Hunter Valley Operations

Community Consultative Committee

Business Papers – July 2017

Materials ahead of meeting of the committee on 13 July 2017

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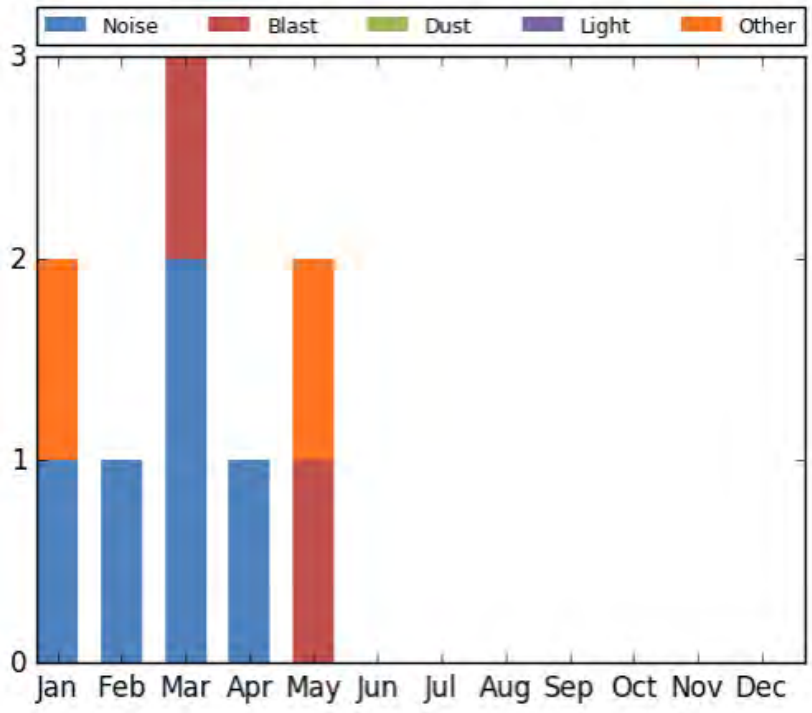
1.0 Complaints

Complaints overview for 2017

Hunter Valley Operations Monthly Complaints Summary

	Noise	Dust	Blast	Lighting	Other	Total
January	1	0	0	0	1	2
February	1	0	0	0	0	1
March	2	0	1	0	0	3
April	1	0	0	0	0	1
May	0	0	1	0	1	2
June	-	-	-	-	-	-
July	-	-	-	-	-	-
August	-	-	-	-	-	-
September	-	-	-	-	-	-
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	-	-	-	-	-	-
Total	5	0	2	0	2	9



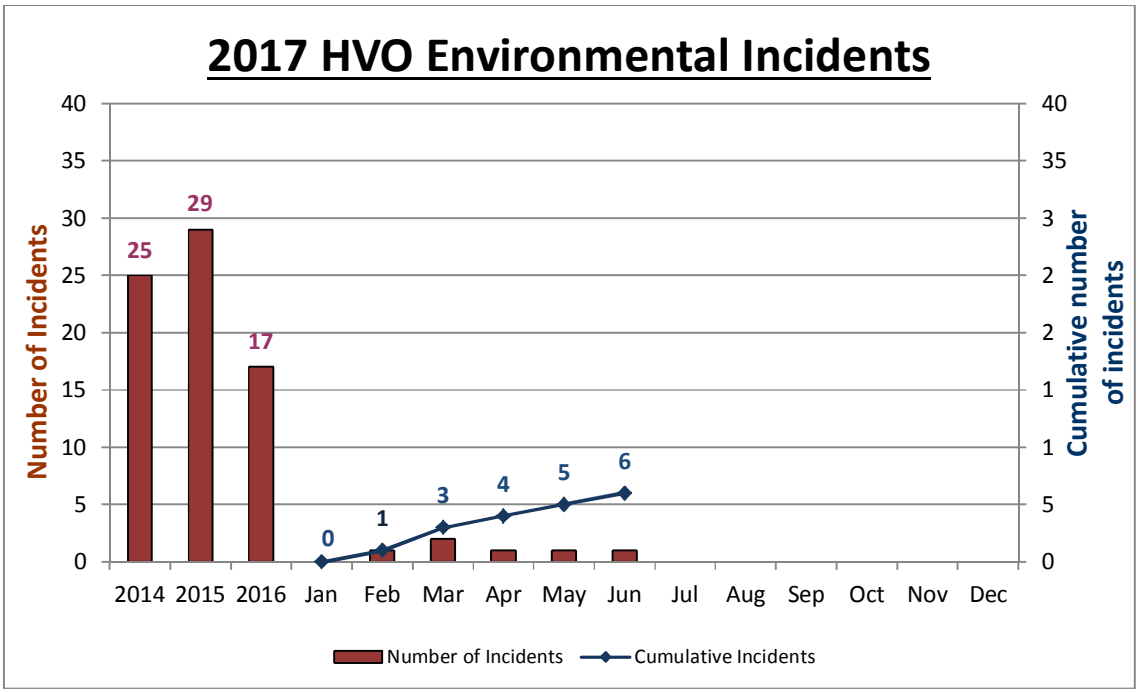
Complaint details for the period 22 February 2017 to 20 June 2017

Date	Time	Type	Location	Method Received	Monitoring Indicates Exceedance?#
11/03/2017	22:53	Noise	Jerrys Plains	Complaints Line	No
19/03/2017	23:09	Noise	Jerrys Plains	Complaints Line	Yes*
29/03/2017	15:50	Blast/Odour	Long Point	Via phonecall	No
20/04/2017	9:05	Noise	Jerrys Plains	Complaints Line	No
11/05/2017	18:14	Feral animals	Jerrys Plains	Complaints Line	No
17/05/2017	10:21	Blast	Redmanvale Road	Complaints Line	No

* Real time noise monitoring alerts were generated prior to the time of complaint. Noise levels were reduced following the alarm .

2.0 Incidents

Incident overview for 2017 (YTD as at 20 June 2017)



Incident details for the period 22 February 2017 to 20 June 2017

Date	Details	Key Actions	Aspect
27/03/2017	**Excavation in windrow allowing wet slurry to escape ROM** An excavation in the windrow encapsulating the ROM has provided a pathway for wet slurry to leave ROM area and enter the mine water system. All materials contained within the mine, no potential for offsite flow.	• Hole in windrow was repaired	Water

Date	Details	Key Actions	Aspect
30/03/2017	**Sump overtopping to Bayswater Creek** On 30/03/2017 at approximately 15:25 a sediment sump at the Hunter Valley Load Point (HVLP) was observed to be overtopping via the sump spillway into Bayswater Creek, following a high intensity, short duration rainfall event. Sampling of the sump water and receiving waters in Bayswater Creek was undertaken on 30 March 2017 (follow-up sampling completed on 31 March 2017). The volume of water that discharged from the HVLP Sump is unable to be determined exactly, however based on catchment size, rainfall intensity, residual capacity of the sump prior to the storm event and a conservative pump duty rate of 30 m3/hr it is estimated that the volume of water discharged is less than 0.24ML (or estimated at less than 0.14ML based on maximum pump duty rate of 80 m3/hr). There is no evidence of any environmental harm and there was low risk of potential for environmental harm given the nature of the water in the sediment sump and the degraded state of Bayswater Creek. An existing improvement project is underway to increase the size and pumping capacity of the HVLP sediment sump. These works have commenced and are scheduled for completion in 2017. The incident was reported to the Department of Planning and Environment and the NSW EPA. In accordance with environmental regulatory obligations HVO also enacted its Pollution Incident Response Management Plan.	• Increase water storage and transfer capacity. Additional temporary storage has been created with commencement of the improvement project. Completion of the works in 2017 will see additional and permanent capacity created.	Water
12/04/2017	**Hole dug in windrow on HVO ROM loop** An additional hole was dug in the HVO ROM windrow allowing wet slurry to leave the ROM area and enter the mine water system.	• Hole in windrow was repaired. • Area drainage redesigned to redirect water away from ROM bins.	Water
08/05/2017	**Mine water discharge to ground due to pipeline damage** Cattle damage to breather valve on Lake James to Barrys mine water pipeline resulted in minor discharge of water to adjacent ground. Mine water was retained onsite due to natural geography. No offsite water discharge occurred.	• Existing Capital project in 2017 and 2018 plan to further implement secondary containment and leak detection on pipelines across HVO.	Water
09/06/2017	**Level 3 Fume event from WN43UPG08A Blast** A production shot WN43UPG08A initiated at 13:00 on 09/06/2017 in the northern end of Westpit generated a level 3 blast fume. The fume dissipated over the pit and did not leave site. Drill holes were dipped ahead of loading and were found to be dry and were loaded accordingly. Loading was halted on the third day due to degradation in bench conditions following rainfall overnight. Prior to rainfall 87% of the holes were loaded with a heavy ANFO product (Fortan 10). After rainfall explosives which are designed to minimise post blast fume were loaded into the remaining holes. There was no evidence of slumping occurring in any of the holes. The shot was in the ground for a maximum of four days before being fired. The fume is believed to be caused by an issue with the decking of the shot, whereby the gravel layer in between had caused damage to the product below or misalignment of decking material throughout the shot. This is supported by the delay in fume appearing after the shot had been fired.	• Hole by hole recording of product placed and stemming on decked shots will be trialled in sections and may assist in QA of decking placement • Higher frequency of inspections to ensure QA/QC being maintained throughout shot.	Blast

3.0 Community Investment

Coal & Allied provides investment and support to many local organisations and programmes through the Community Development Fund and the Site Donations Committee, contributions are summarised below.

Community Development Fund

Partner	Programme	Value
Sirolli Institute	Enterprise Facilitation	$45,000
Upper Hunter Where There's A Will Foundation	Positive Education Programme	$80,000
University of Newcastle	Science and Engineering Challenge, and SMART Programme (2015-2017)	$83,952
Upper Hunter Education Fund	HSC Study Camps and Upper Hunter Education Fund Scholarships (2015-2017)	$84,000
Singleton Business Chamber	Business Development Officer	$72,000
University of Newcastle	University of Newcastle Scholarships	$80,000
Outward Bound Australia	Youth Leadership Programme (2015-2017)	$245,332
Singleton Council	Singleton Economic Development and Funding Coordinator (2015-2017)	$100,000
Ungooroo Aboriginal Corporation	Health Services Programme (2017-2018)	$110,000
Bulga Rural Fire Service	Electronic Datasign	$24,500
Australian Christian College Singleton	STEM Lego Robotics Programme	$10,420
Jerrys Plains Public School	Ready 4 School Programme (2017-2018)	$58,000
Tocal College	Tocal Steers Challenge (2015-2017)	$25,725
Milbrodale Public School	Early Learning Programme (2017-2018)	$64,000

Site Donations – 2017

The HVO site donations committee meets monthly to consider applications from a range of local community organisations and groups. Listed below are the organisations, HVO has supported in 2017.

Organisation / Programme	Value
Rotary Club of Singleton on Hunter – 2017 Singleton Art Prize	$5,000
Australian Families of the Military – Mental Health Retreat	$600
Wildlife Aid Inc – Injured wildlife rescue	$2,000
Singleton Business Chamber - International Women's Day event	$775
Cancer Council NSW – Singleton Relay for Life	$2,500
Singleton Junior Rugby League Club – Sporting equipment	$2,500
Singleton Junior Rugby Club – 2017 Season sponsorship	$2,500
Northern Agriculture Association Inc – 2017 Singleton Show	$3,125
Glendon Brook Hall Inc – Safety fencing for children's play area	$2,000
Singleton Pony Club – Club house improvements	$500
Singleton Theatrical Society – 2017 production 'Oliver Twist'	$1,500
Singleton Historical Society & Museum Inc - Consumables	$1,000
Total	**$24,000**

4.0 Environmental monitoring

Monthly summaries of environmental monitoring – February 2017 – May 2017.

February 2017
Attached as **Appendix A**

March 2017
Attached as **Appendix B**

April 2017
Attached as **Appendix C**

May 2017
Attached as **Appendix D**

5.0 Environmental Documents

Environmental documents uploaded to the RTCA website since March 2017 CCC are listed below:

3/03/2017	Hunter Valley Operations North Development Consent DA 450-10-2003 Current
3/03/2017	Hunter Valley Operations Environmental Monitoring Report January 2017
23/03/2017	Hunter Valley Operations Environmental Protection Licence 640 Monthly Meaningful Summary February 2017
23/03/2017	Hunter Valley Operations Environmental Protection Licence 640 Monthly Obtained Data Summary February 2017
30/03/2017	Annual Environmental Review - Appendix 5 Rehabilitation Monitoring Report
31/03/2017	Hunter Valley Operations 2016 Annual Environmental Review - Appendices 1-4
31/03/2017	Hunter Valley Operations 2016 Annual Environmental Review
30/03/2017	Hunter Valley Operations Environmental Monitoring Report February 2017
6/04/2017	Hunter Valley Operations Independent Environmental Audit Report and Appendices December 2016
6/04/2017	Hunter Valley Operations Bushfire Management Plan 2015
2/05/2017	Hunter Valley Operations Community Consultative Committee Meeting Minutes November 2016
2/05/2017	Hunter Valley Operations Environmental Protection Licence 640 Monthly Meaningful Summary March 2017
2/05/2017	Hunter Valley Operations Environmental Protection Licence 640 Monthly Obtained Data Summary March 2017
26/05/2017	Hunter Valley Operations Environmental Monitoring Report March 2017

26/05/2017	Hunter Valley Operations Community Consultative Committee Meeting Minutes Endorsed March 2017
19/05/2017	Hunter Valley Operations Environmental Protection Licence 640 Monthly Meaningful Summary April 2017
19/05/2017	Hunter Valley Operations Environmental Protection Licence 640 Monthly Obtained Data Summary April2017
16/06/2017	Hunter Valley Operations Environmental Monitoring Report April 2017
20/06/2017	Hunter Valley Operations South Modification 5 Response to Submissions Part 1
20/06/2017	Hunter Valley Operations South Modification 5 Response to Submissions Part 2

COAL & ALLIED

Managed by Rio Tinto Coal Australia

Business Papers – Appendix A

Environmental Monitoring Report – February 2017

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Hunter Valley Operations

Monthly Environmental Report

February 2017

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	**Environmental Graduate**	**Draft**	**23/03/2017**
1.0	**Acting Environmental Specialist**	**Final**	**30/03/2017**

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 February to 28th February 2017.

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 2017 trend and historical trend are shown in Figure 1.

Table 1: Monthly Rainfall HVO

2017	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
February	34.6	61.2

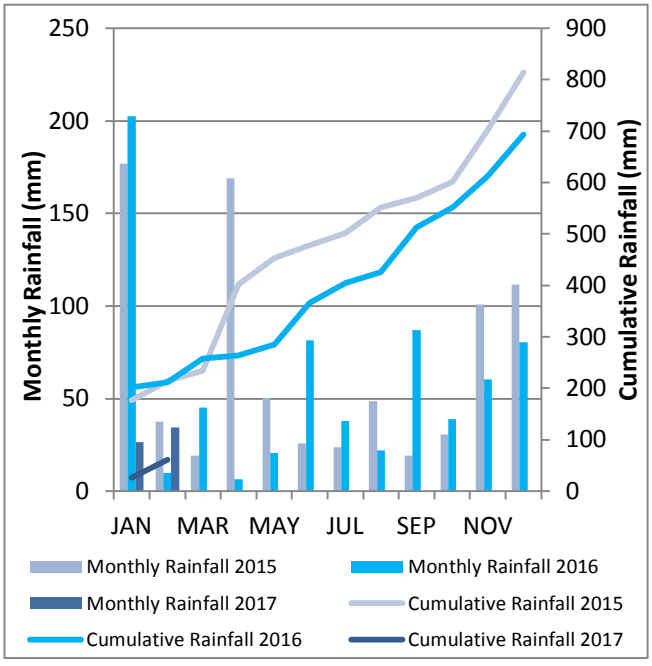

Figure 1: Year to Date Rainfall Summary 2017

2.1.2 Wind Speed and Direction

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

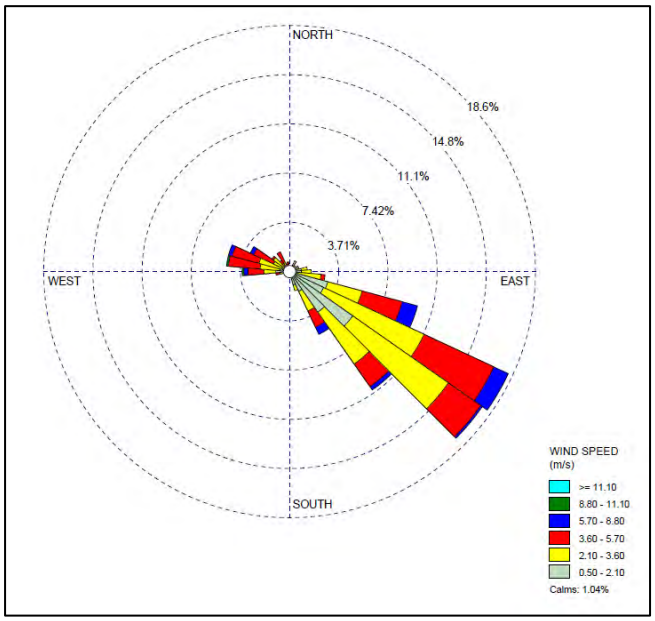

Figure 2: HVO Corporate Wind Rose – February 2017

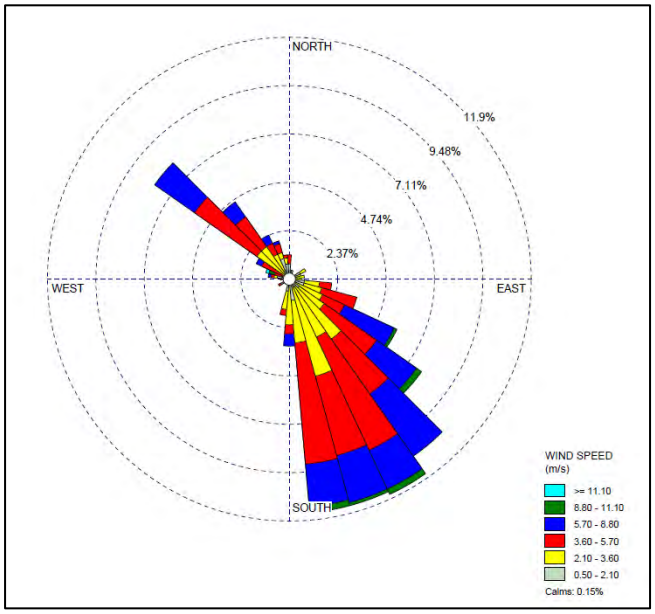

Figure 3: HVO Cheshunt Wind Rose – February 2017

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 monitor recorded a monthly result above the long term impact assessment criteria of 4.0 g/m^2 per month. There is no evidence to suggest that the D122 result is contaminated. Accordingly, this result will be included in the annual average calculation.

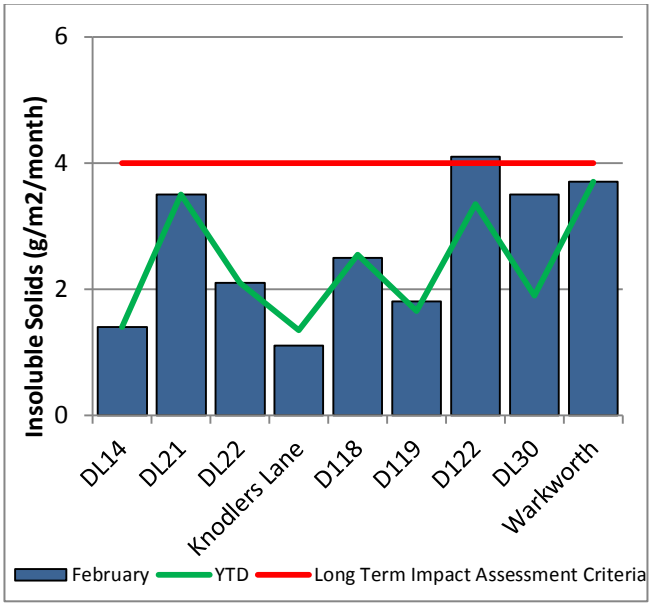

Figure 5: Depositional Dust Results – February 2017

2.3 Suspended Particulates

Suspended particulates are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM_{10}). The location of these monitors can be found in Figure 4. Each HVAS was run for 24 hours on a six-day cycle in accordance with EPA requirements.

2.3.1 HVAS PM_{10} Results

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

The Kilburnie South, Maison Dieu, Warkworth and Gliding Club HVAS monitors failed to collect valid samples on the 17th of February due to a power outage (likely related to storm activity).

On 05/02/2017 two HVAS PM_{10} units recorded results greater than the short term (24hr) PM_{10} impact assessment criteria; Long Point (57 µg/m^3) and Gliding Club (60 µg/m^3).

Investigation indicates that that the likely HVO contribution to the results at Long Point and Gliding Club on the 5th February is less than 75%. Accordingly, no further action is required (as per approved Air Quality Monitoring Programme).

On 11/02/2017 two HVAS PM_{10} units recorded results greater than the short term (24hr) PM_{10} impact assessment criteria; Knodlers Lane (58 µg/m^3) and Gliding Club (67 µg/m^3).

Investigation indicates that that the likely HVO contribution to the results at Knodlers Lane and Gliding Club on the 11th February is less than 75%. Accordingly, no further action is required.

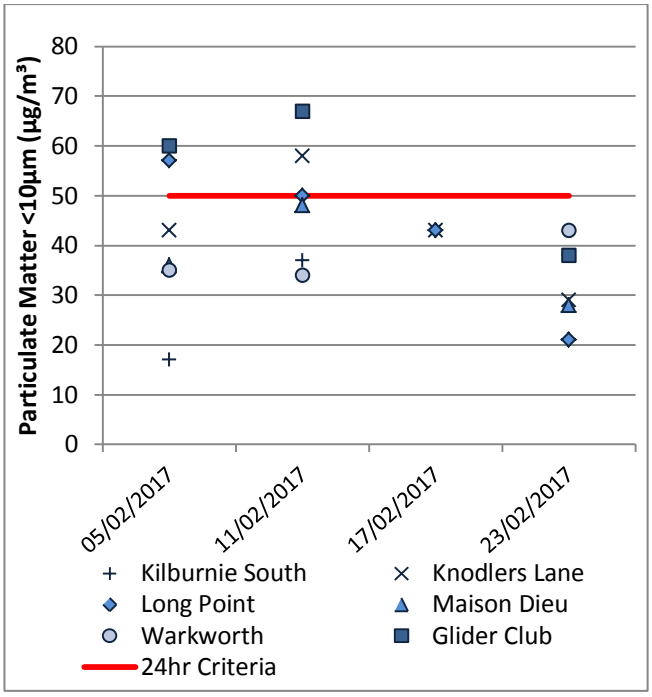

Figure 6: Individual PM_{10} Results – February 2017

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

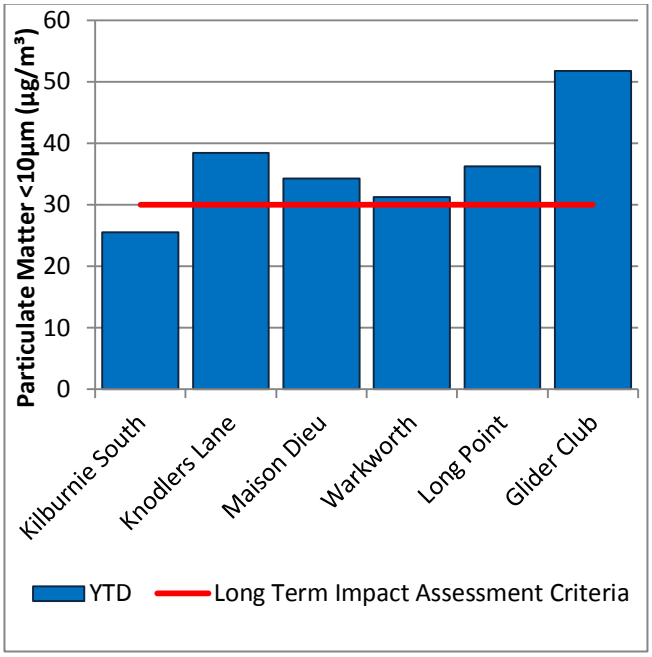

Figure 7: Year To Date Average PM_{10} – February 2017

2.3.2 TSP Results

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

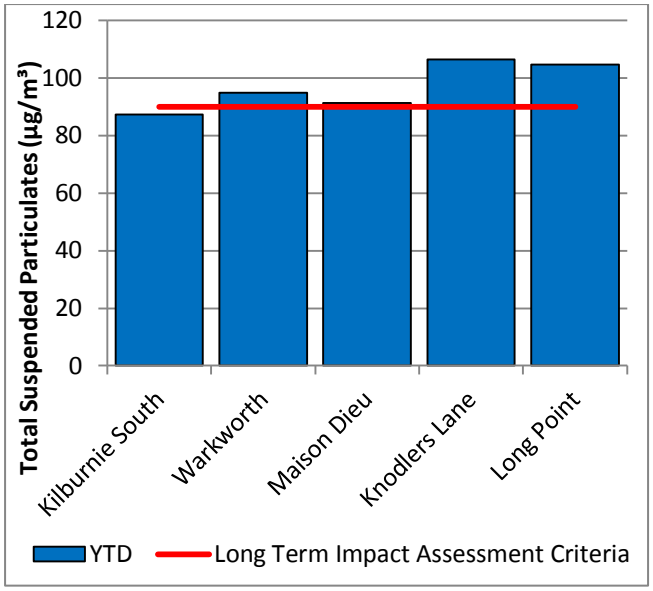

Figure 8: Year To Date Average Total Suspended Particulates - February 2017

2.3.3 Real Time PM_{10} Results

Hunter Valley Operations maintains a network of real time PM_{10} monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits. Results from real time PM_{10} monitoring are used as a reactive measure to guide mining operations to ensure compliance with the relevant conditions of the project approval.

Results for real time dust sampling are shown in Figure 9, including the daily 24 hour average PM_{10} result and the 24 hour YTD PM_{10} average. There were three results recorded which exceeded the short term (24hr) criteria in the approvals. A measurement of 50.3µg/m³ was recorded at the Knodlers Lane TEOM location, a measurement of 61.2 µg/m³ was recorded at the Maison Dieu TEOM and a measurement of 52.3µg/m³ was recorded at Warkworth TEOM location on the 12th February.

An investigation was undertaken to assess air quality and meteorological conditions on the day, and to assess the maximum potential HVO contribution to the measured result. The investigation determined that HVO's maximum potential contribution to measured levels at Knodlers Lane, Maison Dieu and Warkworth is estimated at less than 75%. Accordingly, no further action is required (as per approved Air Quality Monitoring Programme).

Data was not available on the 18th February (Maison Dieu) due to technical issues.

2.3.4 Real Time Alarms for Air Quality

During February, the real time monitoring system generated 102 automated air quality related alarms. 27 alarms were related to adverse weather conditions and 75 alarms related to PM_{10}.

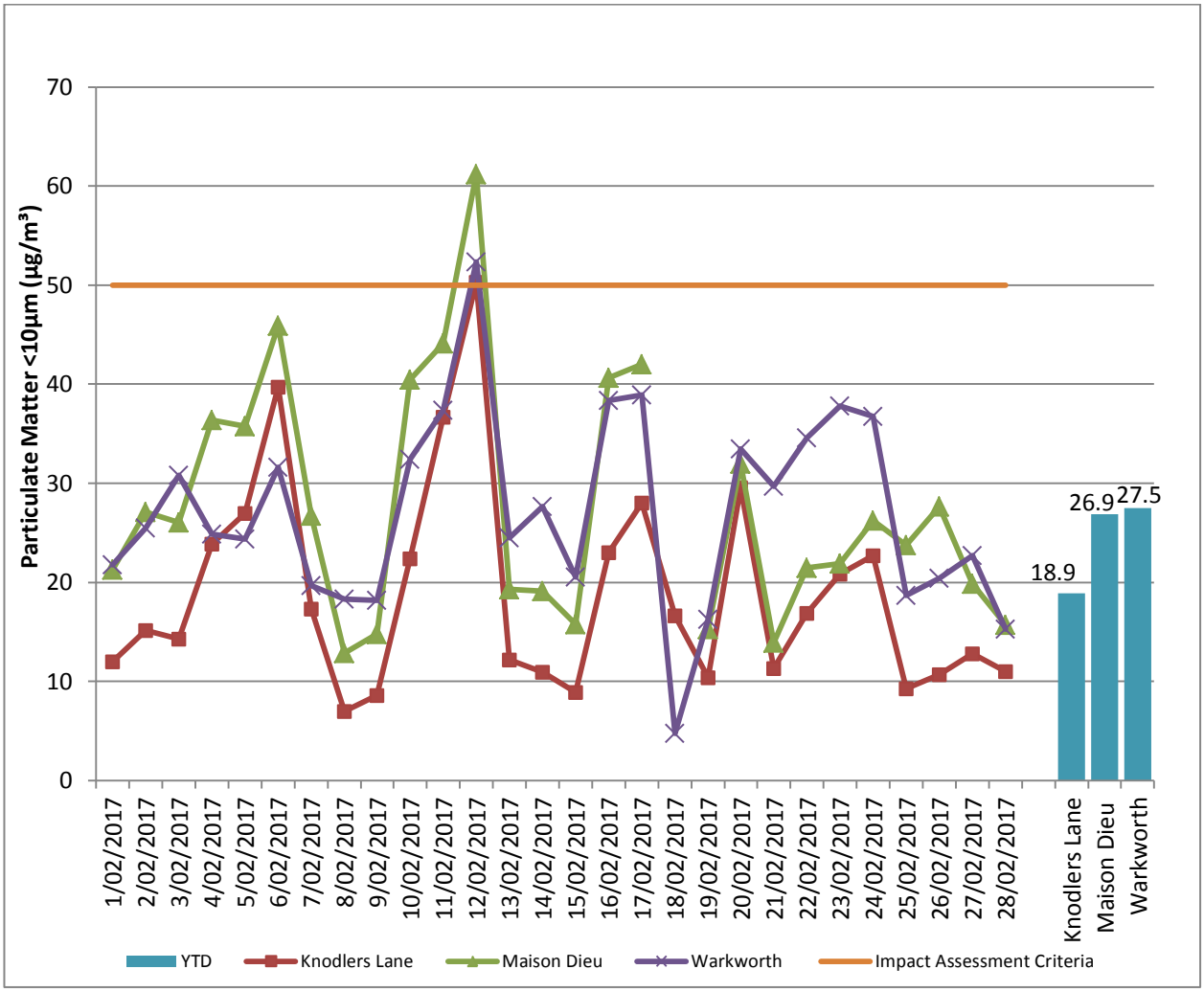

Figure 9: Real Time PM_{10} 24hr average and YTD Average – February 2017

3.0 WATER QUALITY

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

3.1.1 Surface Water

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

Results of monitoring on Site Dams and the Hunter River as well as other natural tributaries are provided on a quarterly basis, results will appear in the March 2017 report.

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 did not extract any water from the Hunter River.

3.1.3 HRSTS Discharge

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

During the reporting period no water was discharged under the HRSTS.

3.2.1 Groundwater Monitoring Results

Groundwater monitoring is undertaken on a quarterly basis in accordance with the HVO Water Management Plan and Ground Water Monitoring Programme. Results of groundwater monitoring are reported quarterly and as such will be reported in the March 2017 monthly report.

4.0 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 15.

During February, 24 blasts were initiated at HVO. Figure 10 through to Figure 14 show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in Table 2.

Table 2: 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 one blast exceeded the 115 dB(L) threshold for airblast overpressure. A blast recorded on the 25st February at 12:37pm, recorded an elevated airblast overpressure reading of 115.19dB(L) at the Knodlers Lane blast monitoring location. No blasts exceeded the 5mm/s criterion for ground vibration.

4.1 Blast Monitoring Results

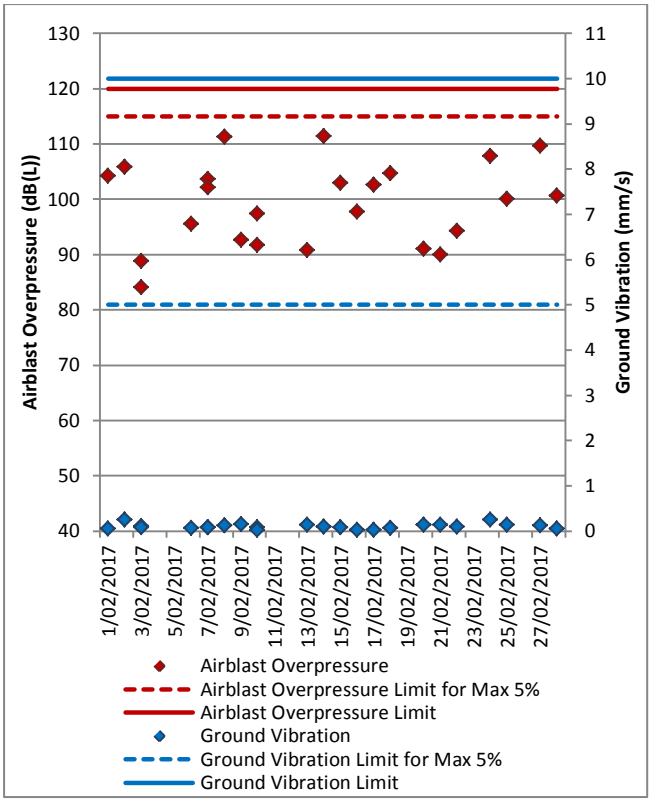

Figure 10: Moses Crossing Blast Monitoring Results – February 2017

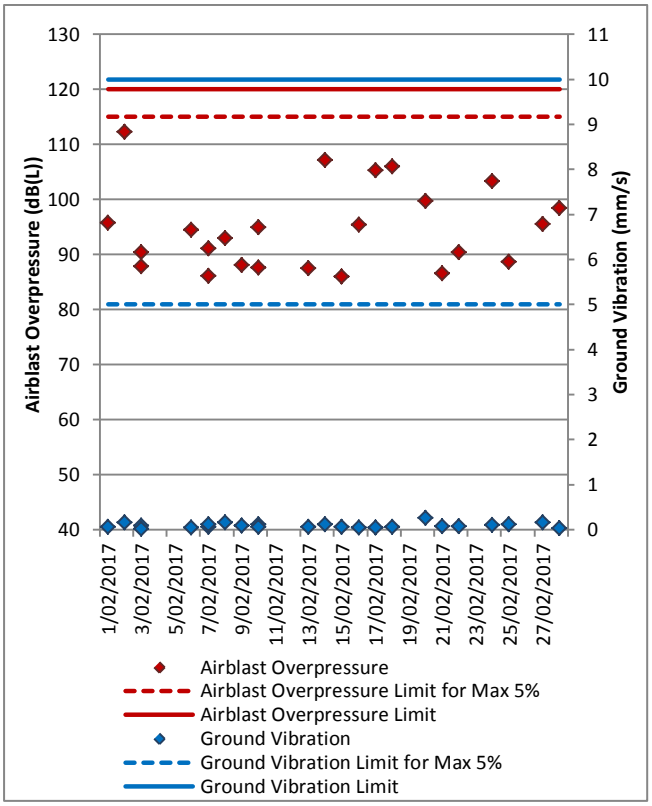

Figure 11: Jerrys Plains Blast Monitoring Results – February 2017

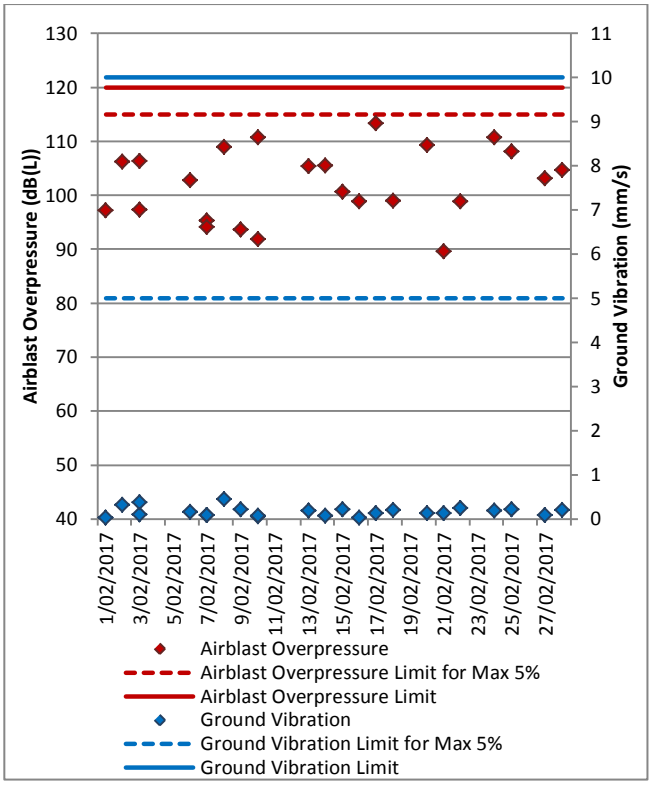

Figure 12: Maison Dieu Blast Monitoring Results - February 2017

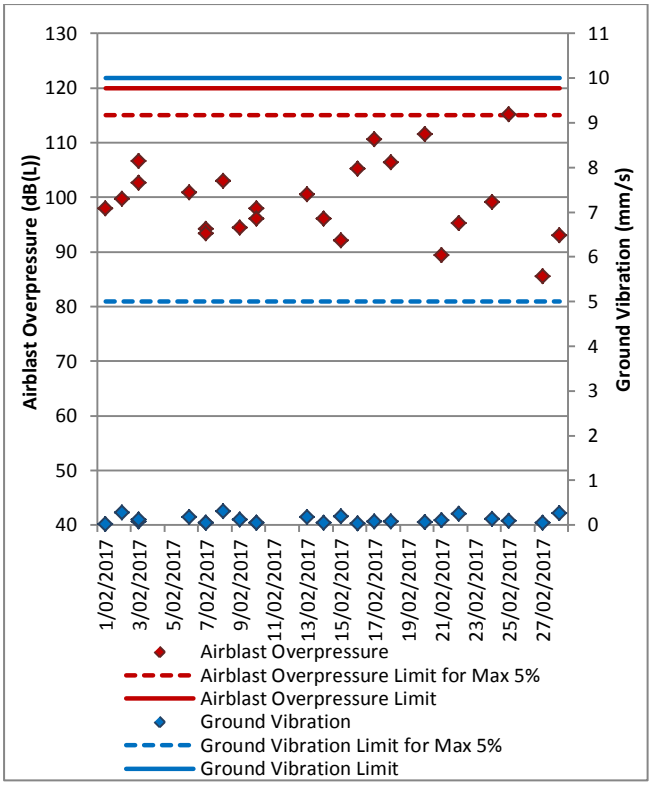

Figure 14: Knodlers Lane Blast Monitoring Results – February 2017

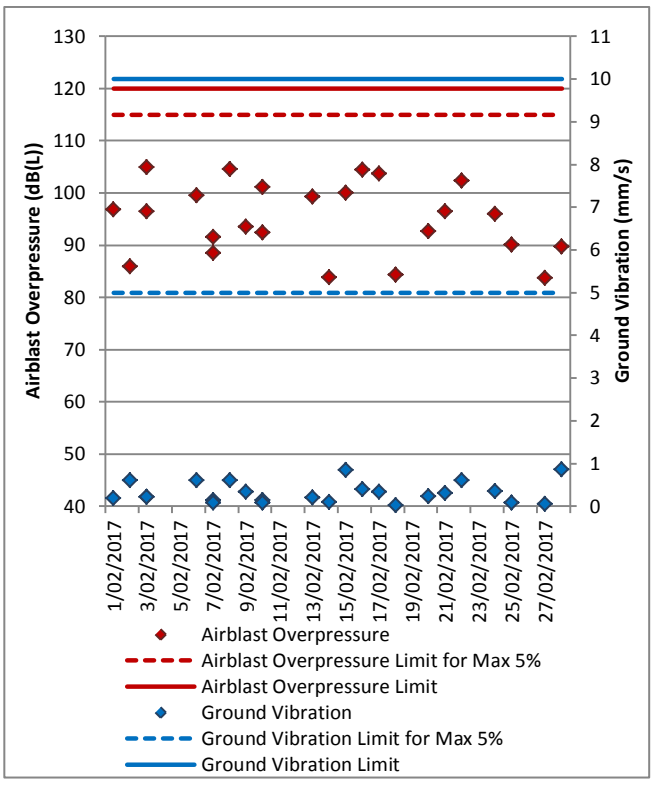

Figure 13: Warkworth Blast Monitoring Results - February 2017

Figure 15: 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 16.

5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding HVO on the night of 9th of February 2017. Monitoring results are detailed in Table 3 to Table 8.

Table 3: $L_{Aeq,\ 15\ minute}$ HVO South - Impact Assessment Criteria – February 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO South L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	9/02/2017 21:02	2	3	37	No	IA	NA
Maison Dieu	9/02/2017 21:25	1.5	3	37	No	IA	NA
Shearers Lane	9/02/2017 21:48	1.7	3	41	No	IA	NA
Kilburnie South	9/02/2017 22:36	0.9	3	36	No	IA	NA
Jerrys Plains Village	9/02/2017 21:30	1.5	3	35	No	IA	NA
Jerrys Plains East	9/02/2017 21:07	2	3	35	No	IA	NA
Long Point Road	9/02/2017 21:32	2.3	3	35	No	IA	NA
HVGC	9/02/2017 23:10	0.9	3	55	No	32	NA

Table 4: $L_{Aeq,\ 15\ minute}$ HVO South - Land Acquisition Criteria – February 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO South L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	9/02/2017 21:02	2	3	41	No	IA	NA
Maison Dieu	9/02/2017 21:25	1.5	3	41	No	IA	NA
Shearers Lane	9/02/2017 21:48	1.7	3	41	No	IA	NA
Kilburnie South	9/02/2017 22:36	0.9	3	41	No	IA	NA
Jerrys Plains Village	9/02/2017 21:30	1.5	3	40	No	IA	NA
Jerrys Plains East	9/02/2017 21:07	2	3	40	No	IA	NA
Long Point Road	9/02/2017 21:32	2.3	3	40	No	IA	NA
HVGC	9/02/2017 23:10	0.9	3	NA	No	32	NA

Table 5: $L_{A1, 1minute}$ HVO South - Impact Assessment Criteria – February 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO South $L_{A1, 1min}$ dB[2,4]	Exceedance[3]
Knodlers Lane	9/02/2017 21:02	2	3	45	No	IA	NA
Maison Dieu	9/02/2017 21:25	1.5	3	45	No	IA	NA
Shearers Lane	9/02/2017 21:48	1.7	3	45	No	IA	NA
Kilburnie South	9/02/2017 22:36	0.9	3	45	No	IA	NA
Jerrys Plains Village	9/02/2017 21:30	1.5	3	45	No	IA	NA
Jerrys Plains East	9/02/2017 21:07	2	3	45	No	IA	NA
Long Point Road	9/02/2017 21:32	2.3	3	45	No	IA	NA
HVGC	9/02/2017 23:10	0.9	3	NA	No	NA	NA

Notes
1. Noise emission limits apply for winds up to 3 metres per second (at a height of 10m), or vertical temperature gradients of up to 3 degrees/100m and wind speeds of up to 2 m/s (at a height of 10m);
2. Estimated or measured $L_{Aeq,15minute}$ dB attributed to HVO South Pit Area;
3. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
4. Bolded results in red indicate exceedance of criteria;
5. Atmospheric data is sourced from the HVO Corporate weather station using logged met data;
6. Criterion may or may not apply due to rounding of meteorological data values

Table 6: $L_{Aeq, 15minute}$ HVO North – Impact Assessment Criteria – February 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO North L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	9/02/2017 21:02	2.0	3	35	Yes	IA	Nil
Maison Dieu	9/02/2017 21:25	1.5	3	35	Yes	IA	Nil
Shearers Lane	9/02/2017 21:48	1.7	3	35	Yes	IA	Nil
Kilburnie South	9/02/2017 22:36	0.9	3	39	Yes	34	Nil
Jerrys Plains Village	9/02/2017 21:30	1.5	3	36	Yes	IA	Nil
Jerrys Plains East	9/02/2017 21:07	2	3	39	Yes	<30	Nil
Long Point Road	9/02/2017 21:32	2.3	3	35	Yes	IA	Nil
HVGC	9/02/2017 23:10	0.9	3	NA	No	IA	NA

Table 7: $L_{Aeq,15minute}$ HVO North - Land Acquisition Criteria – February 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO North L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	9/02/2017 21:02	2	3	41	Yes	IA	Nil
Maison Dieu	9/02/2017 21:25	1.5	3	41	Yes	IA	Nil
Shearers Lane	9/02/2017 21:48	1.7	3	41	Yes	IA	Nil
Kilburnie South	9/02/2017 22:36	0.9	3	41	Yes	34	Nil
Jerrys Plains Village	9/02/2017 21:30	1.5	3	41	Yes	IA	Nil
Jerrys Plains East	9/02/2017 21:07	2	3	41	Yes	<30	Nil
Long Point Road	9/02/2017 21:32	2.3	3	41	Yes	IA	Nil
HVGC	9/02/2017 23:10	0.9	3	NA	No	IA	NA

Table 8: $L_{A1, 1Minute}$ HVO North - Impact Assessment Criteria – February 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO North $L_{A1, 1min}$ dB[2,4]	Exceedance[3]
Knodlers Lane	9/02/2017 21:02	2	3	46	Yes	IA	Nil
Maison Dieu	9/02/2017 21:25	1.5	3	46	Yes	IA	Nil
Shearers Lane	9/02/2017 21:48	1.7	3	46	Yes	IA	Nil
Kilburnie South	9/02/2017 22:36	0.9	3	46	Yes	40	Nil
Jerrys Plains Village	9/02/2017 21:30	1.5	3	46	Yes	IA	Nil
Jerrys Plains East	9/02/2017 21:07	2	3	NA	Yes	35	NA
Long Point Road	9/02/2017 21:32	2.3	3	46	Yes	IA	Nil
HVGC	9/02/2017 23:10	0.9	3	NA	No	IA	NA

Notes
1. Noise emission limits apply for winds up to 3 metres per second (at a height of 10m), or vertical temperature gradients of up to 3 degrees/100m and wind speeds of up to 2 m/s (at a height of 10m);
2. Estimated or measured $L_{Aeq,15minute}$ dB attributed to HVO North Area;
3. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
4. Bolded results in red indicate exceedance of criteria;
5. Atmospheric data is sourced from the HVO Corporate weather station using logged met data;
6. Criterion may or may not apply due to rounding of meteorological data values

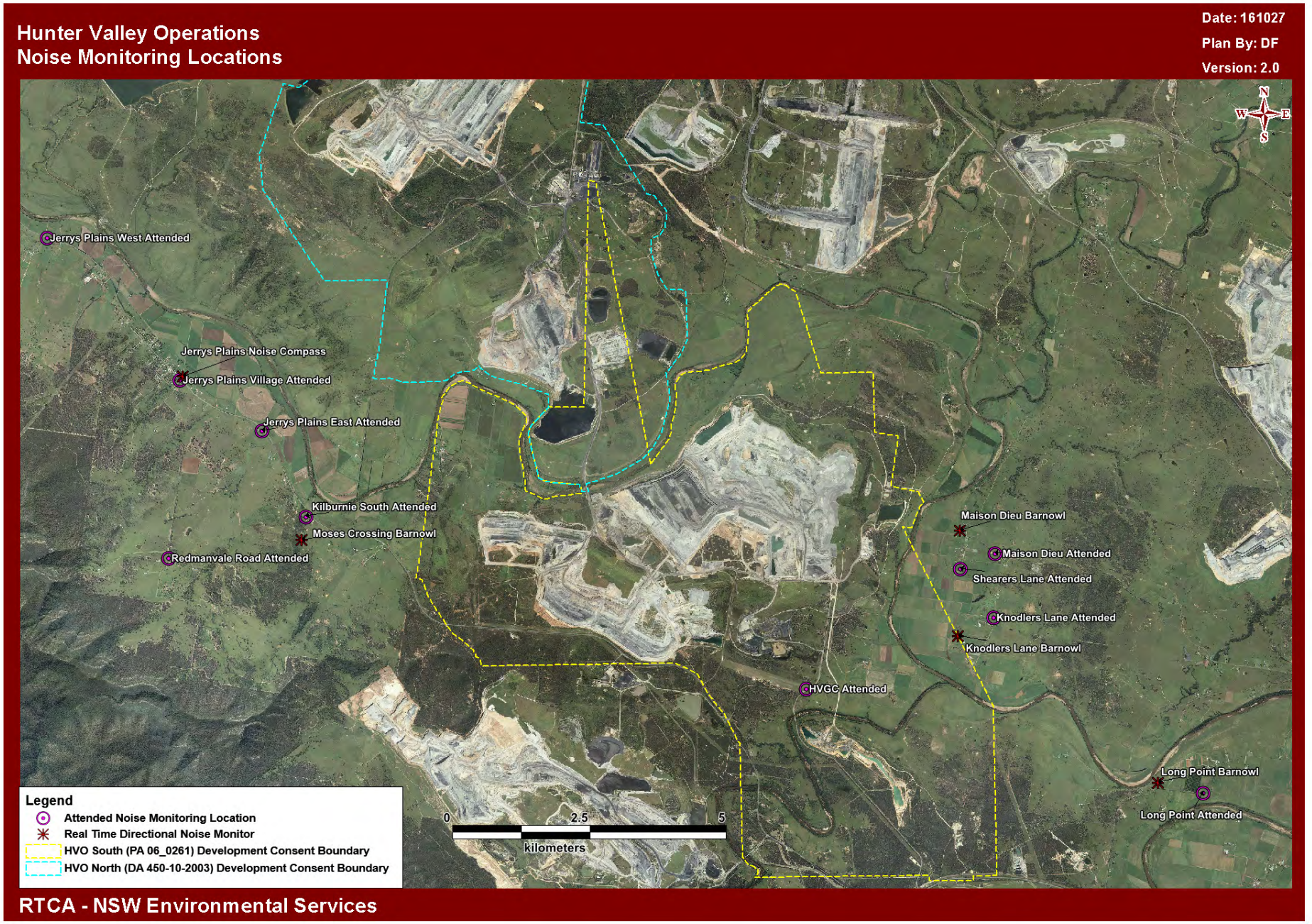

Figure 16: Noise Monitoring Location Plan

5.2 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.

