



# Mount Thorley Warkworth Community Consultative Committee (CCC)

BUSINESS PAPERS – August 2018

## Contents page

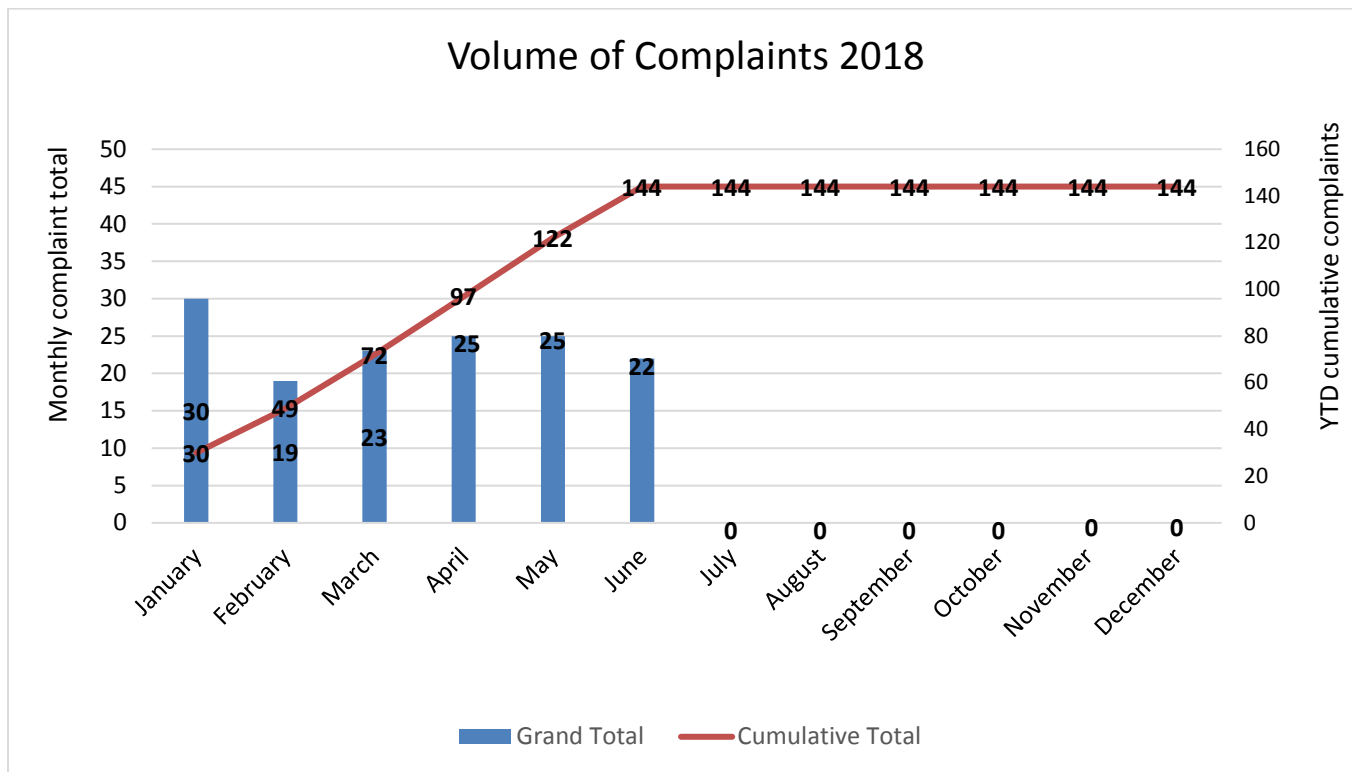
1	Complaints.....	3
2	Incidents .....	4
3	Environmental Monitoring.....	6
4	Rehabilitation Plan .....	7
5	Acquisition Update .....	12
6	Website Uploads .....	13
7	Yancoal Corporate and community Investment .....	15

### Appendices

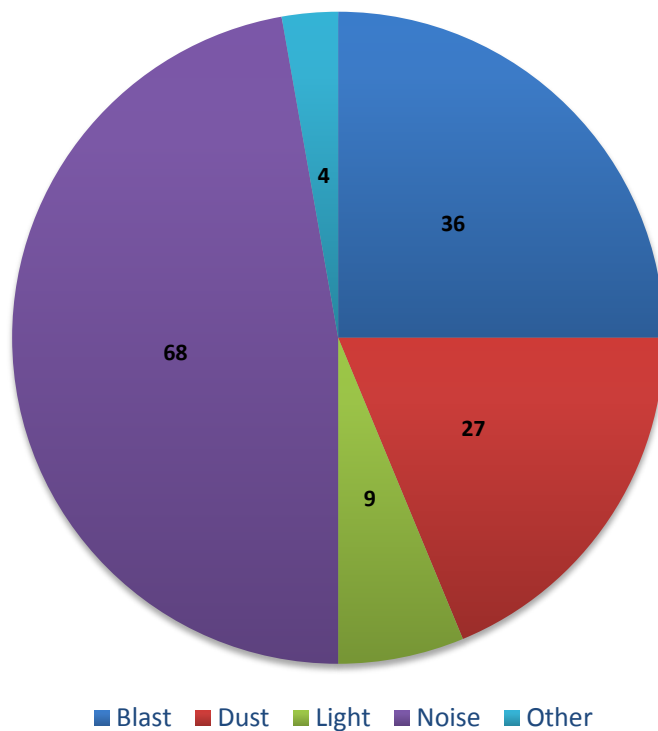
- Appendix A – Environmental Monitoring Report April 2018
- Appendix B – Environmental Monitoring Report May 2018
- Appendix C – Environmental Monitoring Report June 2018
- Appendix D – MTW Property Update

## 1 COMPLAINTS

### Complaints overview YTD 2018 (01.01.2018 - 30.06.2018)

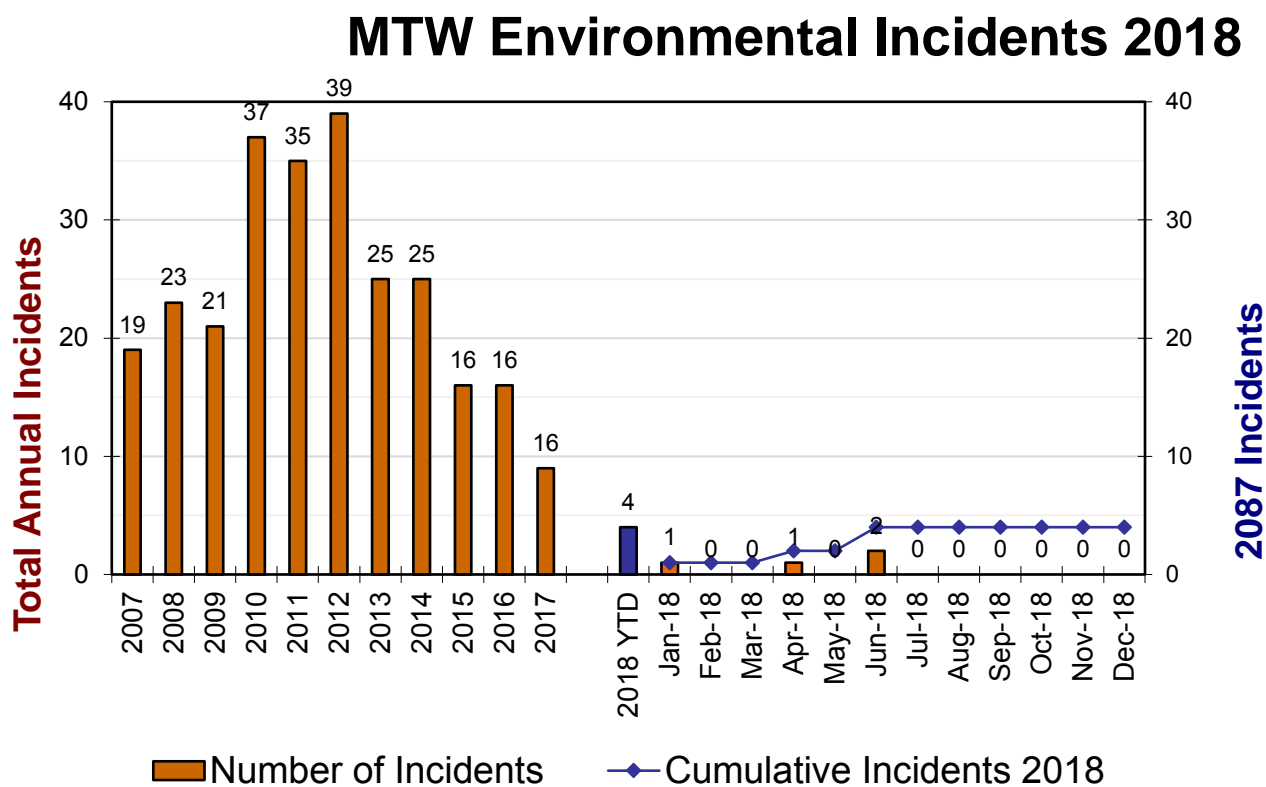


### Complaints by Type YTD



## 2 INCIDENTS

Overview of environmental incidents for period first quarter 2018 – 01 January 2018 to 30 March 2018.



**Incident Summary for the period of 1 April to 30 June 2018.**

<b>Date</b>	<b>Details</b>	<b>Key Actions</b>	<b>Aspect</b>
07-June-2018	Dozer and Truck made contact on interburden emplacement area. Dozer blade contacted Truck fuel tank resulting in diesel spill.	Spill was contained. Incident investigated.	Hydrocarbon
25-June-2018	Contract company incorrectly isolated fuel tanks when delivering diesel to site. As a result, fuel overtopped receiving tank into bunded area. Valve on bunded area had unknowingly deteriorated resulting in diesel spill into earthen containment cell.	Spill was contained and recovered. Incident investigated.	Hydrocarbon

### **3 ENVIRONMENTAL MONITORING**

**Monthly summaries of environmental monitoring for the period 1 January 2018 to 30 March 2018.**

**April 2018**

Attached as **Appendix A**

**May 2018**

Attached as **Appendix B**

**June 2018**

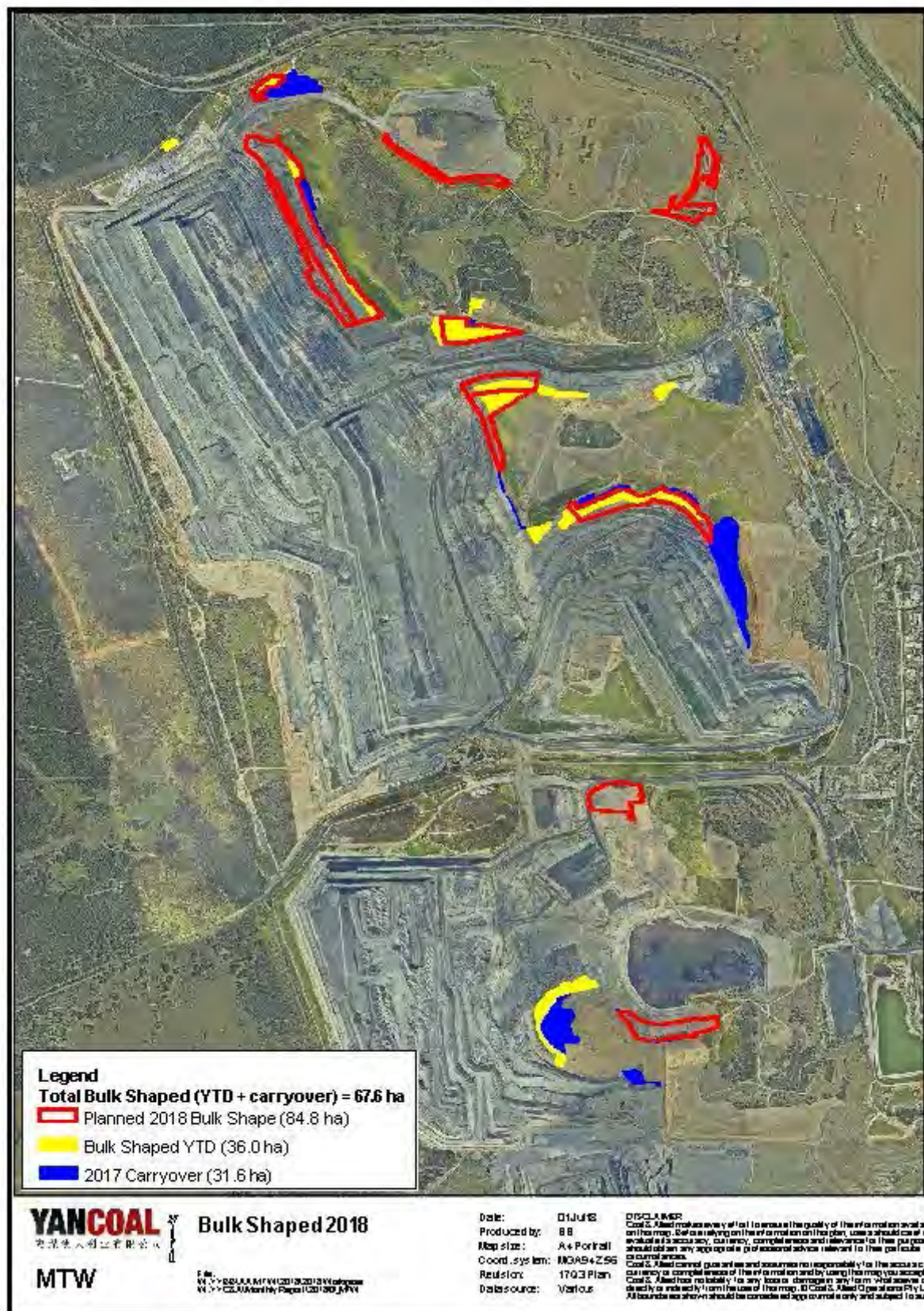
Attached as **Appendix C**

#### **4 REHABILITATION PLAN**

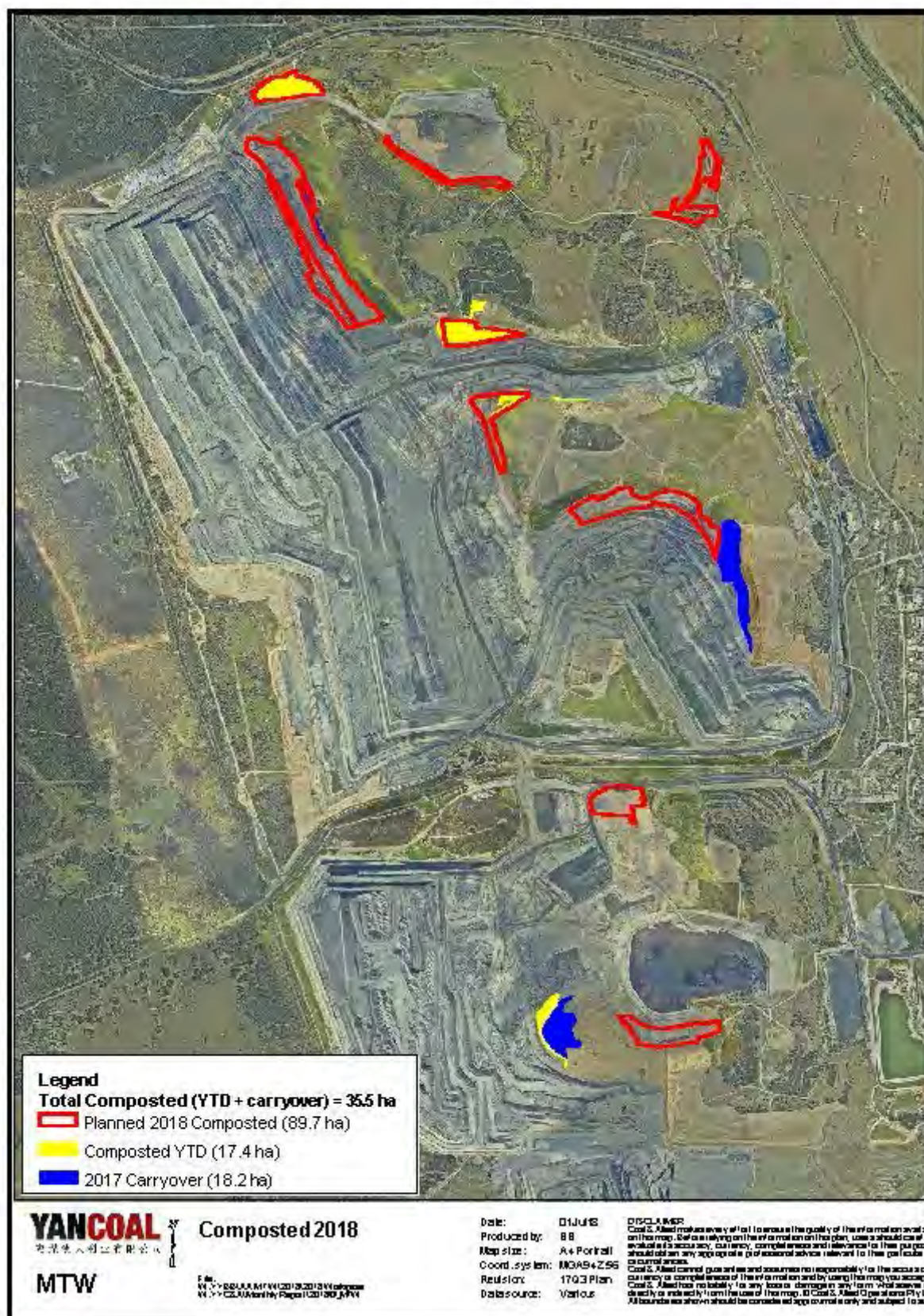
Further progress has been made to date against the 2018 MTW rehab target of 100ha, with bulk shaping completed on 67.5ha. Rehabilitation activities have progressed further on many of these areas such that 26.5ha have been seeded and a further 9ha are ready for seeding.

The year to date disturbance is 122.8ha. The bulk of the disturbance that has occurred since the last meeting is due to clearing associated with the construction of the emergency access track/fire trail (schedule 3, cond.50, SSD-6464).

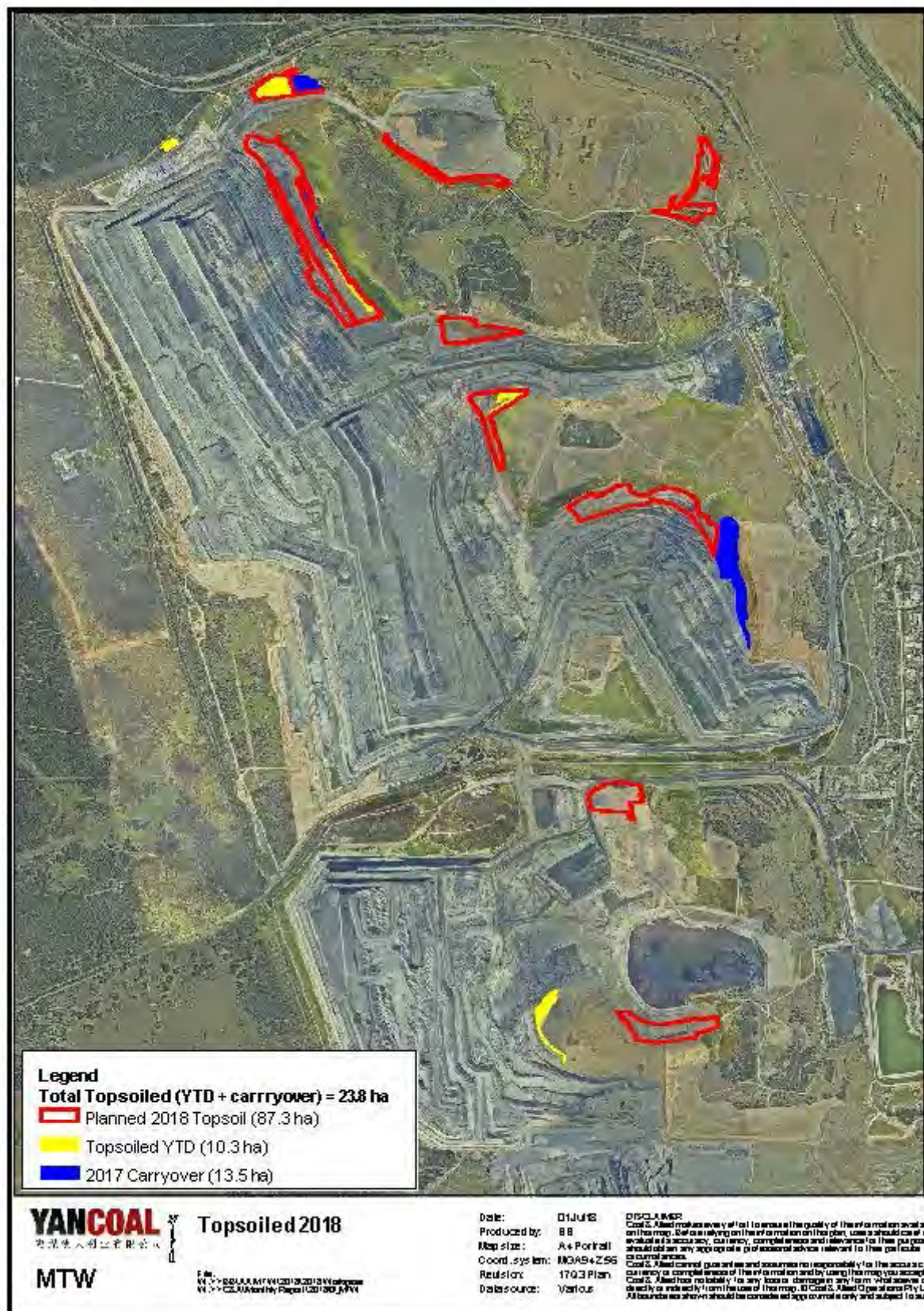




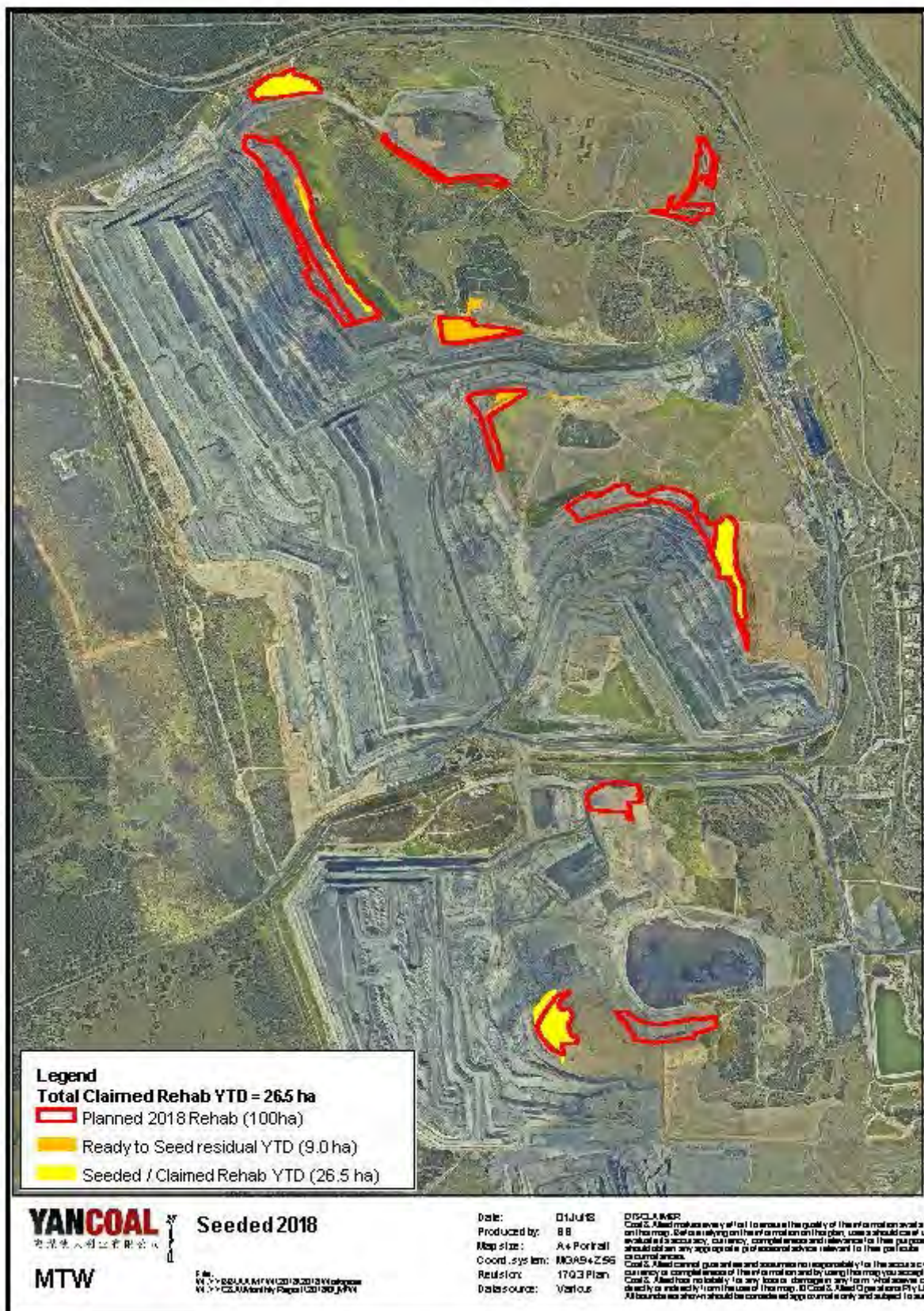




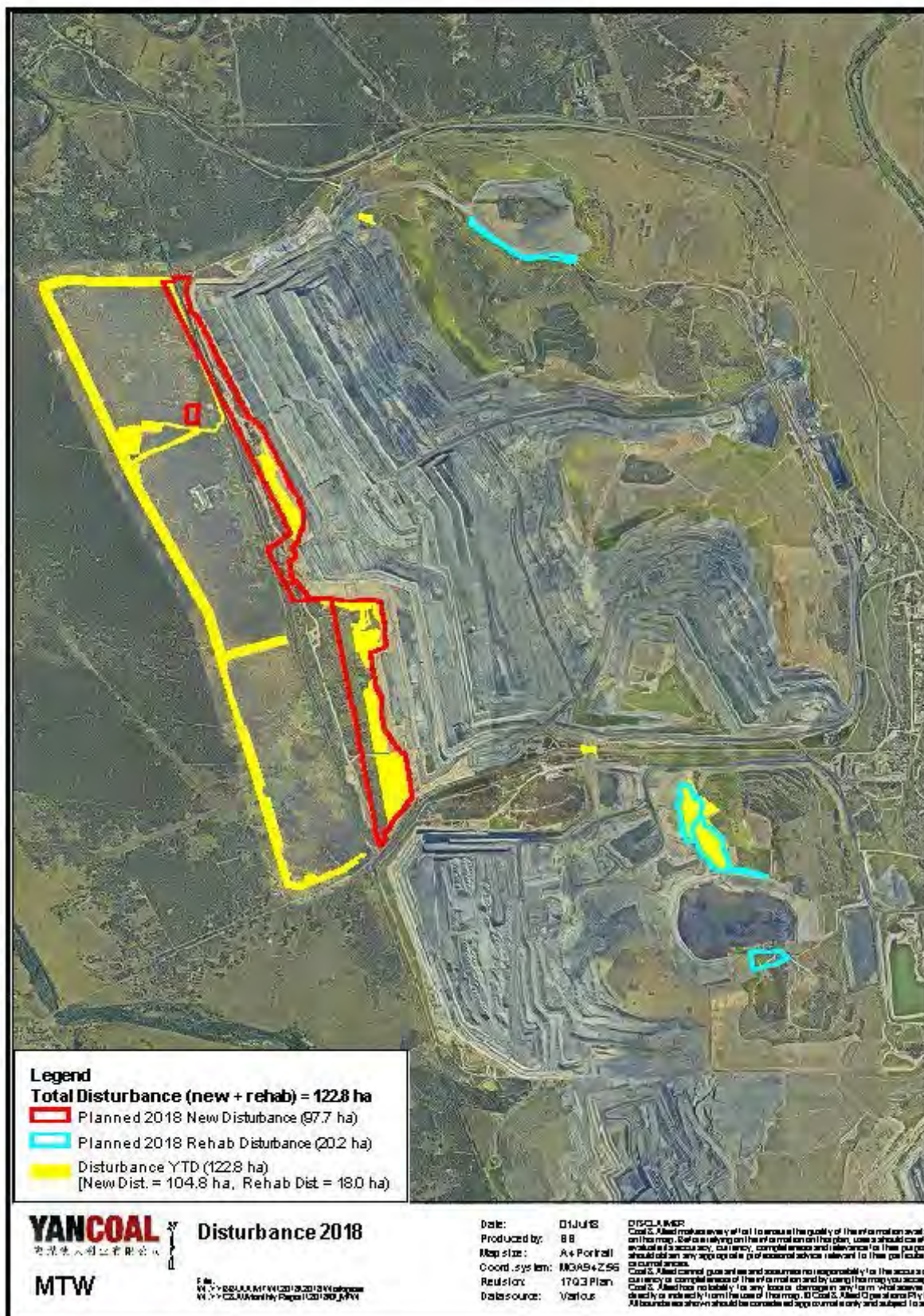












## 5 ACQUISITION UPDATE

There have been no new land acquisitions by Yancoal. Full summary included in Appendix D.

## 6 WEBSITE UPLOADS

Table 1 below is a list of all documents uploaded to the MTW library of the Yancoal Australia InSite website since 30 April 2018 (to 23 July 2018). Uploads have been characterised as Additions, being a new document, or a Change, meaning a new version of an existing document. Please refer to the library page of the website for document contents:

<https://insite.yancoal.com.au/document-library/mtw>

Document Title	Upload
EPBC 2002/629 and EPBC 2009/5081 Annual Compliance Report - 1 February 2017 to 31 January 2018	3/05/2018
Local Biodiversity Areas Annual Report 2017	3/05/2018
Regional Biodiversity Areas Annual Report 2017	3/05/2018
Mount Thorley Warkworth Environmental Monitoring Report March 2018	3/05/2018
Mount Thorley Warkworth Environment Protection Licence 1376 1976 Monitoring Data April 2018	18/05/2018
Aboriginal Heritage Management Plan	22/05/2018
Warkworth Continuation Project 2014 Environmental Impact Statement - Appendices O to R	22/05/2018
Warkworth Continuation Project 2014 Environmental Impact Statement - Main Report	22/05/2018
Warkworth Continuation Project 2014 Environmental Impact Statement - Appendices A to G	22/05/2018
Warkworth Continuation Project 2014 Environmental Impact Statement - Appendix H	22/05/2018
Warkworth Continuation Project 2014 Environmental Impact Statement - Appendices I to L	22/05/2018
Warkworth Continuation Project 2014 Environmental Impact Statement - Appendices M to N	22/05/2018
Warkworth Continuation 2014 - Response to Submissions	22/05/2018
Mount Thorley Operations 2014 Environmental Impact Statement - Appendices G to J	22/05/2018
Mount Thorley Operations 2014 Environmental Impact Statement - Appendices K to L	22/05/2018
Mount Thorley Operations 2014 Environmental Impact Statement - Appendices M to O	22/05/2018
Mount Thorley Operations 2014 Environmental Impact Statement - Main Report	22/05/2018

Mount Thorley Operations 2014 Environmental Impact Statement - Appendices A to F	22/05/2018
Mount Thorley Operations 2014 - Response to Submissions	22/05/2018
Bowditch Biodiversity Area Management Plan	28/05/2018
Goulburn River Biodiversity Area Management Plan	28/05/2018
North Rothbury Biodiversity Area Management Plan	28/05/2018
Putty Biodiversity Area Management Plan	28/05/2018
Seven Oaks Biodiversity Area Management Plan	28/05/2018
Southern Biodiversity Area Management Plan	28/05/2018
Mount Thorley Warkworth Environmental Monitoring Report April 2018	6/06/2018
Mount Thorley Warkworth Environment Protection Licence 1376 1976 Monitoring Data May 2018	26/06/2018
Mount Thorley Warkworth Environmental Monitoring Report May 2018	12/07/2018
Mount Thorley Warkworth Community Consultative Committee Meeting Business Papers December 2017	12/07/2018
Mount Thorley Warkworth Community Consultative Committee Meeting Minutes December 2017	12/07/2018
Mount Thorley Warkworth Community Consultative Committee Presentation December 2017	12/07/2018
Mount Thorley Warkworth Community Consultative Committee Meeting Minutes February 2018	12/07/2018
Mount Thorley Warkworth Community Consultative Committee Meeting Business Papers May 2018	12/07/2018
Mount Thorley Warkworth Community Consultative Committee Meeting Minutes May 2018	12/07/2018
Mount Thorley Warkworth Community Consultative Committee Presentation May 2018	12/07/2018
Mount Thorley Warkworth Environment Protection Licence 1376 1976 Monitoring Data June 2018	23/07/2018

## **7 YANCOAL CORPORATE AND COMMUNITY INVESTMENT**

The MTW site donations program is active. For information please contact Travis Bates.

Travis Bates  
Yancoal Community Relations Specialist  
+61 2 6575 5911  
[Travis.bates@yancoal.com.au](mailto:Travis.bates@yancoal.com.au)



# **Appendix A: April Monthly Environmental Monitoring Report**



# Monthly Environmental Monitoring Report

Yancoal Mount Thorley Warkworth

April 2018

## CONTENTS

1.0	INTRODUCTION .....	4
2.0	AIR QUALITY .....	4
2.1	Meteorological Monitoring.....	4
2.1.1	Rainfall .....	4
2.1.2	Wind Speed and Direction .....	4
2.2	Depositional Dust .....	6
2.3	Suspended Particulates .....	6
2.3.1	HVAS PM <sub>10</sub> Results.....	6
2.3.2	TSP Results .....	7
2.3.3	Real Time PM <sub>10</sub> Results.....	7
2.3.4	Real Time Alarms for Air Quality .....	7
3.0	WATER QUALITY .....	8
3.1	Surface Water .....	8
3.2	Groundwater Monitoring.....	8
3.3	HRSTS Discharge.....	8
4.0	BLAST MONITORING.....	9
4.1	Blast Monitoring Results.....	9
5.0	NOISE .....	12
5.1	Attended Noise Monitoring Results .....	12
5.1.1	WML Noise Assessment.....	12
5.1.3	MTO Noise Assessment .....	13
5.1.4	NPfl Low Frequency Assessment .....	14
5.2	Noise Management Measures .....	16
6.0	OPERATIONAL DOWNTIME.....	16
7.0	REHABILITATION.....	17
8.0	ENVIRONMENTAL INCIDENTS .....	17
9.0	COMPLAINTS .....	17
	Appendix A: Meteorological Data .....	18

## Figures

Figure 1: Rainfall Trend YTD	4
Figure 2: Charlton Ridge Wind Rose – April 2018	4
Figure 3: Air Quality Monitoring Locations	5
Figure 4: Depositional Dust – April 2018	6
Figure 5: Individual PM <sub>10</sub> Results – April 2018	6
Figure 6: Annual Average PM <sub>10</sub> – April 2018	7
Figure 7: Annual Average Total Suspended Particulates – April 2018	7
Figure 8: Real Time PM <sub>10</sub> daily 24hr average (line graphs) and YTD annual average (column graphs) – April 2018	8
Figure 9: Abbey Green Blast Monitoring Results – April 2018	9
Figure 10: Bulga Village Blast Monitoring Results – April 2018	9
Figure 11: MTIE Blast Monitoring Results – April 2018	10
Figure 12: Wollemi Peak Road Blast Monitoring Results – April 2018	10
Figure 13: Wambo Road Blast Monitoring Results – April 2018	10
Figure 14: Warkworth Blast Monitoring Results – April 2018	10
Figure 15: MTW Blast Monitoring Location Plan	11
Figure 16: Noise Monitoring Location Plan	15
Figure 17: Operational Downtime by Equipment Type – April 2018	16
Figure 18: Rehabilitation YTD – April 2018	17

## Tables

Table 1: Monthly Rainfall MTW	4
Table 2: Blasting Limits	9
Table 3: L <sub>Aeq, 15 minute</sub> Warkworth Impact Assessment Criteria – April 2018	12
Table 4: L <sub>A1, 1 minute</sub> Warkworth - Impact Assessment Criteria – April 2018	12
Table 5: L <sub>Aeq, 15minute</sub> Mount Thorley - Impact Assessment Criteria – April 2018	13
Table 6: L <sub>A1, 1Minute</sub> Mount Thorley - Impact Assessment Criteria – April 2018	14
Table 7: Low Frequency Noise Modifying Factor Assessment – April 2018	14
Table 8: Supplementary Attended Noise Monitoring Data – April 2018	16
Table 9: Complaints Summary YTD	17
Table 10: Meteorological Data – Charlton Ridge Meteorological Station – April 2018	19

## Revision History

Version No.	Person Responsible	Document Status	Date
1.0	Environmental Advisor	Draft	24/05/2018
1.1	Environment & Community Manager	Final	04/06/2018

## 1.0 INTRODUCTION

This report has been compiled to provide a monthly summary of environmental monitoring results for Mount Thorley Warkworth (MTW). This report includes all monitoring data collected for the period 1<sup>st</sup> April to 30<sup>th</sup> April 2018.

## 2.0 AIR QUALITY

### 2.1 Meteorological Monitoring

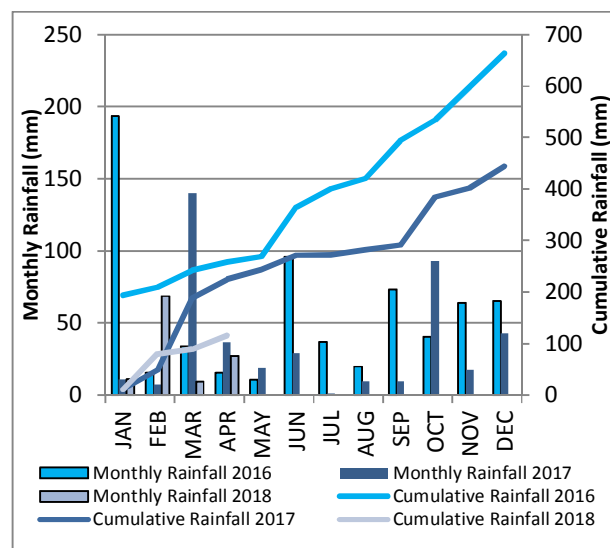
Meteorological data is collected at MTW's 'Charlton Ridge' meteorological station (refer to **Figure 3: Air Quality Monitoring Locations**).

#### 2.1.1 Rainfall

Rainfall for the period is summarised in **Table 1**, the year-to-date trend and historical trend are shown in **Figure 1**.

**Table 1: Monthly Rainfall MTW**

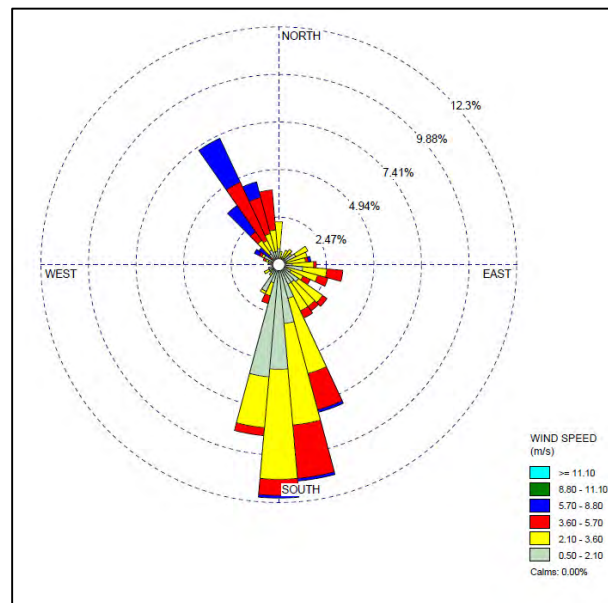
2018	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
April	27	115.5



**Figure 1: Rainfall Trend YTD**

### 2.1.2 Wind Speed and Direction

Winds from the south were dominant throughout the reporting period as shown in **Figure 2**.



**Figure 2: Charlton Ridge Wind Rose – April 2018**



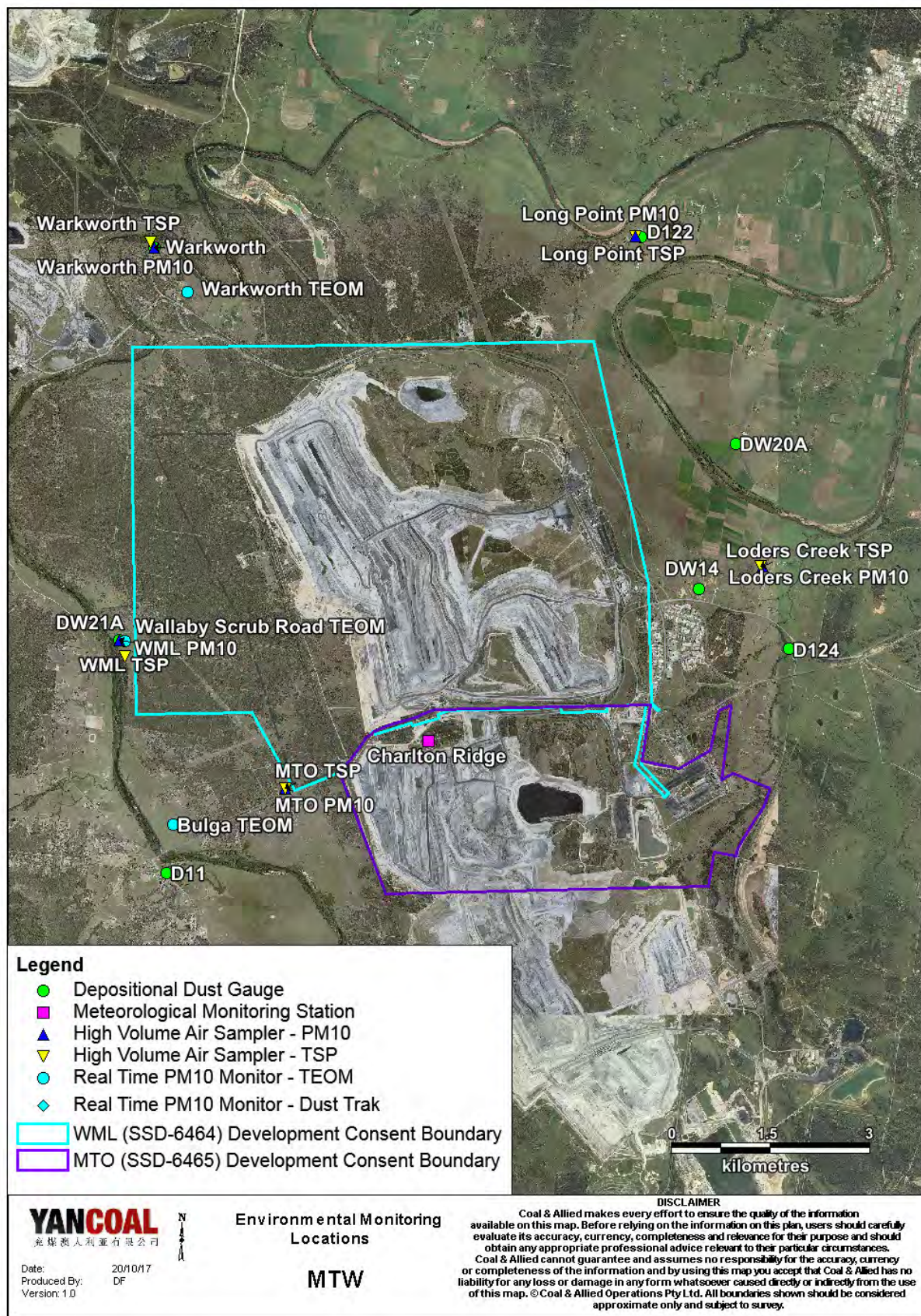


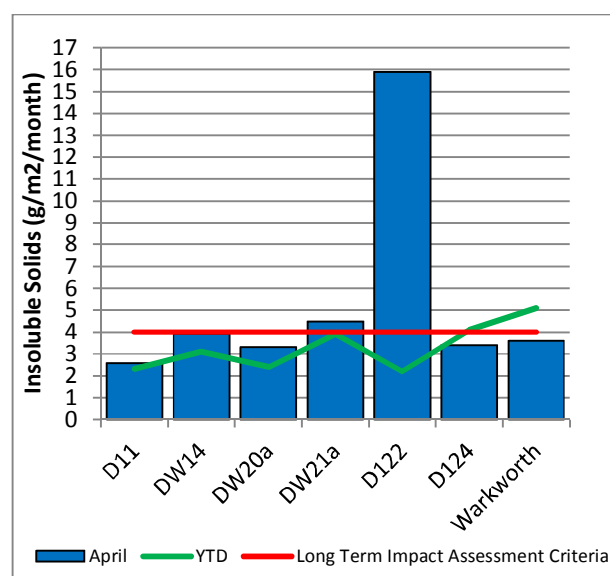
Figure 3: Air Quality Monitoring Locations

## 2.2 Depositional Dust

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

**Figure 4** 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 and DW21a monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m<sup>2</sup> per month. Field notes associated with D122 confirm the presence of insects and bird droppings. As such the result is considered contaminated and will be excluded from calculation of the annual average. There is no evidence to suggest that the DW21a result is contaminated. Accordingly, the result will be included in the annual average calculation.



**Figure 4: Depositional Dust – April 2018**

## 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<sub>10</sub>). The location of these monitors can be found in Figure 3. Each HVAS was run for 24 hours on a six-day cycle in accordance with EPA requirements.

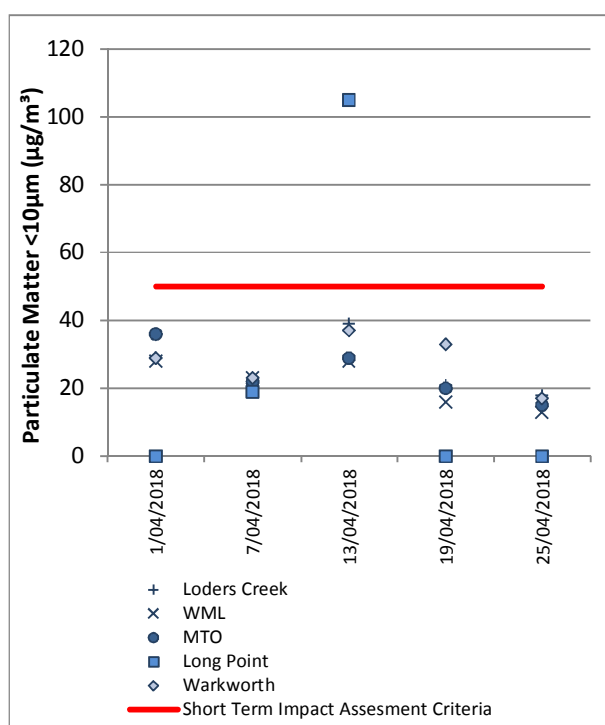
### 2.3.1 HVAS PM<sub>10</sub> Results

**Figure 5** shows the individual PM<sub>10</sub> results at each monitoring station against the short term impact assessment criteria of 50µg/m<sup>3</sup>.

Data was not available on 1<sup>st</sup>, 19<sup>th</sup> or 25<sup>th</sup> April 2018 at the Long Point HVAS due to power related issues.

On 13<sup>th</sup> April 2018 the Long Point HVAS PM<sub>10</sub> unit recorded a result of 105 µg/m<sup>3</sup>, which is greater than the short term (24hr) PM<sub>10</sub> impact assessment criteria.

An Investigation determined that the wind direction was generally not from MTW's angle of influence at Long Point on the 13<sup>th</sup> April. Accordingly, no further action is required.



**Figure 5: Individual PM<sub>10</sub> Results – April 2018**

**Figure 6** shows the annual average PM<sub>10</sub> results against the long term impact assessment criteria.

An assessment of MTW's contribution to the long term assessment criteria will be reported in the 2018 Annual Review Report.



