

Hunter Valley Operations

Community Consultative Committee

Business Papers – August 2019

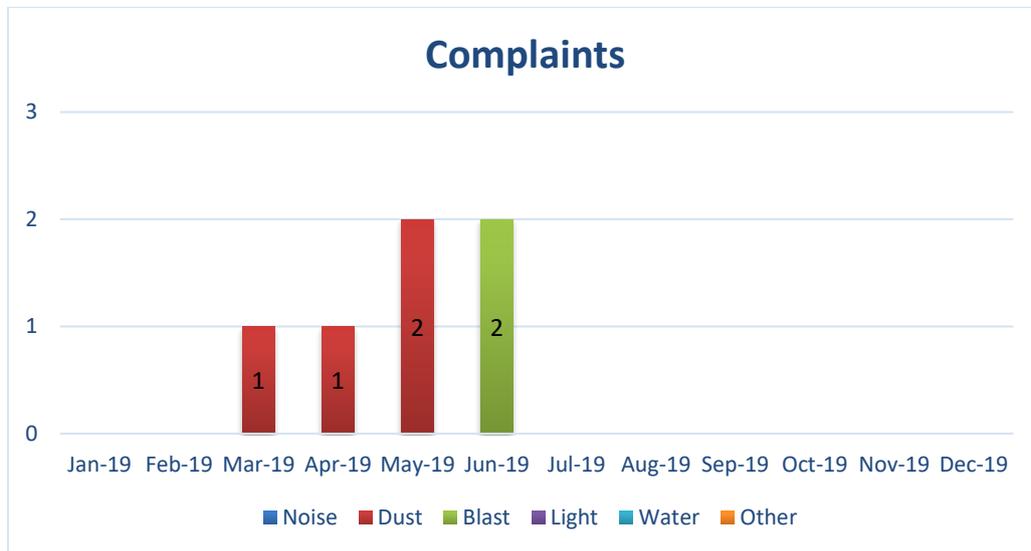
Materials ahead of meeting of the committee on **21 August 2019**

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1.0 Complaints

Complaints overview for 2019



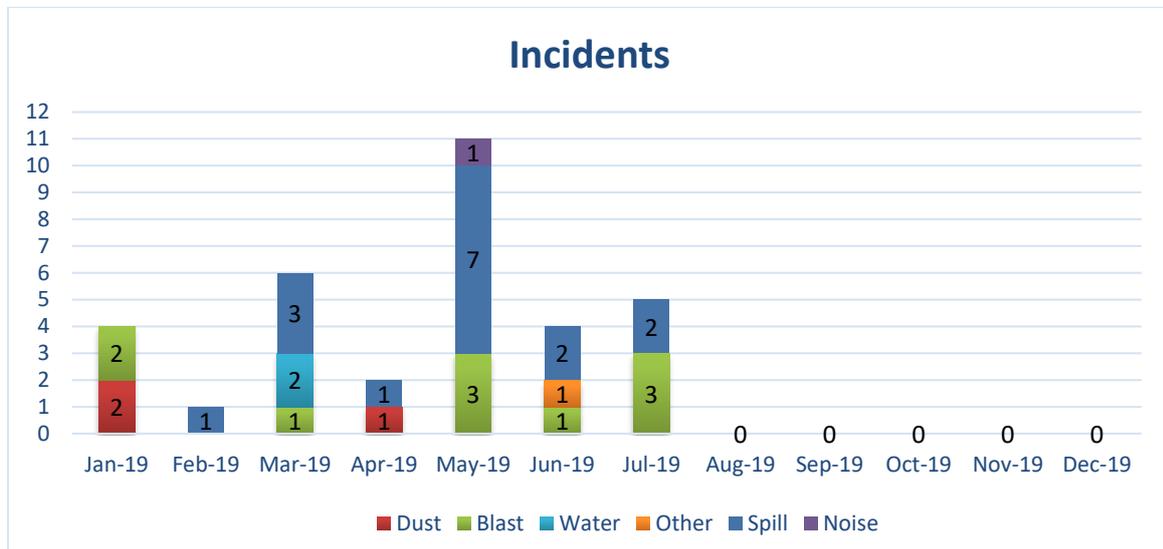
Complaint details 2019 YTD

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 OEHL 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 OEHL website.	Community member	No
27/5/2019	10.33	Air Quality	Gouldsville	An email was received via the EPA at 11.20am regarding a complaint received from a resident at Long Point Road, Gouldsville. The complainant mentioned extremely dusty conditions observed on Sunday 26 May and during the morning of Monday 27 May. HVO had enacted its TARP due to strong winds prior to the complaint. Only one excavator and a few trucks were hauling coal and rejects in Pit 1 with no equipment operating in Pit 2 since 9.00-9.30am on the morning of the complaint. In addition, five water trucks were in circulation in South Pit. A blast scheduled for 1pm was also postponed for the next day.	EPA	No

Date	Time	Type	Location	Complaint details	Method Received	Monitoring Indicates Exceedance?
27/5/2019	11.10	Air Quality	Lemington	A complaint was received by a motorist about high levels of dust on Lemington Road at about 10.30am. The Environment and Community Officer spoke to the complainant at 11.30am. A dust inspection was conducted following the complaint at 11.35am from Lemington Road whereby no dust was observed to be coming from the West Pit over Lemington Road. HVO had enacted its TARP at 9.30am due to strong winds prior to the complaint. Earlier dust inspections had been conducted at West Pit whereby no significant dust was observed emanating from the pit.	Community Member	No
7/6/2019	12.45	Blast Fume	Unknown (east of HVO)	The Department of Planning (DP&E) and Environment received a complaint in relation to blast fume at HVO for a blast that occurred on 6 June. The blast was fired from West Pit at approximately 13:10 and produced fume that was ranked 3B. The blast plume was observed to disperse over mine land. The DPE advised they could not disclose complainant details therefore the complainant could not be contacted for follow up by HVO.	DP&E	No
26/6/2019	15:03	Blast Dust	Jerrys Plains	A complainant called the HVO public telephone number to complain about dust being emitted from the mine and covering their property following a blast at Riverview Pit at 2.48pm. Video footage indicated a visible dust plume crossed the mine boundary however it was dispersing as it tracked westwards. Video footage was insufficient to track the dust plumes path offsite however based on wind direction at the time, it is possible the dust plume would have travelled in the general direction of the resident who is located approximately 4km from the blast. The dust plume is likely to have dissipated over this distance. Blast was fired in accordance with blasting permissions which indicated acceptable wind speed and direction (4.9 m/s @ 128°).	Community Member	No

2.0 Incidents

Incident overview for 2019 YTD



Date	Details	Key Actions	Aspect
2/1/2019	<p>Category 3B fume West Pit North LED Blast WN45LED01A was fired at 13:10 and produced fume ranked as 3B which did not leave site.</p>	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	<p>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.</p>	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
10/1/2019	<p>Blast capture near miss at Jerrys Plains Village blast monitor The environmental monitoring contractor notified HVO Environment Department at 12.30pm to communicate that the Jerrys Plains Village Blast Monitor was offline (due to the failure of the GPS affecting the time stamp. The contractor was reminded that a blast was being fired at 1pm (30 minutes later) and that the issue needed to be resolved prior to the shot being fired to avoid a miscapture of data at this monitor. Attempts were made at 12.50pm to contact the contractor to ascertain the status of the issue however he was not answering his phone. The Drill & Blast Supervisor was also called to advise him of the status of the monitor but could also not be reached. The two shots were fired successfully and both sets of data were captured, however at the time it appeared that the Jerrys Plains blast monitor was offline.</p>	The battery was changed out on the day of the incident and on the following day (11 January), all blast monitor batteries were checked. It was subsequently found that a firmware issue affected the monitoring networks time syncing which was rectified with a software update.	Blasting
26/1/2019	<p>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.</p>	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	<p>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.</p>	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

Date	Details	Key Actions	Aspect
2/3/2019	<p>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).</p>	<p>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.</p>	Hydrocarbon
18/3/2019	<p>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</p>	<p>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. Under investigation by EPA and NSW Resource Regulator</p>	Water Management
19/3/2019	<p>Category 3C blast fume event At 13:00, a blast in West Pit was fired and produced a Category 3C fume event. The blast plume was observed to move in the direction of Ravensworth Open Cut before dispersing over mine land.</p>	<p>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.</p>	Blasting
28/3/2019	<p>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.</p>	<p>The operator stopped operation and reported to supervisor. The spill was contained and cleaned up.</p>	Hydrocarbon
30/3/2019	<p>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.</p>	<p>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.</p>	Water Management
18/4/2019	<p>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.</p>	<p>The spill was contained and cleaned up and contaminated material delivered to the south bioremediation area.</p>	Hydrocarbon
25/4/2019	<p>HVGC PM10 monitor mis-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.</p>	<p>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.</p>	Dust

Date	Details	Key Actions	Aspect
2/5/2019	<p>Hydraulic hose leak on Loader 652 During operation a hydraulic hose blew on Loader 652 at the ROM Reject pad resulting in a spill of approximately 50L.</p>	Loader 652 was shut down immediately and the spill contained, controlled and cleaned up and the contaminated material delivered to north bioremediation area.	Hydrocarbon
5/5/2019	<p>Oil spill from make-up valve on Excavator 311 During operation of Excavator 311 the make-up relief valve cap unscrewed resulting in a spill of approximately 300L.</p>	The excavator was shutdown immediately, the spill contained, cleaned up and the contaminated material delivered to the south bioremediation area.	Hydrocarbon
7/5/2019	<p>HVO South noise exceedance During attended noise monitoring, an exceedance of the LAeq 15min Impact Assessment Criteria (39dB(A) was measured at the Maison Dieu Noise monitoring location. This resulted in an LAeq of 42dB(A) which included a +2dB penalty applied due to low frequency noise.. The source of the noise was made up of engine/exhaust and equipment fan noise.</p>	The noise monitoring contractor contacted Dispatch to advise of the exceedance whereby Loading units 312, 311 & 340 where shut down or sent to crib in response. In accordance with the Noise Management Plan, a follow up measurement was undertaken within 75 minutes resulting in compliant noise levels. The measurement is deemed compliant in accordance with the Noise Management Plan.	Noise
9/5/2019	<p>Level 3 Blast fume A blast from West Pit North was fired at 13:10 and produced fume ranked as 3 which did not leave site. The investigation found that a heavy rain event over multiple days prior to the blast, resulted in elevated levels of fume when the shot was fired.</p>	Recommendations for preventing a re-occurrence include avoiding sleeping blasts across rain events, capturing environmental forecasts and these impacts on current loading and potential product changes and adding delayed shots to the pre blast checklist.	Fume
11/5/2019	<p>Newdell coal stockpile dozer oil leak Operator was pushing up stockpile coal and while reversing, noticed approximately 30L of oil on the coal that was being worked on.</p>	The dozer was parked up and the supervisor notified and all oil was contained on the stockpile.	Hydrocarbon
12/5/2019	<p>Hydraulic hose leak on Loader 652 During operation, a hydraulic steering hose blew on Loader 652 at the ROM Reject pad resulting in a spill of approximately 200L.</p>	Loader 652 was shut down immediately, the spill contained, cleaned up and the contaminated material delivered to the north bioremediation area.	Hydrocarbon
15/5/2019	<p>Hydraulic filter failure on Drill 221 During drilling activities in West Pit, the operator was attaching the second rod to continue drilling when hydraulic oil was identified to be leaking onto the ground. The spill was estimated to be approximately 300L.</p>	The drill was shut down and the spill was contained.	Hydrocarbon
15/5/2019	<p>Truck 467 steering oil leak Truck 467 was leaving the loading area, when the operator realised the truck had lost steering. An inspection identified that the steering oil line had been damaged and spilled approximately 40L of oil on the bench.</p>	The operator shutdown the truck and the incident reported incident to supervisor.	Hydrocarbon

Date	Details	Key Actions	Aspect
23/5/2019	<p>Blast overpressure exceedance <120dB(L) A blast from the Riverview pit was fired at approximately 13:14 which recorded an overpressure result of 116.72 dB(L) at the Moses Crossing Blast Monitor. HVO is permitted 5% of blasts measure above 115dB(L).</p>	An investigation found that the overpressure recording was due to a suspected hole with shorter stemming height than designed. An Overpressure validation was undertaken to confirm the result.	Blasting
23/5/2019	<p>Truck 416 fuel overflow at in-pit fuel bay During refuelling at the 1580 fuel farm, the operator has overflowed the fuel tank causing a spill of approximately 30L within the bunded area.</p>	The spill was contained and cleaned up using contents of a nearby spill kit.	Hydrocarbon
28/5/2019	<p>Potential blast overpressure exceedance >120dB(L) A blast from Cheshunt was fired at approximately 9:25 am resulting in an overpressure result of 125.69dB(L) at the Maison Dieu Blast Monitor.</p>	<p>HVO engaged two specialist blast engineers to review the blast result and investigate the cause. Both engineers concluded that the elevated measurement recorded at Maison Dieu was an anomaly compared with other monitors in the network. On the basis of available data, both assessments indicate a likely overpressure level due to the blast alone would be less than 120 dB(L). Wind gusts are thought to have contributed to the measured exceedance.</p> <p>- Investigate siting of the monitor and shielding of microphones on the Maison Dieu blast monitor - Risk assessing the use of short inter-hole delays when blasting a free-face.</p> <p>The exceedance was reported to the authorities and an incident report provided.</p>	Blasting
5/6/2019	<p>Hydraulic hose leak on excavator 311 During operation a hydraulic hose blew on Excavator 311 in Cheshunt Pit resulting in a spill of approximately 40L.</p>	Excavator 311 was shut down immediately, and the spill contained, controlled, cleaned up with the contaminated material delivered to south bioremediation area.	Hydrocarbon
6/6/2019	<p>Blast fume 3B A blast was fired in West Pit at approximately 13:10 and produced fume that was ranked 3B. The blast plume was observed to disperse over mine land. An investigation of the blast found that a moderate rain event over multiple days prior to the blast, resulted in elevated levels of fume when the shot was fired.</p>	Recommendations for preventing a re-occurrence include avoiding sleeping blasts across rain events, capturing environmental forecasts and these impacts on current loading and potential product changes and adding delayed shots to the pre blast checklist.	Fume
13/6/2019	<p>Signposts installed on council land It was identified that signposts had been installed on council land without approval and without a ground disturbance permit.</p>	An application was submitted for a Sect 138 permit from Singleton Council which was approved on 24 June 2019.	Approvals

Date	Details	Key Actions	Aspect
14/6/2019	<p>Fuel tank leak from truck 413</p> <p>During an inspection of Truck 413, the operator identified a leak in the fuel tank that was spilling fuel onto ground in a bunded area of the crib hut in West Pit resulting in a spill of approximately 400L of diesel.</p>	<p>Maintenance were called who isolated the flow and the truck was removed from the area for repair. The contaminated material was contained and cleaned up.</p>	Hydrocarbon
15/6/2019	<p>Steering hose leak on truck 472</p> <p>During operation a steering hose blew on Truck 472 in West Pit resulting in a spill of approximately 500L.</p>	<p>The truck was shut down immediately and the spill contained, controlled and cleaned up and the contaminated material delivered to the north bioremediation area.</p>	Hydrocarbon
1/7/2019	<p>Blast Overpressure at Warkworth Monitor</p> <p>Cheshunt Pit blast P120BAC03A was fired resulting in an overpressure result of 118 db at the Warkworth monitor</p>	<p>Currently under investigation.</p>	Blasting
3/7/2019	<p>Blast overpressure exceedance <120dB(L)</p> <p>West Pit blast WN45UPG08A was fired at approximately 13:04 recording an overpressure result of 116.40 dB(L) at the Moses Crossing blast monitor. HVO is permitted 5% of blasts measure above 115dB(L).</p>	<p>An overpressure validation was undertaken to confirm the result.</p>	Blasting
17/7/2019	<p>Blast overpressure exceedance <120dB(L)</p> <p>West Pit blast WN45LPG03A was fired at approximately 13:20 recording an overpressure result of 115.92 dB(L) at the Maison Dieu blast monitor. HVO is permitted 5% of blasts measure above 115b dB(L).</p>	<p>The enhanced overpressure result is suspected to be due to wind speed localised to the monitor. An overpressure validation was undertaken to confirm the result.</p>	Blasting
20/07/2019	<p>Blown hydraulic hose on Truck 410</p> <p>During an inspection of Truck 410, the operator identified an oil leak of approximately 50L from a blown hydraulic line at the HVO coal loop.</p>	<p>Maintenance isolated the flow and Truck 410 was removed. The spill was contained and area isolated.</p>	Hydrocarbon
22/7/2019	<p>Blown hydraulic hose on fuel cart 985</p> <p>Whilst refuelling Excavator 312, Fuel Cart 985 blew a hydraulic hose in pit at HVO South, resulting in a spill of approximately 30L.</p>	<p>The fuel cart was isolated and the contaminated material delivered to south bioremediation area.</p>	Hydrocarbon

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. A number of local organisations were successful in obtaining funds totalling almost \$29,680 and these were:

- Camp Quality - Camp Quality 1000ks 4 kids bike ride
- Singleton Theatrical Society – Les Miserables production
- Singleton PCYC – Open Day
- Westpac Rescue Helicopter Service - 2019 Hunter Valley Mining Charity Rugby League Day
- Singleton Bowling Club Co-operative Limited - Graded Triples Tournament
- Singleton Pony Club - Portable Horse Yards
- Singleton Heights Pre-School - Outdoor Classroom Project
- Singleton Council - Singleton Community Vehicle Messaging Sign

Round Two of the 2019 Community Grants Program will open in September.

In conjunction with the Upper Hunter Mining Dialogue, HVO welcomed The Australian Christian College to site on 24 May which included a tour of operational areas and rehabilitation. Students enjoyed their time on site and were able to learn more about the mining process and view our operations in action. A visit from school careers advisors from several Hunter Valley high schools is planned for September.

4.0 Environmental monitoring

Monthly summaries of environmental monitoring; April – June 2019.

April 2019

Attached as **Appendix A**

May2019

Attached as **Appendix B**

June 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/>)

17/06/2019	Hunter Valley Operations Environment Protection Licence 640 Monitoring Data May 2019
21/06/2019	HVO Community Consultative Committee Minutes February 2019
08/07/2019	Hunter Valley Operations Environment Protection Licence 640 Monitoring Data June 2019
10/07/2019	Community Complaints Register 2019
11/07/2019	Hunter Valley Operations Environmental Monitoring Report April 2019
31/7/2019	Hunter Valley Operations Environmental Monitoring Report May 2019
07/8/2019	HVO Community Consultative Committee Presentation May 2019
07/8/2019	HVO Community Consultative Committee Business Papers May 2019
12/8/2019	Hunter Valley Operations Environmental Monitoring Report June 2019

**HUNTER VALLEY
OPERATIONS**



**Monthly
Environmental
Monitoring Report**
Hunter Valley Operations
April 2019

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	Environment & Community Officer	Draft	20/05/2019
1.1	Environment & Community Coordinator	Final	9/07/2019

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 April to 30 April 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)
April	1.4	244.4

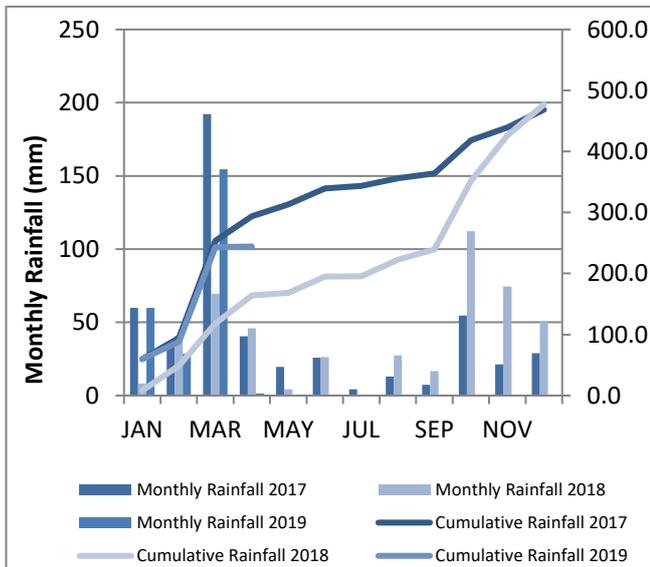


Figure 1: Rainfall Summary 2019

2.1.2 Wind Speed and Direction

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

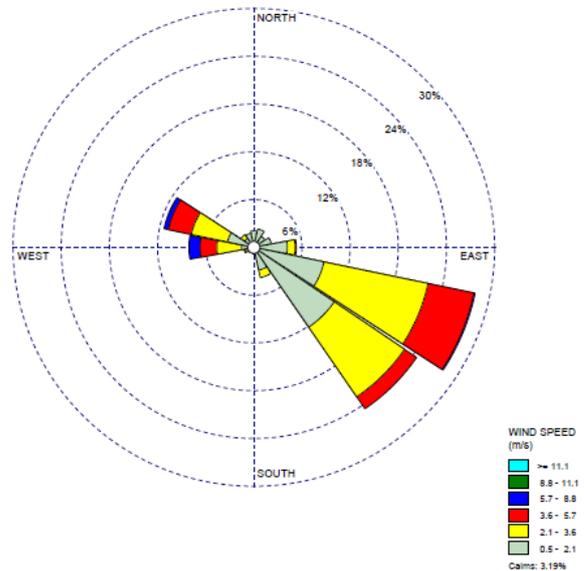


Figure 2: HVO Corporate Wind Rose – April 2019

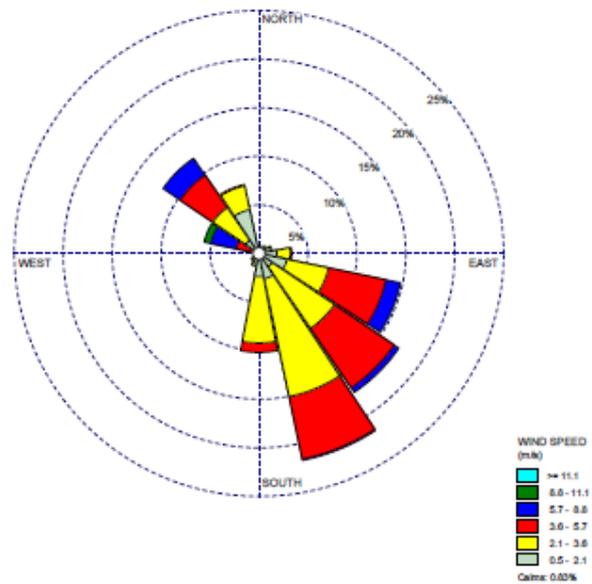


Figure 3: HVO Cheshunt Wind Rose – April 2019

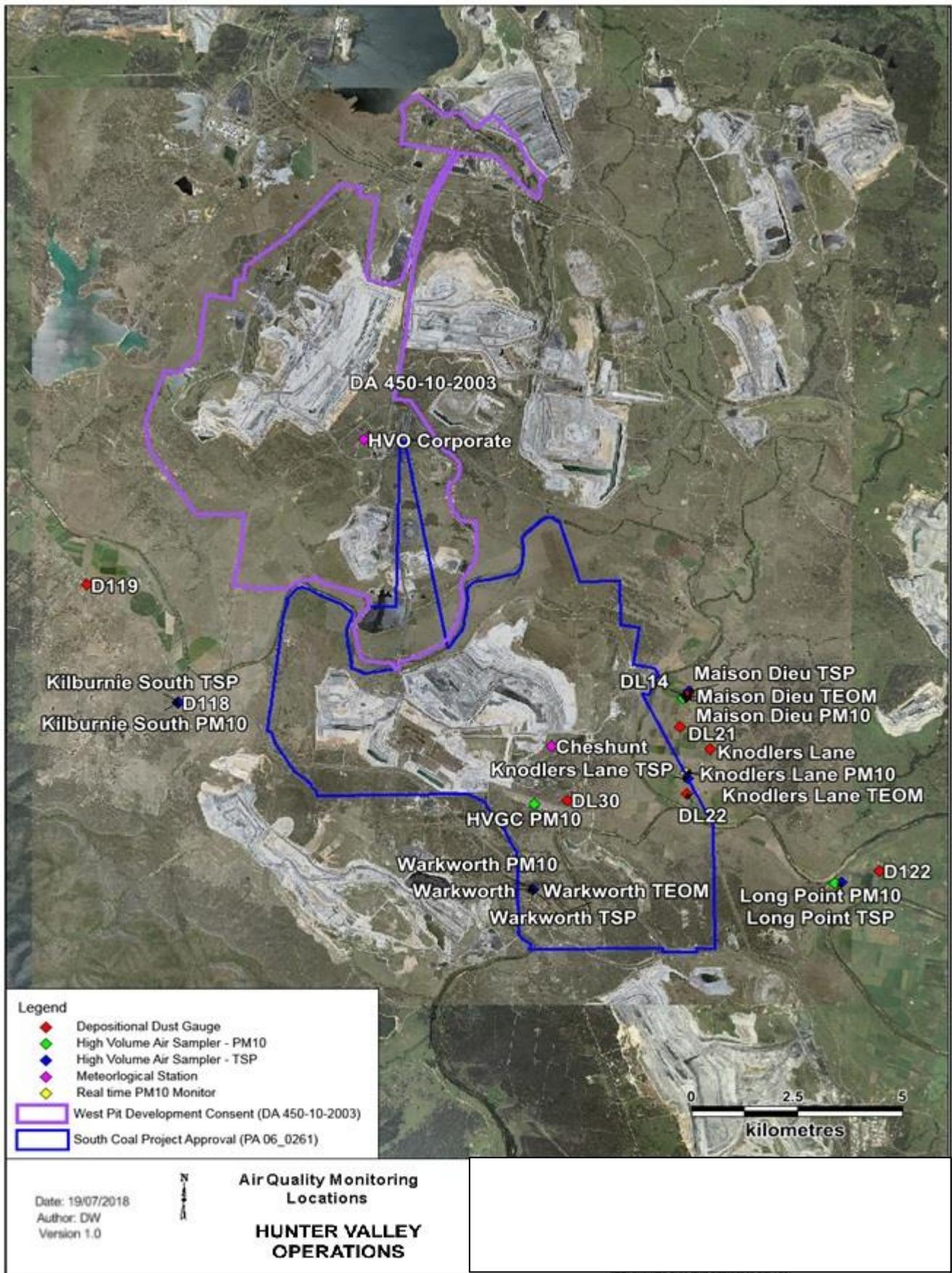


Figure 4: Air Quality Monitoring Location Plan

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, D118 and DL22 monitors recorded a monthly result above the long term impact assessment criteria of 4.0 g/m² per month. No sample was collected for the Warkworth monitor due to a broken sample jar.

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

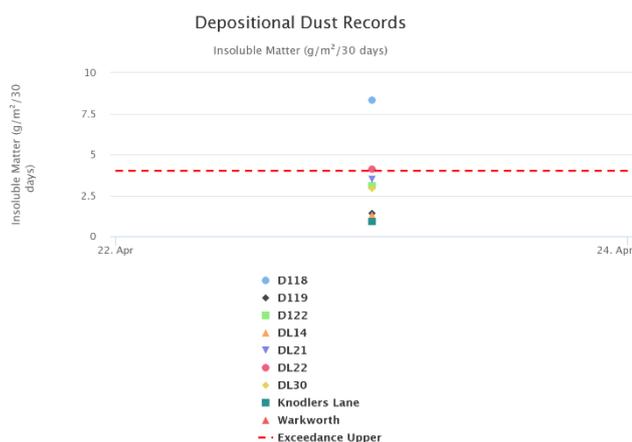


Figure 5: Depositional Dust Results – April 2019

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 (PM₁₀). 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 PM₁₀ Results

Figure 6 shows individual PM₁₀ results at each monitoring station against the short term impact assessment criteria of 50 µg/m³.

On 8 April 2019, the Knodlers Lane HVAS unit recorded an elevated 24 hour averages of 76µg/m³, with HVO's maximum contribution was calculated to be 53.5 µg/m³ or 70.4% of the total measured result.

On 26 April 2019, the Knodlers Lane HVAS unit recorded an elevated 24 hour averages of 54µg/m³, with HVO's maximum contribution was calculated to be 22 µg/m³ or 40.7% of the total measured result.

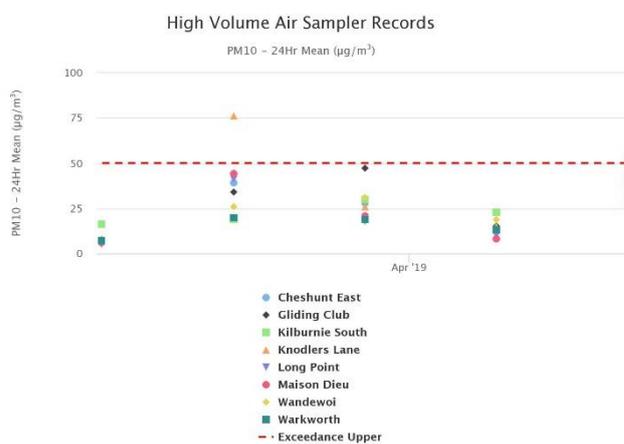


Figure 6: Individual PM₁₀ Results – April 2019

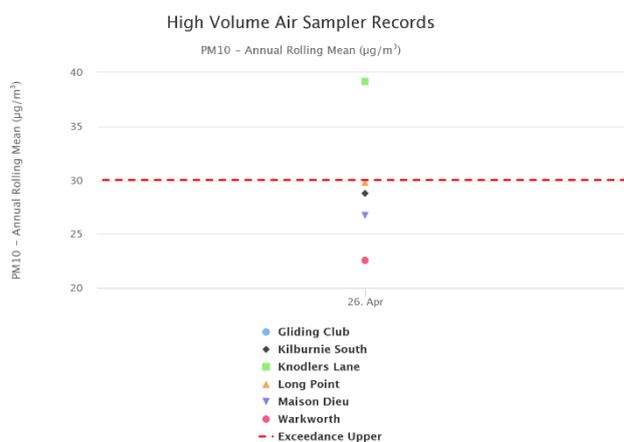


Figure 7 shows the year to date annual average PM₁₀ results.

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

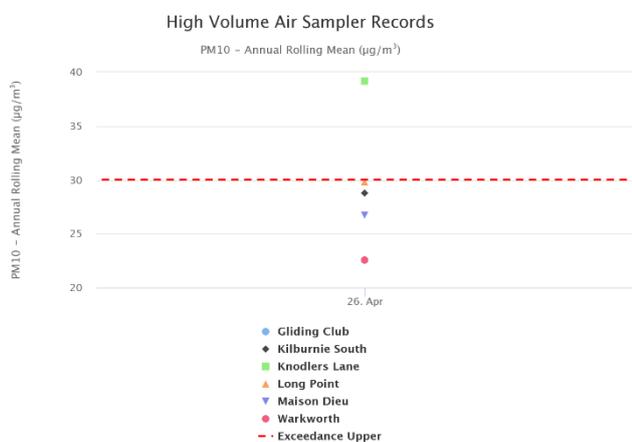


Figure 7: Year to Date Average PM₁₀ – as at end of April 2019

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.

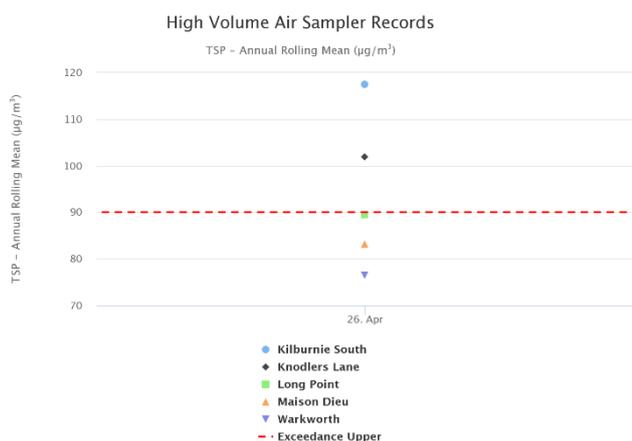


Figure 8: Year to Date Average Total Suspended Particulates – as at end of April 2019

2.3.3 Real Time PM₁₀ Results

Hunter Valley Operations maintains a network of real time PM₁₀ 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 PM₁₀ 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 PM₁₀ result and the year to date 24 hour PM₁₀ annual average.

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

2.3.4 Real Time Alarms for Air Quality

During April the real time monitoring system generated 223 automated air quality related alarms. 90 alarms were related to adverse weather conditions and 133 alarms relating to PM₁₀.

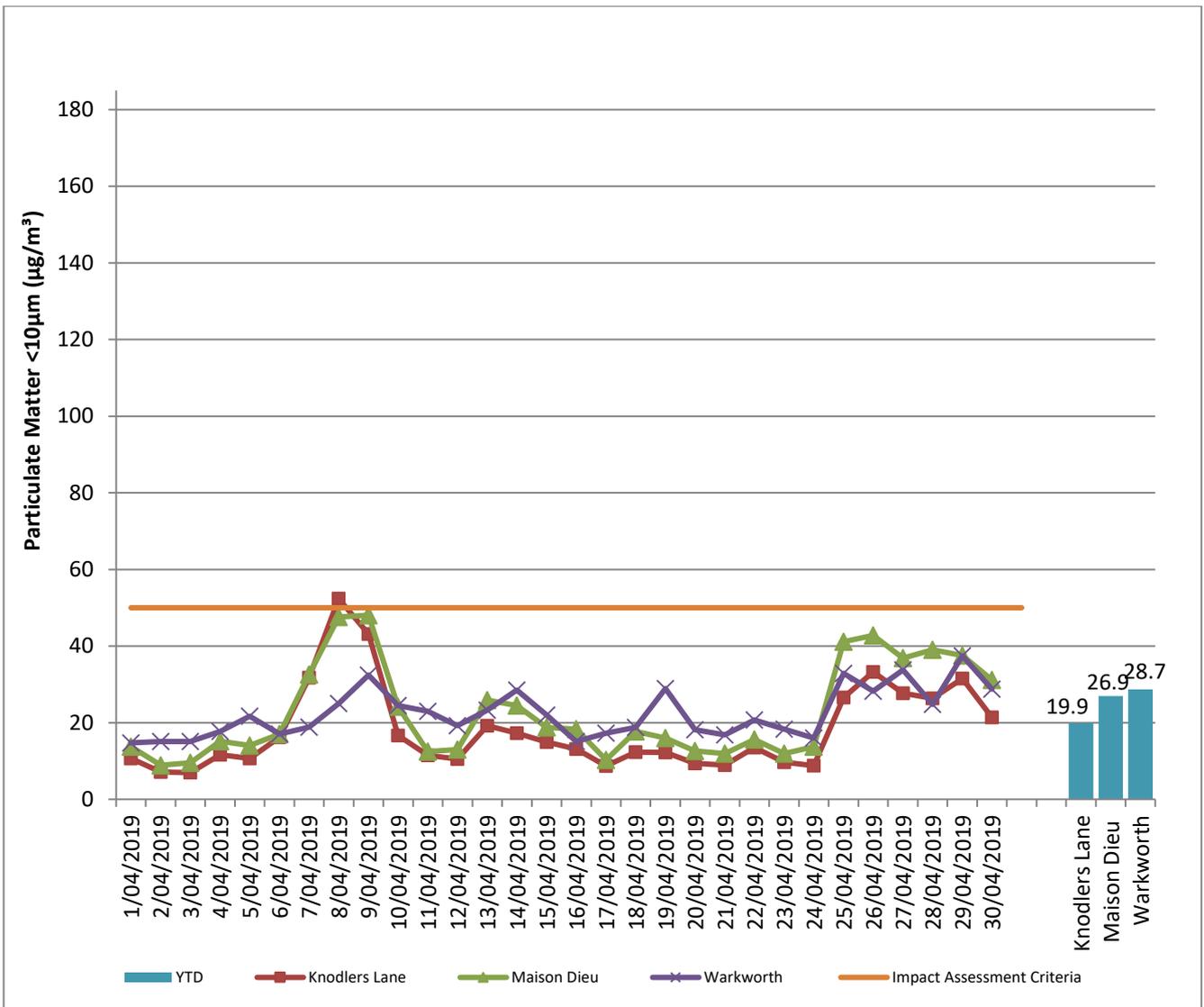


Figure 9: Real Time PM₁₀ 24hr average and YTD average – April 2019

Table 2: Real-time PM10 Investigation Results

Date	Site	Total Measured Result ($\mu\text{g}/\text{m}^3$)	Estimated contribution from HVO ($\mu\text{g}/\text{m}^3$ / %)	Discussion
08/04/2019	Knodlers Lane TEOM	52.4	18.9 $\mu\text{g}/\text{m}^3$ Or 36%	An internal investigation determined HVO maximum potential contribution to be in the order of 18.9 $\mu\text{g}/\text{m}^3$ or 36% 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 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 June 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 281.6 ML of water from the Hunter River.

3.3 HRSTS Discharge

HVO participates in the Hunter River Salinity Trading Scheme (HRSTS), allowing discharge from licensed discharge points Dam 11N (to Farrell's Creek), Lake James (to the Hunter River) and Parnell's Dam (to Parnell's Creek). Discharges can only take place subject to HRSTS regulations.

During the reporting period 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 June 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 April, 12 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 – April 2019

Figure 11: Ground Vibration Blast Monitoring Results – April 2019

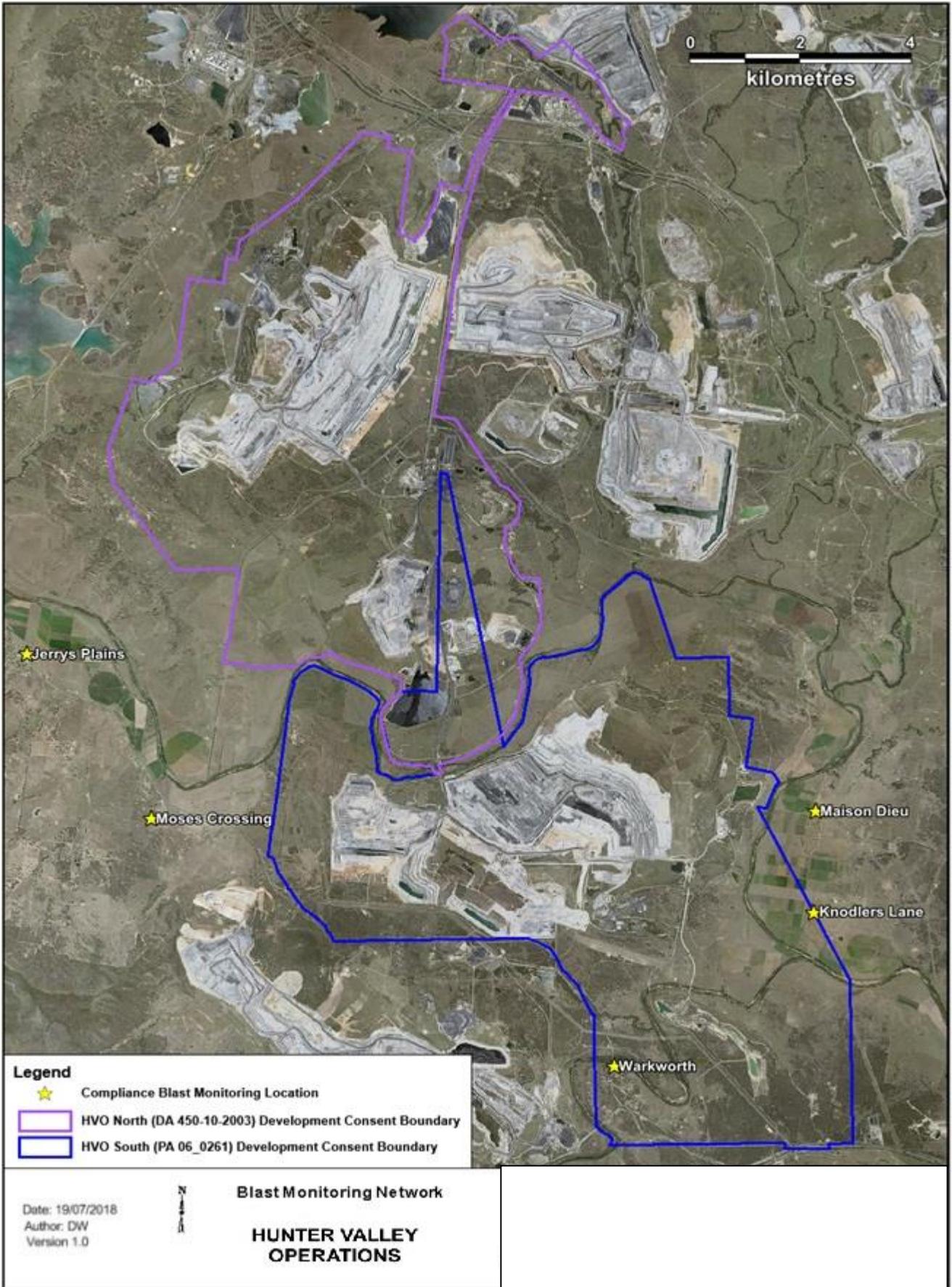


Figure 12: Blast Monitoring Location Plan

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 4-5 April 2019. Monitoring results are detailed in Table 4 to Table 8 . During April attended noise monitoring, noise levels complied with the relevant development consent noise limits at all monitoring locations.

Table 4: LAeq, 15 minute HVO South - Impact Assessment Criteria – April 2019

Location	Date and Time	Wind Speed (m/s) ¹	VTG °C/100m ¹	Criterion dB (A)	Criterion Applies? ²	HVO South LAeq dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	5/04/2019 0:12	2.5	-1	39	Yes	IA	Nil
Maison Dieu	4/04/2019 23:51	3.3	0.5	39	No	<30	NA
Shearers Lane	4/04/2019 23:29	3.5	-1	41	No	NM	NA
Kilburnie South	4/04/2019 22:54	3.1	-1	39	No	32	NA
Jerrys Plains Village	4/04/2019 21:21	3.9	0.5	35	No	IA	NA
Jerrys Plains East	4/04/2019 21:00	3.9	-1	35	No	IA	NA
Long Point Road	4/04/2019 21:00	3.9	-1	35	No	IA	NA
HVGC	4/04/2019 23:37	3.5	-1	55	No	IA	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: LA1, 1minute HVO South - Impact Assessment Criteria – April 2019

Location	Date and Time	Wind Speed (m/s) ¹	VTG °C/100m ¹	Criterion dB (A)	Criterion Applies? ²	HVO South LA1, 1min dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	5/04/2019 0:12	2.5	-1	45	Yes	IA	Nil
Maison Dieu	4/04/2019 23:51	3.3	0.5	45	No	40	NA
Shearers Lane	4/04/2019 23:29	3.5	-1	45	No	NM	NA
Kilburnie South	4/04/2019 22:54	3.1	-1	45	No	35	NA
Jerrys Plains Village	4/04/2019 21:21	3.9	0.5	45	No	IA	NA
Jerrys Plains East	4/04/2019 21:00	3.9	-1	45	No	IA	NA
Long Point Road	4/04/2019 21:00	3.9	-1	45	No	IA	NA
HVGC	4/04/2019 23:37	3.5	-1	NA	NA	IA	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: LAeq, 15minute HVO North – Impact Assessment Criteria – April 2019

Location	Date and Time	Wind Speed (m/s) ¹	VTG °C/100m ¹	Criterion dB (A)	Criterion Applies? ²	HVO North LAeq dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	5/04/2019 0:12	1.4	0.5	35	Yes	IA	Nil
Maison Dieu	4/04/2019 23:51	1.5	0.5	35	Yes	IA	Nil
Shearers Lane	4/04/2019 23:29	1.8	0.5	35	Yes	IA	Nil
Kilburnie South	4/04/2019 22:54	1.9	0.5	39	Yes	IA	Nil
Jerrys Plains Village	4/04/2019 21:21	2.6	-1	36	Yes	IA	Nil
Jerrys Plains East	4/04/2019 21:00	3.1	-1	39	No	IA	NA
Long Point Road	4/04/2019 21:00	3.1	-1	35	No	IA	NA
HVGC	4/04/2019 23:37	1.8	0.5	NA	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: LAeq,15minute HVO North - Land Acquisition Criteria – April 2019

Location	Date and Time	Wind Speed (m/s) ¹	VTG °C/100m ¹	Criterion dB (A)	Criterion Applies? ²	HVO North LAeq dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	5/04/2019 0:12	1.4	0.5	41	Yes	IA	Nil
Maison Dieu	4/04/2019 23:51	1.5	0.5	41	Yes	IA	Nil
Shearers Lane	4/04/2019 23:29	1.8	0.5	41	Yes	IA	Nil
Kilburnie South	4/04/2019 22:54	1.9	0.5	41	Yes	IA	Nil
Jerrys Plains Village	4/04/2019 21:21	2.6	-1	41	Yes	IA	Nil
Jerrys Plains East	4/04/2019 21:00	3.1	-1	41	No	IA	NA
Long Point Road	4/04/2019 21:00	3.1	-1	41	No	IA	NA
HVGC	4/04/2019 23:37	1.8	0.5	NA	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: LA1, 1Minute HVO North - Impact Assessment Criteria – April 2019

Location	Date and Time	Wind Speed (m/s) ¹	VTG °C/100m ¹	Criterion dB (A)	Criterion Applies? ²	HVO North LA1, 1min dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	5/04/2019 0:12	1.4	0.5	46	Yes	IA	Nil
Maison Dieu	4/04/2019 23:51	1.5	0.5	46	Yes	IA	Nil
Shearers Lane	4/04/2019 23:29	1.8	0.5	46	Yes	IA	Nil
Kilburnie South	4/04/2019 22:54	1.9	0.5	46	Yes	IA	Nil
Jerrys Plains Village	4/04/2019 21:21	2.6	-1	46	Yes	IA	Nil
Jerrys Plains East	4/04/2019 21:00	3.1	-1	46	No	IA	NA
Long Point Road	4/04/2019 21:00	3.1	-1	46	No	IA	NA
HVGC	4/04/2019 23:37	1.8	0.5	NA	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 April 2019 all measurements were compliant. The assessment for low frequency noise is shown in Table 9.

