



Centennial Coal

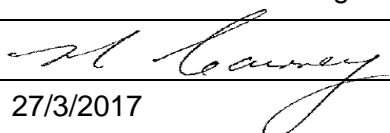


CENTENNIAL COAL AIRLY MINE ANNUAL REVIEW

March 2017 (Reporting Period: Jan – Dec 2016)



Table 1: Annual Review Title Block

Name of Operation	Airly Mine
Name of Operator	Centennial Airly Pty Limited
Development Consent/ Project Approval #	DA162/91 MOD 6
Mining Lease #	ML1331
Name of Holder of Mining Lease	Centennial Airly Pty Limited
Water Licence #	WAL 24386 and WAL 36565
Name of Holder of Water License	Centennial Airly Pty Limited
MOP/RMP Start Date	14/03/2014
MOP/RMP End Date	31/12/2017
Annual Review Start Date	1/1/2016
Annual Review End Date	31/12/2016
<p>I, Mick Cairney, certify that this audit report is a true and accurate record of the compliance status of Airly Mine for the period 1 January 2016 to 31 December 2016 and that I am authorized to make this statement on behalf of Centennial Airly.</p> <p><i>Note:</i></p> <p>a) <i>The Annual Review is an 'environmental audit' for the purposes of s122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion) in an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</i></p> <p>b) <i>The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (intention to defraud by false or misleading statement – maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents –maximum penalty 2 years imprisonment or \$22,000, or both).</i></p>	
Name of Authorised Reporting Officer	Mick Cairney
Title of Authorised Reporting Officer	Executive General Manager Operations
Signature of Authorised Reporting Officer	
Date	27/3/2017

Contents

1. STATEMENT OF COMPLIANCE	4
2. INTRODUCTION.....	5
3. APPROVALS	7
4. OPERATIONS SUMMARY.....	9
4.1. Other Operations.....	9
4.2. Next Reporting Period	10
5. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW.....	10
6. ENVIRONMENTAL PERFORMANCE	11
6.1. NOISE.....	13
6.2. AIR QUALITY.....	17
6.3 BIODIVERSITY.....	20
6.4 HERITAGE.....	25
7 WATER MANAGEMENT.....	27
8 REHABILITATION.....	54
8.1 Next Reporting Period	54
9 SUBSIDENCE.....	57
10 COMMUNITY.....	63
10.1Community Engagement.....	63
10.2Community Contributions	63
10.3Community Complaints	63
11 INDEPENDENT AUDIT.....	64
12 INCIDENTS & NON-COMPLIANCES DURING THE REPORTING PERIOD ...	64
13 ACTIVITES TO BE COMPLETED IN THE NEXT REPORTING PERIOD.....	66

1. STATEMENT OF COMPLIANCE

Table 2: Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	
DA162/91	YES
ML1331	YES
EPL12374	YES
A232	YES

Table 3: Non-Compliances

Relevant Approval	Condition #	Condition summary	Compliance Status	Comment	Page # addressed in Annual Review

Note: Compliance Status Key for Table 3

Risk Level	Colour Code	Description
High		Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium		Non-compliance with: <ul style="list-style-type: none"> • Potential for serious environmental consequences, but is unlikely to occur; or • Potential for moderate environmental consequences, but is likely to occur
Low		Non-compliance with: <ul style="list-style-type: none"> • Potential for moderate environmental consequences, but is unlikely to occur; or Potential for low environmental consequences, but is likely to occur
Administrative		Only to be applied where the non-compliance does not result in any risk of environmental harm (eg submitting a report to government later than required under approval conditions)

There were no non-compliances for Airly Mine in 2016.

2. INTRODUCTION

Airly Mine is an existing underground coal mine operated by Centennial Airly Pty Limited (Centennial Airly). It is located near Capertee village, approximately 40 km north-west of Lithgow on the Castlereagh Highway in the Western Coalfield of NSW (Figure 2.1).

Airly Mine was granted Development Consent DA162/91 for the development of an underground coal mine on 14 April 1993 by the then Minister for Planning following a Commission of Inquiry held in 1993. The development consent allows Airly Mine to extract up to 1.8 million tonnes per annum (Mtpa) of run of mine (ROM) coal within the mining lease ML1331. In October 2014 the development consent for Airly Mine was extended until 31 October 2015 (DA162/91 MOD3). In August 2015 the development consent for Airly Mine was extended until 30 April 2016 (DA162/91 MOD4); in March 2016 the consent was extended until 31 October 2016 (DA162/91 MOD5) and in September 2016 the consent was extended until 31 January 2017 (DA162/91 MOD6). The Airly Mine Extension Project (SSD_5581) was approved in December 2016 and allows mining for a period of 20 years within the boundaries of ML1331 and Authorisation 232 (A232). Airly commenced operations under SSD_5581 on 31 January 2017.

Coal mining to date at Airly Mine has been bord and pillar mining only within the Lithgow Seam. Airly Mine moved to a care and maintenance phase in January 2013 and remained in care and maintenance until March 2014. During this phase extraction activities ceased, however environmental management of the mine was ongoing including ongoing environmental monitoring. Coal production at Airly Mine resumed in March 2014.

Airly's disturbance footprint is limited to the pit top and surface infrastructure including water management systems, car park, administration building, workshop, pit top area, conveyors, coal handling plant and mine ventilation infrastructure. The current disturbance footprint of Airly Mine is 43.34Ha, Figures 8.1 and 8.2.

Airly does not have any offset areas.

The contact details for personnel responsible for environmental management and community relations at Airly Mine are presented below in **Table 2**.

Table 2.1: Airly Mine Contact Details

Position	Key Contact	Contact Details
Mine Manager	Bob Miller	(02) 6359 2101 Email: bob.miller@centennialcoal.com.au
Environment and Community Coordinator	Sam Price	(02) 6359 2108 Email: sam.price@centennialcoal.com.au

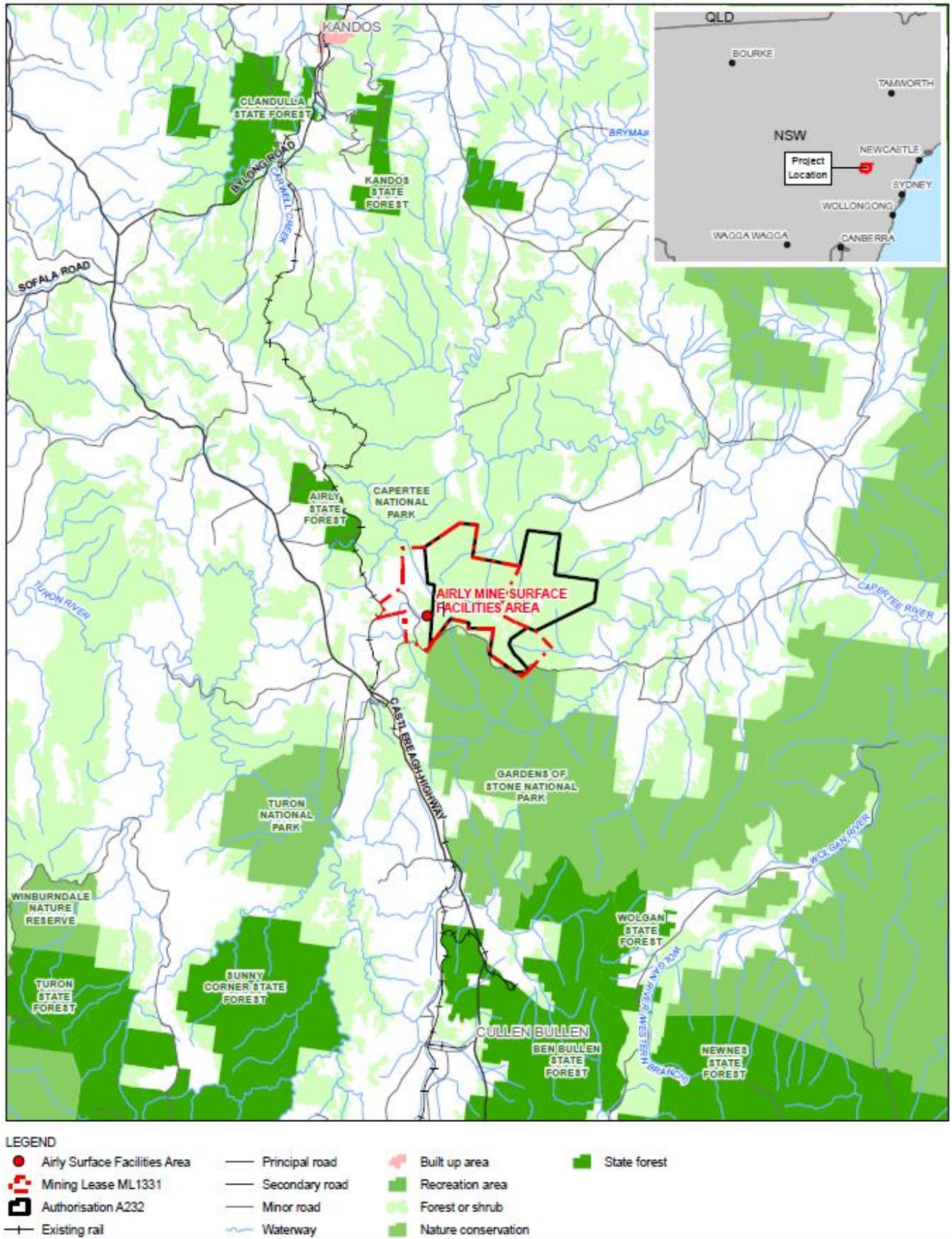


Figure 1: Airly Mine Locality Plan

3. APPROVALS

Table 3.1: Airly Mine Leases, Licences and Consents

Leases (Department of Trade & Investment, Regional Infrastructure & Services)

Lease	Summary	Grant Date	Expiry Date
Mining Lease (ML) 1331	Mining lease area of approx 2745 hectares.	8/05/2014	20/10/2035
Authorisation (A) 232	Exploration area of approx 3054 hectares.	21/5/2015	20/10/2019

Consents (Department of Planning and Environment)

Consent	Summary	Grant Date	Expiry Date
Development Consent DA 162/91	Underground mine development to extract 1.8 million tonnes per annum	14/4/1993	12/10/2014
Development Consent Modification DA 162/91 MOD 1	Temporary coal transport by road for trial mine	20/10/1999	12/10/2014
Development Consent Modification DA 162/91 MOD 2	Construction of a 66kV Powerline and Associated Infrastructure	21/8/2009	12/10/2014
Development Consent Modification DA 162/91 MOD 3	Extension of operations until 31 October 2015	9/10/2014	31/10/2015
Development Consent Modification DA 162/91 MOD 4	Extension of operations until 30 April 2016	28/8/2015	30/04/2016
Development Consent Modification DA 162/91 MOD 5	Extension of operations until 31 October 2016	17/3/2016	31/10/2016

Development Consent Modification DA 162/91 MOD 6	Extension of operations until 31 January 2017	29/9/2016	31/1/2017
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Mining Operations Plan (Department of Trade & Investment, Regional Infrastructure & Services)

MOP Period	Summary	Grant Date	Expiry Date
2014-2016	Covers activities at Airly Mine during operations.	14/3/2014	1/3/2016
2014-2016 (extension)	Covers activities at Airly Mine during operations.	15/1/2016	30/4/2016
2014-2016 (extension)	Covers activities at Airly Mine during operations.	20/4/2016	31/10/2016
2014-2016 (extension)	Covers activities at Airly Mine during operations.	28/10/2016	28/2/2017

Environmental Protection Licence (NSW Environment Protection Authority)

EPL	Summary	Grant Date	Expiry Date
12374	3 licenced discharge points Production of coal >500,000T to 2,000,000T per annum	12/12/2005	Renewed Annually

Groundwater Monitoring Bore Licences (NSW Office of Water)

Licence Reference	Reference/Summary	Grant Date	Expiry Date
10BL604518	ARP01	14/02/2011	Perpetuity
10BL604520	ARP02A & ARP03A	14/02/2011	Perpetuity
10BL604521	ARP04 & ARP05	14/02/2011	Perpetuity
10BL605352	ARP06, ARP07, ARP08 & ARP09	28/03/2013	Perpetuity

10BL605794	ARP11	19/08/2016	Perpetuity
10BL605793	ARP12, ARP13, ARP13SP, ARP14, ARP15 & ARP15SP	17/08/2016	Perpetuity

Groundwater Extraction Licences (NSW Office of Water)

License Reference	Reference/Summary	Grant Date	Expiry Date
WAL 24386	Extract 158ML per annum	1/9/2014	Perpetuity
WAL 36565	Extract 120ML per annum	11/2/2014	Perpetuity

4. OPERATIONS SUMMARY

Table 4: Production Summary

Material	Approved Limit (and source)	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
Waste Rock/ Overburden				
ROM Coal	1.8 MT per annum	745,570 (t)	842,768 (t)	749,752 (t)
Coarse reject				
Fine reject (Tailings)				
Saleable product		745,570 (t)	842,768 (t)	749,752 (t)

4.1. Other Operations

Table 5: Operations Summary

	Approved Limit (and source)	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Comment (if applicable)
Hours of operation	24 hours/7 days a week	24 hours/7 days a week	24 hours/7 days a week	
Transport (rail)		745,570 (t)	816,635 (t)	

4.2. Next Reporting Period

Development Consent SSD_5581 was approved under *Section 89E of the Environmental Planning & Assessment Act 1979* and was issued to Airly Mine on 15 December 2016. Airly Mine commenced operating under the new Consent on 31 January 2017. The 2017 Annual Review will be undertaken in accordance with Development Consent SSD_5581.

During the next reporting period, Airly will develop and implement new and revised environmental management plans in accordance with SSD_5581. Airly will continue to conduct environmental monitoring and land management practices in accordance with the relevant approved management plans during 2017. Updates of these activities will be provided to the community via the Community Consultative Committee (CCC) meeting process and monthly website reporting of environmental monitoring data.

Airly Mine is still currently seeking project determination under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). A determination under the EPBC Act is expected prior to 30 April 2017.

5. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

An acceptance of the 2015 Annual Review letter from the Department of Planning and Environment (DPE) was provided to Airly Mine on 13 September 2016. The letter also identified several requests for the 2016 Annual Review. The requested actions from the DPE are detailed in Table 6 below.

No actions were received from other Agencies in relation to the Airly Mine 2015 Annual Review.

Table 6: Actions from previous Annual Review

Action Required	Requested By	Action Taken
Include a unit of measure in Table 4;	Department of Planning and Environment	Table 4 (Production Summary) has been updated to clearly show that all results are in tonnes.
Include specific plans/maps which show the regional context, approval boundary, mining lease boundaries, current operational disturbance footprint and any offset areas as relevant;	Department of Planning and Environment	Addressed within this document: <ul style="list-style-type: none"> - Regional Context = Figure 1 - Approval Boundary = Figure 2 - ML Boundaries = Figures, 2, 7.3.4, 7.7.1, 8.1, 8.2 - Disturbance Footprint = Figure 8.1 and 8.2 - Offset Areas = N/A
Consistently report spikes in air quality data;	Department of Planning and Environment	Addressed within section 6.2 'Air Quality'. Additionally, detailed monthly air quality monitoring results are publically available on the Centennial Airly website.
Provide long term comparison graphs for all	Department of Planning and	Addressed within this document and also in Appendices A – C. Long term

data, including surface water and groundwater.	Environment	comparison graphs are provided for Air Quality, Noise, Surface Water and Groundwater monitoring. Additionally, monthly monitoring results are publically available on the Centennial Airly website.
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6. ENVIRONMENTAL PERFORMANCE

Table 6: Environmental Performance

Aspect	Approval criteria/ EIS prediction	Performance during the reporting period (actual)	Trend/ key management implications	Implemented / proposed management action
Noise	Condition 29. (a) and (d) of DA 162/91.	Compliant and consistent with EIS predictions.	See section 6.1	Maintain noise monitoring and mitigation procedures in accordance with Airly Mine's Noise Management Plan.
Air quality	Condition 29. (a) and (d) of DA 162/91.	Compliant and consistent with EIS predictions.	See section 6.2	Maintain air quality monitoring and mitigation procedures in accordance with Airly Mine's Air Quality Management Plan.
Biodiversity	EIS - No impact	No impact	Ongoing identification and monitoring in consultation with NPWS. See section 6.3	Operate in accordance with the Western Region Biodiversity Monitoring and Management Plan. Continue ongoing consultation with NPWS.
Heritage	EIS - No impact	No impact	No trends, No Impact. See Section 6.4	Continue implementing Western ACHMP
Water Management	Condition 29. (e) and (f) of DA 162/91. Condition L1, L2 and L3 of EPL12374.	Compliant and consistent with EIS predictions.	See section 7 and Appendices A – C.	Continue surface and ground water monitoring and management.

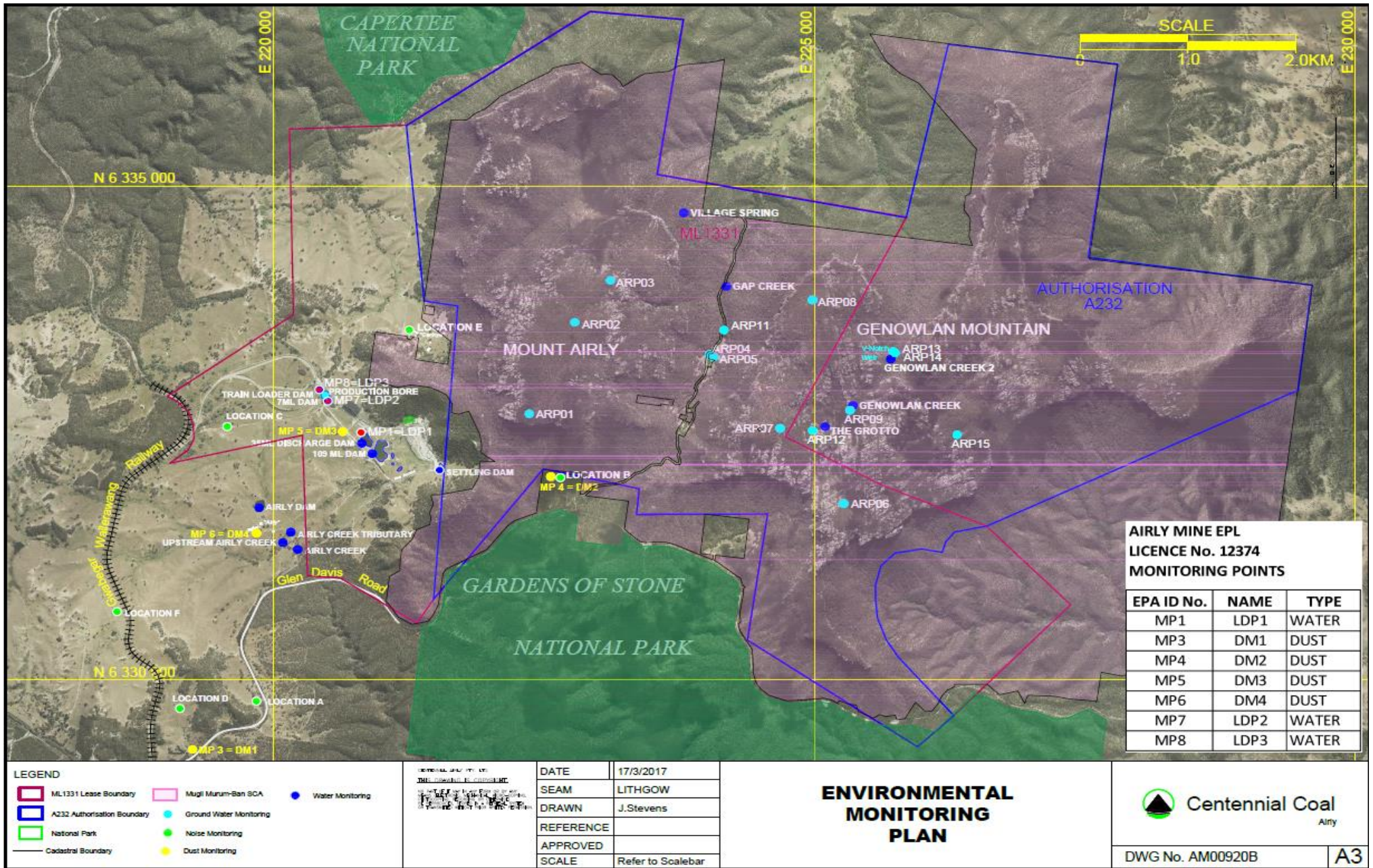


Figure 2: Airly Mine Environmental Monitoring Report

6.1. NOISE

Airly Mine has no specific noise monitoring requirements or noise criteria under DA162/91 Project Approval or Environmental Protection Licence (EPL) No. 12374.

Five of the six monitoring locations used as part of the annual noise survey are mine owned, therefore noise criteria were not adopted for these locations. One location, Location B, is a privately owned residence, so the minimum criteria able to be determined using the NSW EPA's Industrial Noise Policy were adopted for this location and are outlined in table 6.1.1 below. Figure 2 shows the Airly noise monitoring locations.

Table 6.1.1: Airly Mine – Adopted Noise Monitoring Criteria.

Descriptor	Day/Evening/Night Criteria L _{Aeq,15minute}	Night Criteria L _{A1,1minute}
Location A	NA	NA
Location B	35	45
Location C	NA	NA
Location D	NA	NA
Location E	NA	NA
Location F	NA	NA

Adopted noise criteria detailed in Table 6.1.1 apply under all meteorological conditions except the following:

- Average wind speed at microphone height exceeds 5m/s;
- Wind speeds greater than 3m/s measured at 10 metres above ground level; or
- Temperature inversion conditions greater than 3°C/100m.

Noise monitoring at Airly is scheduled and adjusted accordingly to help ensure neutral meteorological conditions. This process enables an accurate assessment of mine generated noise levels at each monitoring location.

Airly Mine 2016 noise monitoring results are described in Tables 6.1.2, 6.1.3 and 6.1.4 below. There were no noise exceedances during the 2016 reporting period.

Table 6.1.2: Airly Mine – 2016 Day Noise Monitoring Results

Location	Start Date and Time	Wind Speed m/s ¹	VTG °C/100m ¹	Criterion dB ²	Criterion Applies? ^{2,3}	Airly Mine L _{Aeq,15min} dB ^{4,5}	Exceedance ⁶
<i>Day</i>							
A	14/10/2016 11:36	0.5	-2.0	NA	Yes	IA	Nil
A	14/10/2016 11:53	0.8	-2.0	NA	Yes	IA	Nil
B	14/10/2016 09:36	0.8	-2.0	35	Yes	IA	Nil
B	14/10/2016 09:51	0.8	-2.0	35	Yes	IA	Nil
C	21/10/2016 13:51	1.8	-1.6	NA	Yes	<30	Nil
C	21/10/2016 14:06	1.7	-1.6	NA	Yes	<30	Nil
D	14/10/2016 10:56	0.5	-2.0	NA	Yes	IA	Nil
D	14/10/2016 11:12	0.5	-2.0	NA	Yes	IA	Nil
E	21/10/2016 13:09	1.8	-1.6	NA	Yes	IA	Nil
E	21/10/2016 13:24	1.8	-1.6	NA	Yes	IA	Nil
F	21/10/2016 12:06	1.7	-1.8	NA	Yes	IA	Nil
F	21/10/2016 12:22	1.7	-1.8	NA	Yes	IA	Nil

Notes:

1. Criterion may or may not apply due to rounding of meteorological data values sourced from Airly Mine's meteorological station;
2. NA in this column indicates that this location is owned by Airly Mine and has no criterion;
3. Adopted noise criteria have been considered not to apply during the following meteorological conditions: wind speeds greater than 3 metres per second (at a height of 10 metres); or temperature inversion conditions greater than 3°C/100m;
4. Estimated or measured L_{Aeq,15min} attributed to Airly Mine;
5. Bolded results in red indicate exceedance of adopted criterion; and
6. NA in exceedance column means atmospheric conditions outside conditions specified and so adopted criterion is not applicable.

Table 6.1.3: Airly Mine – 2016 Evening Noise Monitoring Results

Location	Start Date and Time	Wind Speed m/s ¹	VTG °C/100m ¹	Criterion dB ²	Criterion Applies? ^{2,3}	Airly Mine L _{Aeq,15min} dB ^{4,5}	Exceedance ⁶
<i>Evening</i>							
A	13/10/2016 20:25	0.6	3.0	NA	Yes	<30	Nil
A	13/10/2016 20:40	0.6	3.0	NA	Yes	<30	Nil
B	13/10/2016 21:09	0.3	3.0	35	Yes	IA	Nil
B	13/10/2016 21:25	0.3	3.0	35	Yes	IA	Nil
C	20/10/2016 20:13	0.6	3.0	NA	Yes	35	Nil
C	20/10/2016 20:29	0.6	3.0	NA	Yes	35	Nil
D	13/10/2016 19:43	0.5	3.0	NA	Yes	IA	Nil
D	13/10/2016 19:59	0.6	3.0	NA	Yes	IA	Nil
E	20/10/2016 20:57	0.2	3.0	NA	Yes	<25	Nil
E	20/10/2016 21:12	0.2	3.0	NA	Yes	<25	Nil
F	20/10/2016 21:39	0.2	3.0	NA	Yes	<30	Nil
F	20/10/2016 21:54	0.2	3.0	NA	Yes	<30	Nil

Notes:

1. Criterion may or may not apply due to rounding of meteorological data values sourced from Airly Mine's meteorological station;
2. NA in this column indicates that this location is owned by Airly Mine and has no criterion;
3. Adopted noise criteria have been considered not to apply during the following meteorological conditions: wind speeds greater than 3 metres per second (at a height of 10 metres); or temperature inversion conditions greater than 3°C/100m;
4. Estimated or measured $L_{Aeq,15min}$ attributed to Airly Mine;
5. Bolded results in red indicate exceedance of adopted criterion; and
6. NA in exceedance column means atmospheric conditions outside conditions specified and so adopted criterion is not applicable.

Table 6.1.4: Airly Mine – 2016 Night Noise Monitoring Results

Location	Start Date and Time	Wind Speed m/s ¹	VTG °C/100m ¹	Criterion dB ²	Criterion Applies? ^{2,3}	Airly Mine $L_{Aeq,15min}$ dB ^{4,5}	Exceedance ⁶
<i>Night</i>							
A	13/10/2016 23:30	0.3	3.0	NA	Yes	NM	Nil
A	13/10/2016 23:45	0.3	3.0	NA	Yes	NM	Nil
B	13/10/2016 22:00	0.2	3.0	35	Yes	IA	Nil
B	13/10/2016 22:16	0.2	3.0	35	Yes	NM	Nil
C	20/10/2016 23:57	0.2	3.0	NA	Yes	<20	Nil
C	21/10/2016 00:12	0.2	3.0	NA	Yes	<20	Nil
D	13/10/2016 22:52	0.2	3.0	NA	Yes	IA	Nil
D	13/10/2016 23:08	0.3	3.0	NA	Yes	IA	Nil
E	20/10/2016 23:09	0.3	-1.0	NA	Yes	IA	Nil
E	20/10/2016 23:24	0.3	-1.0	NA	Yes	IA	Nil
F	20/10/2016 22:09	0.2	3.0	NA	Yes	<30	Nil
F	20/10/2016 22:24	0.2	3.0	NA	Yes	<30	Nil

Notes:

1. Criterion may or may not apply due to rounding of meteorological data values sourced from Airly Mine's meteorological station;
2. NA in this column indicates that this location is owned by Airly Mine and has no criterion;
3. Adopted noise criteria have been considered not to apply during the following meteorological conditions: wind speeds greater than 3 metres per second (at a height of 10 metres); or temperature inversion conditions greater than 3°C/100m;
4. Estimated or measured $L_{Aeq,15min}$ attributed to Airly Mine;
5. Bolded results in red indicate exceedance of adopted criterion; and
6. NA in exceedance column means atmospheric conditions outside conditions specified and so adopted criterion is not applicable.

Historic monitoring of the Airly Mine's estimated noise contribution ($L_{Aeq,15min}$) is shown in figures 6.1.1, 6.1.2 and 6.1.3.

