



Mount Thorley Warkworth

Community Consultative Committee (CCC)

Business Papers – August 2017

Materials supplied to members for the meeting on the 14th August 2017.

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Appendices

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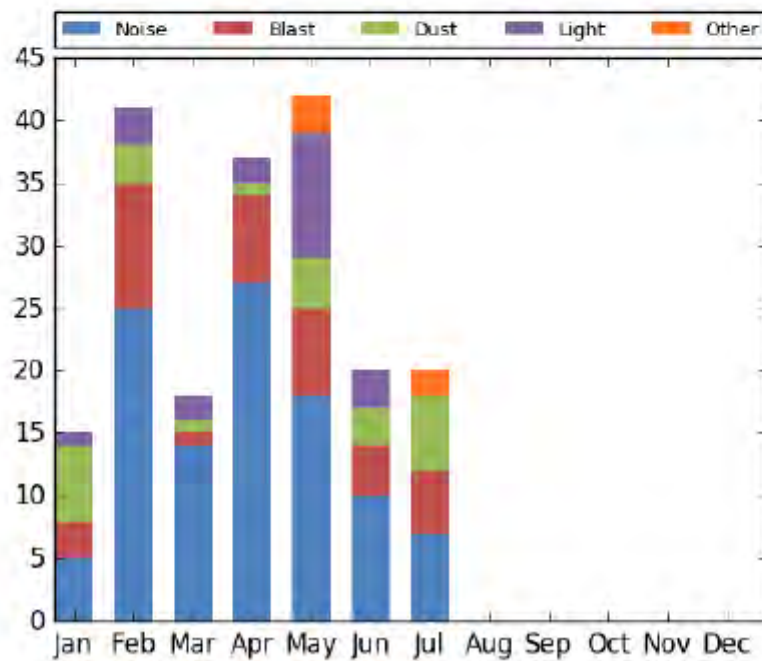
Appendix D – Acquisition Update – Mount Thorley Warkworth Property Portfolio

1.0 Complaints

Complaints overview for period YTD 2017 (27.7.2017)

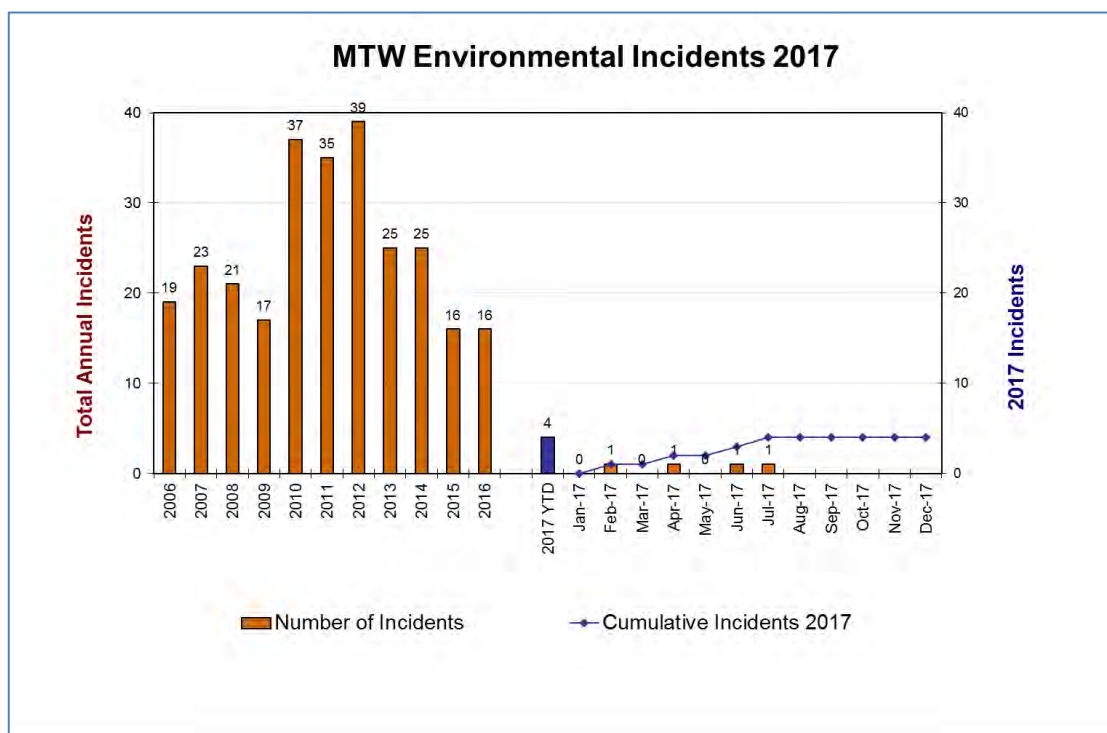
Mount Thorley Warkworth Monthly Complaints Summary

	Noise	Dust	Blast	Lighting	Other	Total
January	5	6	3	1	0	15
February	25	3	10	3	0	41
March	14	1	1	2	0	18
April	27	1	7	2	0	37
May	18	4	7	10	3	42
June	10	3	4	3	0	20
July	7	6	5	0	2	20
August	-	-	-	-	-	-
September	-	-	-	-	-	-
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	-	-	-	-	-	-
Total	106	24	37	21	5	193



2.0 Incidents

Overview of environmental incidents for period YTD 2017
(27.7.2017)



Incident summary for the period 1 May to 31 July 2017

Date	Details	Key Actions	Aspect
21-June-2017	<p>Diesel spill caused by overfilling drill rig tank</p> <p>A drill rig has been overfilled inadvertently in West Pit. The drill rig was in a raised position at the time of filling, when the rig was lowered onto uneven ground, the diesel escaped through the fuel tank breather. Approximately 30 litres of diesel was spilt.</p>	<p>Incident investigated.</p> <p>HSE Alert communicated to site.</p> <p>Spill was recovered. Material excavated and transferred to bioremediation pad.</p>	Waste
21-July-2017	<p>Damage to service cart causing diesel spill</p> <p>Structural damage to the service bay of the vehicle caused a small crack in a fuel line causing diesel to spill to ground in pit. Estimated to be 100 litres.</p>	<p>Incident investigated.</p> <p>Spill could not be recovered due to a small volume spread over a large area.</p>	Waste

3.0 Environmental monitoring

Monthly summaries of environmental monitoring for the period
1 April 2017 to 30 June 2017

April 2017

Attached as **Appendix A**

May 2017

Attached as **Appendix B**

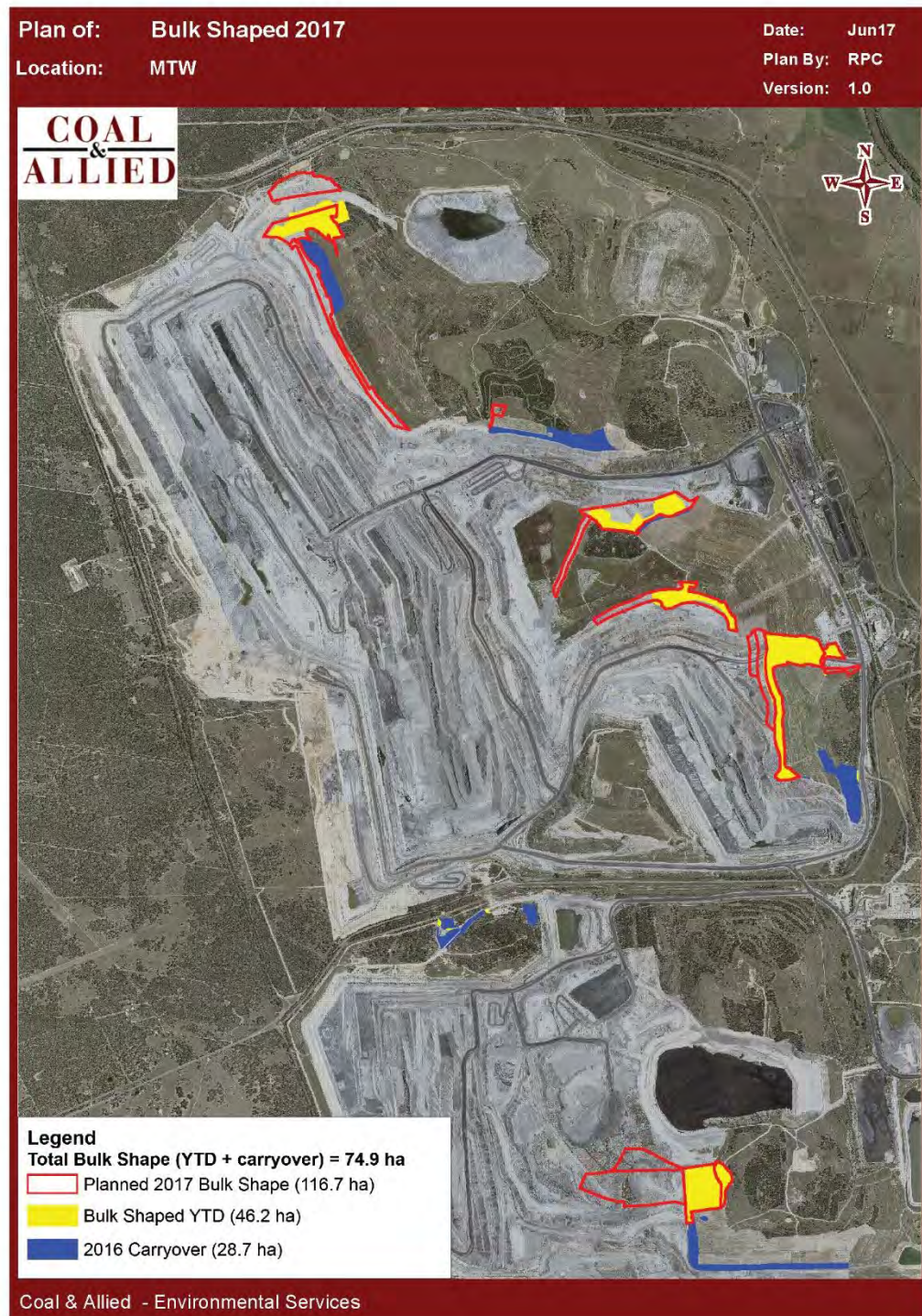
June 2017

NOT YET AVAILABLE. THIS WILL BE SUPPLIED TO MEMBERS IN A SEPARATE
DOCUMENT PRIOR TO 14th AUGUST 2017.

4.0 Rehabilitation plan

As of June 30th, delivery of the 2017 rehabilitation plan is progressing well with a total of 74.9 ha of the targeted areas bulk shaped, 50.2 ha topsoiled, and 22.9 ha seeded.

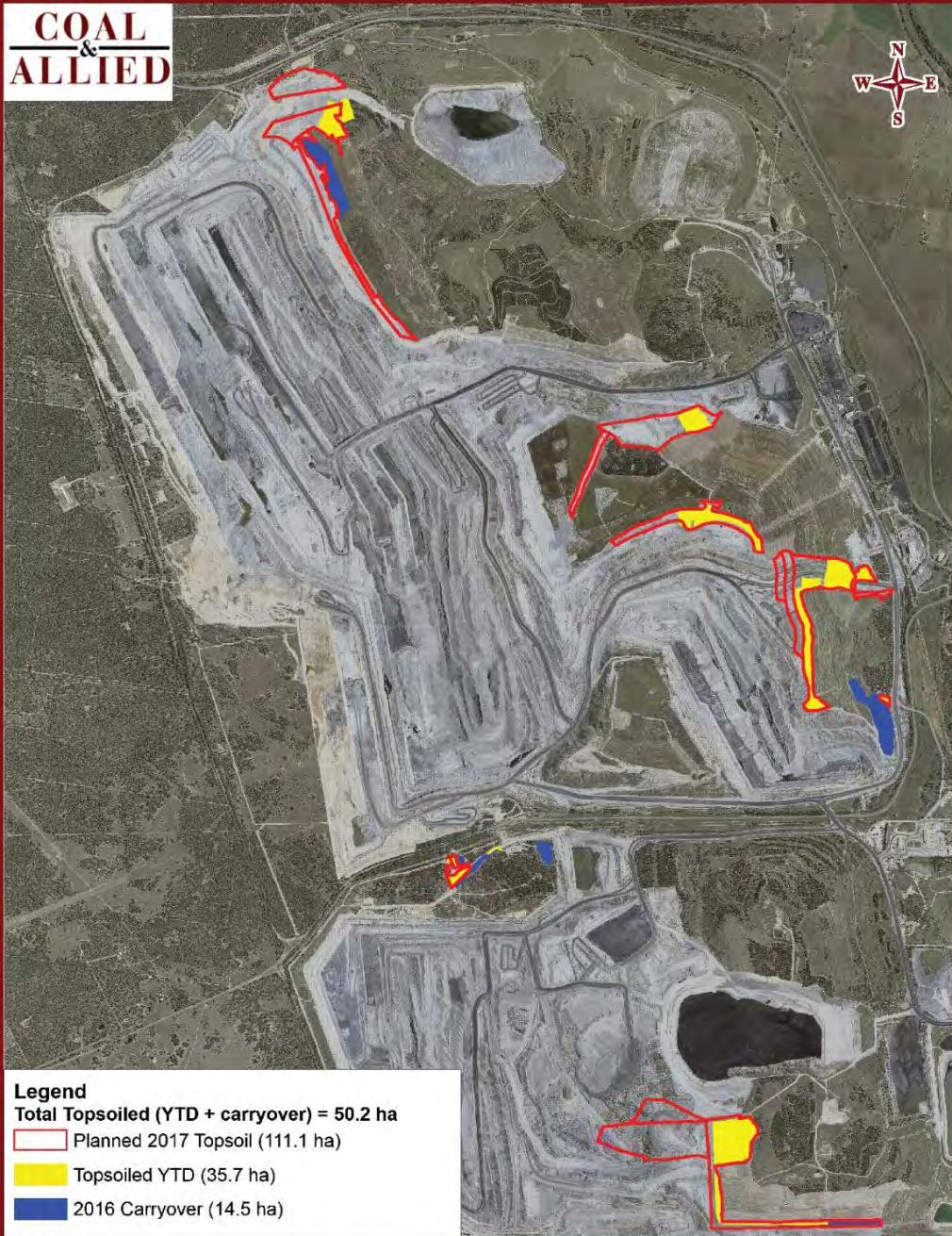
New disturbance was **predominantly in Warkworth's North Pit area** for planned mine progression. A total of 27.5 ha has been disturbed as of the June 30th 2017.



Plan of: Topsoiled 2017
Location: MTW

Date: Jun17
Plan By: RPC
Version: 1.0

**COAL
&
ALLIED**



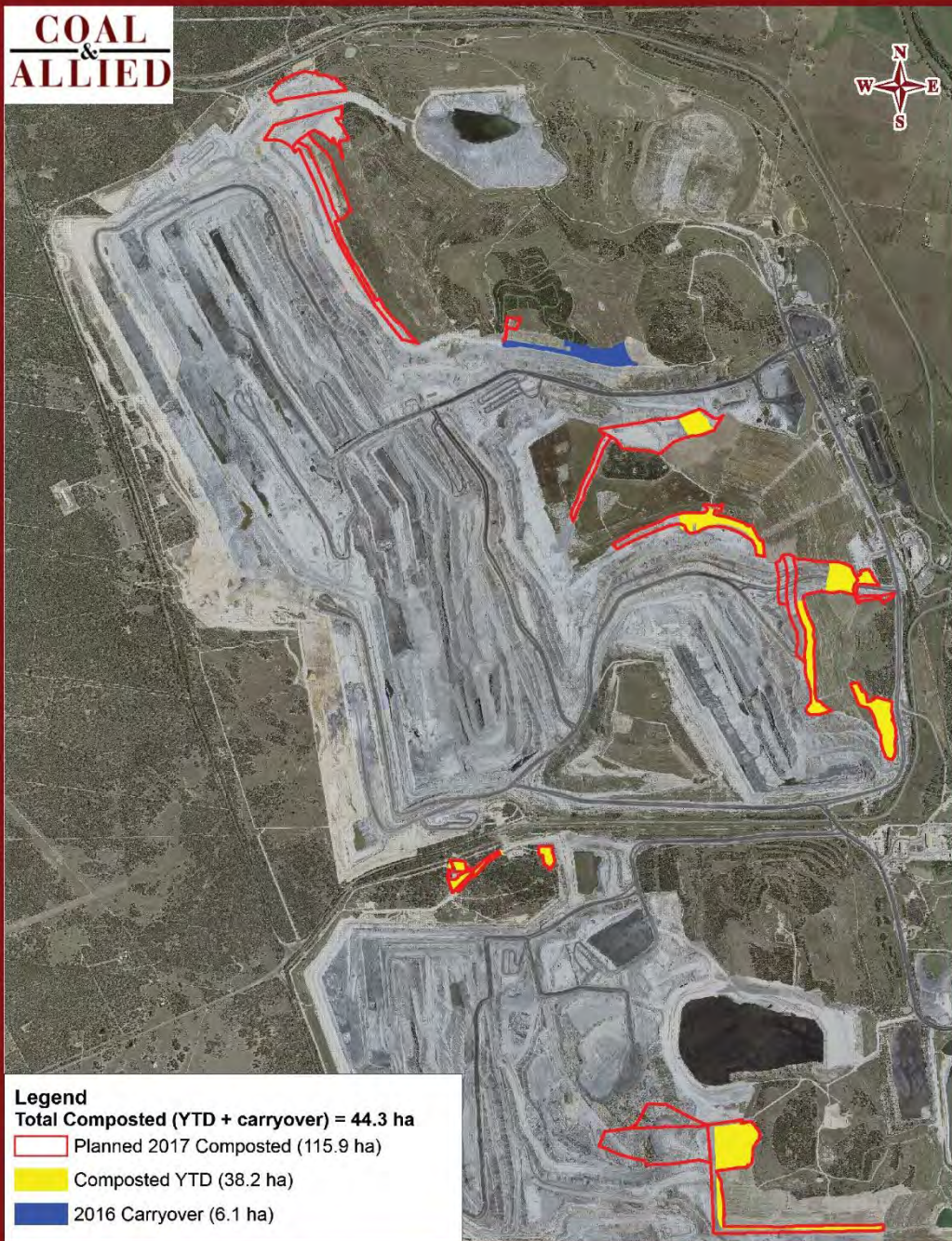
Legend
Total Topsoiled (YTD + carryover) = 50.2 ha
Planned 2017 Topsoil (111.1 ha)
Topsoiled YTD (35.7 ha)
2016 Carryover (14.5 ha)

Coal & Allied - Environmental Services

Plan of: Composted 2017
Location: MTW


Date: Jun17
Plan By: RPC
Version: 1.0


**COAL
&
ALLIED**



Legend

Total Composted (YTD + carryover) = 44.3 ha

 Planned 2017 Composted (115.9 ha)

 Composted YTD (38.2 ha)

 2016 Carryover (6.1 ha)

Coal & Allied - Environmental Services

Plan of: Seeded 2017

Location: MTW

Date: Jun17

Plan By: RPC


Version: 1.0


**COAL
&
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Legend

Total Claimed Rehab YTD = 22.9 ha

 Planned 2017 seeding (122 ha)

 Seeding claimed YTD (22.9 ha)

Coal & Allied - Environmental Services

Plan of: Disturbance 2017

Location: MTW

Date: Jun17

Plan By: RPC

Version: 1.0

**COAL
&
ALLIED**



Coal & Allied - Environmental Services

5.0 Acquisition Update

A presentation with a property acquisition update for Mount Thorley Warkworth is included in **Appendix D** of this Business Paper.

One acquisition was made to the property portfolio during the May – July period.

6.0 Website Uploads

The following is a list of all documents uploaded to the MTW library of the Rio Tinto website during the period of 1st April 2017 to 30th June 2017. 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: <http://www.riotinto.com/copperandcoal/documents-10401.aspx>

To manage document availability to the public during the transition from Rio Tinto to Yancoal, MTW has developed the capability to store documents on the INSITE monitoring webpage. The following link can be used over the coming months to access relevant documentation. <http://insite.riotinto.com/>

Table 1: Uploaded Documents to Rio Tinto Website

Document Title	Upload
Mount Thorley Warkworth Annual Environmental Review 2016	Addition
Mount Thorley Warkworth Annual Environmental Review 2016 - Appendices	Addition
Mount Thorley Warkworth Environmental Monitoring Report February 2017	Addition
Warkworth Sands Woodland Integrated Management Plan February 2017	Addition
Mount Thorley Warkworth Environmental Protection Licence 1376 1976 Monthly Meaningful Summary March 2017	Addition
Mount Thorley Warkworth Environmental Protection Licence 1376 1976 Monthly Obtained Data Summary March 2017	Addition
Mount Thorley Warkworth Environmental Monitoring Report March 2017	Addition
Mount Thorley Warkworth Environmental Protection Licence 1376 1976 Monthly Meaningful Summary April 2017	Addition
Mount Thorley Warkworth Environmental Protection Licence 1376 1976 Monthly Obtained Data Summary April 2017	Addition
Mount Thorley Warkworth EPBC Compliance Report 2017	Addition
Mount Thorley Warkworth Environmental Monitoring Report April 2017	Addition
Mount Thorley Warkworth Environmental Protection Licence 1376 1976 Monthly Meaningful Summary May 2017	Addition

Mount Thorley Warkworth Environmental Protection Licence 1376 1976 Monthly Obtained Data Summary May 2017	Addition
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7.0 Community Investment & Support

Mount Thorley Warkworth (MTW) site donations

The site donations committee provides an opportunity for employees to assess and make recommendations on requests for sponsorship and donations received by MTW.

Funding is provided in the form of sponsorship or a donation to assist local, community-based organisations. **The funding criteria for site donations has been updated to reflect MTW's focus on funding projects and initiatives from the Bulga, Milbrodale, Broke and Singleton area.**

Application forms can be requested by emailing CNACommunityRelation@riotinto.com. Alternatively, potential projects and opportunities for support from Coal & Allied can be discussed with Travis Bates – Community Relations Specialist, Singleton.

Since the start of 2017, MTW has provided \$37,527 to 19 local projects and initiatives, including.

Table 2 MTW Site Donations Committee Funding

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

Singleton Historical Society & Museum - Copier and printing consumables	\$1,000
Singleton Hospital Community Trust - Holes 4 Hospital Charity Golf Day 2017	\$2,500
Singleton Council - Christmas on John St - Fireworks	\$2,277
Greta Branxton Wildcats Football Club - Jerseys for junior football teams	\$500
Milbrodale Public School P&C Association - Family Fun Day 2017	\$1,550
Singleton Golf Club Lady Members - Annual Open Day 2017	\$200
Total	\$37,527

Coal & Allied Community Development Fund (CDF)

The year 2017 marks 19 years of operation of the CDF, which has invested over \$15 million to support over 120 community projects in the Hunter Valley since its establishment in 1999, across the areas of health, education, environment and economic development.

In 2014, Coal & Allied announced that a further \$3 million would be made available to the CDF over a three year period (2015 – 2017) for projects in the Singleton, Muswellbrook and Upper Hunter LGAs. Strategic priority areas were refined for the 2015-2017 funding cycle to enable a more targeted approach to addressing identified community need and to leverage other resources Coal and Allied may be able to offer to strengthen community partnerships.

Priority areas for the 2015-2017 funding cycle include:

- Economic Development: encouraging the diversity and competitiveness of the Upper Hunter economy
- Community Health: Supporting projects which target health, safety and social wellbeing of the community
- Education: Promoting the value of education and building skills within our community
- Environment and Land Management: Supporting projects that can make a difference on a greater scale. i.e. beyond C&A mining operations

In 2017, the CDF has committed to funding 14 unique projects, to a value of almost \$700,000. These projects are aimed at delivering long term benefits for communities in the CDF catchment, which include the Singleton, Muswellbrook and Upper Hunter LGAs.

Table 3: Coal & Allied Community Development Fund Projects

Partner	Programme	Value
Sirrolli Institute	Enterprise Facilitation	\$45,000
Upper Hunter Where There's A Will Foundation	Positive Education Programme	\$80,000
University of Newcastle	Science and Engineering Challenge, and SMART Programme (2015-2019)	\$138,493
Upper Hunter Education Fund	HSC Study Camps and Upper Hunter Education Fund Scholarships (2015-2017)	\$84,000
Singleton Business Chamber	Business Development Officer	\$72,000
University of Newcastle	University of Newcastle Scholarships	\$80,000
Outward Bound Australia	Youth Leadership Programme (2015-2017)	\$245,332
Singleton Council	Singleton Economic Development and Funding Coordinator (2015-2017)	\$100,000

Ungooroo Aboriginal Corporation	Health Services Programme (2017-2018)	\$110,000
Bulga Rural Fire Service	Electronic Datasign	\$24,500
Australian Christian College Singleton	STEM Lego Robotics Programme	\$10,420
Jerrys Plains Public School	Ready 4 School Programme (2017-2018)	\$58,000
Tocal College	Tocal Steers Challenge (2015-2017)	\$25,725
Milbrodale Public School	Early Learning Programme (2017-2018)	\$64,000

8.0 MTW Human Resourcing and Contractor Information

During the MTW CCC meeting held on the 22nd May 2017, several actions were raised by members in regards to MTW human resourcing and contractor statistics. To address these items and allow an appropriate time for review, the following information has been included in this Business Paper.

Action 3:

In response to a request from Hollee; MTW (Travis) to clarify if the numbers exist to split the percentages of where people are located individually for MTW and HVO and if so provide them at the next CCC.

The following information provides an overview of the locality of personnel at MTW and HVO.

HVO 2016 Permanent (excluding contractors)

Area	Percentage of workforce
Singleton	26%
Muswellbrook	9%
Cessnock	11%
Maitland	23%
Upper Hunter	5%
Other	26%

MTW 2016 Permanent (excluding contractors)

Area	Percentage of workforce
Singleton	28%
Muswellbrook	2%
Cessnock	9%
Maitland	28%
Upper Hunter	1%
Other	31%

Workpac HVO/MTW (role replacement) contractors 2016

Area	Percentage of workforce
Singleton	21%
Muswellbrook	12%
Cessnock	12%
Maitland	24%
Upper Hunter	4%
Other	26%

**Skilled (Programmed) HVO/MTW (role replacement)
contractors 2016**

Area	Percentage of workforce
Singleton	22%
Muswellbrook	5%
Cessnock	13%
Maitland	28%
Upper Hunter	2%
Other	31%

Note that role replacement contractors (or Category 1 contractors) work within teams (largely operators and maintainers) and are for all intents and purposes treated as employees. This is to be distinguished from external services contractors (Category 3 contractors) where contracting companies are engaged to carry out specific tasks such as equipment shutdown, civil earthworks etc. Definitions of contractor types are provided below in Action 4.

In regards to the 'Other', across this includes employees and contractors with home addresses primarily in Newcastle, Post Stephens and Lake Macquarie.

Action 4:

In response to a query from Stewart; MTW (Travis) to provide a breakdown on the people working across site into Contractors and full time Employees

The following definitions have been provided to complement the information requested.

- **Headcount** – The number of personnel that are Category 1 Contractors or permanent employees regardless of the level of employment.
- **Category 1 Contractor** – Contractors that are filling a permanent full time or part time role on site (i.e. role replacement).
- **Category 3 Contractor** - Contractors which are engaged as required to provide service support on site. For example shutdown periods or on-call maintenance support.

MTW Headcount	Count
Employees	991.85
Category 1 Contractors	392.3
Total	1384.15

Action 5:

In response to a query from Christina; MTW (Travis) to check what the Employment figures on C&A's website relate to.

Currently, the employment figures listed in the 2015 Sustainable Development Report (available using the link below) represent a headcount of all direct employees and Category 1 Contractors. This does not include Category 3 Contractors which are engaged as required to provide service support.

MTW can confirm that the step change between 2014 and 2015 in the employee figures advertised on the Rio Tinto website was due to the inclusion of Category 1 Contractors in the headcount. This information is summarised in Figure 1.

http://www.riotinto.com/documents/RTCA_2015_sustainable_development_report.pdf

Mount Thorley Warkworth 2015 sustainable development report				
Area		2013	2014	2015
Employees	Male	927	884	1160 ¹
	Female	82	78	191 ¹
	Total	1009	962	1351 ¹

¹Includes category 1 contractors and direct employees. Numbers do not include roles at Hunter Valley Services, which have shared responsibilities across different mines. These roles may be allocated to each relevant mine in other reports.

Figure 1 MTW 2015 Sustainable Development Report

Action 16:

In response to a request from Hollee; MTW (Travis) to provide the dollar spend by postcode level to marry up with the Pie Chart presentation of people working at C&A and to provide the Local Procurement Policy to the CCC.

An update regarding this request will be provided to the CCC at the meeting on the 14th August, 2017.

Action 14

MTW (Colin) to liaise with Programmed regarding the availability of HR statistics.

At the request of MTW, the following information has been provided by Programmed.

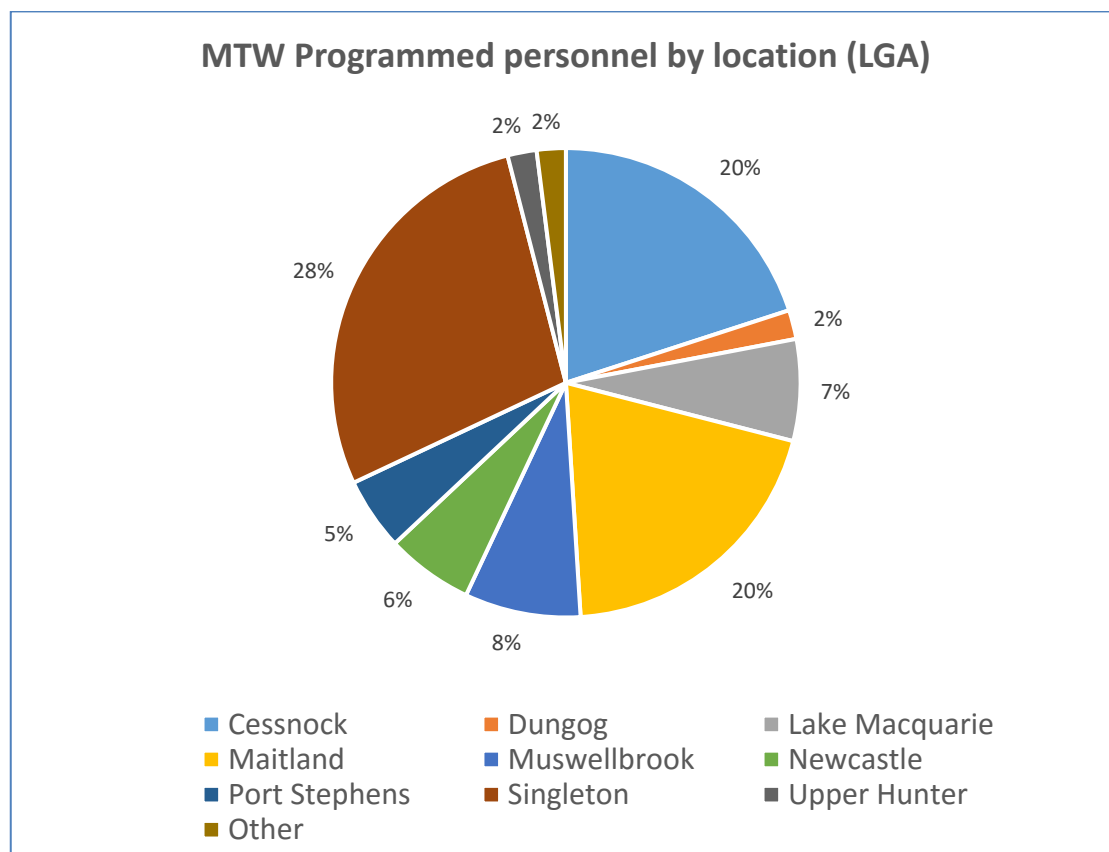


Figure 2 Location of Programmed personnel by location

Site	Indigenous	Female
HVO	4.79%	33.99%
MTW	5.77%	46.92%

Figure 3 Programme diversity statistics

Action 15**MTW (Colin) to provide feedback to Programmed in regards to call-backs to applicants.**

At the request of MTW, Programmed provided an audit report which confirmed that all applicants during the April to June period received a response following a pre-screening period. MTW can confirm that each record is linked to a candidate identification number and the average wait time for confirmation is approximately 48 days. All Programmed applicants get a form of communication back around the status of their application throughout the selection process.



Appendix A

Environmental Monitoring
April 2017



Mount Thorley Warkworth

Monthly Environmental Report

April 2017

Coal & Allied Operations Pty Ltd

ABN 16 000 023 656

Lemington Road, Ravensworth via Singleton NSW 2330 Australia

PO Box 315 Singleton NSW 2330 Australia

Telephone +61 2 6570 0300 Facsimile +61 2 6570 0399

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Revision History

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

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 1st April to 30th April 2017.

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

2017	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
April	36.2	224.2

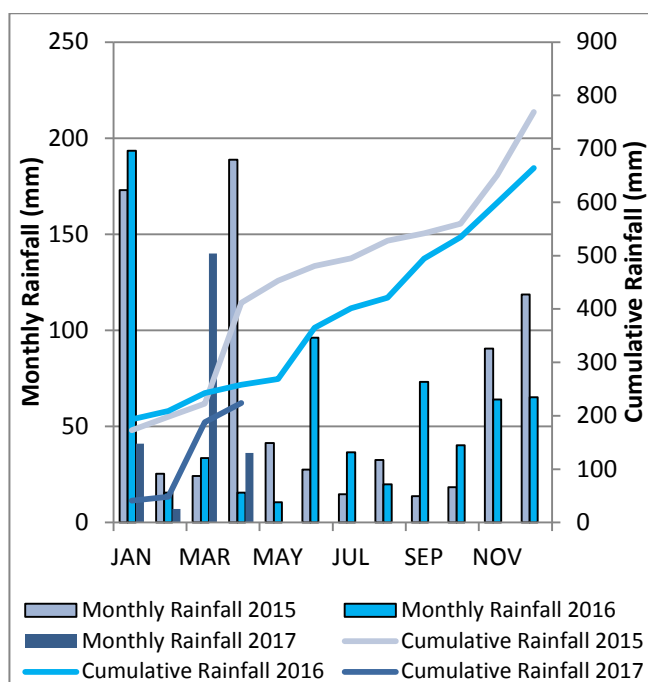


Figure 1: Rainfall Trend YTD

2.1.2 Wind Speed and Direction

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

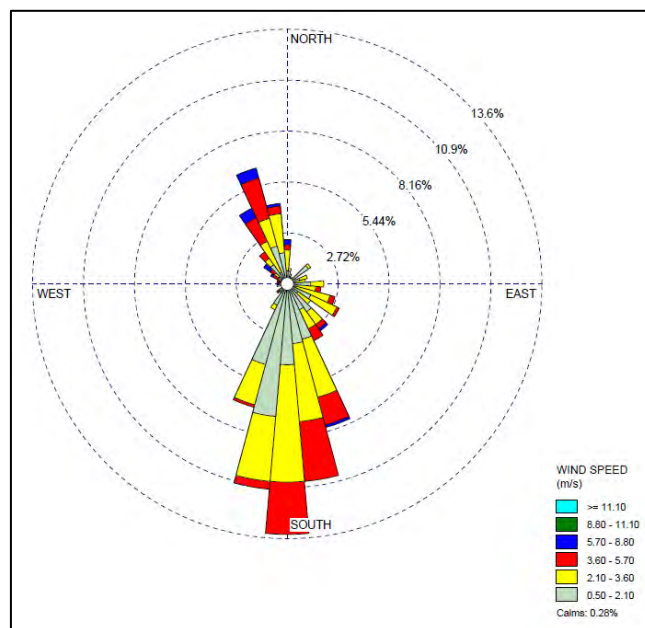


Figure 2: Charlton Ridge Wind Rose – April 2017

**Mount Thorley Warkworth
Air Quality Monitoring Programme**

Date: 170301
Plan By: DF
Version: 1.3



RTCA - NSW Environmental Services

Figure 3: Air Quality Monitoring Locations

2.2 Depositional Dust

To monitor regional air quality, MTW operates and maintains a network of nine 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 DW20a monitor recorded a monthly result above the long term impact assessment criteria of 4.0 g/m² per month. There is no evidence to suggest that the DW20a result was contaminated. Accordingly, this result will be included in the annual average calculation.

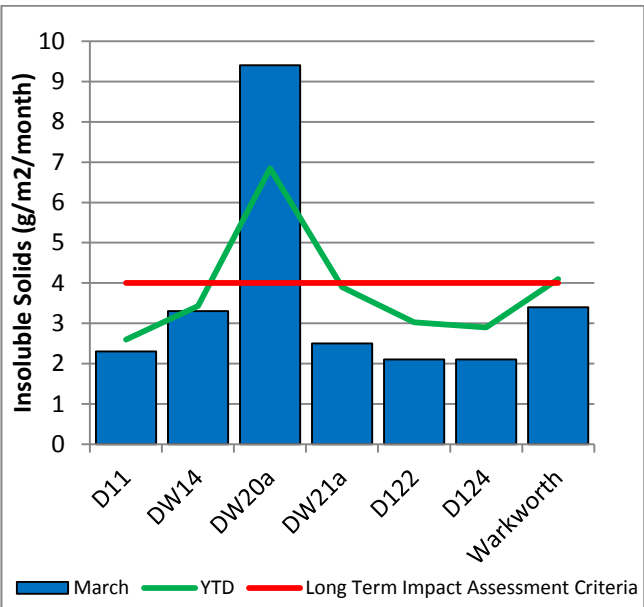


Figure 4: Depositional Dust – April 2017

2.3 Suspended Particulates

Suspended particulates are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM₁₀). 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 PM₁₀ Results

Figure 5 shows the individual PM₁₀ results at each monitoring station against the short term impact assessment criteria of 50µg/m³.

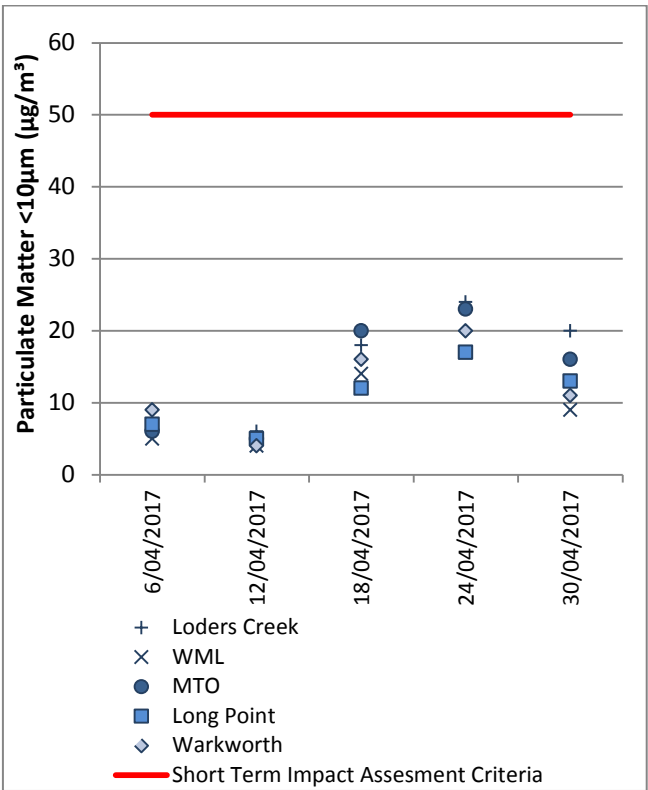


Figure 5: Individual PM₁₀ Results – April 2017

Figure 6 shows the annual average PM₁₀ results against the long term impact assessment criteria.