Table 9: Low Frequency Noise Assessment – April 2019

Location	Date and Time	Measured Site Only LA _{eq} dB (Sth/Nth)	Site Only LC _{eq} dB ¹ (Sth/Nth)	Site-Only L _{Ceq} – LA _{eq} dB ^{1,2} (Sth/Nth)	Result Max exceedance of ref spectrum dB ^{1,3} (Sth/Nth)	Penalty dB(A) ¹ (Sth/Nth)
Knodlers Lane	5/04/2019 0:12	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Maison Dieu	4/04/2019 23:51	<30/IA	NA/NA	NA/NA	NA/NA	NA/NA
Shearers Lane	4/04/2019 23:29	NM/IA	NA/NA	NA/NA	NA/NA	NA/NA
Kilburnie South	4/04/2019 22:54	32/IA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains Village	4/04/2019 21:21	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains East	4/04/2019 21:00	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Long Point Road	4/04/2019 21:00	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, this is noted as NA (not available) and no further assessment has been undertaken;
2. As per NPfI, if L_{Ceq} – LA_{eq} ≥ 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.

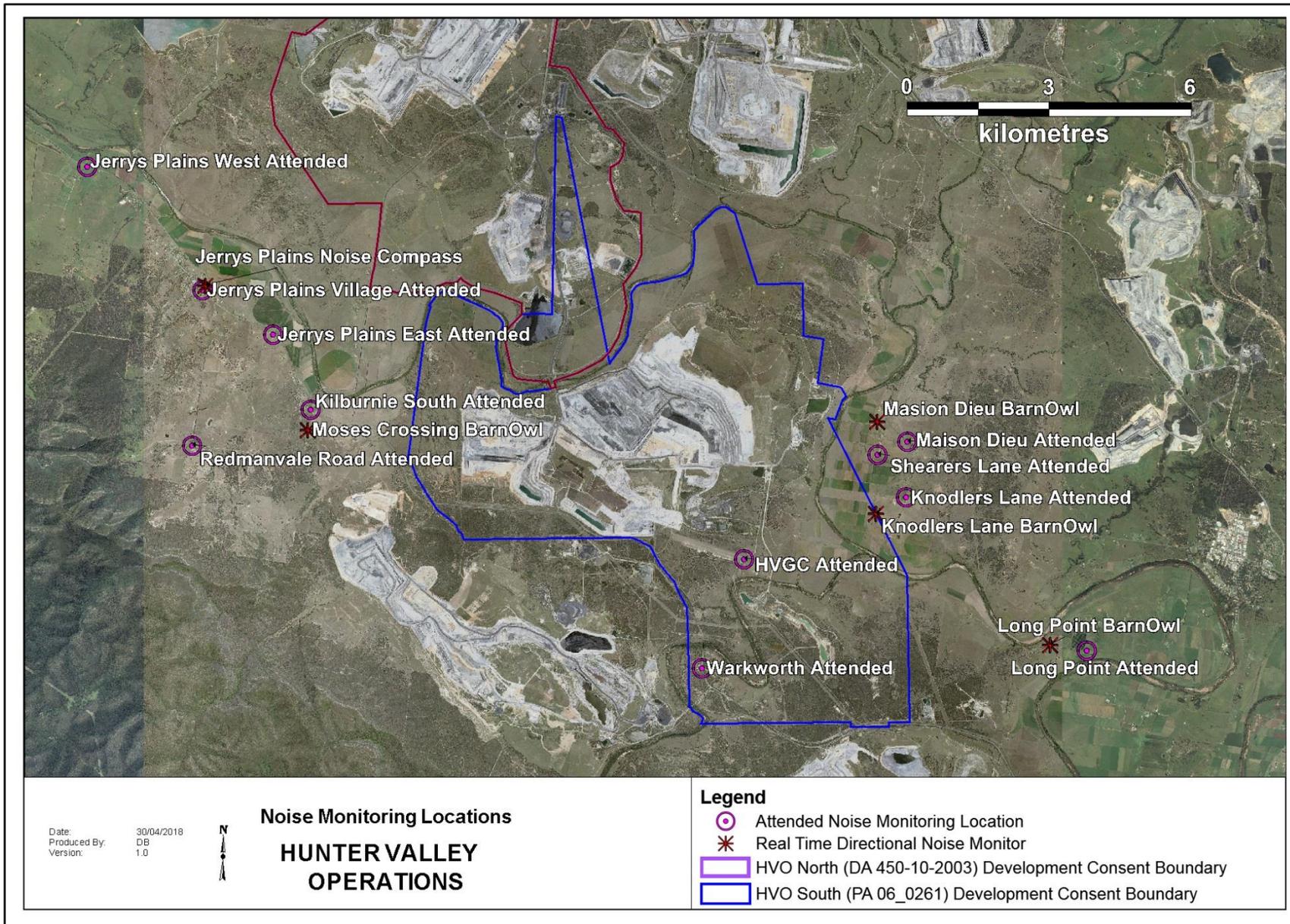


Figure 13: Noise Monitoring Location Plan

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 April, a total of 6.05 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.

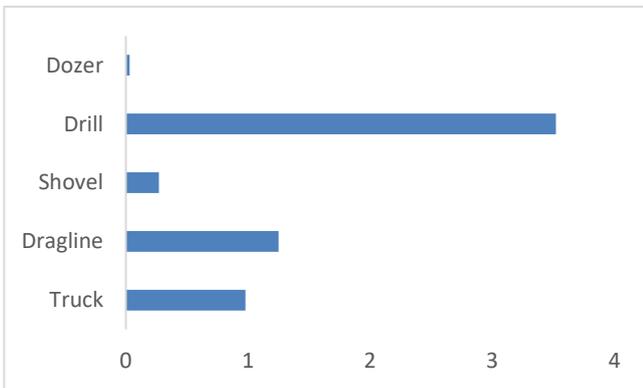


Figure 14: Operational Downtime by Equipment Type – April 2019

7.0 REHABILITATION

During April 1.65 Ha of land was released, 5.52 Ha of land was bulk shaped and 10.45 Ha of land was rehabilitated. Year to date progress can be viewed in Figure 15.

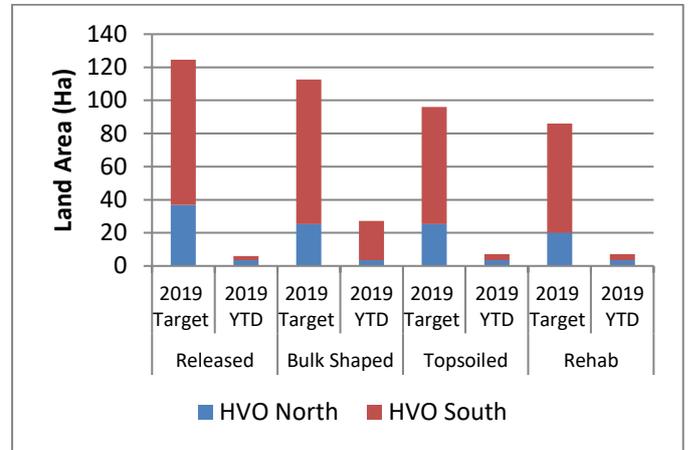


Figure 15: Rehabilitation YTD – April 2018

8.0 COMPLAINTS

Planning and Environment were notified once the invalid sample was confirmed.

One complaint was received during April in relation to regional dust levels.

Details of complaints received YTD are shown in Table 10 below.

Table 10: Complaints Summary YTD

	Noise	Dust	Blast	Lighting	Other	Total
January	-	-	-	-	-	-
February	-	-	-	-	-	-
March	-	1	-	-	-	1
April	-	1	-	-	-	1
May						
June						
July						
August						
September						
October						
November						
December						
Total	0	2	0	0	0	2

9.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were two recordable environmental incidents;

25 April 2019 – HVGC HVAS PM10 miss-capture

The Environment and Community 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 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

Appendix A: Meteorological Data

Table 11: Meteorological Data - HVO Corporate Meteorological Station – April 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)
1/4/2019	23	4	100	36	1042	177	2	0.4
2/4/2019	22	9	100	60	1215	127	2	0.4
3/4/2019	25	8	100	35	809	134	2	0.2
4/4/2019	24	8	100	39	1110	130	2	0
5/4/2019	23	10	98	55	1108	134	2	0
6/4/2019	28	10	100	26	756	248	2	0
7/4/2019	31	12	73	14	755	279	3	0
8/4/2019	31	13	57	13	790	262	3	0
9/4/2019	31	10	79	15	1157	250	4	0
10/4/2019	22	6	82	33	1014	122	3	0
11/4/2019	23	5	90	37	1020	112	2	0
12/4/2019	23	8	98	38	913	118	2	0
13/4/2019	26	8	100	23	1071	173	1	0
14/4/2019	22	8	99	42	978	143	1	0
15/4/2019	23	7	100	33	874	135	1	0.2
16/4/2019	24	8	99	47	1025	128	2	0
17/4/2019	25	10	100	45	920	118	2	0
18/4/2019	26	13	100	36	709	154	2	0
19/4/2019	25	11	100	50	1080	117	2	0.2
20/4/2019	26	15	100	50	1007	117	3	0
21/4/2019	25	15	100	47	817	129	2	0
22/4/2019	25	14	100	48	764	125	2	0
23/4/2019	26	9	100	35	827	121	3	0
24/4/2019	26	14	100	35	750	131	2	0
25/4/2019	29	11	98	27	641	206	2	0
26/4/2019	27	12	43	22	794	273	5	0
27/4/2019	20	5	85	35	990	144	2	0
28/4/2019	24	7	90	17	663	262	3	0
29/4/2019	23	7	87	36	756	126	2	0
30/4/2019	22	4	100	44	626	148	1	0

**HUNTER VALLEY
OPERATIONS**



**Monthly
Environmental
Monitoring Report**

Hunter Valley Operations

May 2019

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	Environment & Community Officer	Draft	13/06/2019
1.1	Environment & Community Coordinator	Final	09/07/2019

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 May to 30 May 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)
May	11.8	256.2

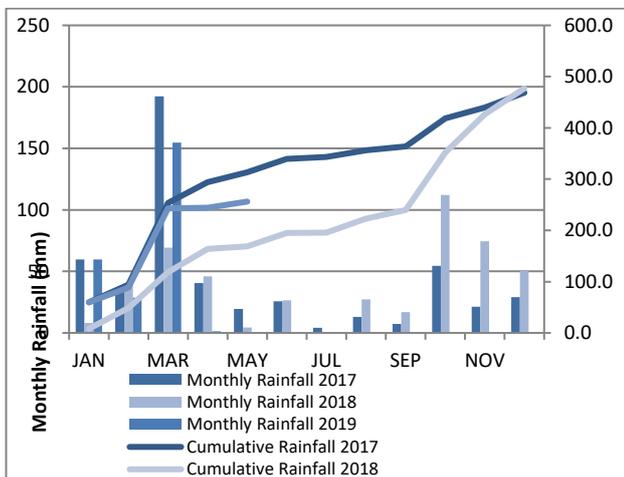


Figure 1: Rainfall Summary 2019

2.1.2 Wind Speed and Direction

North-westerly winds were dominant during May as shown in Figure 2 (HVO Corporate) and Figure 3 (HVO Cheshunt).

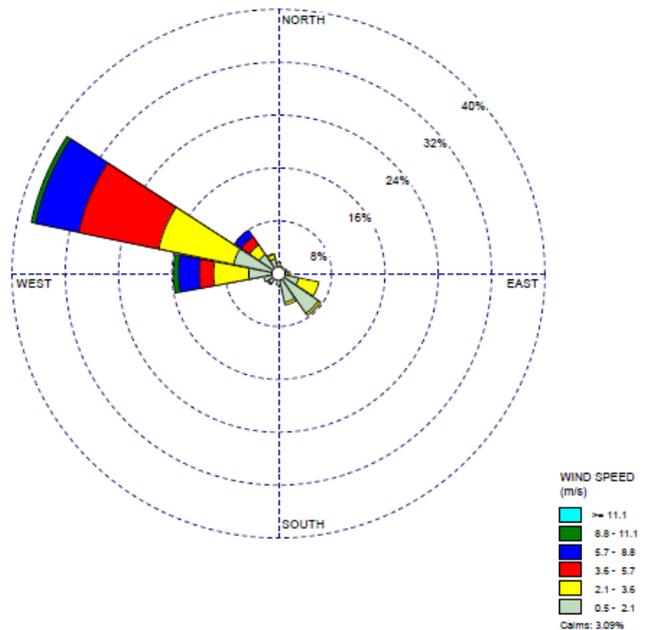


Figure 2: HVO Corporate Wind Rose – May 2019

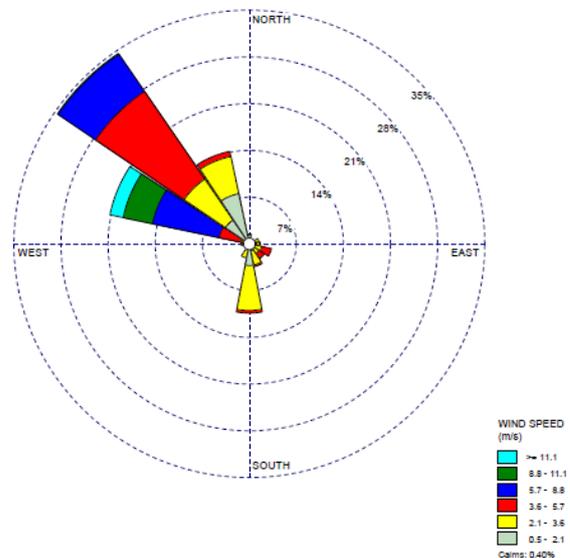


Figure 3: HVO Cheshunt Wind Rose – May 2019

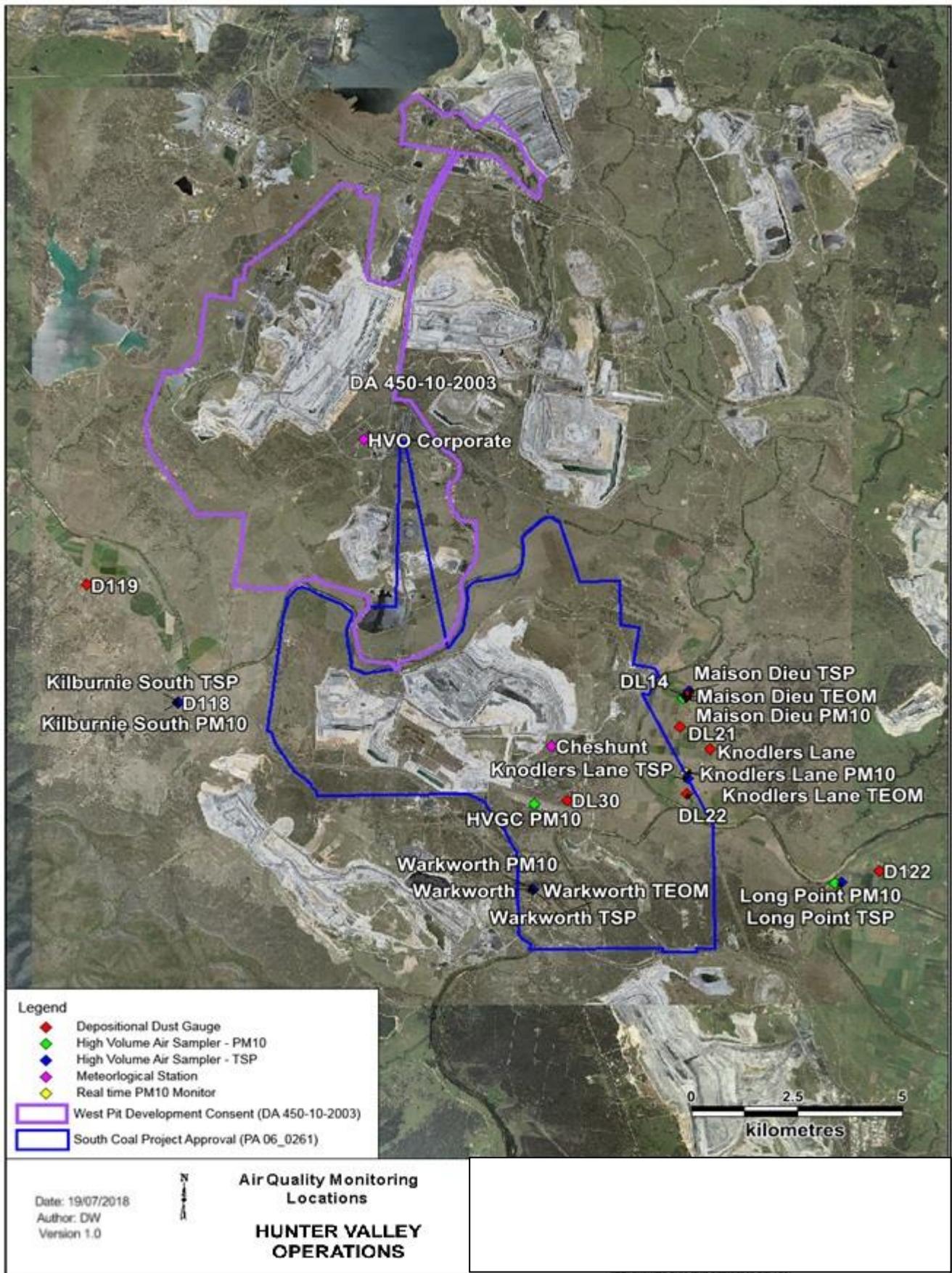


Figure 4: Air Quality Monitoring Location Plan

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, DL21 and DL30 monitors recorded a monthly result above the long term impact assessment criteria of 4.0 g/m² per month. The DL21 sample was deemed contaminated due to the presence of bird droppings

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

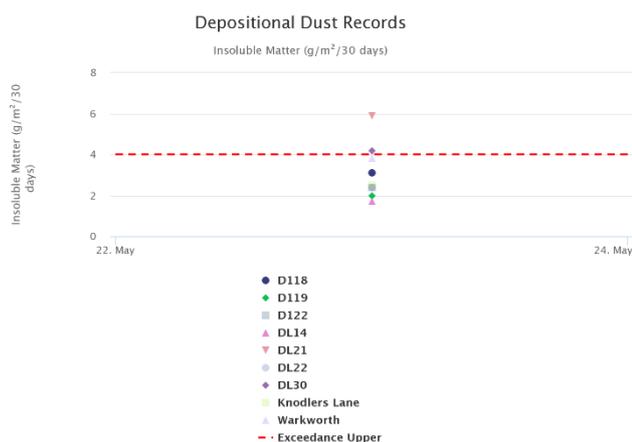


Figure 5: Depositional Dust Results – May 2019

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 (PM₁₀). 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 PM₁₀ Results

Figure 6 shows individual PM₁₀ results at each monitoring station against the short term impact assessment criteria of 50 µg/m³.

On 26 May 2019, the Knodlers Lane HVAS unit recorded an elevated 24 hour averages of 61µg/m³, with HVO's maximum contribution was calculated to be 34.5 µg/m³ or 57% of the total measured result.

On 26 May 2019, the Glider Club HVAS unit recorded an elevated 24 hour averages of 56µg/m³, with HVO's maximum contribution was calculated to be 41.6 µg/m³ or 74% of the total measured result.

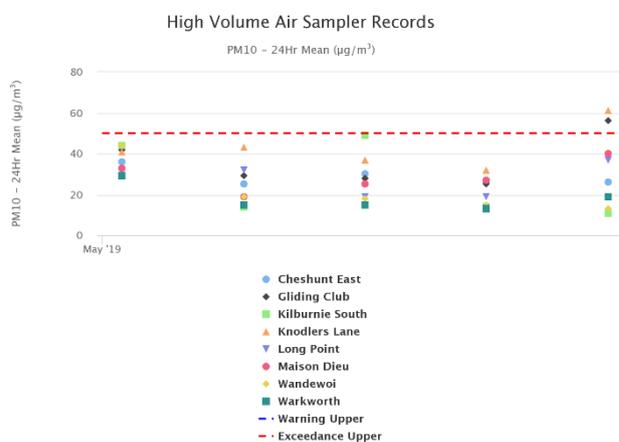


Figure 6: Individual PM₁₀ Results – May 2019

Figure 7 shows the year to date annual average PM₁₀ 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 PM₁₀ – as at end of May 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.

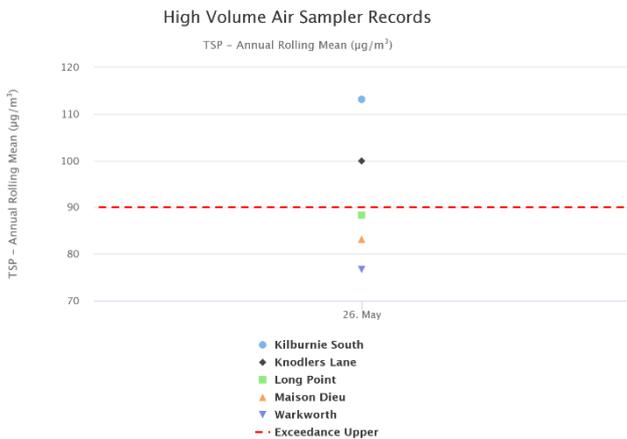


Figure 8: Year to Date Average Total Suspended Particulates – as at end of May 2019

2.3.3 Real Time PM₁₀ Results

Hunter Valley Operations maintains a network of real time PM₁₀ 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 PM₁₀ 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 PM₁₀ result and the year to date 24 hour PM₁₀ annual average.

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

2.3.4 Real Time Alarms for Air Quality

During May the real time monitoring system generated 231 automated air quality related alarms. 131 alarms were related to adverse weather conditions and 100 alarms relating to PM₁₀.

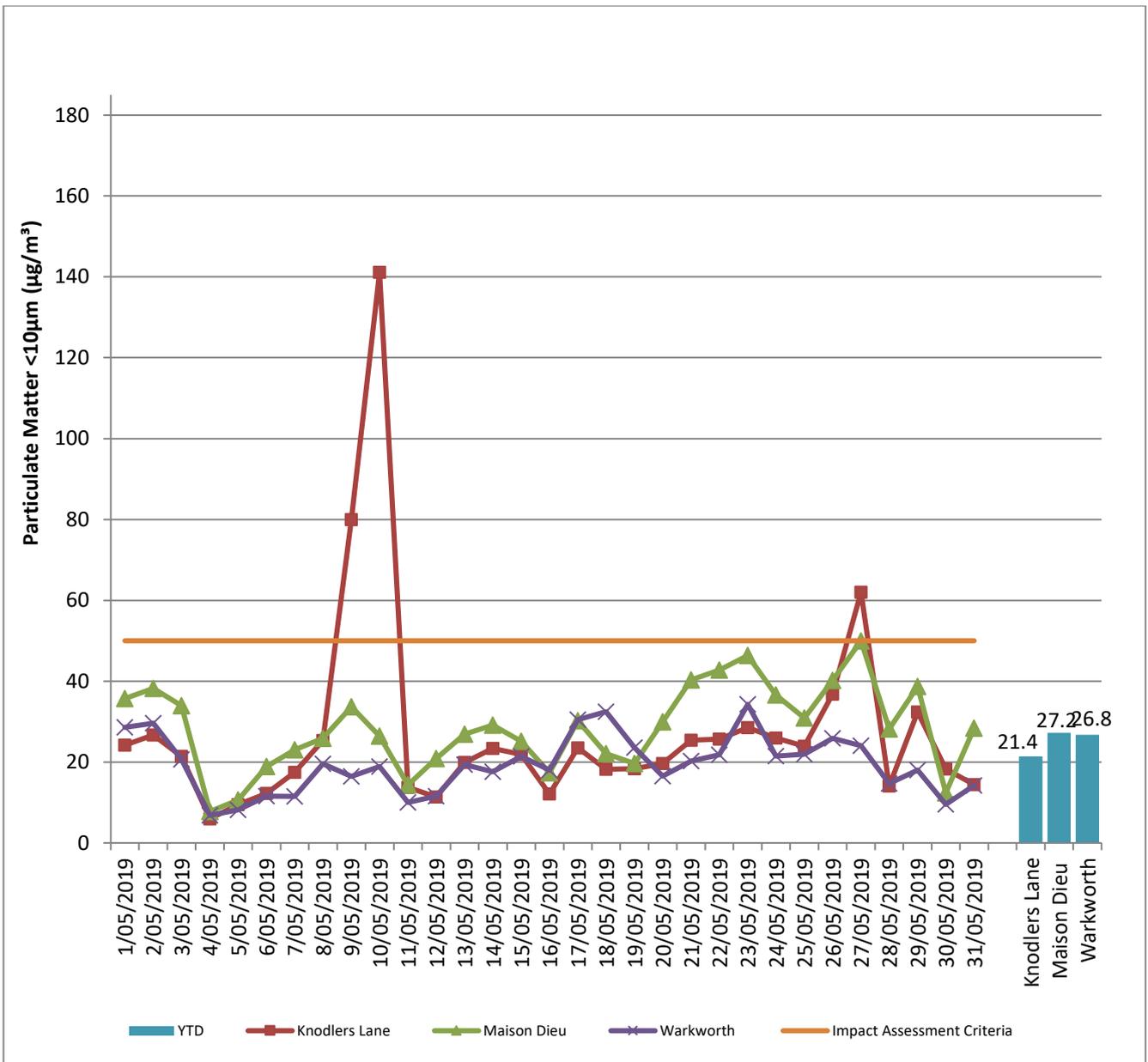


Figure 9: Real Time PM₁₀ 24hr average and YTD average – May 2019

Table 2: Real-time PM10 Investigation Results

Date	Site	Total Measured Result ($\mu\text{g}/\text{m}^3$)	Estimated contribution from HVO ($\mu\text{g}/\text{m}^3$ / %)	Discussion
09/05/2019	Knodlers Lane TEOM	79.9	56.4 $\mu\text{g}/\text{m}^3$ Or 70.5%	An internal investigation determined HVO maximum potential contribution to be in the order of 56.4 $\mu\text{g}/\text{m}^3$ or 70.5% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
10/05/2019	Knodlers Lane TEOM	141.1	118.7 $\mu\text{g}/\text{m}^3$ Or 84.1%	An internal investigation determined HVO maximum potential contribution to be in the order of 118.7 $\mu\text{g}/\text{m}^3$ or 84.1% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results. No further action is required as this monitor is currently used only for management purposes.
27/05/2019	Knodlers Lane TEOM	62.0	34.6 $\mu\text{g}/\text{m}^3$ Or 55.7%	An internal investigation determined HVO maximum potential contribution to be in the order of 34.6 $\mu\text{g}/\text{m}^3$ or 55.7% 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 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 June 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 570.7 ML of water from the Hunter River.

3.3 HRSTS Discharge

HVO participates in the Hunter River Salinity Trading Scheme (HRSTS), allowing discharge from licensed discharge points Dam 11N (to Farrell's Creek), Lake James (to the Hunter River) and Parnell's Dam (to Parnell's Creek). Discharges can only take place subject to HRSTS regulations.

During the reporting period 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 June 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 May, 17 blasts were initiated at HVO.

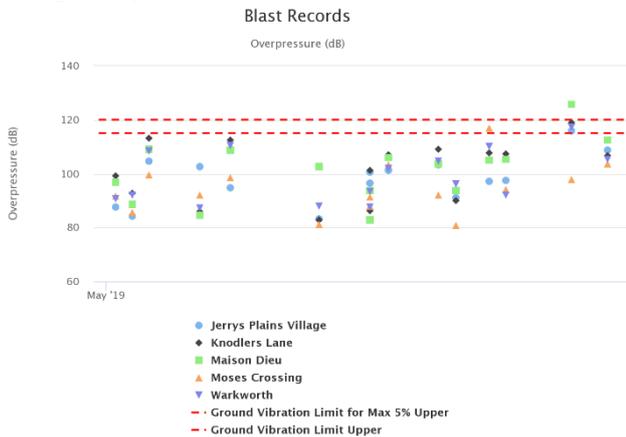


Figure 10 and 11 show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in Table 3. One blast recorded elevated Overpressure exceeding 120db(L) criteria at the Maison Dieu monitoring location on 28 May 2019. The results are considered to be preliminary until an investigation is completed. The preliminary results have been reported to DP&E and the EPA.

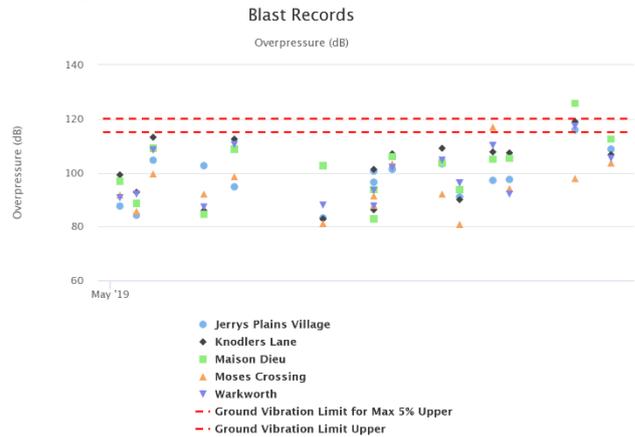


Figure 10: Overpressure Blast Monitoring Results – May 2019

Figure 11: Ground Vibration Blast Monitoring Results – May 2019

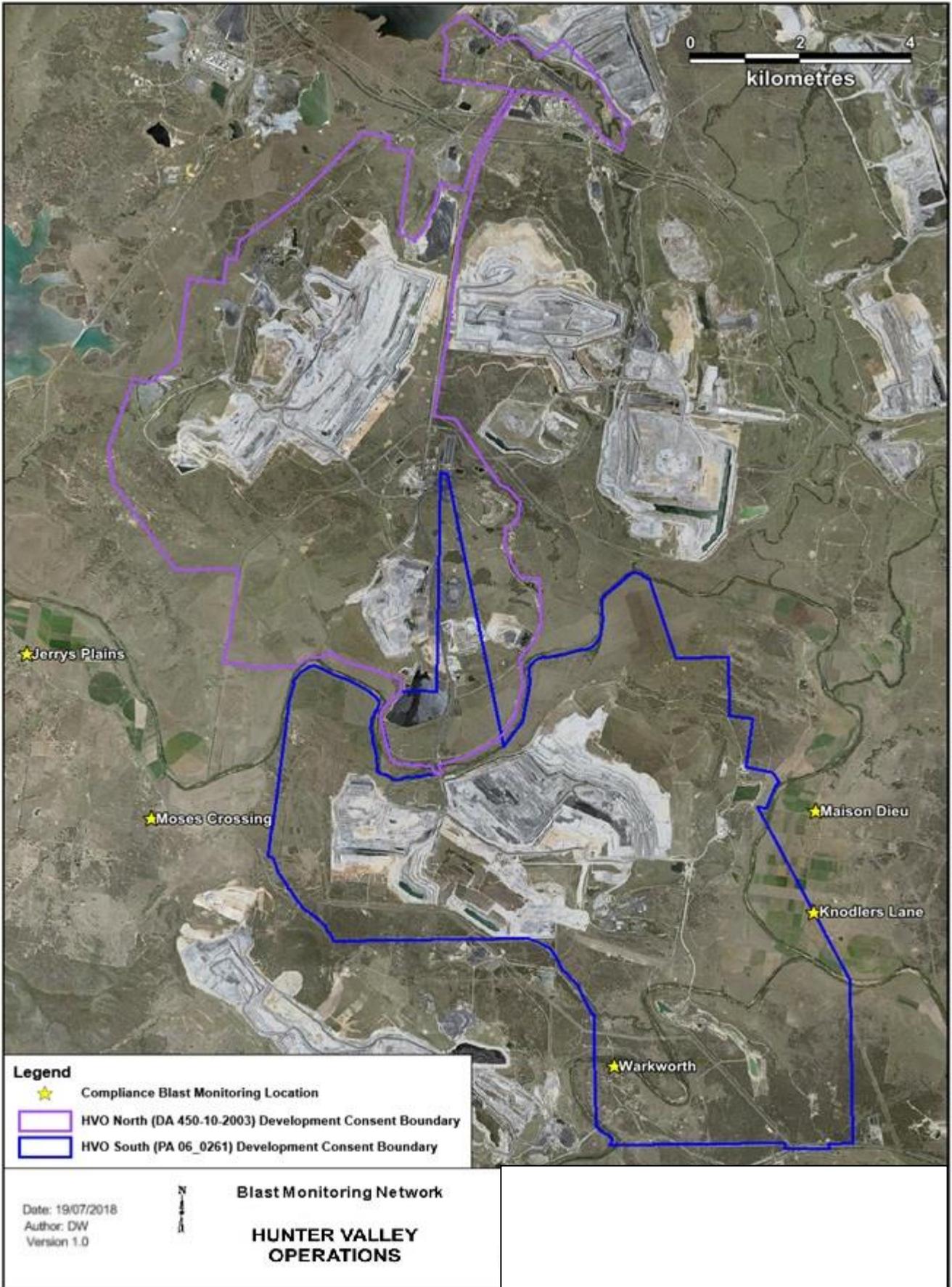


Figure 12: Blast Monitoring Location Plan

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 nights of 7 May and 12 May 2019. Monitoring results are detailed in Table 4 to Table 8. During May attended noise monitoring, noise levels complied with the relevant development consent noise limits at all monitoring locations with the exception of HVO South Pit noise levels at Maison Dieu during the measurement on 7 May 2019. As per the Noise Management Plan, the monitoring contractor contacted dispatch to advise of exceedance, Several loading units were shut down/sent to crib in response. A follow up measurement was undertaken within 75mins resulting in compliant noise levels, however criteria was not applicable due to invalid meteorological conditions. A follow up measurement was conducted within 7 days on 12 May 2019, resulting in compliant noise measurement as noise from HVO South was inaudible. These results were reported to the Department of Planning & Environment.

Table 4: LAeq, 15 minute HVO South - Impact Assessment Criteria – May 2019

Location	Date and Time	Wind Speed (m/s) ¹	VTG °C/100m ¹	Criterion dB (A)	Criterion Applies? ²	HVO South LAeq dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	7/05/2019 21:00	4.9	-1	39	No	38	NA
Maison Dieu	7/05/2019 22:33	2.5	-1	39	Yes	42⁸	3
Maison Dieu ⁶	7/05/2019 23:45	4.7	-1	39	No	37	NA
Maison Dieu ⁷	12/05/2019 21:25	2.2	-1	39	Yes	IA	Nil
Shearers Lane	8/05/2019 0:16	5.5	-1	41	No	34	NA
Kilburnie South	7/05/2019 22:55	3.6	-1	39	No	IA	NA
Jerrys Plains	7/05/2019 21:20	3.9	-1	35	No	IA	NA
Jerrys Plains East	7/05/2019 21:01	4.9	-1	35	No	IA	NA
Long Point Road	8/05/2019 0:27	5.2	-1	35	No	IA	NA
HVGC	7/05/2019 23:24	4.7	-1	55	No	42	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;
6. Re-measure;
7. Follow up measurement;
8. Includes LF modifying factor of 2 dB

Table 5: LA1, 1minute HVO South - Impact Assessment Criteria – May 2019

Location	Date and Time	Wind Speed (m/s) ¹	VTG °C/100m ¹	Criterion dB (A)	Criterion Applies? ²	HVO South LA1, 1min dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	7/05/2019 21:00	4.9	-1	45	No	50	NA
Maison Dieu	7/05/2019 22:33	2.5	-1	45	Yes	45	Nil
Maison Dieu ⁶	7/05/2019 23:45	4.7	-1	45	No	43	NA
Maison Dieu ⁷	12/05/2019 21:25	2.2	-1	45	Yes	IA	Nil
Shearers Lane	8/05/2019 0:16	5.5	-1	45	No	39	NA
Kilburnie South	7/05/2019 22:55	3.6	-1	45	No	IA	NA
Jerrys Plains Village	7/05/2019 21:20	3.9	-1	45	No	IA	NA
Jerrys Plains East	7/05/2019 21:01	4.9	-1	45	No	IA	NA
Long Point Road	8/05/2019 0:27	5.2	-1	45	No	IA	NA
HVGC	7/05/2019 23:24	4.7	-1	NA	No	43	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;
6. Re-measure; and
7. Follow up measurement;

Table 6: LAeq, 15minute HVO North – Impact Assessment Criteria – May 2019

Location	Date and Time	Wind Speed (m/s) ¹	VTG °C/100m ¹	Criterion dB (A)	Criterion Applies? ²	HVO North LAeq dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	7/05/2019 21:00	2.4	-1	35	Yes	IA	Nil
Maison Dieu	7/05/2019 22:33	5.7	-1	35	No	IA	NA
Shearers Lane	8/05/2019 0:16	3.5	-1	35	No	IA	NA
Kilburnie South	7/05/2019 22:55	4.7	-1	39	No	<25	NA
Jerrys Plains	7/05/2019 21:20	2.4	-1	36	Yes	IA	Nil
Jerrys Plains East	7/05/2019 21:01	2.4	-1	39	Yes	IA	Nil
Long Point Road	8/05/2019 0:27	2.7	3	35	Yes	IA	Nil
HVGC	7/05/2019 23:24	4	-1	NA	No	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;
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
6. Re-measure; and
7. Follow up measurement;

Table 7: LAeq,15minute HVO North - Land Acquisition Criteria – May 2019

Location	Date and Time	Wind Speed (m/s) ¹	VTG °C/100m ¹	Criterion dB (A)	Criterion Applies? ²	HVO North LAeq dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	7/05/2019 21:00	2.4	-1	41	Yes	IA	Nil
Maison Dieu	7/05/2019 22:33	5.7	-1	41	No	IA	NA
Shearers Lane	8/05/2019 0:16	3.5	-1	41	No	IA	NA
Kilburnie South	7/05/2019 22:55	4.7	-1	41	No	<25	NA
Jerrys Plains Village	7/05/2019 21:20	2.4	-1	41	Yes	IA	Nil
Jerrys Plains East	7/05/2019 21:01	2.4	-1	41	Yes	IA	Nil
Long Point Road	8/05/2019 0:27	2.7	3	41	Yes	IA	Nil
HVGC	7/05/2019 23:24	4	-1	NA	No	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;
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
6. Re-measure; and
7. Follow up measurement;

Table 8: LA1, 1Minute HVO North - Impact Assessment Criteria – May 2019

Location	Date and Time	Wind Speed (m/s) ¹	VTG °C/100m ¹	Criterion dB (A)	Criterion Applies? ²	HVO North LA1, 1min dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	7/05/2019 21:00	2.4	-1	46	Yes	IA	Nil
Maison Dieu	7/05/2019 22:33	5.7	-1	46	No	IA	NA
Shearers Lane	8/05/2019 0:16	3.5	-1	46	No	IA	NA
Kilburnie South	7/05/2019 22:55	4.7	-1	46	No	<25	NA
Jerrys Plains Village	7/05/2019 21:20	2.4	-1	46	Yes	IA	Nil
Jerrys Plains East	7/05/2019 21:01	2.4	-1	46	Yes	IA	Nil
Long Point Road	8/05/2019 0:27	2.7	3	46	Yes	IA	Nil
HVGC	7/05/2019 23:24	4	-1	NA	No	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
6. Re-measure; and
7. Follow up measurement;

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 May 2019 the measurement at Maison Dieu on 7 May resulted in a 2 dB penalty being applied. The assessment for low frequency noise is shown in Table 9.

Table 9: Low Frequency Noise Assessment – May 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 (Sth/Nth)
Knodlers Lane	7/05/2019 21:00	38/IA	NA/NA	NA/NA	NA/NA	NA/NA
Maison Dieu	7/05/2019 22:33	40/IA	57/NA	17/NA	4 dB @ 125Hz/NA	2/NA
Maison Dieu ⁴	7/05/2019 23:45	37/IA	NA/NA	NA/NA	NA/NA	NA/NA
Maison Dieu ⁵	12/05/2019 21:25	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Shearers Lane	8/05/2019 0:16	34/IA	NA/NA	NA/NA	NA/NA	NA/NA
Kilburnie South	7/05/2019 22:55	IA/<25	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains Village	7/05/2019 21:20	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains East	7/05/2019 21:01	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Long Point Road	8/05/2019 0:27	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, this is noted as NA (not available) and no further assessment has been undertaken;

2. As per NPfI, if LC_{eq} – LA_{eq} ≥ 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'

4. remeasure; and

5. follow-up measurement.

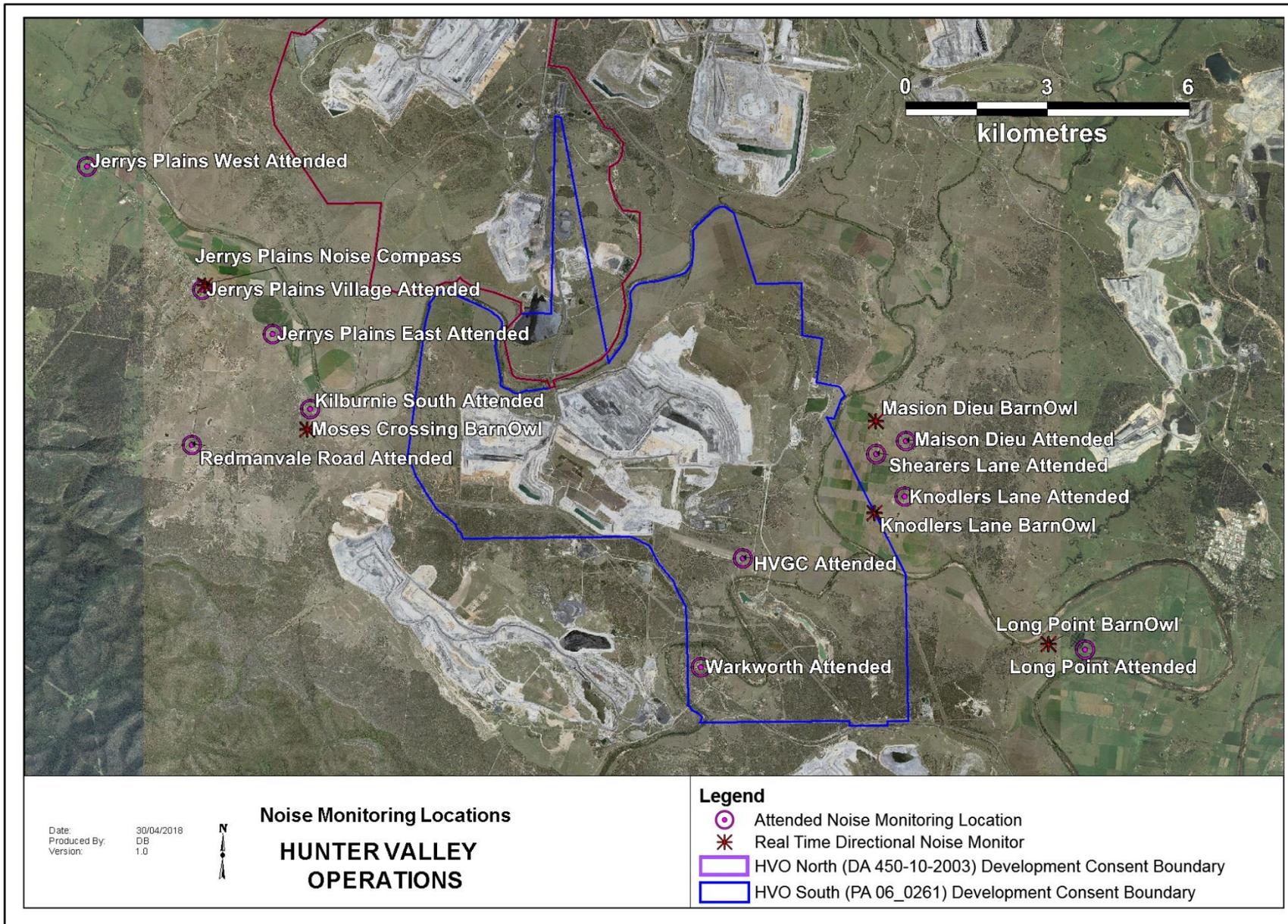


Figure 13: Noise Monitoring Location Plan

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 May, a total of 571 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.

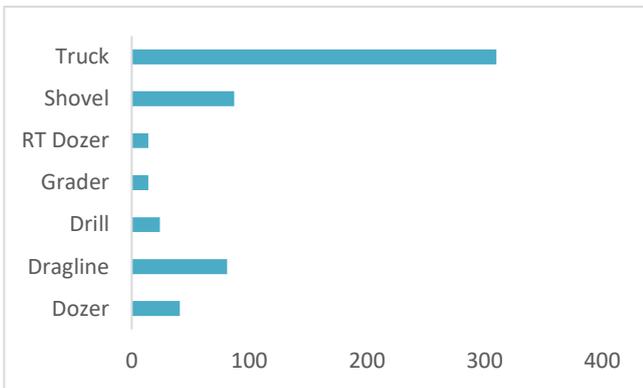


Figure 14: Operational Downtime by Equipment Type – May 2019

7.0 REHABILITATION

During May 5.68 Ha of land was released, 7.75 Ha of land was bulk shaped and 8.96 Ha of land was rehabilitated. Year to date progress can be viewed in Figure 15.