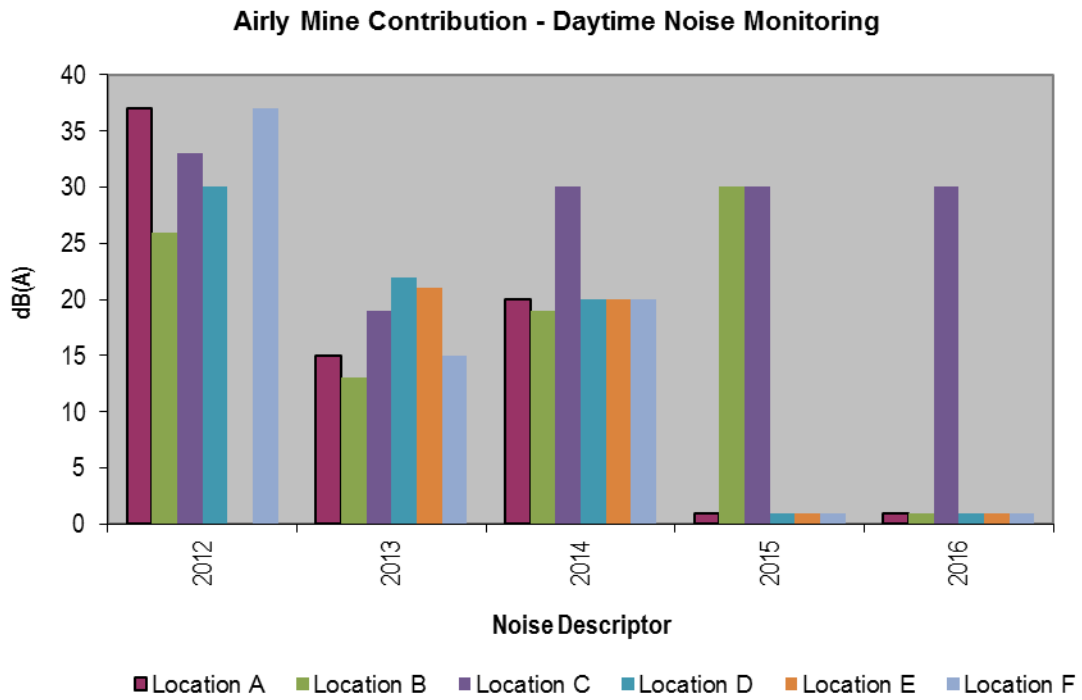


Figure 6.1.1: Airly Mine – Historic Daytime Noise Monitoring Results.

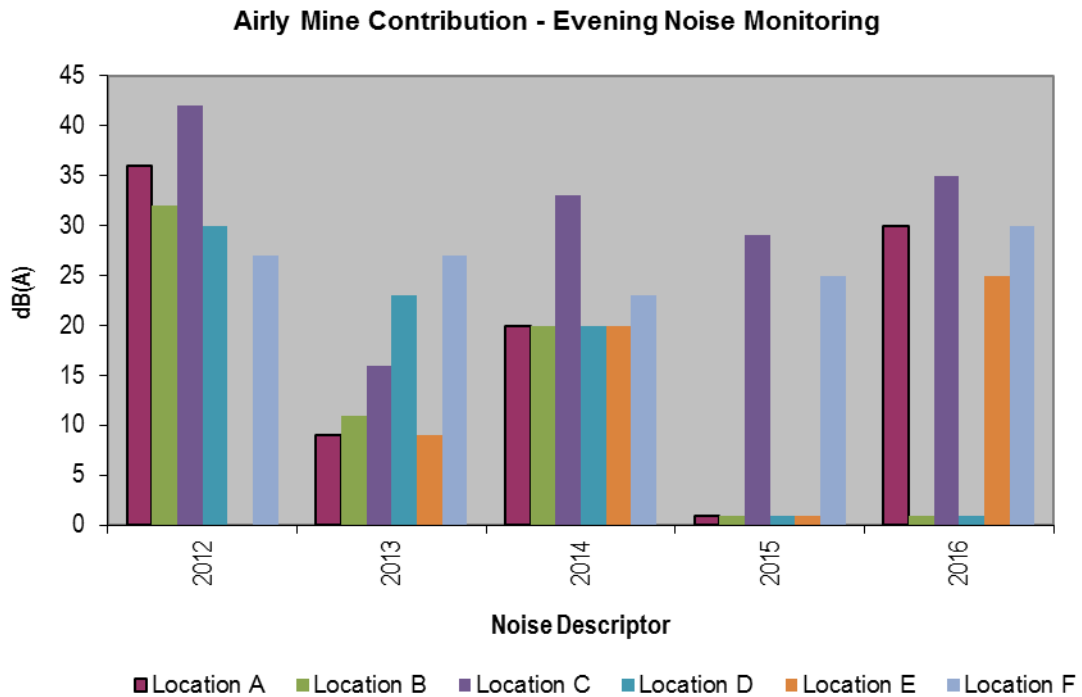


Figure 6.1.2: Airly Mine – Historic Evening Noise Monitoring Results.

Airly Mine Contribution - Night Noise Monitoring

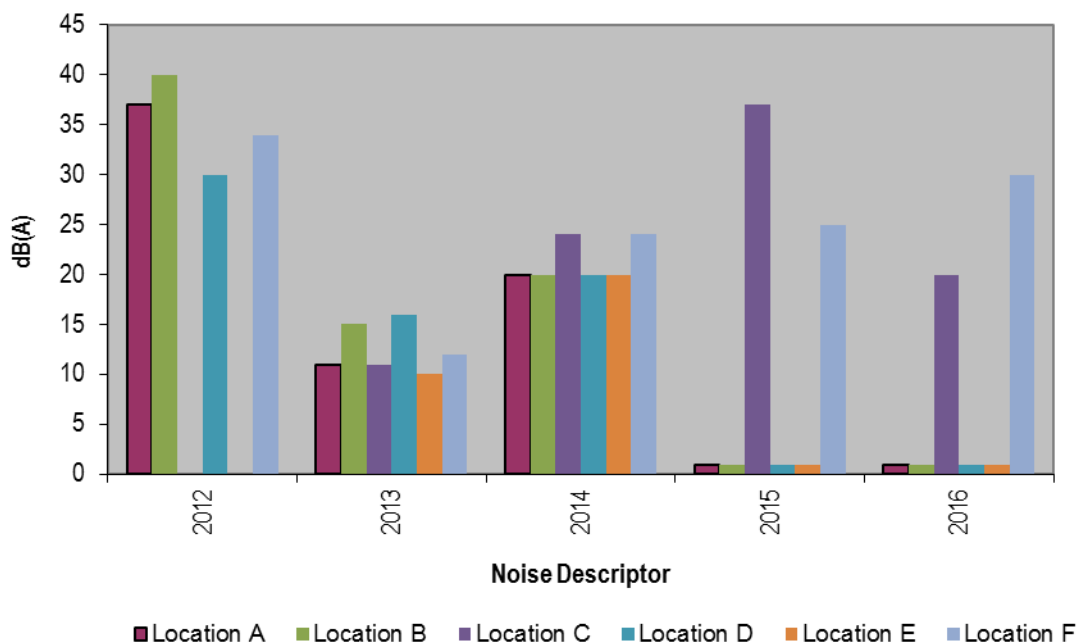


Figure 6.1.3: Airly Mine – Historic Night Noise Monitoring Results.

The above graphs shows the years succeeding 2012, have recorded lower noise monitoring results. It is difficult to draw further trends in noise monitoring data at Airly Mine due to a number of results being inaudible and detectible results being recorded at their maximum potential. For example, a recording of <30dB is graphically represented as 30dB when the actual results might be half of that recording. What is clear from the historic trends is Airly Mine is a low noise generating site. For the last 4 years have maintained compliance with the adopted criteria and for the past 2 years have recorded inaudible results at the nearest residential receiver.

Airly Mine will utilise this historic data to optimize the noise monitoring program that will be detailed in the revised 2017 Noise Management Plan.

6.2. AIR QUALITY

Depositional dust (g/m²/mth) results (insoluble solids) for 2016 are summarised below. There were no exceedances for depositional dust during the 2016 reporting period.

Table 6.2.1: Airly Mine – 2016 Depositional Dust Monitoring Results

Data Published:						Licensee:						
Data Sampled:						Address:						
Data Obtained:						EPL No.						
	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
MP3 (DM1)	2.4	1.6	0.5	0.3	0.5	0.1	0.5	0.4	0.4	0.6	1.4	1.3
MP4 (DM2)	0.4	0.9	0.4	2.7	0.2	0.2	0.2	0.3	0.1	0.6	0.6	0.9
MP5 (DM3)	1.2	1.8	1	1.3	2.9	0.3	5.2*	0.6	0.4	0.6	0.6	1.4

MP6 (DM4)	0.4	0.8	0.4	0.6	9.4*	0.2	10.6*	0.3	0.2	0.6	0.5	0.8
Annual Average Limit (4g/m ² /mth)	4	4	4	4	4	4	4	4	4	4	4	4

DM – Dust Monitoring Station

MP – Monitoring Point as identified in EPL 12374.

*Sample contaminated by external factors such as bird droppings. Sample excluded from graphs and annual average.

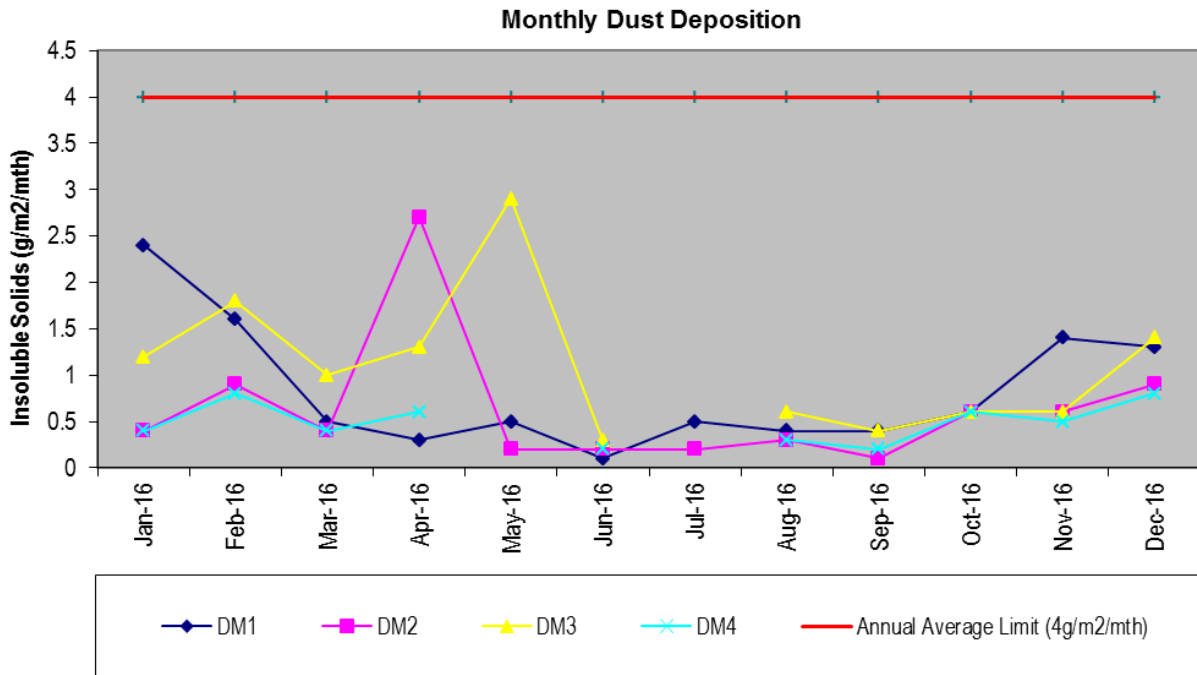


Figure 6.2.1: Airly Mine – 2016 Depositional Dust Monitoring Results

Historic trends in depositional dust data is graphically represented below in figures 6.2.2, 6.2.3, 6.2.3 and 6.2.4. There are no identifiable trends in historic data. All historic depositional dust monitoring results from 2012 to 2016 have been compliant with the annual average limit of 4g/m²/mth.

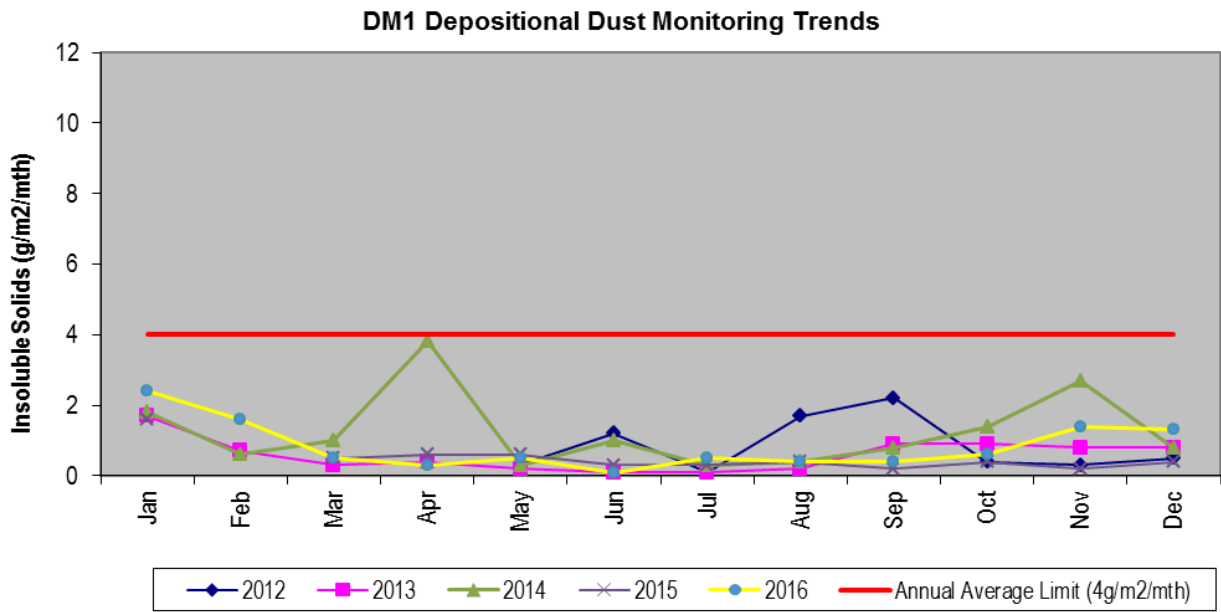


Figure 6.2.2: Airly Mine – Historic Trends in Depositional Dust – DM1

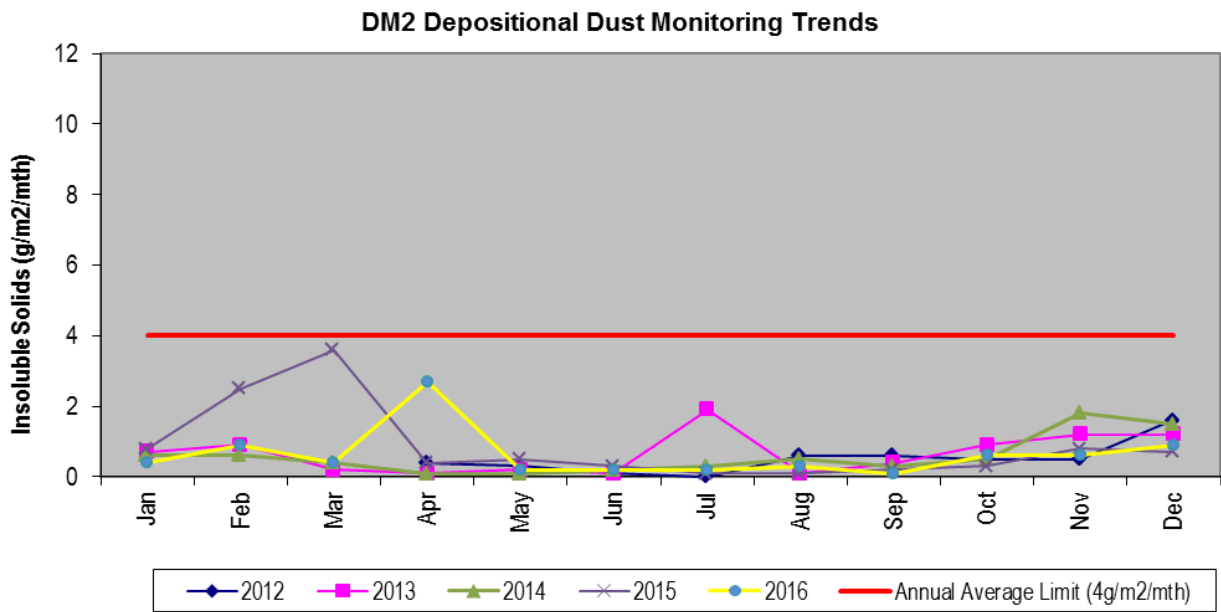


Figure 6.2.3: Airly Mine – Historic Trends in Depositional Dust – DM2

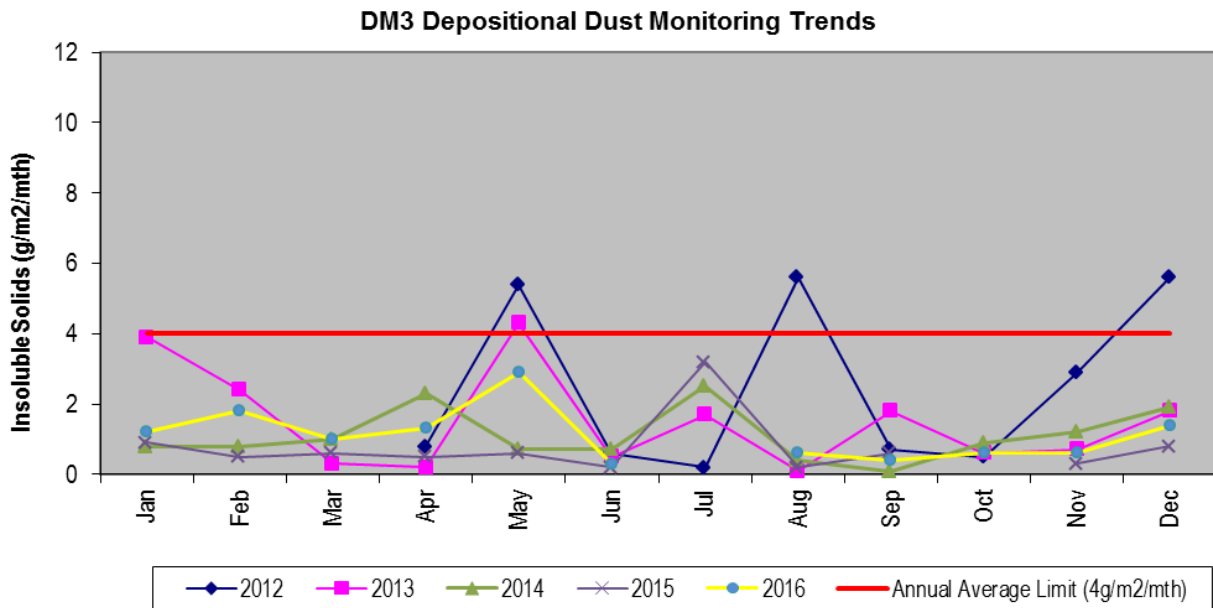


Figure 6.2.4: Airly Mine – Historic Trends in Depositional Dust – DM3

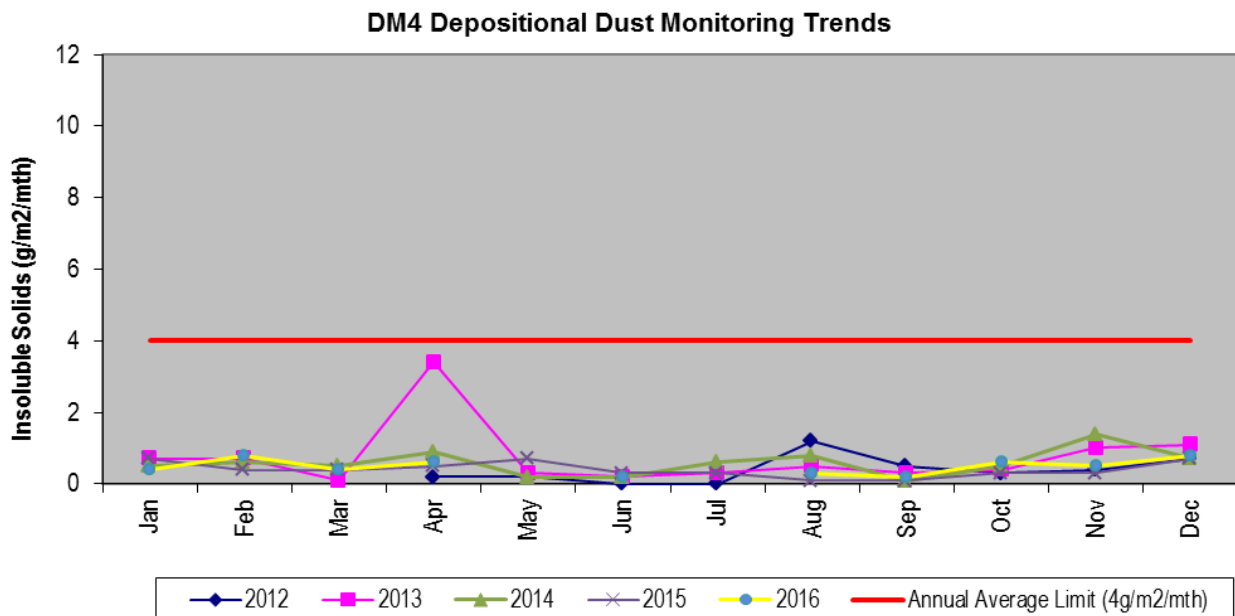


Figure 6.2.4: Airly Mine – Historic Trends in Depositional Dust – DM4

6.3 BIODIVERSITY

Airly’s licence to operate requires baseline fauna and flora data, as well as long-term monitoring. Ongoing seasonal monitoring has been conducted since 2012 in order to examine the potential effects, if any, of underground mining on threatened species

and communities of flora and fauna that are present onsite. Monitoring methodology has been refined and adjusted to specifically target threatened species, populations and communities and to identify potential changes to these overtime as a result of mining activities on site. Flora monitoring locations are shown in Figure 6.3.1; and fauna monitoring locations shown in Figure 6.3.2.

Airly flora surveys include:

- Point transects and density quadrats for *Prostanthera stricta*;
- Point transects for *Eucalyptus cannonii* to measure condition, crown extent, growth changes and associated species in relation to prior monitoring;
- Targeted surveys throughout the Airly Mining Lease Boundary to determine the presence of undetected individual *E. cannonii*; and
- 50 x 20m quadrats to measure vegetation health within Capertee Rough-barked Apple – Redgum – Yellow Box Grassy Woodland (MU20).

Airly fauna surveys include:

- Micro-bat monitoring at Torbane adits using harp traps and echolocation recording apparatus;
- Habitat area assessments for the Glossy-Black Cockatoo (*Calyptorhynchus lathami*);
- Call Playback for forest owls in addition to visiting known roosts to assess owl activity;
- Bird censuses in suitable habitat for a range of threatened bird species known to occur across the site and in the local area; and
- Remote cameras to target Rosenberg's Monitor, Broad-headed Snake and Spotted-tailed Quoll in suitable habitats.

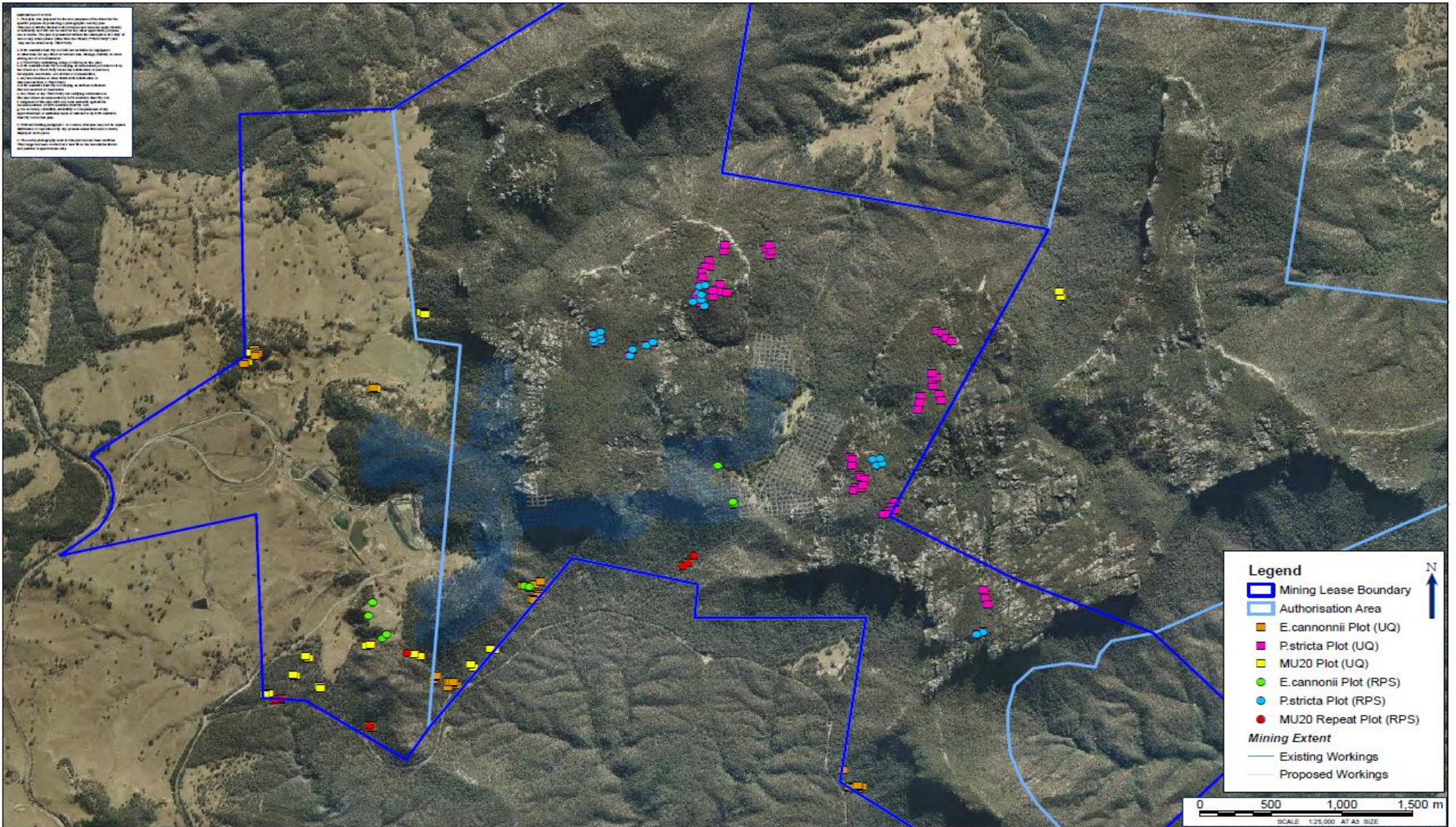
The following key results were obtained from the 2015/16 monitoring activities:

- Capertee Rough-Barked Apple – Redgum – Yellow Bow Grassy Woodland (MU20): Flora quadrats revealed species diversities and cover abundance that indicated good health within each monitoring location. This suggests that there have been no definable adverse impacts to MU20 health as a result of the current mining practices.
- Capertee Stringybark (*Eucalyptus cannonii*): Two existing *Eucalyptus cannonii* monitoring points were re-visited in 2015 and seven new monitoring locations were established. The observed condition scores of *Eucalyptus cannonii* individuals monitored indicated that there was no condition decline evident as a result of mining.
- Mount Vincent Mintbush (*Prostanthera stricta*): Nine existing *Prostanthera stricta* plots were revisited during 2015 surveys and two new plots were established. No observable decline in population condition was perceived during monitoring.
- Glossy Black Cockatoo: Glossy Black Cockatoos were recorded a number of times throughout annual monitoring showing a continued presence within the Airly mining lease boundary.
- Sooty and Powerful Owl: Two Sooty Owls were heard calling at the base of

Mt. Airly following call-playback showing a continued presence within the Airly mining lease boundary.