HVO's Planning approvals stipulate noise criteria which must be met during the life of the development(s). The approvals however do not stipulate requirements or give guidance on noise affectation, or the frequency of any elevated noise event which would constitute noise affectation. Page 6 of the NSW Industrial Noise Policy (INP) comments that criteria "*seek to restrict the risk of people being highly annoyed to less than 10 percent, and to meet this for at least 90 percent of the time*".

For the purposes of assessing the effectiveness of the noise management system, HVO applies a similar approach with regard to the frequency of any elevated noise event. 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.

6.0 OPERATIONAL DOWNTIME

During February, a total of 991.3 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 17.

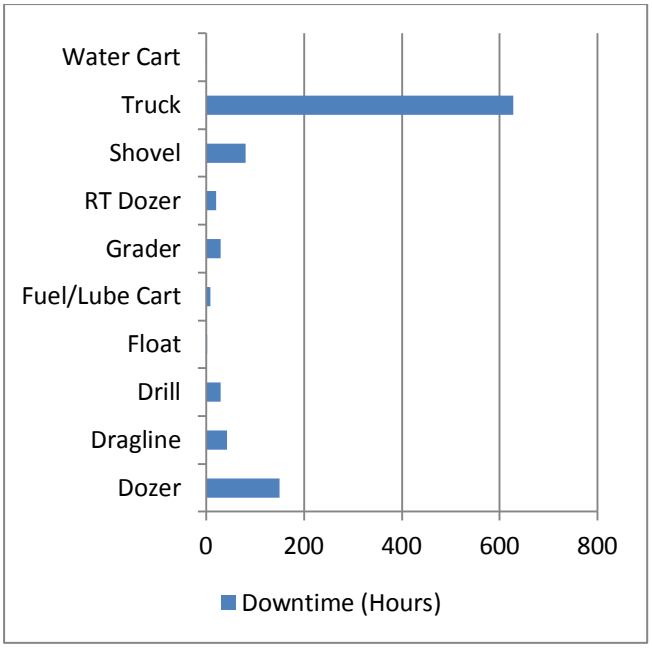

Figure 17: Operational Downtime by Equipment Type – February 2017

7.0 REHABILITATION

During February, 35.8 Ha of land was released, 15.8 Ha of land was bulk shaped, 5.1 Ha of land was topsoiled and 5.1 Ha of land was composted. Year to date progress can be viewed in Figure 86.

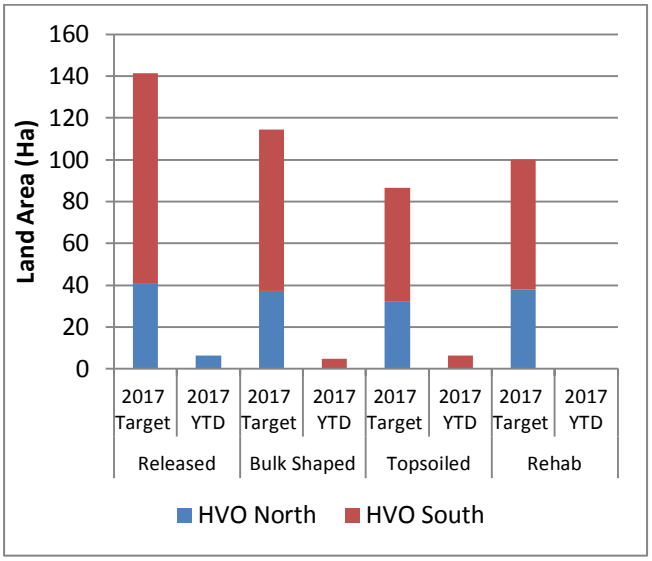

Figure 18: Rehabilitation YTD - February 2017

8.0 COMPLAINTS

One complaint was received during the reporting period. Details of complaints received YTD are shown in Figure 19 below.

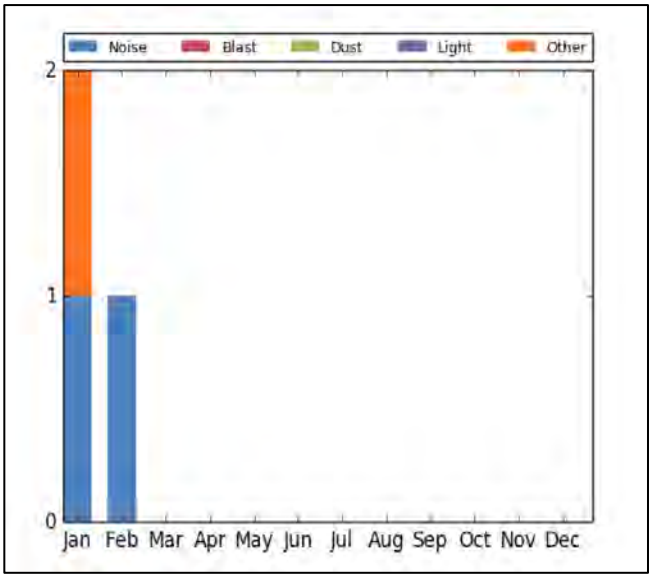

Figure 19: Complaints Graph – February 2017

9.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were no reportable environmental incidents.

Appendix A: Meteorological Data

Table 9: Meteorological Data - HVO Corporate Meteorological Station – February 2017

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)
1/02/2017 0:00	33.6	19.4	88.4	38.6	1210	122.3	3.2	0.0
2/02/2017 0:00	33.3	19.1	95.2	33.0	1529	143.3	3.2	0.0
3/02/2017 0:00	29.9	18.3	95.1	52.7	1365	133.8	2.7	0.0
4/02/2017 0:00	39.9	19.4	100.0	26.0	1354	209.6	2.4	0.0
5/02/2017 0:00	40.3	23.6	57.9	20.2	1124	259.8	2.9	0.0
6/02/2017 0:00	42.7	24.1	76.2	9.6	1012	230.7	3.8	0.0
7/02/2017 0:00	32.3	19.3	86.4	40.4	1331	126.7	3.9	0.0
8/02/2017 0:00	30.4	18.4	100.0	46.7	1632	117.9	3.6	2.0
9/02/2017 0:00	35.8	18.6	100.0	21.1	1048	135.9	1.6	0.0
10/02/2017 0:00	44.8	19.2	84.5	7.7	998	200	2.0	0.0
11/02/2017 0:00	46.4	21.5	79.2	6.0	1196	225.5	2.9	0.0
12/02/2017 0:00	44.8	19.1	86.5	3.4	1134	180.2	4.3	0.0
13/02/2017 0:00	33.3	16.8	100.0	20.6	1082	125.2	3.0	0.0
14/02/2017 0:00	29.3	15.6	89.5	32.1	1437	117.3	4.2	0.0
15/02/2017 0:00	30.9	14.8	92.7	31.0	1419	124.2	2.4	0.0
16/02/2017 0:00	38.2	15.4	85.7	12.3	1274	202.4	1.9	0.0
17/02/2017 0:00	39.1	17.3	99.4	17.0	1183	-	2.4	16.0
18/02/2017 0:00	38.1	19.4	85.7	20.0	1159	209.9	3.9	0.4
19/02/2017 0:00	25.5	17.6	100.0	46.3	1561	140.1	2.0	0.0
20/02/2017 0:00	29.1	13.9	55.6	9.9	1037	254.3	3.4	0.0
21/02/2017 0:00	31.2	11.3	75.3	9.8	1010	149.1	2.2	0.0
22/02/2017 0:00	34.1	14.1	82.5	16.6	969	126.7	2.2	0.0
23/02/2017 0:00	36.7	14.0	90.3	11.4	948	127.6	1.7	0.0
24/02/2017 0:00	34.4	16.0	84.1	18.4	992	117.2	3.0	0.0
25/02/2017 0:00	26.5	14.8	100.0	52.0	1230	132.1	3.5	1.2
26/02/2017 0:00	26.8	15.6	100.0	34.6	1452	132.1	3.6	0.2
27/02/2017 0:00	27.7	13.4	100.0	34.3	1285	126.5	3.1	6.4
28/02/2017 0:00	26.6	15.5	100.0	53.2	1335	127.9	2.8	8.4

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

COAL & ALLIED

Managed by Rio Tinto Coal Australia

Business Papers – Appendix B

Environmental Monitoring Report – March 2017

Hunter Valley Operations

Monthly Environmental Report

March 2017

Coal & Allied Operations Pty Ltd

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	Environmental Graduate	Draft	4/05/2017
1.1	Acting Environmental Specialist	Final	08/05/2017

1.0 INTRODUCTION

This report has been compiled to provide a monthly summary of environmental monitoring results for Hunter Valley Operations (HVO) as described in the Hunter Valley Operations Online Communication Plan. This report includes all monitoring data collected for the period 1 March 2017 to 31 March 2017.

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 2017 trend and historical trend are shown in Figure 1.

Table 1: Monthly Rainfall HVO

2017	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
March	192.2	253.4

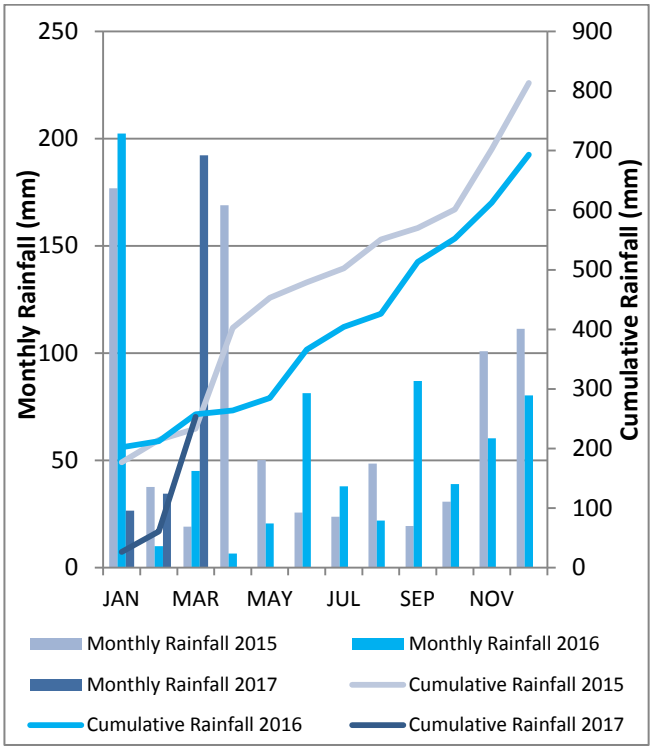

Figure 1: Year to Date Rainfall Summary 2017

2.1.2 Wind Speed and Direction

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

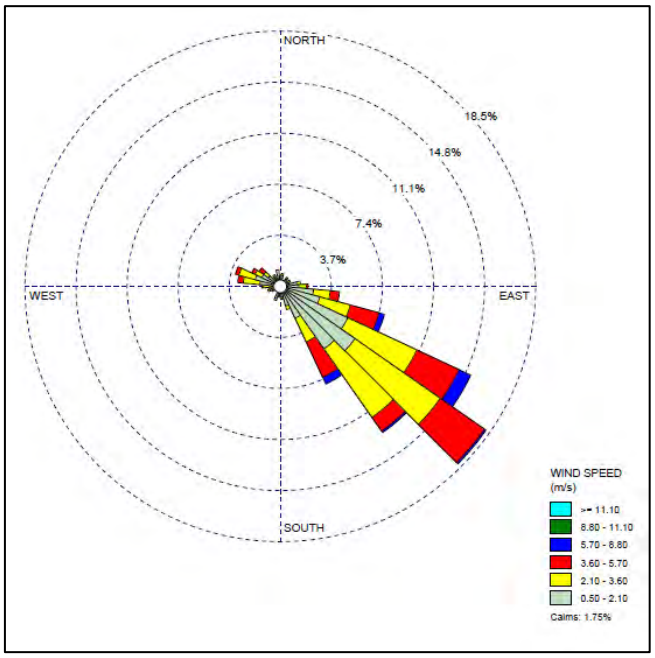

Figure 2: HVO Corporate Wind Rose – March 2017

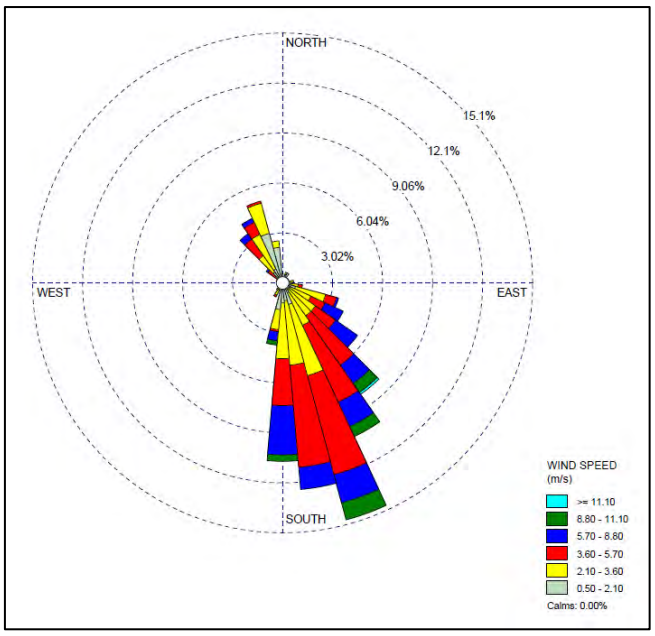

Figure 3: HVO Cheshunt Wind Rose – March 2017

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 DL21, DL22, D118, DL30 and Warkworth monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m^2 per month. The field notes associated with the DL21 and DL22 results confirm the presence of insects and bird droppings. As such the results are considered contaminated and will be excluded from calculation of the annual average. There is no evidence to suggest that the D118, DL30 and Warkworth results were contaminated. Accordingly, these results will be included in the annual average calculation.

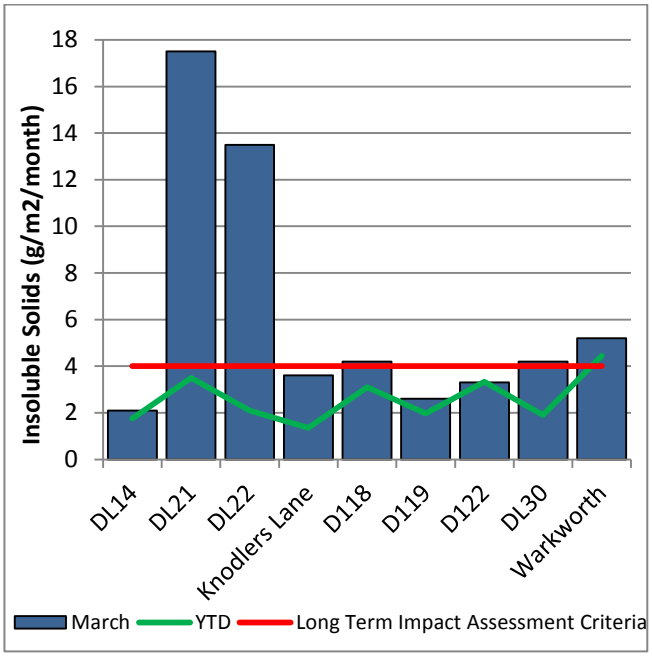

Figure 5: Depositional Dust Results – March 2017

2.3 Suspended Particulates

Suspended particulates are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM_{10}). The location of these monitors can be found in Figure 4. Each HVAS was run for 24 hours on a six-day cycle in accordance with EPA requirements.

2.3.1 HVAS PM_{10} Results

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

The Kilburnie South HVAS monitor failed to collect a valid sample on the 19th of March due to a power outage.

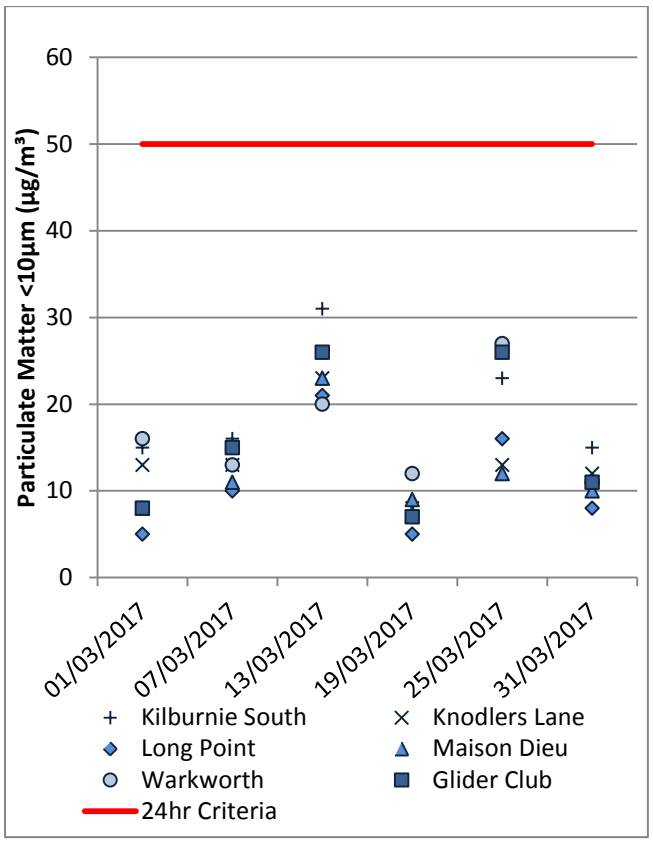

Figure 6: Individual PM_{10} Results – March 2017

Figure 7 shows the annual average PM_{10} results. During the reporting period, all PM_{10} results were below the long term impact assessment criteria.

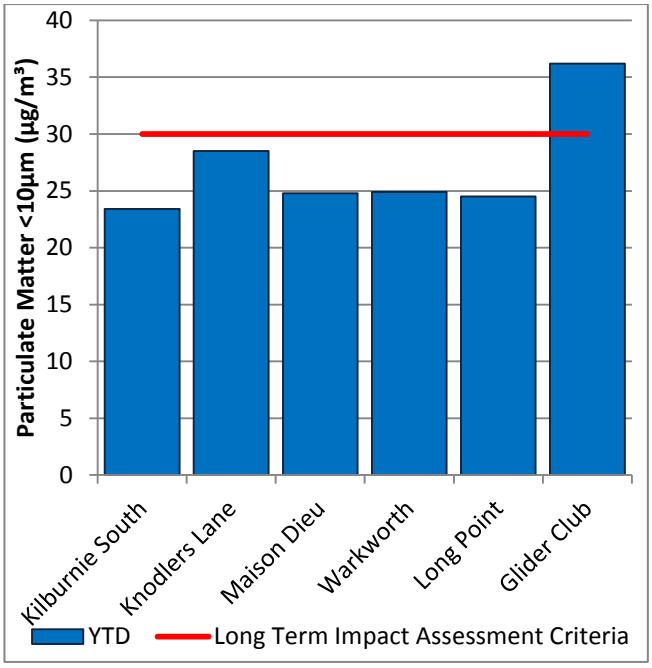

Figure 7: Year to Date Average PM_{10} – March 2017

2.3.2 TSP Results

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

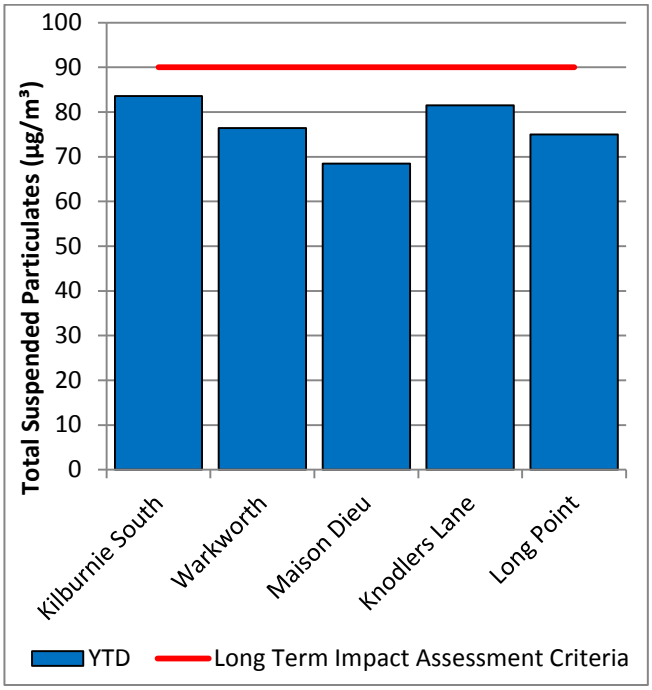

Figure 8: Annual Average Total Suspended Particulates – March 2017

2.3.3 Real Time PM_{10} Results

Hunter Valley Operations maintains a network of real time PM_{10} monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits. Results from real time PM_{10} monitoring are used as a reactive measure to guide mining operations to ensure compliance with the relevant conditions of the project approval.

Results for real time dust sampling are shown in Figure 9, including the daily 24 hour average PM_{10} result and the 24 hour YTD PM_{10} average. There were no results recorded which exceeded the short term (24hr) criteria of 50 µg/m³.

Data was not available on the 15th March (Knodlers Lane) due to technical issues.

2.3.4 Real Time Alarms for Air Quality

During March, the real time monitoring system generated 25 automated air quality related alarms. 12 alarms were related to adverse weather conditions and 13 alarms related to PM_{10}.

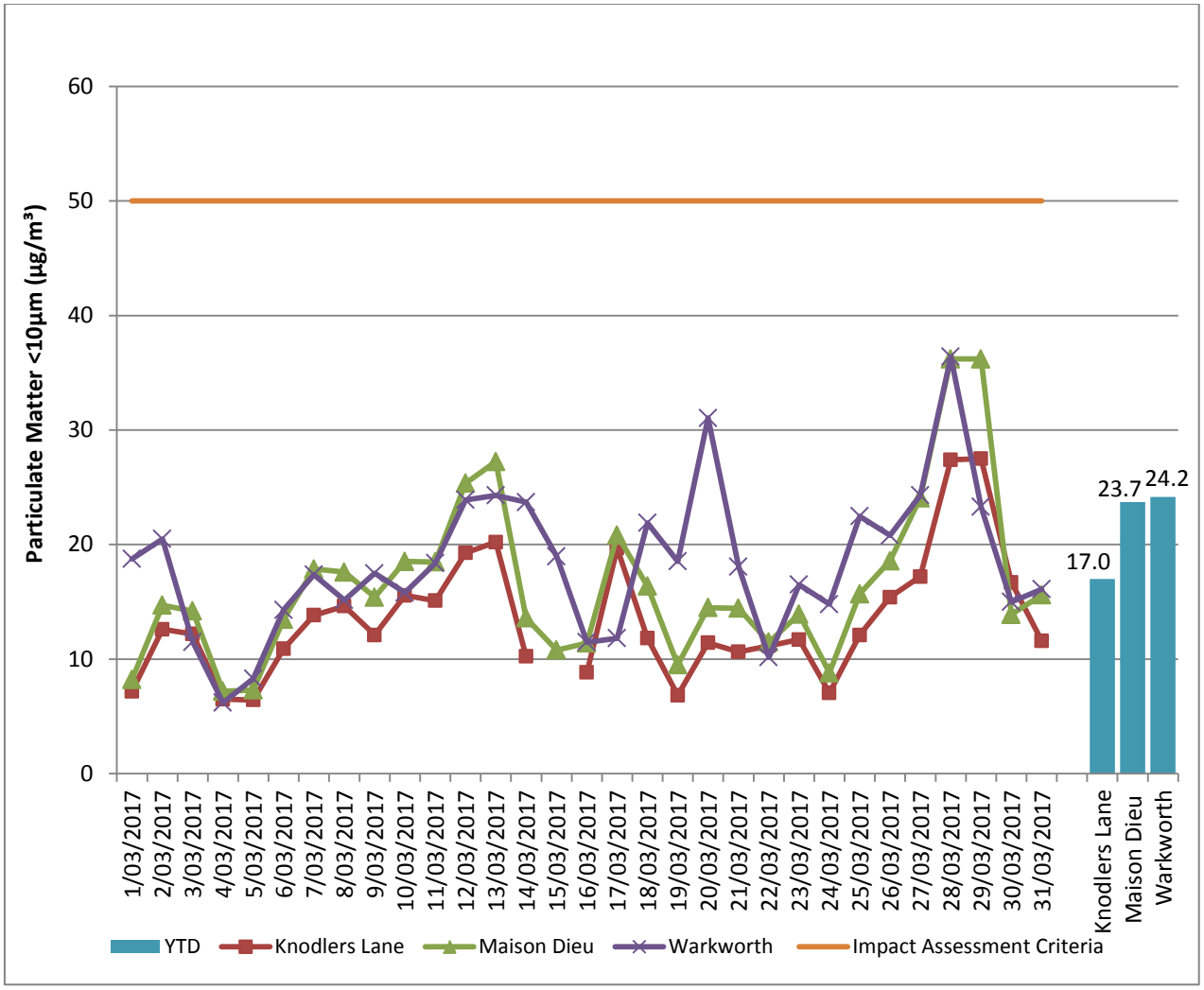

Figure 9: Real Time PM_{10} 24hr average and YTD average – March 2017

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).

Watercourses are assessed against ANZECC Guidelines for Fresh and Marine Water Quality (2000) for:

- pH (6.5 to 8.5);
- Electrical Conductivity (125 to 2200µS/cm); and
- Total Suspended Solids (maximum 50mg/L)