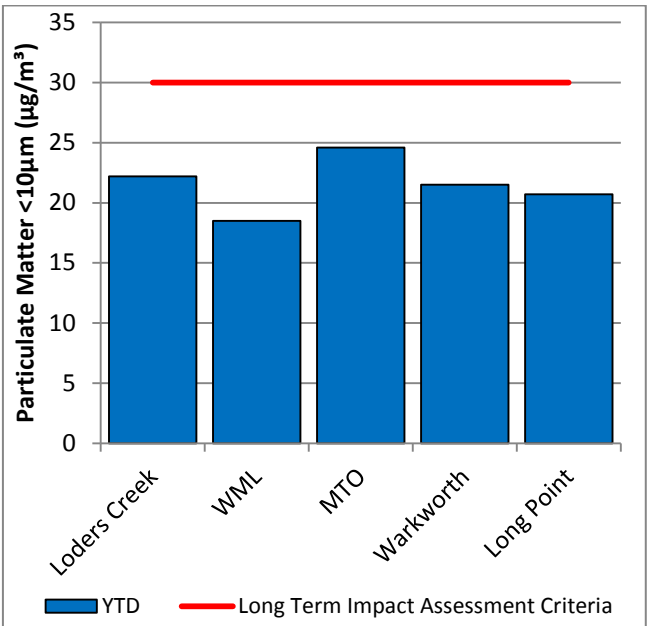


Figure 6: Annual Average PM₁₀ – April 2017

2.3.2 TSP Results

Figure 7 shows the annual average TSP results compared against the long term impact assessment criteria of $90\mu\text{g}/\text{m}^3$.

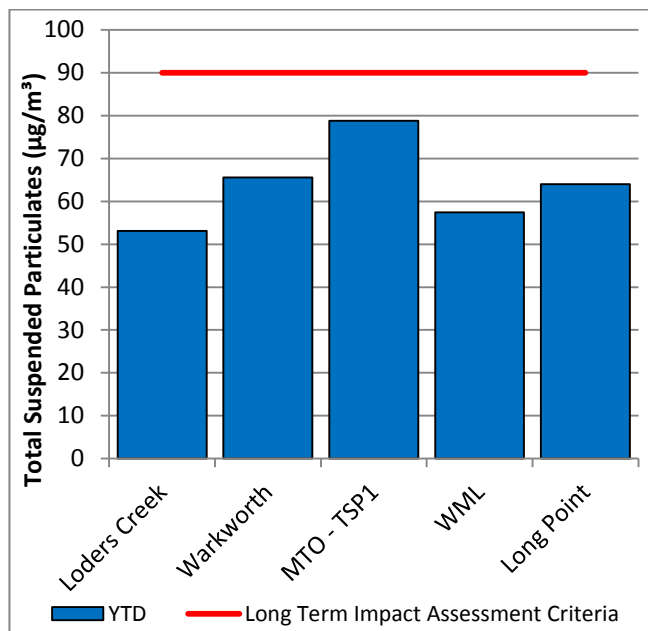


Figure 7: Annual Average Total Suspended Particulates – April 2017

2.3.3 Real Time PM₁₀ Results

Mount Thorley Warkworth maintains a network of real time PM₁₀ monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits.

Results for real time dust sampling are shown in Figure 8, including the daily 24 hour average PM₁₀ result and the annual PM₁₀ average.

2.3.4 Real Time Alarms for Air Quality

During April, the real time monitoring system generated 34 automated air quality related alerts, including 3 alerts for adverse meteorological conditions and 95 alerts for elevated PM₁₀ levels.

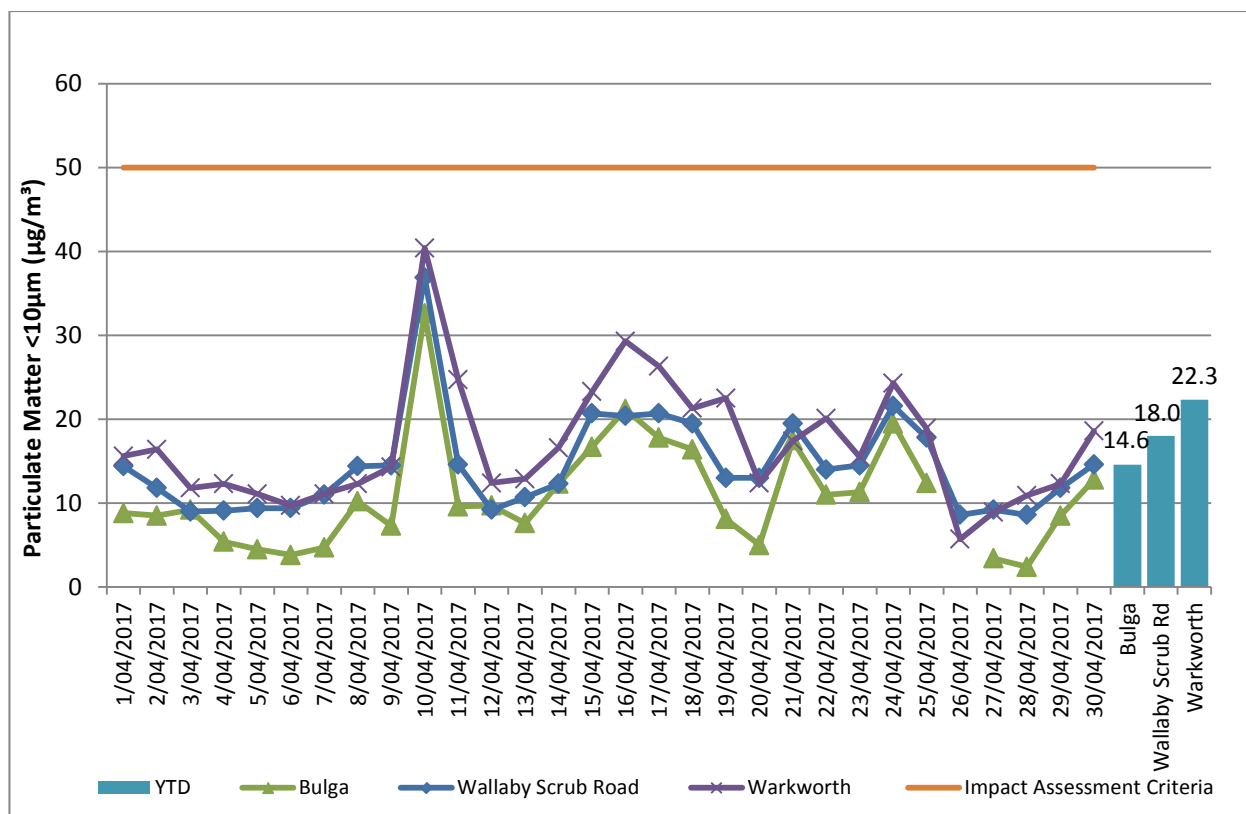


Figure 8: Real Time PM₁₀ daily 24hr average and annual average – April 2017

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 2017 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 2017 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 2017, 21 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.

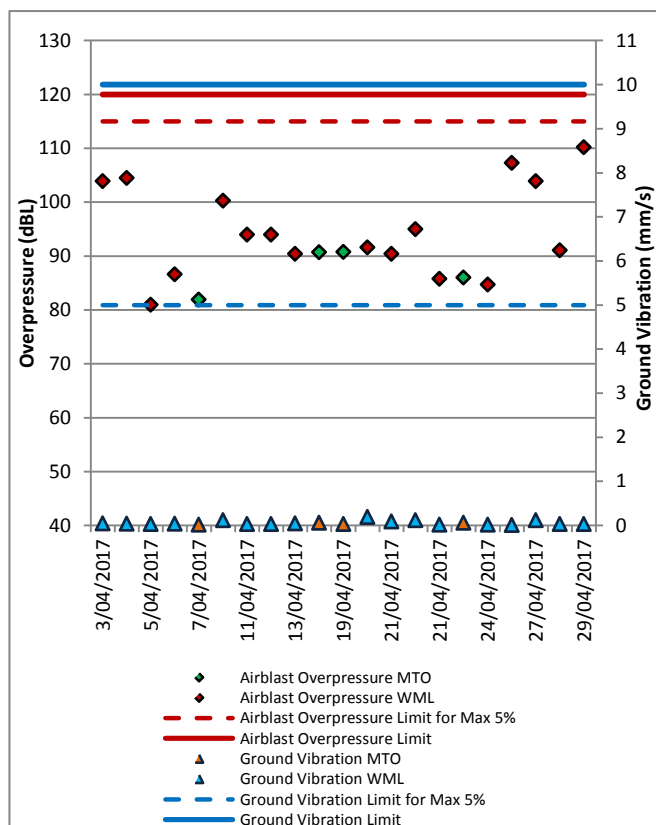


Figure 9: Abbey Green Blast Monitoring Results – April 2017

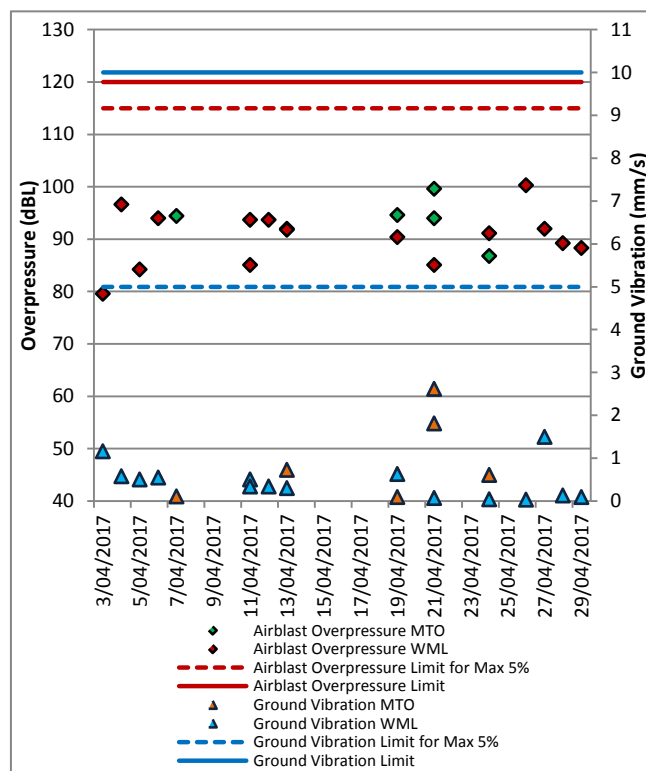


Figure 10: Bulga Village Blast Monitoring Results – April 2017

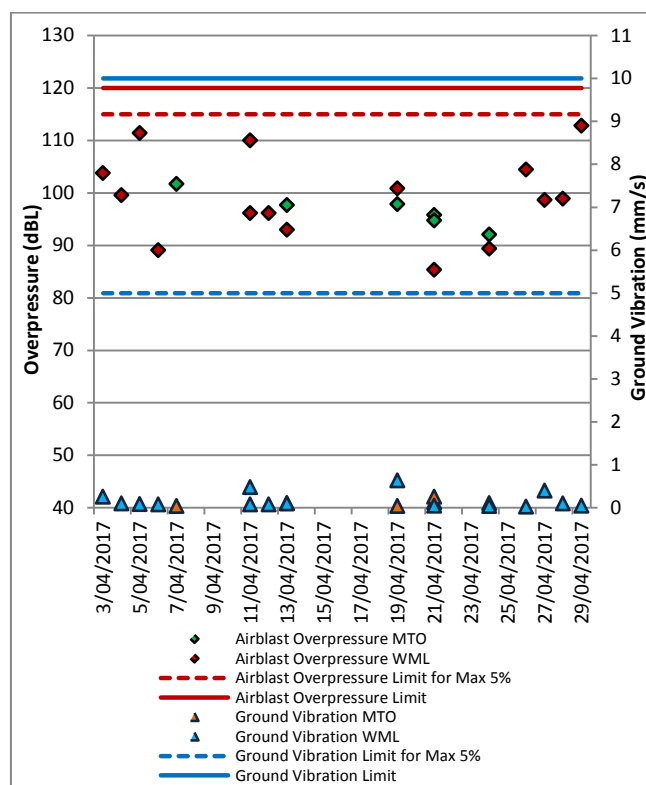


Figure 11: MTIE Blast Monitoring Results – April 2017

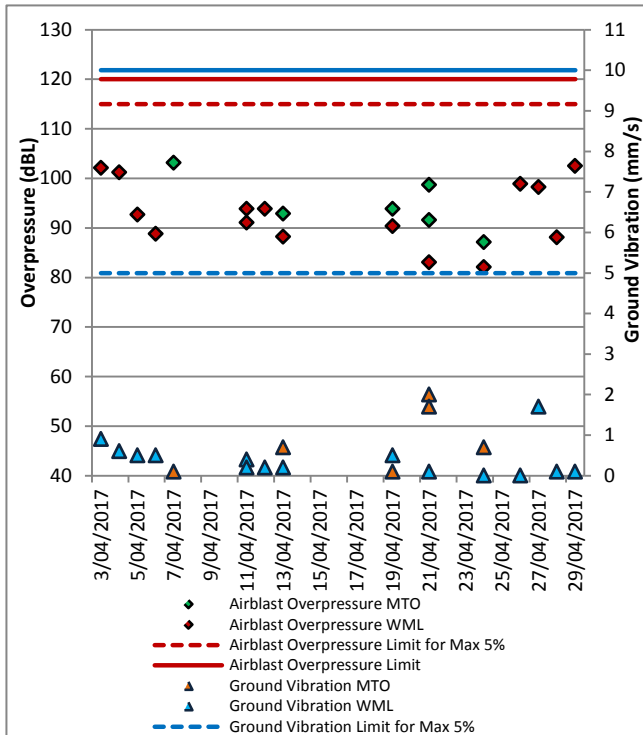


Figure 12: Wollemi Peak Road Blast Monitoring Results - April 2017

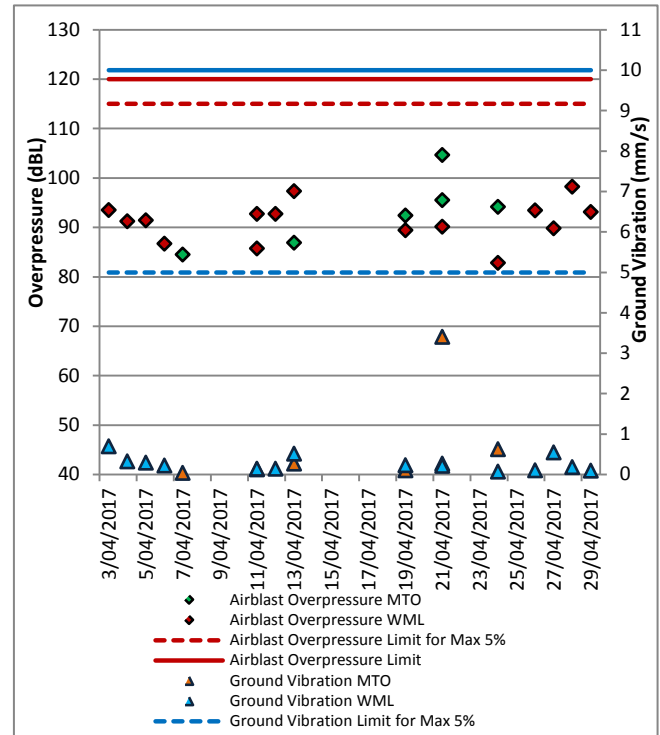


Figure 14: Warkworth Blast Monitoring Results - April 2017

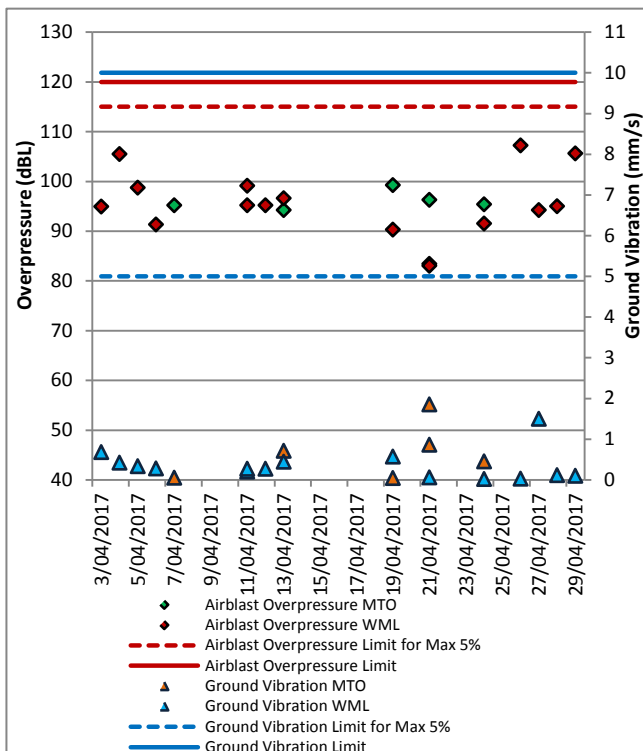


Figure 13: Wambo Road Blast Monitoring Results - April 2017

Mount Thorley Warkworth Blast Monitoring Locations

Date: 160621
Plan By: DF
Version: 4.0



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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. 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 nine 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 12th April 2017. 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 minute Warkworth Impact Assessment Criteria –April 2017

Location	Date and Time	Wind Speed (m/s) ⁵	Stability Class	Criterion (dB(A))	Criterion Applies? ^{1,6}	WML L _{Aeq} dB ^{2,4}	Exceedance ³	Total L _{Ceq} – L _{Aeq}	Revised WML L _{Aeq} ^{5,6}
Bulga RFS	12/04/2017 21:17	3	D	37	Yes	IA	Nil	17	IA
Bulga Village	12/04/2017 23:25	3.2	D	38	No	IA	NA	11	IA
Gouldsville	12/04/2017 21:24	2.9	E	38	Yes	31	Nil	27	36
Inlet Rd	12/04/2017 22:39	3.2	D	37	No	IA	NA	15	IA
Inlet Rd West	12/04/2017 23:01	2.9	E	35	Yes	IA	Nil	22	IA
Long Point	12/04/2017 21:00	2.4	D	35	Yes	22	Nil	18	27
South Bulga	12/04/2017 21:39	2.4	D	35	Yes	IA	Nil	17	IA
Wambo Road	12/04/2017 23:51	3.4	D	38	No	IA	NA	18	IA

Table 4: L_{A1}, 1 minute Warkworth - Impact Assessment Criteria – April 2017

Location	Date and Time	Wind Speed (m/s) ⁵	Stability Class	Criterion dB	Criterion Applies? ^{1,6}	WML L _{A1} , 1min dB ^{2,4}	Exceedance ³
Bulga RFS	12/04/2017 21:17	3.0	D	47	Yes	IA	Nil
Bulga Village	12/04/2017 23:25	3.2	D	48	No	IA	NA
Gouldsville	12/04/2017 21:24	2.9	E	48	Yes	33	Nil
Inlet Rd	12/04/2017 22:39	3.2	D	47	No	IA	NA
Inlet Rd West	12/04/2017 23:01	2.9	E	45	Yes	IA	Nil
Long Point	12/04/2017 21:00	2.4	D	45	Yes	23	Nil
South Bulga	12/04/2017 21:39	2.4	D	45	Yes	IA	Nil
Wambo Road	12/04/2017 23:51	3.4	D	48	No	IA	NA

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_{A1}, 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. 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 Tables 5 and 6.

Table 5: $L_{Aeq, 15\text{minute}}$ Mount Thorley - Impact Assessment Criteria – April 2017

Location	Date and Time	Wind Speed (m/s) ⁵	Stability Class	Criterion dB	Criterion Applies? ^{1,6}	MTO L_{Aeq} dB ^{2,4}	Exceedance ³	Total $L_{Ceq} - L_{Aeq}$ ⁷	Revised MTO L_{Aeq} ^{5,6}
Bulga RFS	12/04/2017 21:17	3	D	37	Yes	IA	Nil	17	IA
Bulga Village	12/04/2017 23:25	3.2	D	38	No	NM	NA	11	NM
Gouldsville	12/04/2017 21:24	2.9	E	35	Yes	IA	Nil	27	IA
Inlet Rd	12/04/2017 22:39	3.2	D	37	No	IA	NA	15	IA
Inlet Rd West	12/04/2017 23:01	2.9	E	35	Yes	NM	Nil	22	NM
Long Point	12/04/2017 21:00	2.4	D	35	Yes	IA	Nil	18	IA
South Bulga	12/04/2017 21:39	2.4	D	36	Yes	NM	Nil	17	NM
Wambo Road	12/04/2017 23:51	3.4	D	38	No	31	NA	18	36

Table 6: $L_{A1, 1\text{Minute}}$ Mount Thorley - Impact Assessment Criteria – April 2017

Location	Date and Time	Wind Speed (m/s) ⁵	Stability Class	Criterion dB	Criterion Applies? ^{1,6}	MTO $L_{A1, 1\text{min}}$ dB ^{2,4}	Exceedance ³
Bulga RFS	12/04/2017 21:17	3	D	47	Yes	IA	Nil
Bulga Village	12/04/2017 23:25	3.2	D	48	No	NM	NA
Gouldsville	12/04/2017 21:24	2.9	E	45	Yes	IA	Nil
Inlet Rd	12/04/2017 22:39	3.2	D	47	No	IA	NA
Inlet Rd West	12/04/2017 23:01	2.9	E	45	Yes	25	Nil
Long Point	12/04/2017 21:00	2.4	D	45	Yes	IA	Nil
South Bulga	12/04/2017 21:39	2.4	D	46	Yes	NM	Nil
Wambo Road	12/04/2017 23:51	3.4	D	48	No	37	NA

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 $L_{A1, 1\text{minute}}$ 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 INP Low Frequency

In accordance with the requirements of the NSW Industrial Noise Policy (INP), the low frequency modification factor has been applied where appropriate. It should be noted that the Industrial Noise Policy does not give guidance on the application of the penalty where more than one target noise source is audible. The L_{Ceq} levels reported above are “Total”, or “Total mine noise” at best, and cannot be attributed accurately to a single mine. Accordingly, where the INP criteria for the application of the Low Frequency modification factor is triggered, the penalty has been applied to the dominant mine noise source (either of WML or MTO), as such resulting in the application of a 5 dB penalty to the site only L_{Aeq} for the measurements taken at Gouldsville, Long Point and Wambo Road. The resulting L_{Aeq} noise levels remained in compliance.

**Mount Thorley Warkworth
Noise Monitoring Programme**

Date: 160226

Plan By: DF

Version: 2.0

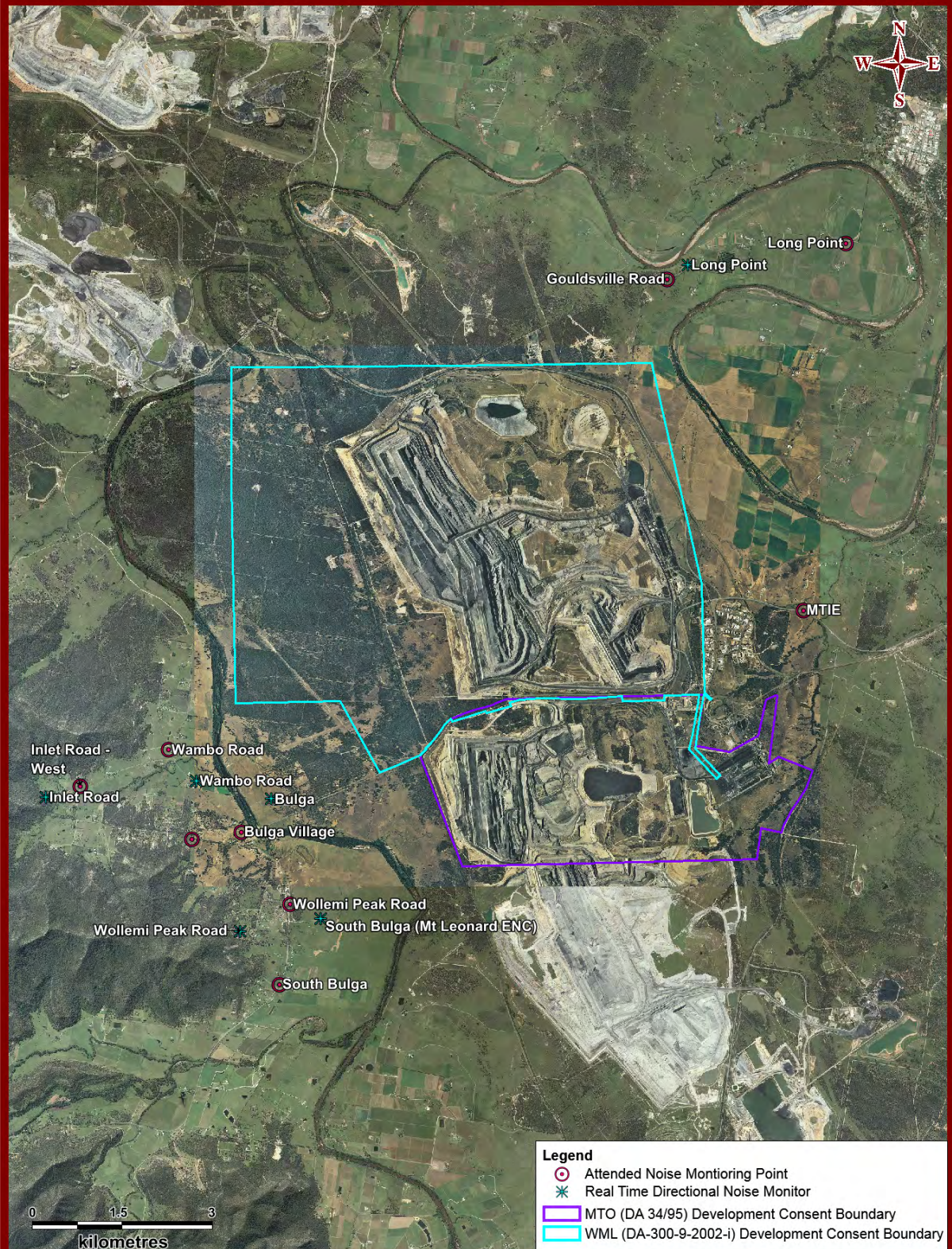


Figure 16: Noise Monitoring Location Plan

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:

- Replacement of non-attenuated equipment with sound attenuated equipment;
- 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 7.

Table 7: Supplementary Attended Noise Monitoring Data – April 2017

No. of assessments	No. of assessments > trigger	No. of nights where assessments > trigger	% greater than trigger
545	5	2	0.9

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 58.0 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.

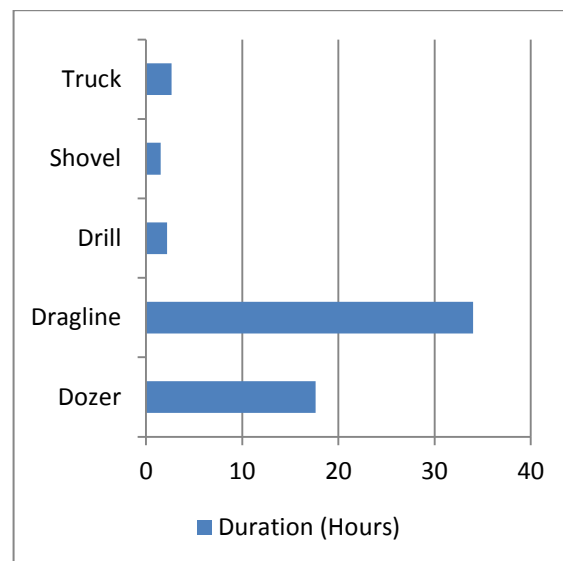


Figure 17: Operational Downtime by Equipment Type – April 2017

7.0 REHABILITATION

During April, 5.97 Ha of land was released, 5.42 Ha of land was bulk shaped and 7.35 Ha of land was topsoiled.

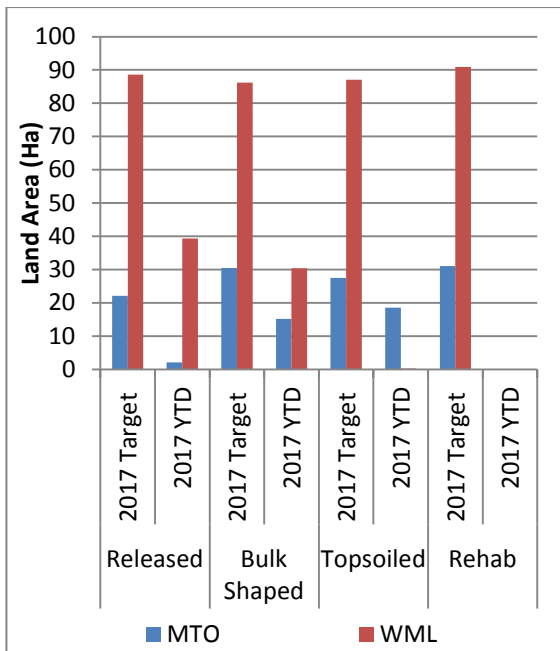


Figure 18: Rehabilitation YTD - April 2017

8.0 ENVIRONMENTAL INCIDENTS

On Thursday the 27th of April, a blast event produced a fume that was categorised as a Level 4 fume event. The shot was prepared and fired within the explosive manufacturer's guidelines and the fume and dust plume travelled in the exact direction expected and dispersed inside the Mount Thorley Warkworth (MTW) boundary. The Level 4 fume event was reported to the appropriate authorities.

9.0 COMPLAINTS

During the reporting period 37 complaints were received, details of these complaints are shown in Figure 19 below.

	Noise	Dust	Blast	Lighting	Other	Total
January	5	6	3	1	0	15
February	25	3	10	3	0	41
March	14	1	1	2	0	18
April	27	1	7	2	0	37
May	-	-	-	-	-	-
June	-	-	-	-	-	-
July	-	-	-	-	-	-
August	-	-	-	-	-	-
September	-	-	-	-	-	-
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	-	-	-	-	-	-
Total	71	11	21	8	0	111

Figure 19: Complaints Summary – YTD April 2017

Appendix A: Meteorological Data

Table 8: Meteorological Data – Charlton Ridge Meteorological Station – April 2017

Date	Air Temperature Maximum (°C)	Air Temperature Minimum (°C)	Relative Humidity Maximum (%)	Relative Humidity Minimum (%)	Wind Direction Average (°)	Wind Speed Average (m/sec)	Rainfall(mm)
1/04/2017	25.8	35.4	80.3	35.4	160.0	2.2	0.0
2/04/2017	21.7	52.2	95.9	52.2	166.5	4.1	3.4
3/04/2017	22.3	40.4	89.6	40.4	171.4	4.6	0.2
4/04/2017	22.9	48.7	88.7	48.7	166.7	3.9	1.6
5/04/2017	20.6	61.0	92.1	61.0	157.9	2.6	3.6
6/04/2017	23.2	49.0	96.4	49.0	183.7	1.8	9.4
7/04/2017	23.7	46.9	96.3	46.9	154.3	2.3	0.2
8/04/2017	25.5	29.8	95.2	29.8	162.5	1.9	0.0
9/04/2017	27.3	35.9	95.5	35.9	235.1	3.3	8.0
10/04/2017	18.3	42.1	67.4	42.1	302.8	4.7	0.0
11/04/2017	24.0	40.9	77.9	40.9	219.8	2.7	0.0
12/04/2017	23.8	46.3	85.5	46.3	168.2	3.3	0.0
13/04/2017	24.5	37.6	89.0	37.6	159.7	1.9	0.0
14/04/2017	25.1	32.5	95.4	32.5	169.4	1.6	0.0
15/04/2017	25.5	33.2	94.1	33.2	185.8	1.9	0.0
16/04/2017	26.2	32.4	94.2	32.4	191.3	2.2	0.0
17/04/2017	24.9	44.6	87.1	44.6	153.4	2.1	0.0
18/04/2017	25.3	44.0	93.7	44.0	150.4	1.9	0.0
19/04/2017	25.3	45.1	91.7	45.1	168.0	2.0	0.0
20/04/2017	25.7	36.2	95.8	36.2	152.3	2.4	0.0
21/04/2017	24.6	43.6	88.4	43.6	146.5	1.9	0.0
22/04/2017	22.2	62.1	93.0	62.1	184.8	1.5	0.0
23/04/2017	26.1	37.6	97.4	37.6	190.6	1.7	0.0
24/04/2017	25.3	41.0	95.0	41.0	154.1	1.7	0.0
25/04/2017	28.0	37.0	93.7	37.0	252.0	3.0	6.2
26/04/2017	23.8	36.2	93.5	36.2	291.0	3.8	3.6
27/04/2017	19.0	41.2	90.1	41.2	241.7	2.3	0.0
28/04/2017	20.6	35.9	85.4	35.9	192.2	1.8	0.0
29/04/2017	23.2	36.6	93.0	36.6	230.7	2.1	0.0
30/04/2017	23.4	47.4	93.3	47.4	170.7	1.7	0.0



Appendix B

Environmental Monitoring
May 2017



Mount Thorley Warkworth
Monthly Environmental Report
May 2017

Coal & Allied Operations Pty Ltd

ABN 16 000 023 656

Lemington Road, Ravensworth via Singleton NSW 2330 Australia

PO Box 315 Singleton NSW 2330 Australia

Telephone +61 2 6570 0300 Facsimile +61 2 6570 0399

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Revision History

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

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 1st May to 31st May 2017.

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 **Error!**
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Table 1: Monthly Rainfall MTW

2017	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
May	18.8	243.0

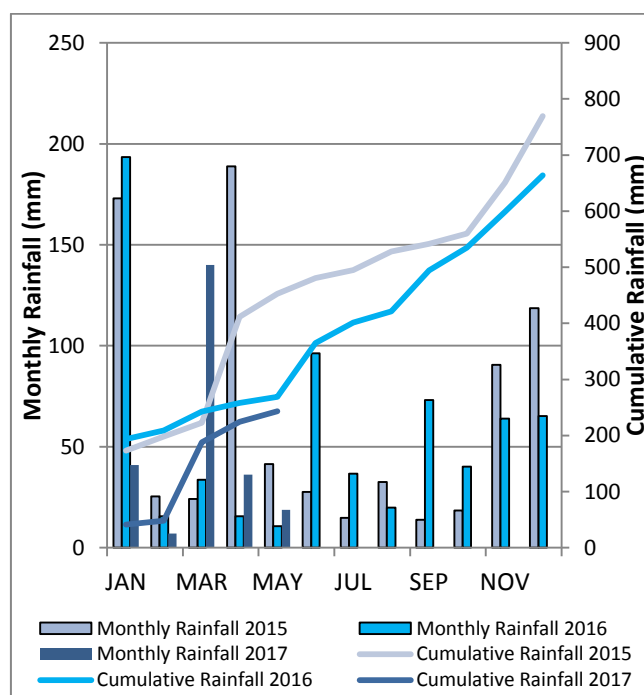


Figure 1: Rainfall Trend YTD

2.1.2 Wind Speed and Direction

Winds from the South and North West were dominant throughout the reporting period as shown in **Error!**
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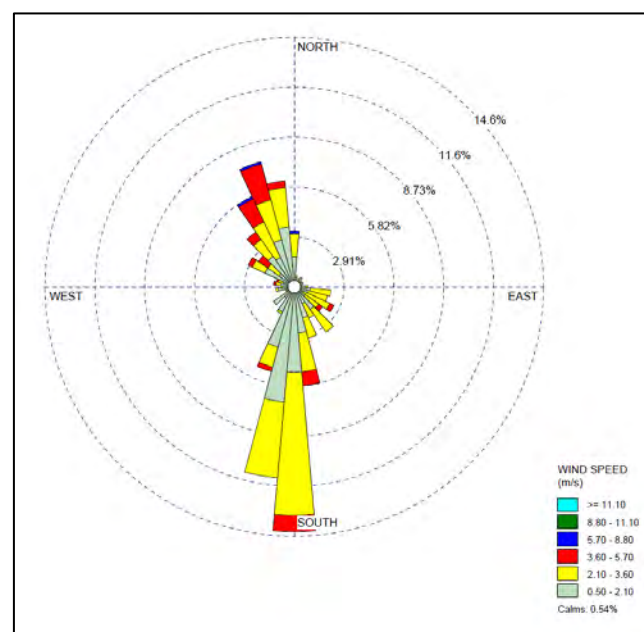


Figure 2: Charlton Ridge Wind Rose – May 2017

**Mount Thorley Warkworth
Air Quality Monitoring Programme**

Date: 170301
Plan By: DF
Version: 1.3



RTCA - NSW Environmental Services

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.

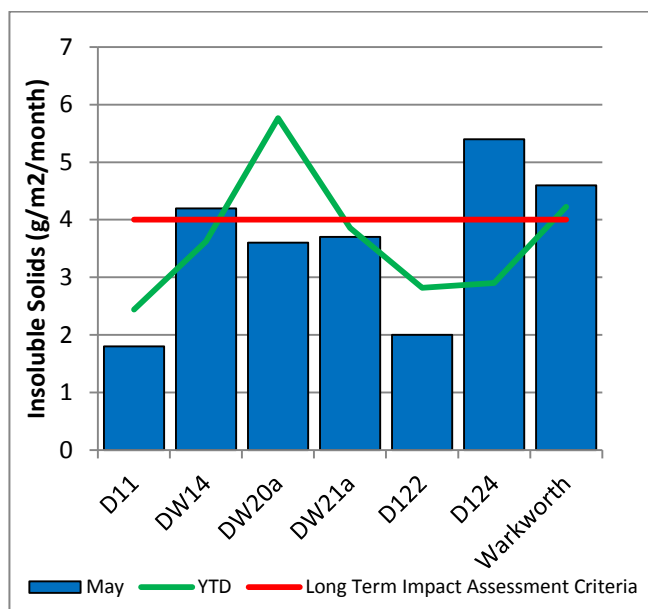


Figure 4 displays insoluble solids results from depositional dust gauges during the reporting period compared against the year-to-date average and the annual impact assessment criteria.

During the reporting period the DW14, D124 and Warkworth monitors recorded a monthly result above the long term impact assessment criteria of 4.0 g/m² per month. Field notes associated with D124 confirm the presence of insects and vegetation. 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 DW14 and Warkworth results were contaminated. Accordingly, this result will be included in the annual average calculation.

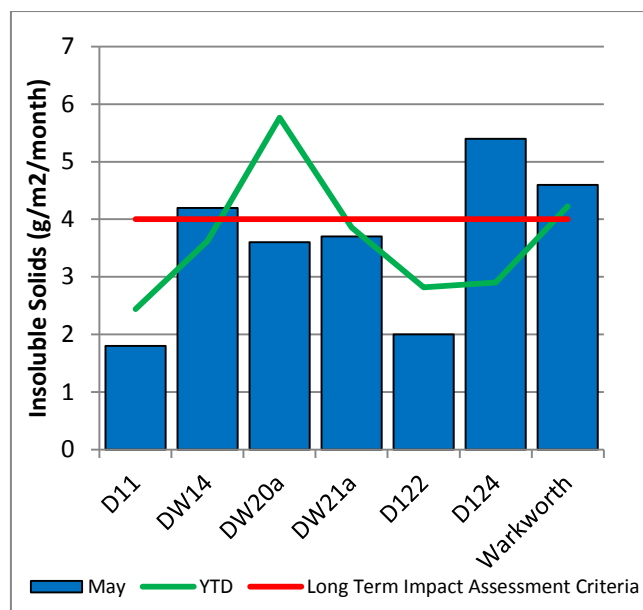


Figure 4: Depositional Dust – May 2017

2.3 Suspended Particulates

Suspended particulates are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM₁₀). 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 PM₁₀ Results

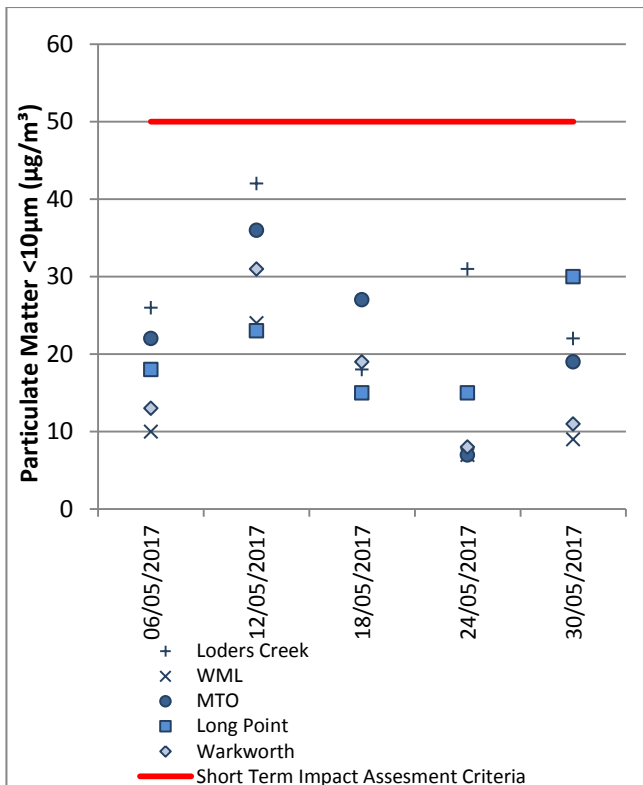


Figure 5 shows the individual PM₁₀ results at each monitoring station against the short term impact assessment criteria of 50µg/m³.

