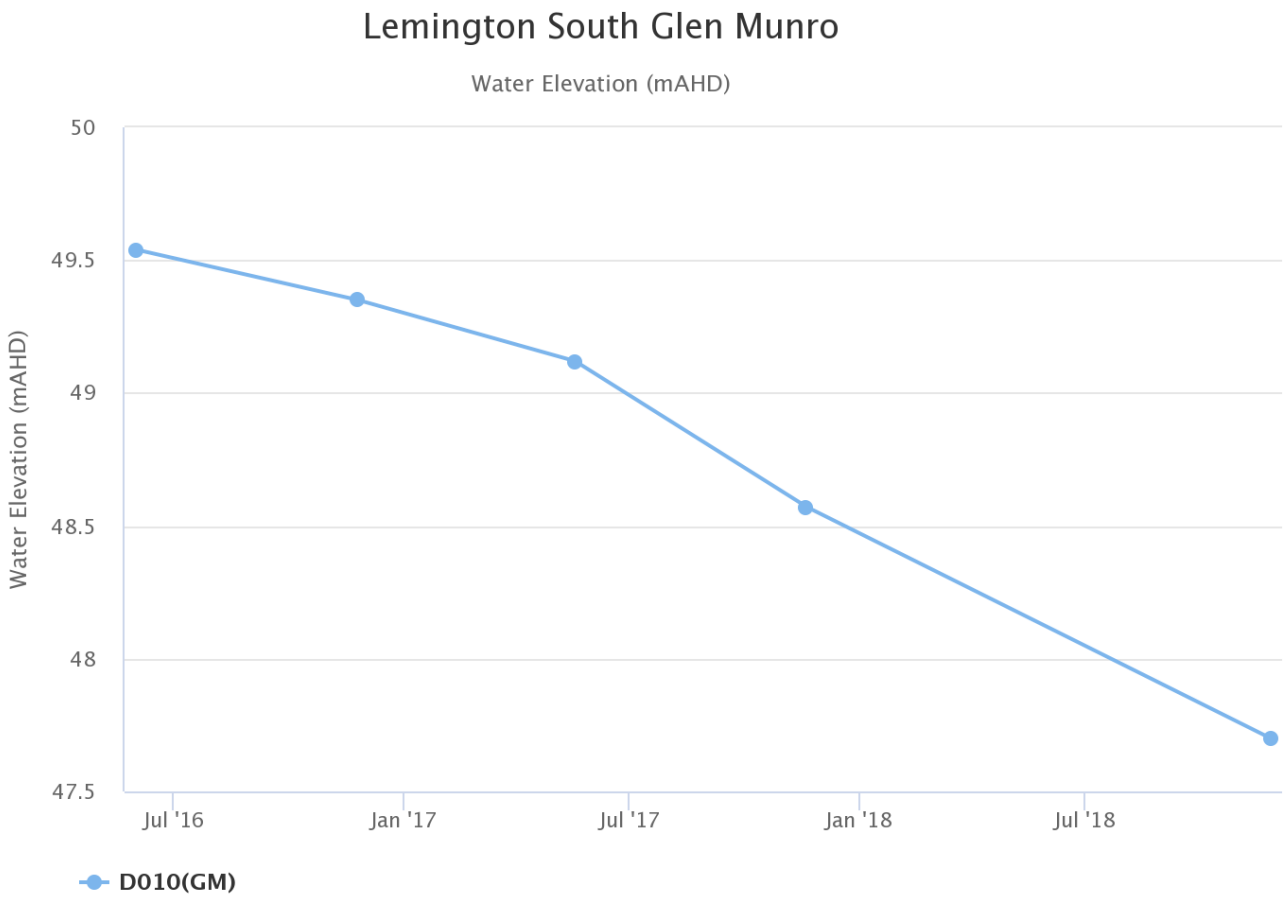

Figure 79: Lemington South Glen Munro Standing Water Level Trend – March 2019

4.2.1 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.

Current internal trigger limits breaches are summarised in Table 4.

Table 4: Groundwater Triggers – Q1 2019

Site	Date	Trigger Limit Breached	Action Taken in Response
CFW55R	3/1/2019 to 26/3/2019	EC – 95th Percentile	Investigation in progress
BZ4A(2)	25/02/2019	pH – 5th Percentile	First exceedance of pH 5th Percentile trigger.Watching brief*
BZ3-3	25/02/2019	pH – 5th Percentile	Second exceedance of pH 5th Percentile trigger.Watching brief*
PBO1(ALL)	26/02/2019	EC – 95th Percentile	Investigation in progress
C130(ALL)	26/02/2019	EC – 95th Percentile	Second exceedance of EC 95th Percentile trigger.Watching brief*
CGW49	13/03/2019	EC – 95th Percentile	Second exceedance of EC 95th Percentile trigger.Watching brief*
MB14HVO05	15/03/2019	EC – 95th Percentile	First exceedance of EC 95th Percentile trigger.Watching brief*
NPZ2	27/03/2019	EC – 95th Percentile	First exceedance of EC 95th Percentile trigger.Watching brief*

* = Watching brief established pending outcomes of subsequent monitoring events. No specific actions required.