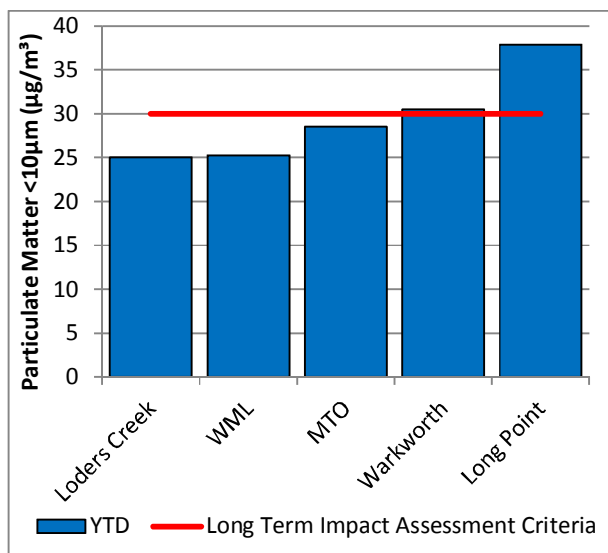


Figure 6: Annual Average PM<sub>10</sub> – April 2018

### 2.3.2 TSP Results

Figure 7 shows the annual average TSP results compared against the long-term impact assessment criteria of 90µg/m³.

An assessment of MTW's contribution to the long-term assessment criteria will be reported in the 2018 Annual Review Report.

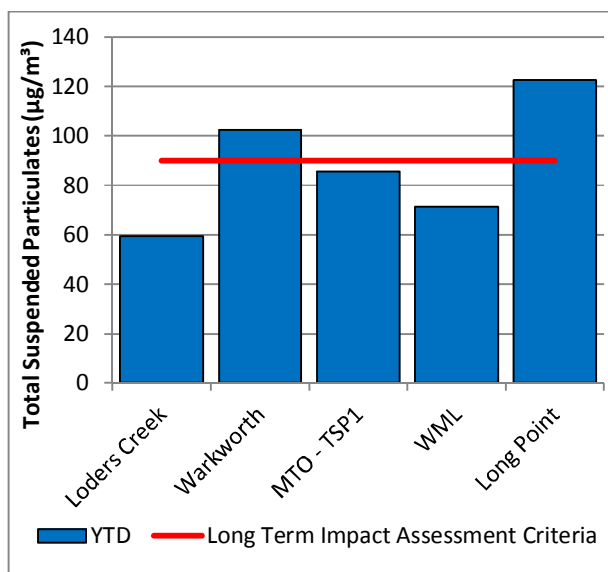


Figure 7: Annual Average Total Suspended Particulates – April 2018

### 2.3.3 Real Time PM<sub>10</sub> Results

MTW maintains a network of real time PM<sub>10</sub> 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 for real time dust sampling are shown in Figure 8, including the daily 24-hour average PM<sub>10</sub> result and the annual PM<sub>10</sub> average.

On 15<sup>th</sup> April 2018, the Bulga OEH (58.9 µg/m³), Wallaby Scrub Road (62.3 µg/m³) and Warkworth (57.3 µg/m³) TEOM results exceeded the short term (24hr) criteria. An analysis of meteorological data has determined that the Bulga OEH, Wallaby Scrub Road and Warkworth monitoring locations were all generally upwind of MTW throughout the day (for more than 98% of the day). Therefore, it is unlikely that MTW operations was a significant contributor to the results and thus estimations of contribution have not been calculated.

### 2.3.4 Real Time Alarms for Air Quality

During April, the real time monitoring system generated 113 automated air quality related alerts, including 14 alerts for adverse meteorological conditions and 99 alerts for elevated PM<sub>10</sub> levels.

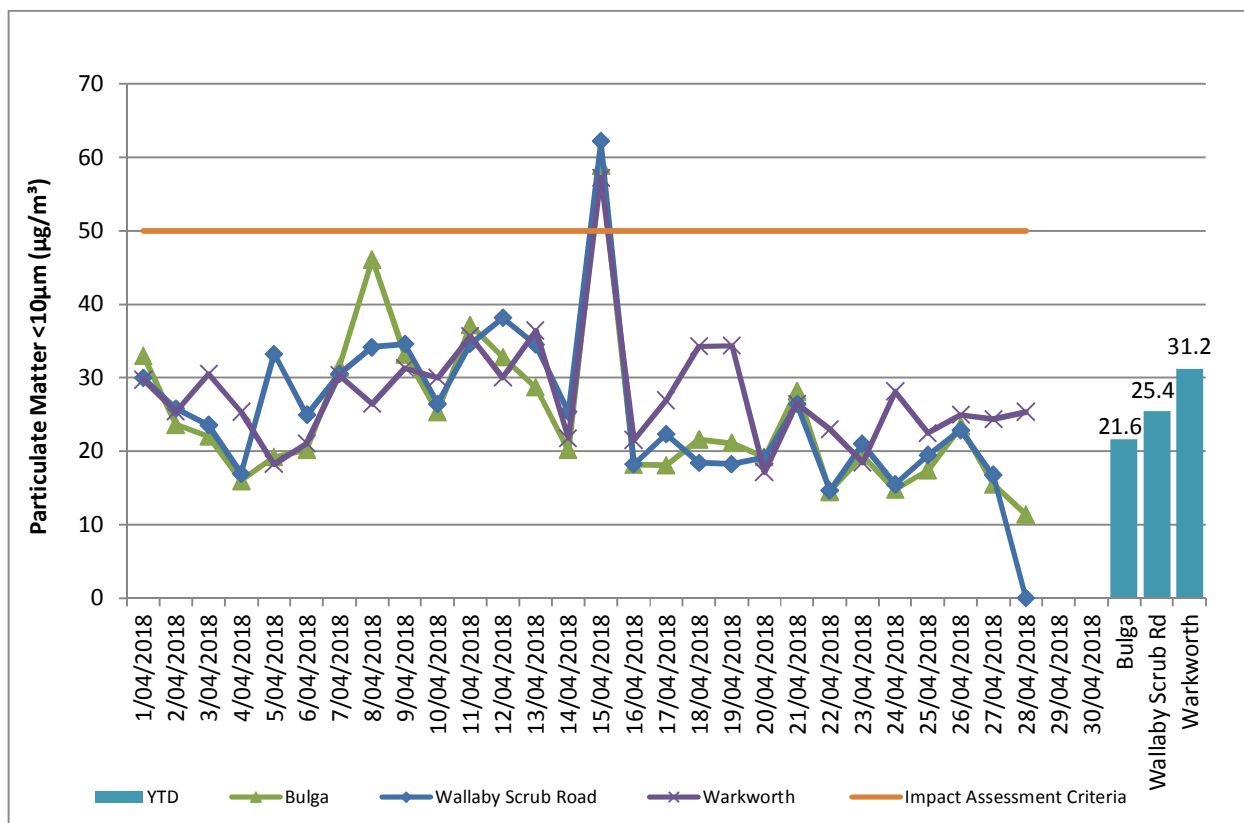


Figure 8: Real Time PM<sub>10</sub> daily 24hr average (line graphs) and YTD annual average (column graphs) – April 2018

### 3.0 WATER QUALITY

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

#### 3.1 Surface Water

Monitoring is conducted at mine site dams and surrounding natural watercourses.

Surface water courses are sampled on a monthly or quarterly sampling regime. Water quality is evaluated through the parameters of pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS). The Hunter River and the Wollombi Brook are sampled both upstream and downstream of mining operations, to monitor the potential impact of mining on the river. Other Hunter River tributaries are also monitored.

Results of monitoring are reported quarterly, next available in the June 2018 report.

### 3.2 Groundwater Monitoring

Groundwater monitoring is undertaken on a quarterly basis in accordance with the MTW Groundwater Monitoring Programme.

Groundwater results are reported quarterly, next available in the June 2018 report.

### 3.3 HRSTS Discharge

MTW participates in the Hunter River Salinity Trading Scheme (HRSTS), allowing discharge from licensed discharge points Dam 1N and Dam 9S. Discharges can only take place subject to HRSTS regulations.

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

## 4.0 BLAST MONITORING

MTW have a network of six 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**.

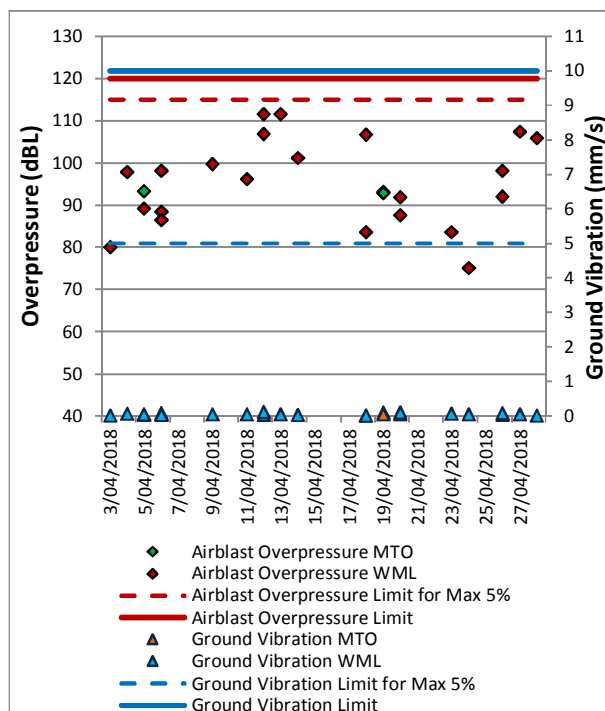
### 4.1 Blast Monitoring Results

During April 2018, 25 blasts were initiated at MTW. **Figure 9 to Figure 14** show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in **Table 2**.

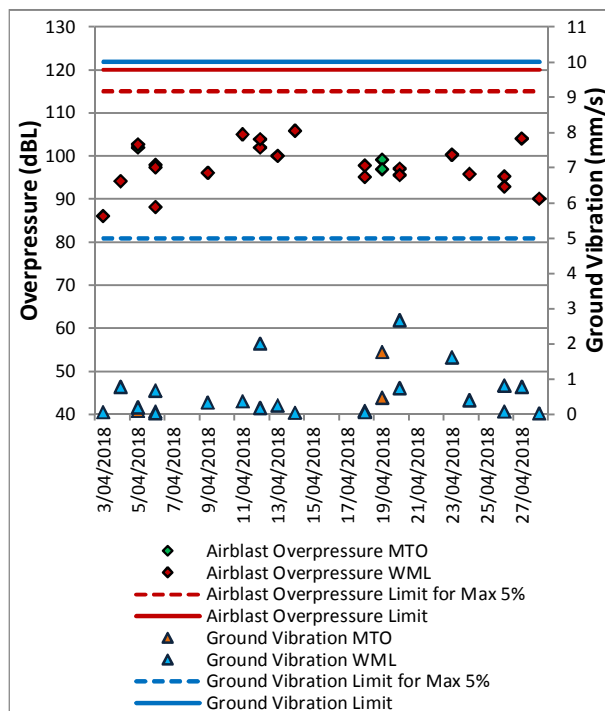
**Table 2: Blasting Limits**

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 no blasts exceeded the 115 dB(L) 5% threshold for airblast overpressure or 5mm/s 5% threshold for ground vibration.



**Figure 9: Abbey Green Blast Monitoring Results – April 2018**



**Figure 10: Bulga Village Blast Monitoring Results – April 2018**

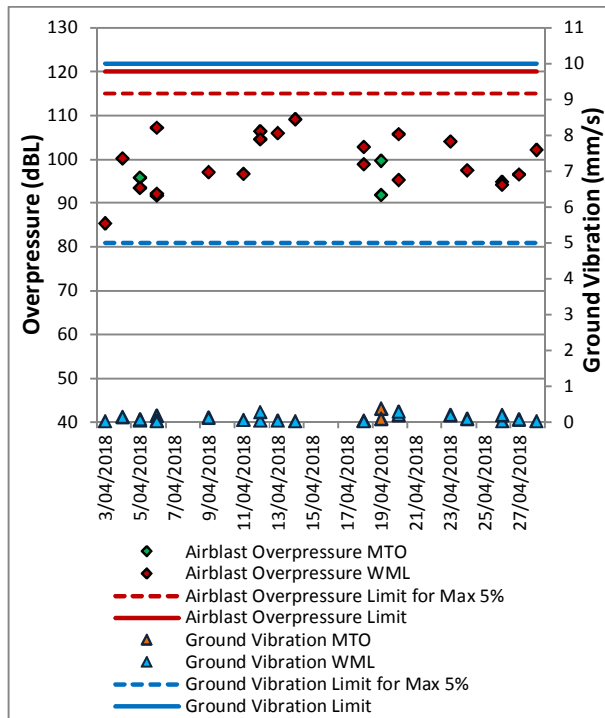


Figure 11: MTIE Blast Monitoring Results – April 2018

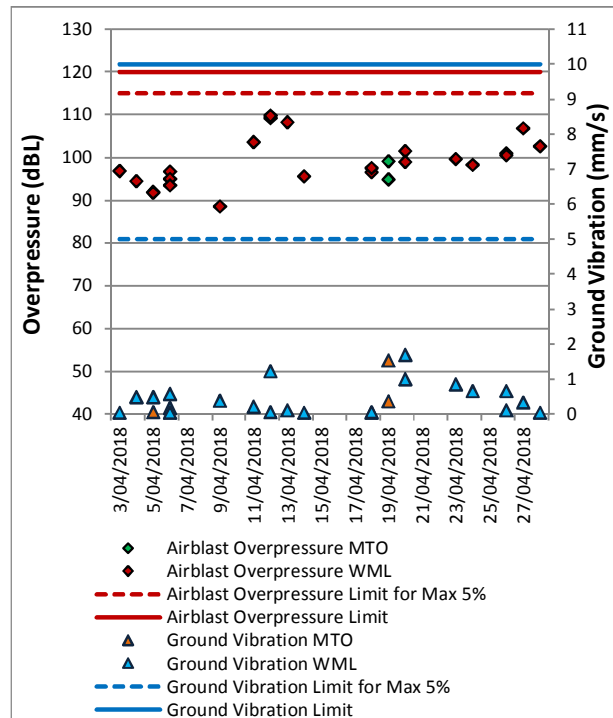


Figure 13: Wambo Road Blast Monitoring Results – April 2018

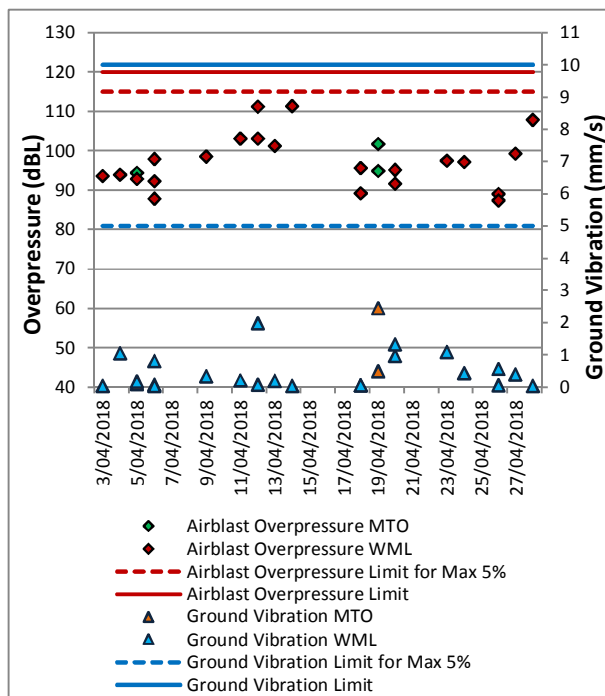


Figure 12: Wollemi Peak Road Blast Monitoring Results – April 2018

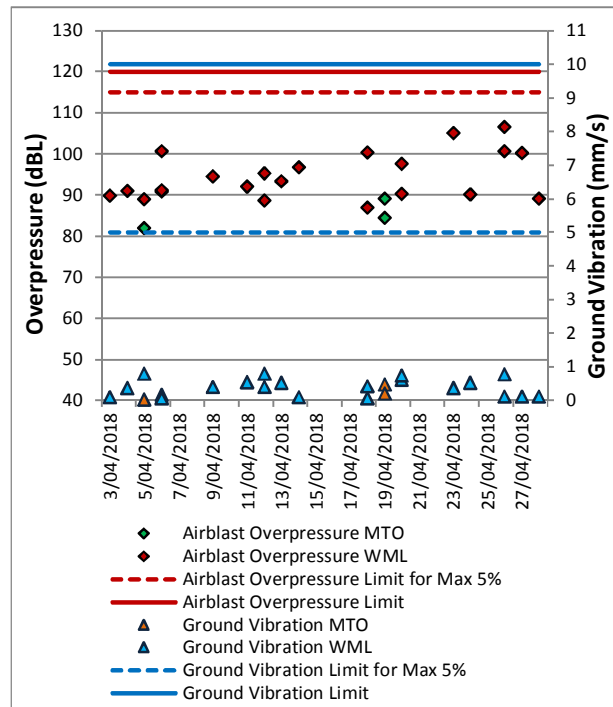


Figure 14: Warkworth Blast Monitoring Results – April 2018





Figure 15: MTW Blast Monitoring Location Plan

## 5.0 NOISE

Routine attended noise monitoring is carried out in accordance with the MTW Noise Management Plan. A review against EIS predictions will be reported in the Annual Review Report. The purpose of the noise surveys is to quantify and describe the acoustic environment around the site and compare results with specified limits. Real time noise monitoring also occurs at five sites surrounding MTW. Noise monitoring locations are displayed in **Figure 16**.

### 5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding MTW on the night of 5 April 2018. All measurements complied with the relevant criteria. Results are detailed in **Table 3 to Table 6**.

#### 5.1.1 WML Noise Assessment

Compliance assessments undertaken against the WML noise criteria are presented in **Tables 3 and 4**.

**Table 3:  $L_{Aeq, 15 \text{ minute}}$  Warkworth Impact Assessment Criteria – April 2018**

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	Stability Class	Criterion dB(A)	Criterion Applies? <sup>1,5</sup>	WML $L_{Aeq}$ dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Bulga RFS	5/04/2018 21:00	1.5	F	37	Yes	32	Nil
Bulga Village	5/04/2018 22:56	2.4	D	38	Yes	NM	Nil
Gouldsville	5/04/2018 21:03	1.5	F	35	Yes	1A	Nil
Inlet Rd	5/04/2018 21:30	2.3	E	37	Yes	32	Nil
Inlet Rd West	5/04/2018 21:05	1.5	F	35	Yes	31	Nil
Long Point	5/04/2018 21:28	2.3	E	35	Yes	1A	Nil
South Bulga	5/04/2018 21:34	2.3	E	36	Yes	<30	Nil
Wambo Road	5/04/2018 23:22	2.5	D	38	Yes	26	Nil

**Notes:**

1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;

2. Estimated or measured  $L_{Aeq, 15 \text{ minute}}$  attributed to WML;

3. NA means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable;

4. Bolded results in red are possible exceedances of relevant criteria; and

5. Criterion may or may not apply due to rounding of meteorological data values.

**Table 4: L<sub>A1</sub>, 1 minute Warkworth - Impact Assessment Criteria – April 2018**

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	Stability Class	Criterion dB(A)	Criterion Applies? <sup>1,5</sup>	WML L <sub>A1</sub> , 1min dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Bulga RFS	5/04/2018 21:00	1.5	F	47	Yes	37	Nil
Bulga Village	5/04/2018 22:56	2.4	D	48	Yes	NM	Nil
Gouldsville	5/04/2018 21:03	1.5	F	48	Yes	IA	Nil
Inlet Rd	5/04/2018 21:30	2.3	E	47	Yes	NM	Nil
Inlet Rd West	5/04/2018 21:05	1.5	F	45	Yes	40	Nil
Long Point	5/04/2018 21:28	2.3	E	45	Yes	IA	Nil
South Bulga	5/04/2018 21:34	2.3	E	45	Yes	32	Nil
Wambo Road	5/04/2018 23:22	2.5	D	48	Yes	31	Nil

**Notes:**

- Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
- Estimated or measured L<sub>A1</sub>,1minute attributed to Warkworth mine (WML);
- NA in exceedance column means atmospheric conditions outside conditions specified in project approval and so criterion is not applicable. NA (not applicable) in criterion column means criterion not specified for this location;
- Bolded results in red are possible exceedances of relevant criteria; and
- Criterion may or may not apply due to rounding of meteorological data values.

### 5.1.3 MTO Noise Assessment

Compliance assessments undertaken against the MTO noise criteria are presented in **Table 5** and **6**.

**Table 5: L<sub>Aeq</sub>, 15minute Mount Thorley - Impact Assessment Criteria – April 2018**

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	Stability Class	Criterion dB	Criterion Applies? <sup>1,5</sup>	MTO L <sub>Aeq</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Bulga RFS	5/04/2018 21:00	1.5	F	37	Yes	<30	Nil
Bulga Village	5/04/2018 22:56	2.4	D	38	Yes	IA	Nil
Gouldsville	5/04/2018 21:03	1.5	F	35	Yes	IA	Nil
Inlet Rd	5/04/2018 21:30	2.3	E	37	Yes	IA	Nil
Inlet Rd West	5/04/2018 21:05	1.5	F	35	Yes	IA	Nil
Long Point	5/04/2018 21:28	2.3	E	35	Yes	IA	Nil
South Bulga	5/04/2018 21:34	2.3	E	36	Yes	<30	Nil
Wambo Road	5/04/2018 23:22	2.5	D	38	Yes	IA	Nil

**Notes:**

- Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
- Estimated or measured L<sub>Aeq</sub>,15minute attributed to MTO;
- NA means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable;
- Bolded results in red are possible exceedances of relevant criteria; and
- Criterion may or may not apply due to rounding of meteorological data values.



**Table 6: L<sub>A1, 1Minute</sub> Mount Thorley - Impact Assessment Criteria – April 2018**

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	Stability Class	Criterion dB	Criterion Applies? <sup>1,5</sup>	MTO L <sub>A1, 1min</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Bulga RFS	5/04/2018 21:00	1.5	F	47	Yes	32	Nil
Bulga Village	5/04/2018 22:56	2.4	D	48	Yes	IA	Nil
Gouldsville	5/04/2018 21:03	1.5	F	45	Yes	IA	Nil
Inlet Rd	5/04/2018 21:30	2.3	E	47	Yes	IA	Nil
Inlet Rd West	5/04/2018 21:05	1.5	F	45	Yes	IA	Nil
Long Point	5/04/2018 21:28	2.3	E	45	Yes	IA	Nil
South Bulga	5/04/2018 21:34	2.3	E	46	Yes	<30	Nil
Wambo Road	5/04/2018 23:22	2.5	D	48	Yes	IA	Nil

**Notes**

1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured L<sub>A1, 1minute</sub> attributed to Mt Thorley Operations (MTO);
3. NA in exceedance column means atmospheric conditions outside conditions specified in project approval and so criterion is not applicable. NA (not applicable) in criterion column means criterion not specified for this location;
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.

## 5.1.4 NPfI Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfI), the applicability of the low frequency modification penalty has been assessed. During April 2018 no measurements required the penalty to be applied. The assessment for low frequency noise is shown in **Table 7**.

**Table 7: Low Frequency Noise Modifying Factor Assessment – April 2018**

Location	Date and Time	Measured Site Only LAeq dB (WML/MTO)	Site Only LCeq dB <sup>4</sup> (WML/MTO)	Site Only LCeq – LAeq dB <sup>1,4</sup> (WML/MTO)	Result Max exceedance of ref spectrum dB (WML/MTO) <sup>2,3,4</sup>	Penalty dB(A)	Exceedance
Bulga RFS	5/04/2018 21:00	32/<30	NA/NA	NA/NA	NA/NA	NA/NA	NA
Bulga Village	5/04/2018 22:56	NM/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA
Gouldsville	5/04/2018 21:03	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA
Inlet Rd	5/04/2018 21:30	32/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA
Inlet Rd West	5/04/2018 21:05	31/IA	51/NA	20/NA	0/NA	Nil/NA	NA
Long Point	5/04/2018 21:28	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA
South Bulga	5/04/2018 21:34	<30/<30	NA/NA	NA/NA	NA/NA	NA/NA	NA
Wambo Road	5/04/2018 23:22	26/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA

**Notes:**

1. As per NPfI, if LCeq – LAeq >= 15 dB further assessment of low frequency noise required.
2. As per NPfI, compare measured spectrum against reference spectrum to determine if the low frequency modifying factor is triggered and application of penalty is required;
3. Bold results and penalties in red are where the relevant modifying factor trigger was exceeded; and
4. Where it is not possible to determine the site only result due to the presence of other low frequency noise sources occurring during the measurement, or where criteria were not applicable due to meteorological conditions, this is noted as NA (not available) and no further assessment has been undertaken.



Figure 16: Noise Monitoring Location Plan

## 5.2 Noise Management Measures

A program of targeted supplementary attended noise monitoring is in place at MTW, supported by the real-time directional monitoring network and ensuring the highest level of noise management is maintained. The supplementary program is undertaken by MTW personnel and involves:

- Routine inspections from both inside and outside the mine boundary;
- Routine and as-required handheld noise assessments (undertaken in response to noise alarm and/or community complaint), comparing measured levels against consent noise limits; and
- Validation monitoring following operational modifications to assess the adequacy of the modifications.

Where a noise assessment identifies noise emissions which are exceeding the relevant noise limit(s) for any particular residence, modifications will be made so as to ensure that the noise event is resolved within 75 minutes of identification. The actions taken are commensurate with the nature and severity of the noise event, but can include:

- Changing the haul route to a less noise sensitive haul;
- Changing dump locations (in-pit or less exposed dump option);
- Reducing equipment numbers;
- Shut down of task; or
- Site shut down.
- A summary of these assessments undertaken during April are provided in **Table 8**.

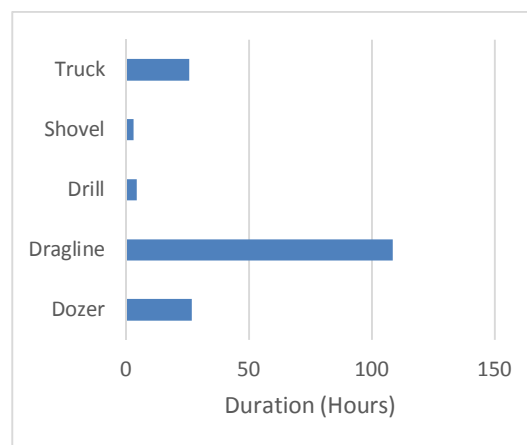
**Table 8: Supplementary Attended Noise Monitoring Data – April 2018**

No. of assessments	No. of assessments > trigger	No. of nights where assessments > trigger	% greater than trigger
498	1	1	0.2

Note: Measurements are taken under all meteorological conditions, including conditions under which the consent noise criteria do not apply.

## 6.0 OPERATIONAL DOWNTIME

During April, a total of 168 hours of equipment downtime was logged in response to environmental events such as dust, noise and adverse meteorological conditions. Operational downtime by equipment type is shown in **Figure 17**.



**Figure 17: Operational Downtime by Equipment Type – April 2018**



## 7.0 REHABILITATION

During April 2018, 8.1 Ha of land was released, 0.9 Ha of land was bulk shaped, 6.2 Ha of land was topsoiled, 4.6 Ha of land was composted and 7.0 Ha of land was rehabilitated.

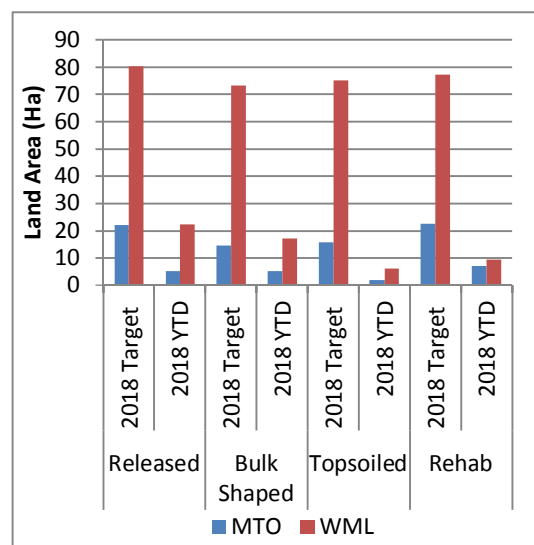


Figure 18: Rehabilitation YTD – April 2018

## 8.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were no reportable environmental incidents.

## 9.0 COMPLAINTS

During the reporting period 27 complaints were received. Details of these complaints are shown in **Table 9** below.

Table 9: Complaints Summary YTD

	Noise	Dust	Blast	Lighting	Other	Total
January	9	6	14	0	1	30
February	8	5	1	3	1	18
March	22	0	0	2	0	24
April	8	4	9	6	0	27
May	-	-	-	-	-	-
June	-	-	-	-	-	-
July	-	-	-	-	-	-
August	-	-	-	-	-	-
September	-	-	-	-	-	-
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	-	-	-	-	-	-
Total	47	15	24	11	2	99

## **Appendix A: Meteorological Data**



**Table 10: Meteorological Data – Charlton Ridge Meteorological Station – April 2018**

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)
1/04/2018	32	17	96	29	843	169	1.7	0.0
2/04/2018	33	16	87	28	1201	230	2.4	13.2
3/04/2018	26	18	87	52	1102	145	2.8	0.0
4/04/2018	27	17	84	46	1165	151	2.9	0.0
5/04/2018	28	16	92	38	998	147	1.9	0.0
6/04/2018	30	14	92	35	838	165	1.8	0.0
7/04/2018	29	17	88	35	817	159	2.0	0.0
8/04/2018	32	14	87	21	809	166	1.5	0.0
9/04/2018	34	14	79	14	836	202	3.0	0.0
10/04/2018	27	16	79	41	1005	137	2.6	0.0
11/04/2018	30	14	90	33	798	155	1.9	0.0
12/04/2018	31	15	86	27	823	290	3.7	0.0
13/04/2018	31	19	43	26	815	299	5.1	0.0
14/04/2018	30	17	82	35	991	300	5.3	2.6
15/04/2018	24	15	54	32	883	310	5.7	0.0
16/04/2018	29	18	53	30	680	290	4.1	0.0
17/04/2018	24	14	77	39	1005	153	2.7	0.0
18/04/2018	23	14	73	41	1132	141	2.5	0.0
19/04/2018	28	11	92	37	783	188	2.3	9.0
20/04/2018	26	12	96	43	775	162	1.7	0.0
21/04/2018	24	15	91	53	968	141	2.4	0.6
22/04/2018	24	12	94	47	1085	154	2.0	0.0
23/04/2018	25	12	95	41	823	165	1.7	0.0
24/04/2018	25	12	94	31	771	161	2.0	0.0
25/04/2018	21	12	94	64	912	186	2.3	1.4
26/04/2018	27	13	98	29	727	214	2.5	0.2
27/04/2018	21	14	83	48	1016	168	3.6	0.0
28/04/2018	21	12	82	47	855	166	4.0	0.0
29/04/2018	20	11	84	49	1086	153	2.5	0.0
30/04/2018	21	9	86	47	1000	166	2.8	0.0

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

# **Appendix B: May Monthly Environmental Monitoring Report**



# Monthly Environmental Monitoring Report

Yancoal Mount Thorley Warkworth

May 2018

## CONTENTS

1.0	INTRODUCTION .....	4
2.0	AIR QUALITY .....	4
2.1	Meteorological Monitoring .....	4
2.1.1	Rainfall .....	4
2.1.2	Wind Speed and Direction .....	4
2.2	Depositional Dust .....	6
2.3	Suspended Particulates .....	6
2.3.1	HVAS PM <sub>10</sub> Results.....	6
2.3.2	TSP Results .....	7
2.3.3	Real Time PM <sub>10</sub> Results.....	7
2.3.4	Real Time Alarms for Air Quality .....	7
3.0	WATER QUALITY .....	8
3.1	Surface Water.....	8
3.2	Groundwater Monitoring.....	8
3.3	HRSTS Discharge.....	8
4.0	BLAST MONITORING.....	9
4.1	Blast Monitoring Results .....	9
5.0	NOISE .....	12
5.1	Attended Noise Monitoring Results .....	12
5.1.1	WML Noise Assessment.....	12
5.1.3	MTO Noise Assessment .....	13
5.1.4	NPfl Low Frequency Assessment .....	14
5.2	Noise Management Measures .....	16
6.0	OPERATIONAL DOWNTIME.....	16
7.0	REHABILITATION .....	17
8.0	ENVIRONMENTAL INCIDENTS .....	17
9.0	COMPLAINTS .....	17
	Appendix A: Meteorological Data .....	18



## Figures

<b>Figure 1: Rainfall Trend YTD</b>	<b>4</b>
<b>Figure 2: Charlton Ridge Wind Rose – May 2018</b>	<b>4</b>
<b>Figure 3: Air Quality Monitoring Locations</b>	<b>5</b>
<b>Figure 4: Depositional Dust – May 2018</b>	<b>6</b>
<b>Figure 5: Individual PM10 Results – May 2018</b>	<b>6</b>
<b>Figure 6: Annual Average PM10 – May 2018</b>	<b>7</b>
<b>Figure 7: Annual Average Total Suspended Particulates – May 2018</b>	<b>7</b>
<b>Figure 8: Real Time PM10 daily 24hr average (line graphs) and YTD annual average (column graphs) – May 2018</b>	<b>8</b>
<b>Figure 9: Abbey Green Blast Monitoring Results – May 2018</b>	<b>9</b>
<b>Figure 10: Bulga Village Blast Monitoring Results – May 2018</b>	<b>9</b>
<b>Figure 11: MTIE Blast Monitoring Results – May 2018</b>	<b>10</b>
<b>Figure 12: Wollemi Peak Road Blast Monitoring Results – May 2018</b>	<b>10</b>
<b>Figure 13: Wambo Road Blast Monitoring Results – May 2018</b>	<b>10</b>
<b>Figure 14: Warkworth Blast Monitoring Results – May 2018</b>	<b>10</b>
<b>Figure 15: MTW Blast Monitoring Location Plan</b>	<b>11</b>
<b>Figure 16: Noise Monitoring Location Plan</b>	<b>15</b>
<b>Figure 17: Operational Downtime by Equipment Type – May 2018</b>	<b>16</b>
<b>Figure 18: Rehabilitation YTD – May 2018</b>	<b>17</b>

## Tables

<b>Table 1: Monthly Rainfall MTW</b>	<b>4</b>
<b>Table 2: Blasting Limits</b>	<b>9</b>
<b>Table 3: LAeq, 15 minute Warkworth Impact Assessment Criteria – May 2018</b>	<b>12</b>
<b>Table 4: LA1, 1 minute Warkworth - Impact Assessment Criteria – May 2018</b>	<b>13</b>
<b>Table 5: LAeq, 15minute Mount Thorley - Impact Assessment Criteria – May 2018</b>	<b>13</b>
<b>Table 6: LA1, 1Minute Mount Thorley - Impact Assessment Criteria – May 2018</b>	<b>14</b>
<b>Table 7: Low Frequency Noise Modifying Factor Assessment – May 2018</b>	<b>14</b>
<b>Table 8: Supplementary Attended Noise Monitoring Data – May 2018</b>	<b>16</b>
<b>Table 9: Complaints Summary YTD</b>	<b>17</b>
<b>Table 10: Meteorological Data – Charlton Ridge Meteorological Station – May 2018</b>	<b>19</b>

## Revision History

Version No.	Person Responsible	Document Status	Date
1.0	Environmental Advisor	Draft	28/06/2018
1.1	Environmental Specialist	Final	29/06/2018

# 1.0 INTRODUCTION

This report has been compiled to provide a monthly summary of environmental monitoring results for Mount Thorley Warkworth (MTW). This report includes all monitoring data collected for the period 1<sup>st</sup> May to 31<sup>st</sup> May 2018.

# 2.0 AIR QUALITY

## 2.1 Meteorological Monitoring

Meteorological data is collected at MTW’s ‘Charlton Ridge’ meteorological station (refer to **Figure 3: Air Quality Monitoring Locations**).

### 2.1.1 Rainfall

Rainfall for the period is summarised in **Table 1**, the year-to-date trend and historical trend are shown in **Figure 1**.

Table 1: Monthly Rainfall MTW

2018	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
May	9	125

## 2.1.2 Wind Speed and Direction

Winds from the south and northwest were dominant throughout the reporting period as shown in **Figure 2**.

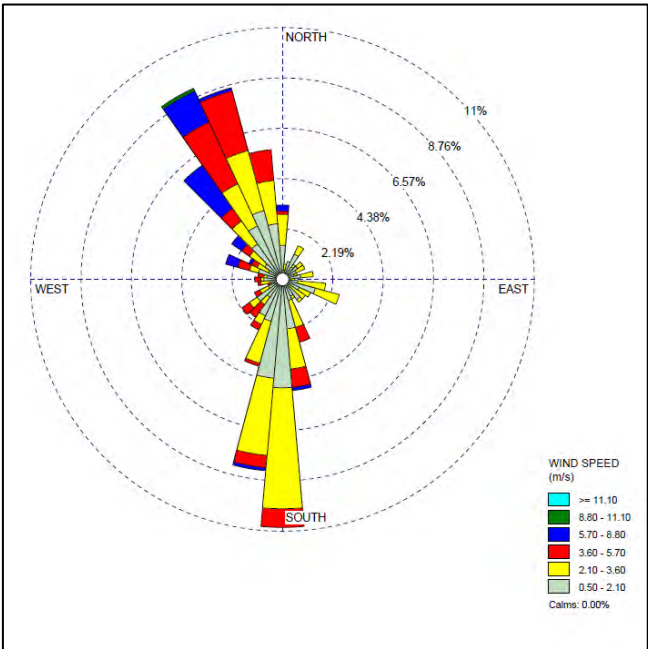


Figure 2: Charlton Ridge Wind Rose – May 2018

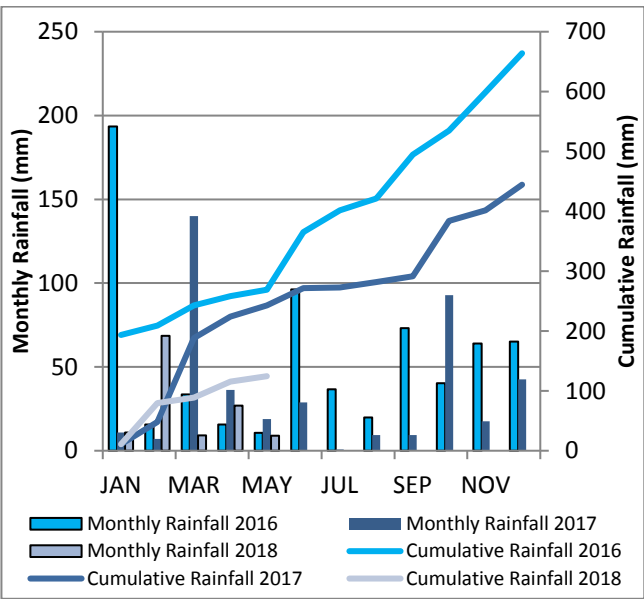


Figure 1: Rainfall Trend YTD



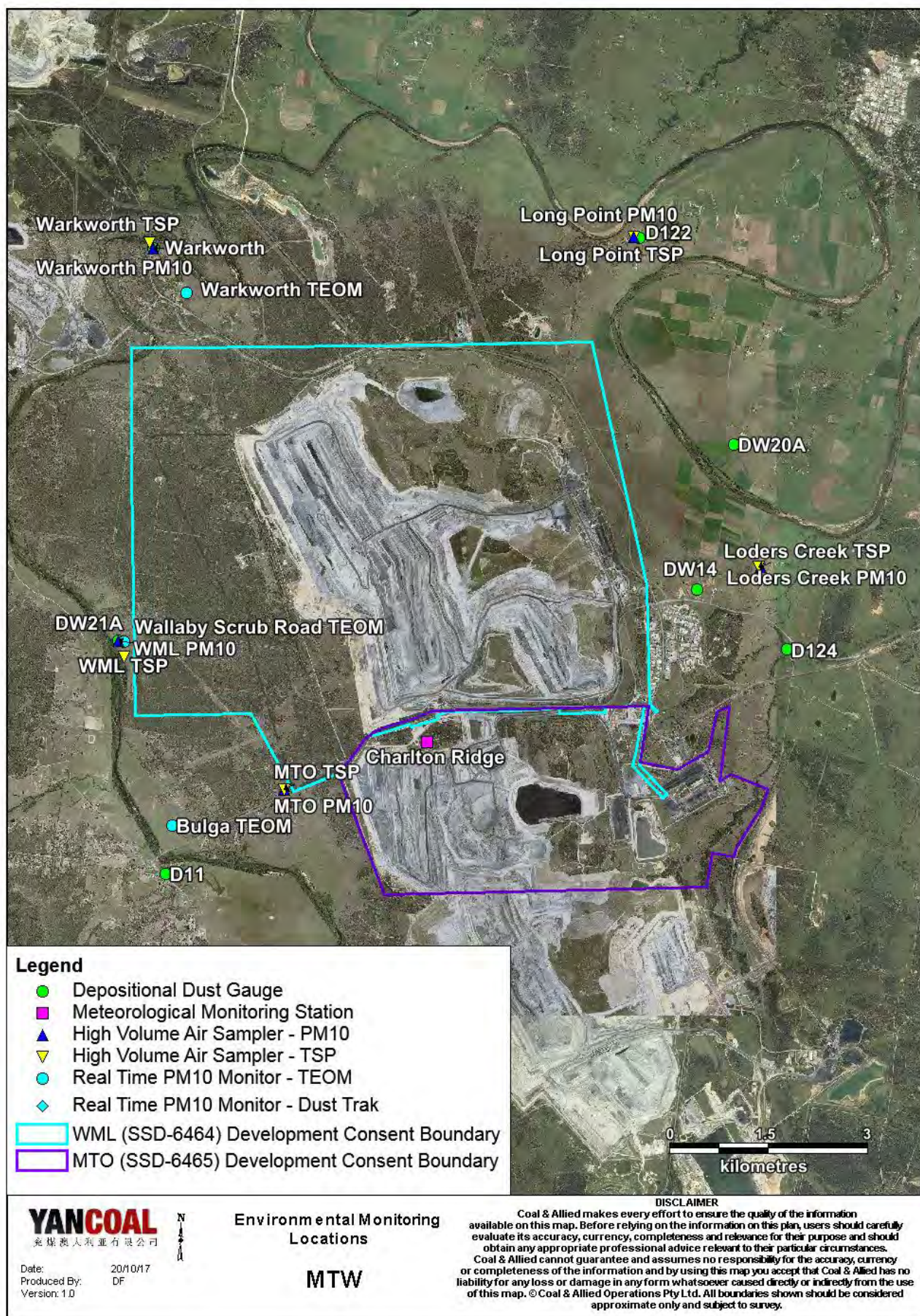


Figure 3: Air Quality Monitoring Locations

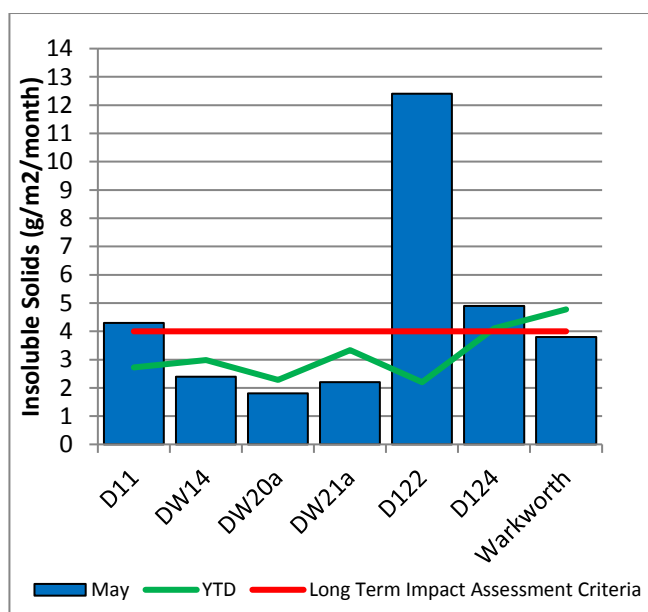


## 2.2 Depositional Dust

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

**Figure 4** 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 D11, D122 and D124 monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m<sup>2</sup> per month. Field notes associated with D122 and D124 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 D11 result is contaminated. Accordingly, the result will be included in the annual average calculation.



**Figure 4: Depositional Dust – May 2018**

## 2.3 Suspended Particulates

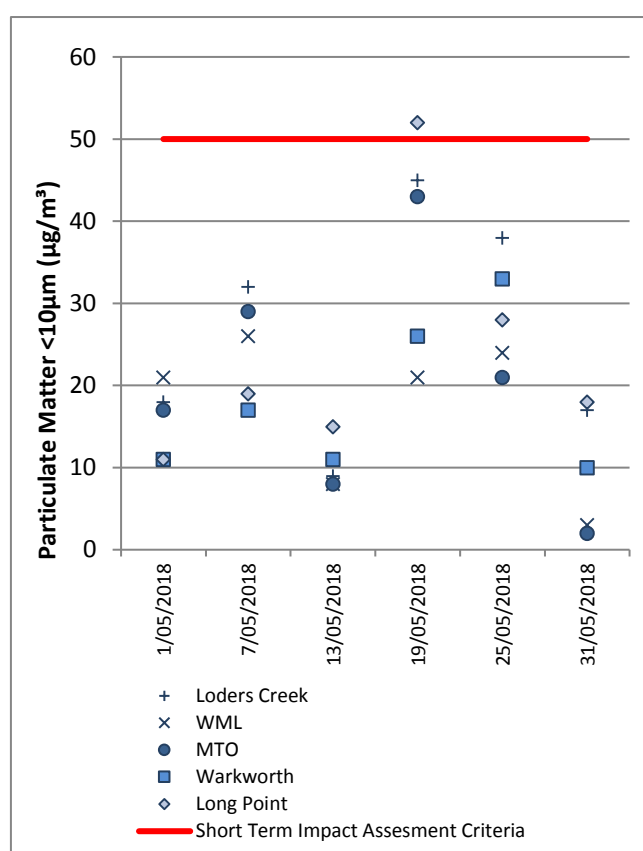
Suspended particulates are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM<sub>10</sub>). The location of these monitors can be found in Figure 3. Each HVAS was run for 24 hours on a six-day cycle in accordance with EPA requirements.

### 2.3.1 HVAS PM<sub>10</sub> Results

**Figure 5** shows the individual PM<sub>10</sub> results at each monitoring station against the short term impact assessment criteria of 50µg/m<sup>3</sup>.

On 19<sup>th</sup> May 2018 the Long Point HVAS PM<sub>10</sub> unit recorded a result of 52 µg/m<sup>3</sup>, which is greater than the short term (24hr) PM<sub>10</sub> impact assessment criteria.

Investigation indicates that the likely MTW contribution to the results at Long Point on the 19<sup>th</sup> May is less than 40%. Accordingly, no further action is required (as per approved Air Quality Monitoring Programme).



**Figure 5: Individual PM<sub>10</sub> Results – May 2018**

**Figure 6** shows the annual average PM<sub>10</sub> results against the long term impact assessment criteria.

An assessment of MTW's contribution to the long term assessment criteria will be reported in the 2018 Annual Review Report.



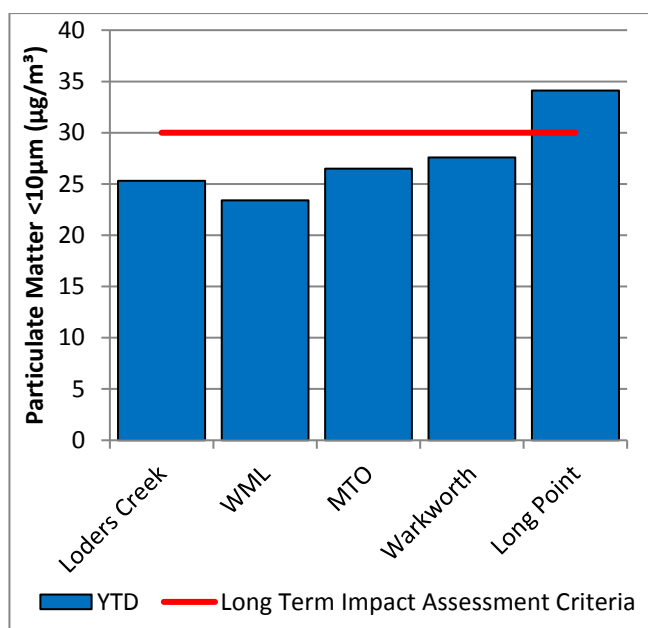


Figure 6: Annual Average PM<sub>10</sub> – May 2018

### 2.3.2 TSP Results

Figure 7 shows the annual average TSP results compared against the long-term impact assessment criteria of 90µg/m³.