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

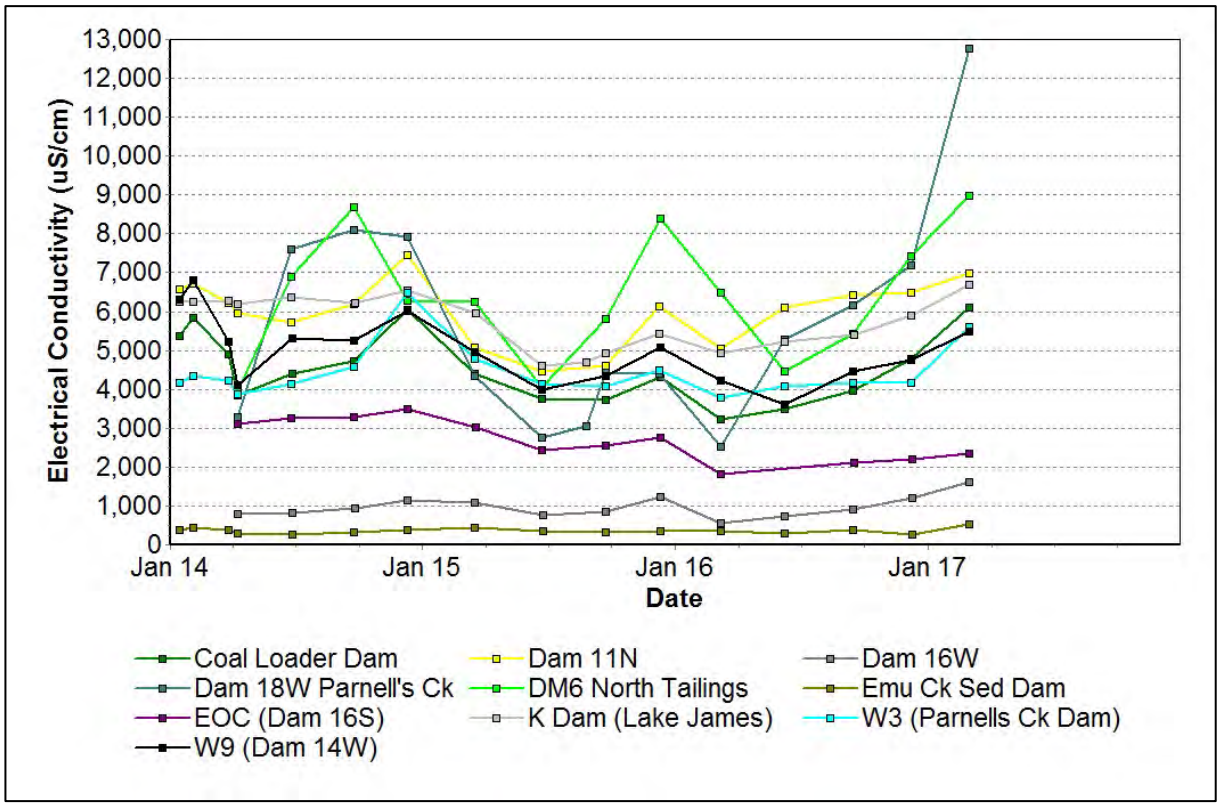

Figure 10: Site Dams Electrical Conductivity Trend - March 2017

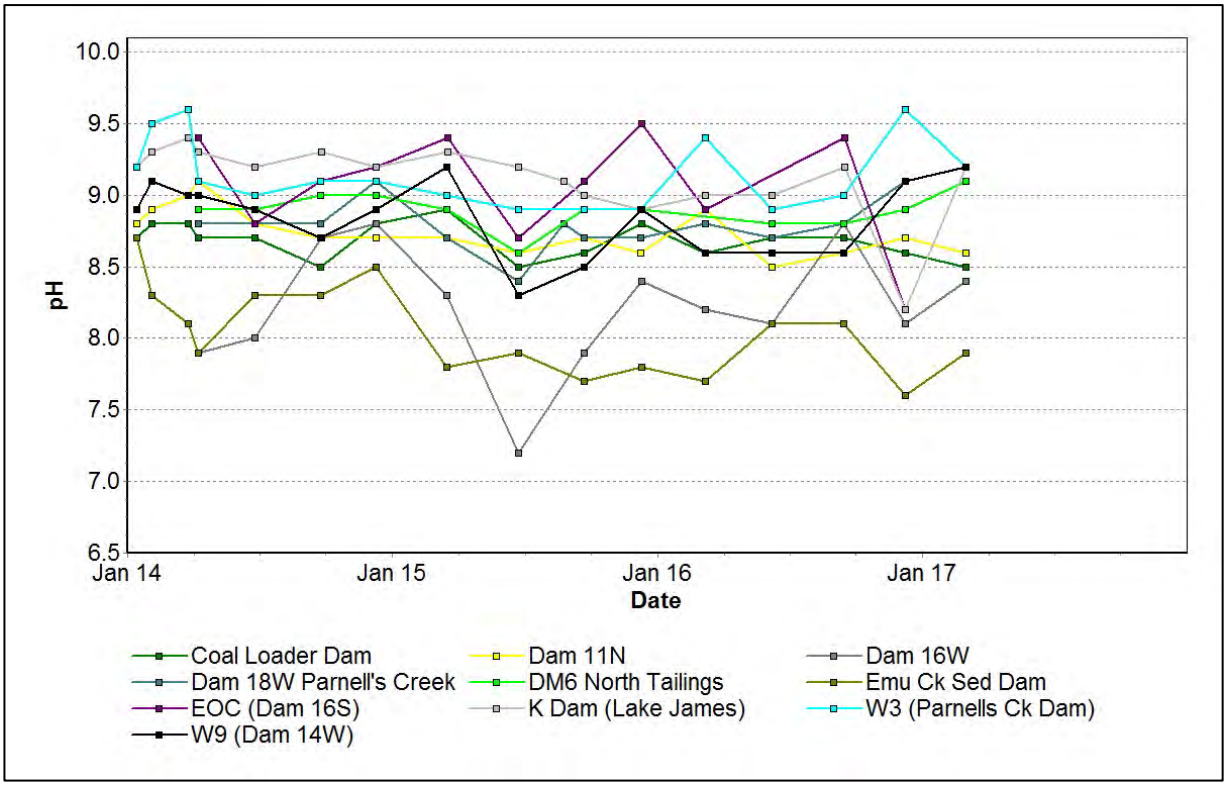

Figure 11: Site Dams pH Trend - March 2017

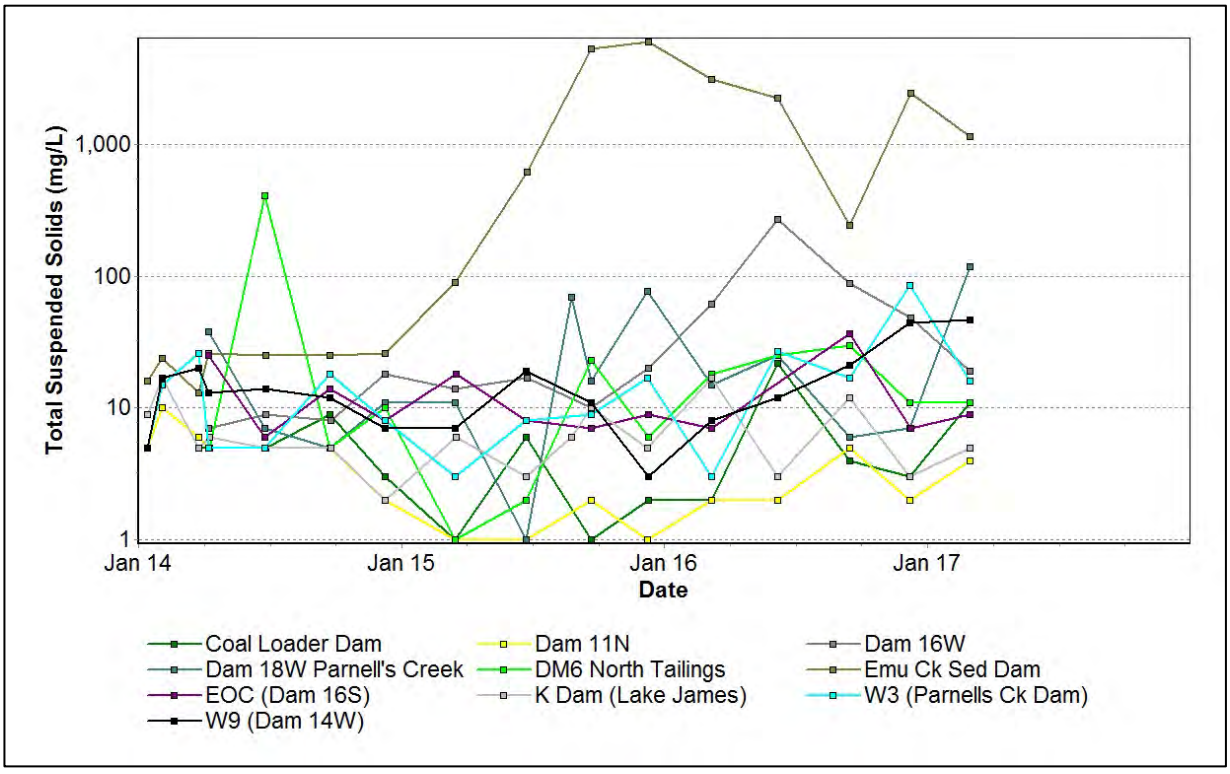

Figure 12: Site Dams Total Suspended Solids Trend – March 2017

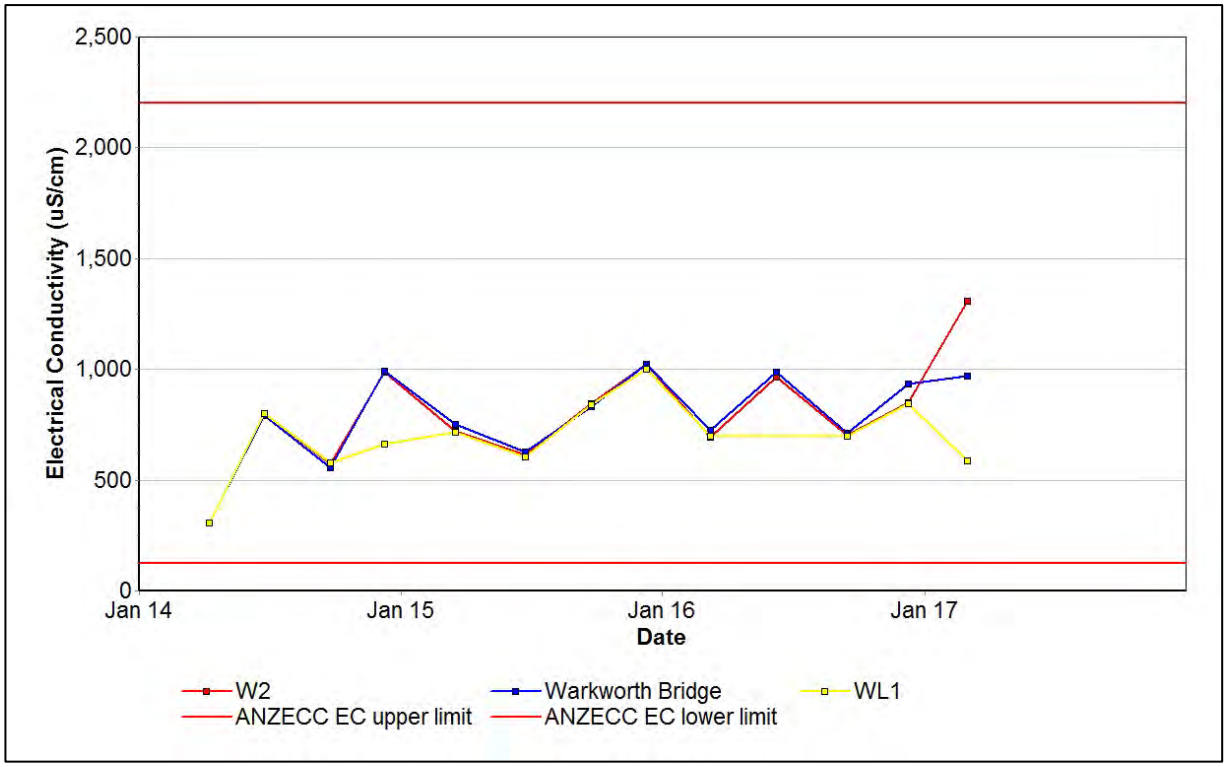

Figure 13: Wollombi Brook Electrical Conductivity Trend - March 2017

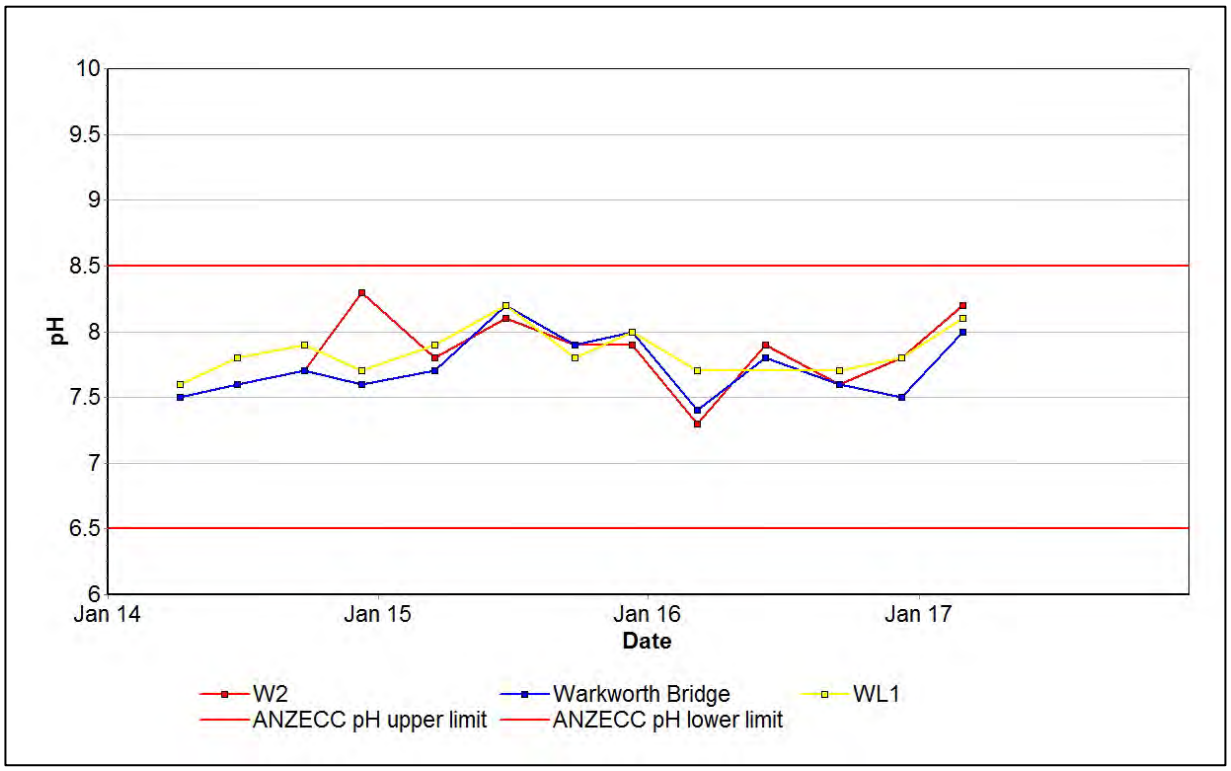

Figure 14: Wollombi Brook pH Trend - March 2017

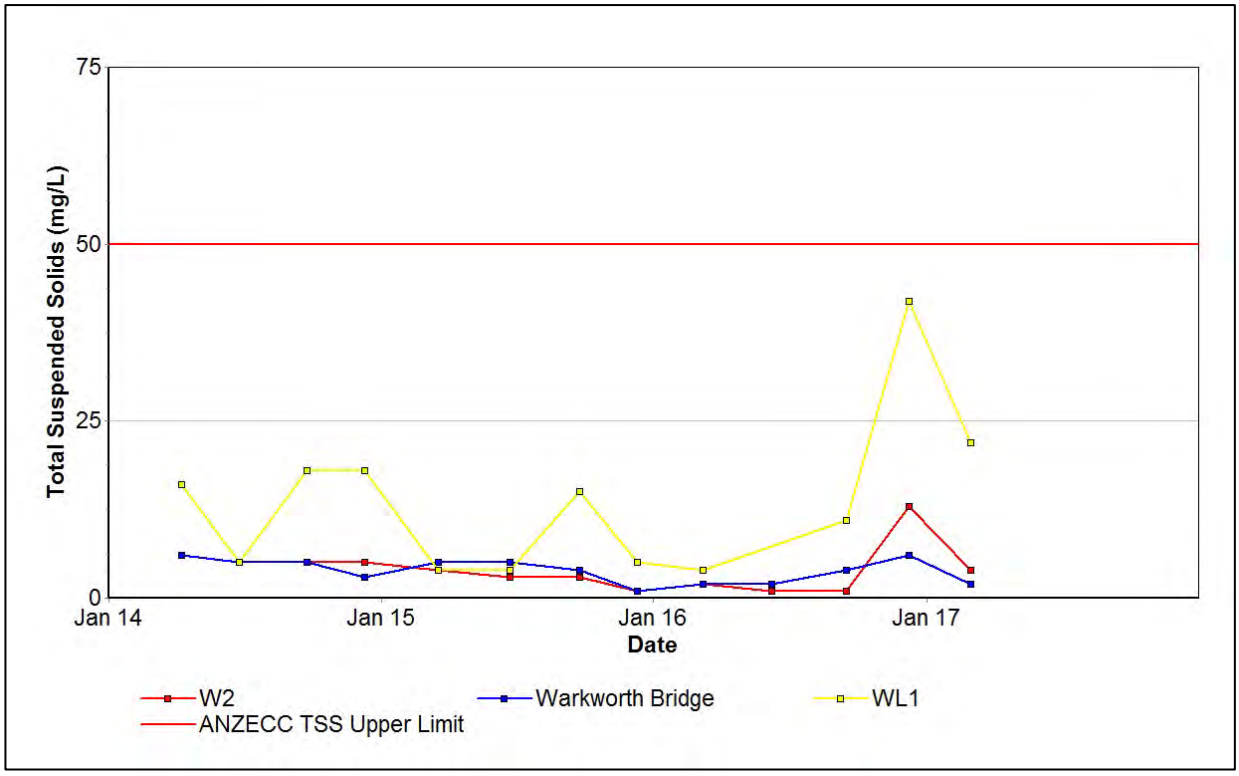

Figure 15: Wollombi Brook Total Suspended Solids Trend - March 2017

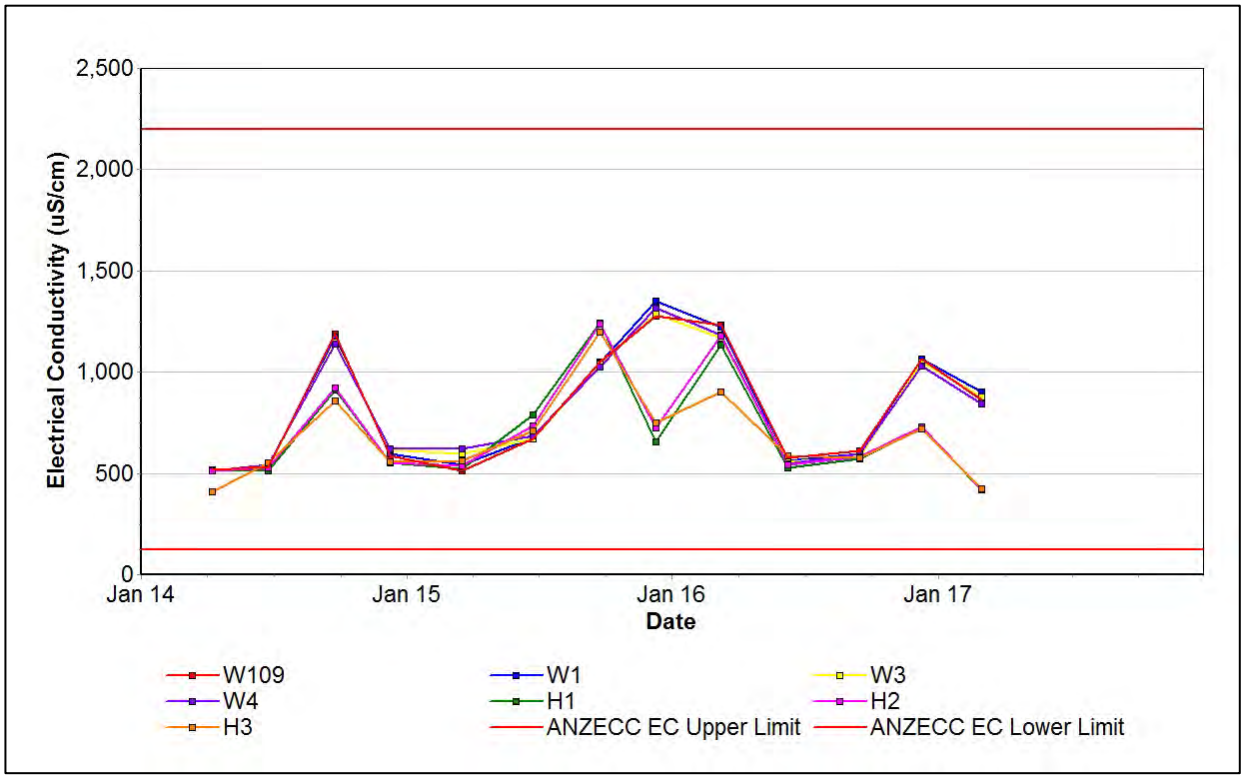

Figure 16: Hunter River Electrical Conductivity Trend - March 2017

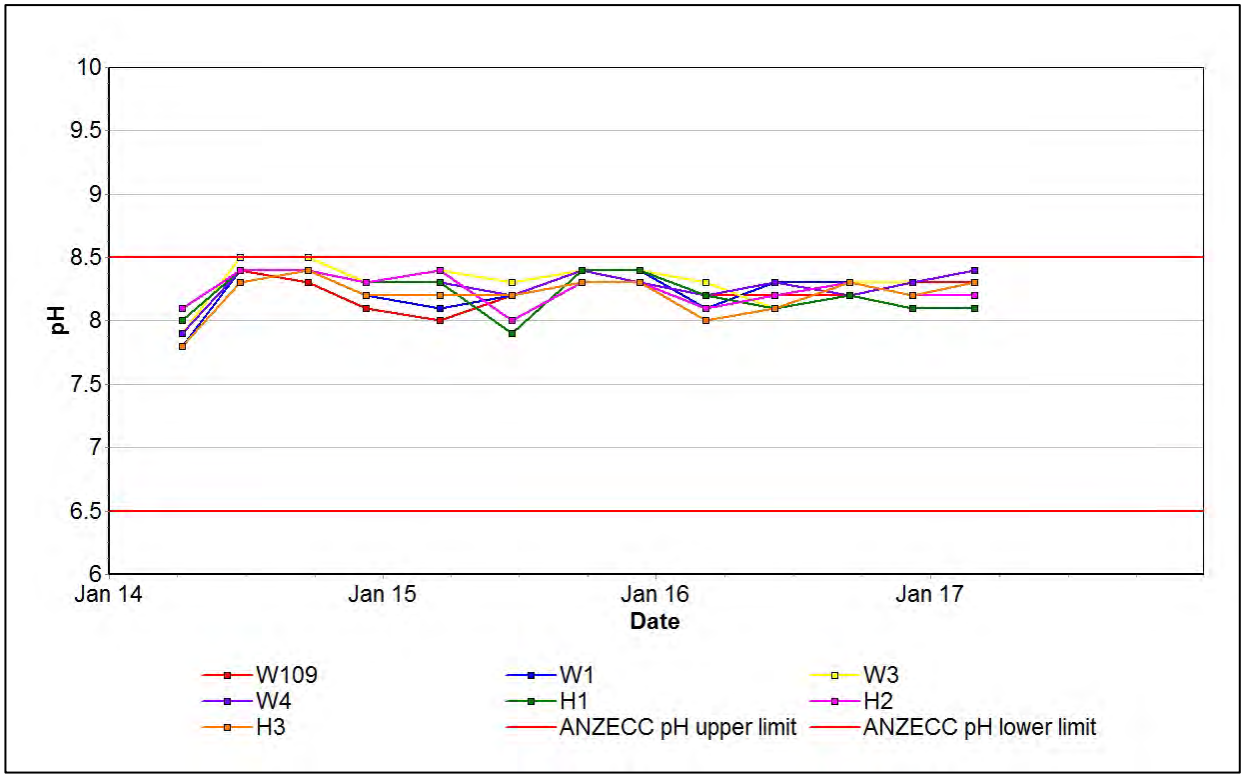

Figure 17: Hunter River pH Trend - March 2017

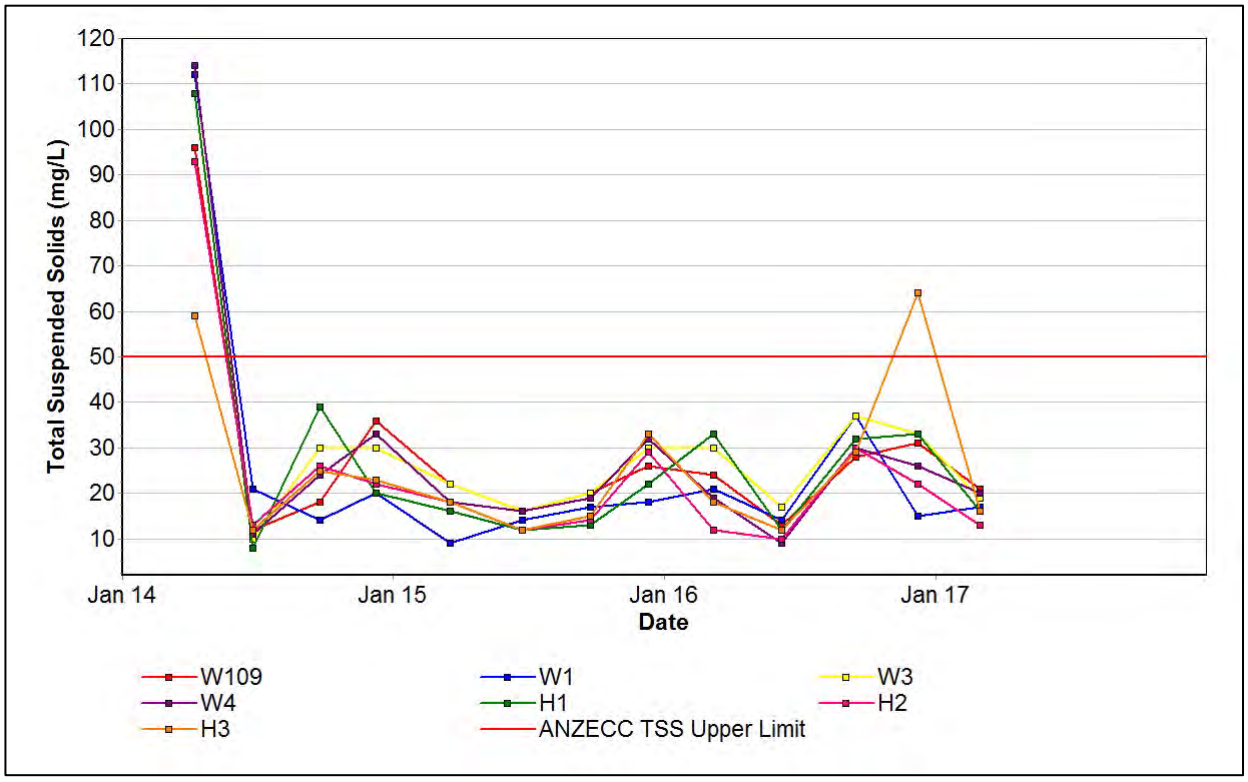

Figure 18: Hunter River Total Suspended Solids - March 2017

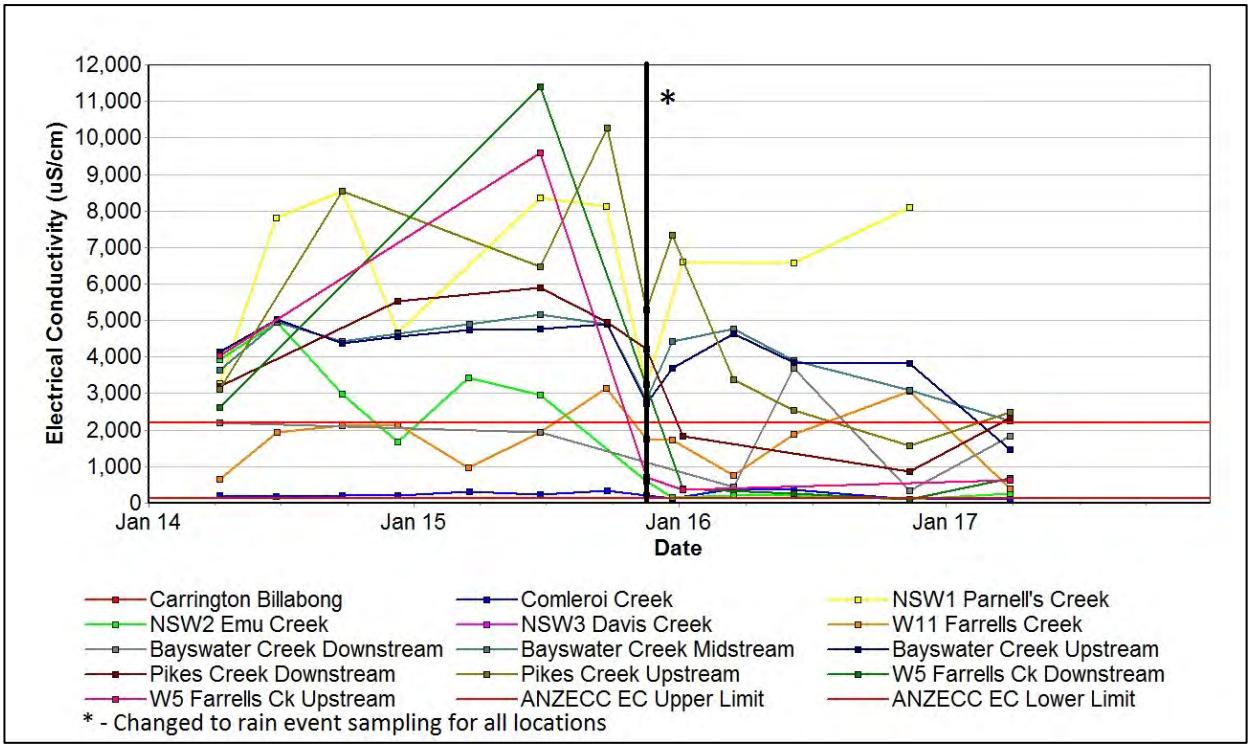

Figure 19: Other Tributaries Electrical Conductivity Trend - March 2017

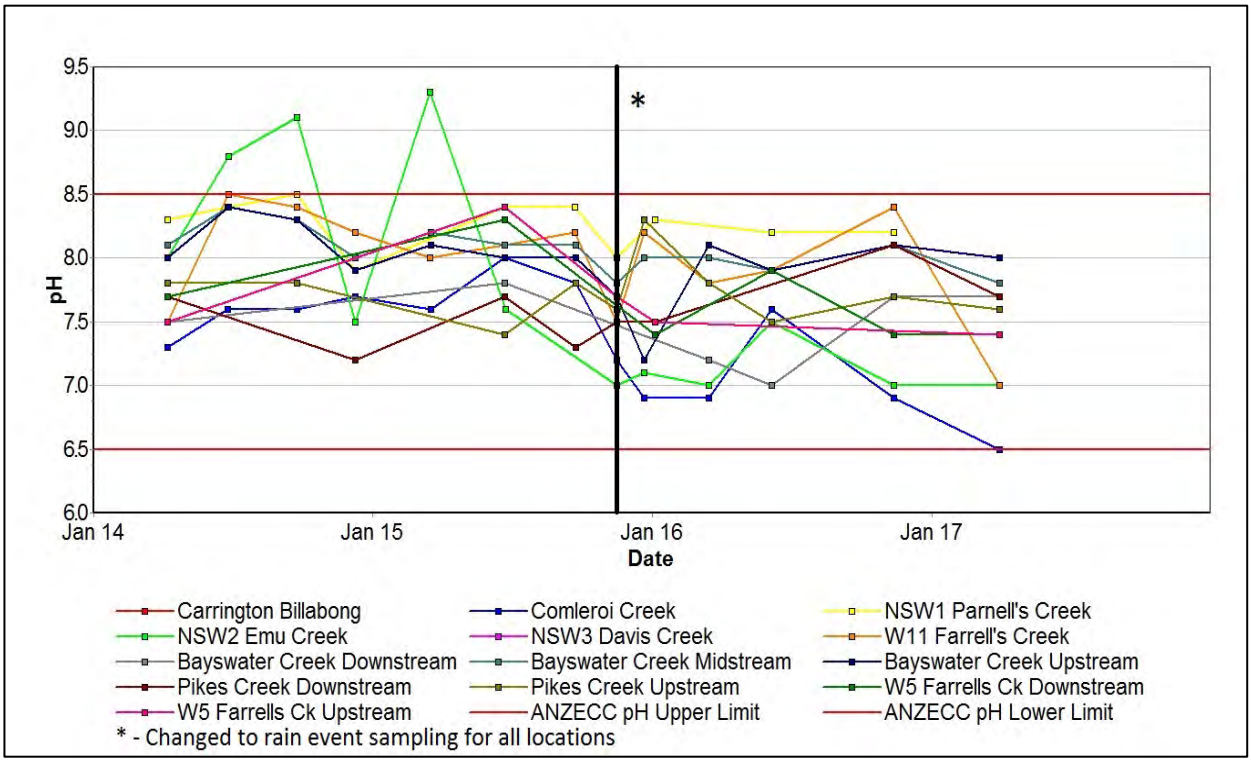

Figure 20: Other Tributaries pH Trend – March 2017

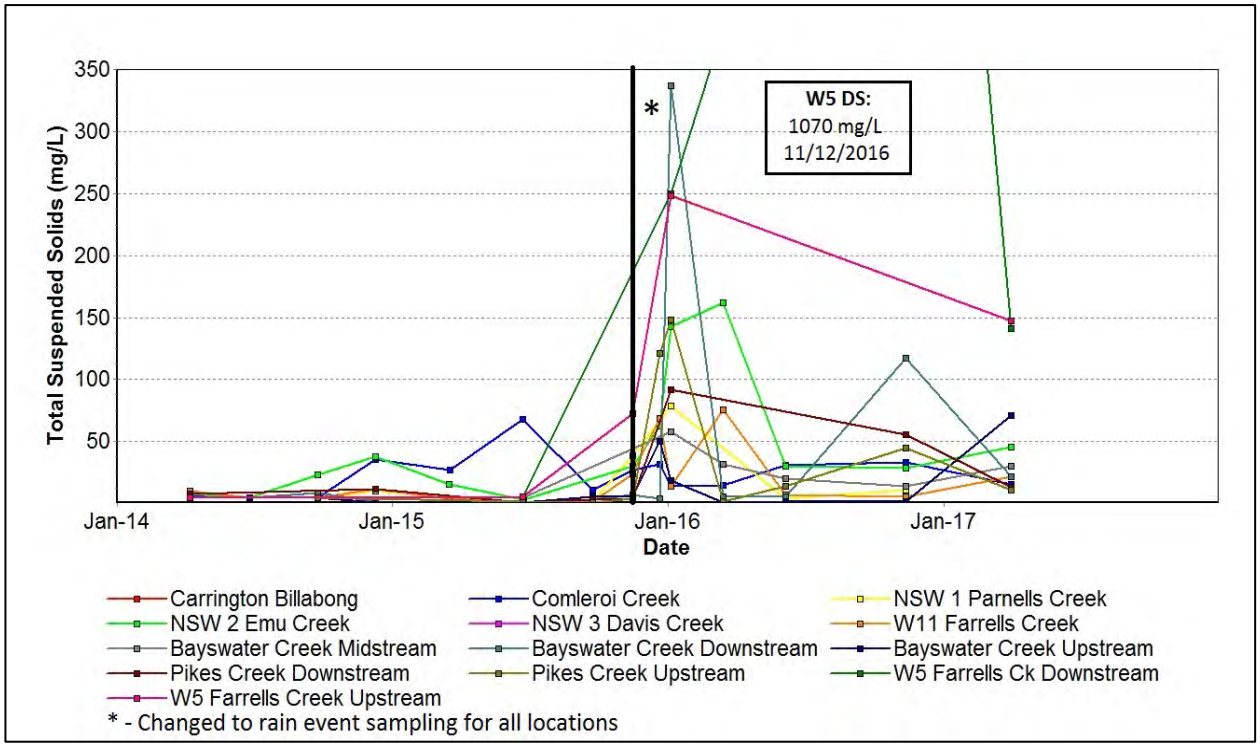

Figure 21: Other Tributaries Total Suspended Solids Trend - March 2017

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 did not extract any 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.

During Q1 2017 5 internal trigger limits were breached, summarised in Table 2.

Table 2: Surface Water Trigger Limit Summary

Site	Date	Trigger Limit Breached	Action taken in response

W2	01/03/2017	EC –95th Percentile	Watching Brief*
Bayswater Creek Midstream	01/03/2017	pH – 5th Percentile	Watching Brief*
W11	31/03/2017	pH – 5th Percentile	Watching Brief*
W3 Hunter River	01/03/2017	pH – 95th Percentile	Watching Brief*
Bayswater Creek Upstream	31/03/2017	TSS – 50mg/L (ANZECC criteria)	Elevated TSS associated with high-intensity rainfall event; any potential sources of sediment upstream from operations. No further action.

* = 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 77.