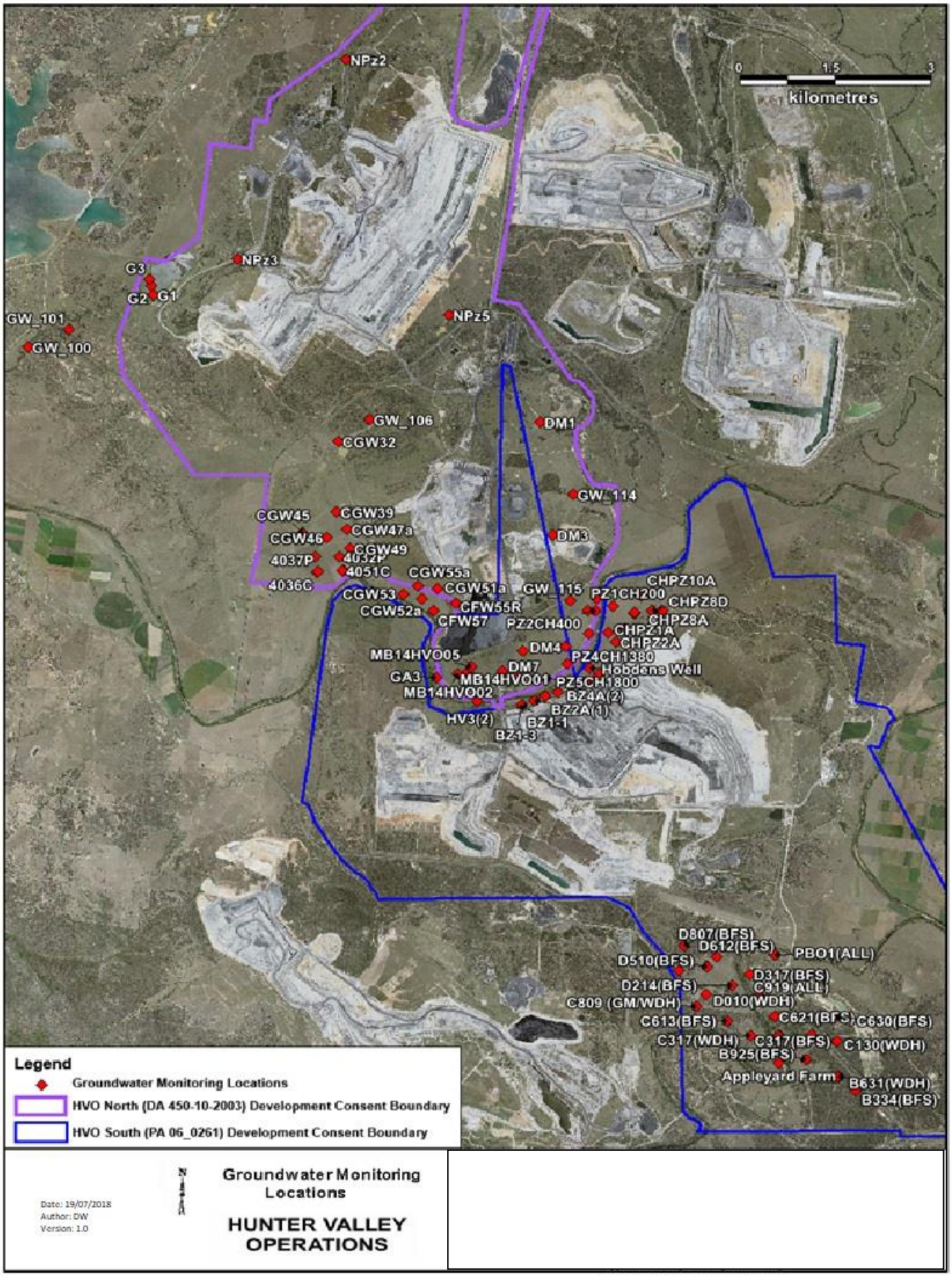

Figure 80: Groundwater Monitoring Location Plan

5.0 BLASTING

5.1.1 Blast Monitoring

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 83.

During March, 19 blasts were initiated at HVO. Figure 81 and Figure 82 show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in Table 5.

Table 5: Blasting Limits

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%

During the reporting period there were no exceedances of the airblast overpressure or ground vibration criteria.