An assessment of MTW's contribution to the long-term assessment criteria will be reported in the 2018 Annual Review Report.

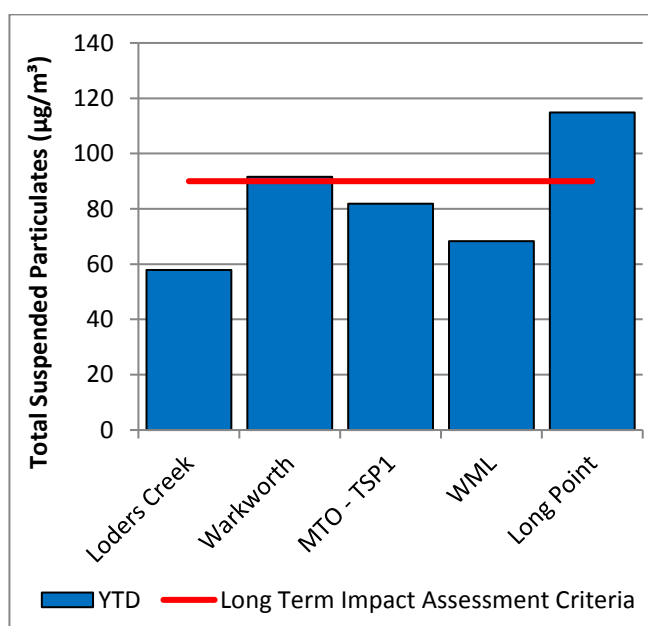


Figure 7: Annual Average Total Suspended Particulates – May 2018

### 2.3.3 Real Time PM<sub>10</sub> Results

MTW maintains a network of real time PM<sub>10</sub> 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 for real time dust sampling are shown in Figure 8, including the daily 24-hour average PM<sub>10</sub> result and the annual PM<sub>10</sub> average.

Data was not available on 7<sup>th</sup> to 9<sup>th</sup> May 2018 from the Wallaby Scrub Road monitor due to a communications issue. Data was also not available on 31<sup>st</sup> May 2018 from the Warkworth monitor due to equipment issues.

### 2.3.4 Real Time Alarms for Air Quality

During May, the real time monitoring system generated 74 automated air quality related alerts, including 11 alerts for adverse meteorological conditions and 63 alerts for elevated PM<sub>10</sub> levels.

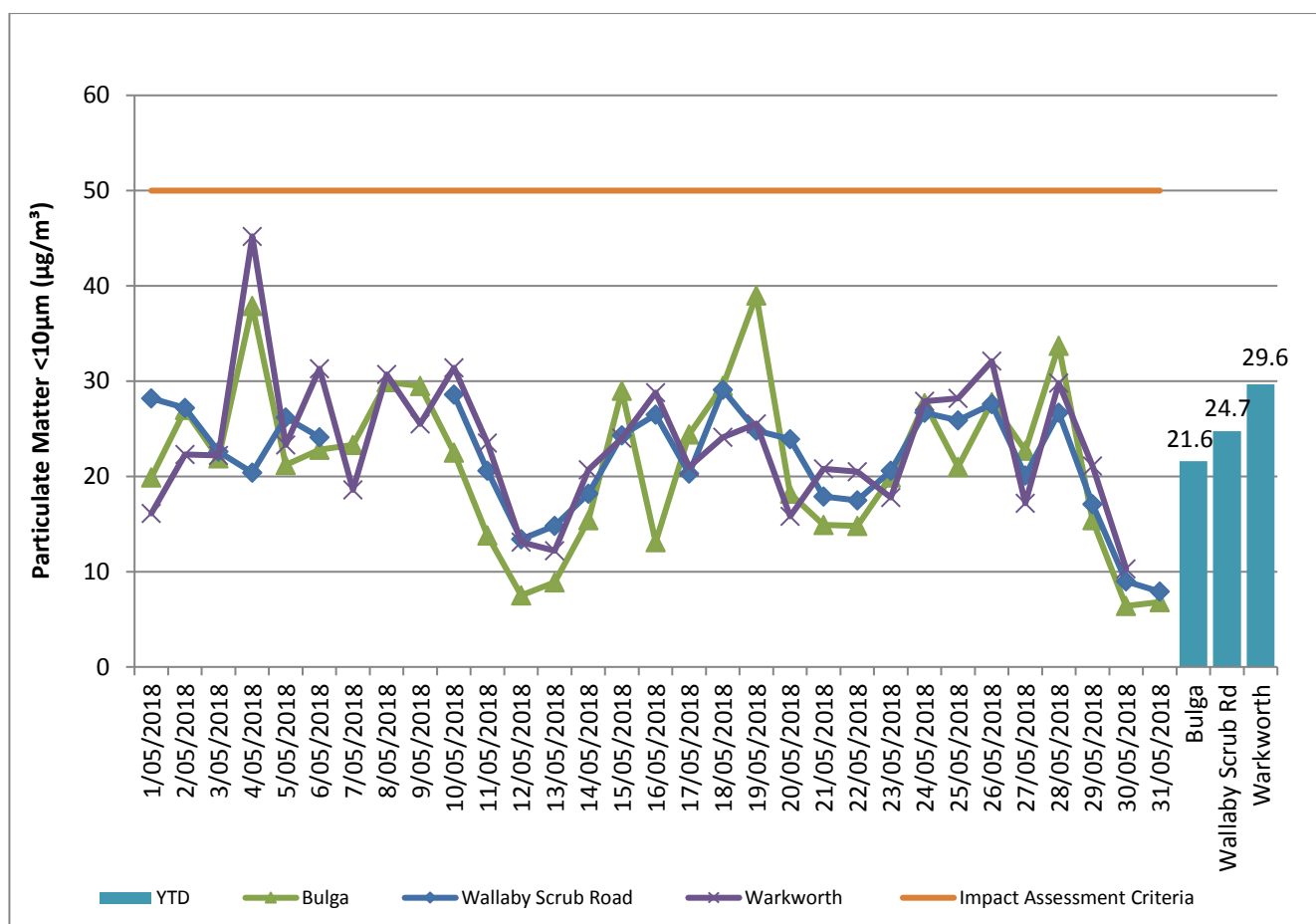


Figure 8: Real Time PM<sub>10</sub> daily 24hr average (line graphs) and YTD annual average (column graphs) – May 2018

### 3.0 WATER QUALITY

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

#### 3.1 Surface Water

Monitoring is conducted at mine site dams and surrounding natural watercourses.

Surface water courses are sampled on a monthly or quarterly sampling regime. Water quality is evaluated through the parameters of pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS). The Hunter River and the Wollombi Brook are sampled both upstream and downstream of mining operations, to monitor the potential impact of mining on the river. Other Hunter River tributaries are also monitored.

Results of monitoring are reported quarterly, next available in the June 2018 report.

#### 3.2 Groundwater Monitoring

Groundwater monitoring is undertaken on a quarterly basis in accordance with the MTW Groundwater Monitoring Programme.

Groundwater results are reported quarterly, next available in the June 2018 report.

#### 3.3 HRSTS Discharge

MTW participates in the Hunter River Salinity Trading Scheme (HRSTS), allowing discharge from licensed discharge points located at Dam 1N and Dam 9S. Discharges can only take place subject to HRSTS regulations.

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

## 4.0 BLAST MONITORING

MTW have a network of six 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**.

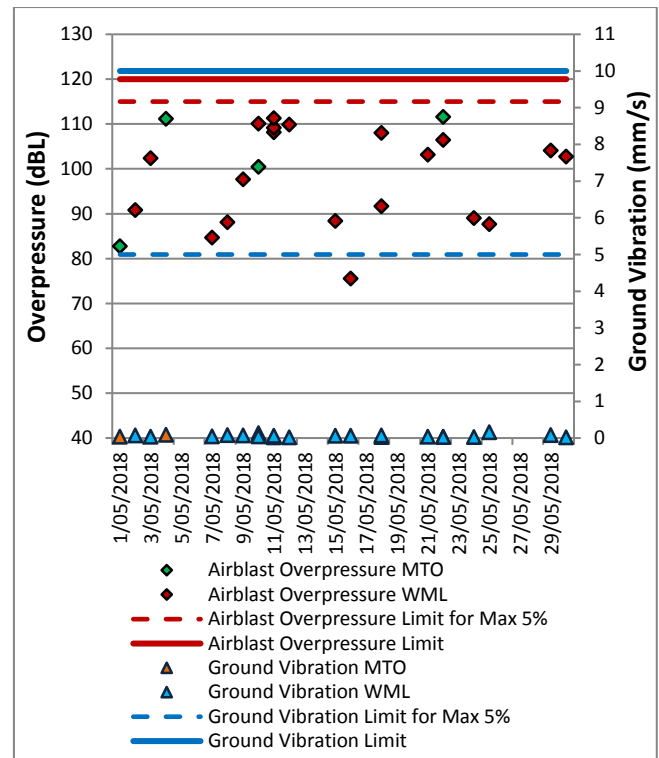
### 4.1 Blast Monitoring Results

During May 2018, 24 blasts were initiated at MTW. **Figure 9** to **Figure 14** show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in **Table 2**.

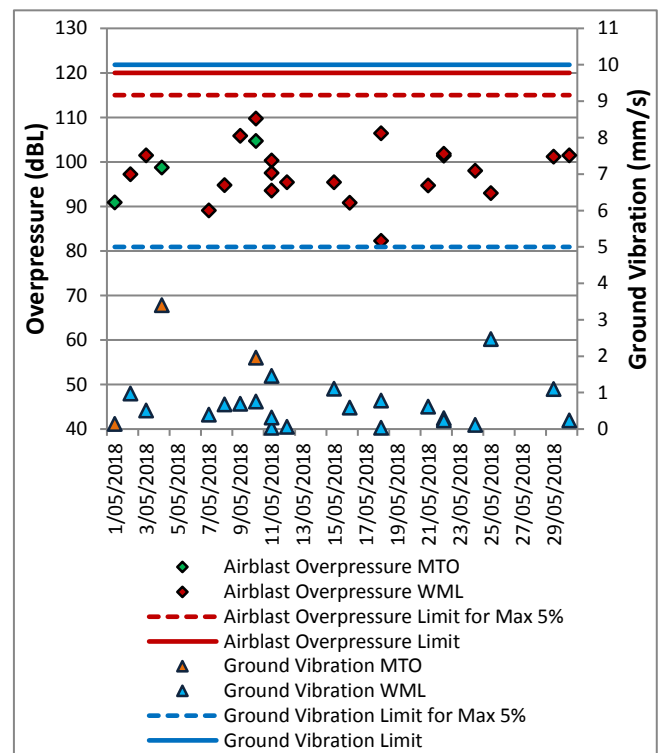
**Table 2: Blasting Limits**

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 at the Putty Road MTIE blast monitor on 22 May 2018 at 13:30. No blast exceeded the 5mm/s criteria for ground vibration.



**Figure 9: Abbey Green Blast Monitoring Results – May 2018**



**Figure 10: Bulga Village Blast Monitoring Results – May 2018**

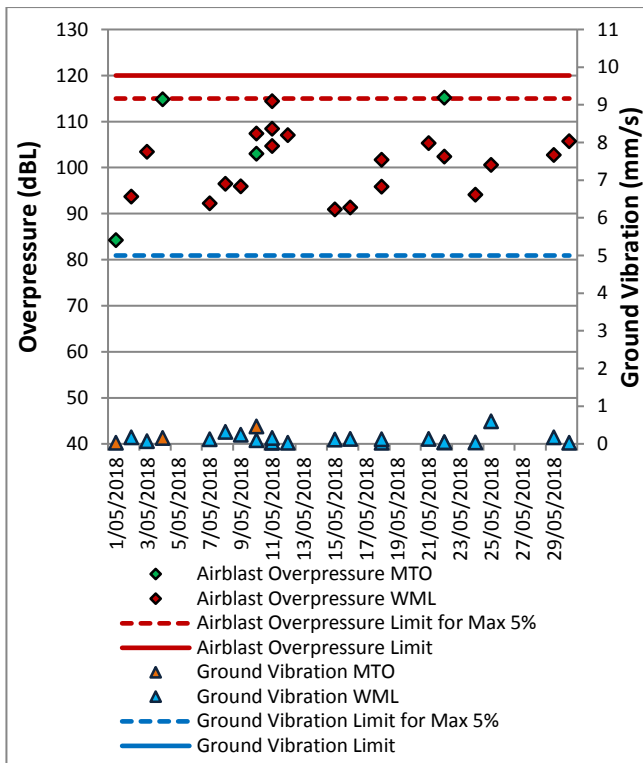


Figure 11: MTIE Blast Monitoring Results – May 2018

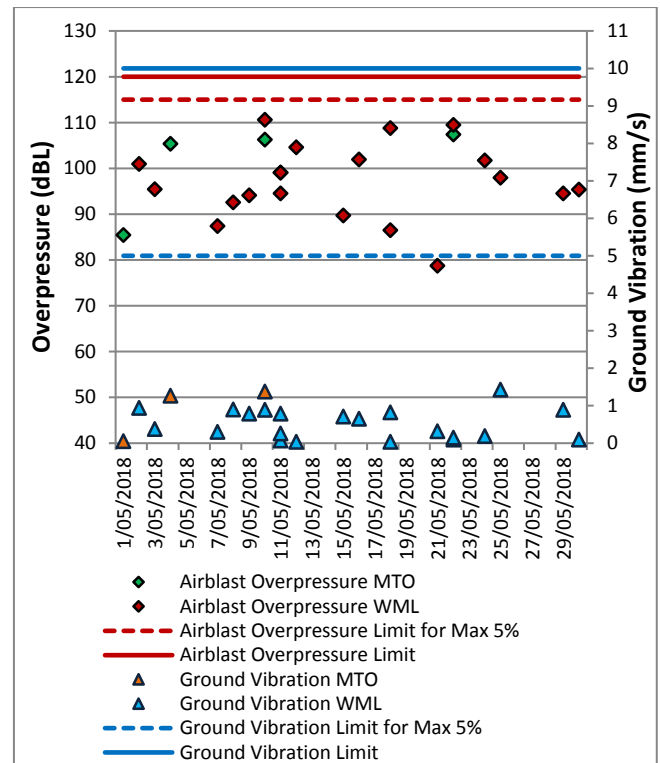


Figure 13: Wambo Road Blast Monitoring Results – May 2018

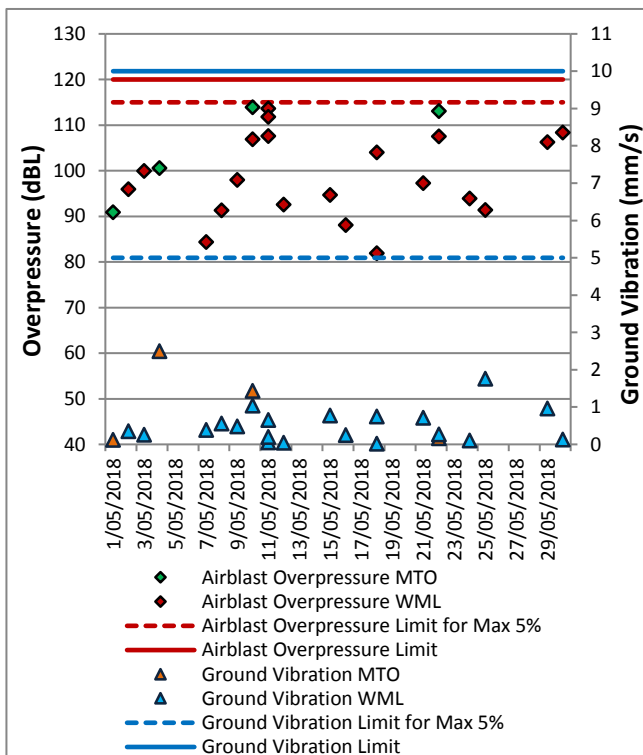


Figure 12: Wollemi Peak Road Blast Monitoring Results – May 2018

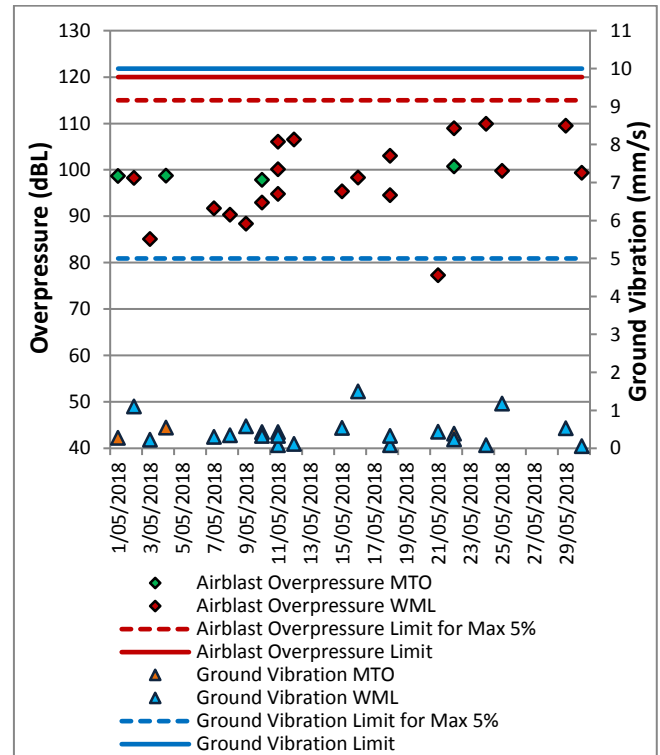


Figure 14: Warkworth Blast Monitoring Results – May 2018



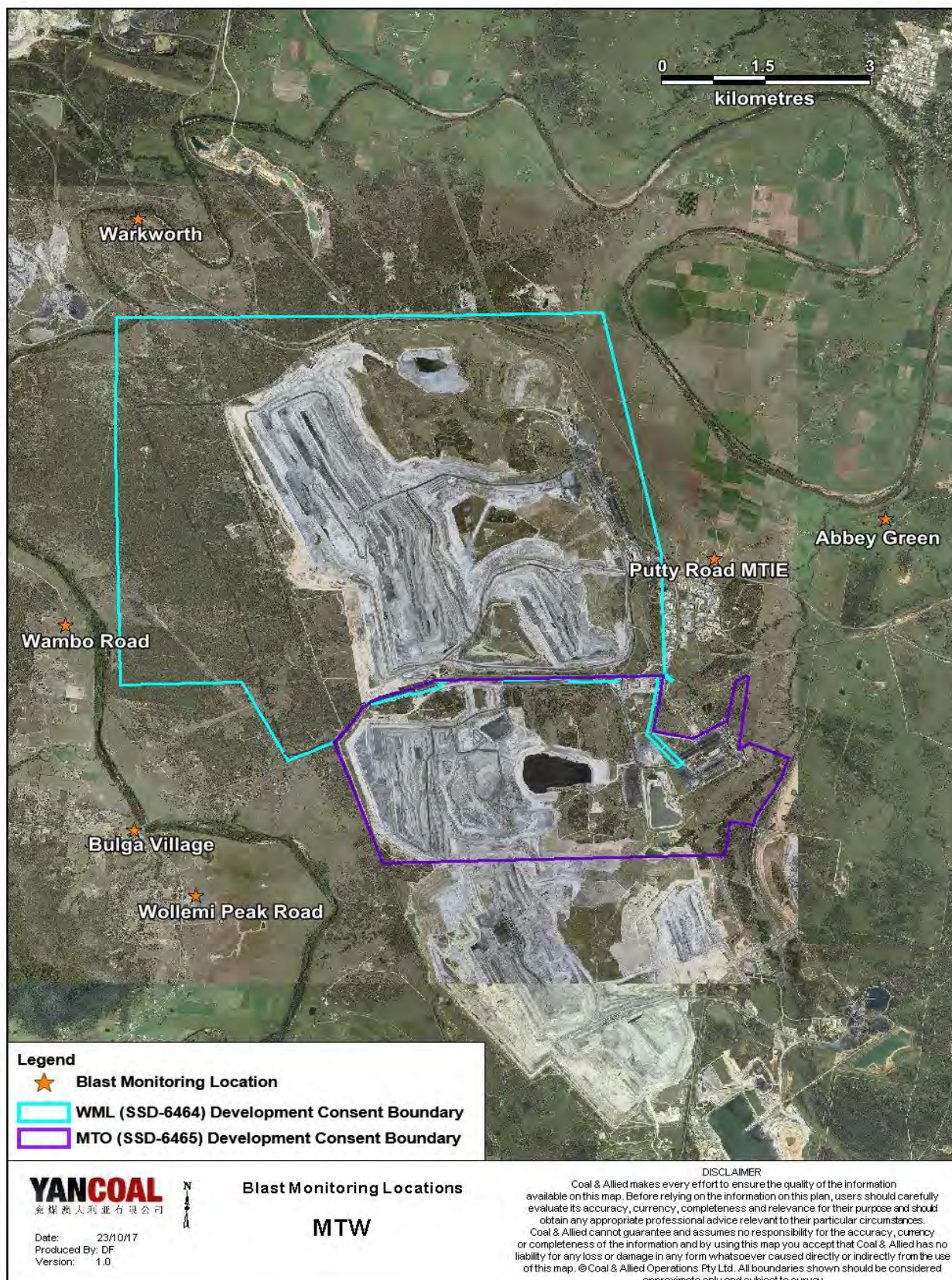


Figure 15: MTW Blast Monitoring Location Plan

## 5.0 NOISE

Routine attended noise monitoring is carried out in accordance with the MTW Noise Management Plan. A review against EIS predictions will be reported in the Annual Review Report. The purpose of the noise surveys is to quantify and describe the acoustic environment around the site and compare results with specified limits. Real time noise monitoring also occurs at five sites surrounding MTW. Noise monitoring locations are displayed in **Figure 16**.

### 5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding MTW on the night of 17 May 2018. All measurements complied with the relevant criteria. Results are detailed in **Table 3 to Table 6**.

#### 5.1.1 WML Noise Assessment

Compliance assessments undertaken against the WML noise criteria are presented in **Tables 3 and 4**.

**Table 3: L<sub>Aeq</sub>, 15 minute Warkworth Impact Assessment Criteria – May 2018**

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	Stability Class	Criterion dB(A)	Criterion Applies <sup>2,5</sup>	WML L <sub>Aeq</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Bulga RFS	17/05/2018 21:00	1.5	E	37	Yes	IA	Nil
Bulga Village	17/05/2018 23:23	2.2	E	38	Yes	<30	Nil
Gouldsville	18/05/2018 0:47	1.5	F	38	Yes	29	Nil
Inlet Rd	17/05/2018 21:23	1.6	F	37	Yes	32	Nil
Inlet Rd West	17/05/2018 21:00	1.5	E	35	Yes	28	Nil
Long Point	18/05/2018 0:20	1.6	F	35	Yes	<25	Nil
South Bulga	17/05/2018 21:24	1.9	E	35	Yes	IA	Nil
Wambo Road	17/05/2018 23:02	2.2	E	38	Yes	<30	Nil

**Notes:**

1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;

2. Estimated or measured L<sub>Aeq</sub>,15minute attributed to WML;

3. NA means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable;

4. Bolded results in red are possible exceedances of relevant criteria; and

5. Criterion may or may not apply due to rounding of meteorological data values.

**Table 4: L<sub>A1, 1 minute</sub> Warkworth - Impact Assessment Criteria – May 2018**

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	Stability Class	Criterion dB(A)	Criterion Applies? <sup>1,5</sup>	WML L <sub>A1, 1min</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Bulga RFS	17/05/2018 21:00	1.5	E	47	Yes	IA	Nil
Bulga Village	17/05/2018 23:23	2.2	E	48	Yes	32	Nil
Gouldsville	18/05/2018 0:47	1.5	F	48	Yes	33	Nil
Inlet Rd	17/05/2018 21:23	1.6	F	47	Yes	37	Nil
Inlet Rd West	17/05/2018 21:00	1.5	E	45	Yes	32	Nil
Long Point	18/05/2018 0:20	1.6	F	45	Yes	<25	Nil
South Bulga	17/05/2018 21:24	1.9	E	45	Yes	IA	Nil
Wambo Road	17/05/2018 23:02	2.2	E	48	Yes	32	Nil

**Notes**

1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured L<sub>A1,1minute</sub> attributed to Warkworth mine (WML);
3. NA in exceedance column means atmospheric conditions outside conditions specified in project approval and so criterion is not applicable. NA (not applicable) in criterion column means criterion not specified for this location;
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.

**5.1.3 MTO Noise Assessment**

Compliance assessments undertaken against the MTO noise criteria are presented in **Table 5** and **6**.

**Table 5: L<sub>Aeq, 15minute</sub> Mount Thorley - Impact Assessment Criteria – May 2018**

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	Stability Class	Criterion dB	Criterion Applies? <sup>1,5</sup>	MTO L <sub>Aeq</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Bulga RFS	17/05/2018 21:00	1.5	E	37	Yes	36	Nil
Bulga Village	17/05/2018 23:23	2.2	E	38	Yes	<30	Nil
Gouldsville	18/05/2018 0:47	1.5	F	35	Yes	IA	Nil
Inlet Rd	17/05/2018 21:23	1.6	F	37	Yes	<30	Nil
Inlet Rd West	17/05/2018 21:00	1.5	E	35	Yes	NM	Nil
Long Point	18/05/2018 0:20	1.6	F	35	Yes	IA	Nil
South Bulga	17/05/2018 21:24	1.9	E	36	Yes	33	Nil
Wambo Road	17/05/2018 23:02	2.2	E	38	Yes	<30	Nil

**Notes:**

1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured L<sub>Aeq,15minute</sub> attributed to MTO;
3. NA means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable;
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.



**Table 6: L<sub>A1, 1Minute</sub> Mount Thorley - Impact Assessment Criteria – May 2018**

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	Stability Class	Criterion dB	Criterion Applies? <sup>1,5</sup>	MTO L <sub>A1, 1min</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Bulga RFS	17/05/2018 21:00	1.5	E	47	Yes	42	Nil
Bulga Village	17/05/2018 23:23	2.2	E	48	Yes	34	Nil
Gouldsville	18/05/2018 0:47	1.5	F	45	Yes	IA	Nil
Inlet Rd	17/05/2018 21:23	1.6	F	47	Yes	32	Nil
Inlet Rd West	17/05/2018 21:00	1.5	E	45	Yes	NM	Nil
Long Point	18/05/2018 0:20	1.6	F	45	Yes	IA	Nil
South Bulga	17/05/2018 21:24	1.9	E	46	Yes	34	Nil
Wambo Road	17/05/2018 23:02	2.2	E	48	Yes	33	Nil

**Notes**

1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured L<sub>A1,1minute</sub> attributed to Mt Thorley Operations (MTO);
3. NA in exceedance column means atmospheric conditions outside conditions specified in project approval and so criterion is not applicable. NA (not applicable) in criterion column means criterion not specified for this location;
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.

## 5.1.4 NPfI Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfI), the applicability of the low frequency modification penalty has been assessed. There were no noise measurements taken during the reporting period which required the penalty to be applied. The assessment for low frequency noise is shown in **Table 7**.

**Table 7: Low Frequency Noise Modifying Factor Assessment – May 2018**

Location	Date and Time	Measured Site Only LA <sub>eq</sub> dB (WML/MTO)	Site Only L <sub>Ceq</sub> dB <sup>4</sup> (WML/MTO)	Site Only L <sub>Ceq</sub> – LA <sub>eq</sub> dB <sup>1,4</sup> (WML/MTO)	Result Max exceedance of ref spectrum dB (WML/MTO) <sup>2,3,4</sup>	Penalty dB(A)	Exceedance
Bulga RFS	17/05/2018 21:00	IA/36	NA/52	NA/16	NA/0	NA/Nil	NA
Bulga Village	17/05/2018 23:23	<30/<30	NA/NA	NA/NA	NA/NA	NA/NA	NA
Gouldsville	18/05/2018 0:47	29/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA
Inlet Rd	17/05/2018 21:23	32/<30	NA/NA	NA/NA	NA/NA	NA/NA	NA
Inlet Rd West	17/05/2018 21:00	28/NM	NA/NA	NA/NA	NA/NA	NA/NA	NA
Long Point	18/05/2018 0:20	<25/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA
South Bulga	17/05/2018 21:24	IA/33	NA/49	NA/16	NA/0	NA/Nil	NA
Wambo Road	17/05/2018 23:02	<30/<30	NA/NA	NA/NA	NA/NA	NA/NA	NA

**Notes:**

1. As per NPfI, if L<sub>Ceq</sub> – LA<sub>eq</sub> >= 15 dB further assessment of low frequency noise required.
2. As per NPfI, compare measured spectrum against reference spectrum to determine if the low frequency modifying factor is triggered and application of penalty is required;
3. Bold results and penalties in red are where the relevant modifying factor trigger was exceeded; and
4. Where it is not possible to determine the site only result due to the presence of other low frequency noise sources occurring during the measurement, or where criteria were not applicable due to meteorological conditions, this is noted as NA (not available) and no further assessment has been undertaken.





Figure 16: Noise Monitoring Location Plan

## 5.2 Noise Management Measures

A program of targeted supplementary attended noise monitoring is in place at MTW, supported by the real-time directional monitoring network and ensuring the highest level of noise management is maintained. The supplementary program is undertaken by MTW personnel and involves:

- Routine inspections from both inside and outside the mine boundary;
- Routine and as-required handheld noise assessments (undertaken in response to noise alarm and/or community complaint), comparing measured levels against consent noise limits; and
- Validation monitoring following operational modifications to assess the adequacy of the modifications.

Where a noise assessment identifies noise emissions which are exceeding the relevant noise limit(s) for any particular residence, modifications will be made so as to ensure that the noise event is resolved within 75 minutes of identification. The actions taken are commensurate with the nature and severity of the noise event, but can include:

- Changing the haul route to a less noise sensitive haul;
- Changing dump locations (in-pit or less exposed dump option);
- Reducing equipment numbers;
- Shut down of task; or
- Site shut down.
- A summary of these assessments undertaken during May are provided in **Table 8**.

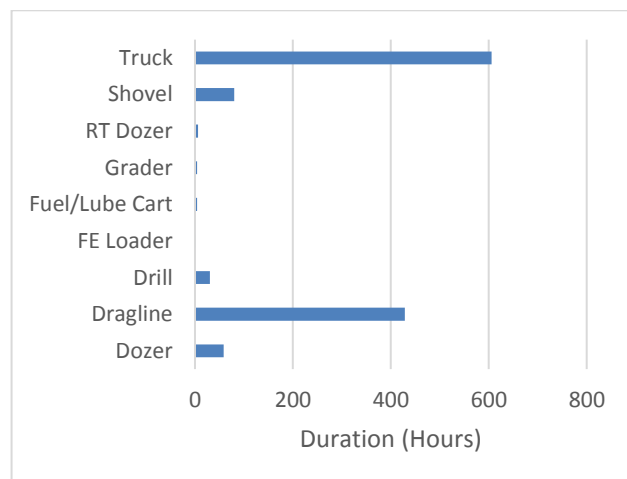
**Table 8: Supplementary Attended Noise Monitoring Data – May 2018**

No. of assessments	No. of assessments > trigger	No. of nights where assessments > trigger	% greater than trigger
483	3	2	0.6

Note: Measurements are taken under all meteorological conditions, including conditions under which the consent noise criteria do not apply.

## 6.0 OPERATIONAL DOWNTIME

During May, a total of 1220 hours of equipment downtime was logged in response to environmental events such as dust, noise and adverse meteorological conditions. Operational downtime by equipment type is shown in **Figure 17**.



**Figure 17: Operational Downtime by Equipment Type – May 2018**



## 7.0 REHABILITATION

During May 2018, 20.4 Ha of land was released for rehabilitation, 9.6 Ha of land was bulk shaped, 2.2 Ha of land was topsoiled, 10.0 Ha of land was composted and 6.2 Ha of land was rehabilitated.

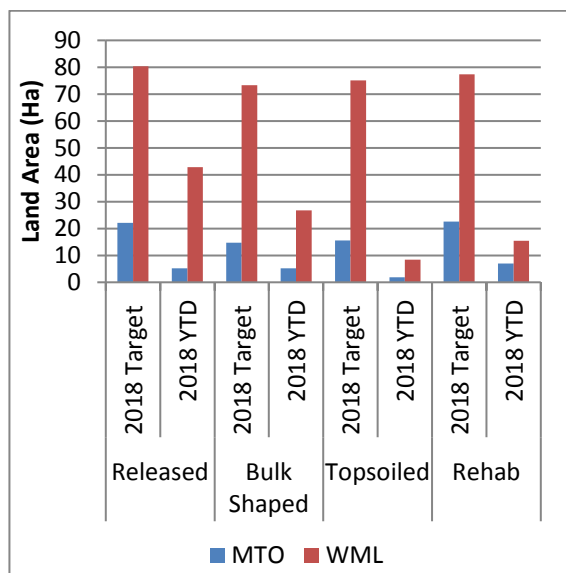


Figure 18: Rehabilitation YTD – May 2018

## 8.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were no reportable environmental incidents.

## 9.0 COMPLAINTS

During the reporting period 25 complaints were received. Details of these complaints are shown in Table 9 below.

Table 9: Complaints Summary YTD

	Noise	Dust	Blast	Lighting	Other	Total
January	9	6	14	0	1	30
February	8	5	2	3	1	19
March	21	0	0	2	0	23
April	8	3	9	3	2	25
May	10	11	3	1	0	25
June						
July						
August						
September						
October						
November						
December						
<b>Total</b>	<b>56</b>	<b>25</b>	<b>28</b>	<b>9</b>	<b>4</b>	<b>122</b>

## **Appendix A: Meteorological Data**



**Table 10: Meteorological Data – Charlton Ridge Meteorological Station – May 2018**

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)
1/05/2018	23	9	91	39	712	161	1.7	0.0
2/05/2018	24	10	93	44	830	182	1.6	0.0
3/05/2018	27	9	92	28	689	215	2.0	0.0
4/05/2018	28	13	72	23	767	261	3.7	0.0
5/05/2018	23	6	68	22	704	209	2.1	0.0
6/05/2018	22	5	83	25	702	159	2.2	0.0
7/05/2018	25	8	94	21	665	200	2.0	0.0
8/05/2018	25	8	84	31	739	184	1.6	0.0
9/05/2018	25	9	83	30	643	199	1.8	0.0
10/05/2018	25	10	71	21	799	293	4.1	0.0
11/05/2018	15	6	62	27	870	310	6.2	0.0
12/05/2018	19	8	86	36	978	273	5.3	0.6
13/05/2018	19	10	73	45	929	218	3.1	0.0
14/05/2018	18	9	72	41	554	179	3.4	0.0
15/05/2018	21	7	80	28	663	207	1.7	0.0
16/05/2018	20	8	86	38	772	160	2.4	0.0
17/05/2018	20	6	93	37	669	176	1.6	0.0
18/05/2018	22	4	84	17	640	224	2.0	0.0
19/05/2018	21	5	77	31	620	191	1.6	0.0
20/05/2018	20	4	78	28	655	283	3.2	0.0
21/05/2018	21	6	70	25	647	293	3.8	0.0
22/05/2018	22	7	72	32	629	289	3.3	0.0
23/05/2018	21	7	83	40	621	199	1.5	0.0
24/05/2018	22	6	91	35	598	189	1.6	0.0
25/05/2018	21	10	84	36	760	159	2.4	0.0
26/05/2018	21	8	90	44	595	160	2.0	0.0
27/05/2018	18	7	98	55	721	187	1.6	0.0
28/05/2018	20	7	93	44	784	179	1.6	0.0
29/05/2018	23	7	93	29	599	269	2.1	0.0
30/05/2018	18	8	96	28	704	231	3.0	8.4
31/05/2018	17	5	79	28	847	247	3.6	0.0

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

# **Appendix C: June Monthly Environmental Monitoring Report**



# Monthly Environmental Monitoring Report

Yancoal Mt Thorley Warkworth

June 2018

## CONTENTS

1.0	INTRODUCTION.....	5
2.0	AIR QUALITY.....	5
2.1	Meteorological Monitoring.....	5
2.1.1	Rainfall.....	5
2.1.2	Wind Speed and Direction.....	5
2.2	Depositional Dust.....	7
2.3	Suspended Particulates.....	7
2.3.1	HVAS PM <sub>10</sub> Results.....	7
2.3.2	TSP Results.....	8
2.3.3	Real Time PM <sub>10</sub> Results.....	8
2.3.4	Real Time Alarms for Air Quality.....	8
3.0	WATER QUALITY.....	9
3.1	Surface Water.....	9
3.1.1	Surface Water Monitoring Results.....	9
3.1.2	Surface Water Trigger Tracking.....	13
3.2	Groundwater Monitoring.....	15
3.2.1	Groundwater Trigger Tracking.....	38
4.0	BLAST MONITORING.....	42
4.1	Blast Monitoring Results.....	42
5.0	NOISE.....	45
5.1	Attended Noise Monitoring Results.....	45
5.1.1	WML Noise Assessment.....	45
5.1.2	MTO Noise Assessment.....	46
5.1.3	Low Frequency Assessment.....	47
5.2	Noise Management Measures.....	49
6.0	OPERATIONAL DOWNTIME.....	49
7.0	REHABILITATION.....	49
8.0	ENVIRONMENTAL INCIDENTS.....	50
9.0	COMPLAINTS.....	50
	Appendix A: Meteorological Data.....	51



## Figures

Figure 1: Rainfall Trends YTD	5
Figure 2: Charlton Ridge Wind Rose – June 2018	5
Figure 3: Air Quality Monitoring Locations	6
Figure 4: Depositional Dust – June 2018	7
Figure 5: Individual PM <sub>10</sub> Results – June 2018	7
Figure 6: Annual Average PM <sub>10</sub> – June 2018	8
Figure 7: Annual Average Total Suspended Particulates – June 2018	8
Figure 8: Real Time PM <sub>10</sub> 24hr average and Year-to-date average – June 2018	9
Figure 9: Site Dams Electrical Conductivity Trend – June 2018	10
Figure 10: Site Dams pH Trend – June 2018	10
Figure 11: Site Dams Total Suspended Solids Trend – June 2018	11
Figure 12: Watercourse Electrical Conductivity Trend – June 2018	11
Figure 13: Watercourse pH Trend – June 2018	12
Figure 14: Watercourse Total Suspended Solids Trend – June 2018	12
Figure 15: Surface Water Monitoring Location Plan	14
Figure 16: Bayswater Seam Electrical Conductivity Trend – June 2018	15
Figure 17: Bayswater Seam pH Trend – June 2018	16
Figure 18: Bayswater Seam Standing Water Level Trend – June 2018	16
Figure 19: Blakefield Seam Electrical Conductivity Trend – June 2018	17
Figure 20: Blakefield Seam pH Trend – June 2018	17
Figure 21: Blakefield Seam Standing Water Level Trend – June 2018	18
Figure 22: Bowfield Seam Electrical Conductivity Trend – June 2018	18
Figure 23: Bowfield Seam pH Trend – June 2018	19
Figure 24: Bowfield Seam Standing Water Level Trend – June 2018	19
Figure 25: Redbank Seam Electrical Conductivity Trend – June 2018	20
Figure 26: Redbank Seam pH Trend – June 2018	20
Figure 27: Redbank Seam Standing Water Level Trend – June 2018	21
Figure 28: Shallow Overburden Seam Electrical Conductivity Trend – June 2018	21
Figure 29: Shallow Overburden Seam pH Trend – June 2018	22
Figure 30: Shallow Overburden Seam Standing Water Level Trend – June 2018	22
Figure 31: Vaux Seam Electrical Conductivity Trend – June 2018	23
Figure 32: Vaux Seam pH Trend – June 2018	23
Figure 33: Vaux Seam Standing Water Level Trend – June 2018	24
Figure 34: Wambo Seam Electrical Conductivity Trend – June 2018	24
Figure 35: Wambo Seam pH Trend – June 2018	25
Figure 36: Wambo Seam Standing Water Level Trend – June 2018	25
Figure 37: Warkworth Seam Electrical Conductivity Trend – June 2018	26
Figure 38: Warkworth Seam pH Trend – June 2018	26
Figure 39: Warkworth Seam Standing Water Level Trend – June 2018	27
Figure 40: Wollombi Alluvium 1 Electrical Conductivity Trend – June 2018	27
Figure 41: Wollombi Alluvium 1 pH Trend – June 2018	28
Figure 42: Wollombi Alluvium 2 Electrical Conductivity Trend – June 2018	28
Figure 43: Wollombi Alluvium 2 pH Trend – June 2018	29
Figure 44: Wollombi Alluvium Standing Water Level Trend – June 2018	29
Figure 45: Aeolian Warkworth Sands Electrical Conductivity Trend – June 2018	30
Figure 46: Aeolian Warkworth Sands pH Trend – June 2018	30
Figure 47: Aeolian Warkworth Sands Standing Water Level Trend – June 2018	31

Figure 48: Hunter River Alluvium 1 Seam Electrical Conductivity Trend – June 2018	31
Figure 49: Hunter River Alluvium 1 Seam pH Trend – June 2018	32
Figure 50: Hunter River Alluvium 2 Seam Electrical Conductivity Trend – June 2018	32
Figure 51: Hunter River Alluvium 2 Seam pH Trend – June 2018	33
Figure 52: Hunter River Alluvium 3 Seam Electrical Conductivity Trend – June 2018	33
Figure 53: Hunter River Alluvium 3 Seam pH Trend – June 2018	34
Figure 54: Hunter River Alluvium 4 Seam Electrical Conductivity Trend – June 2018	34
Figure 55: Hunter River Alluvium 4 Seam pH Trend – June 2018	35
Figure 56: Hunter River Alluvium 5 Seam Electrical Conductivity Trend – June 2018	35
Figure 57: Hunter River Alluvium 5 Seam pH Trend – June 2018	36
Figure 58: Hunter River Alluvium 6 Seam Electrical Conductivity – June 2018	36
Figure 59: Hunter River Alluvium 6 Seam pH Trend – June 2018	37
Figure 60: Hunter River Alluvium Standing Water Level Trend – June 2018	37
Figure 61: Groundwater Monitoring Location Plan	41
Figure 62: Abbey Green Blast Monitoring Results – June 2018	42
Figure 63: Bulga Village Blast Monitoring Results – June 2018	42
Figure 64: MTIE Blast Monitoring Results – June 2018	43
Figure 65: Warkworth Blast Monitoring Results - June 2018	43
Figure 66: Wambo Road Blast Monitoring Results – June 2018	43
Figure 67: Wollemi Peak Road Blast Monitoring Results - June 2018	43
Figure 68: Blast and Vibration Monitoring Location Plan	44
Figure 69: Noise Monitoring Location Plan	48
Figure 70: Operational Downtime by Equipment Type – June 2018	49
Figure 71: Rehabilitation YTD - June 2018	50
Figure 72: Complaints Summary - YTD June 2018	50

## Tables

Table 1: Monthly Rainfall MTW	5
Table 3: Surface Water Trigger Tracking – June YTD 2018	13
Table 4: Groundwater Triggers - 2018	39
Table 5: Blasting Limits	42
Table 6: $L_{Aeq, 15 \text{ minute}}$ Warkworth Impact Assessment Criteria – June 2018	45
Table 7: $L_{A1, 1 \text{ minute}}$ Warkworth Impact Assessment Criteria – June 2018	45
Table 8: $L_{Aeq, 15 \text{ minute}}$ Mount Thorley Operations - Impact Assessment Criteria – June 2018	46
Table 9: $L_{A1, 1 \text{ Minute}}$ Mount Thorley Operations - Impact Assessment Criteria – June 2018	46
Table 10: Low Frequency Noise Assessment - June 2018	47
Table 11: Supplementary Attended Noise Monitoring Data – June 2018	49
Table 12: Meteorological Data – Charlton Ridge Meteorological Station – June 2018	52

## Revision History

Version No.	Person Responsible	Document Status	Date
1.0	Environmental Advisor	Draft	30/07/2018
1.1	Environmental Specialist	Final	31/07/2018

## 1.0 INTRODUCTION

This report has been compiled to provide a monthly summary of environmental monitoring results for Mt Thorley Warkworth (MTW). This report includes all monitoring data collected for the period 1<sup>st</sup> June to 30<sup>th</sup> June 2018.

## 2.0 AIR QUALITY

### 2.1 Meteorological Monitoring

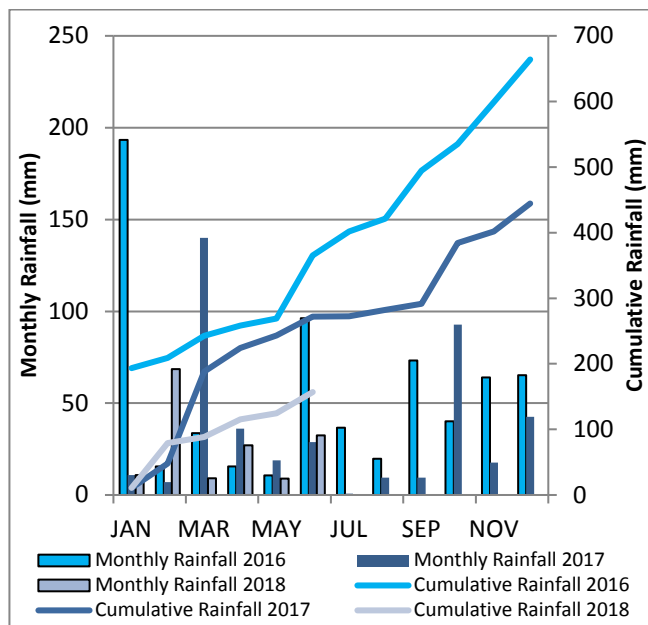
Meteorological data is collected at MTW's 'Charlton Ridge' meteorological station (refer to **Figure 3: Air Quality Monitoring Locations**).

#### 2.1.1 Rainfall

Rainfall for the period is summarised in **Table 1**, the year-to-date trend and historical trend are shown in **Figure 1**.

**Table 1: Monthly Rainfall MTW**

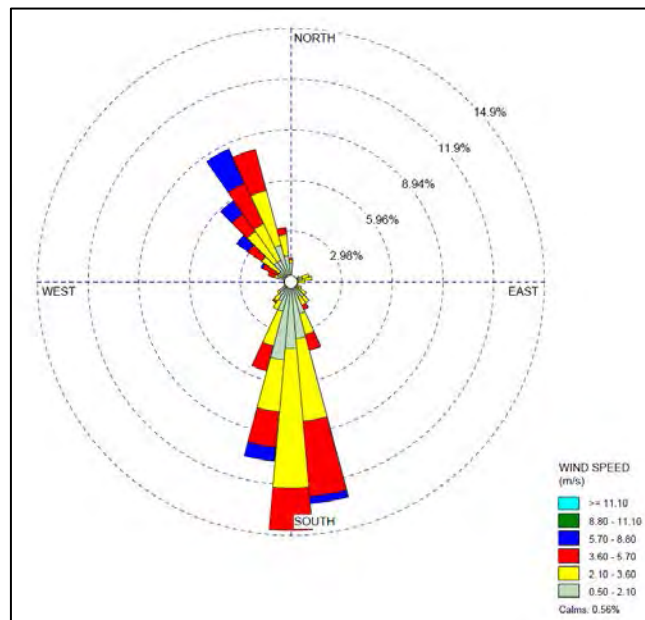
2018	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
June	32.4	156.9



**Figure 1: Rainfall Trends YTD**

#### 2.1.2 Wind Speed and Direction

Winds from the South were dominant throughout the reporting period as shown in **Figure 2**.