- Cave Dwelling Microbats: All three target microbat species (Eastern Bentwing-bat, *Eastern Horseshoe bat* and *Large-eared Pied Pat*) were detected during surveys in autumn, spring and summer.
- Bird Census: Seven diurnal birds species listed as threatened under the TSC Act were recorded during annual monitoring. Diurnal bird species richness was comparable to previous annual monitoring.
- Targeted threatened fauna search: The Rosenberg Monitor was observed opportunistically in two locations and once via camera trapping. Neither Spotted-tailed Quolls, now Broad-headed Snakes were identified within the site during 2015 surveys.
- Three different species of threated fauna were specifically targeted with camera traps. These included Rosenberg's Goannas (*Varanus rosenbergi*), Spotted-tailed quoll's (*Dasyurus maculates*) and Broad-headed snakes (*Hoplocephalus bungaroides*).
- Rosenberg's Goannas (*Varanus rosenbergi*) were identified on site via opportunistic observations and camera trapping.

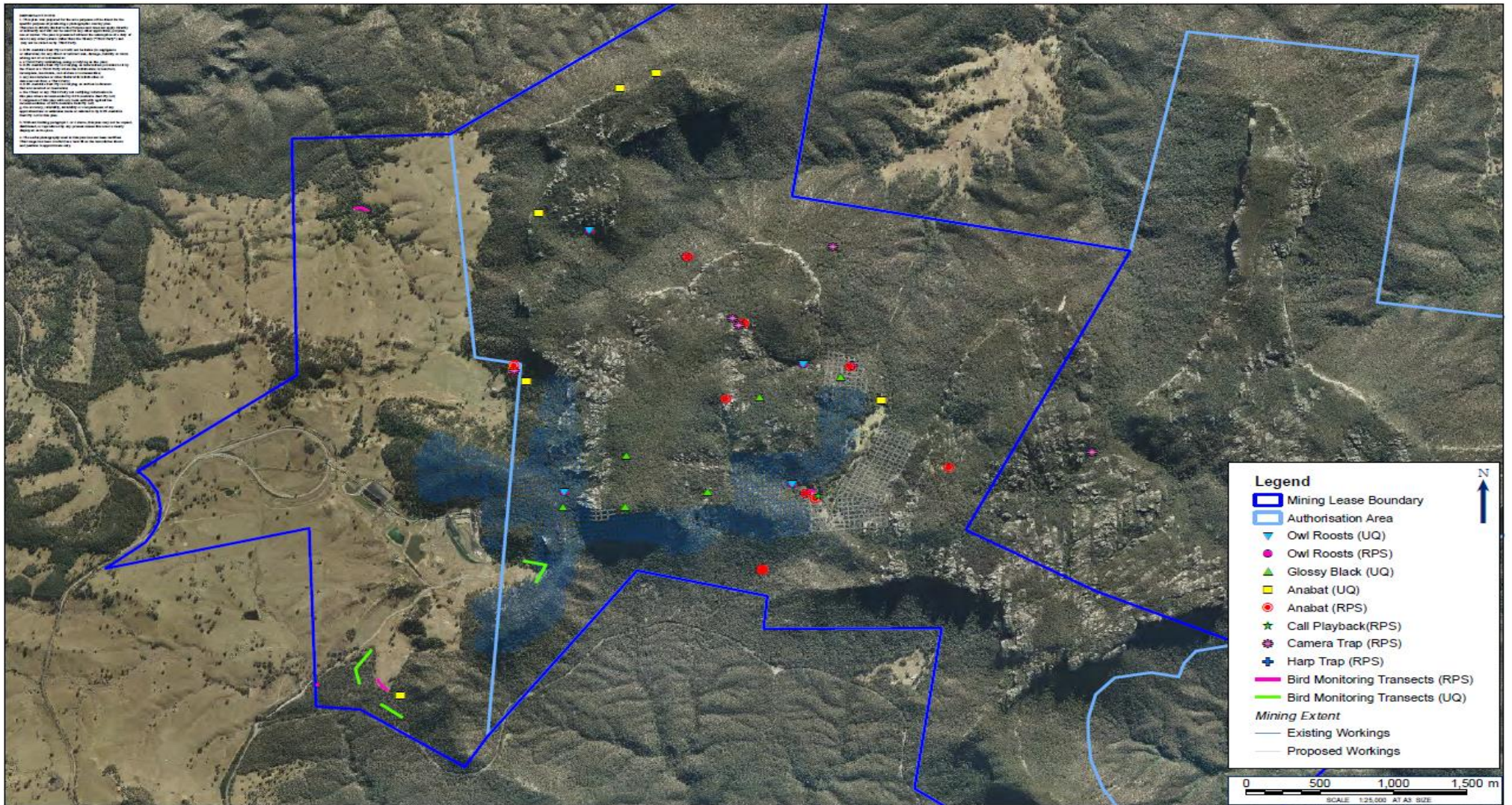
Flora monitoring during the 2015/16 period revealed that most sites exhibited target species and communities which were deemed to be in good health, indicating that there were no definable adverse impacts to flora health as a result of the current mining practices. Similarly, fauna monitoring results indicated that the target species continue to persist in the area at comparable activity rates.



TITLE : FIGURE 2: FLORA MONITORING | LOCATION : AIRLY NSW | DATUM:GDA 1994 | DATE : 5/09/2016 | VERSION (PLAN BY): A.A3 (amy.obrien)
 PROJECTION: GDA 1994 MGA Zone 56 | PURPOSE: ECOLOGY | PATH: \\rps01\data\UOB\5\Cartesian\A\Job\1127652 Airly Seasonal Eco Monitoring\10 - Drafting\Angle Map Documents\Cov\1127652 Flora Monitoring @ 20160715.mxd

CLIENT: [REDACTED] | RPS AUSTRALIA EAST PTY LTD (ABN 44 140 202 782) | creative people making a difference | RPS
 JOB REF: PR127652 | 241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303 | T: 02 4640 4200 F: 02 4981 6794 www.rpsgroup.com.au

Figure 6.3.1 Airly Mine – Flora Monitoring Locations



TITLE : FIGURE 3:FAUNA MONITORING LOCATIONS	LOCATION : AIRLY NSW	DATUM:GDA 1994	DATE : 5/09/2016	VERSION (PLAN BY): A.A3 (amy.obrien)
		PROJECTION: GDA 1994 MGA Zone 56	PURPOSE: ECOLOGY	PATH: \\rps2\hda\UOB\Central\All Jobs\127852 Airly Seasonal Eco Monitoring\10 - Drafting\Aerial Map Documents\Eco\127852 Fauna Monitoring 20160715.mxd

CLIENT: [REDACTED] RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
 JOB REF: PR127652 241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
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Figure 6.3.2 Airly Mine – Fauna Monitoring Locations

6.4 HERITAGE

A Western Region Aboriginal Cultural Heritage Sub-Committee was established in 2015. Meetings with the committee members are conducted biannually. The meeting invitees include registered Aboriginal Groups, the Office of Environment and Heritage and Centennial representatives.

Airly Mine participated in two meetings with Aboriginal Groups during May and October 2016 and provided updates on site activities in relation to registered aboriginal sites. Discussions during 2016 included Aboriginal Groups involvement in due diligence surveys and discussions regarding site specific activities.

Figure 6.4.1 shows the registered Aboriginal sites in relation to underground workings completed to date, workings completed during 2016 and forecast underground workings for the 2017 reporting period. No Aboriginal sites were undermined during 2016. No Aboriginal sites were impacted during 2016. Additionally, Airly Mine has completed fencing works around a number of cultural heritage sites to help mitigate against potential disturbance.

During the next reporting period, one site (45-1-2748) is scheduled to be undermined. No impacts are predicted to occur to this site and pre and post mining inspections of the site will be conducted in accordance with the Western Region Aboriginal Cultural Heritage Management Plan.

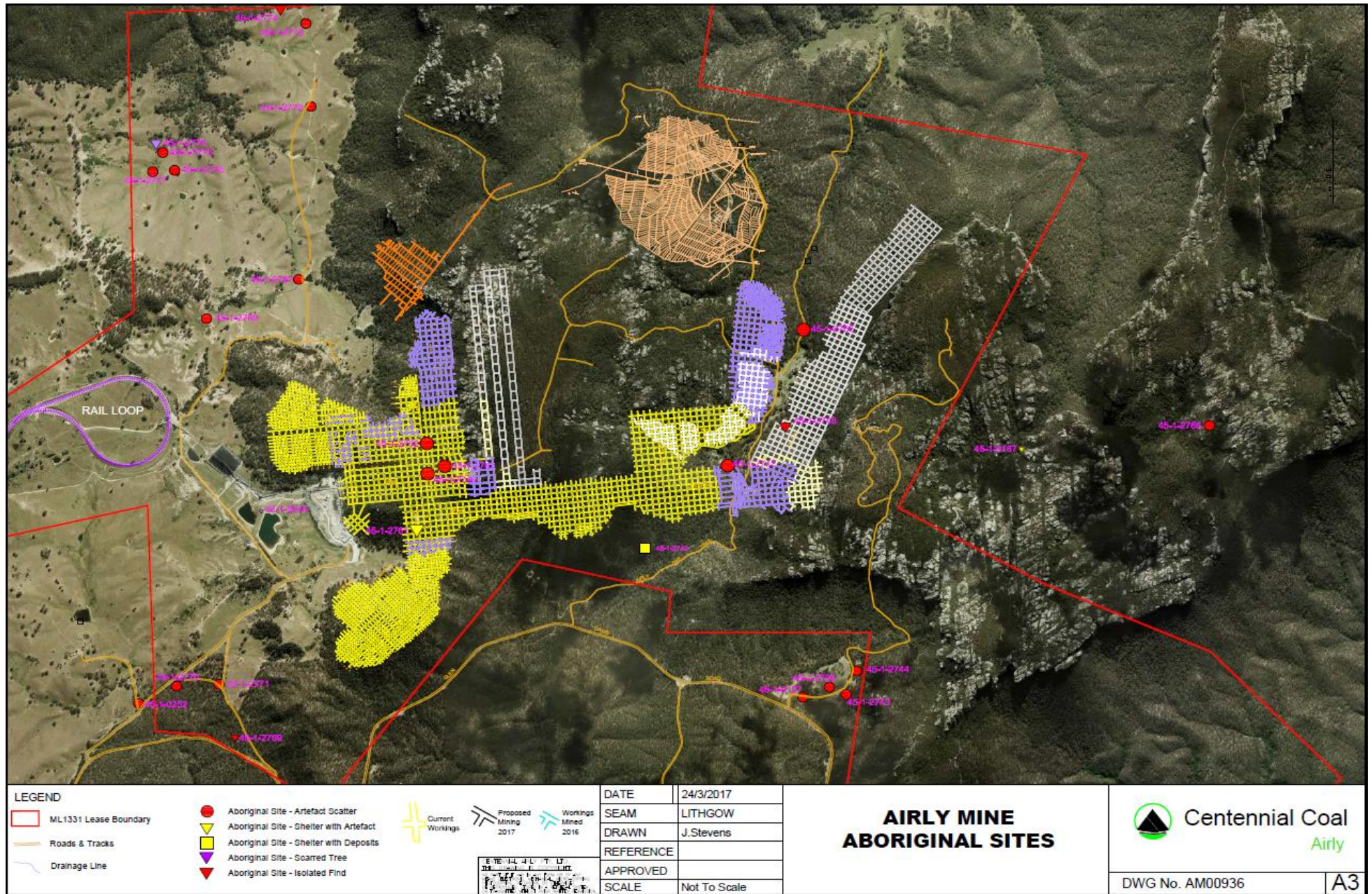


Figure 6.4.1 Airly Mine Registered Cultural Heritage Sites

7 WATER MANAGEMENT

It is important to note that Table 7 reports on the WATER YEAR which is from 1 July to 30 June, not the calendar year.

Table 7: Water Take

License #	Water Sharing Plan, source and management zone (as applicable)	Entitlement	Passive take inflows	Active pumping	TOTAL
WAL36565	Greater Metropolitan Region. Sydney Basin North.	120units	0	0	0
WAL 24386	Greater Metropolitan Region. Sydney Basin North.	158units	0	4.126	4.126

Volume is reported in annual megalitres (ML)

7.1 Airly Mine Water Courses:

Airly Mine lies within the Capertee River catchment, which is part of the Greater Hawkesbury/Nepean catchment. The following four major creek systems are located within the ML1331 and A232 areas, as shown in Figure 7.1.1:

- Torbane-Oaky Creek.
- Airly Creek.
- Emu Swamp Creek.
- Gap-Genowlan Creek.

The north-west section of ML1331 is drained by the Torbane-Oaky Creek system. Torbane Creek joins Oaky Creek approximately 2 km downstream of the ML1331 boundary. Approximately 518 ha of the Torbane Creek catchment and 71 ha of the upper Oaky Creek catchment lay inside the ML1331 area.

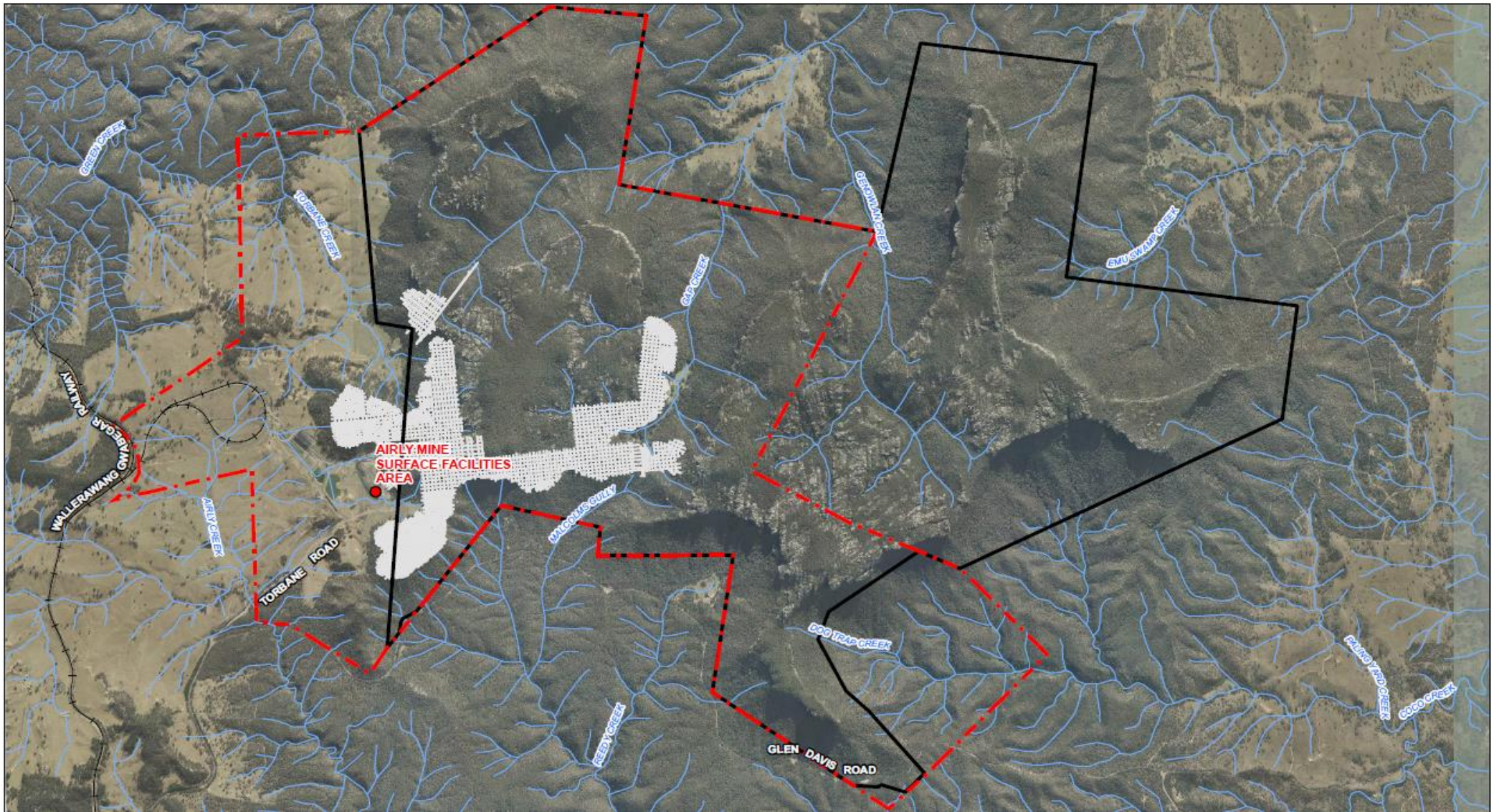
The Airly Creek system drains the southern sector of ML1331 and joins the Capertee River within the Gardens of Stone National Park approximately 17 km north-east of the surface facilities area at Airly Mine. Approximately 1,400 ha of the ML1331 area drain into Airly-Coco Creek.

Centennial Airly is currently licensed under Environmental Protection Licence (EPL) 12374 to discharge water to Airly Creek. Based on water quality sampling data, Airly Creek is generally brackish, extremely hard and slightly alkaline in the vicinity of the Airly Mine surface facilities area. The water quality of Airly Creek is closely related to the natural geology of the catchment and it is the same water type (magnesium/calcium sulfate) as the underlying Shoalhaven Group aquifer (represented by site 'Production Bore' water quality data).

Surface flows from a small area of the north-east of A232 flow eastwards via a series of drainage lines into Emu Swamp Creek, which drains into the Capertee River approximately 10 km downstream of the A232 boundary. Approximately 355 ha of the A232 area drain into Emu Swamp Creek catchment.

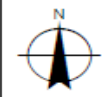
Surface runoff from the northern sections of ML1331 and A232 drains into Gap Creek and Genowlan Creek. The two creeks drain northward approximately 2 km before converging into the greater Genowlan Creek. Genowlan Creek continues to drain in a north-east direction until its confluence with the Capertee River approximately 8 km downstream. The Gap-Genowlan Creek sub-catchment occupies the largest portion of the ML1331 and A232 area, with 1,558 ha draining to the creek system. Based on water quality sampling data, these creeks are generally fresh and slightly acidic.

All of the watercourses draining the ML1331 and A232 areas are ephemeral. Generally, these watercourses flow for relatively brief periods following significant rainfall events. Flows within Airly Creek, Oaky Creek, Coco Creek and Genowlan Creek become continual outside the ML1331 and A232 boundaries.



Paper Size A4
 0 375 750 1,125 1,500
 Metres

Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 MGA Zone 56



LEGEND

- Airly Surface Facilities Area
- - - Mining Lease ML1331
- Authorisation A232

- Existing workings
- ~ ~ ~ Waterway
- +— Railway



Centennial
Airly

Airly Mine
Water Management Plan

Watercourses at Airly Mine

Figure 7.1.1 Airly Mine Watercourses

7.2 Rainfall:

Airly Mine has a site-based meteorological station which was established in April 2010. Rainfall and temperature data for 2016 is shown in Figure 7.2.1 below.

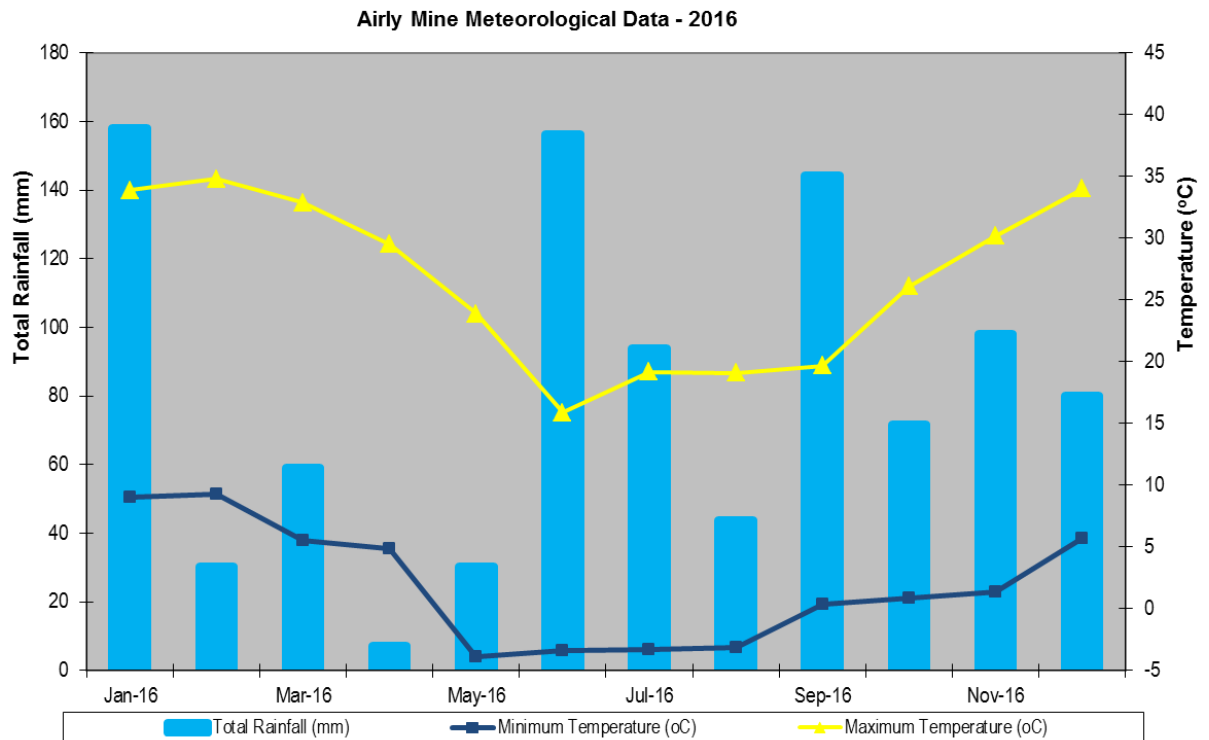


Figure 7.2.1 Airly Mine 2016 Meteorological Data

Historic and trended rainfall data has been obtained from the BOM Ilford (Warrangunyah) weather station, which is located approximately 29km north-west of Airly Mine. The period of rainfall data extends from January 1901 to December 2016 and is summarised as annual totals in Figure 7.2.2.

The statistics for this rainfall dataset are:

- Minimum annual rainfall – 277mm (1982)
- Average annual rainfall – 675mm
- Maximum annual rainfall – 1,513mm (1950)

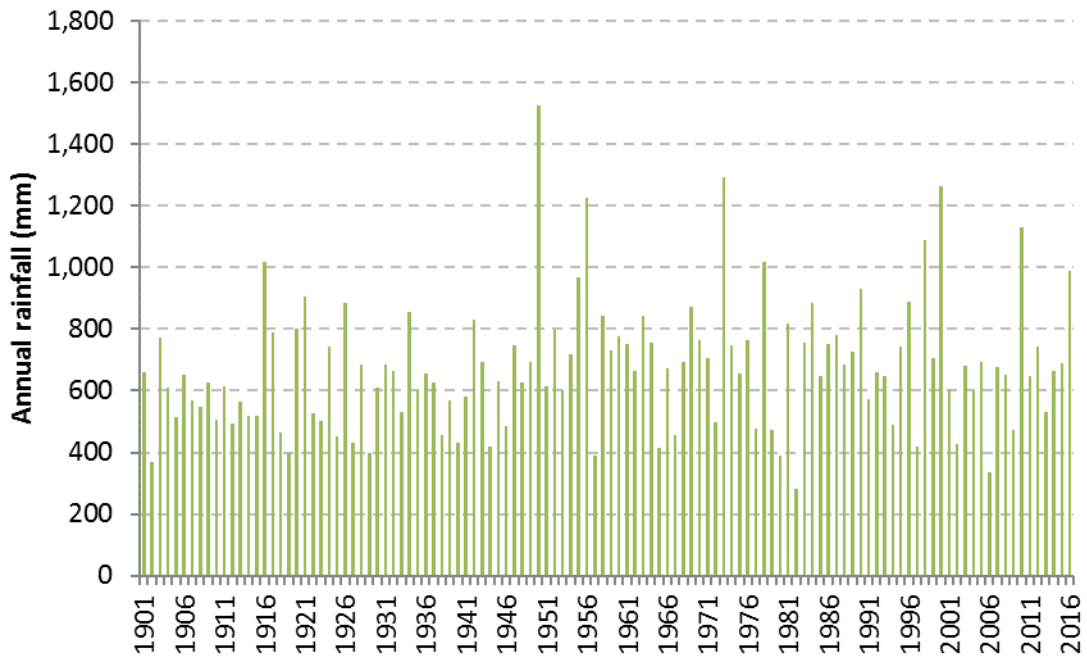


Figure 7.2.2 Annual rainfall recorded at Illford (Warrangunyah) Weather Station

7.3 Airly Mine Water Management Compliance:

There were no discharges from any licenced discharge point at Airly Mine during the 2016 reporting period. Below is a summary of the monitoring results as seen in the 2016 Annual Return.

Airly’s surface layout and water management structures are shown in Figure 7.3.3.

Table 7.3.1: LDP1 – 2016 Summary of monitoring results (No Discharges)

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Conductivity	microsiemens per centimetre	0	0	N/A	N/A	N/A
Oil and Grease	milligrams per litre	0	0	N/A	N/A	N/A
pH	pH	0	0	N/A	N/A	N/A
Total suspended solids	milligrams per litre	0	0	N/A	N/A	N/A

Table 7.3.2: LDP2 – 2016 Summary of monitoring results (No Discharges)

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Conductivity	microsiemens per centimetre	0	0	N/A	N/A	N/A
Oil and Grease	milligrams per litre	0	0	N/A	N/A	N/A
pH	pH	0	0	N/A	N/A	N/A
Total suspended solids	milligrams per litre	0	0	N/A	N/A	N/A

Table 7.3.3: LDP3 – 2016 Summary of monitoring results (No Discharges)

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Conductivity	microsiemens per centimetre	0	0	N/A	N/A	N/A
Oil and Grease	milligrams per litre	0	0	N/A	N/A	N/A
pH	pH	0	0	N/A	N/A	N/A
Total suspended solids	milligrams per litre	0	0	N/A	N/A	N/A

Historic water discharges from Airly Mine have been summarised in Figure 7.3.1, there has been three (3) discharges from LDP1 and four (4) discharges from LDP3 from 2012 to 2014. Corresponding water discharge volumes can be seen within Figure 7.3.2. There were no discharges from any licenced discharge point during the 2015 or 2016 reporting period.