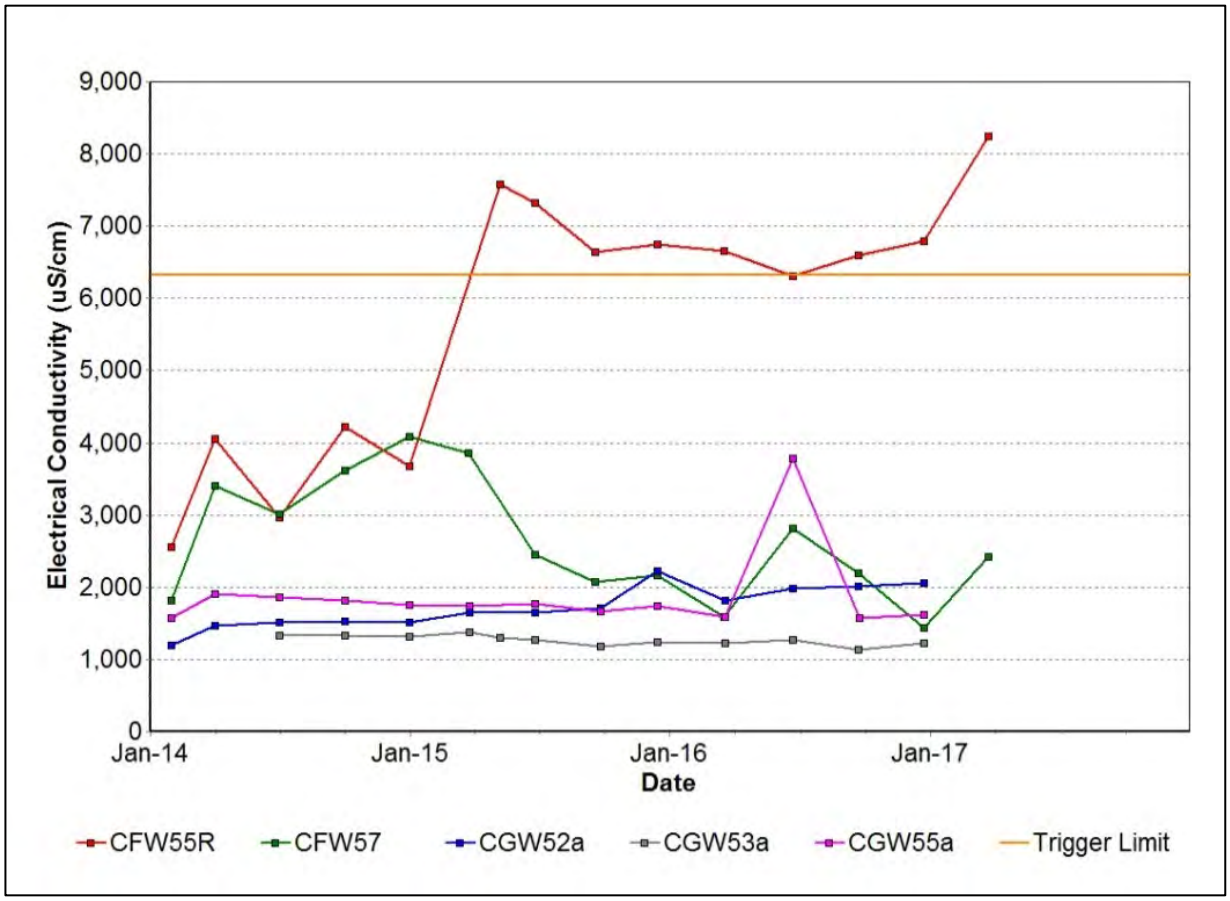

Figure 23: Carrington Alluvium Electrical Conductivity Trend - March 2017

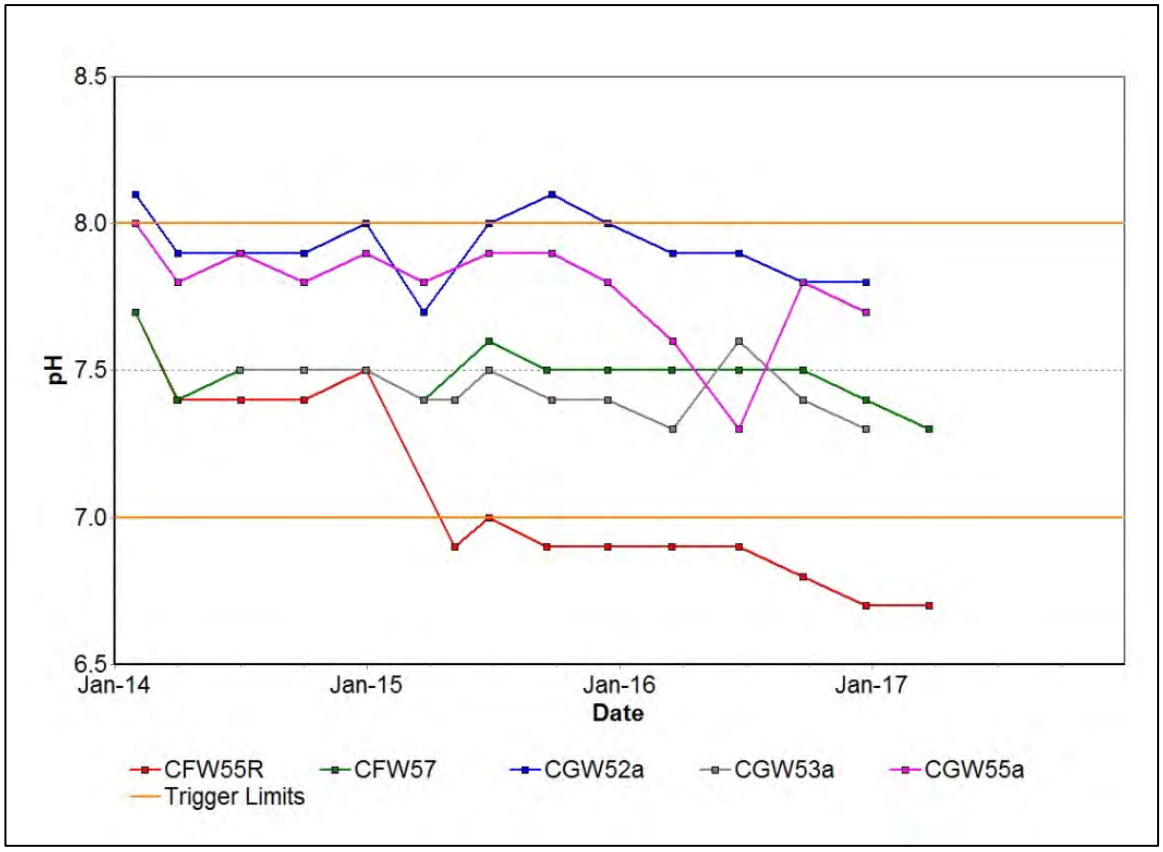

Figure 24: Carrington Alluvium pH Trend – March 2017

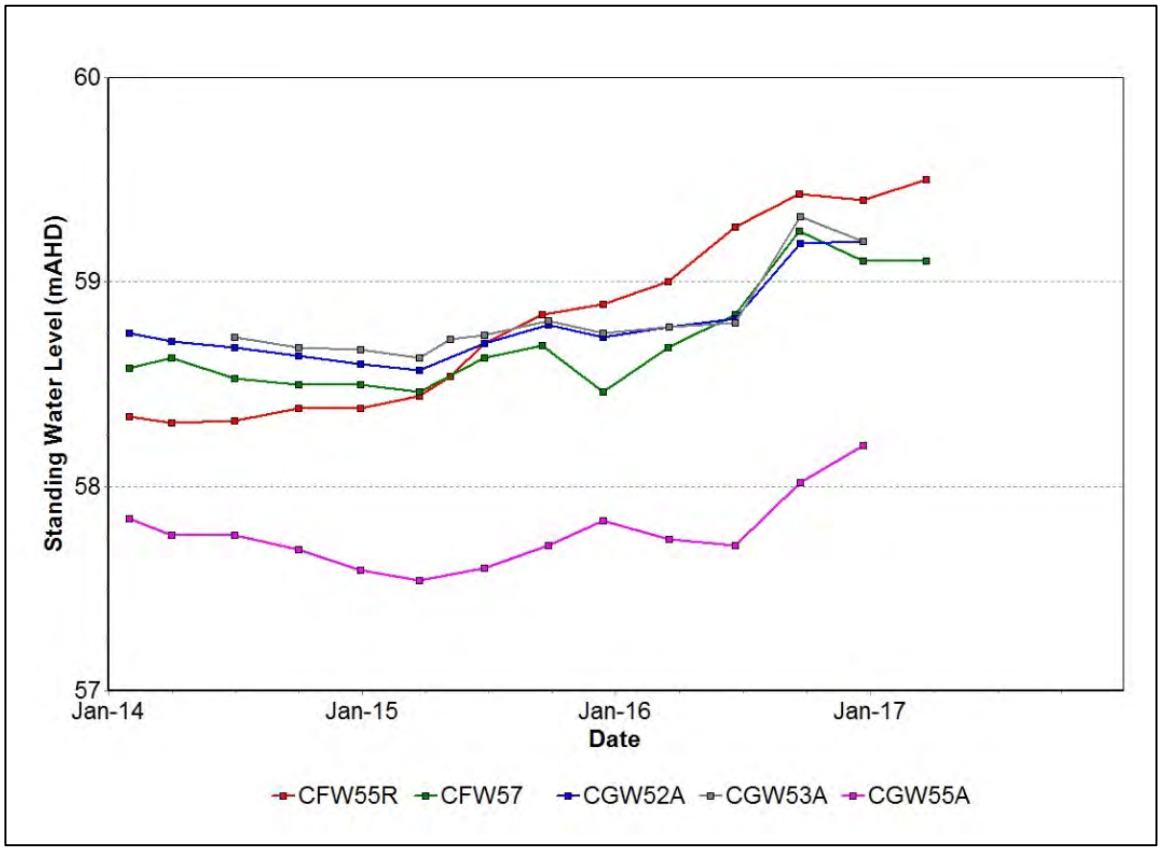

Figure 25: Carrington Alluvium Standing Water Level - March 2017

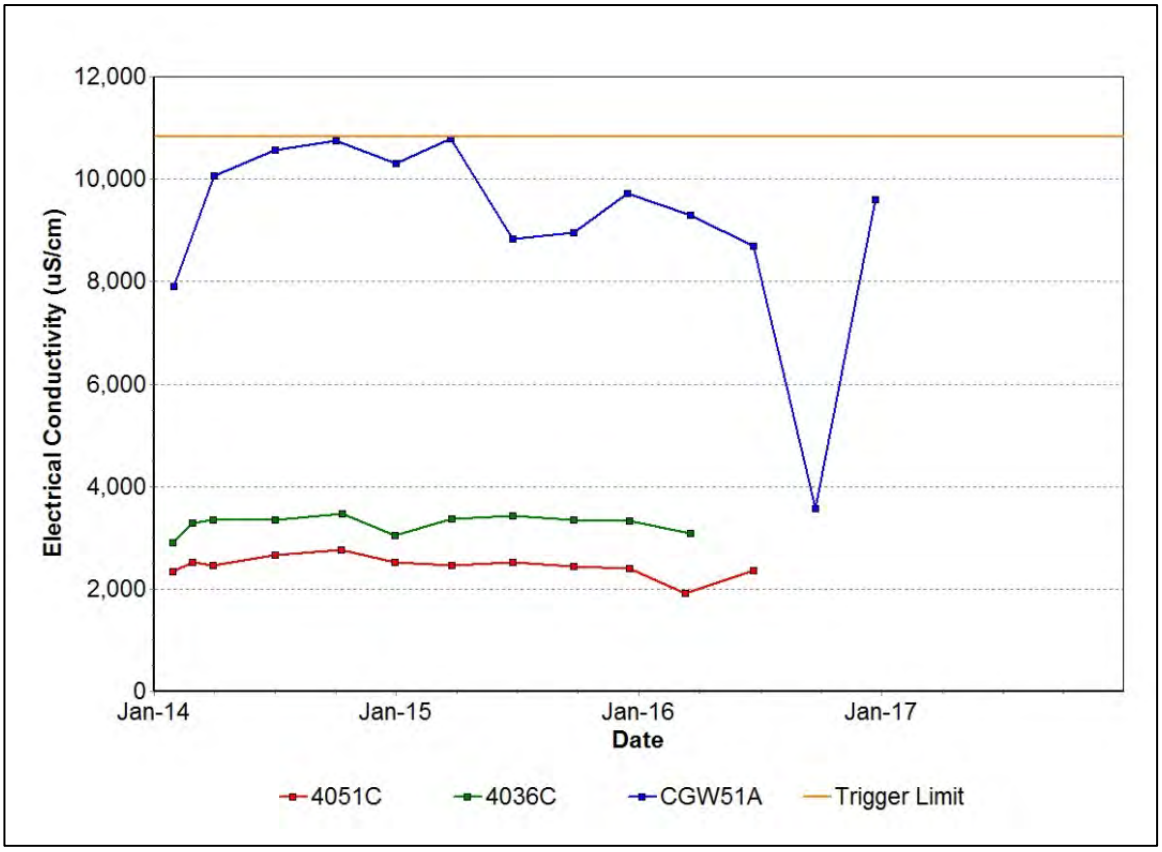

Figure 26: Carrington Interburden Electrical Conductivity Trend - March 2017

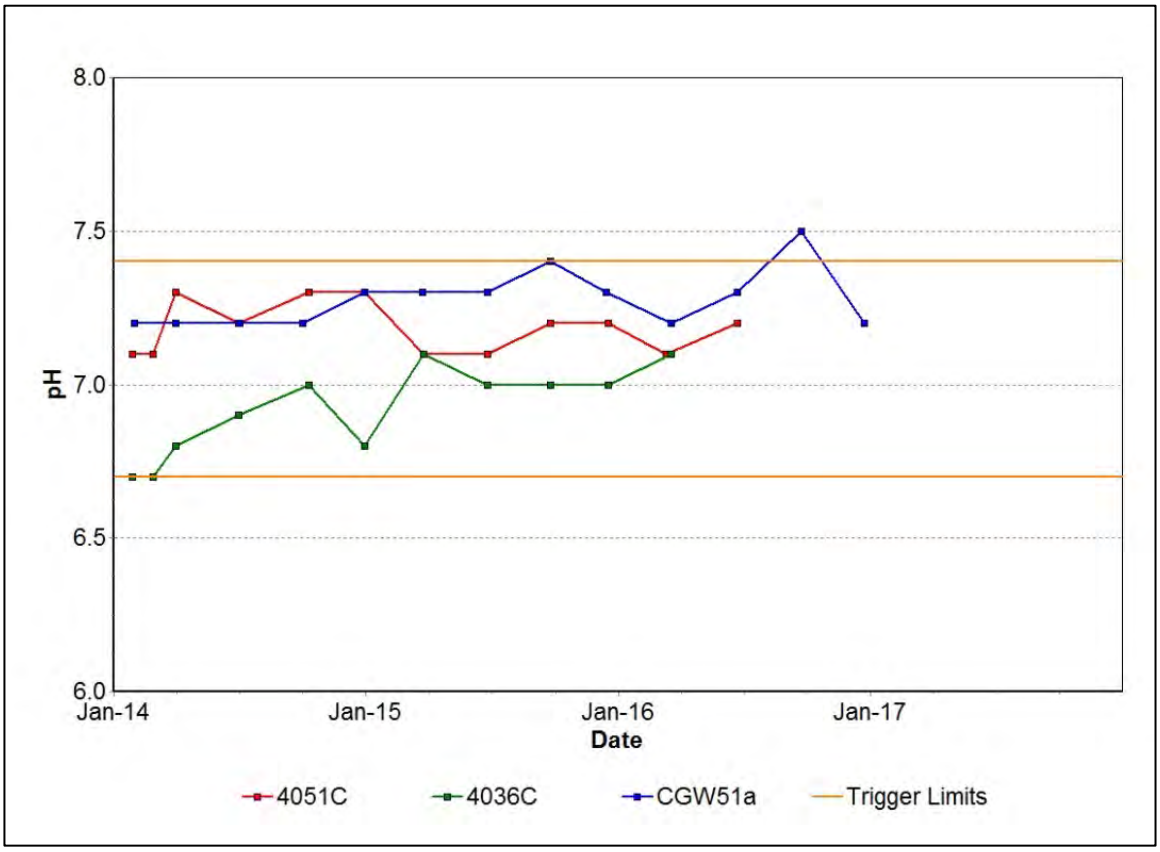

Figure 27: Carrington Interburden pH Trend – March 2017

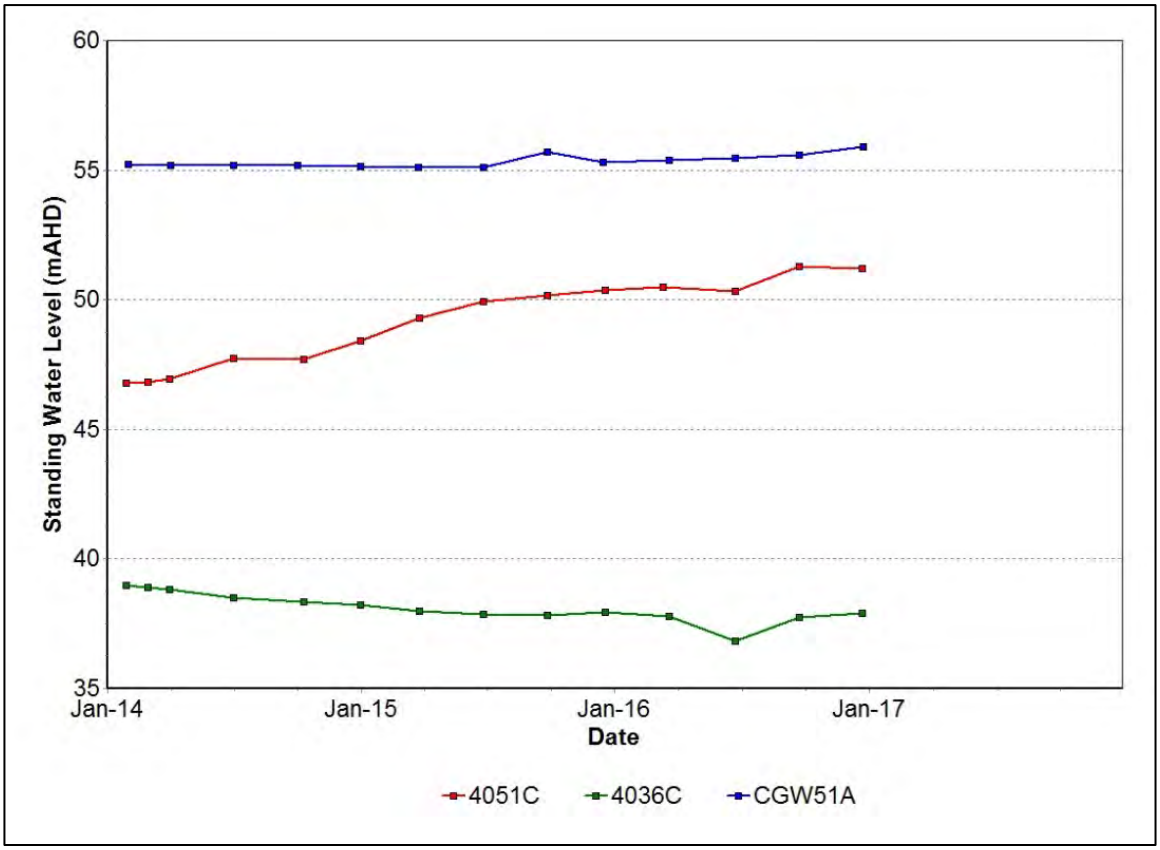

Figure 28: Carrington Interburden Standing Water Level - March 2017

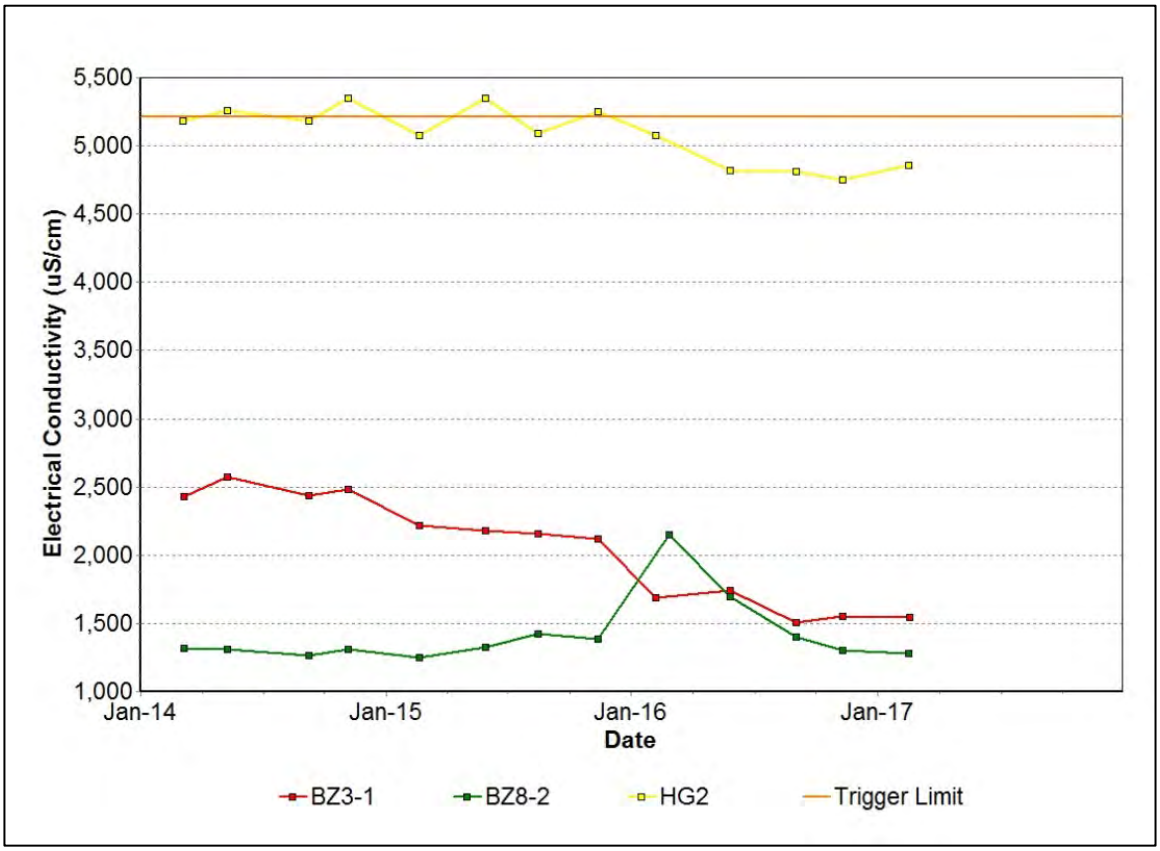

Figure 29: Cheshunt Interburden Electrical Conductivity Trend - March 2017

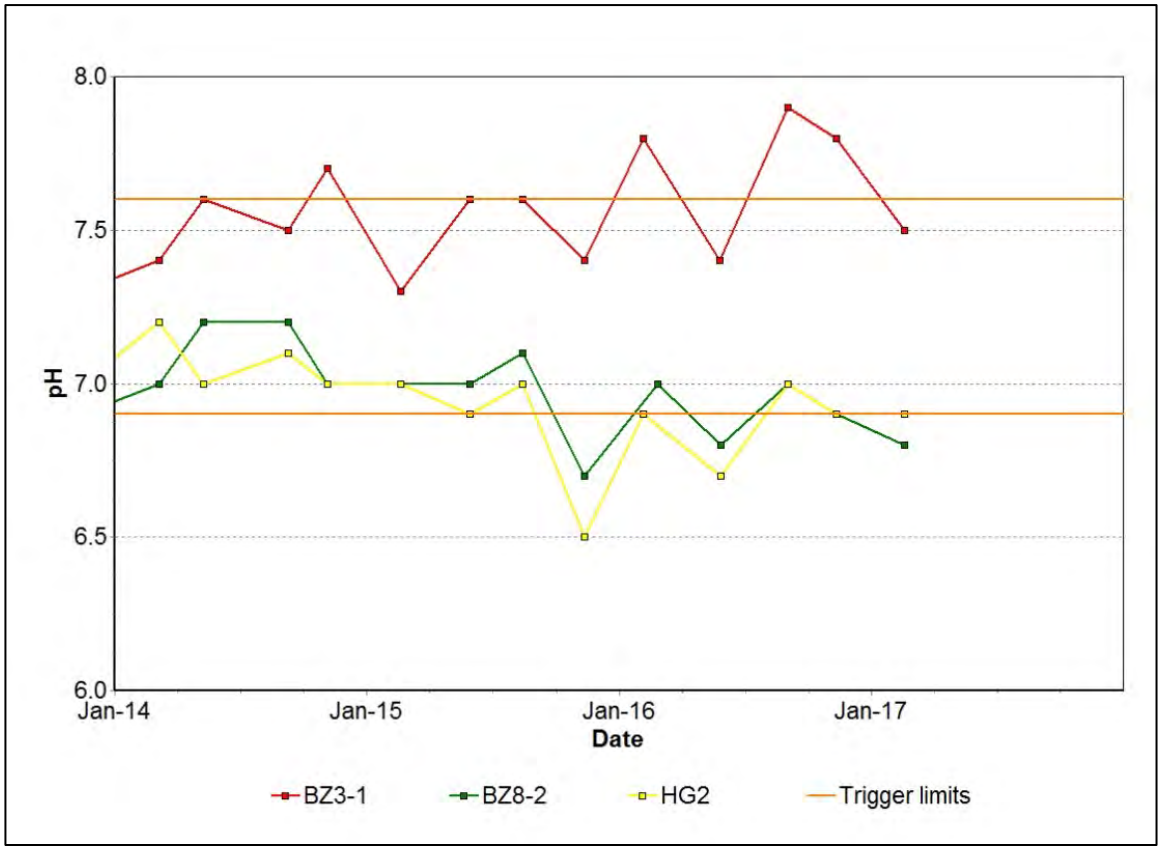

Figure 30: Cheshunt Interburden pH Trend - March 2017

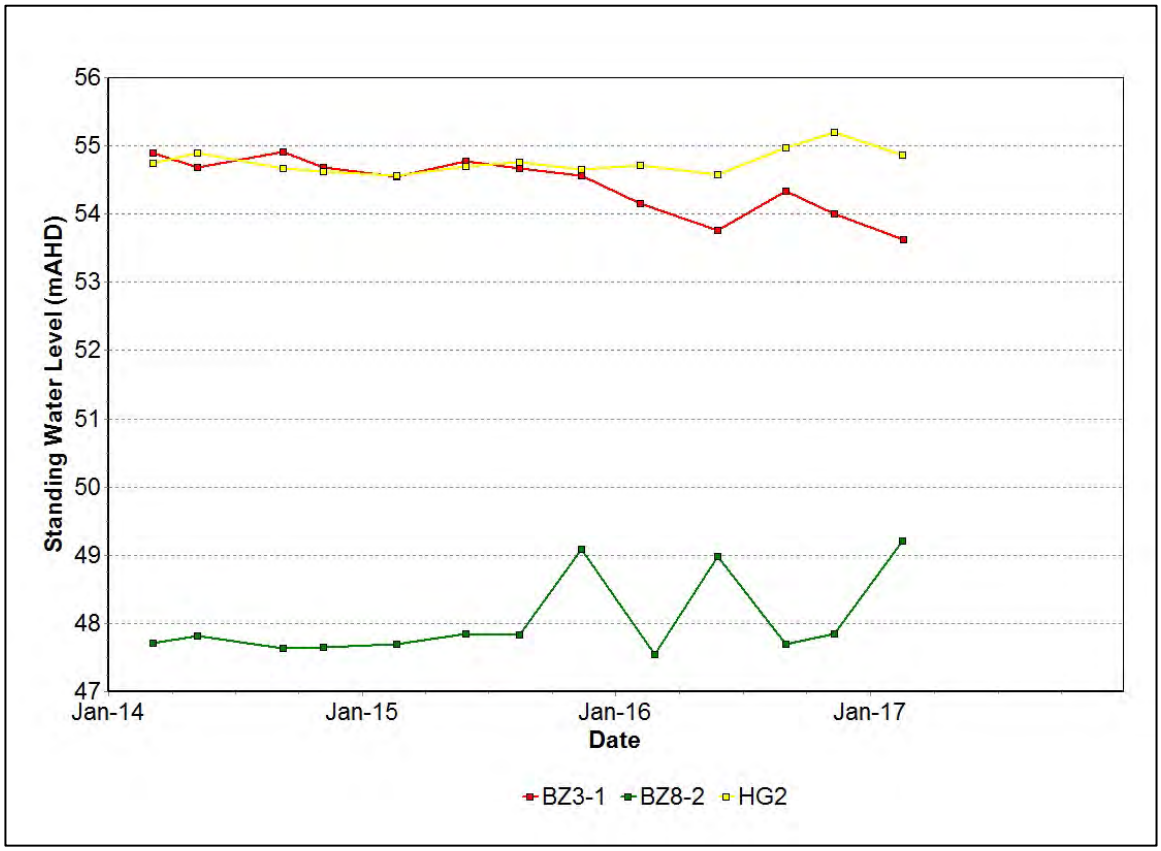

Figure 31: Cheshunt Interburden Standing Water Level – March 2017

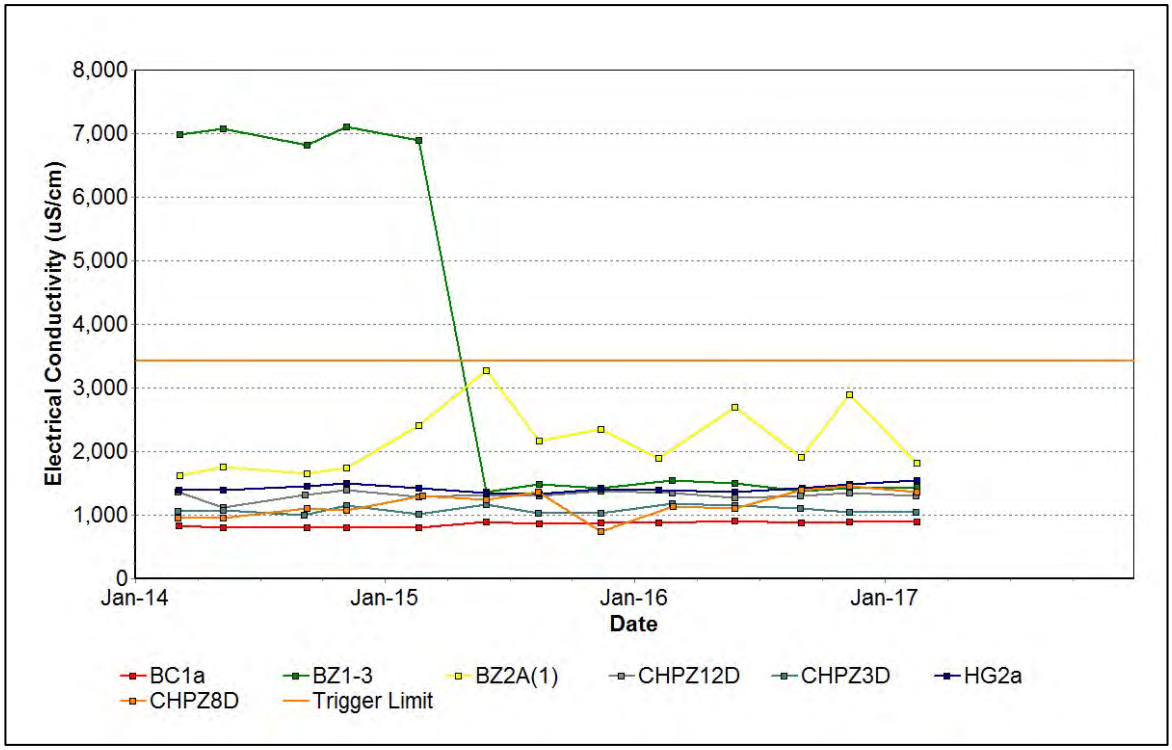

Figure 32: Cheshunt Mt Arthur Electrical Conductivity Trend - March 2017

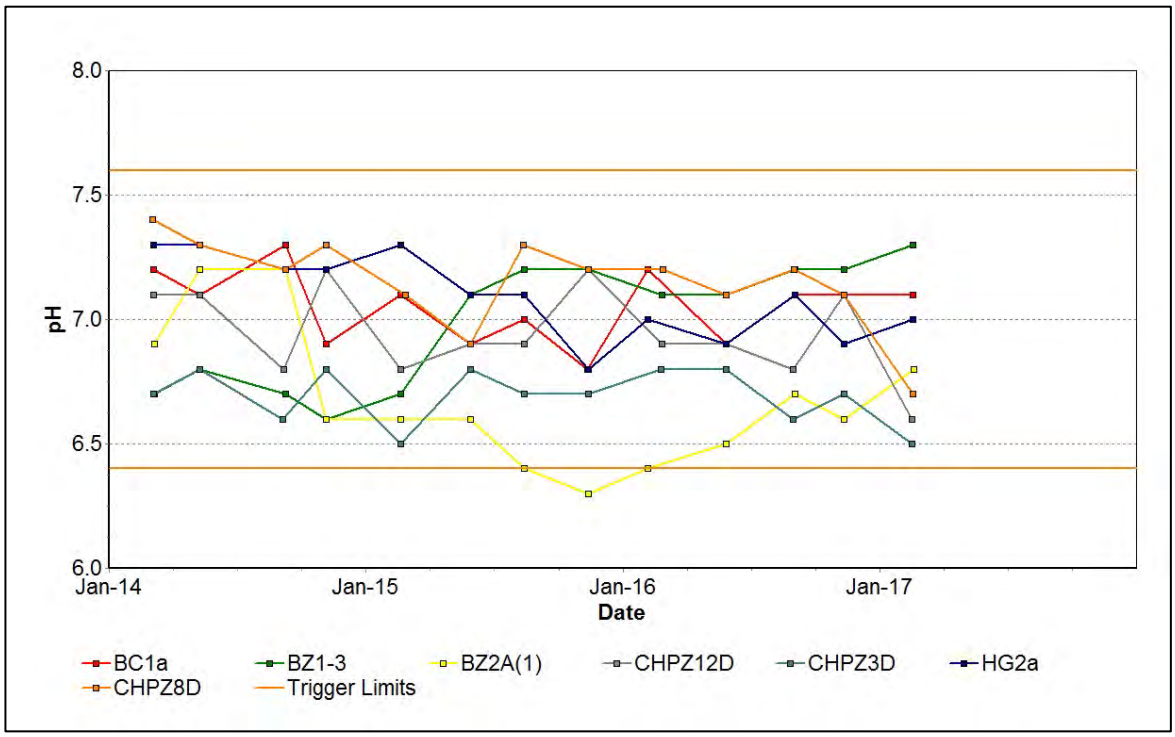

Figure 33: Cheshunt Mt Arthur pH Trend - March 2017

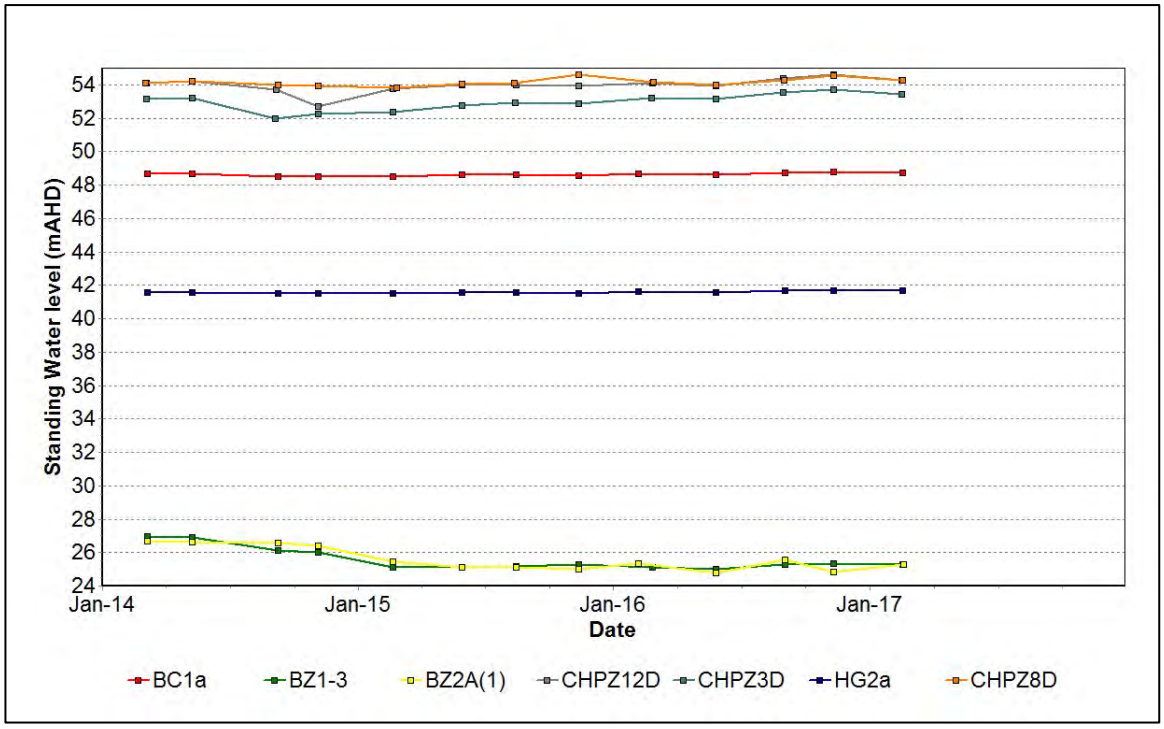

Figure 34: Cheshunt Mt Arthur Standing Water Level – March 2017

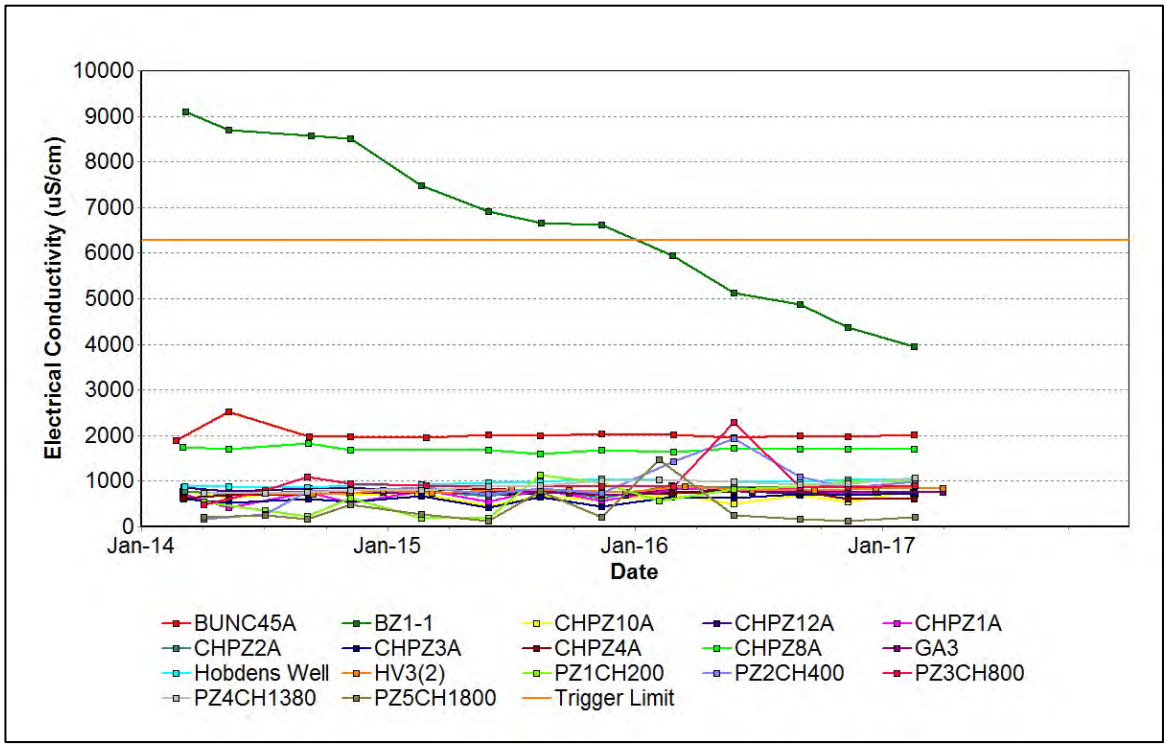

Figure 35: Cheshunt / North Pit Alluvium Electrical Conductivity Trend - March 2017

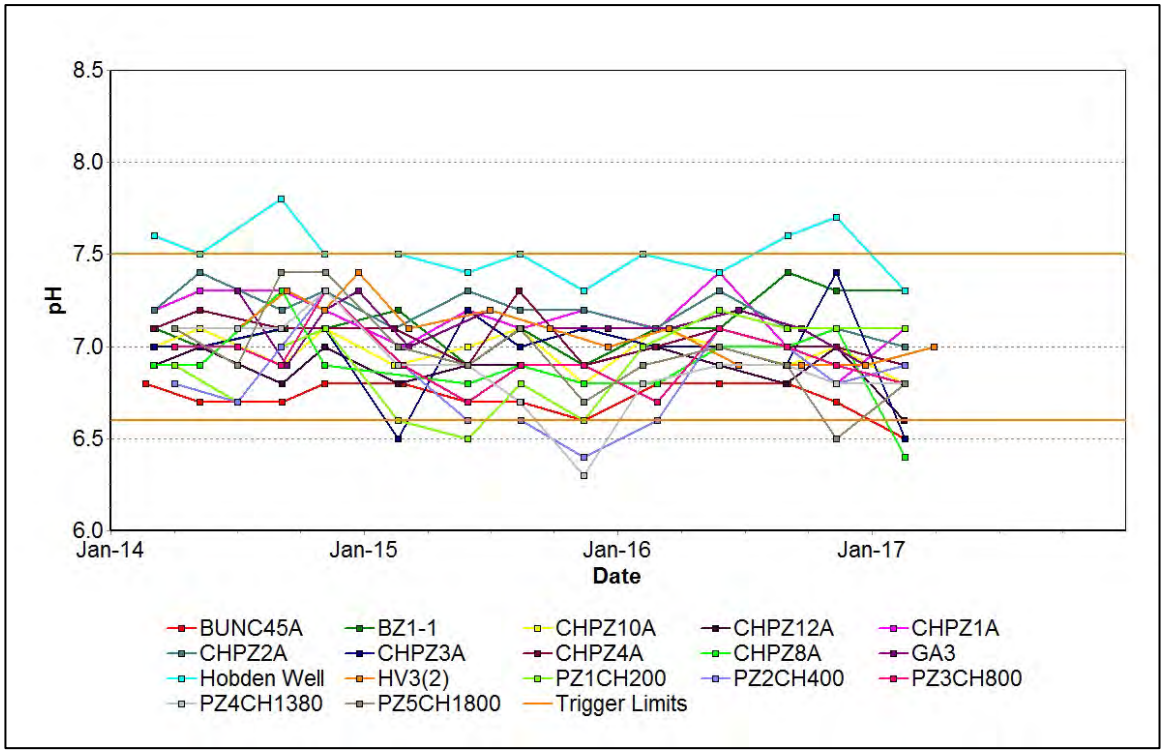

Figure 36: Cheshunt / North Pit Alluvium pH Trend - March 2017

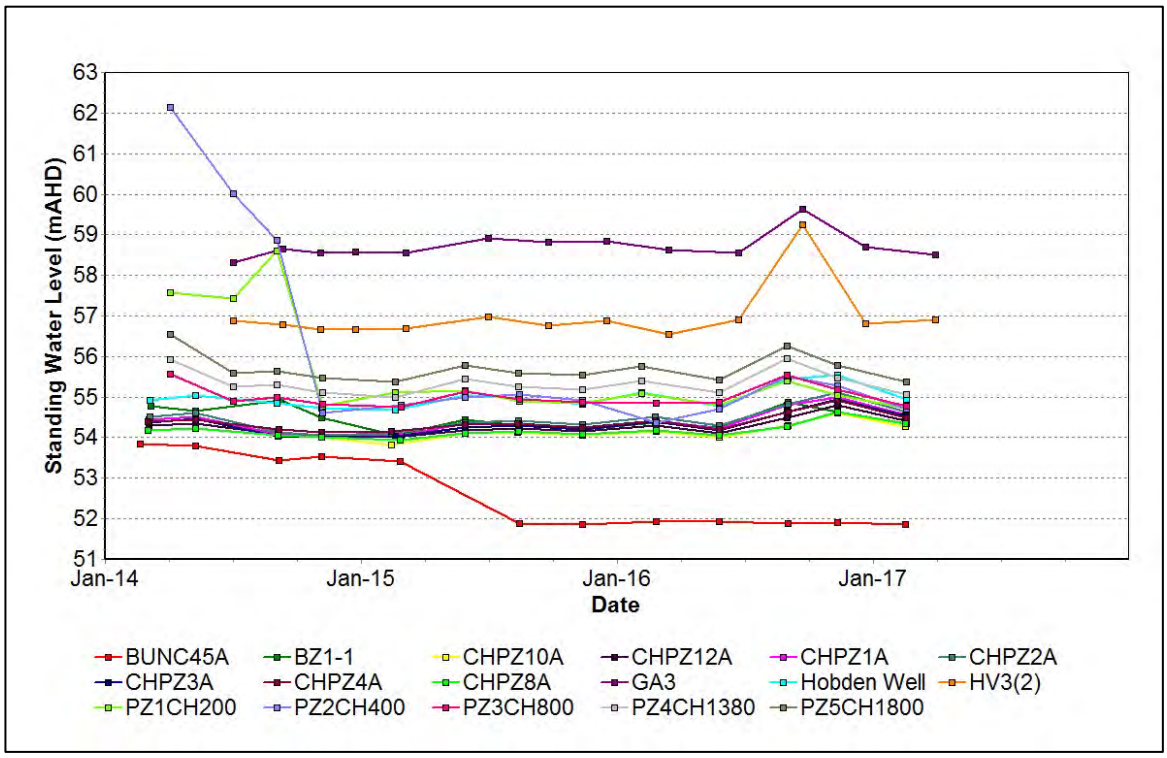

Figure 37: Cheshunt / North Pit Alluvium Standing Water Level – March 2017

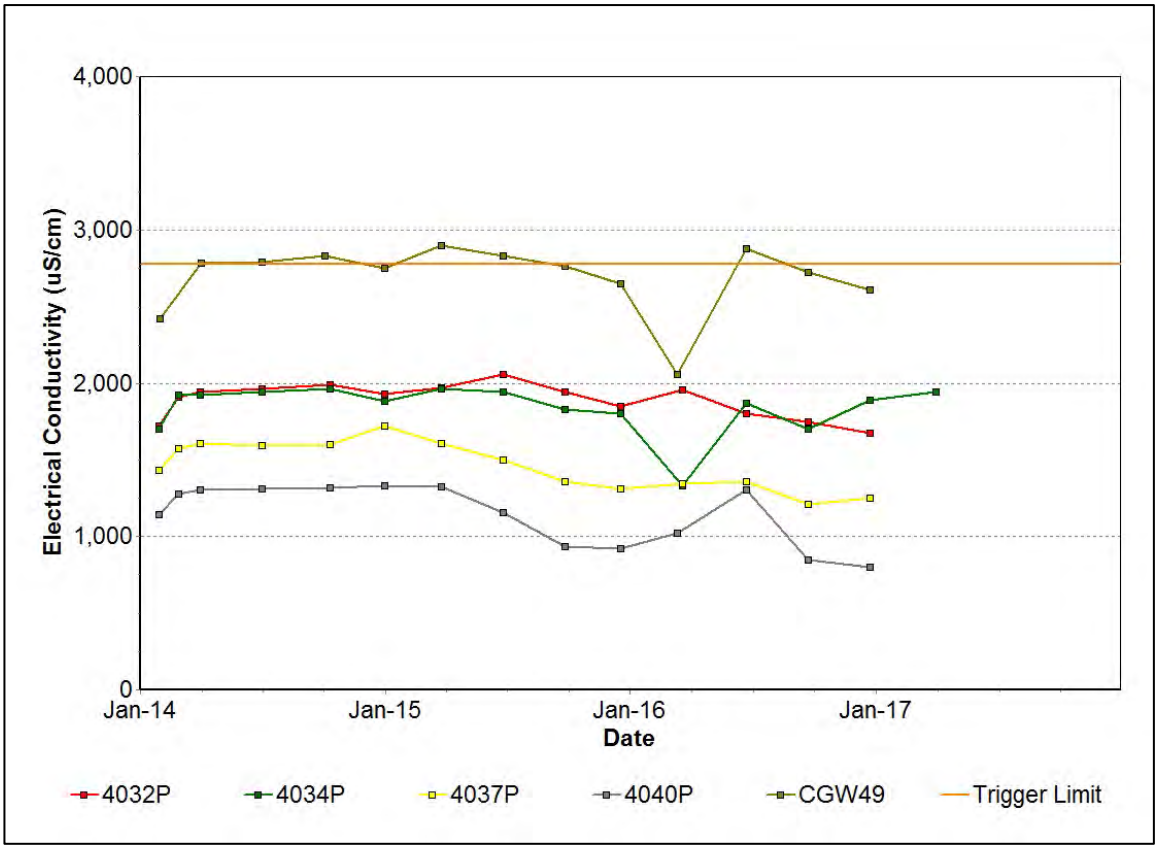

Figure 38: Carrington West Wing Alluvium Electrical Conductivity Trend - March 2017

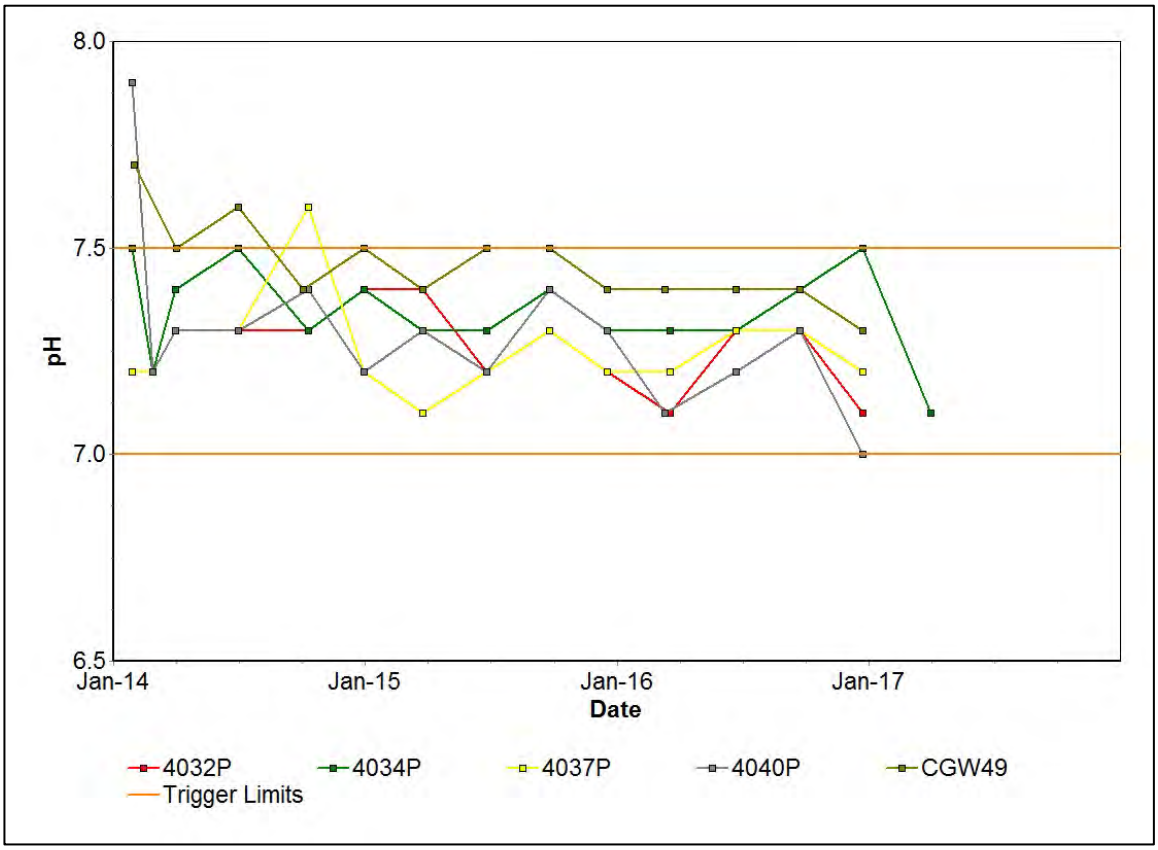

Figure 39: Carrington West Wing Alluvium pH Trend - March 2017

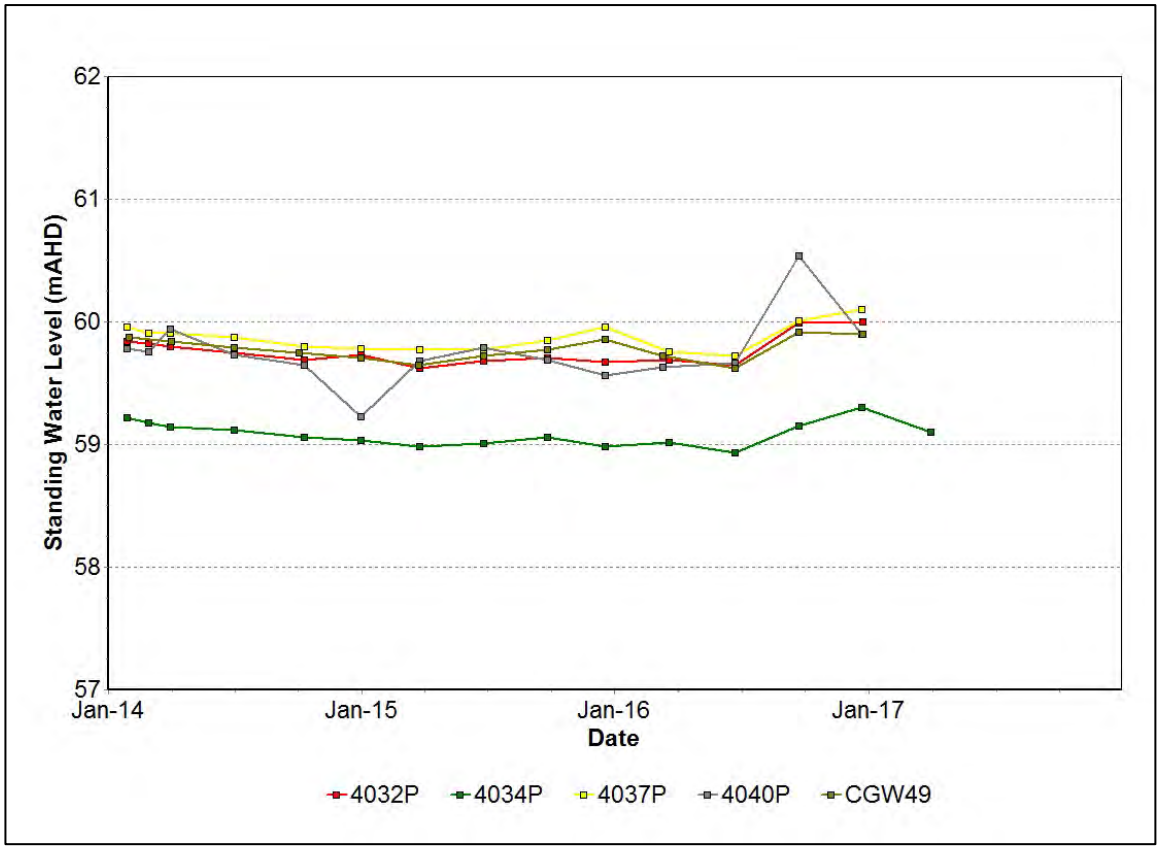

Figure 40: Carrington West Wing Alluvium Standing Water Level – March 2017

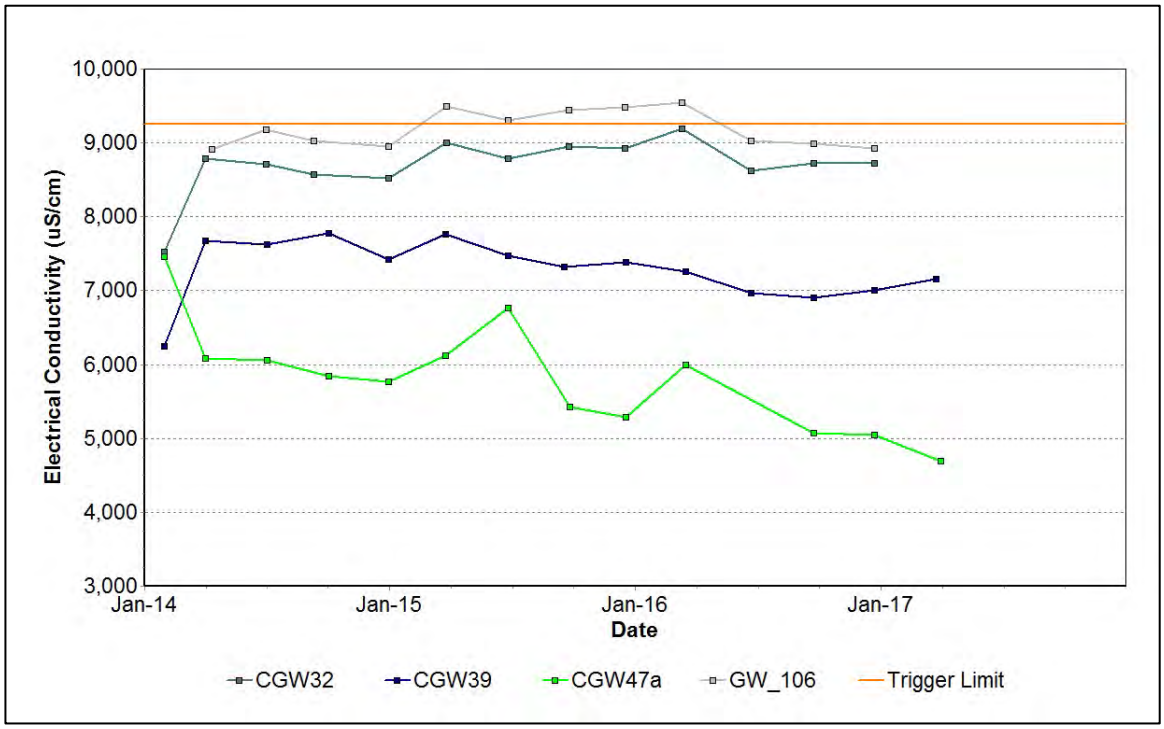

Figure 41: Carrington West Wing Flood Plain Electrical Conductivity Trend - March 2017