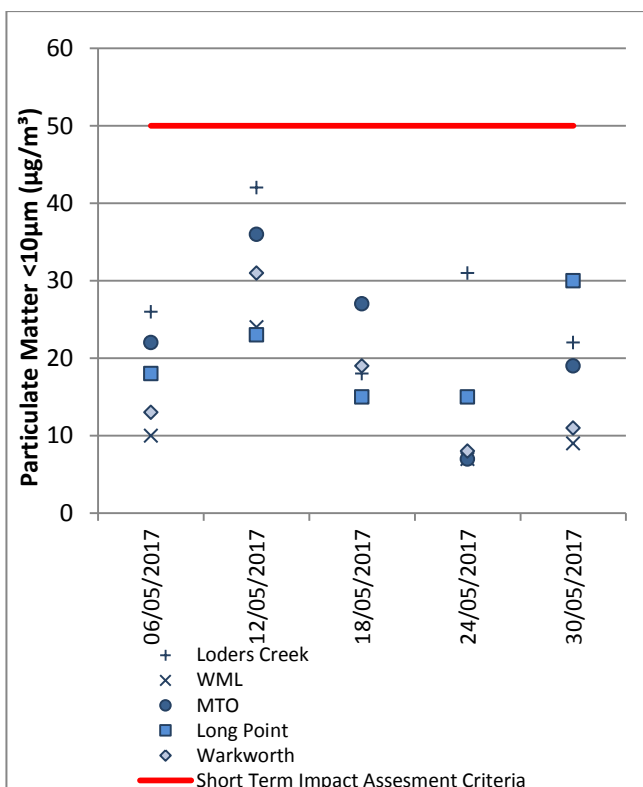


Figure 5: Individual PM₁₀ Results – May 2017

Figure 6 shows the annual average PM₁₀ results against the long term impact assessment criteria.

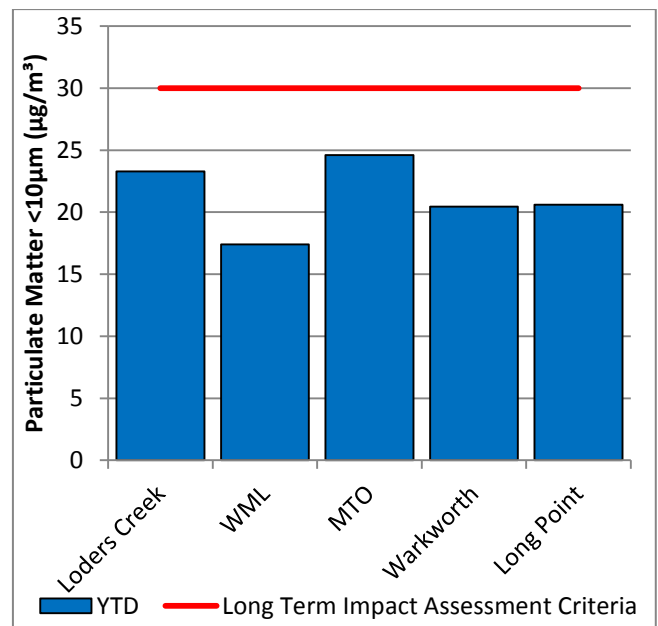


Figure 6: Annual Average PM₁₀ – May 2017

2.3.2 TSP Results

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

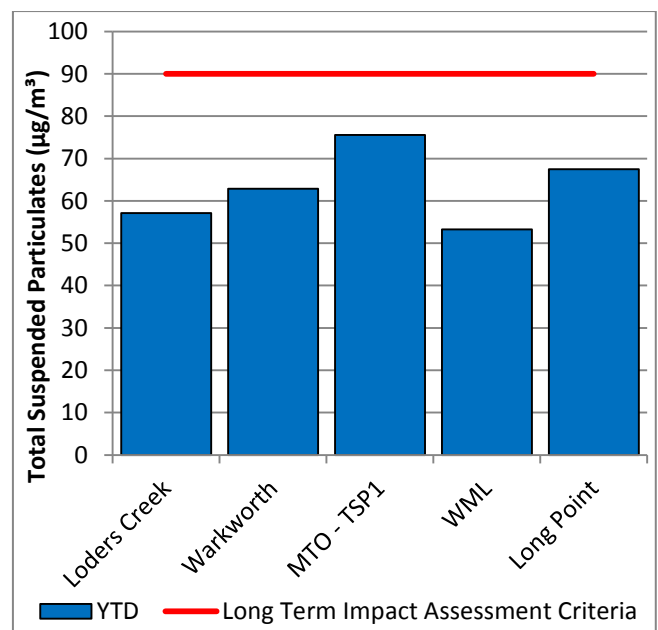


Figure 7: Annual Average Total Suspended Particulates – May 2017

2.3.3 Real Time PM₁₀ Results

Mount Thorley Warkworth maintains a network of real time PM₁₀ monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits.

Results for real time dust sampling are shown in Figure 8, including the daily 24 hour average PM₁₀ result and the annual PM₁₀ average.

2.3.4 Real Time Alarms for Air Quality

During May, the real time monitoring system generated 46 automated air quality related alerts for elevated PM₁₀ levels.

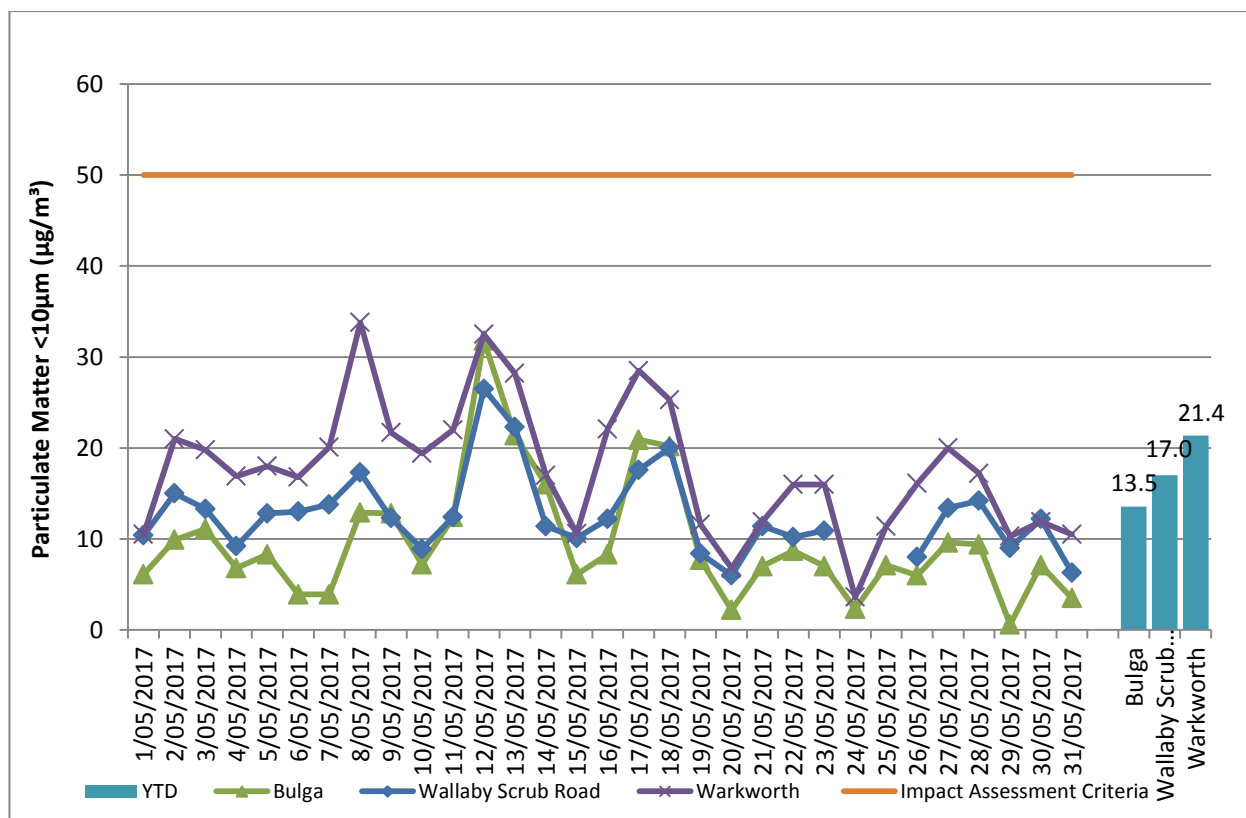


Figure 8: Real Time PM₁₀ daily 24hr average and annual average – May 2017

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 2017 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 2017 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 **Error! Reference source not found.**

4.1 Blast Monitoring Results

During May 2017, 30 blasts were initiated at MTW. **Error! Reference source not found.** to **Error! Reference source not found.** 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.

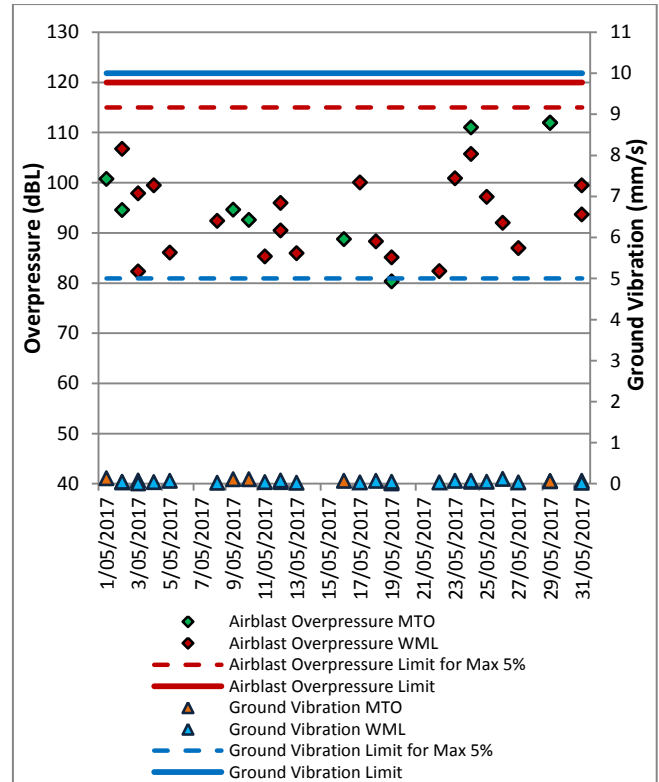


Figure 9: Abbey Green Blast Monitoring Results – May 2017

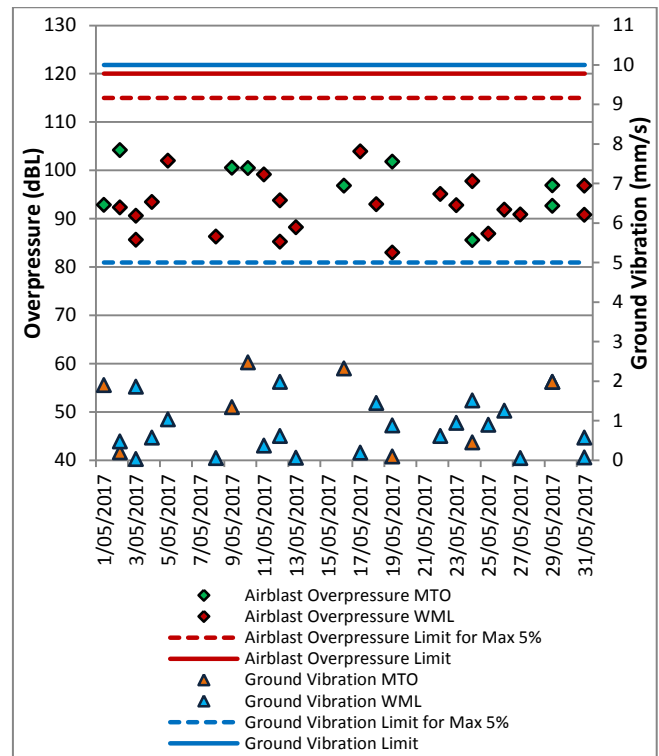


Figure 10: Bulga Village Blast Monitoring Results – May 2017

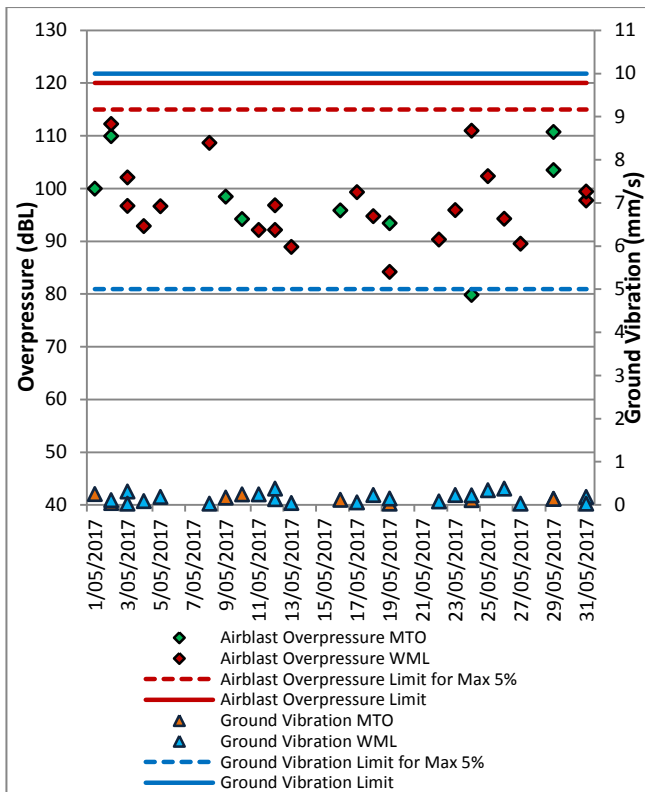


Figure 11: MTIE Blast Monitoring Results – May 2017

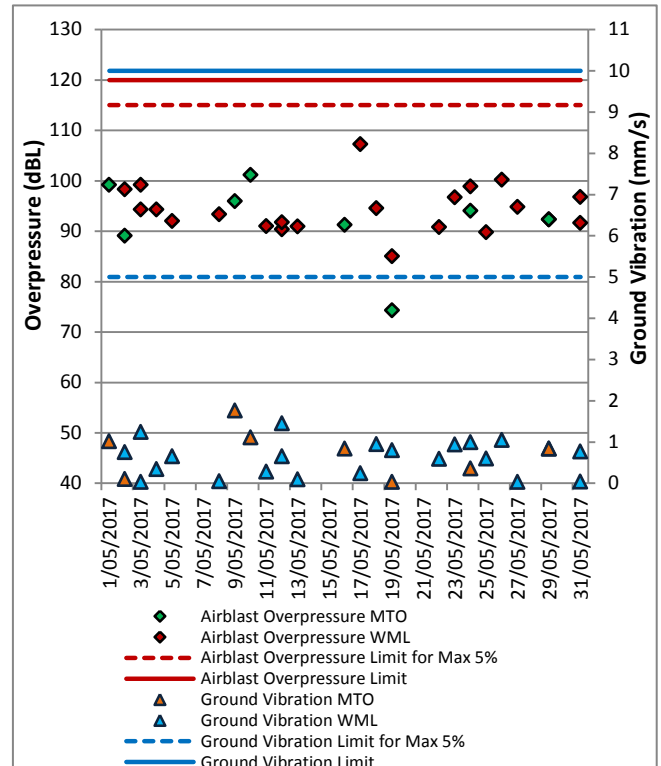


Figure 13: Wambo Road Blast Monitoring Results - May 2017

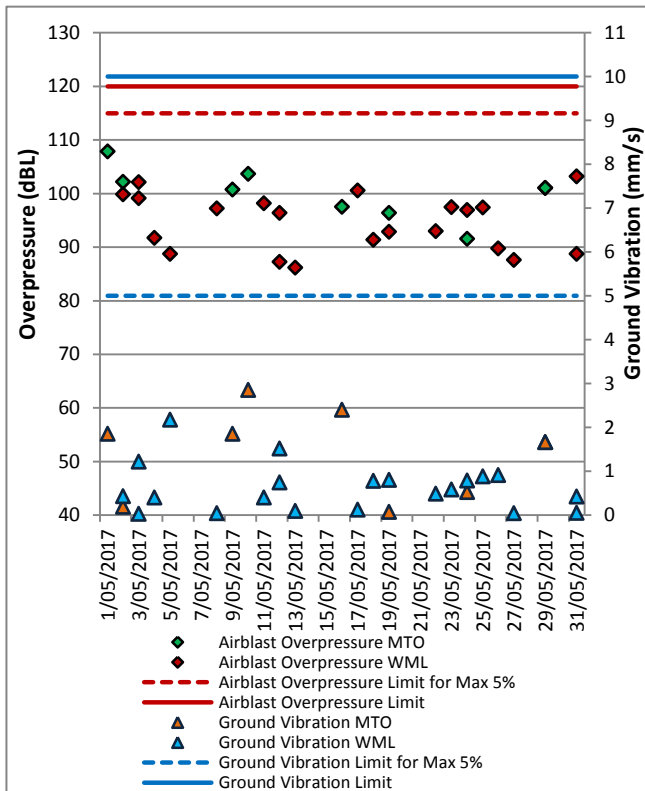


Figure 12: Wollemi Peak Road Blast Monitoring Results - May 2017

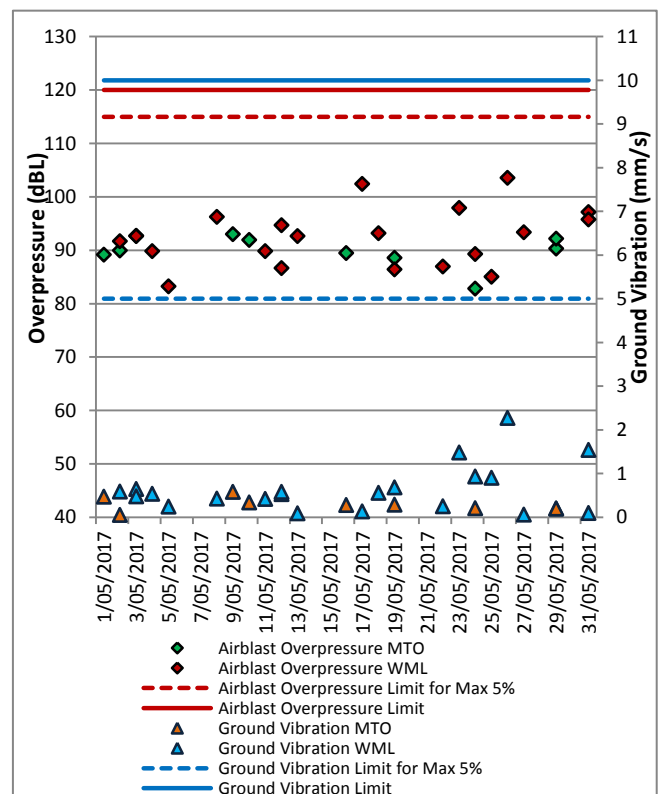


Figure 14: Warkworth Blast Monitoring Results - May 2017

**Mount Thorley Warkworth
Blast Monitoring Locations**

Date: 160621
Plan By: DF
Version: 4.0



RTCA - NSW Environmental Services

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. 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 nine 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 18th and 19th May 2017. All measurements complied with the relevant criteria. Results are detailed in Table 3 to **Error! Reference source not found.**

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 minute Warkworth Impact Assessment Criteria – May 2017

Location	Date and Time	Wind Speed (m/s) ⁵	Stability Class	Criterion (dB(A))	Criterion Applies? ^{1,6}	WML L _{Aeq} dB ^{2,4}	Exceedance ³	Total L _{Ceq} – L _{Aeq}	Revised WML L _{Aeq} ^{5,6}
Bulga RFS	19/05/2017 0:14	2.1	E	37	Yes	34	Nil	20	39
Bulga Village	18/05/2017 22:02	3.3	E	38	No	39	NA	21	44
Bulga Village (remeasure)	18/05/2017 23:16	2.2	F	38	No	36	NA	20	41
Gouldsville	18/05/2017 21:30	3.4	D	38	No	IA	NA	21	IA
Inlet Rd	18/05/2017 21:35	3.4	D	37	No	37	NA	20	41
Inlet Rd West	18/05/2017 21:10	3.5	D	35	No	29	NA	22	34
Long Point	18/05/2017 21:02	3.6	D	35	No	IA	NA	18	IA
South Bulga	19/05/2017 1:17	2	F	35	Yes	29	Nil	19	34
Wambo Road	18/05/2017 23:42	2.2	F	38	No	36	NA	22	40

Table 4: L_{A1}, 1 minute Warkworth - Impact Assessment Criteria – May 2017

Location	Date and Time	Wind Speed (m/s) ⁵	Stability Class	Criterion dB	Criterion Applies? ^{1,6}	WML L _{A1} , 1min dB ^{2,4}	Exceedance ³
Bulga RFS	19/05/2017 0:14	2.1	E	47	Yes	44	Nil
Bulga Village	18/05/2017 22:02	3.3	E	48	No	43	NA
Bulga Village (remeasure)	18/05/2017 23:16	2.2	F	48	No	38	NA
Gouldsville	18/05/2017 21:30	3.4	D	48	No	IA	NA
Inlet Rd	18/05/2017 21:35	3.4	D	47	No	40	NA
Inlet Rd West	18/05/2017 21:10	3.5	D	45	No	34	NA
Long Point	18/05/2017 21:02	3.6	D	45	No	IA	NA
South Bulga	19/05/2017 1:17	2	F	45	Yes	NM	Nil
Wambo Road	18/05/2017 23:42	2.2	F	48	No	39	NA

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 LA1,1minute 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. 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_{Aeq}, 15minute Mount Thorley - Impact Assessment Criteria – May 2017

Location	Date and Time	Wind Speed (m/s) ⁵	Stability Class	Criterion dB	Criterion Applies? ^{1,6}	MTO L _{Aeq} dB ^{2,4}	Exceedance ³	Total L _{Ceq} – L _{Aeq} ⁷	Revised MTO L _{Aeq} ^{5,6}
Bulga RFS	19/05/2017 0:14	2.1	E	37	Yes	36	Nil	20	41
Bulga Village	18/05/2017 22:02	3.3	E	38	No	NM	NA	21	NA
Bulga Village (remeasure)	18/05/2017 23:16	2.2	F	38	No	NM	NA	20	NA
Gouldsville	18/05/2017 21:30	3.4	D	35	No	IA	NA	21	NA
Inlet Rd	18/05/2017 21:35	3.4	D	37	No	IA	NA	20	NA
Inlet Rd West	18/05/2017 21:10	3.5	D	35	No	IA	NA	22	NA
Long Point	18/05/2017 21:02	3.6	D	35	No	IA	NA	18	NA
South Bulga	19/05/2017 1:17	2	F	36	Yes	29	Nil	19	34
Wambo Road	18/05/2017 23:42	2.2	F	38	No	NM	NA	22	NA

Table 6: LA1, 1Minute Mount Thorley - Impact Assessment Criteria – May 2017

Location	Date and Time	Wind Speed (m/s) ⁵	Stability Class	Criterion dB	Criterion Applies? ^{1,6}	MTO LA1, 1min dB ^{2,4}	Exceedance ³
Bulga RFS	19/05/2017 0:14	2.1	E	47	Yes	44	Nil
Bulga Village	18/05/2017 22:02	3.3	E	48	No	NM	NA
Bulga Village (remeasure)	18/05/2017 23:16	2.2	F	48	No	NM	NA
Gouldsville	18/05/2017 21:30	3.4	D	45	No	IA	NA
Inlet Rd	18/05/2017 21:35	3.4	D	47	No	IA	NA
Inlet Rd West	18/05/2017 21:10	3.5	D	45	No	IA	NA
Long Point	18/05/2017 21:02	3.6	D	45	No	IA	NA
South Bulga	19/05/2017 1:17	2	F	46	Yes	34	Nil
Wambo Road	18/05/2017 23:42	2.2	F	48	No	NM	NA

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 LA1,1minute 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 INP Low Frequency

In accordance with the requirements of the NSW Industrial Noise Policy (INP), the low frequency modification factor has been applied where appropriate. It should be noted that the Industrial Noise Policy does not give guidance on the application of the penalty where more than one target noise source is audible. The L_{Ceq} levels **reported above are “Total”, or “Total mine noise” at best, and cannot be attributed accurately to a single mine.** Accordingly, where the INP criteria for the application of the Low Frequency modification factor is triggered, the penalty has been applied to the dominant mine noise source (either of WML or MTO).

Resulting L_{Aeq} noise levels exceed the WML and MTO impact assessment criteria at Bulga RFS by 2 dB and 4 dB respectively due to in the application of a 5 dB penalty to the site only L_{Aeq} .

MTW reports these measurements so as to ensure full disclosure, however it remains MTW’s position that the prescribed methodology is unsuitable when applied to receptors at large distances from mine noise sources due to the nature of noise attenuation. Excess attenuation of noise with distance is greater for high frequency noise than it is for low frequency noise. At significant distance from a noise source (such as private residences from the MTW complex) this often results in large differentials between L_{Aeq} and L_{Ceq} . The NSW Industrial Noise Policy requires the penalty to be applied in these instances, irrespective of actual low frequency affectation. As such, MTW does not consider these instances to constitute non-compliance with the conditions of approval.

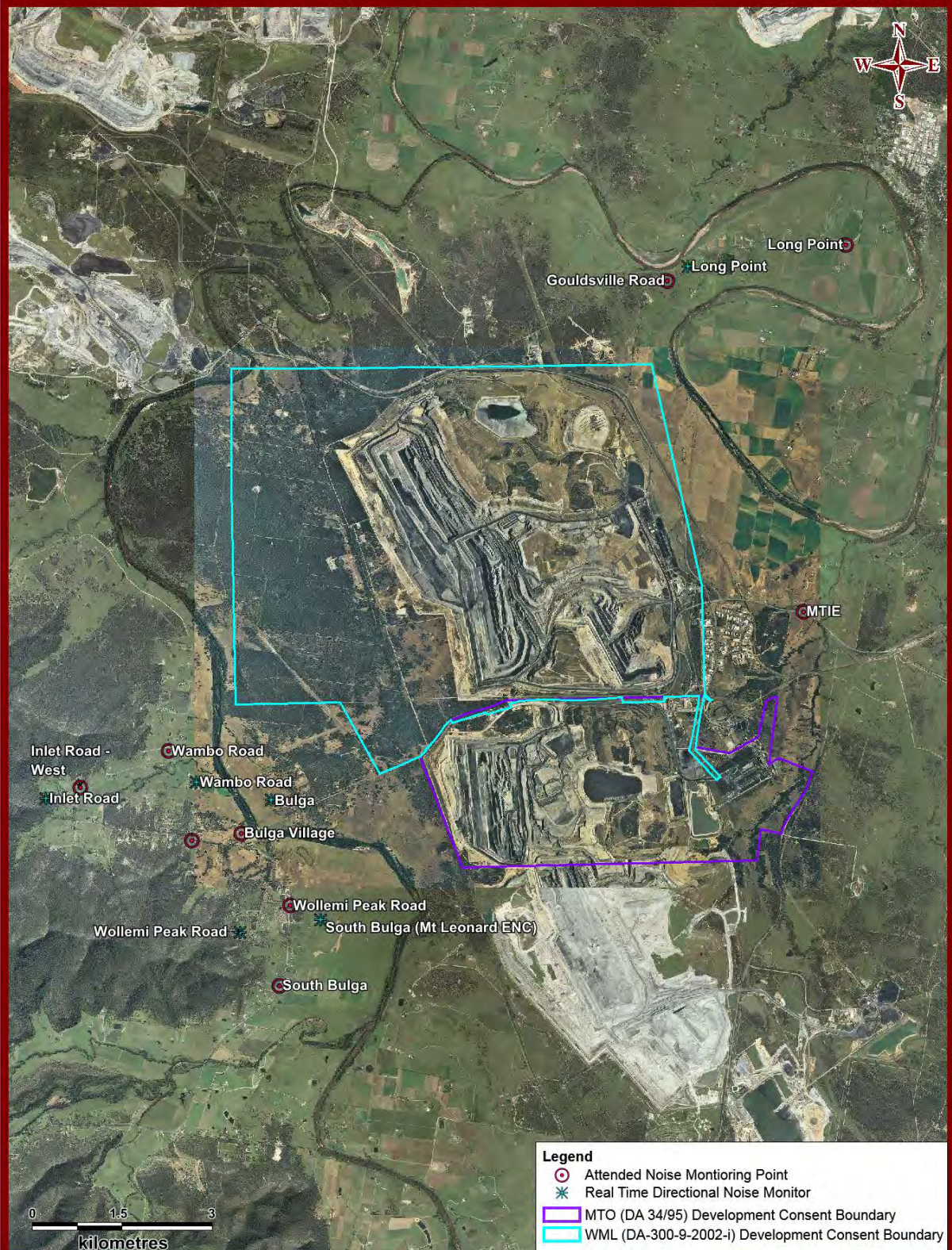
The results have been reported to the Department of Planning and Environment.

**Mount Thorley Warkworth
Noise Monitoring Programme**

Date: 160226

Plan By: DF

Version: 2.0



RTCA - NSW Environmental Services

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:

- Replacement of non-attenuated equipment with sound attenuated equipment;
- 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 7: Supplementary Attended Noise Monitoring Data – May 2017

No. of assessments	No. of assessments > trigger	No. of nights where assessments > trigger	% greater than trigger
567	4	3	0.7

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 123.5.0 hours of equipment downtime were logged in response to environmental events such as dust, noise and adverse meteorological conditions. Operational downtime by equipment type is shown in Figure 17.

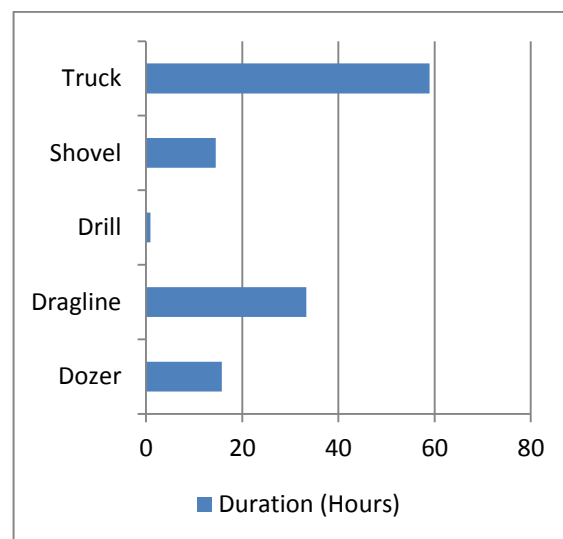


Figure 17: Operational Downtime by Equipment Type – May 2017

7.0 REHABILITATION

During May, 2.5 Ha of land was released, 6.7 Ha of land was bulk shaped, 5.5 Ha of land was topsoiled, 8.0 Ha of land was composted and 12.2 Ha of land was rehabilitated.

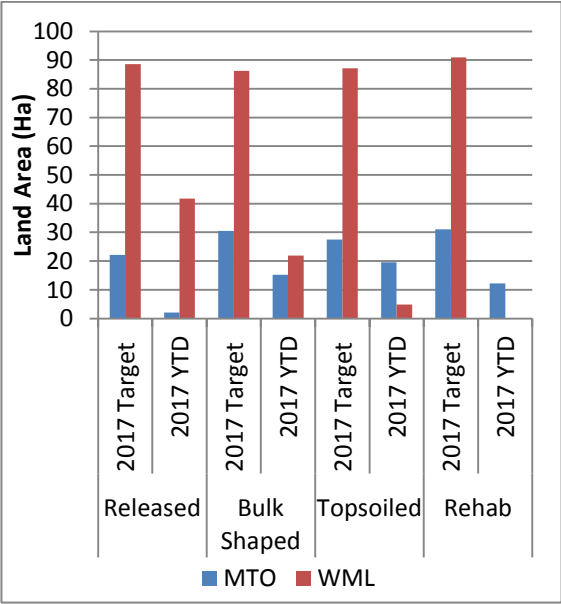


Figure 18: Rehabilitation YTD - May 2017

8.0 ENVIRONMENTAL INCIDENTS

During the reporting period MTW there were no reportable environmental incidents.

9.0 COMPLAINTS

During the reporting period 42 complaints were received, details of these complaints are shown in **Error! Reference source not found.** below.

	Noise	Dust	Blast	Lighting	Other	Total
January	5	6	3	1	0	15
February	25	3	10	3	0	41
March	14	1	1	2	0	18
April	27	1	7	2	0	37
May	18	4	7	10	3	42
June	-	-	-	-	-	-
July	-	-	-	-	-	-
August	-	-	-	-	-	-
September	-	-	-	-	-	-
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	-	-	-	-	-	-
Total	89	15	28	18	3	153

Figure 19: Complaints Summary – YTD May 2017

Appendix A: Meteorological Data

Table 8: Meteorological Data – Charlton Ridge Meteorological Station –May 2017

Date	Air Temperature Maximum (°C)	Air Temperature Minimum (°C)	Relative Humidity Maximum (%)	Relative Humidity Minimum (%)	Wind Direction Average (°)	Wind Speed Average (m/sec)	Rainfall(mm)
1/05/2017	23.4	8.5	93.3	47.4	170.7	1.7	0.0
2/05/2017	24.5	8.1	98.1	44.4	235.1	2.1	0.0
3/05/2017	26.4	9.2	89.6	29.1	238.1	2.4	0.0
4/05/2017	18.7	12.4	76.9	57.8	170.5	3.3	0.0
5/05/2017	20.0	10.5	87.1	55.1	165.8	2.7	0.0
6/05/2017	22.2	6.8	95.5	39.3	150.0	1.6	0.0
7/05/2017	24.2	6.5	95.8	36.3	249.3	2.0	0.0
8/05/2017	23.3	8.3	84.5	25.9	196.0	2.0	0.0
9/05/2017	20.3	6.8	72.2	38.7	166.7	2.4	0.0
10/05/2017	21.2	6.3	80.6	35.7	164.2	2.3	0.0
11/05/2017	21.1	6.5	92.8	38.9	192.9	1.5	0.0
12/05/2017	21.6	5.9	94.0	35.3	212.1	1.6	0.0
13/05/2017	18.4	9.1	91.5	67.7	183.8	2.3	0.4
14/05/2017	20.9	9.0	97.0	58.2	167.3	1.5	0.2
15/05/2017	20.7	10.0	92.3	61.6	183.2	2.0	1.4
16/05/2017	20.6	9.4	86.3	46.8	204.0	1.7	0.0
17/05/2017	21.0	6.2	93.2	39.5	213.9	1.9	0.0
18/05/2017	21.4	5.3	92.3	40.8	177.6	1.7	0.0
19/05/2017	21.9	8.4	94.3	51.4	159.5	2.2	0.0
20/05/2017	18.8	12.7	97.2	73.4	126.7	2.2	12.4
21/05/2017	22.8	12.4	97.8	62.0	204.7	1.5	4.0
22/05/2017	23.3	11.0	98.1	54.7	173.4	1.6	0.0
23/05/2017	22.4	12.7	88.5	57.2	151.2	2.1	0.0
24/05/2017	22.5	11.3	96.2	55.5	250.9	2.1	0.0
25/05/2017	-	-	-	-	-	-	-
26/05/2017	22.0	5.7	94.7	38.9	252.6	2.2	0.0
27/05/2017	20.0	5.2	92.2	42.1	225.7	1.7	0.0
28/05/2017	20.8	5.5	96.0	49.3	190.8	1.7	0.2
29/05/2017	21.5	5.6	97.3	49.1	276.5	2.7	0.0
30/05/2017	18.4	4.9	74.6	28.2	275.0	3.0	0.0
31/05/2017	16.8	1.1	84.7	37.5	302.5	3.1	0.0

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



Appendix C

Environmental Monitoring
June 2017



Mount Thorley Warkworth
Monthly Environmental Report
June 2017

Coal & Allied Operations Pty Ltd

ABN 16 000 023 656

Putty Road, Mount Thorley via Singleton NSW 2330 Australia

PO Box 315 Singleton NSW 2330 Australia

Telephone +61 2 6570 0300 Facsimile +61 2 6570 0399

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	Environmental Graduate	Draft	4/08/2017
1.1	Environmental Specialist	Final	8/08/2017

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 June to 30 June 2017.

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 **Error!**
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Table 1: Monthly Rainfall MTW

2017	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
June	28.8	271.8

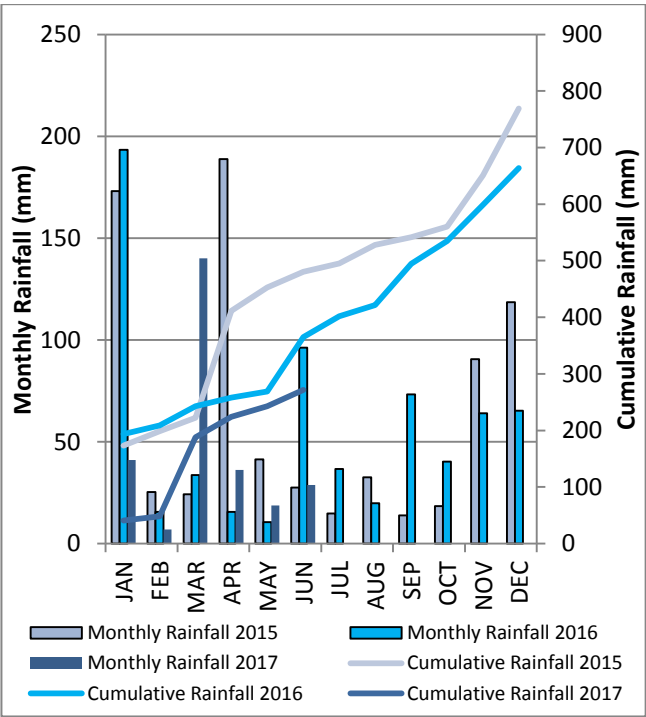


Figure 1: Rainfall Trends YTD

2.1.2 Wind Speed and Direction

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

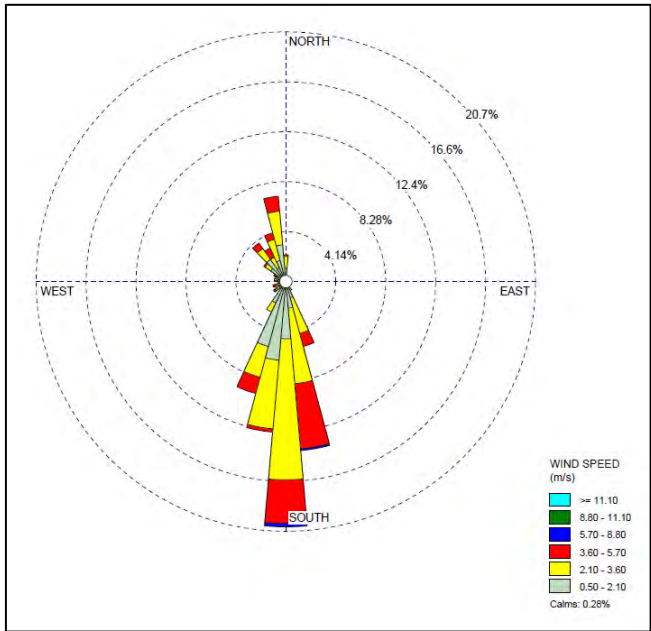


Figure 2: Charlton Ridge Wind Rose – June 2017

Mount Thorley Warkworth Air Quality Monitoring Programme

Date: 170301
Plan By: DF
Version: 1.3



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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 DW14 and D124 monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m² per month. Field notes associated with D124 confirm the presence of insects and vegetation. 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 DW14 results are contaminated. Accordingly, the results will be included in the annual average calculation.