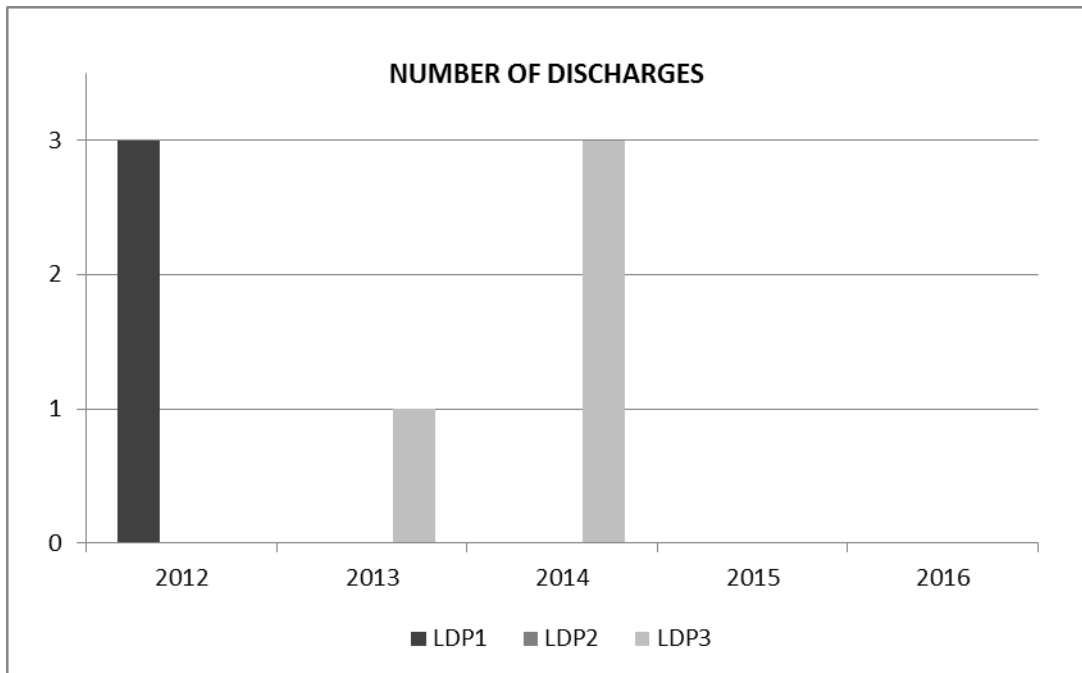


Figure 7.3.1 Airly Mine – Historic Discharges

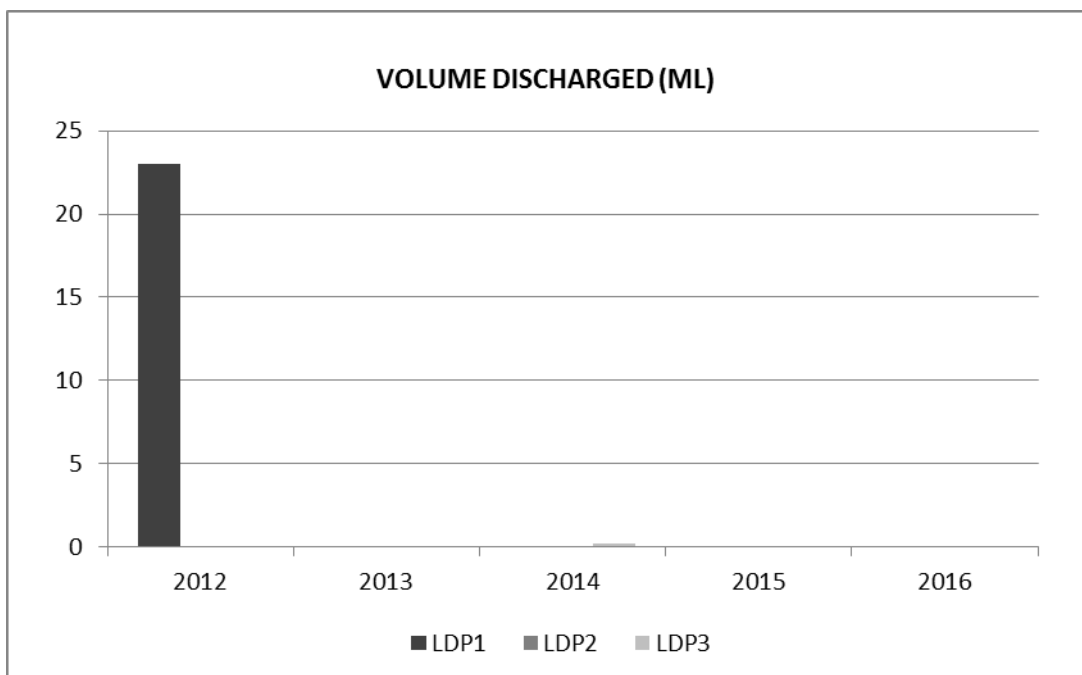
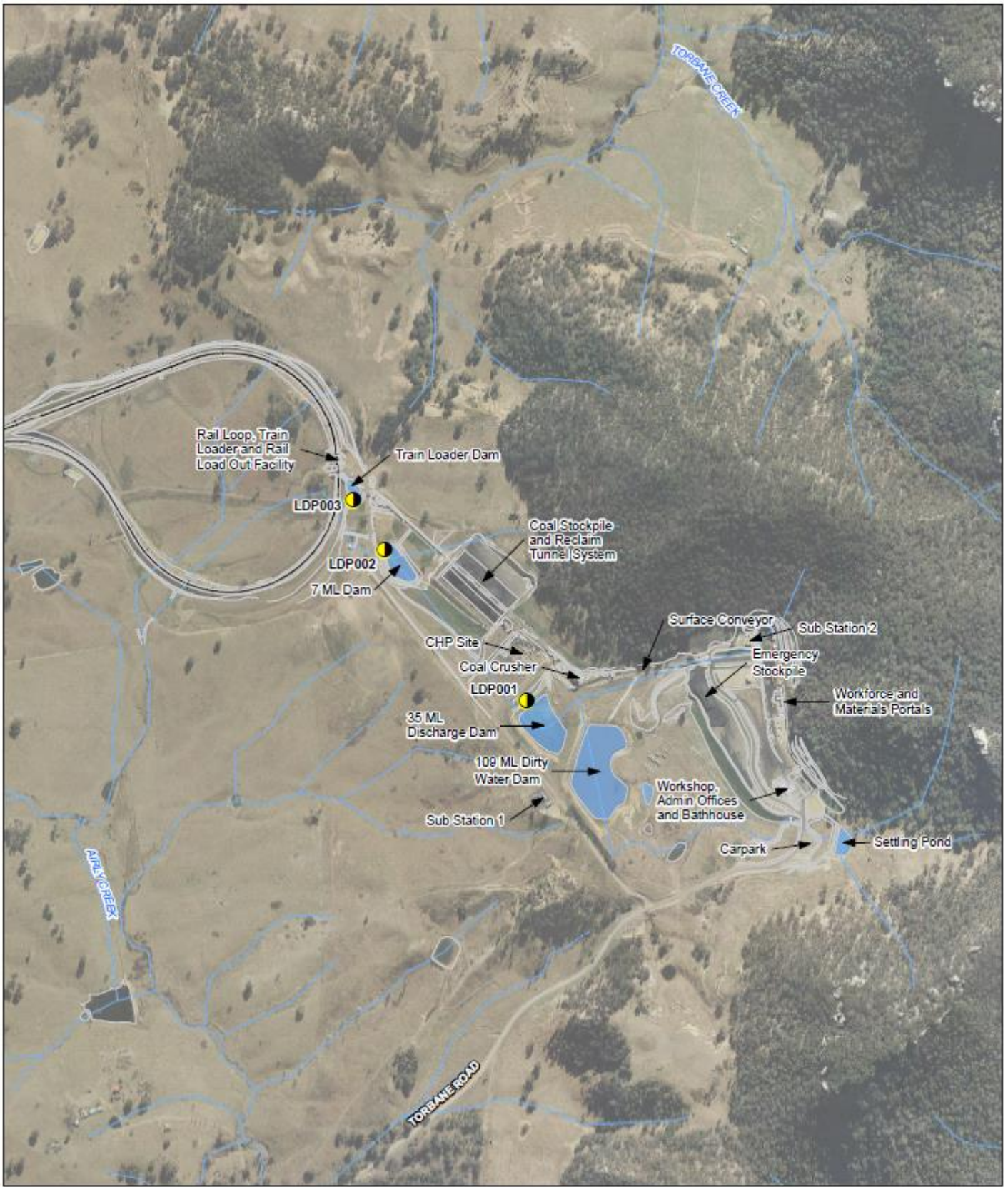


Figure 7.3.2 Airly Mine – Historic Discharges – Volume (ML)



LEGEND






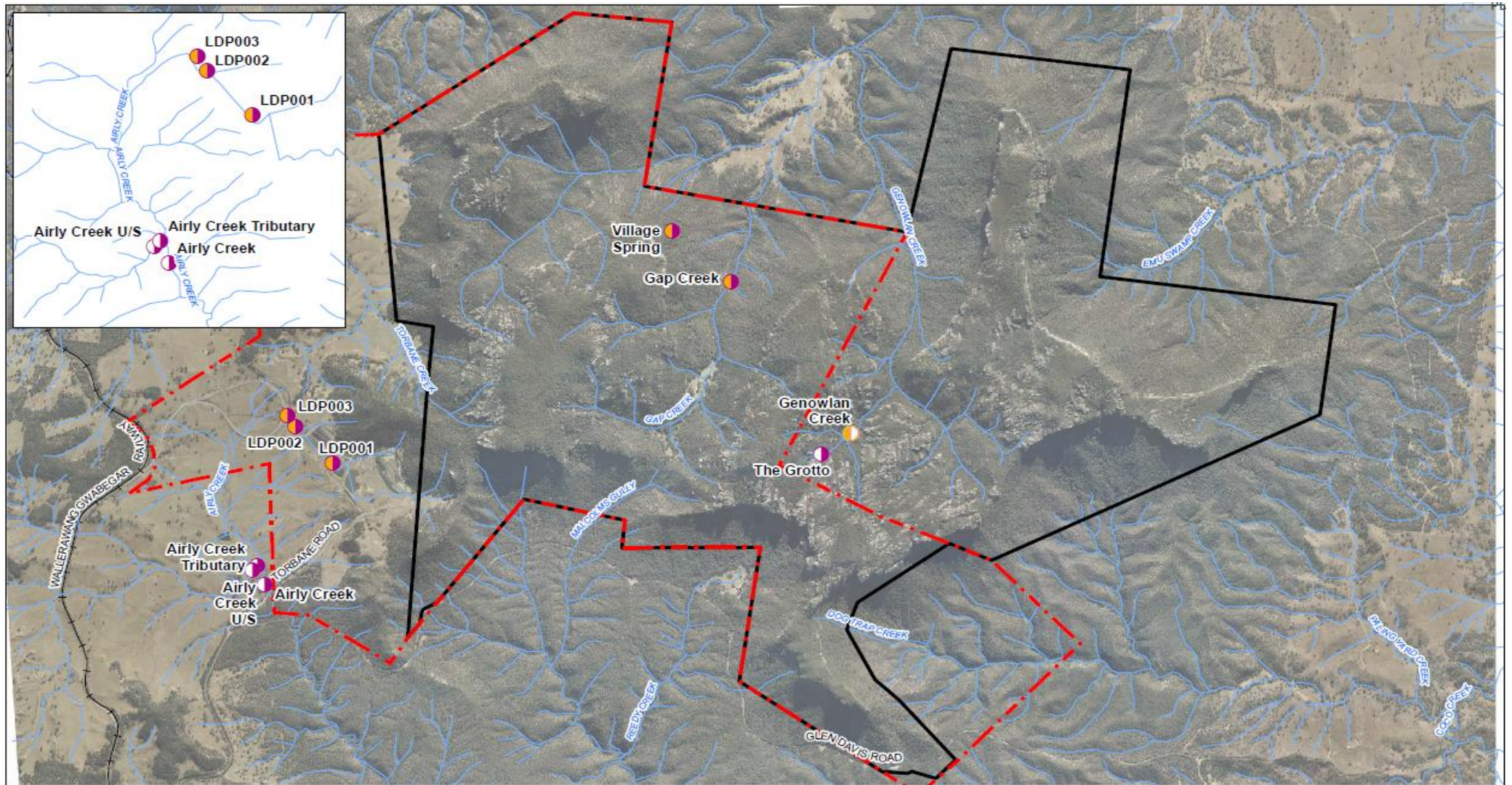
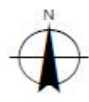
-  Licensed discharge point
-  Rail loop
-  Infrastructure
-  Pollution control structure
-  Waterway

Figure 7.3.3 Airly Mine Surface Features & Water Management Structures



Paper Size A4
 0 165330 660 990 1,320
 Metres
 Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 MGA Zone 56



LEGEND

- Mining Lease ML1331
- Authorisation A232
- Waterway
- Existing railway
- Flow monitoring
- Flow and water quality monitoring
- Water quality monitoring



Airly Mine
 Annual Surface Water and Groundwater
 Monitoring Report 2016

Job Number	22-18481
Revision	A
Date	24 Mar 2017

Surface water monitoring
 locations

Figure 7-1

Figure 7.3.4: Airly Mine Surface Water Monitoring Locations

7.4 Airly Mine Pit Top Runoff Surface Water Quality:

There were no discharges from any licenced discharge point at Airly Mine during the 2016 reporting period. However, in accordance with the Water Management Plan, monthly water monitoring continued regardless.

Water from LDP2 and LDP3 is pumped to the 35 Discharge Dam as required. The water within the 35ML Discharge Dam then serves as production water and utilized by site surface and mining operations. All water runoff from Airly's pit top surface disturbance footprint and infrastructure areas report to the 35ML Discharge Dam. Therefore the below water quality data is representative of Airly's pit top 'dirty water' runoff. There were no water quality exceedances of EPL12374 during 2016.

A graphical summary of the historic trends of monitoring results from 2012 to 2016 from the 35ML 'Discharge Dam' (LDP1) is shown in Figures 7.4.1 – 7.4.5. Additional water quality results are available in Appendix A.

The time series plots shown below and in Appendix A indicate that surface water quality recorded in 2016 is similar to pre-2016 surface water quality. Therefore, there has been no observable impact on surface water quality in 2016 attributable to mining operations.

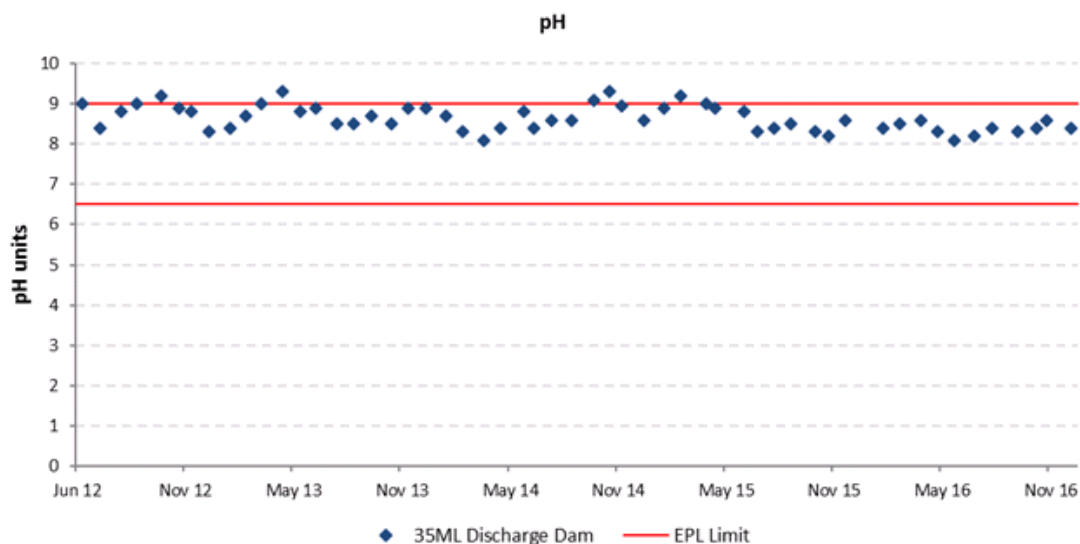


Figure 7.4.1: Airly Mine – 35ML Discharge Dam (Production Dam) – pH

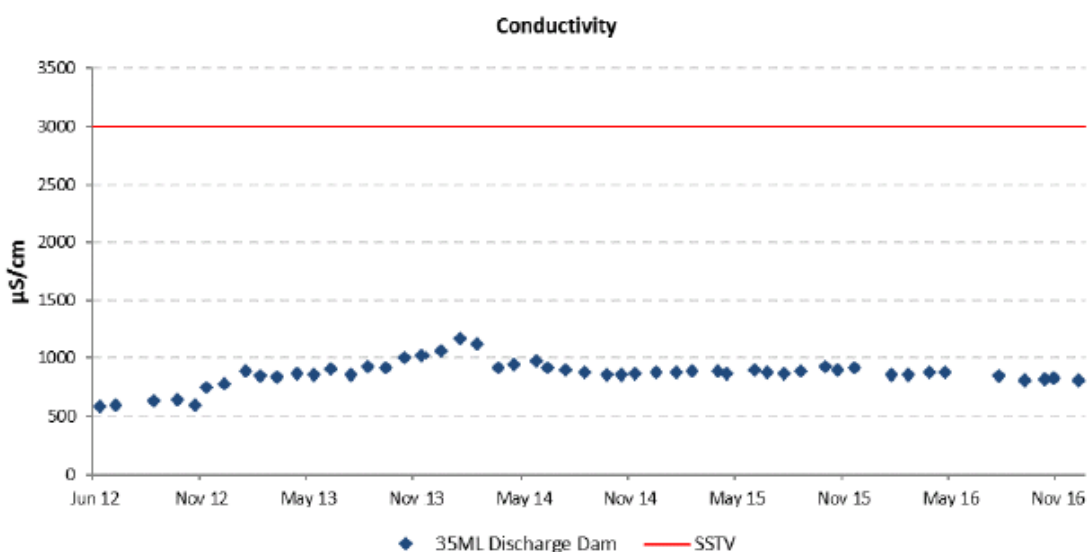


Figure 7.4.2: Airly Mine – 35ML Discharge Dam (Production Dam) – EC

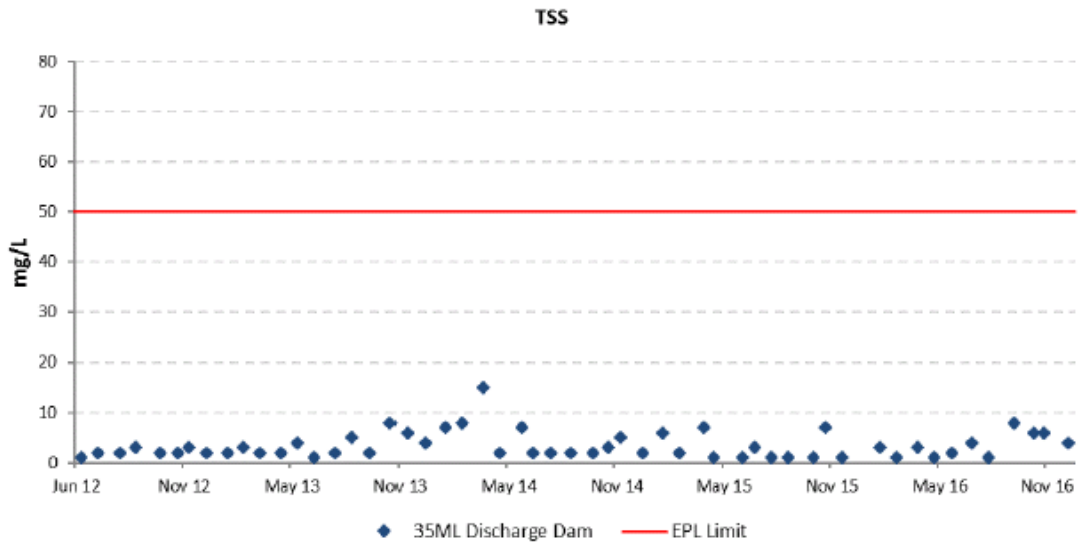


Figure 7.4.3: Airly Mine – 35ML Discharge Dam (Production Dam) – TSS

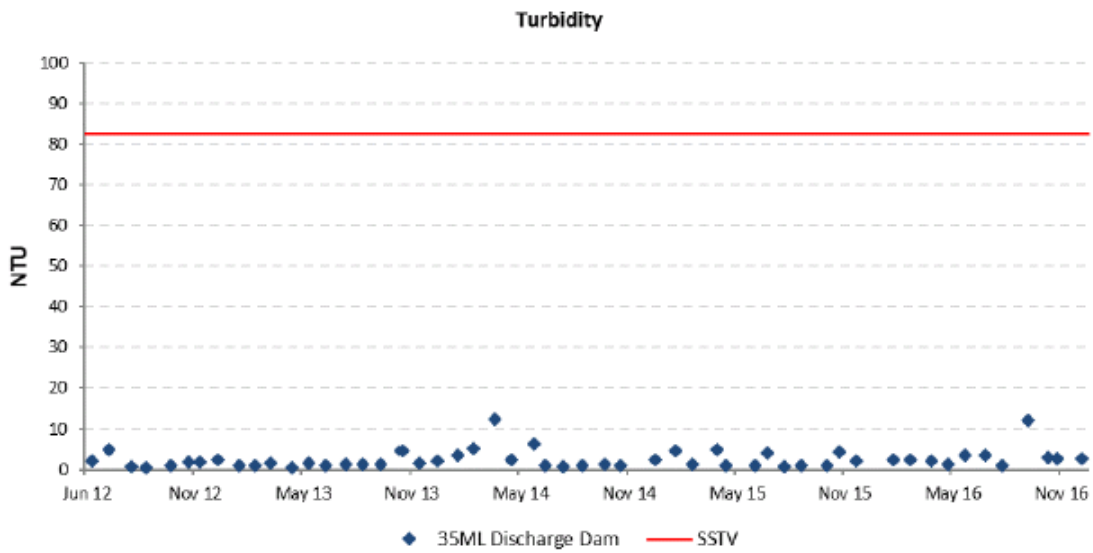


Figure 7.4.4: Airly Mine – 35ML Discharge Dam (Production Dam) – Turbidity

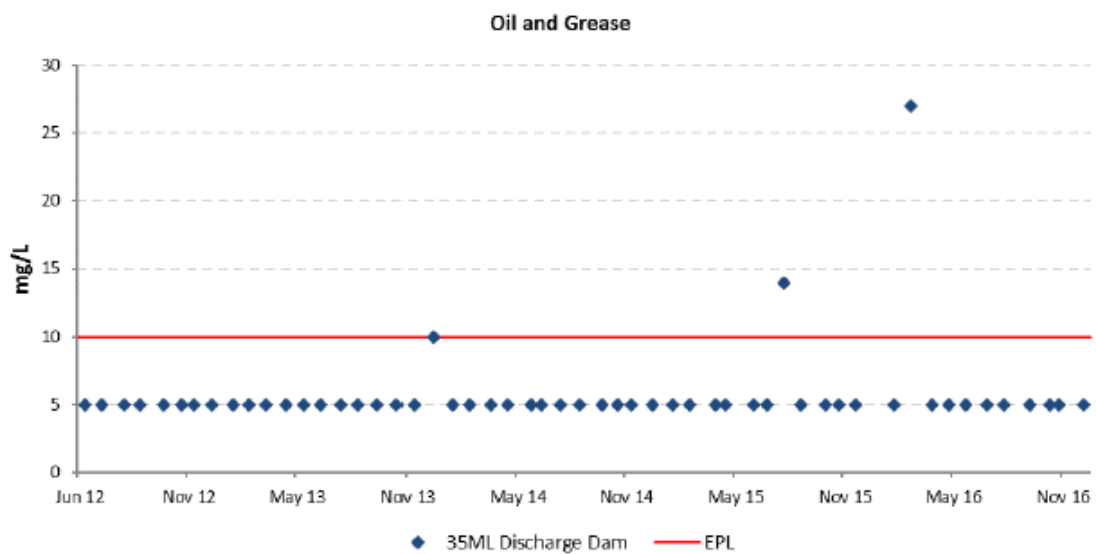


Figure 7.4.5: Airly Mine – 35ML Discharge Dam (Production Dam) – Oil & Grease

7.5 Surface Water Quality Results from: Airly Creek, Airly Creek Upstream, Airly Tributary, The Grotto and Gap Creek:

Airly Mine conducts monthly surface water monitoring. The majority of the water systems surrounding Airly Mine are ephemeral. Therefore some water data is missing as there was often no water available to sample. Figures 7.5.1 to 7.5.4 shows historic trends in basic water quality parameters from 2010 to 2016 from named water courses within the project area. Additional water quality results are available in Appendix B.

Airly Mine did not discharge any water from site during the 2016 reporting period.

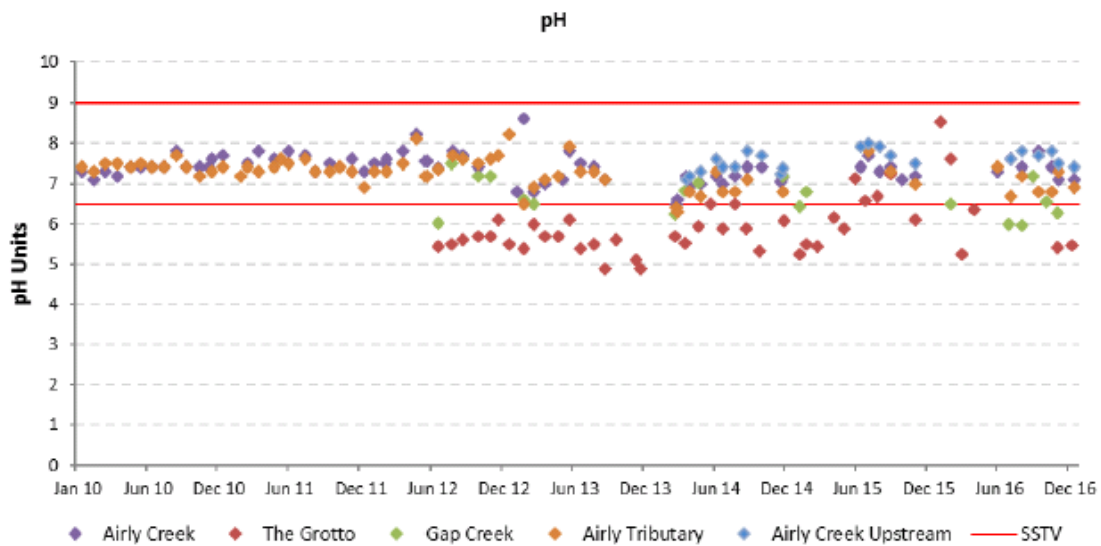


Figure 7.5.1: Airly Mine – Surface Water – pH

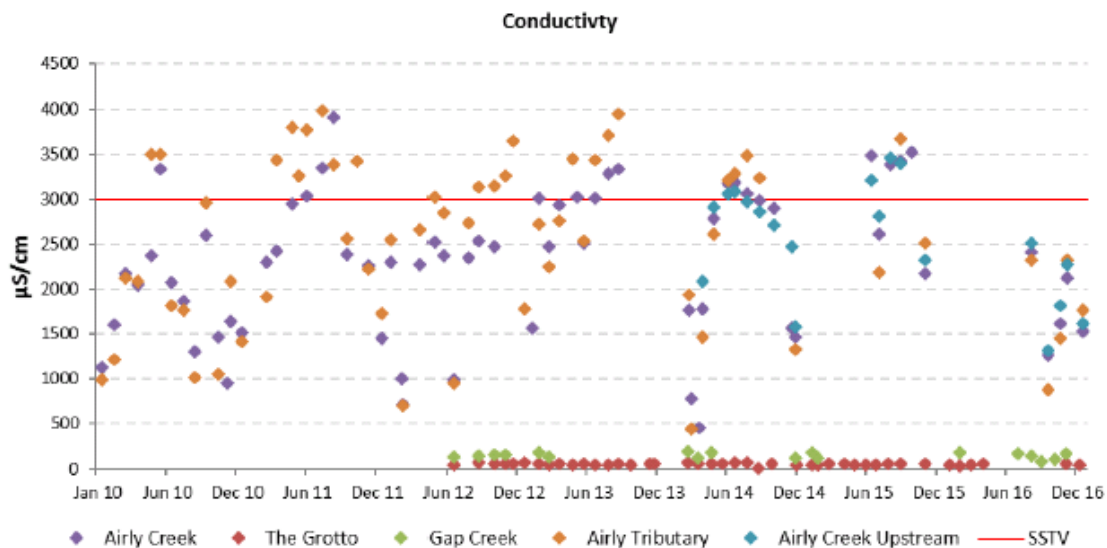


Figure 7.5.2: Airly Mine – Surface Water – EC

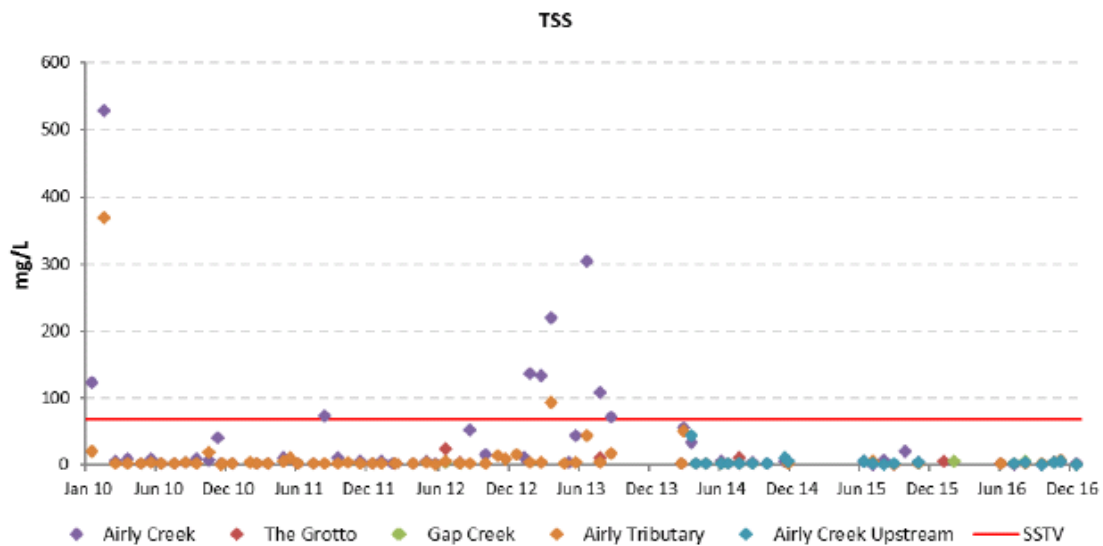


Figure 7.5.3: Airly Mine – Surface Water – TSS

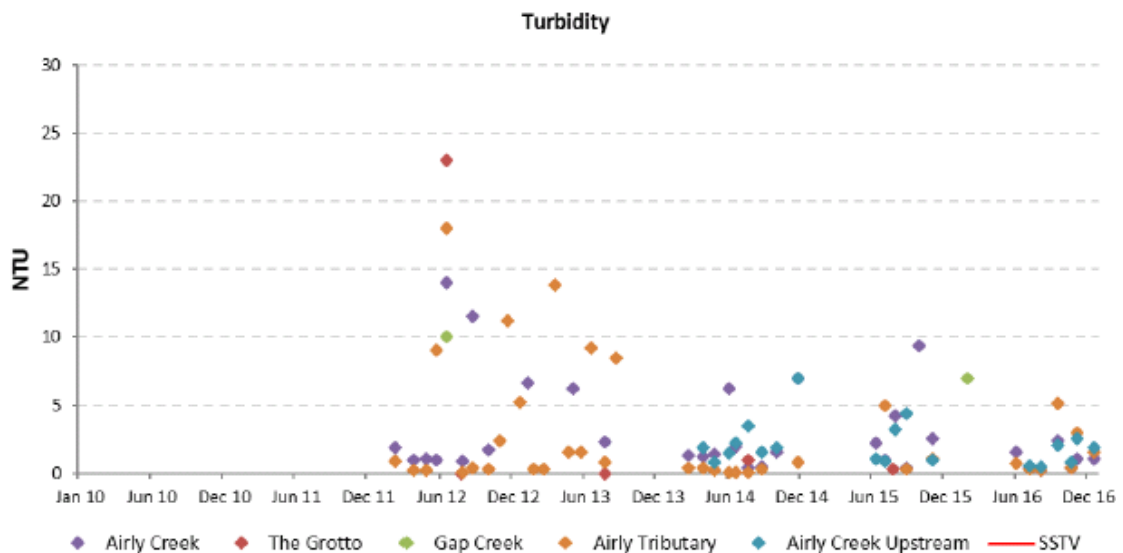


Figure 7.5.4: Airly Mine – Surface Water – Turbidity

7.6 Groundwater Hydrology

The local groundwater sources within ML1331 and A232 are generally low yielding and predominantly within the Quaternary alluvium, weathered and/or fractured sandstone and coal seams that occur within Mount Airly and Genowlan Mountain. They are classified as ‘less productive’ in accordance with the criteria specified in the NSW Aquifer Interference Policy (i.e. the yield is typically less than 5L/s and/or the total dissolved solids (TSD) concentration is typically greater than 1,500 mg/L). The local groundwater sources are managed under the WSP for the Greater Metropolitan Region Groundwater Sources and specifically are part of the Sydney Basin North groundwater source.