**Figure 2: Charlton Ridge Wind Rose – June 2018**



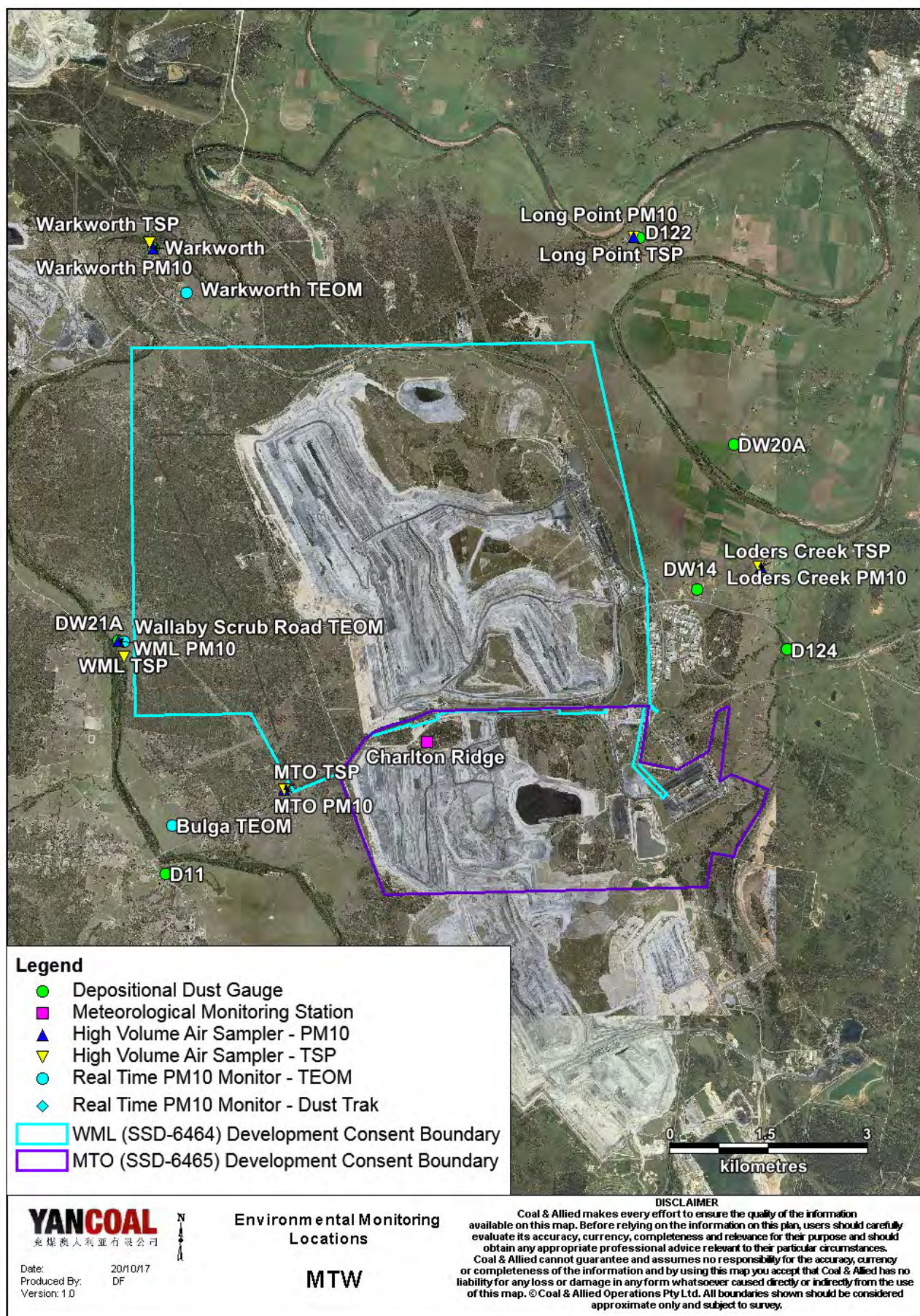


Figure 3: Air Quality Monitoring Locations



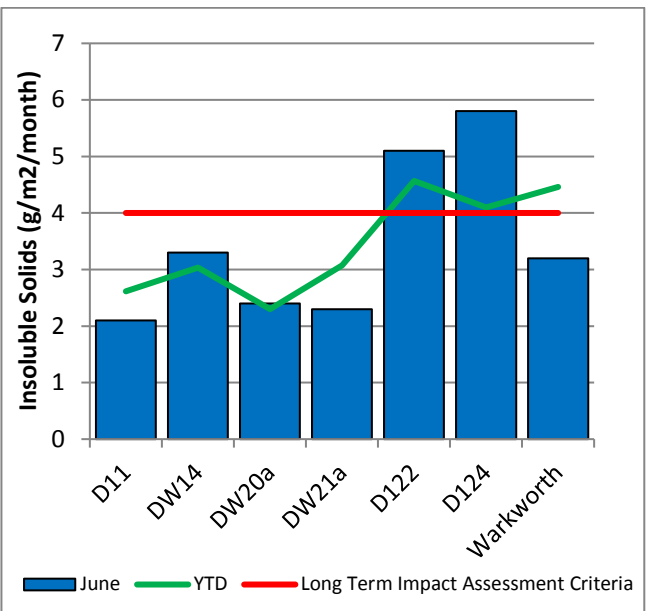
## 2.2 Depositional Dust

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

**Figure 4** 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 and D124 monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m<sup>2</sup> per month. Field notes associated with monitor D124 result confirms the presence of insects and bird droppings. As such the result is considered contaminated and will be excluded from calculation of the annual average. There is no evidence to suggest that the D122 result is contaminated. Accordingly, the result will be included in the annual average calculation.

An assessment of MTW's contribution to the long term Impact assessment criteria will be provided in the 2018 Annual Review Report.



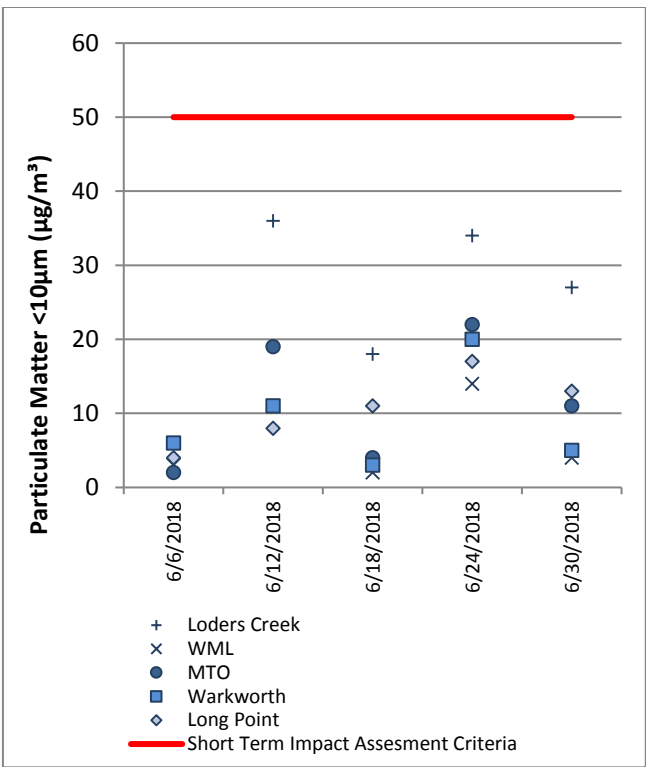
**Figure 4: Depositional Dust – June 2018**

## 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<sub>10</sub>). The location of these monitors can be found in Figure 3. Each HVAS was run for 24 hours on a six-day cycle in accordance with EPA requirements.

### 2.3.1 HVAS PM<sub>10</sub> Results

**Figure 5** shows the individual PM<sub>10</sub> results at each monitoring station against the short term impact assessment criteria of 50µg/m<sup>3</sup>.



**Figure 5: Individual PM<sub>10</sub> Results – June 2018**

**Figure 6** shows the annual average PM<sub>10</sub> results against the long term impact assessment criteria.

An assessment of MTW's contribution to the long term Impact assessment criteria will be provided in the 2018 Annual Review Report.

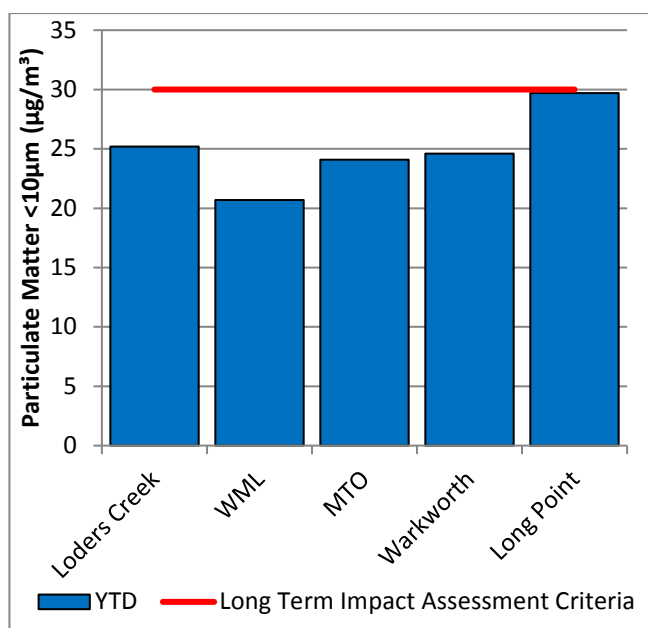


Figure 6: Annual Average PM<sub>10</sub> – June 2018

### 2.3.2 TSP Results

Figure 7 shows the annual average TSP results compared against the long term impact assessment criteria of 90µg/m³.

An assessment of MTW's contribution to the long-term assessment criteria will be reported in the 2018 Annual Review Report.

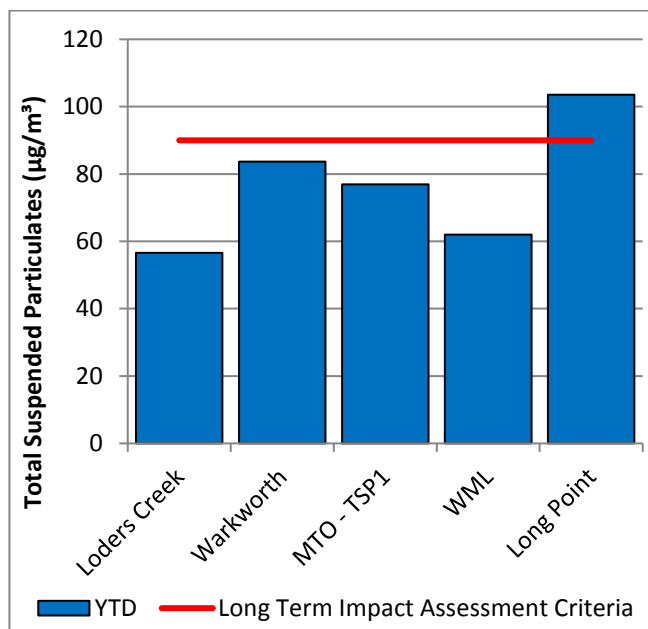


Figure 7: Annual Average Total Suspended Particulates – June 2018

### 2.3.3 Real Time PM<sub>10</sub> Results

Mt Thorley Warkworth maintains a network of real time PM<sub>10</sub> 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 for real time dust sampling are shown in Figure 8, including the daily 24 hour average PM<sub>10</sub> result and the annual PM<sub>10</sub> average.

### 2.3.4 Real Time Alarms for Air Quality

During July, the real time monitoring system generated 52 automated air quality related alerts, including 12 alerts for adverse meteorological conditions and 40 alerts for elevated PM<sub>10</sub> levels.

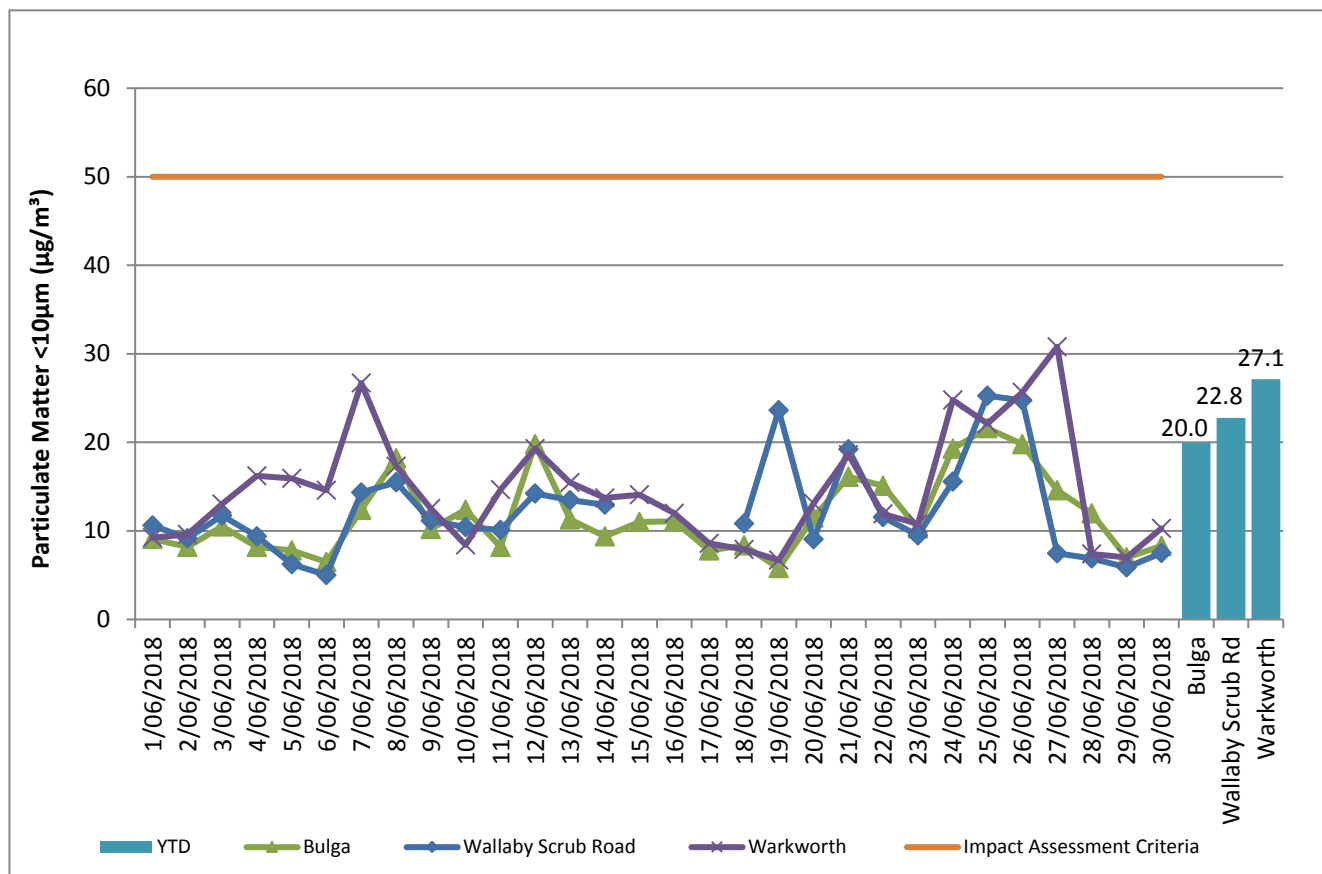


Figure 8: Real Time PM<sub>10</sub> 24hr average and Year-to-date average – June 2018

### 3.0 WATER QUALITY

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

#### 3.1 Surface Water

Monitoring is conducted at mine site dams and surrounding natural watercourses. The surface water monitoring locations are outlined in Figure 15.

Surface water courses are sampled on a monthly or quarterly sampling regime. Water quality is evaluated through the parameters of pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS). The Hunter River and the Wollombi Brook are sampled both upstream and downstream of mining operations, to monitor the potential impact of mining. Other Hunter River tributaries are also monitored.

##### 3.1.1 Surface Water Monitoring Results

Figure 9 to Figure 11 show the long term surface water trend (2015 – current) within MTW mine dams. Figure 12 to Figure 14 show the long term surface water trend (2015 - current) in surrounding watercourses.

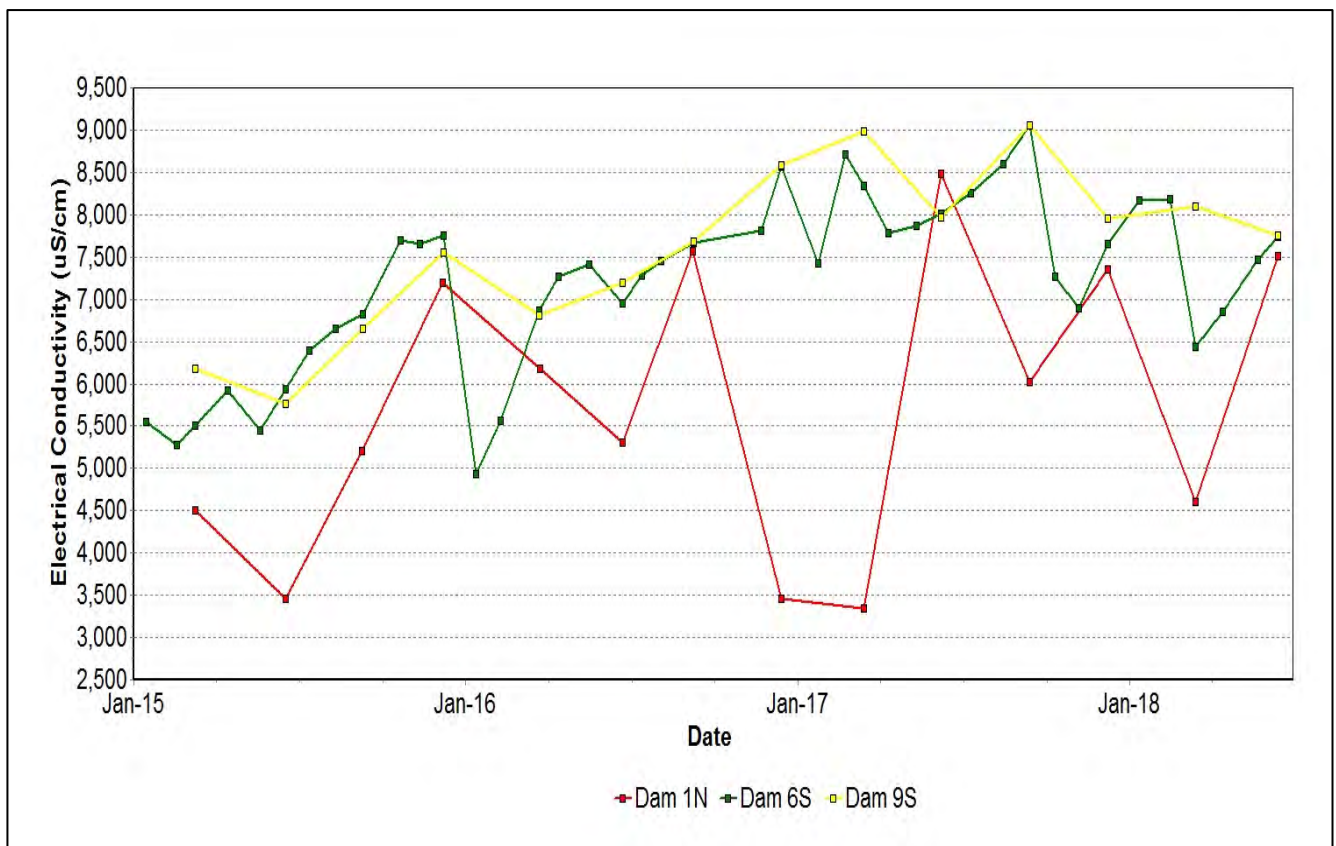


Figure 9: Site Dams Electrical Conductivity Trend – June 2018

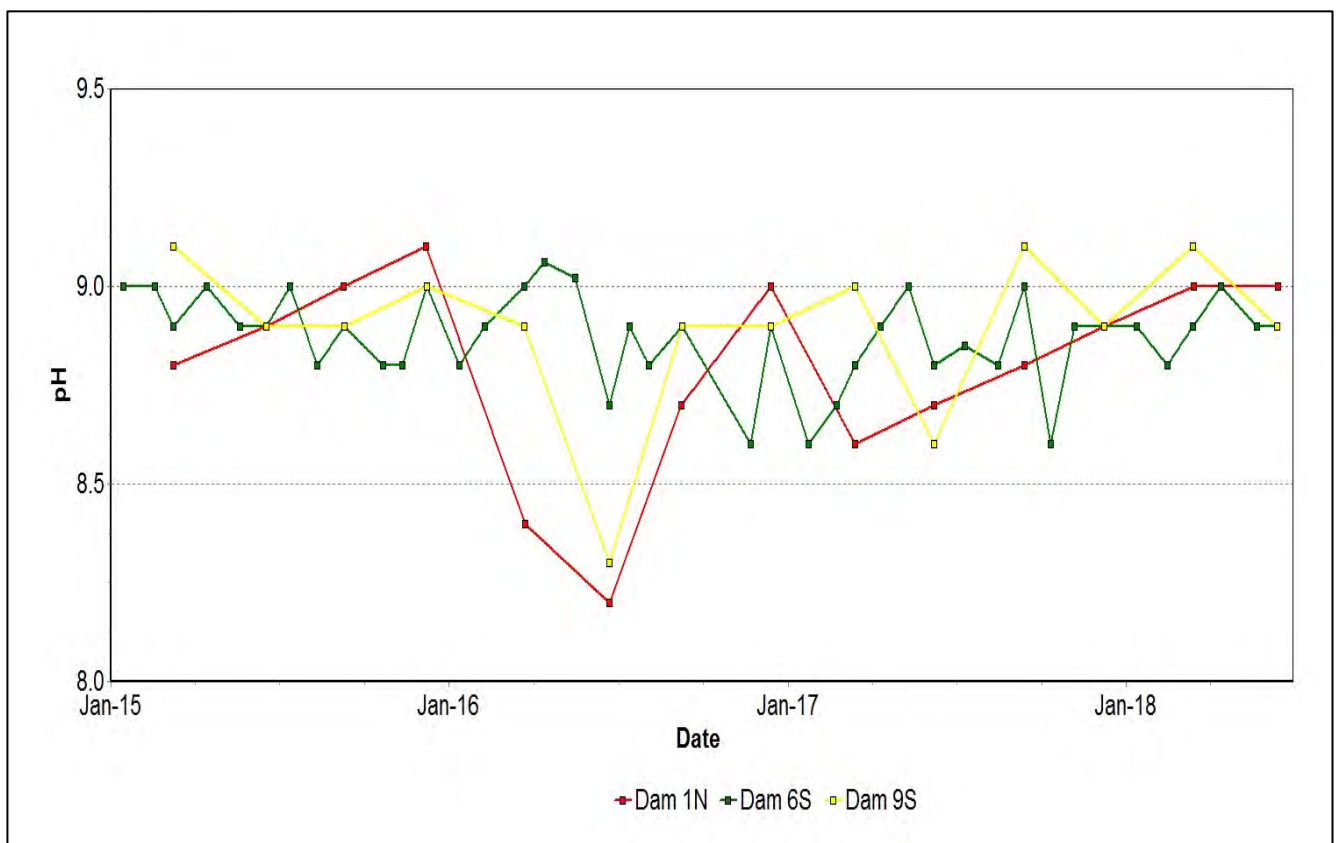


Figure 10: Site Dams pH Trend – June 2018



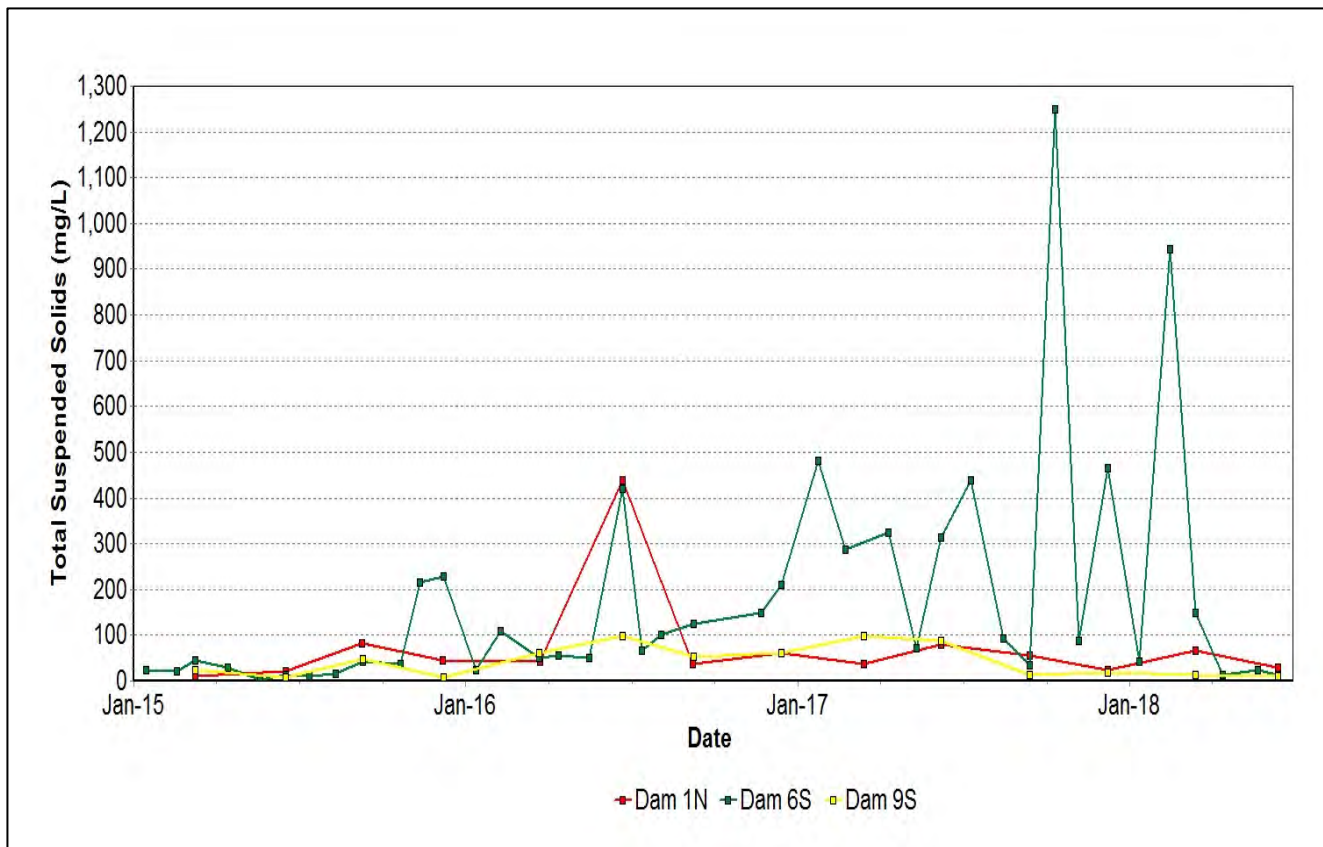


Figure 11: Site Dams Total Suspended Solids Trend – June 2018

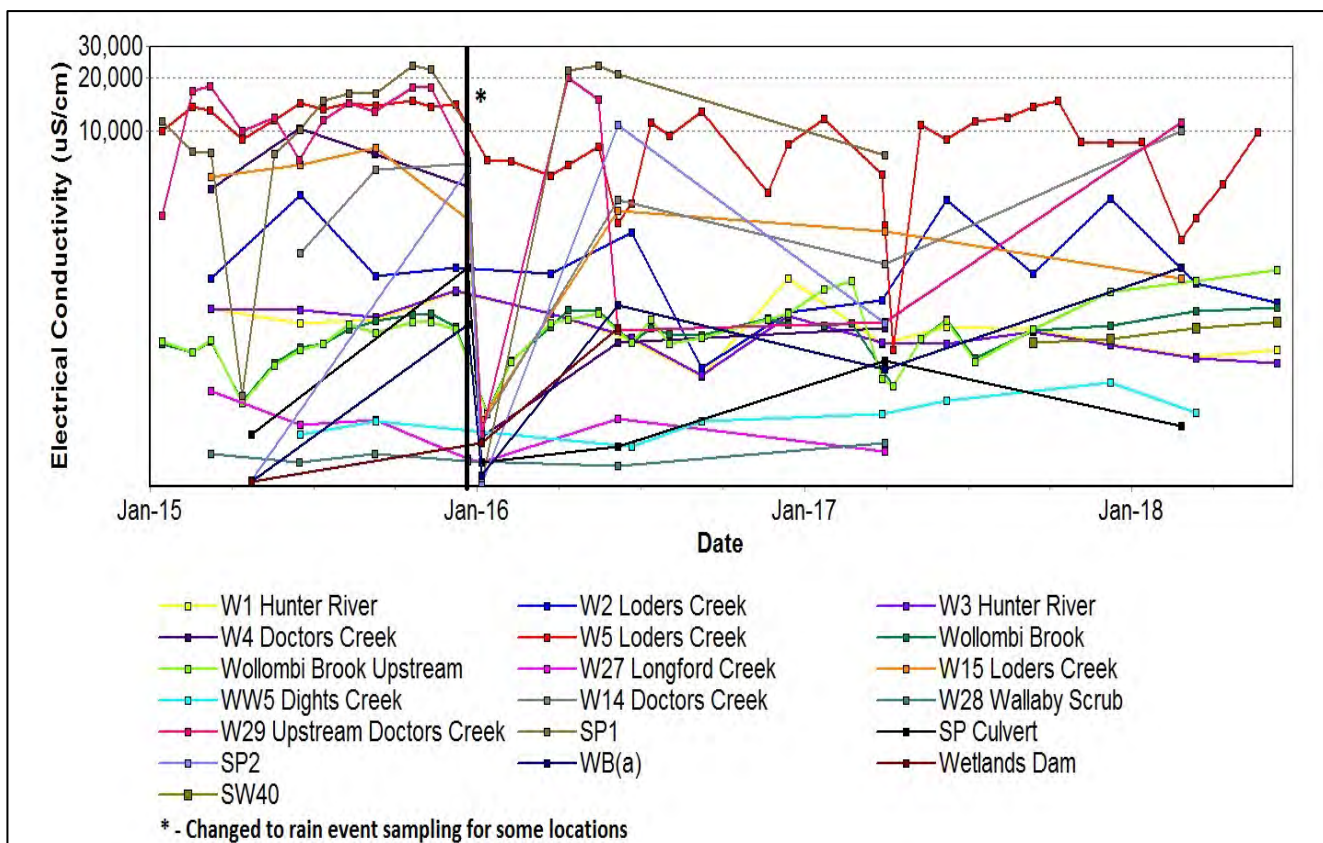


Figure 12: Watercourse Electrical Conductivity Trend – June 2018

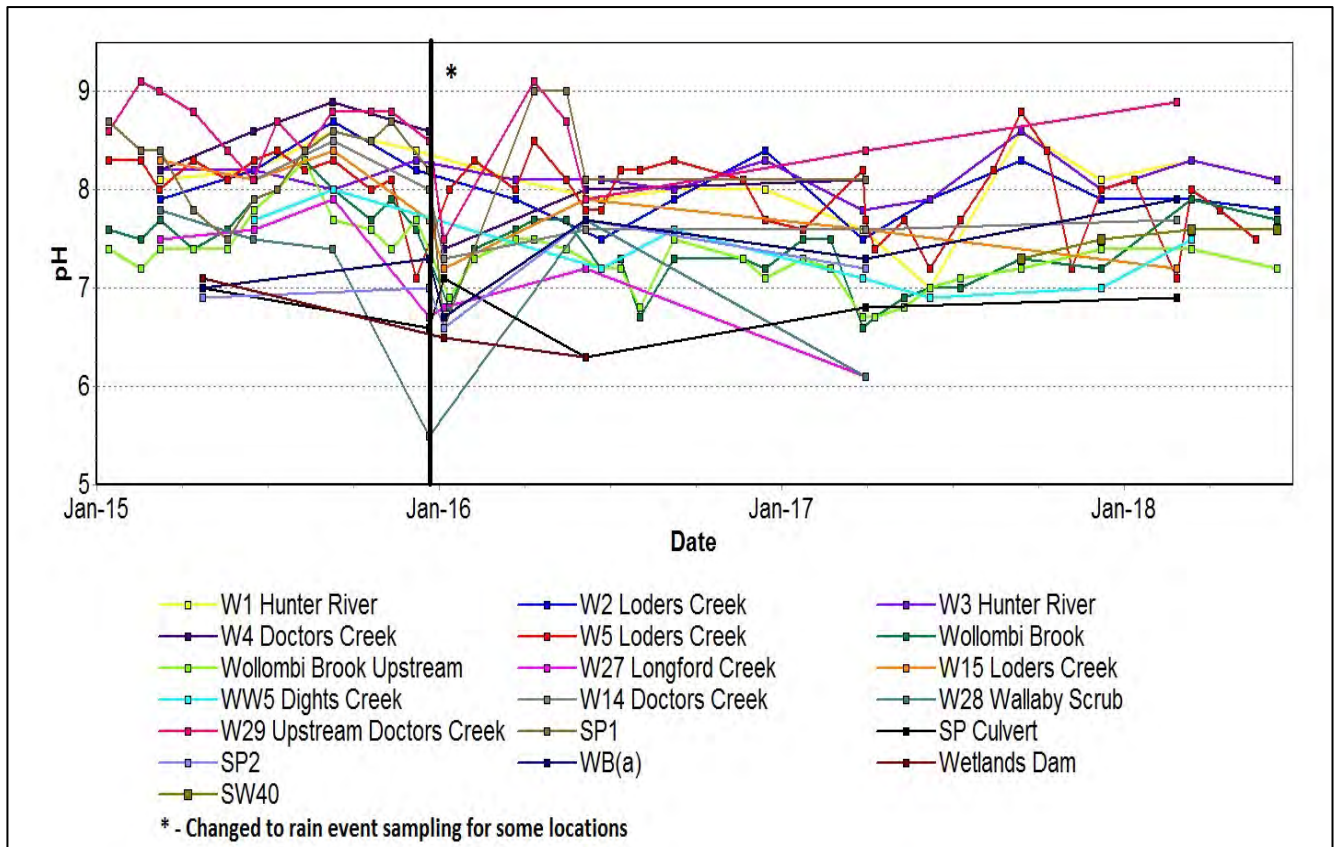


Figure 13: Watercourse pH Trend – June 2018

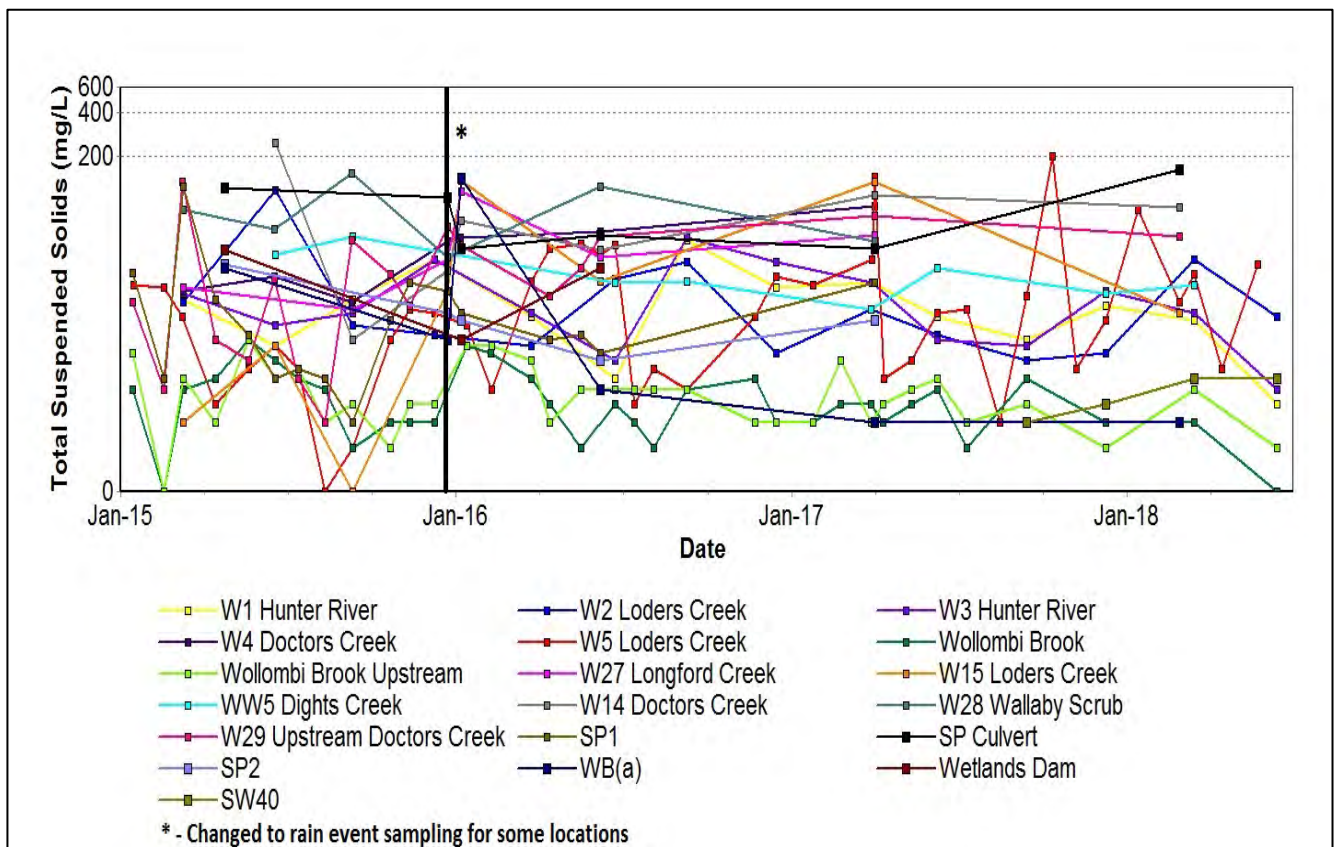


Figure 14: Watercourse Total Suspended Solids Trend – June 2018

### 3.1.2 Surface Water Trigger Tracking

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 MTW Water Management Plan.

Current internal surface water trigger limit breaches are summarised in **Table 3**.

**Table 2: Surface Water Trigger Tracking – June YTD 2018**

Site	Date	Trigger Limit Breached	Action Taken in Response
W14	26/02/2018	EC –95 <sup>th</sup> Percentile	Watching Brief*
Wollombi Brook	14/03/2018	EC –95 <sup>th</sup> Percentile	Watching Brief*
Wollombi Brook	13/06/2018	EC –95 <sup>th</sup> Percentile	Watching Brief*
Wollombi Brook Upstream	14/03/2018	EC –95 <sup>th</sup> Percentile	Watching Brief*
Wollombi Brook Upstream	13/06/2018	EC –95 <sup>th</sup> Percentile	Elevated EC is considered attributable to prolonged dry climatic conditions, and not related to mining related impacts. Continue to watch and monitor.
W5	14/02/2018	pH –5 <sup>th</sup> Percentile	Watching Brief*
W5	22/05/2018	pH –5 <sup>th</sup> Percentile	Watching Brief*
W15	26/02/2018	pH –5 <sup>th</sup> Percentile	Watching Brief*
W5	12/01/2018	TSS – 50mg/L (ANZECC criteria)	Field investigation did not identify any mining related sources of sediment. Elevated TSS associated with high intensity rainfall event after prolonged dry period. No further action taken
W14	26/02/2018	TSS – 50mg/L (ANZECC criteria)	Field investigation did not identify any mining related sources of sediment. Elevated TSS associated with high intensity rainfall event after prolonged dry period. No further action taken
W29	26/02/2018	TSS – 50mg/L (ANZECC criteria)	Field investigation did not identify any mining related sources of sediment. Elevated TSS associated with high intensity rainfall event after prolonged dry period. No further action taken

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



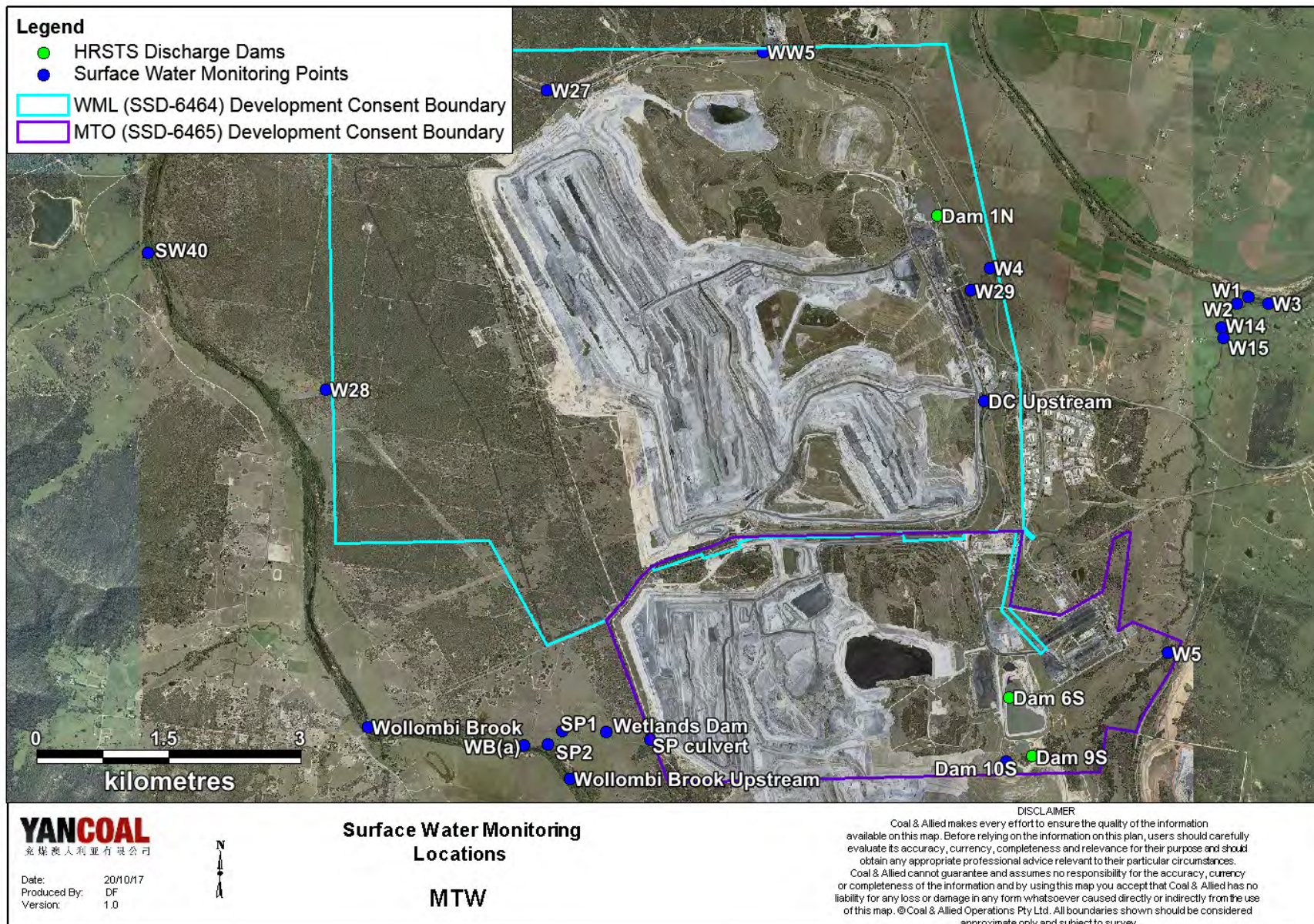


Figure 15: Surface Water Monitoring Location Plan



### 3.2 Groundwater Monitoring

Groundwater monitoring is undertaken on a quarterly basis in accordance with the MTW Groundwater Monitoring Programme.

Figure 16 to Figure 60 show the long term water quality trends (2015 – current) for groundwater bores monitored at MTW.