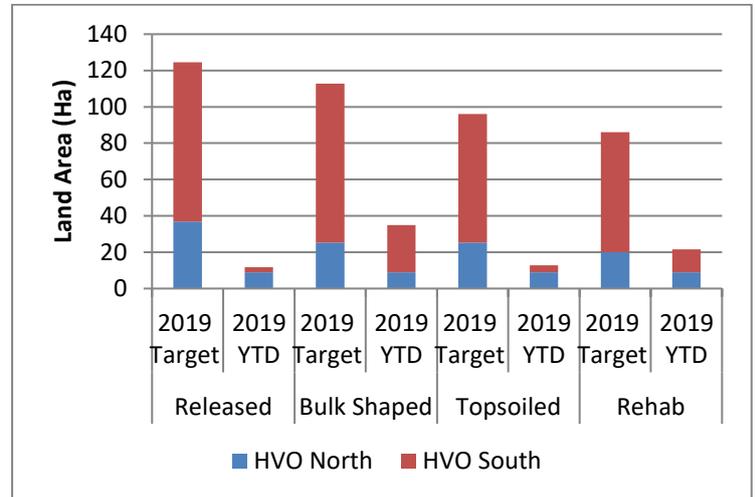


Figure 15: Rehabilitation YTD – May 2019

8.0 COMPLAINTS

Two complaints was received during May 2019.

Details of complaints received YTD are shown in Table 10 below.

Table 10: Complaints Summary YTD

	Noise	Dust	Blast	Lighting	Other	Total
January	-	-	-	-	-	-
May	-	-	-	-	-	-
March	-	1	-	-	-	1
April	-	1	-	-	-	1
May	-	2	-	-	-	2
June						
July						
August						
September						
October						
May						
December						
Total	0	4	0	0	0	4

12 May 2019, resulting in compliant noise measurement as noise from HVO South was inaudible. These results were reported to the Department of Planning & Environment.

28 May 2019 – Potential blast overpressure exceedance (.120dB)

Cheshunt blast P120R0803A was fired at approximately 9:25 am. The blast recorded an overpressure result of 125.69dB(L) at the Maison Dieu Blast Monitor. The blast event is under investigation and the results are considered to be preliminary. The preliminary results have been reported to DP&E and the EPA.

9.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were two recordable environmental incidents;

7 May 2019 – HVO South Noise Exceedance

During attended noise monitoring, an exceedance of the L_{Aeq} 15min Impact Assessment Criteria (39dB(A)) was measured at the Maison Dieu Noise monitoring location. This resulted in an L_{Aeq} of 42dB(A) including a +2dB penalty applied due to low frequency noise.. The source of the noise was general mine continuum made up of engine/exhaust and equipment fan noise. T As per the Noise Management Plan, the monitoring contractor contacted dispatch to advise of exceedance, Several loading units where shut down/sent to crib in response. A follow up measurement was undertaken within 75mins resulting in compliant noise levels, however criteria was not applicable due to invalid meteorological conditions. A follow up measurement was conducted within 7 days on

Appendix A: Meteorological Data

Table 11: Meteorological Data - HVO Corporate Meteorological Station – May 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)
1/5/2019	22.7	12.6	100.0	45.5	609.6	179.9	1.1	0
2/5/2019	23.0	15.6	96.4	48.4	645.1	166.1	0.8	0
3/5/2019	23.3	15.9	100.0	35.5	602.6	268.8	2.3	7.6
4/5/2019	20.1	13.8	100.0	44.4	898.0	195.7	1.7	3.2
5/5/2019	18.5	9.6	83.4	34.9	965.0	217.4	1.7	0
6/5/2019	19.4	8.7	89.3	33.0	775.7	273.7	2.2	0
7/5/2019	20.1	8.6	82.1	24.2	648.2	290.9	4.2	0
8/5/2019	18.8	10.3	71.8	19.0	856.0	283.2	4.3	0
9/5/2019	18.9	6.5	78.3	24.8	712.1	249.6	2.0	0
10/5/2019	15.8	6.2	89.2	39.6	836.0	240.6	3.7	0.8
11/5/2019	18.1	8.2	75.9	25.9	612.0	287.5	6.0	0
12/5/2019	18.8	6.4	80.5	28.9	613.8	207.6	2.2	0
13/5/2019	20.0	8.3	92.9	43.9	753.9	169	0.8	0
14/5/2019	22.5	12.6	87.2	21.5	597.9	245.8	2.3	0
15/5/2019	20.5	9.4	93.7	35.2	736.8	155.8	1.6	0
16/5/2019	20.6	9.6	100.0	34.2	570.3	131.4	1.5	0
17/5/2019	21.3	10.6	96.4	37.0	839.0	171	1.1	0
18/5/2019	21.2	9.5	88.5	74.2	-11.5	145	1.1	0
19/5/2019	20.5	9.7	100.0	35.0	587.9	153.4	1.6	0
20/5/2019	21.5	10.5	100.0	31.2	761.0	256	1.7	0
21/5/2019	23.7	11.1	79.8	23.8	534.2	263	2.7	0
22/5/2019	24.6	12.1	77.8	19.1	696.4	225	2.1	0
23/5/2019	21.6	12.3	94.9	41.8	651.2	184	1.1	0
24/5/2019	22.2	10.4	98.6	21.8	532.2	284.1	2.4	0
25/5/2019	22.5	9.4	76.6	11.8	645.0	275.5	2.8	0
26/5/2019	20.9	11.1	63.7	23.7	705.5	279.3	3.7	0
27/5/2019	16.3	7.9	76.3	22.7	654.5	285.5	6.9	0.2
28/5/2019	13.5	5.2	66.3	24.0	536.2	298.4	5.4	0
29/5/2019	15.1	10.0	64.5	30.5	836.0	280.7	7.6	0
30/5/2019	13.8	5.3	67.4	14.8	550.7	287.4	5.0	0
31/5/2019	15.4	3.3	79.2	23.2	533.1	290	3.4	0

**HUNTER VALLEY
OPERATIONS**



**Monthly Environmental
Monitoring Report**

Hunter Valley Operations

June 2019

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	Environment & Community Officer	Draft	05/08/2019
1.1	Environment & Community Coordinator	Final	09/08/2019

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 June to 30th June 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)
June	8.6	264.8

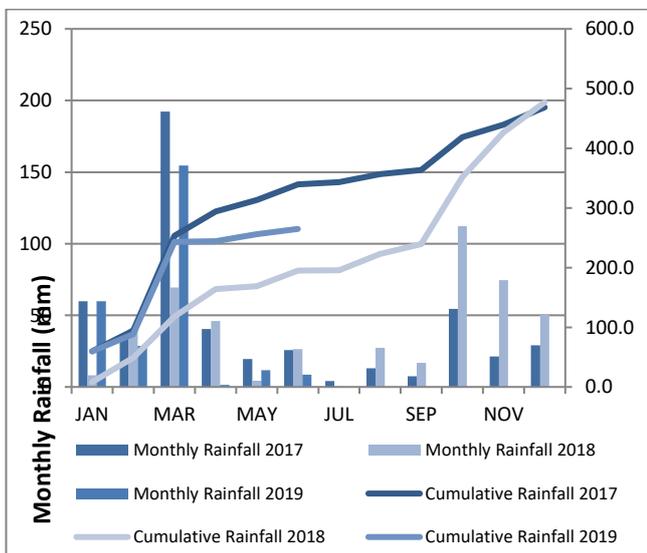


Figure 1: Rainfall Summary 2019

2.1.2 Wind Speed and Direction

North-westerly winds were dominant during June as shown in Figure 2 (HVO Corporate) and Figure 3 (HVO Cheshunt).

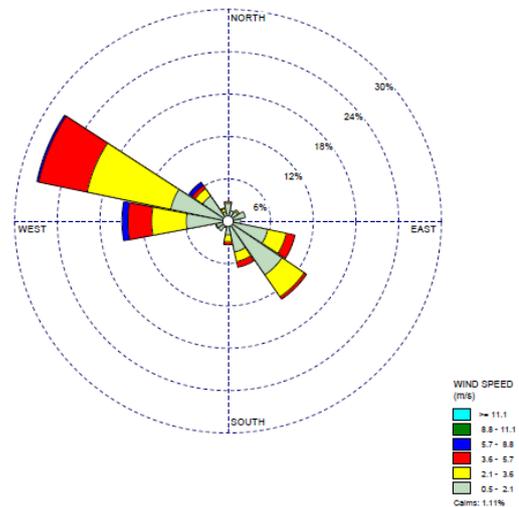


Figure 2: HVO Corporate Wind Rose – June 2019

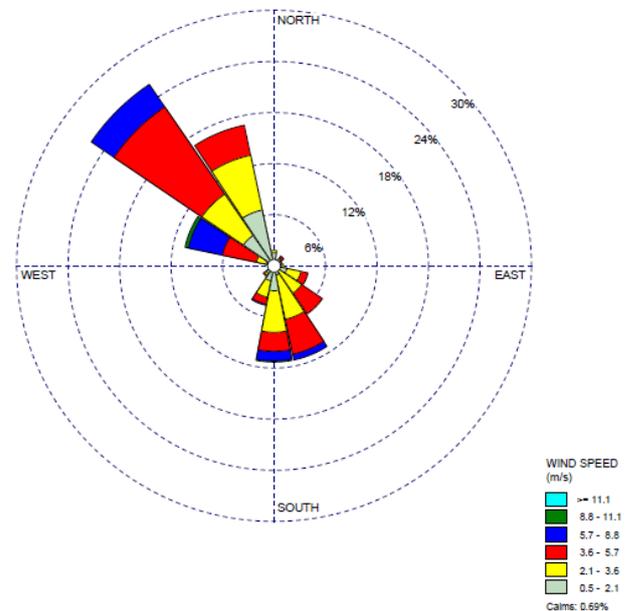


Figure 3: HVO Cheshunt Wind Rose – June 2019

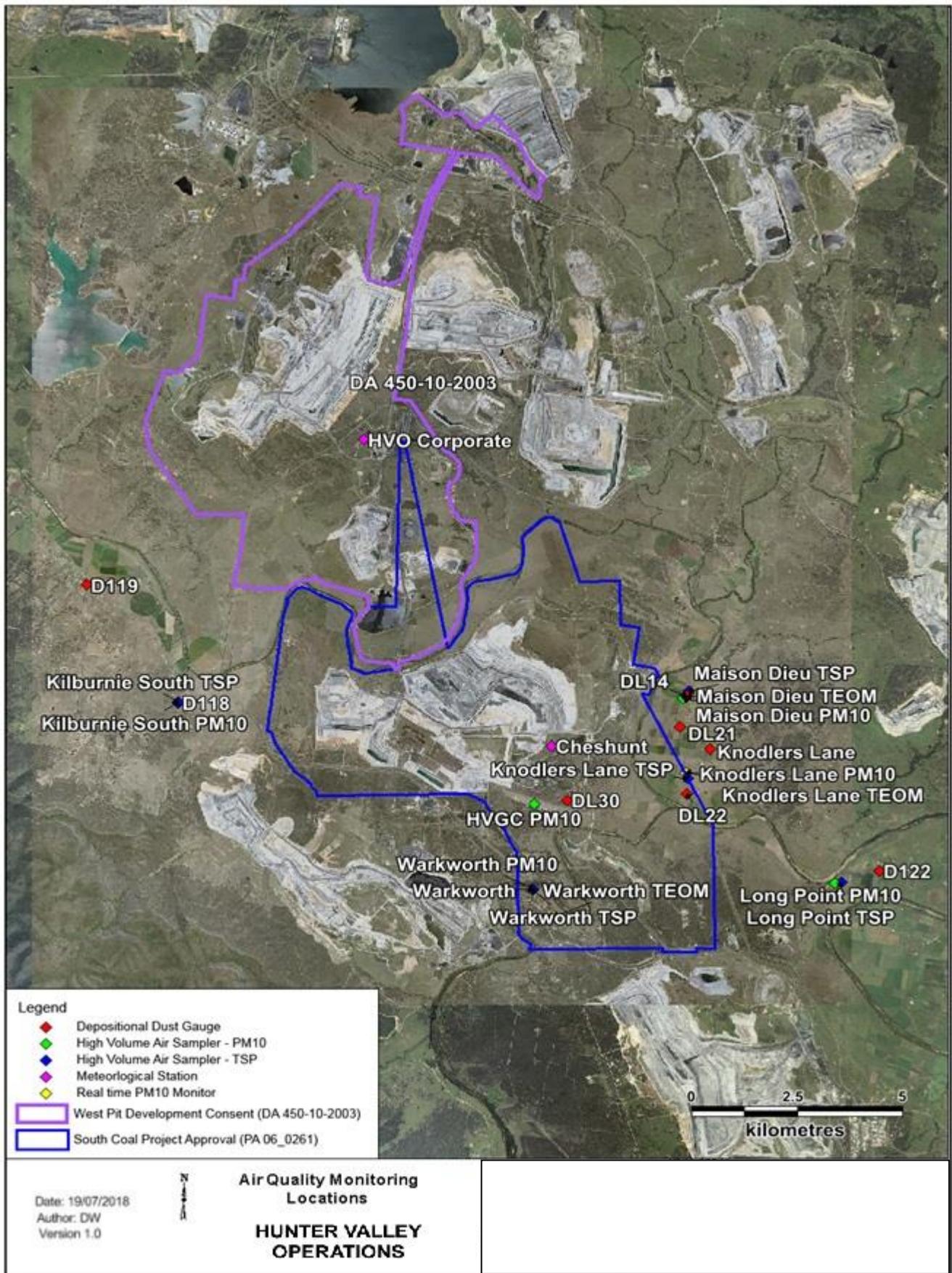


Figure 4: Air Quality Monitoring Location Plan

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 D122, DL21 and DL30 monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m² per month.

The field notes associated with the DL21 and DL30 monitor results indicates no evidence to suggest that these results were contaminated and will be included in the annual average calculation.

Field notes for D122 state that the sample was contaminated with insects and was green and slightly turbid.

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

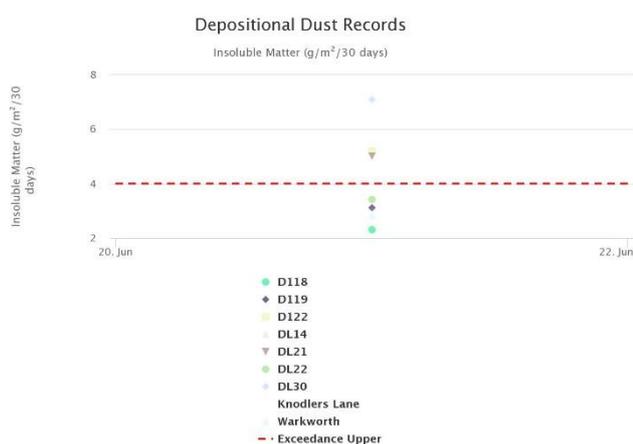


Figure 5: Depositional Dust Results – June 2019

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 (PM₁₀). 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 PM₁₀ Results

Figure 6 shows individual PM₁₀ results at each monitoring station against the short term impact assessment criteria of 50 µg/m³.

On 1 June 2019, the Hunter Valley Gliding Club HVAS unit recorded an elevated 24 hour average of 72µg/m³, with HVO's maximum contribution was calculated to be 45.3 µg/m³ or 63% of the total measured result.

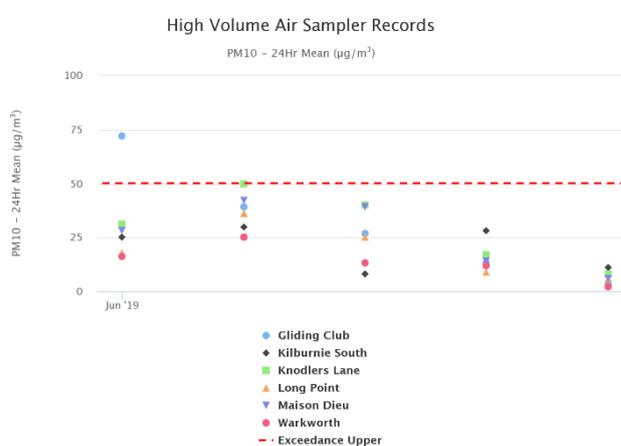


Figure 6: Individual PM₁₀ Results – June 2019

Figure 7 shows the year to date annual average PM₁₀ results. An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2019 Annual Review.

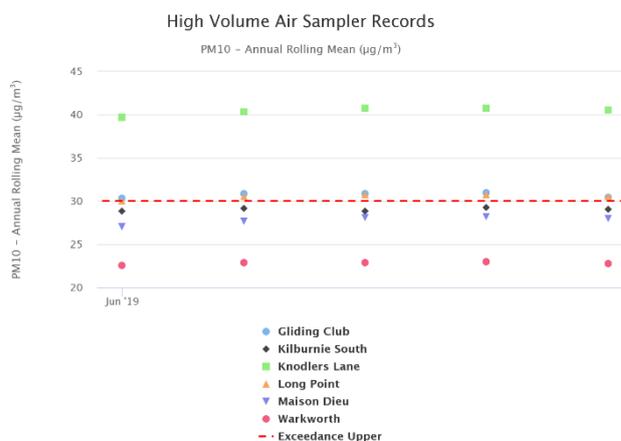


Figure 7: Year to Date Average PM₁₀ – June 2019

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.

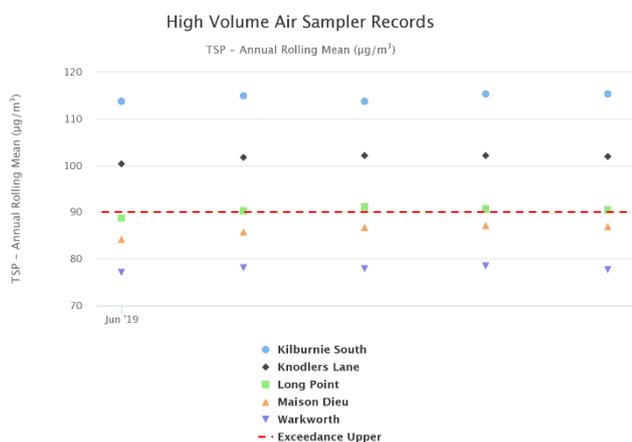


Figure 8: Year to Date Average Total Suspended Particulates – June 2019

2.3.3 Real Time PM₁₀ Results

Hunter Valley Operations maintains a network of real time PM₁₀ 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 PM₁₀ 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 PM₁₀ result and the year to date 24 hour PM₁₀ annual average.

Table 2 shows the exceedances for real time PM₁₀ monitoring for June.

2.3.4 Real Time Alarms for Air Quality

During June the real time monitoring system generated 154 automated air quality related alarms. 10 were related to adverse weather conditions and 144 alarms relating to PM₁₀.

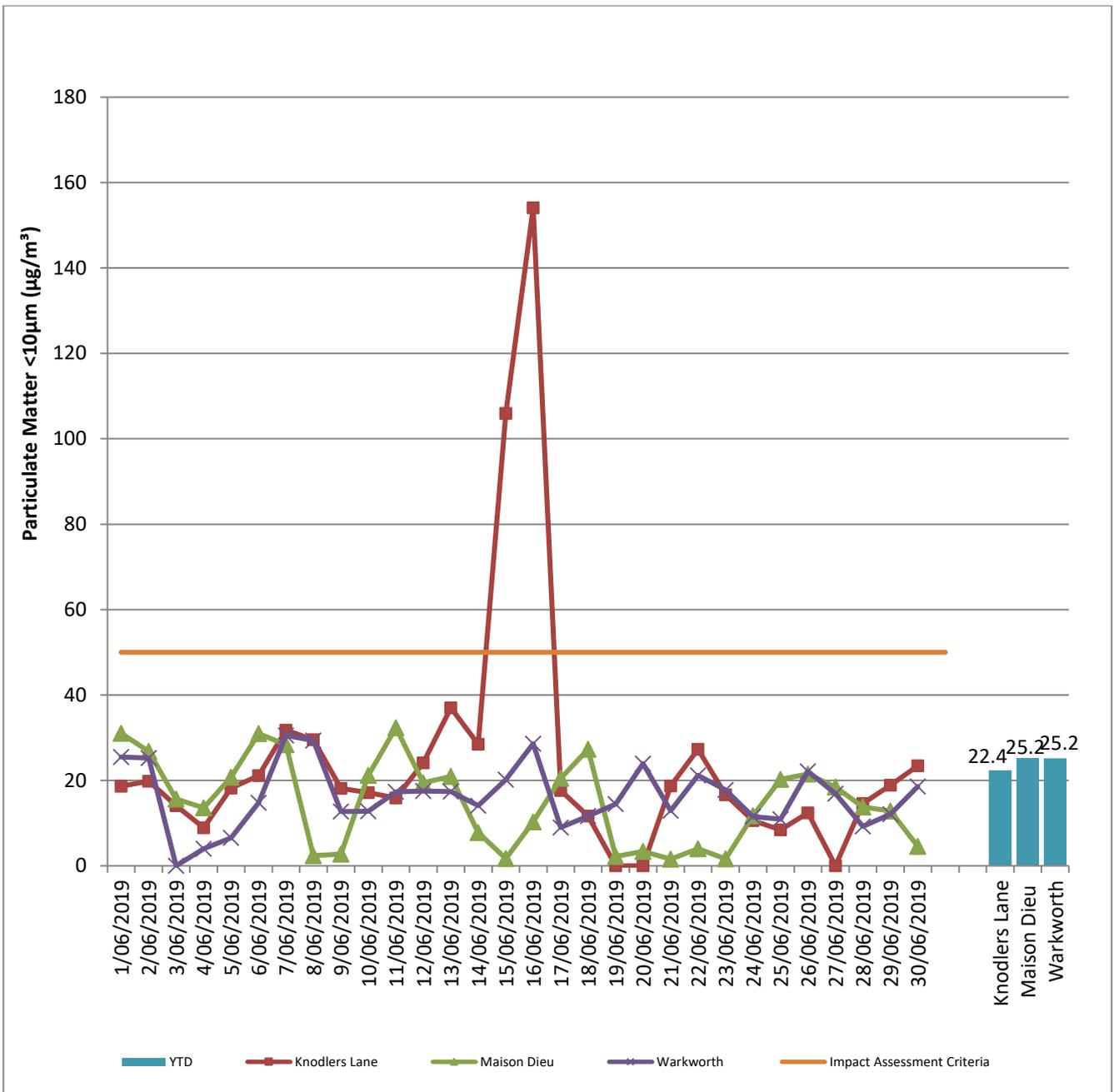


Figure 9: Real Time PM_{10} 24hr average and YTD average – June 2019

Table 2: Real-time PM10 Investigation Results

Date	Site	Total Measured Result ($\mu\text{g}/\text{m}^3$)	Estimated contribution from HVO ($\mu\text{g}/\text{m}^3$ / %)	Discussion
15/06/2019	Knodlers Lane TEOM	105.9	71.0 $\mu\text{g}/\text{m}^3$ Or 67%	An internal investigation determined HVO maximum potential contribution to be in the order of 71 $\mu\text{g}/\text{m}^3$ or 67% of the total measured based on prevailing wind conditions. However it was identified that a fault with the monitor caused flat line data at 399.
16/06/2019	Knodlers Lane TEOM	N/A	N/A	Insufficient amount of valid data to calculate a 24 hour average.

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 2 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