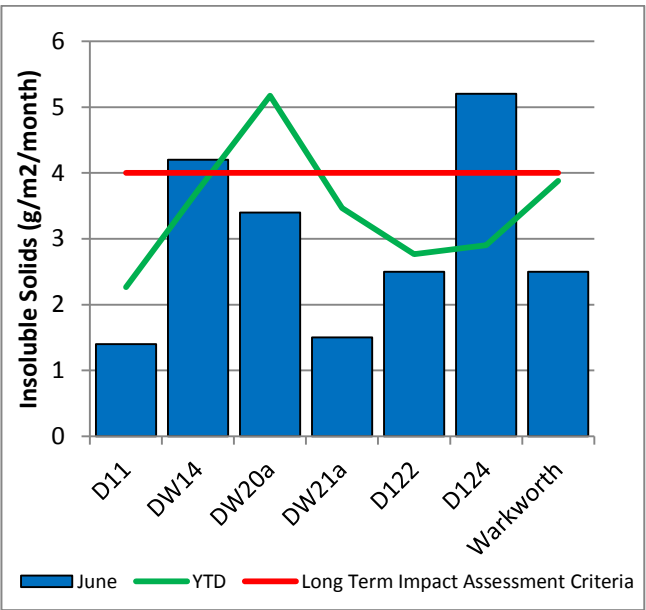


Figure 4: Depositional Dust – June 2017

2.3 Suspended Particulates

Suspended particulates are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM₁₀). 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 PM₁₀ Results

Figure 5 shows the individual PM₁₀ results at each monitoring station against the short term impact assessment criteria of 50µg/m³.

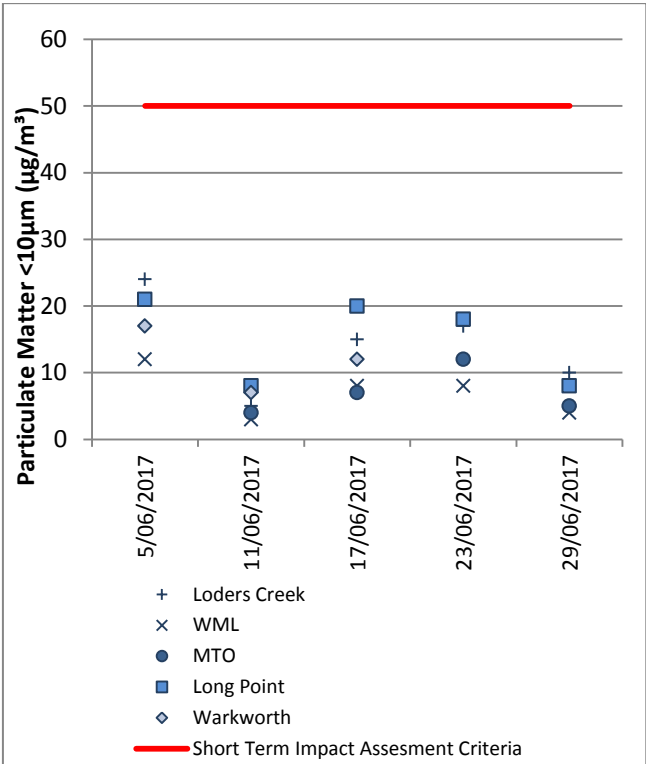


Figure 5: Individual PM₁₀ Results – June 2017

Figure 6 shows the annual average PM₁₀ results against the long term impact assessment criteria.

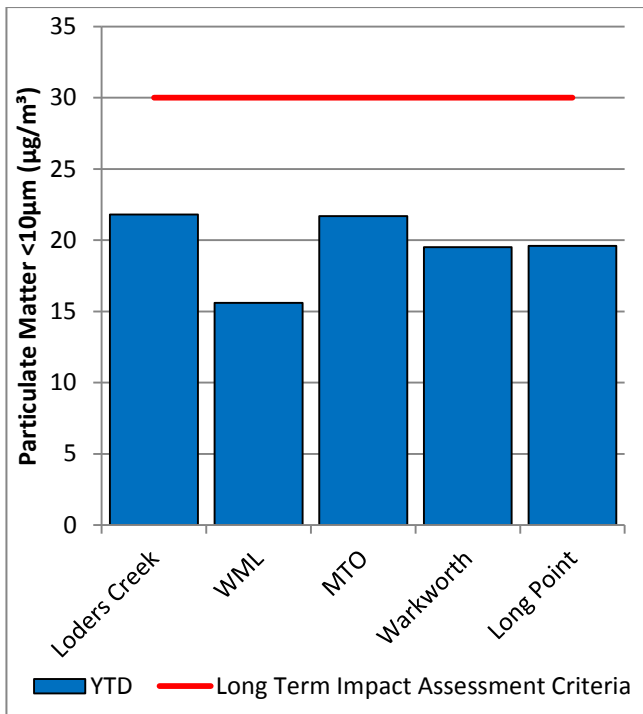


Figure 6: Annual Average PM₁₀ – June 2017

2.3.2 TSP Results

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

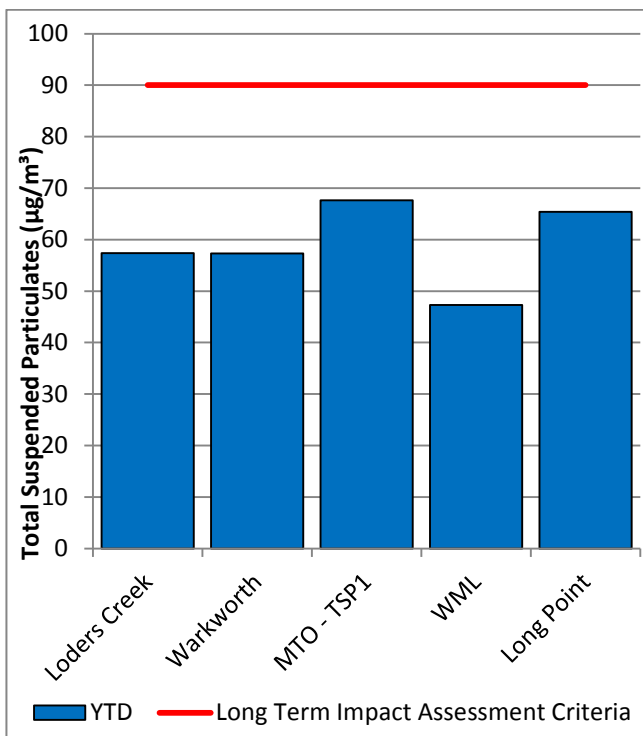


Figure 7: Annual Average Total Suspended Particulates – June 2017

2.3.3 Real Time PM₁₀ Results

Mount Thorley Warkworth maintains a network of real time PM₁₀ monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits.

Results for real time dust sampling are shown in Figure 8, including the daily 24 hour average PM₁₀ result and the annual PM₁₀ average.

2.3.4 Real Time Alarms for Air Quality

During June, the real time monitoring system did not generate any air quality related alarms.

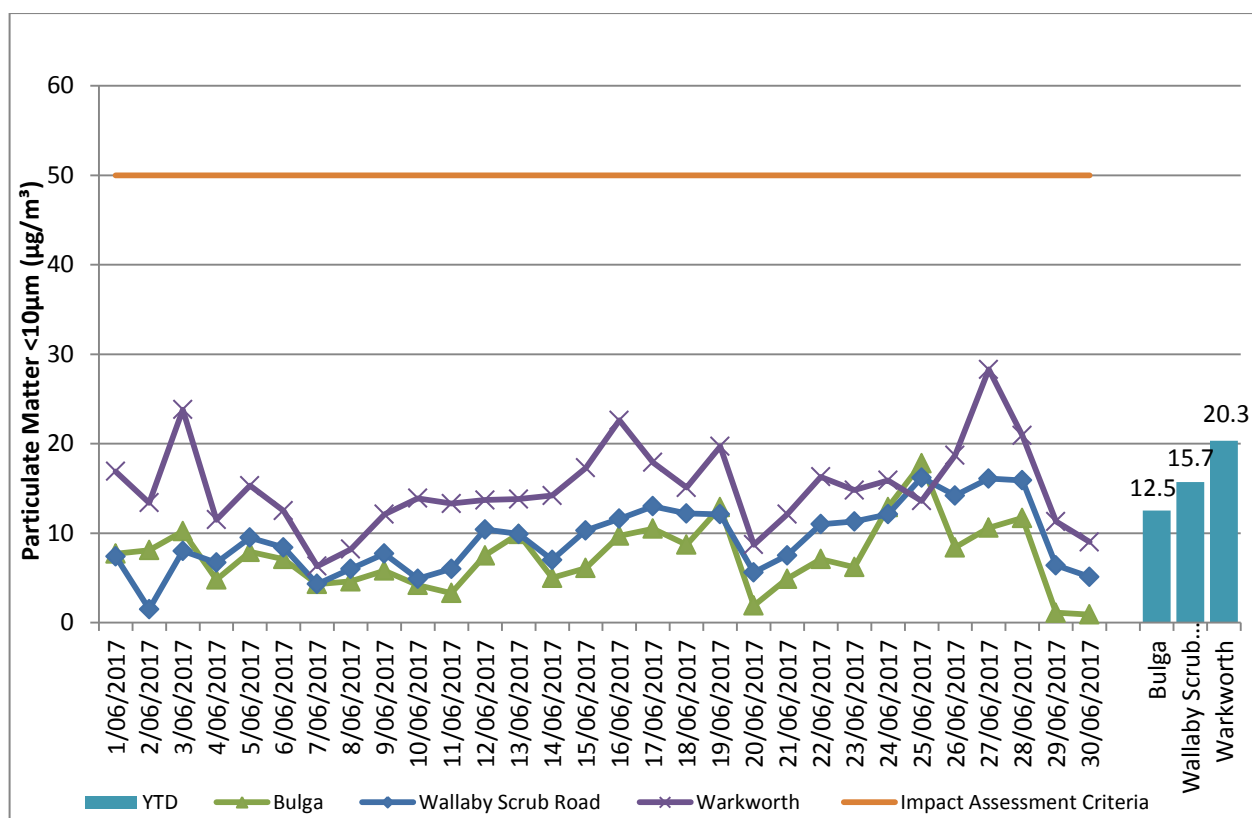


Figure 8: Real Time PM₁₀ 24hr average and Year-to-date average – June 2017

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 (2014 – current) within MTW mine dams. Figure 12 to Figure 14 show the long term surface water trend (2014 - current) in surrounding watercourses.

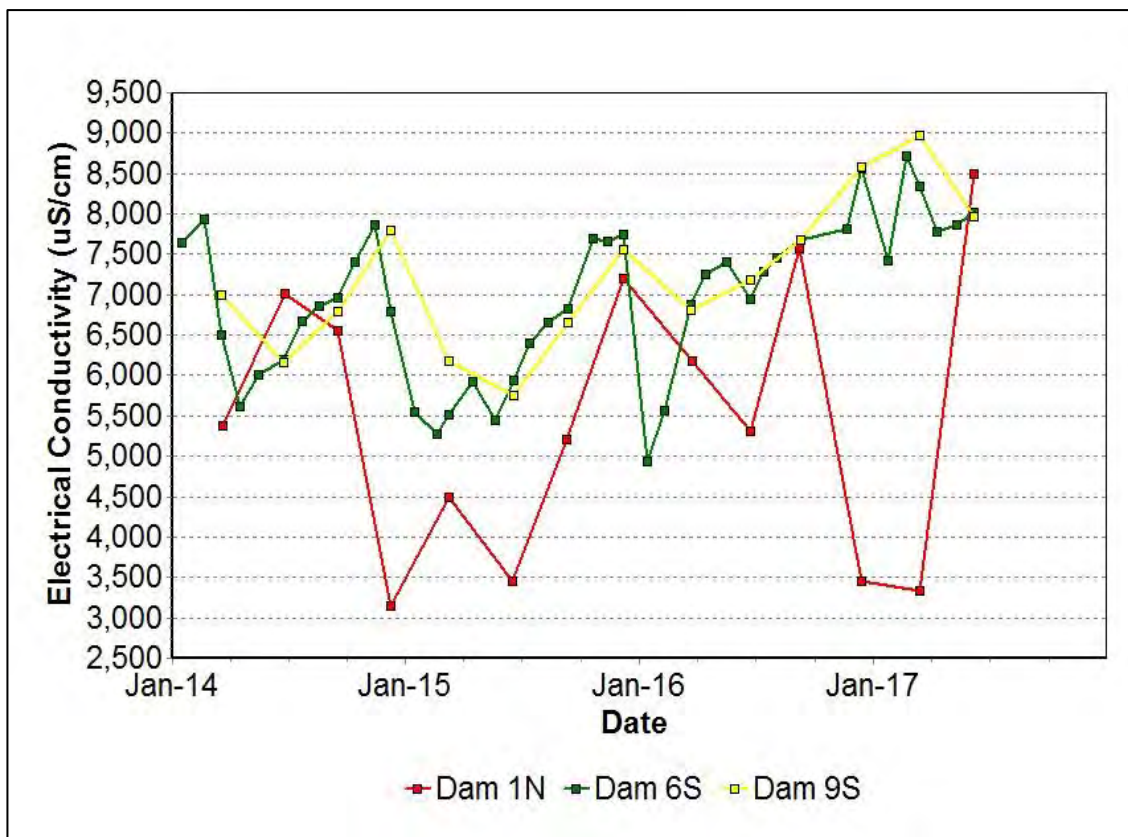


Figure 9: Site Dams Electrical Conductivity Trend 2014 – Current

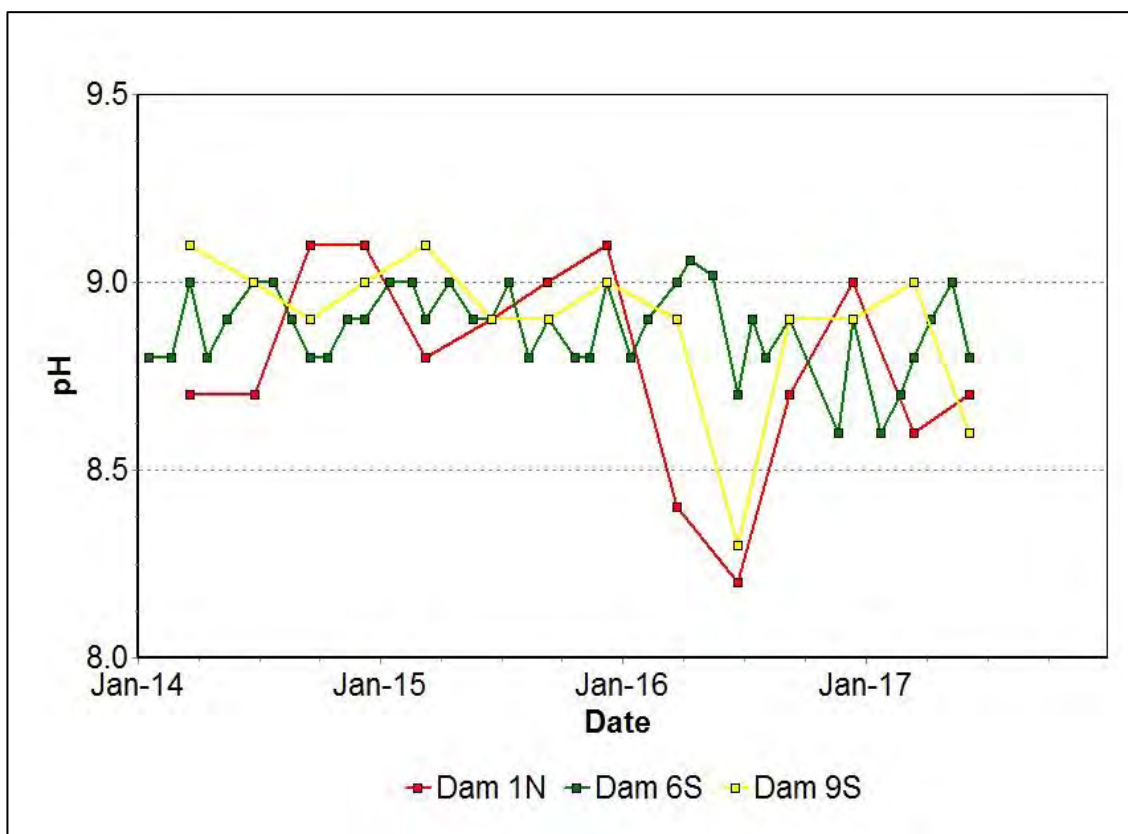


Figure 10: Site Dams pH Trend 2014 - Current

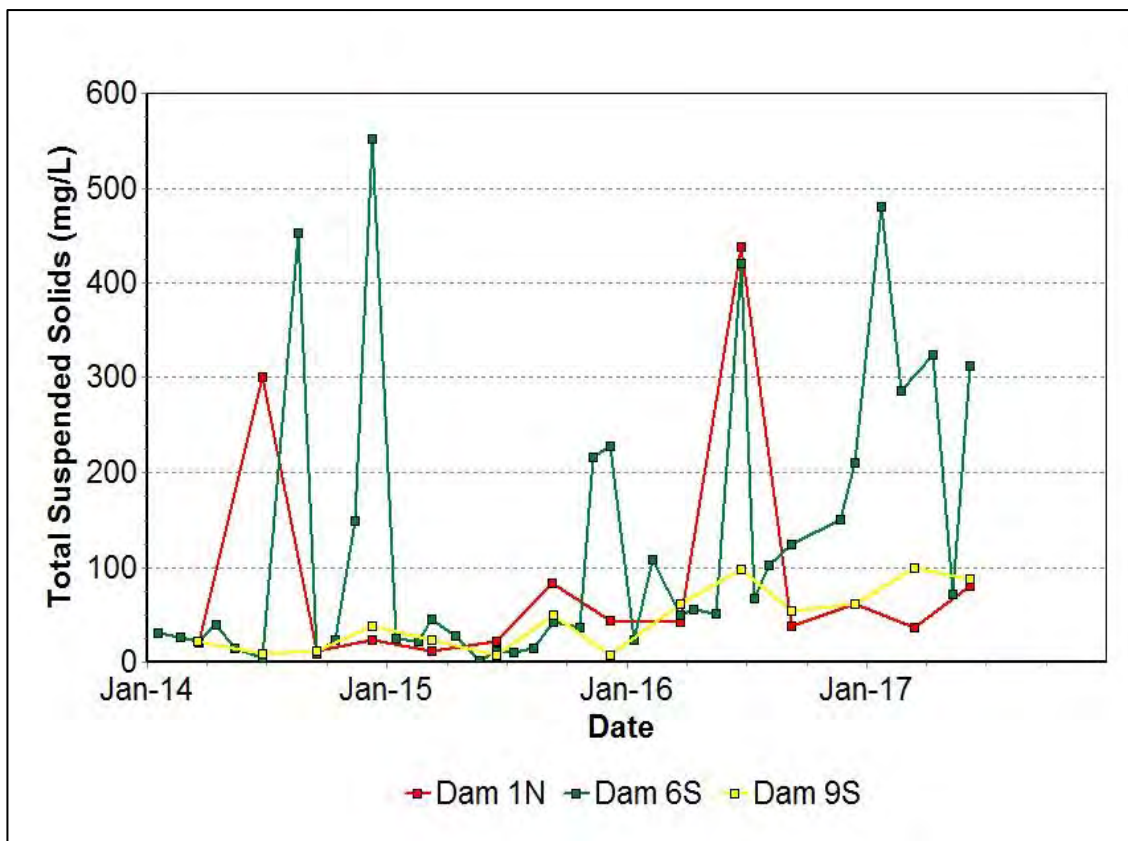


Figure 11: Site Dams Total Suspended Solids Trend 2014 – Current

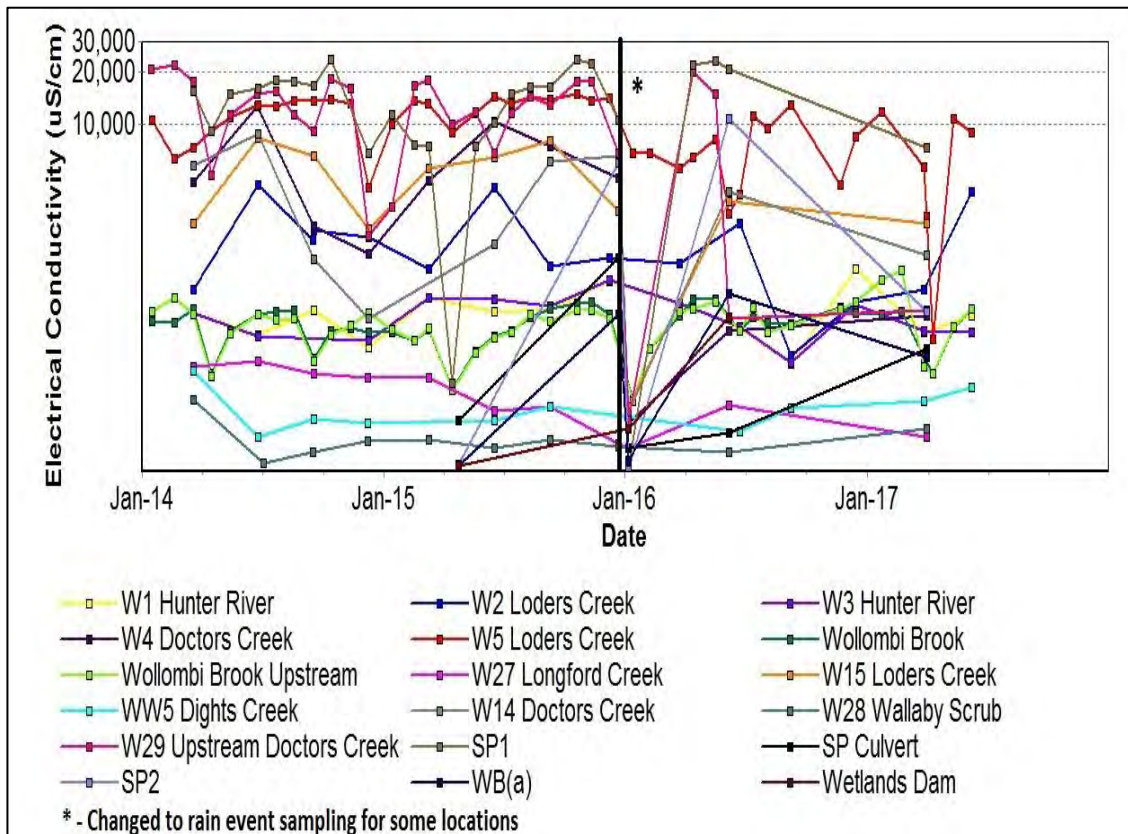


Figure 12: Watercourse Electrical Conductivity Trend 2014 - Current

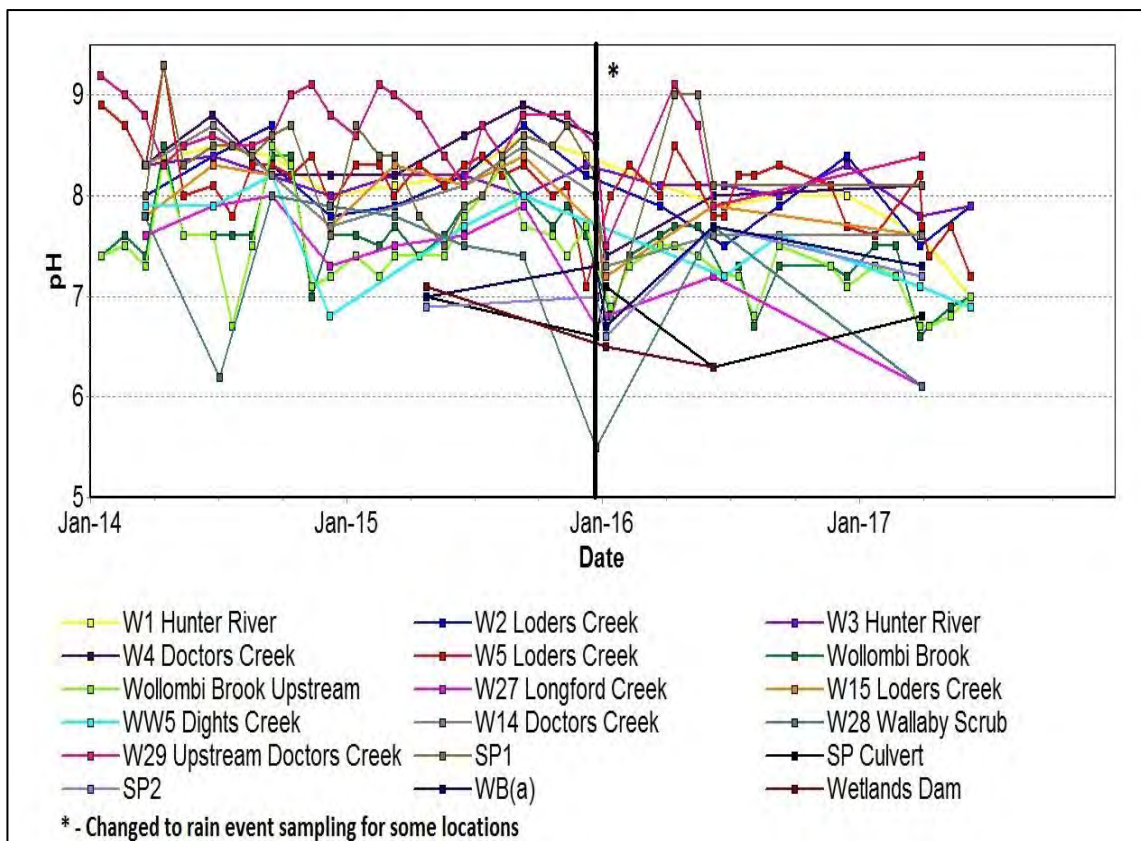


Figure 13: Watercourse pH Trend 2014 – Current

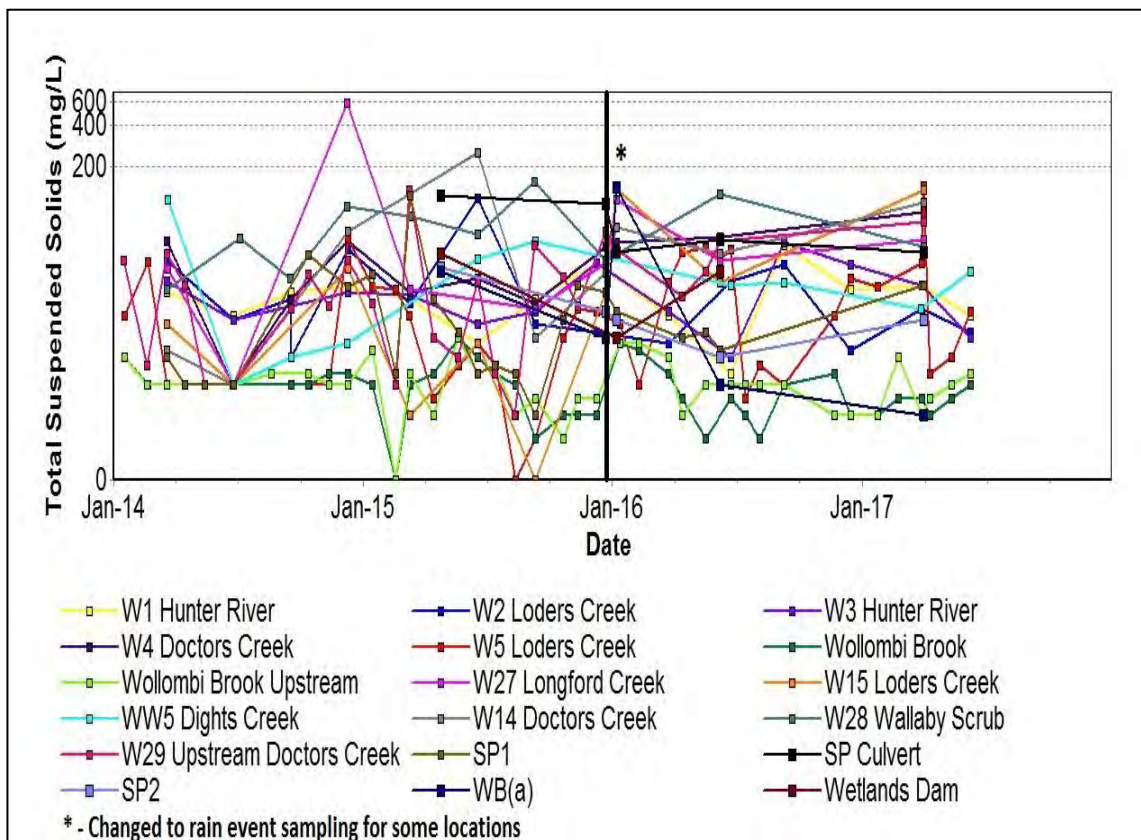


Figure 14: Watercourse Total Suspended Solids Trend 2014 – Current

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.

During H1 2017 24 internal trigger limits were breached, summarised in Table 2.

Table 2: Surface Water Trigger Tracking - June 2017

Site	Date	Trigger Limit Breached	Action Taken in Response
W5	28/03/2017	EC –95 th Percentile	Watching Brief*
W1	28/03/2017	EC –95 th Percentile	Watching Brief*
W1	28/03/2017	pH –5 th Percentile	Watching Brief*
W1	08/06/2017	pH –5 th Percentile	Watching Brief*
W2	28/03/2017	pH –5 th Percentile	Watching Brief*
W4	31/03/2017	pH –5 th Percentile	Watching Brief*
W5	28/03/2017	pH –5 th Percentile	Watching Brief*
W5	10/04/2017	pH –5 th Percentile	Watching Brief*
W5	11/05/2017	pH –5 th Percentile	Watching Brief*
W5	08/06/2017	pH –5 th Percentile	Low flow conditions in Loders Creek; pH low but within historical range. Continue to watch and monitor.
W15	31/03/2017	pH –5 th Percentile	Watching Brief*
W27	31/03/2017	pH –5 th Percentile	Watching Brief*
W28	31/03/2017	pH –5 th Percentile	Watching Brief*
Wollombi Brook	28/03/2017	pH –5 th Percentile	Watching Brief*
Wollombi Brook	10/04/2017	pH –5 th Percentile	Watching Brief*
Wollombi Brook Upstream	28/03/2017	pH –5 th Percentile	Watching Brief*

Wollombi Brook Upstream	10/04/2017	pH –5 th Percentile	Watching Brief*
Wollombi Brook Upstream	11/05/2017	pH –5 th Percentile	Low flow conditions in Wollombi Brook; pH low but within historical range. Continue to watch and monitor.
W4	31/03/2017	TSS – 50mg/L (ANZECC criteria)	Field investigation did not identify any mining-related sources of sediment. Elevated TSS associated with high-intensity rainfall event. No further action.
W14	31/03/2017	TSS – 50mg/L (ANZECC criteria)	Field investigation did not identify any mining-related sources of sediment. Elevated TSS associated with high-intensity rainfall event. No further action.
W15	31/03/2017	TSS – 50mg/L (ANZECC criteria)	Investigation did not identify any mining-related sources of sediment. Elevated TSS associated with high-intensity rainfall event. No further action.
W27	31/03/2017	TSS – 50mg/L (ANZECC criteria)	Investigation did not identify any mining-related sources of sediment. Elevated TSS associated with high-intensity rainfall event; data consistent with historical range. No further action.
W28	31/03/2017	TSS – 50mg/L (ANZECC criteria)	Investigation did not identify any mining-related sources of sediment. Elevated TSS associated with high-intensity rainfall event; data consistent with historical range. No further action.
W29	31/03/2017	TSS – 50mg/L (ANZECC criteria)	Field investigation did not identify any mining-related sources of sediment. Elevated TSS associated with high-intensity rainfall event. No further action.

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

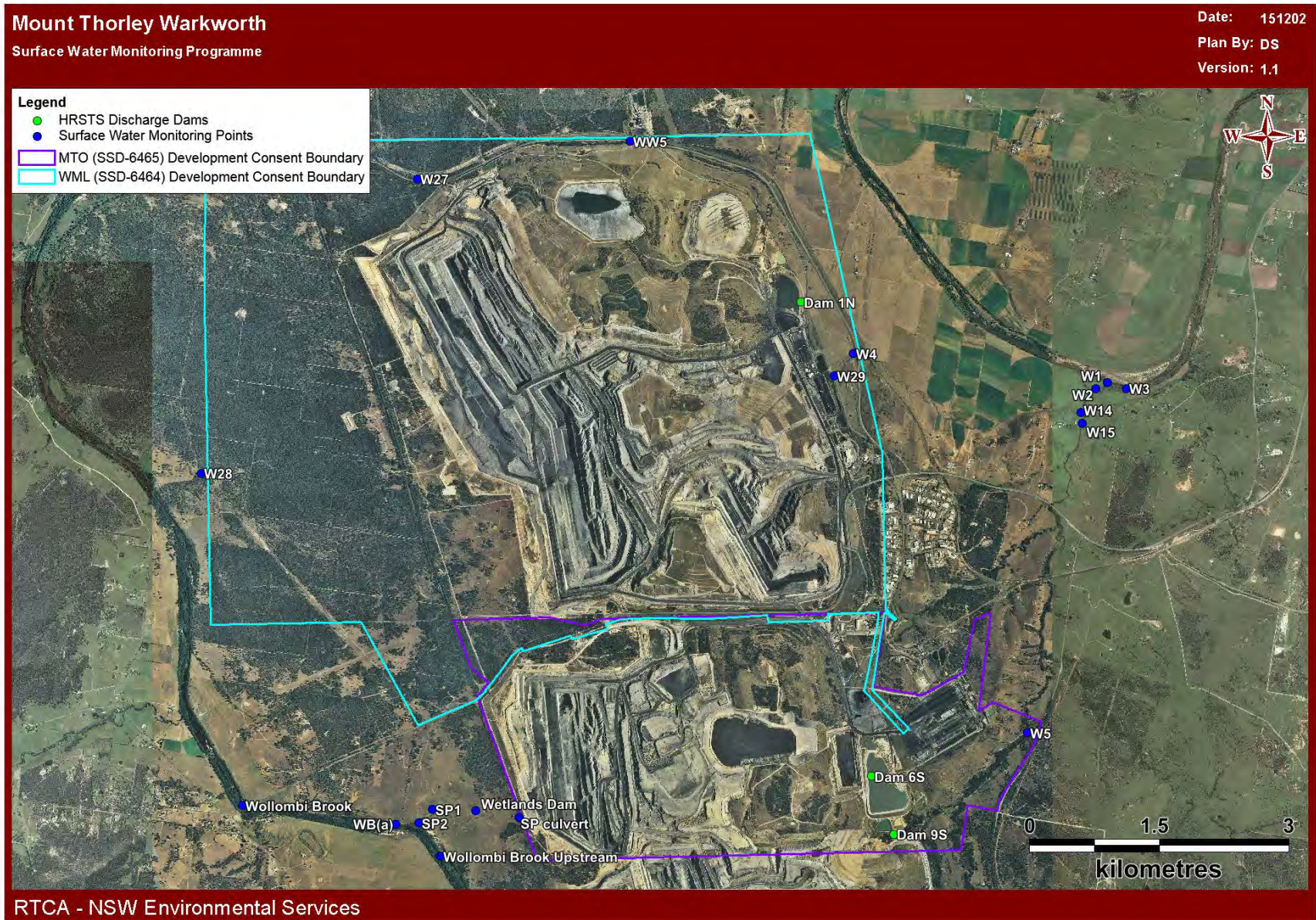


Figure 15: Surface Water Monitoring Location Plan

3.2 Groundwater Monitoring

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

Figures 16 to 58 show the long term water quality trends (2014 – current) for groundwater bores monitored at MTW.