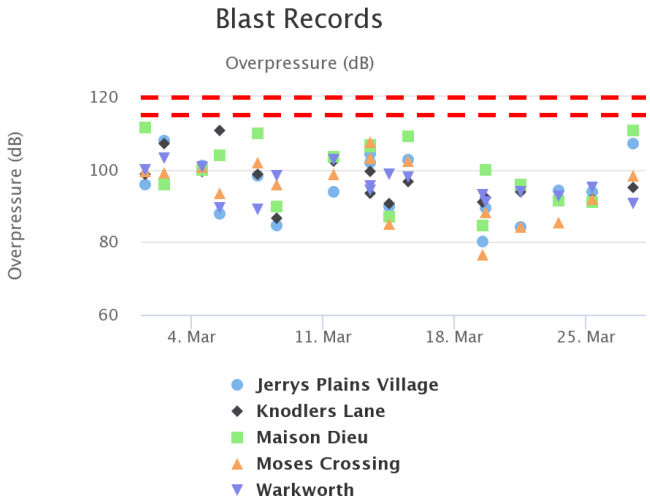

Figure 81: Overpressure Blast Monitoring Results – February 2019

Figure 82: Ground Vibration Blast Monitoring Results – February 2019

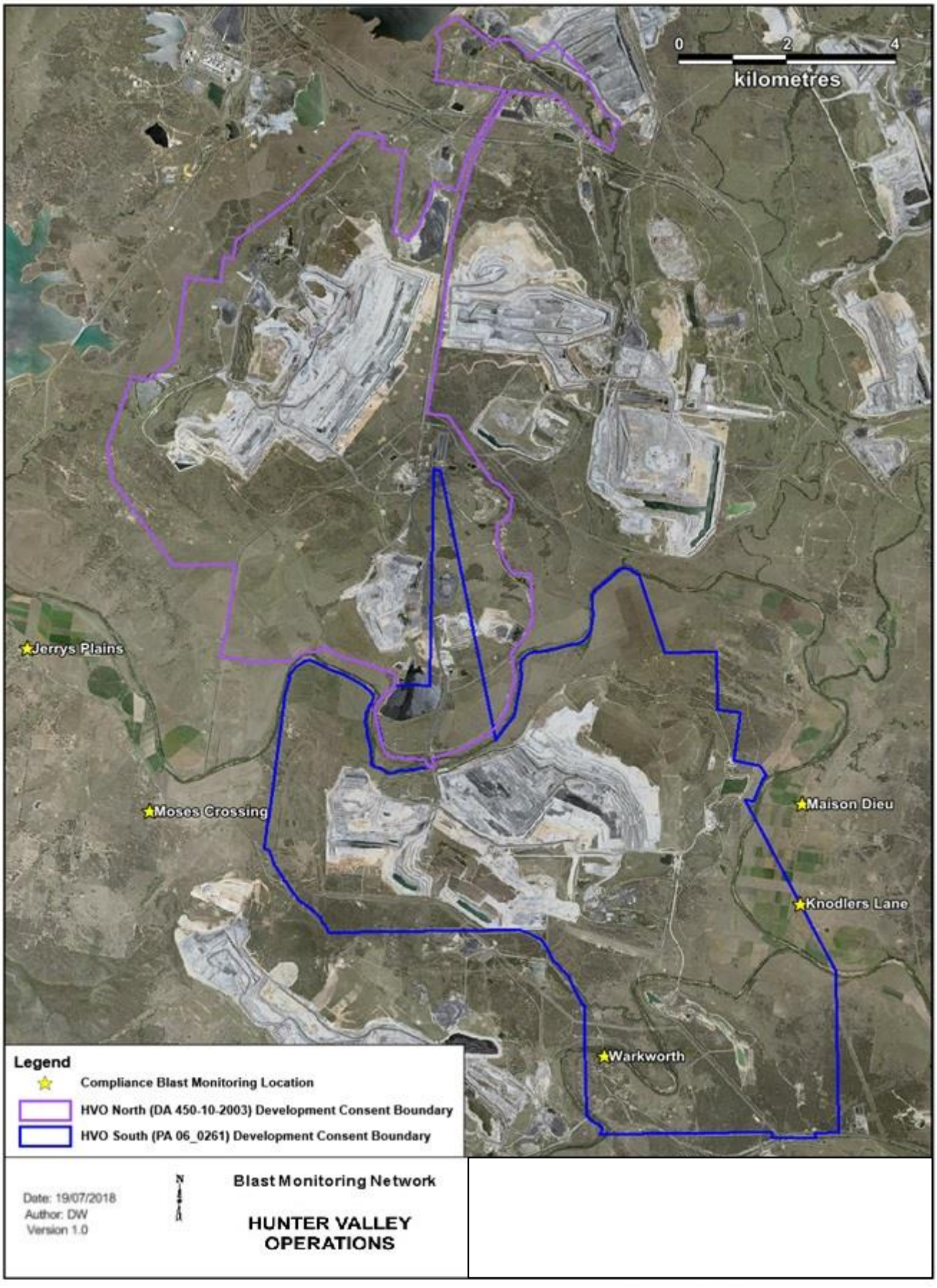

Figure 83: Blast Monitoring Location Plan

6.0 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 84.

6.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding HVO on the night shift of 19 and 20 March 2019 and additional monitoring for HVO North on 21 and 22 March 2019. Monitoring results are detailed in Table 6 to Table 10 . During the reporting period, no exceedances were recorded.