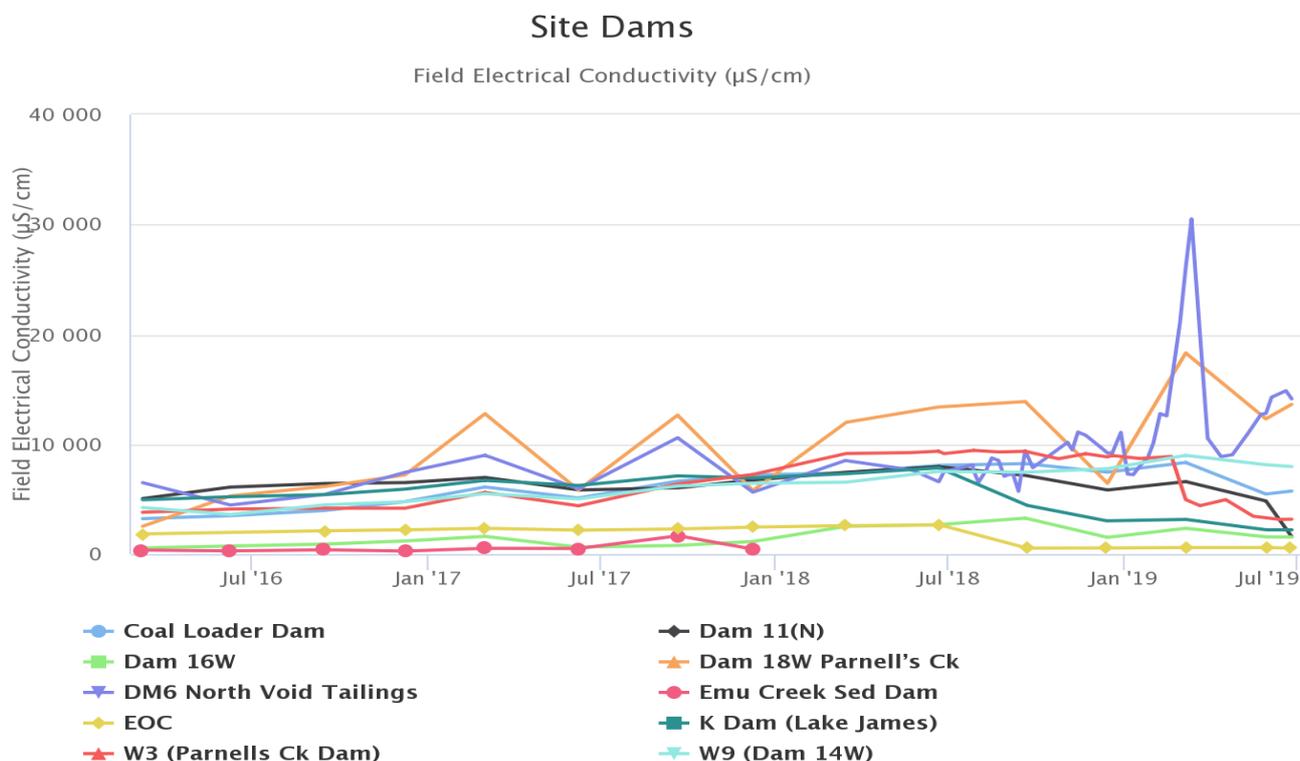


Figure 10: Site Dams Electrical Conductivity Trend – June 2019

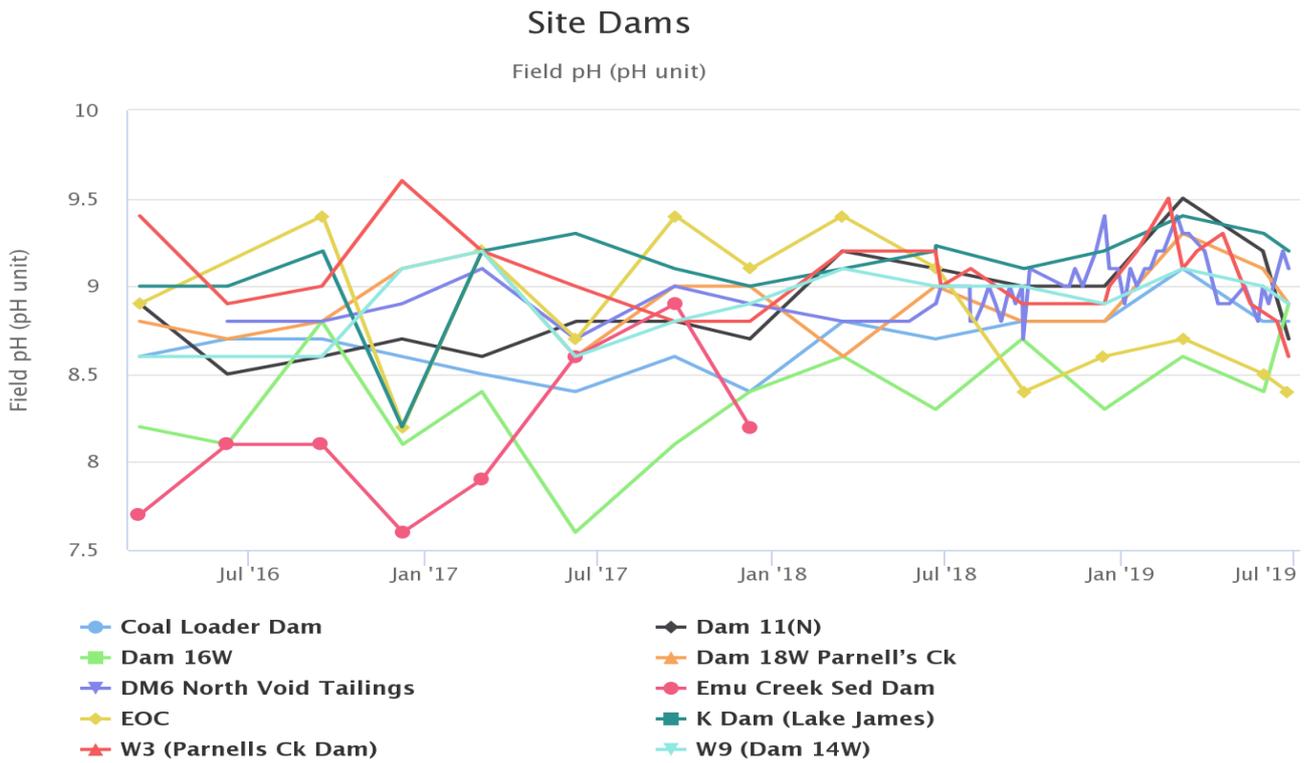


Figure 11: Site Dams pH Trend – June 2019

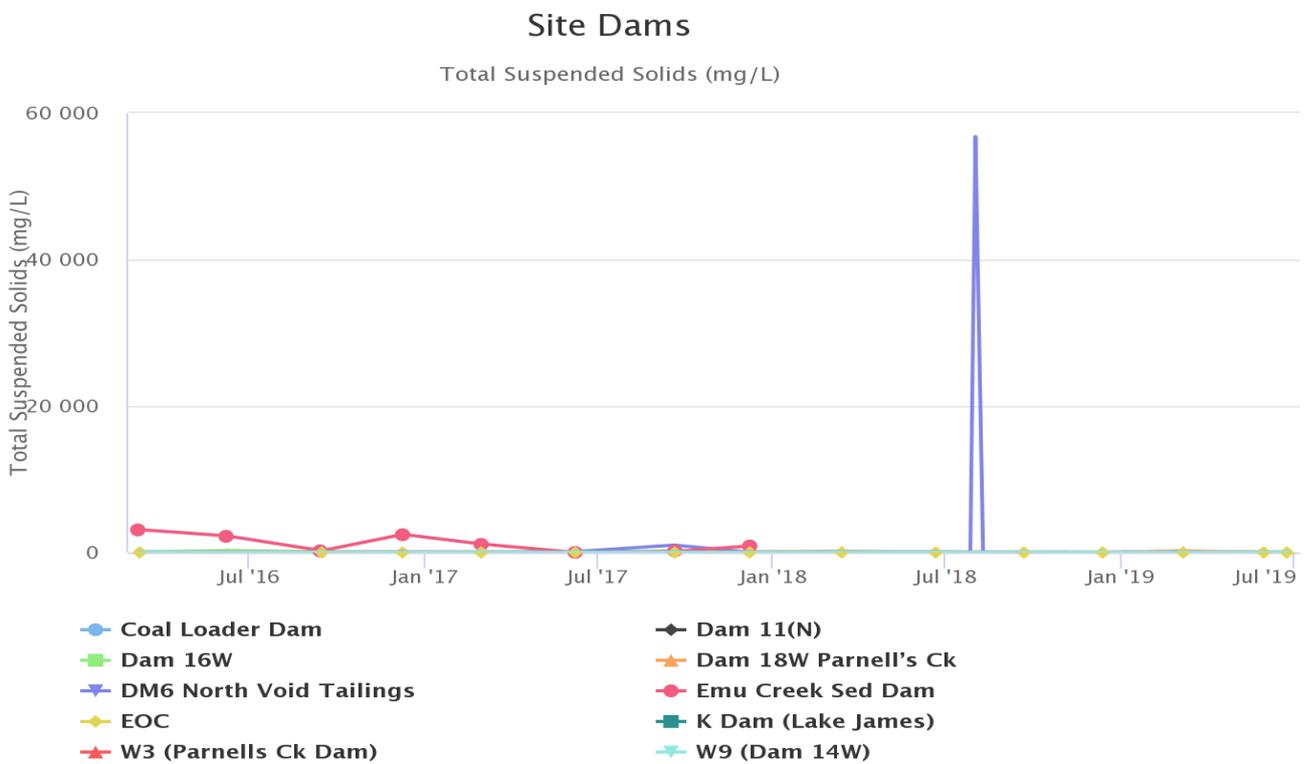


Figure 12: Site Dams Total Suspended Solids Trend – June 2019

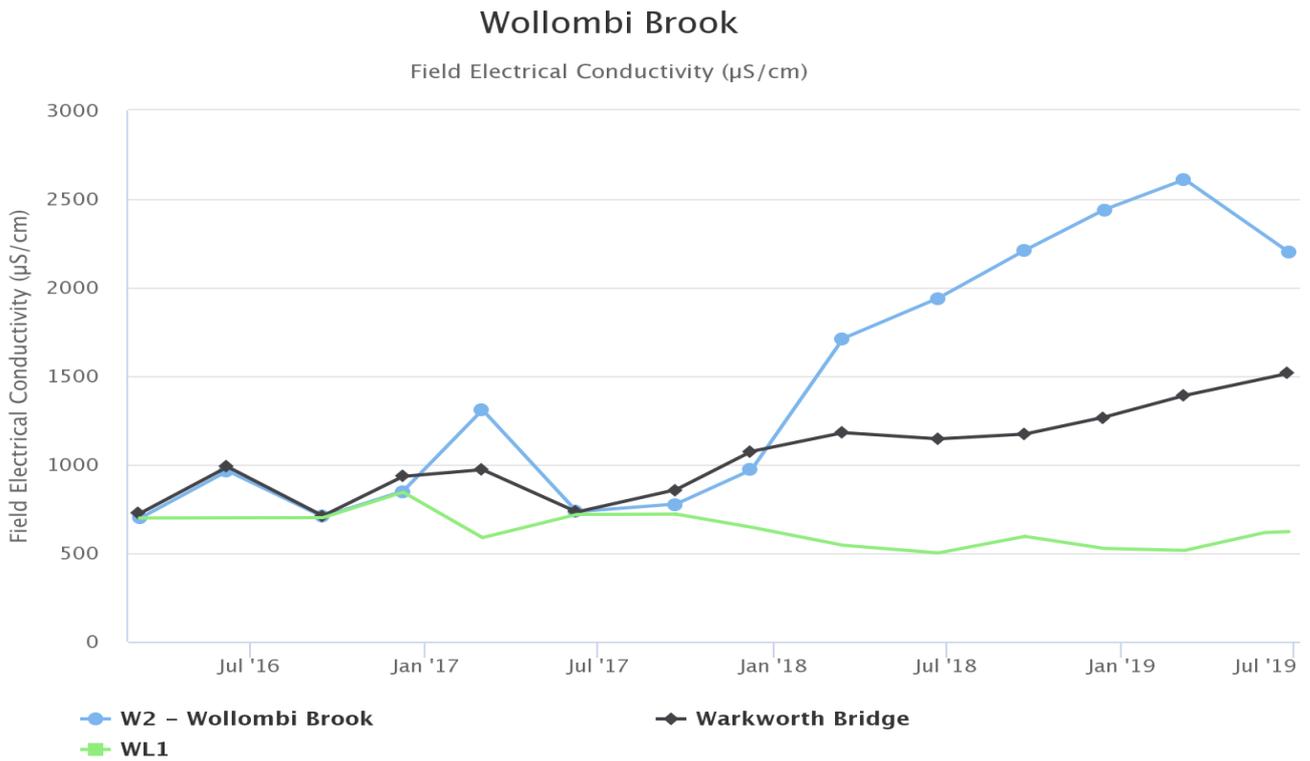


Figure 13: Wollombi Brook Electrical Conductivity Trend – June 2019

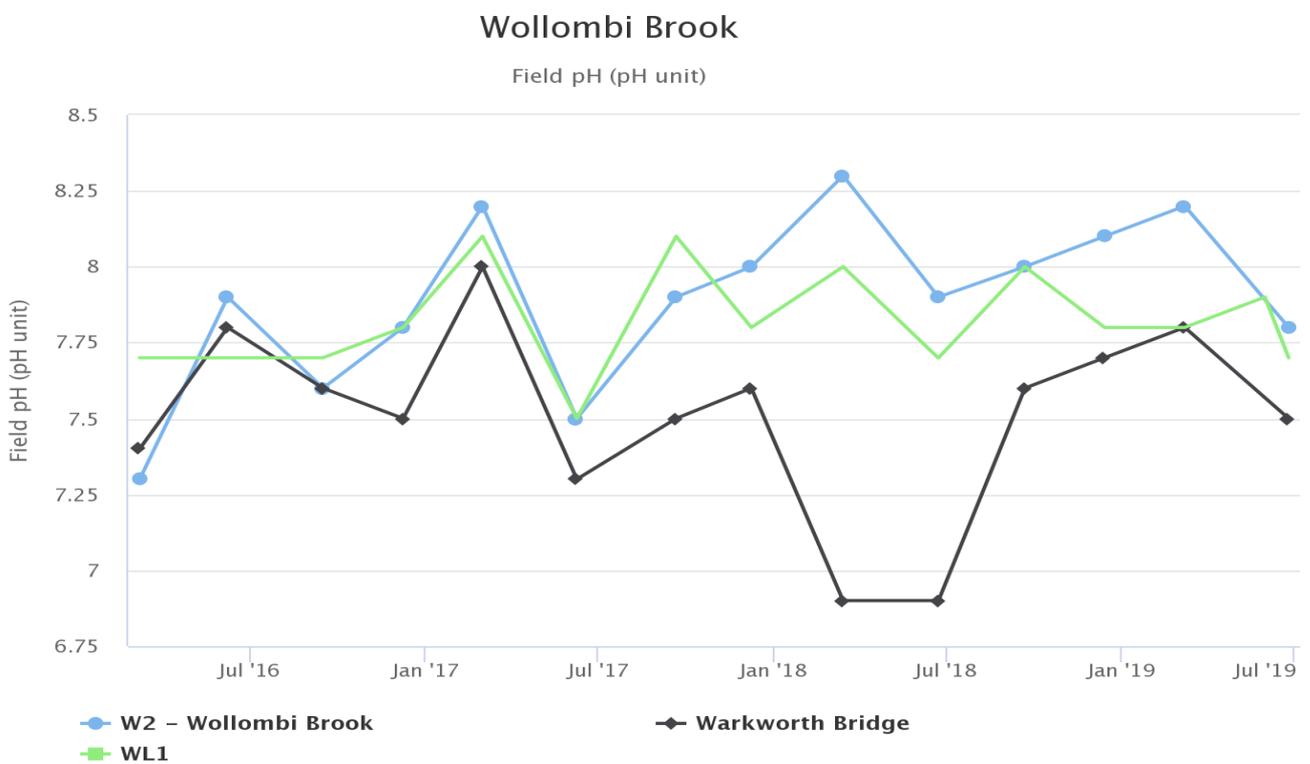


Figure 14: Wollombi Brook pH Trend – June 2019

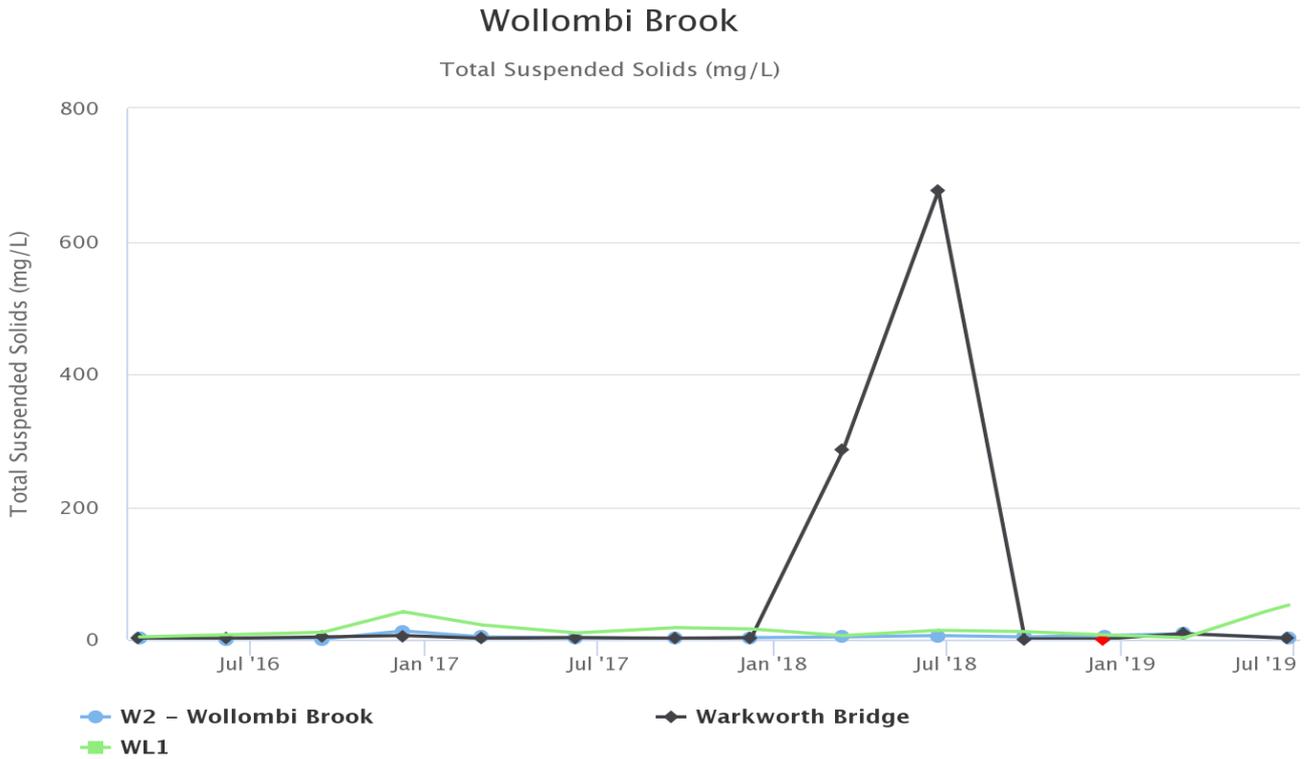


Figure 15: Wollombi Brook Total Suspended Solids Trend – June 2019

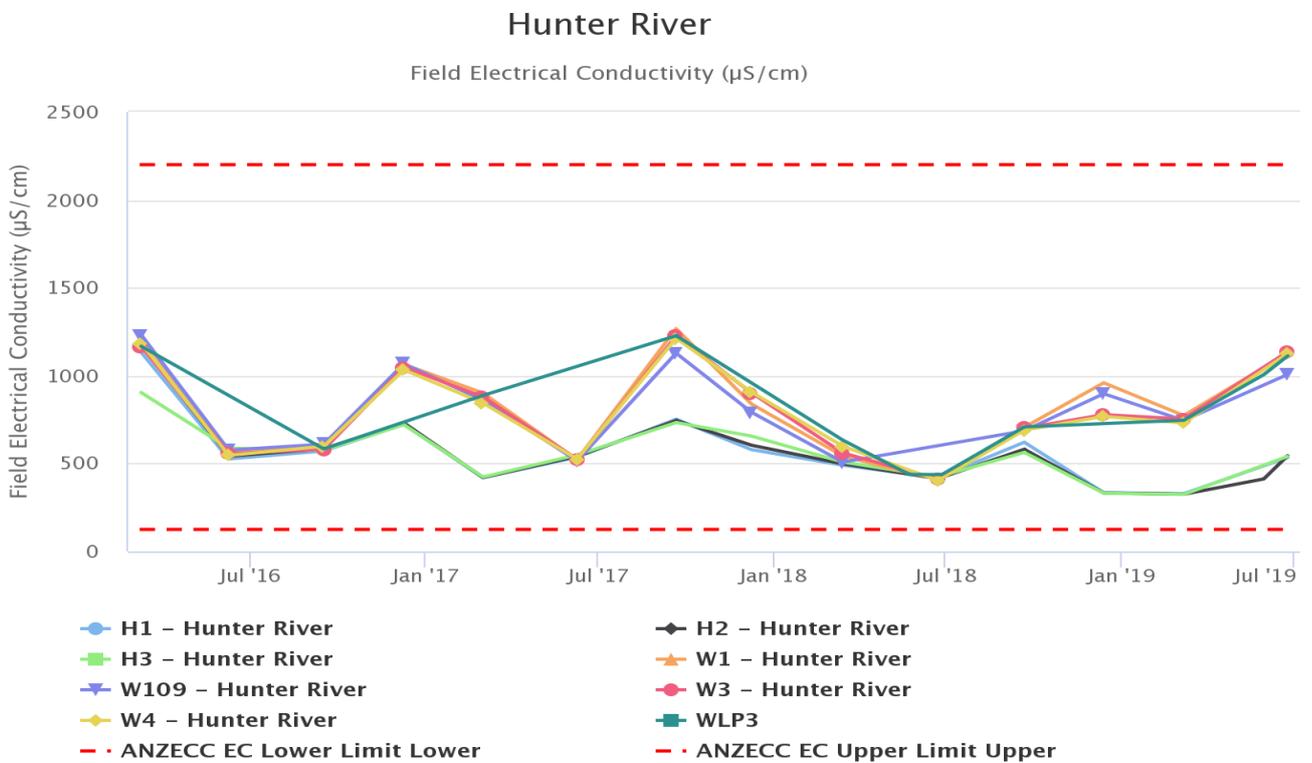


Figure 16: Hunter River Electrical Conductivity Trend – June 2019

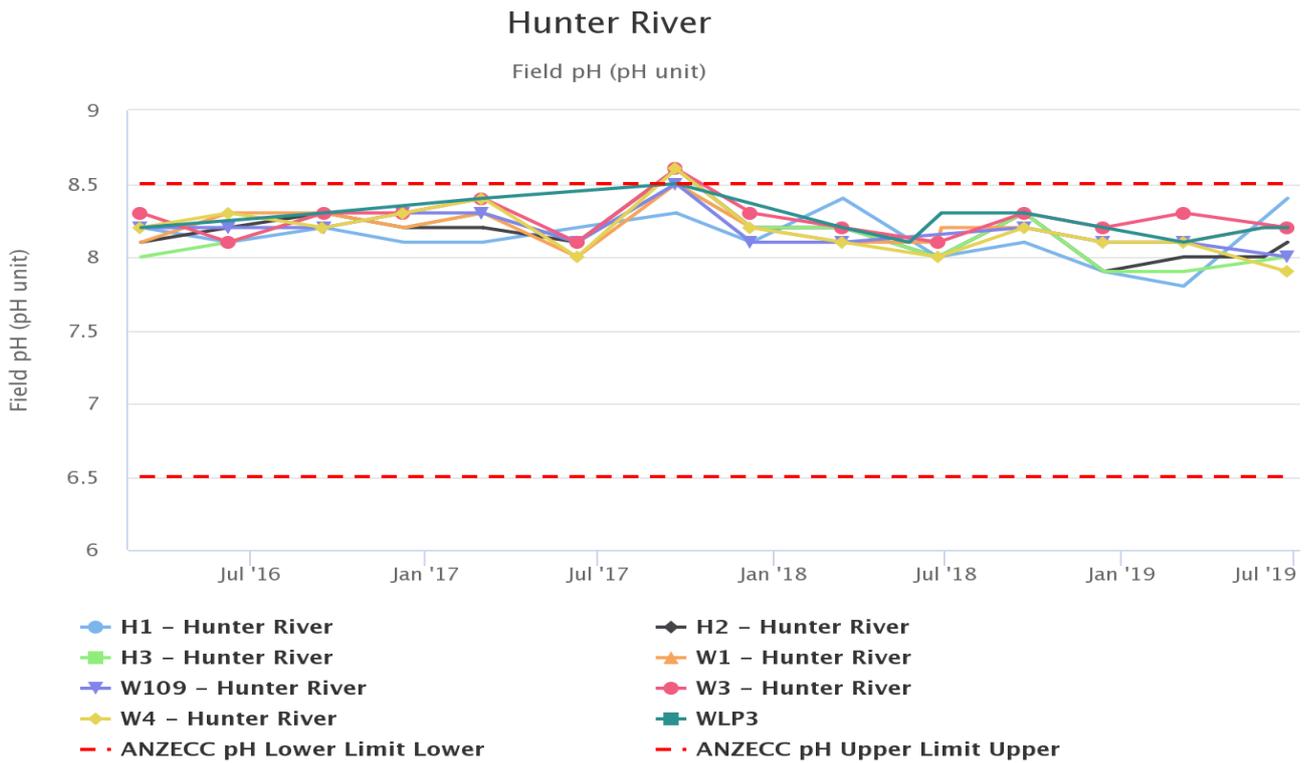


Figure 17: Hunter River pH Trend – June 2019

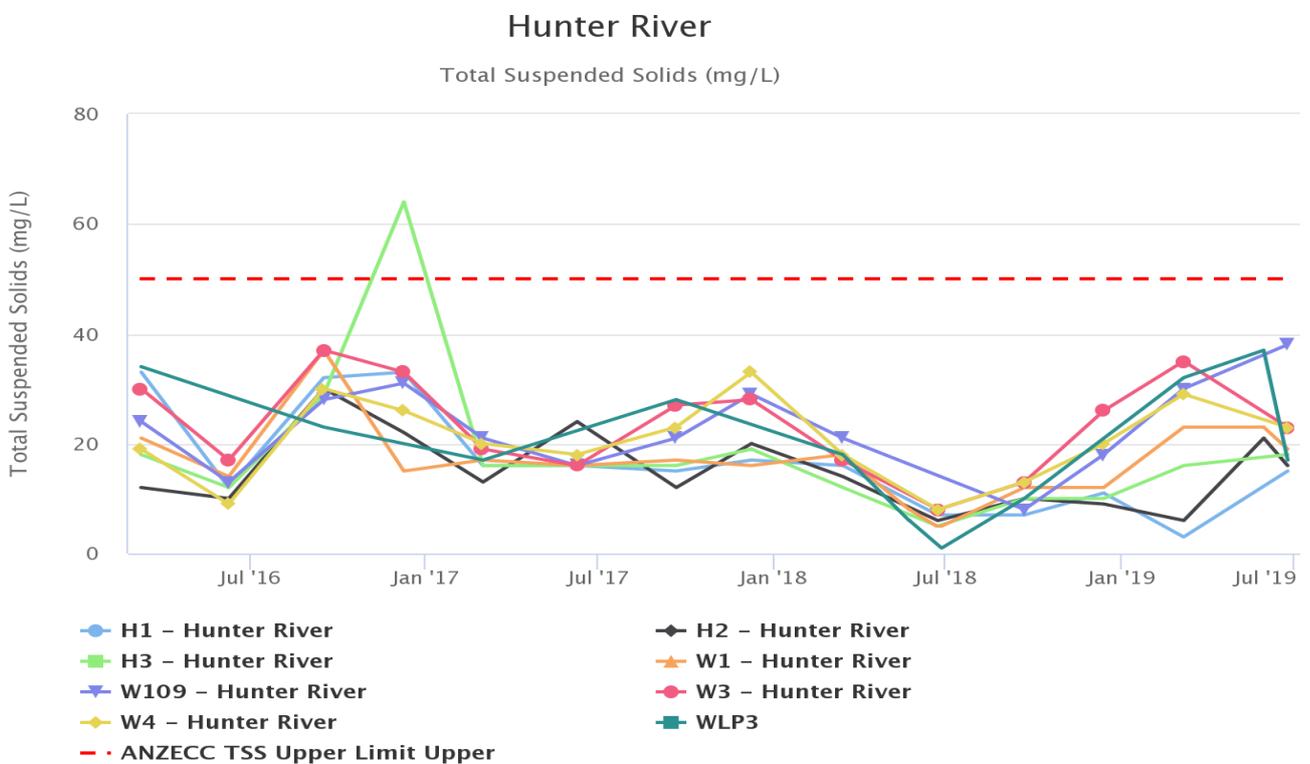


Figure 18: Hunter River Total Suspended Solids – June 2019

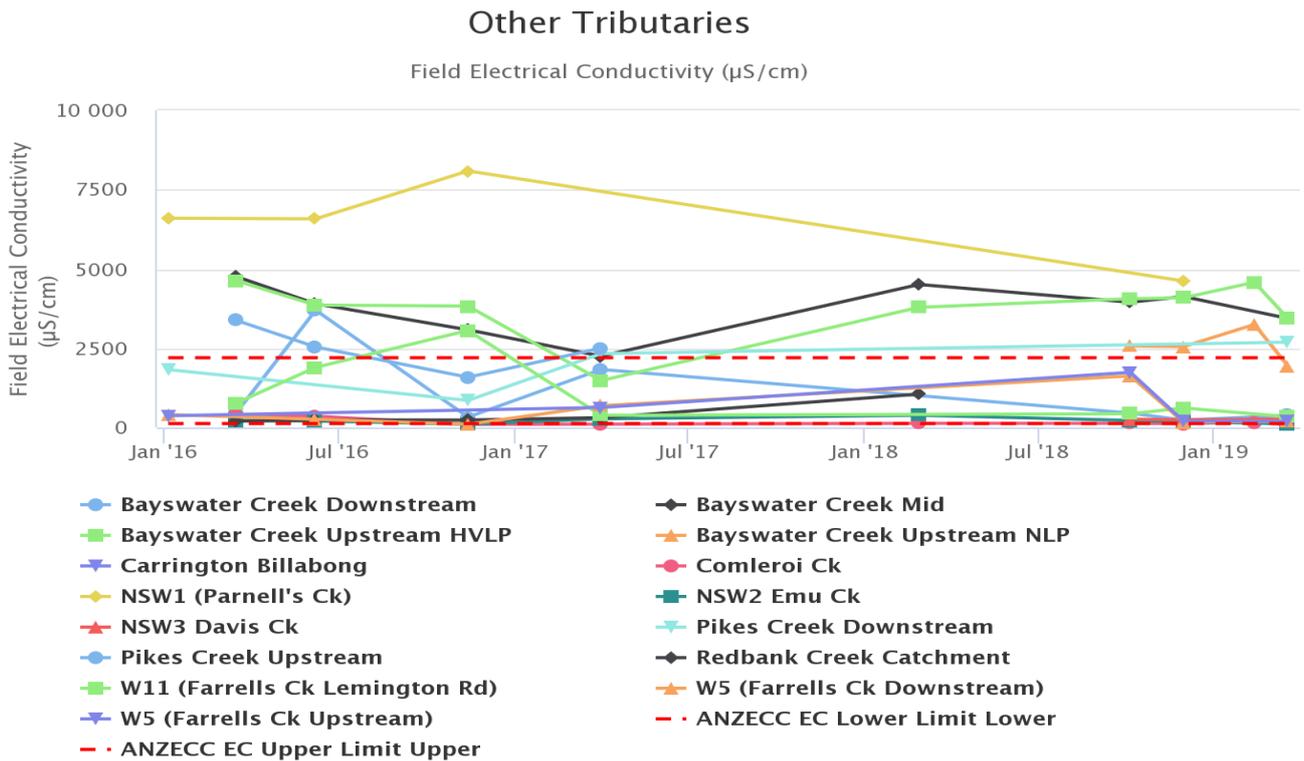


Figure 19: Other Tributaries Electrical Conductivity Trend – June 2019

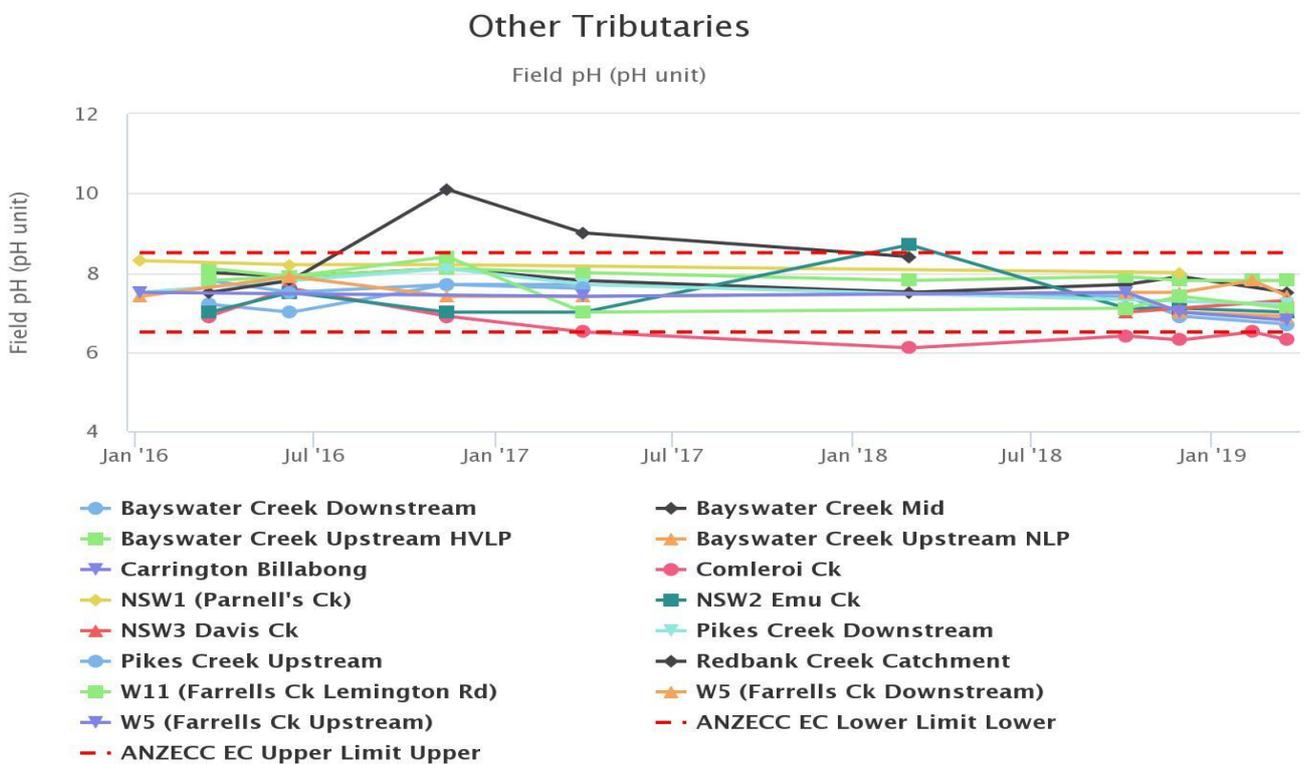


Figure 20: Other Tributaries pH Trend – June 2019

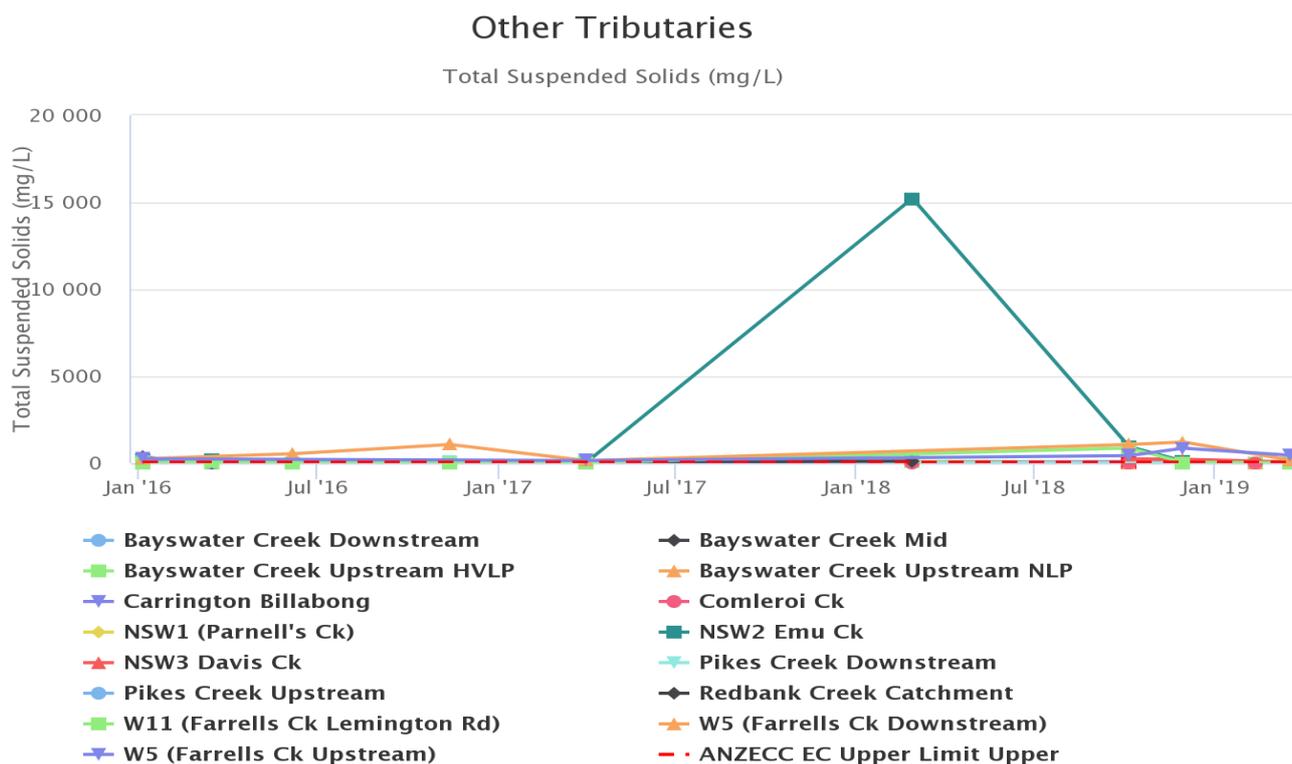


Figure 21: Other Tributaries Total Suspended Solids Trend – June 2019

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 421.5ML 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
W4 Hunter River	24/06/2019	pH 5 th Percentile	First Breach of pH 5 th Percentile trigger. Watching Brief*. Seventh exceedance of EC 95 th Percentile trigger (1515us/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 moderate flow and lower EC level (621us/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*.
Warkworth Bridge	24/06/2019	EC 95 th Percentile	Sixth exceedance of EC 95 th Percentile trigger (2200us/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 moderate flow and lower EC level (621us/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	24/06/2019	EC 95 th Percentile	First Breach of TSS. Downstream results at monitoring location H3 in the Hunter indicate better water quality than that measured at WL1 indicating that the TSS results may be isolated to a local source to the sampling location and not from a broader impact. Watching Brief*
WL1	24/06/2019	TSS	

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

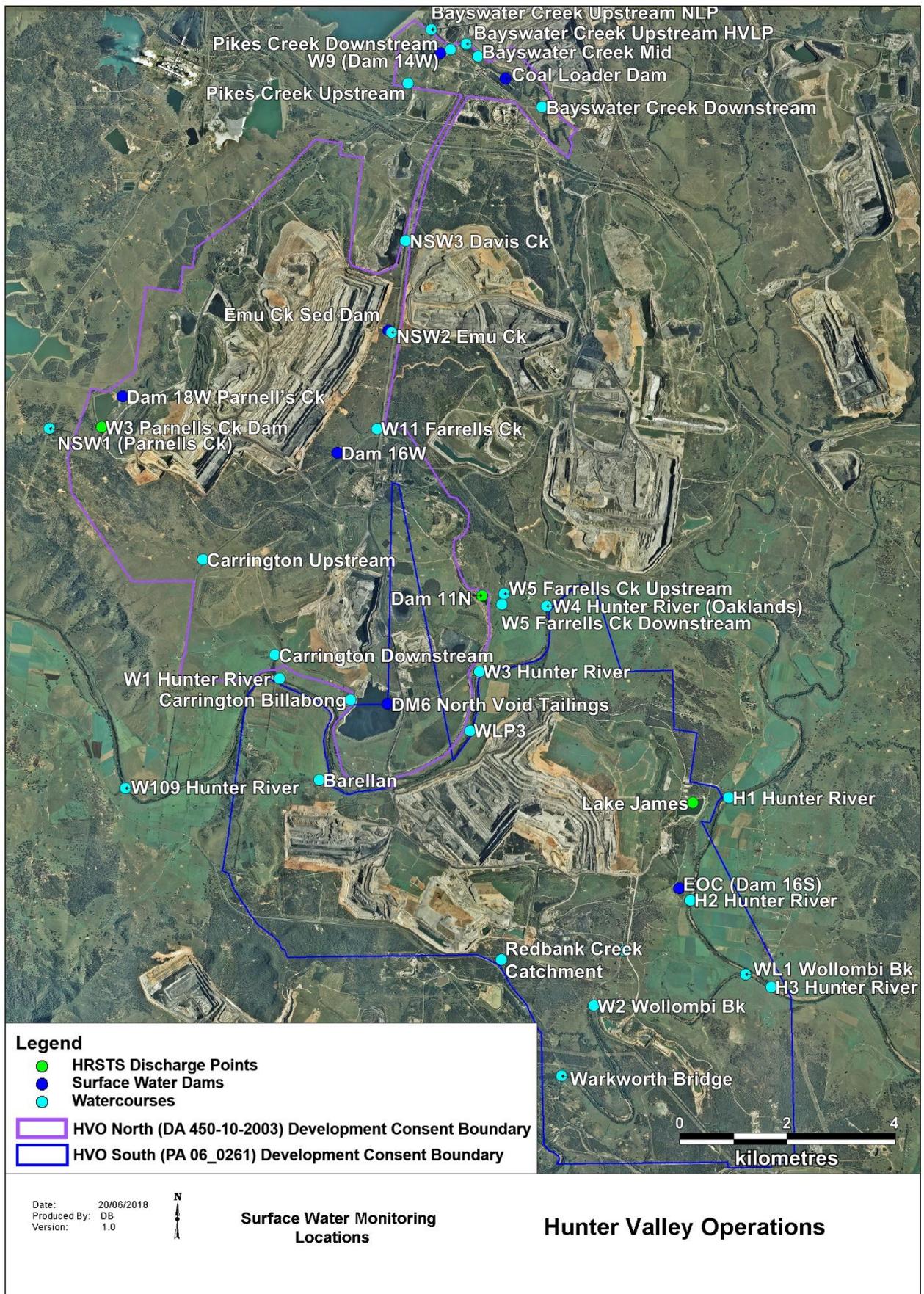


Figure 22: Surface Water Monitoring Location Plan

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.

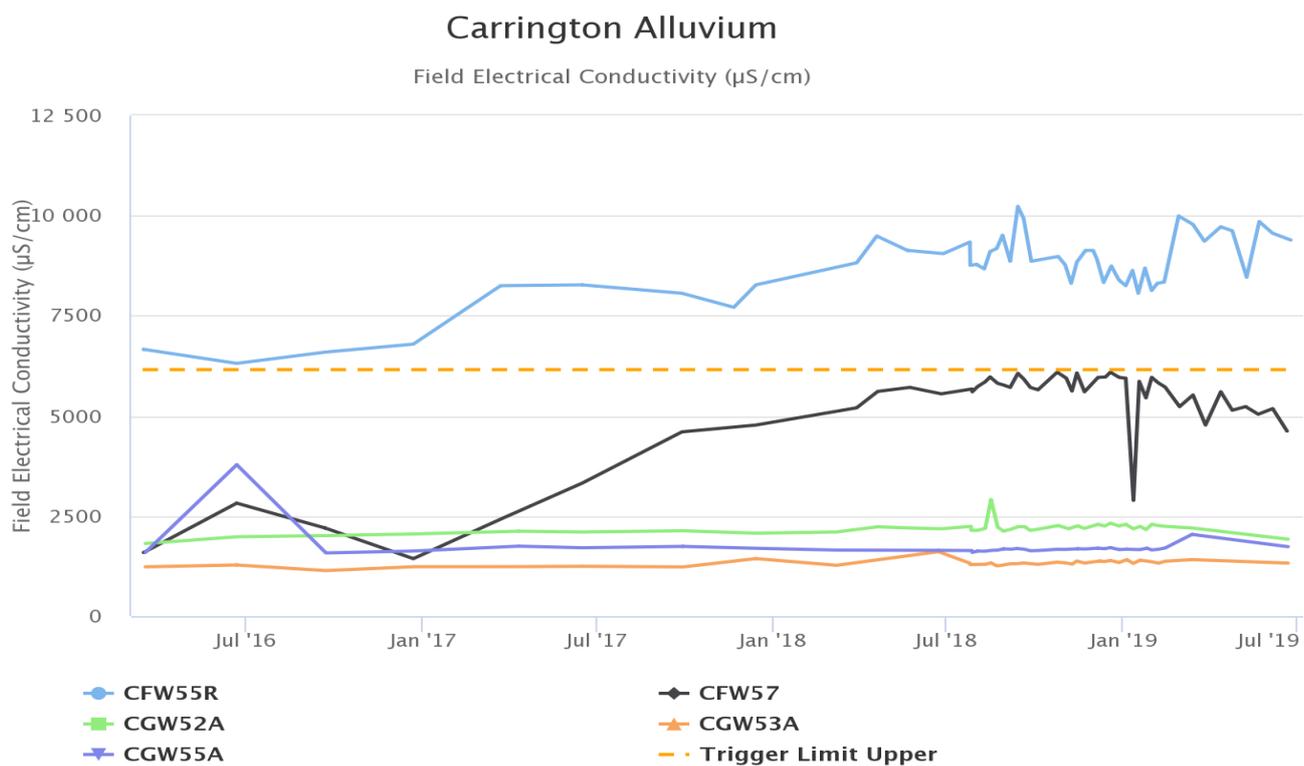


Figure 23: Carrington Alluvium Electrical Conductivity Trend – June 2019

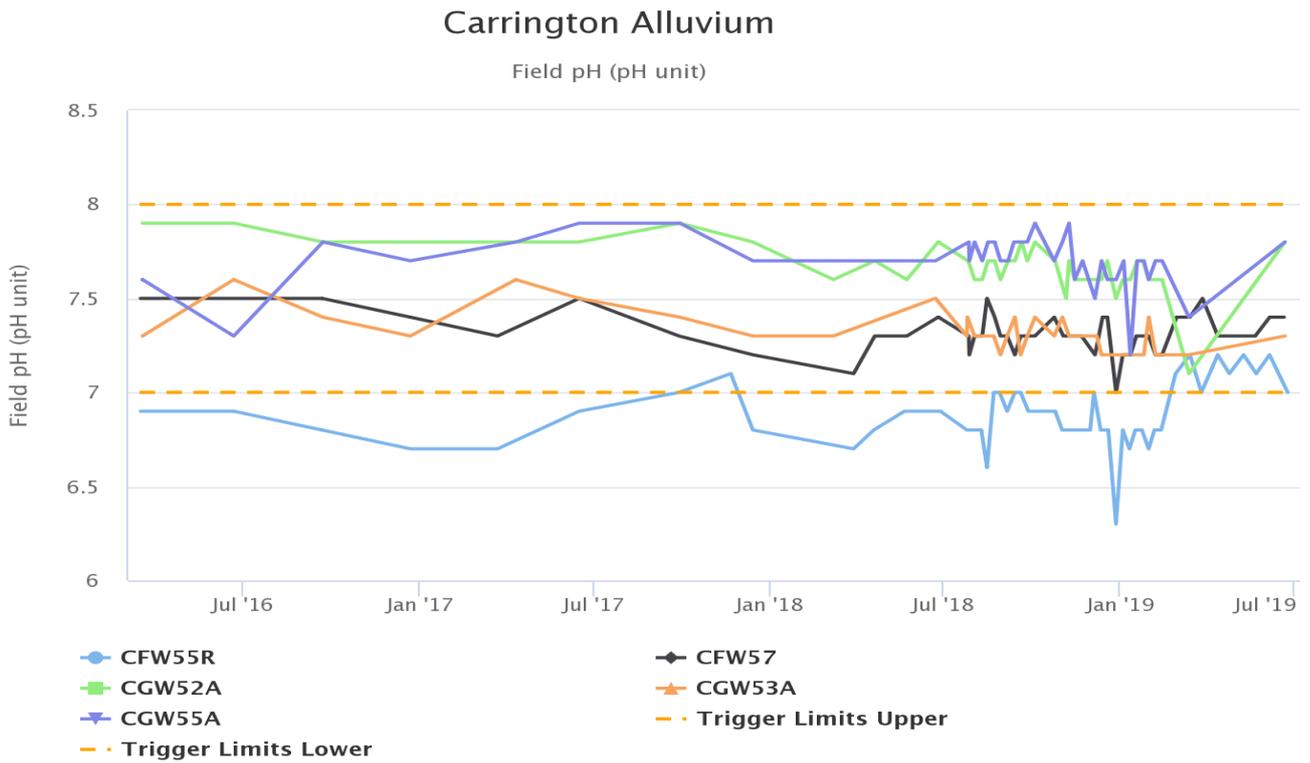


Figure 24: Carrington Alluvium pH Trend – June 2019

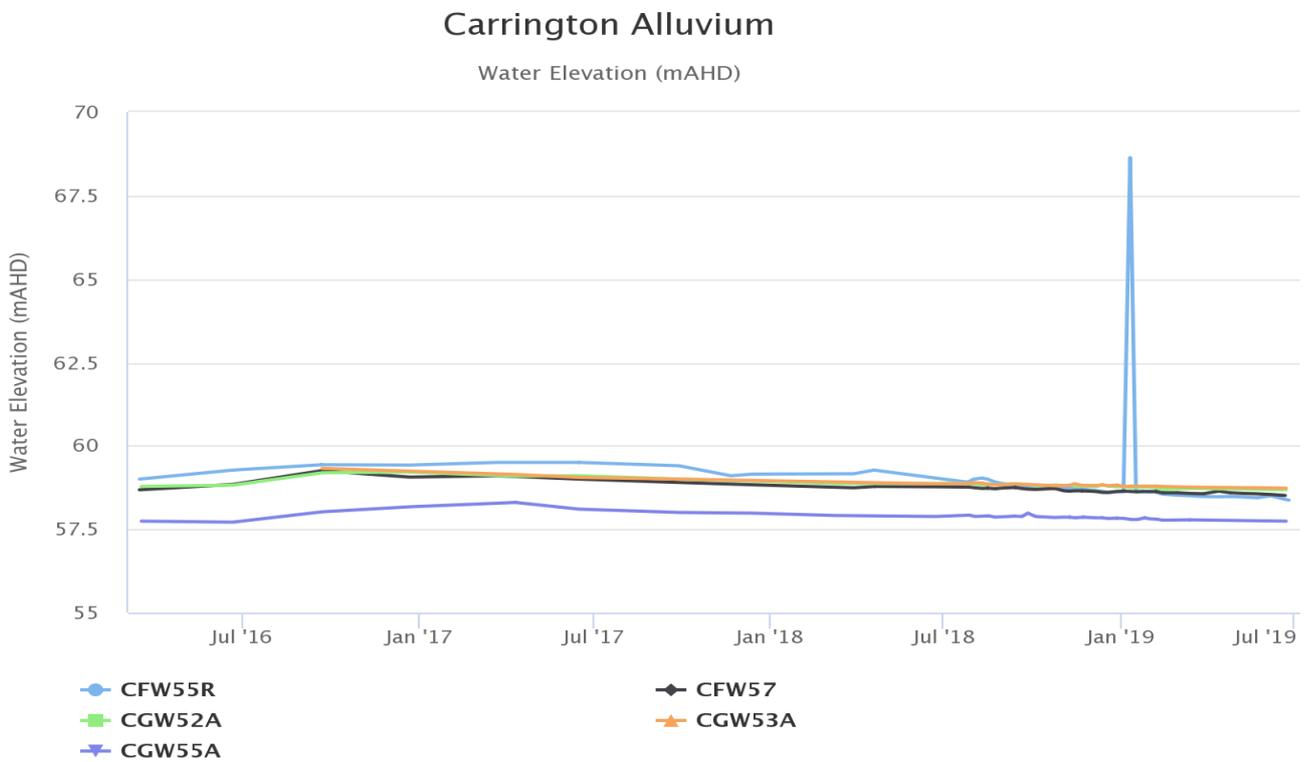


Figure 25: Carrington Alluvium Standing Water Level – June 2019

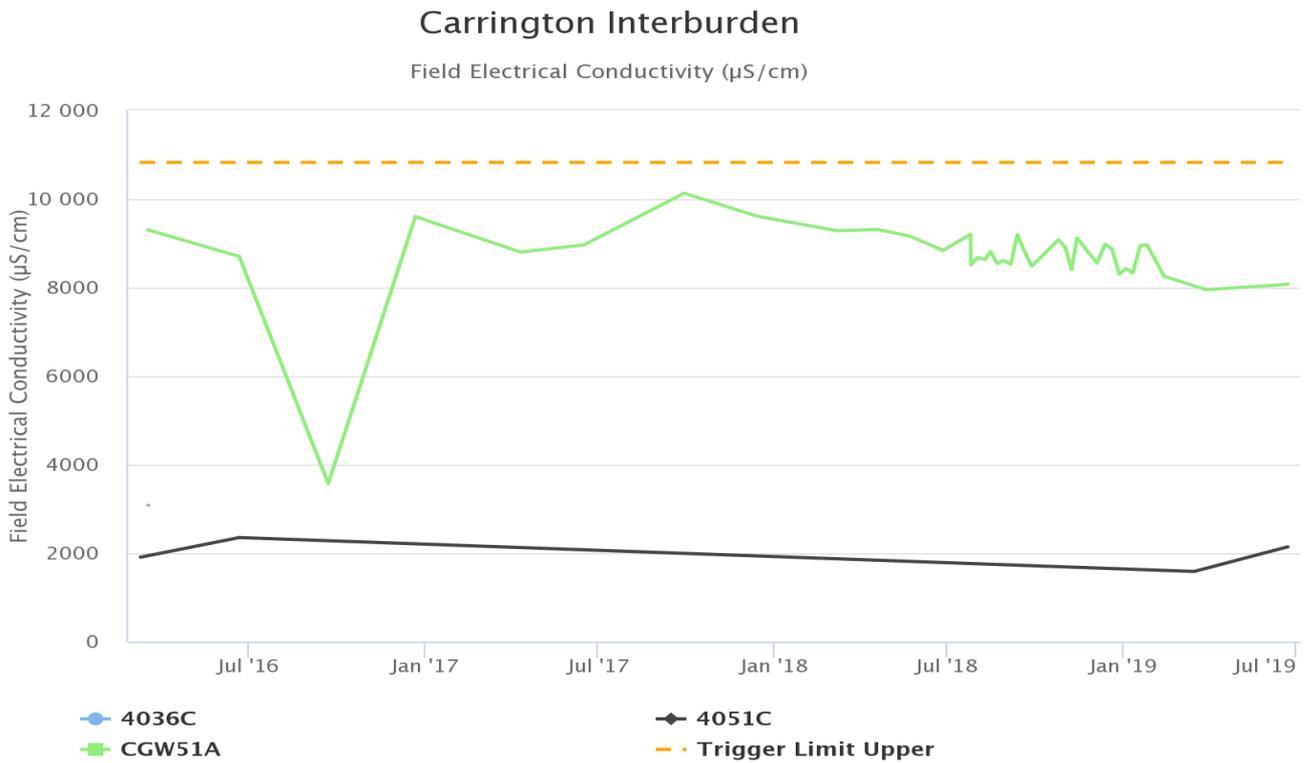


Figure 26: Carrington Interburden Electrical Conductivity Trend – June 2019

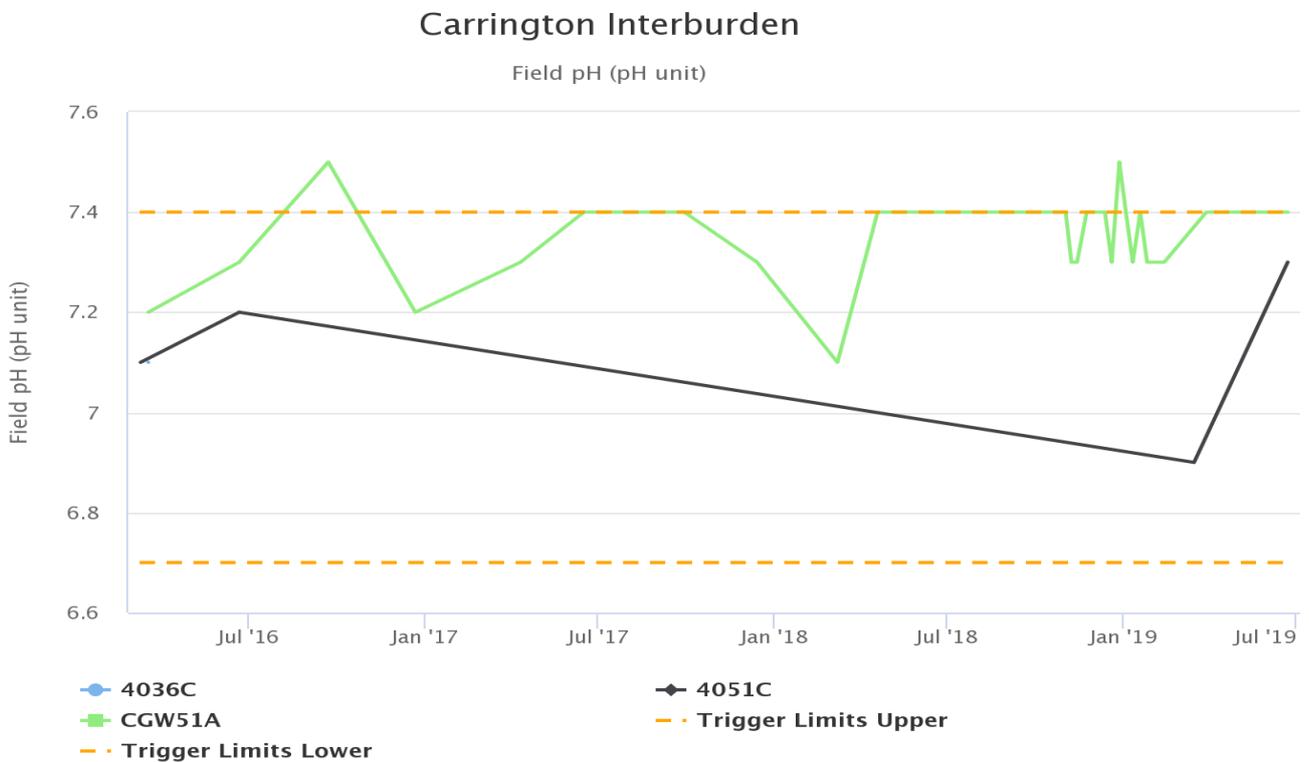


Figure 27: Carrington Interburden pH Trend – June 2019

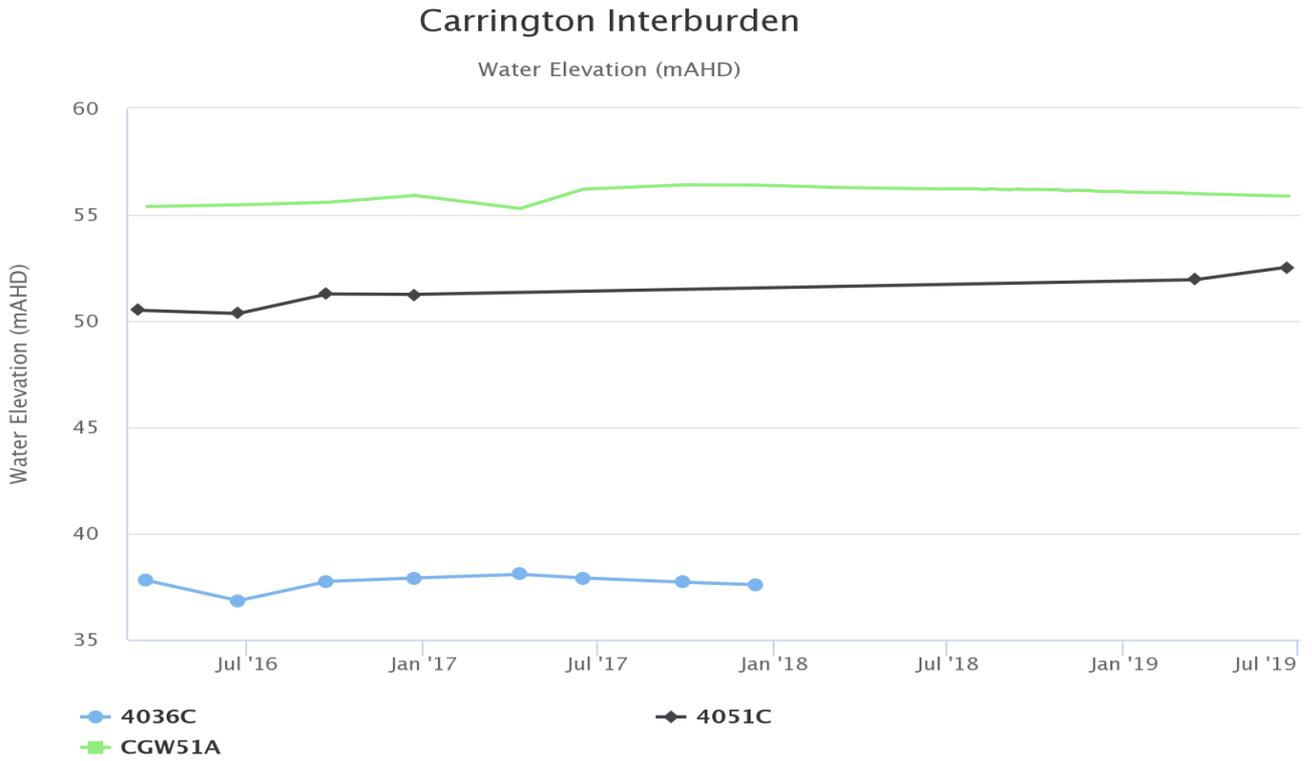


Figure 28: Carrington Interburden Standing Water Level – June 2019

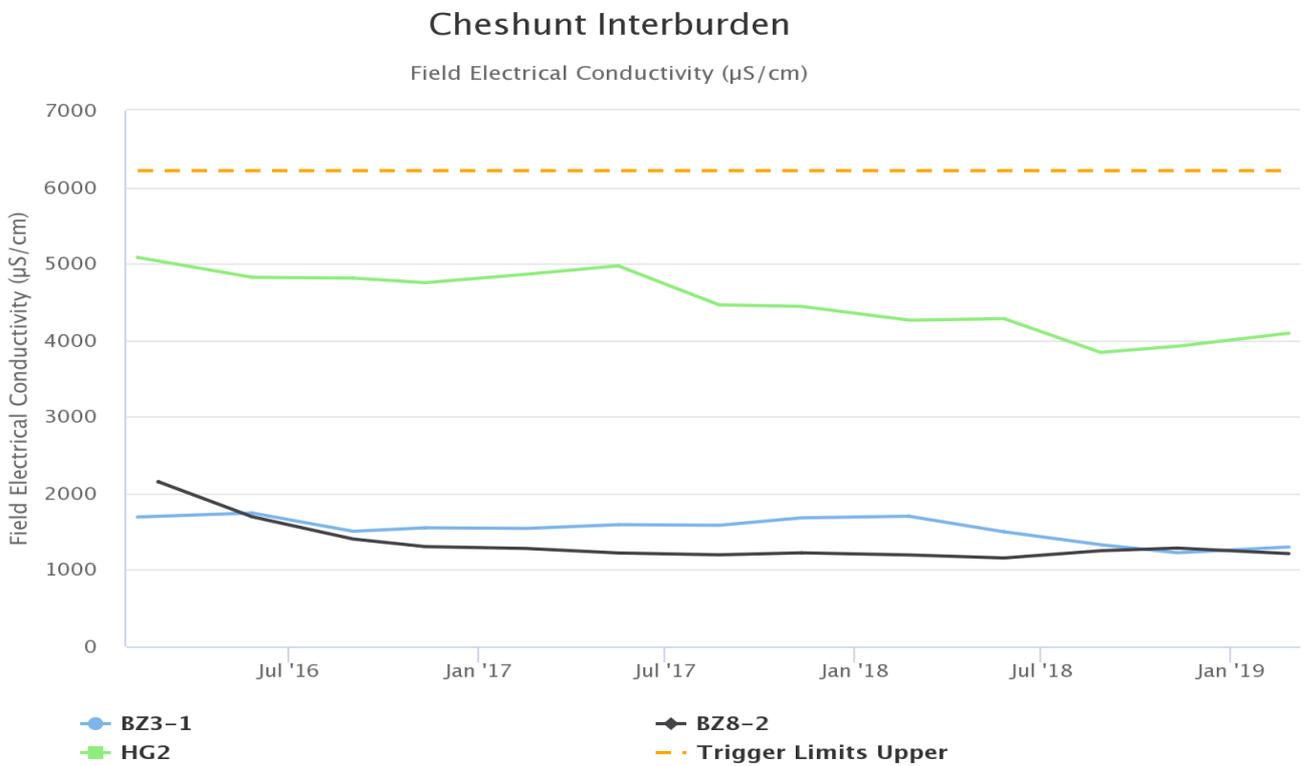


Figure 29: Cheshunt Interburden Electrical Conductivity Trend – June 2019

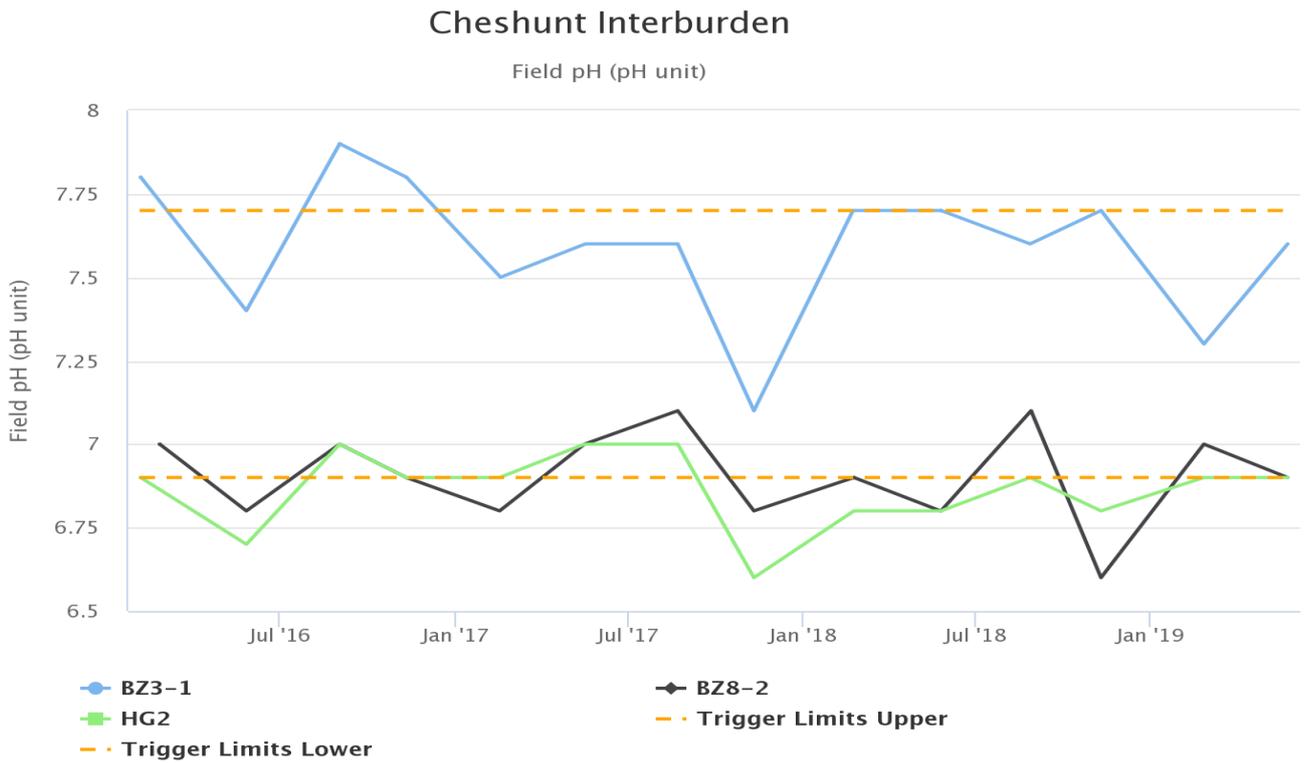


Figure 30: Cheshunt Interburden pH Trend – June 2019

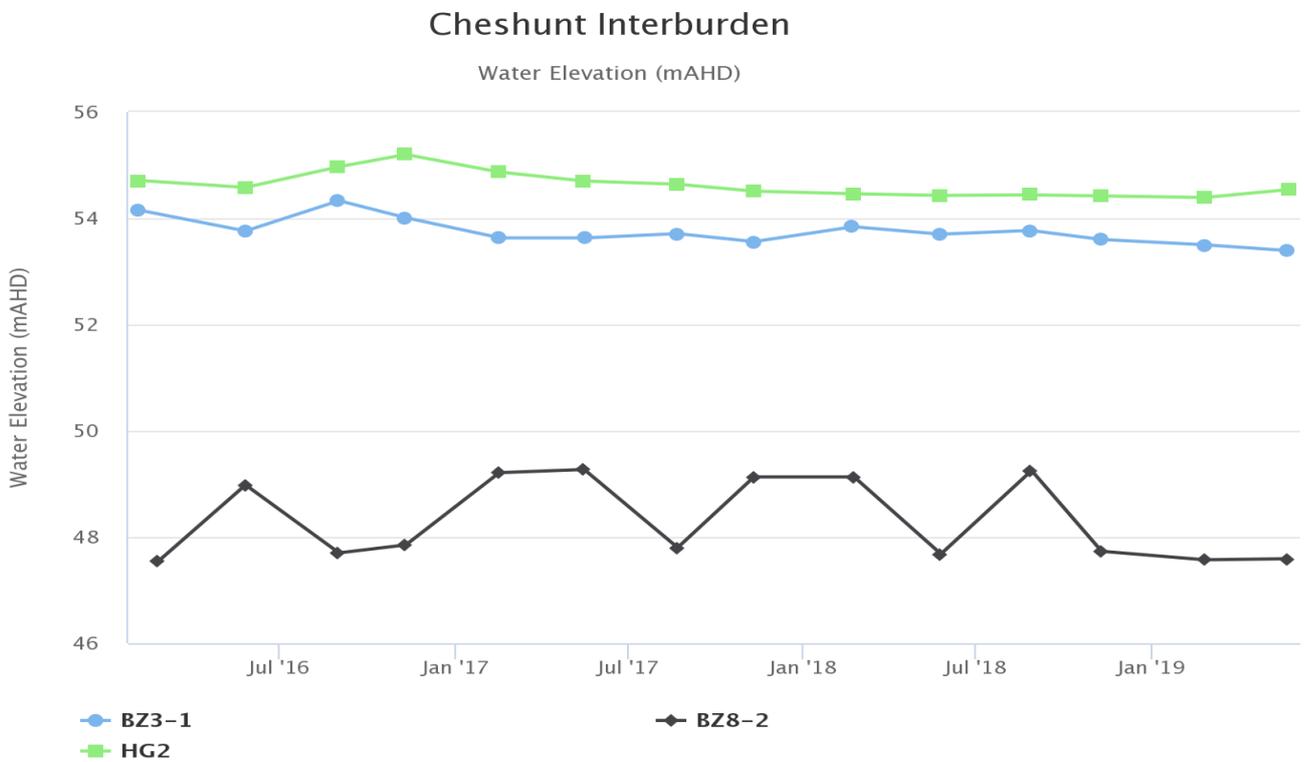


Figure 31: Cheshunt Interburden Standing Water Level – June 2019

Cheshunt Mt Arthur

Field Electrical Conductivity ($\mu\text{S}/\text{cm}$)