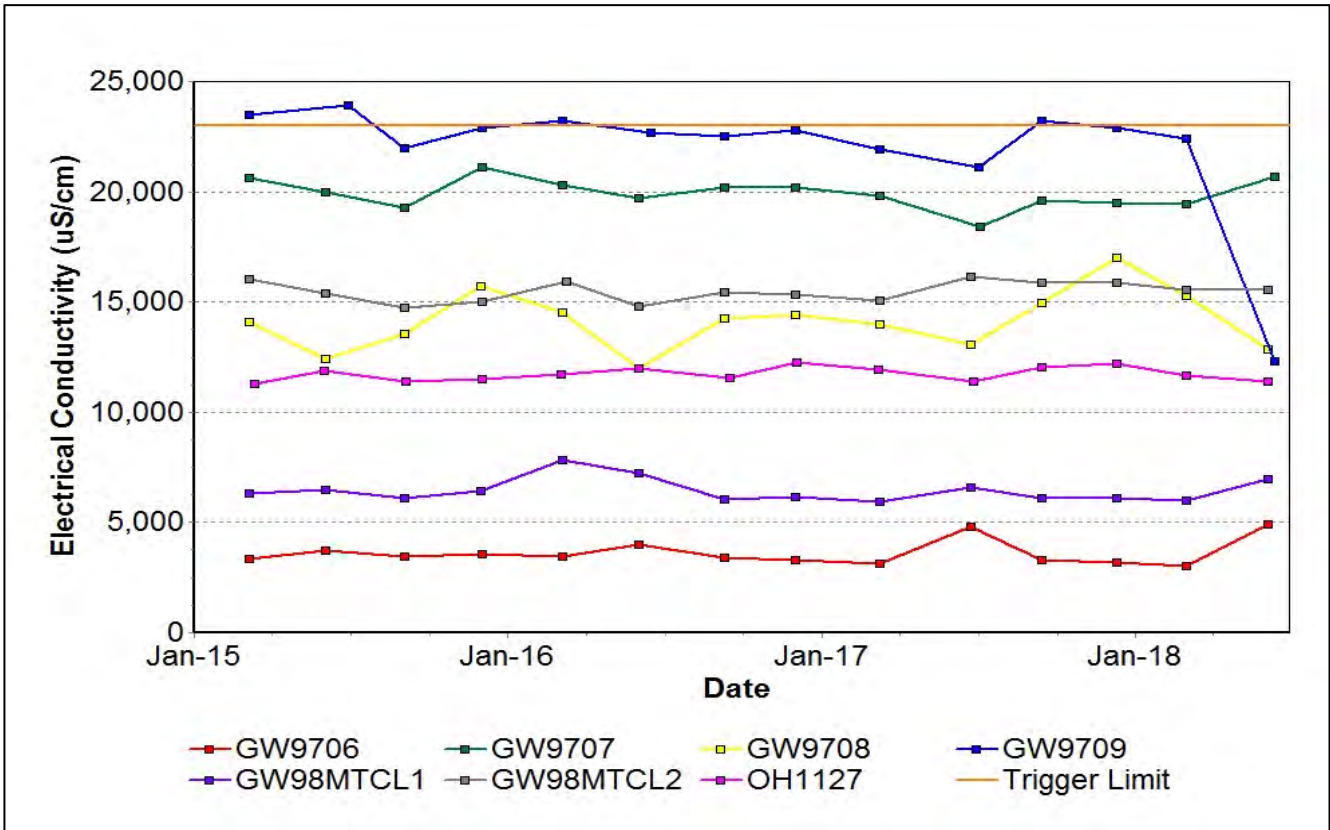


Figure 16: Bayswater Seam Electrical Conductivity Trend – June 2018

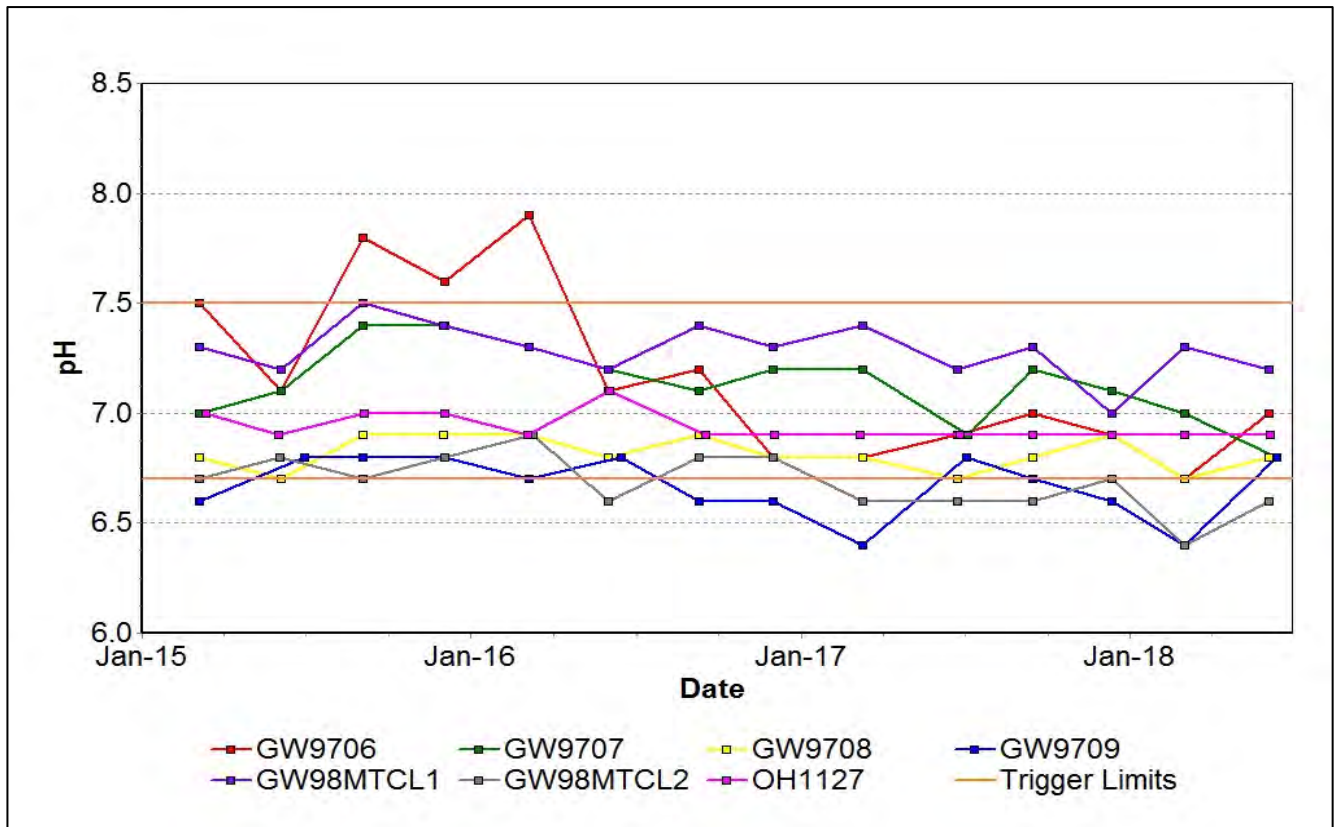


Figure 17: Bayswater Seam pH Trend – June 2018

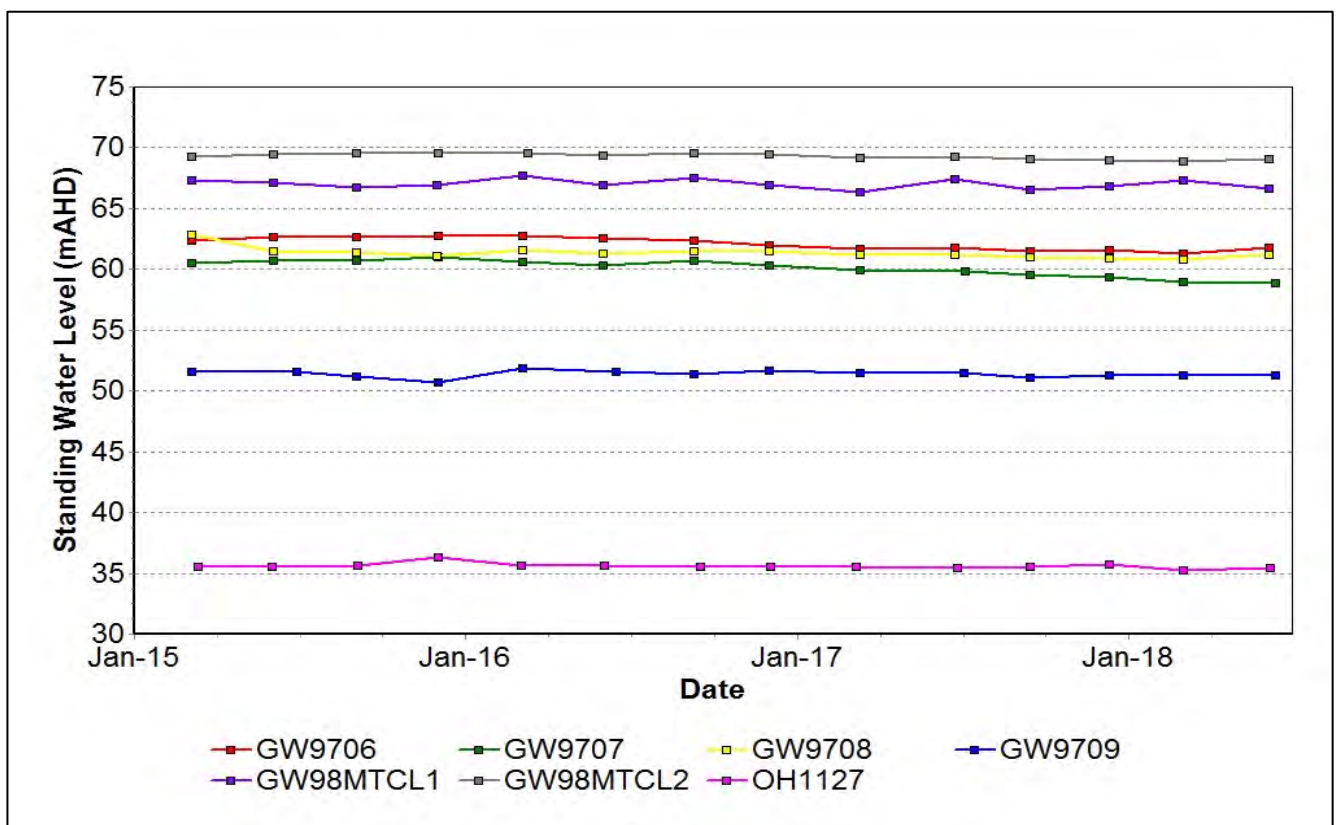


Figure 18: Bayswater Seam Standing Water Level Trend – June 2018

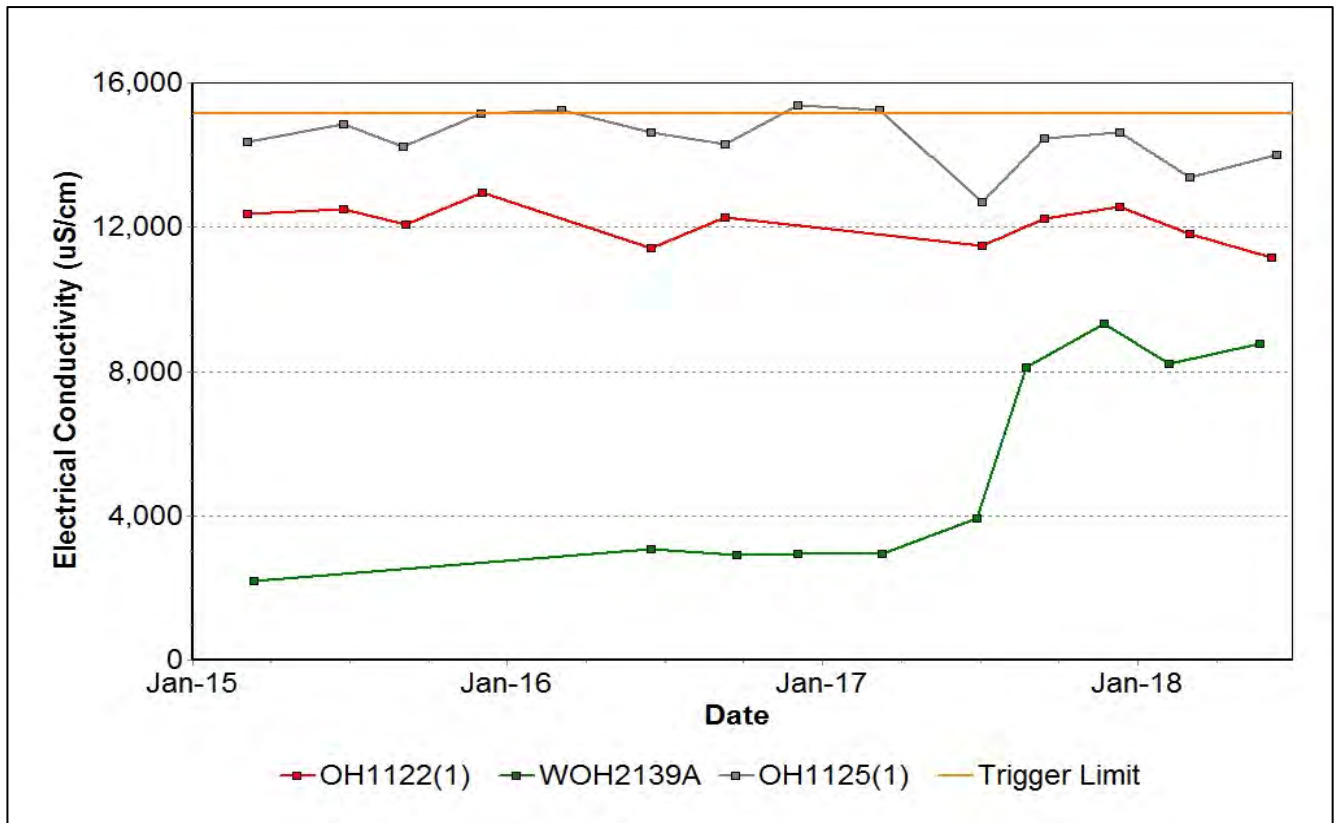


Figure 19: Blakefield Seam Electrical Conductivity Trend – June 2018

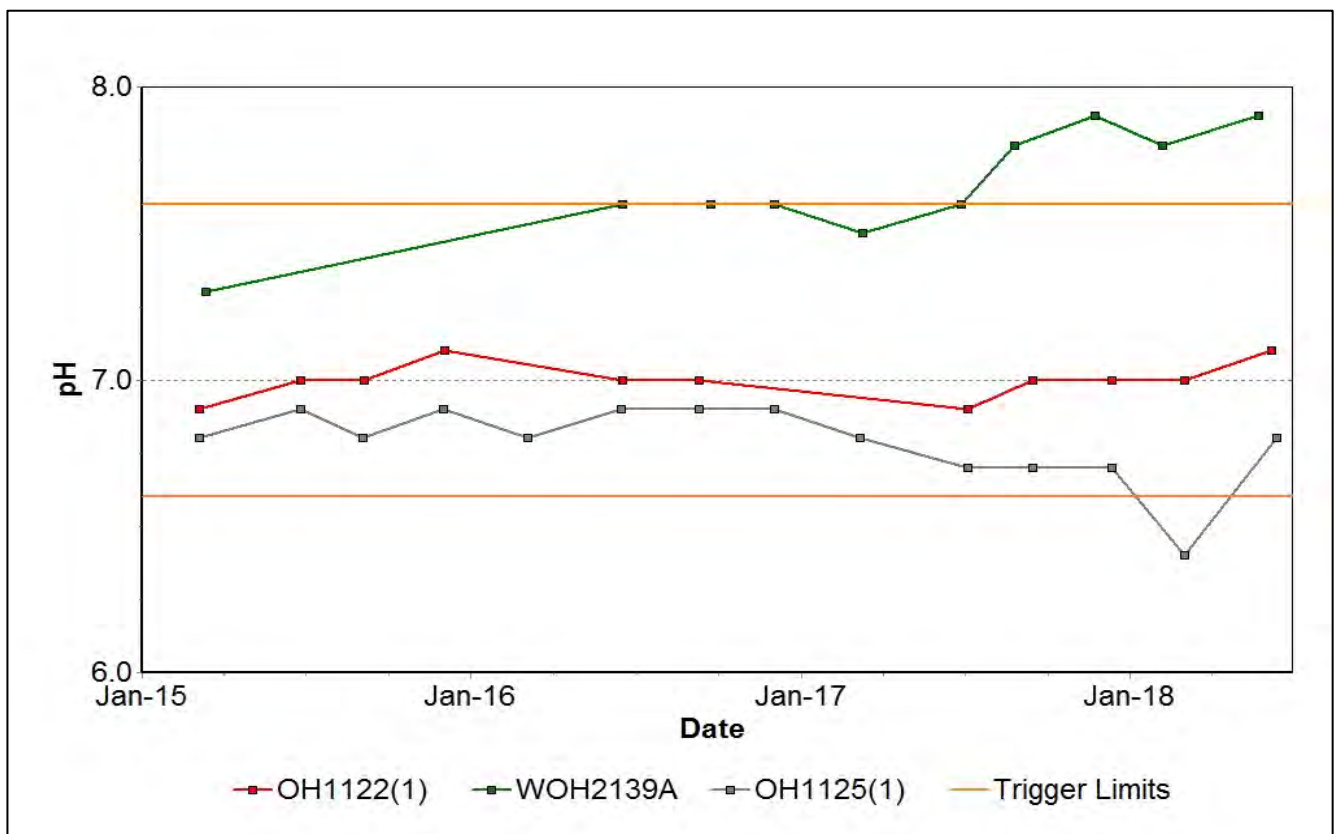


Figure 20: Blakefield Seam pH Trend – June 2018

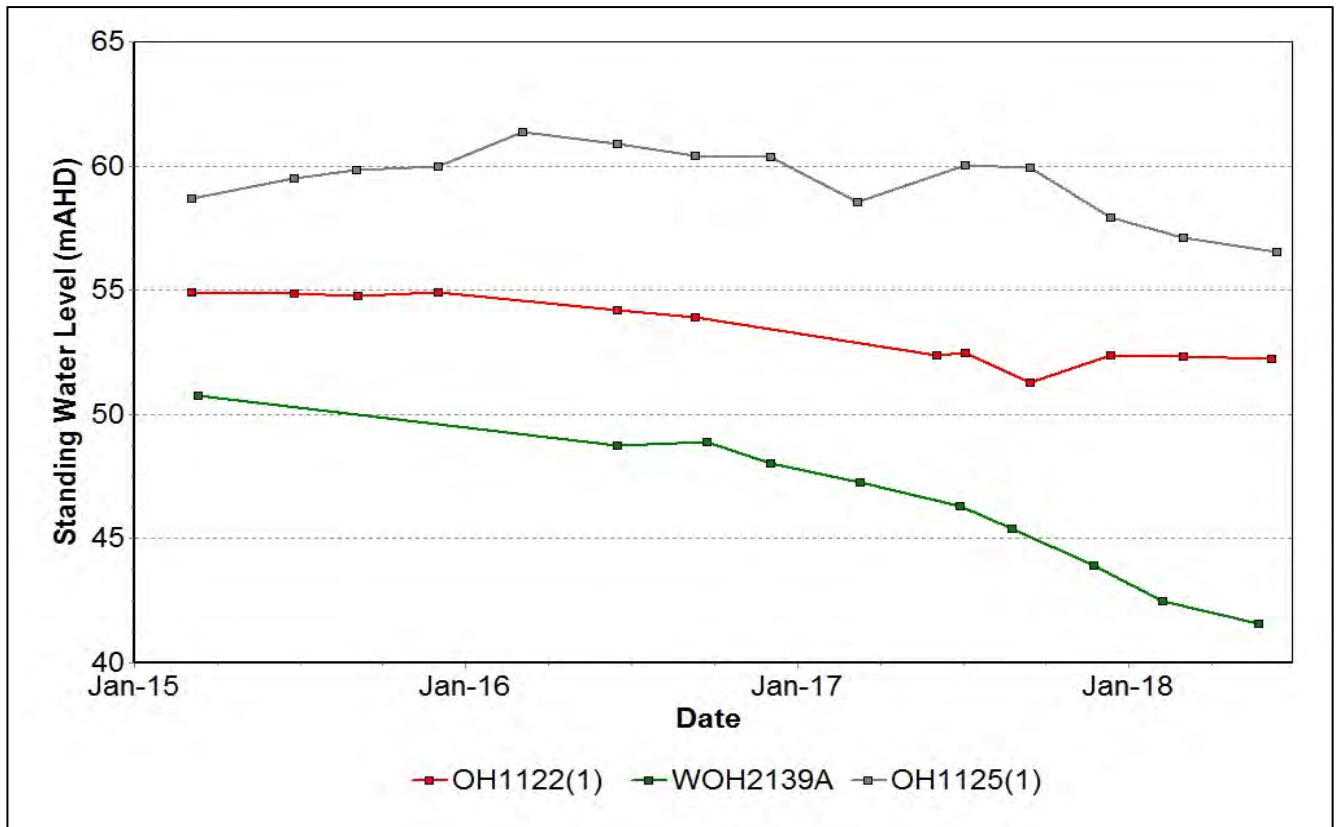


Figure 21: Blakefield Seam Standing Water Level Trend – June 2018

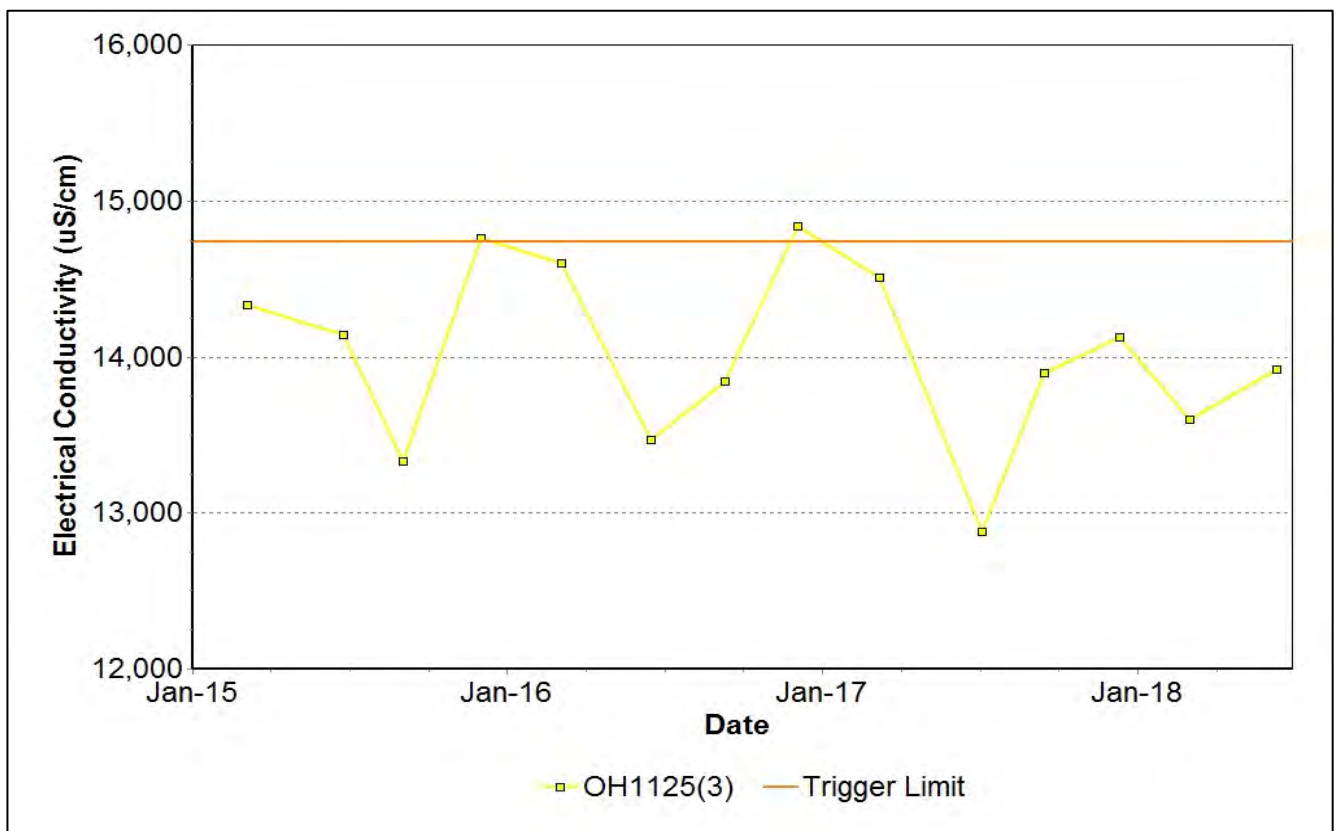


Figure 22: Bowfield Seam Electrical Conductivity Trend – June 2018



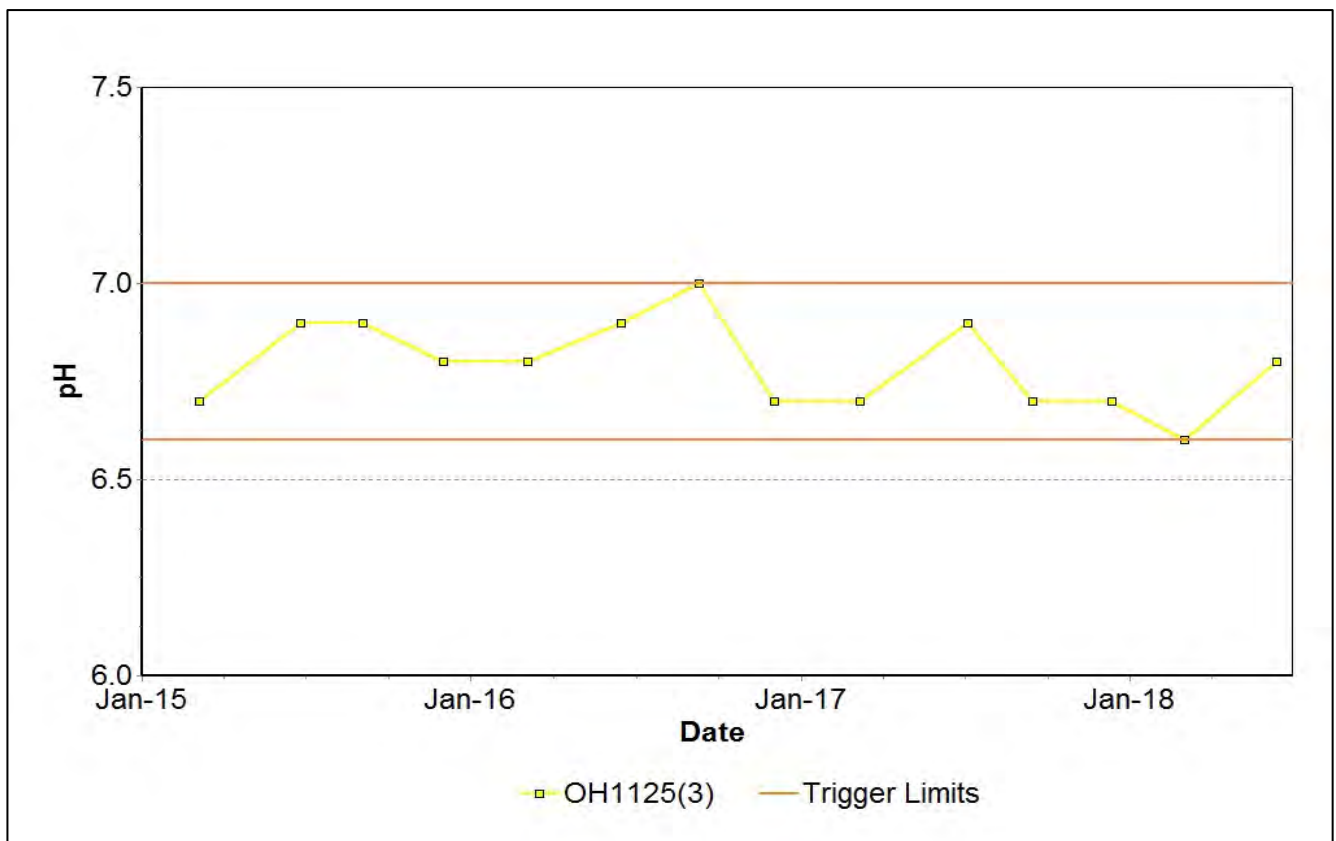


Figure 23: Bowfield Seam pH Trend – June 2018

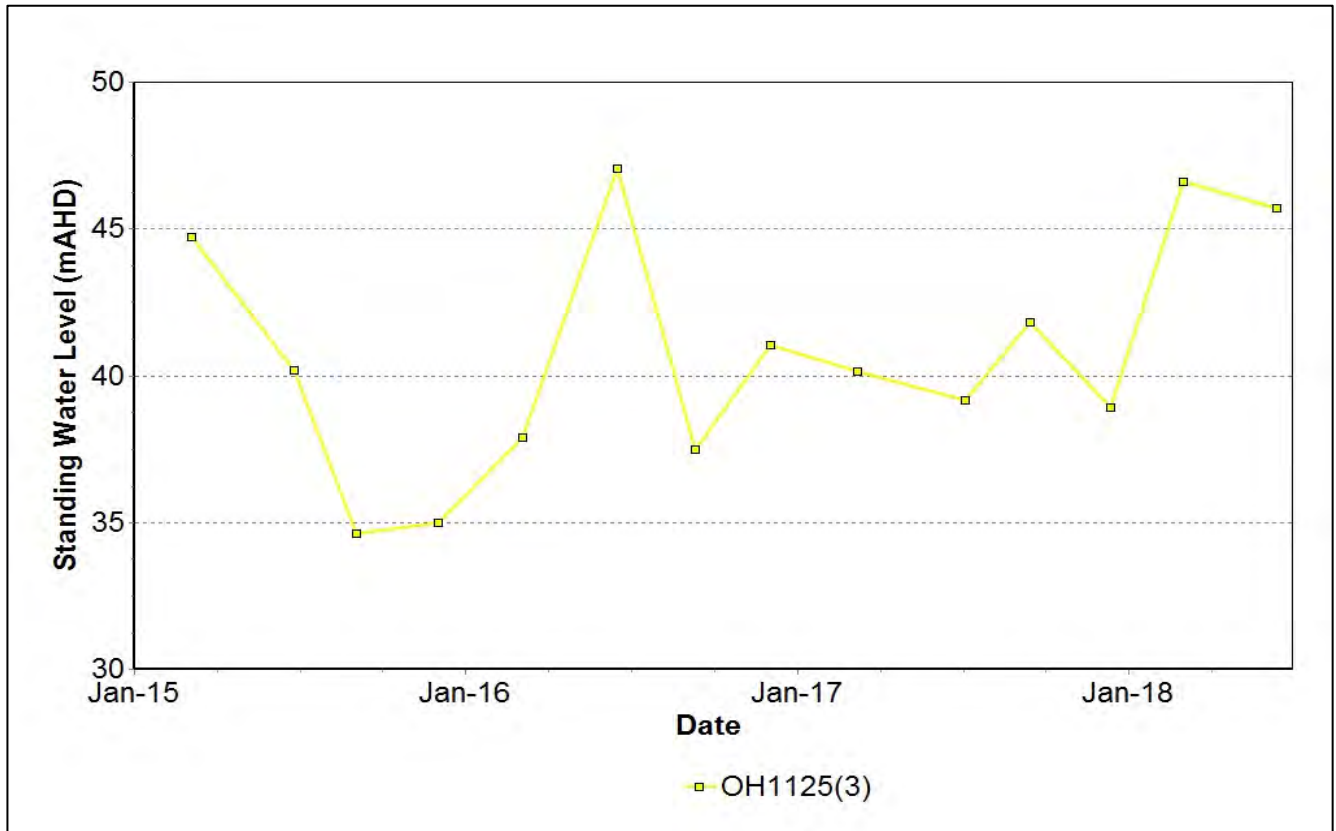


Figure 24: Bowfield Seam Standing Water Level Trend – June 2018

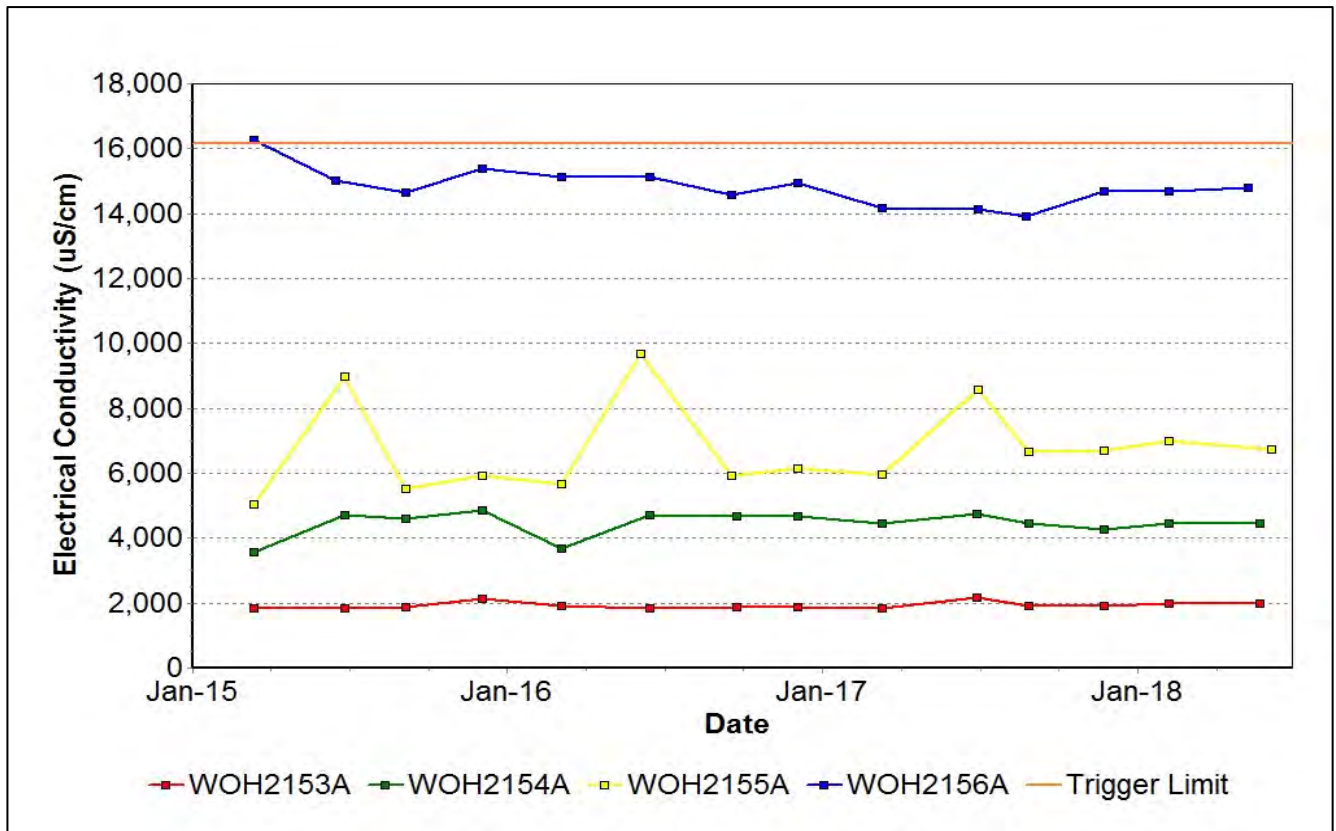


Figure 25: Redbank Seam Electrical Conductivity Trend – June 2018

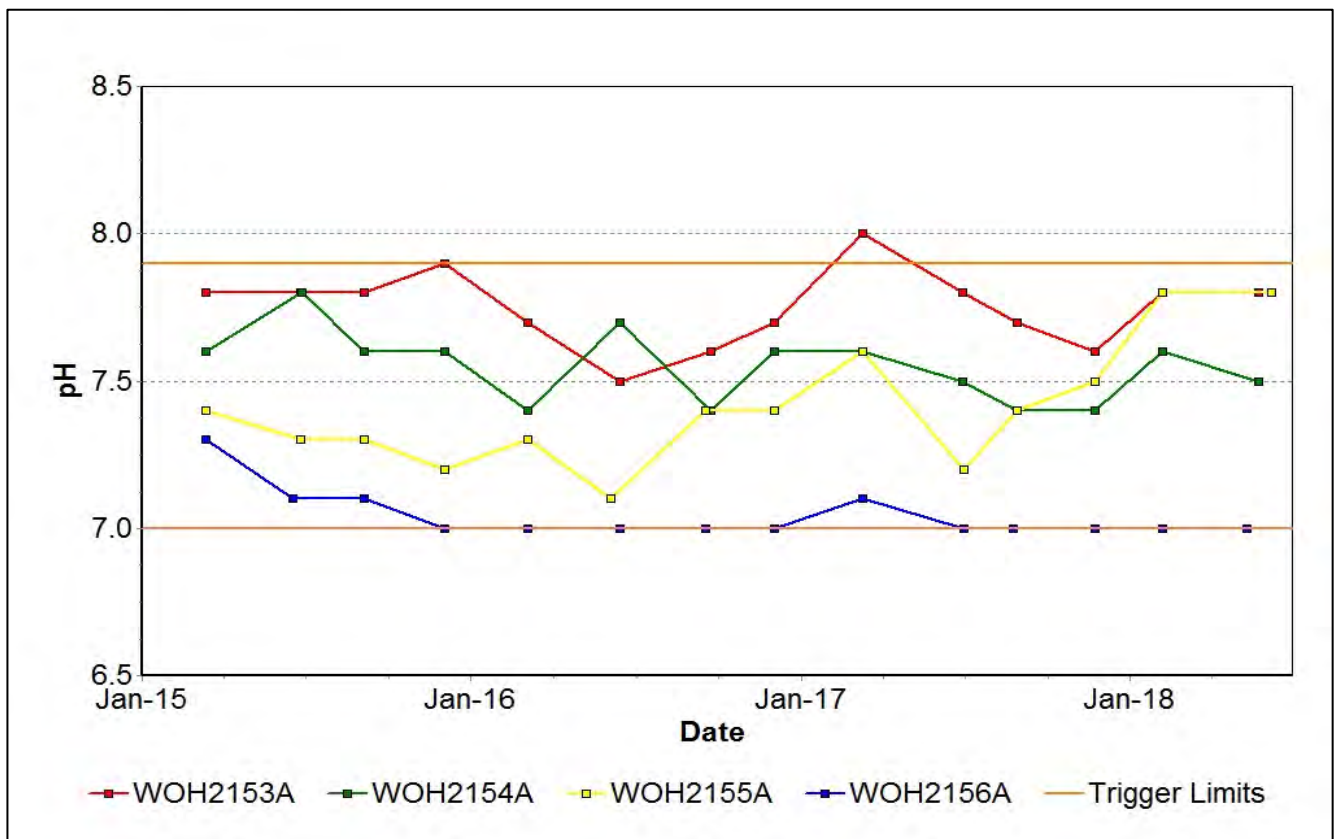


Figure 26: Redbank Seam pH Trend – June 2018

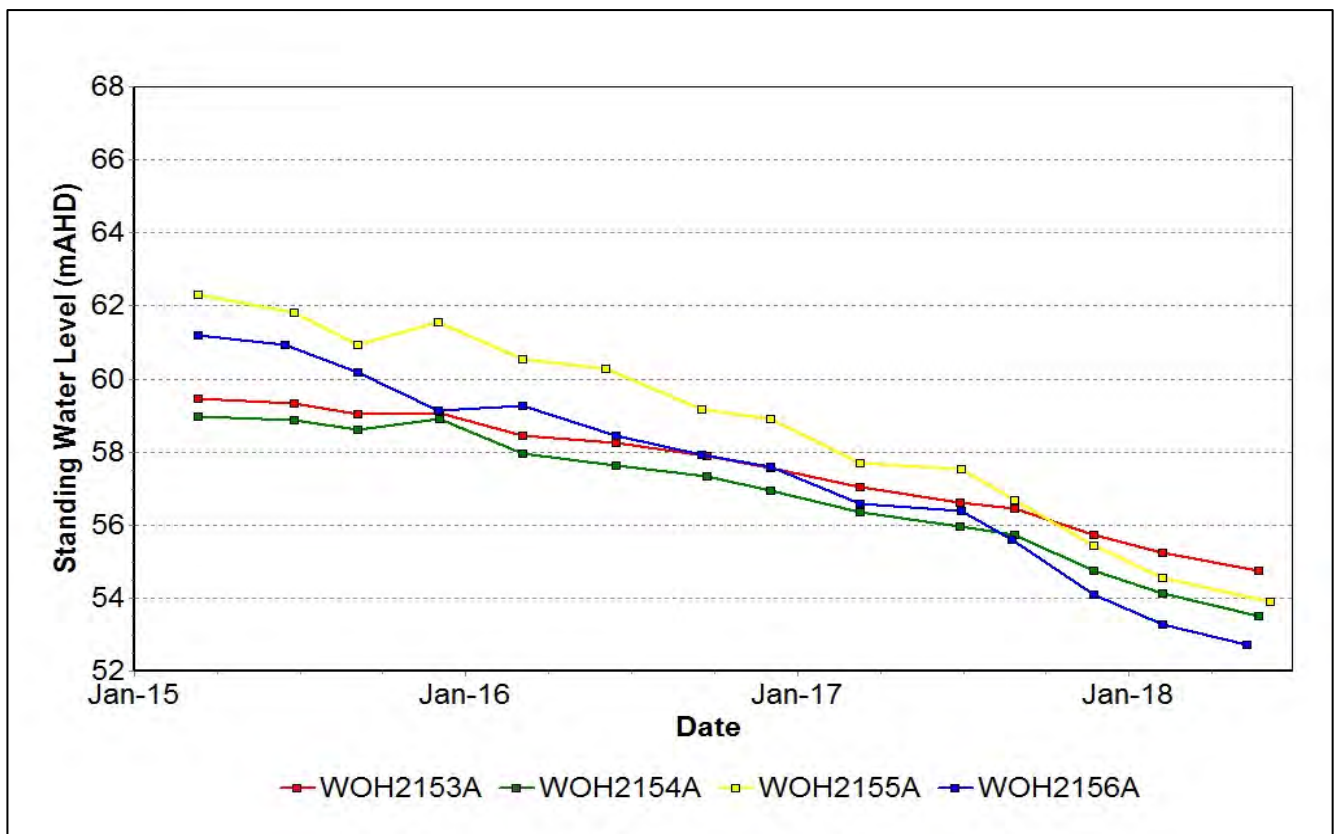


Figure 27: Redbank Seam Standing Water Level Trend – June 2018

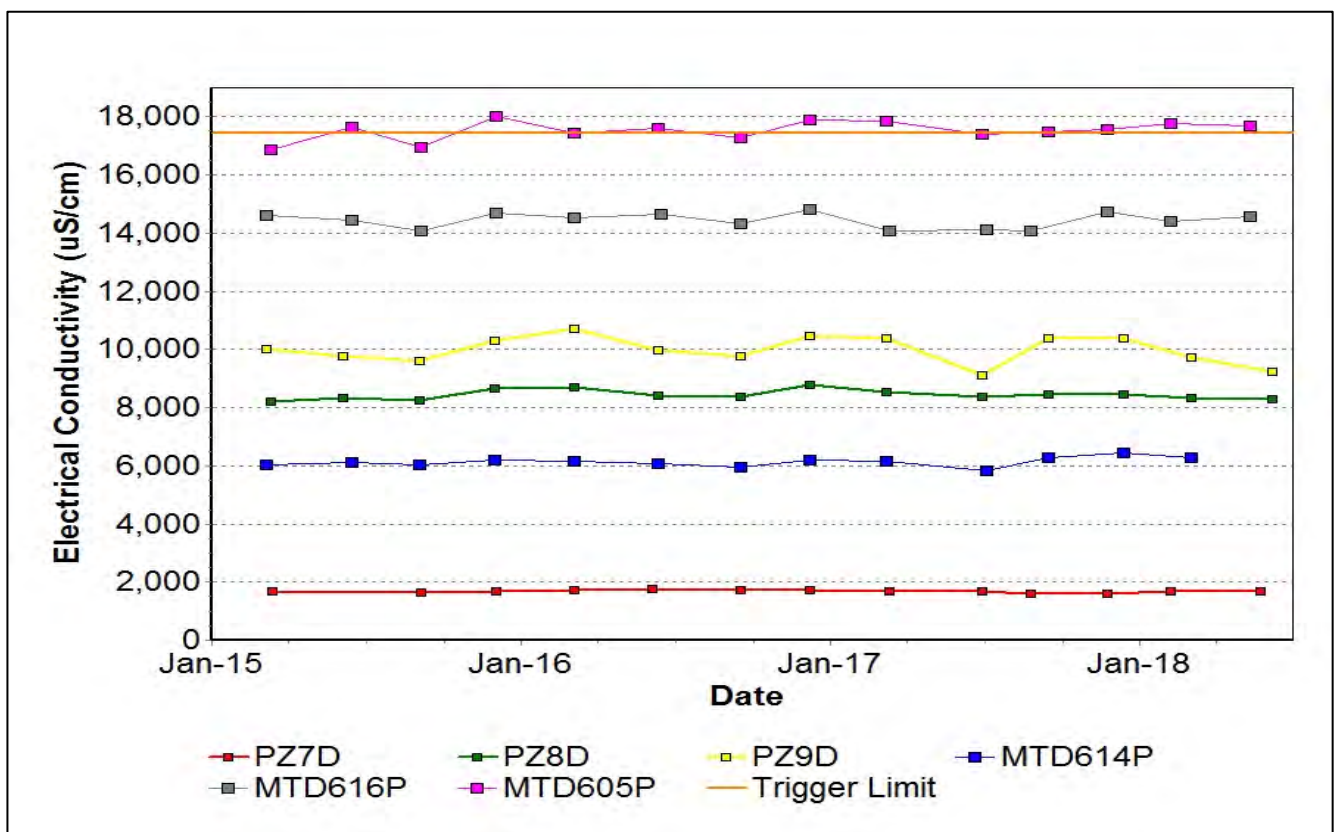


Figure 28: Shallow Overburden Seam Electrical Conductivity Trend – June 2018

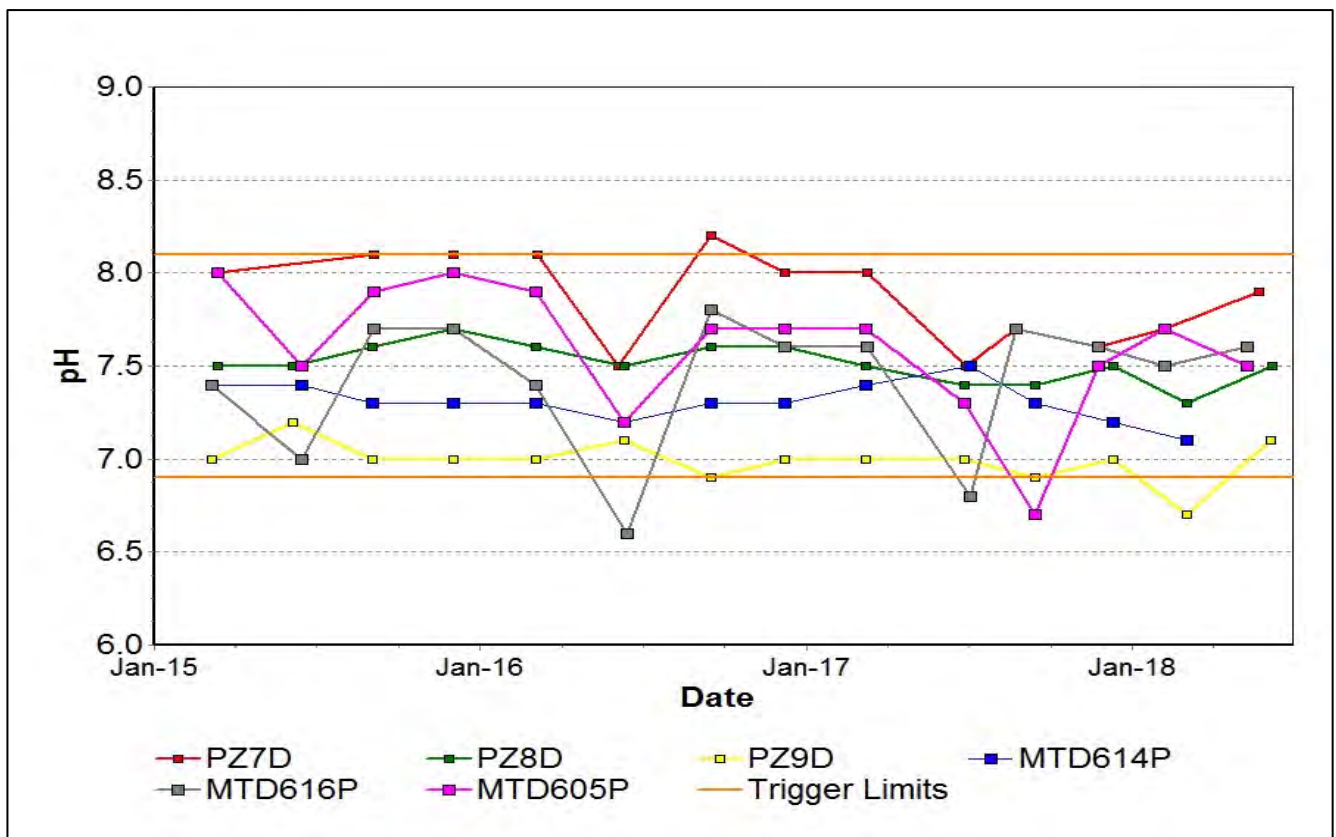


Figure 29: Shallow Overburden Seam pH Trend – June 2018