The regional groundwater sources occur within the Shoalhaven Group below the target coal seam. A schematic representation of the local and regional groundwater flow is shown in Figure 7.6.1.

The hydrogeological modelling for Airly Mine (GHD, 2014c) was updated to reflect the proposed workings for 2017. The updated hydrogeological model predicts that there will be groundwater inflows of approximately 6.4ML/year into the mine in 2017. Groundwater inflows are predicted to occur predominately from the overlying Permian strata and from the coal seam itself.

No drawdown is predicted to occur in the alluvium under the proposed mining plan. No changes to groundwater quality along Gap Creek alluvium is predicted since there will be no groundwater drawdown.

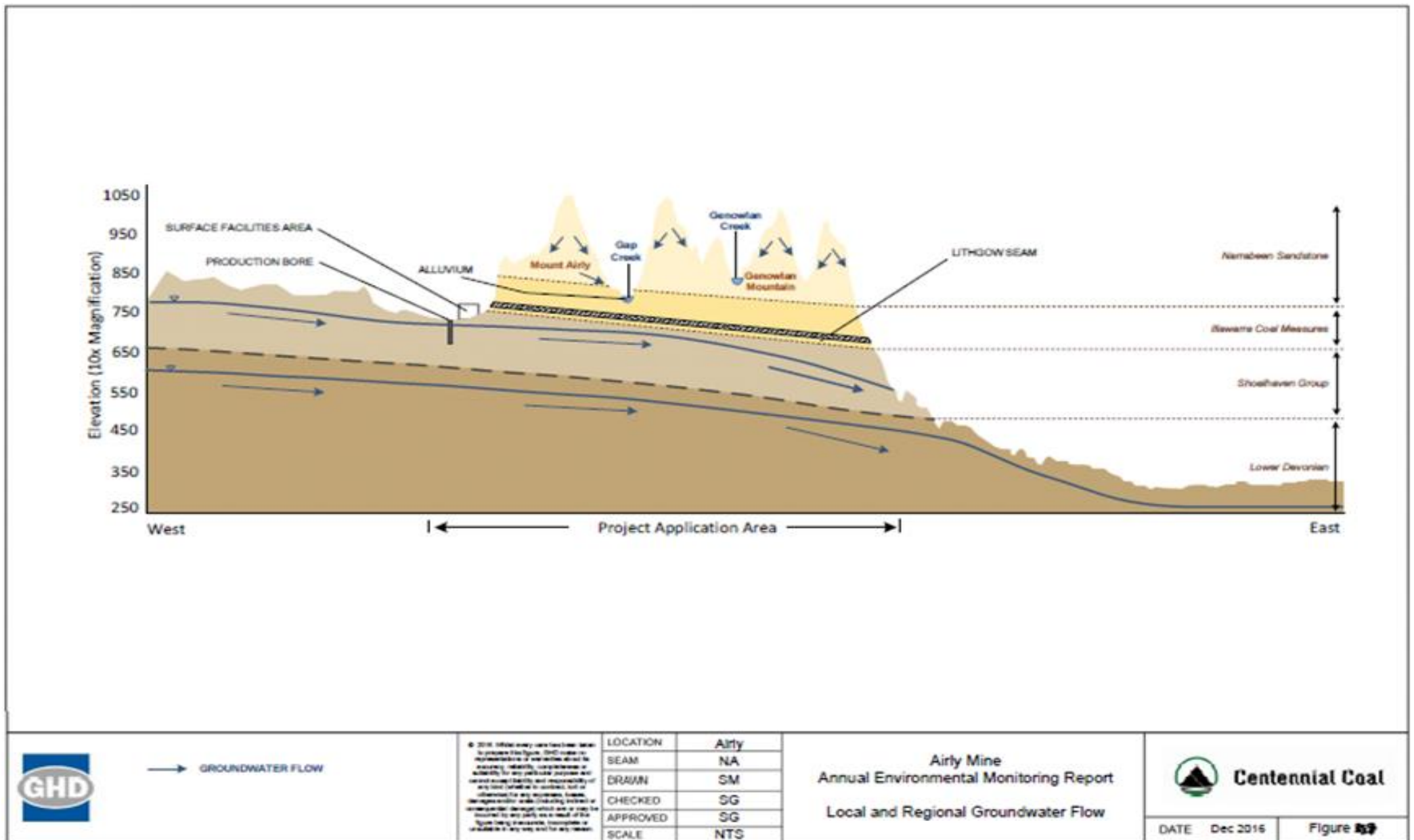


Figure 7.6.1 Airly Mine Local & Regional Groundwater Schematic

7.7 Airly Mine Groundwater Monitoring Program

Groundwater monitoring at Airly Mine consists of vibrating wire piezometers (VWP), groundwater level monitoring and water quality sampling of bores/standpipes and groundwater seepage locations. Monitoring details are outlined in Table 7.7.1 and corresponding monitoring locations Figure 7.7.1. Additional groundwater monitoring results are shown in Appendix C.

Additional monitoring bores ARP11, ARP12, ARP13, ARP13SP and ARP14 were installed within exploration area A232 by Highland Drilling between November and December 2016. Monitoring bores ARP15 and ARP15SP were installed within exploration area A232 by Highland Drilling in January 2017. Bore hole drilling depths are shown within Table 7.7.1 and locations of the new groundwater monitoring sites are shown within Figure 7.7.1. Routine water monitoring of the newly installed bore holes is scheduled to commence in mid-2017 once the bores have had sufficient time to settle.

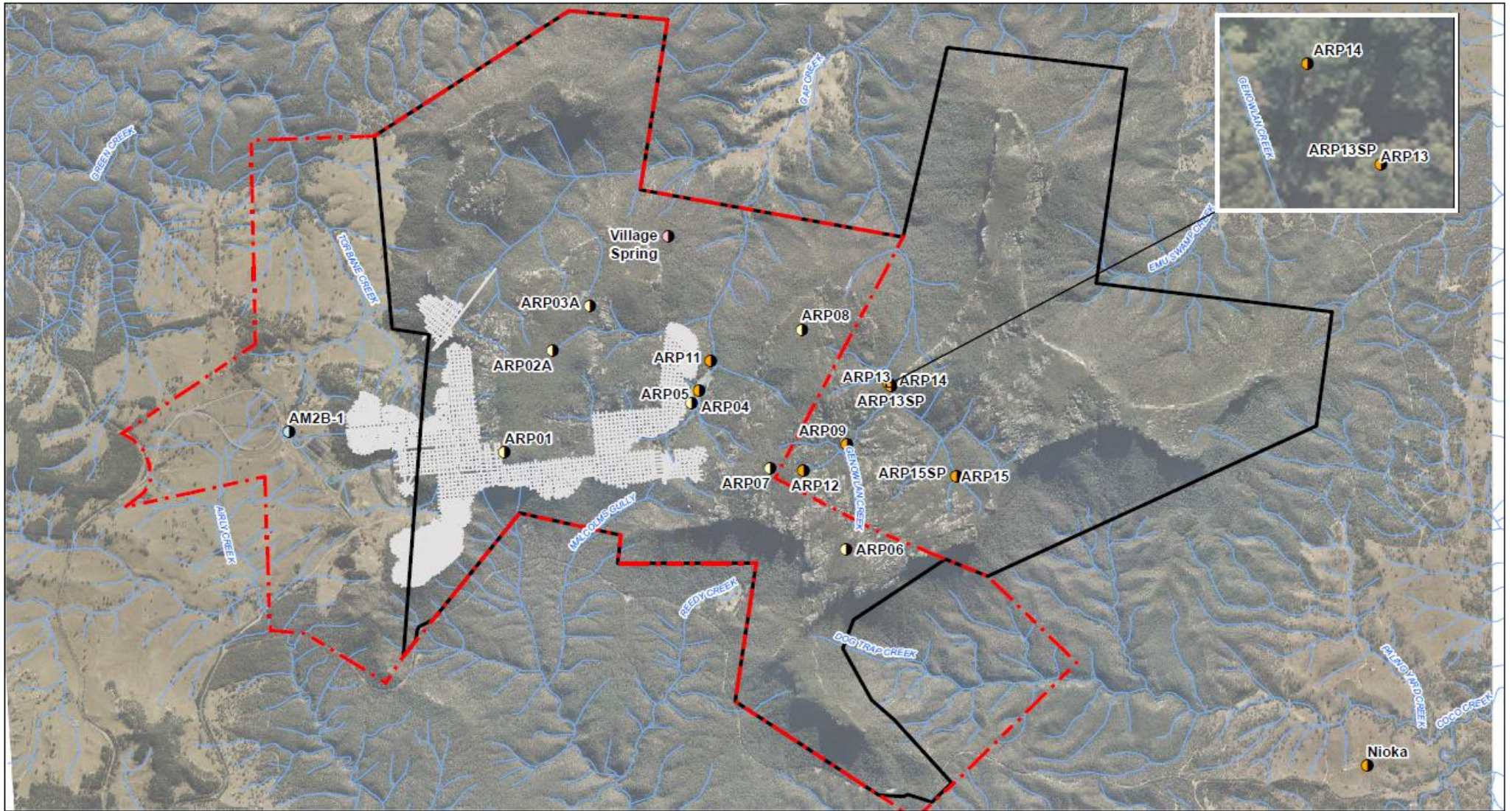
Table 7.7.1: Airly Mine – Groundwater Monitoring Locations and Details

Monitoring type	Location name	Period of data	Lithology
VWP	ARP01	June 2012–present	Narrabeen Sandstone (74 m bgl)
			Irondale Seam (238.5 m bgl)
			Lithgow Seam (260 m bgl)
			Marrangaroo Formation (263 m bgl)
	ARP02A	May 2012–present	Narrabeen Sandstone (65 m bgl)
			Irondale Seam (243 m bgl)
			Lithgow Seam (266 m bgl)
			Marrangaroo Formation (270 m bgl)
	ARP03A	July 2012–present	Narrabeen Sandstone (136 m bgl)
			Middle River Seam (165 m bgl)
			Lithgow Seam (252 m bgl)
			Marrangaroo Formation (257 m bgl)
	ARP04	April 2012–present	Lithgow Seam (25 m bgl)
			Marrangaroo Formation (28.5 m bgl)
			Shoalhaven Siltstone (210.3 m bgl)
	ARP06	June 2013–present	Narrabeen Sandstone (230 m bgl)
			Irondale Seam (252 m bgl)
			Lithgow Seam (288 m bgl)
			Marrangaroo Formation (295 m bgl)
	ARP07	July 2013–present	Middle River Seam (168 m bgl)
			Lithgow Seam (252 m bgl)

Monitoring type	Location name	Period of data	Lithology
	ARP08	September 2013–present	Narrabeen Sandstone (183 m bgl)
			Irondale Seam (282.5 m bgl)
	ARP13	December 2016–present ¹	Shoalhaven Group (120 m bgl)
			Devonian strata (280 m bgl)
	ARP15	January 2017–present ¹	Lithgow Seam (125 m bgl)
			Shoalhaven Group (200 m bgl)
Devonian strata (365 m bgl)			
Bore/standpipe	AM2B-1	2009–present (quality only)	Shoalhaven Group (38–87 m bgl)
	ARP05	August 2012–present	Gap Creek alluvium (8–11 m bgl)
	ARP07	July 2013–present (dry)	Narrabeen Sandstone (110–119 m bgl)
	ARP08	September 2013–present (no groundwater)	Lithgow Seam (301–305 m bgl)
	ARP09	June 2013–present (mostly dry)	Genowlan Creek alluvium (3–4 m bgl)
	ARP11	January 2017–present ¹	Permian strata (1.25–15.3 m bgl)
	ARP12	January 2017–present ¹	Genowlan Creek alluvium (0.5–2.6 m bgl)
	ARP13SP	January 2017–present ¹	Lithgow Seam (67.5–70.5 m bgl)
	ARP14	January 2017–present ¹	Genowlan Creek alluvium (0.5–2.3 m bgl)
	ARP15SP	January 2017–present ¹	Narrabeen sandstone (10–16 m bgl)
Seepage	Village Spring	February 2011–present	Permian Siltstone
	Mine workings	December 2009–present (negligible)	Lithgow Seam

Note:

1. ARP11, ARP12, ARP13SP, ARP13, ARP14, ARP15 and ARP15SP installed in December 2016 – January 2017. No data yet collected for analysis.



<p>Paper Size A4</p> <p>0 200 400 800 1,200 1,600</p> <p>Metres</p> <p>Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56</p>		<p>LEGEND</p> <ul style="list-style-type: none"> ● Groundwater seepage ● Production bore ● Standpipe monitoring bore ● Vibrating wire piezometer Mining Lease ML1331 Authorisation A232 Existing workings Waterway 		<p>Airly Mine Annual Surface Water and Groundwater Monitoring Report 2016</p>	<p>Job Number 22-18481 Revision A Date 24 Mar 2017</p>
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Figure 7.7.1: Airly Mine Groundwater Monitoring Locations

7.8 Vibrating Wire Piezometers

Piezometric pressure is recorded automatically for each VWP every 12 hours and saved by the data logger at each bore. Data loggers were downloaded every one to three months throughout 2016.

Piezometric pressure is generally low and stable at the existing VWP monitoring locations, generally ranging from 0 m to 10 m above the measuring point elevation, with little observable response to rainfall. The low piezometric pressure is considered to reflect the extensive groundwater seepage areas across the slopes of Mount Airly and Genowlan Mountain.

Pressures reported in 2016 are generally similar to those reported between 2013 and 2015 (and reported in the EIS). Minor decreasing trends were observed in 2014 and 2015 in the middle river stream at ARP07, in the Irondale Seam at ARP08 and in the Marrangaroo Sandstone at ARP02A. These minor decreasing trends continued in 2016. There was a minor decreasing trend in pressures at ARP07 in the Lithgow Seam during 2014 and 2015. This trend ceased in 2016 with pressures very stable in the Lithgow Seam at ARP07.

There was also an observed decrease in piezometric pressure between September and December 2015 of approximately 0.5 m at ARP04 in the Lithgow Seam and the Marrangaroo Formation. The depressurisation at ARP04 may be attributable to activities at Airly Mine since the mine workings came within 200 m of this monitoring site in 2015. Following this sudden decrease, there was a minor decreasing trend in piezometric pressure throughout 2016 at ARP04 in the Lithgow Seam and the Marrangaroo Formation. These observed trends are consistent with the predictions made within the EIS for the Airly Mine Extension Project.

There is a downward hydraulic gradient across the strata from the Narrabeen Sandstone to the Illawarra Coal Measures. It is noted that at some locations (ARP02A, ARP03A and ARP04), the piezometric pressure of the Marrangaroo Formation underlying the Lithgow Seam is similar to or higher than the pressure within the Lithgow Seam.

Trended piezometric head data recorded from 2012 to 2016 for locations ARP01, ARP02A, ARP03A, ARP04, ARP06, ARP07 and ARP08 are shown below.