Table 6: $L_{Aeq,\ 15\ minute}$ HVO South - Impact Assessment Criteria – March 2019

Location	Date and Time	Wind Speed (m/s)[1]	VTG[1]	Criterion dB (A)	Criterion Applies?[2]	HVO South L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	20/03/2019 0:02	1.7	0.5	37	Yes	IA	Nil
Maison Dieu	20/03/2019 0:25	1.8	3	37	No	22	NA
Shearers Lane	19/03/2019 23:37	1.6	0.5	41	Yes	<25	Nil
Kilburnie South	19/03/2019 23:00	2	0.5	36	Yes	IA	Nil
Jerrys Plains Village	19/03/2019 21:20	3.1	0.5	35	No	IA	NA
Jerrys Plains East	19/03/2019 21:01	3	0.5	35	No	IA	NA
Long Point Road	19/03/2019 21:00	3.0.	0.5	35	No	IA	NA
HVGC	19/03/2019 23:39	2	0.5	55	Yes	IA	Nil
Kilburnie South	21/03/2019 23:00	2.8	0.5	36	Yes	IA	Nil
Jerrys Plains Village	21/03/2019 22:36	3.8	0.5	35	No	IA	NA
Jerrys Plains East	21/03/2019 22:13	3.6	0.5	35	No	IA	NA

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt (or MTW Charlton Ridge for Long Point) weather station using logged meteorological data;
2. Assumed noise emission limits (see Section 2.2 of this report for more information) apply for wind speeds up to 3 metres per second (at a height of 10m), or temperature inversion conditions of up to 3 degrees/100m (at a height of 10m). Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute attributed to HVO South Pit Area;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicabl.

Table 7: $L_{A1, 1minute}$ HVO South - Impact Assessment Criteria – March 2019

Location	Date and Time	Wind Speed (m/s)[1]	VTG[1]	Criterion dB (A)	Criterion Applies?[2]	HVO South $L_{A1, 1min}$ dB[3,4]	Exceedance[4,5]
Knodlers Lane	20/03/2019 0:02	1.7	0.5	45	Yes	IA	Nil
Maison Dieu	20/03/2019 0:25	1.8	3	45	No	37	NA
Shearers Lane	19/03/2019 23:37	1.6	0.5	45	Yes	26	Nil
Kilburnie South	19/03/2019 23:00	2	0.5	45	Yes	IA	Nil
Jerrys Plains Village	19/03/2019 21:20	3.1	0.5	45	No	IA	NA
Jerrys Plains East	19/03/2019 21:01	3	0.5	45	No	IA	NA
Long Point Road	19/03/2019 21:00	3.0.	0.5	45	No	IA	NA
HVGC	19/03/2019 23:39	2	0.5	NA	NA	IA	NA
Kilburnie South	21/03/2019 23:00	2.8	0.5	45	Yes	IA	Nil
Jerrys Plains Village	21/03/2019 22:36	3.8	0.5	45	No	IA	NA
Jerrys Plains East	21/03/2019 22:13	3.6	0.5	45	No	IA	NA
Knodlers Lane	20/03/2019 0:02	1.7	0.5	45	Yes	IA	Nil

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt (or MTW Charlton Ridge for Long Point) weather station using logged meteorological data;
2. Assumed noise emission limits (see Section 2.3 of this report for more information) apply for wind speeds up to 3 metres per second (at a height of 10m), or temperature inversion conditions of up to 3 degrees/100m (at a height of 10m). Criterion may or may not apply due to rounding of meteorological data values;
3. These are results for HVO South Pit Area in the absence of all other noise sources;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable

Table 8: $L_{Aeq, 15minute}$ HVO North – Impact Assessment Criteria – March 2019

Location	Date and Time	Wind Speed (m/s)[1]	VTG[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	20/03/2019 0:02	0.9	0.5	35	Yes	IA	Nil
Maison Dieu	20/03/2019 0:25	1	3	35	Yes	IA	Nil
Shearers Lane	19/03/2019 23:37	0.9	0.5	35	Yes	IA	Nil
Kilburnie South	19/03/2019 23:00	1.1	0.5	39	Yes	IA	Nil
Jerrys Plains Village	19/03/2019 21:20	0.9	0.5	36	Yes	IA	Nil
Jerrys Plains East	19/03/2019 21:01	1.4	0.5	39	Yes	IA	Nil
Long Point Road	19/03/2019 21:00	1.4	0.5	35	Yes	IA	Nil
HVGC	19/03/2019 23:39	1	0.5	NA	NA	IA	NA
Kilburnie South	21/03/2019 23:00	2.2	-1	39	Yes	IA	Nil
Jerrys Plains Village	21/03/2019 22:36	2.3	0.5	36	Yes	<30	Nil
Jerrys Plains East	21/03/2019 22:13	2.4	-1	39	Yes	IA	Nil
Knodlers Lane	19/03/2019 23:37	0.9	0.5	35	Yes	IA	Nil

Notes:
1. Atmospheric data is sourced from the HVO Corporate (or MTW Charlton Ridge for Long Point) weather station using logged meteorological data;
2. Noise emission limits 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 temperature inversion conditions greater than 3 degrees C/100m. Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute attributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable.