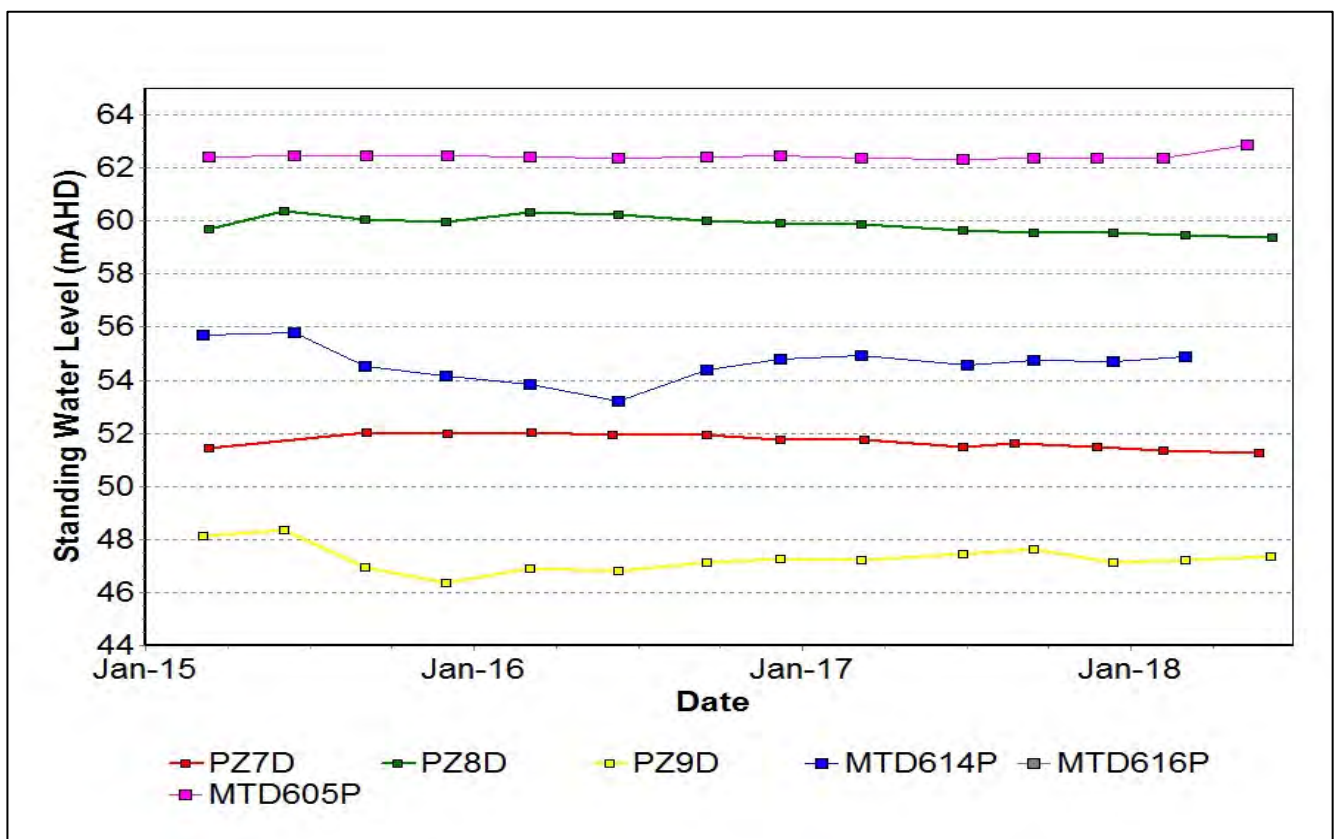


Figure 30: Shallow Overburden Seam Standing Water Level Trend – June 2018



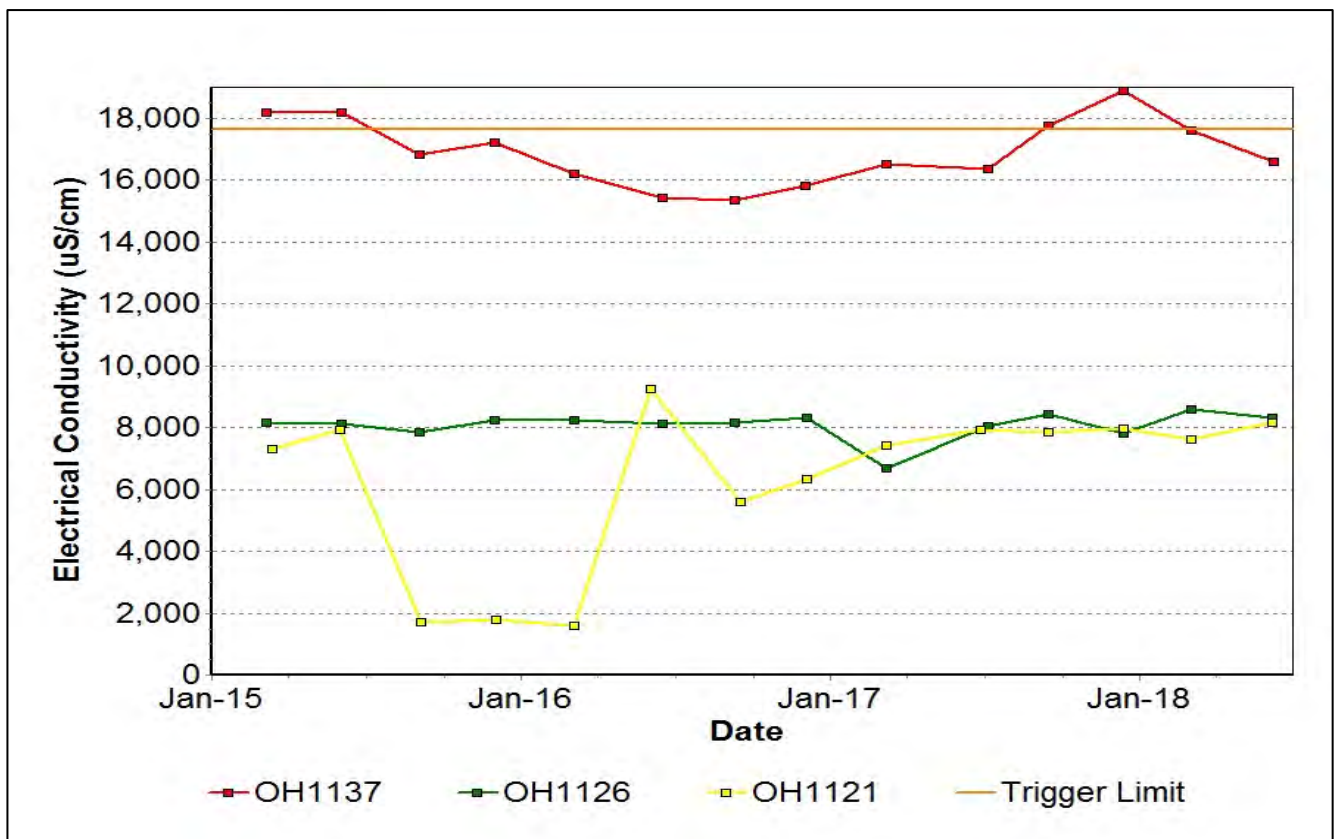


Figure 31: Vaux Seam Electrical Conductivity Trend – June 2018

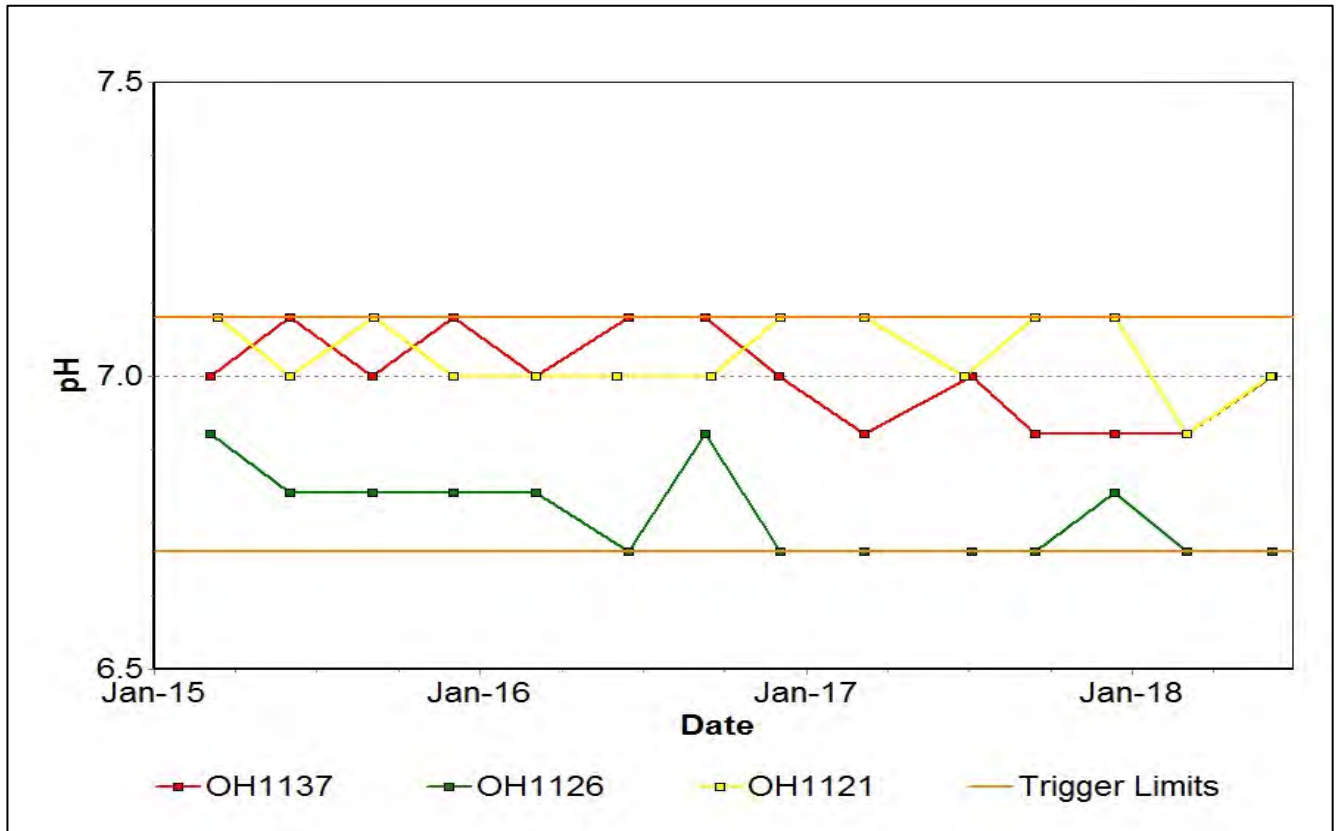


Figure 32: Vaux Seam pH Trend – June 2018

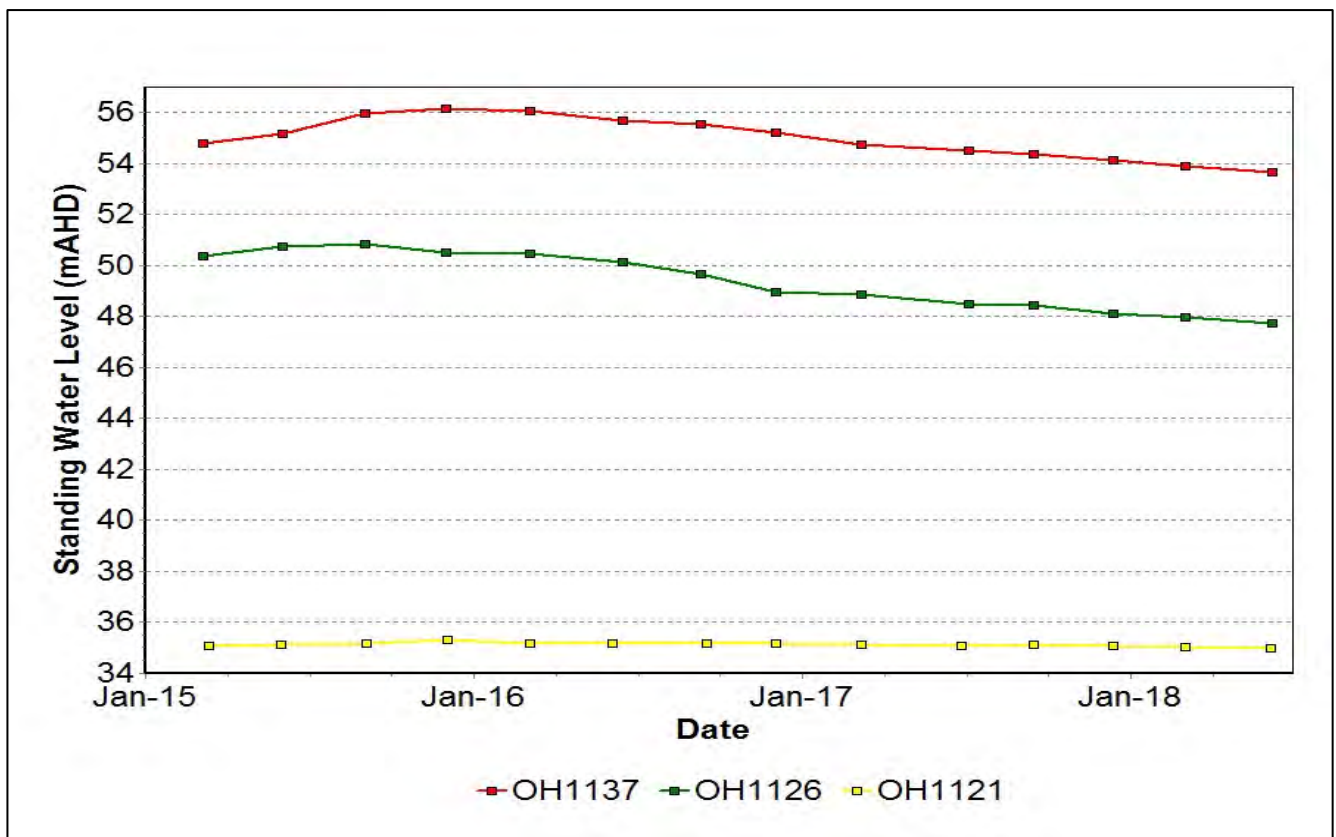


Figure 33: Vaux Seam Standing Water Level Trend – June 2018

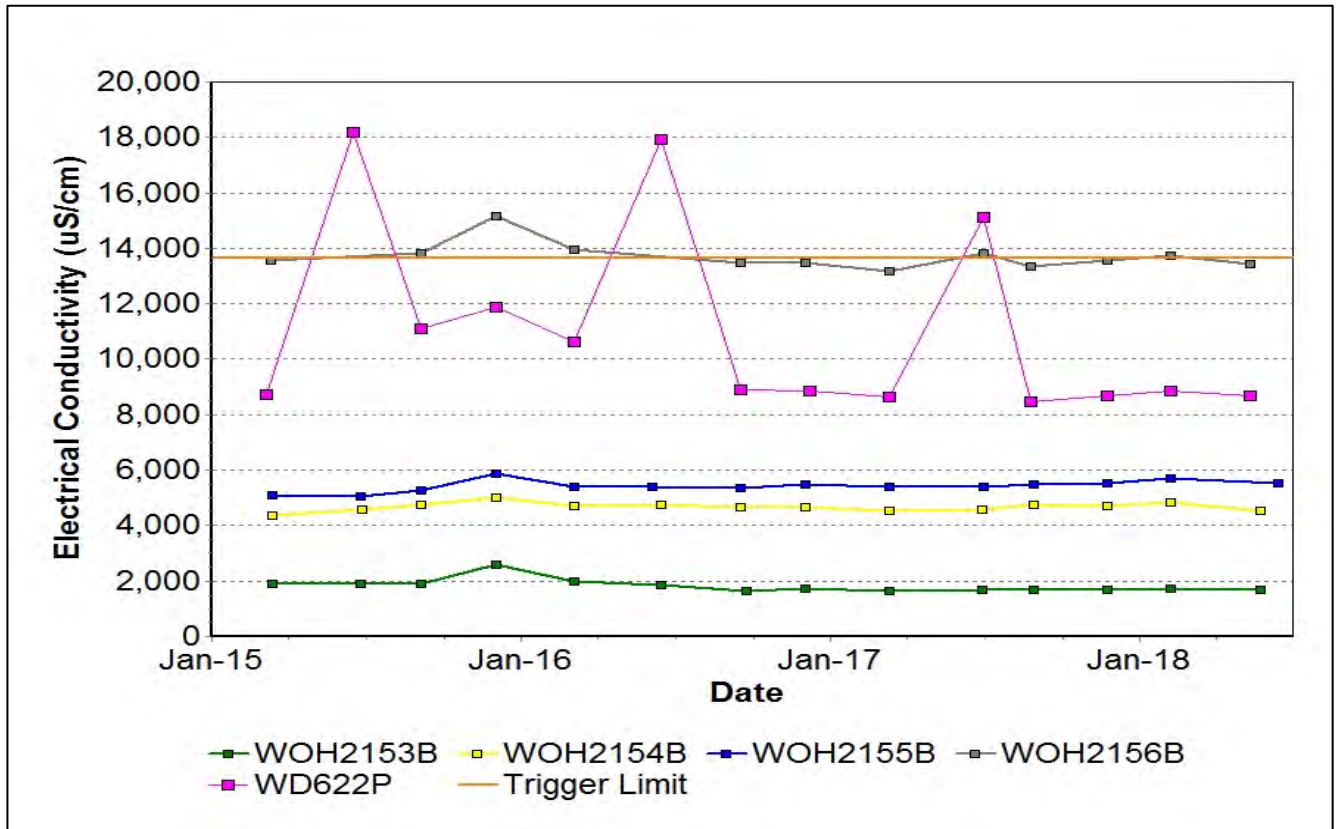


Figure 34: Wambo Seam Electrical Conductivity Trend – June 2018

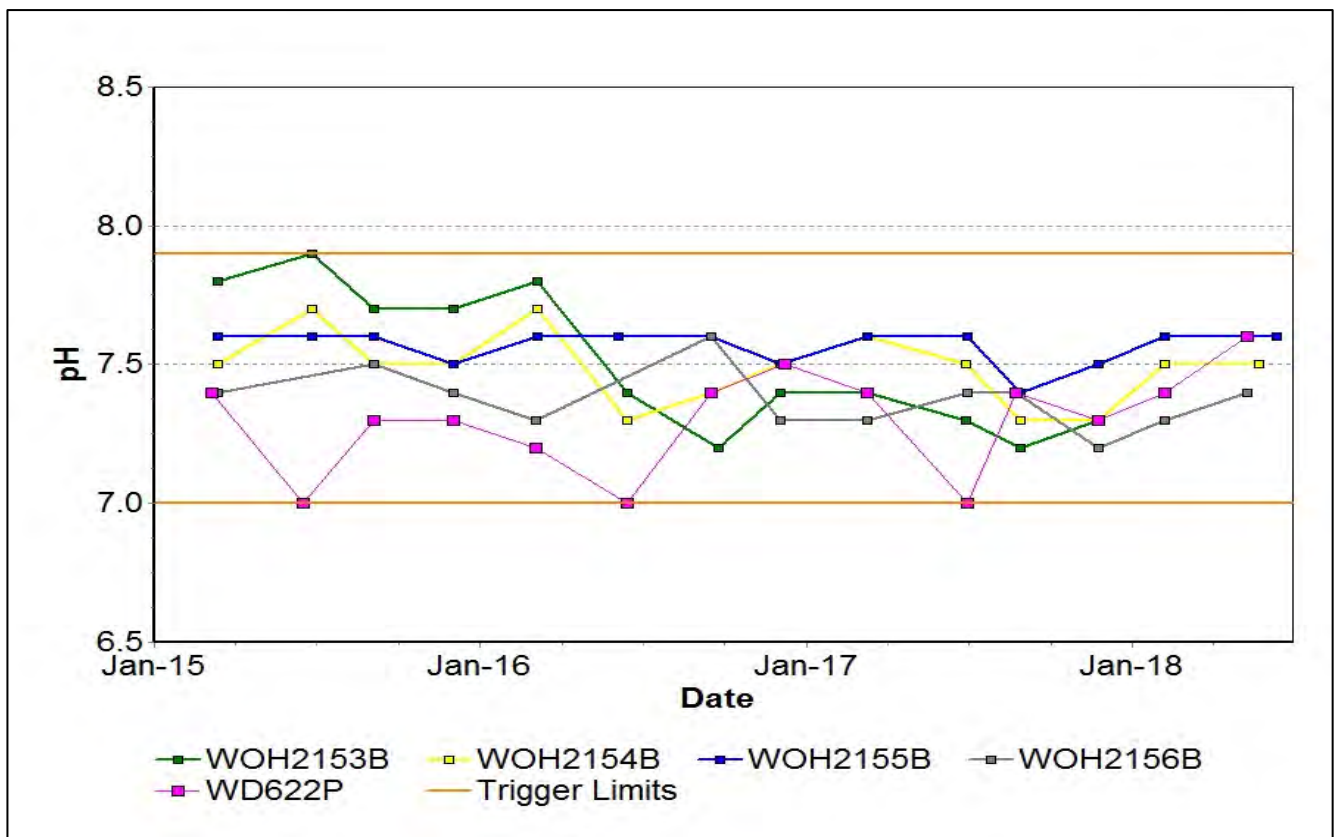


Figure 35: Wambo Seam pH Trend – June 2018

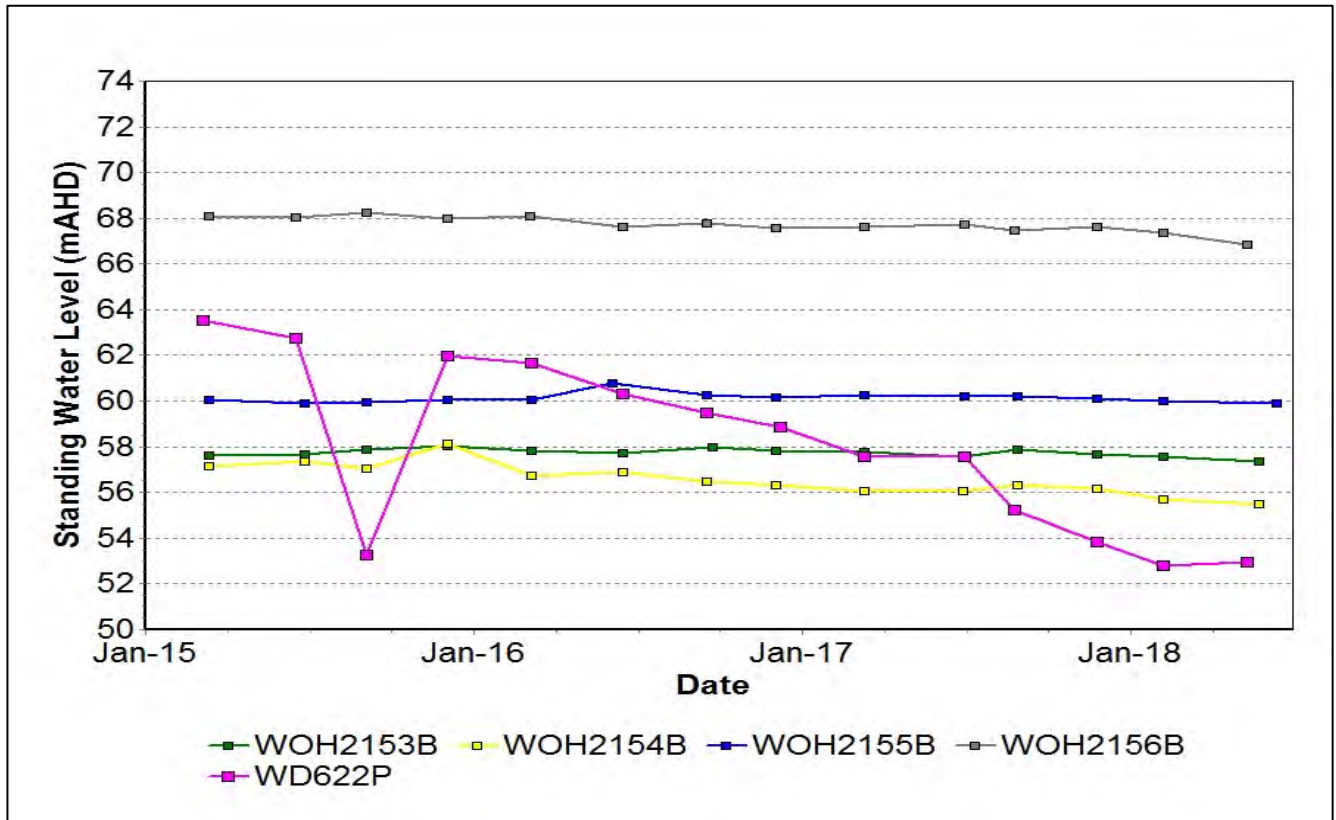


Figure 36: Wambo Seam Standing Water Level Trend – June 2018

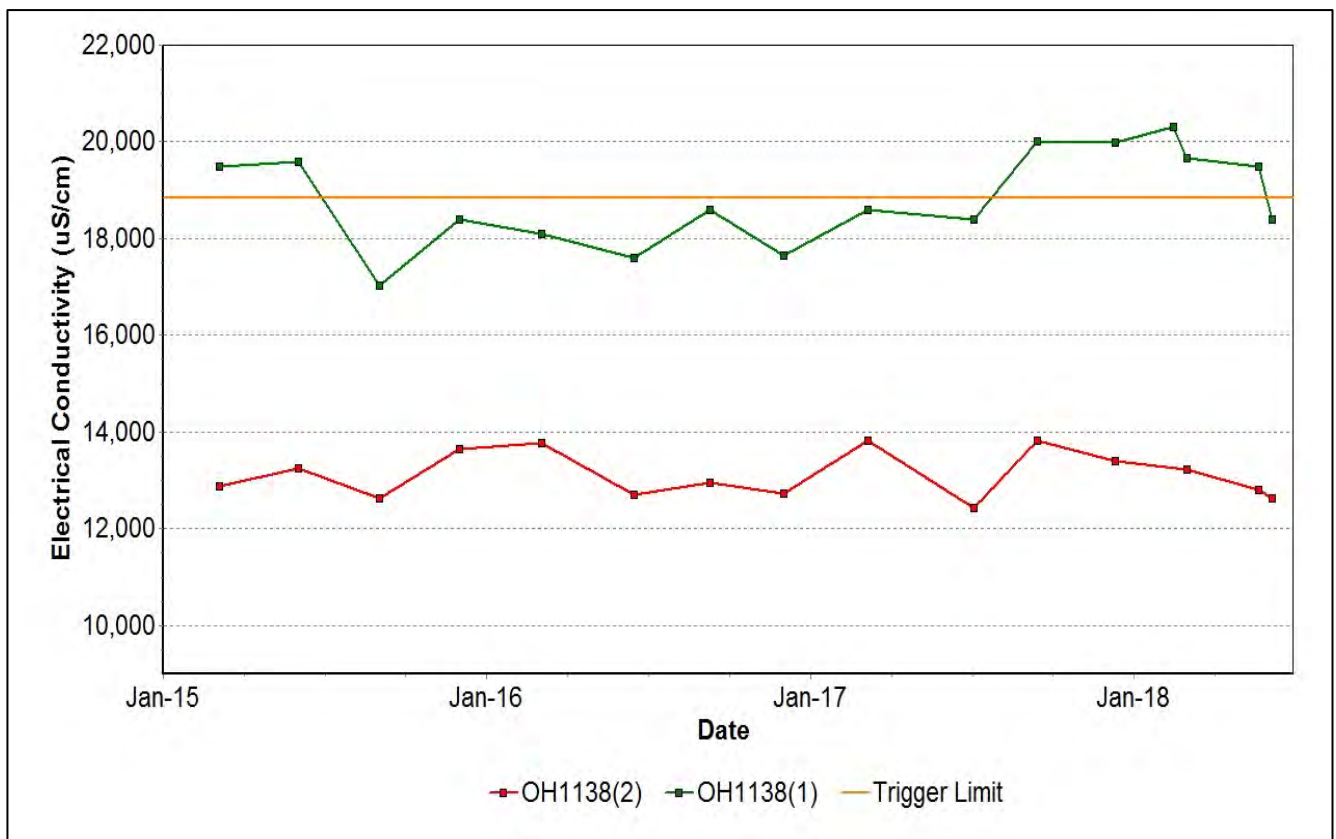


Figure 37: Warkworth Seam Electrical Conductivity Trend – June 2018

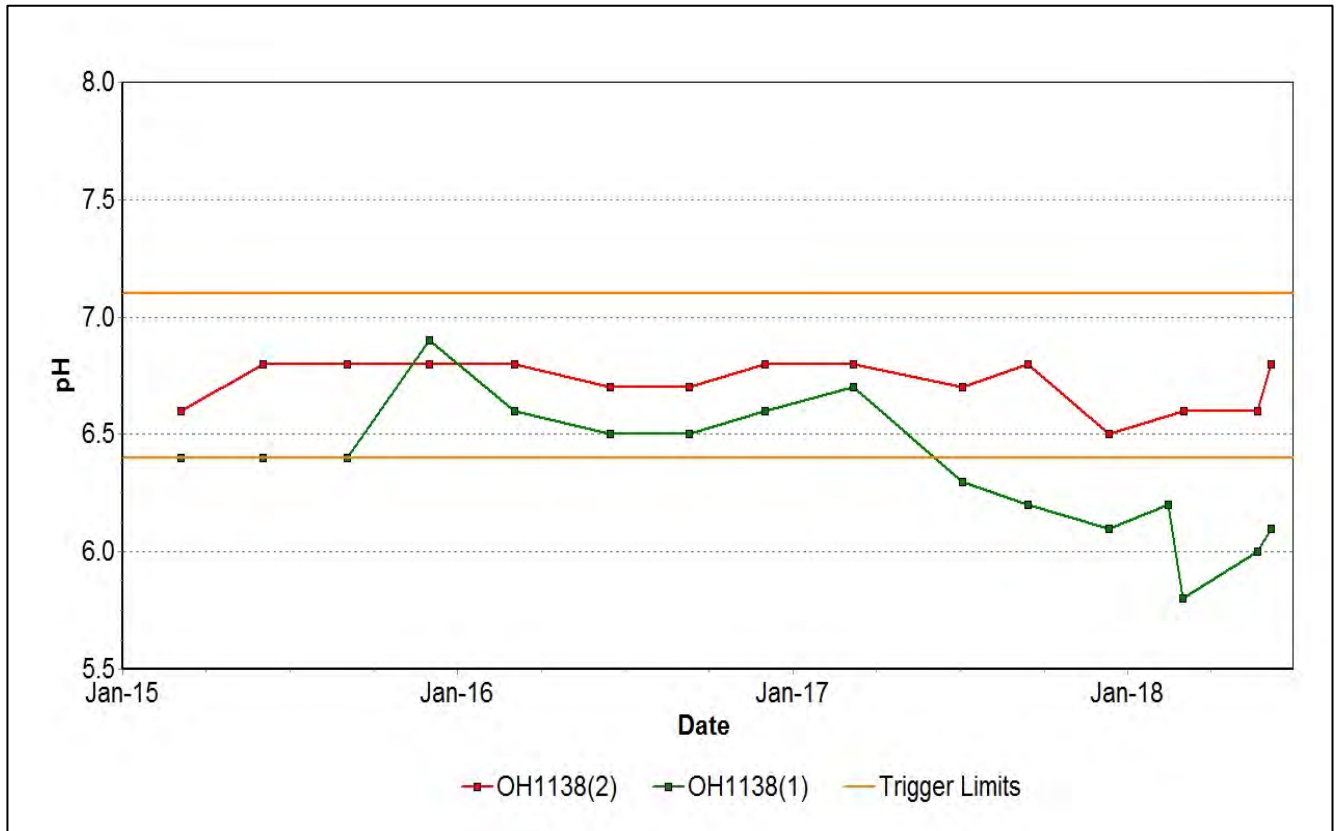


Figure 38: Warkworth Seam pH Trend – June 2018



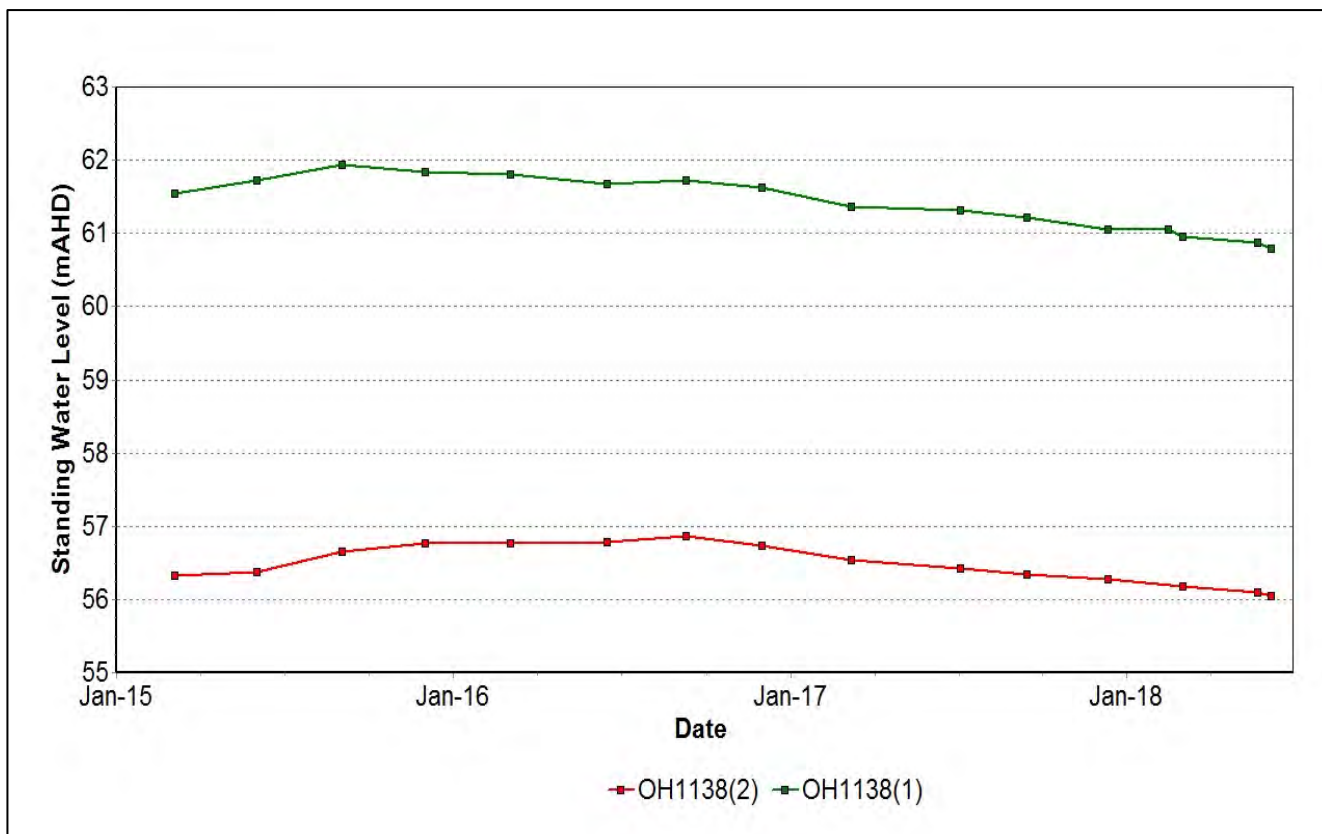


Figure 39: Warkworth Seam Standing Water Level Trend – June 2018

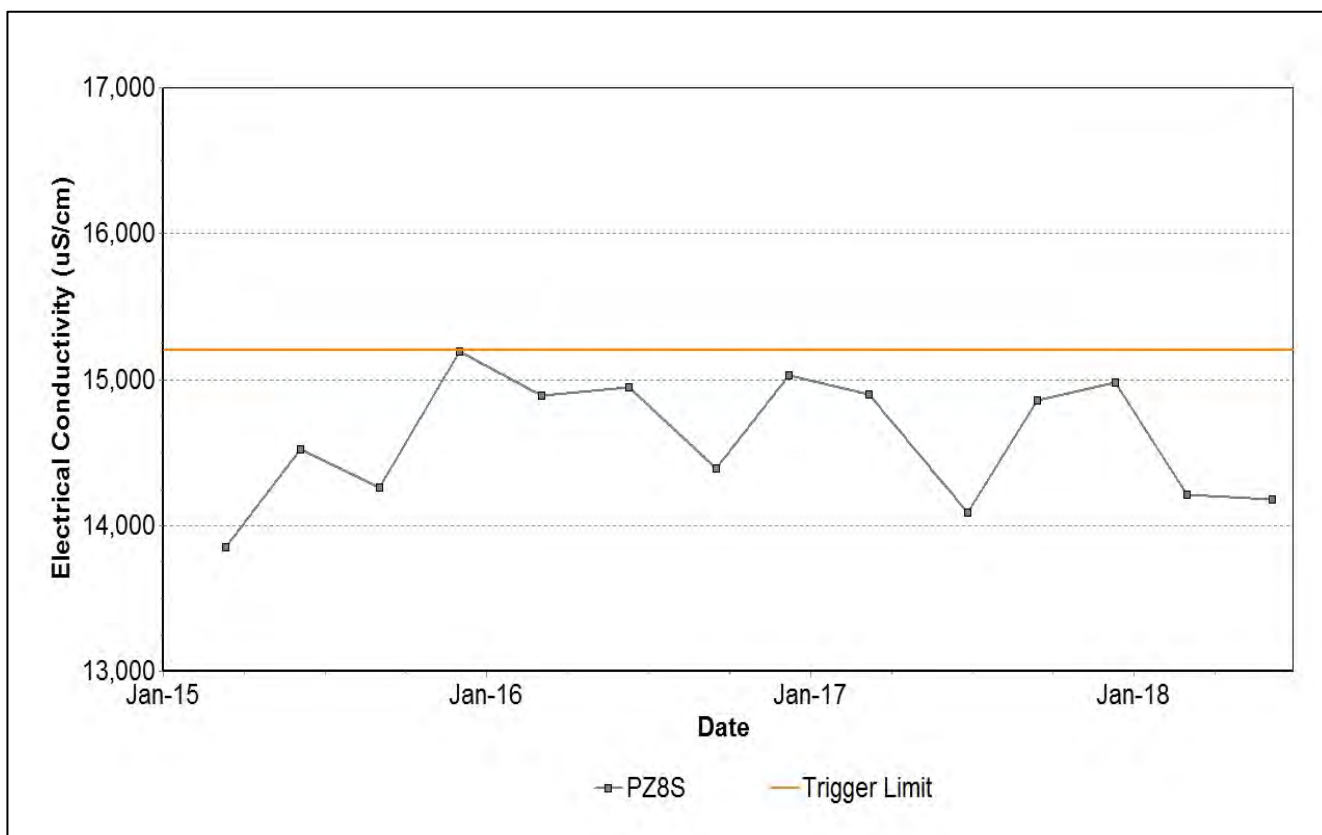


Figure 40: Wollombi Alluvium 1 Electrical Conductivity Trend – June 2018

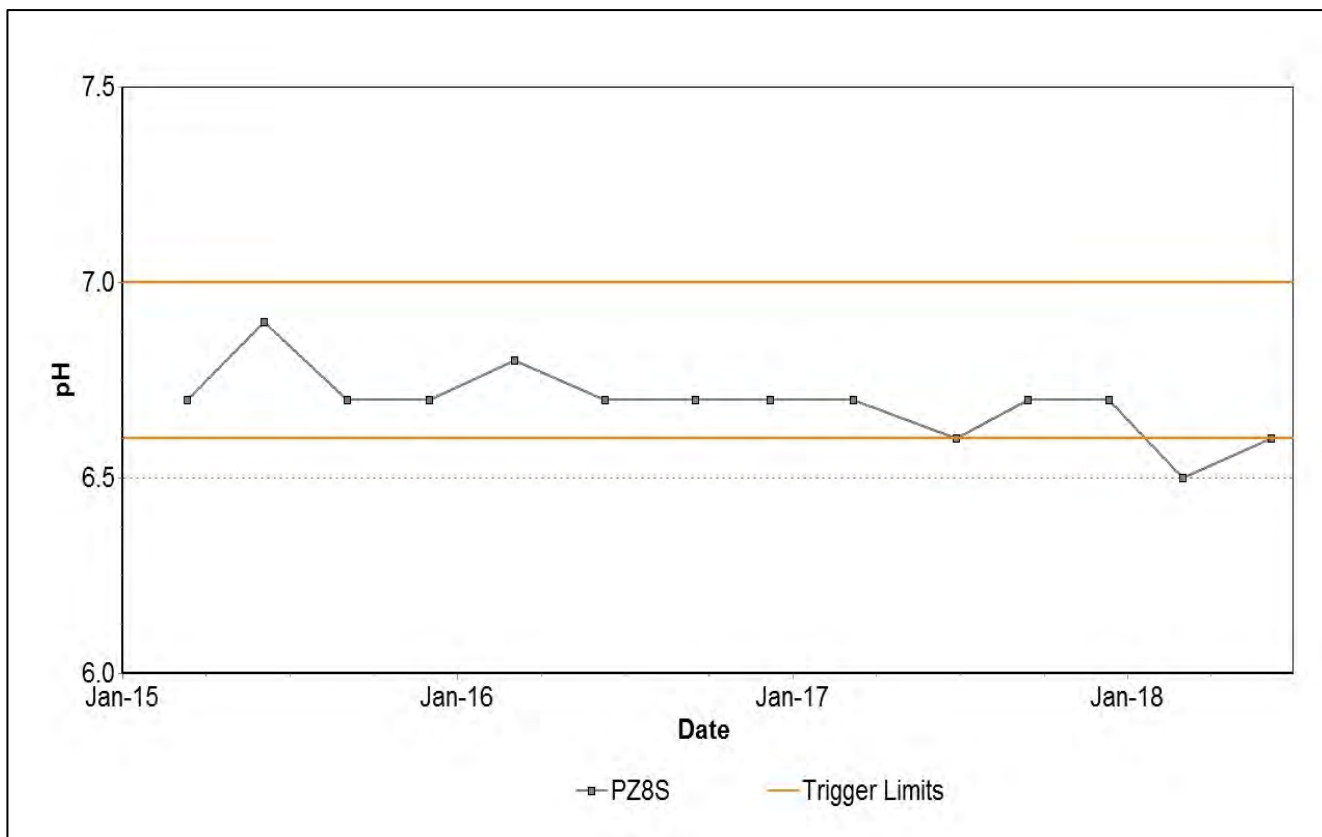


Figure 41: Wollombi Alluvium 1 pH Trend – June 2018

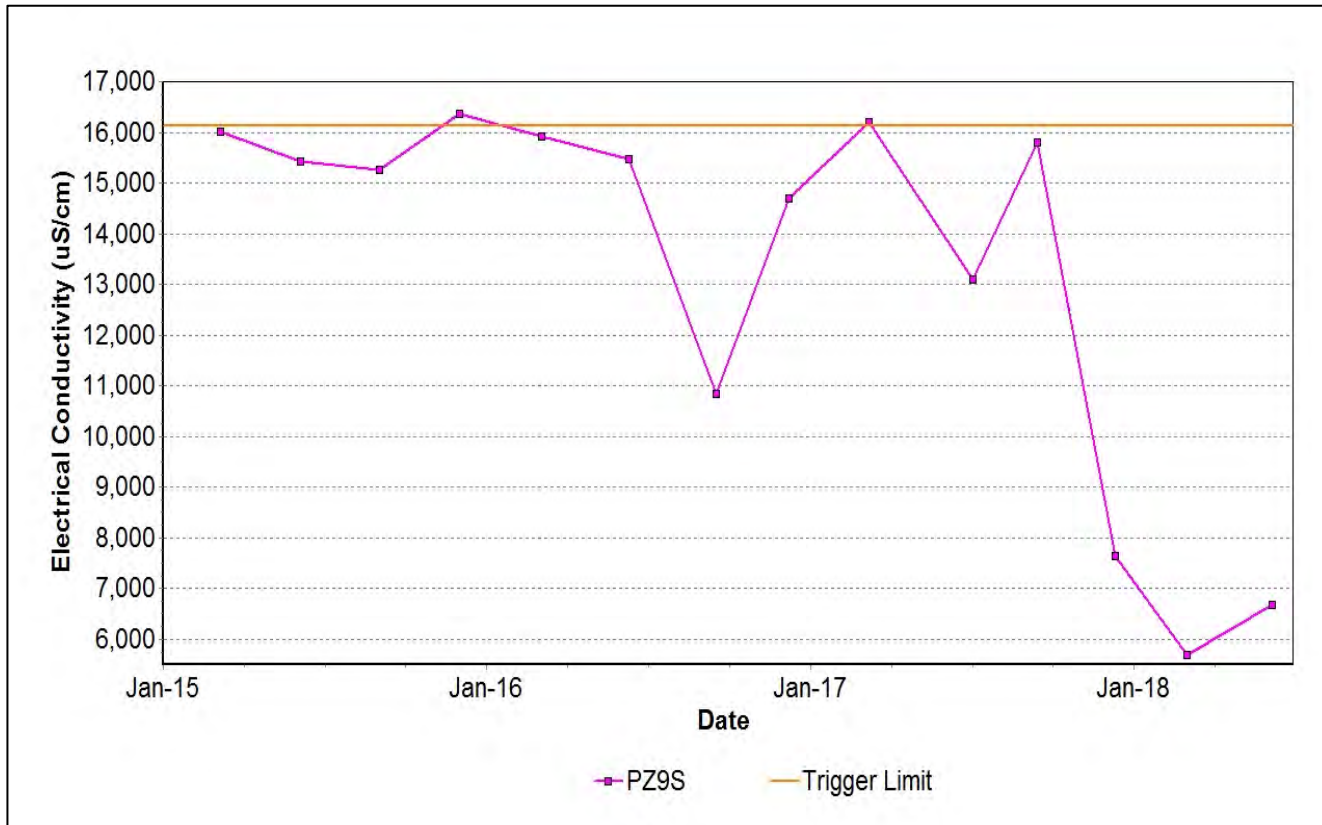


Figure 42: Wollombi Alluvium 2 Electrical Conductivity Trend – June 2018

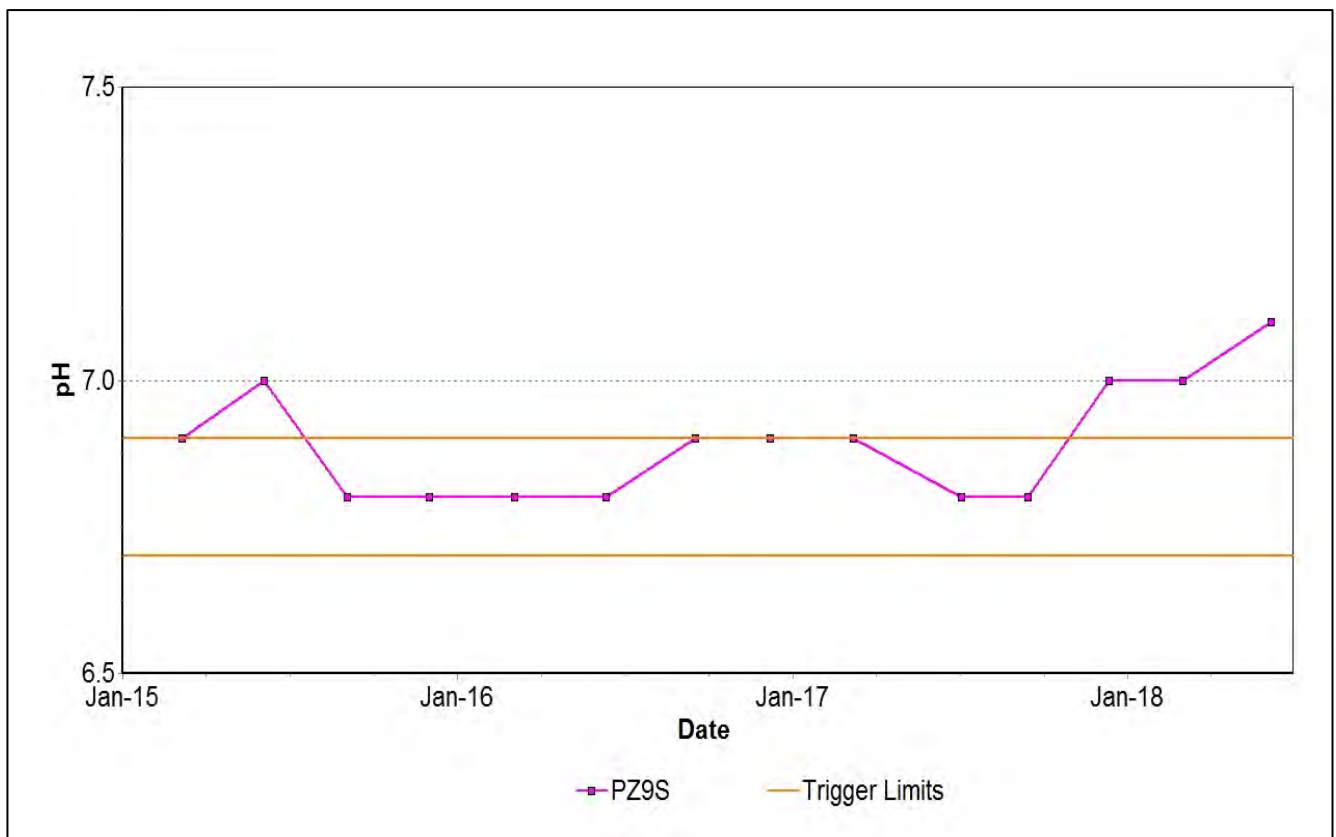


Figure 43: Wollombi Alluvium 2 pH Trend – June 2018

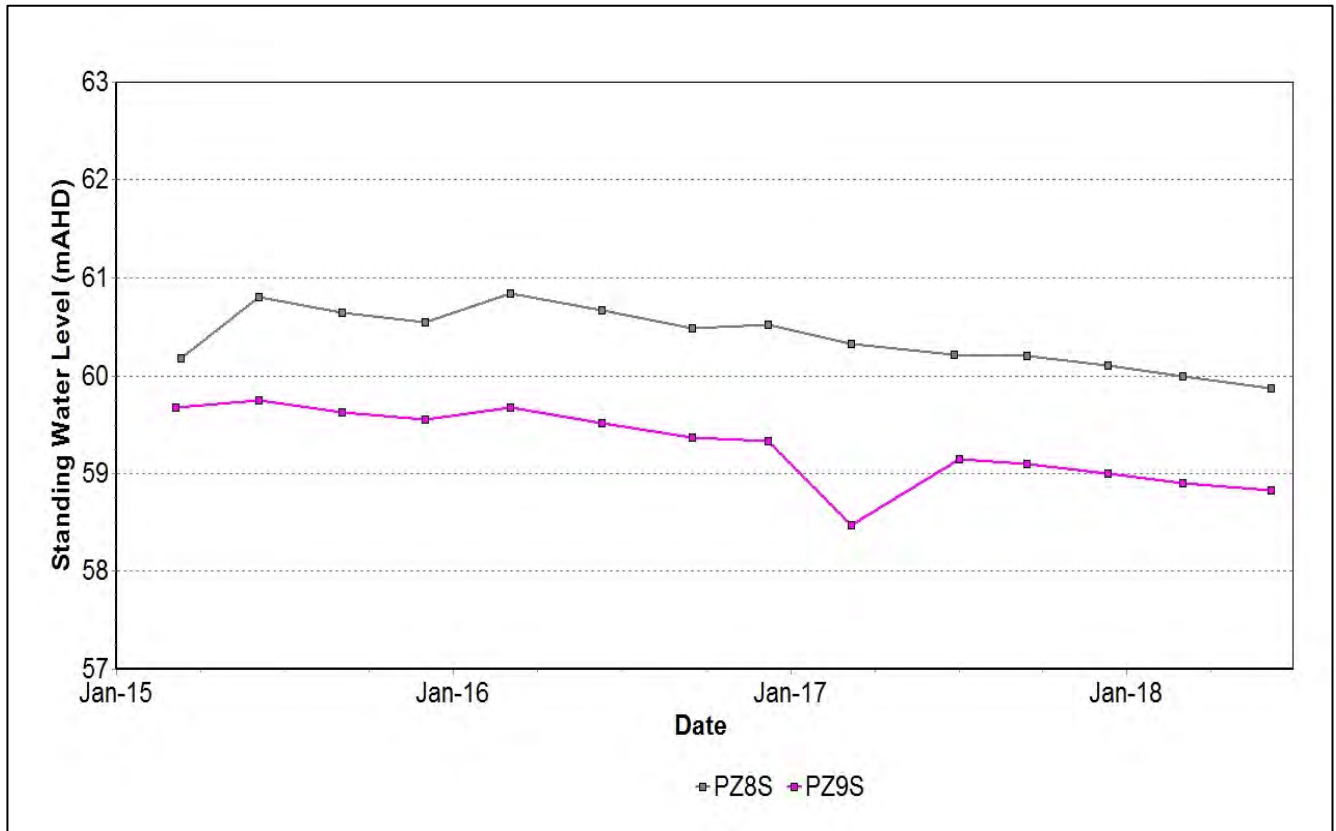