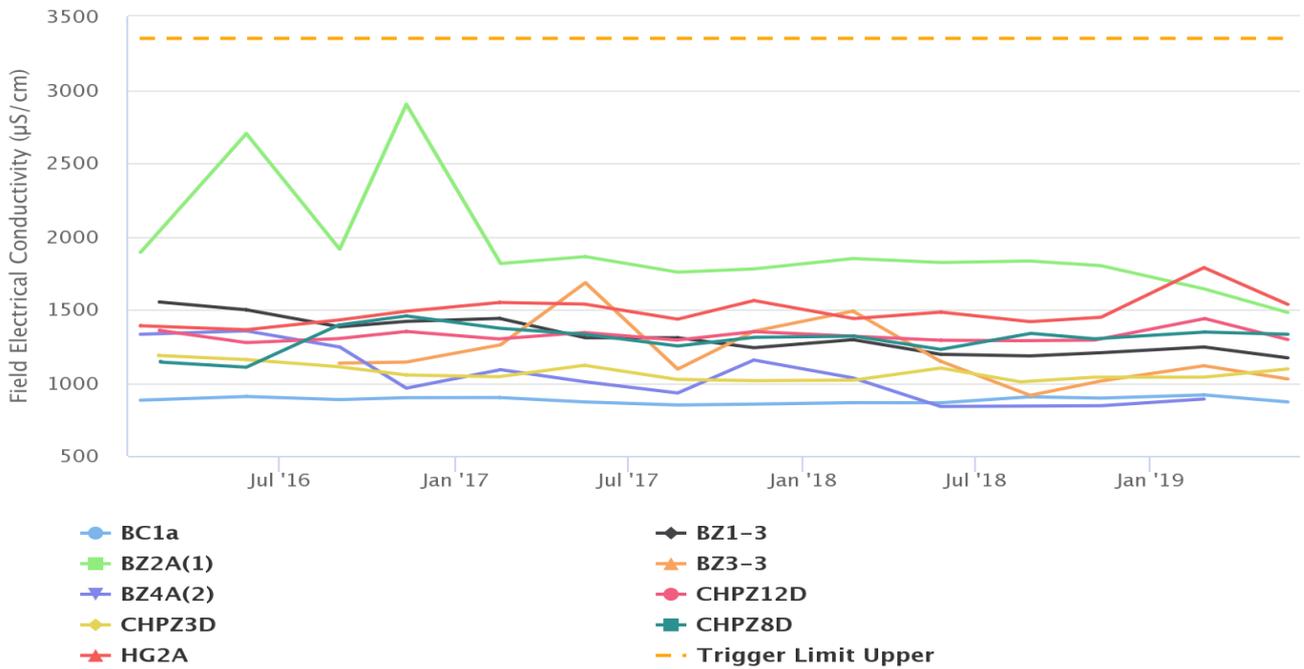


Figure 32: Cheshunt Mt Arthur Electrical Conductivity Trend – June 2019

Cheshunt Mt Arthur

Field pH (pH unit)

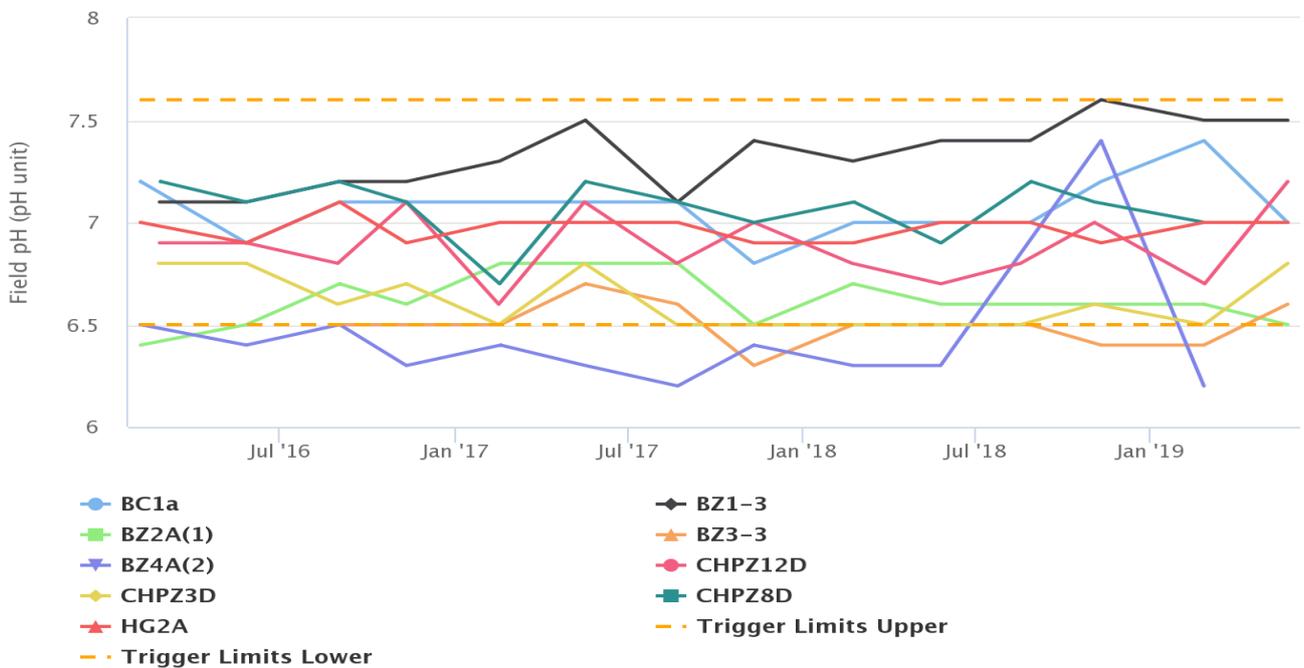


Figure 33: Cheshunt Mt Arthur pH Trend – June 2019

Cheshunt Mt Arthur

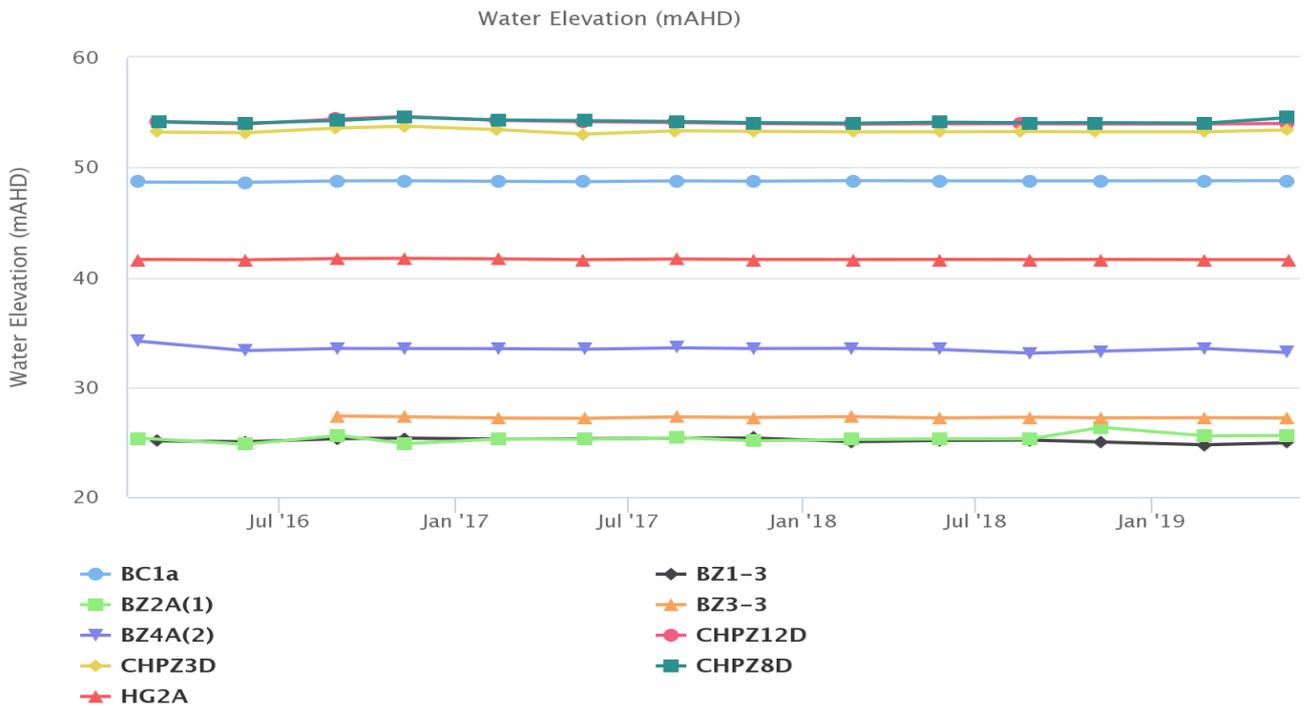


Figure 34: Cheshunt Mt Arthur Standing Water Level – June 2019

Cheshunt / North Pit Alluvium

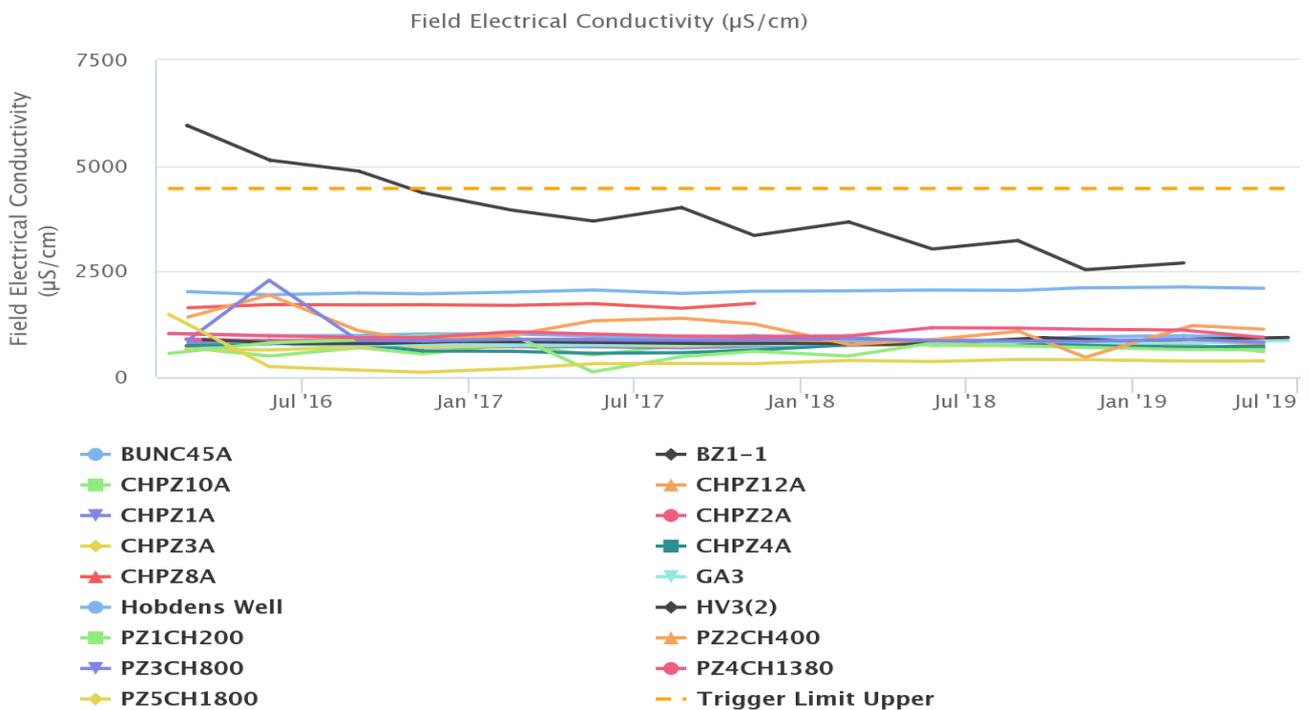


Figure 35: Cheshunt / North Pit Alluvium Electrical Conductivity Trend – June 2019

Cheshunt / North Pit Alluvium

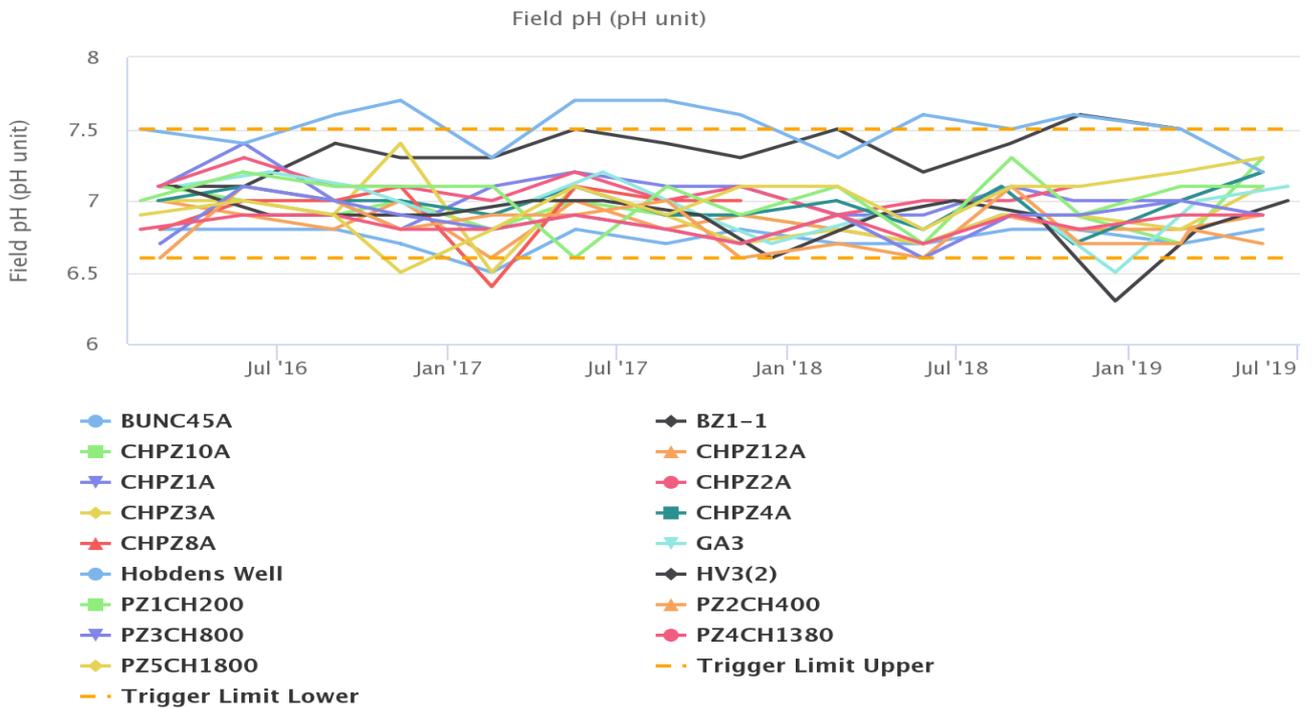


Figure 36: Cheshunt / North Pit Alluvium pH Trend – June 2019

Cheshunt / North Pit Alluvium

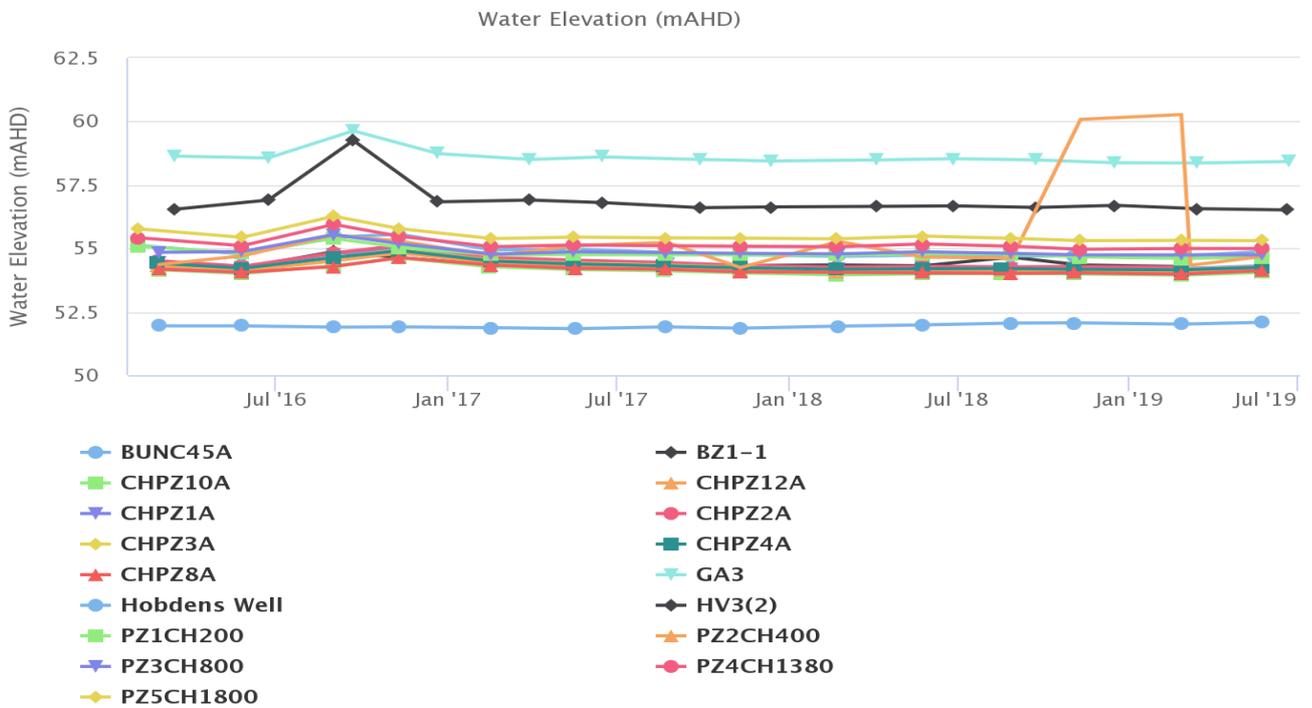


Figure 37: Cheshunt / North Pit Alluvium Standing Water Level – June 2019

Carrington West Wing Alluvium

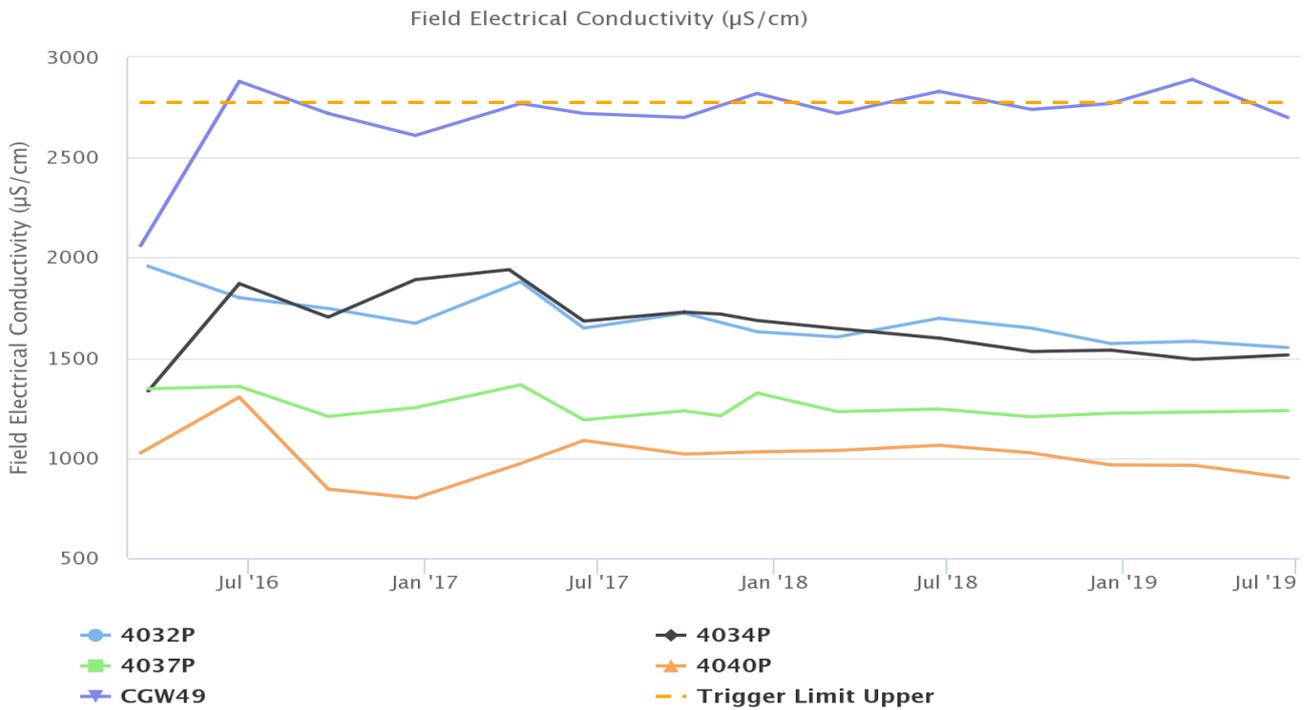


Figure 38: Carrington West Wing Alluvium Electrical Conductivity Trend – June 2019

Carrington West Wing Alluvium

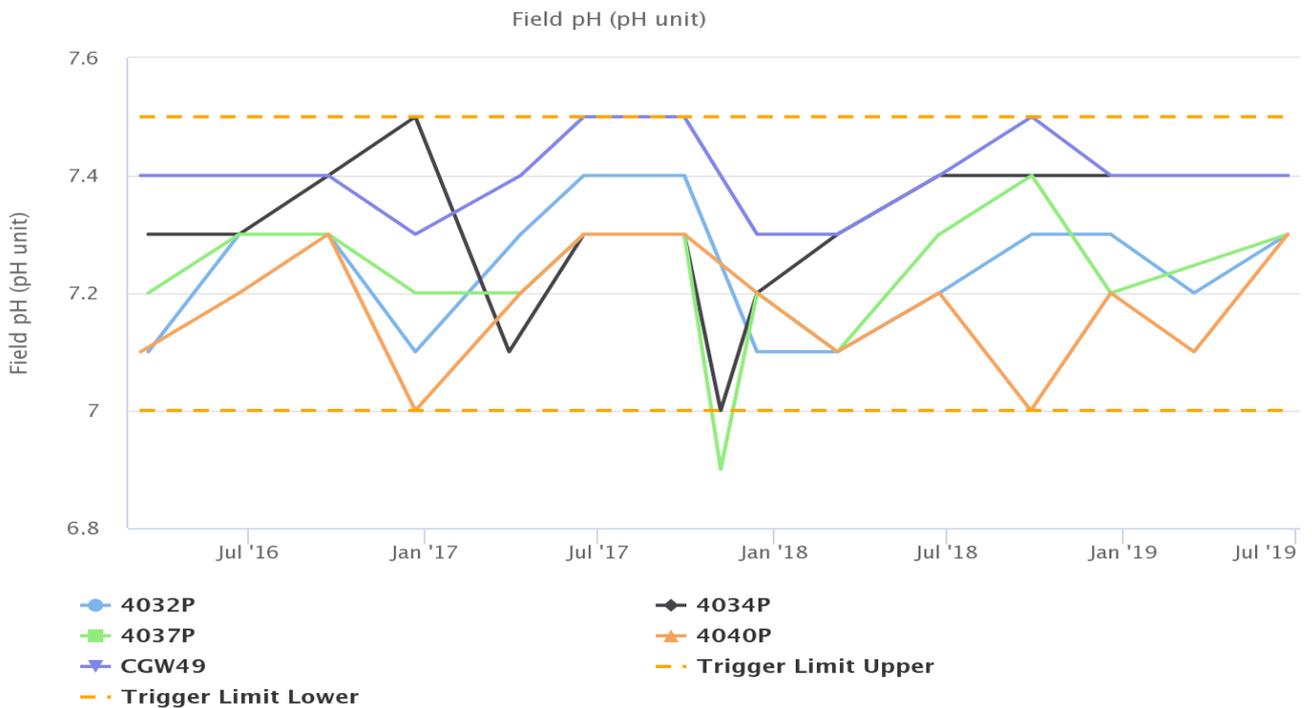


Figure 39: Carrington West Wing Alluvium pH Trend – June 2019

Carrington West Wing Alluvium

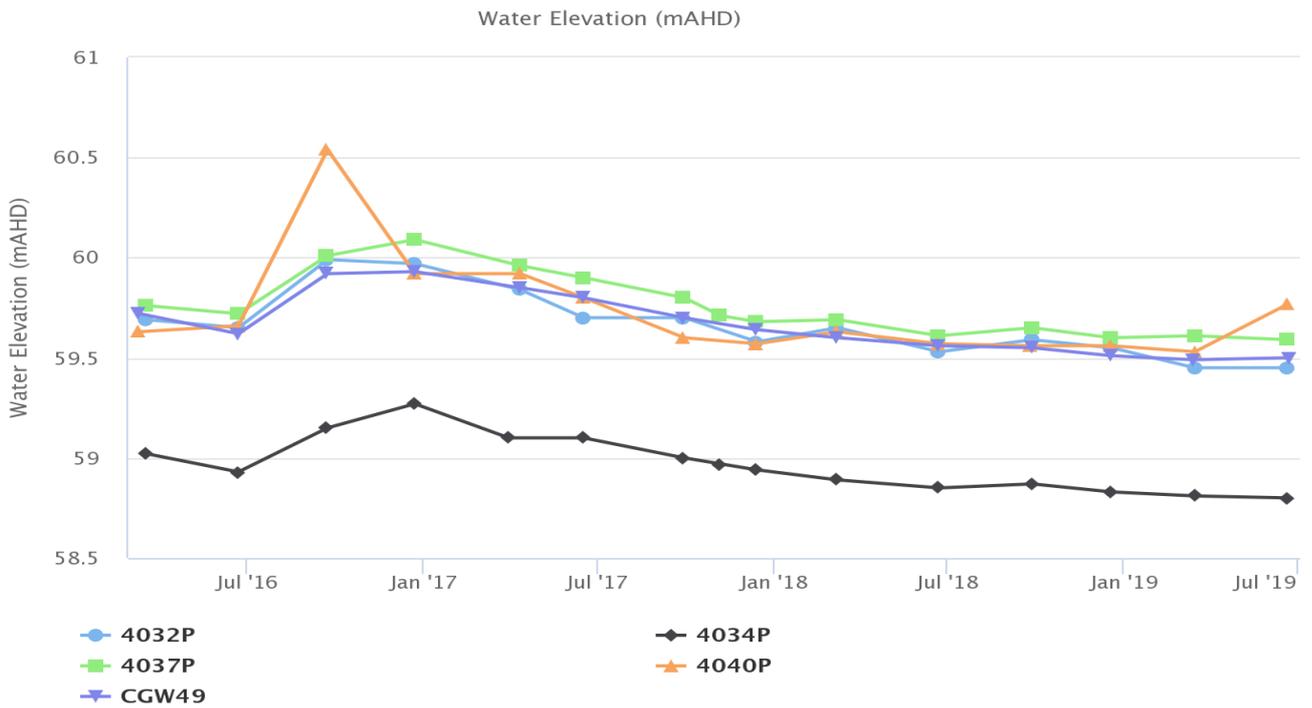


Figure 40: Carrington West Wing Alluvium Standing Water Level – June 2019

Carrington West Wing Flood Plain

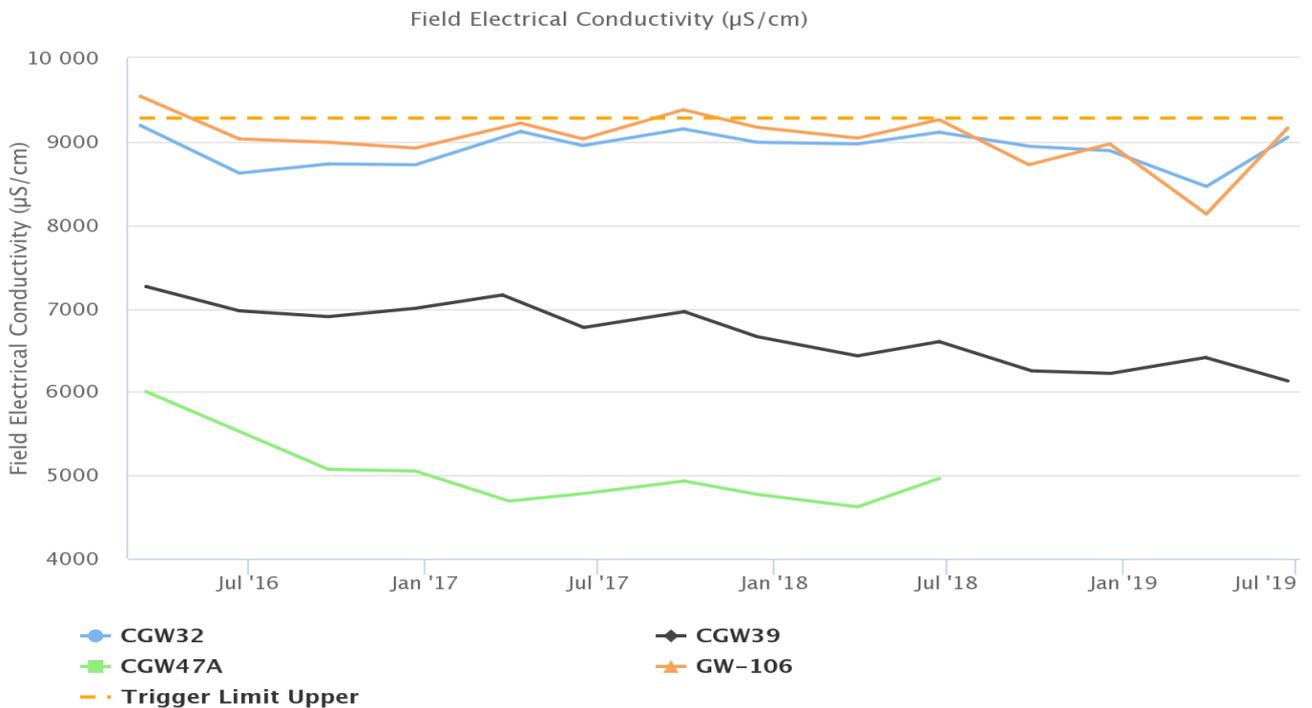


Figure 41: Carrington West Wing Flood Plain Electrical Conductivity Trend – June 2019

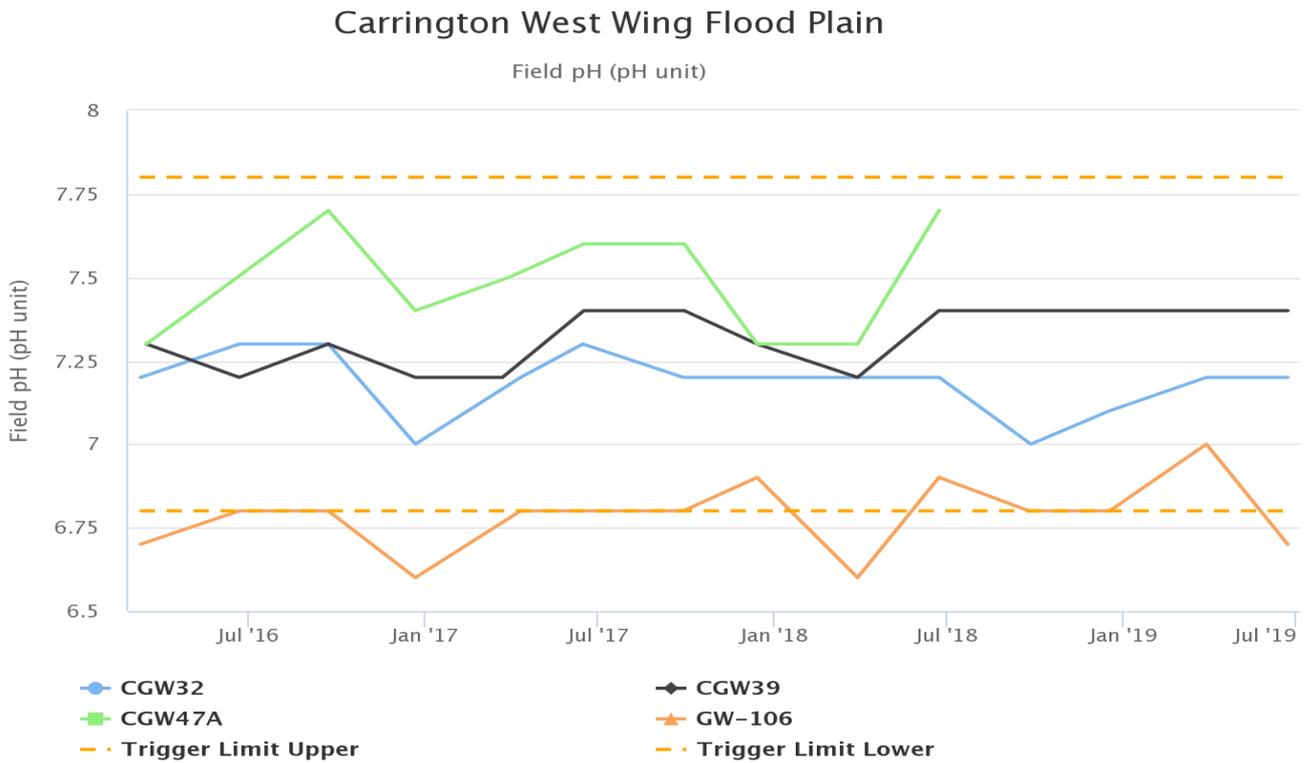


Figure 42: Carrington West Wing Flood Plain pH Trend – June 2019

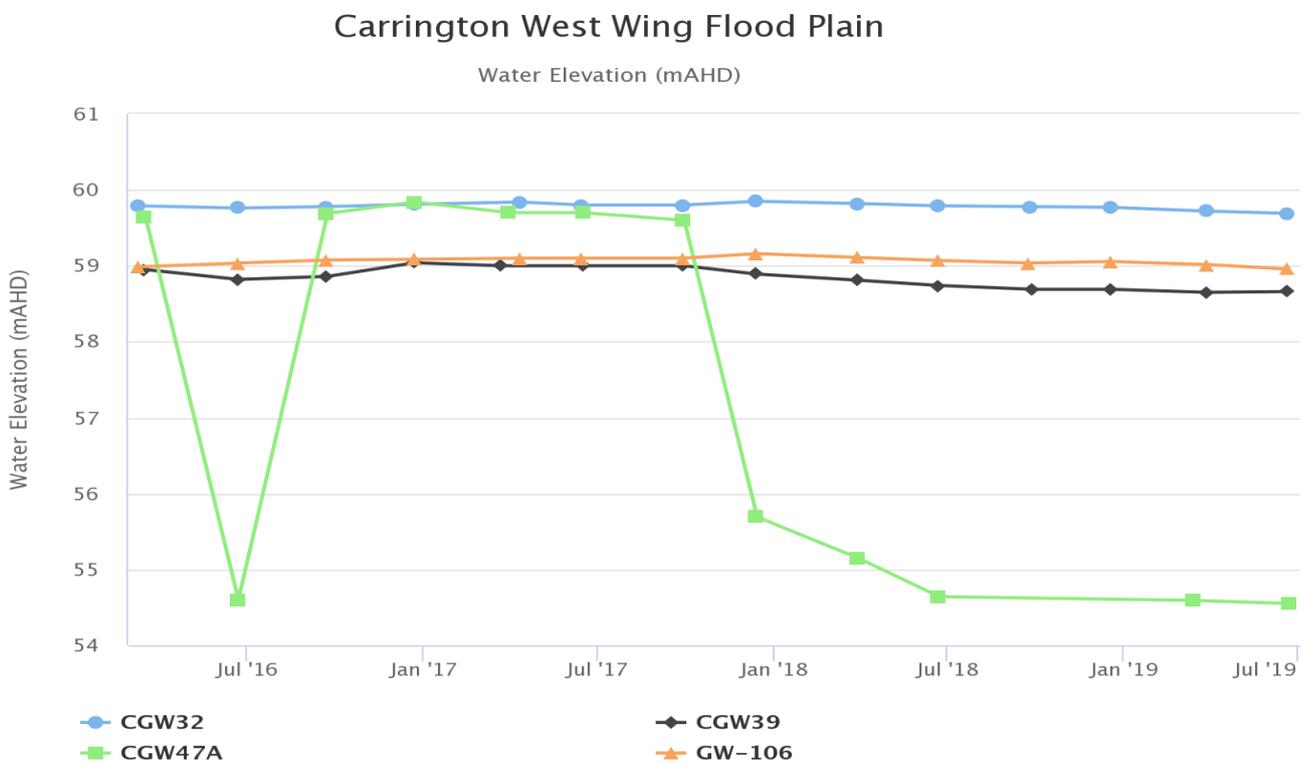


Figure 43: Carrington West Wing Flood Plain Standing Water Level – June 2019

Carrington West Wing LBL

Field Electrical Conductivity ($\mu\text{S}/\text{cm}$)

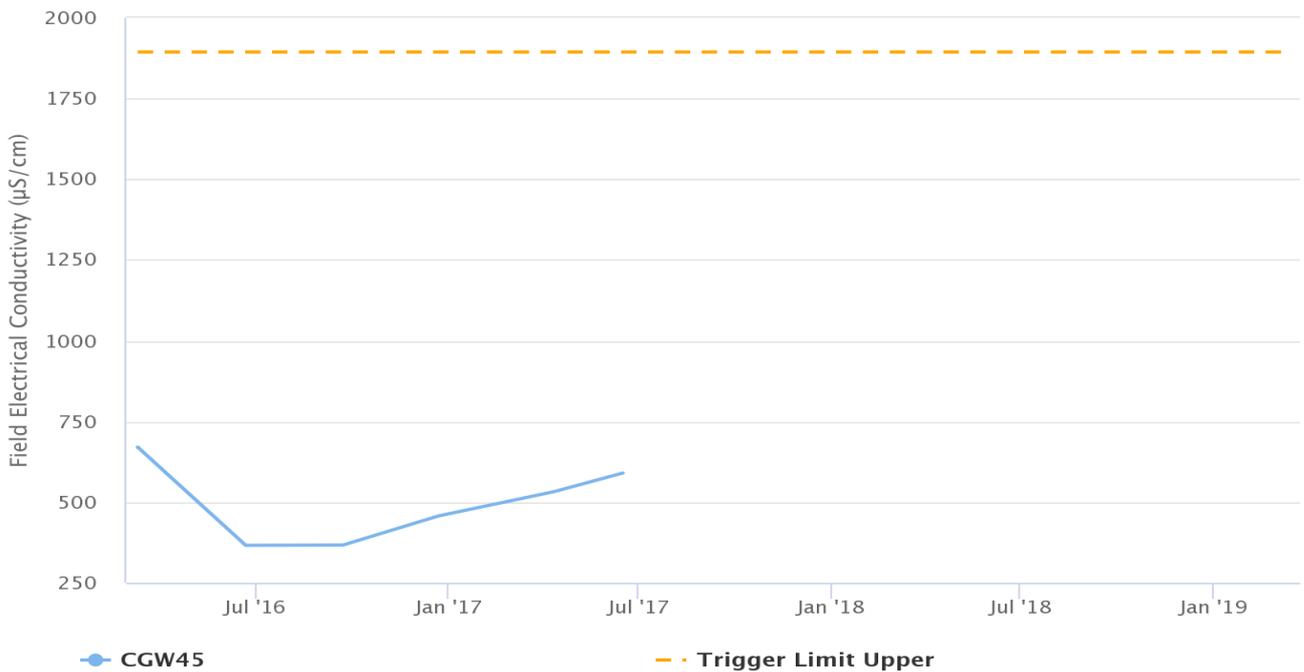


Figure 44: Carrington West Wing LBL Electrical Conductivity Trend – June 2019*

*CGW45 has been blocked since June 2018 hence why no data is shown Figure 44.