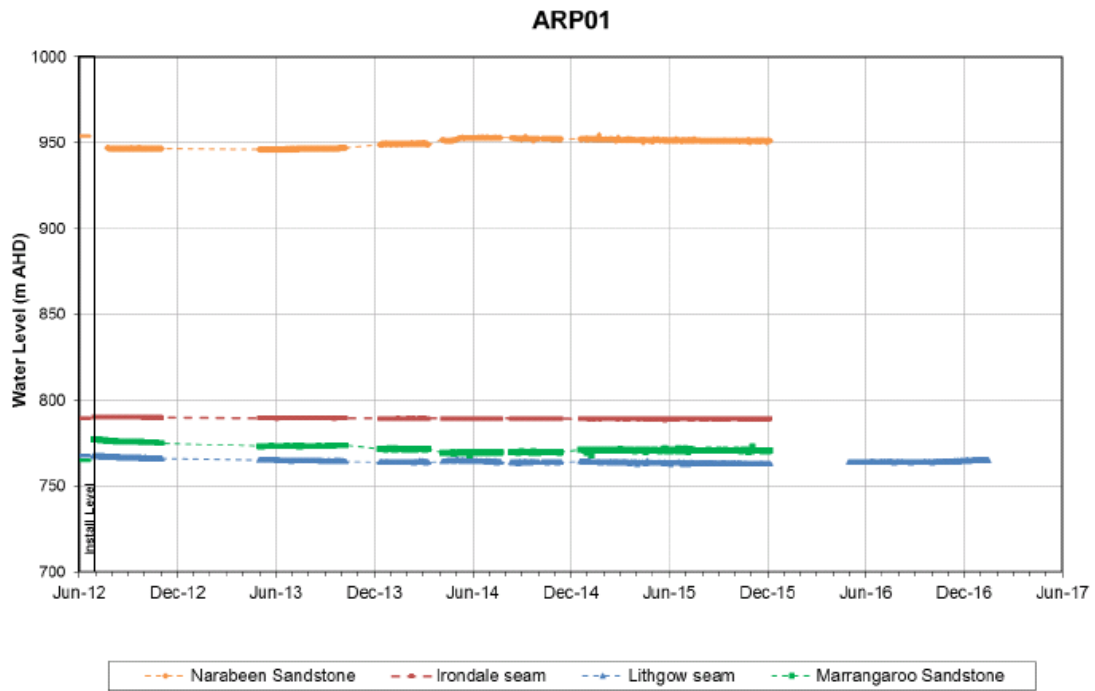


Figure 7.8.1: ARP01

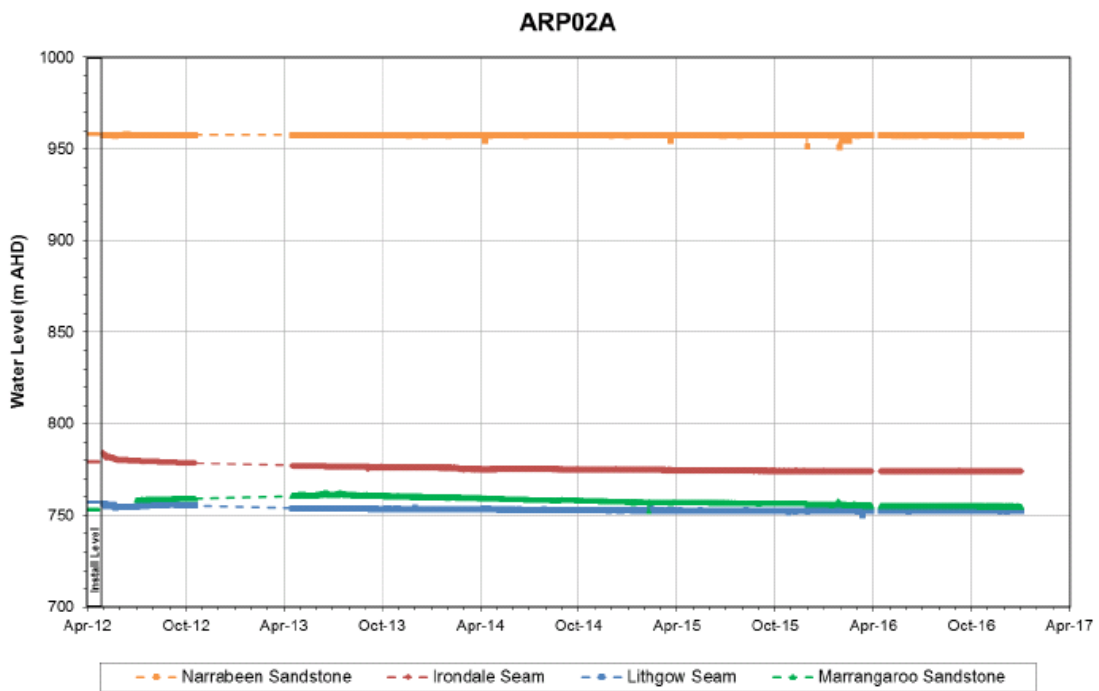


Figure 7.8.2: ARP02A



Figure 7.8.3: ARP03

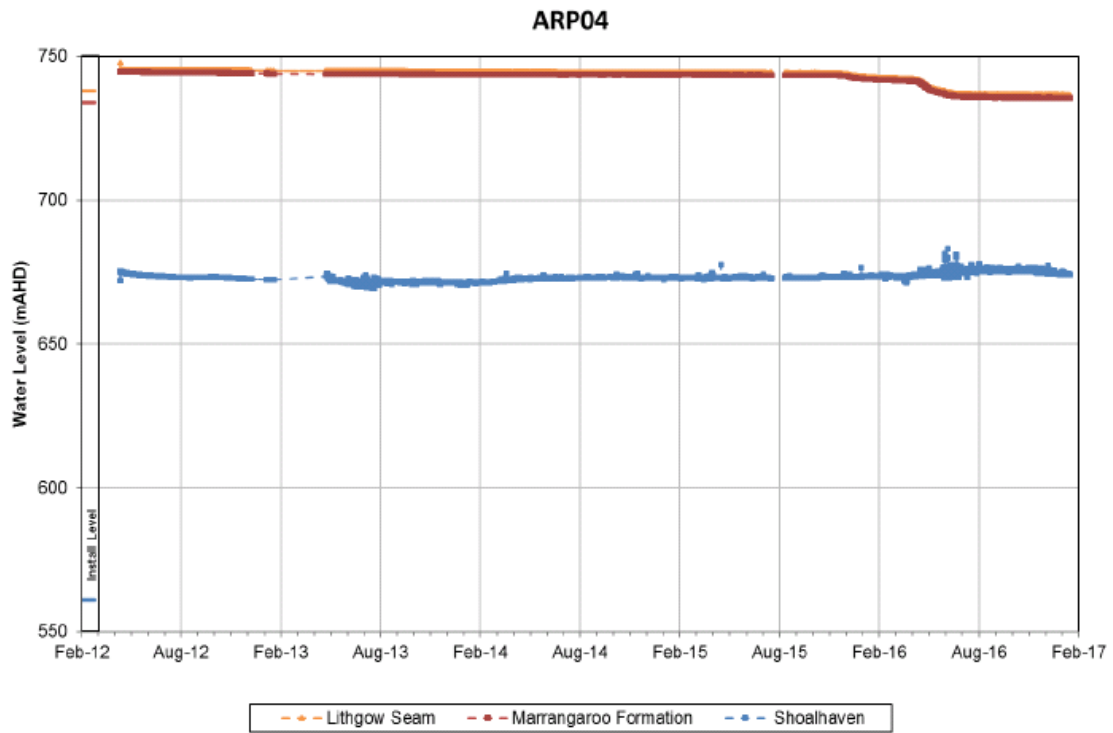


Figure 7.8.4: ARP04

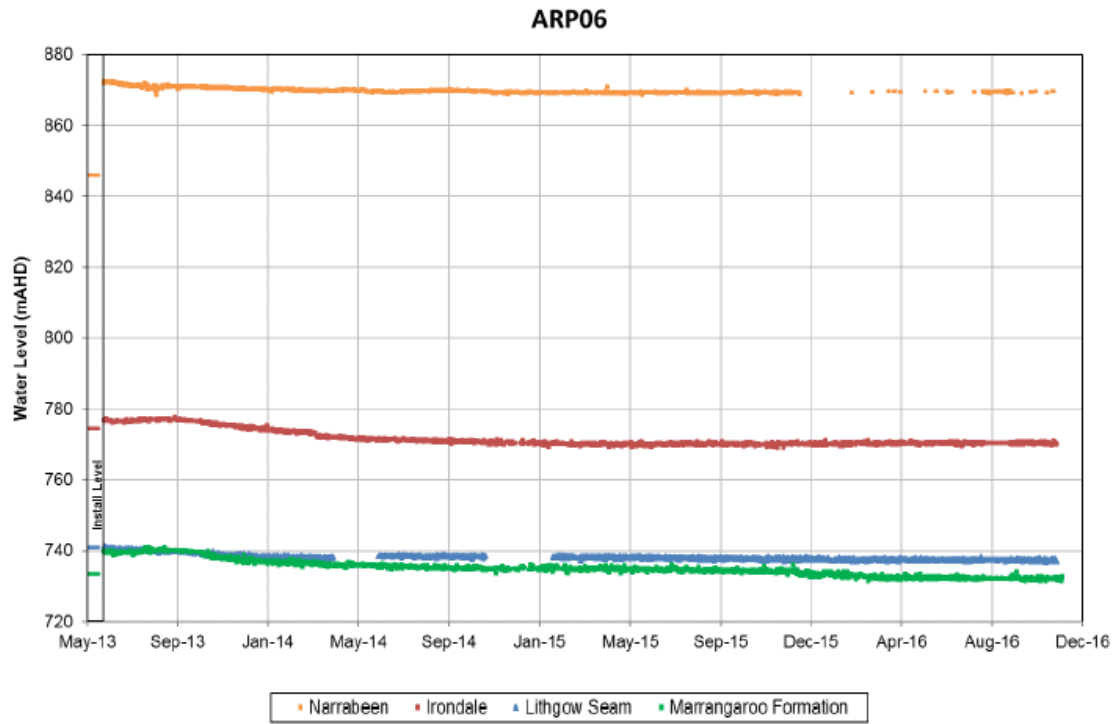


Figure 7.8.5: ARP06

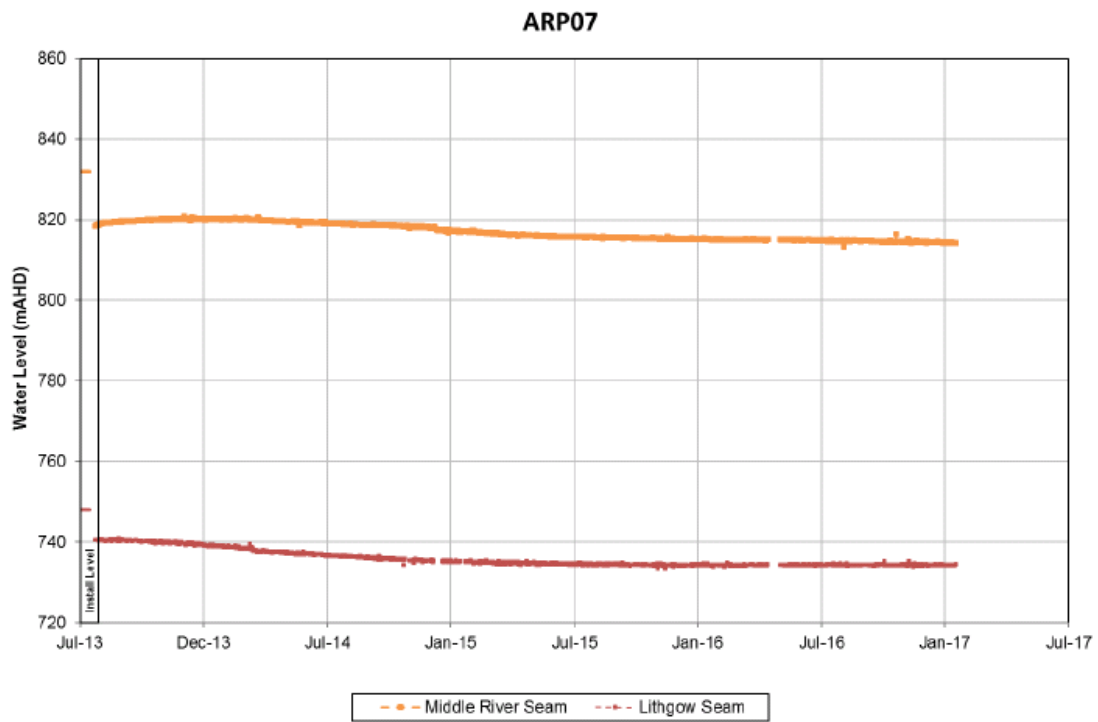


Figure 7.8.6: ARP07

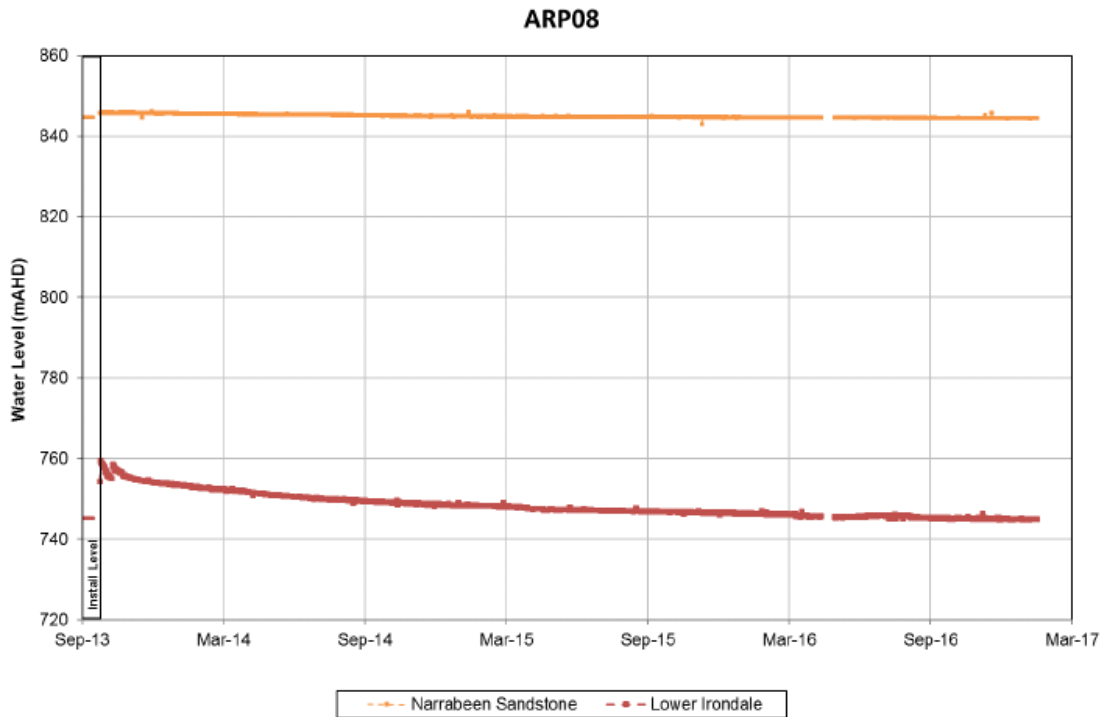


Figure 7.8.7: ARP08

7.9 Bores/standpipes

ARP05 was dry between January and mid-September 2016. There was no response to rainfall over this period. Groundwater levels showed a strong response to rainfall during September and October 2016 with levels increasing to approximately 750.9m AHD. Following this, groundwater levels began to decrease with no response to rainfall over this period.

The standpipe within Genowlan Creek alluvium at ARP09 responded to periods of rainfall during January and February 2016 with groundwater levels reaching a peak of approximately 856.6m AHD (1m bgl) during this period. Between March and May the standpipe was dry. Between March and May 2016 the standpipe ARP09 was dry. Between June and December 2016 the standpipe ARP09 responded to periods of rainfall with groundwater levels reaching a peak of 586.8 AHD (0.8m bgl) during July 2016 and again in September 2016.

Hydrographs for alluvial groundwater at ARP05 and ARP09 are shown below.

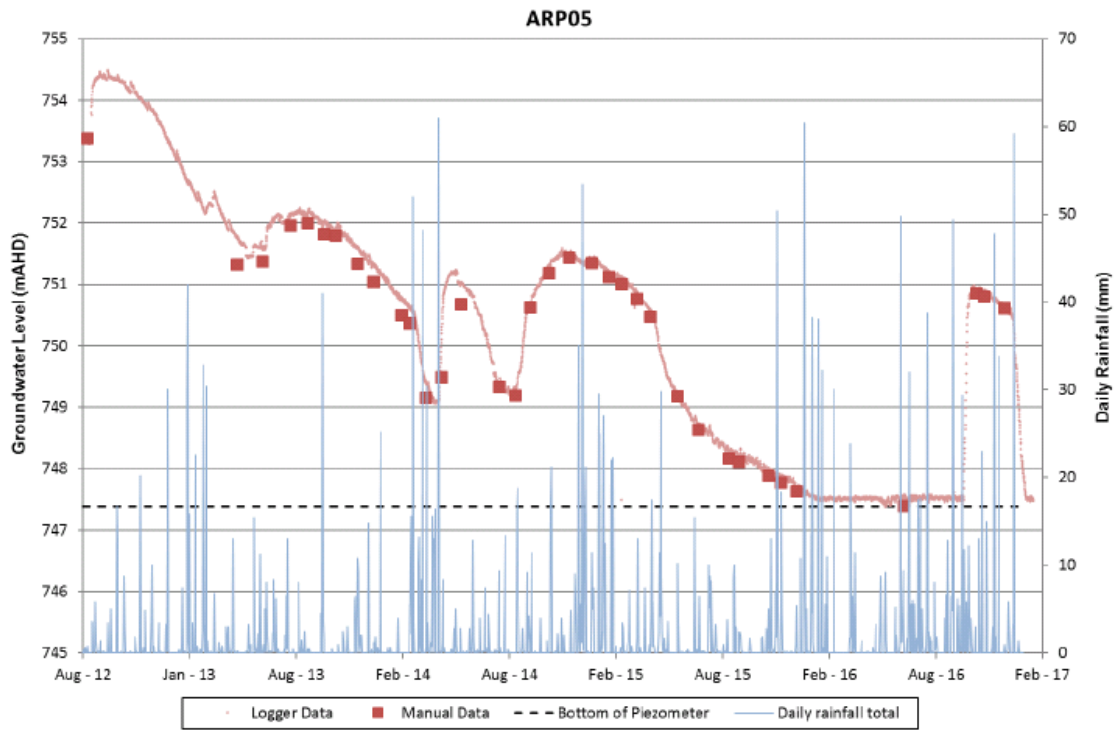


Figure 7.9.1: ARP05 – Rainfall Comparison

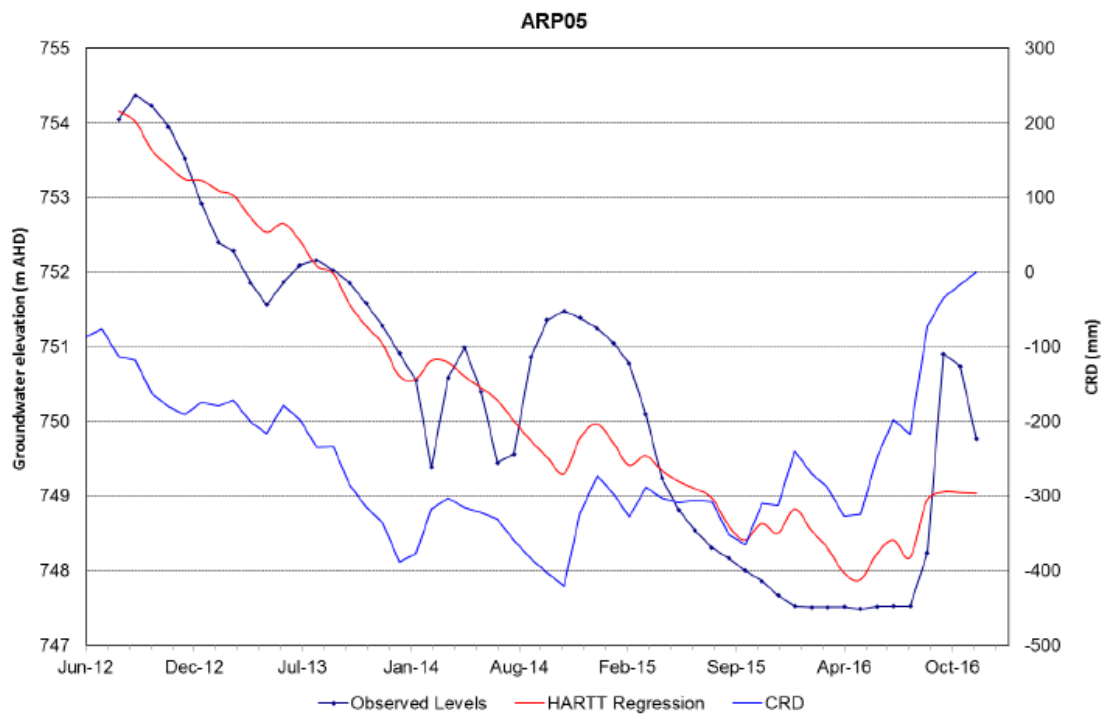


Figure 7.9.2: ARP05 – HARTT Regression

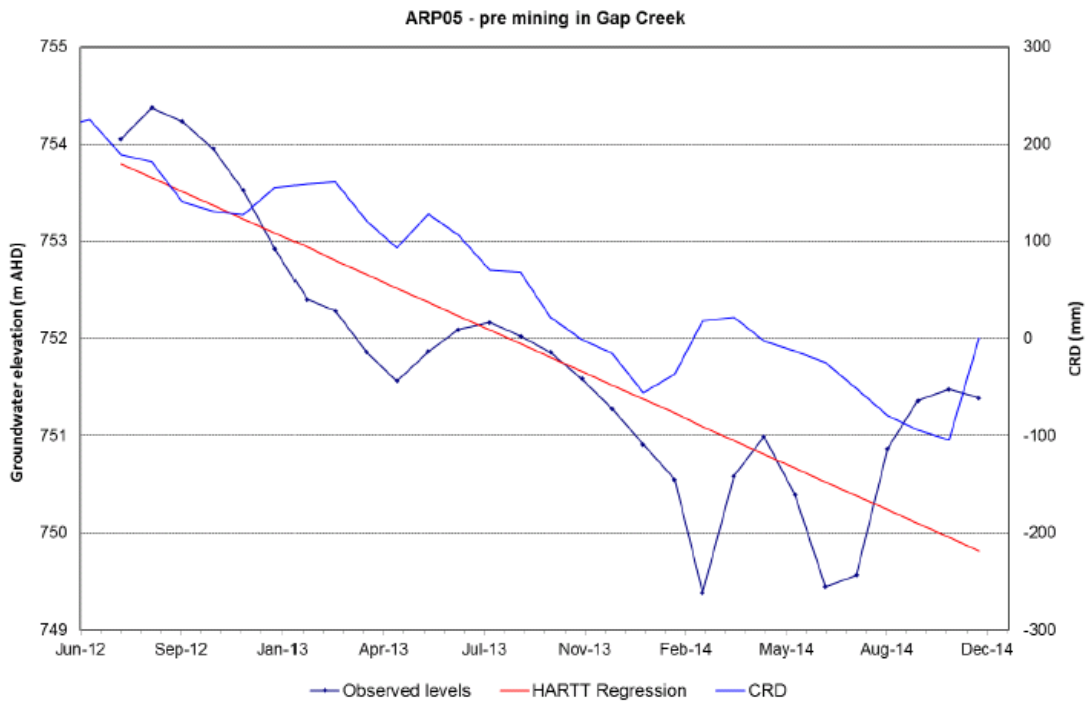


Figure 7.9.3: ARP05 – Pre-mining HARTT Regression

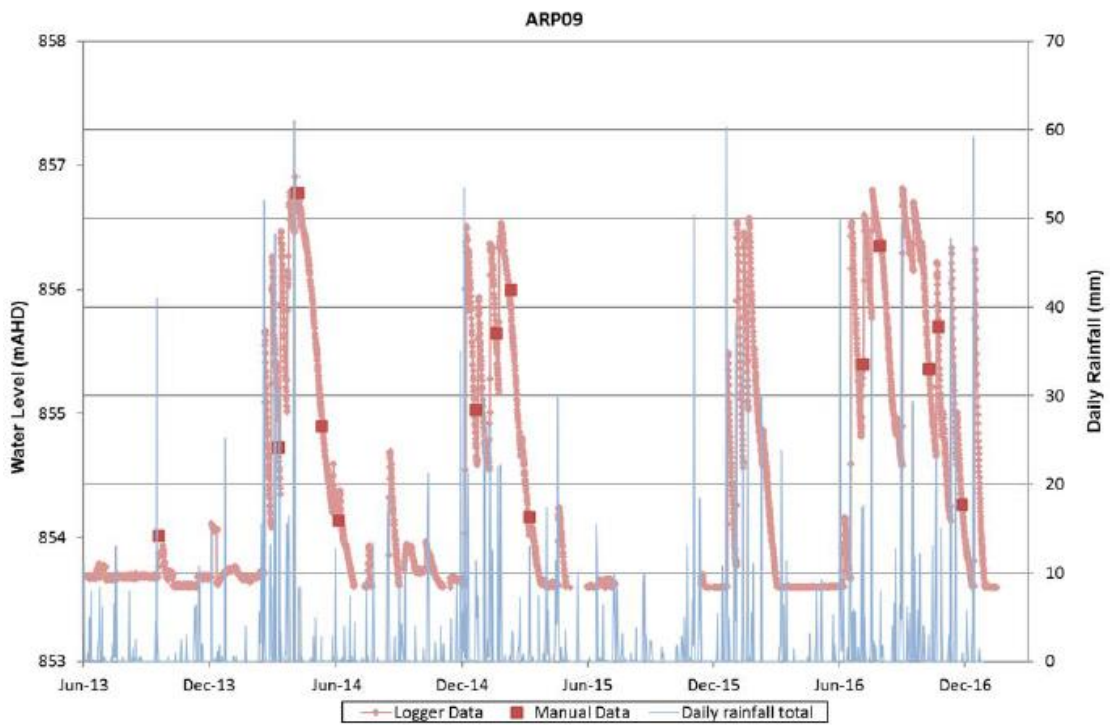


Figure 7.9.1: ARP09 – Rainfall Comparison

7.10 Seepage

Seepage at Village Spring is fresh and generally slightly alkaline and calcium/magnesium-bicarbonate water type. All dissolved metal concentrations were below ANZECC (2000) DTVs in 2016. It is most likely that this seepage is coming from the old shale workings within the Permian strata above the Lithgow Seam. Water quality results of Village Spring are available in Appendix C.

The rate of seepage of groundwater from the Permian strata at Village Spring has been monitored since February 2011 and was monitored throughout 2016. The Village Spring groundwater seepage rate was not available from 1 January 2016 to 30 January 2016. A plot of the daily groundwater seepage rate at Village Spring is shown in Figure 7.10.1. Flow rate gauging indicated that there was no seepage from Village Spring throughout much of 2016.

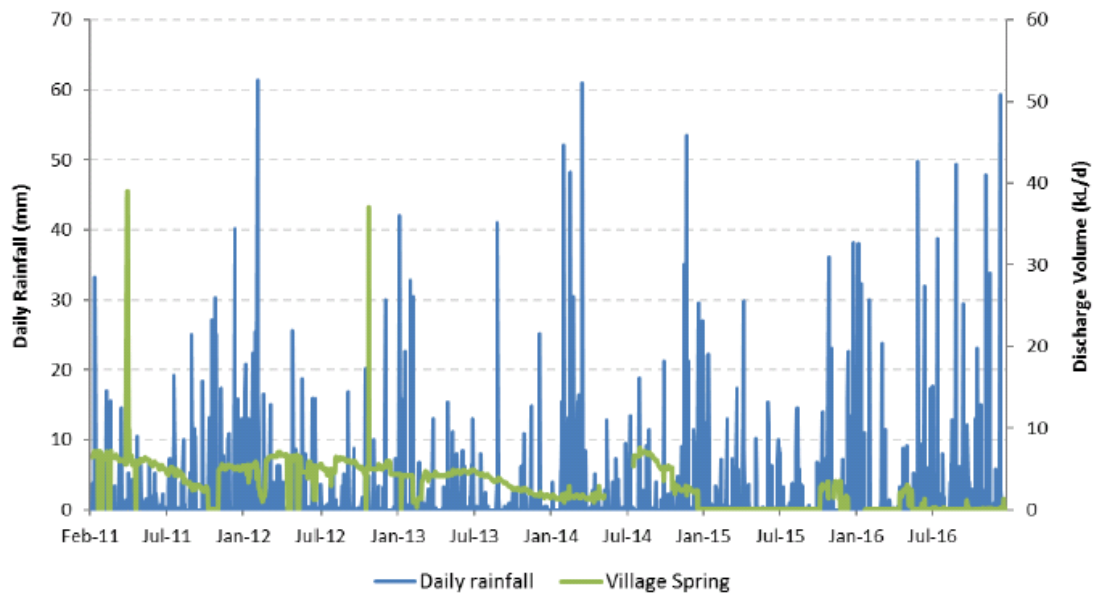


Figure 7.10.1: Village Spring – Seepage Rate

8 REHABILITATION

Airly Mine did not complete any rehabilitation within the 2016 reporting period. Airly will conduct rehabilitation works in accordance with the approved Mining Operations Plan/Rehabilitation Management Plan at the completion of life-of-mine operations. Due to the nature of Airly Mine, there is limited opportunity for any progressive rehabilitation to occur prior to the cessation of life-of-mine operations.

Airly's disturbance footprint increase by 0.54ha during 2016 due to minor drill site clearing for the installation of groundwater monitoring bores ARP11, ARP12, ARP13, ARP14 and ARP15. Details regarding the 2016 drilling program can be found in the Airly 2016 Exploration REF which is available on the Centennial Coal website. Airly's current disturbance footprint is 43.34ha, see Figures 8.1 and 8.2.

- *Note, highlighted disturbances shown on Figures 8.1 and 8.2 have been exaggerated in order to be visible on the plans.*

8.1 Next Reporting Period

During the next reporting period, Airly Mine will develop a combined Mining Operations and Rehabilitation Management Plan (MOP & RMP). This plan will be developed in consultation with the relevant government departments.

Rehabilitation of drill sites, ARP11, ARP12, ARP13, ARP14 and ARP15 will be undertaken by National Parks and Wildlife Service (NPWS) during the 2017 reporting period.

Table 8: Rehabilitation Status

Mine Area Type	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
	Year 2015 (ha)	Year 2015 (ha)	Year 2016 (ha)
A. Total mine footprint¹	42.8	43.34	43.34
B. Total active disturbance²	42.8	43.34	43.34
C. Land being prepared for rehabilitation³	0	0	0
D. Land under active rehabilitation⁴	0	0	0
E. Completed rehabilitation⁵	0	0	0

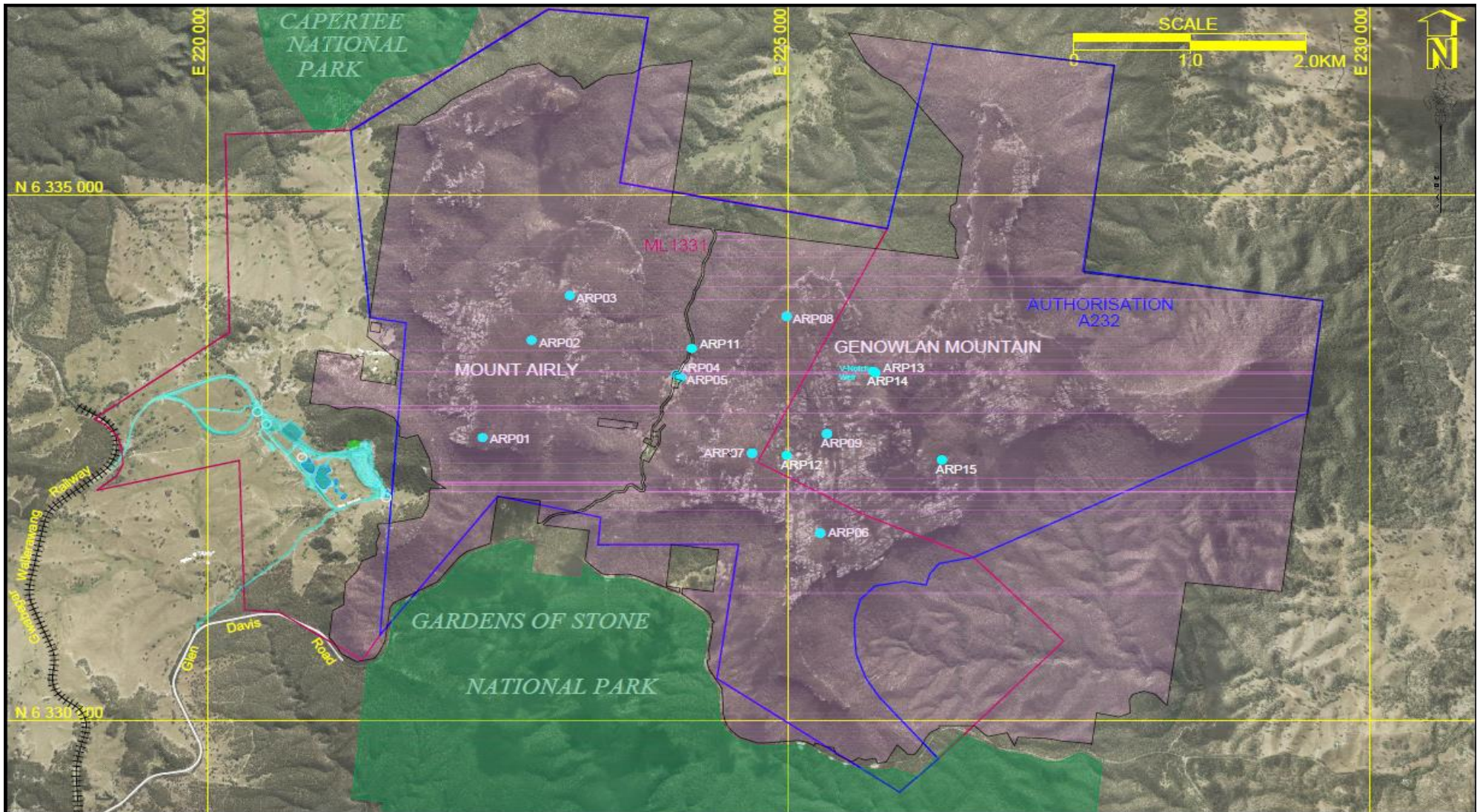
¹ **Total Mine Footprint:** includes all areas within a mining lease that either have at some point in time or continue to pose a rehabilitation liability due to mining and associated activities. As such it is the sum of total active disturbance, decommissioning, landform establishment, growth medium development, ecosystem establishment, ecosystem development and relinquished lands (as defined in the DRE MOP/RMP Guidelines). Please note that subsidence remediation areas are excluded.

² **Total Active Disturbance:** includes all areas requiring rehabilitation

³ **Land being prepared for rehabilitation:** includes the sum of mine disturbed land that is under the following rehabilitation phases – decommissioning, landform establishment and growth medium development (as defined in DRE MOP/RMP Guidelines)

⁴ **Land under active rehabilitation:** includes areas under rehabilitation and being managed to achieve relinquishment – includes 'ecosystem and land use establishment' and 'ecosystem and land use sustainability' (as defined under the DRE MOP/RMP Guidelines)

⁵ **Completed rehabilitation:** requires formal sign off from DRE that the area has successfully met the rehabilitation land use objectives or completion criteria



LEGEND ML1331 Lease Boundary A232 Authorisation Boundary National Park Cadastral Boundary Mugil Murum-Ban SCA Disturbance Foot Print Rehabilitation Site Current Disturbance Footprint = 43.34 Ha	GENERAL PROJECT TITLE AIRLY SURFACE DISTURBANCE FOOTPRINT DRAWN BY: J. STEVENS DATE: 17/3/2017	DATE 17/3/2017	PLAN C AIRLY SURFACE DISTURBANCE FOOT PRINT	Centennial Coal Airly
		SEAM LITHGOW		
	REFERENCE APPROVED SCALE Refer to Scalebar		DWG No. AM00920C	A3

Figure 8.1: Airly Mine Surface Disturbance Footprint – Project Area

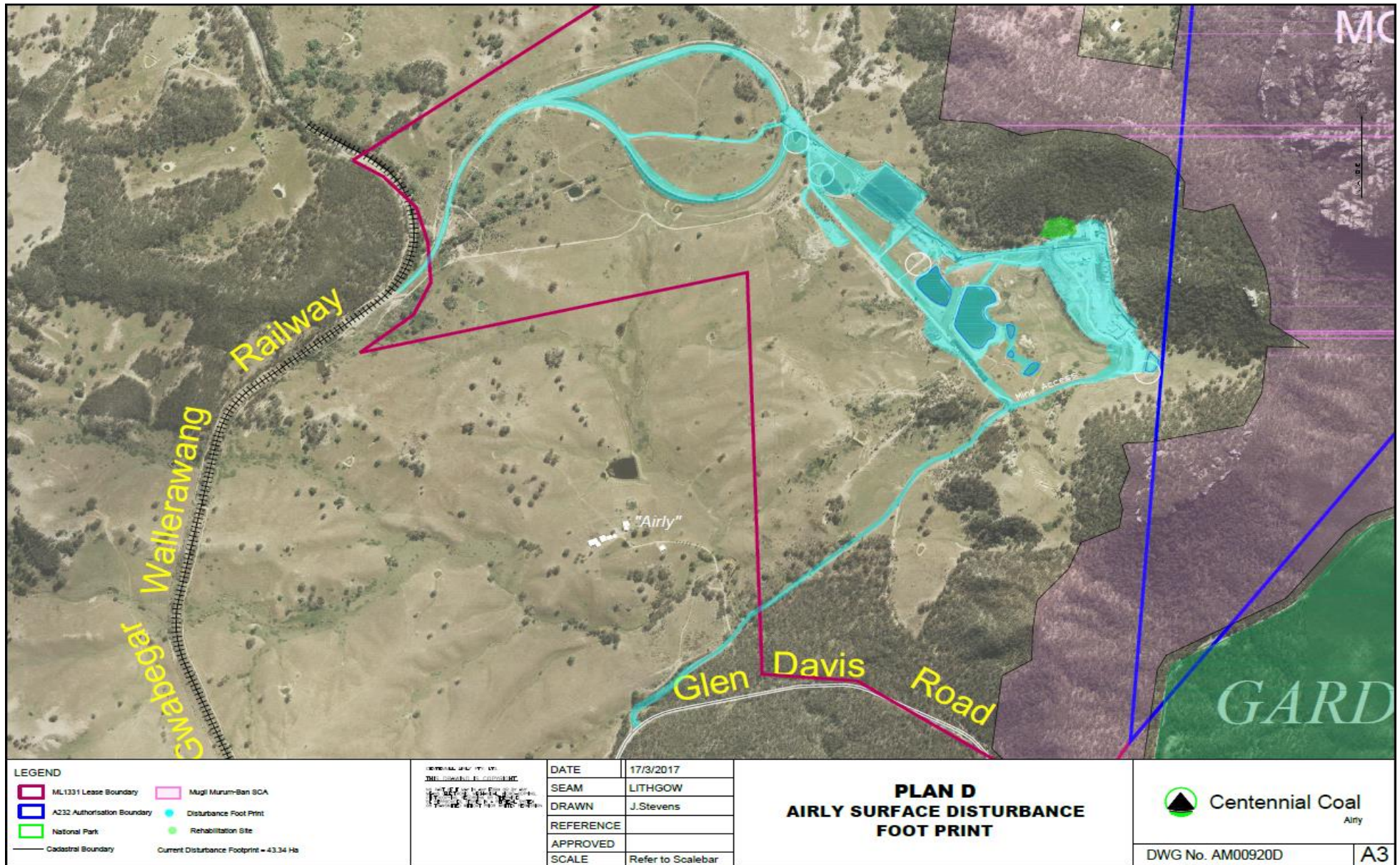


Figure 8.2: Airly Mine Surface Disturbance Footprint – Surface Facilities

9 SUBSIDENCE

9.1 Subsidence Monitoring Data

Secondary coal extraction using splitting and quartering techniques was undertaken in the following panels during 2016:

- 200 panel - completed
- 101A panel and 101 panel – completed
- 122 panel – extraction ongoing

Subsidence monitoring of these panels was carried out in accordance with the commitments in Modification 3 and the Modification 3 Variation Extraction Plan.