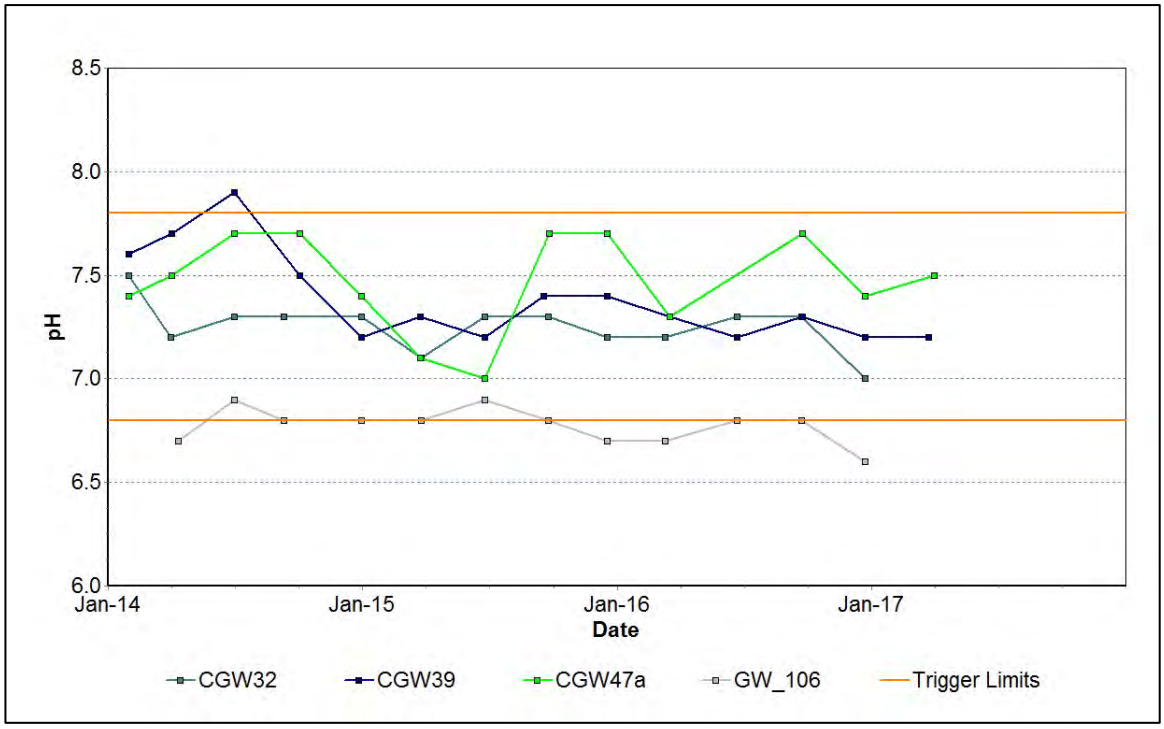

Figure 42: Carrington West Wing Flood Plain pH Trend - March 2017

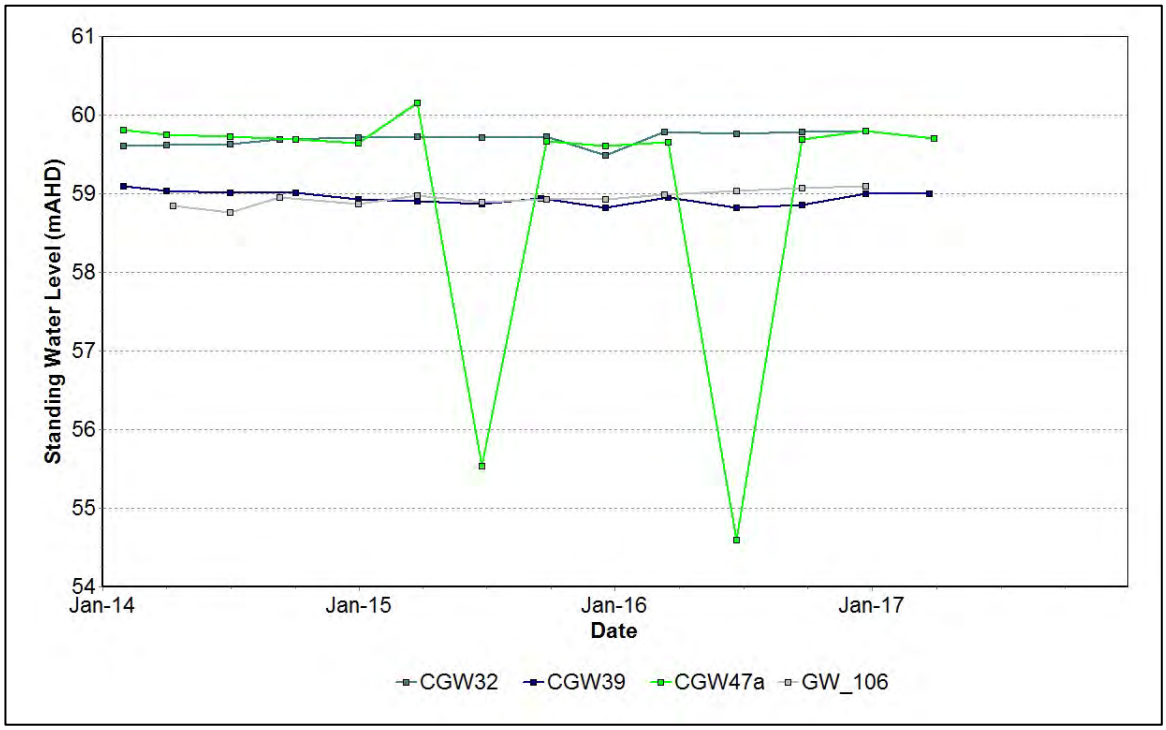

Figure 43: Carrington West Wing Flood Plain Standing Water Level – March 2017

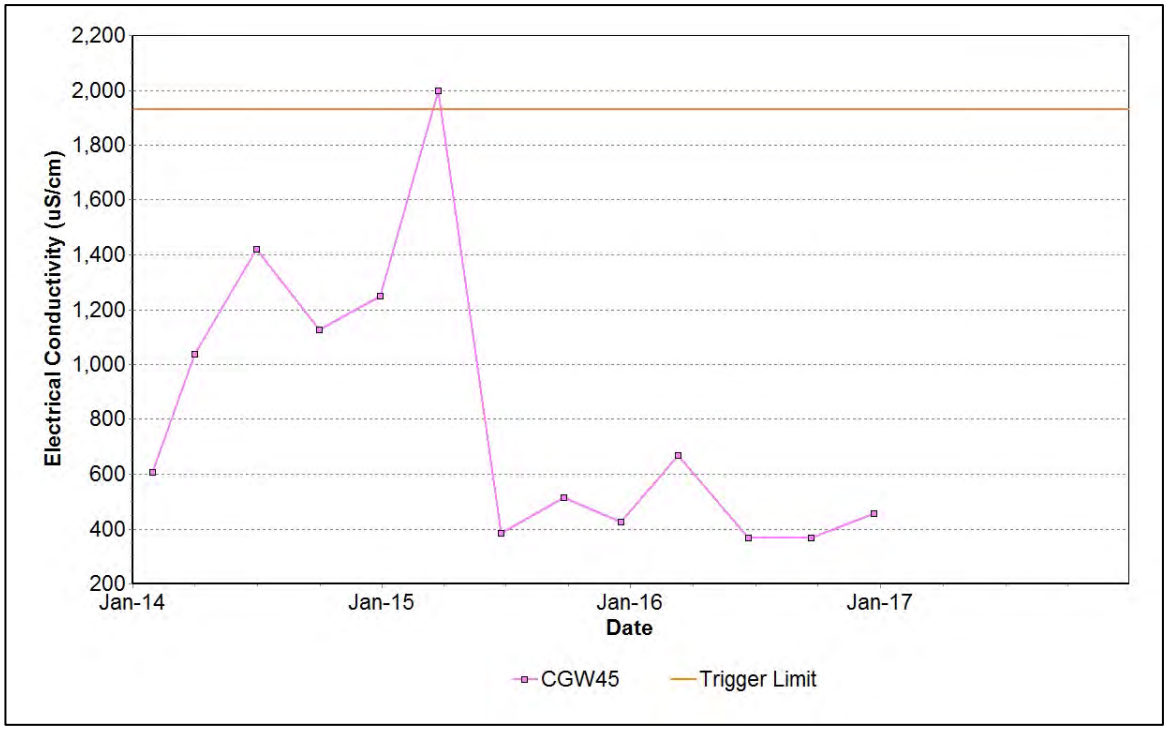

Figure 44: Carrington West Wing LBL Electrical Conductivity Trend - March 2017

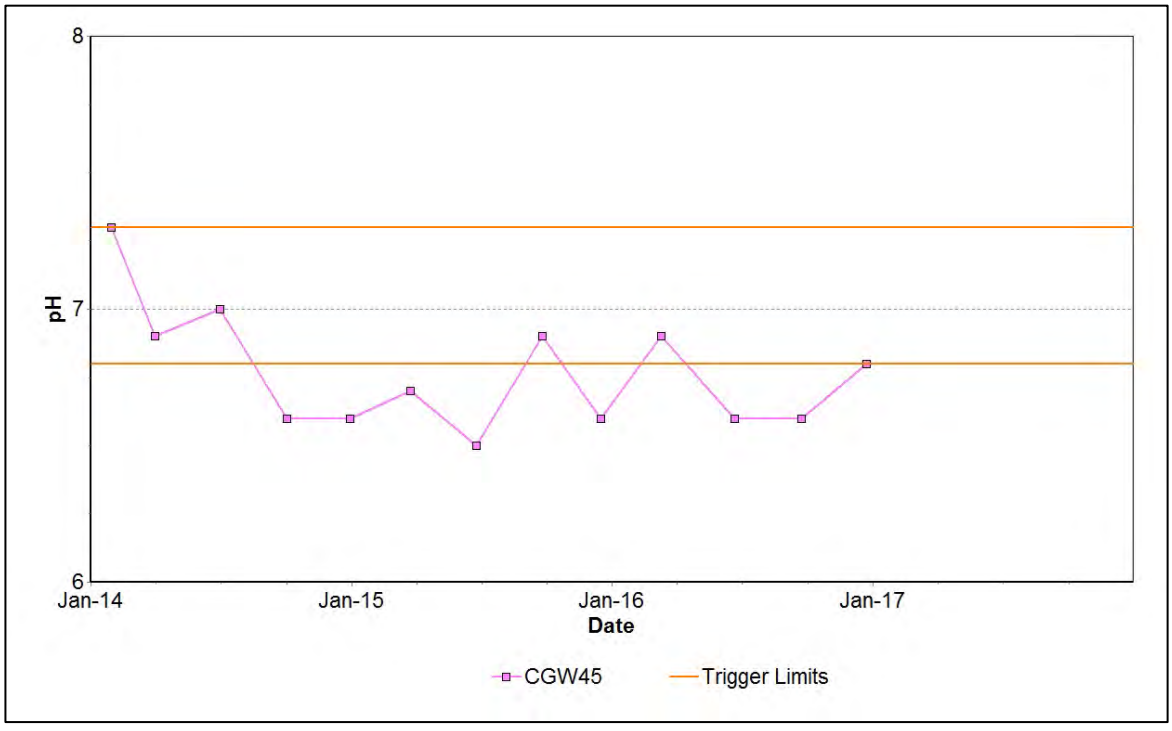

Figure 45: Carrington West Wing LBL pH Trend - March 2017

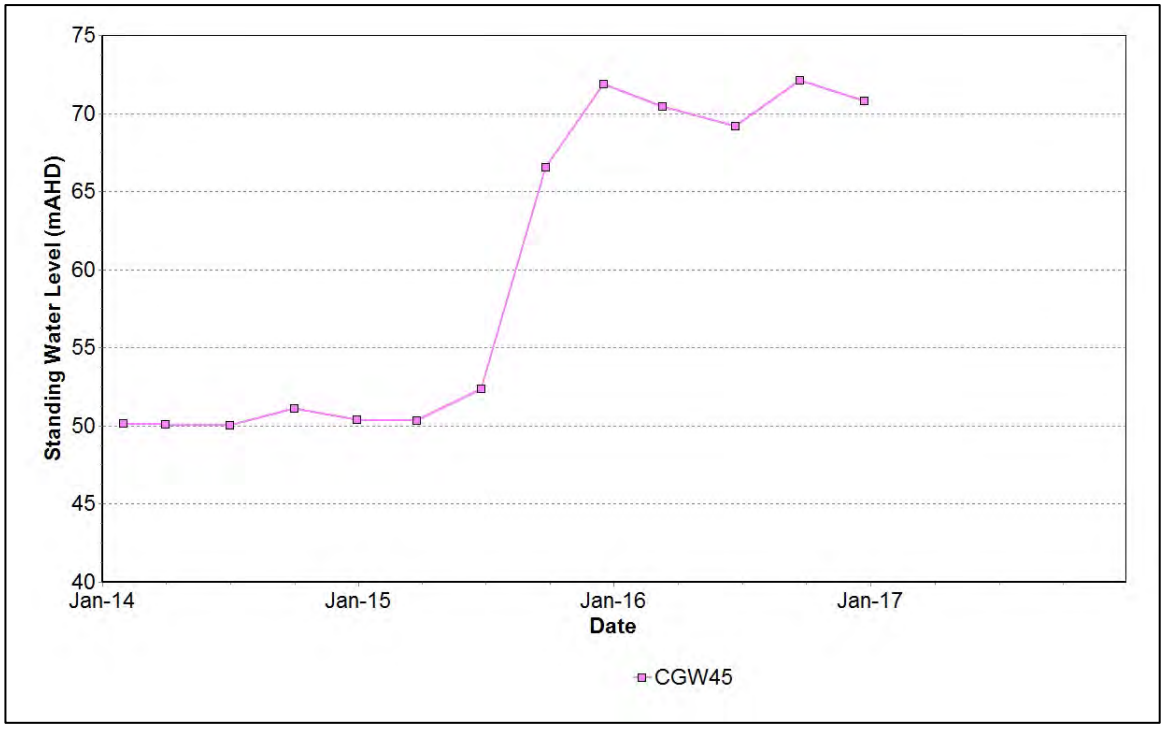

Figure 46: Carrington West Wing LBL Standing Water Level - March 2017

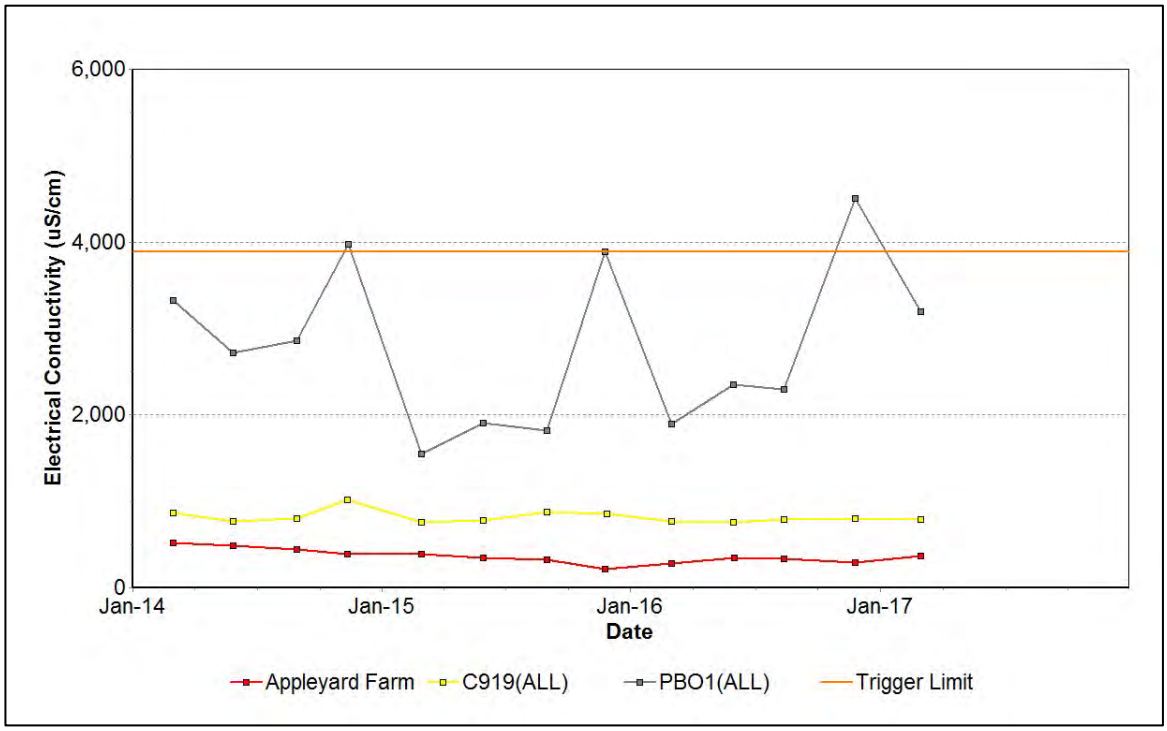

Figure 47: Lemington South Alluvium Electrical Conductivity Trend - March 2017

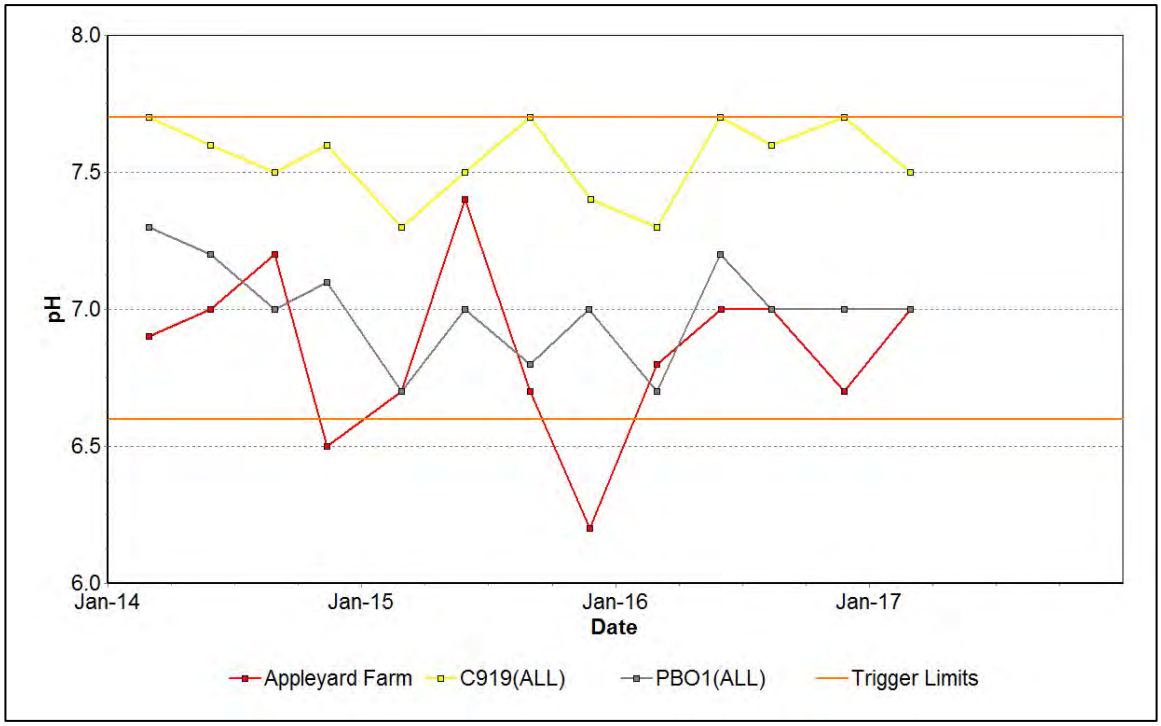

Figure 48: Lemington South Alluvium pH Trend – March 2017

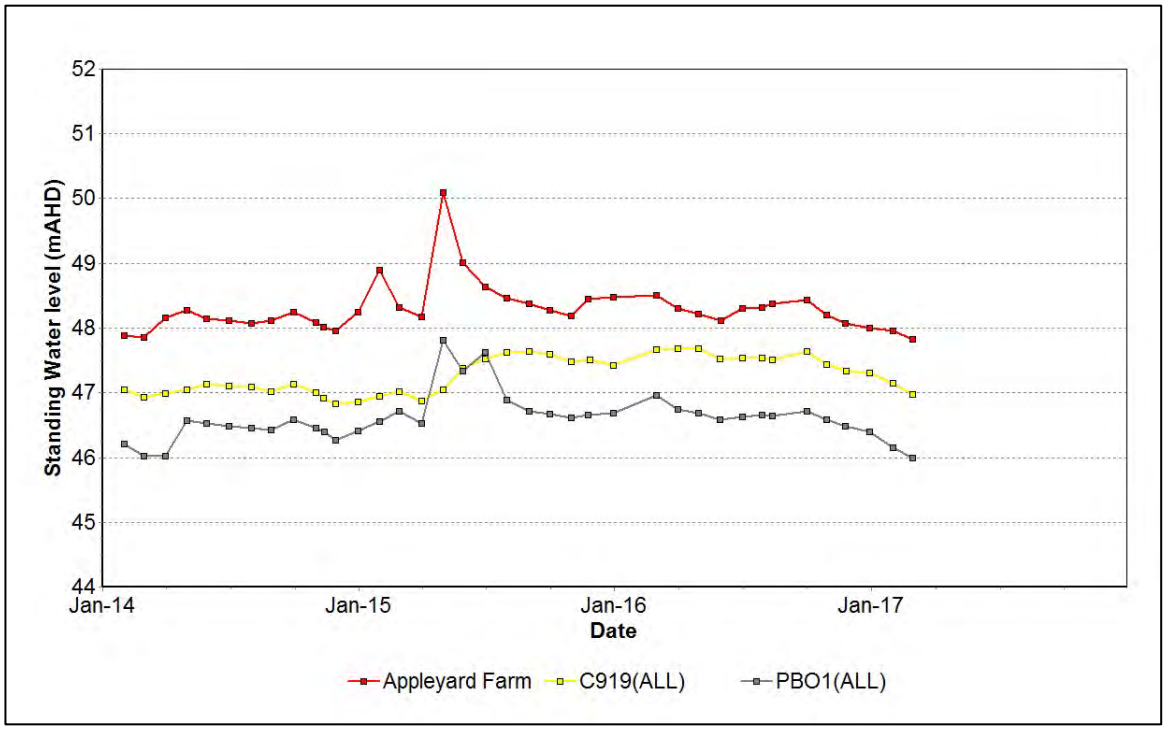

Figure 49: Lemington South Alluvium Standing Water Level Trend – March 2017

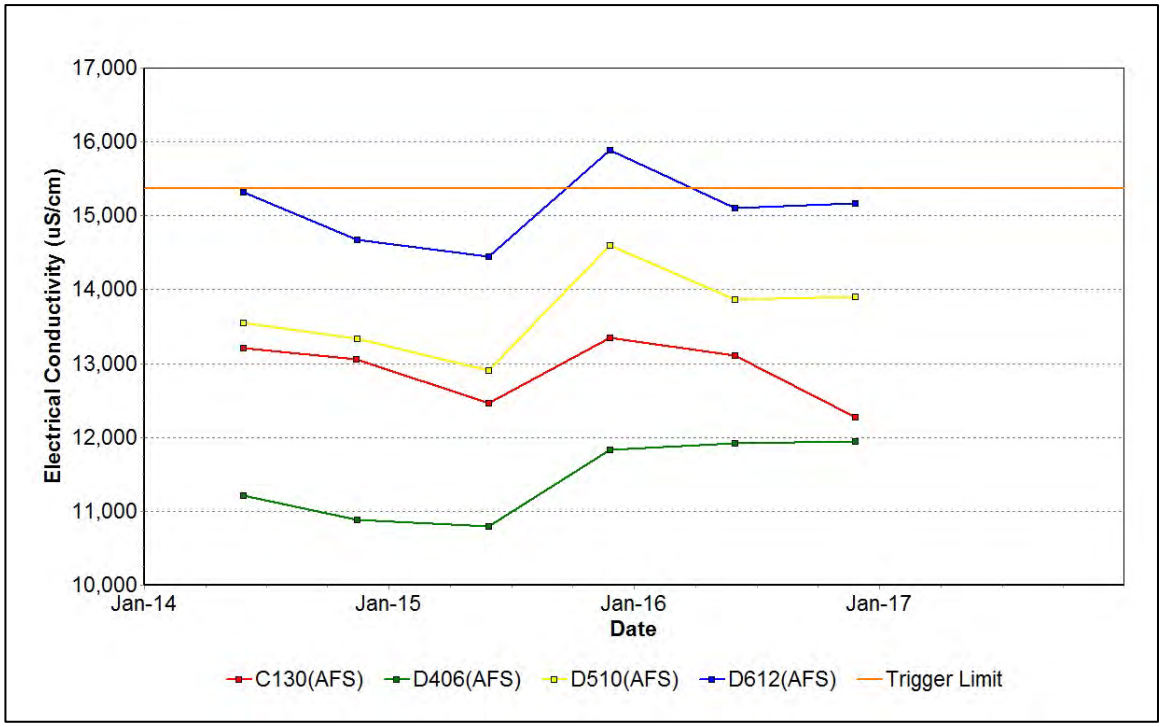

Figure 50: Lemington South Arrowfield Electrical Conductivity Trend – March 2017

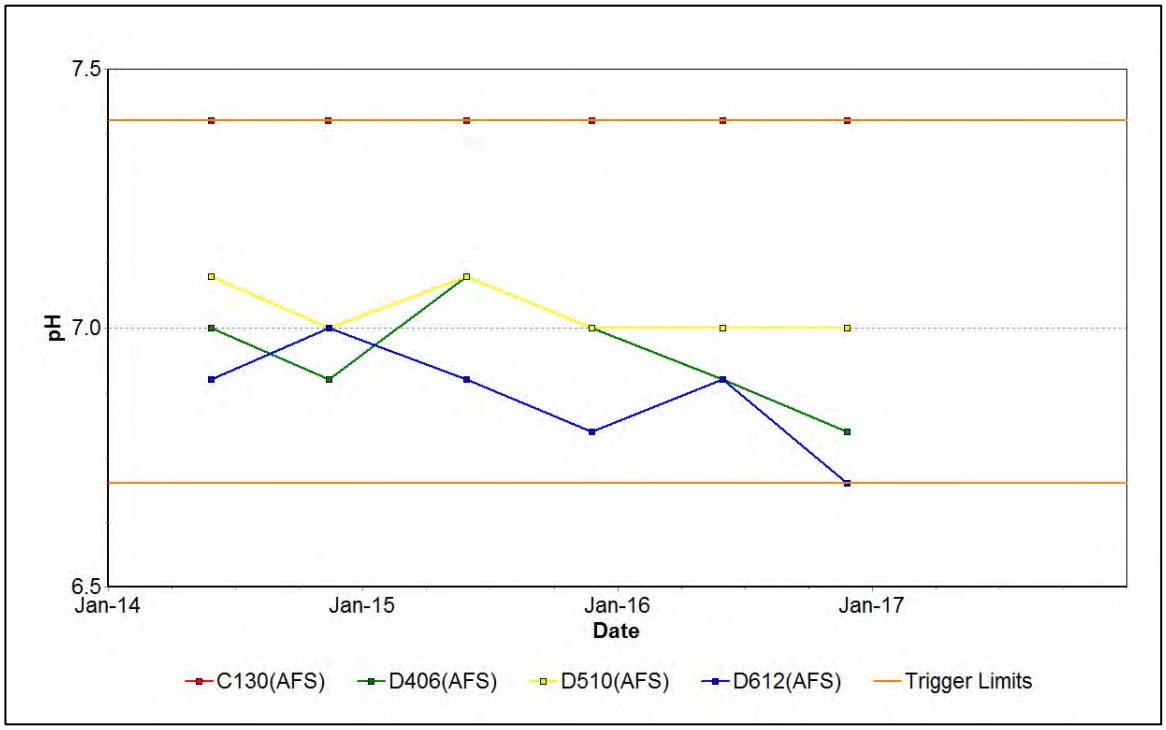

Figure 51: Lemington South Arrowfield pH Trend – March 2017

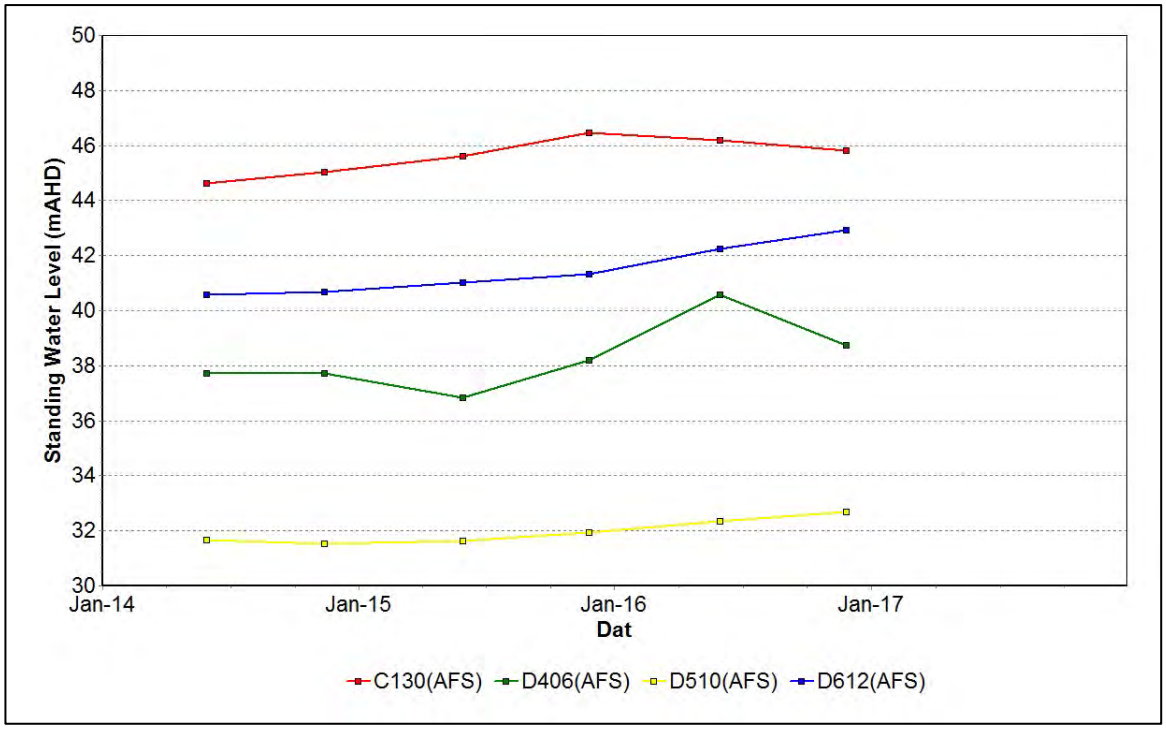

Figure 52: Lemington South Arrowfield Standing Water Level - March 2017

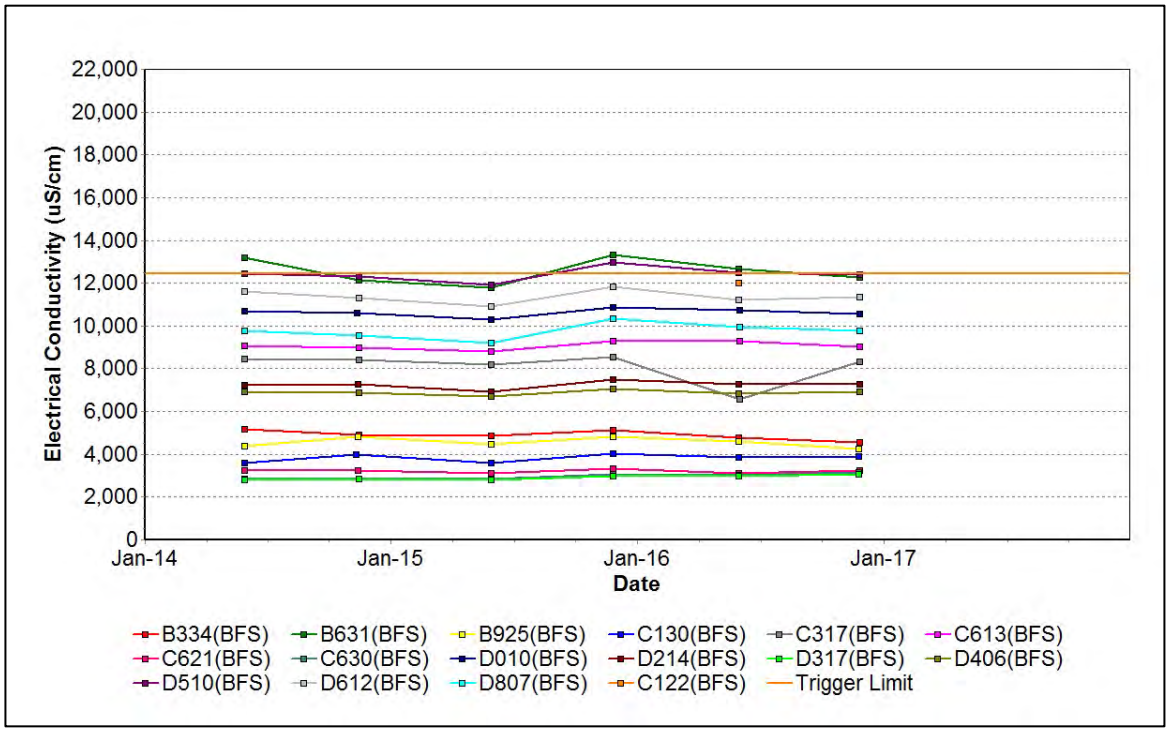

Figure 53: Lemington South Bowfield Electrical Conductivity Trend - March 2017

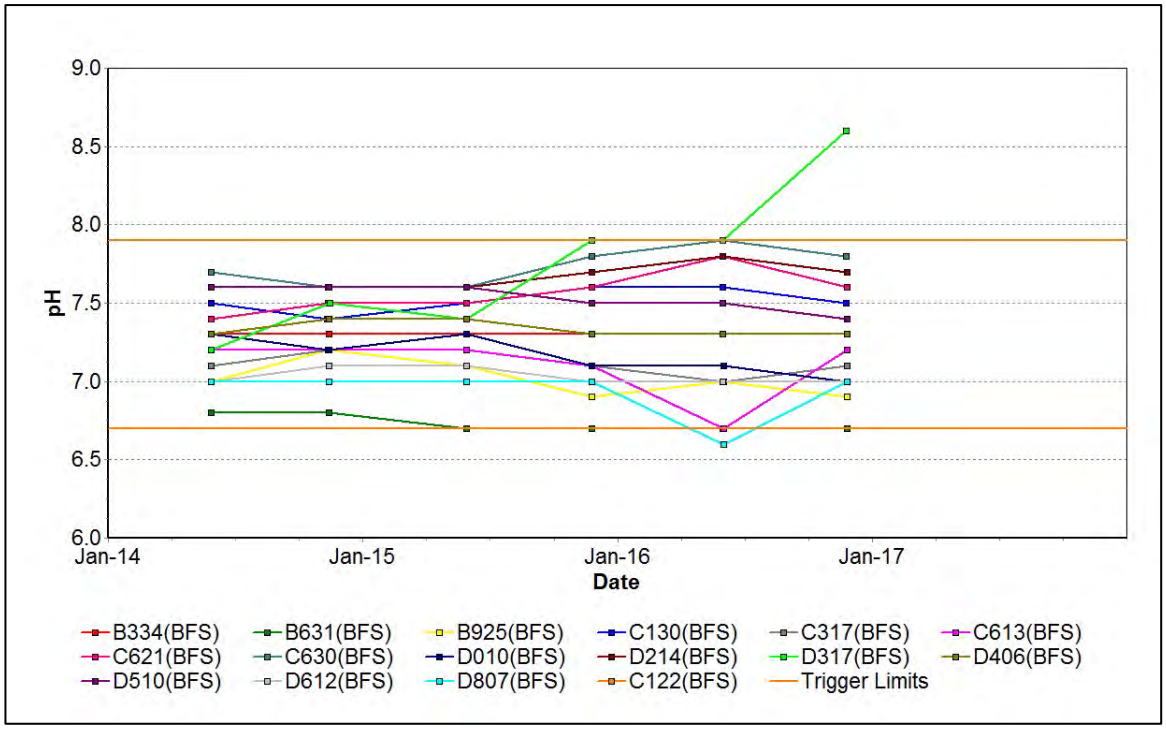

Figure 54: Lemington South Bowfield pH Trend - March 2017

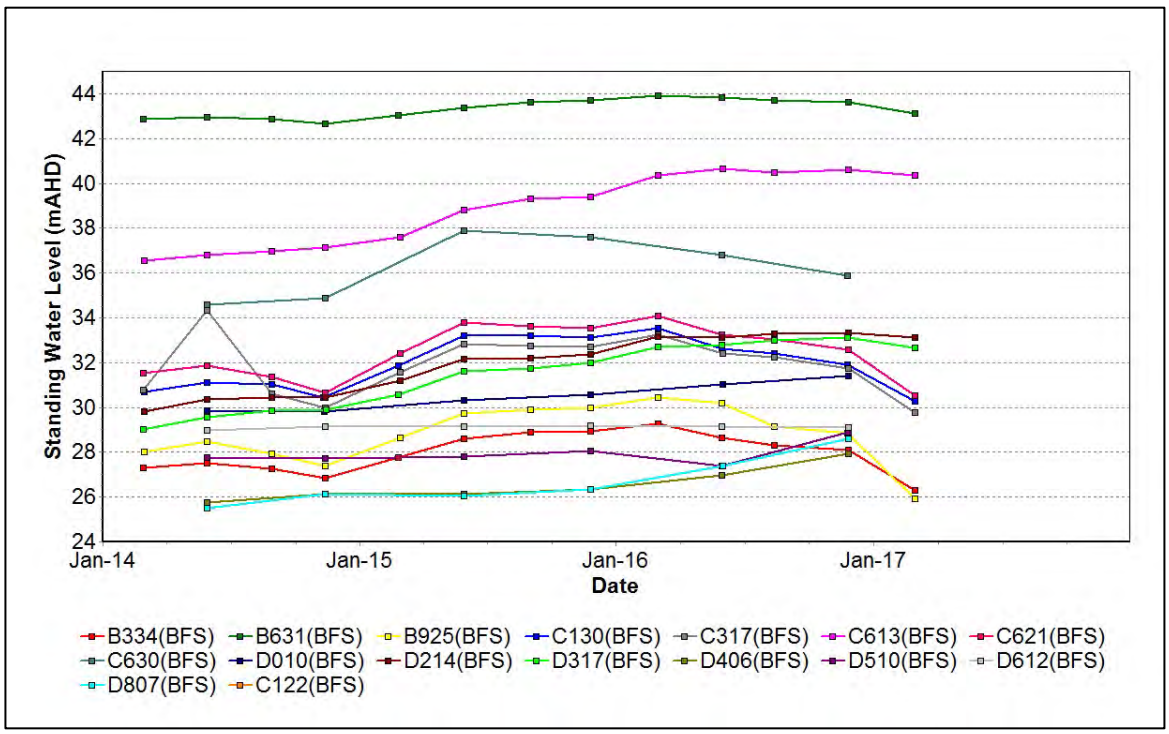

Figure 55: Lemington South Bowfield Standing Water Level - March 2017

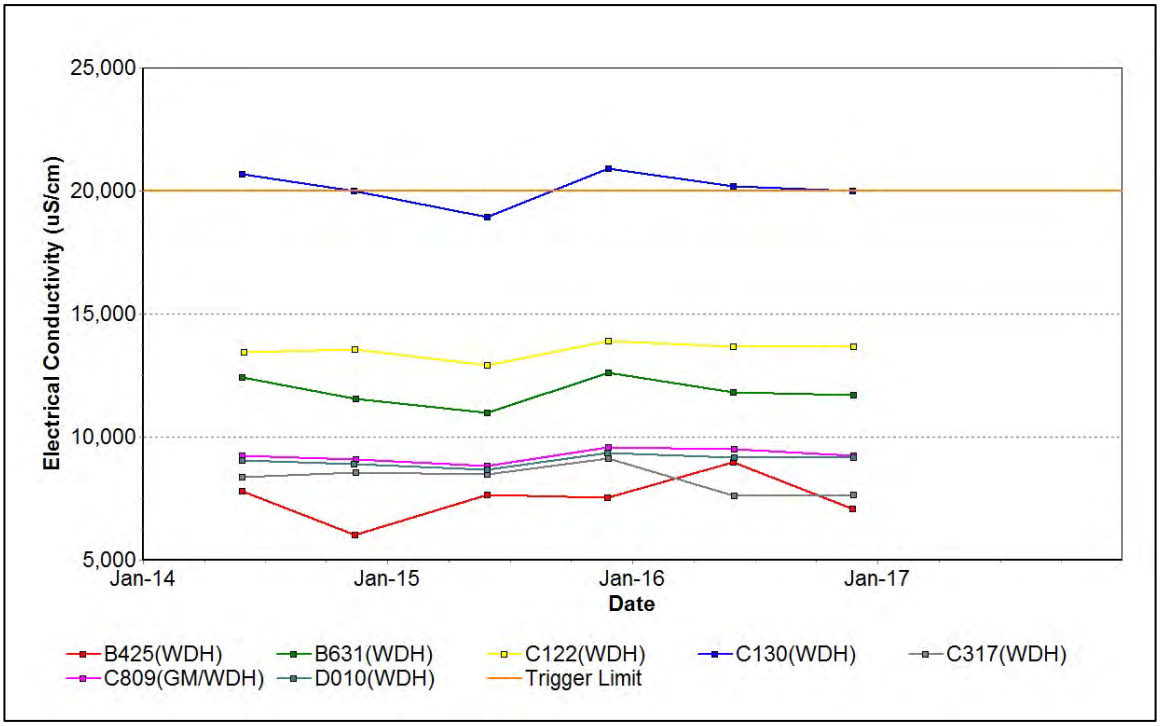

Figure 56: Lemington South Woodlands Hill Electrical Conductivity Trend - March 2017

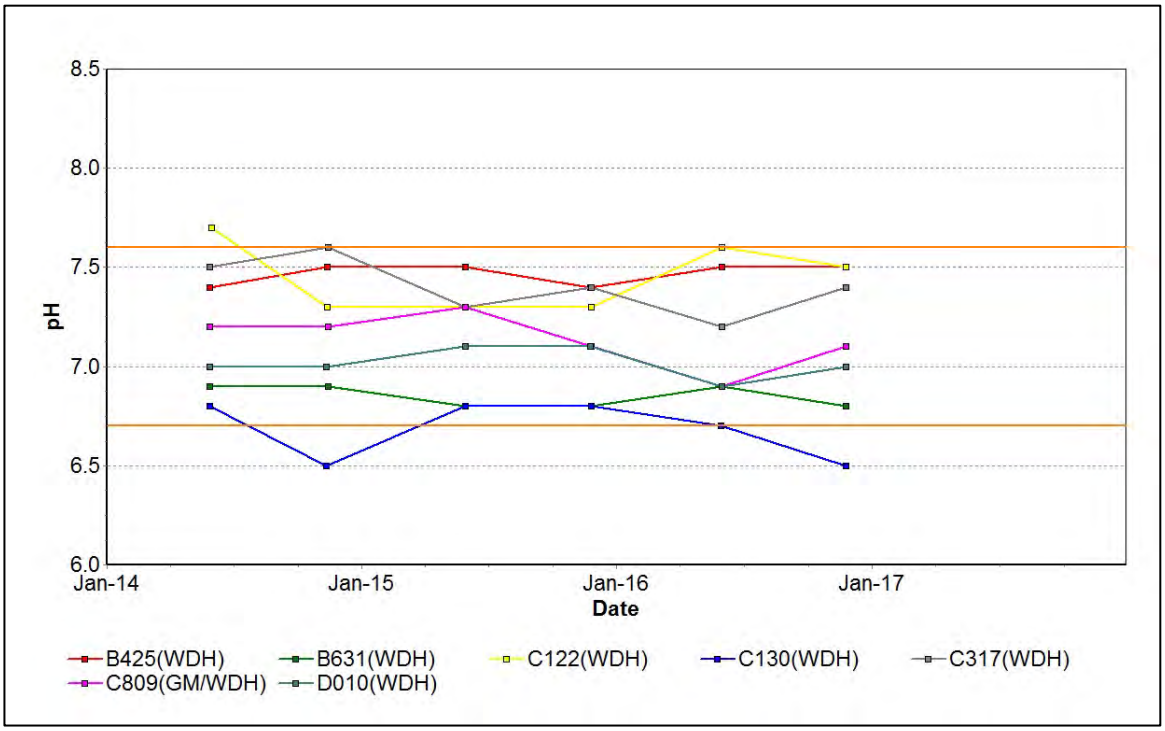

Figure 57: Lemington South Woodlands Hill pH Trend - March 2017

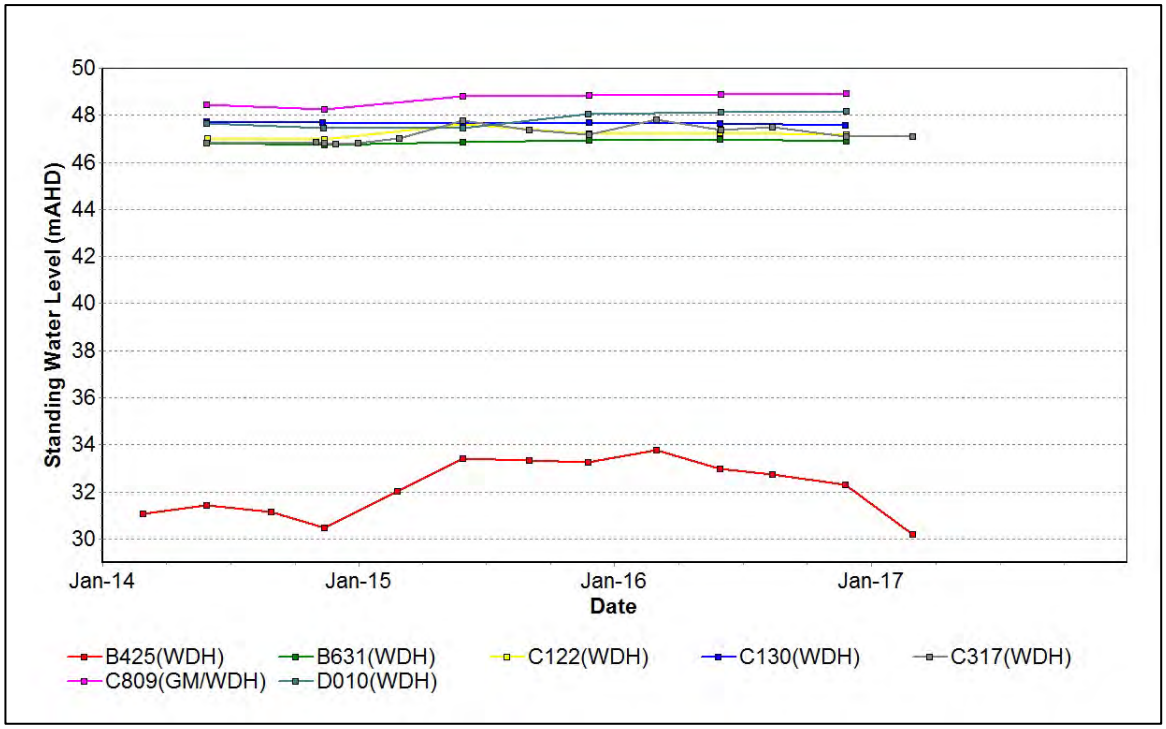

Figure 58: Lemington South Woodlands Hill Standing Water Level – March 2017

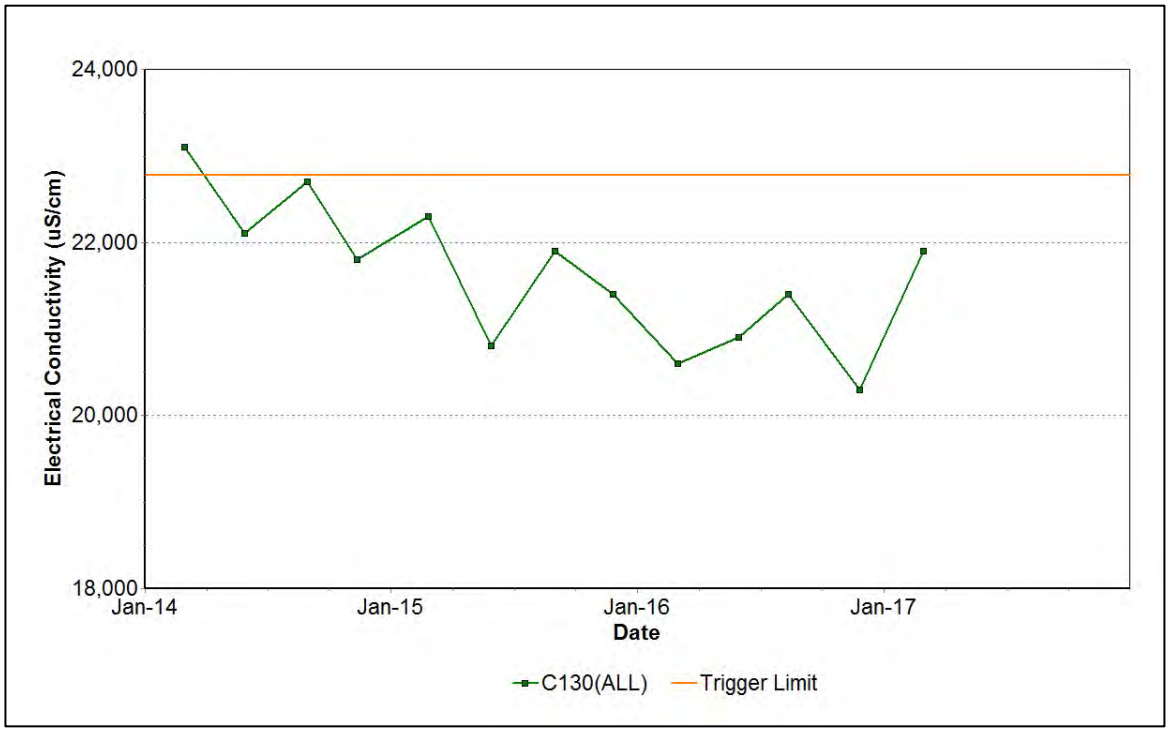

Figure 59: Lemington South Interburden Electrical Conductivity Trend - March 2017