Carrington West Wing LBL

Field pH (pH unit)

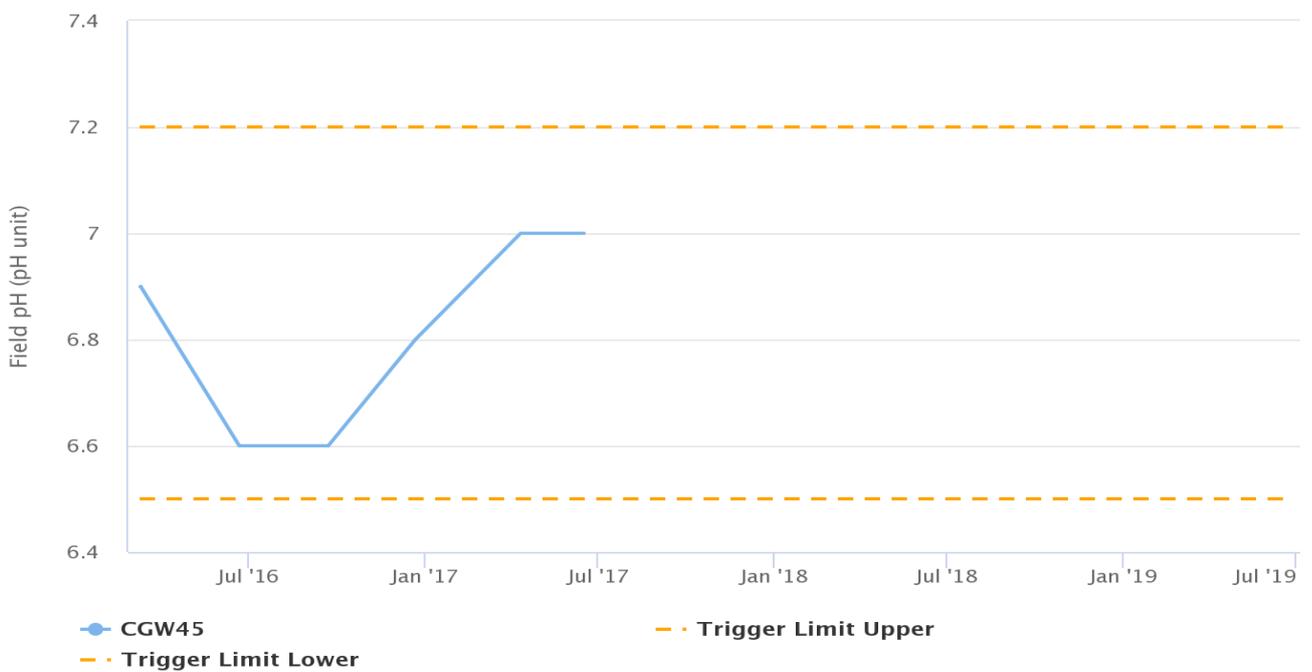


Figure 45: Carrington West Wing LBL pH Trend – June 2019

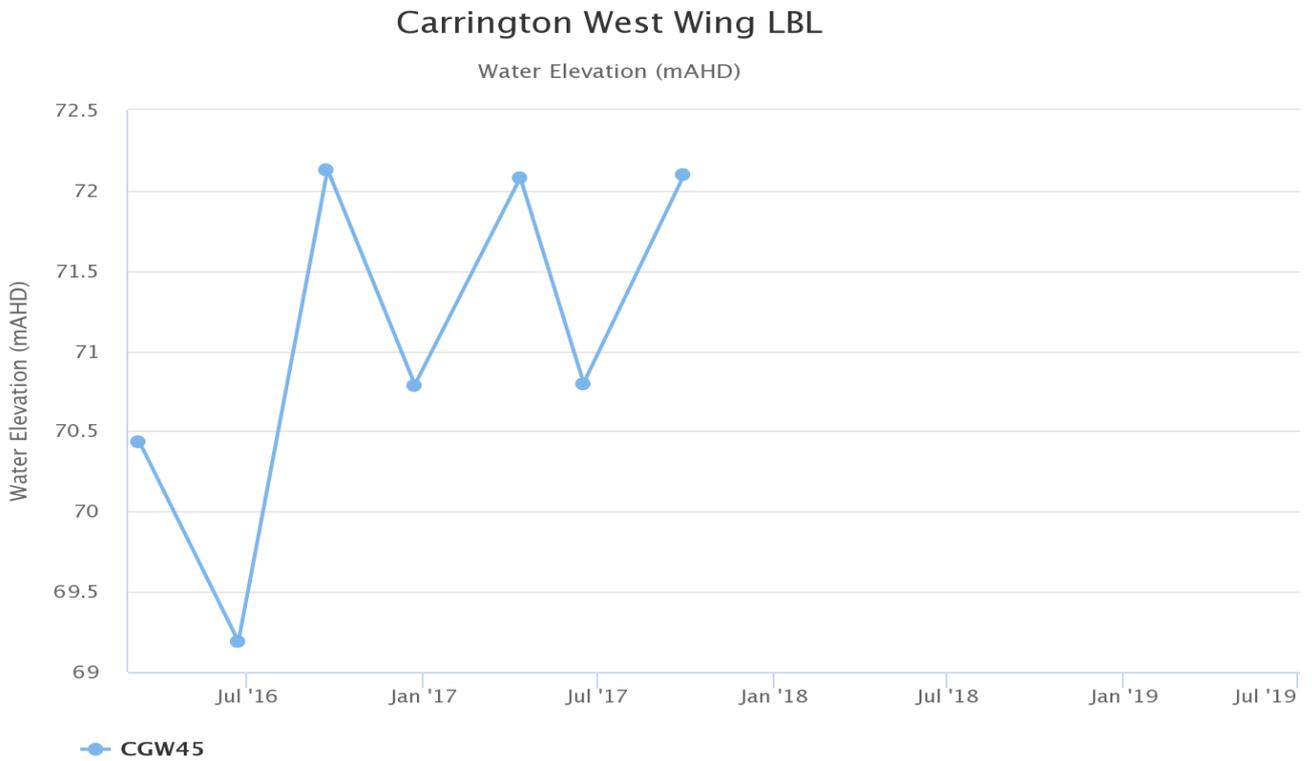


Figure 46: Carrington West Wing LBL Standing Water Level – June 2019

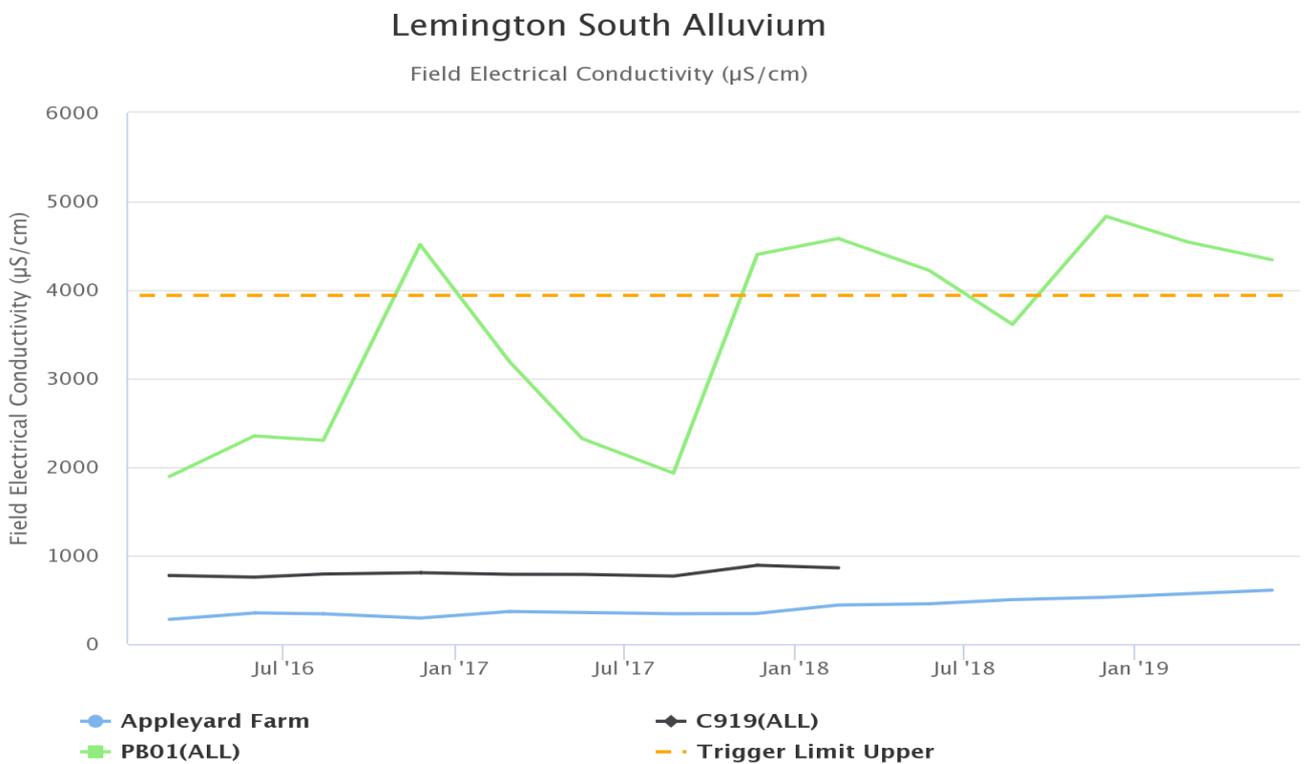


Figure 47: Lemington South Alluvium Electrical Conductivity Trend – June 2019

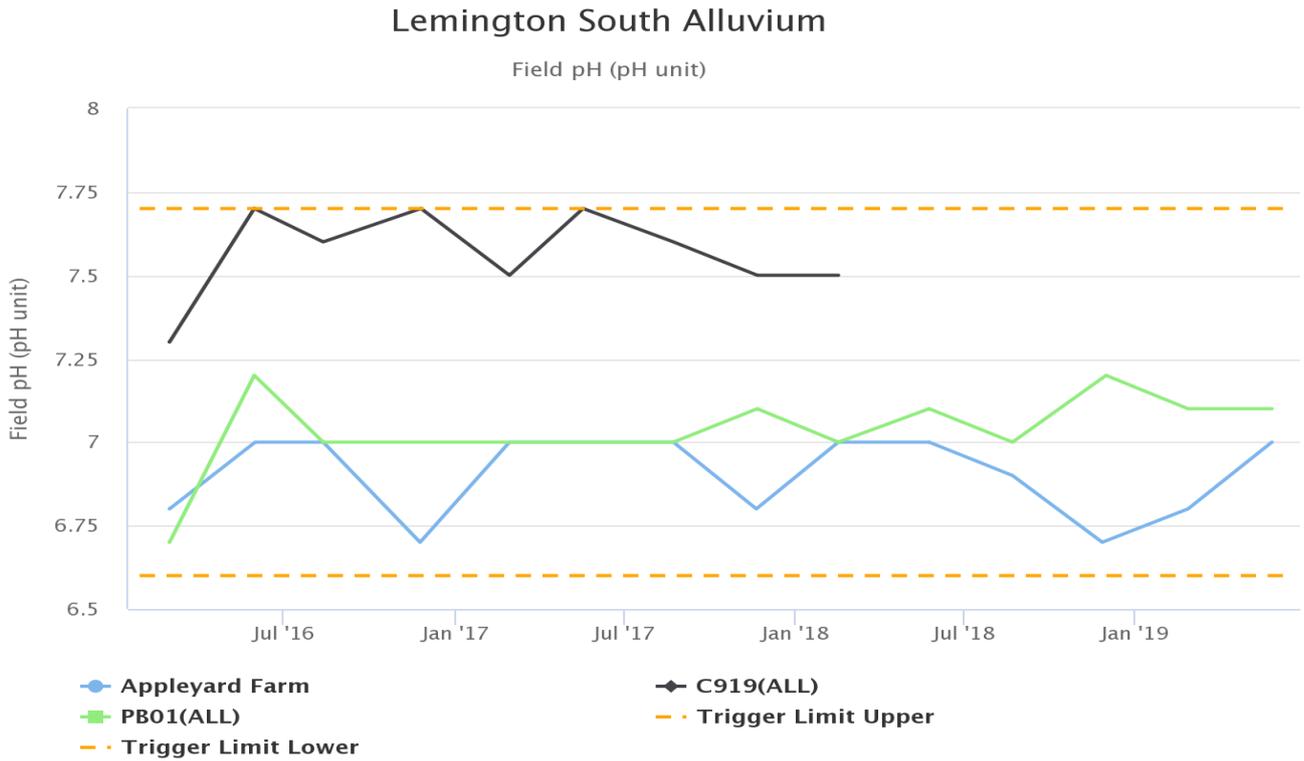


Figure 48: Lemington South Alluvium pH Trend – June 2019

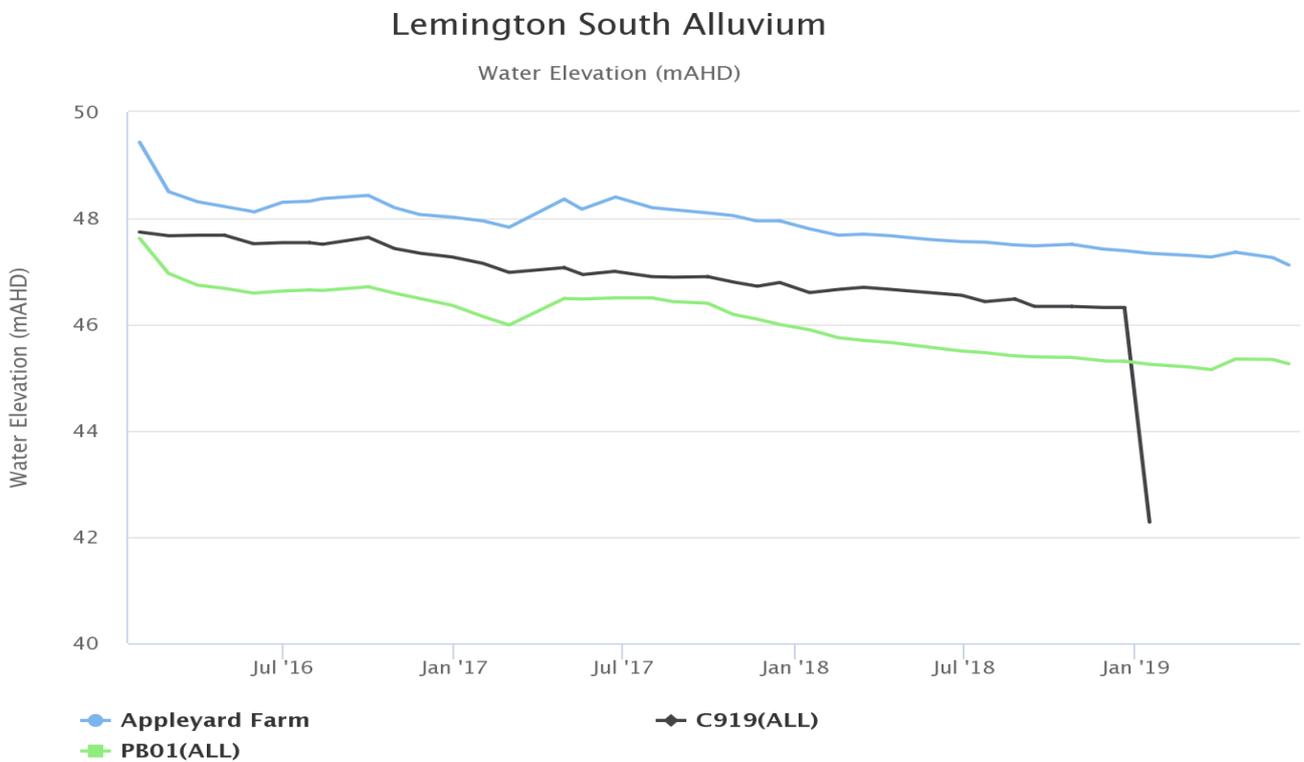


Figure 49: Lemington South Alluvium Standing Water Level Trend – June 2019*

*C919(ALL) has been dry from February to June 2019

Lemington South Arrowfield

Field Electrical Conductivity ($\mu\text{S}/\text{cm}$)

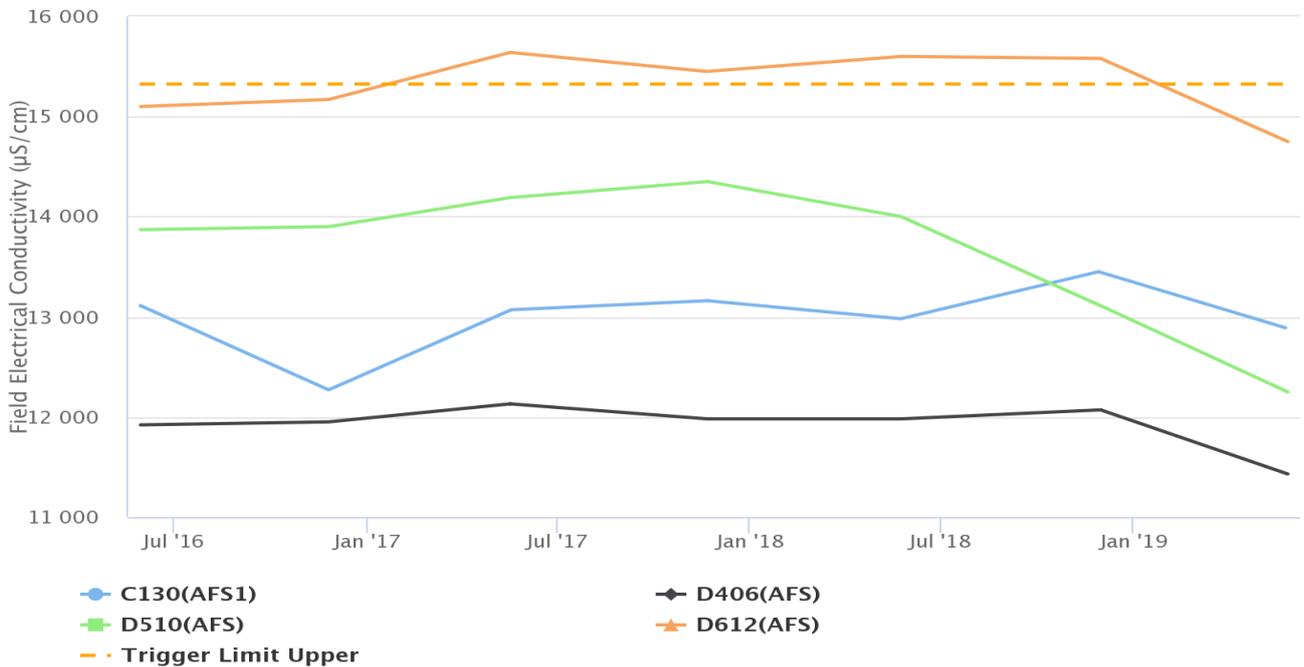


Figure 50: Lemington South Arrowfield Electrical Conductivity Trend – June 2019

Lemington South Arrowfield

Field pH (pH unit)

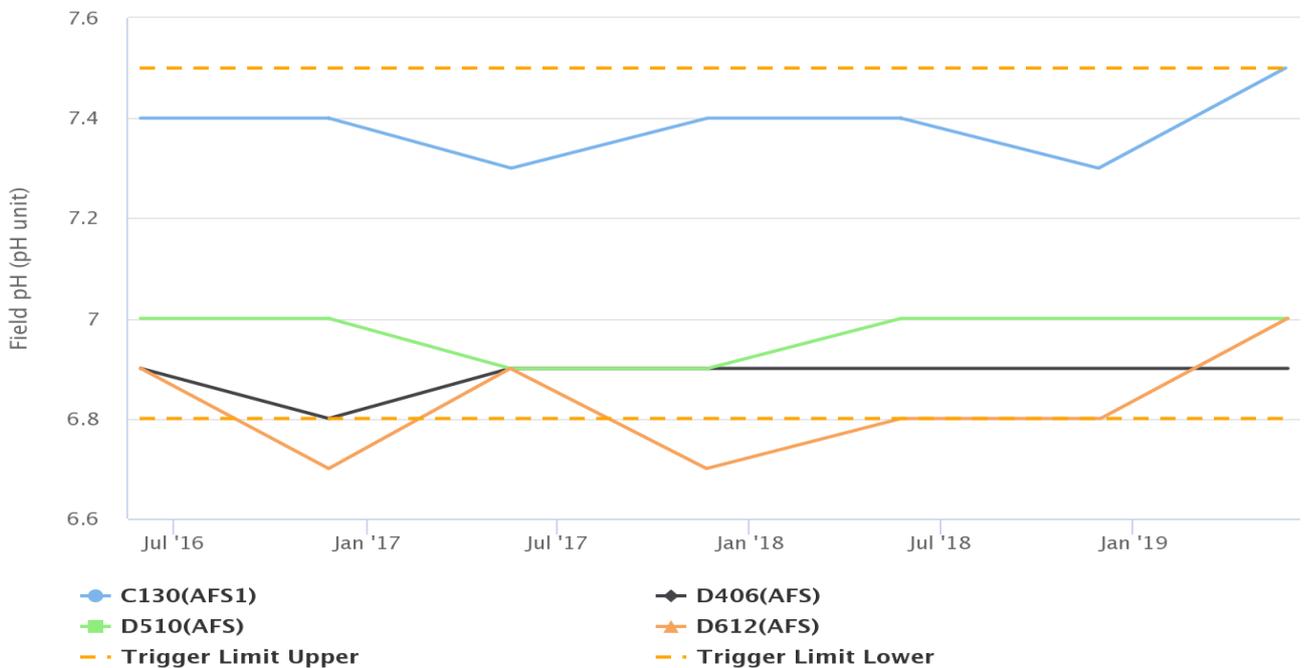


Figure 51: Lemington South Arrowfield pH Trend – June 2019

Lemington South Arrowfield

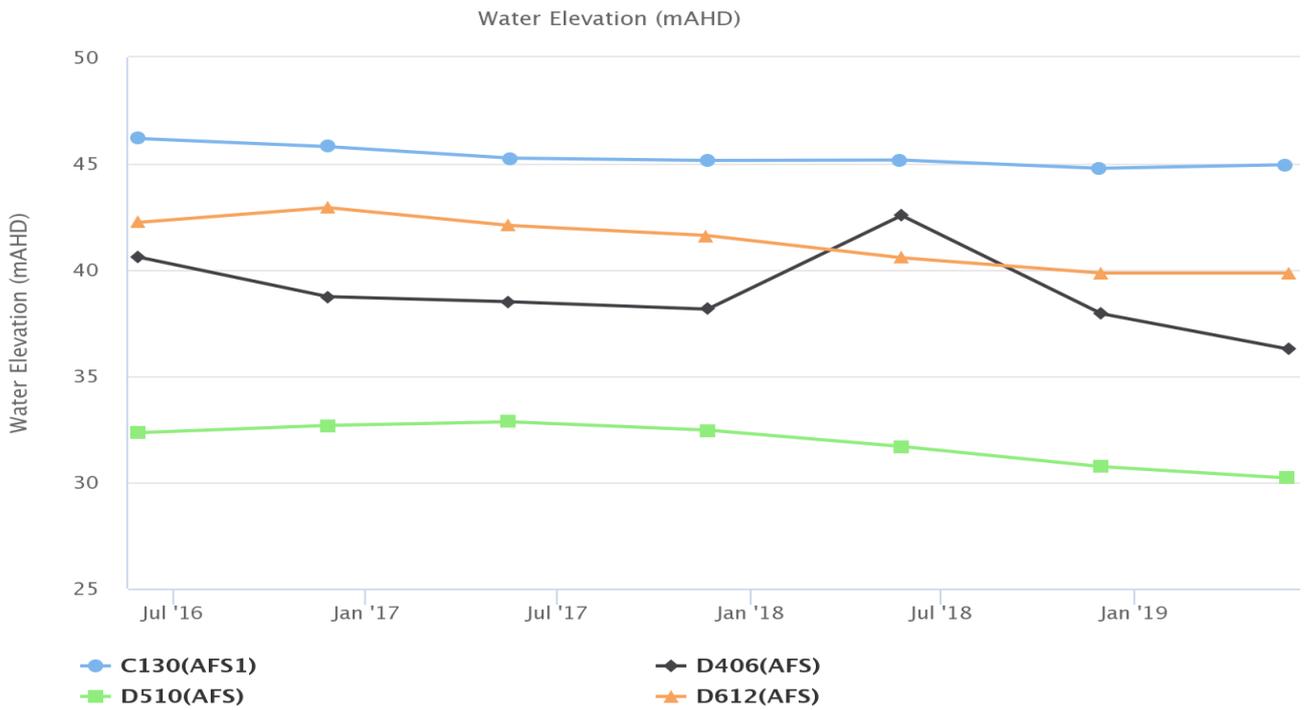


Figure 52: Lemington South Arrowfield Standing Water Level – June 2019

Lemington South Bowfield

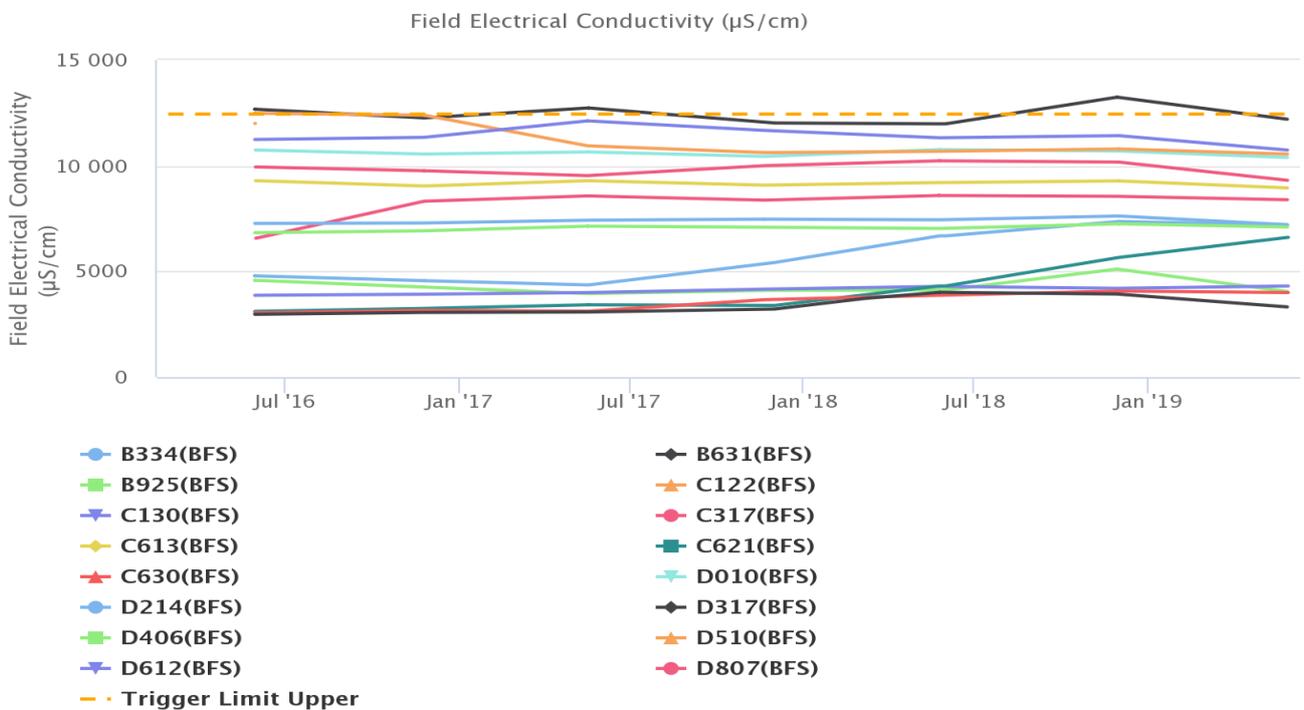


Figure 53: Lemington South Bowfield Electrical Conductivity Trend – June 2019

Lemington South Bowfield

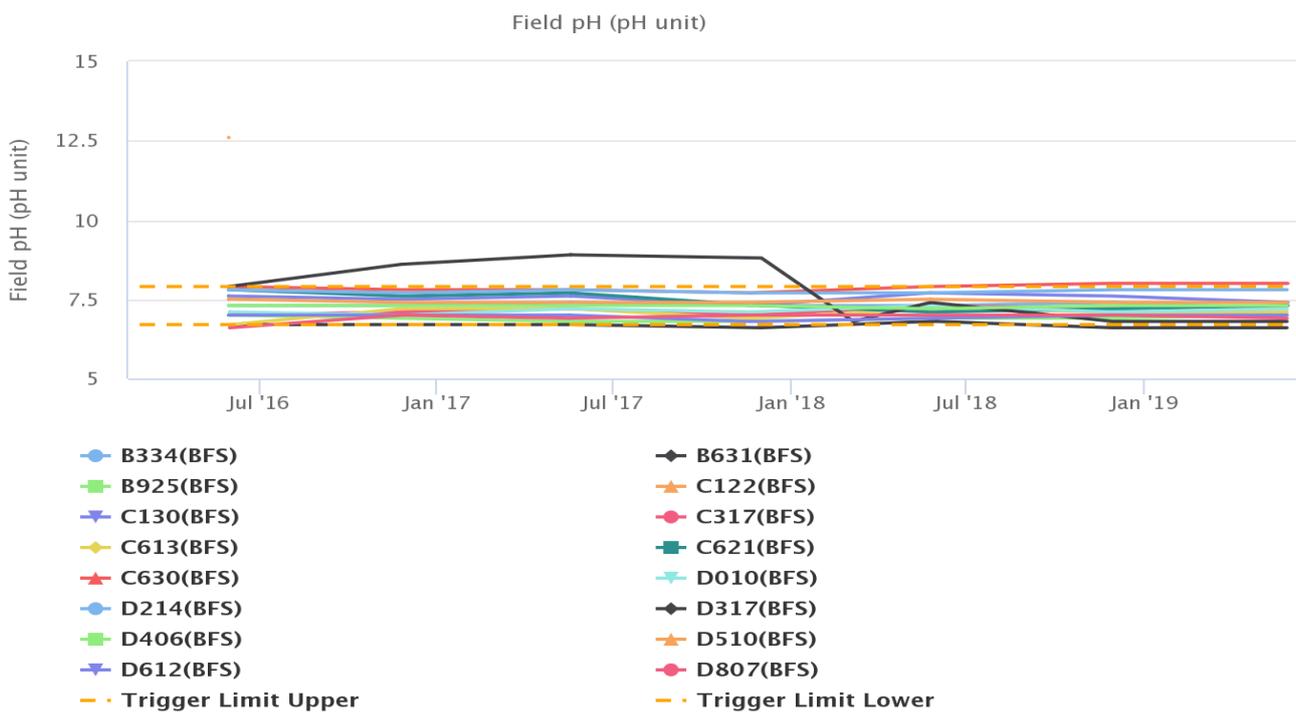


Figure 54: Lemington South Bowfield pH Trend – June 2019

Lemington South Bowfield

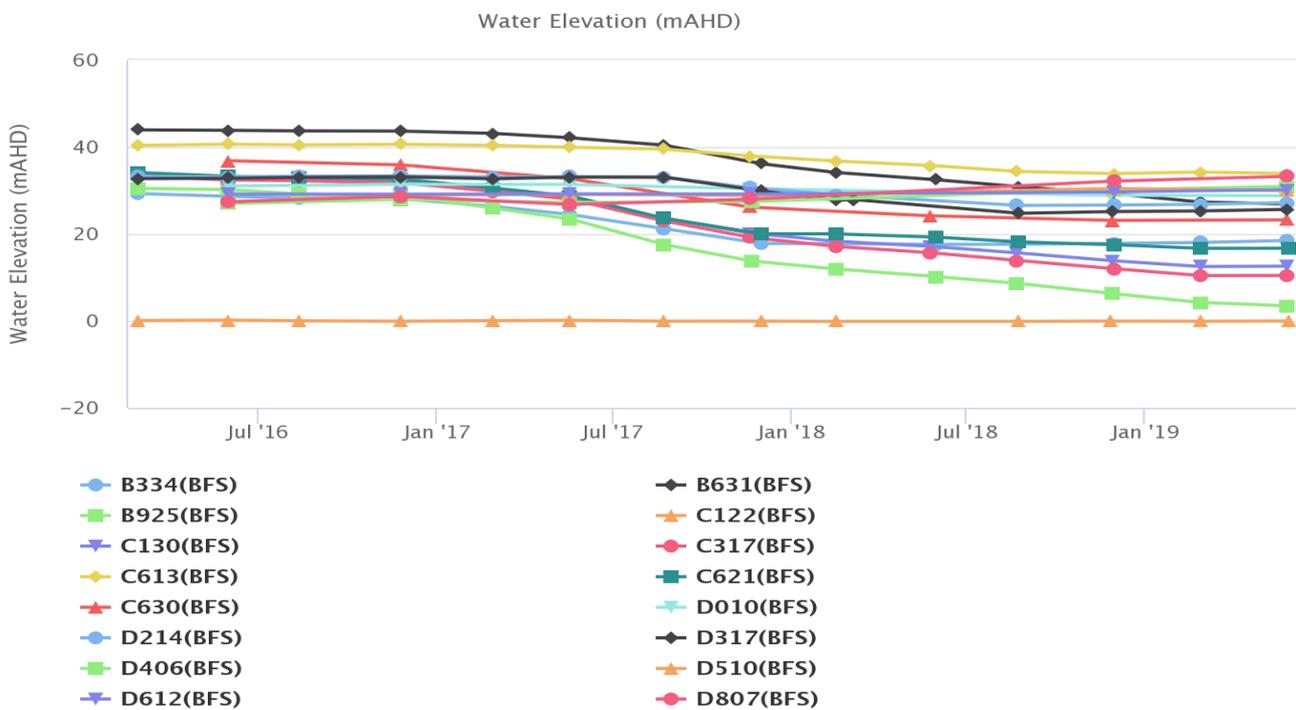


Figure 55: Lemington South Bowfield Standing Water Level – June 2019

Lemington South Woodlands Hill

Field Electrical Conductivity ($\mu\text{S}/\text{cm}$)

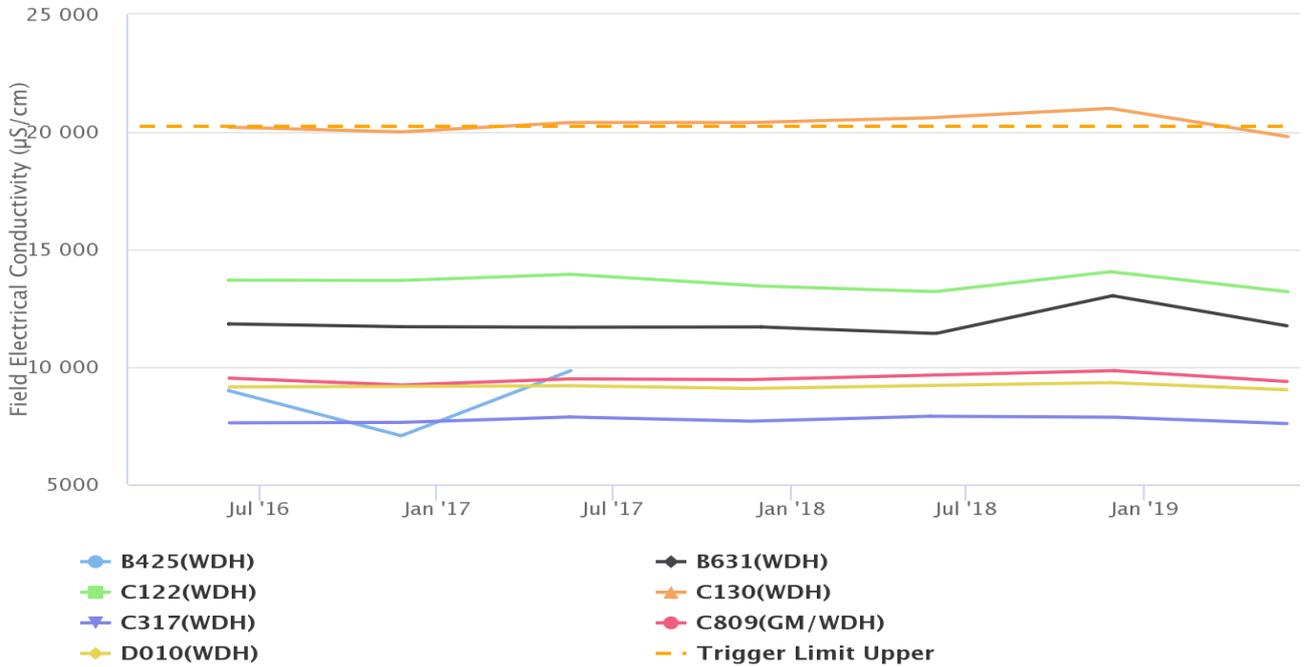


Figure 56: Lemington South Woodlands Hill Electrical Conductivity Trend – June 2019

Lemington South Woodlands Hill

Field pH (pH unit)