Table 9: $L_{Aeq,15minute}$ HVO North - Land Acquisition Criteria – March 2019

Location	Date and Time	Wind Speed (m/s)[1]	VTG[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	20/03/2019 0:02	0.9	0.5	41	Yes	IA	Nil
Maison Dieu	20/03/2019 0:25	1	3	41	Yes	IA	Nil
Shearers Lane	19/03/2019 23:37	0.9	0.5	41	Yes	IA	Nil
Kilburnie South	19/03/2019 23:00	1.1	0.5	41	Yes	IA	Nil
Jerrys Plains Village	19/03/2019 21:20	0.9	0.5	41	Yes	IA	Nil
Jerrys Plains East	19/03/2019 21:01	1.4	0.5	41	Yes	IA	Nil
Long Point Road	19/03/2019 21:00	1.4	0.5	41	Yes	IA	Nil
HVGC	19/03/2019 23:39	1	0.5	NA	NA	IA	NA
Kilburnie South	21/03/2019 23:00	2.2	-1	41	Yes	IA	Nil
Jerrys Plains Village	21/03/2019 22:36	2.3	0.5	41	Yes	<30	Nil
Jerrys Plains East	21/03/2019 22:13	2.4	-1	41	Yes	IA	Nil
Knodlers Lane	20/03/2019 0:02	0.9	0.5	41	Yes	IA	Nil

Notes:
1. Atmospheric data is sourced from the HVO Corporate (or MTW Charlton Ridge for Long Point) weather station using logged meteorological data;

2. Noise emission limits 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 temperature inversion conditions greater than 3 degrees C/100m. Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute attributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable.

Table 10: $L_{A1,\ 1Minute}$ HVO North - Impact Assessment Criteria – March 2019

Location	Date and Time	Wind Speed (m/s)[1]	VTG[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North $L_{A1,\ 1min}$ dB[3,4]	Exceedance[4,5]
Knodlers Lane	20/03/2019 0:02	0.9	0.5	46	Yes	IA	Nil
Maison Dieu	20/03/2019 0:25	1	3	46	Yes	IA	Nil
Shearers Lane	19/03/2019 23:37	0.9	0.5	46	Yes	IA	Nil
Kilburnie South	19/03/2019 23:00	1.1	0.5	46	Yes	IA	Nil
Jerrys Plains Village	19/03/2019 21:20	0.9	0.5	46	Yes	IA	Nil
Jerrys Plains East	19/03/2019 21:01	1.4	0.5	46	Yes	IA	Nil
Long Point Road	19/03/2019 21:00	1.4	0.5	46	Yes	IA	Nil
HVGC	19/03/2019 23:39	1	0.5	NA	NA	IA	NA
Kilburnie South	21/03/2019 23:00	2.2	-1	46	Yes	IA	Nil
Jerrys Plains Village	21/03/2019 22:36	2.3	0.5	46	Yes	30	Nil
Jerrys Plains East	21/03/2019 22:13	2.4	-1	46	Yes	IA	Nil
Knodlers Lane	20/03/2019 0:02	0.9	0.5	46	Yes	IA	Nil

Notes:
1. Atmospheric data is sourced from the HVO Corporate or (MTW Charlton Ridge for Long Point) weather station using logged meteorological data;
2. Noise emission limits 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 temperature inversion conditions greater than 3 degrees C/100m. Criterion may or may not apply due to rounding of meteorological data values;
3. These are results for HVO North Pit Area in the absence of all other noise sources;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable

5.2 Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfI), the applicability of the low frequency modification penalty has been assessed. During March 2019 no measurements required the penalty to be applied. The assessment for low frequency noise is shown in Table 11.

Table 11: Low Frequency Noise Assessment – March 2019

Location	Date and Time	Measured Site Only LA_{eq} dB (Sth/Nth)	Site Only LC_{eq} dB[1] (Sth/Nth)	Site Only LC_{eq}-LA_{eq} dB [1,2] (Sth/Nth)	Result Max exceedance of ref spectrum dB[1,3] (Sth/Nth)	Penalty dB(A)[1]
Knodlers Lane	20/03/2019 0:02	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Maison Dieu	20/03/2019 0:25	22/IA	NA/NA	NA/NA	NA/NA	NA/NA
Shearers Lane	19/03/2019 23:37	<25/IA	NA/NA	NA/NA	NA/NA	NA/NA
Kilburnie South	19/03/2019 23:00	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains Village	19/03/2019 21:20	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains East	19/03/2019 21:01	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Long Point Road	19/03/2019 21:00	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
HVGC	19/03/2019 23:39	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Kilburnie South	21/03/2019 23:00	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains Village	21/03/2019 22:36	IA/<30	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains East	21/03/2019 22:13	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Knodlers Lane	20/03/2019 0:02	IA/IA	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 LAeq criterion this is noted as NA (not available) and no further assessment has been undertaken;
2. As per NPfI, if LCeq – LAeq ≥ 15 dB further assessment of low frequency noise required; and
3. As per NPfI, compare measured spectrum against reference spectrum to determine if the low frequency modifying factor is triggered and application of penalty is required.