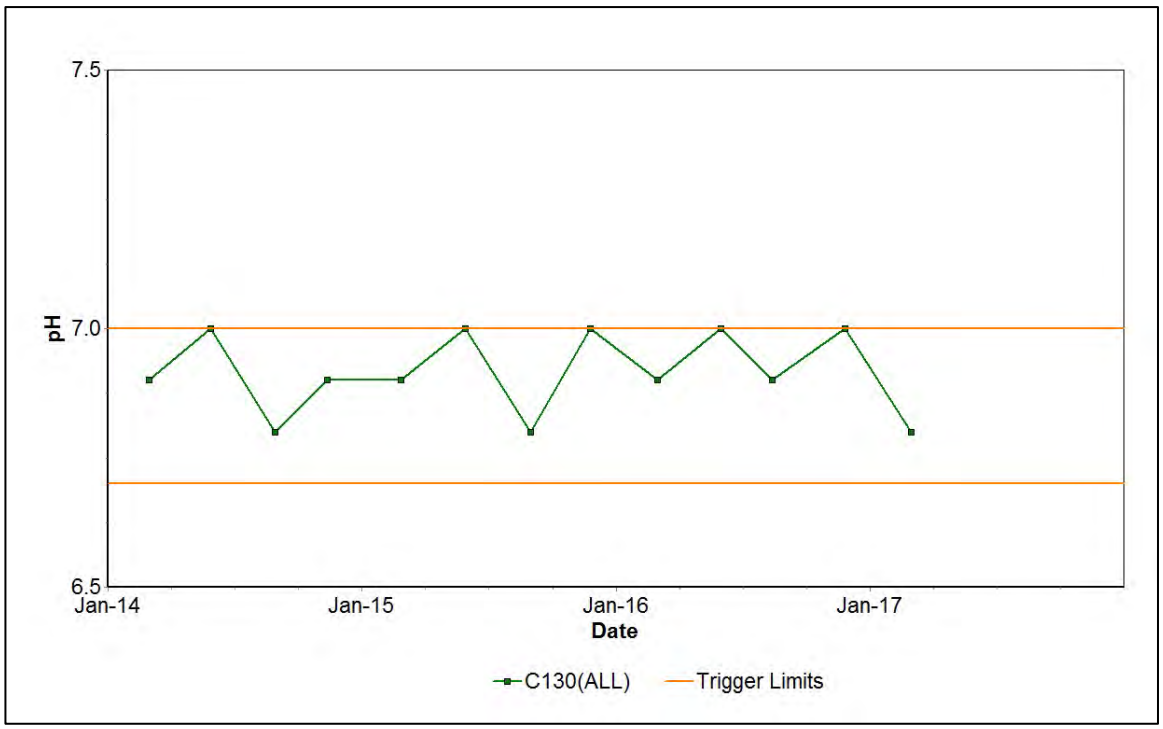

Figure 60: Lemington South Interburden pH Trend - March 2017

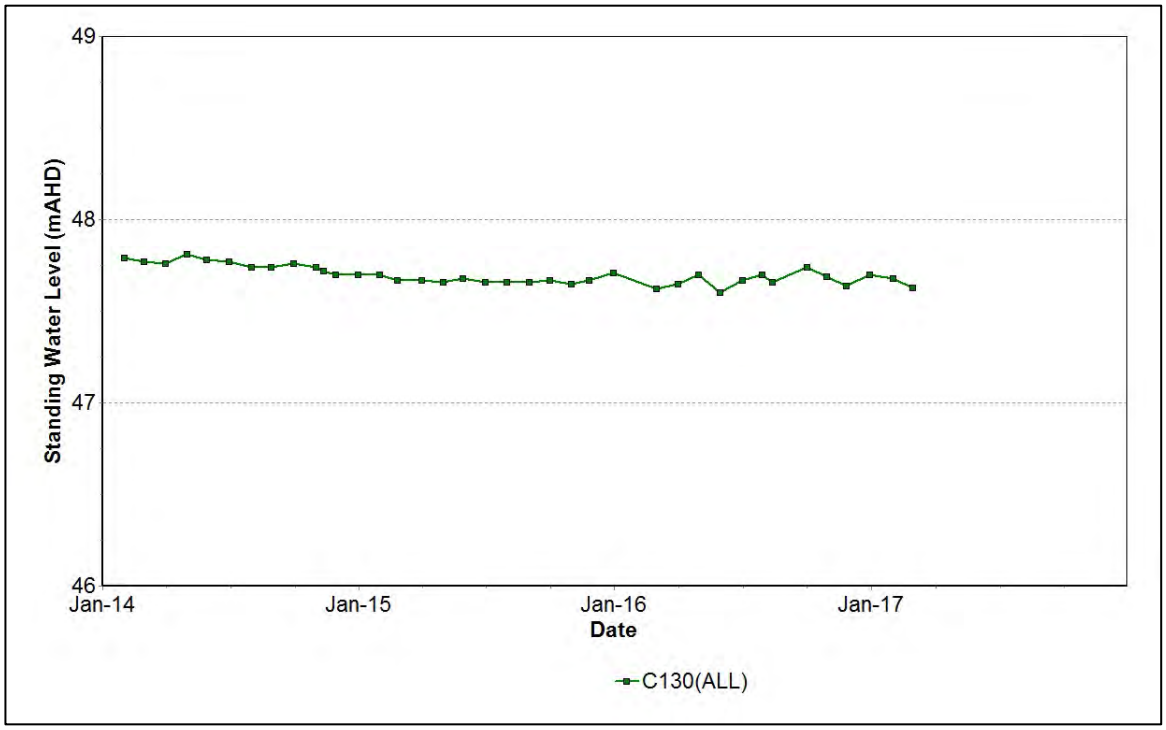

Figure 61: Lemington South Interburden Standing Water Level - March 2017

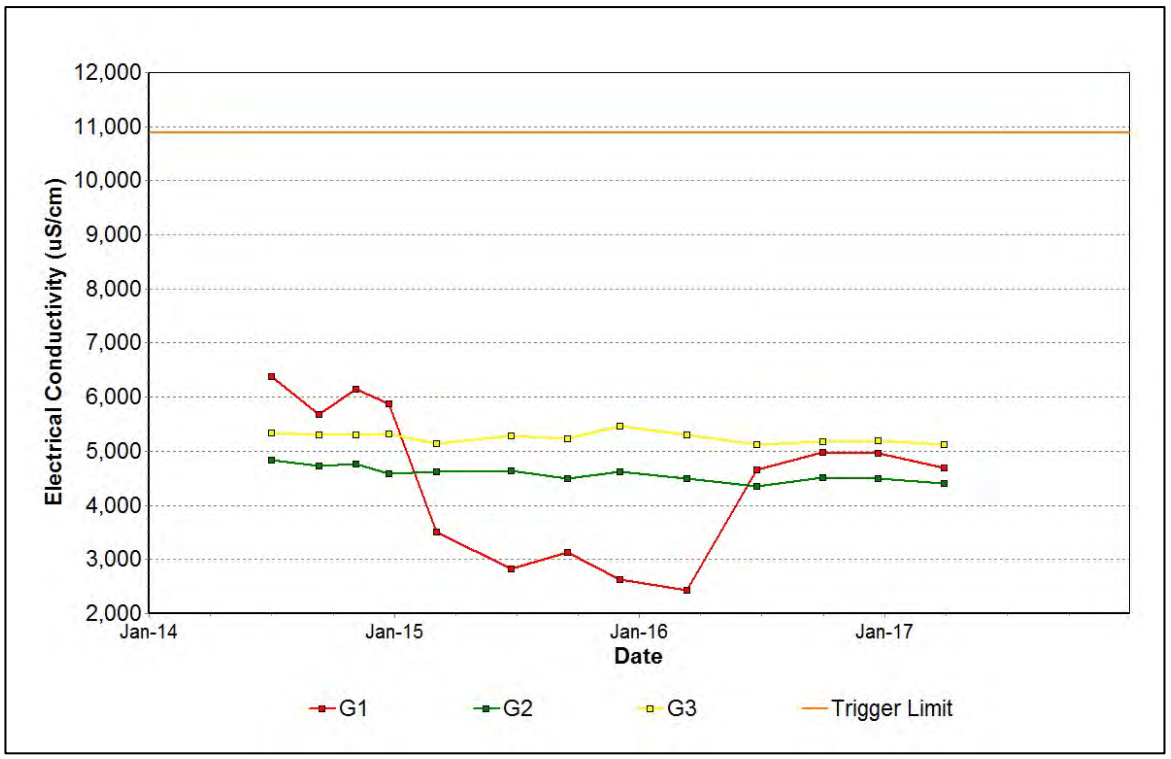

Figure 62: West Pit Alluvium Electrical Conductivity Trend - March 2017

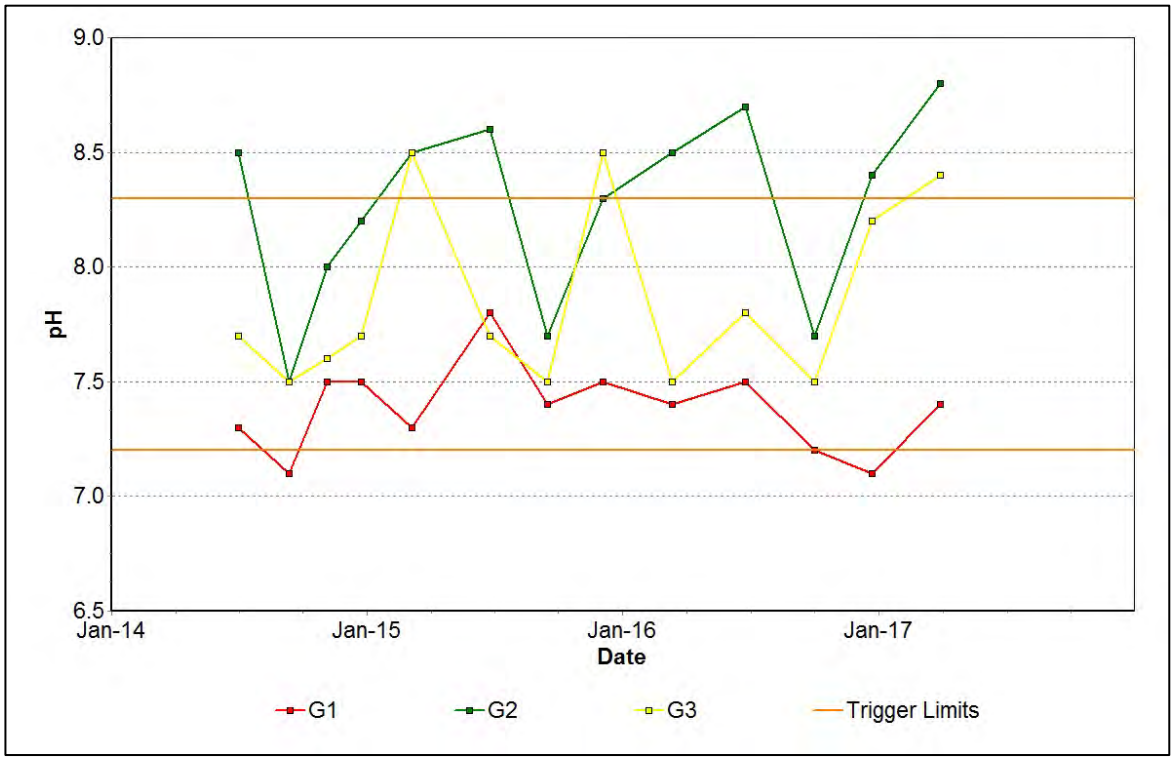

Figure 63: West Pit Alluvium pH Trend – March 2017

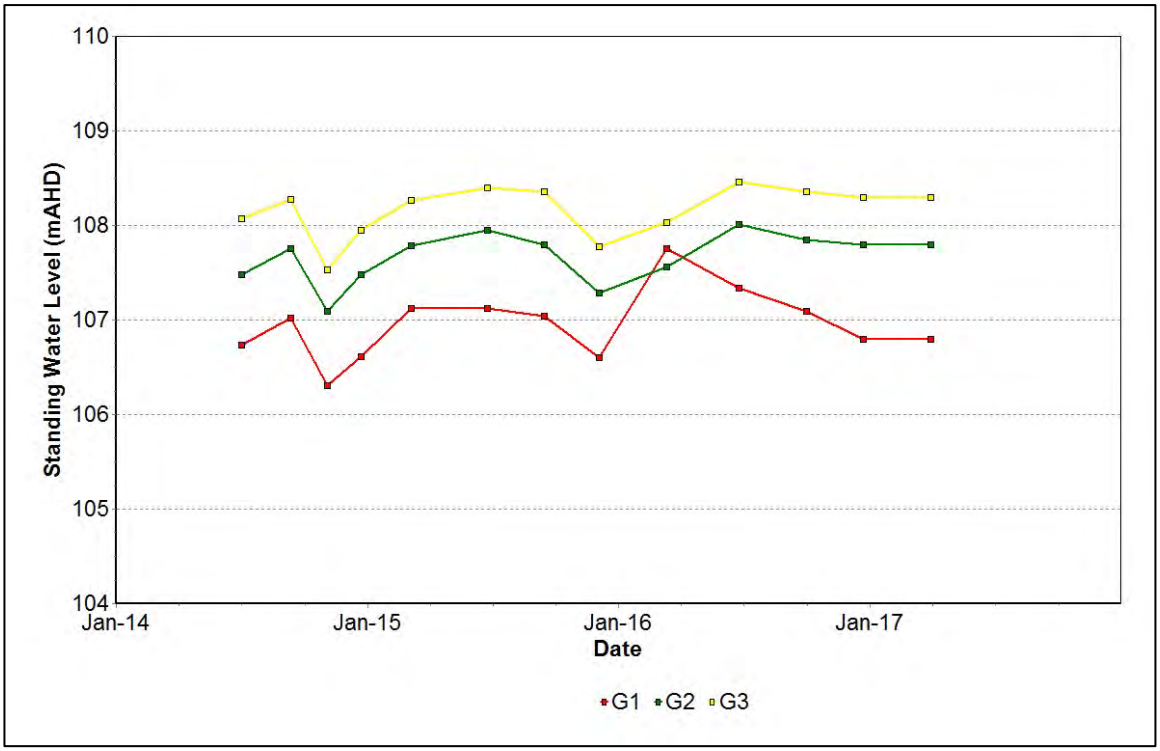

Figure 64: West Pit Alluvium Standing Water Level - March 2017

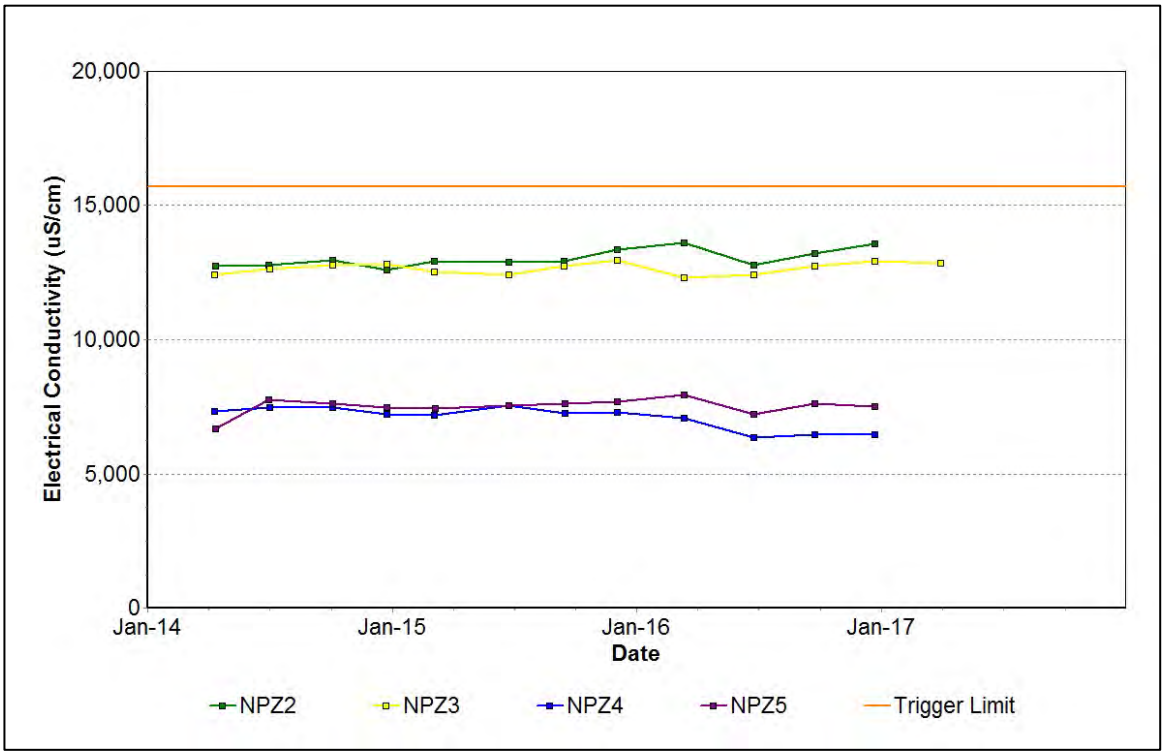

Figure 65: West Pit Siltstone Electrical Conductivity Trend – March 2017

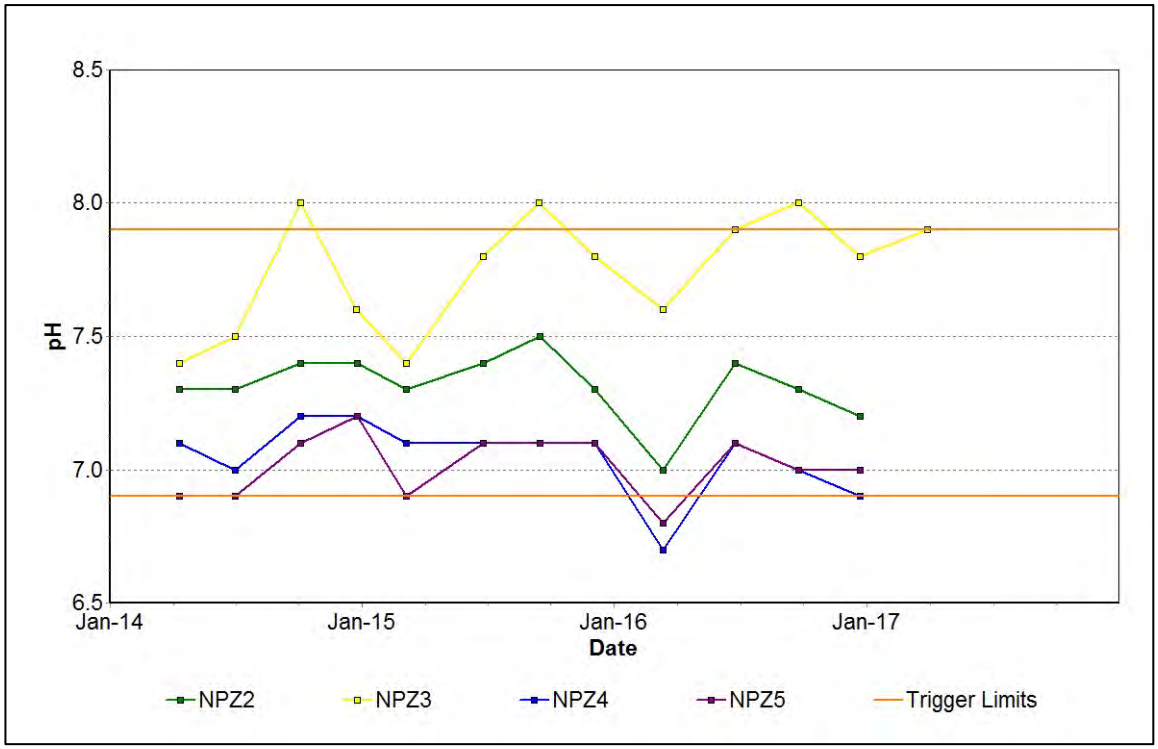

Figure 66: West Pit Siltstone pH Trend – March 2017

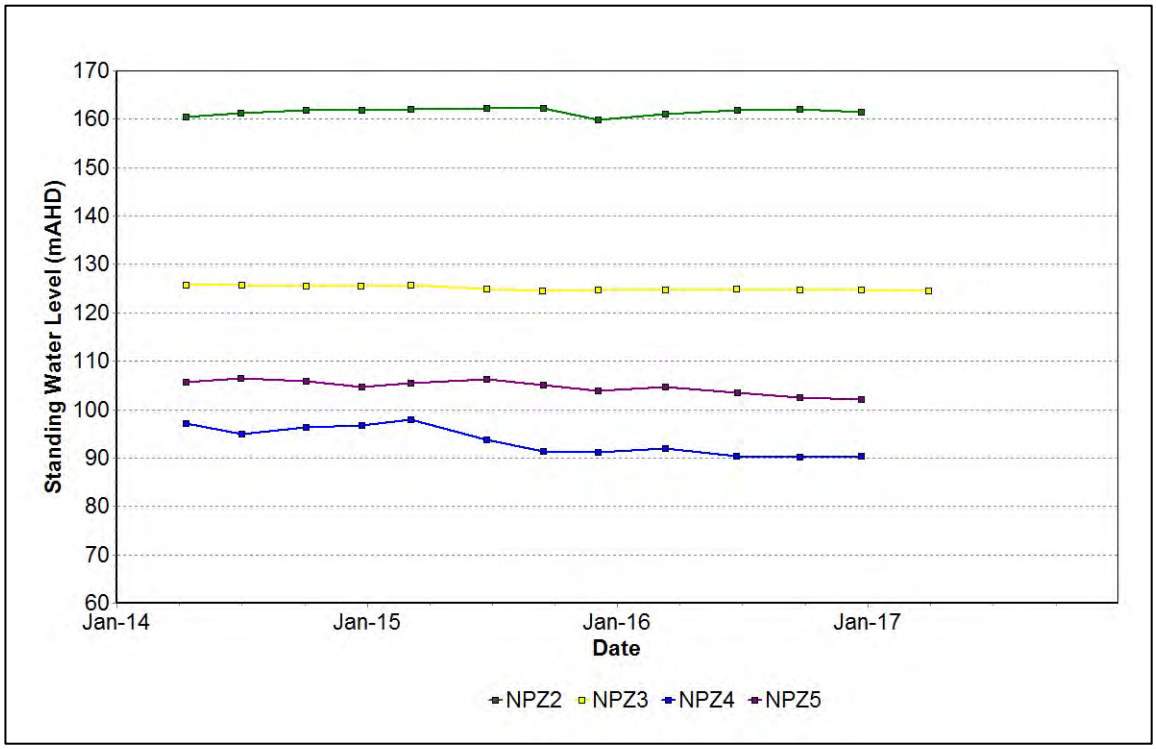

Figure 67: West Pit Siltstone Standing Water Level – March 2017

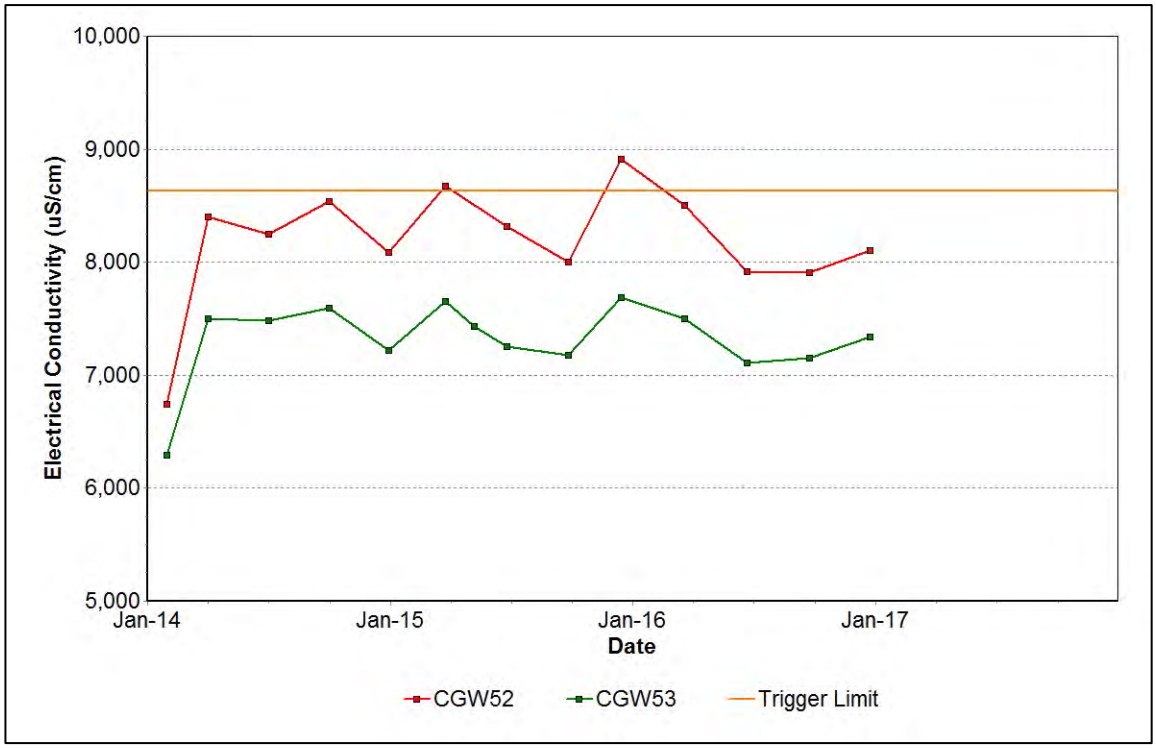

Figure 68: Carrington Broonie Electrical Conductivity Trend - March 2017

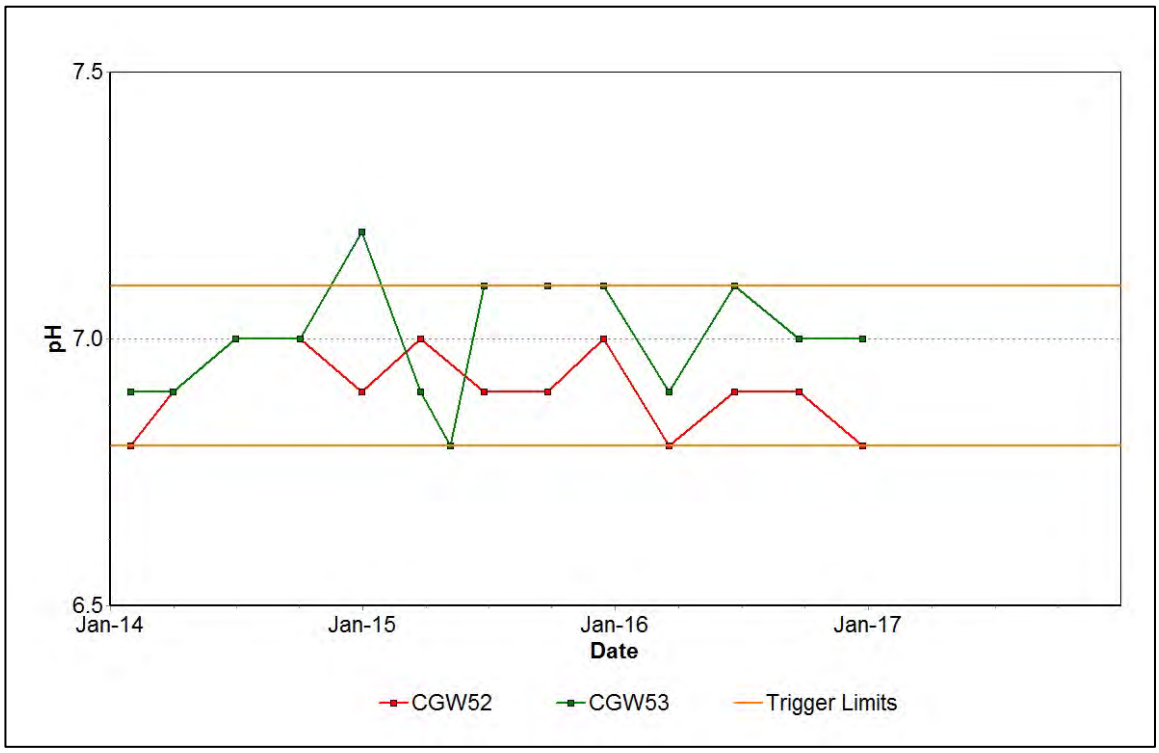

Figure 69: Carrington Broonie pH Trend - March 2017

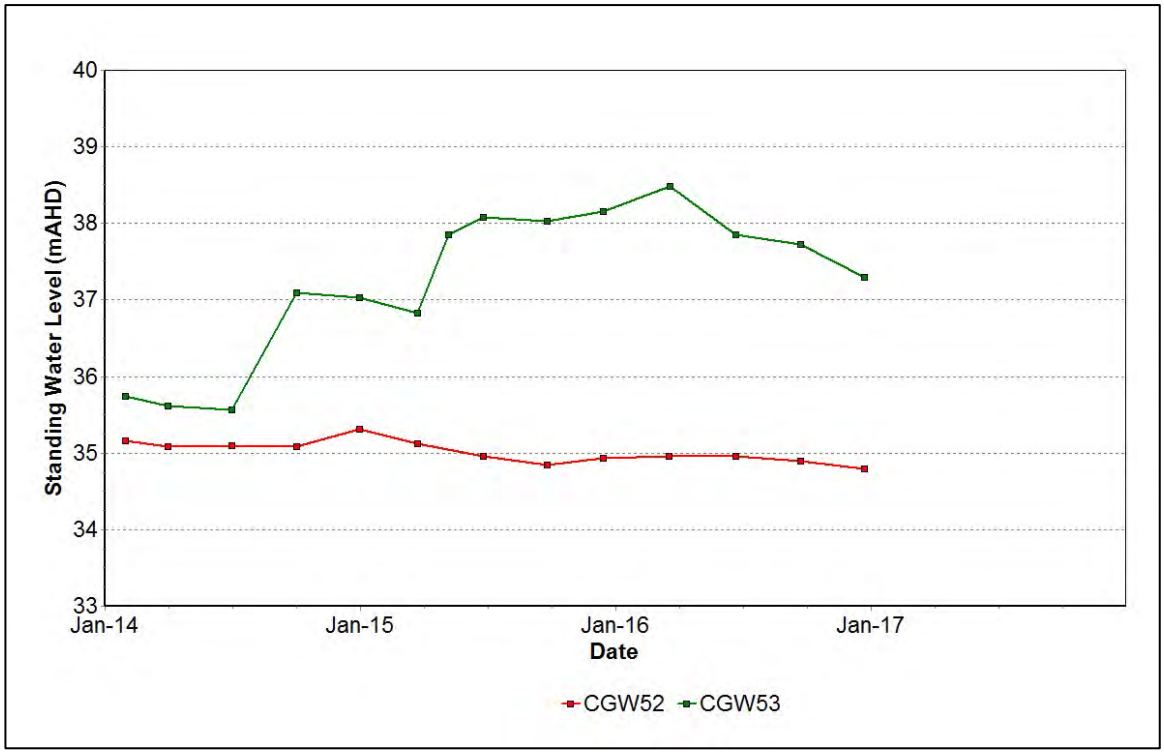

Figure 70: Carrington Broonie Standing Water Level - March 2017

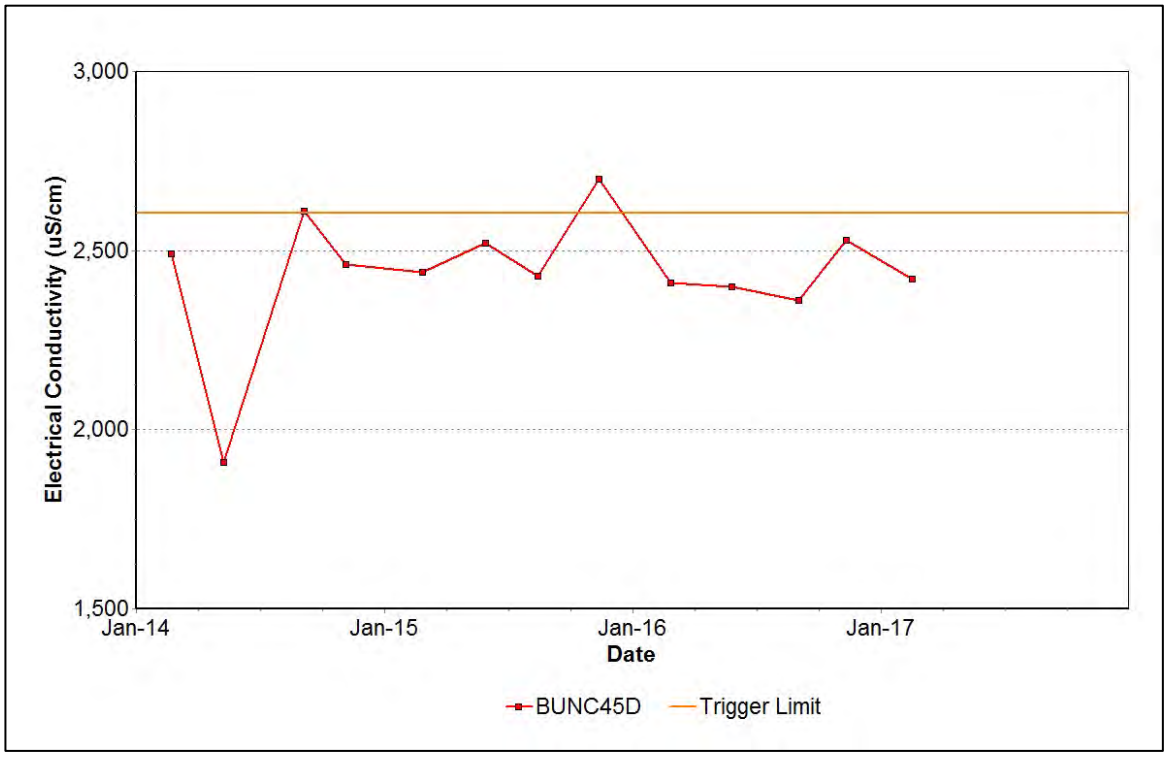

Figure 71: Cheshunt Piercefield Electrical Conductivity Trend - March 2017

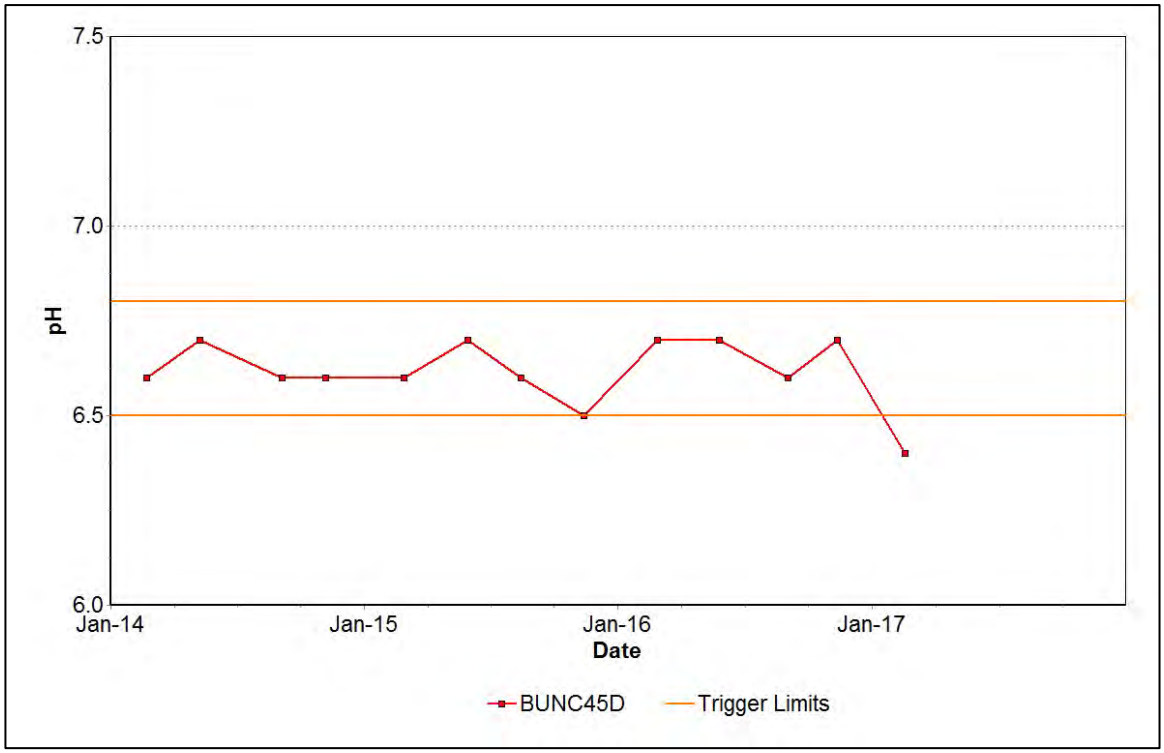

Figure 72: Cheshunt Piercefield pH Trend - March 2017

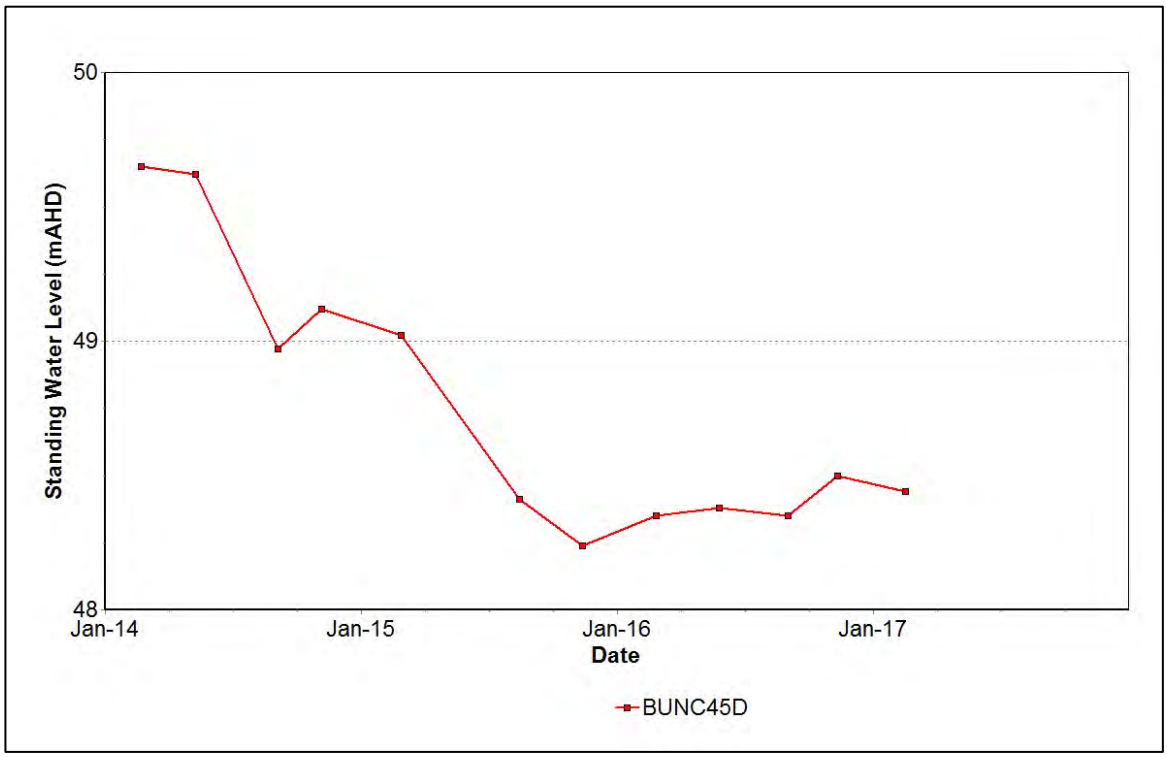

Figure 73: Cheshunt Piercefield Standing Water Level - March 2017

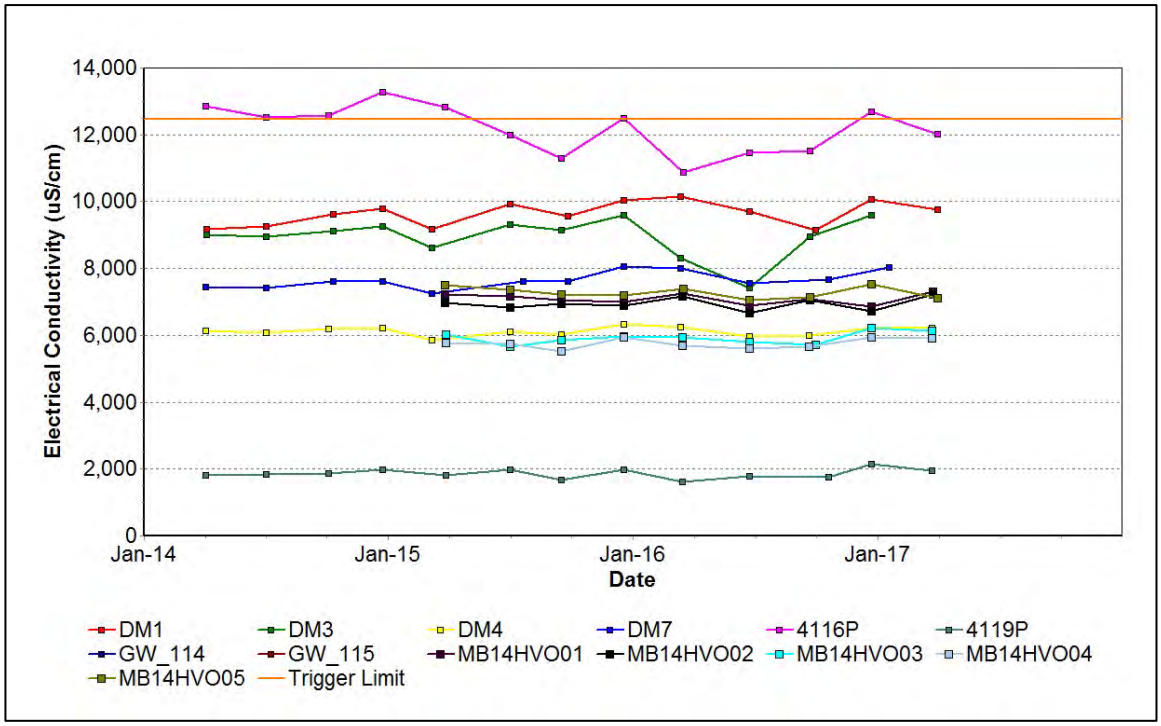

Figure 74: North Pit Spoil Electrical Conductivity Trend - March 2017

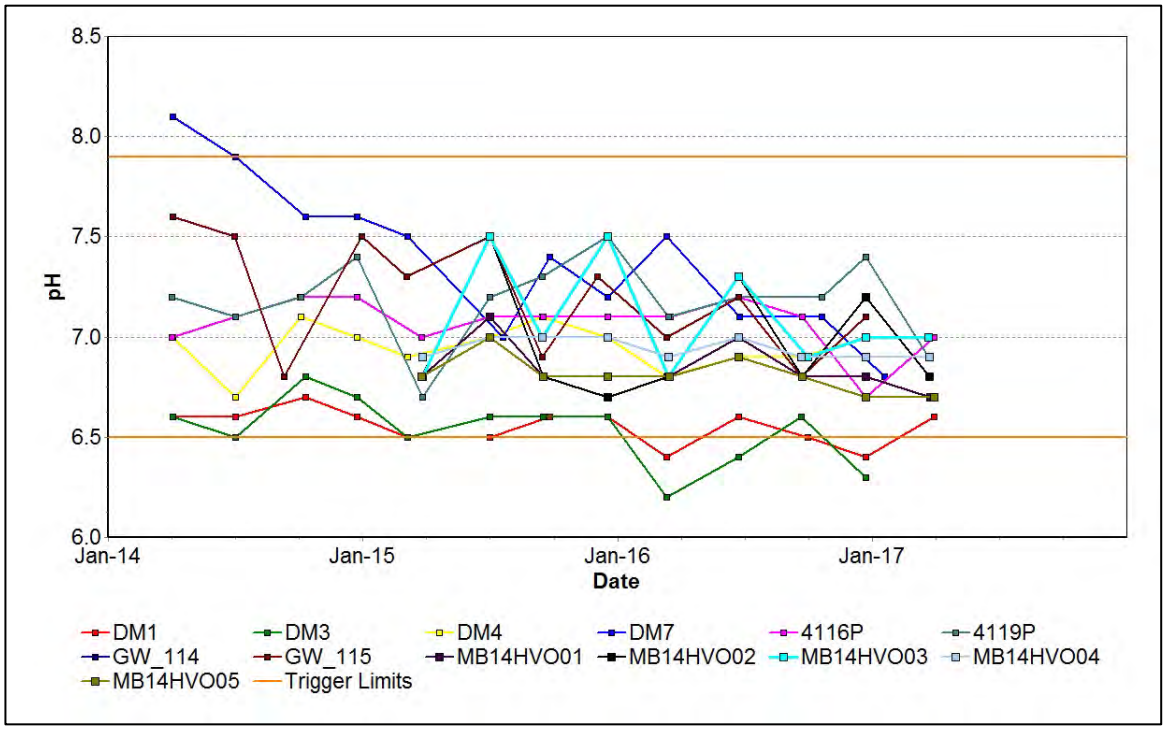

Figure 75: North Pit Spoil pH Trend - March 2017

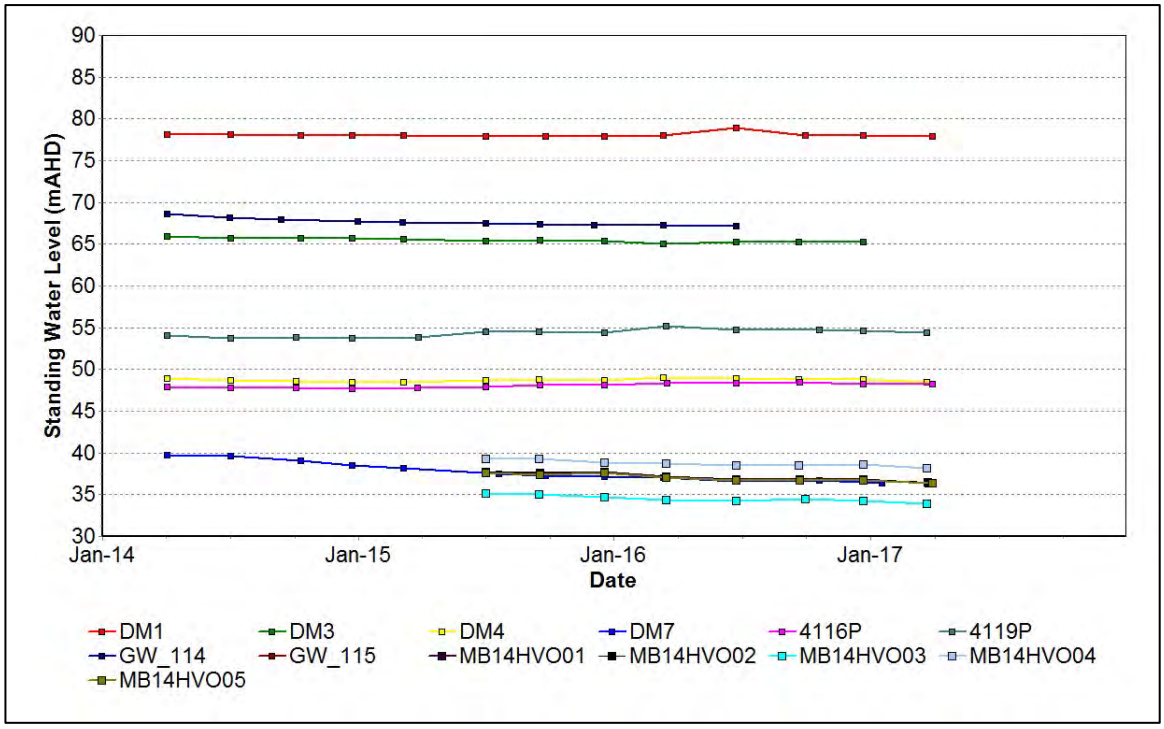

Figure 76: North Pit Spoil Standing Water Level - March 2017

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. Locations of groundwater bores are shown in Figure 77.

During Q1 2017 a range of internal trigger limits were breached, these are summarised in Table 3.

Table 3: Groundwater Triggers - 2017

Site	Date	Trigger Limit Breached	Action Taken in Response
GW-100	29/03/2017	EC – 95th Percentile	Watching Brief*
CFW55R	23/03/2017	EC – 95th Percentile	Previous investigation determined that hydro geochemical speciation has not changed and that water quality is consistent with nearby bore CFW57. This, coupled with historical data showing similar elevated EC and depressed pH, suggests the variations are natural and unlikely to be due to anthropogenic impact. Watching brief, no further action required.
BZ8-2	16/02/2017	PH – 5th Percentile	Watching Brief*
BUNC45A	16/02/2017	PH – 5th Percentile	Watching Brief*
CHPz3A	15/02/2017	PH – 5th Percentile	Watching Brief*
CHPZ8A	16/02/2017	PH – 5th Percentile	Watching Brief*
G2	29/03/2017	PH – 95th Percentile	Watching Brief*
CFW55R	23/03/2017	PH – 5th Percentile	Previous investigation determined that hydro geochemical speciation has not changed and that water quality is consistent with nearby bore CFW57. This, coupled with historical data showing similar elevated EC and depressed pH, suggests the variations are natural and unlikely to be due to anthropogenic impact. Watching brief, no further action required.
BUNC45D	16/02/2017	PH – 5th Percentile	Watching Brief*

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

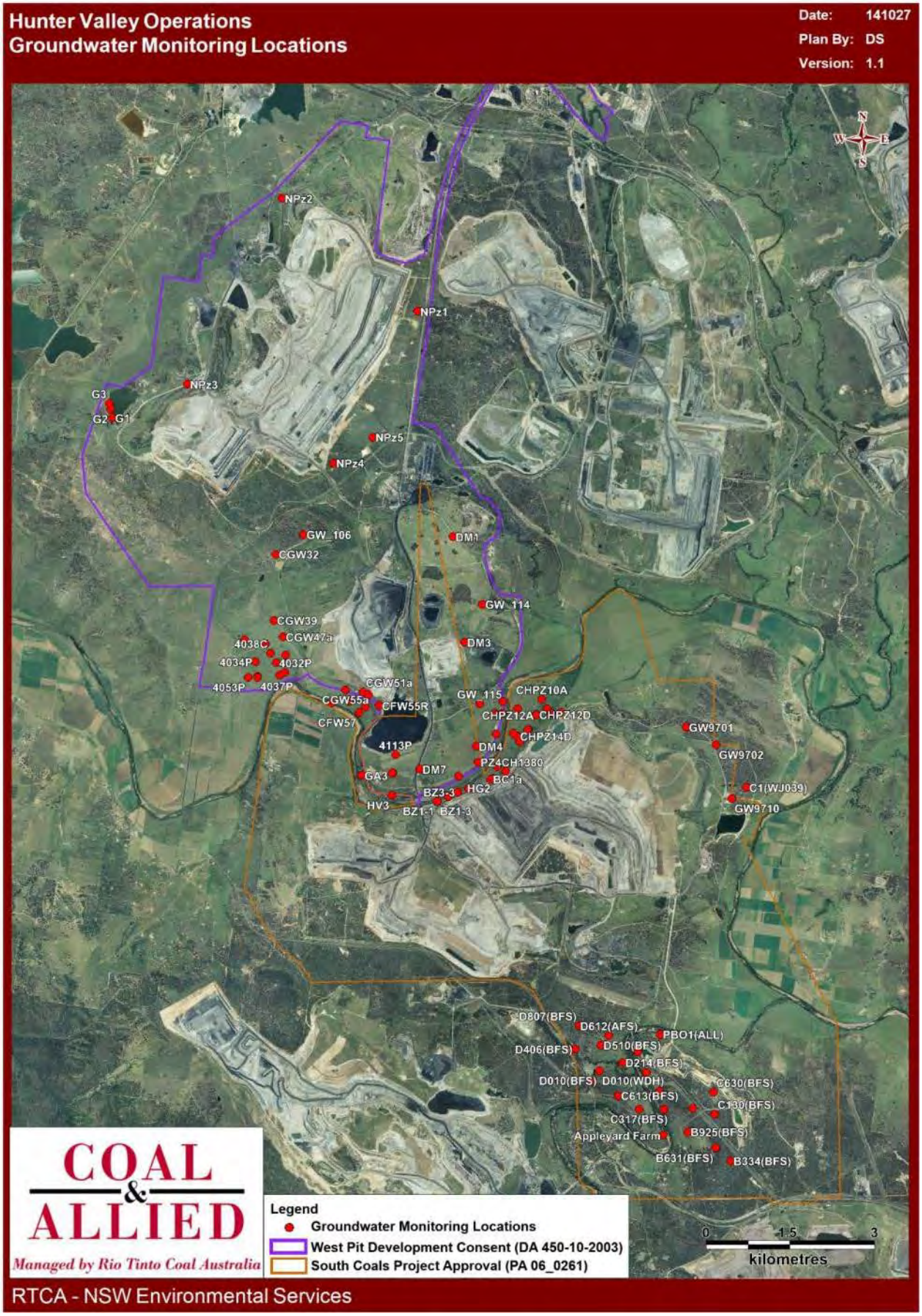

Figure 77: Groundwater Monitoring Location Plan

5.0 BLASTING

5.1.1 Blast Monitoring

HVO have a network of five blast monitoring units. These are located at nearby privately owned residences and function as regulatory compliance monitors. The location of these monitors can be found in Figure 83.

During March, 22 blasts were initiated at HVO. Figure 78 through to Figure 82 show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in Table 4.

Table 4: 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.

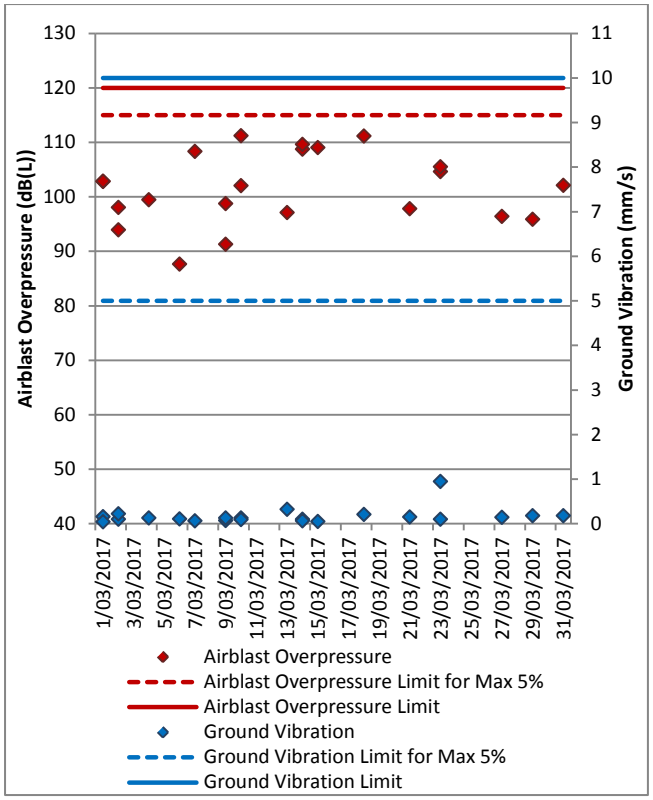

Figure 78: Moses Crossing Blast Monitoring Results – March 2017

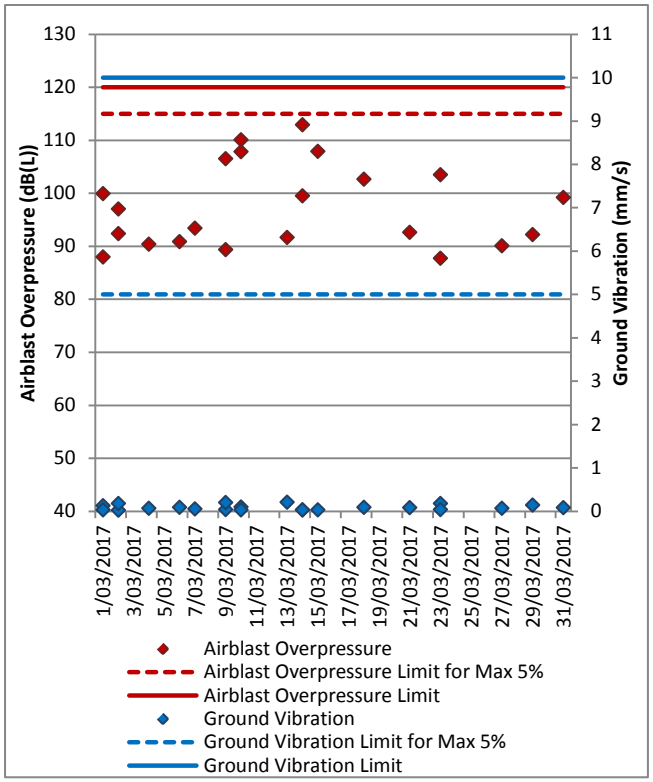

Figure 79: Jerrys Plains Blast Monitoring Results – March 2017

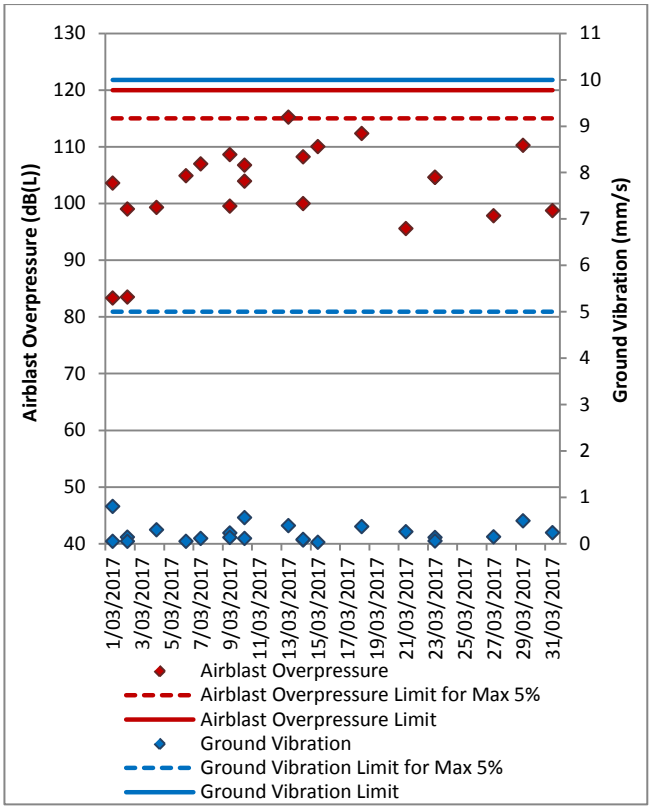

Figure 80: Maison Dieu Blast Monitoring Results – March 2017

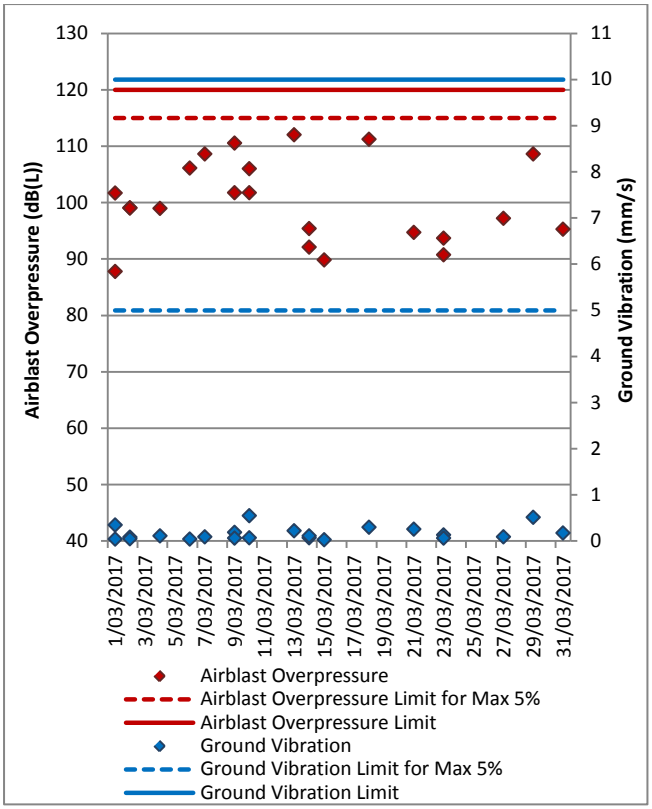

Figure 82: Knodlers Lane Blast Monitoring Results – March 2017

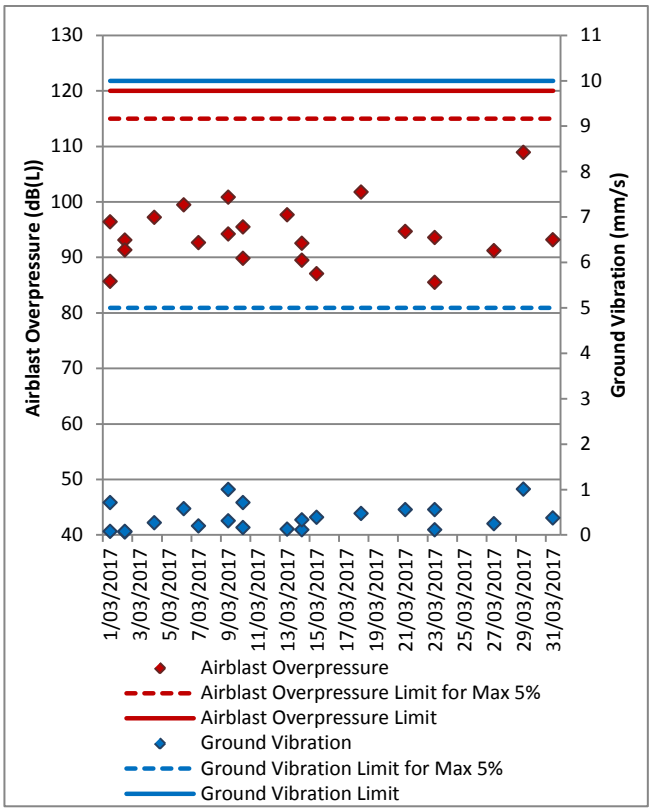

Figure 81: Warkworth Blast Monitoring Results – March 2017

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 of the 7th of March 2017. Monitoring results are detailed in Table 5 to Table 10.

Table 5: $L_{Aeq,\ 15\ minute}$ HVO South - Impact Assessment Criteria – March 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO South L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	7/03/2017 21:01	2.2	3	37	No	IA	NA
Maison Dieu	7/03/2017 21:25	1.5	3	37	No	<30	NA
Shearers Lane	7/03/2017 21:52	1.8	3	41	No	NM	NA
Kilburnie South	7/03/2017 22:41	1.2	3	36	No	27	NA
Jerrys Plains Village	7/03/2017 21:36	1.5	3	35	No	IA	NA
Jerrys Plains East	7/03/2017 21:13	1.6	0.5	35	Yes	IA	Nil
Long Point Road	7/03/2017 21:00	3	-1	35	No	IA	NA
HVGC	7/03/2017 23:17	0.7	3	55	No	IA	NA

Table 6: $L_{Aeq,\ 15\ minute}$ HVO South - Land Acquisition Criteria – March 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO South L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	7/03/2017 21:01	2.2	3	41	No	IA	NA
Maison Dieu	7/03/2017 21:25	1.5	3	41	No	<30	NA
Shearers Lane	7/03/2017 21:52	1.8	3	41	No	NM	NA
Kilburnie South	7/03/2017 22:41	1.2	3	41	No	27	NA
Jerrys Plains Village	7/03/2017 21:36	1.5	3	40	No	IA	NA
Jerrys Plains East	7/03/2017 21:13	1.6	0.5	40	Yes	IA	Nil
Long Point Road	7/03/2017 21:00	3	-1	40	No	IA	NA
HVGC	7/03/2017 23:17	0.7	3	NA	No	IA	NA

Table 7: $L_{A1, 1minute}$ HVO South – Impact Assessment Criteria – March 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO South $L_{A1, 1min}$ dB[2,4]	Exceedance[3]
Knodlers Lane	7/03/2017 21:01	2.2	3	45	No	IA	NA
Maison Dieu	7/03/2017 21:25	1.5	3	45	No	35	NA
Shearers Lane	7/03/2017 21:52	1.8	3	45	No	NM	NA
Kilburnie South	7/03/2017 22:41	1.2	3	45	No	44	NA
Jerrys Plains Village	7/03/2017 21:36	1.5	3	45	No	IA	NA
Jerrys Plains East	7/03/2017 21:13	1.6	0.5	45	Yes	IA	Nil
Long Point Road	7/03/2017 21:00	3	-1	45	No	IA	NA
HVGC	7/03/2017 23:17	0.7	3	NA	No	IA	NA

Notes
1. Noise emission limits apply for winds up to 3 metres per second (at a height of 10m), or vertical temperature gradients of up to 3 degrees/100m and wind speeds of up to 2 m/s (at a height of 10m);
2. Estimated or measured $L_{Aeq,15minute}$ dB attributed to HVO South Pit Area;
3. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
4. Bolded results in red indicate exceedance of criteria;
5. Atmospheric data is sourced from the HVO Corporate weather station using logged met data; and
6. Criterion may or may not apply due to rounding of meteorological data values

Table 8: $L_{Aeq, 15minute}$ HVO North – Impact Assessment Criteria – March 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO North L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	7/03/2017 21:01	2.2	3	35	Yes	IA	Nil
Maison Dieu	7/03/2017 21:25	1.5	3	35	Yes	IA	Nil
Shearers Lane	7/03/2017 21:52	1.8	3	35	Yes	IA	Nil
Kilburnie South	7/03/2017 22:41	1.2	3	39	Yes	IA	Nil
Jerrys Plains Village	7/03/2017 21:36	1.5	3	36	Yes	IA	Nil
Jerrys Plains East	7/03/2017 21:13	1.6	0.5	39	Yes	IA	Nil
Long Point Road	7/03/2017 21:00	3	-1	35	Yes	IA	Nil
HVGC	7/03/2017 23:17	0.7	3	NA	Yes	IA	Nil

Table 9: $L_{Aeq,15minute}$ HVO North - Land Acquisition Criteria – March 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO North L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	7/03/2017 21:01	2.2	3	41	Yes	IA	Nil
Maison Dieu	7/03/2017 21:25	1.5	3	41	Yes	IA	Nil
Shearers Lane	7/03/2017 21:52	1.8	3	41	Yes	IA	Nil
Kilburnie South	7/03/2017 22:41	1.2	3	41	Yes	IA	Nil
Jerrys Plains Village	7/03/2017 21:36	1.5	3	41	Yes	IA	Nil
Jerrys Plains East	7/03/2017 21:13	1.6	0.5	41	Yes	IA	Nil

Long Point Road	7/03/2017 21:00	3	-1	41	Yes	IA	Nil
HVGC	7/03/2017 23:17	0.7	3	NA	NA	IA	NA

Table 10: $L_{A1,\ 1Minute}$ HVO North – Impact Assessment Criteria – March 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO North $L_{A1,\ 1min}$ dB[2,4]	Exceedance[3]
Knodlers Lane	7/03/2017 21:01	2.2	3	46	Yes	IA	Nil
Maison Dieu	7/03/2017 21:25	1.5	3	46	Yes	IA	Nil
Shearers Lane	7/03/2017 21:52	1.8	3	46	Yes	IA	Nil
Kilburnie South	7/03/2017 22:41	1.2	3	46	Yes	IA	Nil
Jerrys Plains Village	7/03/2017 21:36	1.5	3	46	Yes	IA	Nil
Jerrys Plains East	7/03/2017 21:13	1.6	0.5	NA	NA	IA	NA
Long Point Road	7/03/2017 21:00	3	-1	46	Yes	IA	Nil
HVGC	7/03/2017 23:17	0.7	3	NA	NA	IA	NA

Notes
1. Noise emission limits apply for winds up to 3 metres per second (at a height of 10m), or vertical temperature gradients of up to 3 degrees/100m and wind speeds of up to 2 m/s (at a height of 10m);
2. Estimated or measured LAeq,15minute dB attributed to HVO North Area;
3. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
4. Bolded results in red indicate exceedance of criteria;
5. Atmospheric data is sourced from the HVO Corporate weather station using logged met data; and
6. Criterion may or may not apply due to rounding of meteorological data values.