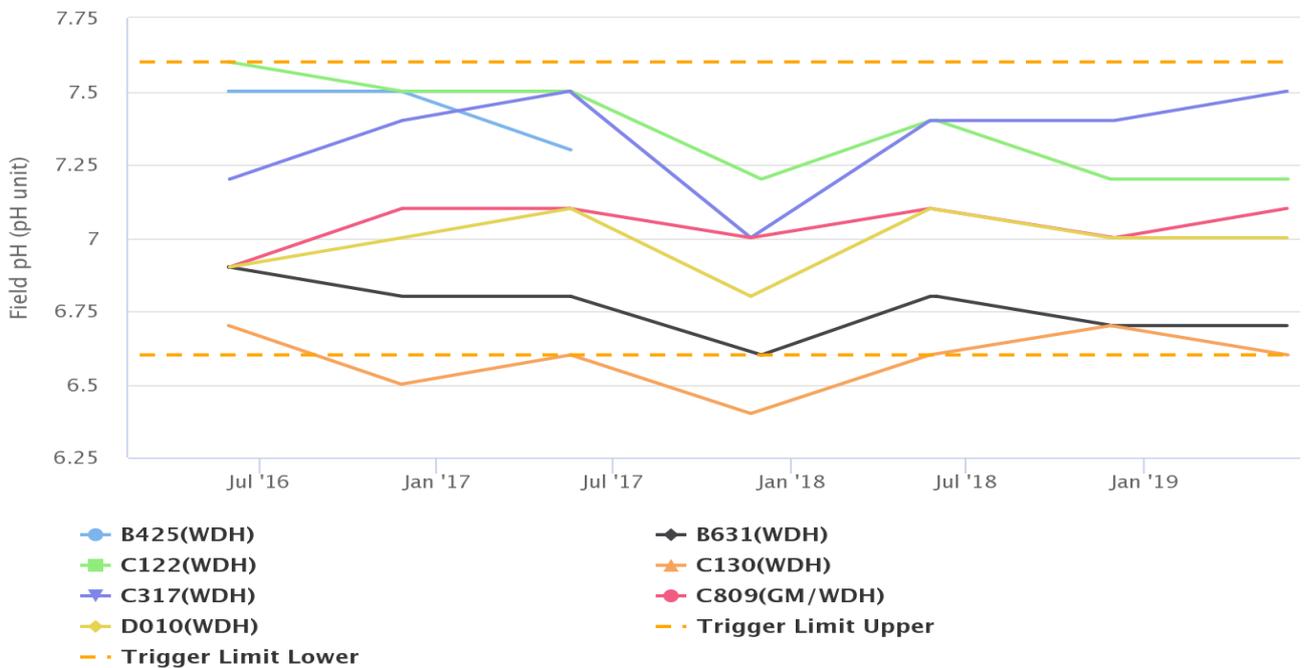


Figure 57: Lemington South Woodlands Hill pH Trend – June 2019

Lemington South Woodlands Hill

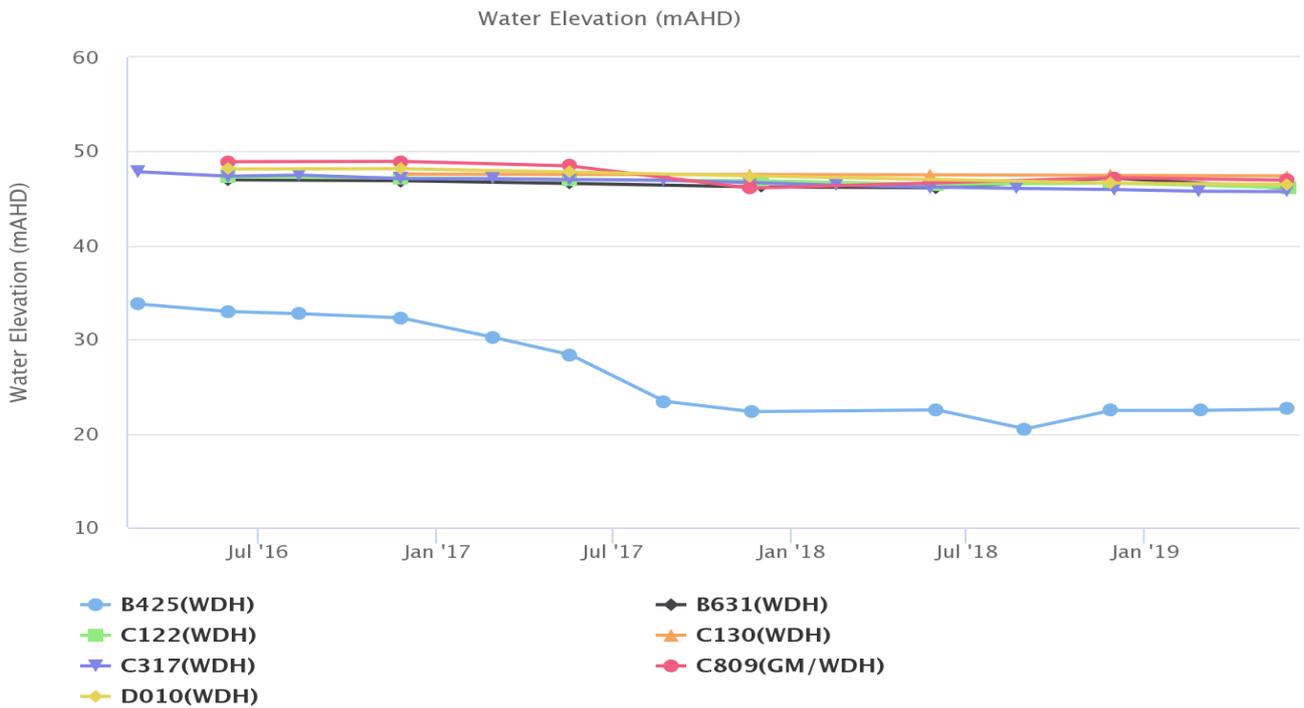


Figure 58: Lemington South Woodlands Hill Standing Water Level – June 2019

Lemington South Interburden

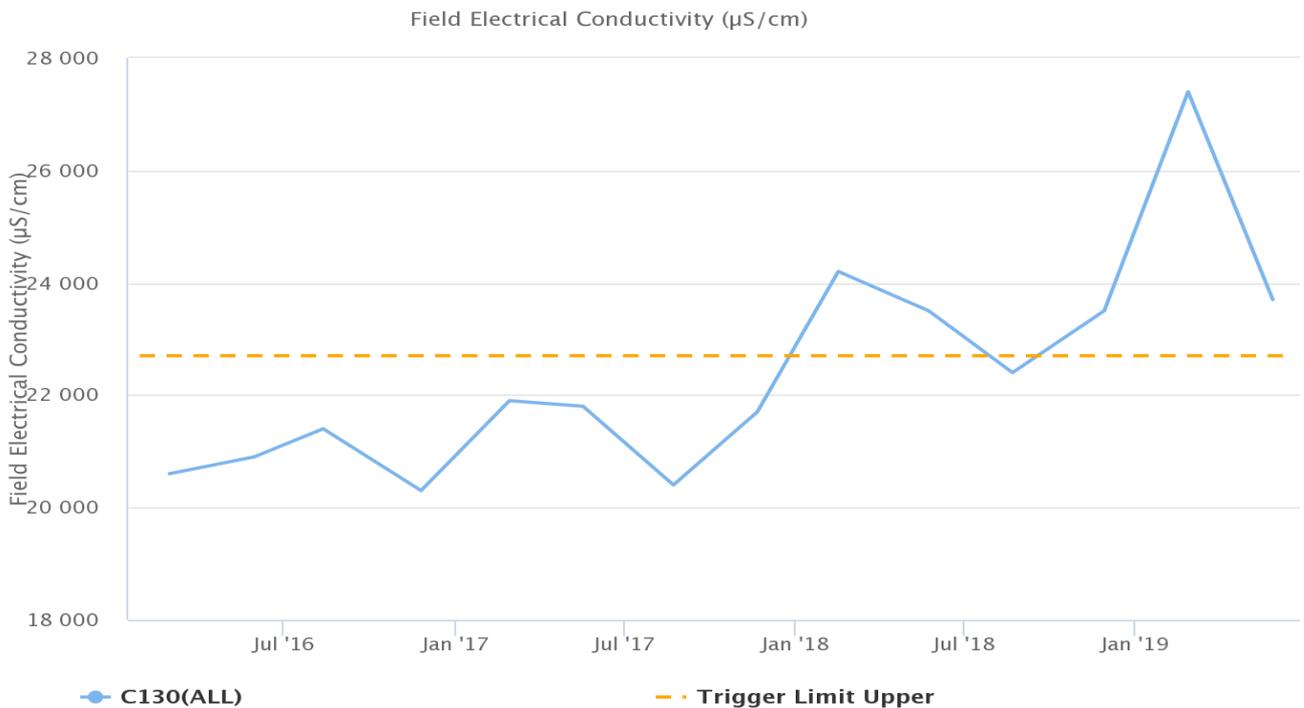


Figure 59: Lemington South Interburden Electrical Conductivity Trend – June 2019

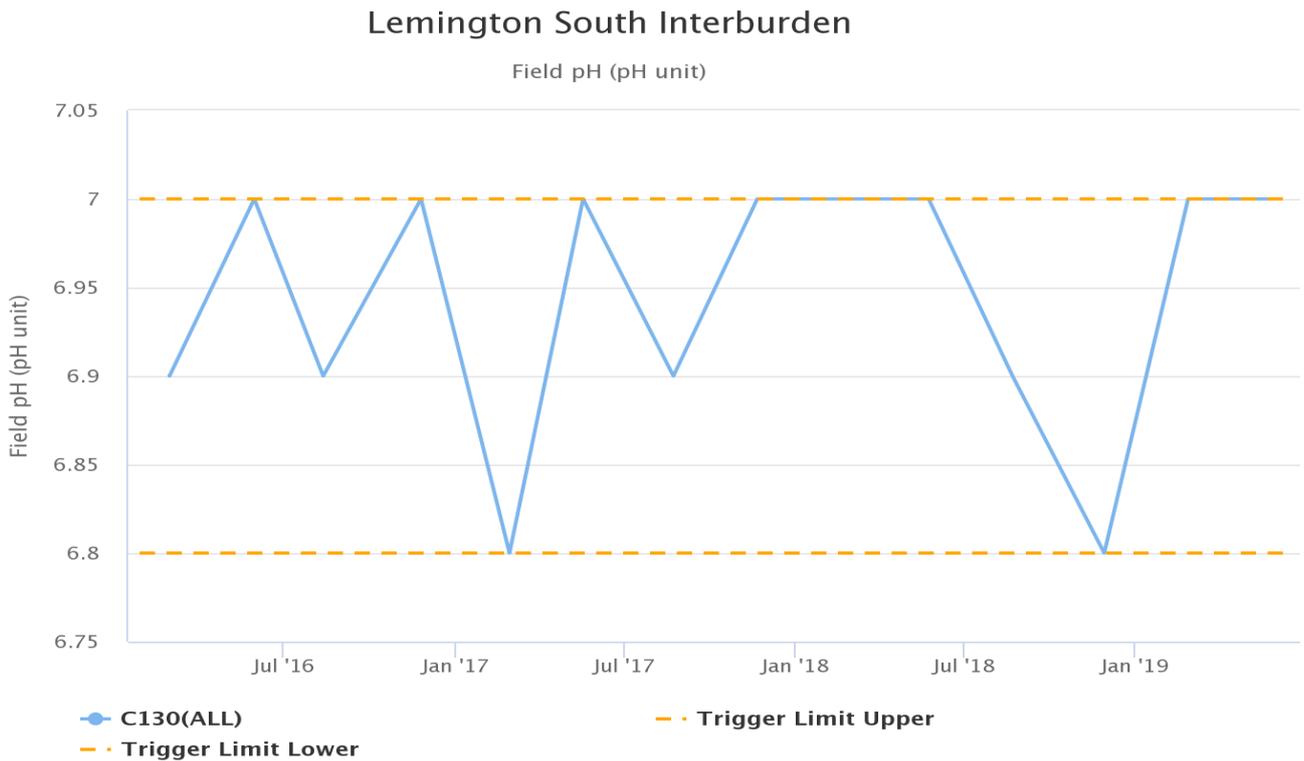


Figure 60: Lemington South Interburden pH Trend – June 2019

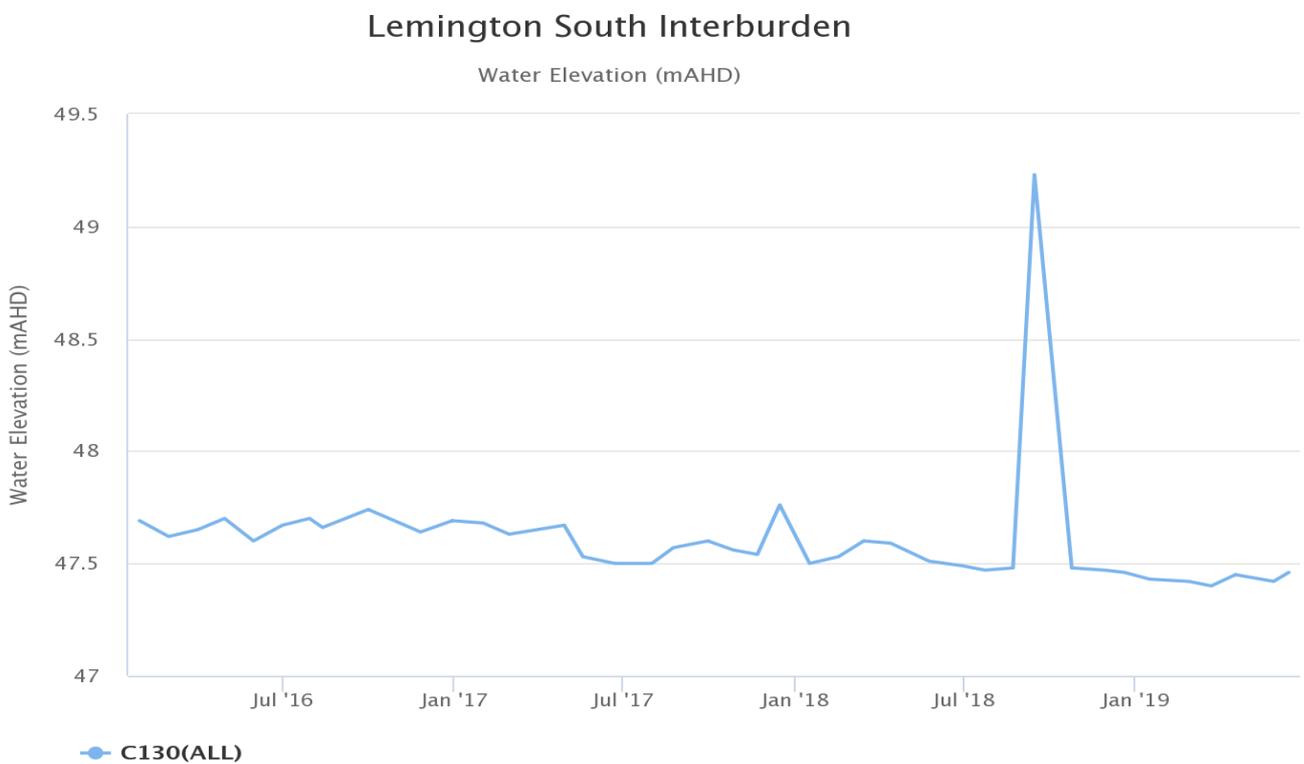


Figure 61: Lemington South Interburden Standing Water Level – June 2019

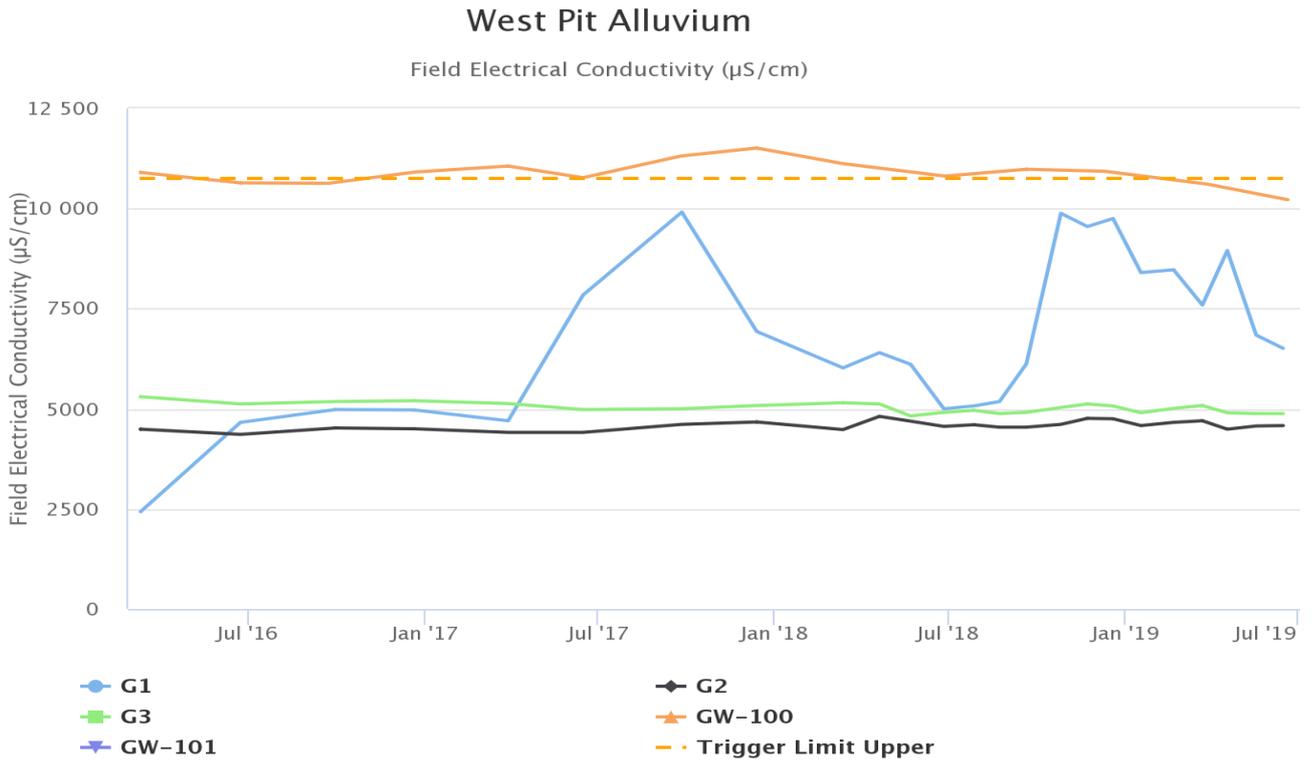


Figure 62: West Pit Alluvium Electrical Conductivity Trend – June 2019

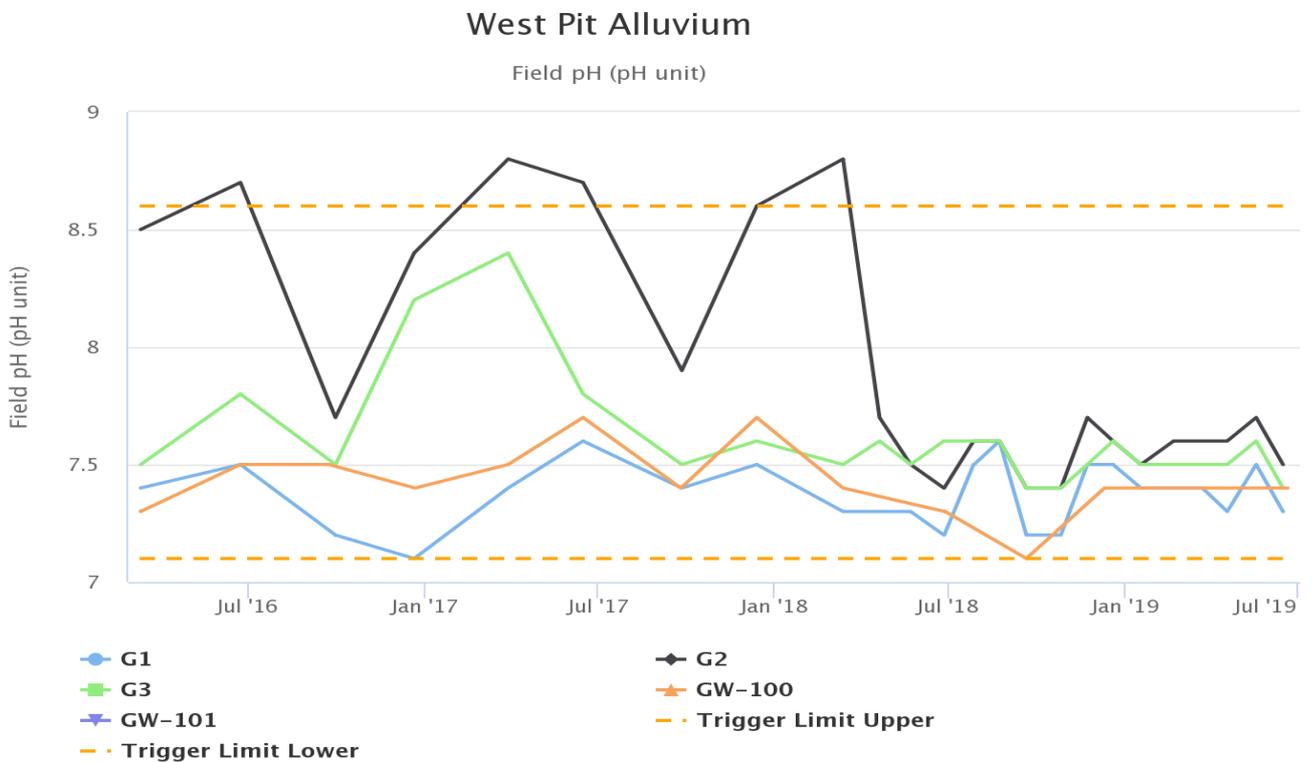


Figure 63: West Pit Alluvium pH Trend – June 2019

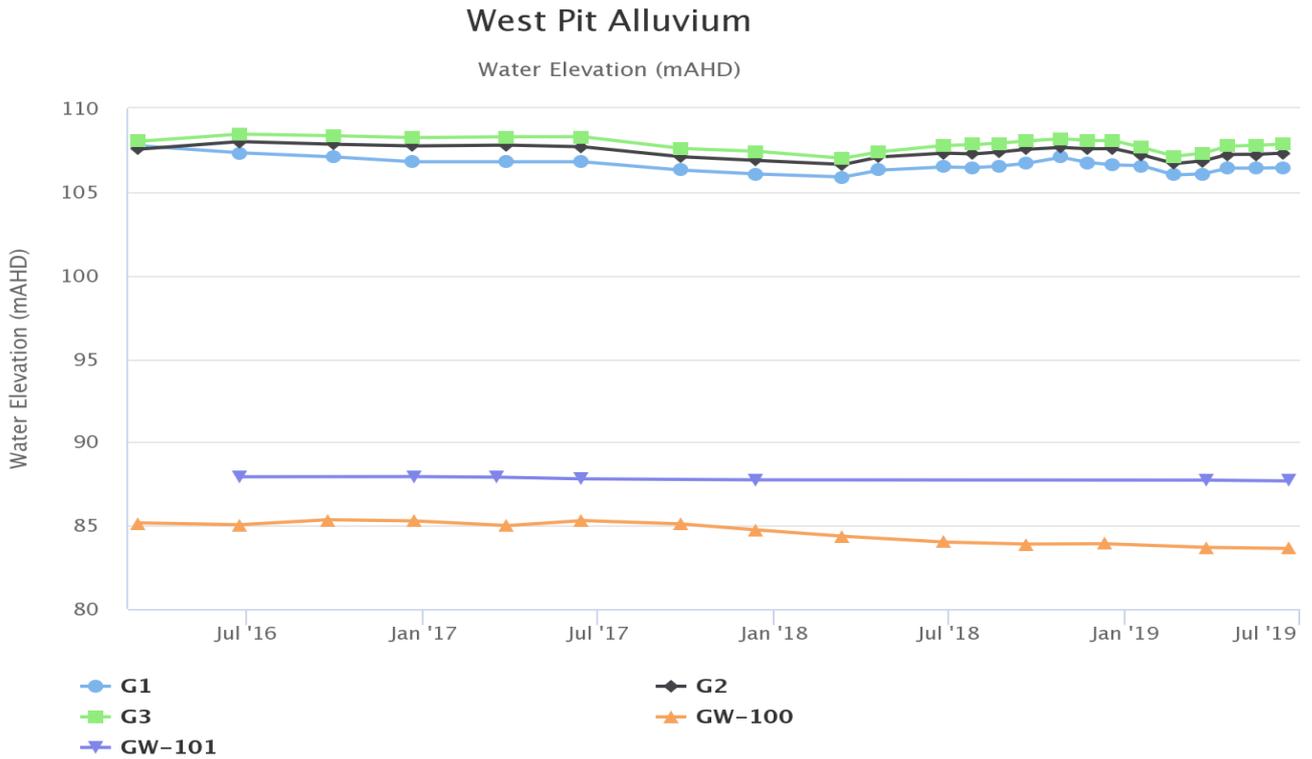


Figure 64: West Pit Alluvium Standing Water Level – June 2019

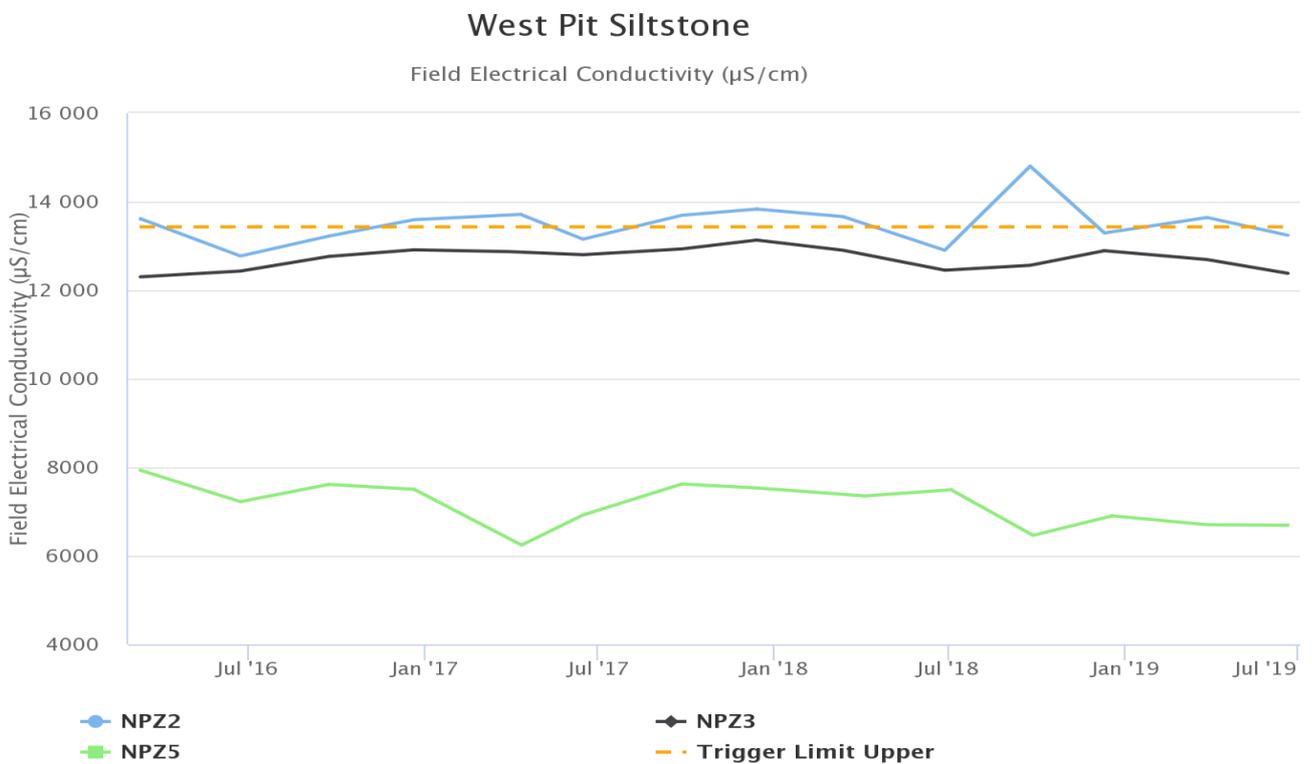


Figure 65: West Pit Siltstone Electrical Conductivity Trend – June 2019

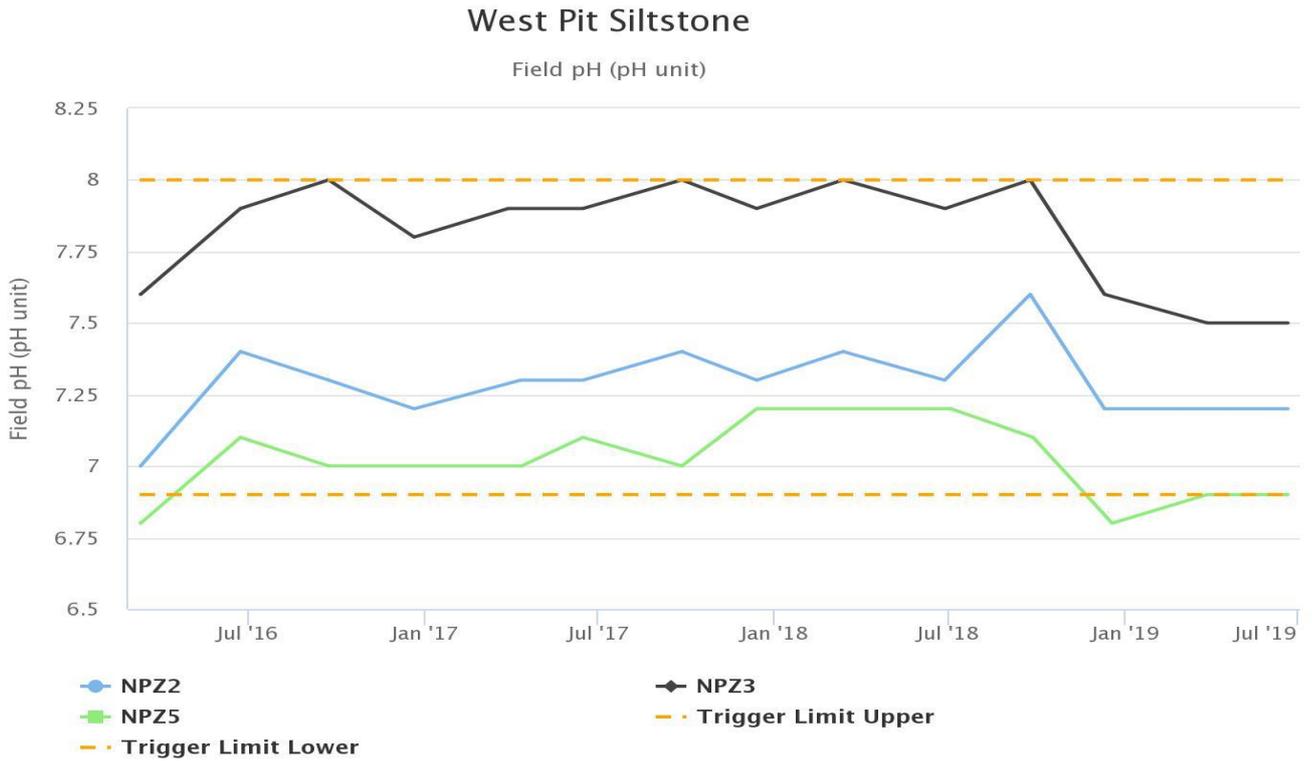


Figure 66: West Pit Siltstone pH Trend – June 2019

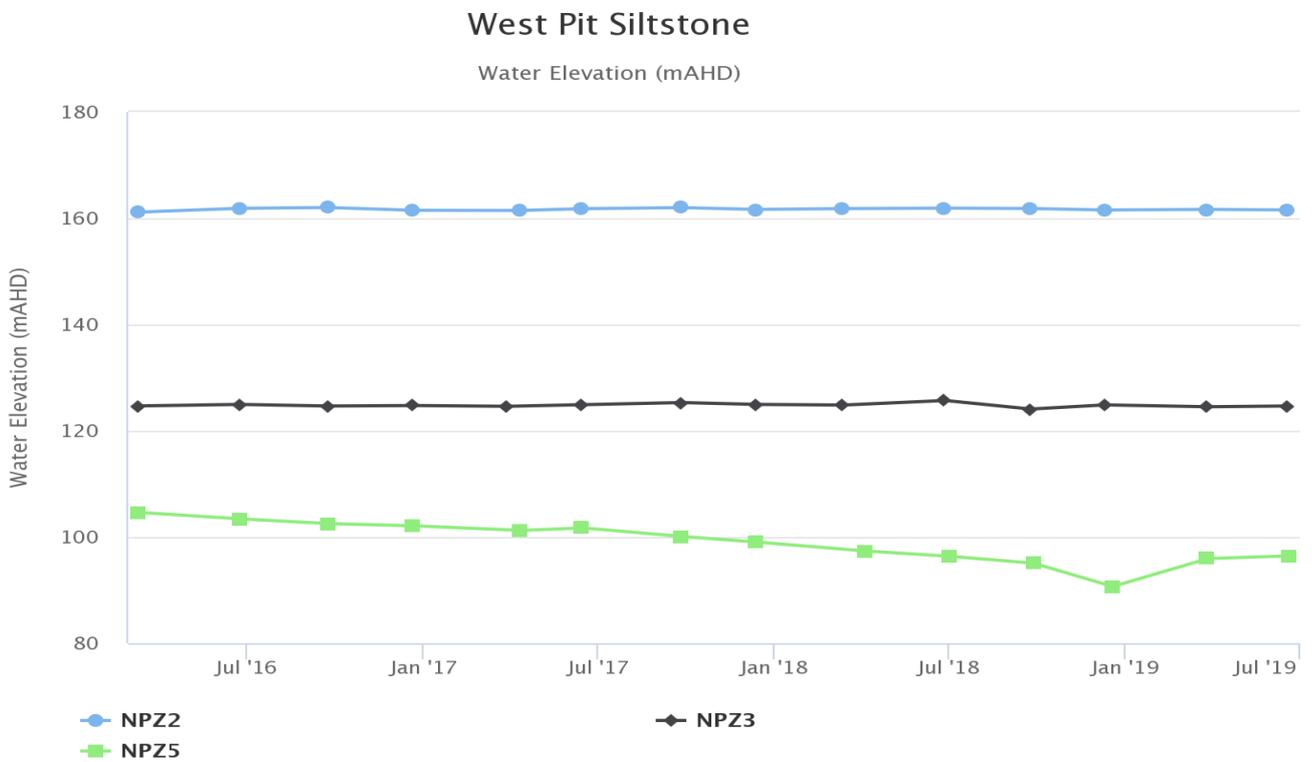


Figure 67: West Pit Siltstone Standing Water Level – June 2019

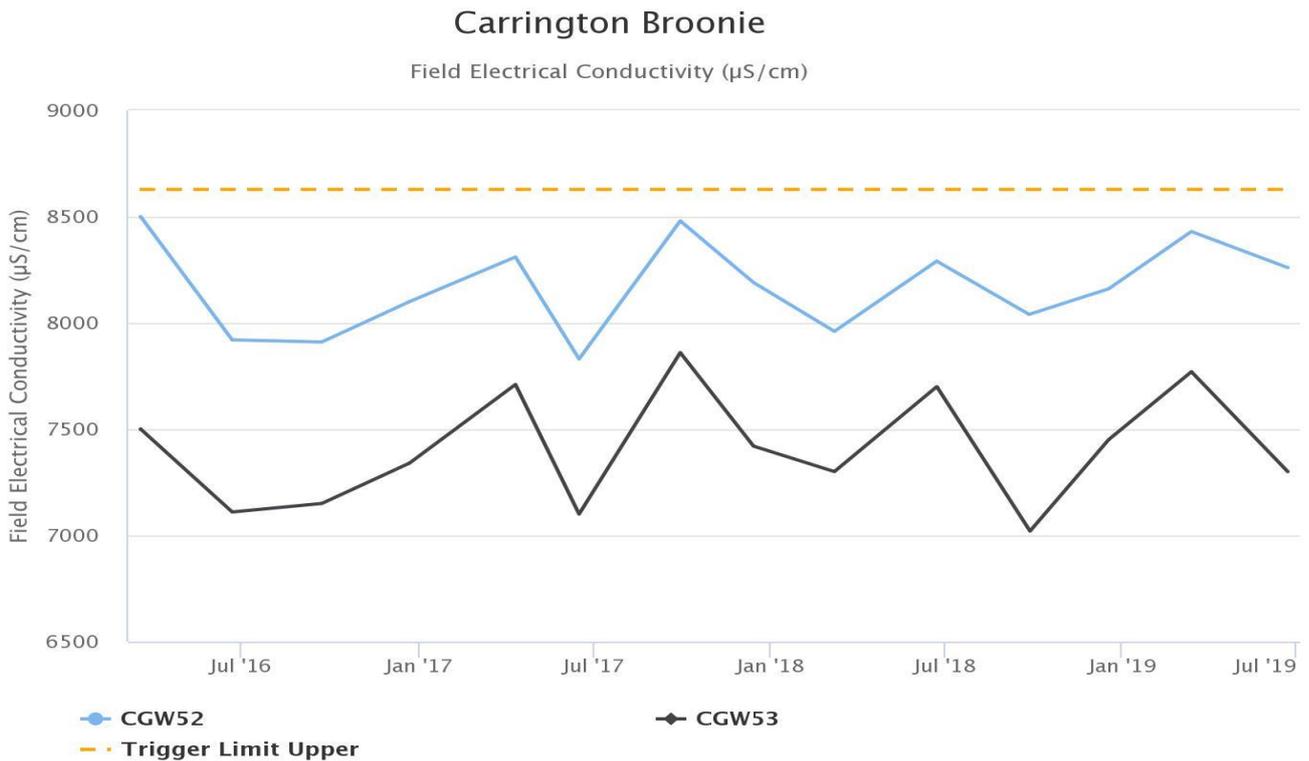


Figure 68: Carrington Broonie Electrical Conductivity Trend – June 2019

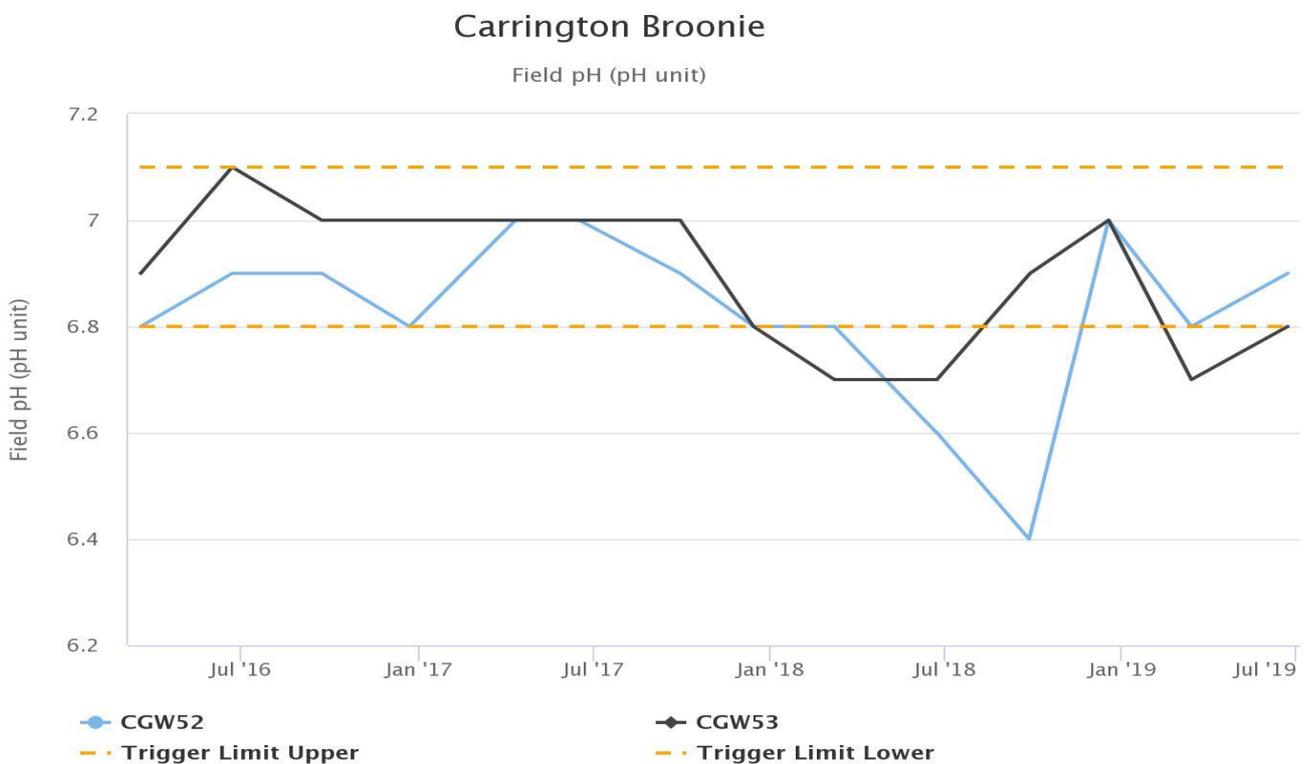


Figure 69: Carrington Broonie pH Trend – June 2019

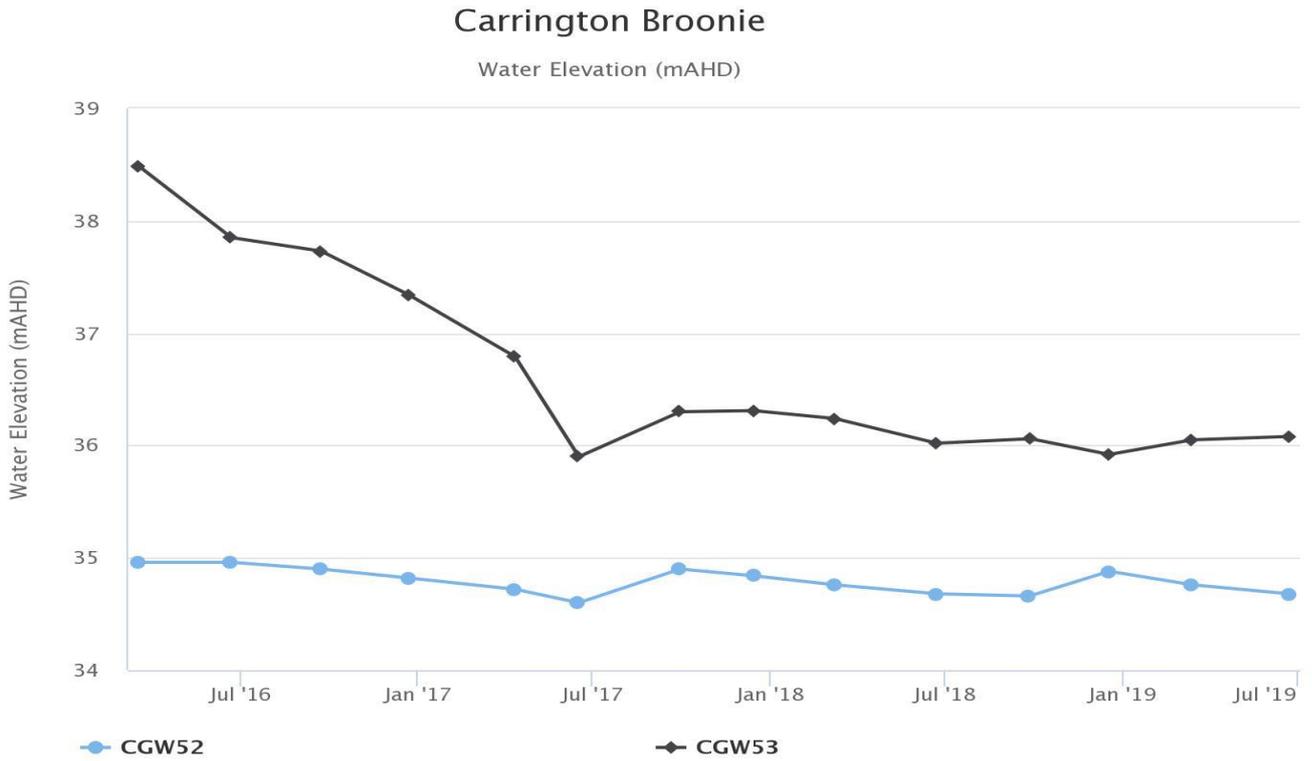


Figure 70: Carrington Broonie Standing Water Level – June 2019

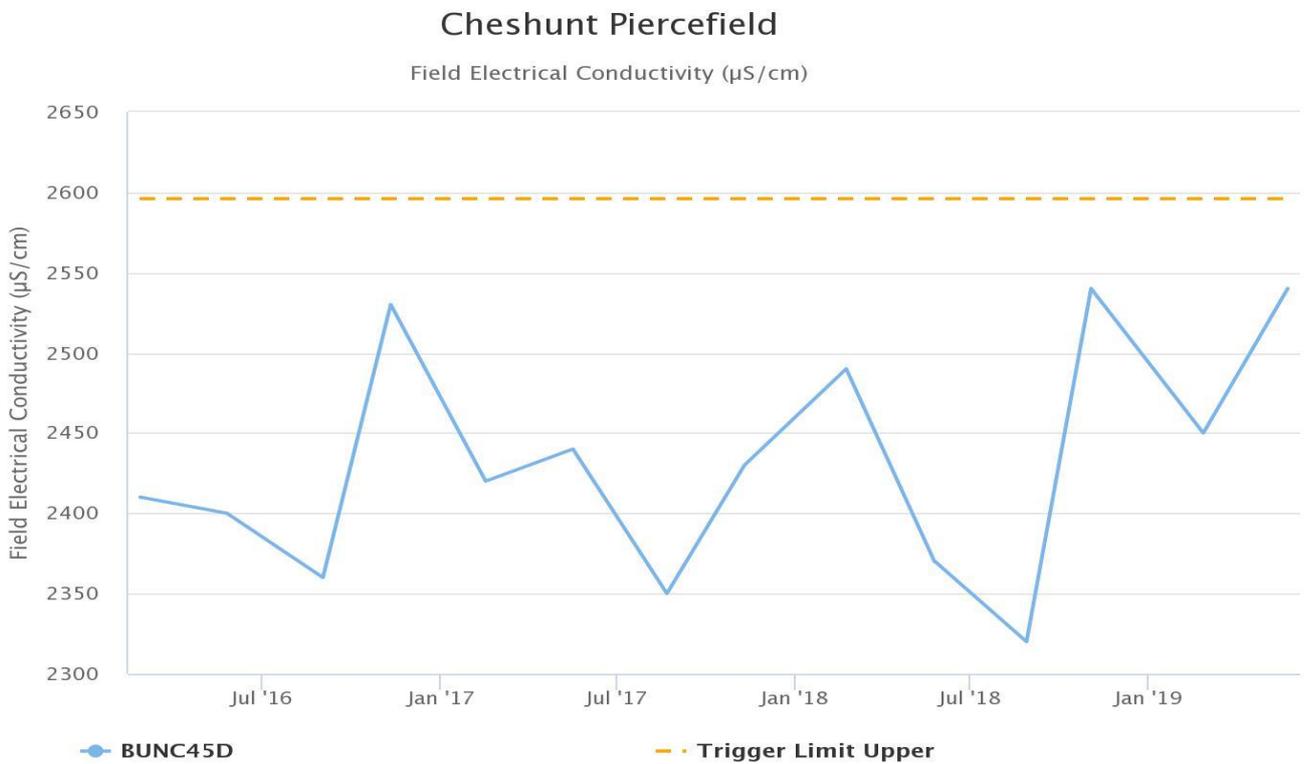


Figure 71: Cheshunt Piercefield Electrical Conductivity Trend – June 2019

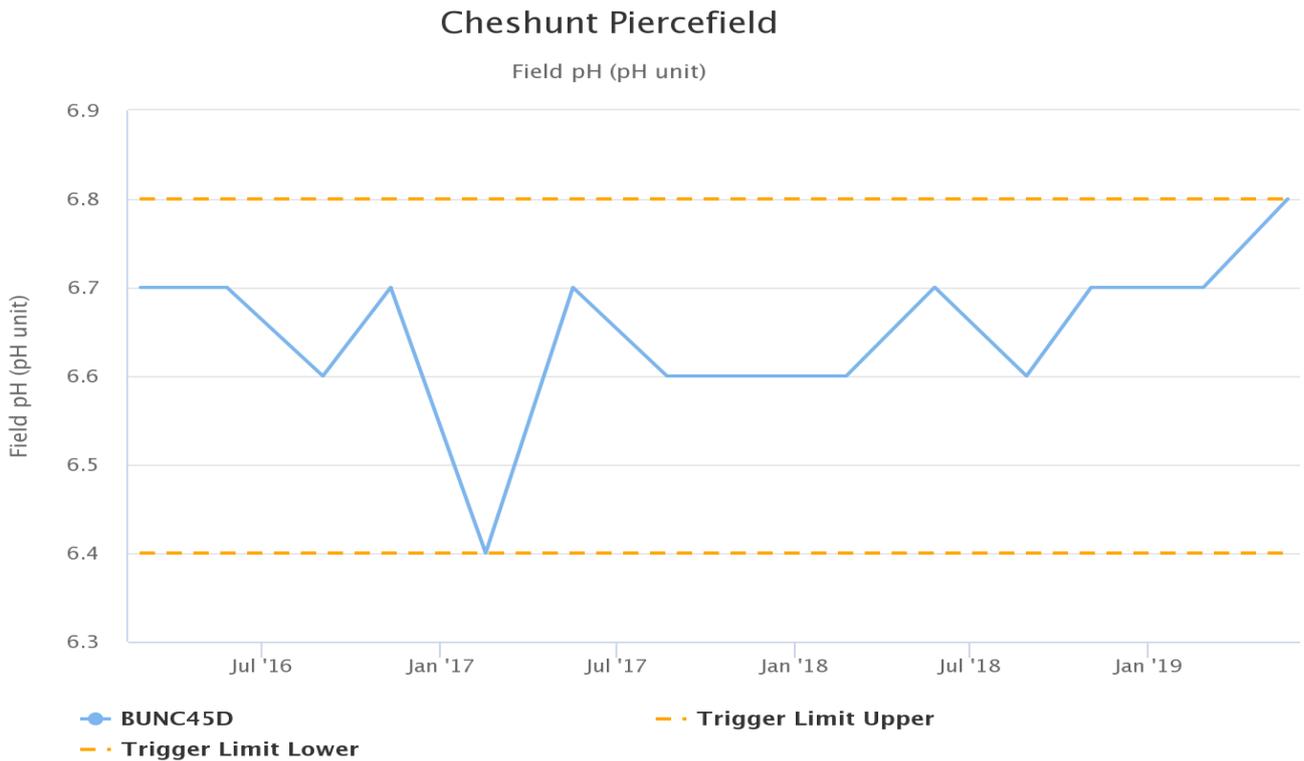


Figure 72: Cheshunt Piercefield pH Trend – June 2019

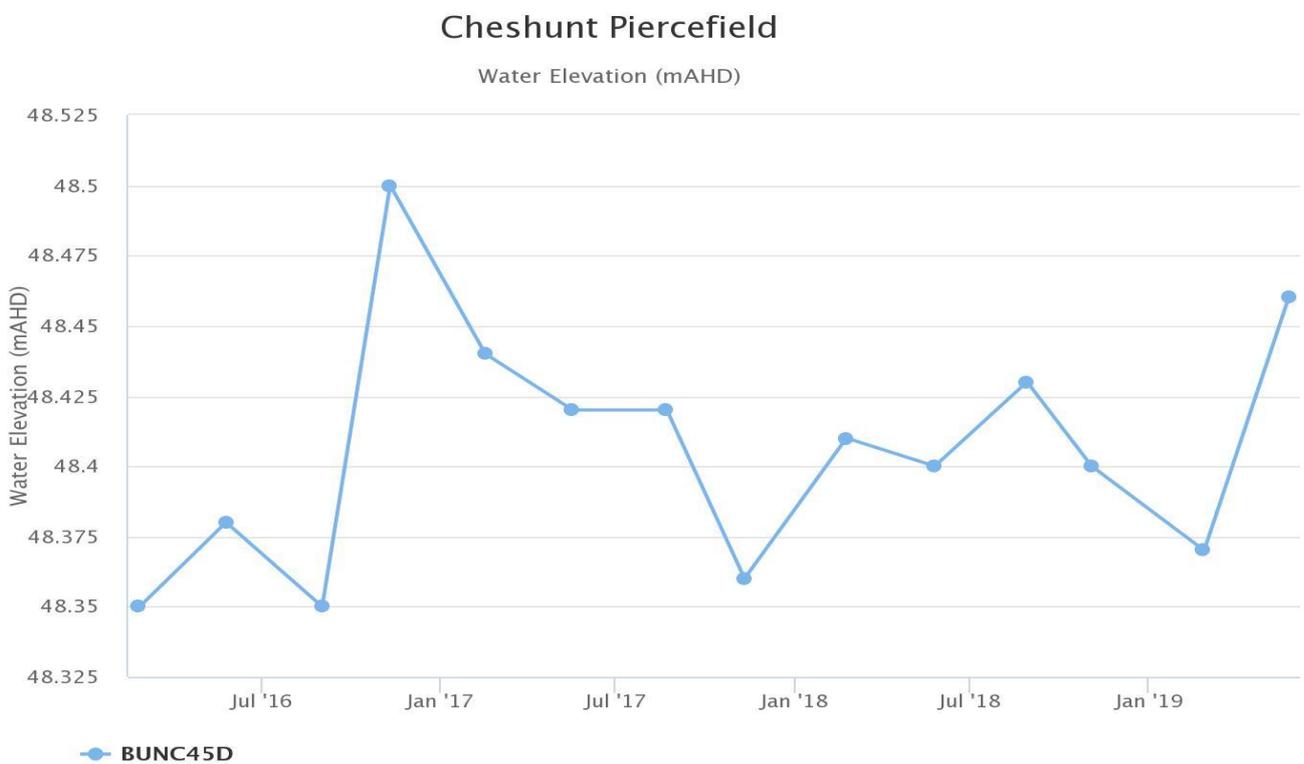


Figure 73: Cheshunt Piercefield Standing Water Level – June 2019

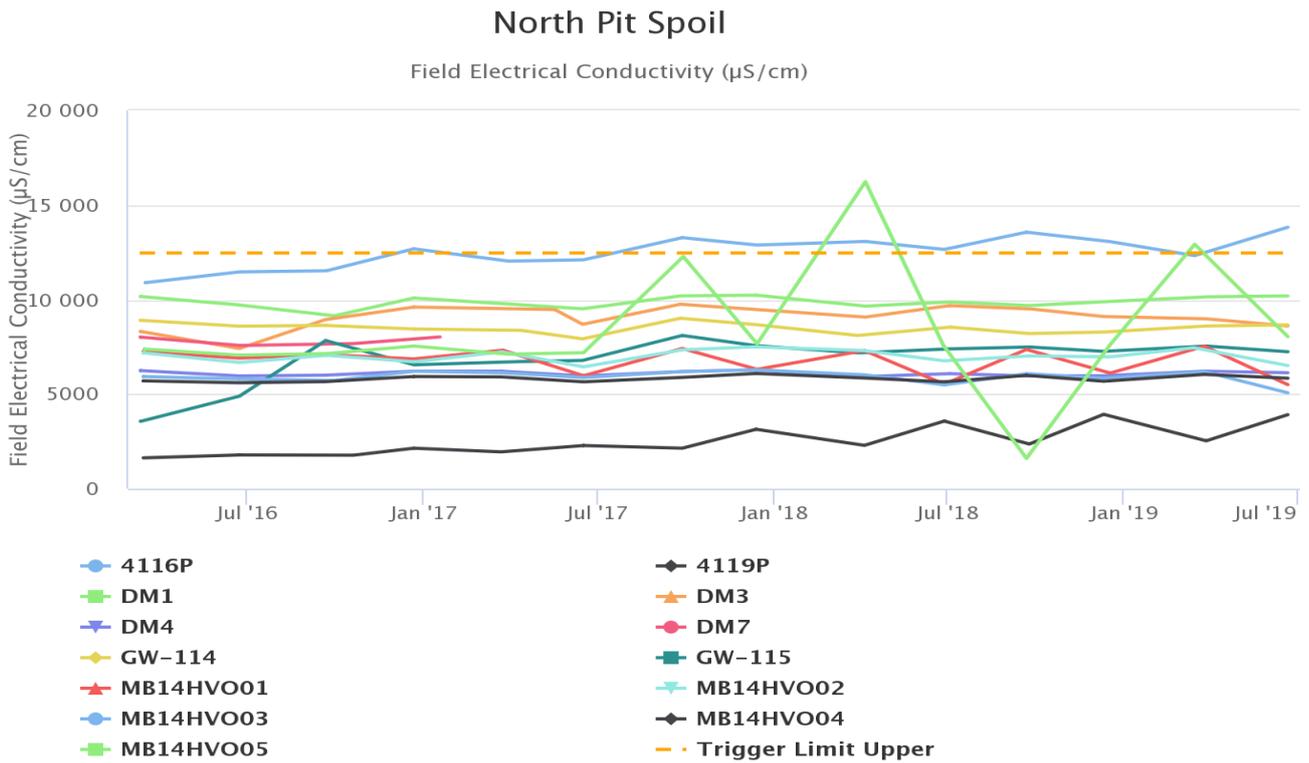


Figure 74: North Pit Spoil Electrical Conductivity Trend – June 2019

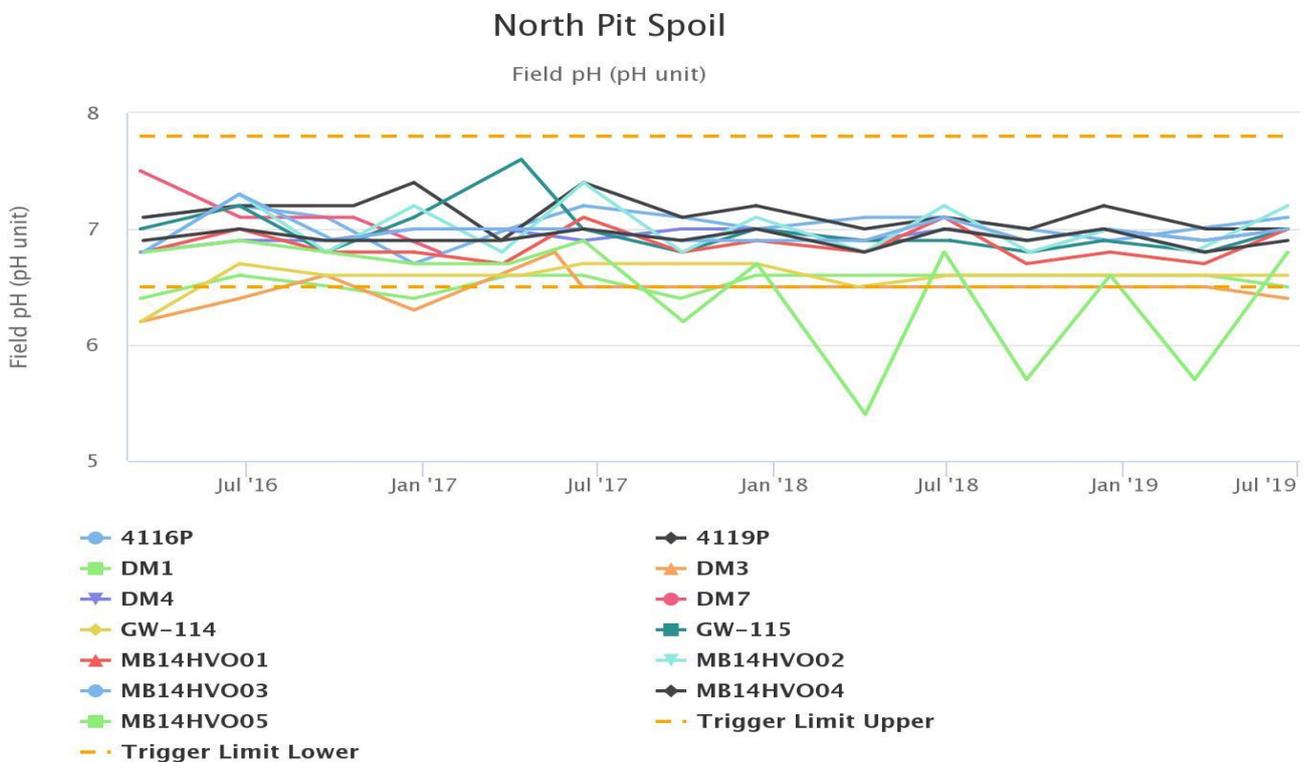


Figure 75: North Pit Spoil pH Trend – June 2019

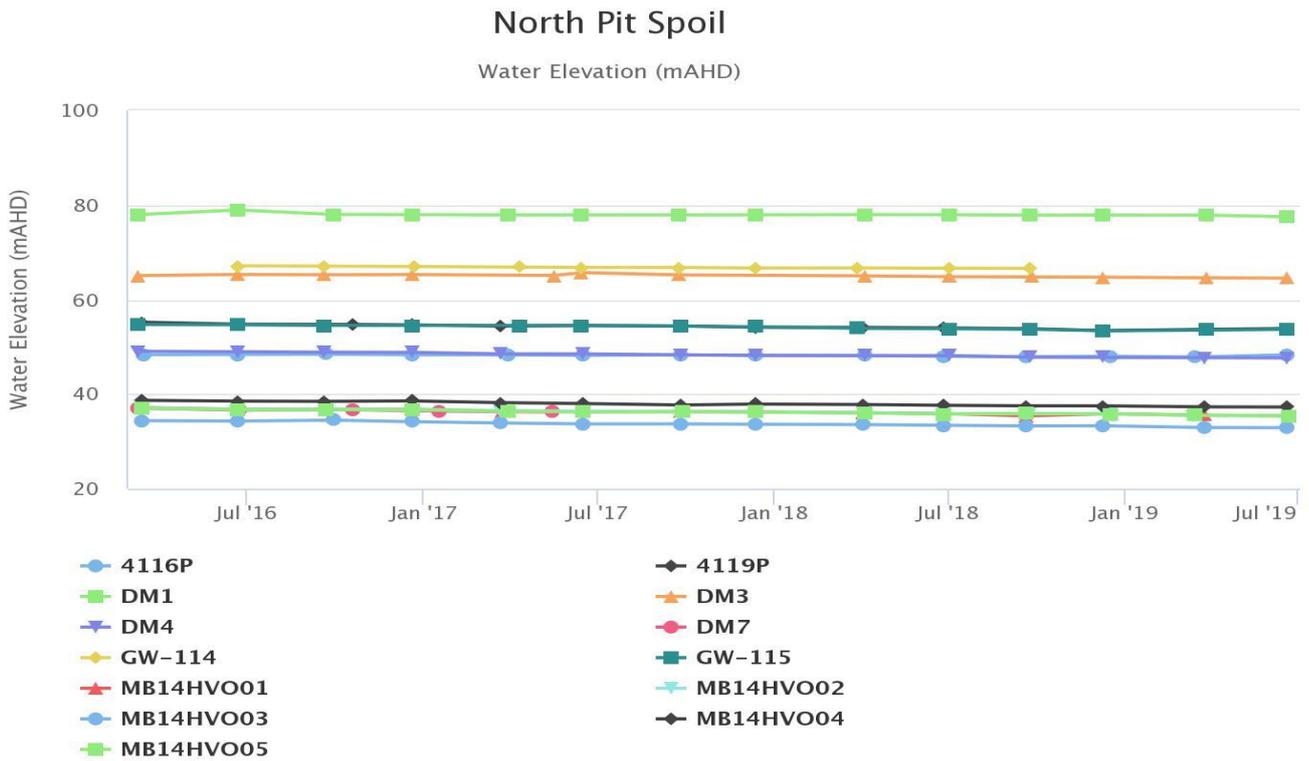


Figure 76: North Pit Spoil Standing Water Level – June 2019

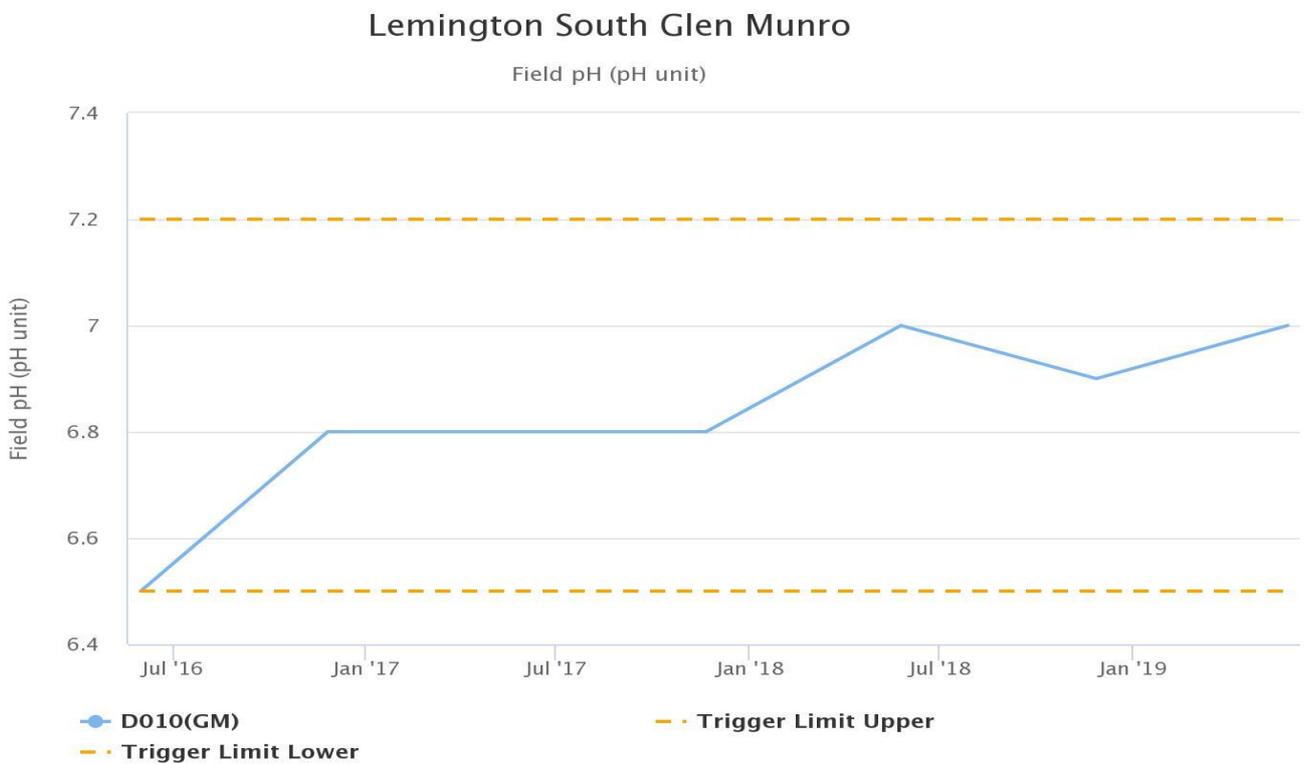


Figure 77: Lemington South Glen Munro pH Trend – June 2019

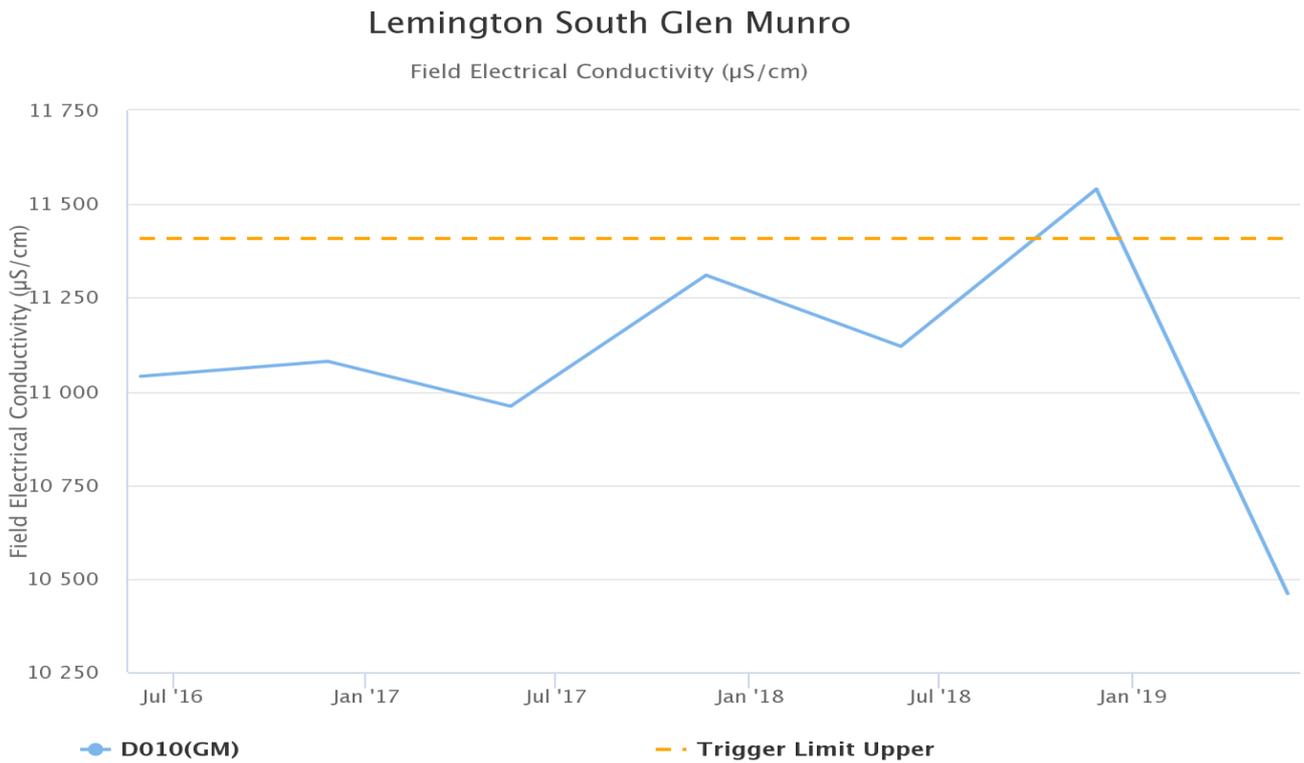


Figure 78: Lemington South Glen Munro Electrical Conductivity Trend – June 2019

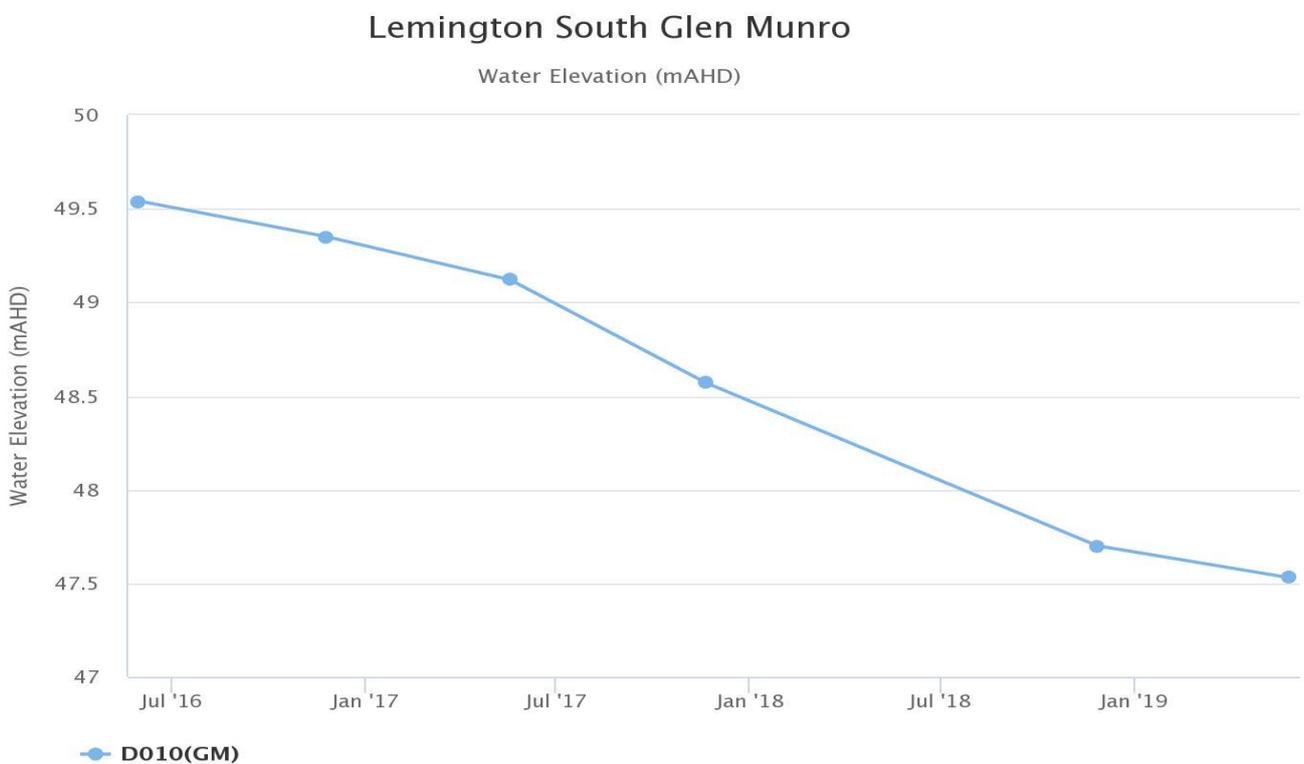


Figure 79: Lemington South Glen Munro Standing Water Level Trend – June 2019

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 – Q2 2019

Site	Date	Trigger Limit Breached	Action Taken in Response
BZ3-1	24/05/2019	pH – 95 th Percentile	First breach. Watching brief established*
BZ3-3	24/05/2019	pH – 95 th Percentile	First breach. Watching brief established*
B631(BFS)	27/05/2019	pH – 95 th Percentile	First breach. Watching brief established*
PB01(ALL)	27/05/2019	EC – 95 th Percentile	First breach. Watching brief established*
C130(ALL)	28/05/2019	EC – 95 th Percentile	First breach. Watching brief established*
C630(BFS)	28/05/2019	pH – 95 th Percentile	First breach. Watching brief established*
CFW55R	12/4/2019, 24/4/2019, 9/5/2019, 22/5/2019, 5/6/2019 and 24/6/2019	EC – 95 th Percentile	Investigation in progress
4051C	21/06/2019	EC – 95 th Percentile	First breach. Watching brief established*
4116P	20/06/2019	EC – 95 th Percentile	First breach. Watching brief established*

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

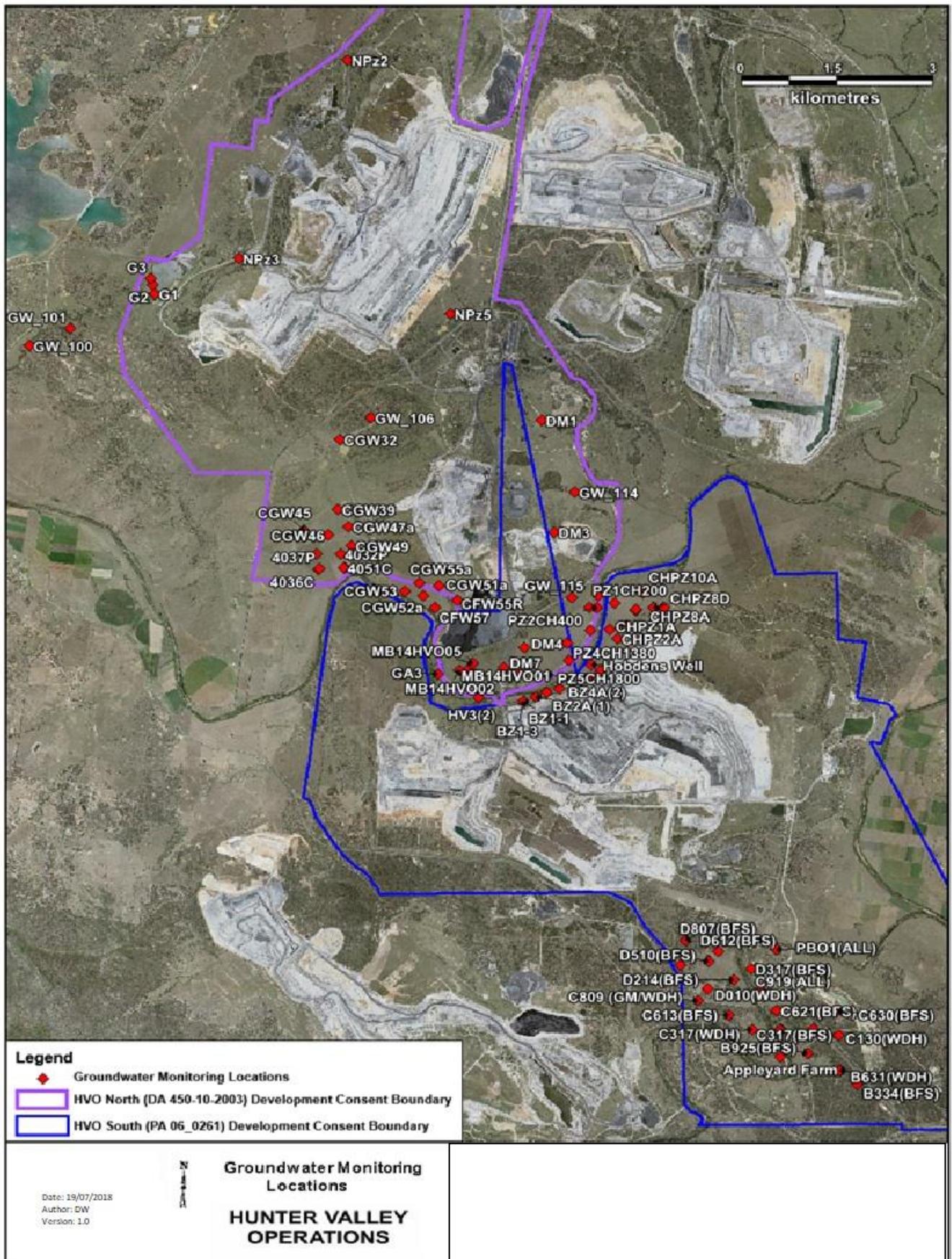


Figure 80: Groundwater Monitoring Location Plan

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 June, 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.

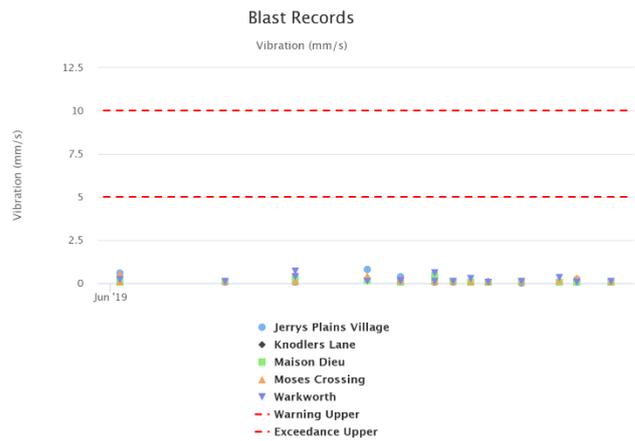


Figure 82: Ground Vibration Blast Monitoring Results – June 2019

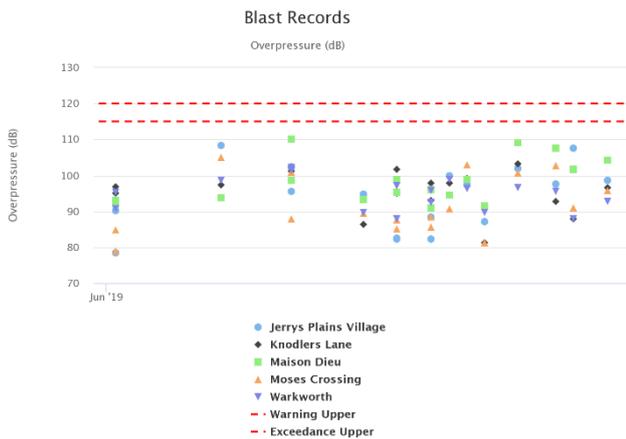


Figure 81: Overpressure Blast Monitoring Results – June 2019

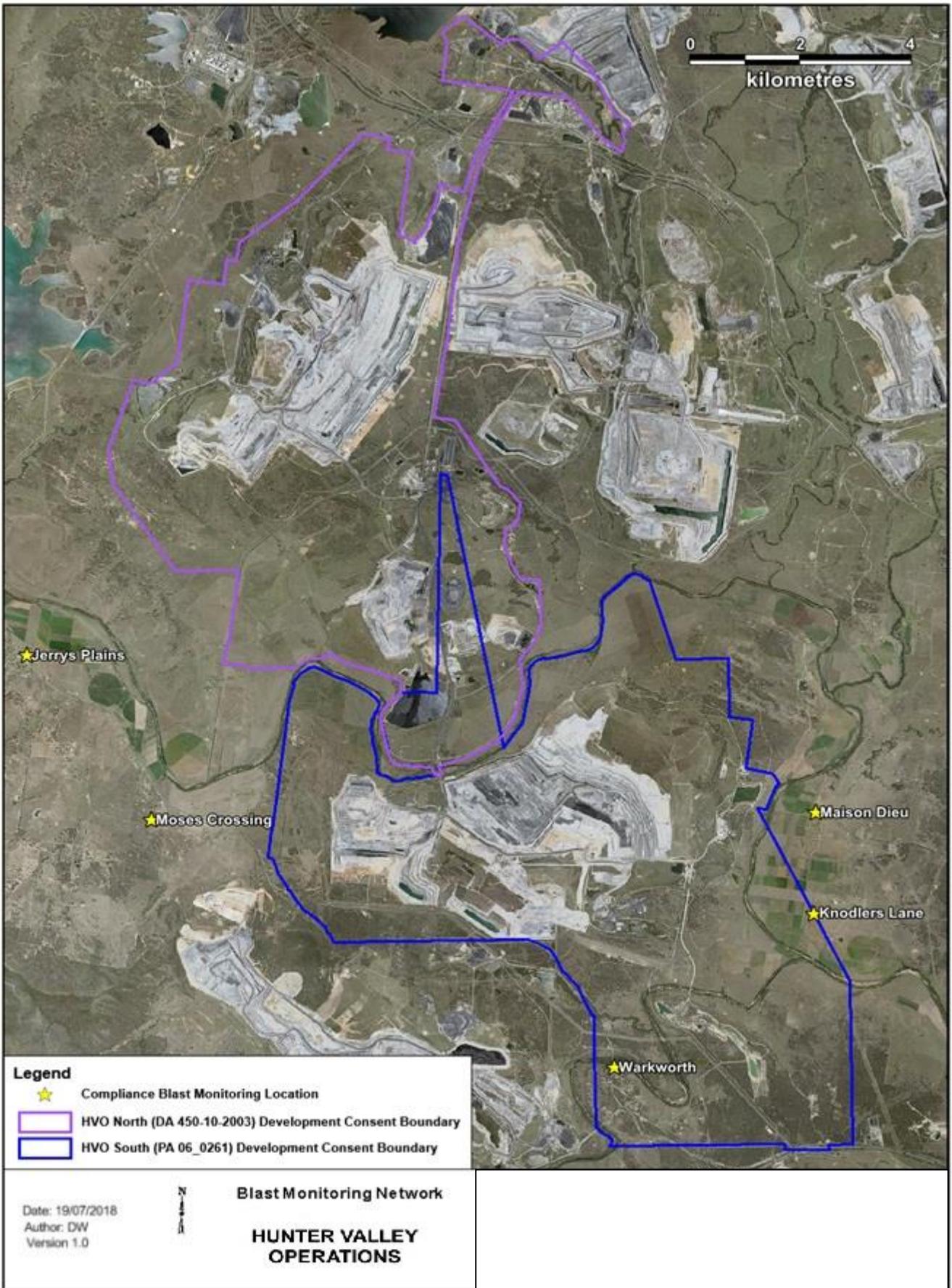


Figure 83: Blast Monitoring Location Plan

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 on 20, 24 and 27 June 2019. Monitoring results are detailed in Table 6 to Table 10 . During the reporting period, no exceedances were recorded.

Table 6: LAeq, 15 minute HVO South - Impact Assessment Criteria – June 2019

Location	Date and Time	Wind Speed (m/s) ¹	VTG ¹	Criterion dB (A)	Criterion Applies? ²	HVO South LAeq dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	24/06/2019 22:22	4.4	-1	39	No	IA	NA
Maison Dieu	24/06/2019 22:43	4.4	-1	39	No	IA	NA
Shearers Lane	24/06/2019 23:05	3.9	-1	41	No	IA	NA
Kilburnie South	24/06/2019 21:25	3.7	0.5	39	No	NM	NA
Jerrys Plains Village	24/06/2019 22:12	4.4	-1	35	No	31	NA
Jerrys Plains East	24/06/2019 21:49	3.6	-1	35	No	IA	NA
Long Point Road	20/06/2019 21:00	1.9	-1	35	Yes	IA	Nil
HVGC	24/06/2019 22:54	4.4	-1	55	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 applicable

Table 7: LA1, 1minute HVO South - Impact Assessment Criteria – June 2019

Location	Date and Time	Wind Speed (m/s) ¹	VTG ¹	Criterion dB (A)	Criterion Applies? ²	HVO South LA1, 1min dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	24/06/2019 22:22	4.4	-1	45	No	IA	NA
Maison Dieu	24/06/2019 22:43	4.4	-1	45	No	IA	NA
Shearers Lane	24/06/2019 23:05	3.9	-1	45	No	IA	NA
Kilburnie South	24/06/2019 21:25	3.7	0.5	45	No	41	NA
Jerrys Plains Village	24/06/2019 22:12	4.4	-1	45	No	33	NA
Jerrys Plains East	24/06/2019 21:49	3.6	-1	45	No	IA	NA
Long Point Road	20/06/2019 21:00	1.9	-1	45	Yes	IA	Nil
HVGC	24/06/2019 22:54	4.4	-1	NA	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 2.3 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: LAeq, 15minute HVO North – Impact Assessment Criteria – June 2019

Location	Date and Time	Wind Speed (m/s) ¹	VTG ¹	Criterion dB (A)	Criterion Applies? ²	HVO North LAeq dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	24/06/2019 22:22	3.5	-1	35	No	IA	NA
Maison Dieu	24/06/2019 22:43	3.2	-1	35	No	IA	NA
Shearers Lane	24/06/2019 23:05	3.1	-1	35	No	IA	NA
Kilburnie South	24/06/2019 21:25	3.3	-1	39	No	IA	NA
Kilburnie South	27/06/2019 22:20	2.2	0.5	39	Yes	35	Nil
Jerrys Plains Village	24/06/2019 22:12	3.5	-1	36	No	IA	NA
Jerrys Plains Village	27/06/2019 21:00	2.1	0.5	36	Yes	36	Nil