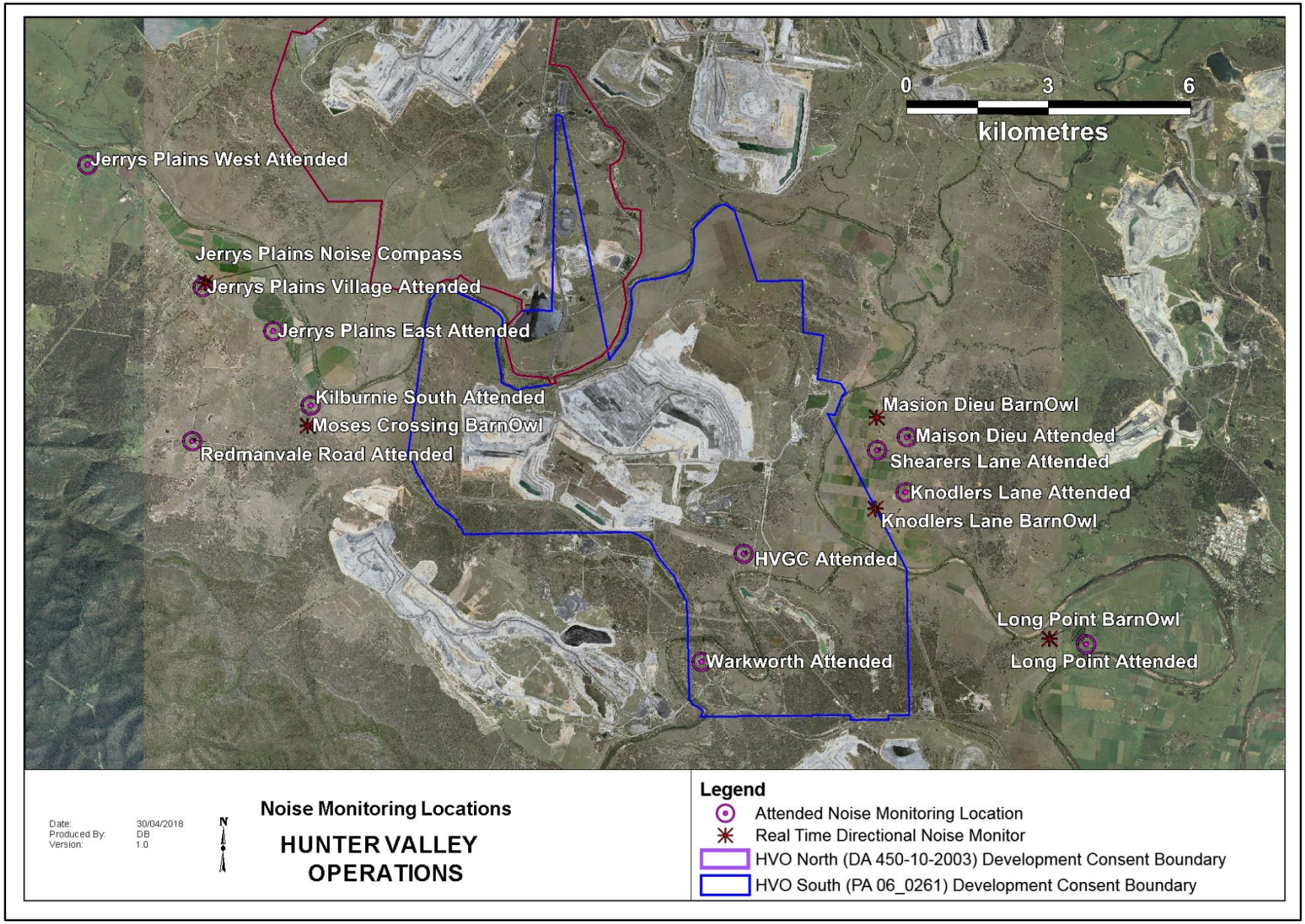

Figure 84: Noise Monitoring Location Plan

6.2 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 6.1, and that real time monitoring data includes non-mine noise sources such as dogs, cows, or more commonly, road traffic.

7.0 OPERATIONAL DOWNTIME

During March, a total of 72 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 85.

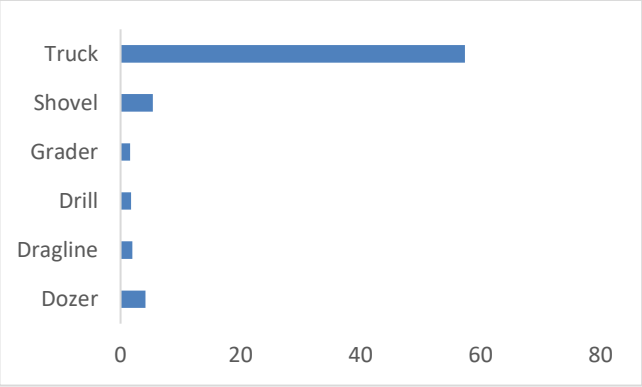

Figure 85: Operational Downtime by Equipment Type – March 2019

8.0 REHABILITATION

During March 4.4 Ha of land was released, 21.6 Ha of land was bulk shaped, 7.1 Ha of land was Topsoiled and 2.2 Ha of land was Rehabilitated.