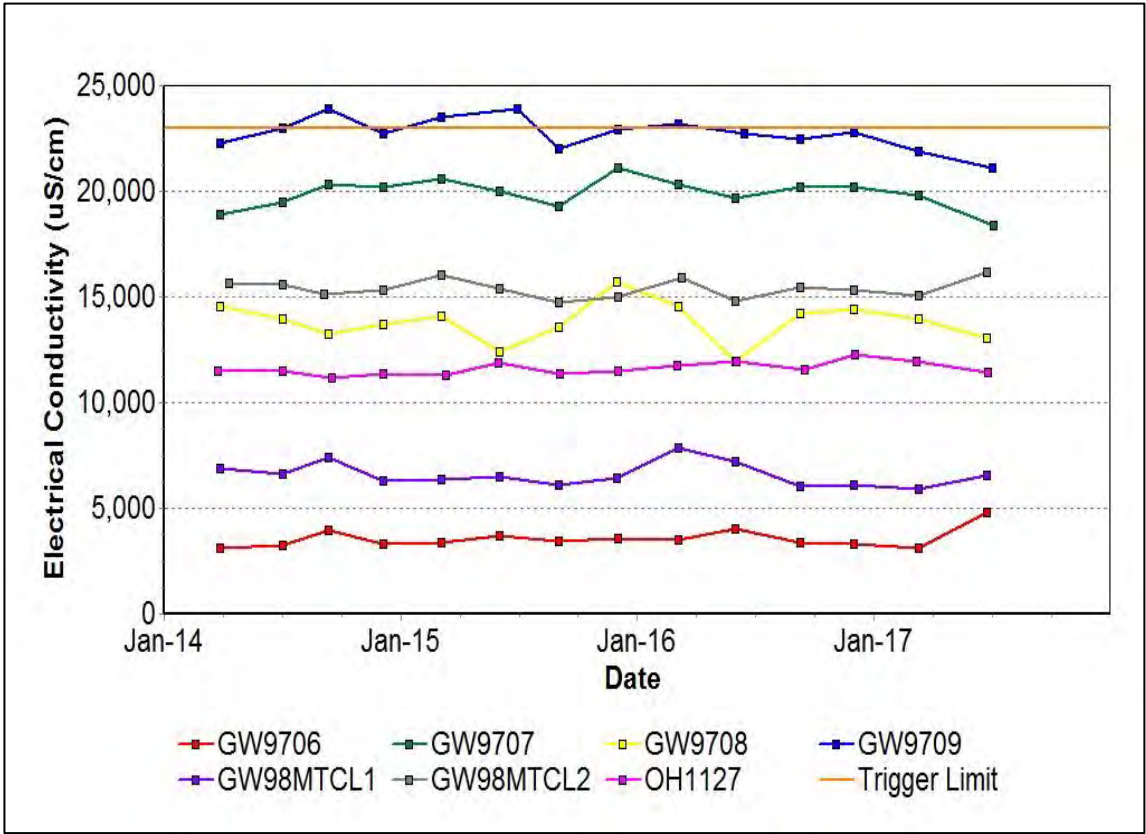


Figure 16: Bayswater Seam Electrical Conductivity Trend – June 2017

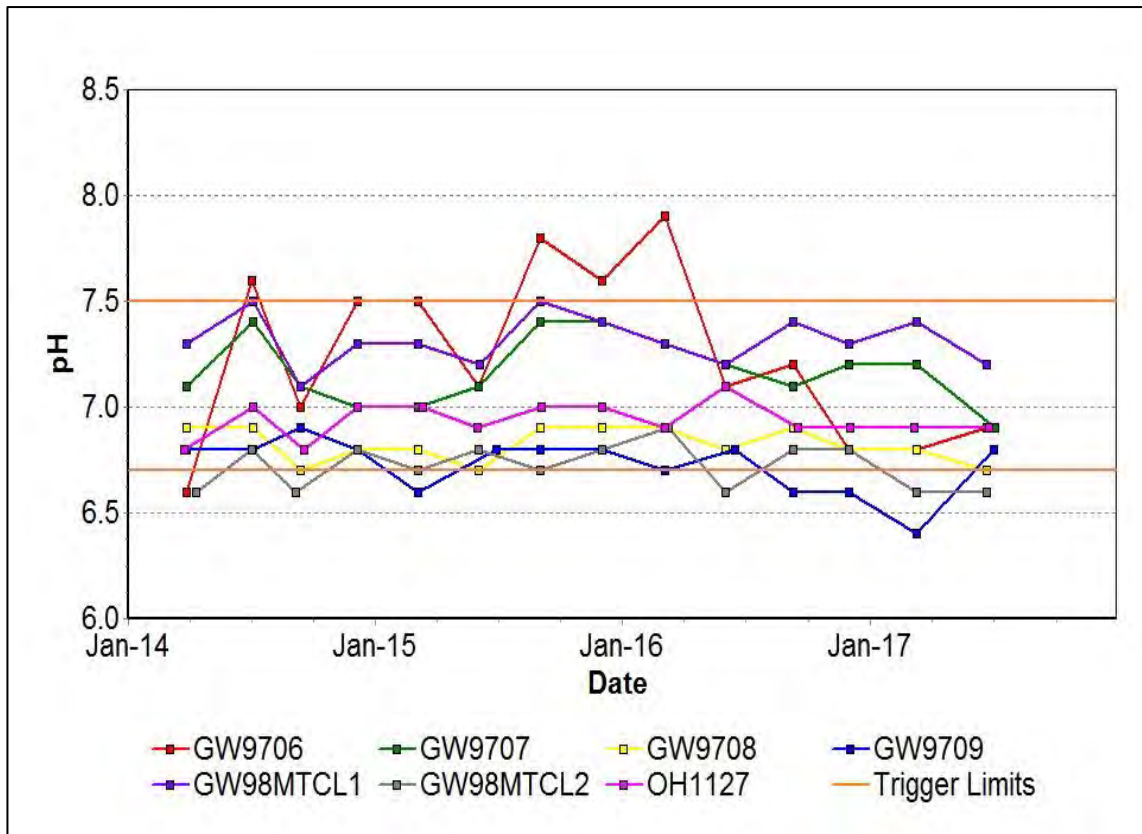


Figure 17: Bayswater Seam pH Trend June 2017

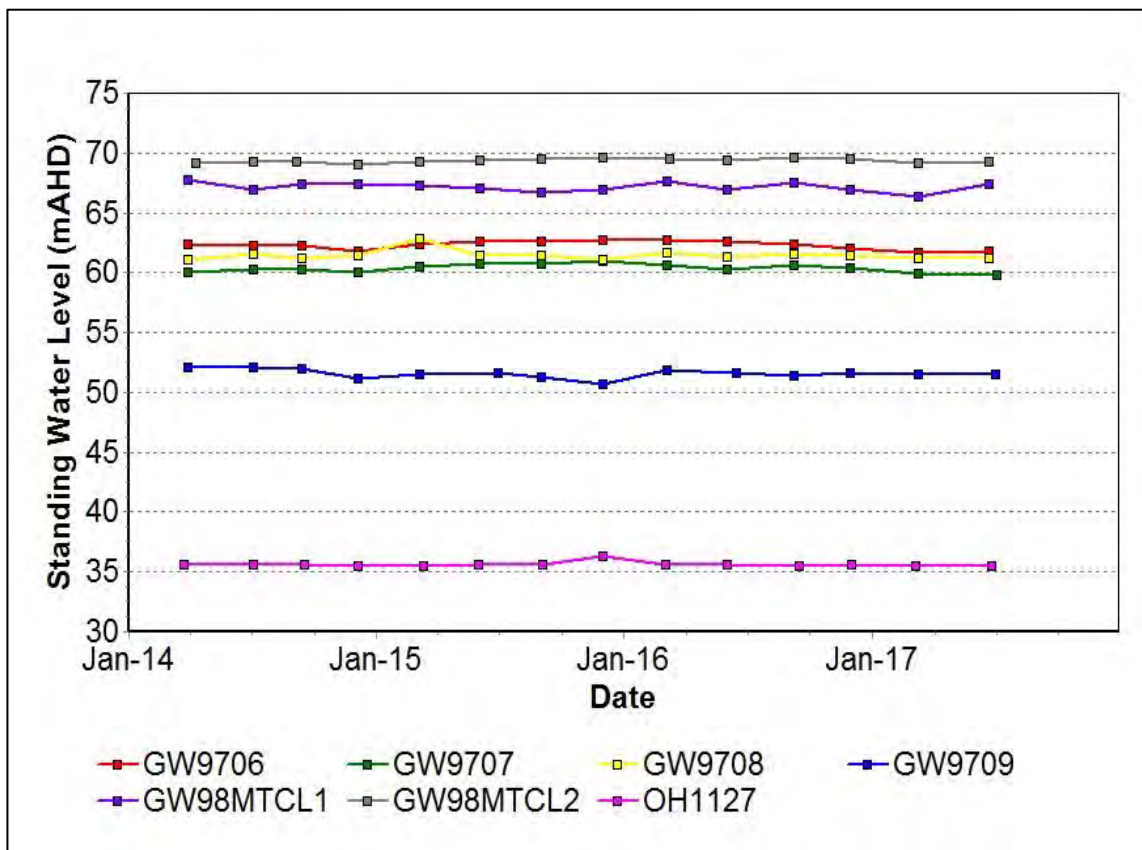


Figure 18: Bayswater Seam Standing Water Level – June 2017

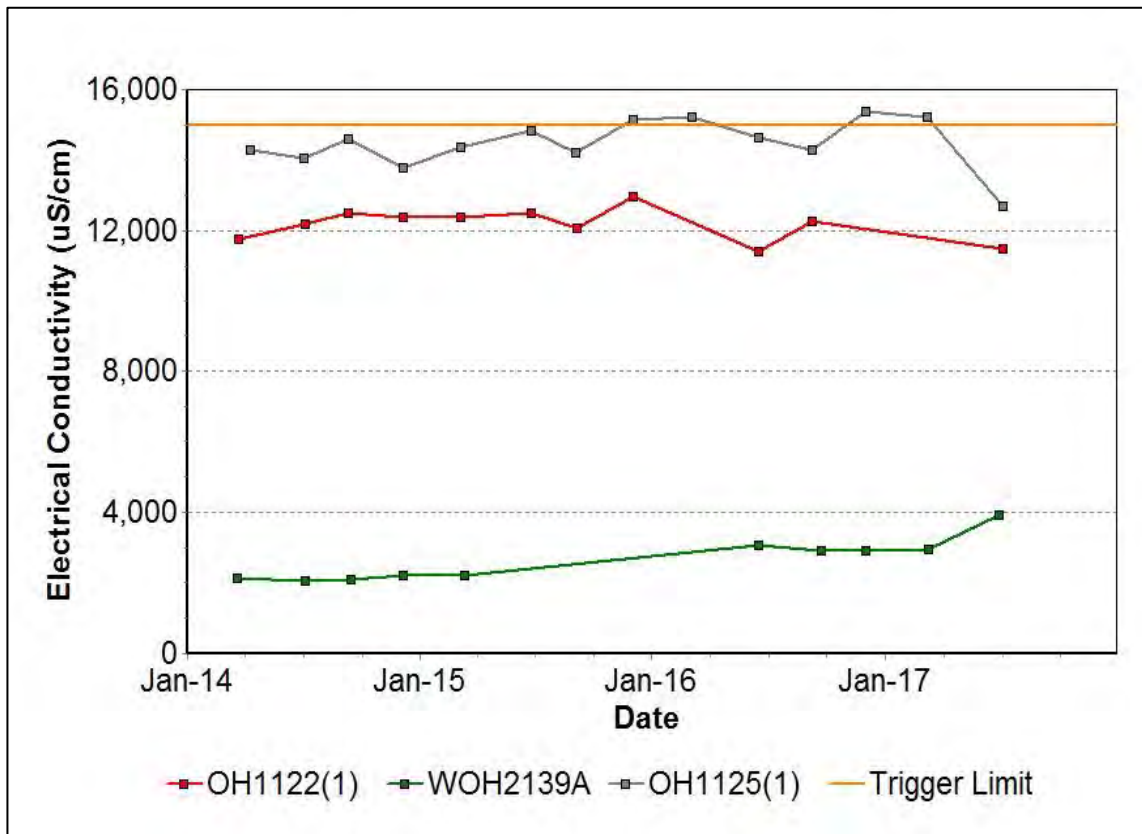


Figure 19: Blakefield Seam Electrical Conductivity Trend - June 2017

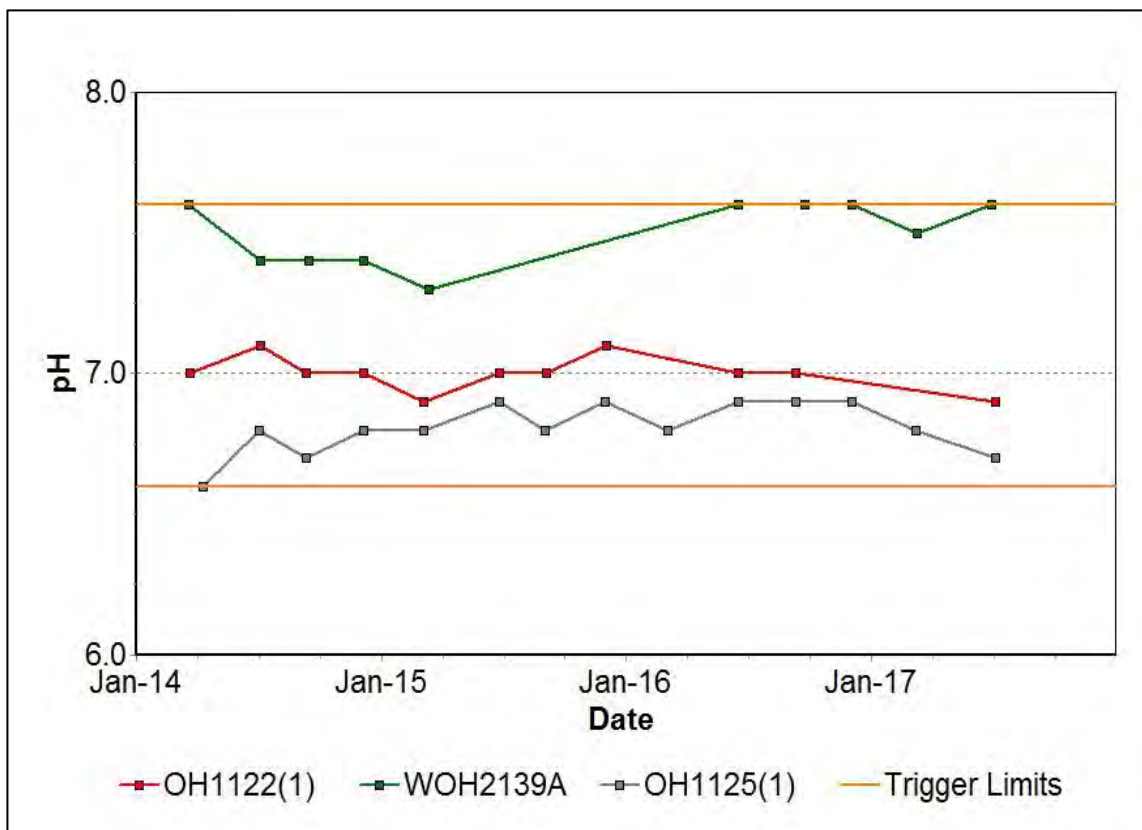


Figure 20: Blakefield Seam pH Trend - June 2017

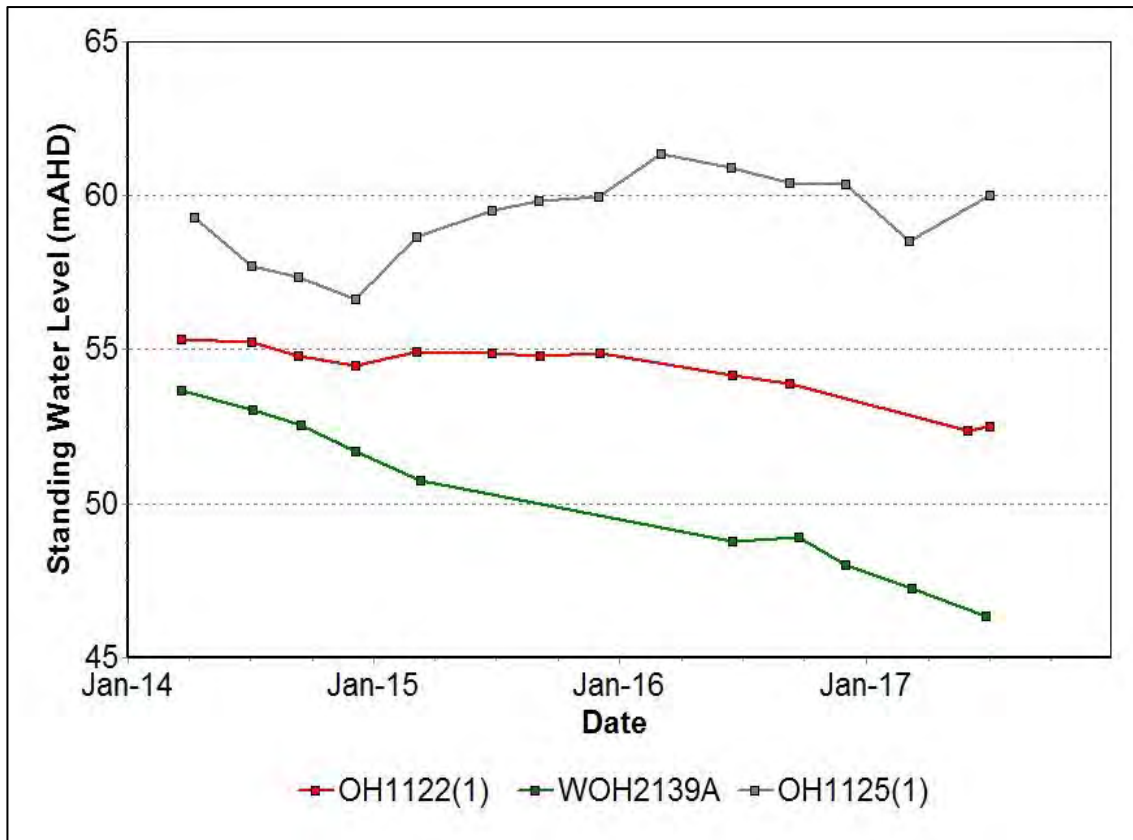


Figure 21: Blakefield Seam Standing Water Level Trend - June 2017

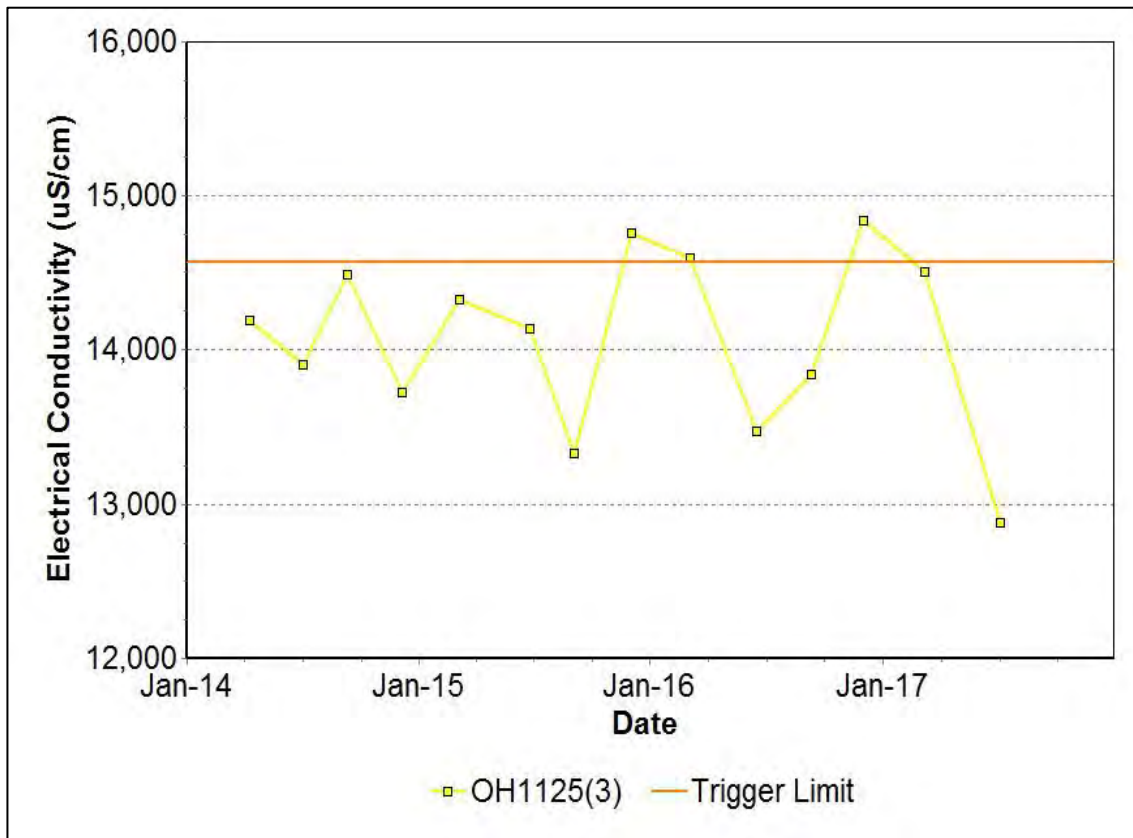


Figure 22: Bowfield Seam Electrical Conductivity Trend - June 2017

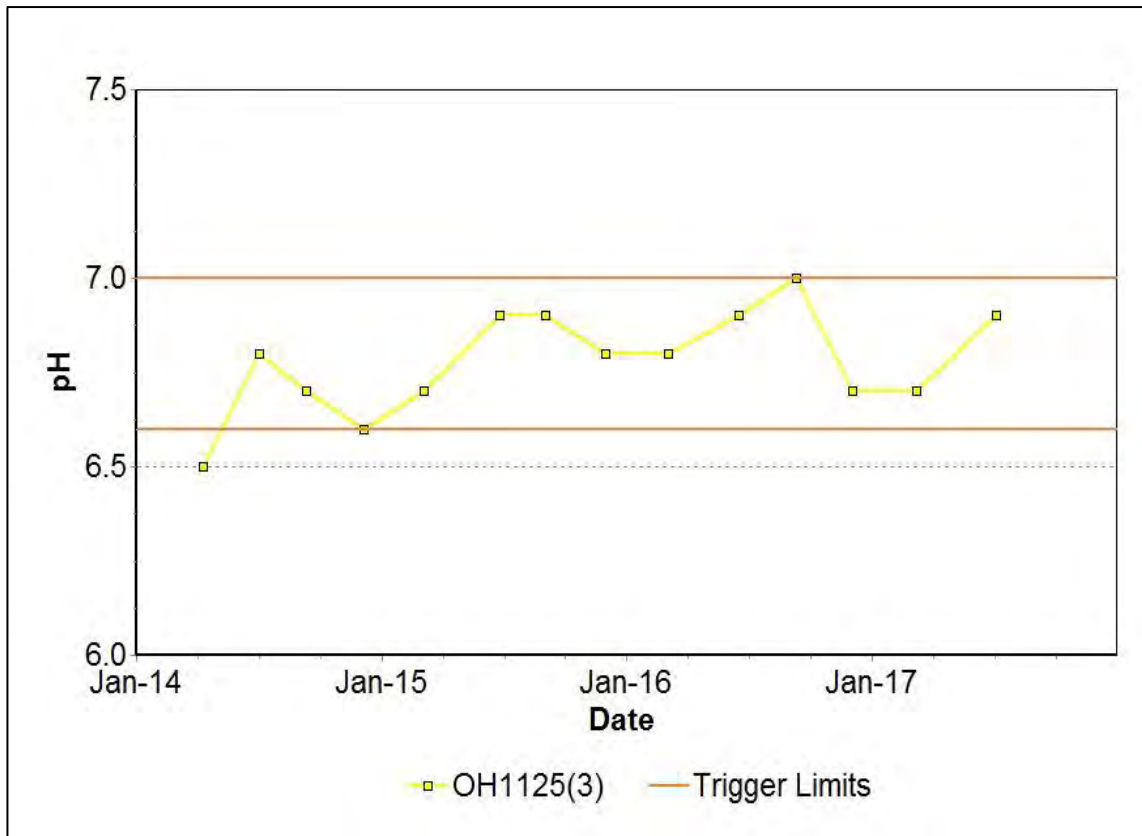


Figure 23: Bowfield Seam pH Trend – June 2017

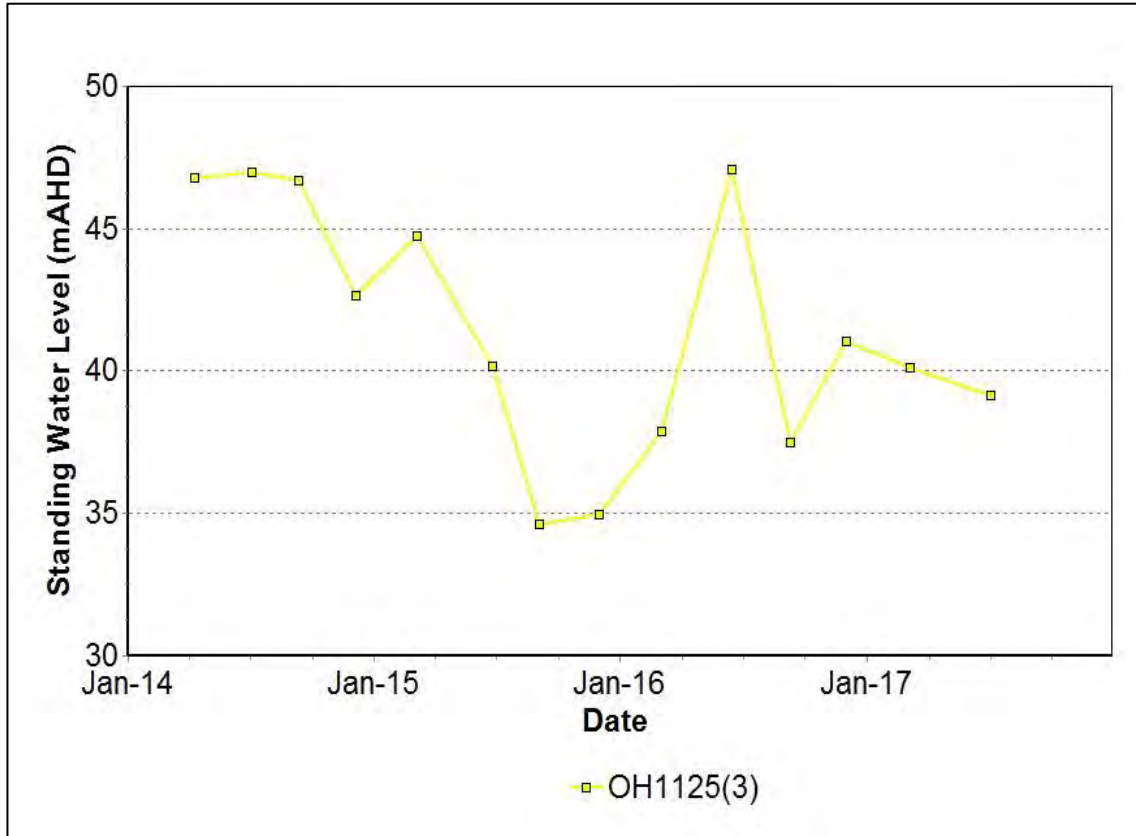


Figure 24: Bowfield Seam Standing Water Level Trend - June 2017

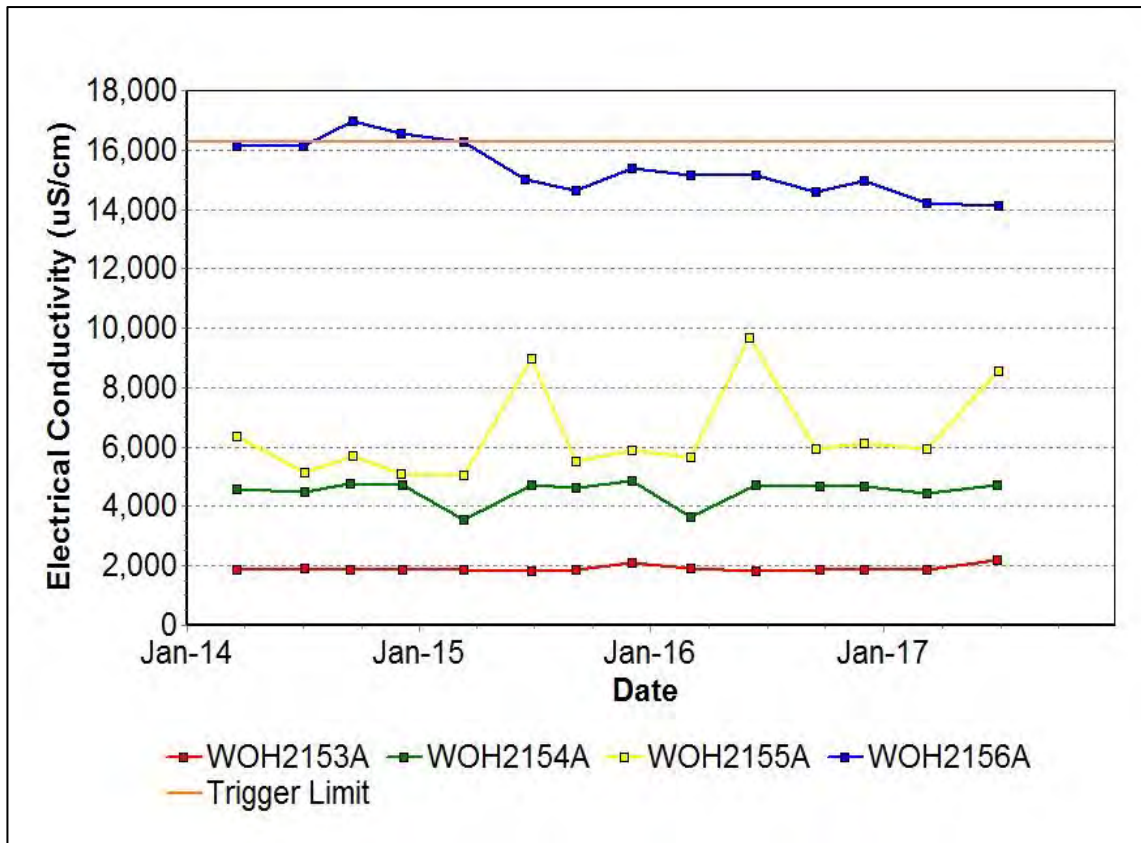


Figure 25: Redbank Seam Electrical Conductivity Trend - June 2017

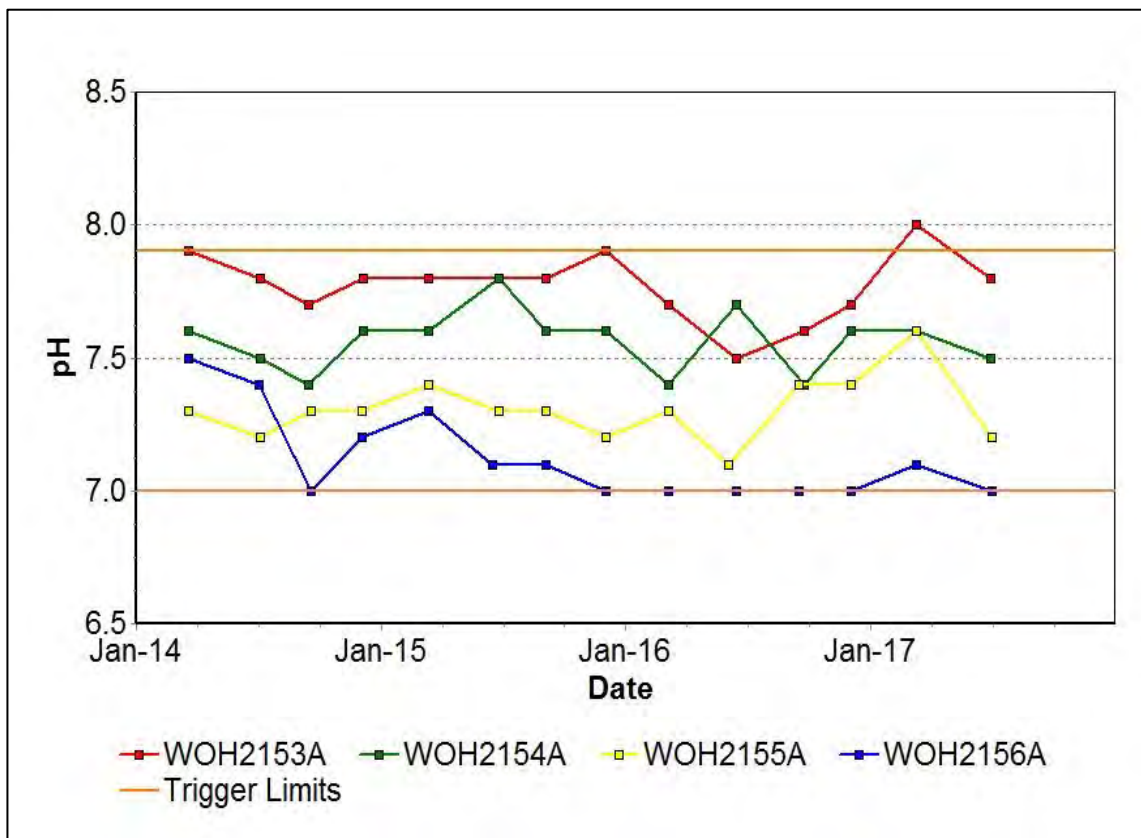


Figure 26: Redbank Seam pH Trend – June 2017

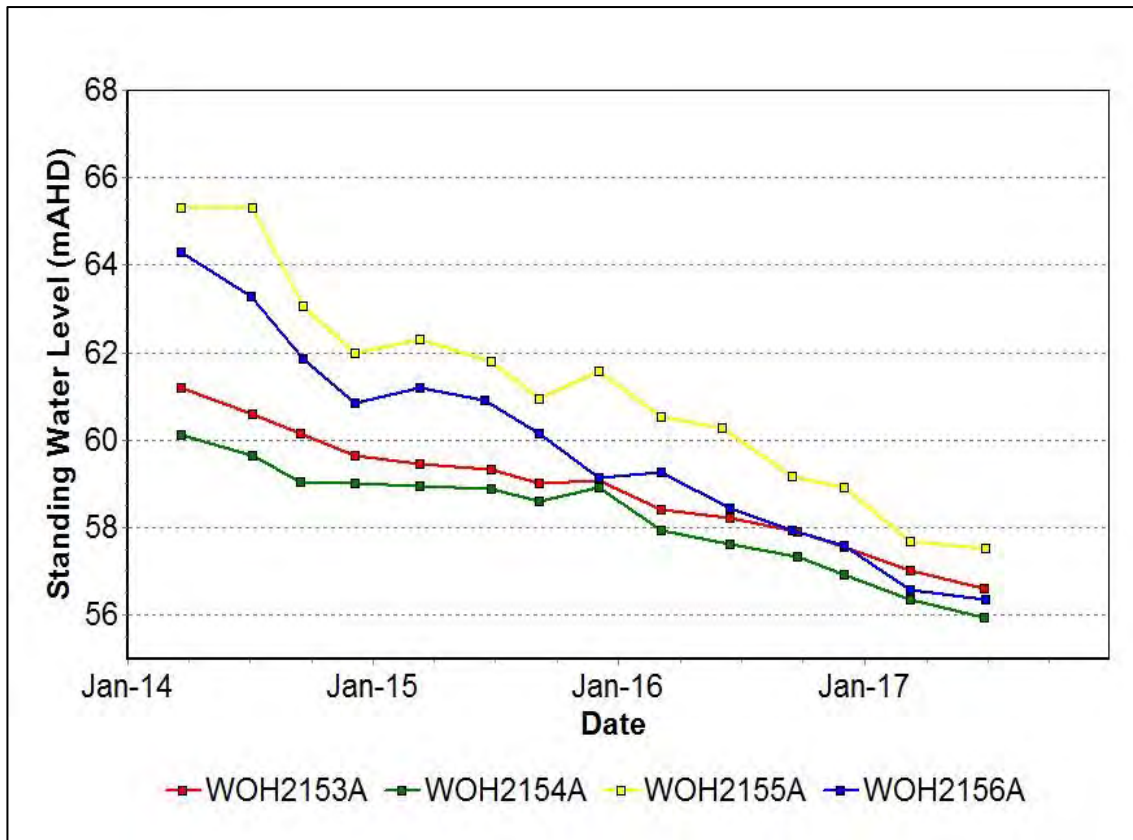


Figure 27: Redbank Seam Standing Water Level - June 2017

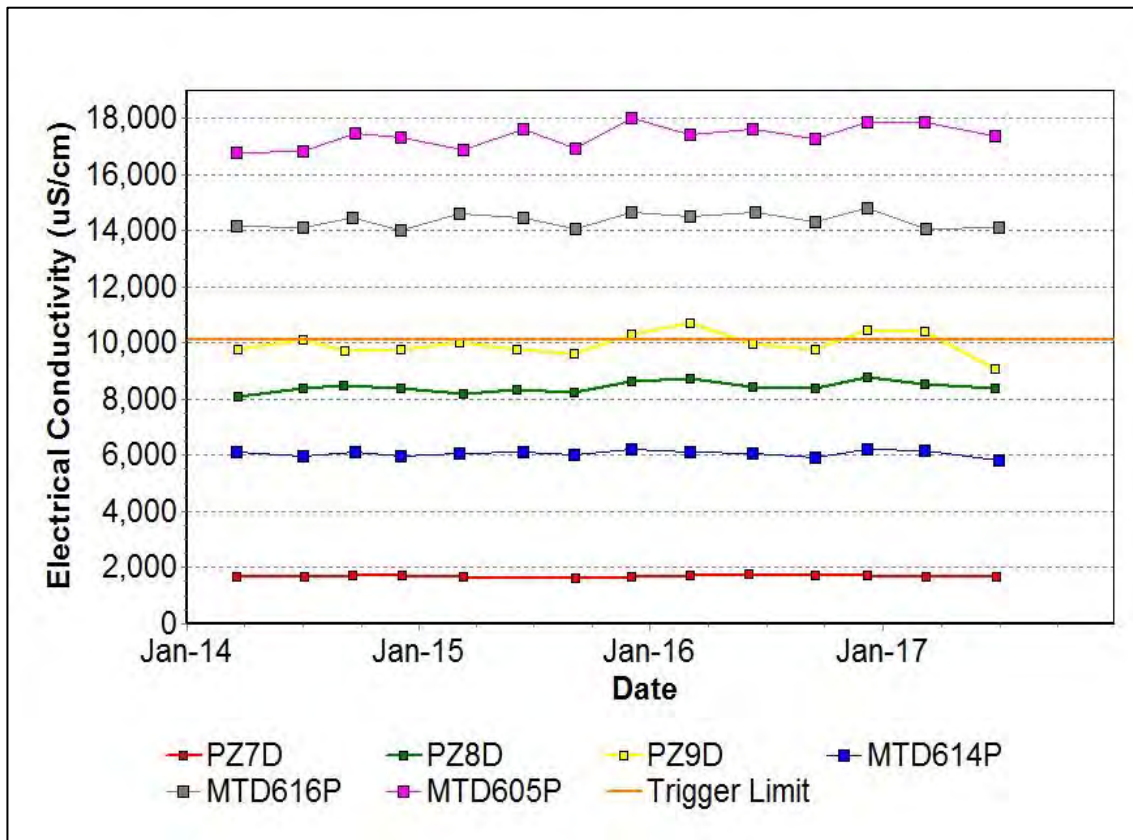


Figure 28: Shallow Overburden Seam Electrical Conductivity Trend - June 2017

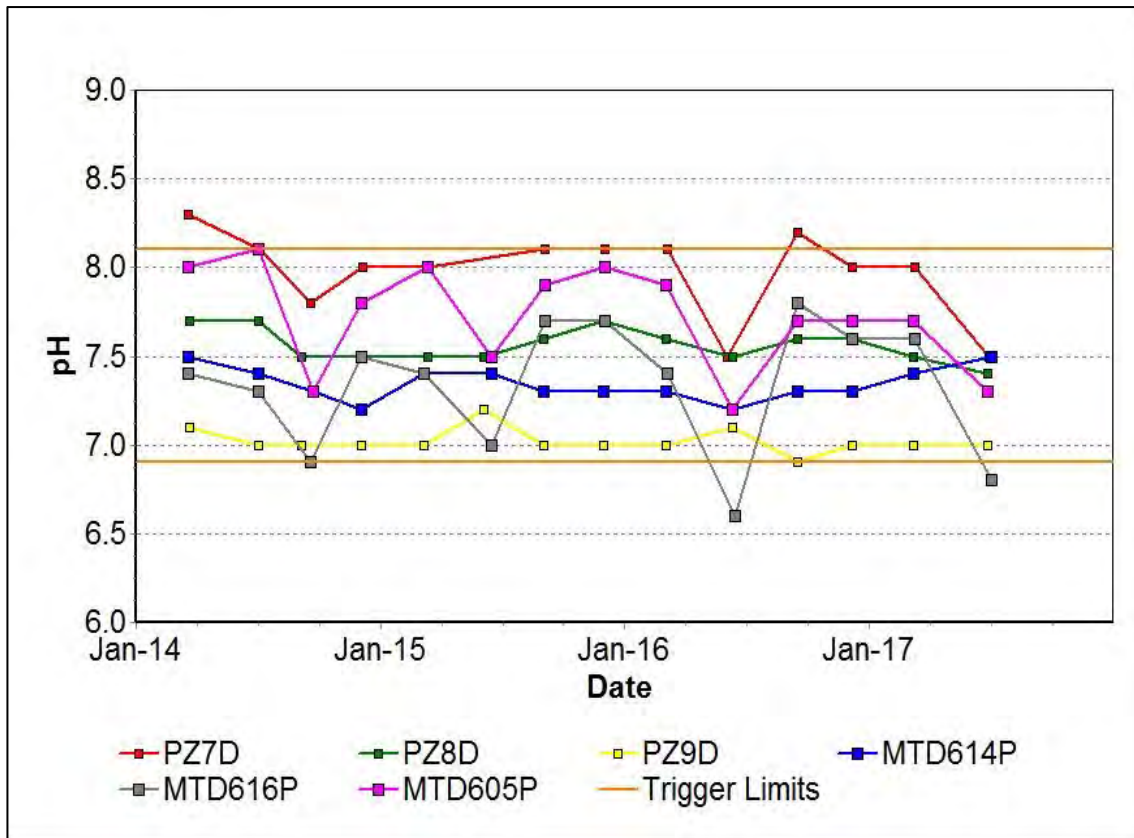


Figure 29: Shallow Overburden Seam pH Trend – June 2017

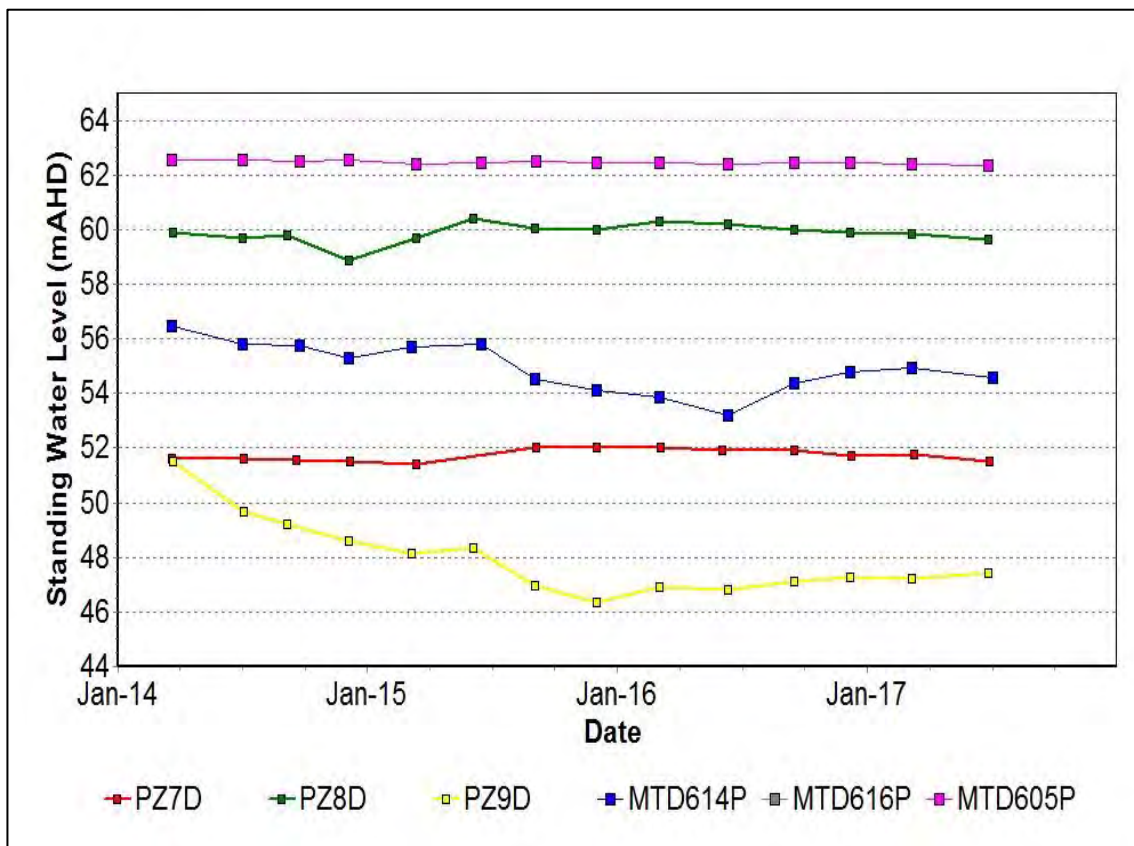


Figure 30: Shallow Overburden Seam Standing Water Level Trend - June 2017

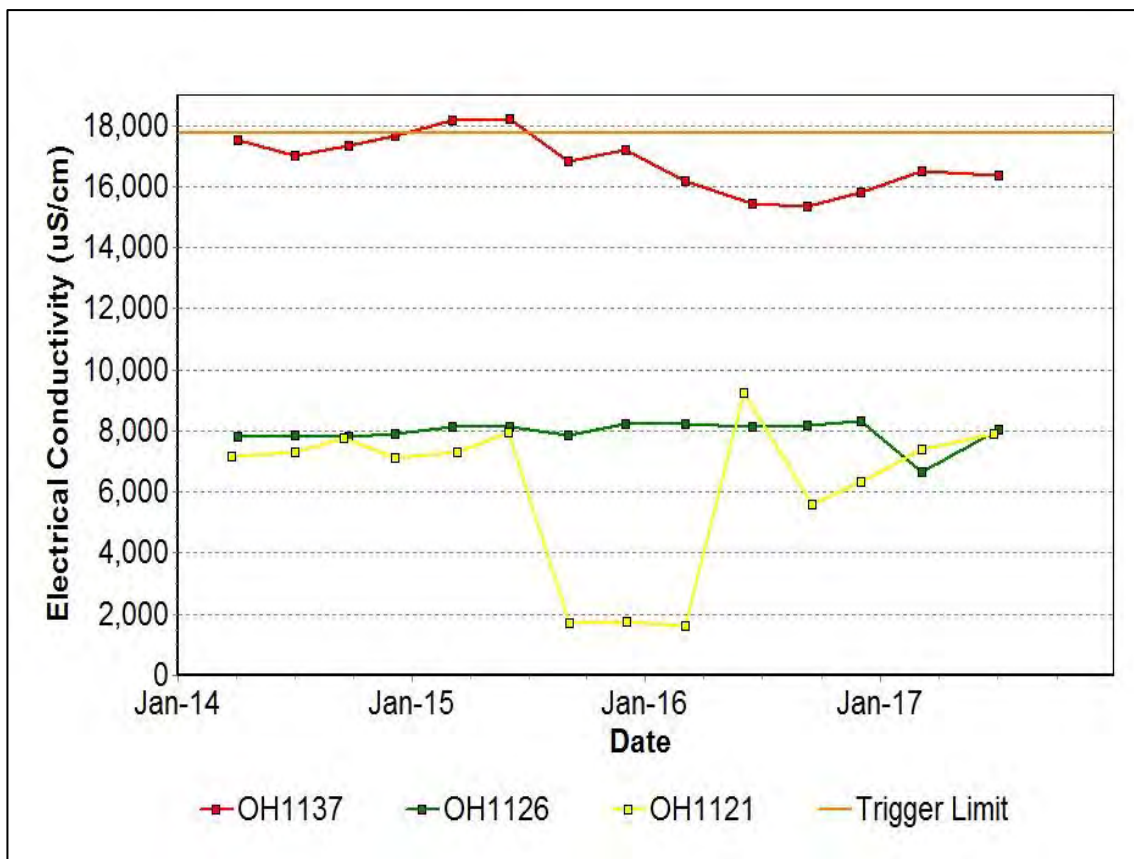


Figure 31: Vaux Seam Electrical Conductivity Trend – June 2017

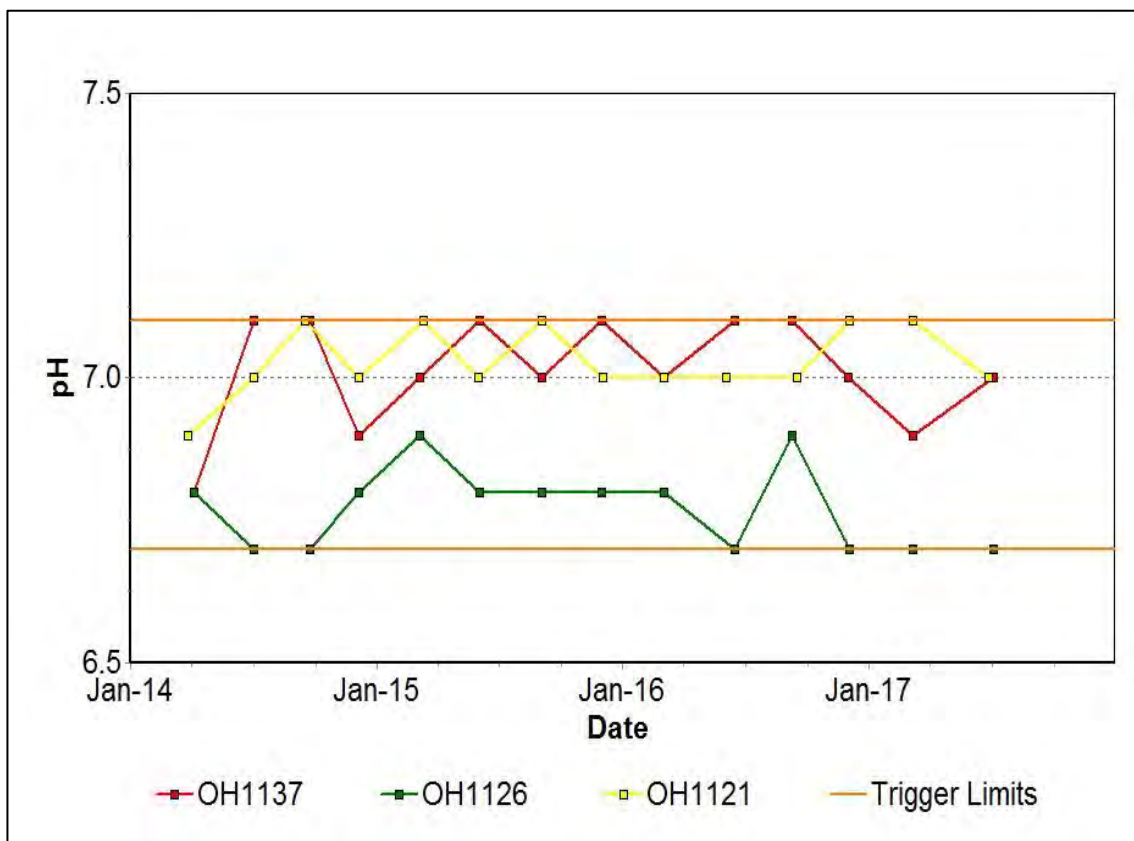


Figure 32: Vaux Seam pH Trend - June 2017

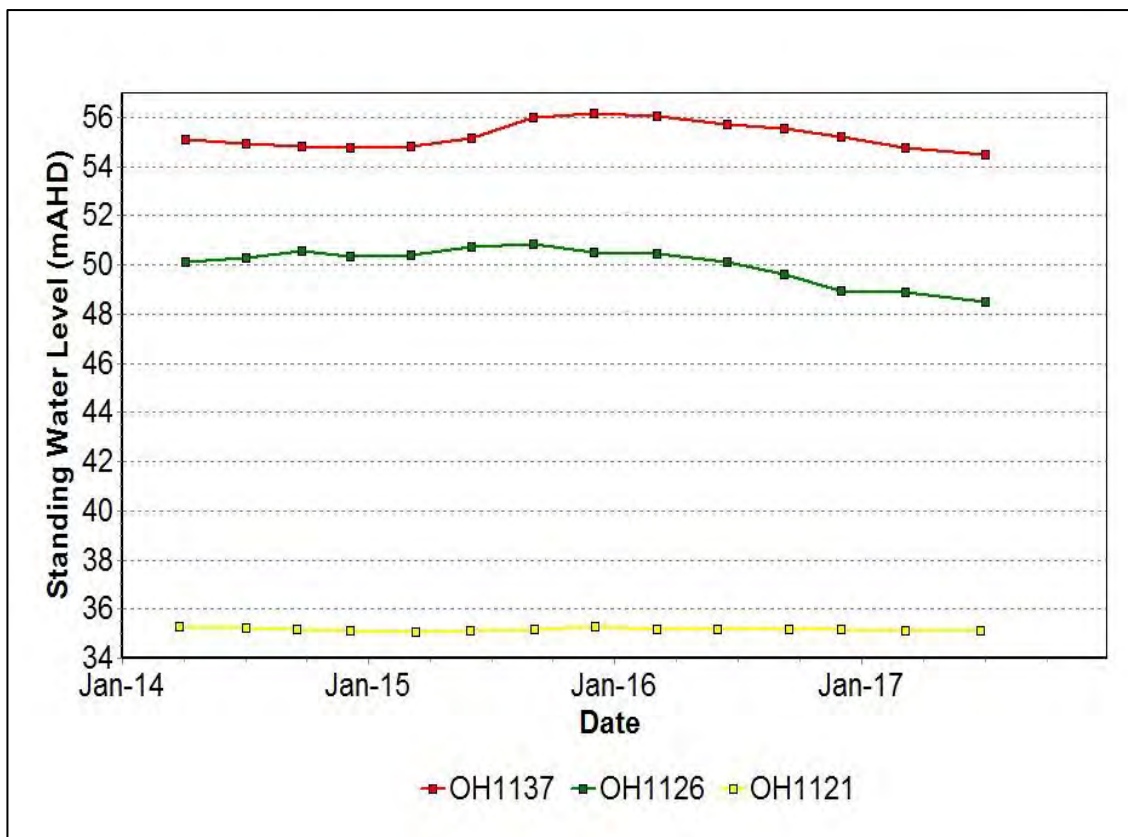


Figure 33: Vaux Seam Standing Water Level Trend - June 2017

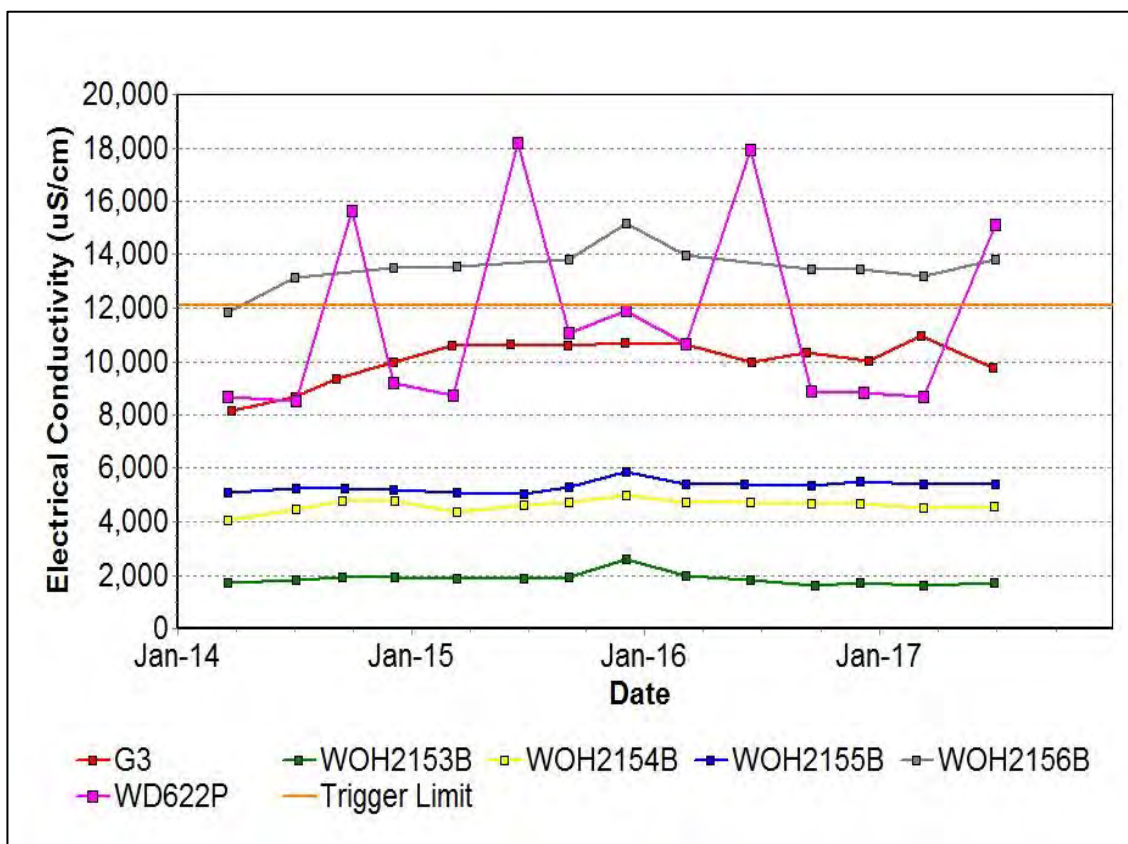


Figure 34: Wambo Seam Electrical Conductivity Trend - June 2017

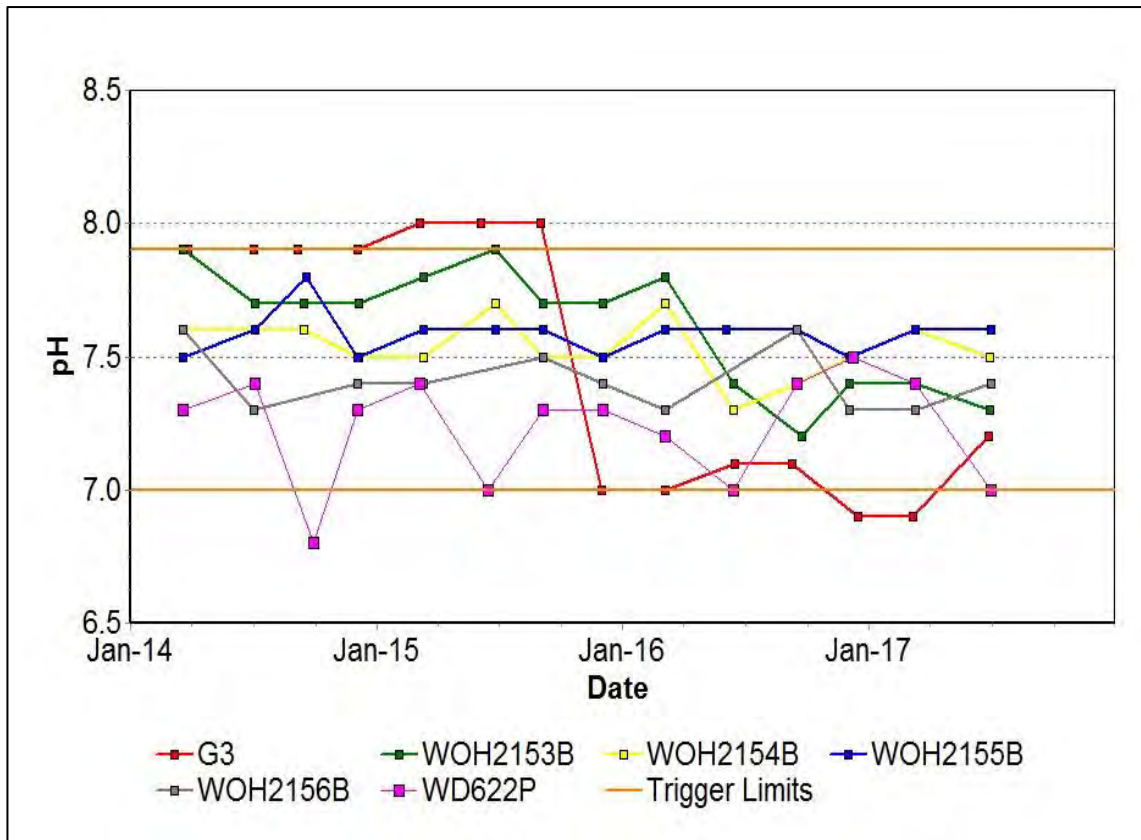


Figure 35: Wambo Seam pH Trend – June 2017

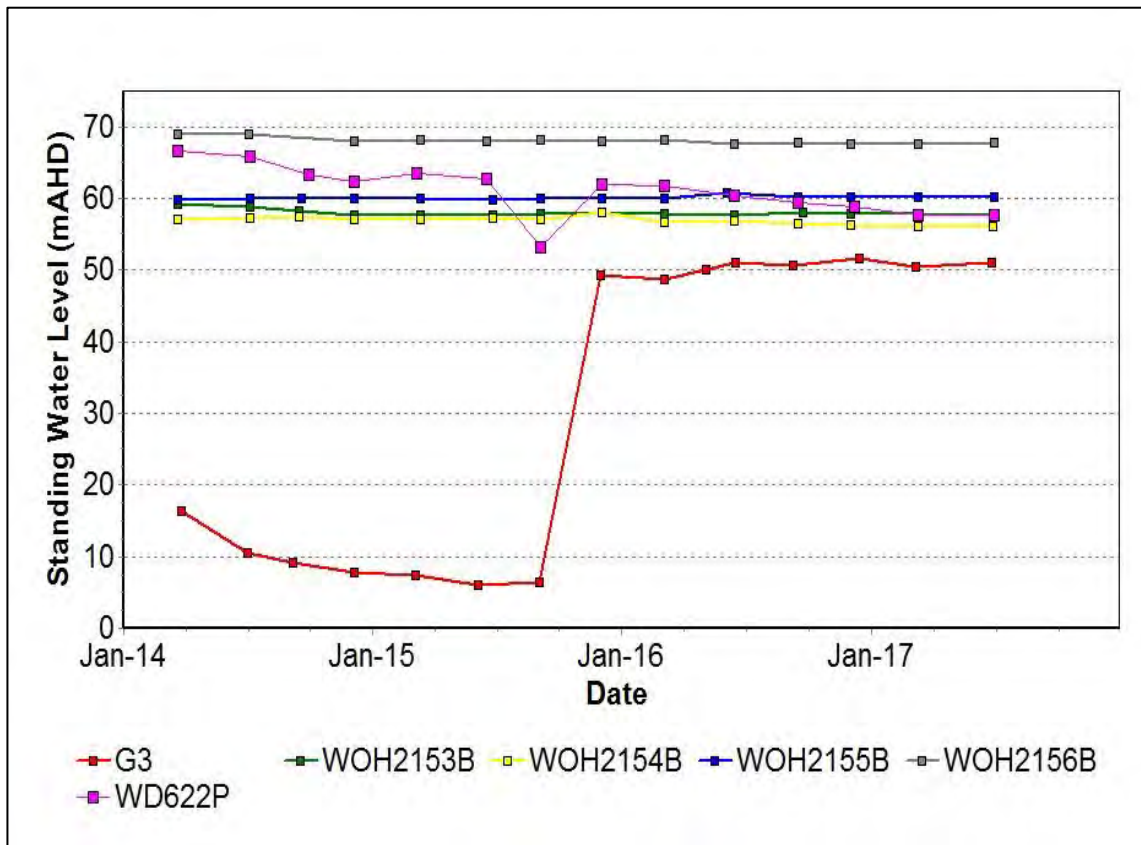


Figure 36: Wambo Seam Standing Water Level Trend - June 2017

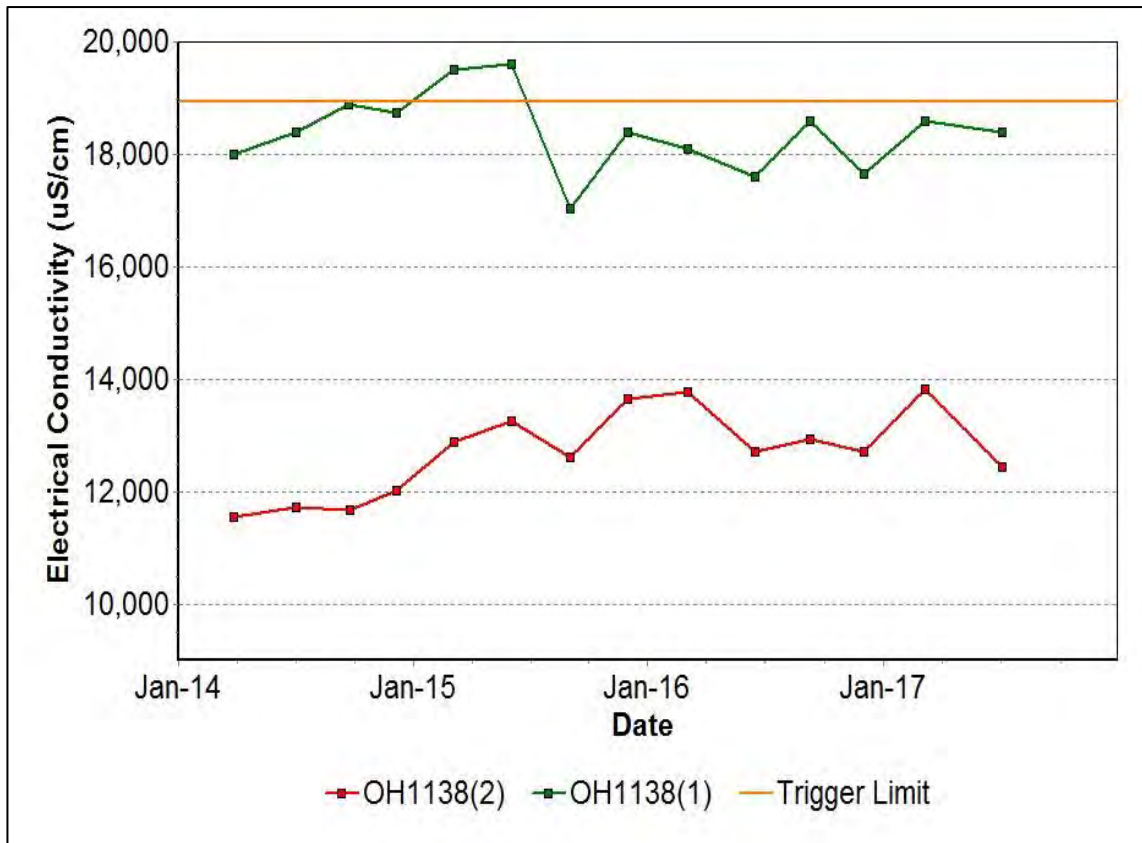


Figure 37: Warkworth Seam Electrical Conductivity Trend – June 2017

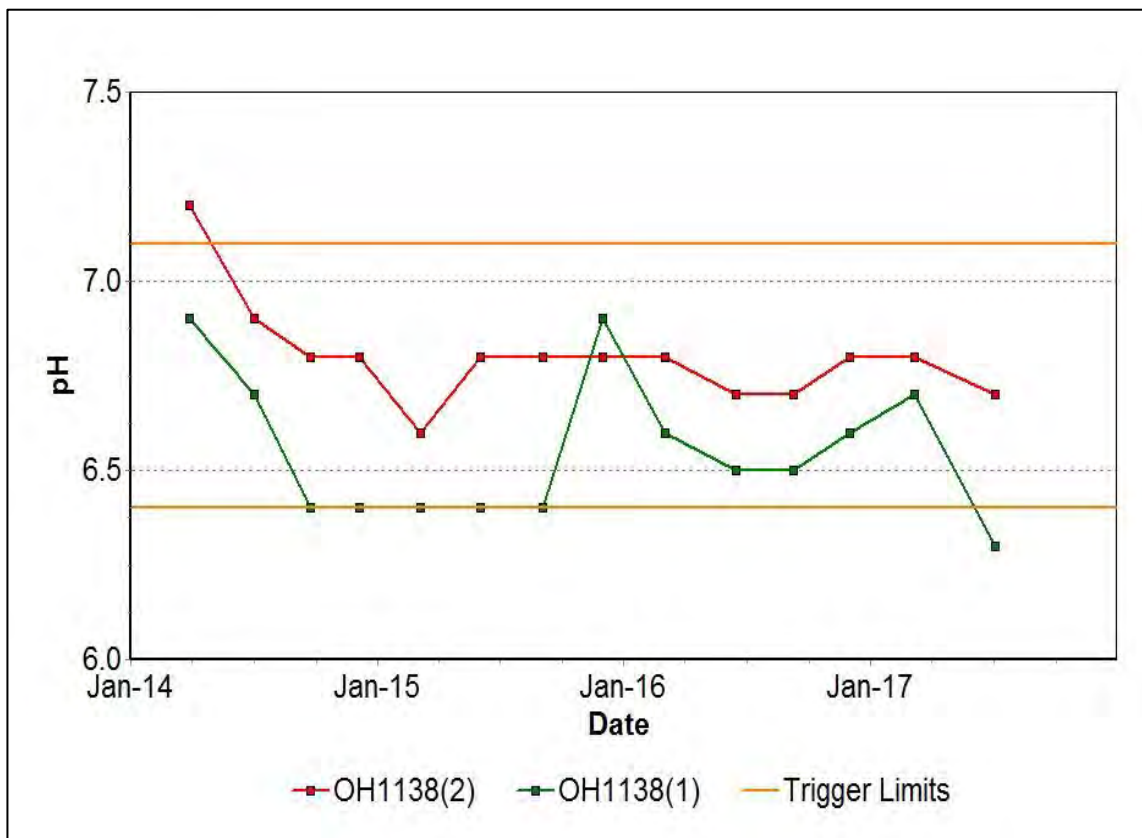


Figure 38: Warkworth Seam pH Trend - June 2017

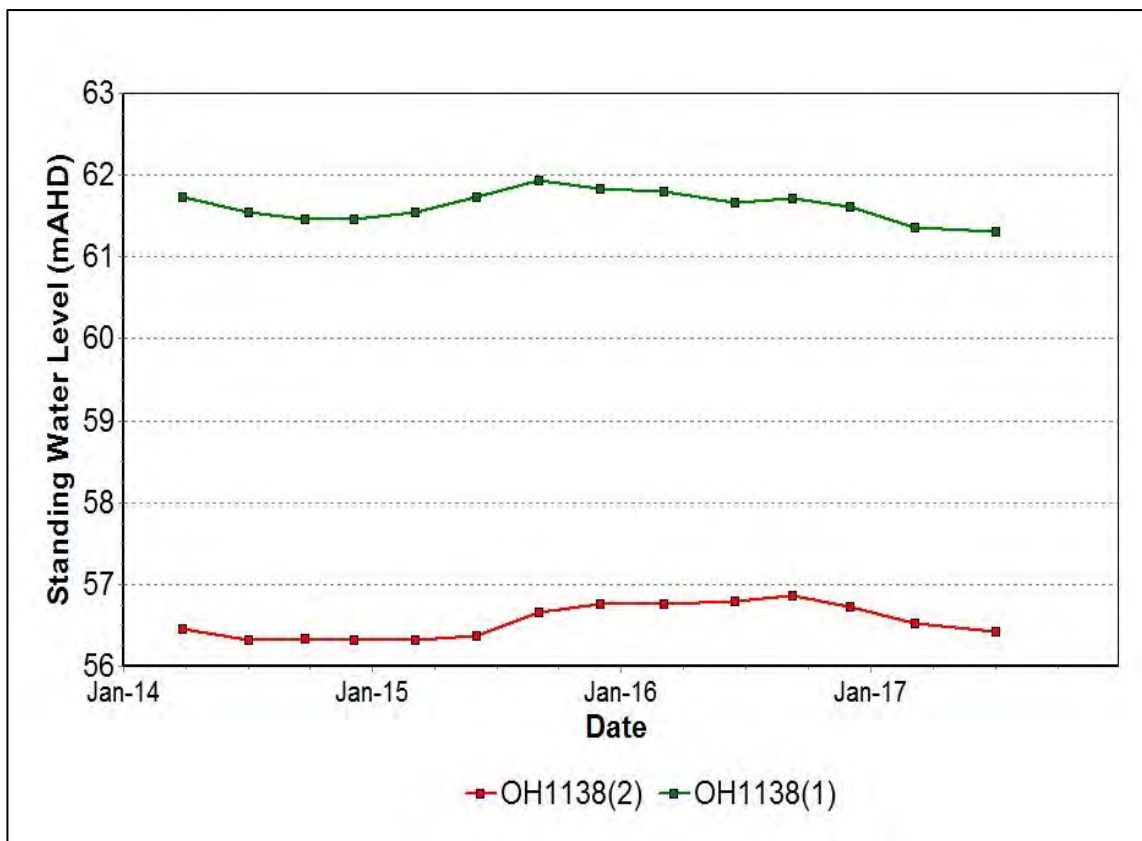


Figure 39: Warkworth Seam Standing Water Level Trend - June 2017

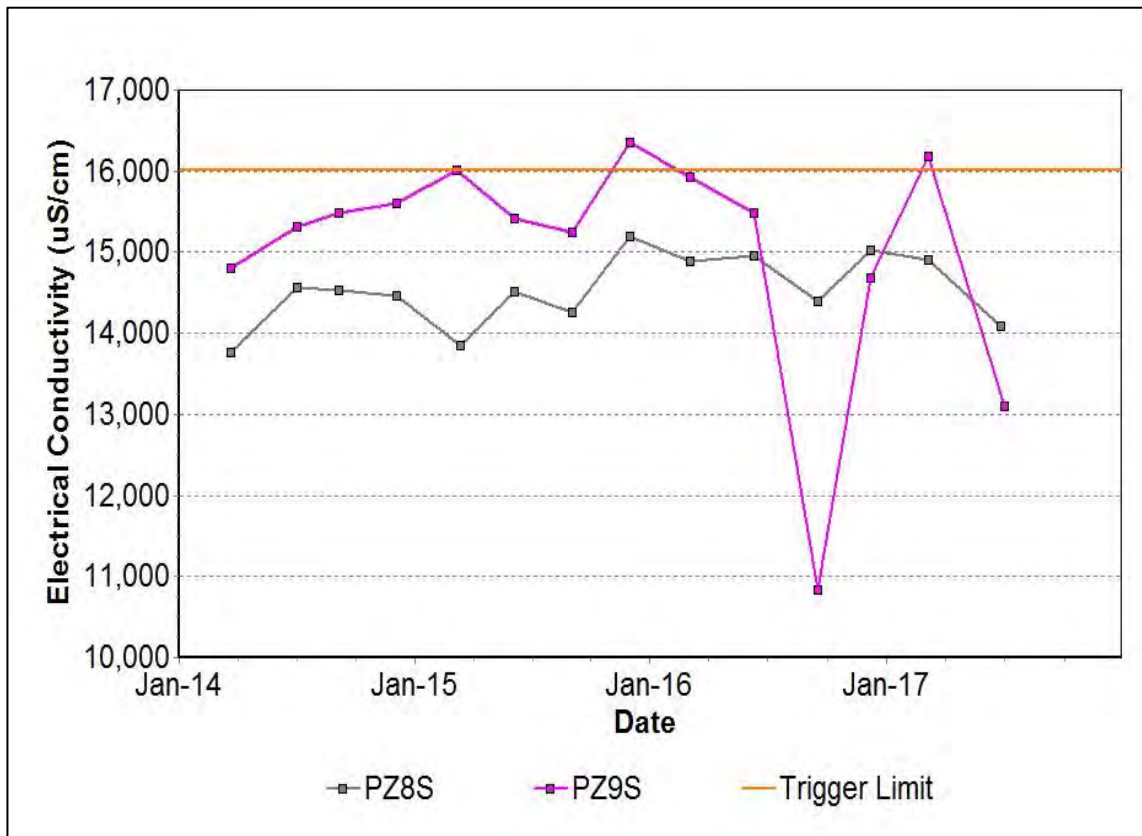


Figure 40: Wollombi Alluvium Electrical Conductivity Trend – June 2017

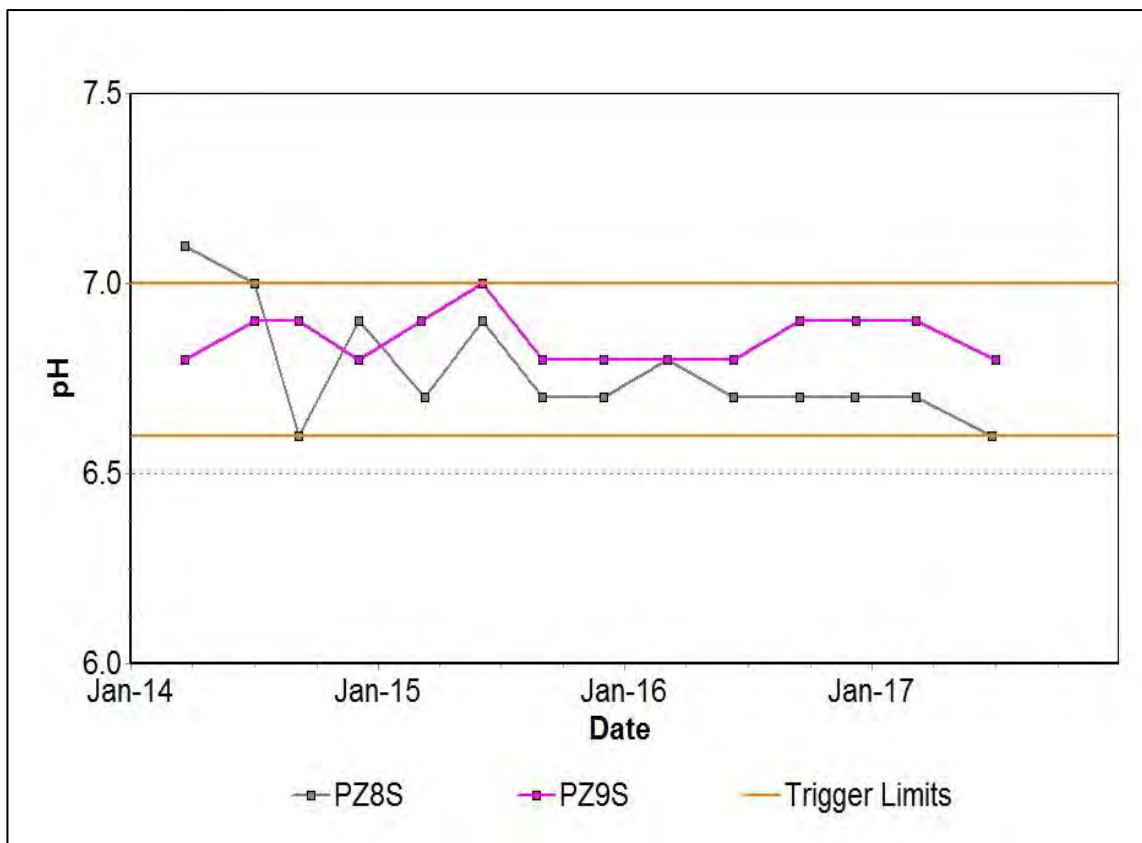


Figure 41: Wollombi Alluvium pH Trend – June 2017

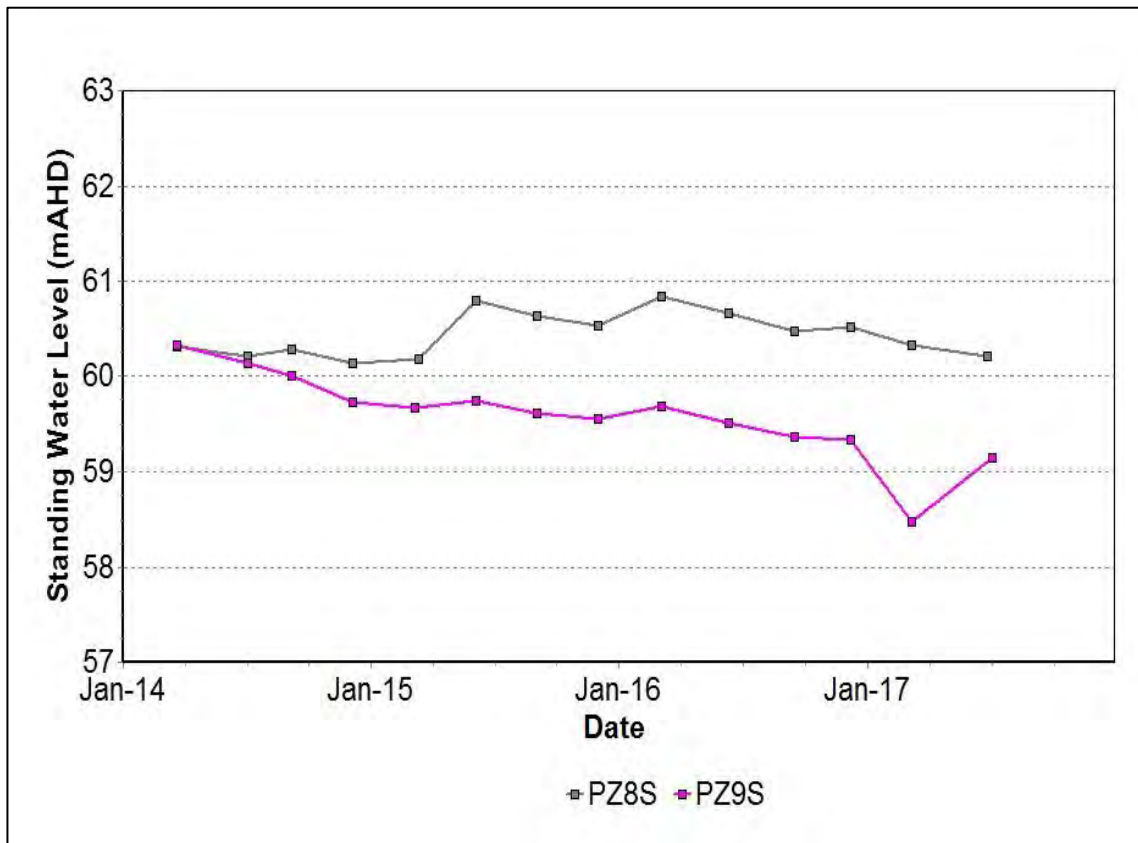


Figure 42: Wollombi Alluvium Standing Water Level Trend - June 2017

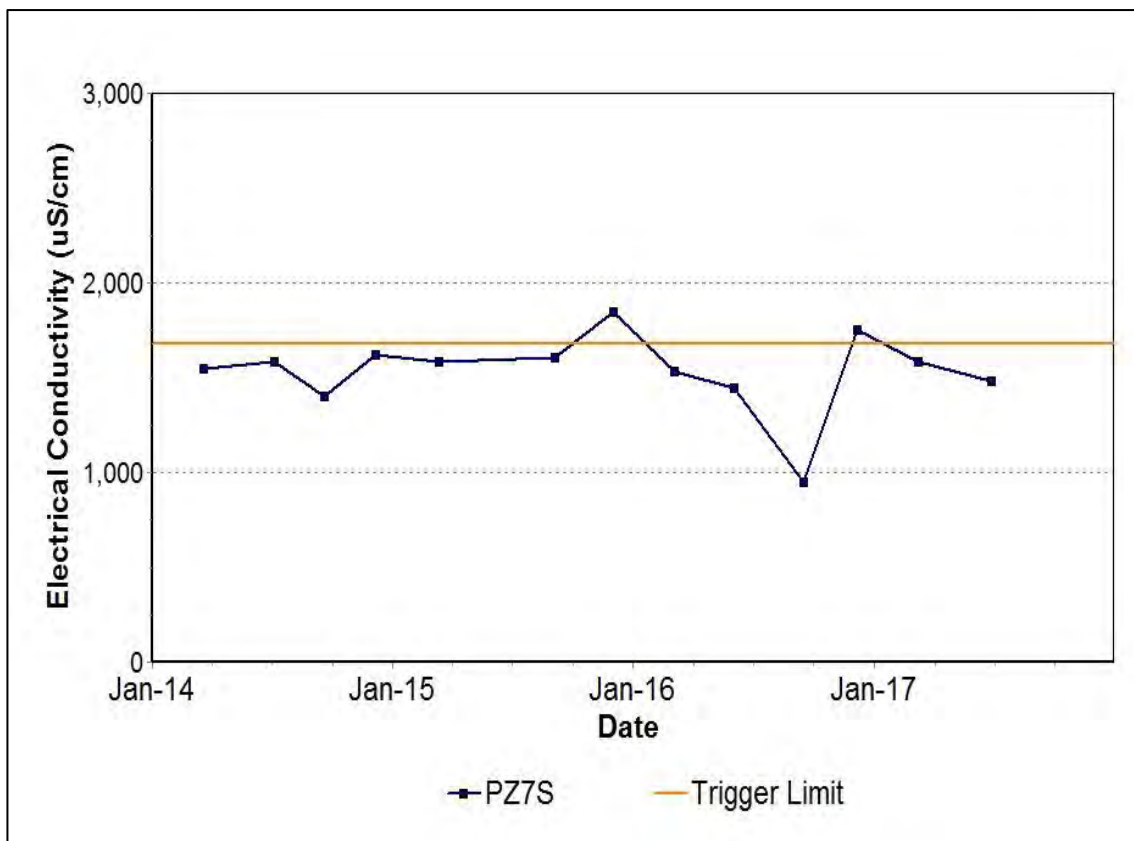


Figure 43: Aeolian Warkworth Sands Electrical Conductivity Trend – June 2017

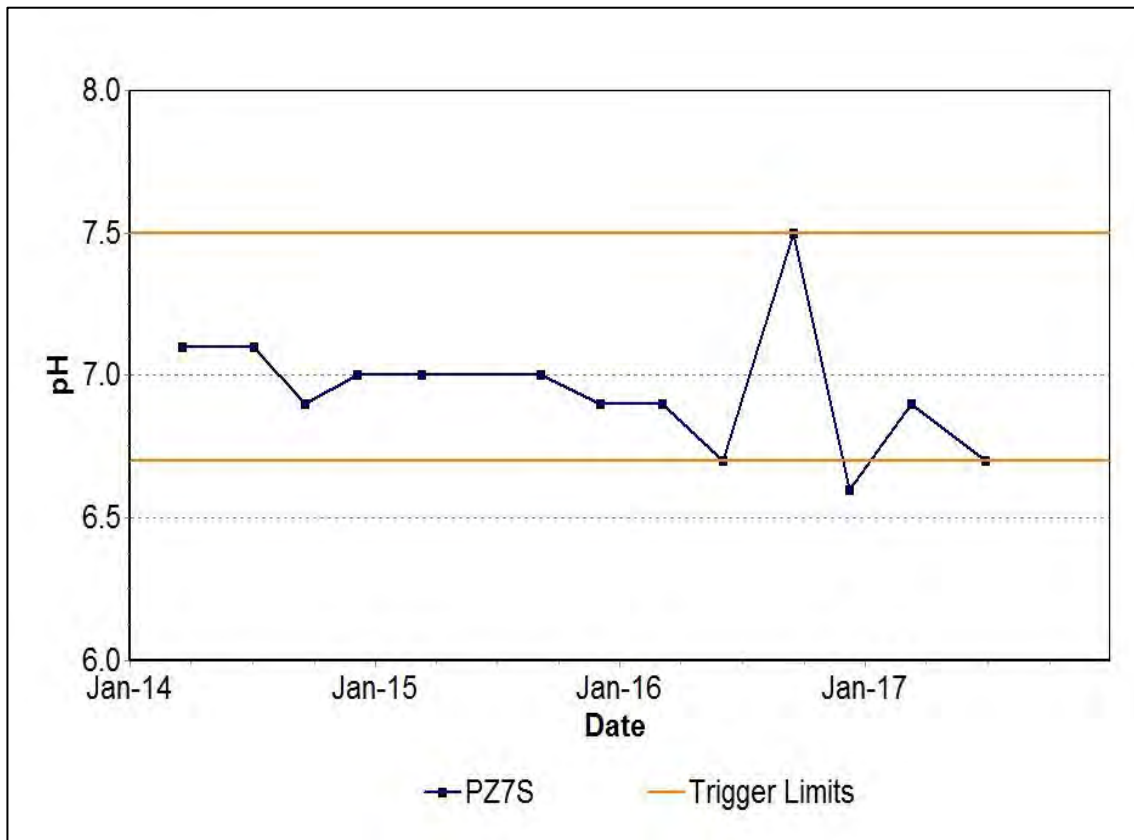


Figure 44: Aeolian Warkworth Sands pH Trend - June 2017

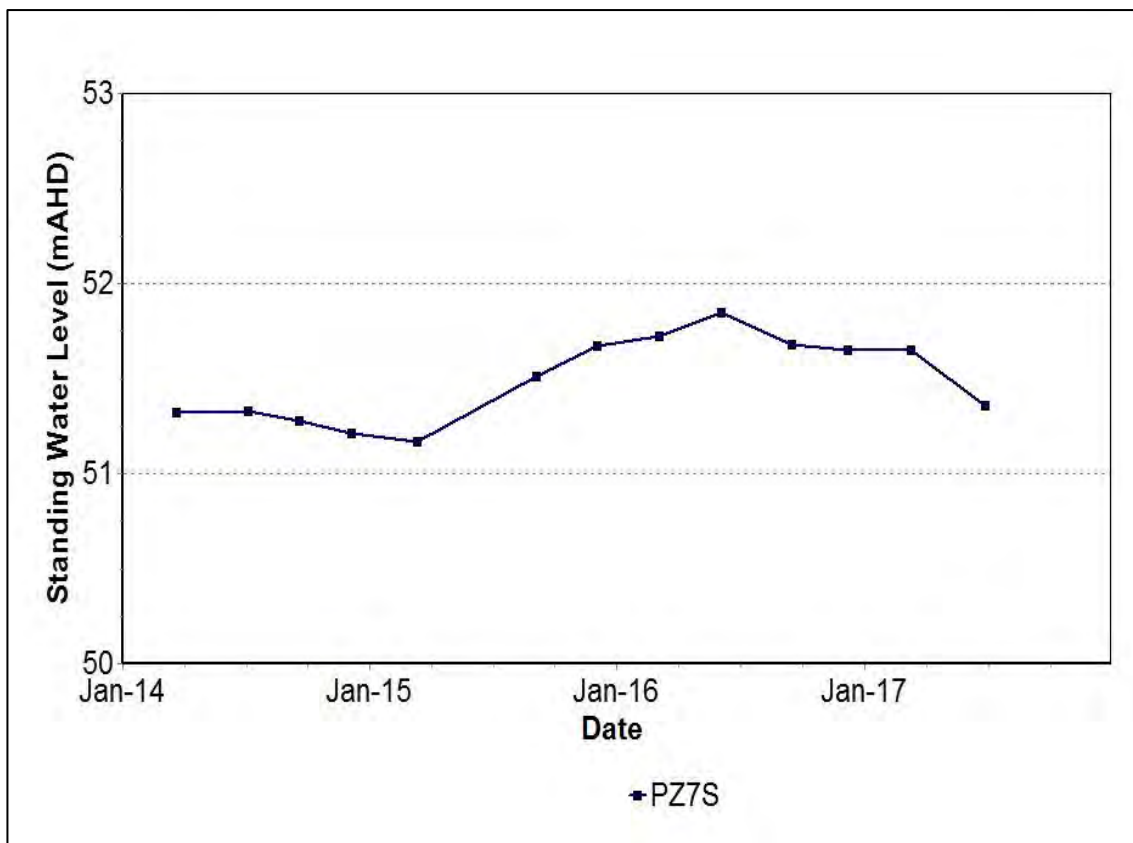


Figure 45: Aeolian Warkworth Sands Standing Water Level Trend - June 2017

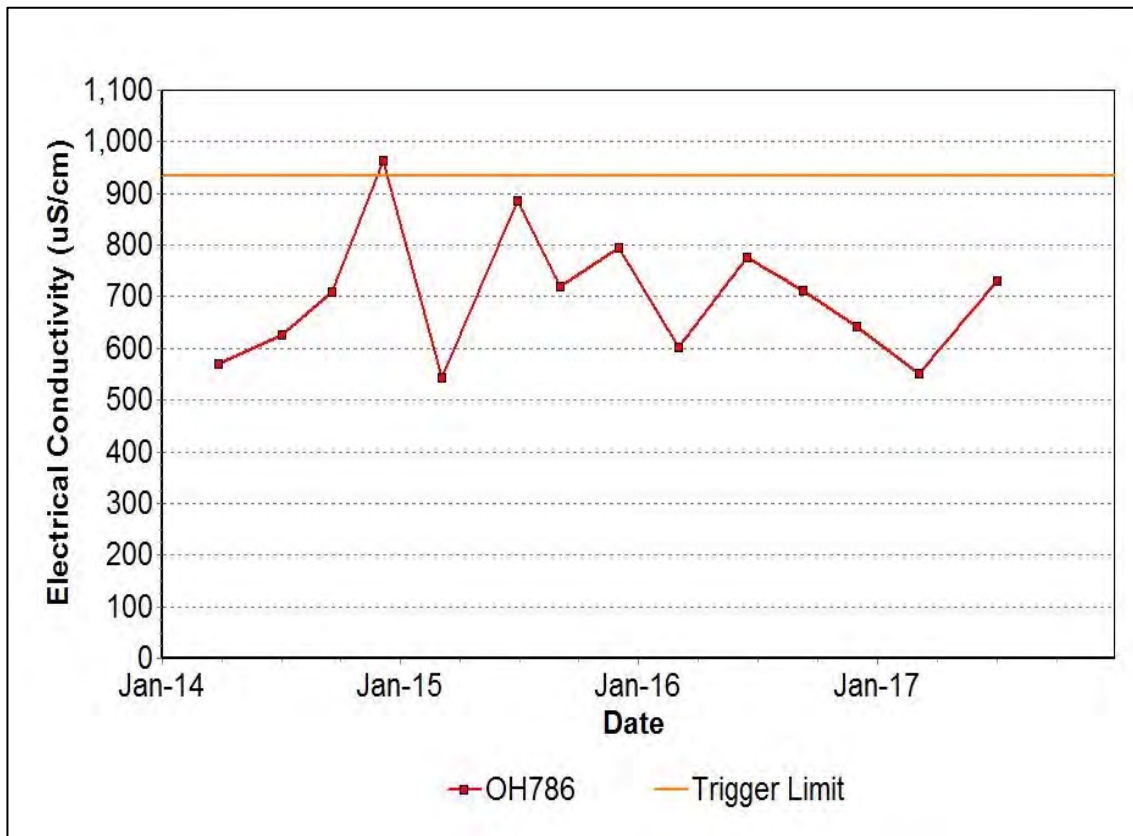


Figure 46: Hunter River Alluvium 1 Seam Electrical Conductivity - June 2017

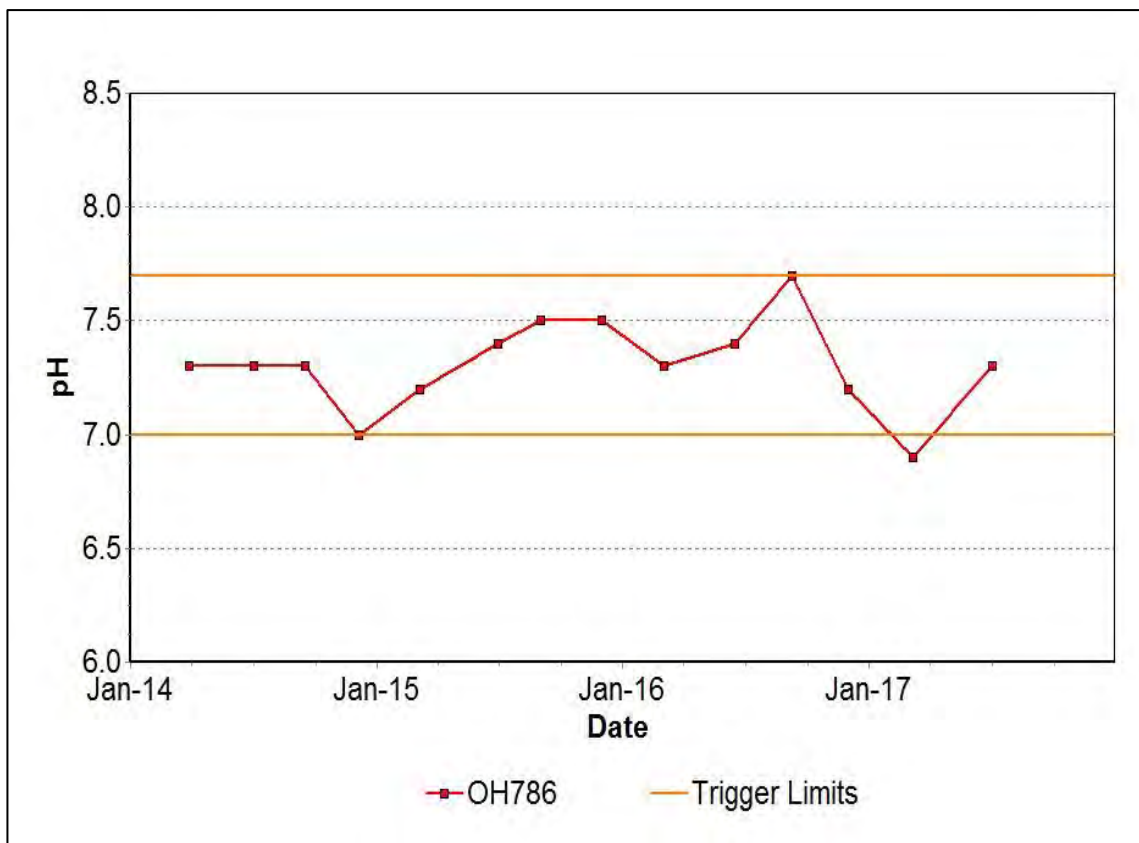


Figure 47: Hunter River Alluvium 1 Seam pH Trend - June 2017

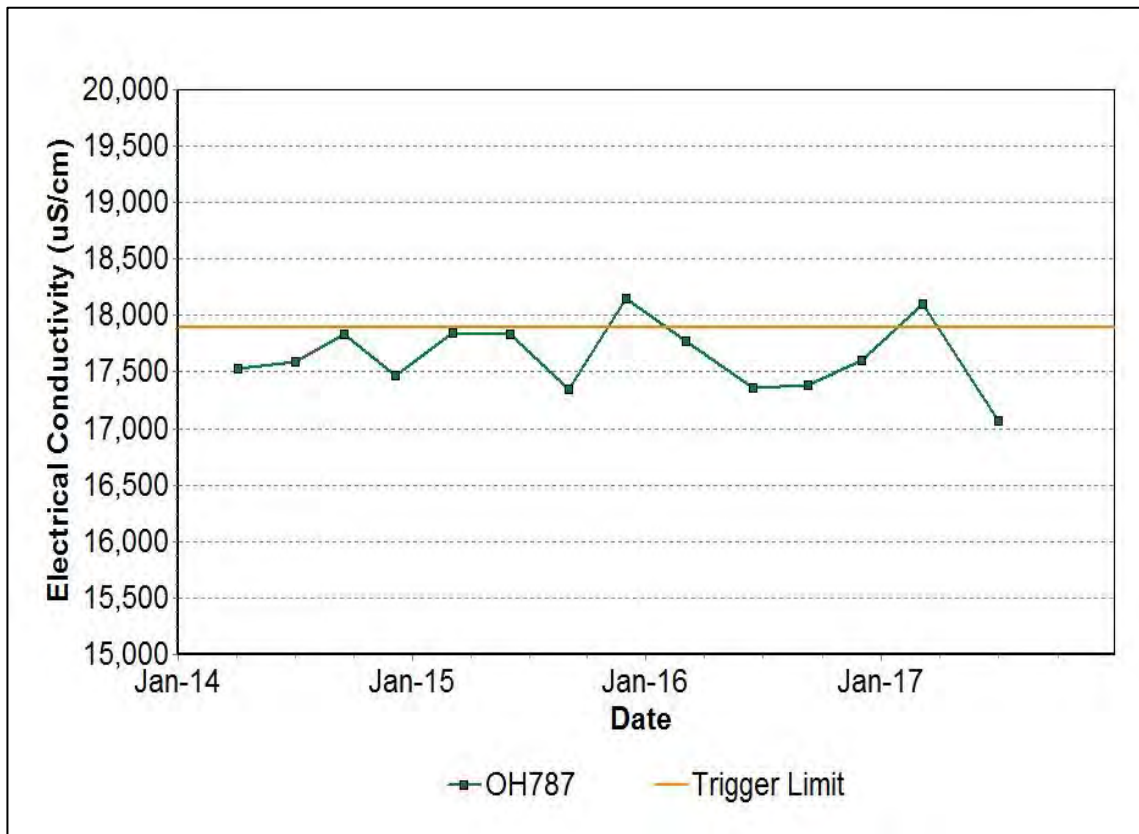


Figure 48: Hunter River Alluvium 2 Seam Electrical Conductivity - June 2017

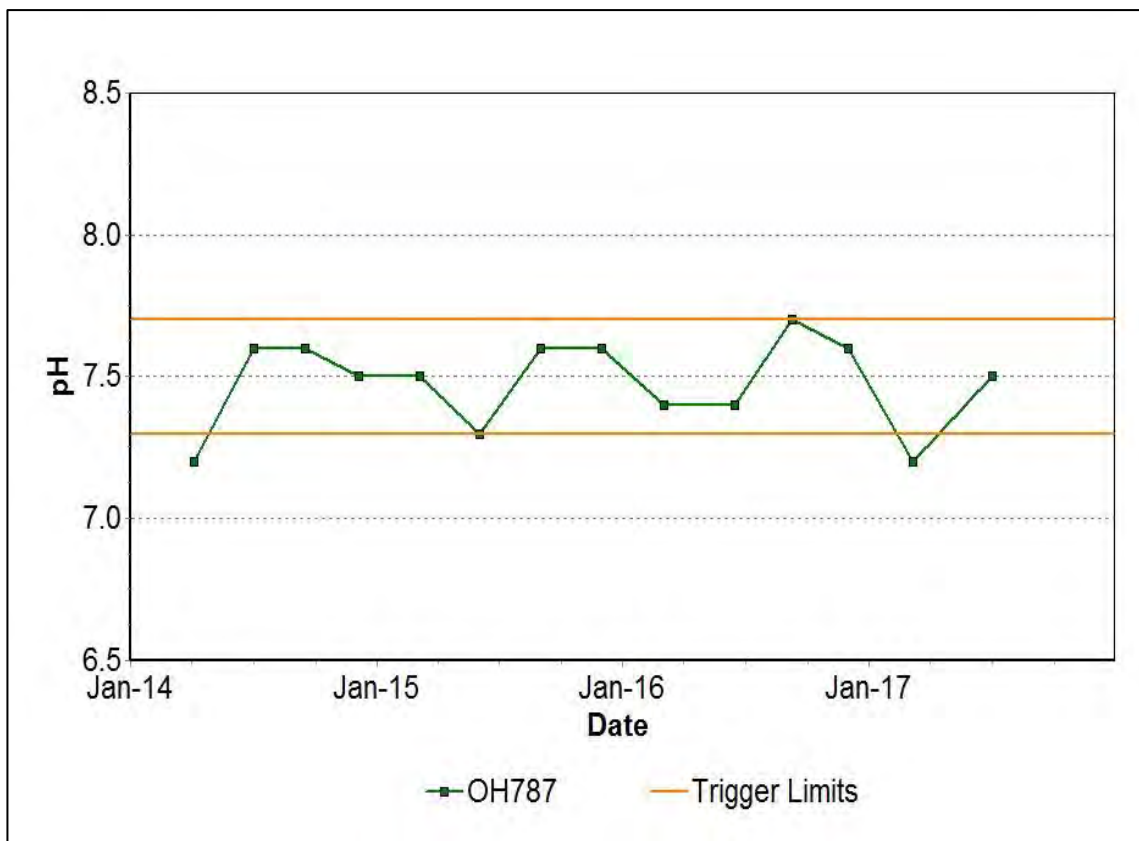


Figure 49: Hunter River Alluvium 2 Seam pH Trend - June 2017

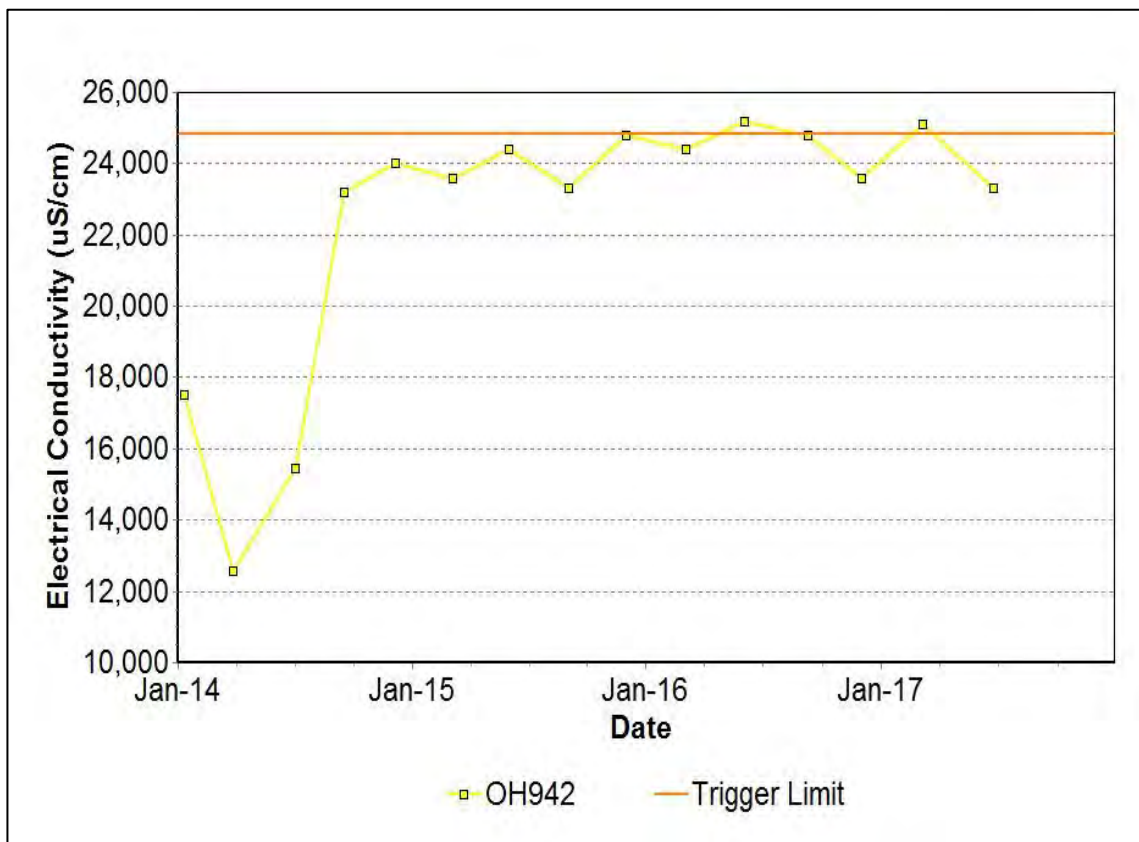


Figure 50: Hunter River Alluvium 3 Seam Electrical Conductivity - June 2017

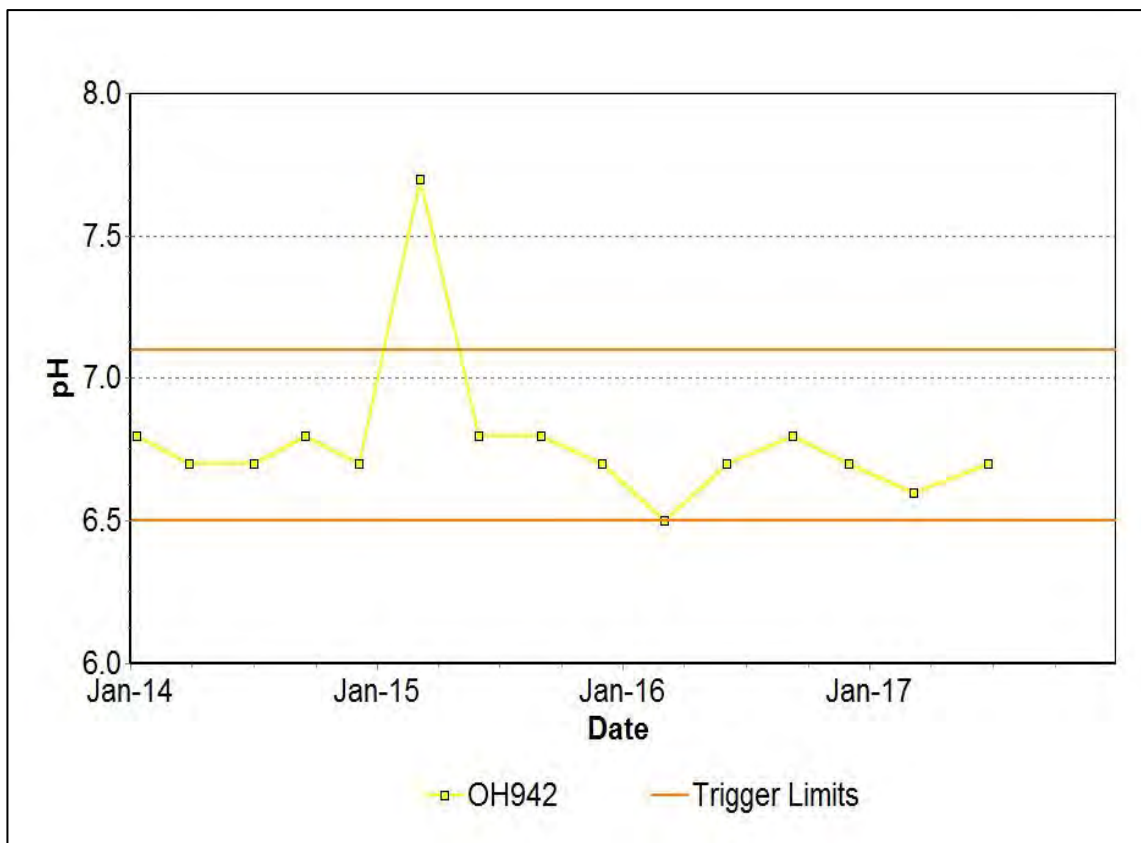


Figure 51: Hunter River Alluvium 3 Seam pH Trend - June 2017

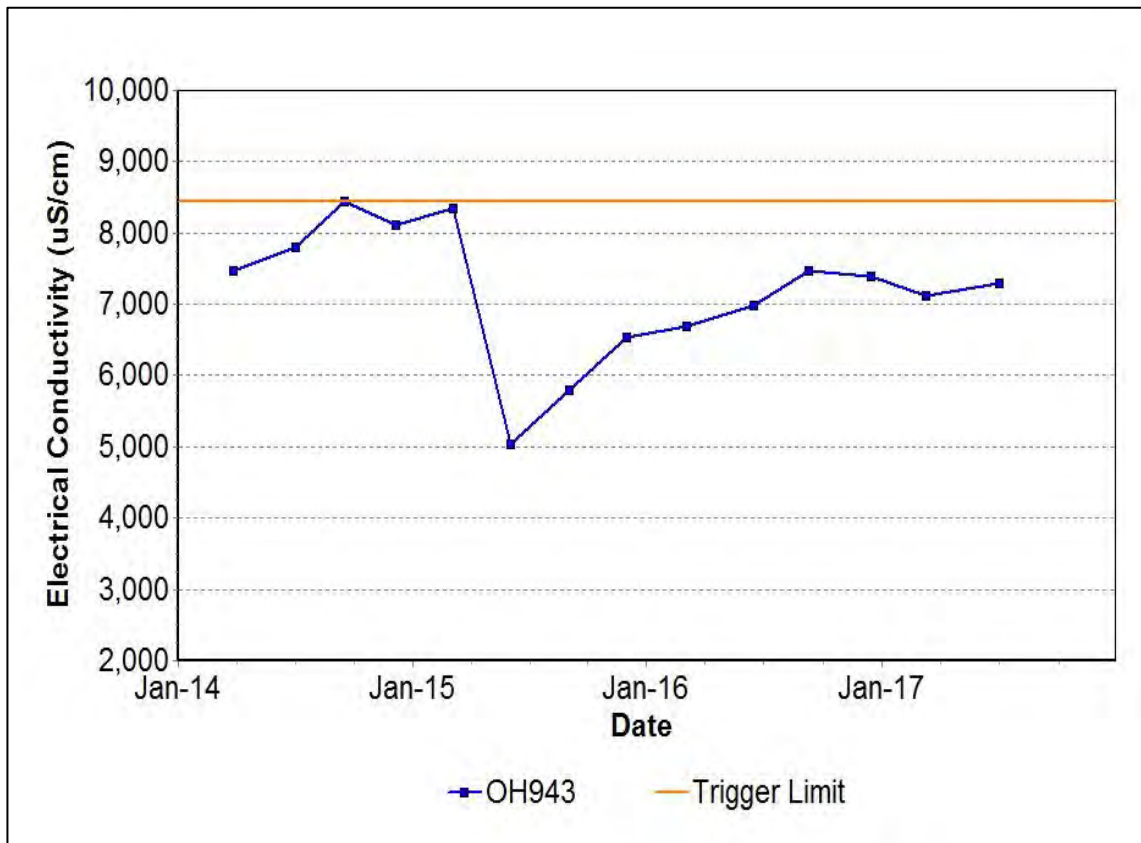


Figure 52: Hunter River Alluvium 4 Seam Electrical Conductivity - June 2017

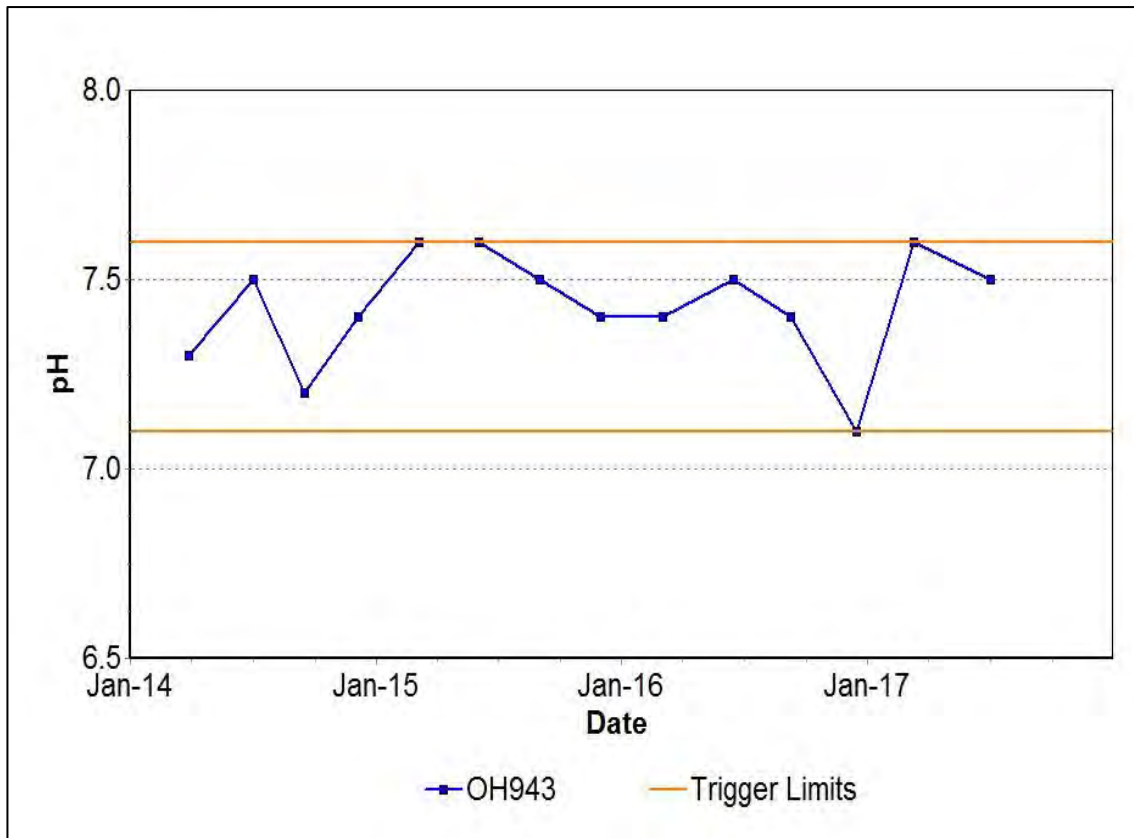


Figure 53: Hunter River Alluvium 4 Seam pH Trend - June 2017

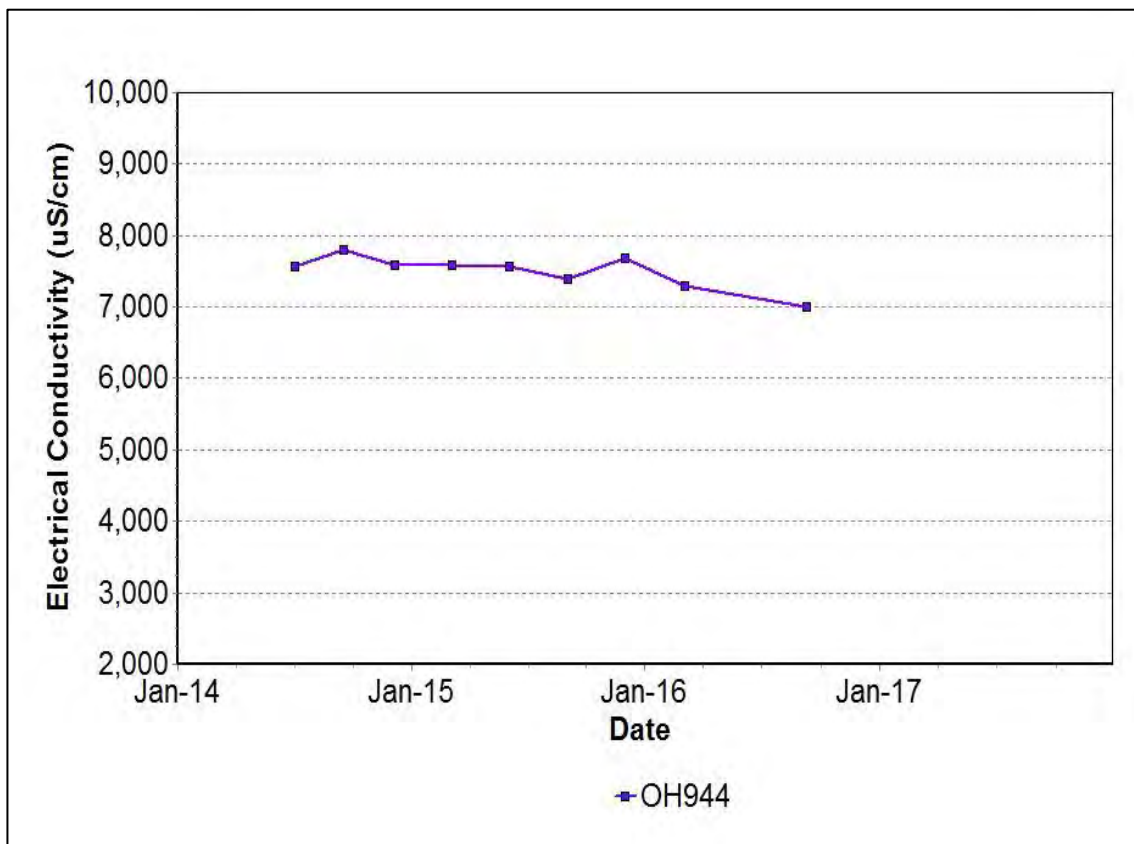


Figure 54: Hunter River Alluvium 5 Seam Electrical Conductivity - June 2017

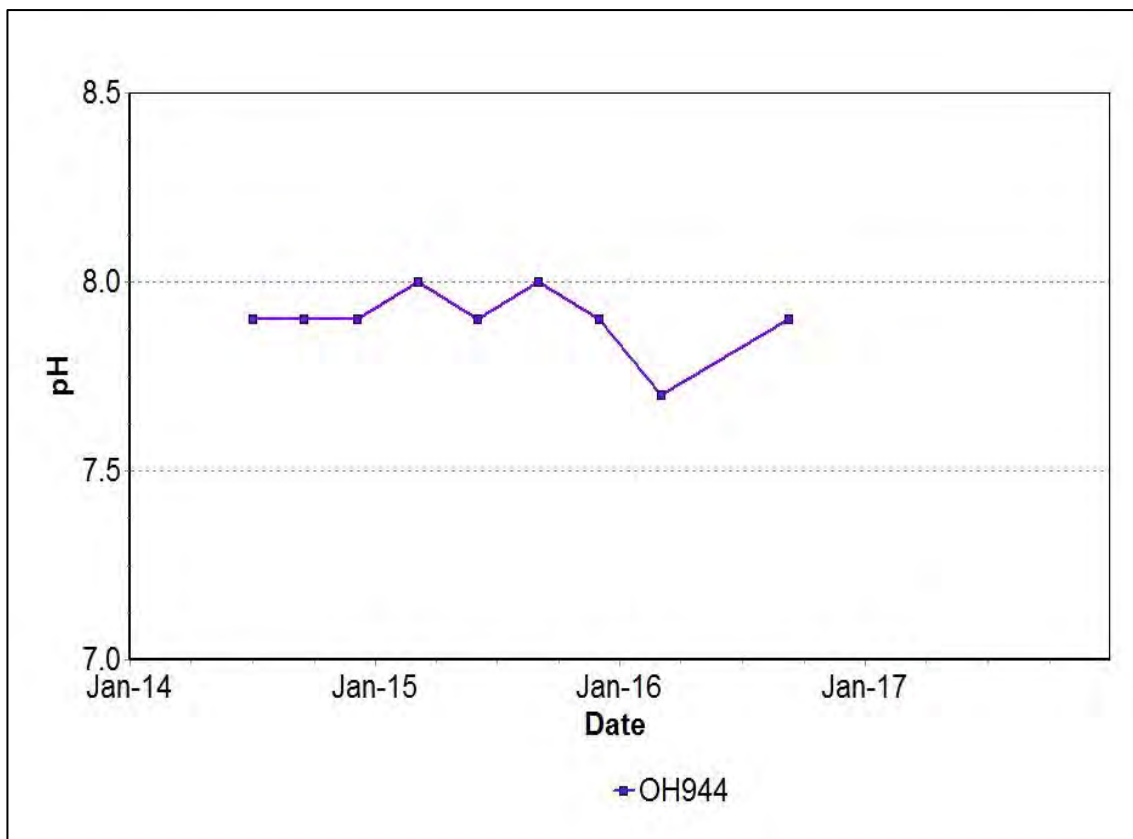


Figure 55: Hunter River Alluvium 5 Seam pH Trend - June 2017

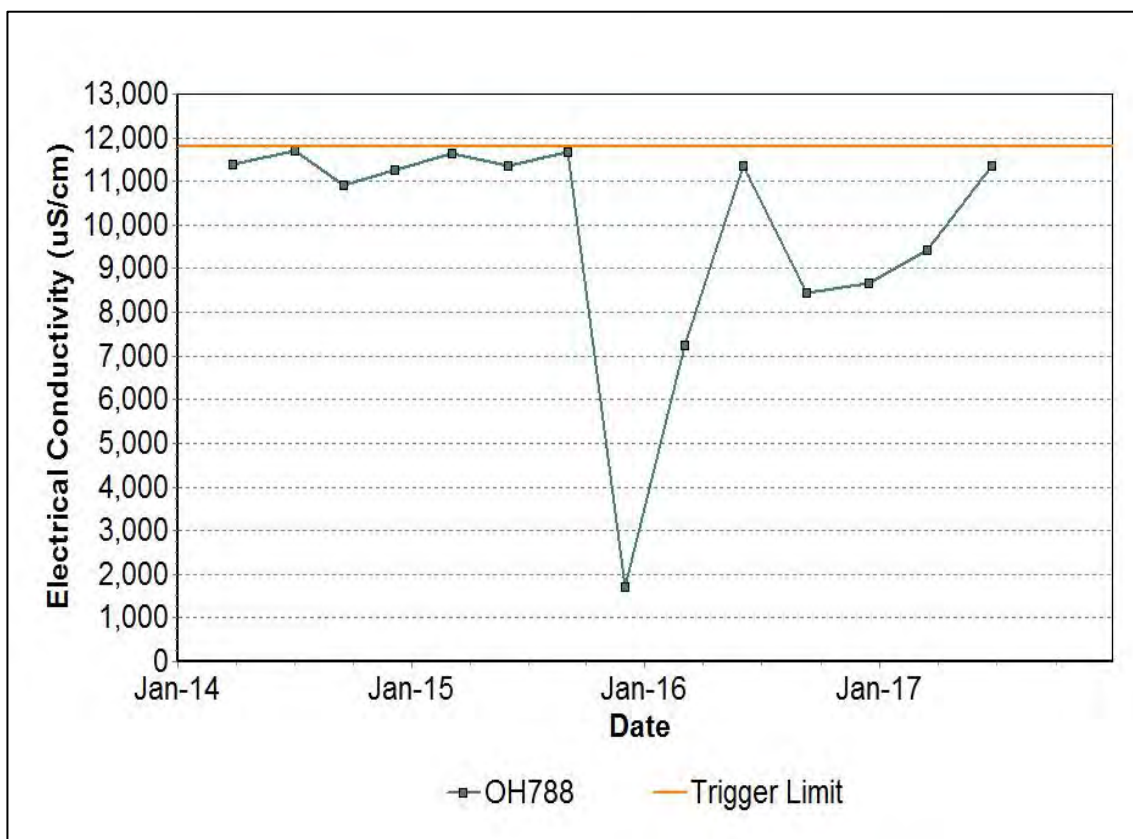


Figure 56: Hunter River Alluvium 6 Seam Electrical Conductivity - June 2017

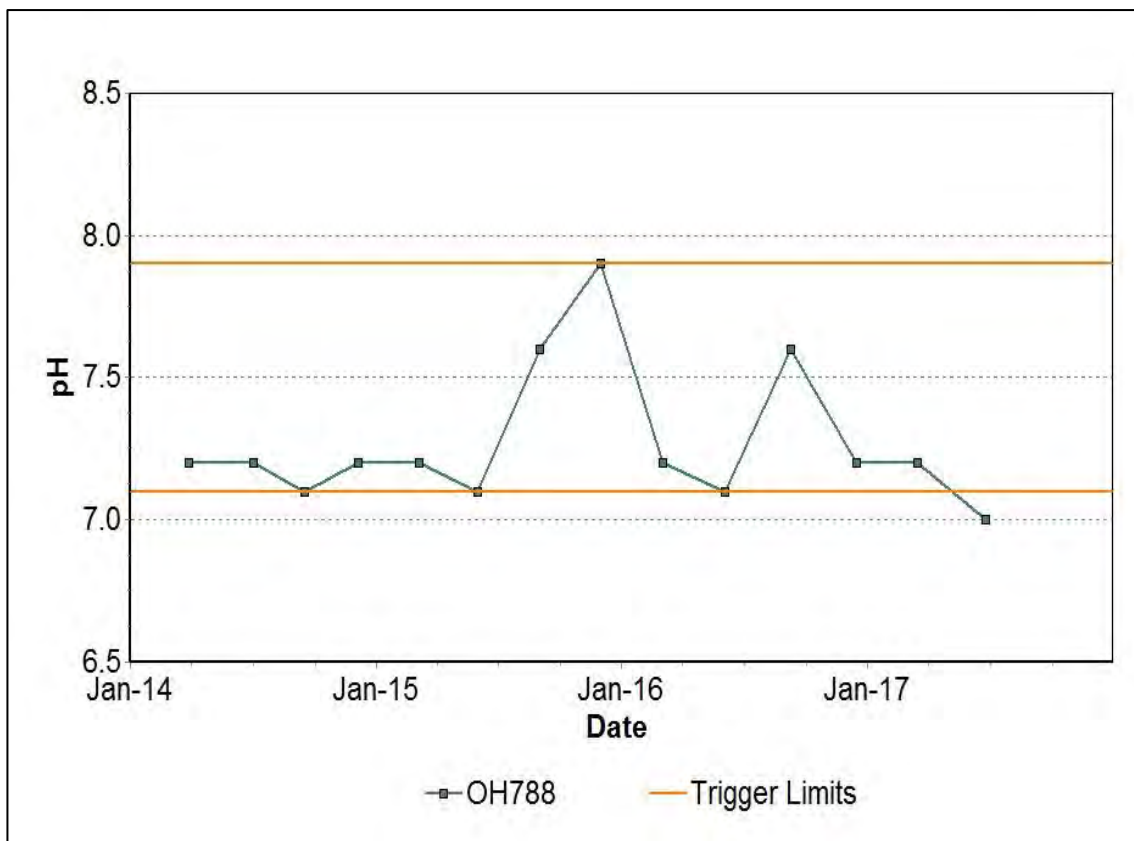


Figure 57: Hunter River Alluvium 6 Seam pH Trend - June 2017

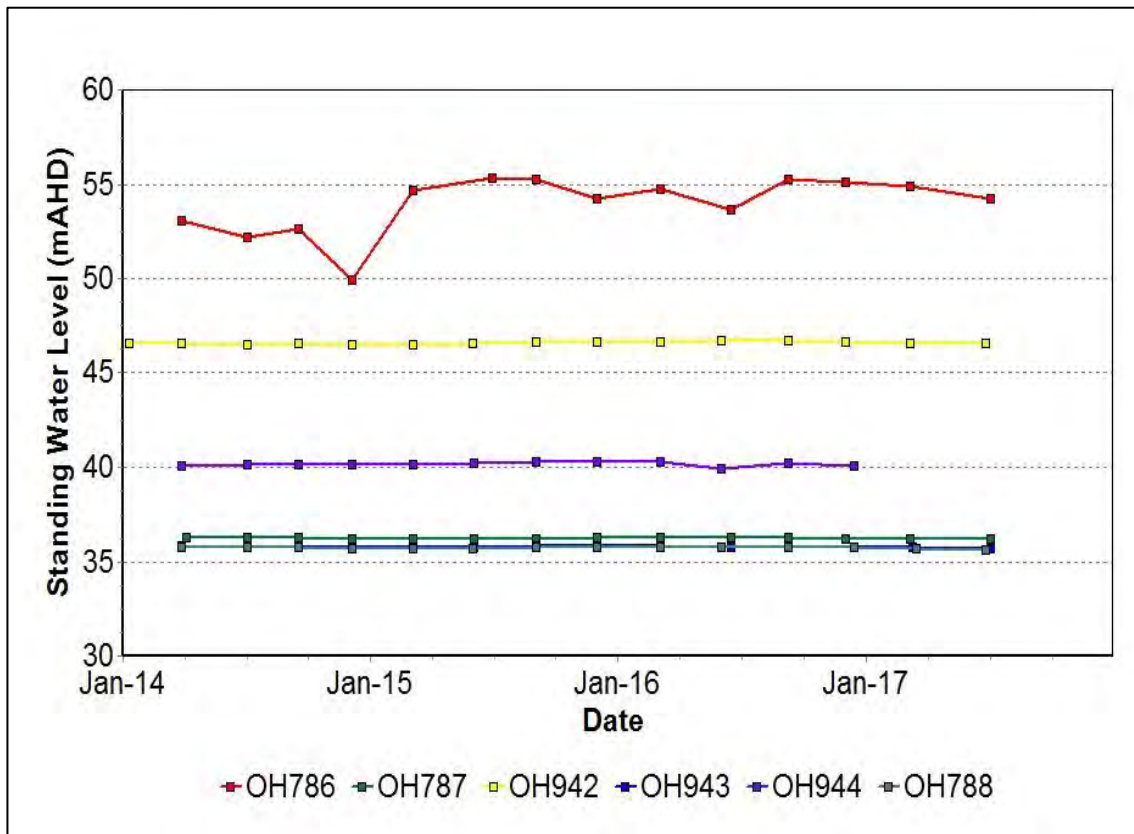


Figure 58: Hunter River Alluvium Standing Water Level Trend - June 2017

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 59.

During H1 2017 24 trigger limits were breached and investigated, summarised in Table 3.

Table 3: Groundwater Triggers - 2017