200 panel was monitored via a surface subsidence monitoring line with 10m bay lengths. Only vertical subsidence was monitored as the very low levels predicted would result in unmeasurable amounts of tilt and strain. An underground stress cell and rib extensometer array was also installed directly below the subsidence line to correlate surface and underground results. The intention was to determine that the system was stable and also demonstrate if underground pillar monitoring was a viable alternative to surface monitoring.

Visual inspections of the surface over the 200, 101A and 101 panels have been conducted after extraction was completed.

Subsidence monitoring of the surface monitoring line over 200 panel was carried out during 2016. Extraction in the 200 panel was completed in January 2016 and a resurvey was completed in February 2016. A further resurvey was completed in June 2016.

Results to date have indicated that subsidence has stabilised and the general maximum amount of subsidence measured was 7mm. Two spike results of 11 and 13mm respectively were noted on the second resurvey, but these are considered anomalous to the rest of the results. The second resurvey showed some potential additional spread of settlement laterally. The previously subsided area from the first resurvey appeared to move back up. This is explained in 9.2.

Underground pillar monitoring in 200 panel has shown very little movement or stress increase associated with pillar quartering. Sites 2, 3 and 4 showed little movement on the rib extensometers and no further movement once extraction had preceded outbye. Only a small stress rise at the time of pillar quartering was seen in the stress cells. No ongoing stress increases were noted

Site 1 (inbye left hand side of the pillar) had the readings impacted by a localised section of rib skin detaching and ultimately falling off. This damaged the instrument site and affected readings of the rib extensometers and damaged the stress cell lines leading to anomalous results.

A five month trial of satellite based Interferometric Synthetic Aperture Radar (InSAR) was conducted over the entire mine site. Data was gathered from February to June 2016. "Pixel" size of the resultant images was 3 metres square. The intention of the trial was firstly to see if a subsidence could be detected during extraction work in the 101A and 101 panels and secondly to see how effective the technique was at picking up surface data points, especially through trees.

Results were not encouraging with some minor amounts of movement (approximately 10mm) picked up close to but not within the zone of influence of 101A panel. No movement with any notable trend was detected directly over the active extraction area. This could be explained by natural ground movements as the detected movements were on a bare hillside that is predominantly clay tallus. No clear trending over the extracted area of 101A panel was noted. See Figure 9.1.

As expected the technique was successful in detecting the surface around exposed rock surfaces and open ground. Results in treed areas were limited; however this is expected to improve with further data gathering as the probability of detecting the ground between trees improves with more images over time. Accuracy of results also improves with a larger baseline dataset.

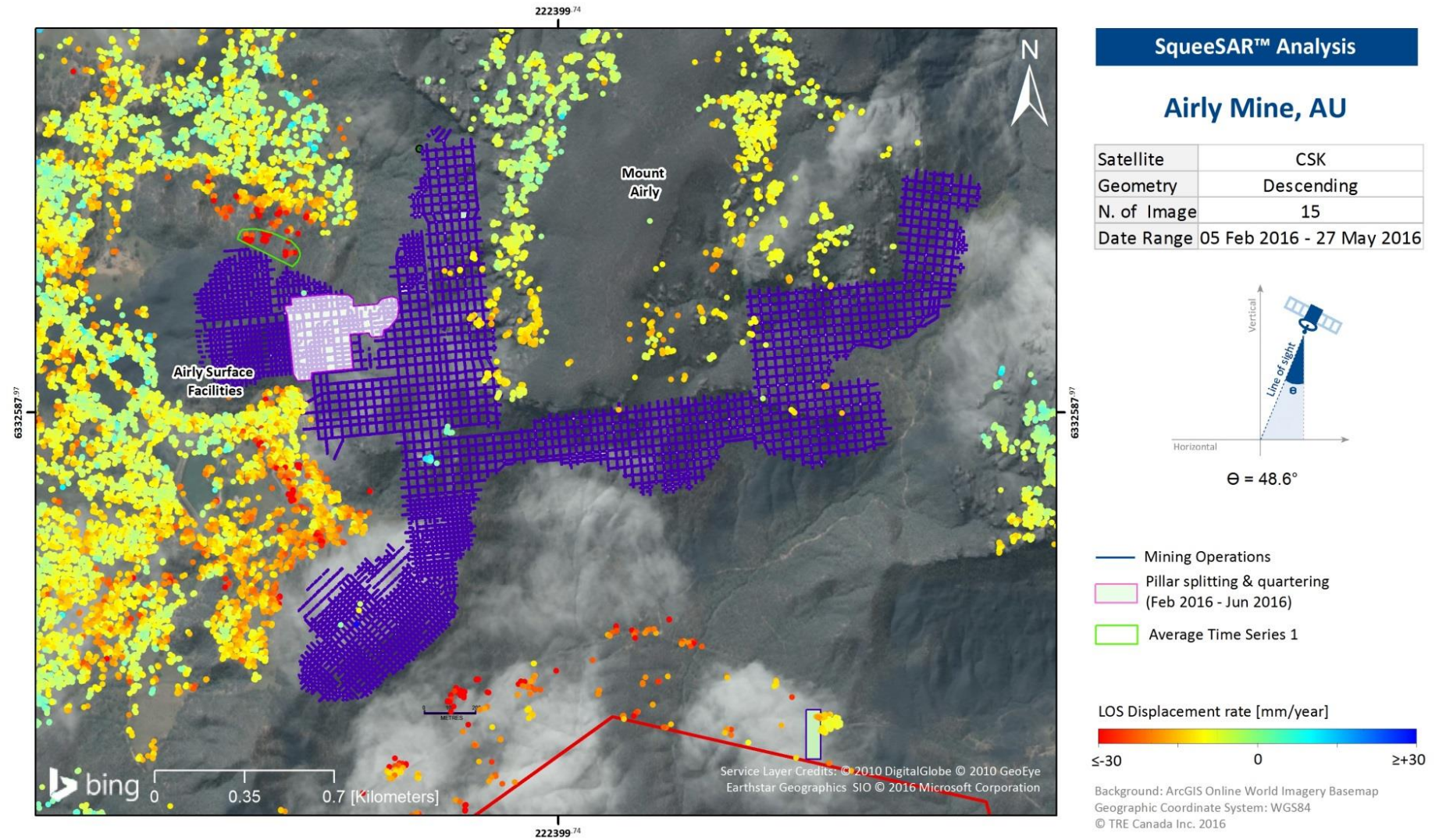


Figure 9.1 Airly Mine InSAR Results

9.2 Environmental Performance and Compliance

The maximum predicted subsidence for 200 panel in the Subsidence And Pillar Stability Assessment reports (Golder 2014) under 80m depth of cover (DOC) was 13.8mm. Excluding two anomalous readings (11 and 13mm), the general maximum measured subsidence was 7mm which is approximately half the predicted value. There is also what appears to be some uplift of the area originally subsided in the first resurvey measured during the second resurvey (Figure 9.2).

This is likely due to a number of factors:

1. The area monitored over 200 panel is a on a ridge (Figure 9.3). The subsidence predictions assume a worst case scenario of a level ground surface placing an even loading an all pillars. The ridge situation over 200 panel has lower DOC on either side resulting in greater stiffness of the adjacent pillars to those under the ridge. This allows load shedding from the deeper pillars to those less stressed by overburden loading nearby.
2. The very low levels of subsidence are potentially impacted by natural ground movements. Subsidence is typically considered to be insignificant below values of 20mm due to these effects. This is tempered somewhat by the results showing a trend of subsidence in the deeper areas as expected.
3. Instrument error can be as much as 3mm. At low levels of subsidence such as these, instrument error becomes a consideration in the overall measurements.

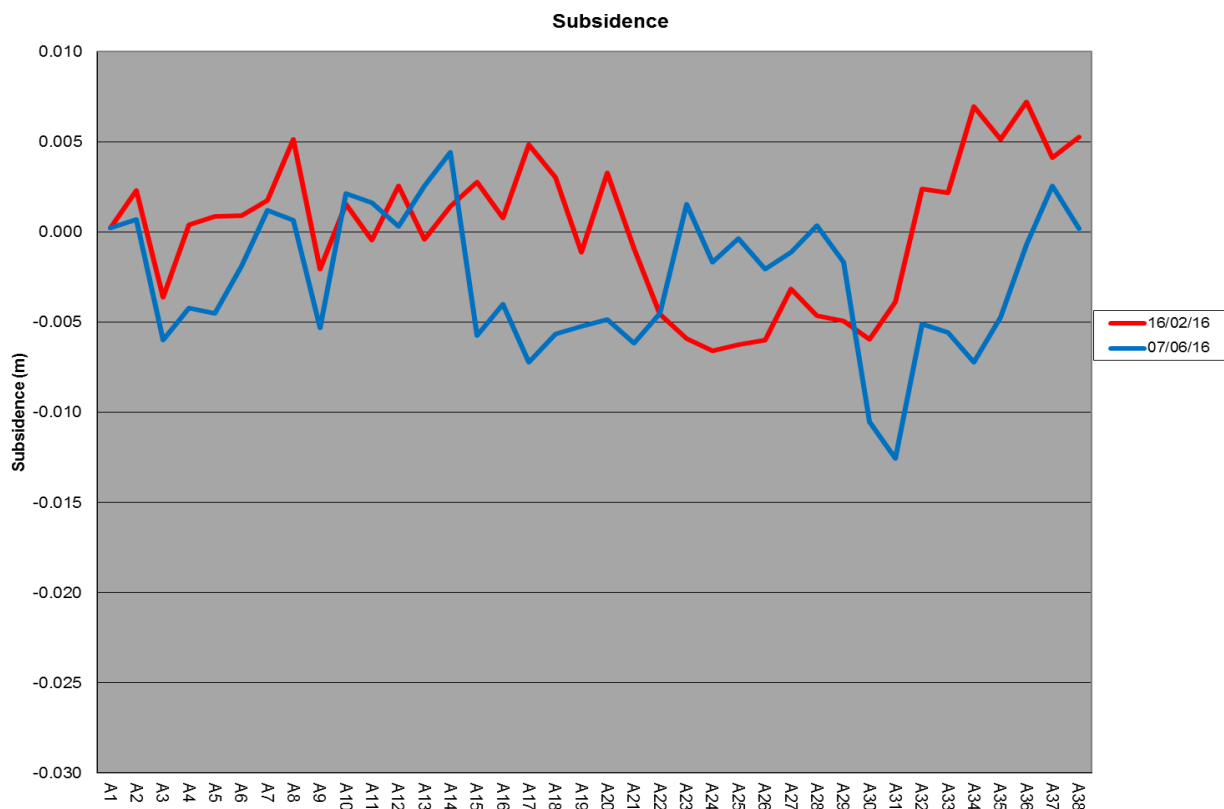


Figure 9.2 Airly Mine Subsidence Results Above 200 Panel

Much of what is being measured in the 200 panel subsidence line is in fact “noise” as mentioned above. General subsidence trends indicate the splitting and quartering system is performing well within predicted outcomes.

The stress cell results and rib extensometer results showed that pillar loading only occurred once pillar quartering occurred in the pillar being monitored and then quickly stabilised. Golder (2016) determined that this indicates elastic behaviour of the pillars as

predicted. Subsequent inspections have shown no further deterioration of the pillars and no roof falls in the roadways are evident in the area around the monitoring site.

Visual inspections of the surface over the 200 area (200, 201, 201A and 201B panels) including the small vertical rock faces (<20m) in the deepest areas showed no deterioration or evidence of collapse after extraction was complete and in the remainder of 2016. It should be noted that splitting and quartering was not carried out at depths exceeding 110m and the rock faces were therefore not undermined.

The shallower portions of the 200 area located on the tallus slopes where also inspected. No evidence of sink holes, cracks or other subsidence related surface movements were noted.

Surface inspections were also carried out over the 101A and 101 panel areas and no evidence of sink holes, cracks or other subsidence related surface movements were noted.

9.3 Airly Mine Subsidence Monitoring Trends:

The trends resulting from the subsidence monitoring indicate long term stability of pillar systems (Golder 2016) as predicted.

9.4 Non-compliances and Corrective Actions

There were no non-compliances with regard to subsidence during the 2016 reporting period.

9.5 Planned Subsidence Monitoring Activities in 2017

200 Panel Surface Subsidence Monitoring Line

- One further resurvey 12 months after completion of extraction (around February 2017) to finalise monitoring of this area. No further monitoring is proposed if results are consistent thus indicating stability has been attained.

121 Panel Surface Subsidence Monitoring Line

- Complete installation of the subsidence line
- Carry out baseline survey
- Conduct resurvey 3 months after completion of extraction
- Conduct resurvey 6 months after completion of extraction if that falls in 2017

Mt Airly

- Complete investigation into feasibility of remote monitoring techniques
- Determine conventional and remote subsidence monitoring requirements for Mt Airly with Independent Review Panel
- Install baseline conventional surface monitoring lines and points
- Carry out baseline remote monitoring for Mt Airly

10 COMMUNITY

10.1 Community Engagement

During 2016 Airly Mine held three (3) Community Consultative Committee Meetings. The Community Consultative Committee Meetings replaced the Special Monitoring Committee established at Airly in 2010.

Members of Airly Mines Community Consultative Committee include at least two Airly Mine representatives and:

- Gerard Martin - *Chairperson*
- Cr Colin Hunter – *Lithgow City Council*
- David Crust – *NSW National Parks and Wildlife Service*
- Donna Upton – *Capertee Valley Alliance Inc*
- Dr Haydn Washington
- Esme Martens AM

During 2016 the Committee met on the 15th March, 21st June and 9th August 2016. Topics discussed during the year at the Community Consultative Committee Meetings include Airly Operations, Environmental Management and Community Relations. Minutes of these meetings are available on the Centennial Coal website: www.centennialcoal.com.au

Airly Mine also attends and provides updates at the monthly Capertee-Valley Progress Association (CPA) meetings.

10.2 Community Contributions

Community contributions were made by Airly to the following local organisations:

- Capertee Public School
- Capertee Valley Progress Association
- Kandos High School
- Rylstone District Wild Dog Association
- Rylstone/Kandos Show
- Rylstone Street Feast

Additionally, Airly Mine volunteered to cook the BBQ at three (3) non-profit fundraising events held by the Capertee Progress Association during 2016. Airly will offer the same service again in 2017.

10.3 Community Complaints

There were no community complaints made to Airly Mine during the 2016 reporting period.

Airly Mine maintains a complaints register which is updated monthly and can be found on the Centennial Coal website: www.centennialcoal.com.au

11 INDEPENDENT AUDIT

An Independent Audit was completed at Airly Mine on 18 and 19 March 2015 by MCW Environmental Consulting Pty Limited.

The Audit identified three non-compliant conditions associated with EPL (12374) that was relevant to the reporting period 2012-14. Two non-determinate conditions were associated with DA162/91 and the Statement of Commitments.

An Action Plan was provided to the Department of Planning and Environment dated May 2015.

Airly Mine Response to Auditor's Recommendations – May 2015.

As required under Schedule 2 Condition 44 of of Airly Coal Mine – Life of Consent (DA162/91 MOD 3), Table 1 below provides a response to the recommendations outlined in the 2015 Independent Environmental Audit Report.

Table 1: Airly Mine Response to Auditor's Recommendations – May 2015.

Condition	Description	Risk	Airly Mine Response
DA 162/91 Schedule 2, Condition 13(b)	Airly management reported that they are in the process of preparing a Draft Extraction Management Plan; however, the draft plan was not in a condition to be provided to the auditors for review at the time of the audit. Given the Draft Extraction Plan was not available for review this condition was found to be indeterminate	Low	Noted. The Extraction Plan has been submitted to the Department of Planning and Environment for approval.
DA 162/91 Schedule 2, Condition 20	Update the 2011 Surface Water Management Plan to reflect current Licenced Discharge Points and water management infrastructure and monitoring requirements or submit the draft Surface Water Monitoring and Management Plan to the Secretary for approval.	Low	Airly Mine will review, update and submit the management plan to the relevant government agencies for review and comment.

12 INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

There were no non-compliances for Airly Mine in 2016. There was one incident recorded during March 2016, this incident is detailed in Table 9 below.

Table 12.1: Incident/Non-Compliance Summary

Nature of the incident/non-compliance	Diesel spill as a result of a derailed Pacific National locomotive on Airly Mine's rail loop within ML1331.
Date of incident/ non-compliance (if known; if not known state not known)	17 March 2016
The location of the incident/ non-compliance (include a figure if appropriate), if known	Near the point change intersection on Airly Mine's rail loop within ML1331.
Detail the cause of the incident/non-compliance	The lead locomotive of an unloaded Pacific National train derailed shortly after the point intersection on Airly Mines rail loop. The locomotive came to rest on an angle that was suffice to cause diesel to spill from the overflow/breather ports of the fuel tanks. Less than 200L of diesel was spilt.
Detail action that has been, or will be,	Diesel was siphoned from the tanks into

taken to mitigate any adverse effects of the incident/ non-compliance	a self banded trans tank to prevent further spillage. Once the locomotive was re-railed and the train removed, contaminated material was excavated and removed from the site to a designated waste facility. The spill site was also treated with a hydrocarbon bio-remediation product to mitigate against any residual contamination. The area where the spill occurred was confined to hard compacted ballast and gravel foundations. No diesel migrated from the site. No environmental harm was observed.
Detail action that has been, or will be, taken to prevent recurrence of the incident/ non-compliance	Rail repair works completed. Additional precautions implemented by Pacific National and Airly Mine to help prevent future derailment. PIRMP reviewed and tested annually.
Consultation with relevant agency (who, when and the response), or agencies if more than one	Enviro-line was notified immediately, NSW Fire & Rescue Pumper and HAZMAT crews attended site. EPA attended site. Incident report supplied to EPA and DRE and also detailed within CCC meetings. No further action required by site.

Table 12.2: Summary of Reportable Incidents and Regulatory Actions

Compliance Type	Agency	Number	Response
Incidents	EPA	1	See Table 9.
Caution Notices	N/A	0	N/A
Warning Letters	EPA	1	See below.
Penalty Notices	N/A	0	N/A
Prosecutions	N/A	0	N/A

Note: This table includes actions taken by DPE, DRE and the EPA during the reporting period.

A Formal Warning Letter from the EPA dated 3 March 2016, relating to a 2015 non-compliance, was received 11 March 2016. The Warning Letter was for a failure to test PIRMP within a 12 month period. Airly Mines Annual Return detailed that the PIRMP was last tested on 12 November 2014. Airly Mine was therefore non-compliant on 13 November 2015.

Airly Mine tested the PIRMP on 14 March 2016 and activated the PIRMP on 17 March 2017. A review of the PIRMP was conducted on 17 November 2017 and uploaded to the Centennial Coal website. The Airly PIRMP will be tested and reviewed on an annual basis to maintain compliance with EPL12374. No further action was required.

13 ACTIVITES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

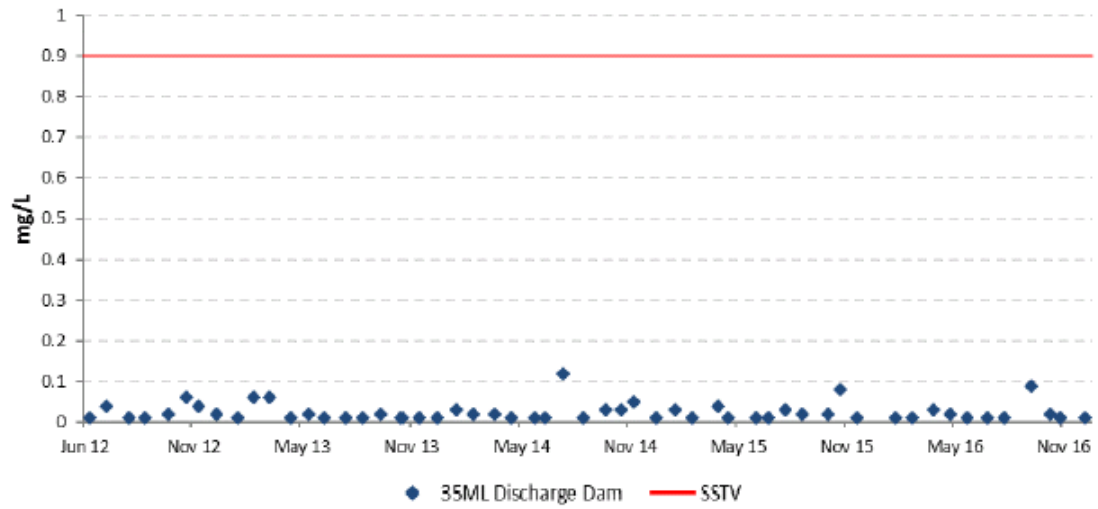
The activities proposed for 2017 are summarised below:

- Preparation and submission of variance Environmental Management Plans required by SSD_5581;
- Preparation and submission of a revised Mining Operations Plan / Rehabilitation Management Plan required by SSD_5581;
- Preparation and submission of an Extraction Plan for the Airly Mine Extension Project;
- Ongoing flora and fauna monitoring work over the lease areas;
- Coal mining activity;
- Annual noise monitoring;
- Continued weed and pest management;
- Surface Water Monitoring;
- Groundwater Monitoring;
- Depositional Dust Gauge monitoring;
- Maintenance of erosion and sediment control structures;
- Community Consultative Committee meetings;
- Ongoing consultation with the community to be maintained.

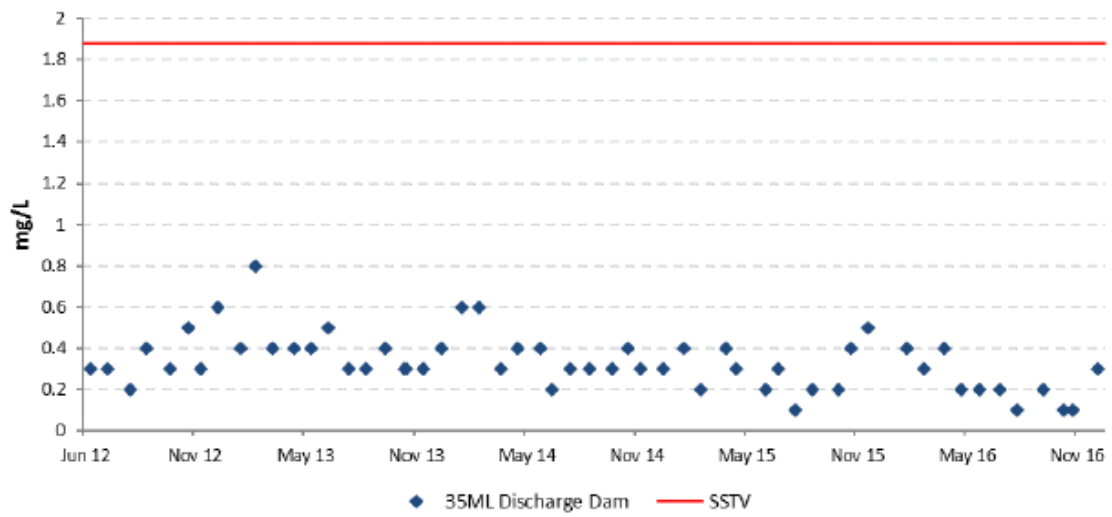
APPENDICES

Appendix A – Surface Water Quality: 35ML Discharge
Dam - Additional Water Quality Data