9.0 COMPLAINTS

During March there was one complaint received from the EPA relating to dust on 6 March. The location of the complaint was described as nearby to HVO. Due to the 6th March being a regional dust day a number of actions were taken by HVO to mitigate dust including working lower in the pit, equipment shutdown and postponing a blast.

Details of complaints received YTD are shown in Table 12.

Table 12: Complaints Summary YTD

	Noise	Dust	Blast	Lighting	Other	Total
January	-	-	-	-	-	-
February	-	-	-	-	-	-
March	-	1	-	-	-	1
April						
May						
June						
July						
August						
September						
October						
November						
March						
Total	0	1	0	0	0	1

10.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were six recordable environmental incidents.

1/3/2019 – Minor diesel spill at north light vehicle bowser

A minor spill of up to 10 litres of diesel was found at the re-fuelling area. The spill was contained and cleaned up using a spill kit in the area. All diesel was contained in the bunded area.

2/3/2019 – Truck 712 engine failure oil spill

Truck 712 was driving up a pit ramp when the engine failed and dropped approximately 200L of oil to the ground). The operator stopped and reported incident to supervisor. The area was contained and cleaned up

18/3/2019 – Turbid water entering Farrells Creek from East TSF rehabilitation area

During post rainfall surface water monitoring event, turbid water was identified in Farrell's Creek downstream from HVO. HVO conducted inspections and determined that a source of turbid water from HVO was due to rainfall runoff entraining sediment from an old rehabilitation slope.

Water samples collected and, erosion and sediment controls put in place. The Pollution Incident Response Management Plan was activated and relevant authorities were notified. There has been ongoing rehabilitation work in the area to repair the erosion and restore structures.

19/3/2019 – Class 3 Blast Fume Event

A blast in West Pit was fired and produced a class 3C fume event. The fume particulates were observed to move in the direction of Ravensworth Open Cut before dispersing over mine land.

An additional check has been added to the Pre-blasting Environmental Checklist to review the weather forecast 48 hours in advance to prevent blasting shots that have been exposed to rainfall producing fume.

28/3/2019 – Excavator 306 leaking hydraulic hose

Excavator 306 developed a hydraulic oil leak under the machine caused by a failed hydraulic hose. The operator stopped operation and reported to supervisor and the spill was contained and cleaned up.

30/3/2019 – Turbid water entered Farrells Creek from two sediment dams

During a significant rainfall event resulted (66 mm) turbid water was observed entering Farrells Creek from the overflow of two sediment dams. Regulatory notifications were made and pumps used to lower dam levels. Water monitoring was undertaken which indicated that there was no environmental impact as receiving waters were of poorer quality than the water from the sediment dams. The incident is currently under investigation.

Appendix A: Meteorological Data

Table 13: Meteorological Data - HVO Corporate Meteorological Station – March 2019

Date	Air Temperature Maximum (°C)	Air Temperature Minimum (°C)	Relative Humidity Maximum (%)	Relative Humidity Minimum (%)	Solar Radiation Maximum (W/Sq. M)	Wind Direction Average (°)	Wind Speed Average (m/sec)	Rainfall(mm)
1/03/2019	31	12	89	17	1316	114	4	0
2/03/2019	31	13	79	19	1312	120	4	0
3/03/2019	32	12	97	21	921	132	3	0
4/03/2019	34	13	89	14	900	128	2	0
5/03/2019	36	12	96	10	885	164	2	0
6/03/2019	36	16	80	12	1120	237	4	0
7/03/2019	22	12	81	52	247	119	4	0
8/03/2019	33	11	84	22	1132	140	2	0
9/03/2019	35	16	100	21	1292	187	3	17.4
10/03/2019	33	15	100	17	1289	209	2	0
11/03/2019	34	16	84	14	878	185	3	0
12/03/2019	35	14	90	5	914	230	3	0
13/03/2019	27	14	82	42	1256	120	5	0
14/03/2019	33	14	89	16	1308	141	3	0
15/03/2019	27	13	86	38	1268	120	4	0
16/03/2019	21	12	100	62	852	114	2	6.6
17/03/2019	21	12	100	74	579	217	2	27
18/03/2019	24	13	92	49	526	257	2	16
19/03/2019	25	12	98	52	1335	171	1	0.6
20/03/2019	28	12	100	39	1361	129	2	0
21/03/2019	28	12	100	41	1195	144	2	0
22/03/2019	28	13	100	42	1232	142	2	13.6
23/03/2019	23	18	97	81	-7	127	3	4
24/03/2019	34	17	83	31	912	181	2	0
25/03/2019	25	15	99	54	693	257	3	2.8
26/03/2019	26	11	97	22	971	255	4	0.6
27/03/2019	25	8	88	27	1067	120	3	0
28/03/2019	26	9	88	30	963	120	2	0
29/03/2019	28	9	98	31	1284	167	1	0
30/03/2019	24	6	100	30	1173	238	4	66
31/03/2019	21	5	60	26	844	278	4	0

Hunter Valley Operations
Annual Report 2018

Community Consultative Committee Details

CCC / Project Name:	Hunter Valley Operations	**Reporting Period:**	1 January to 31 December 2018
Independent Chairperson:	Col Gellatly	**Proponent Contact:**	Merri Bartlett

1. Executive Summary

There were four Community Consultative Committee (CCC) meetings held in the reporting period of 1 January to 31 December 2018 for Hunter Valley Operations (HVO).