Site	Date	Trigger Limit Breached	Action Taken in Response
OH 787	07/03/2017	EC – 95th Percentile	Watching Brief*
OH942	07/03/2017	EC – 95th Percentile	Watching Brief*
PZ9S	07/03/2017	EC – 95th Percentile	Watching Brief*
OH1125(1)	07/03/2017	EC – 95th Percentile	Watching Brief*
MTD616P	10/03/2017	EC – 95th Percentile	Data is stable and consistent with historical trend; significant natural variability in water quality is typical of low-conductivity shallow overburden material. No further action.
MTD616P	03/07/2017	EC – 95th Percentile	Watching Brief*
MTD605P	07/03/2017	EC – 95th Percentile	Data is stable and consistent with historical trend; significant natural variability in water quality is typical of low-conductivity shallow overburden material. No further action.
MTD605P	27/06/2017	EC – 95th Percentile	Watching Brief*
PZ9D	07/03/2017	EC – 95th Percentile	Watching Brief*
WD622P	30/06/2017	EC – 95th Percentile	Watching Brief*
WOH2156B	10/03/2017	EC – 95th Percentile	Data is stable and consistent with historical trend; no further action.
WOH2156B	30/06/2017	EC – 95th Percentile	Watching Brief*
OH786	07/03/2017	PH –5th Percentile	Watching Brief*
OH787	07/03/2017	PH –5th Percentile	Watching Brief*
OH788	26/06/2017	PH –5th Percentile	Watching Brief*
PZ8S	07/03/2017	PH –5th Percentile	Watching Brief*
PZ8S	27/06/2017	PH –5th Percentile	Watching Brief*
GW9709	10/03/2017	PH –5th Percentile	Data broadly in line with historical range; EC or water level do not show a rising or falling trend. Watching brief to be maintained.
GW98MTCL2	10/03/2017	PH –5th Percentile	Watching Brief*

GW98MTCL2	23/07/2017	PH –5th Percentile	Watching Brief*
MTD616P	03/07/2017	PH –5th Percentile	Watching Brief*
G3	07/03/2017	PH –5th Percentile	Bore partially collapsed in early 2016 so data may not be representative of aquifer. Removal from monitoring programme has been recommended following review of data from nearby bores.
OH1138(1)	04/07/2017	PH –5th Percentile	Watching Brief*
WOH2153A	10/03/2017	PH –95th Percentile	Watching Brief*

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



Figure 59: 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 66.

4.1 Blast Monitoring Results

During June 2017, 24 blasts were initiated at MTW. Figure 60 to Figure 65 show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in Table 4.

Table 4: Blasting Limits

Airblast Overpressure (dB(L))	Comments
115	5% of the total number of blasts in a 12 month period
120	0%
Ground Vibration (mm/s)	Comments
5	5% of the total number of blasts in a 12 month period
10	0%

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

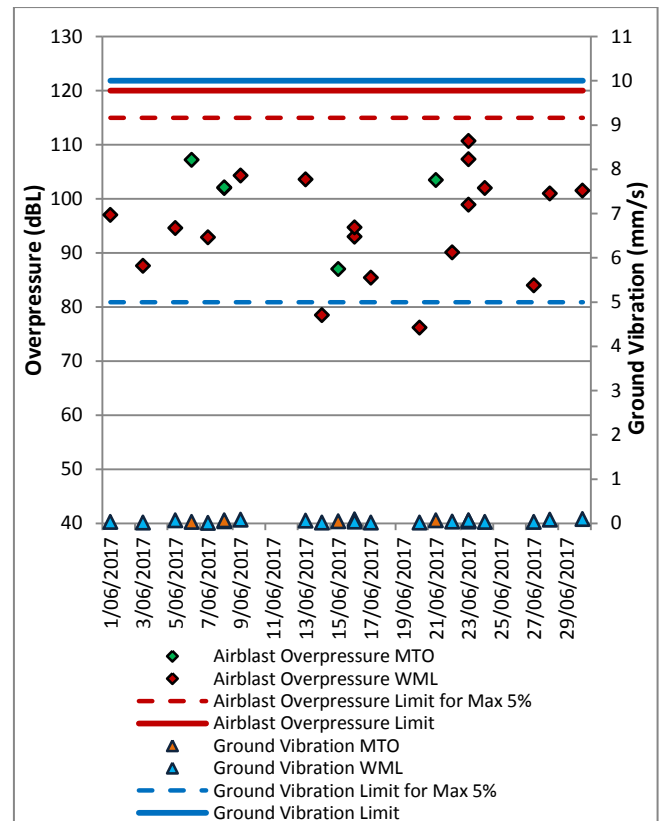


Figure 60: Abbey Green Blast Monitoring Results – June 2017

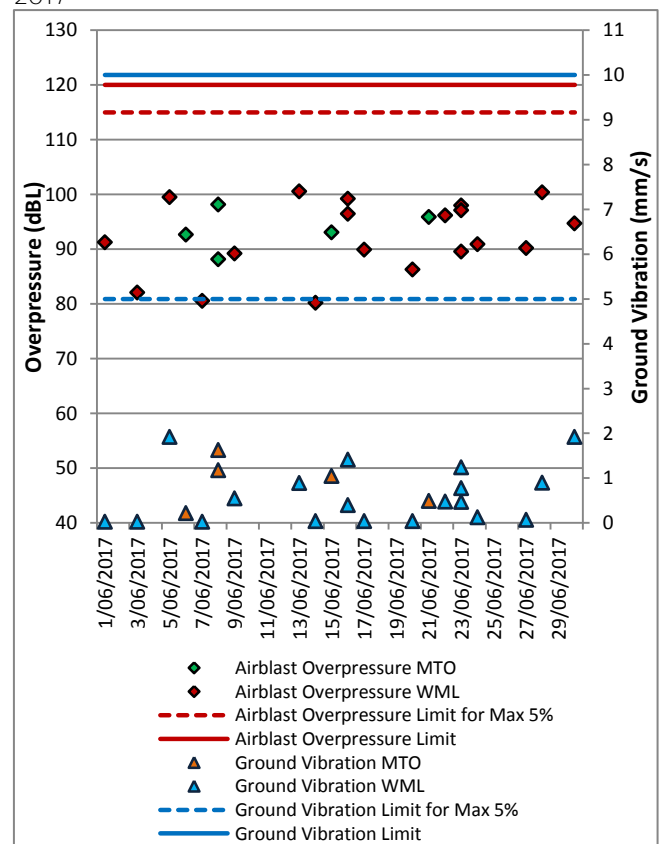


Figure 61: Bulga Village Blast Monitoring Results – June 2017

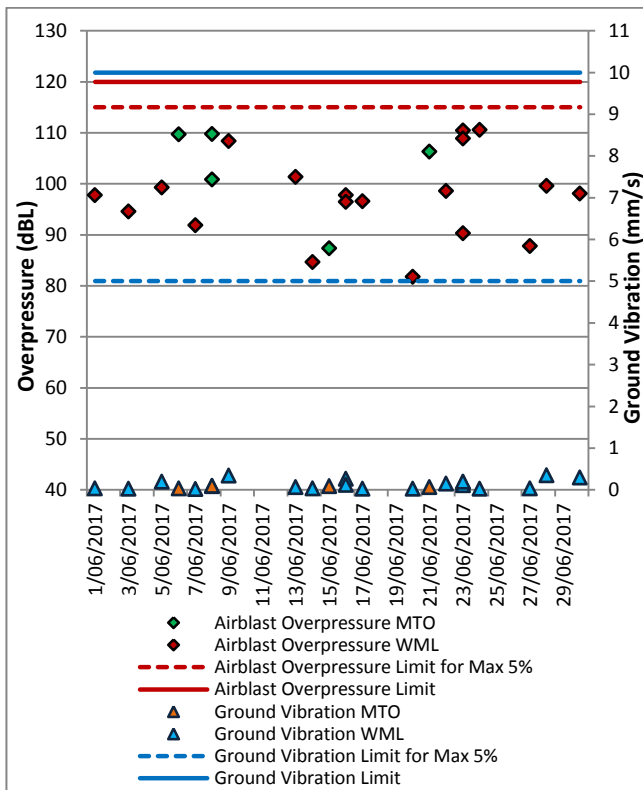


Figure 62: MTIE Blast Monitoring Results – June 2017

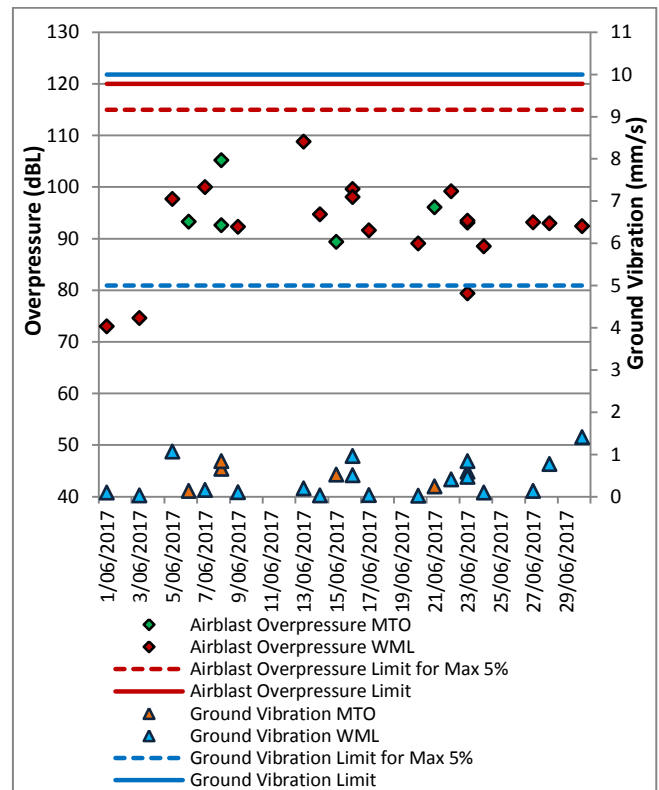


Figure 64: Wambo Road Blast Monitoring Results – June 2017

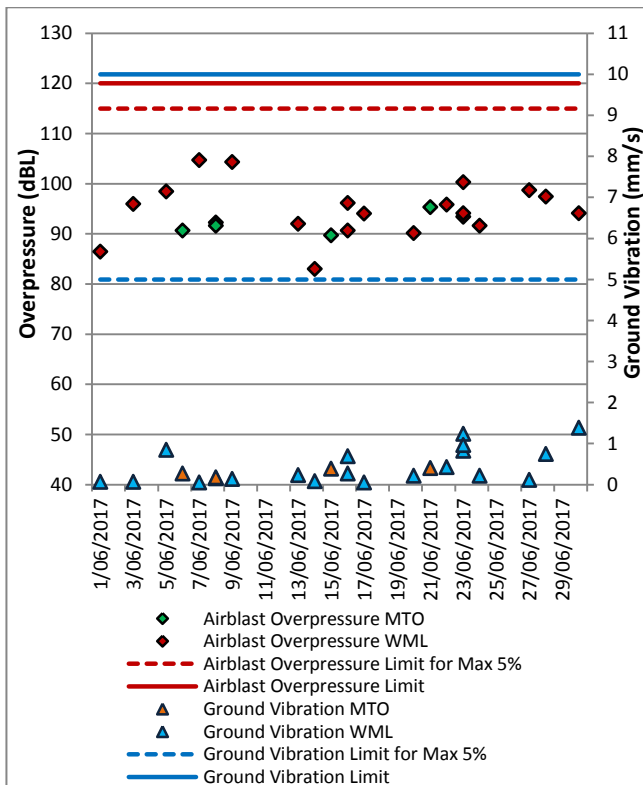


Figure 63: Warkworth Blast Monitoring Results – June 2017

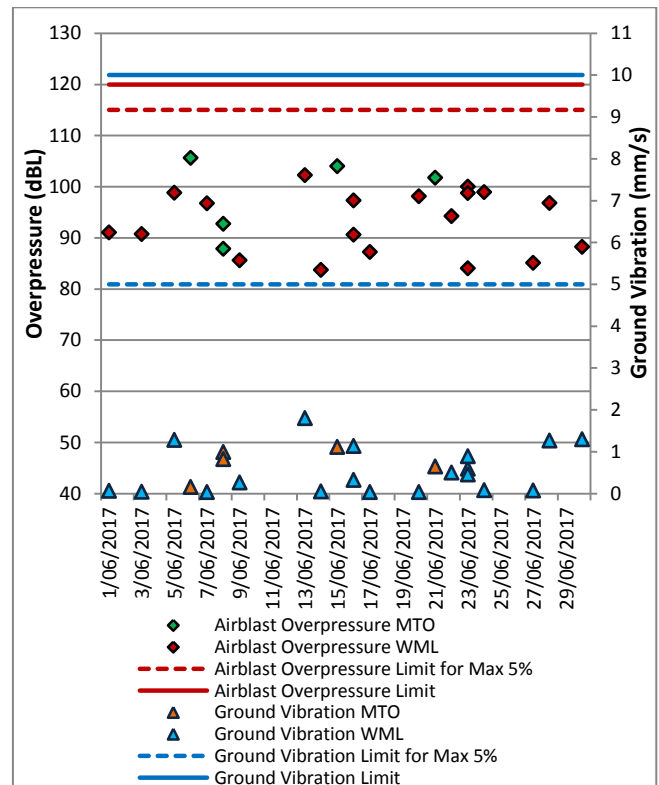


Figure 65: Wollemi Peak Road Blast Monitoring Results – June 2017

**Mount Thorley Warkworth
Blast Monitoring Locations**

Date: 160621
Plan By: DF
Version: 4.0



RTCA - NSW Environmental Services

Figure 66: 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. 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 67.

5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding MTW on the night of 15 June 2017. All measurements complied with the relevant criteria. Results are detailed in Table 5 to Table 8.

5.1.1 WML Noise Assessment

Compliance assessments undertaken against the WML noise criteria are presented in Tables 5 and 6.

Table 5: LAeq, 15 minute Warkworth Impact Assessment Criteria – June 2017

Location	Date and Time	Wind Speed (m/s) ⁵	Stability Class	Criterion (dB(A))	Criterion Applies? ^{1,5}	WML LAeq dB ^{2,4}	Exceedance ³	Total LAeq – LAeq	Revised WML LAeq 4,5,6
Bulga RFS	15/06/2017 21:27	1.6	D	37	Yes	35	Nil	19	40
Bulga Village	15/06/2017 21:55	1.5	D	38	Yes	33	Nil	20	38
Gouldsville Road	15/06/2017 21:24	1.6	D	38	Yes	1A	Nil	22	1A
Inlet Rd	15/06/2017 21:00	2.5	E	37	Yes	31	Nil	21	36
Inlet Rd West	15/06/2017 21:23	1.6	D	35	Yes	26	Nil	20	31
Long point	15/06/2017 21:00	2.5	E	35	Yes	1A	Nil	19	1A
South Bulga	15/06/2017 21:02	2.5	E	35	Yes	32	Nil	16	37
Wambo Road	15/06/2017 21:54	1.5	D	38	Yes	30	Nil	19	35

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 LAeq,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.
6. Revised LAeq, 15minute level following application of low frequency noise penalty as per the INP where applicable.