Figure 44: Wollombi Alluvium Standing Water Level Trend – June 2018

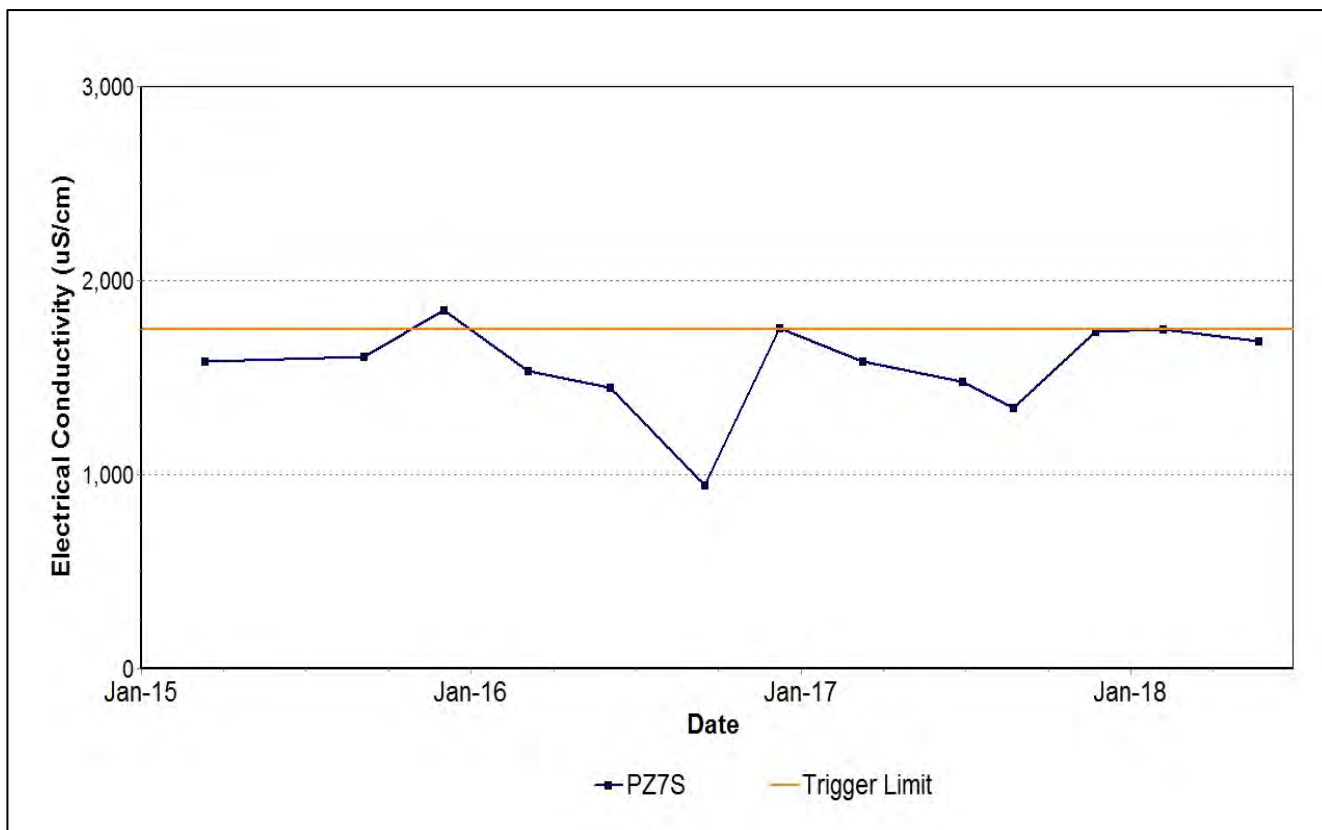


Figure 45: Aeolian Warkworth Sands Electrical Conductivity Trend – June 2018

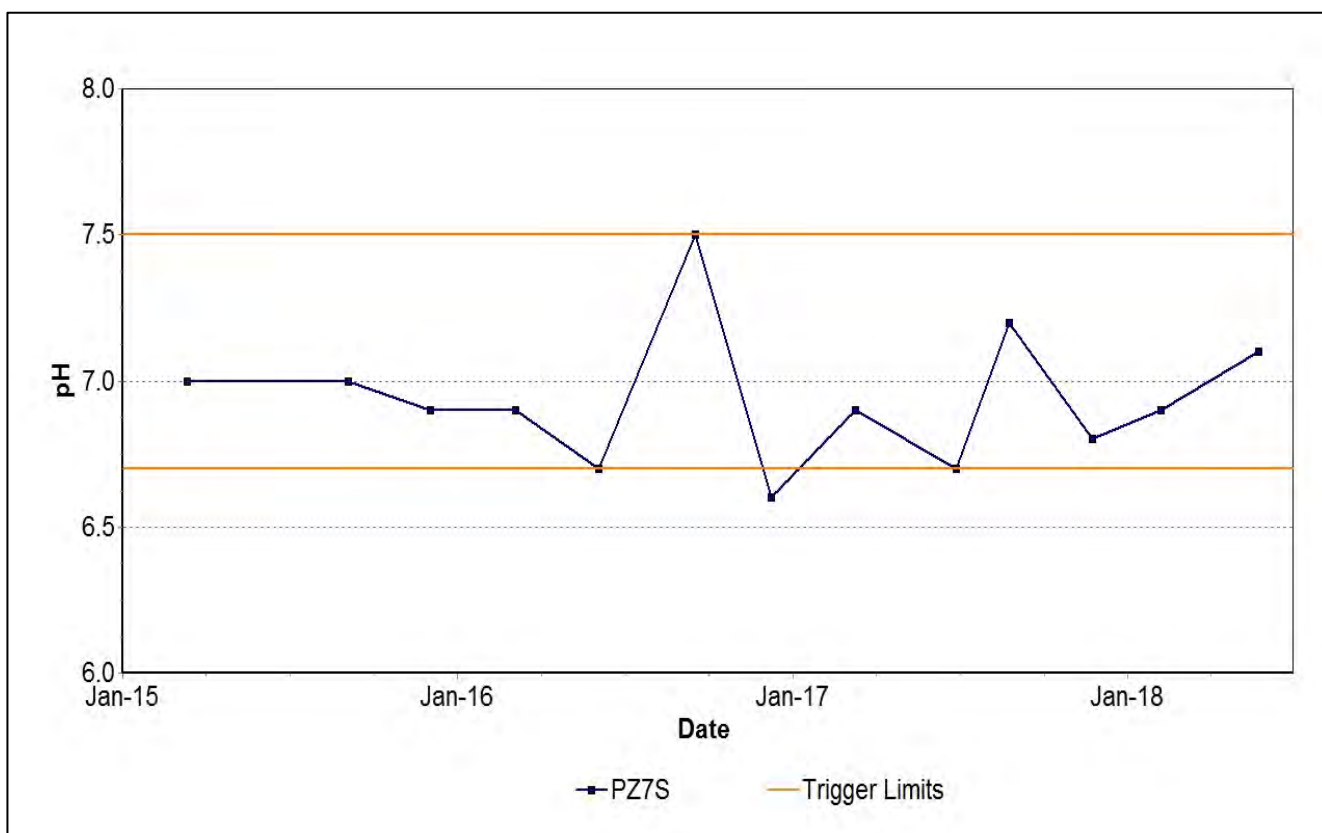


Figure 46: Aeolian Warkworth Sands pH Trend – June 2018



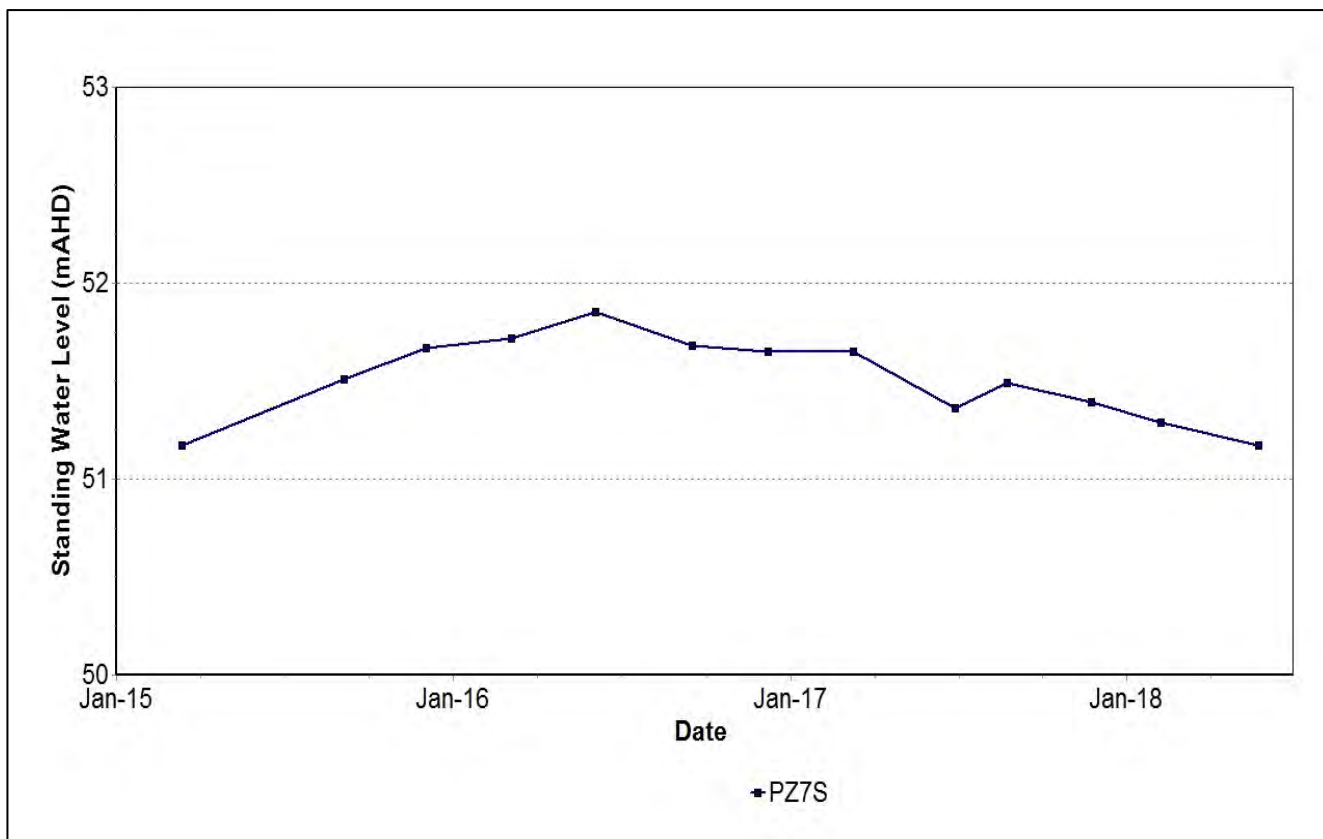


Figure 47: Aeolian Warkworth Sands Standing Water Level Trend – June 2018

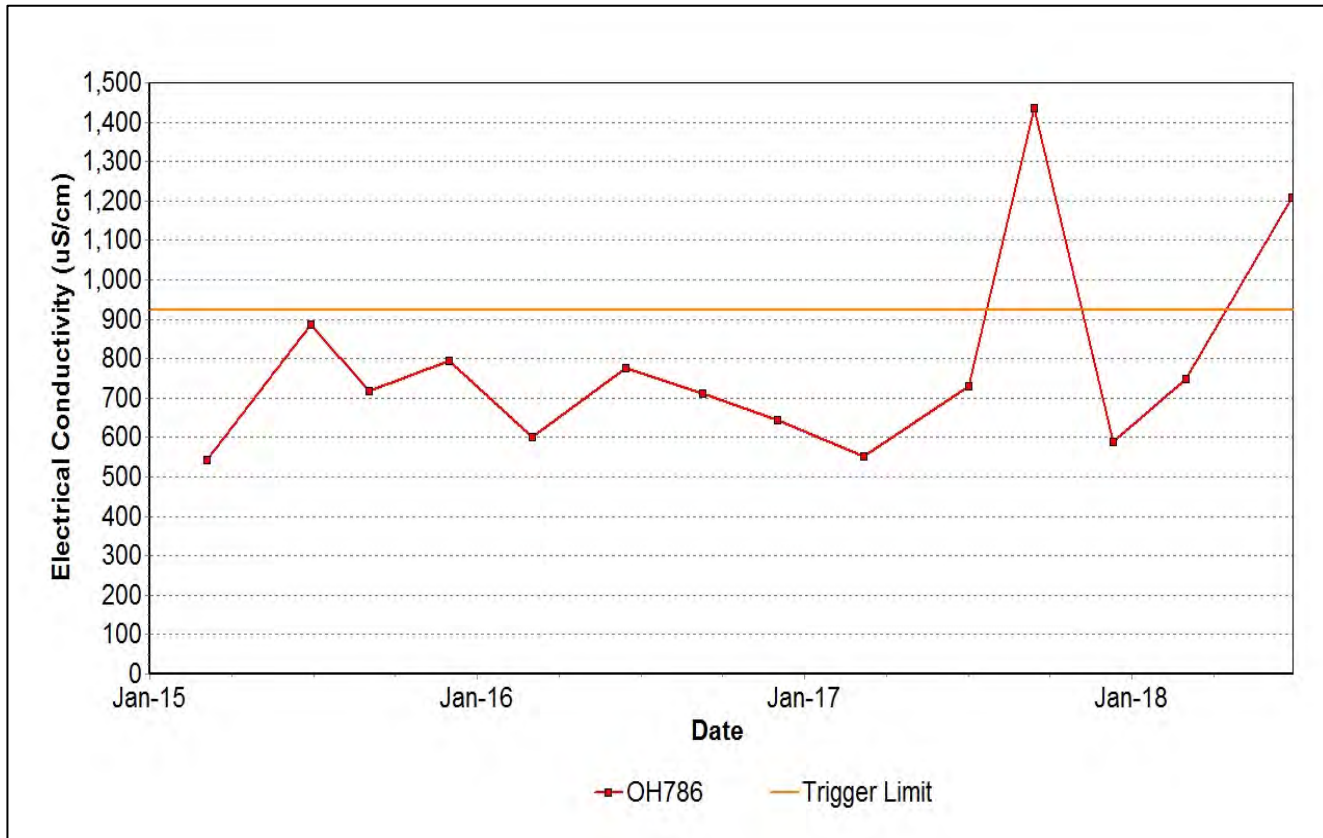


Figure 48: Hunter River Alluvium 1 Seam Electrical Conductivity Trend – June 2018

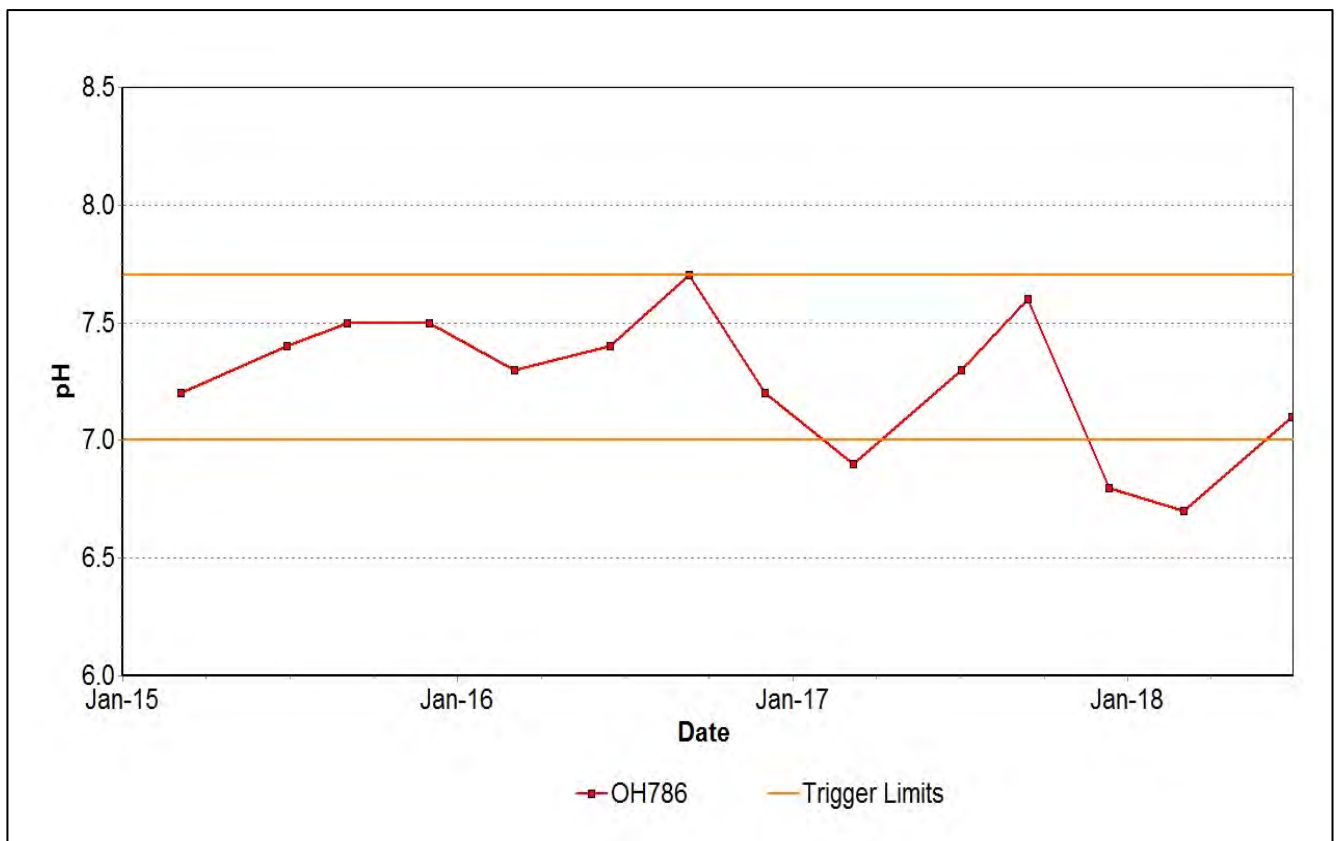


Figure 49: Hunter River Alluvium 1 Seam pH Trend – June 2018

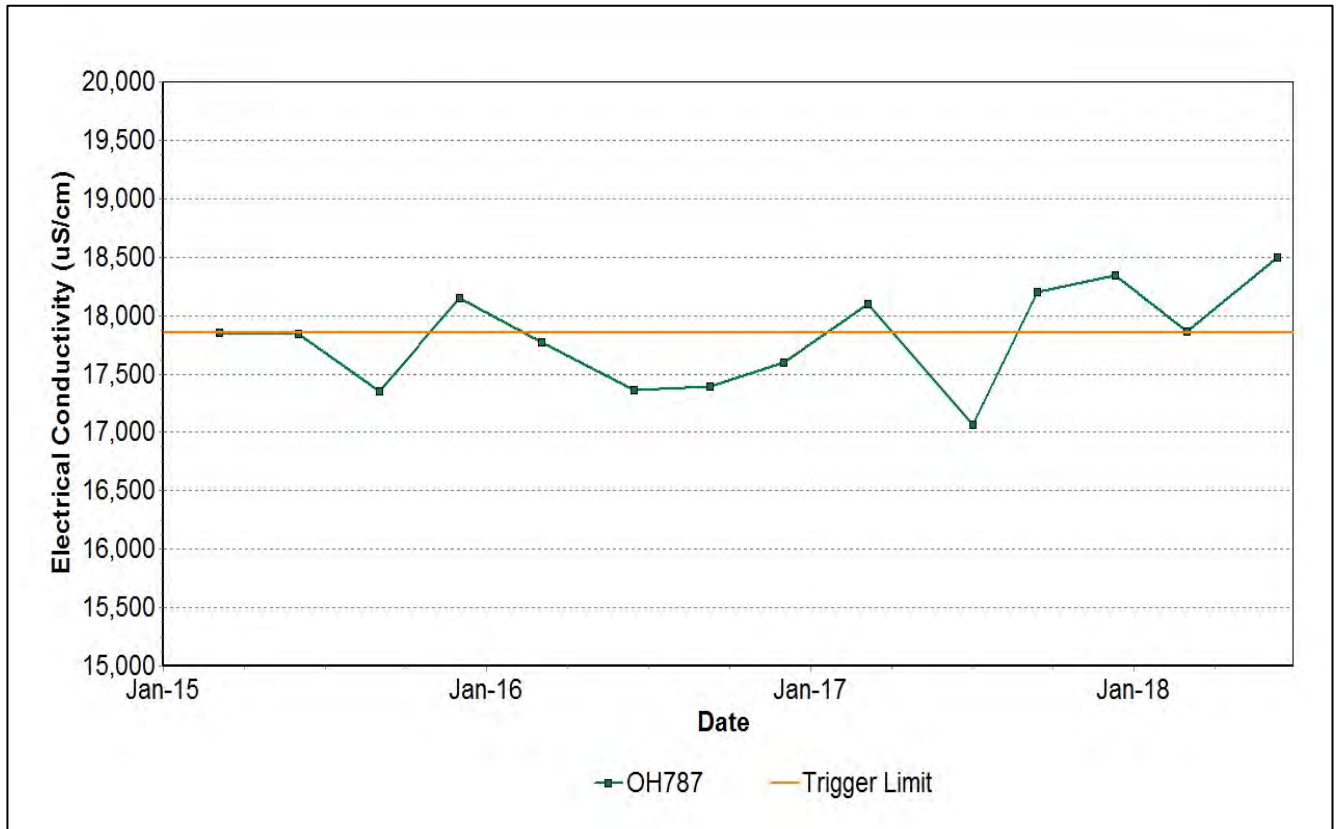


Figure 50: Hunter River Alluvium 2 Seam Electrical Conductivity Trend – June 2018

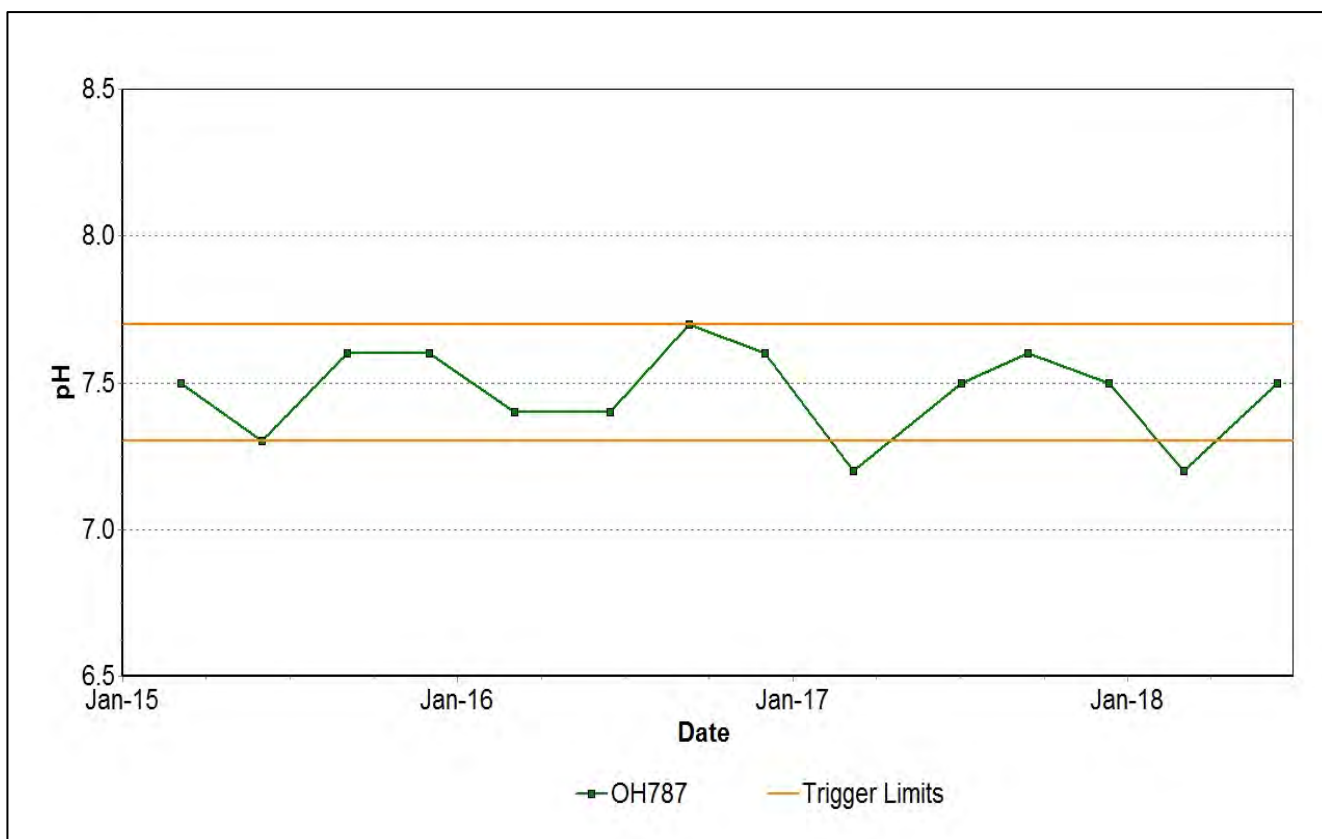


Figure 51: Hunter River Alluvium 2 Seam pH Trend – June 2018

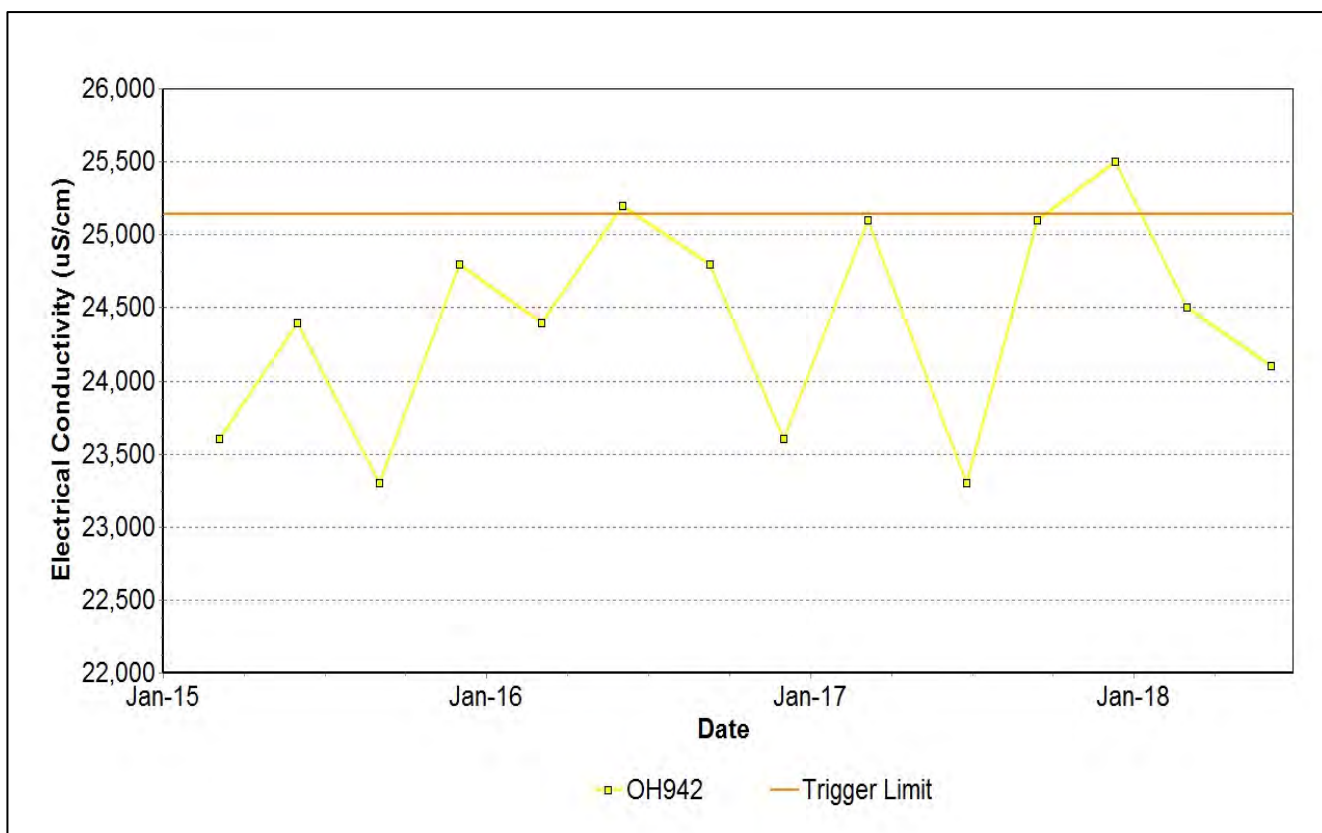


Figure 52: Hunter River Alluvium 3 Seam Electrical Conductivity Trend – June 2018

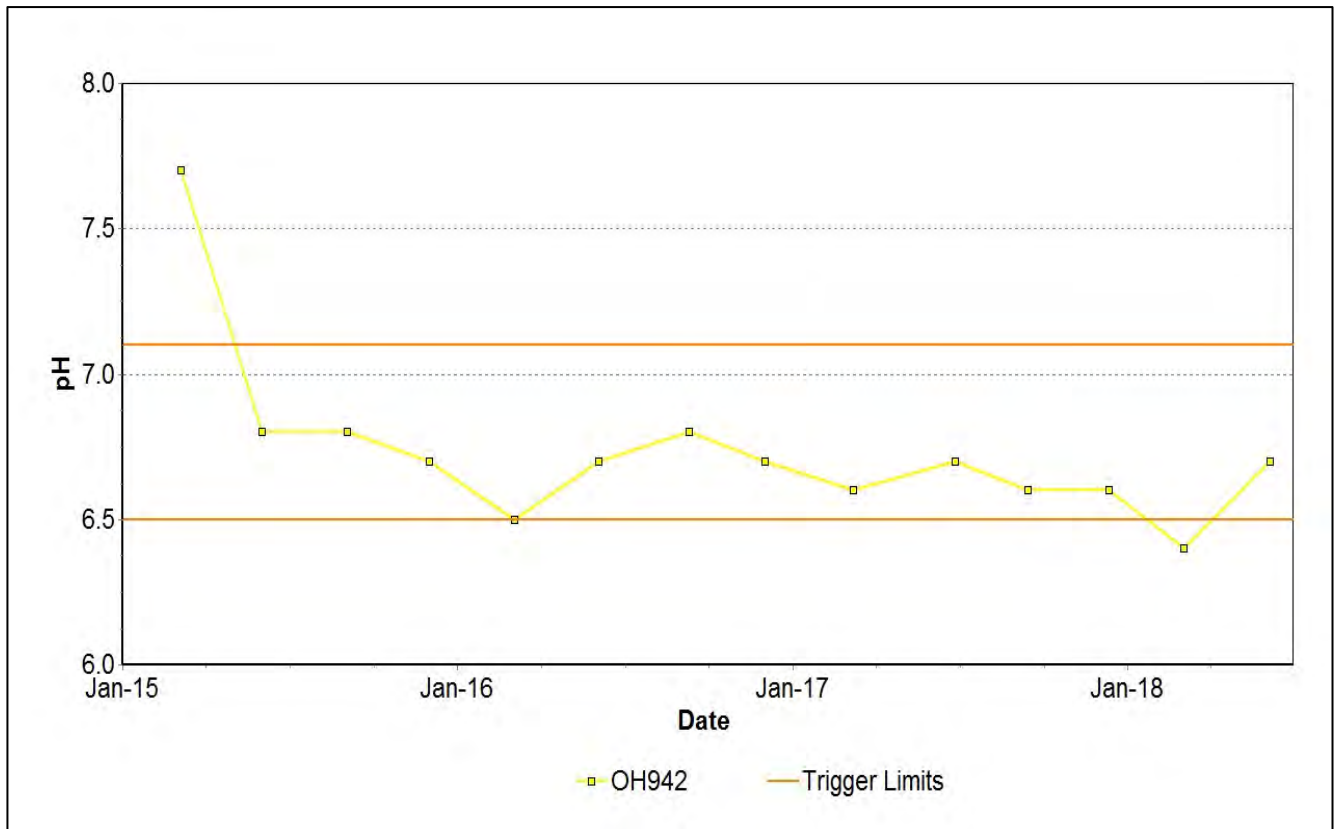


Figure 53: Hunter River Alluvium 3 Seam pH Trend – June 2018

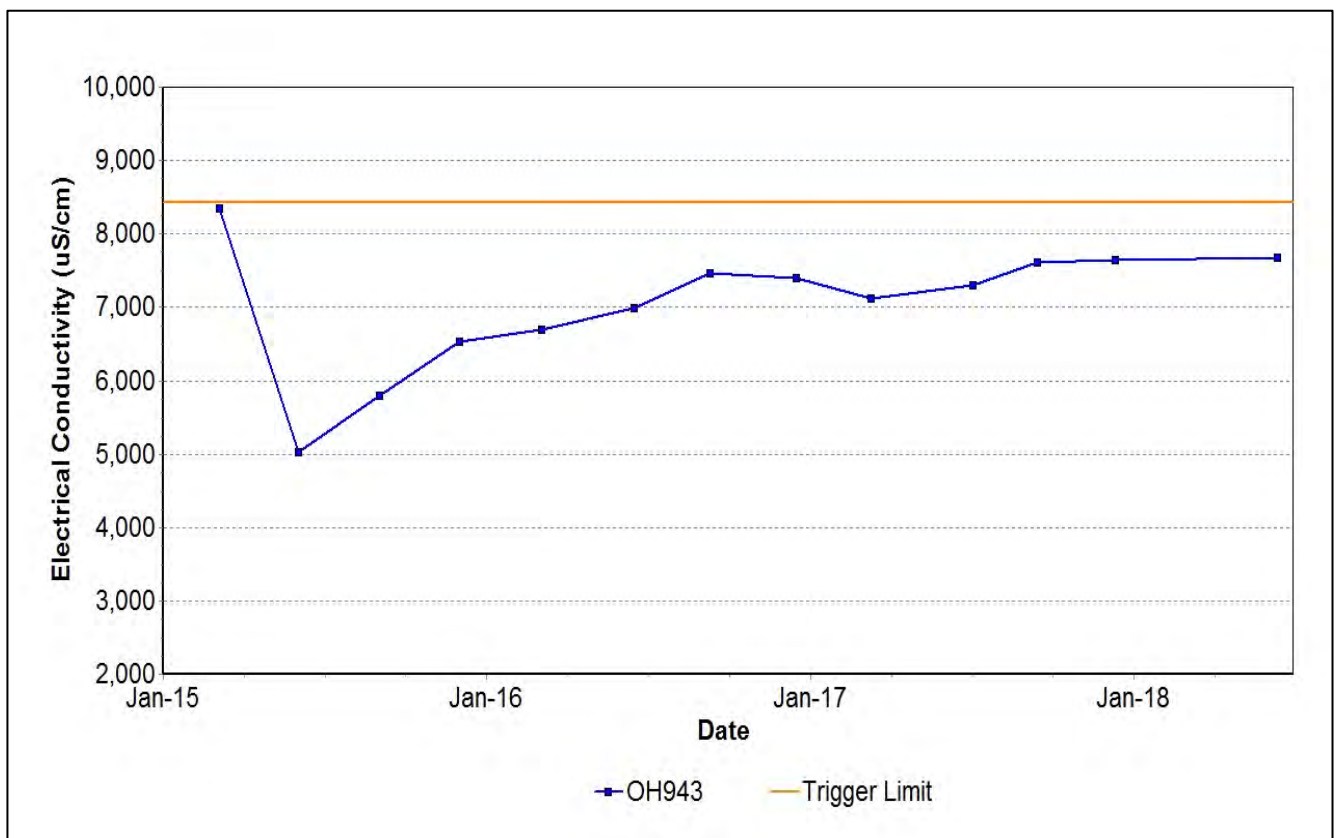


Figure 54: Hunter River Alluvium 4 Seam Electrical Conductivity Trend – June 2018



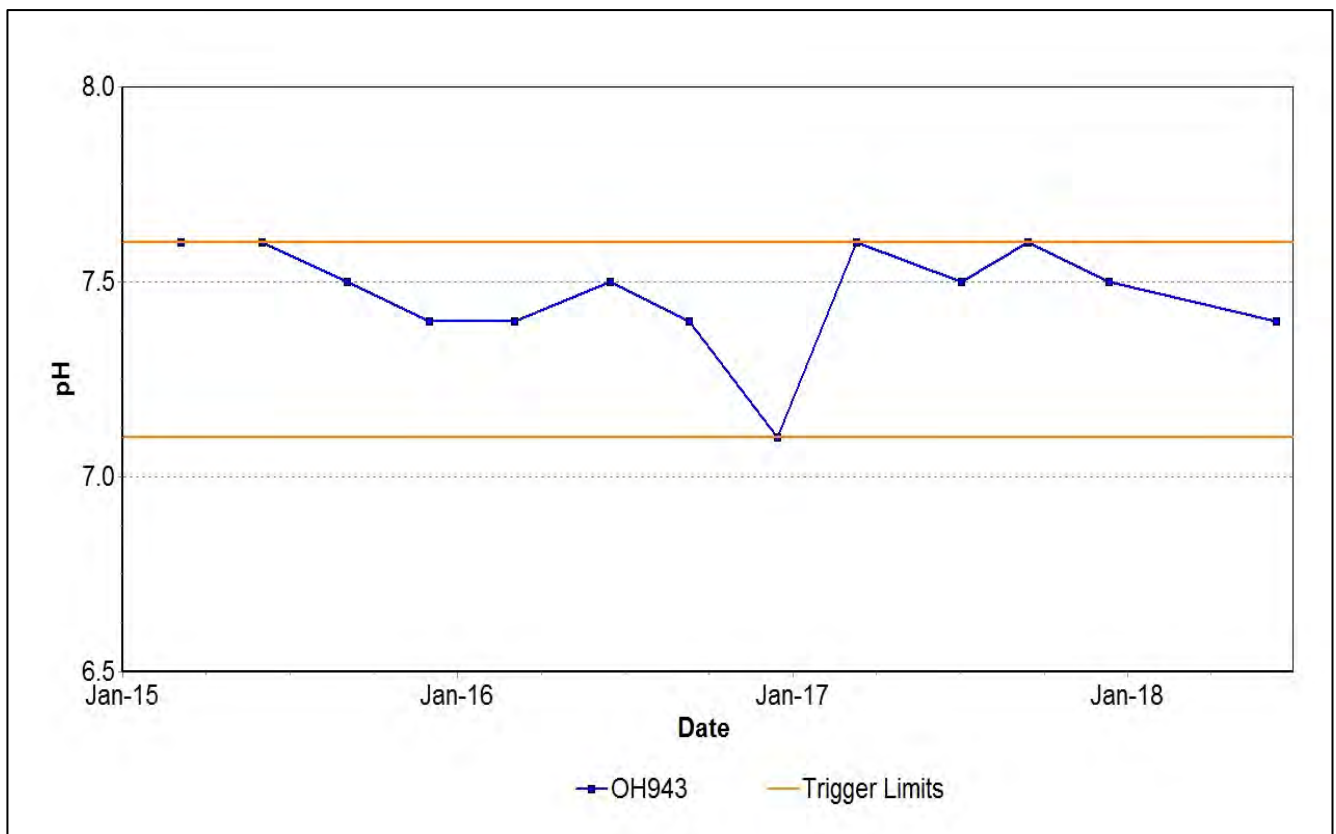
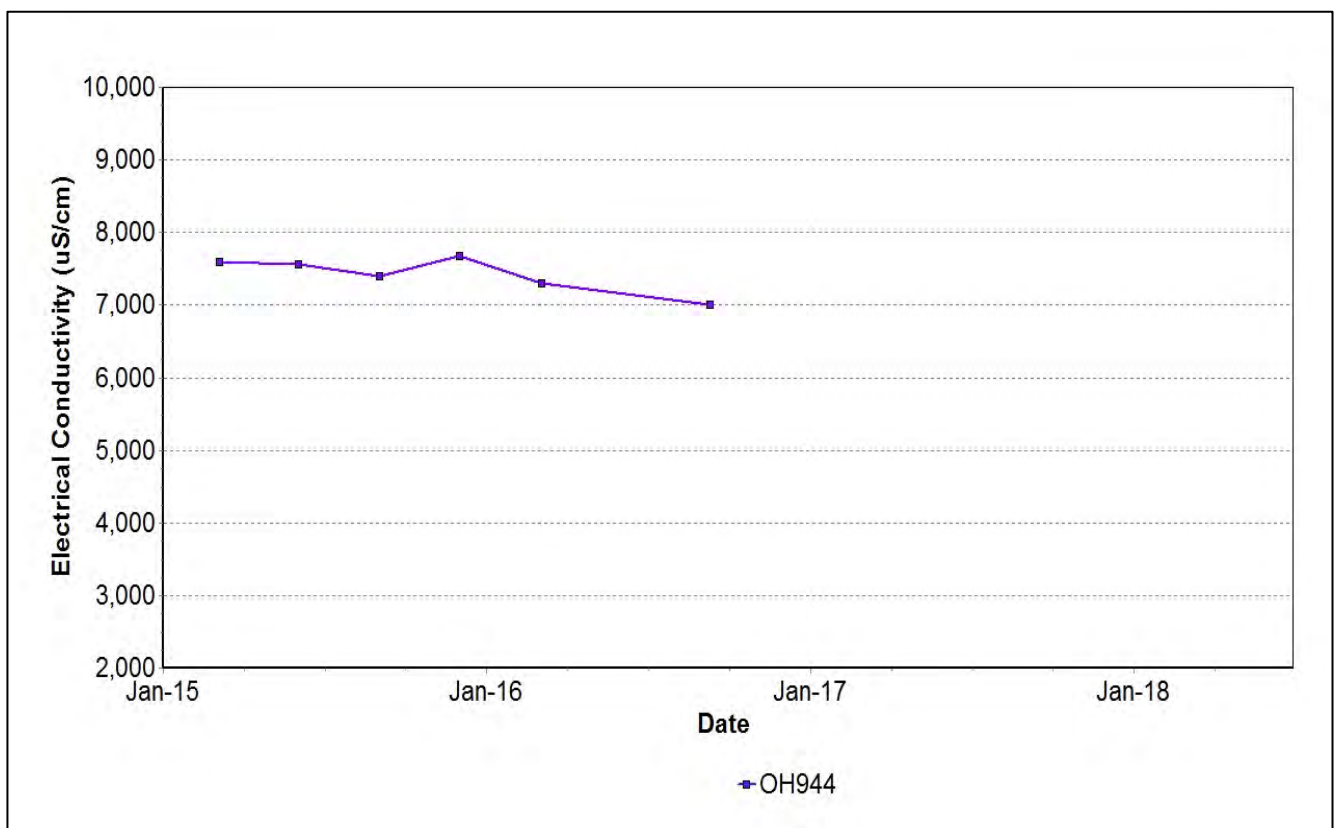
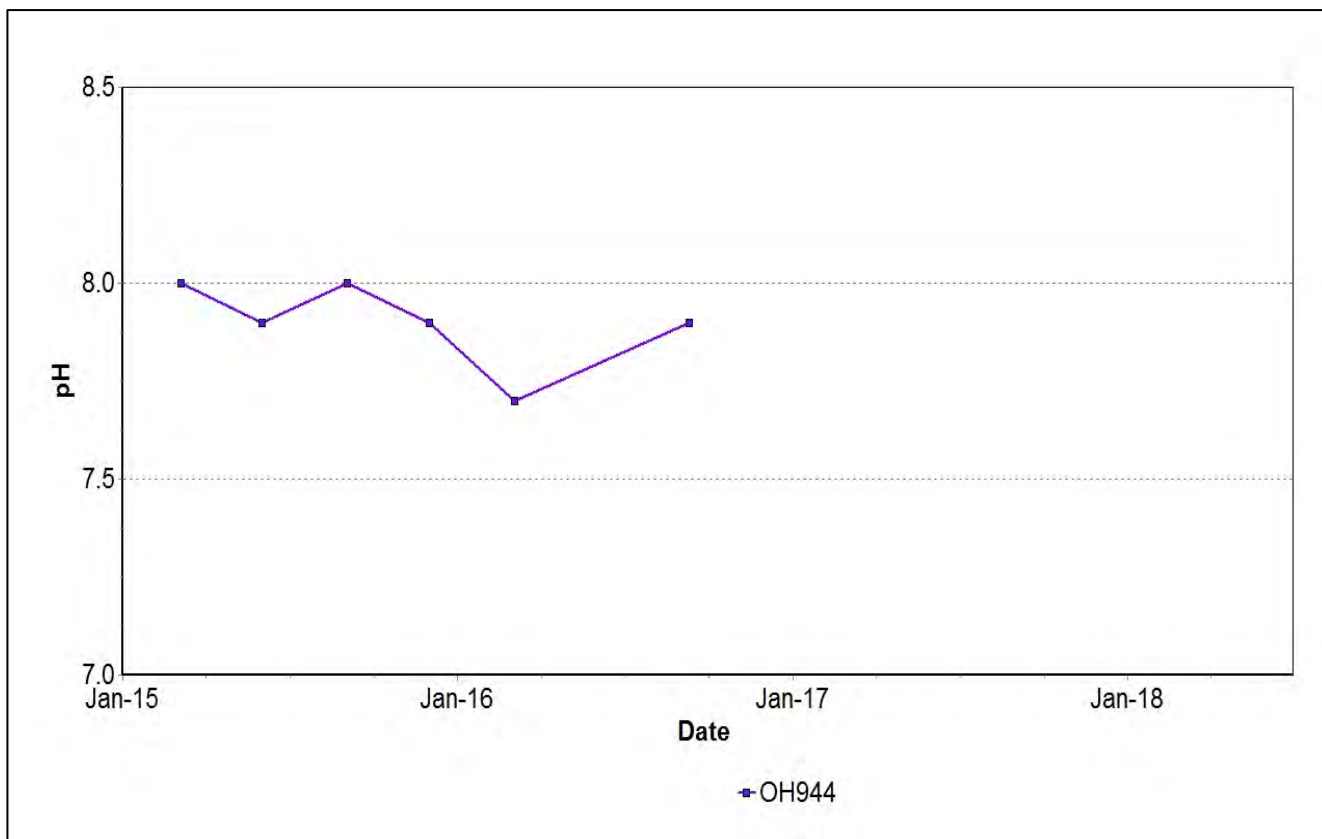


Figure 55: Hunter River Alluvium 4 Seam pH Trend – June 2018



Note: There has been insufficient water to sample since September 2016.