During the reporting period, it was confirmed that the HVO JV will be jointly controlled by Yancoal and Glencore through a Joint-Venture Management Committee (JVMC), and managed by an independent Management Team to be appointed by the JVMC

The key issues that arose during these meetings focused on the management of dust and feral animals, attracting more community representatives to the CCC and community expectations around visual amenity issues.

2. CCC activities over last 12 months

- Four meetings were held during 2018:
  - 21 February
  - 23 May
  - 29 August
  - 21 November
- Attendance at meetings by members is shown in the table below.

Name	Position	Number of Meetings Attended
Colin Gellatly	Independent Chairperson	Four
Hollie Jenkins	Singleton Council Representative	None
Di Gee	Community Representative	Three
Brian Atfield	Community Representative	Four
David Love	Community Representative	Two
Todd Mills	Community Representative	Two
Michael Wellard	Community Representative	None
Jeannie Hayes	Community Representative	One
Janelle Wenham/Charlie Shearer	Community Representative	Two

Dr Neville Hodkinson	Community Representative	Two
Sarah Purser	Minute Taker	Four
Jason McCallum/Tony Galvin	General Manager, HVO	Three
Barry Coe	Acting Mine Manager	Two
Bruce Gould	Production Manager, HVO	One
Shaun Leary	Technical Services Manager	One
Andrew Speechly	Manager Environment and Community, HVO	Four
Dominic Brown	Environment and Community Coordinator, HVO	Two
Jonathan Deacon/Drew Williams	Environment and Community Officer, HVO	Three
Leah Scheepers	Community Relations Specialist, HVO	Three

- A tour of the Carrington pit was undertaken by the CCC members following the meeting held on 21 November.

3. Key issues

Issue	Actions Taken	Next Steps
Dust from Blasting	A Community representative advised that large plumes of dust from blasting could be controlled by using stemming plugs. HVO had subsequently done investigations and learned from the supplier of stemming plugs that these are utilised for smaller hole blasting at 165 millimetres, noting that HVO's smallest hole is 200 millimetres. HVO had confirmed they had received advice that they were conducting best practice for blasting and that the stemming plugs were not big enough.	No further action proposed at this stage
Feral Pests	It was raised in the meeting on 23 May that there is an ongoing issue	Feral pest management program to continue in 2019

	with feral pigs around Jerrys Plains and Maison Dieu. HVO's feral pest management program for 2018 was addressed in the meeting on 29 August which discussed the following activities: • 1080 baiting program, targeting wild dogs and foxes • Rural Licensee feral pig trapping at two sites • Winter feral pig baiting/trapping program • Kangaroo culling (commercial harvest ongoing) • Open range shooting (on-going bounty system linked to commercial harvest program)	
Expressions of Interest from Community members for Community Representatives on the CCC	It was agreed at the meeting on 23 May that there would be an advantage in having a larger pool of community members and to revisit current members ability to attend future meetings and to see if they would prefer a role as an alternate. The Chair advised at the meeting on 29 August that applications from three prospective CCC members were going through the final process by the Department, who appoint the community representatives to the Committee and formally notify the applicants. Three new members were subsequently approved by the Department	None
Dust Management	The issue of dust leaving site and impacting on Maison Dieu residents was raised by a Community Representative at the CCC on 29 August 2018. An action to provide CCC members with a presentation on dust management practices at the CCC held on 21 November 2018 was recommended. The presentation covered the following areas: • Review blast size and the potential impacts on dust generation • Review pre-blast dust risk assessment process	Providing regular updates on dust management.

	• Review control measures for wind conditions (wind direction and speed) • Review blast bench watering practices • Review loading bench irrigation opportunities • Review dragline, shovel, excavator and loader load practices and methods for minimising dust • Review water cart size / capacity for suitability • Consider water additives (e.g. RST Road Binder) and review road construction methods and materials used for suitability in regards to the watering of roads to control dust	
Visual Amenity for Maison Dieu Residents	A Community representative was concerned about the loss of visual amenity of the mountain range from Maison Dieu. It was discussed that what is seen in the EIS and MOP are worst case scenarios and that HVO are trying to limit dump height and decrease the impact on visual amenity.	Provide updates on mine plans for dump construction and rehabilitation of the landform.

4. Focus for next 12 months

- The first CCC for 2019 occurred on 20 Febrruary.
- Its anticipated that the focus areas for 2019 will be similar to 2018. Focus areas will include air quality (including effect on water tank quality), visual amenity, feral animal management and blasting.

Signature of Chair:	
Date:	