Table 6: LA1, 1 minute Warkworth – Impact Assessment Criteria – June 2017

Location	Date and Time	Wind Speed (m/s) ⁵	Stability Class	Criterion (dB(A))	Criterion Applies? ^{1,5}	WML LAeq dB ^{2,4}	Exceedance ³
Bulga RFS	15/06/2017 21:27	1.6	D	47	Yes	38	Nil
Bulga Village	15/06/2017 21:55	1.5	D	48	Yes	38	Nil
Gouldsville Road	15/06/2017 21:24	1.6	D	48	Yes	1A	Nil
Inlet Rd	15/06/2017 21:00	2.5	E	47	Yes	38	Nil
Inlet Rd West	15/06/2017 21:23	1.6	D	45	Yes	32	Nil
Long point	15/06/2017 21:00	2.5	E	45	Yes	1A	Nil
South Bulga	15/06/2017 21:02	2.5	E	45	Yes	42	Nil
Wambo Road	15/06/2017 21:54	1.5	D	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 LA1,1minute 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 Tables **Error! Reference source not found.**7 and 8.

Table 7: LAeq, 15minute Mount Thorley - Impact Assessment Criteria – June 2017

Location	Date and Time	Wind Speed (m/s) ⁵	Stability Class	Criterion dB	Criterion Applies? ^{1,5}	MTO LAeq dB ^{2,4}	Exceedance ³	Total LAeq – LAeq	Revised MTO LAeq ^{4,5,6}
Bulga RFS	15/06/2017 21:27	1.6	D	37	Yes	NM	Nil	19	NM
Bulga Village	15/06/2017 21:55	1.5	D	38	Yes	IA	Nil	20	IA
Gouldsville Road	15/06/2017 21:24	1.6	D	35	Yes	IA	Nil	22	IA
Inlet Rd	15/06/2017 21:00	2.5	E	37	Yes	IA	Nil	21	IA
Inlet Rd West	15/06/2017 21:23	1.6	D	35	Yes	IA	Nil	20	IA
Long point	15/06/2017 21:00	2.5	E	35	Yes	IA	Nil	19	IA
South Bulga	15/06/2017 21:02	2.5	E	36	Yes	IA	Nil	16	IA
Wambo Road	15/06/2017 21:54	1.5	D	38	Yes	IA	Nil	19	IA

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 LAeq,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.
- Revised LAeq, 15minute level following application of low frequency noise penalty as per the INP where applicable.

Table 8: LA1, 1Minute Mount Thorley - Impact Assessment Criteria – June 2017

Location	Date and Time	Wind Speed (m/s) ⁵	Stability Class	Criterion dB	Criterion Applies? ^{1,5}	MTO LA1, 1min dB ^{2,4}	Exceedance ³
Bulga RFS	15/06/2017 21:27	1.6	D	47	Yes	NM	Nil
Bulga Village	15/06/2017 21:55	1.5	D	48	Yes	IA	Nil
Gouldsville Road	15/06/2017 21:24	1.6	D	45	Yes	IA	Nil
Inlet Rd	15/06/2017 21:00	2.5	E	47	Yes	IA	Nil
Inlet Rd West	15/06/2017 21:23	1.6	D	45	Yes	IA	Nil
Long point	15/06/2017 21:00	2.5	E	45	Yes	IA	Nil
South Bulga	15/06/2017 21:02	2.5	E	46	Yes	IA	Nil
Wambo Road	15/06/2017 21:54	1.5	D	48	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 LA1,1minute attributed to Warkworth mine (MTO);
- NA in exceedance column means atmospheric conditions outside conditions specified in project approval 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.

5.1.3 INP Low Frequency Assessment

In accordance with the requirements of the Industrial Noise Policy, the low frequency modification factor has been applied where appropriate. It should be noted that the Industrial Noise Policy does not give guidance on the application of the penalty where more than one target source is audible. The L_{Ceq} levels reported above are “Total”, or “Total mine noise” at best, and cannot be attributed accurately to a single mine. Accordingly, where the INP criteria for the application of the Low Frequency penalty is triggered, the penalty has been applied to the dominant mine noise source (either of WML or MTO).

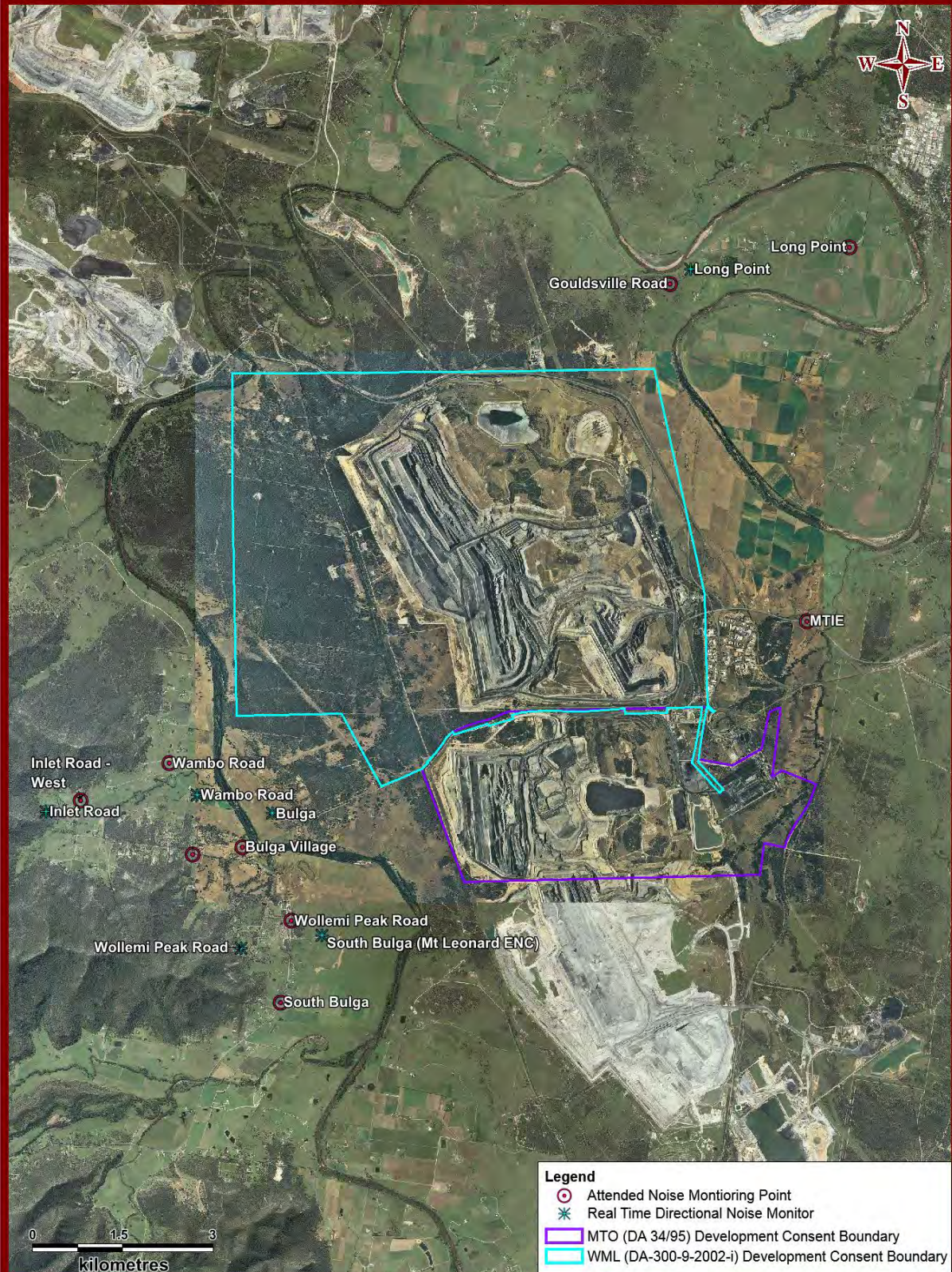
Resulting L_{Aeq} noise levels exceed the WML impact assessment criteria at Bulga RFS and South Bulga by 3dB and 2dB respectively due to the application of a 5 dB penalty to the site only L_{Aeq} .

MTW reports these measurements so as to ensure full disclosure, however it remains MTW’s position that the prescribed methodology is unsuitable when applied to receptors at large distances from mine noise sources due to the nature of noise attenuation. Excess attenuation of noise with distance is greater for high frequency noise than it is for low frequency noise. At significant distance from a noise source (such as private residences from the MTW complex) this often results in large differentials between L_{Aeq} and L_{Ceq} . The NSW Industrial Noise Policy requires the penalty to be applied in these instances, irrespective of actual low frequency affectation. As such, MTW does not consider these instances to constitute non-compliance with the conditions of approval.

The results have been reported to the Department of Planning and Environment.

**Mount Thorley Warkworth
Noise Monitoring Programme**

Date: 160226
Plan By: DF
Version: 2.0



RTCA - NSW Environmental Services

Figure 67: 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 9.

Table 9: Supplementary Attended Noise Monitoring Data –June 2017

No. of assessments	No. of assessments > trigger	No. of nights where assessments > trigger	% greater than trigger
500	0	0	0

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 15.0 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 68.