Figure 56: Hunter River Alluvium 5 Seam Electrical Conductivity Trend – June 2018



Note: There has been insufficient water to sample since September 2016.

Figure 57: Hunter River Alluvium 5 Seam pH Trend – June 2018

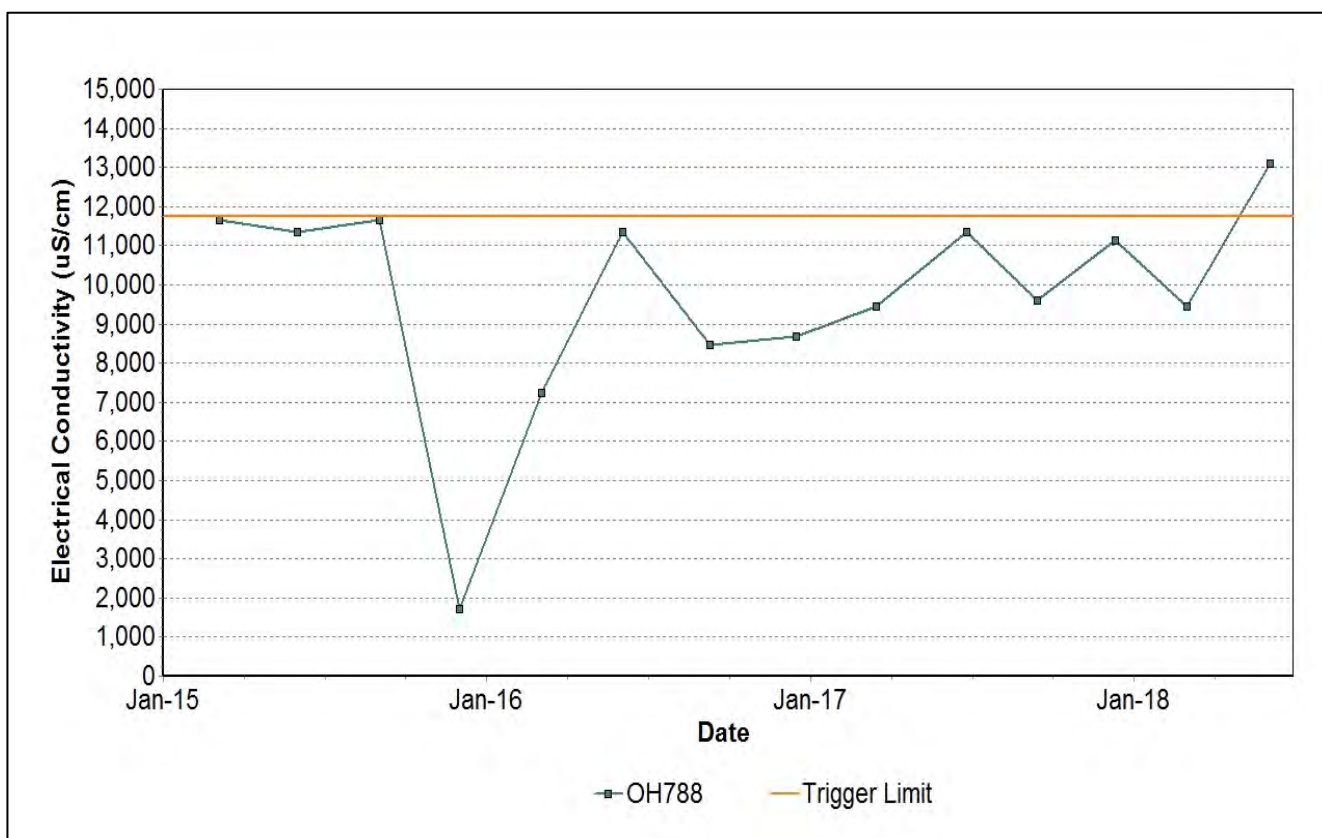


Figure 58: Hunter River Alluvium 6 Seam Electrical Conductivity – June 2018

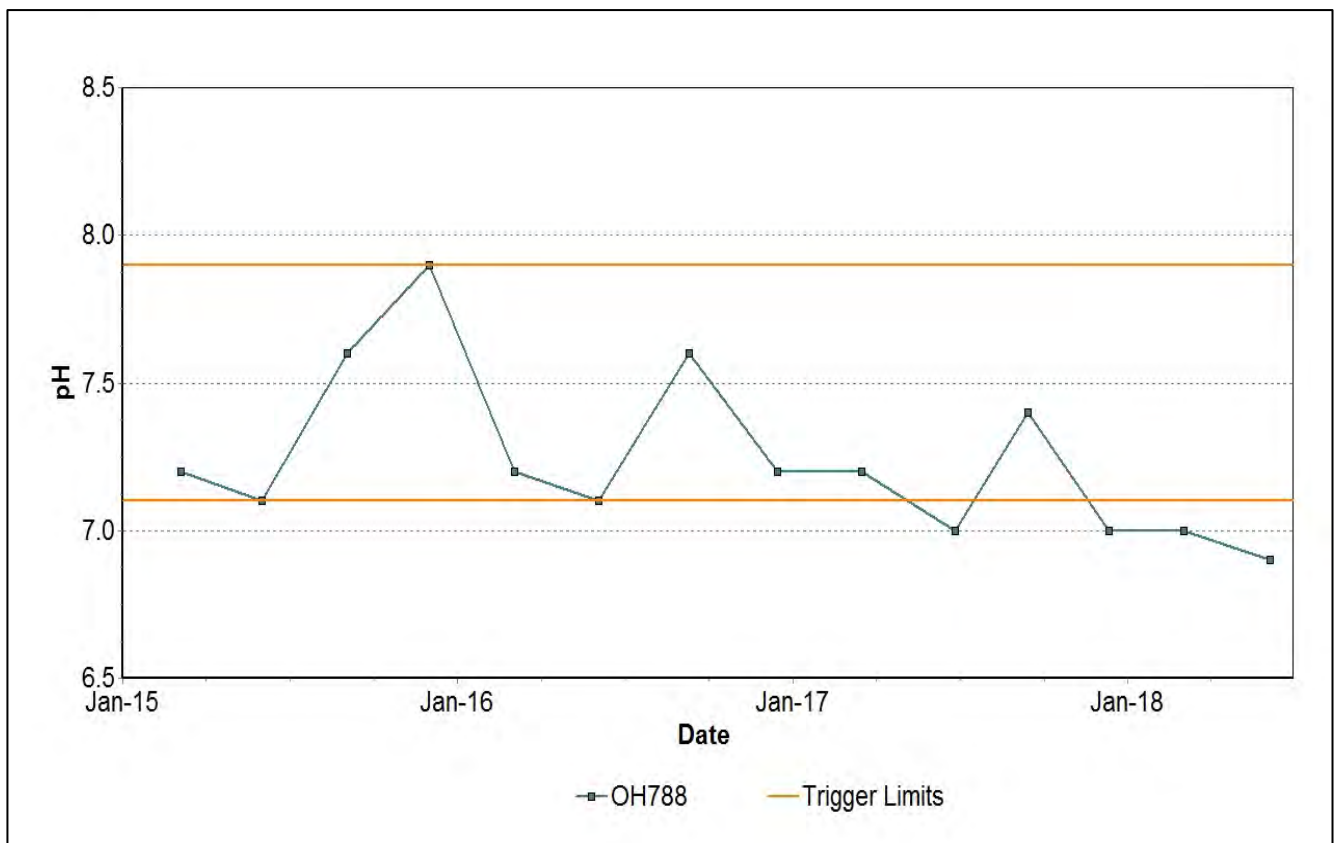


Figure 59: Hunter River Alluvium 6 Seam pH Trend – June 2018

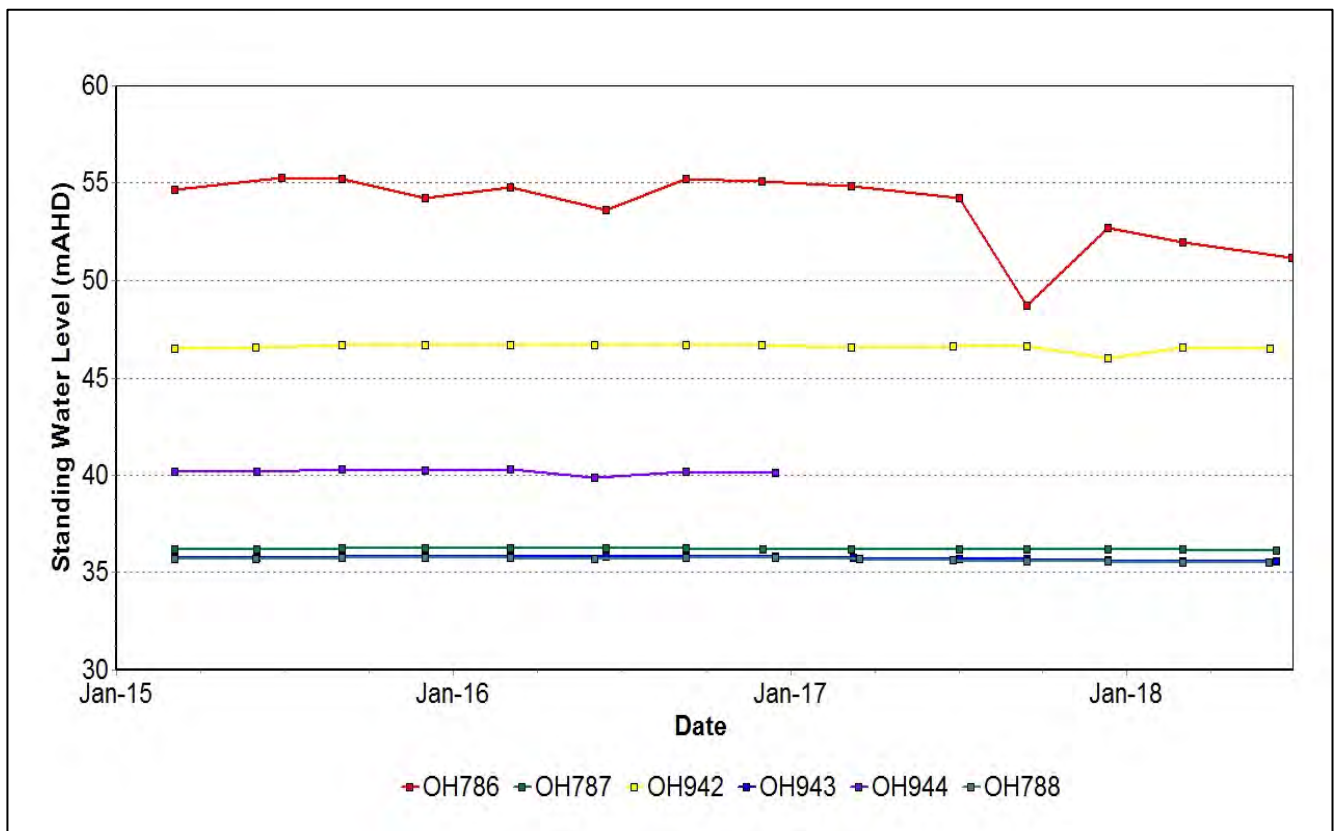


Figure 60: Hunter River Alluvium Standing Water Level Trend – June 2018

### 3.2.1 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 MTW Water Management Plan. Locations of groundwater bores are shown in **Figure 61**.

Current internal groundwater trigger limit breaches are summarised in **Table 4**.



**Table 3: Groundwater Triggers - 2018**

Site	Date	Trigger Limit Breached	Action Taken in Response
OH 786	June	EC – 95th Percentile	Watching Brief*
OH 787	02/03/2018	EC – 95th Percentile	Data is stable and consistent with historical trend; no further action
OH 787	12/06/2018	EC – 95th Percentile	Elevated EC is considered attributable to prolonged dry climatic conditions, and not related to mining related impacts. Continue to watch and monitor
OH788	04/06/2018	EC – 95th Percentile	Watching Brief*
MTD605P	06/02/2018	EC – 95th Percentile	Data is stable and consistent with historical trend; no further action
MTD605P	10/05/2018	EC – 95th Percentile	Data is stable and consistent with historical trend, other bores within the Shallow Overburden are stable; no further action required
WOH2156B	06/02/2018	EC – 95th Percentile	Data is stable and consistent with historical trend; no further action
OH 1138(1)	02/03/2018	EC – 95th Percentile	Data is stable and consistent with historical trend; no further action
OH 786	02/03/2018	pH –5th Percentile	Watching Brief*
OH 787	02/03/2018	pH –5th Percentile	Watching Brief*
OH 942	02/03/2018	pH –5th Percentile	Watching Brief*
OH 788	02/03/2018	pH –5th Percentile	Watching Brief*
OH 788	04/06/2018	pH –5th Percentile	Investigation commenced
PZ8S	02/03/2018	pH –5th Percentile	Watching Brief*
PZ9S	02/03/2018	pH – 95th Percentile	Watching Brief*
PZ9S	06/06/2018	pH – 95th Percentile	Investigation commenced
GW9709	02/03/2018	pH –5th Percentile	Watching Brief*
GW98MTCL2	02/03/2018	pH –5th Percentile	Watching Brief*
GW98MTCL2	04/06/2018	pH –5th Percentile	Watching Brief*
WOH2139A	06/02/2018	pH – 95th Percentile	Data is stable and consistent with historical trend; no further action

WOH2139A	23/05/2018	pH – 95th Percentile	Data is stable and consistent with historical trend. Other bores within the Blakefield seam are stable; no further action required
OH 1125(1)	02/03/2018	pH –5th Percentile	Watching Brief*
MB15MTW01D	06/02/2018	pH –5th Percentile	Watching Brief*
MB15MTW01D	10/05/2018	pH –5th Percentile	Data is stable and consistent with historical trend, other bores within the Shallow Overburden are stable; no further action required
PZ9D	02/03/2018	pH –5th Percentile	Watching Brief*
OH 1138(1)	06/02/2018	pH –5th Percentile	Investigation commenced.
OH 1138(1)	06/06/2018	pH –5th Percentile	pH beginning to recover to historic levels. Continue to monitor on increased frequency

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



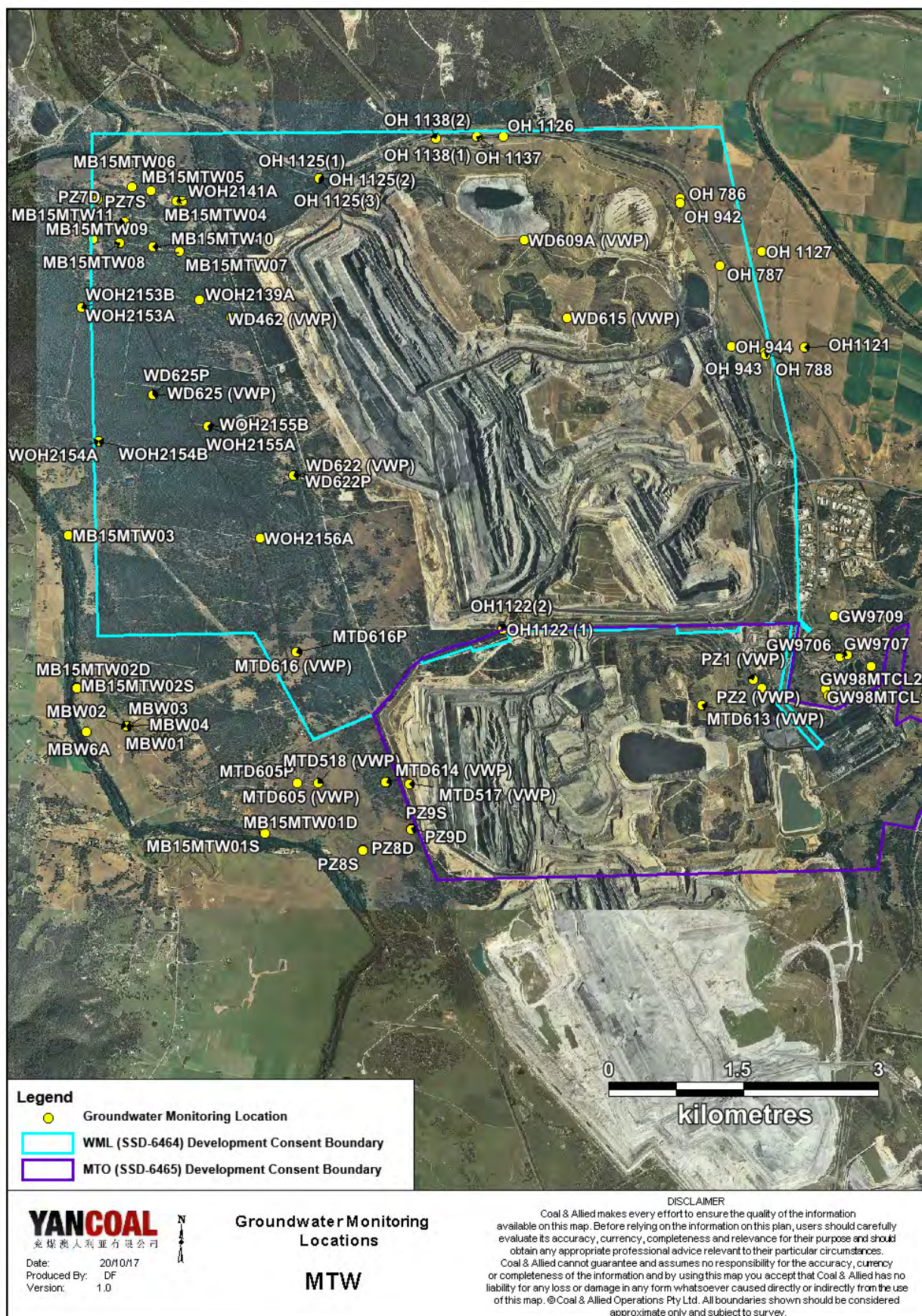


Figure 61: Groundwater Monitoring Location Plan



## 4.0 BLAST MONITORING

MTW have a network of six 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 68**.

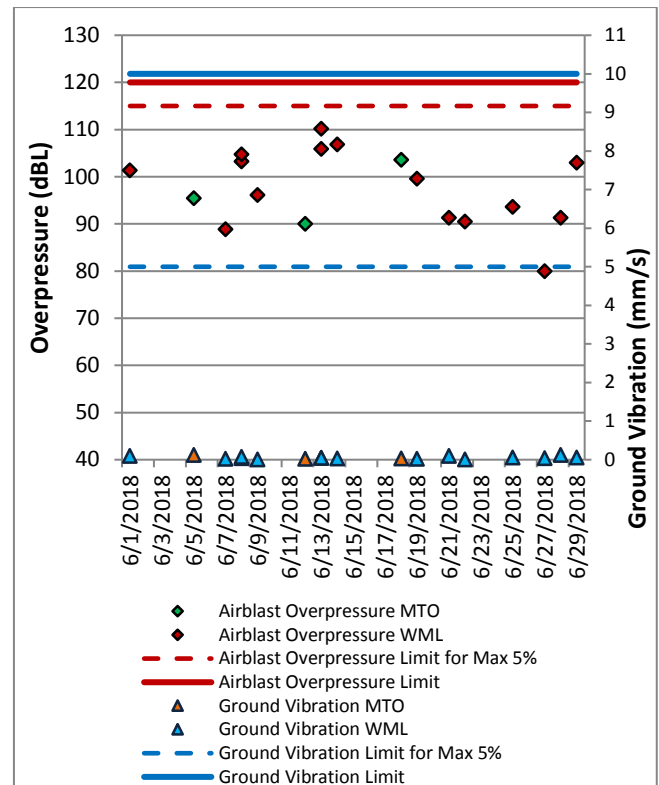
### 4.1 Blast Monitoring Results

During June 2018, 18 blasts were initiated at MTW. **Figure 62** to **Figure 67** show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in **Table 5**.

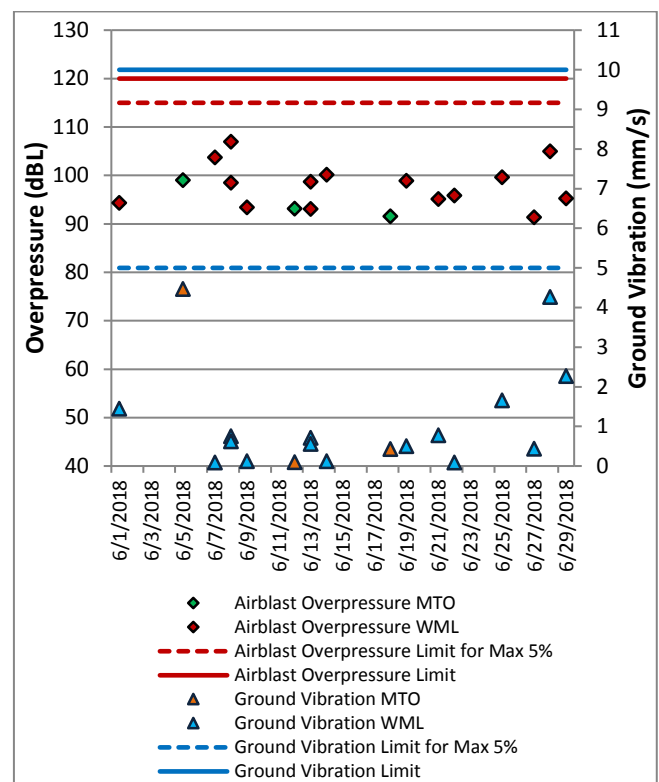
**Table 4: Blasting Limits**

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 no blasts exceeded the 115 dB(L) 5% threshold for airblast overpressure or 5mm/s-5% threshold for ground vibration



**Figure 62: Abbey Green Blast Monitoring Results – June 2018**



**Figure 63: Bulga Village Blast Monitoring Results – June 2018**



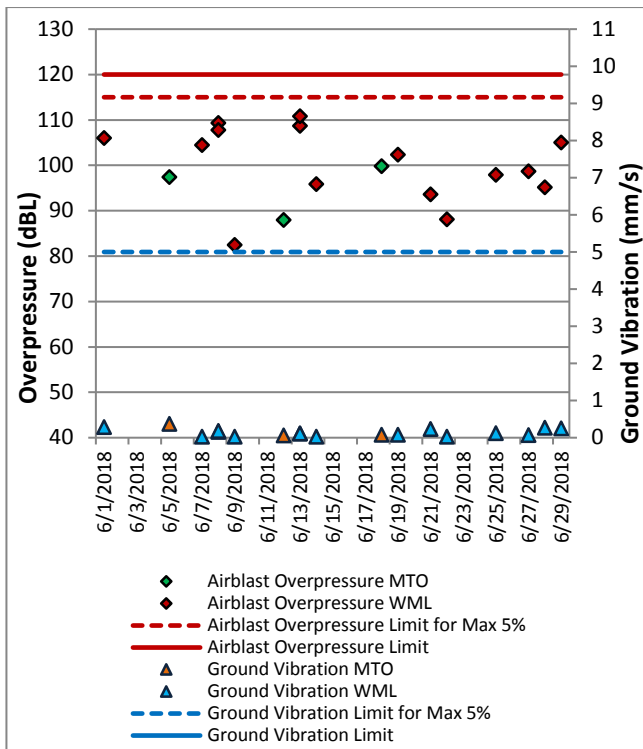


Figure 64: MTIE Blast Monitoring Results – June 2018

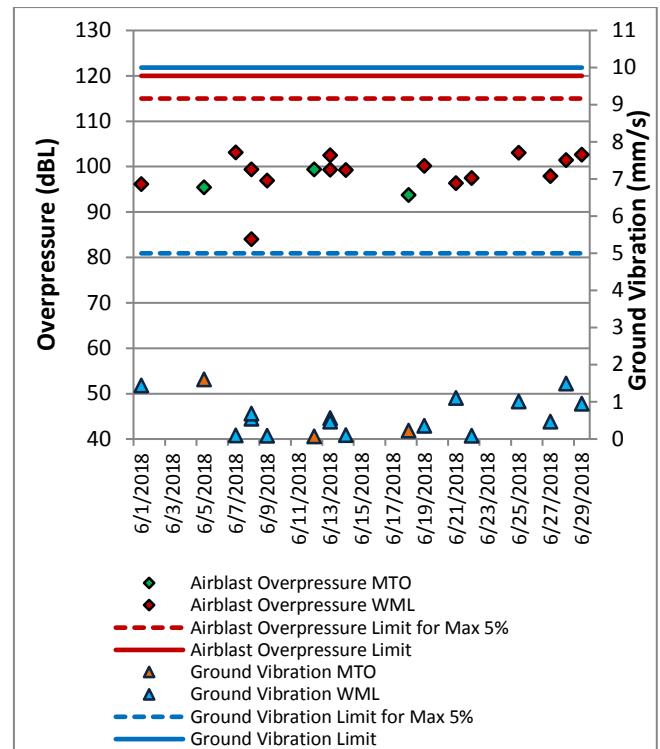


Figure 66: Wambo Road Blast Monitoring Results – June 2018

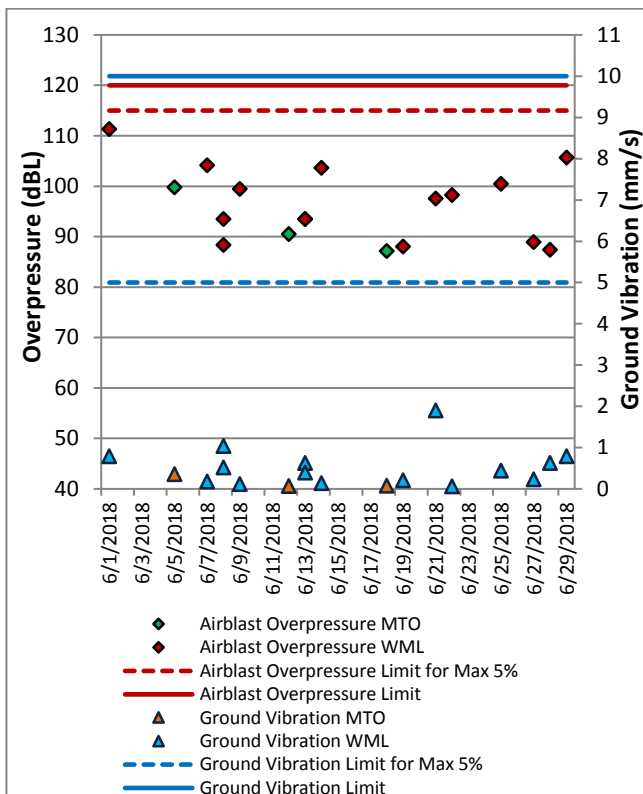


Figure 65: Warkworth Blast Monitoring Results - June 2018

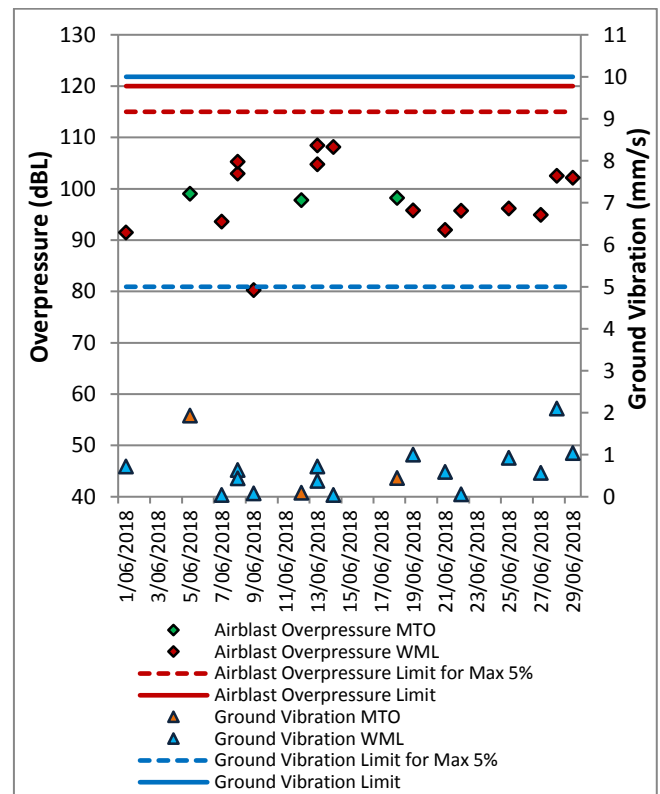


Figure 67: Wollemi Peak Road Blast Monitoring Results - June 2018





Figure 68: Blast and Vibration Monitoring Location Plan



## 5.0 NOISE

Routine attended noise monitoring is carried out in accordance with the MTW Noise Management Plan. A review against EIS predictions will be reported in the Annual Review Report. 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 MTW. The attended noise monitoring locations are displayed in **Figure 69**.

## 5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding MTW on the night of 21 June 2018. All measurements complied with the relevant criteria. Results are detailed in **Table 6** to **Table 9**.

### 5.1.1 WML Noise Assessment

Compliance assessments undertaken against the WML noise criteria are presented in **Table 6** and **Table 7**.

**Table 5: L<sub>Aeq</sub>, 15 minute Warkworth Impact Assessment Criteria – June 2018**

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	Stability Class	Criterion (dB(A))	Criterion Applies? <sup>1,5</sup>	WML L <sub>Aeq</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Bulga RFS	21/06/2018 21:00	1.5	D	37	Yes	<30	Nil
Bulga Village	21/06/2018 23:18	2.3	D	38	Yes	34	Nil
Gouldsville	21/06/2018 23:56	2.5	D	38	Yes	<30	Nil
Inlet Rd	21/06/2018 21:27	1.7	E	37	Yes	33	Nil
Inlet Rd West	21/06/2018 21:00	1.5	D	35	Yes	30	Nil
Long Point	22/06/2018 0:20	2.4	D	35	Yes	IA	Nil
South Bulga	21/06/2018 21:21	1.7	D	35	Yes	IA	Nil
Wambo Road	21/06/2018 21:56	1.9	E	38	Yes	32	Nil

Notes:

1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured L<sub>Aeq</sub>,15minute attributed to WML;
3. NA means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable;
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.

**Table 6: L<sub>A1</sub>, 1 minute Warkworth Impact Assessment Criteria – June 2018**

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	Stability Class	Criterion (dB(A))	Criterion Applies? <sup>1,5</sup>	WML L <sub>Aeq</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Bulga RFS	21/06/2018 21:00	1.5	D	47	Yes	<30	Nil
Bulga Village	21/06/2018 23:18	2.3	D	48	Yes	41	Nil
Gouldsville	21/06/2018 23:56	2.5	D	48	Yes	32	Nil
Inlet Rd	21/06/2018 21:27	1.7	E	47	Yes	43	Nil
Inlet Rd West	21/06/2018 21:00	1.5	D	45	Yes	41	Nil
Long Point	22/06/2018 0:20	2.4	D	45	Yes	IA	Nil
South Bulga	21/06/2018 21:21	1.7	D	45	Yes	IA	Nil
Wambo Road	21/06/2018 21:56	1.9	E	48	Yes	44	Nil

Notes:

1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured L<sub>A1</sub>,1minute attributed to Warkworth mine (WML);
3. NA in exceedance column means atmospheric conditions outside conditions specified in project approval and so criterion is not applicable.
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.

## 5.1.2 MTO Noise Assessment

Compliance assessments undertaken against the MTO noise criteria are presented in **Table 8** and **Table 9**.

**Table 7: L<sub>Aeq, 15minute</sub> Mount Thorley Operations - Impact Assessment Criteria – June 2018**

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	Stability Class	Criterion dB	Criterion Applies? <sup>1,5</sup>	MTO L <sub>Aeq</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Bulga RFS	21/06/2018 21:00	1.5	D	37	Yes	IA	Nil
Bulga Village	21/06/2018 23:18	2.3	D	38	Yes	IA	Nil
Gouldsville	21/06/2018 23:56	2.5	D	35	Yes	IA	Nil
Inlet Rd	21/06/2018 21:27	1.7	E	37	Yes	IA	Nil
Inlet Rd West	21/06/2018 21:00	1.5	D	35	Yes	IA	Nil
Long Point	22/06/2018 0:20	2.4	D	35	Yes	<25	Nil
South Bulga	21/06/2018 21:21	1.7	D	36	Yes	IA	Nil
Wambo Road	21/06/2018 21:56	1.9	E	38	Yes	IA	Nil

**Notes:**

1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured L<sub>Aeq,15minute</sub> attributed to MTO;
3. NA means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable;
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.

**Table 8: L<sub>A1, 1Minute</sub> Mount Thorley Operations - Impact Assessment Criteria – June 2018**

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	Stability Class	Criterion dB	Criterion Applies? <sup>1,5</sup>	MTO L <sub>A1, 1min</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Bulga RFS	21/06/2018 21:00	1.5	D	47	Yes	IA	Nil
Bulga Village	21/06/2018 23:18	2.3	D	48	Yes	IA	Nil
Gouldsville	21/06/2018 23:56	2.5	D	45	Yes	IA	Nil
Inlet Rd	21/06/2018 21:27	1.7	E	47	Yes	IA	Nil
Inlet Rd West	21/06/2018 21:00	1.5	D	45	Yes	IA	Nil
Long Point	22/06/2018 0:20	2.4	D	45	Yes	<25	Nil
South Bulga	21/06/2018 21:21	1.7	D	46	Yes	IA	Nil
Wambo Road	21/06/2018 21:56	1.9	E	48	Yes	IA	Nil

**Notes**

1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured L<sub>A1,1minute</sub> attributed to MTO;
3. NA in exceedance column means atmospheric conditions outside conditions specified in project approval and so criterion is not applicable.
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.



### 5.1.3 Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfI), the applicability of the low frequency modification penalty has been assessed. There were no noise measurements taken during the reporting period which required the penalty to be applied. The assessment for low frequency noise is shown in **Table 10**.

**Table 9: Low Frequency Noise Assessment - June 2018**

Location	Date and Time	Measured Site Only LA <sub>eq</sub> dB (WML/MTO)	Site Only LC <sub>eq</sub> dB <sup>4</sup> (WML/MTO)	Site Only LC <sub>eq</sub> - LA <sub>eq</sub> dB <sup>1,4</sup> (WML/MTO)	Result Max exceedance of ref spectrum dB <sup>2,3,4</sup> (WML/MTO)	Penalty dB(A) (WML/MTO)	Exceedance
Bulga RFS	21/06/2018 21:00	<30/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA
Bulga Village	21/06/2018 23:18	34/IA	53/NA	19/NA	0/NA	Nil/NA	NA
Gouldsville	21/06/2018 23:56	<30/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA
Inlet Rd	21/06/2018 21:27	33/IA	52/NA	19/NA	0/NA	Nil/NA	NA
Inlet Rd West	21/06/2018 21:00	30/IA	47/NA	17/NA	0/NA	Nil/NA	NA
Long Point	22/06/2018 0:20	IA/<25	NA/NA	NA/NA	NA/NA	NA/NA	NA
South Bulga	21/06/2018 21:21	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA
Wambo Road	21/06/2018 21:56	32/IA	50/NA	18/NA	0/NA	Nil/NA	NA

**Notes:**

1. As per NPfI, if LC<sub>eq</sub> – LA<sub>eq</sub> ≥ 15 dB further assessment of low frequency noise required.
2. As per NPfI, compare measured spectrum against reference spectrum to determine if the low frequency modifying factor is triggered and application of penalty is required;
3. Bold results and penalties in red are where the relevant modifying factor trigger was exceeded; and
4. Where it is not possible to determine the site only result due to the presence of other low frequency noise sources occurring during the measurement, or where criteria were not applicable due to meteorological conditions, this is noted as NA (not available) and no further assessment has been undertaken.

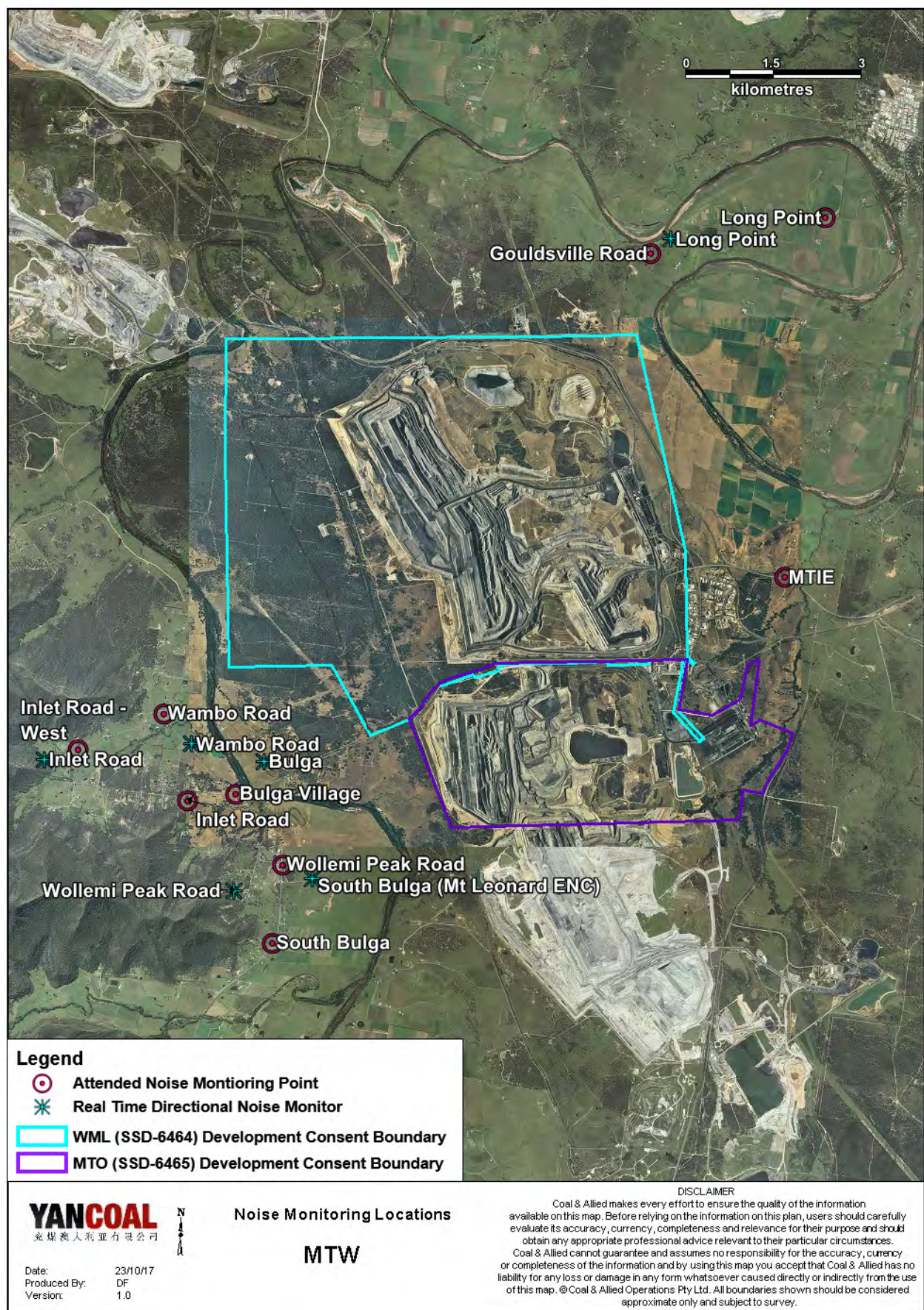


Figure 69: Noise Monitoring Location Plan



## 5.2 Noise Management Measures

A program of targeted supplementary attended noise monitoring is in place at MTW, supported by the real-time directional monitoring network and ensuring the highest level of noise management is maintained. The supplementary program is undertaken by MTW personnel and involves:

- Routine inspections from both inside and outside the mine boundary;
- Routine and as-required handheld noise assessments (undertaken in response to noise alarm and/or community complaint), comparing measured levels against consent noise limits; and
- Validation monitoring following operational modifications to assess the adequacy of the modifications.

Where a noise assessment identifies noise emissions which are exceeding the relevant noise limit(s) for any particular residence, modifications will be made so as to ensure that the noise event is resolved within 75 minutes of identification. The actions taken are commensurate with the nature and severity of the noise event, but can include:

- Changing the haul route to a less noise sensitive haul;
- Changing dump locations (in-pit or less exposed dump option)
- Reducing equipment numbers;
- Shut down of task; or
- Site shut down.

A summary of these assessments undertaken during June are provided in **Table 11**.

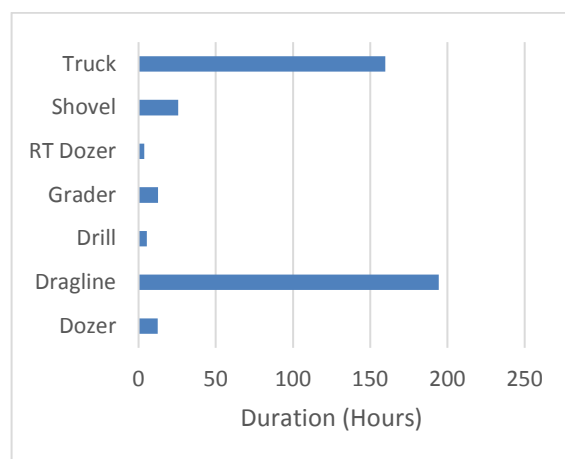
**Table 10: Supplementary Attended Noise Monitoring Data – June 2018**

No. of assessments	No. of assessments > trigger	No. of nights where assessments > trigger	% greater than trigger
582	3	1	0.5

Note: Measurements are taken under all meteorological conditions, including conditions under which the consent noise criteria do not apply.

## 6.0 OPERATIONAL DOWNTIME

During June a total of 413 hours of equipment downtime was logged in response to environmental events such as dust, noise and elevated wind impacts. Operational downtime by equipment type is shown in **Figure 70**.



**Figure 70: Operational Downtime by Equipment Type – June 2018**

## 7.0 REHABILITATION

During June, 2.3Ha of land was released, 4.0Ha was bulk shaped, 0.4 Ha was composted and 4.1Ha was rehabilitated. Year-to-date progress can be viewed in **Figure 71**

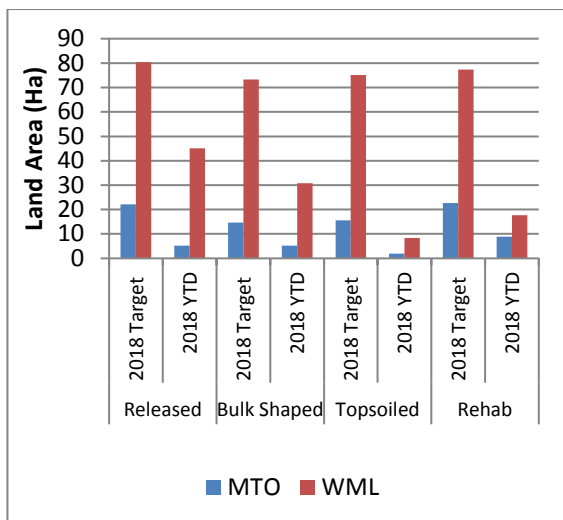


Figure 71: Rehabilitation YTD - June 2018

## 8.0 ENVIRONMENTAL INCIDENTS

There were no reportable environmental incidents during the reporting period.

## 9.0 COMPLAINTS

During the reporting period 22 complaints were received, details of these complaints are displayed in Figure 72 below.

	Noise	Dust	Blast	Lighting	Other	Total
January	9	6	14	0	1	30
February	8	5	2	3	1	19
March	21	0	0	2	0	23
April	8	3	9	3	2	25
May	10	11	3	1	0	25
June	12	2	8	0	0	22
July						
August						
September						
October						
November						
December						
Total	68	27	36	9	4	144

Figure 72: Complaints Summary - YTD June 2018



## **Appendix A: Meteorological Data**

**Table 11: Meteorological Data – Charlton Ridge Meteorological Station – June 2018**

Date	Air Temperature Maximum (°C)	Air Temperature Minimum (°C)	Relative Humidity Maximum (%)	Relative Humidity Minimum (%)	Solar Radiation Maximum (W/Sq. M)	Wind Direction Average (°)	Wind Speed Average (m/sec)	Rainfall(mm)
1/06/2018	16	8	65	41	881	198	3.9	0.0
2/06/2018	16	8	78	47	782	200	3.6	0.2
3/06/2018	20	11	82	42	751	171	4.1	0.0
4/06/2018	19	8	84	45	777	173	2.5	0.0
5/06/2018	17	10	92	53	830	169	3.2	0.4
6/06/2018	14	9	95	80	332	170	2.6	3.2
7/06/2018	19	9	93	49	795	145	2.5	0.0
8/06/2018	16	6	96	54	310	206	1.4	0.6
9/06/2018	15	9	96	78	183	238	1.4	1.8
10/06/2018	14	8	97	77	712	176	2.6	1.2
11/06/2018	18	6	92	47	862	168	2.4	0.0
12/06/2018	17	4	98	52	751	203	1.7	0.2
13/06/2018	17	5	91	39	614	308	3.0	0.0
14/06/2018	18	4	82	32	567	295	2.9	0.0
15/06/2018	19	7	62	27	602	303	4.2	0.0
16/06/2018	17	7	69	27	591	310	5.2	0.0
17/06/2018	14	6	74	37	727	304	5.9	0.0
18/06/2018	16	7	83	37	621	246	3.8	0.4
19/06/2018	14	6	93	55	844	193	3.8	13.2
20/06/2018	17	9	93	56	868	173	3.3	1.2
21/06/2018	16	7	93	54	597	173	1.3	0.0
22/06/2018	16	4	99	66	676	199	1.6	0.2
23/06/2018	20	3	98	31	443	261	2.2	0.2
24/06/2018	17	3	86	36	429	186	1.4	0.0
25/06/2018	17	3	88	37	439	166	1.8	0.0
26/06/2018	18	3	90	41	437	164	1.8	0.0
27/06/2018	17	5	93	60	509	148	2.0	0.0
28/06/2018	17	7	97	55	620	200	1.4	9.4
29/06/2018	14	5	100	47	670	303	2.6	0.2
30/06/2018	19	4	88	33	583	296	3.1	0.0

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

## **Appendix D: Land Acquisition Update**



# Mount Thorley Warkworth Property Update

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July 2018



# Current Property Issues

- Singleton Council – Mount Thorley Warkworth Voluntary Planning Agreement (VPA) Community Committee
  - Yancoal made its first payment of \$4,000,000 under the VPA in early 2018
  - \$2,000,000 of the first payment is to be used exclusively for Bulga
  - Committee functions (as set down by Singleton Council)
    - Recommend to Council a set of principles for the prioritisation of projects which would build sustainability and enhance the quality of life within the community
    - Consult with the community to ascertain needs and opportunities as they relate to sustainable community projects to be considered for funding from the VPA
    - Utilising adopted agreed principles and after appropriate consultation with the community develop a prioritised list of projects
    - Recommend to Council an agreed program of prioritised projects
    - Provide an annual report to Council on the deployment of Council's adopted program of prioritised projects
  - First committee meeting to be held 18 July 2018.

# Current Property Issues -

- VPA Committee Members
  - Adrian Gallagher – Community Member
  - Pauline Rayner – Community Member
  - Christina Metlikovec - Community Member
  - Ian Hedley - Community Member
  - Judith Leslie - Community Member
  - Greg Banks – Alternate Community Member
  - Alan Andrews – Yancoal Australia
  - Mark Ihlein – Singleton Council
  - Cr Sue Moore – Singleton Council Mayor
- Singleton Council – Proposed Bulga Water Supply Scheme
  - Yancoal is generally supportive of the proposed scheme.

# Current Property Issues -

## ■ Bulga Property Agreements

- Engagement continues with landholders listed in consent conditions, and to finalise discretionary undertakings commenced by the previous mine owners
- Generally covers landholdings within the Bulga village and Wambo Rd area

## ■ Bulga Tavern

- Progress continues to bring about a reopening
- Currently working with a preferred tenderer