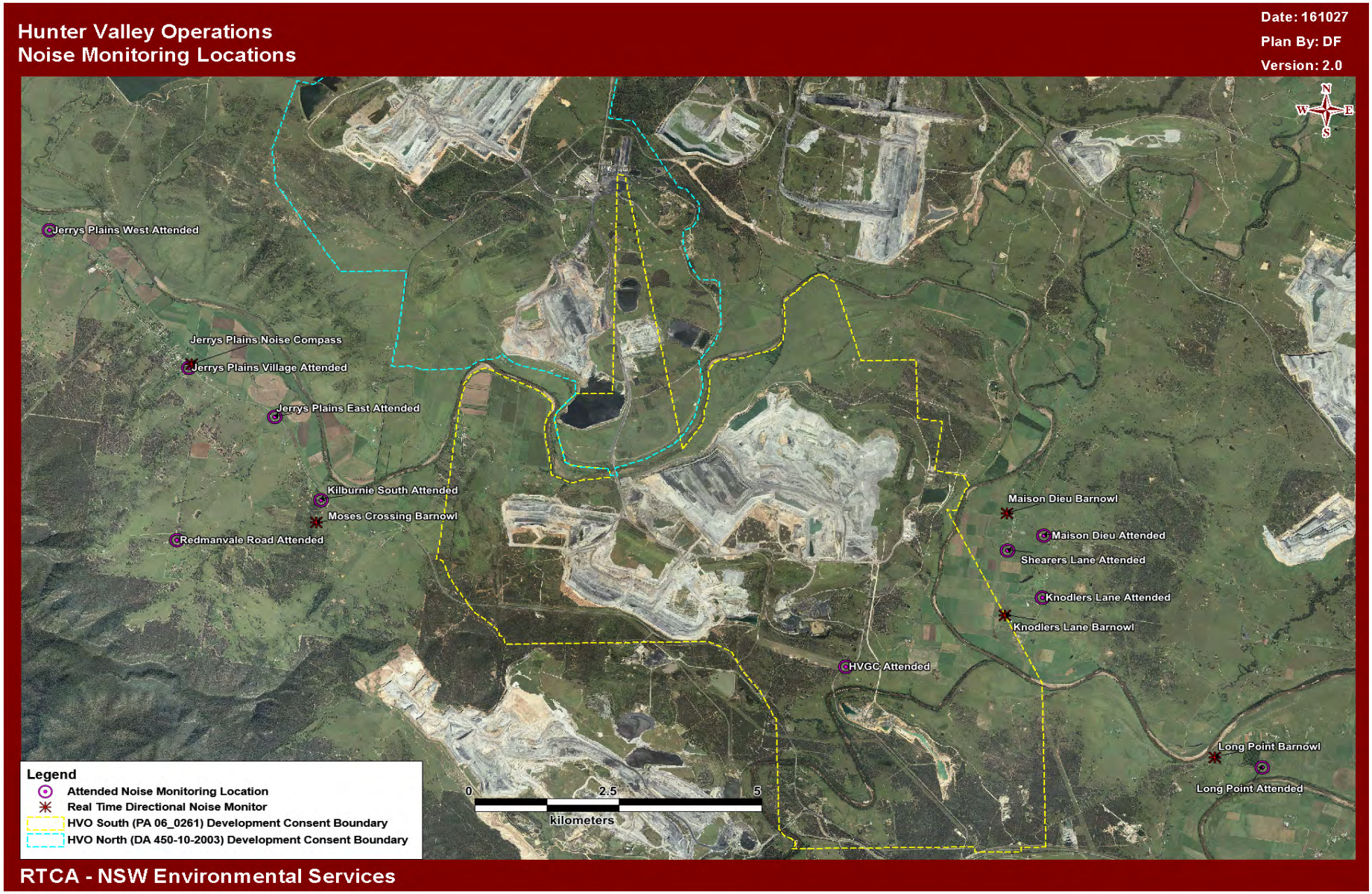

Figure 84: Noise Monitoring Location Plan

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.

HVO's Planning approvals stipulate noise criteria which must be met during the life of the development(s). The approvals however do not stipulate requirements or give guidance on noise affectation, or the frequency of any elevated noise event which would constitute noise affectation. Page 6 of the NSW Industrial Noise Policy (INP) comments that criteria "seek to restrict the risk of people being highly annoyed to less than 10 percent, and to meet this for at least 90 percent of the time".

For the purposes of assessing the effectiveness of the noise management system, HVO applies a similar approach with regard to the frequency of any elevated noise event. It should be noted that this assessment does not compliment or conflict with attended noise monitoring detailed in Section 6.1, and that real time monitoring data includes non-mine noise sources such as dogs, cows, or more commonly, road traffic.

7.0 OPERATIONAL DOWNTIME

During March, a total of 11.3 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.

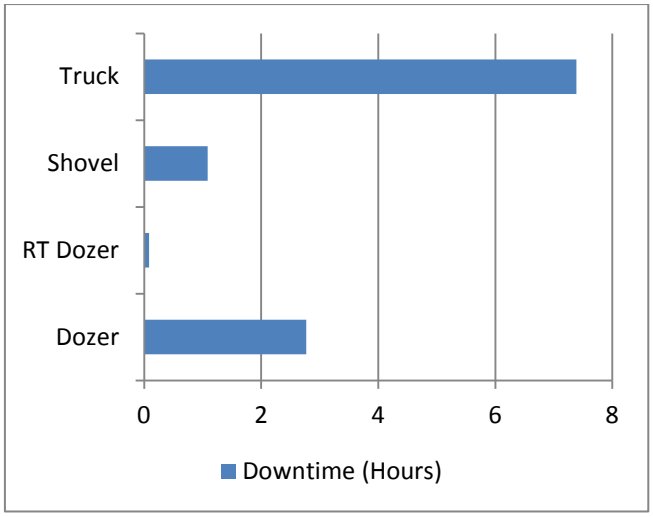

Figure 85: Operational Downtime by Equipment Type –March 2017

8.0 REHABILITATION

During March, 0.9Ha of land was released and 3.0Ha of land was bulk shaped. Year to date progress can be viewed in Figure 86.

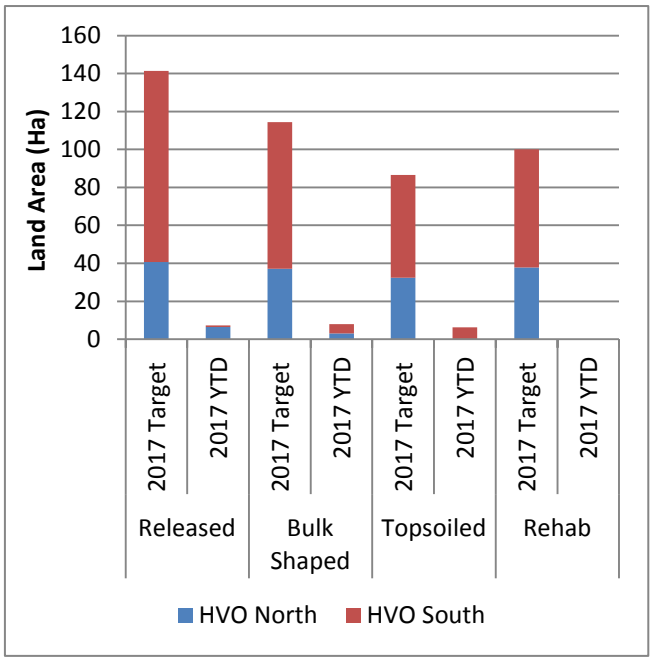

Figure 86: Rehabilitation YTD – March 2017

9.0 COMPLAINTS

Three complaints were received during the reporting period. Details of this complaint are shown in Figure 87 below.

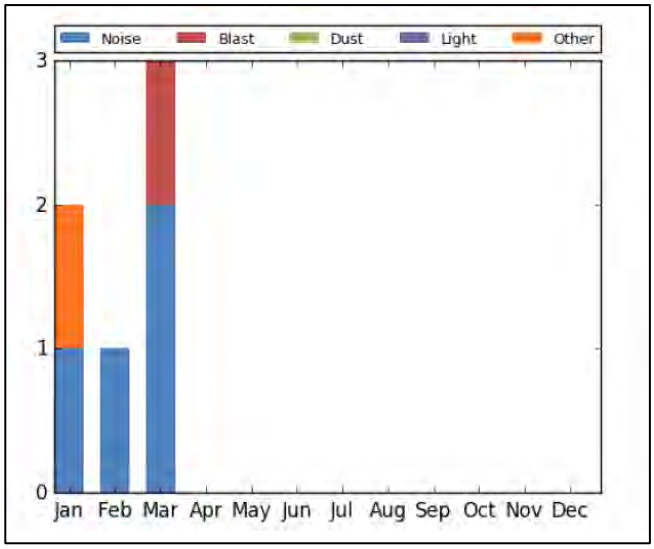

Figure 87: Complaints Graph – March 2017

10.0 ENVIRONMENTAL INCIDENTS

One reportable environmental incident occurred during the reporting period.

On the 30th March 2017 a sediment sump at the Hunter Valley Load Point (HVLP) was observed to be overtopping via the sump spillway into Bayswater Creek, following a high intensity, short duration rainfall event.

Water sampling was undertaken on the 30th March to characterise potential impacts upon receiving waters. Water quality results indicated that no environmental harm is likely to have occurred as a result of the overflowing water. A trailer mounted pump was fitted to provide additional dewatering capacity to the site.

An improvement project is currently underway to increase the size and pumping capacity of the HVLP sediment sump.

The incident was recorded in the Coal and Allied incident and action management system for investigation. The Department of Planning and Environment, the Environmental Protection Agency and other relevant agencies were notified of the incident on 30th March.

Appendix A: Meteorological Data

Table 11: Meteorological Data - HVO Corporate Meteorological Station – March 2017

Date	Air Temperature Maximum (°C)	Air Temperature Minimum (°C)	Relative Humidity Maximum (%)	Relative Humidity Minimum (%)	Solar Radiation Maximum (W/Sq. M)	Wind Direction Average (°)	Wind Speed Average (m/sec)	Rainfall(mm)
1/03/2017	28.7	15.8	100.0	43.2	1289	119.1	2.8	7.0
2/03/2017	29.7	15.8	100.0	35.5	1306	120.3	2.3	0.2
3/03/2017	27.8	16.6	99.1	45.9	1439	128.6	2.7	0.0
4/03/2017	24.1	15.5	100.0	63.1	537	158.6	1.5	18.4
5/03/2017	21.4	14.5	100.0	79.2	1356	238.6	1.3	21.8
6/03/2017	25.5	13.7	100.0	38.9	1459	165.2	2.0	0.2
7/03/2017	24.9	12.7	94.5	37.4	1319	142.3	2.8	0.0
8/03/2017	22.8	12.6	96.9	44.1	1383	126.2	2.6	0.0
9/03/2017	24.1	11.0	100.0	38.4	1305	133.9	2.0	0.4
10/03/2017	26.4	12.7	89.0	33.9	1536	148.6	1.9	0.0
11/03/2017	27.7	12.1	100.0	29.1	1155	160.0	1.5	0.0
12/03/2017	33.6	11.2	93.3	12.1	903	163.9	1.3	0.0
13/03/2017	23.9	17.9	76.4	53.4	-	128.2	2.7	0.0
14/03/2017	29.3	15.9	100.0	37.3	1149	120.6	4.4	0.0
15/03/2017	27.0	15.4	100.0	56.0	1409	121.7	3.8	5.2
16/03/2017	32.4	19.3	100.0	34.7	1205	179.9	2.1	4.2
17/03/2017	23.1	15.6	98.3	65.2	1331	150.2	3.8	0.0
18/03/2017	26.4	15.4	100.0	58.4	1348	128.4	5.7	16.0
19/03/2017	29.7	18.9	100.0	60.0	1388	128.1	3.1	9.2
20/03/2017	27.8	18.8	100.0	62.4	1021	118.8	1.4	0.0
21/03/2017	31.8	17.3	100.0	42.5	1393	163.8	1.8	26.0
22/03/2017	28.7	17.6	100.0	59.5	1259	258.5	2.7	3.6
23/03/2017	23.6	16.2	100.0	69.0	1029	129.2	1.9	0.2
24/03/2017	23.9	14.5	100.0	62.9	1076	117.0	2.1	16.6
25/03/2017	26.4	12.7	100.0	54.8	1250	132.1	1.2	0.8
26/03/2017	28.8	15.8	100.0	48.8	1140	164.2	1.7	0.2
27/03/2017	30.2	14.0	100.0	38.8	1159	158.3	1.0	0.0
28/03/2017	32.2	18.0	100.0	46.3	785	171.6	2.4	0.0
29/03/2017	33.7	17.5	100.0	35.5	815	233.4	1.7	0.0
30/03/2017	27.2	14.5	100.0	49.9	210	201.7	2.7	62.2
31/03/2017	22.6	11.6	84.2	43.0	1046	135.3	2.6	0.0

"-" Data unavailable due to equipment or communications issue

COAL & ALLIED

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Business Papers – Appendix C

Environmental Monitoring Report – April 2017

COAL & ALLIED

Managed by Rio Tinto Coal Australia

Hunter Valley Operations

Monthly Environmental Report

April 2017

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	**Environmental Graduate**	**Draft**	**25/05/2017**
1.0	**Environmental Specialist**	**Final**	**1/06/2017**

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 April to 30th April 2017.

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 2017 trend and historical trend are shown in Figure 1.

Table 1: Monthly Rainfall HVO

2017	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
April	40.4	293.8

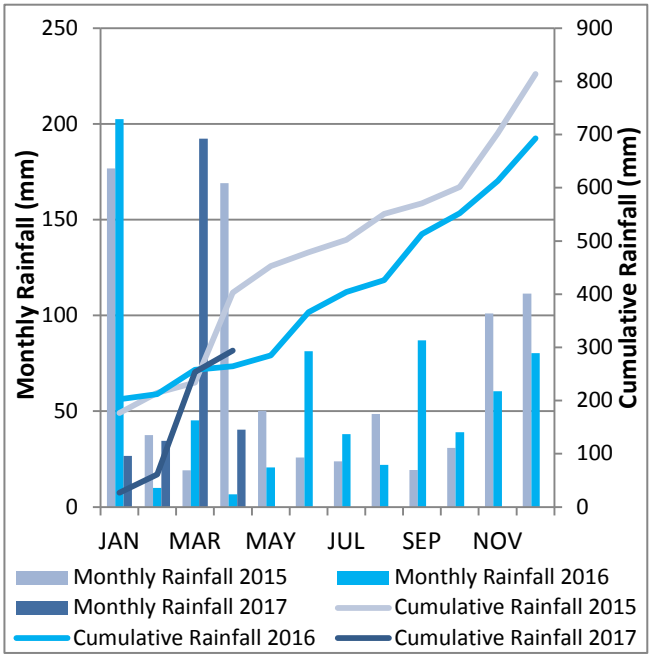

Figure 1: Year to Date Rainfall Summary 2017

2.1.2 Wind Speed and Direction

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

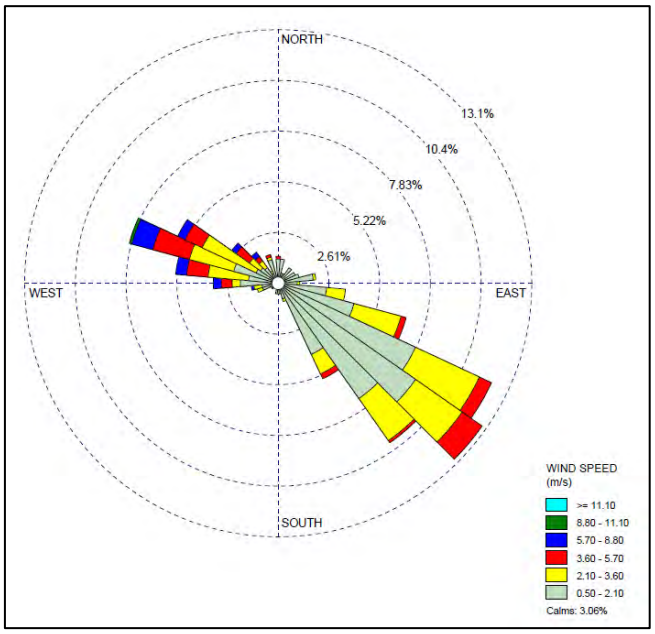

Figure 2: HVO Corporate Wind Rose – April 2017

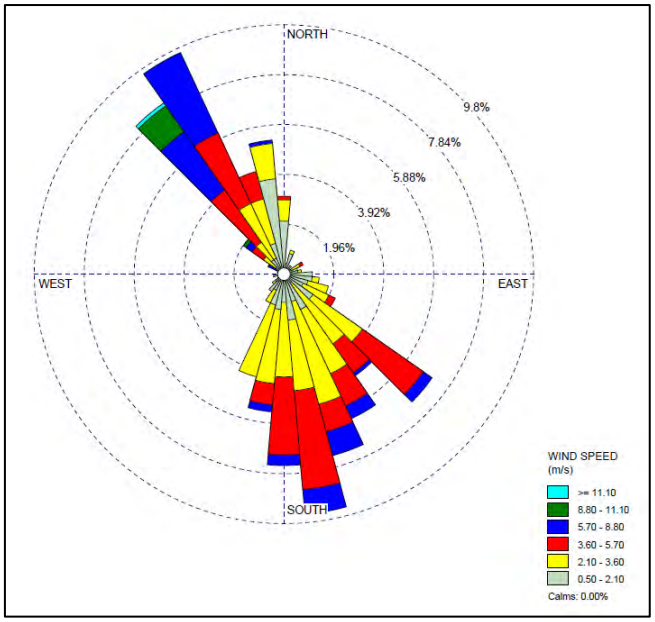

Figure 3: HVO Cheshunt Wind Rose – April 2017

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 DL21 and DL22 monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m^2 per month. . The field notes associated with the DL22 results confirm the presence of insects and bird droppings. As such the results are considered contaminated and will be excluded from calculation of the annual average. There is no evidence to suggest that the DL21 result is contaminated. Accordingly, this result will be included in the annual average calculation.

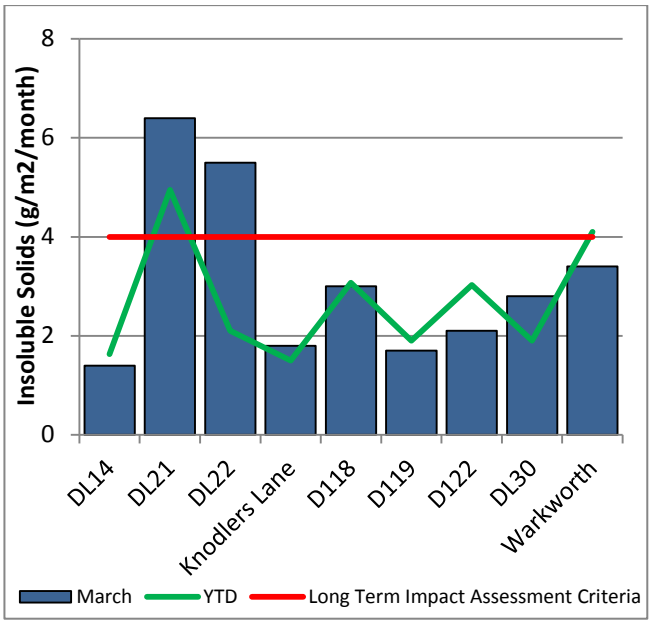

Figure 5: Depositional Dust Results – April 2017

2.3 Suspended Particulates

Suspended particulates are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM_{10}). The location of these monitors can be found in Figure 4. Each HVAS was run for 24 hours on a six-day cycle in accordance with EPA requirements.

2.3.1 HVAS PM_{10} Results

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

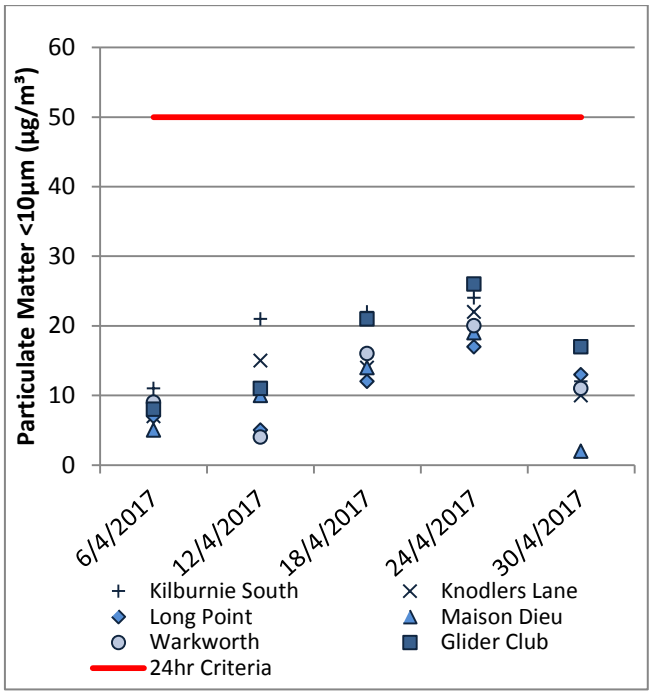

Figure 6: Individual PM_{10} Results – April 2017

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

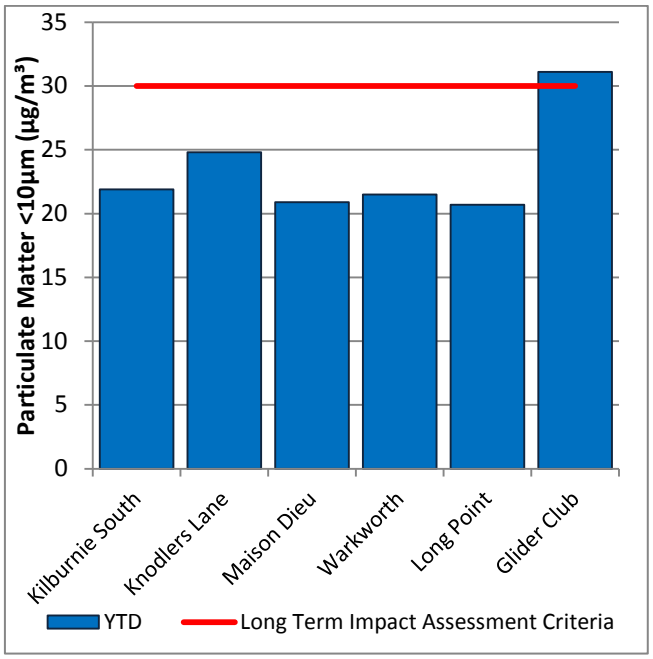

Figure 7: Year To Date Average PM_{10} – April 2017

2.3.2 TSP Results

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

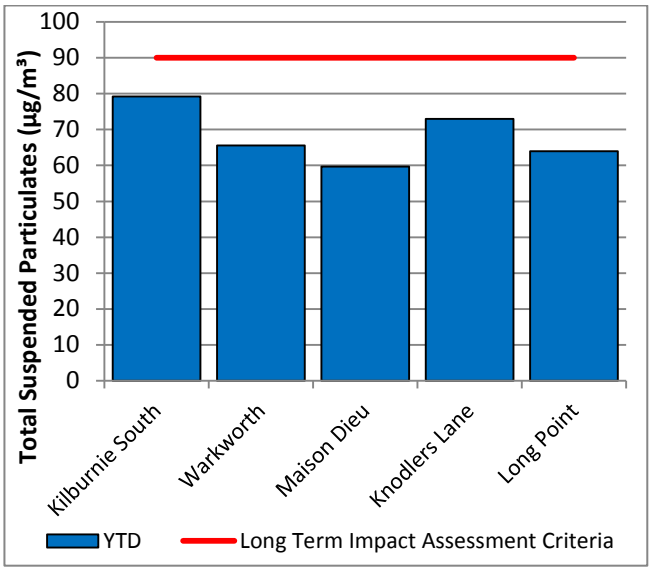

Figure 8: Year To Date Average Total Suspended Particulates - April 2017

2.3.3 Real Time PM_{10} Results

Hunter Valley Operations maintains a network of real time PM_{10} monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits. Results from real time PM_{10} monitoring are used as a reactive measure to guide mining operations to ensure compliance with the relevant conditions of the project approval.

Results for real time dust sampling are shown in Figure 9, including the daily 24 hour average PM_{10} result and the 24 hour YTD PM_{10} average. There were no results recorded which exceeded the short term (24hr) criteria in the approvals.

2.3.4 Real Time Alarms for Air Quality

During April, the real time monitoring system generated 21 automated air quality related alarms. 9 alarms were related to adverse weather conditions and 12 alarms related to PM_{10}.

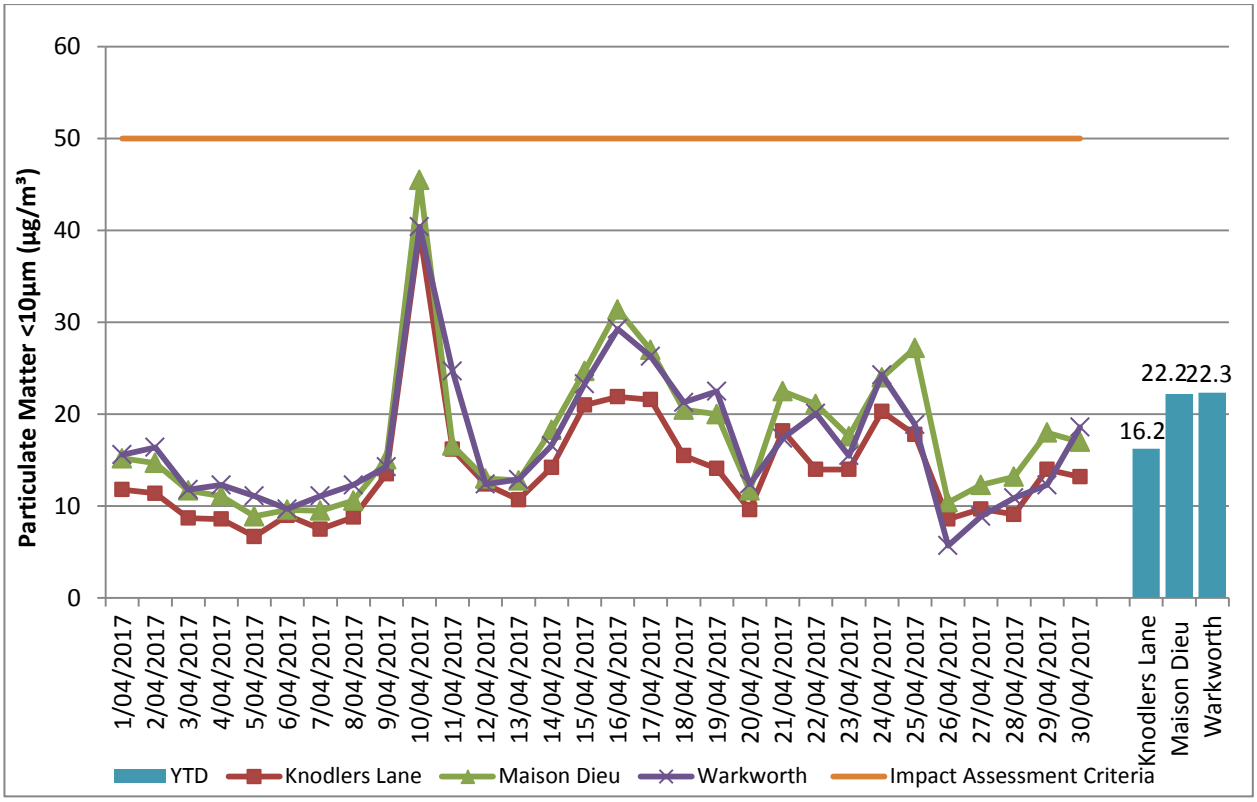

Figure 9: Real Time PM_{10} 24hr average and YTD Average – April 2017

3.0 WATER QUALITY

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

3.1.1 Surface Water

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

Results of monitoring on Site Dams and the Hunter River as well as other natural tributaries are provided on a quarterly basis, results will appear in the June 2017 report.

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 did not extract any water from the Hunter River.

3.1.3 HRSTS Discharge

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

During the reporting period no water was discharged under the HRSTS.

3.2.1 Groundwater Monitoring Results

Groundwater monitoring is undertaken on a quarterly basis in accordance with the HVO Water Management Plan and Ground Water Monitoring Programme. Results of groundwater monitoring are reported quarterly and as such will be reported in the June 2017 monthly report.

4.0 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 15.

During April, 22 blasts were initiated at HVO. Figure 10 through to Figure 14 show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in Table 2.

Table 2: 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%

4.1 Blast Monitoring Results

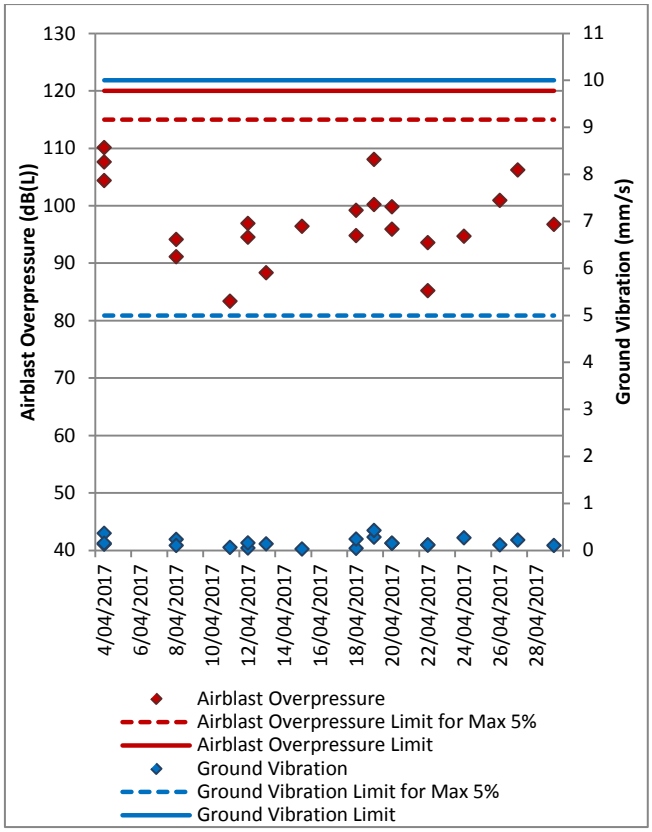

Figure 10: Moses Crossing Blast Monitoring Results – April 2017

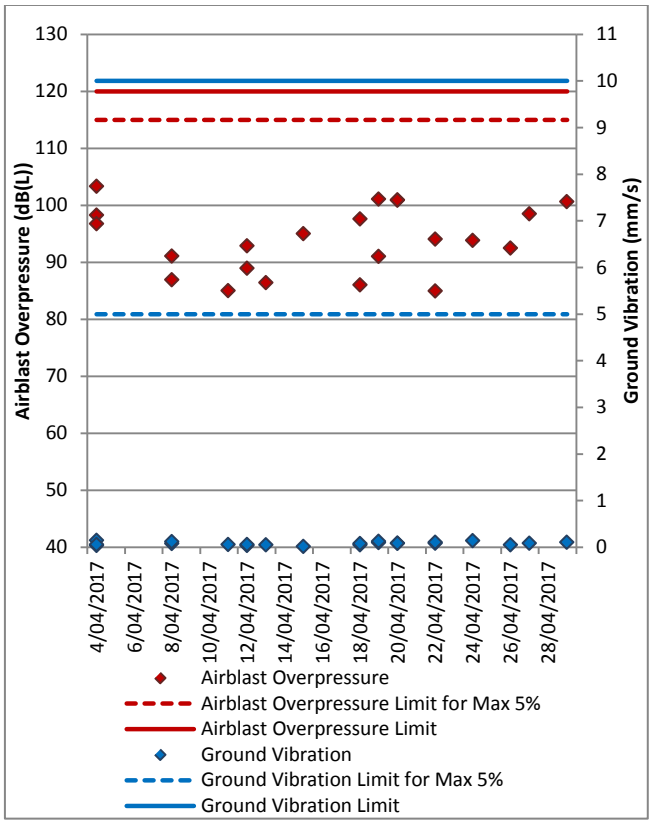

Figure 11: Jerrys Plains Blast Monitoring Results – April 2017

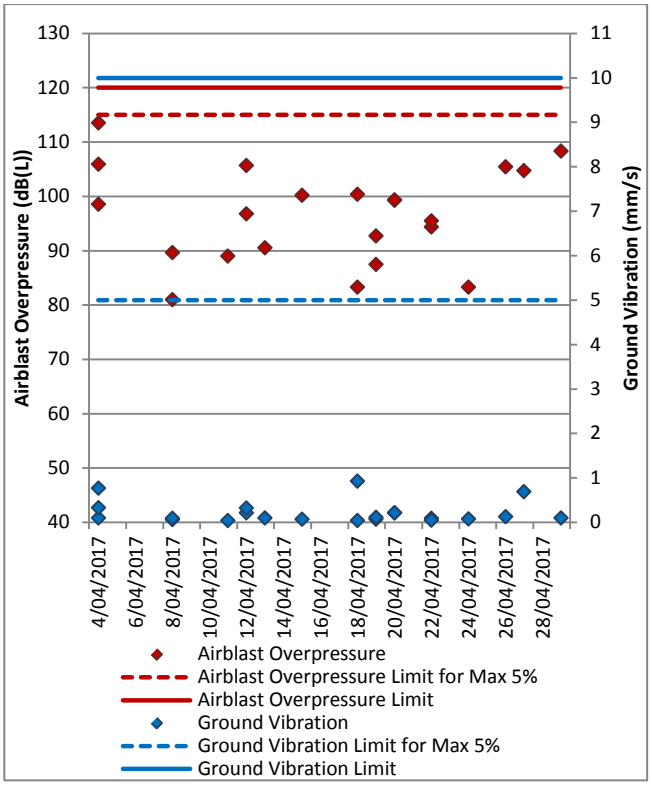

Figure 12: Maison Dieu Blast Monitoring Results – April 2017

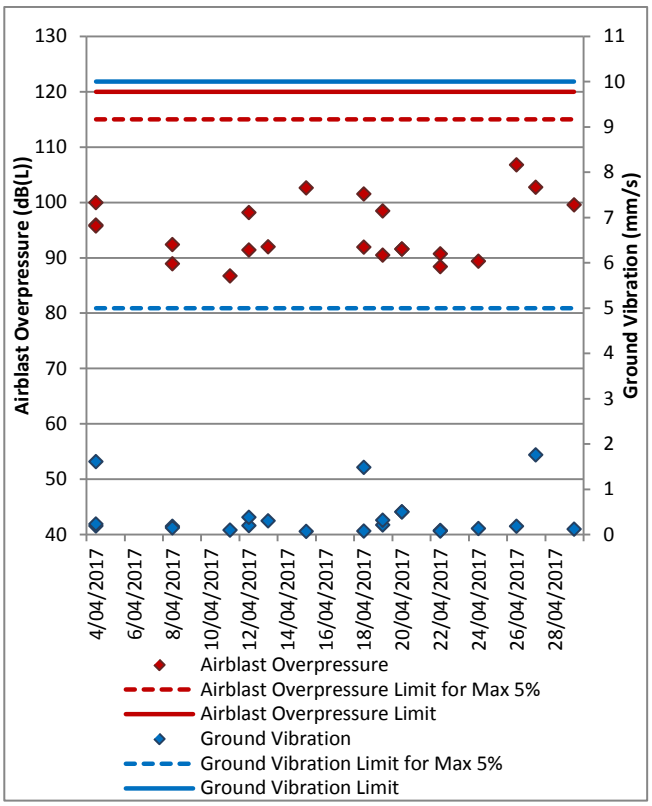

Figure 13: Warkworth Blast Monitoring Results - April 2017

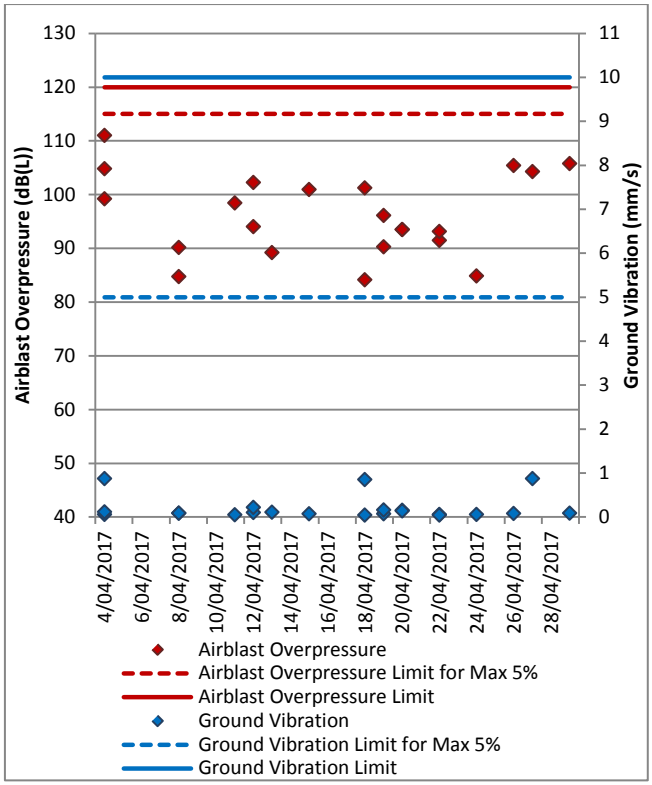

Figure 14: Knodlers Lane Blast Monitoring Results – April 2017

Figure 15: 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 16.

5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding HVO on the nights of 12th and 18th of April 2017. Monitoring results are detailed in Table 3 to Table 8.

Table 3: $L_{Aeq,\ 15\ minute}$ HVO South - Impact Assessment Criteria – April 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO South L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	18/04/2017 21:00	1.1	0.5	37	Yes	IA	Nil
Maison Dieu	18/04/2017 21:20	1.1	0.5	37	Yes	IA	Nil
Shearers Lane	18/04/2017 21:42	1.5	0.5	41	Yes	IA	Nil
Kilburnie South	18/04/2017 23:00	0.6	0.5	36	Yes	NM	Nil
Jerrys Plains Village	18/04/2017 21:58	1.3	0.5	35	Yes	NM	Nil
Jerrys Plains East	18/04/2017 21:34	1.3	0.5	35	Yes	31	Nil
Long Point Road	12/04/2017 21:00	2.4	-1	35	Yes	IA	Nil
HVGC	18/04/2017 21:03	1.1	0.5	55	Yes	IA	Nil

Table 4: $L_{Aeq,\ 15\ minute}$ HVO South - Land Acquisition Criteria – April 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO South L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	18/04/2017 21:00	1.1	0.5	41	Yes	IA	Nil
Maison Dieu	18/04/2017 21:20	1.1	0.5	41	Yes	IA	Nil
Shearers Lane	18/04/2017 21:42	1.5	0.5	41	Yes	IA	Nil
Kilburnie South	18/04/2017 23:00	0.6	0.5	41	Yes	NM	Nil
Jerrys Plains Village	18/04/2017 21:58	1.3	0.5	40	Yes	NM	Nil
Jerrys Plains East	18/04/2017 21:34	1.3	0.5	40	Yes	31	Nil
Long Point Road	12/04/2017 21:00	2.4	-1	40	Yes	IA	Nil
HVGC	18/04/2017 21:03	1.1	0.5	NA	No	IA	NA

Table 5: $L_{A1,\ 1minute}$ HVO South - Impact Assessment Criteria – April 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO South $L_{A1,\ 1min}$ dB[2,4]	Exceedance[3]
Knodlers Lane	18/04/2017 21:00	1.1	0.5	45	Yes	IA	Nil
Maison Dieu	18/04/2017 21:20	1.1	0.5	45	Yes	IA	Nil
Shearers Lane	18/04/2017 21:42	1.5	0.5	45	Yes	IA	Nil
Kilburnie South	18/04/2017 23:00	0.6	0.5	45	Yes	NM	Nil
Jerrys Plains Village	18/04/2017 21:58	1.3	0.5	45	Yes	NM	Nil
Jerrys Plains East	18/04/2017 21:34	1.3	0.5	45	Yes	35	Nil
Long Point Road	12/04/2017 21:00	2.4	-1	45	Yes	IA	Nil
HVGC	18/04/2017 21:03	1.1	0.5	NA	No	IA	NA

Notes
1. Noise emission limits apply for winds up to 3 metres per second (at a height of 10m), or vertical temperature gradients of up to 3 degrees/100m and wind speeds of up to 2 m/s (at a height of 10m);
2. Estimated or measured $L_{Aeq,15minute}$ dB attributed to HVO South Pit Area;
3. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
4. Bolded results in red indicate exceedance of criteria;
5. Atmospheric data is sourced from the HVO Corporate weather station using logged met data;
6. Criterion may or may not apply due to rounding of meteorological data values

Table 6: $L_{Aeq,\ 15minute}$ HVO North – Impact Assessment Criteria – April 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO North L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	18/04/2017 21:00	1.1	0.5	35	Yes	IA	Nil
Maison Dieu	18/04/2017 21:20	1.1	0.5	35	Yes	IA	Nil
Shearers Lane	18/04/2017 21:42	1.5	0.5	35	Yes	IA	Nil
Kilburnie South	18/04/2017 23:00	0.6	0.5	39	Yes	IA	Nil
Jerrys Plains Village	18/04/2017 21:58	1.3	0.5	36	Yes	35	Nil
Jerrys Plains East	18/04/2017 21:34	1.3	0.5	39	Yes	31	Nil
Long Point Road	12/04/2017 21:00	2.4	-1	35	Yes	IA	Nil
HVGC	18/04/2017 21:03	1.1	0.5	NA	No	IA	NA

Table 7: $L_{Aeq,15minute}$ HVO North - Land Acquisition Criteria – April 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO North L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	18/04/2017 21:00	1.1	0.5	41	Yes	IA	Nil
Maison Dieu	18/04/2017 21:20	1.1	0.5	41	Yes	IA	Nil
Shearers Lane	18/04/2017 21:42	1.5	0.5	41	Yes	IA	Nil
Kilburnie South	18/04/2017 23:00	0.6	0.5	41	Yes	IA	Nil
Jerrys Plains Village	18/04/2017 21:58	1.3	0.5	41	Yes	35	Nil
Jerrys Plains East	18/04/2017 21:34	1.3	0.5	41	Yes	31	Nil
Long Point Road	12/04/2017 21:00	2.4	-1	41	Yes	IA	Nil
HVGC	18/04/2017 21:03	1.1	0.5	NA	No	IA	NA

Table 8: $L_{A1, 1Minute}$ HVO North - Impact Assessment Criteria – April 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO North $L_{A1, 1min}$ dB[2,4]	Exceedance[3]
Knodlers Lane	18/04/2017 21:00	1.1	0.5	46	Yes	IA	Nil
Maison Dieu	18/04/2017 21:20	1.1	0.5	46	Yes	IA	Nil
Shearers Lane	18/04/2017 21:42	1.5	0.5	46	Yes	IA	Nil
Kilburnie South	18/04/2017 23:00	0.6	0.5	46	Yes	IA	Nil
Jerrys Plains Village	18/04/2017 21:58	1.3	0.5	46	Yes	43	Nil
Jerrys Plains East	18/04/2017 21:34	1.3	0.5	46	Yes	33	Nil
Long Point Road	12/04/2017 21:00	2.4	-1	46	Yes	IA	Nil
HVGC	18/04/2017 21:03	1.1	0.5	NA	No	IA	NA

Notes
1. Noise emission limits apply for winds up to 3 metres per second (at a height of 10m), or vertical temperature gradients of up to 3 degrees/100m and wind speeds of up to 2 m/s (at a height of 10m);
2. Estimated or measured $L_{Aeq,15minute}$ dB attributed to HVO North Area;
3. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
4. Bolded results in red indicate exceedance of criteria;
5. Atmospheric data is sourced from the HVO Corporate weather station using logged met data;
6. Criterion may or may not apply due to rounding of meteorological data values

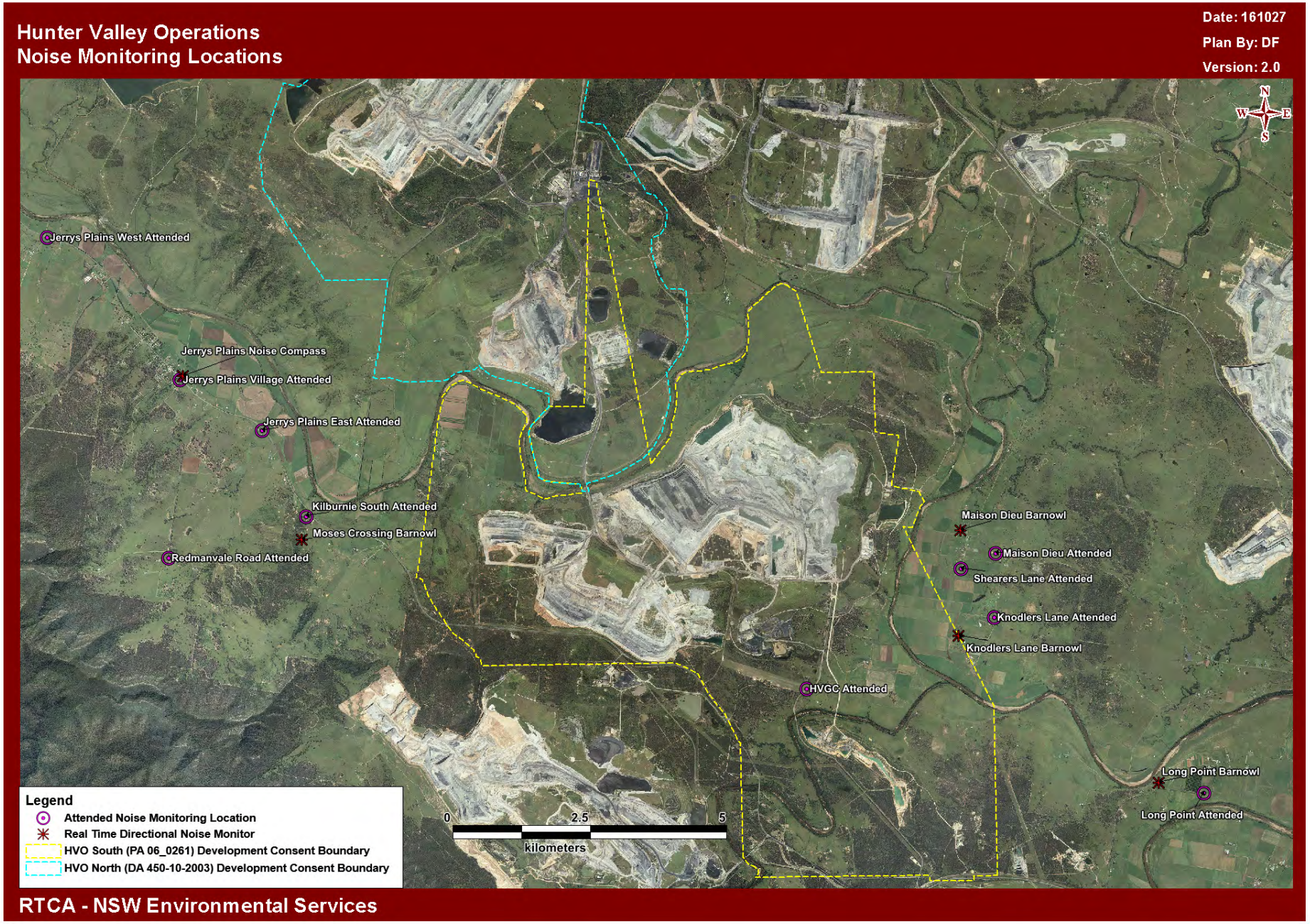

Figure 16: Noise Monitoring Location Plan

5.2 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.

HVO's Planning approvals stipulate noise criteria which must be met during the life of the development(s). The approvals however do not stipulate requirements or give guidance on noise affectation, or the frequency of any elevated noise event which would constitute noise affectation. Page 6 of the NSW Industrial Noise Policy (INP) comments that criteria "*seek to restrict the risk of people being highly annoyed to less than 10 percent, and to meet this for at least 90 percent of the time*".

For the purposes of assessing the effectiveness of the noise management system, HVO applies a similar approach with regard to the frequency of any elevated noise event. 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.

6.0 OPERATIONAL DOWNTIME

During April, a total of 59.0 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 17.

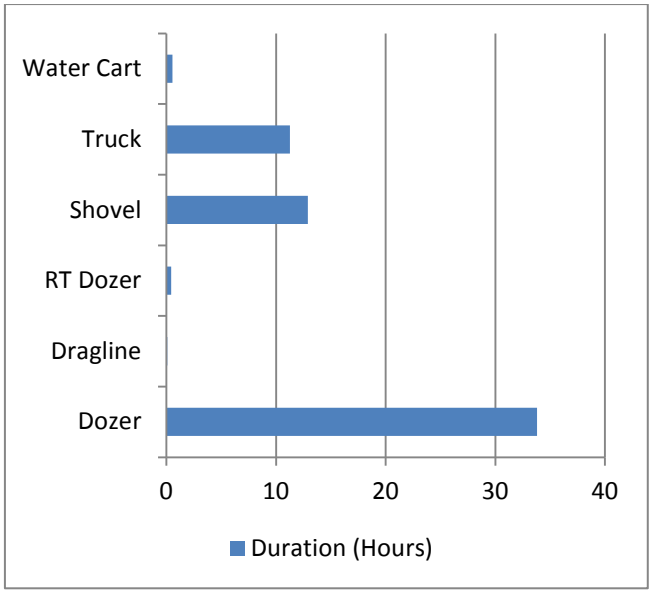

Figure 17: Operational Downtime by Equipment Type – April 2017

7.0 REHABILITATION

During April, 0.36 Ha of land was released and 5.25 Ha of land was bulk shaped. Year to date progress can be viewed in Figure 86.