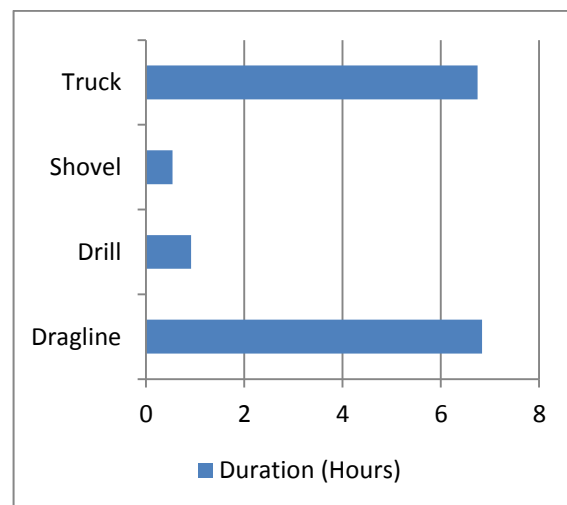


Figure 68: Operational Downtime by Equipment Type – June 2017

7.0 REHABILITATION

During June, 10.1 Ha of land was released, 9.1Ha was bulk shaped, 11.2Ha was top soiled, 4.7Ha was composted and 10.6Ha was rehabilitated. Year-to-date progress can be viewed in Figure 69.

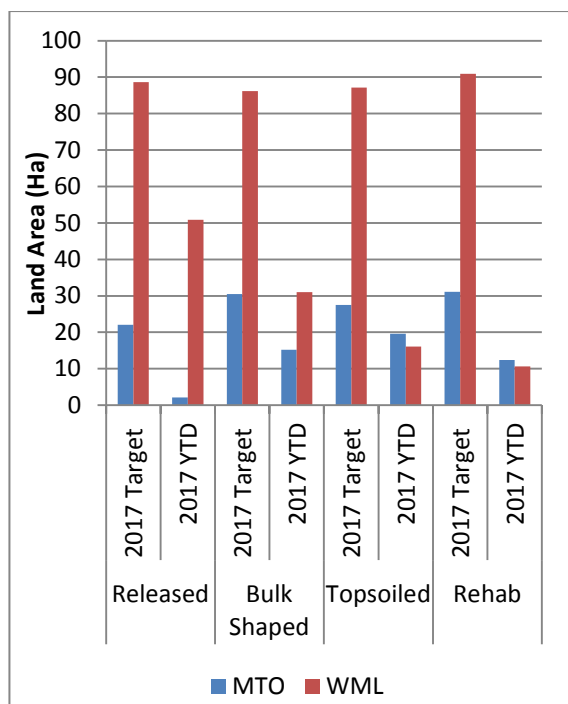


Figure 69: Rehabilitation YTD - June 2017

8.0 ENVIRONMENTAL INCIDENTS

During the reporting period MTW there were no reportable environmental incidents.

9.0 COMPLAINTS

During the reporting period 20 complaints were received, details of these complaints are displayed in Figure 70 below.

	Noise	Dust	Blast	Lighting	Other	Total
January	5	6	3	1	0	15
February	25	3	10	3	0	41
March	14	1	1	2	0	18
April	27	1	7	2	0	37
May	18	4	7	10	3	42
June	10	3	4	3	0	20
July	-	-	-	-	-	-
August	-	-	-	-	-	-
September	-	-	-	-	-	-
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	-	-	-	-	-	-
Total	99	18	32	21	3	173

Figure 70: Complaints Summary - YTD June 2017

Appendix A: Meteorological Data

Table 10: Meteorological Data – Charlton Ridge Meteorological Station – June 2017

Date	Air Temperature Maximum (°C)	Air Temperature Minimum (°C)	Relative Humidity Maximum (%)	Relative Humidity Minimum (%)	Solar Radiation Maximum (W/Sq. M)	Wind Direction Average (°)	Wind Speed Average (m/sec)	Rainfall(mm)
1/06/2017	14.5	5.3	80.4	47.5	748	245.9	2.3	0.0
2/06/2017	16.8	3.6	76.7	37.3	719	200.7	2.5	0.0
3/06/2017	17.5	3.5	85.6	39.5	630	230.5	1.8	0.0
4/06/2017	17.8	7.4	77.5	53.0	689	178.8	2.2	0.0
5/06/2017	19.1	6.7	93.4	48.6	701	174.8	1.7	0.0
6/06/2017	18.0	3.7	97.3	54.0	603	250.1	2.1	0.0
7/06/2017	17.9	3.8	88.6	32.8	712	270.1	3.7	0.0
8/06/2017	12.3	7.0	95.6	69.1	202	198.8	3.2	13.0
9/06/2017	17.4	8.8	95.6	70.2	810	184.1	3.3	0.6
10/06/2017	16.3	10.0	95.7	73.1	727	173.0	3.3	2.8
11/06/2017	16.4	9.9	95.6	73.1	433	169.4	3.2	3.0
12/06/2017	16.9	10.5	94.6	74.2	847	181.5	2.3	1.0
13/06/2017	19.8	9.1	96.8	53.4	759	177.2	1.7	1.0
14/06/2017	16.9	11.0	85.7	67.7	67	169.2	3.4	0.0
15/06/2017	18.0	10.6	92.0	68.4	821	175.2	2.5	0.2
16/06/2017	18.4	9.1	97.3	60.8	701	177.3	1.3	0.0
17/06/2017	16.9	8.0	96.8	69.4	662	196.1	1.6	0.2
18/06/2017	16.4	11.1	87.6	70.9	666	192.8	2.4	0.0
19/06/2017	16.8	10.0	88.5	61.2	803	175.1	4.1	0.0
20/06/2017	18.1	9.4	92.4	54.5	741	168.4	3.8	0.0
21/06/2017	18.1	8.1	94.7	58.4	700	180.7	2.8	0.0
22/06/2017	16.9	4.3	97.9	49.5	526	219.4	1.9	0.2
23/06/2017	18.9	6.1	93.9	47.2	686	193.7	1.4	0.0
24/06/2017	17.9	3.7	97.3	46.8	677	274.8	2.2	0.0
25/06/2017	18.6	5.5	78.4	35.4	647	280.6	2.6	0.0
26/06/2017	19.1	6.8	82.2	38.0	553	266.2	2.1	0.0
27/06/2017	18.4	4.5	88.8	32.8	563	217.6	1.7	0.0
28/06/2017	15.0	2.0	91.9	49.4	669	177.8	1.7	0.0
29/06/2017	-	-	-	-	-	-	-	-
30/06/2017	12.7	7.0	97.6	64.3	443	236.8	1.6	6.8

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



Appendix D

Acquisition Update - Mount Thorley Warkworth
Property Portfolio

Mount Thorley Warkworth property portfolio update

31st July 2017

Approach

Property purchases are based on the following:

- Regulatory criteria (those properties identified as being within a zone of acquisition due to predicted impacts under current operating consent. The majority of properties owned by Coal & Allied fall into this category);

How are properties managed?

- Properties within the mining lease may or may not be tenanted depending on their distance from the operation.
- Some of the properties were purchased as part of consent conditions requiring offer of acquisition to owners. Many have been owned for some time over the 30 year life of the operation (e.g. along Putty Road).
- Properties that are tenanted are offered for lease on the open market at market rates, and are managed through local real estate agents.
- Properties must be managed in accordance with Coal & Allied standards of property management.

Current property portfolio

1909 Putty Road, Bulga
1870 Putty Road, Bulga
1758 Putty Road, Bulga
1804 Putty Road, Bulga
1855 Putty Road, Bulga
1893 Putty Road, Bulga
1906 Putty Road, Bulga
1951 Putty Road, Bulga
2119 Putty Road, Bulga
2042 Putty Road, Bulga
1946 Putty Road, Bulga
1946 Putty Road, Bulga
608 Hambledon Hill Road, Singleton
271 Wallaby Scrub Road, Bulga
277 Wallaby Scrub Road, Bulga
896 Putty Road, Mt Thorley
288 Jerrys Plains Road, Jerrys Plains
11 Inlet Road , Bulga
36 Inlet Road, Bulga
1 Wambo Road, Bulga
89 Wambo Road , Bulga

910 Putty Road, Mt Thorley
129 Wambo Road, Bulga
181 Wambo Road, Bulga
313 Wambo Road, Bulga
317 Wambo Road, Bulga
248 Wambo Road, Bulga
367 Wambo Road, Bulga
Lot 84 Jerrys Plains Road, Warkworth
28 Inlet Road, Bulga
42 Inlet Road, Bulga
5A Wollemi Peak Road, Bulga
2041 Putty Road, Bulga
16 Inlet Road, Bulga
30 Inlet Road, Bulga
2068 Putty Road, Bulga
34 Wambo Road, Bulga