Jerrys Plains East	24/06/2019 21:49	3	-1	39	Yes	IA	Nil
Jerrys Plains East	27/06/2019 21:34	1.9	0.5	39	Yes	35	Nil
Long Point Road	20/06/2019 21:00	1.9	-1	35	Yes	IA	Nil
HVGC	24/06/2019 22:54	3.2	-1	Nil	No	IA	NA

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: LAeq,15minute HVO North - Land Acquisition Criteria – June 2019

Location	Date and Time	Wind Speed (m/s) ¹	VTG ¹	Criterion dB (A)	Criterion Applies? ²	HVO North LAeq dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	24/06/2019 22:22	3.5	-1	41	No	IA	NA
Maison Dieu	24/06/2019 22:43	3.2	-1	41	No	IA	NA
Shearers Lane	24/06/2019 23:05	3.1	-1	41	No	IA	NA
Kilburnie South	24/06/2019 21:25	3.3	-1	41	No	IA	NA
Kilburnie South	27/06/2019 22:20	2.2	0.5	41	Yes	35	Nil
Jerrys Plains Village	24/06/2019 22:12	3.5	-1	41	No	IA	NA
Jerrys Plains Village	27/06/2019 21:00	2.1	0.5	41	Yes	36	Nil
Jerrys Plains East	24/06/2019 21:49	3	-1	41	Yes	IA	Nil
Jerrys Plains East	27/06/2019 21:34	1.9	0.5	41	Yes	35	Nil
Long Point Road	20/06/2019 21:00	1.9	-1	41	Yes	IA	Nil
HVGC	24/06/2019 22:54	3.2	-1	NA	No	IA	NA

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: LA1, 1Minute HVO North - Impact Assessment Criteria – June 2019

Location	Date and Time	Wind Speed (m/s) ¹	VTG ¹	Criterion dB (A)	Criterion Applies? ²	HVO North LA1, 1min dB ^{3,4}	Exceedance ^{4,5}
Knodlers Lane	24/06/2019 22:22	3.5	-1	46	No	IA	NA
Maison Dieu	24/06/2019 22:43	3.2	-1	46	No	IA	NA
Shearers Lane	24/06/2019 23:05	3.1	-1	46	No	IA	NA
Kilburnie South	24/06/2019 21:25	3.3	-1	46	No	IA	NA
Kilburnie South	27/06/2019 22:20	2.2	0.5	46	Yes	38	Nil
Jerrys Plains Village	24/06/2019 22:12	3.5	-1	46	No	IA	NA
Jerrys Plains Village	27/06/2019 21:00	2.1	0.5	46	Yes	39	Nil
Jerrys Plains East	24/06/2019 21:49	3	-1	46	Yes	IA	Nil
Jerrys Plains East	27/06/2019 21:34	1.9	0.5	46	Yes	37	Nil
Long Point Road	20/06/2019 21:00	1.9	-1	46	Yes	IA	Nil
HVGC	24/06/2019 22:54	3.2	-1	NA	No	IA	NA

Notes:

1. Atmospheric data is sourced from the HVO Corporate or (MTW Chariton 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 (NPI), the applicability of the low frequency modification penalty has been assessed. During June 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 – June 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	24/06/2019 22:22	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Maison Dieu	24/06/2019 22:43	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Shearers Lane	24/06/2019 23:05	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Kilburnie South	24/06/2019 21:25	NM/IA	NA/NA	NA/NA	NA/NA	NA/NA
Kilburnie South	27/06/2019 22:20	NA/35	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains Village	24/06/2019 22:12	31/IA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains Village	27/06/2019 21:00	NA/36	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains East	24/06/2019 21:49	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains East	27/06/2019 21:34	NA/35	NA/NA	NA/NA	NA/NA	NA/NA
Long Point Road	20/06/2019 21:00	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
HVGC	24/06/2019 22:54	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 LA_{eq} criterion this is noted as NA (not available) and no further assessment has been undertaken;
2. As per NPI, if LC_{eq} – LA_{eq} ≥ 15 dB further assessment of low frequency noise required; and
3. As per NPI, compare measured spectrum against reference spectrum to determine if the low frequency modifying factor is triggered and application of penalty is required.

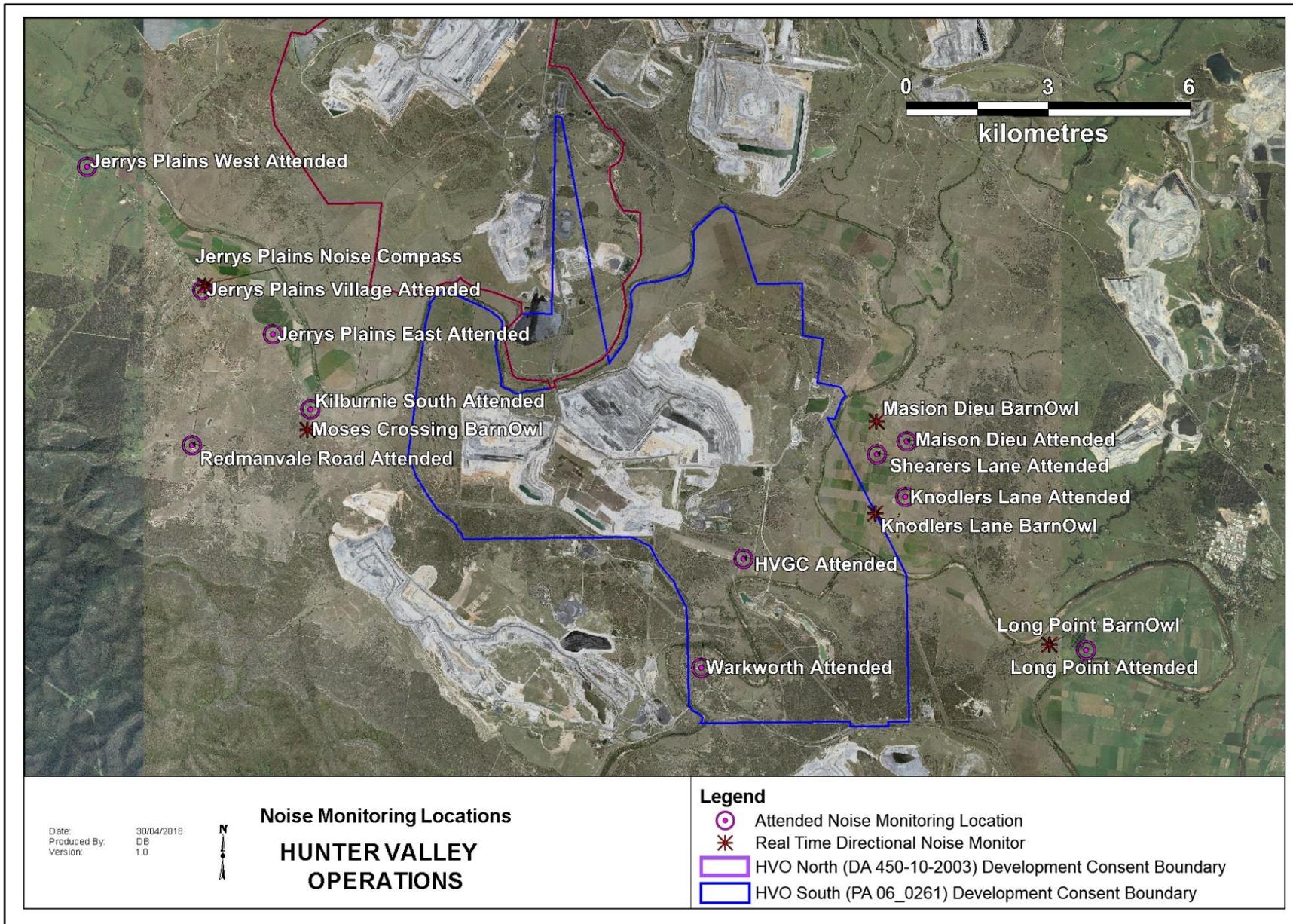


Figure 84: Noise Monitoring Location Plan

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 June, a total of 252.3 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.

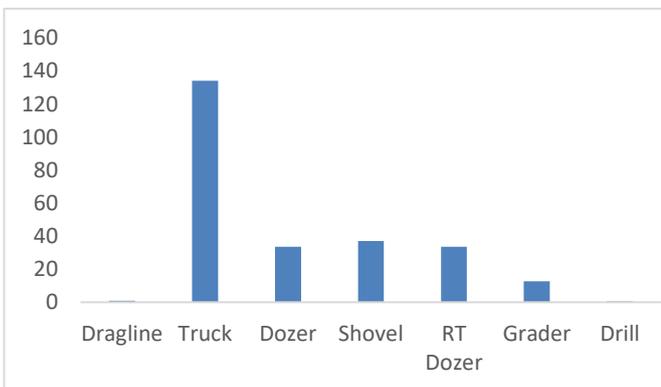


Figure 85: Operational Downtime by Equipment Type – June 2019

8.0 REHABILITATION

During June 0 Ha of land was released, 0 Ha of land was bulk shaped, 0 Ha of land was Topsoiled and 0 Ha of land was Rehabilitated. Year to date progress can be viewed in Figure 86.

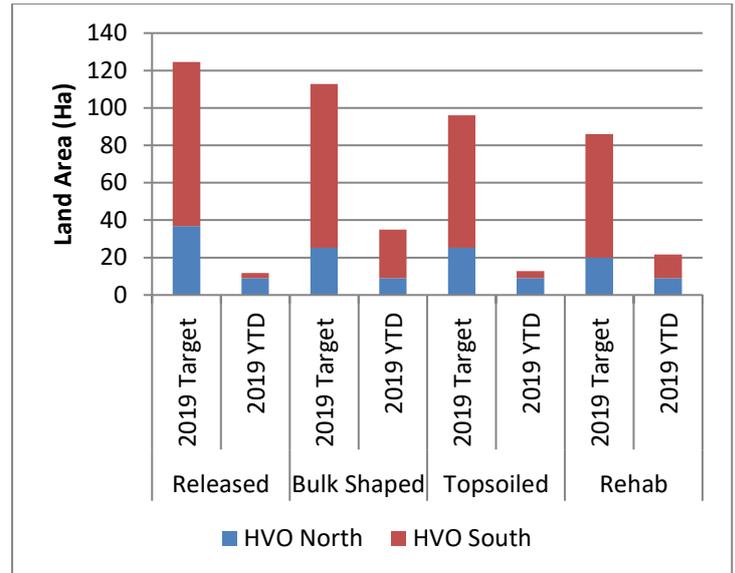


Figure 86: Rehabilitation YTD – June 2019

9.0 COMPLAINTS

During June there were two complaints received, relating to dust and blast fume.

Details of complaints received YTD are shown in Table 12.

Table 12: Complaints Summary YTD

	Noise	Dust	Blast	Lighting	Other	Total
January	-	-	-	-	-	-
May	-	-	-	-	-	-
March	-	1	-	-	-	1
April	-	1	-	-	-	1
May	-	2	-	-	-	2
June	-	1	-	-	1	2
July						
August						
September						
October						
May						
December						
Total	0	5	0	0	1	6

10.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were no reportable environmental incidents.

Appendix A: Meteorological Data

Table 13: Meteorological Data - HVO Corporate Meteorological Station – June 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)
1/06/2019	17.6	5.1	97.5	37.1	671.5	211.3	1.7	0
2/06/2019	16.8	10.2	99.6	51.4	620.5	232.2	1.1	0.2
3/06/2019	14.3	5.9	99	36.1	718.7	284.5	4.4	0.6
4/06/2019	14.8	4.7	81.5	31.9	758.1	227.4	3.6	0
5/06/2019	14.1	8.0	77.19	38.3	764.5	179.8	2.0	0
6/06/2019	17.8	4.6	90.4	13.1	526.7	230	2.3	0
7/06/2019	16.2	5.3	90	42.6	745	191.3	1.4	0
8/06/2019	13.4	8.2	100	69.1	194.7	186.7	1.0	0
9/06/2019	19.6	9.7	98.4	31.5	518	277.1	2.7	0
10/06/2019	20.3	8.1	90.9	32.6	798	-*	3.1	0
11/06/2019	23.0	11.7	81.6	25.1	513.8	237.1	3.0	0
12/06/2019	21.3	8.2	55.87	21.1	712.6	300.3	3.7	0
13/06/2019	22.6	11.5	84.4	19.2	644.4	282.2	4.4	0
14/06/2019	17.8	6.9	95.4	12.7	672.5	266.6	2.0	0
15/06/2019	16.8	3.1	88.6	6.0	517.4	191.6	1.2	0
16/06/2019	13.9	3.6	88.1	46.0	587.3	190.4	0.9	0
17/06/2019	15.9	8.9	86	40.1	771.9	178.6	1.6	0
18/06/2019	15.0	9.9	100	57.5	277.4	286.9	2.3	0.2
19/06/2019	15.9	5.6	80.4	17.6	519.2	213.9	2.1	0
20/06/2019	15.0	1.4	94	36.2	711.6	182.8	1.2	0
21/06/2019	12.9	2.8	87.1	13.3	490	247.3	2.1	0
22/06/2019	13.9	0.0	85.5	29.5	788.6	216.1	1.5	0
23/06/2019	13.4	5.4	94.9	35.5	766	143.1	1.6	0.8
24/06/2019	13.8	6.9	100	62.6	798.8	127.9	2.0	3.2
25/06/2019	13.9	8.9	100	70.2	716.6	124.8	1.5	2.8
26/06/2019	16.8	8.7	100	35.6	681.1	128.2	2.4	0.4
27/06/2019	17.5	8.2	100	50.3	650	115.2	2.1	0
28/06/2019	17.3	6.1	100	46.2	664.9	159.1	1.2	0.2
29/06/2019	20.1	5.2	100	30.0	649.9	211.6	1.4	0.2
30/06/2019	17.5	8.8	77	18.4	829	281.9	3.7	0

*NAN – data not available