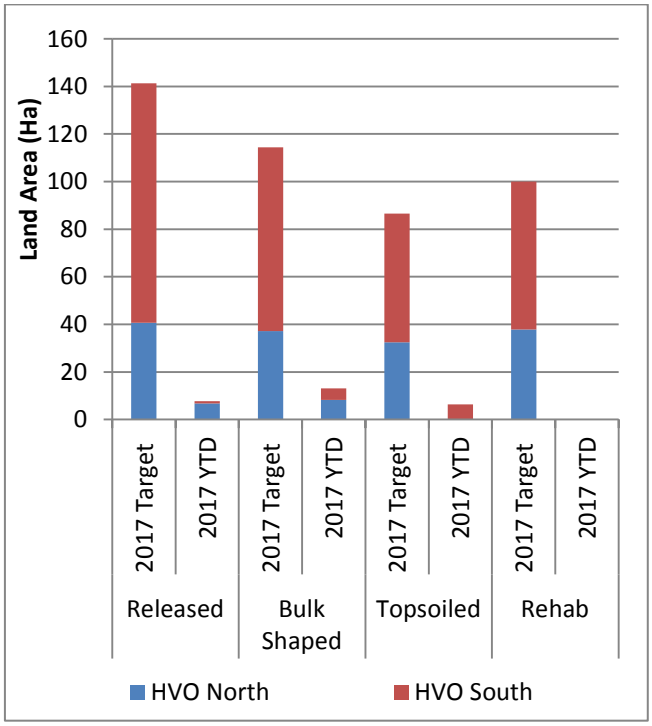

Figure 18: Rehabilitation YTD - April 2017

8.0 COMPLAINTS

One complaint was received during the reporting period. Details of complaints received YTD are shown in Figure 19 below.

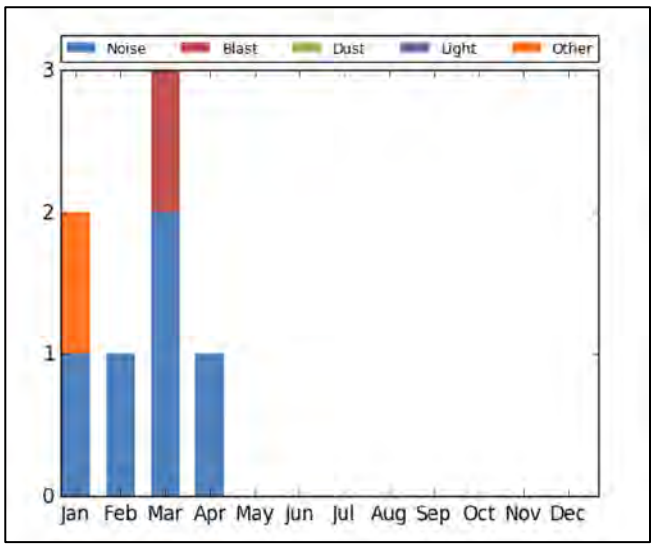

Figure 19: Complaints Graph – April 2017

9.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were no reportable environmental incidents.

Appendix A: Meteorological Data

Table 9: Meteorological Data - HVO Corporate Meteorological Station – April 2017

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)
1/04/2017	24.9	12.4	100.0	38.1	1211	172.8	1.3	0.0
2/04/2017	21.3	13.1	100.0	51.5	1140	133.2	2.9	2.8
3/04/2017	21.4	10.6	100.0	38.4	1251	134.2	2.7	0.8
4/04/2017	22.2	10.6	98.5	43.0	1146	129.2	2.4	0.8
5/04/2017	21.2	9.3	100.0	56.2	1221	129.8	1.8	13.8
6/04/2017	21.0	10.4	100.0	61.2	1209	127.6	1.4	3.8
7/04/2017	22.3	10.3	100.0	52.2	1207	120.3	1.9	0.2
8/04/2017	24.1	8.9	100.0	37.2	799	158.2	1.2	0.0
9/04/2017	26.4	10.7	100.0	32.5	819	-	3.1	6.6
10/04/2017	17.1	6.7	75.0	42.7	1091	291.9	5.5	0.6
11/04/2017	24.0	10.5	76.8	40.3	1039	193.2	2.6	0.0
12/04/2017	22.9	12.5	92.4	47.7	1189	137.5	1.7	0.0
13/04/2017	23.4	11.1	100.0	39.3	1137	131.9	1.1	0.0
14/04/2017	24.4	11.1	100.0	37.2	897	174.5	1.0	0.0
15/04/2017	25.8	8.0	100.0	26.8	719	196.9	1.7	0.0
16/04/2017	26.0	11.5	100.0	27.6	711	209.9	1.8	0.0
17/04/2017	24.0	10.7	89.8	45.6	806	147.8	1.5	0.0
18/04/2017	24.4	10.2	100.0	43.2	732	132.8	1.3	0.0
19/04/2017	24.5	11.2	97.6	44.4	947	136.4	1.4	0.0
20/04/2017	24.6	10.1	100.0	33.4	817	121.9	1.8	0.0
21/04/2017	23.1	8.0	100.0	43.5	813	152.1	1.1	0.0
22/04/2017	20.3	12.1	100.0	70.0	761	208.4	0.9	0.0
23/04/2017	24.8	8.9	100.0	40.7	782	207.8	1.4	0.2
24/04/2017	24.4	9.7	100.0	43.4	666	147.1	1.0	0.0
25/04/2017	27.2	12.1	100.0	36.5	794	260.2	2.7	4.4
26/04/2017	22.1	6.3	100.0	32.8	910	282.1	4.5	6.2
27/04/2017	18.4	5.9	90.6	41.6	953	283.8	2.8	0.2
28/04/2017	20.2	7.6	86.3	33.9	669	168.3	1.2	0.0
29/04/2017	22.5	5.4	91.5	34.8	669	245.1	2.2	0.0
30/04/2017	21.9	7.3	100.0	47.3	817	159.9	1.3	0.0

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

COAL & ALLIED

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Business Papers – Appendix D

Environmental Monitoring Report –May 2017

COAL & ALLIED

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Hunter Valley Operations

Monthly Environmental Report

May 2017

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	**Environmental Graduate**	**Draft**	**23/06/2017**
1.0	**Environmental Specialist**	**Final**	**29/06/2017**

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 May to 31st May 2017.

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 2017 trend and historical trend are shown in Figure 1.

Table 1: Monthly Rainfall HVO

2017	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
May	19.6	313.4

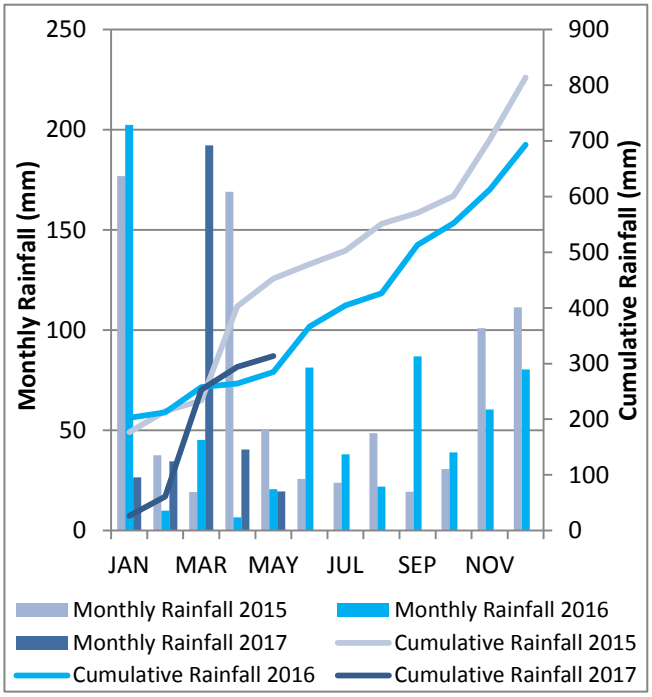

Figure 1: Year to Date Rainfall Summary 2017

2.1.2 Wind Speed and Direction

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

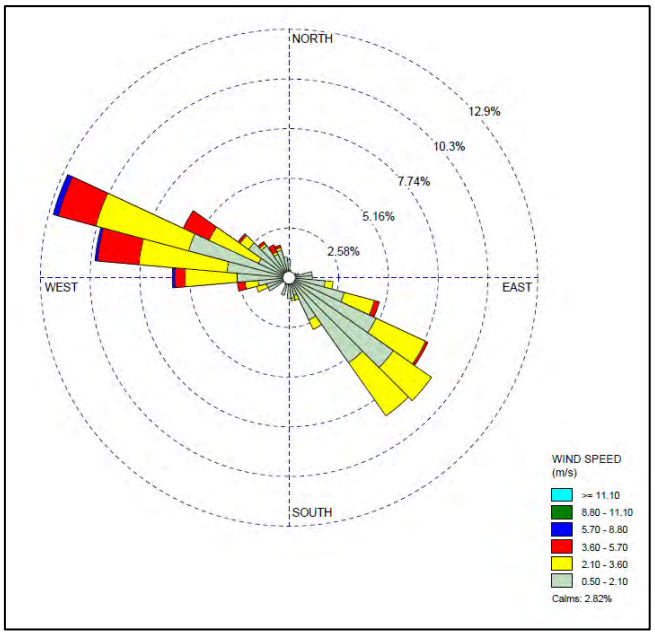

Figure 2: HVO Corporate Wind Rose – May 2017

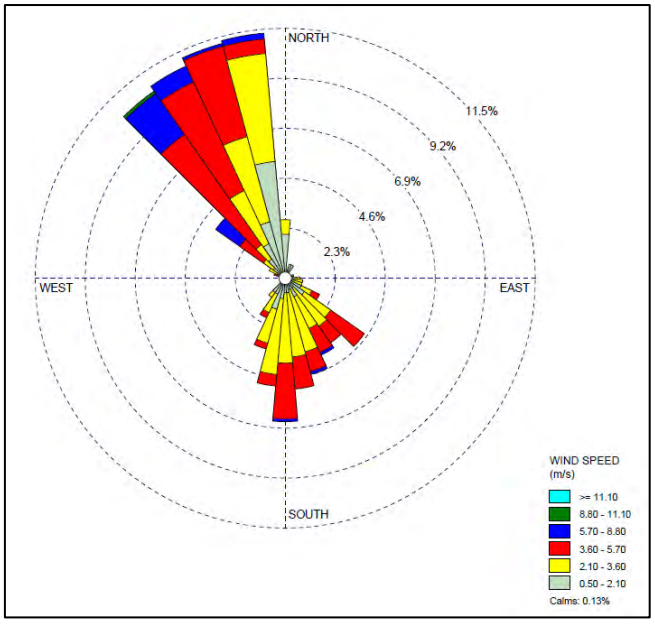

Figure 3: HVO Cheshunt Wind Rose – May 2017

Figure 4: Air Quality Monitoring Location Plan

2.2 Depositional Dust

To monitor regional air quality, HVO operates and maintains a network of nine depositional dust gauges, situated on private and mine owned land surrounding HVO.

Figure 5 displays insoluble solids results from depositional dust gauges during the reporting period compared against the year-to-date average and the annual impact assessment criteria.

During the reporting period the D118, DL30 and Warkworth monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m² per month. There is no evidence to suggest that the D118, DL30 or Warkworth results are contaminated. Accordingly, this result will be included in the annual average calculation.

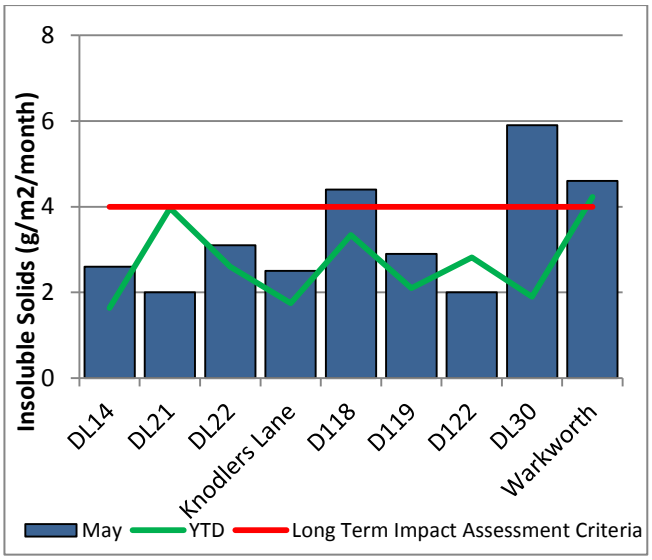

Figure 5: Depositional Dust Results – May 2017

2.3 Suspended Particulates

Suspended particulates are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM_{10}). The location of these monitors can be found in Figure 4. Each HVAS was run for 24 hours on a six-day cycle in accordance with EPA requirements.

2.3.1 HVAS PM_{10} Results

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

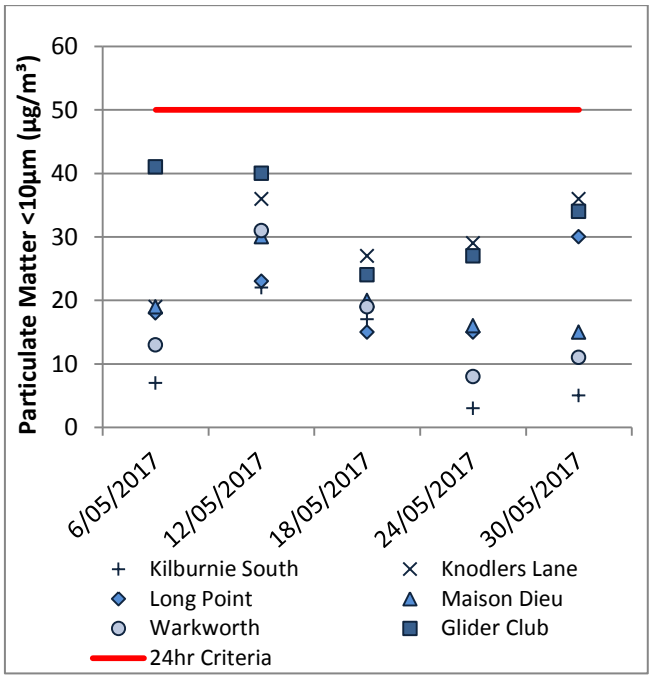

Figure 6: Individual PM_{10} Results – May 2017

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

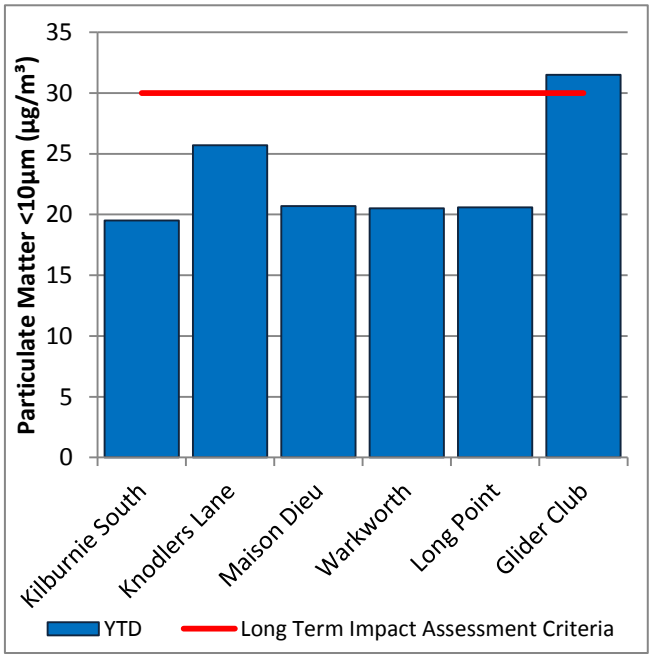

Figure 7: Year To Date Average PM_{10} – May 2017

2.3.2 TSP Results

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

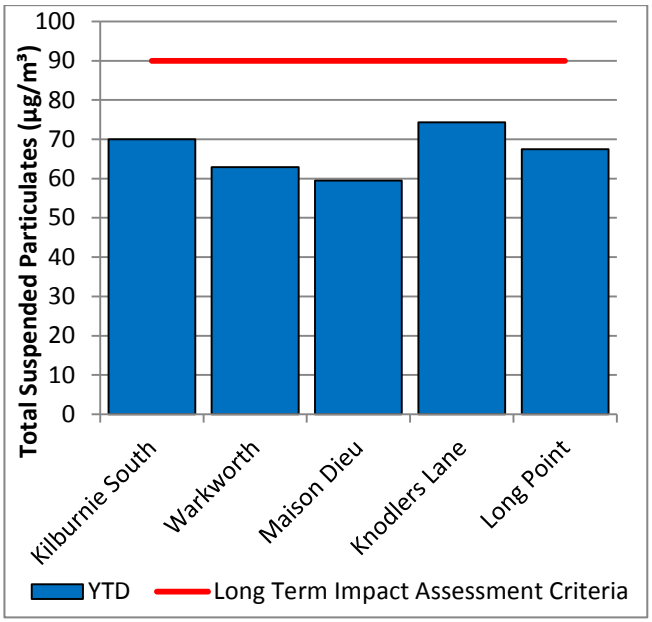

Figure 8: Year To Date Average Total Suspended Particulates - May 2017

2.3.3 Real Time PM_{10} Results

Hunter Valley Operations maintains a network of real time PM_{10} monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits. Results from real time PM_{10} monitoring are used as a reactive measure to guide mining operations to ensure compliance with the relevant conditions of the project approval.

Results for real time dust sampling are shown in Error! Reference source not found., including the daily 24 hour average PM_{10} result and the 24 hour YTD PM_{10} average. There were no results recorded which exceeded the short term (24hr) criteria in the approvals.

2.3.4 Real Time Alarms for Air Quality

During May, the real time monitoring system generated 14 automated air quality related alarms. 4 alarms were related to adverse weather conditions and 10 alarms related to PM_{10}.

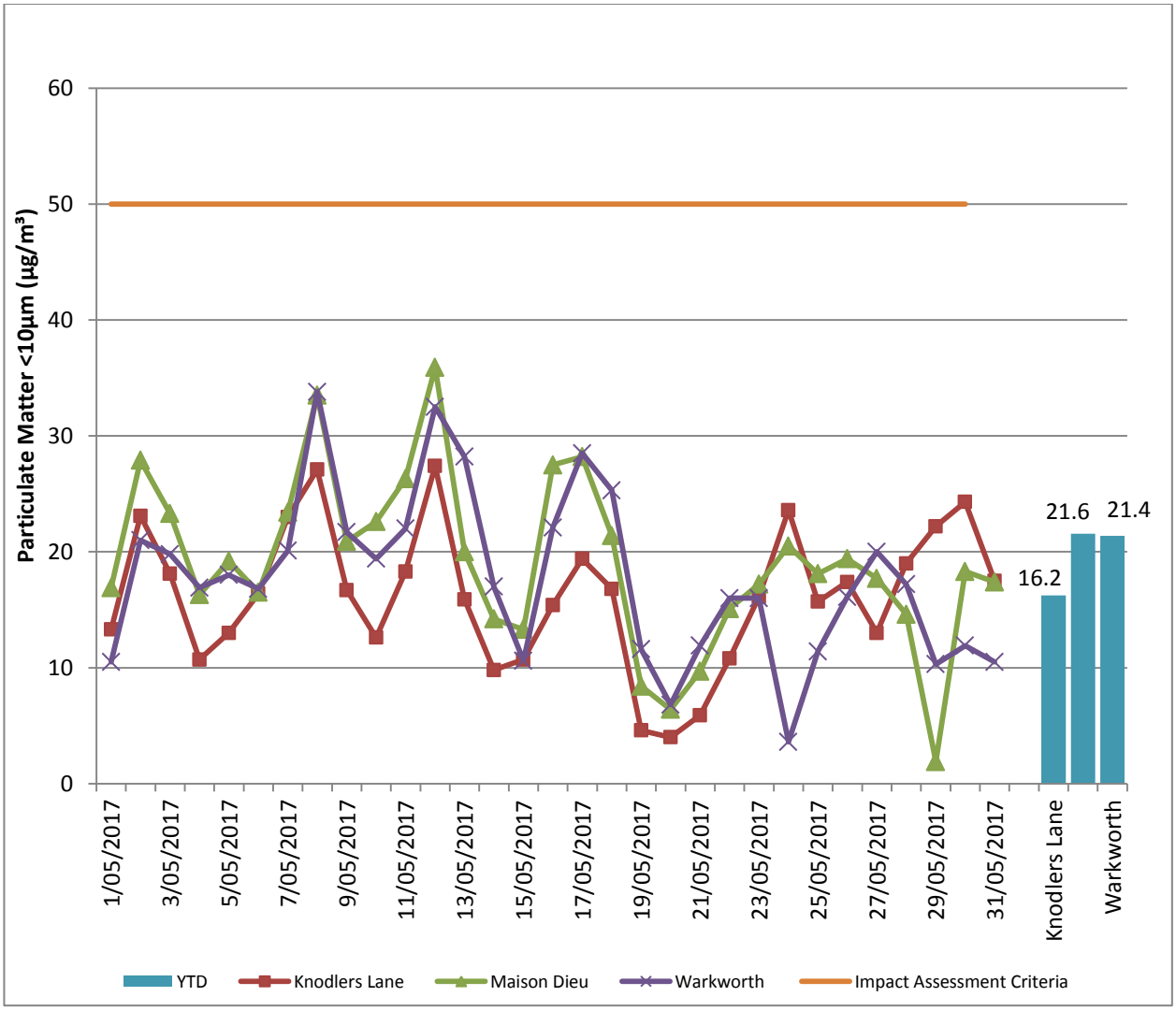

Figure 9: Real Time PM_{10} 24hr average and YTD Average – May 2017

3.0 WATER QUALITY

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

3.1.1 Surface Water

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

Results of monitoring on Site Dams and the Hunter River as well as other natural tributaries are provided on a quarterly basis, results will appear in the June 2017 report.

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 did not extract any water from the Hunter River.

3.1.3 HRSTS Discharge

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

During the reporting period no water was discharged under the HRSTS.

3.2.1 Groundwater Monitoring Results

Groundwater monitoring is undertaken on a quarterly basis in accordance with the HVO Water Management Plan and Ground Water Monitoring Programme. Results of groundwater monitoring are reported quarterly and as such will be reported in the June 2017 monthly report.

4.0 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 15.

During May, 29 blasts were initiated at HVO. Figure 10 through to Figure 14 show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in Table 2.

Table 2: 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%

4.1 Blast Monitoring Results

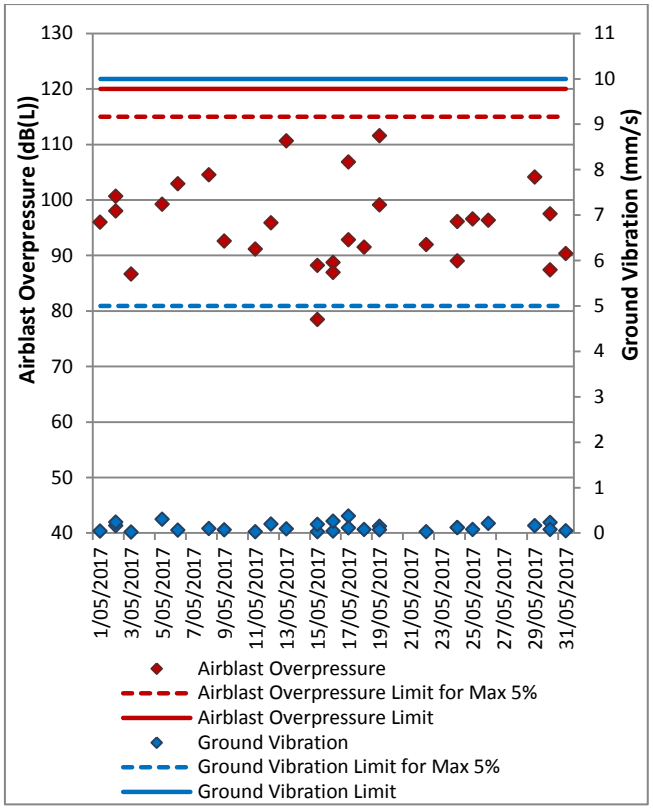

Figure 10: Moses Crossing Blast Monitoring Results – May 2017

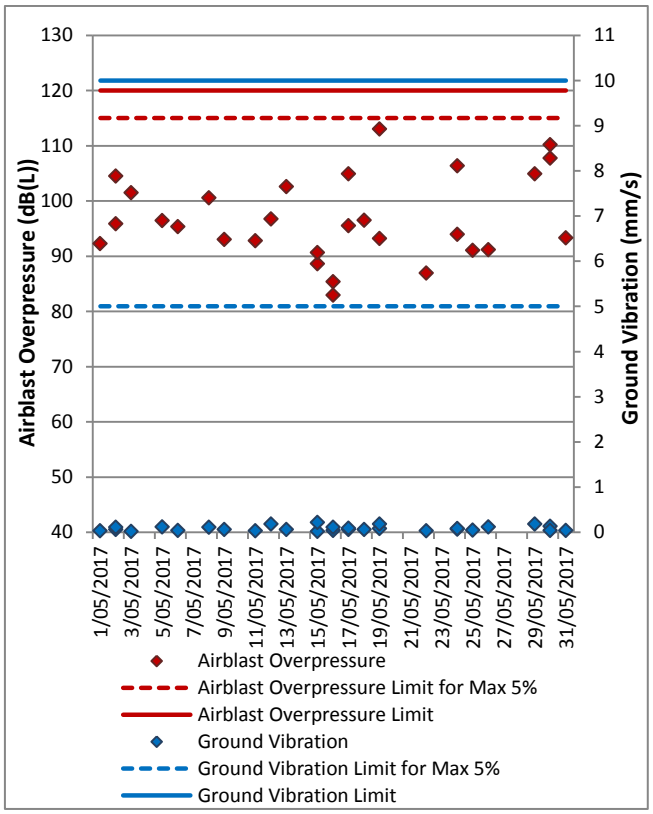

Figure 11: Jerrys Plains Blast Monitoring Results – May 2017

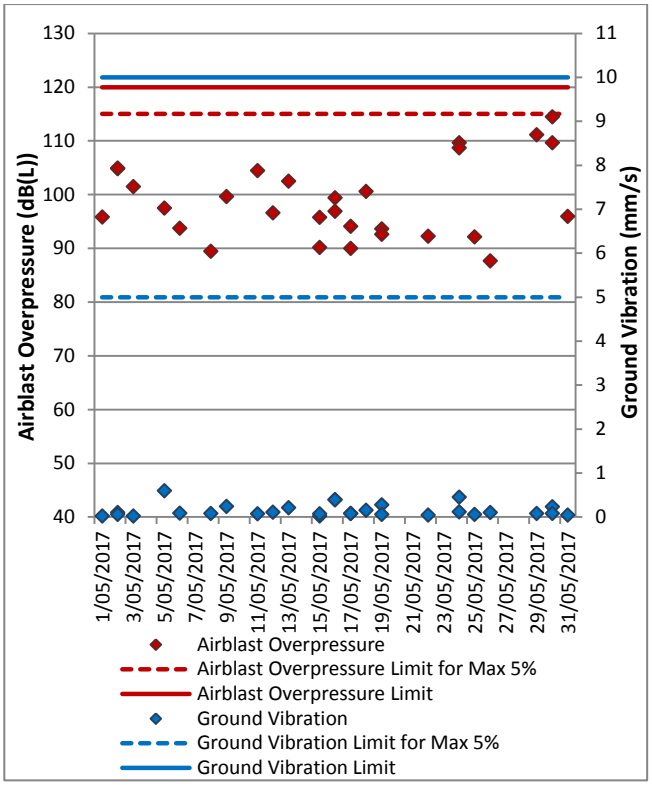

Figure 12: Maison Dieu Blast Monitoring Results – May 2017

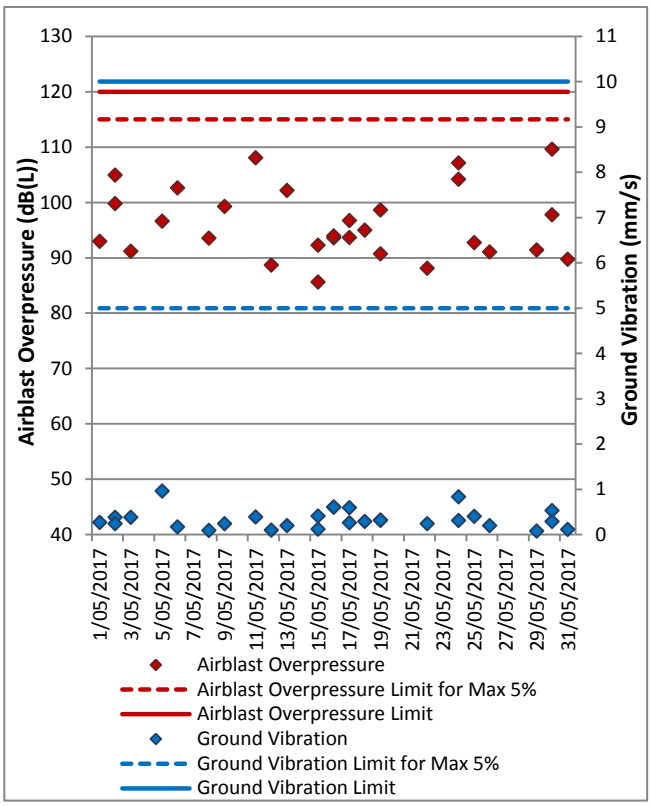

Figure 13: Warkworth Blast Monitoring Results - May 2017

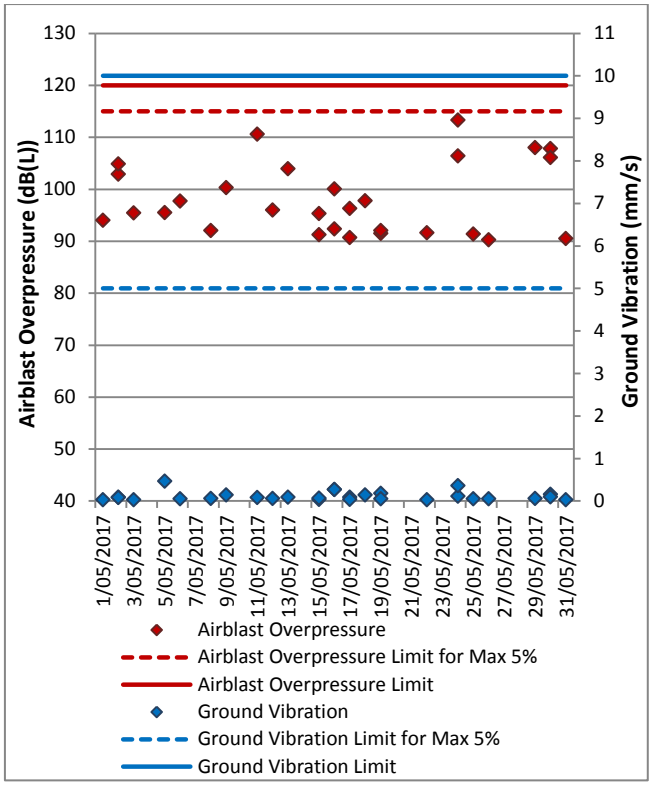

Figure 14: Knodlers Lane Blast Monitoring Results – May 2017

Figure 15: 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 16.

5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding HVO on the nights of 15th and 18th of May 2017. Monitoring results are detailed in Table 3 to

Table **8**.

Table 3: $L_{Aeq,\ 15\ minute}$ HVO South - Impact Assessment Criteria – May 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO South L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	15/05/2017 21:00	1.3	0.5	37	Yes	29	Nil
Maison Dieu	15/05/2017 21:23	0.9	0.5	37	Yes	26	Nil
Shearers Lane	15/05/2017 21:44	2.1	-1	41	Yes	36	Nil
Kilburnie South	15/05/2017 22:48	1.5	3	36	No	32	NA
Jerrys Plains Village	15/05/2017 21:53	2.1	-1	35	Yes	28	Nil
Jerrys Plains East	15/05/2017 21:31	1.3	3	35	No	30	NA
Long Point Road	18/05/2017 21:02	3.6	-1	35	No	IA	NA
HVGC	15/05/2017 21:03	1.3	0.5	55	Yes	46	Nil

Table 4: $L_{Aeq,\ 15\ minute}$ HVO South - Land Acquisition Criteria – May 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO South L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	15/05/2017 21:00	1.3	0.5	41	Yes	29	Nil
Maison Dieu	15/05/2017 21:23	0.9	0.5	41	Yes	26	Nil
Shearers Lane	15/05/2017 21:44	2.1	-1	41	Yes	36	Nil
Kilburnie South	15/05/2017 22:48	1.5	3	41	No	32	NA
Jerrys Plains Village	15/05/2017 21:53	2.1	-1	40	Yes	28	Nil
Jerrys Plains East	15/05/2017 21:31	1.3	3	40	No	30	NA
Long Point Road	18/05/2017 21:02	3.6	-1	40	No	IA	NA
HVGC	15/05/2017 21:03	1.3	0.5	NA	NA	46	NA

Table 5: $L_{A1,\ 1minute}$ HVO South - Impact Assessment Criteria – May 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO South $L_{A1,\ 1min}$ dB[2,4]	Exceedance[3]
Knodlers Lane	15/05/2017 21:00	1.3	0.5	45	Yes	35	Nil
Maison Dieu	15/05/2017 21:23	0.9	0.5	45	Yes	32	Nil
Shearers Lane	15/05/2017 21:44	2.1	-1	45	Yes	43	Nil
Kilburnie South	15/05/2017 22:48	1.5	3	45	No	39	NA
Jerrys Plains Village	15/05/2017 21:53	2.1	-1	45	Yes	30	Nil
Jerrys Plains East	15/05/2017 21:31	1.3	3	45	No	33	NA
Long Point Road	18/05/2017 21:02	3.6	-1	45	No	IA	NA
HVGC	15/05/2017 21:03	1.3	0.5	NA	NA	60	NA

Notes
1. Noise emission limits apply for winds up to 3 metres per second (at a height of 10m), or vertical temperature gradients of up to 3 degrees/100m and wind speeds of up to 2 m/s (at a height of 10m);
2. Estimated or measured $L_{Aeq,15minute}$ dB attributed to HVO South Pit Area;
3. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
4. Bolded results in red indicate exceedance of criteria;
5. Atmospheric data is sourced from the HVO Corporate weather station using logged met data;
6. Criterion may or may not apply due to rounding of meteorological data values

Table 6: $L_{Aeq,\ 15minute}$ HVO North – Impact Assessment Criteria – May 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO North L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	15/05/2017 21:00	1.3	0.5	35	Yes	IA	Nil
Maison Dieu	15/05/2017 21:23	0.9	0.5	35	Yes	IA	Nil
Shearers Lane	15/05/2017 21:44	2.1	-1	35	Yes	IA	Nil
Kilburnie South	15/05/2017 22:48	1.5	3	39	Yes	IA	Nil
Jerrys Plains Village	15/05/2017 21:53	2.1	-1	36	Yes	30	Nil
Jerrys Plains East	15/05/2017 21:31	1.3	3	39	Yes	NM	Nil
Long Point Road	18/05/2017 21:02	3.6	-1	35	No	IA	NA
HVGC	15/05/2017 21:03	1.3	0.5	NA	NA	IA	NA

Table 7: $L_{Aeq,15minute}$ HVO North - Land Acquisition Criteria – May 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO North L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	15/05/2017 21:00	1.3	0.5	41	Yes	IA	Nil
Maison Dieu	15/05/2017 21:23	0.9	0.5	41	Yes	IA	Nil
Shearers Lane	15/05/2017 21:44	2.1	-1	41	Yes	IA	Nil
Kilburnie South	15/05/2017 22:48	1.5	3	41	Yes	IA	Nil
Jerrys Plains Village	15/05/2017 21:53	2.1	-1	41	Yes	30	Nil
Jerrys Plains East	15/05/2017 21:31	1.3	3	41	Yes	NM	Nil
Long Point Road	18/05/2017 21:02	3.6	-1	41	No	IA	NA
HVGC	15/05/2017 21:03	1.3	0.5	NA	NA	IA	NA

Table 8: $L_{A1, 1Minute}$ HVO North - Impact Assessment Criteria – May 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO North $L_{A1, 1min}$ dB[2,4]	Exceedance[3]
Knodlers Lane	15/05/2017 21:00	1.3	0.5	46	Yes	IA	Nil
Maison Dieu	15/05/2017 21:23	0.9	0.5	46	Yes	IA	Nil
Shearers Lane	15/05/2017 21:44	2.1	-1	46	Yes	IA	Nil
Kilburnie South	15/05/2017 22:48	1.5	3	46	Yes	IA	Nil
Jerrys Plains Village	15/05/2017 21:53	2.1	-1	46	Yes	34	Nil
Jerrys Plains East	15/05/2017 21:31	1.3	3	46	Yes	NM	Nil
Long Point Road	18/05/2017 21:02	3.6	-1	46	No	IA	NA
HVGC	15/05/2017 21:03	1.3	0.5	NA	NA	IA	NA

Notes
1. Noise emission limits apply for winds up to 3 metres per second (at a height of 10m), or vertical temperature gradients of up to 3 degrees/100m and wind speeds of up to 2 m/s (at a height of 10m);
2. Estimated or measured $L_{Aeq,15minute}$ dB attributed to HVO North Area;
3. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
4. Bolded results in red indicate exceedance of criteria;
5. Atmospheric data is sourced from the HVO Corporate weather station using logged met data;
6. Criterion may or may not apply due to rounding of meteorological data values

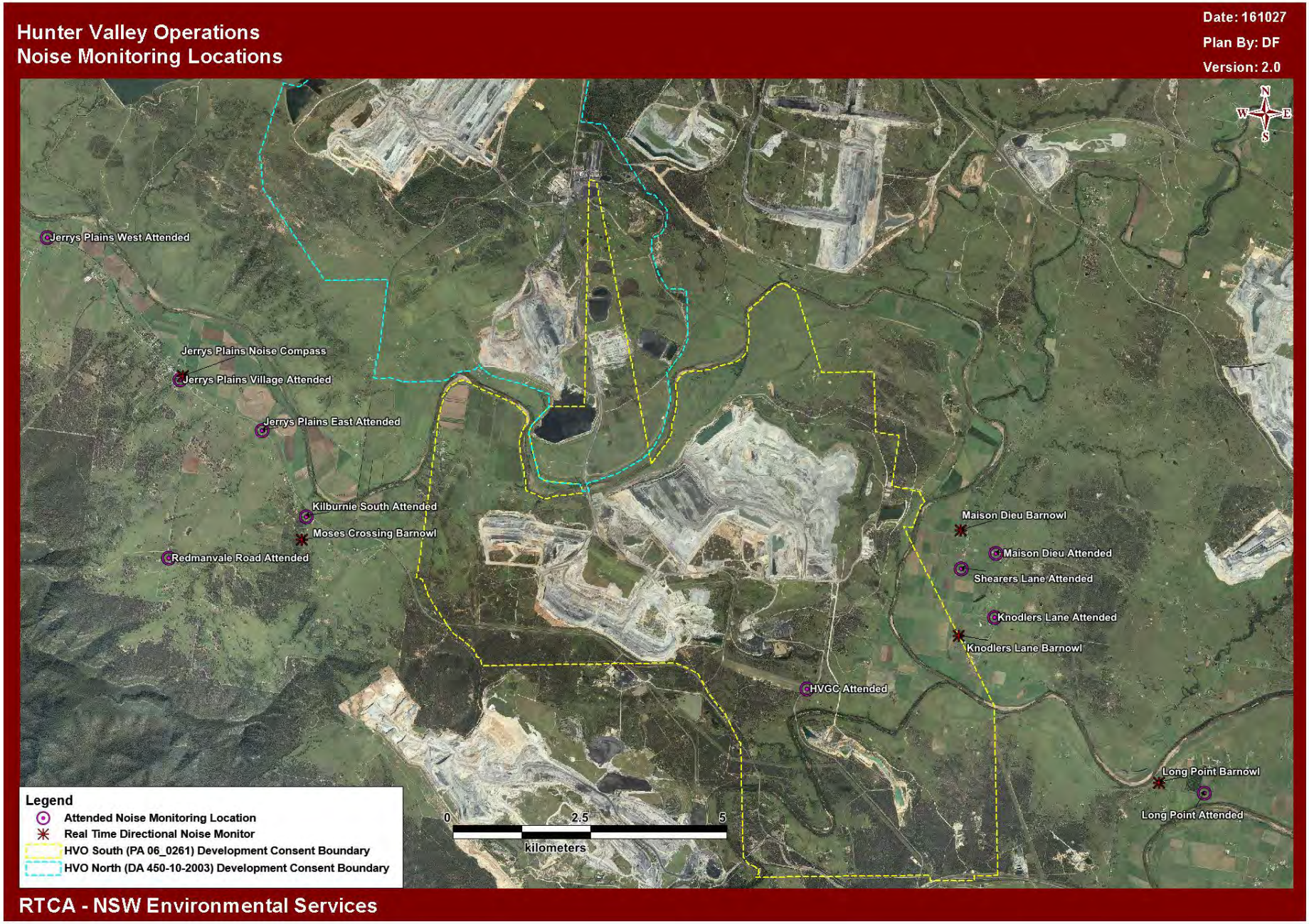

Figure 16: Noise Monitoring Location Plan

5.2 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.

HVO's Planning approvals stipulate noise criteria which must be met during the life of the development(s). The approvals however do not stipulate requirements or give guidance on noise affectation, or the frequency of any elevated noise event which would constitute noise affectation. Page 6 of the NSW Industrial Noise Policy (INP) comments that criteria "*seek to restrict the risk of people being highly annoyed to less than 10 percent, and to meet this for at least 90 percent of the time*".

For the purposes of assessing the effectiveness of the noise management system, HVO applies a similar approach with regard to the frequency of any elevated noise event. 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.

6.0 OPERATIONAL DOWNTIME

During May, a total of 13.9 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 17.

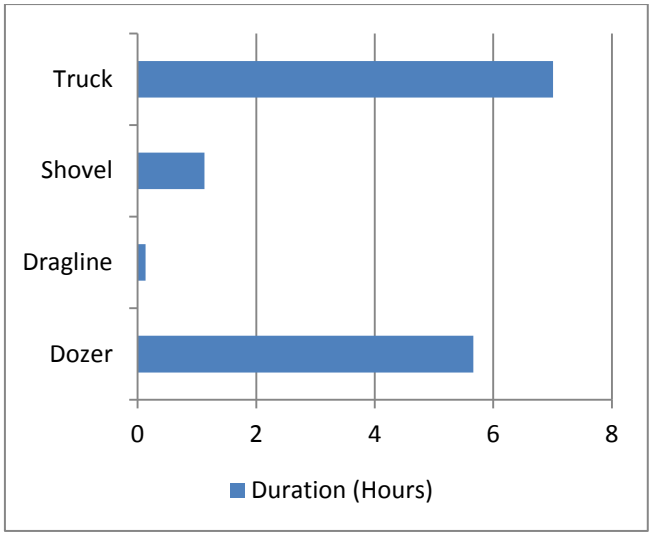

Figure 17: Operational Downtime by Equipment Type – May 2017

7.0 REHABILITATION

During May, 17.1 Ha of land was released, 14.9 Ha of land was bulk shaped and 8.7 Ha of land was topsoiled. Year to date progress can be viewed in Figure 18.

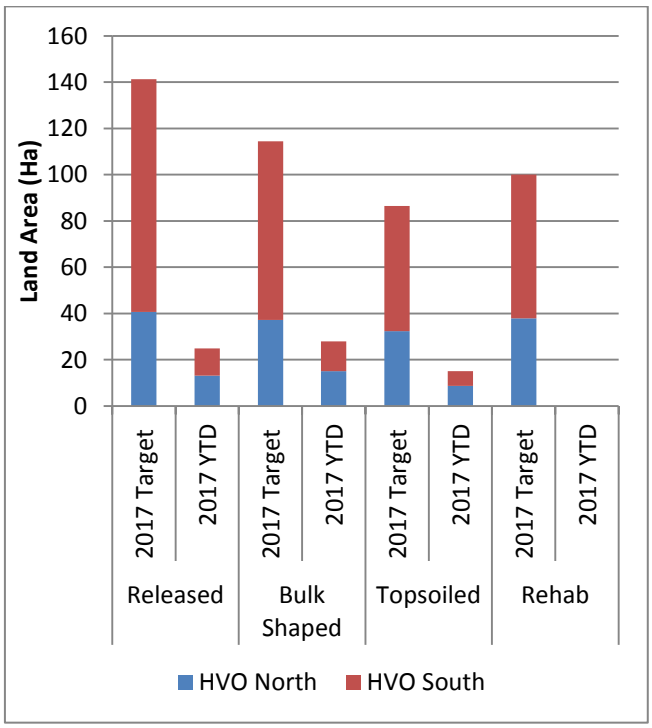

Figure 18: Rehabilitation YTD - May 2017

8.0 COMPLAINTS

Two complaints were received during the reporting period. Details of complaints received YTD are shown in Figure 19 below.

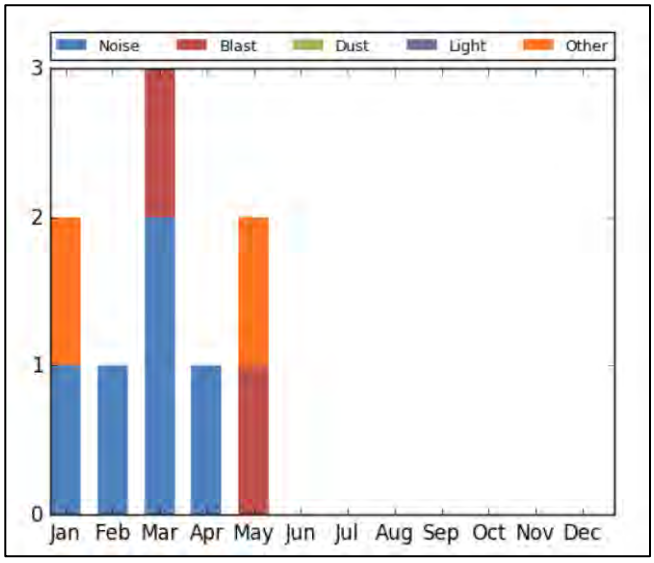

Figure 19: Complaints Graph – May 2017

9.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were no reportable environmental incidents.

Appendix A: Meteorological Data

Table 9: Meteorological Data - HVO Corporate Meteorological Station – May 2017

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)
1/05/2017	21.9	7.3	100.0	47.3	817	159.9	1.3	0.0
2/05/2017	23.9	8.7	100.0	48.8	862	246.5	1.6	0.0
3/05/2017	25.0	11.7	81.9	34.0	627	240.0	2.3	0.0
4/05/2017	18.3	9.8	88.1	60.0	1010	131.7	2.5	0.0
5/05/2017	19.5	9.0	89.6	56.6	889	128.5	2.4	0.0
6/05/2017	21.3	6.2	100.0	42.5	636	174.7	1.0	0.0
7/05/2017	23.4	6.9	100.0	38.4	726	270.5	1.9	0.2
8/05/2017	22.8	8.5	72.4	25.5	627	242.2	2.8	0.0
9/05/2017	19.6	5.1	82.3	41.5	613	160.7	1.6	0.0
10/05/2017	20.0	6.7	89.4	41.7	652	109.6	1.4	0.0
11/05/2017	20.7	5.5	100.0	37.7	610	186.7	1.0	0.0
12/05/2017	21.5	4.4	100.0	33.4	578	196.1	1.3	0.0
13/05/2017	18.4	7.8	100.0	70.0	725	169.6	1.1	1.0
14/05/2017	20.1	8.4	100.0	63.3	807	146.1	0.8	0.0
15/05/2017	20.0	9.7	100.0	64.3	766	173.8	1.5	0.2
16/05/2017	19.8	9.1	100.0	51.3	761	250.5	1.7	0.2
17/05/2017	22.1	6.8	100.0	28.3	578	220.2	1.8	0.2
18/05/2017	20.4	4.3	100.0	41.7	572	174.0	1.3	0.0
19/05/2017	20.5	7.0	100.0	58.6	641	156.5	1.7	0.0
20/05/2017	17.8	10.6	100.0	84.7	814	132.1	1.8	13.4
21/05/2017	21.8	11.5	100.0	68.6	838	224.9	1.6	3.6
22/05/2017	22.8	12.1	100.0	63.1	827	193.3	1.4	0.2
23/05/2017	21.3	11.7	99.7	62.0	852	124.2	1.3	0.0
24/05/2017	21.9	10.7	100.0	58.8	702	265.9	1.7	0.0
25/05/2017	-	-	-	-	-	-	-	-
26/05/2017	21.0	6.2	84.8	38.2	820	269.9	2.8	0.0
27/05/2017	19.9	5.1	93.4	45.5	557	210.0	2.0	0.0
28/05/2017	20.9	4.6	100.0	51.2	534	210.1	1.0	0.0
29/05/2017	21.2	6.4	100.0	48.3	747	283.5	2.9	0.6
30/05/2017	17.1	4.6	74.4	26.8	558	291.4	3.4	0.0
31/05/2017	15.8	0.1	87.1	34.5	571	288.5	3.3	0.0

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