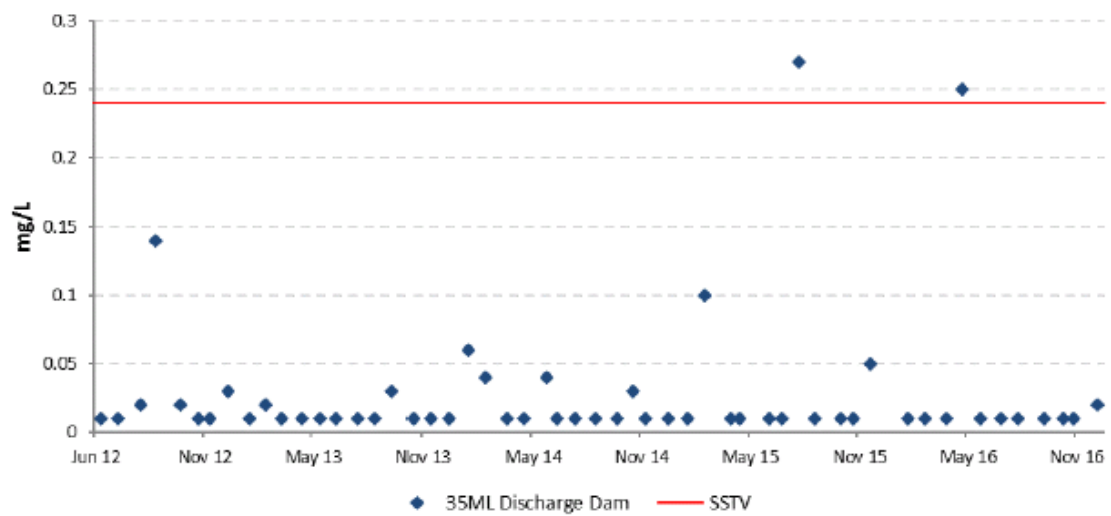
Ammonia as N



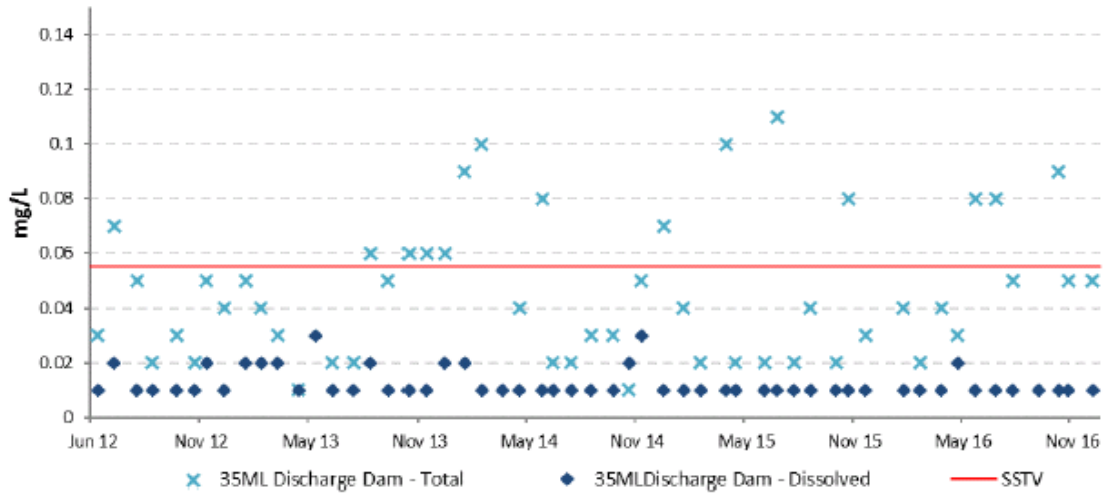
Total Nitrogen



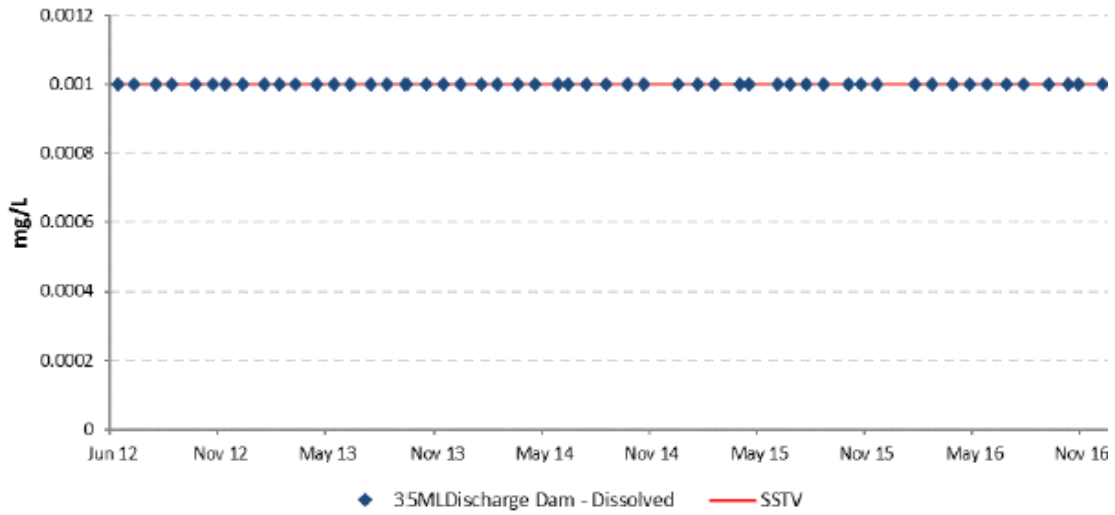
Total Phosphorus



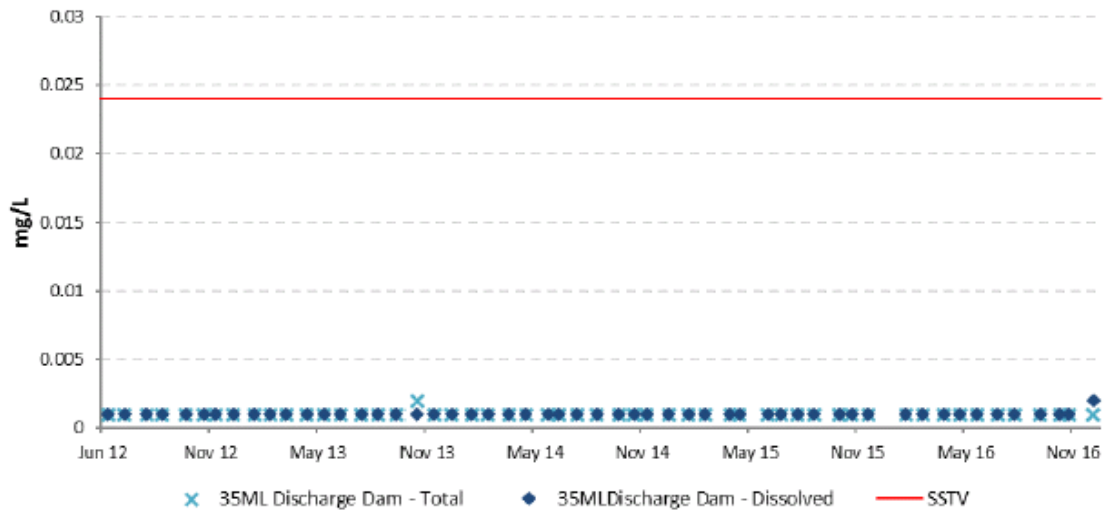
Aluminium

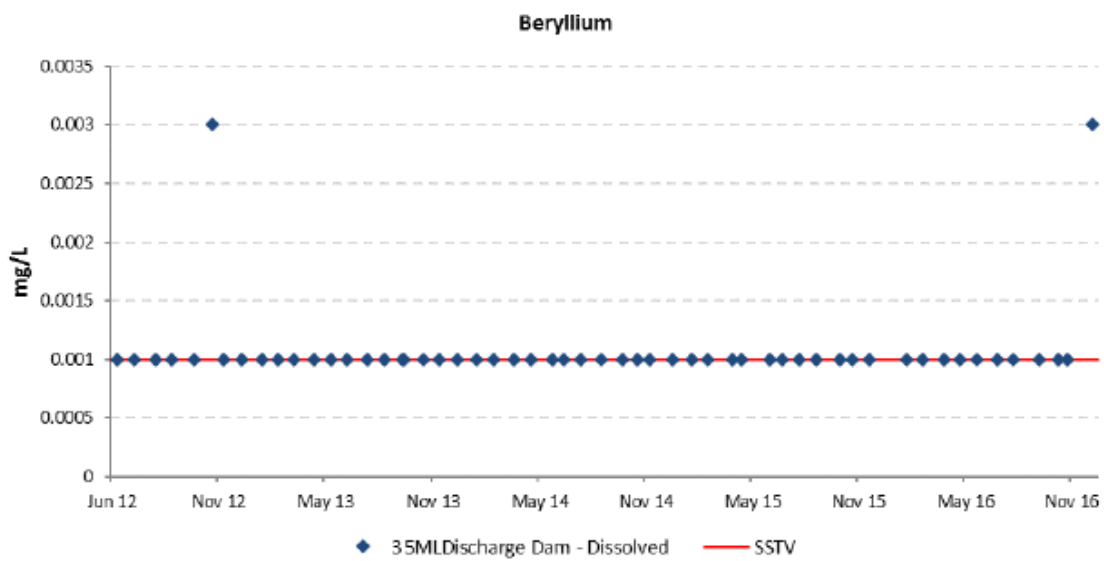
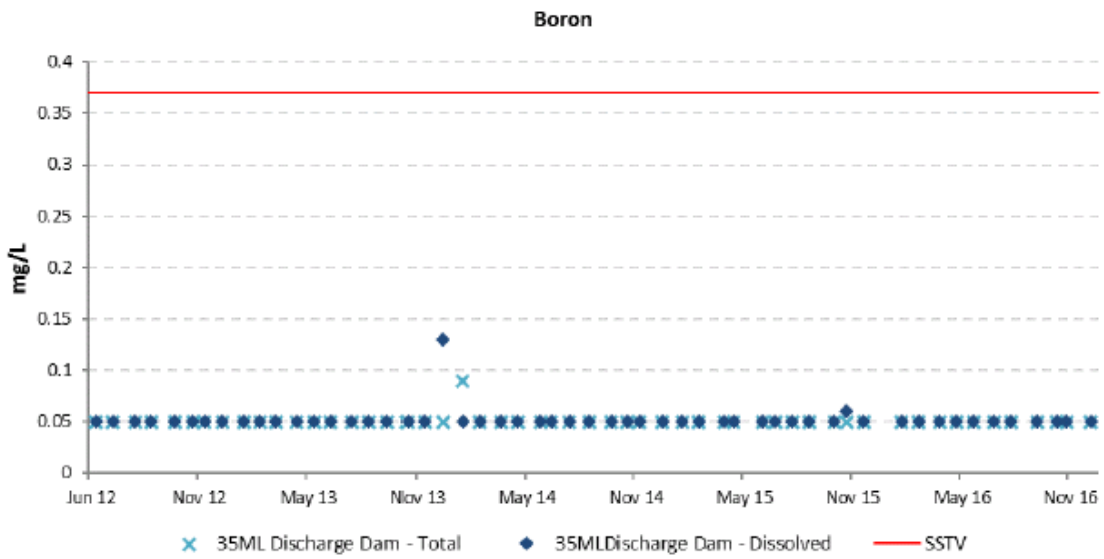
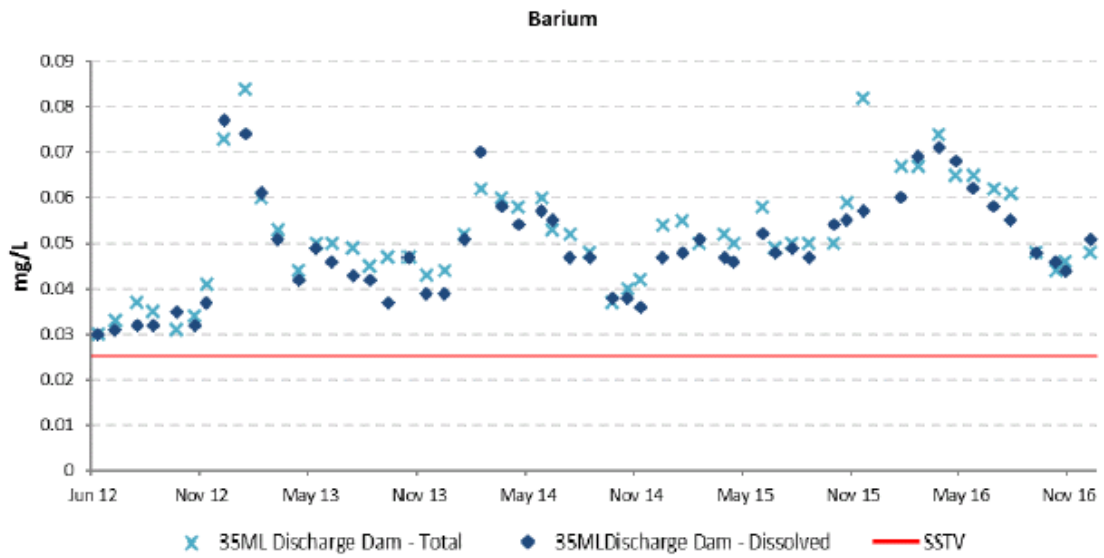


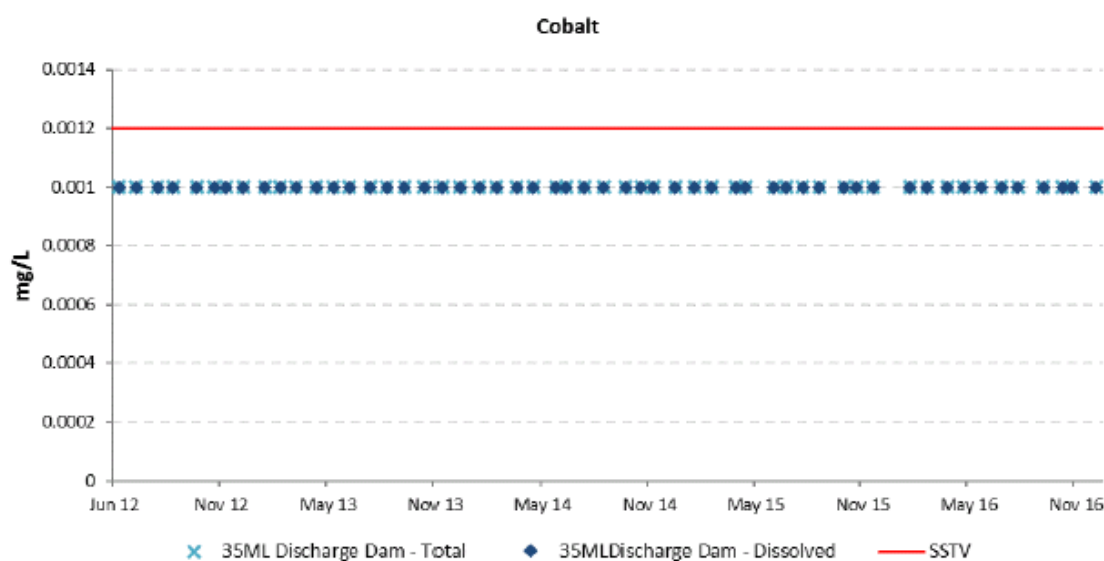
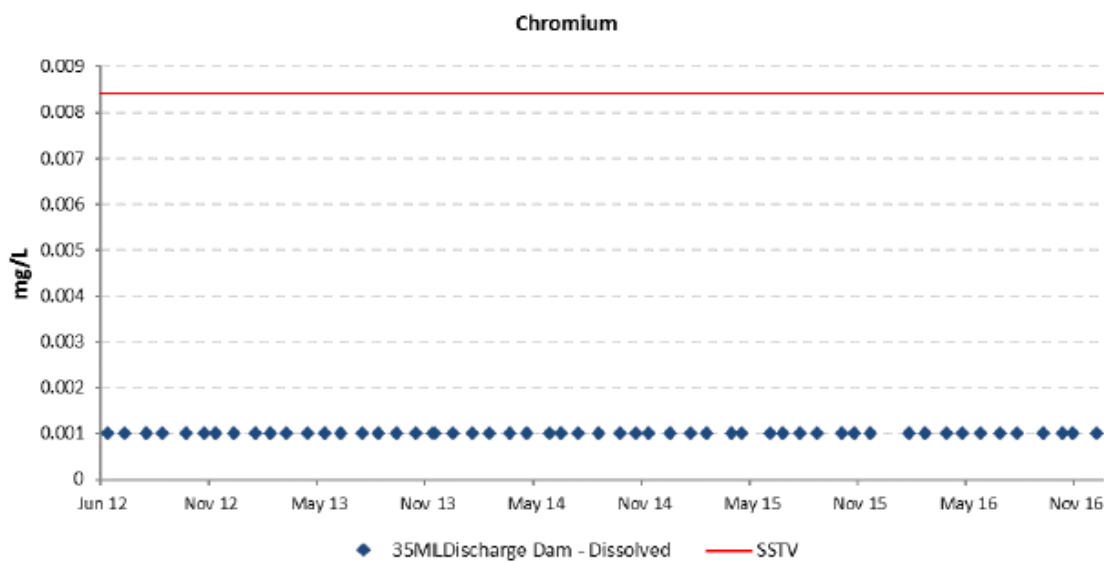
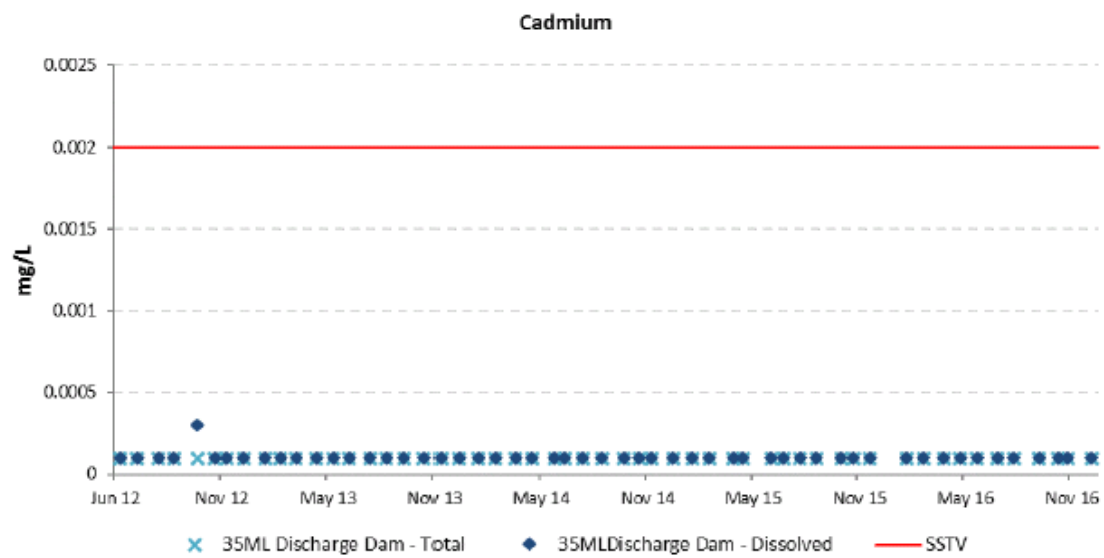
Antimony



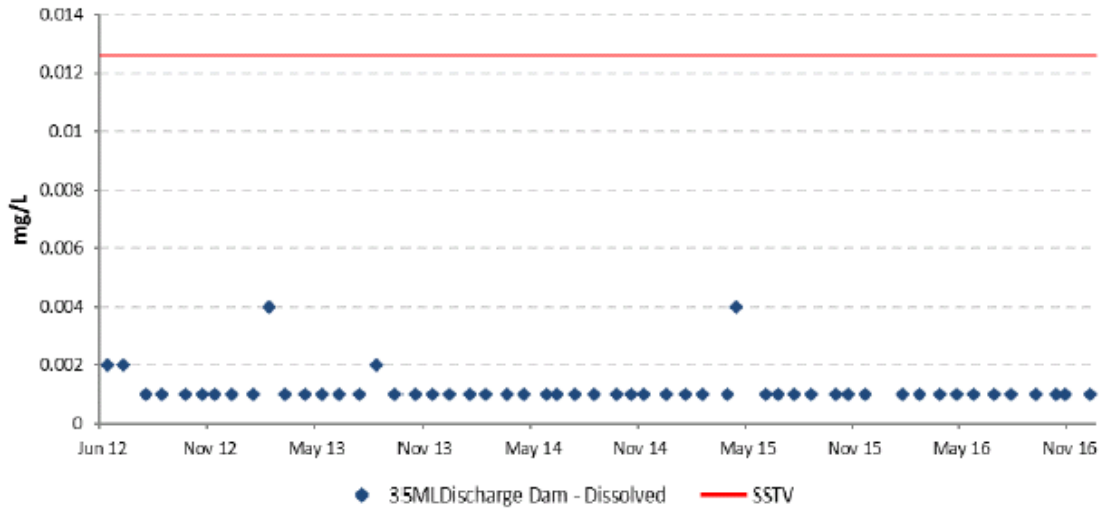
Arsenic



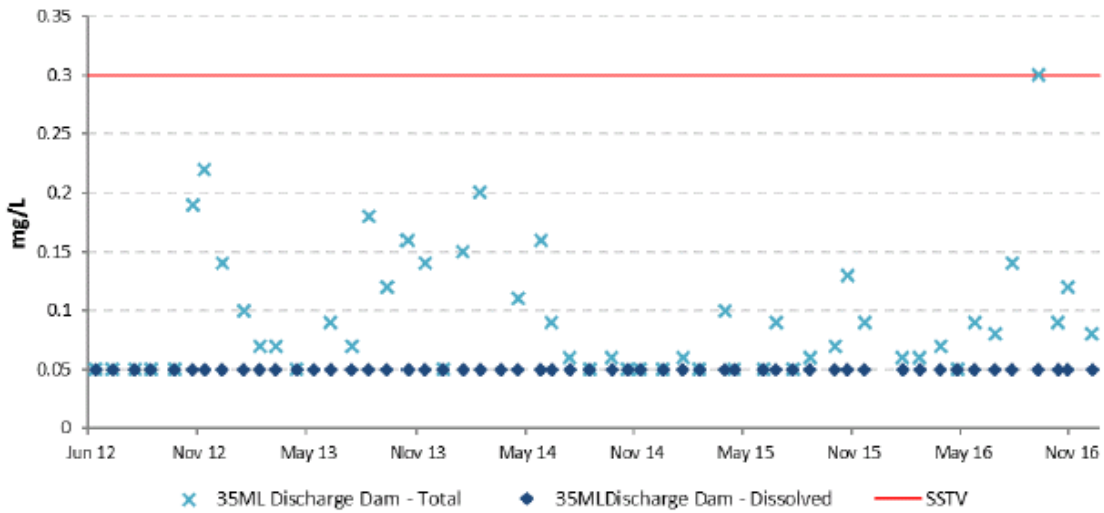




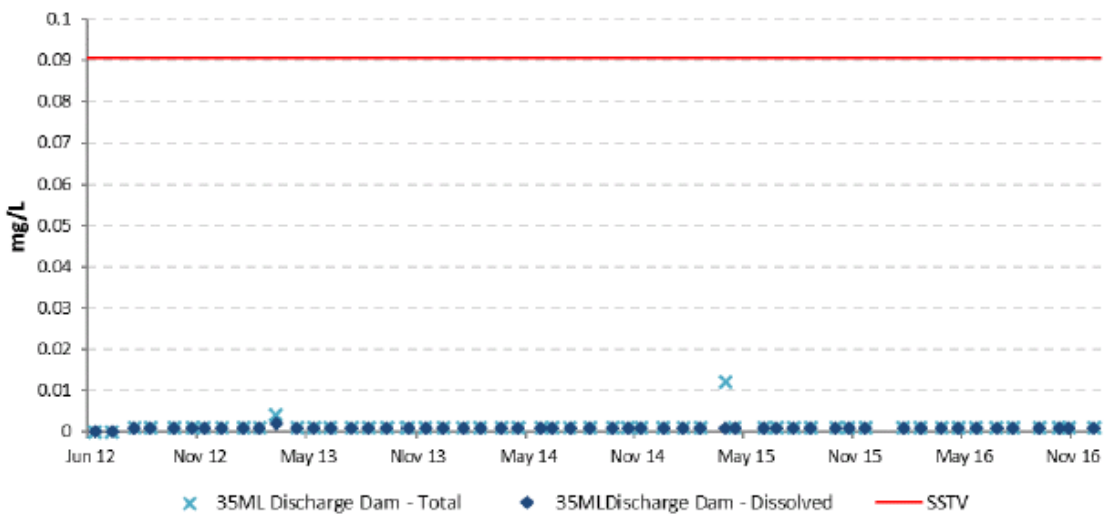
Copper



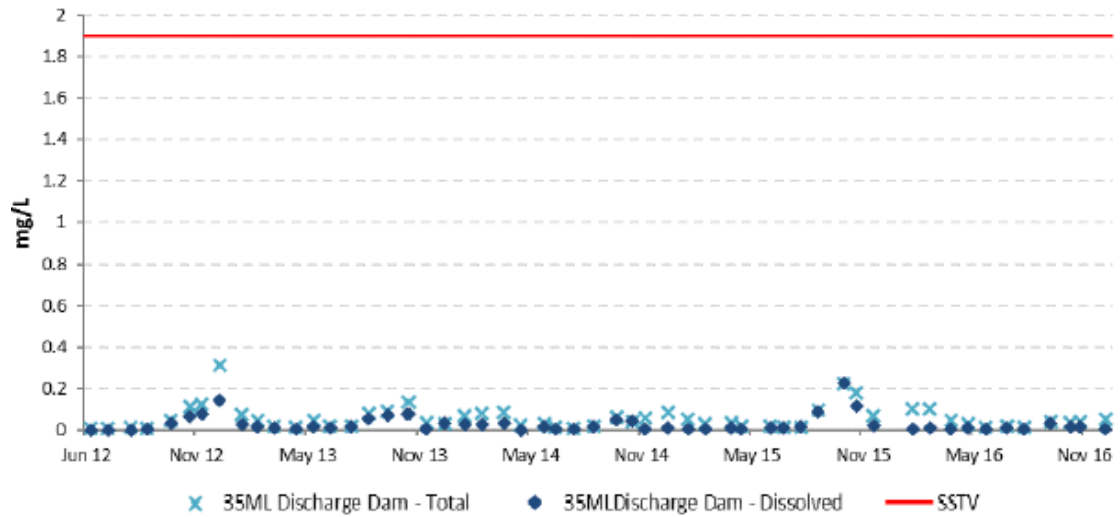
Iron



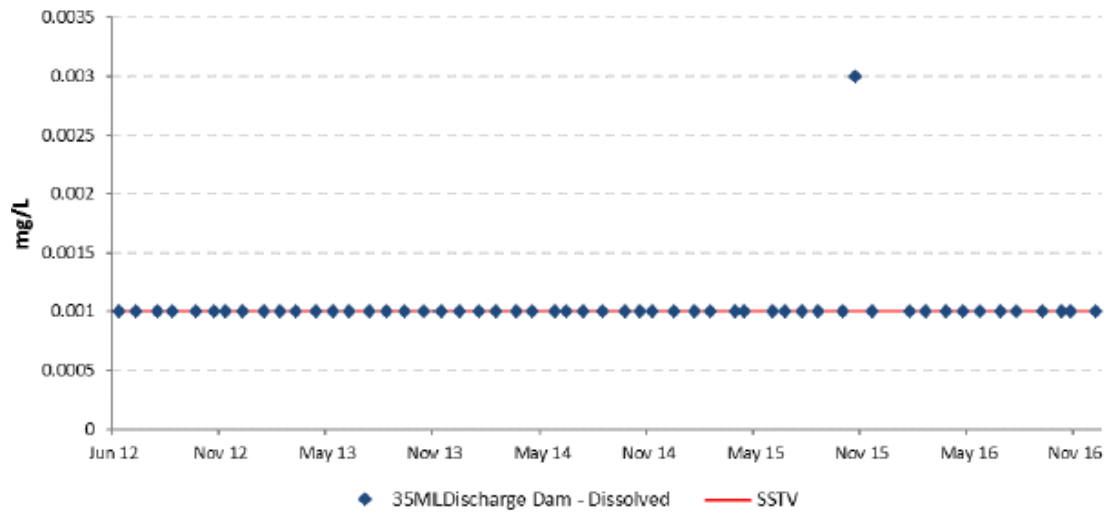
Lead



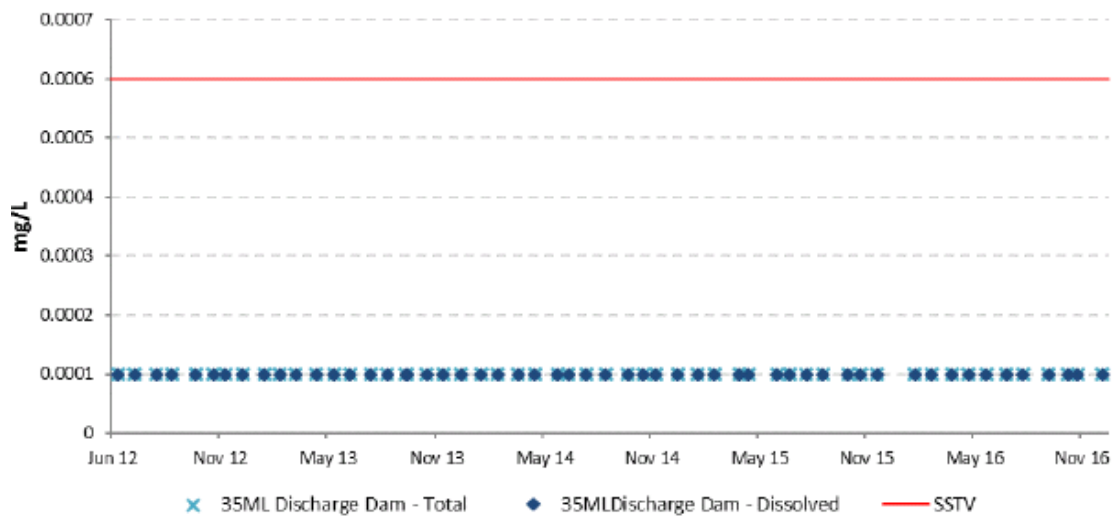
Manganese

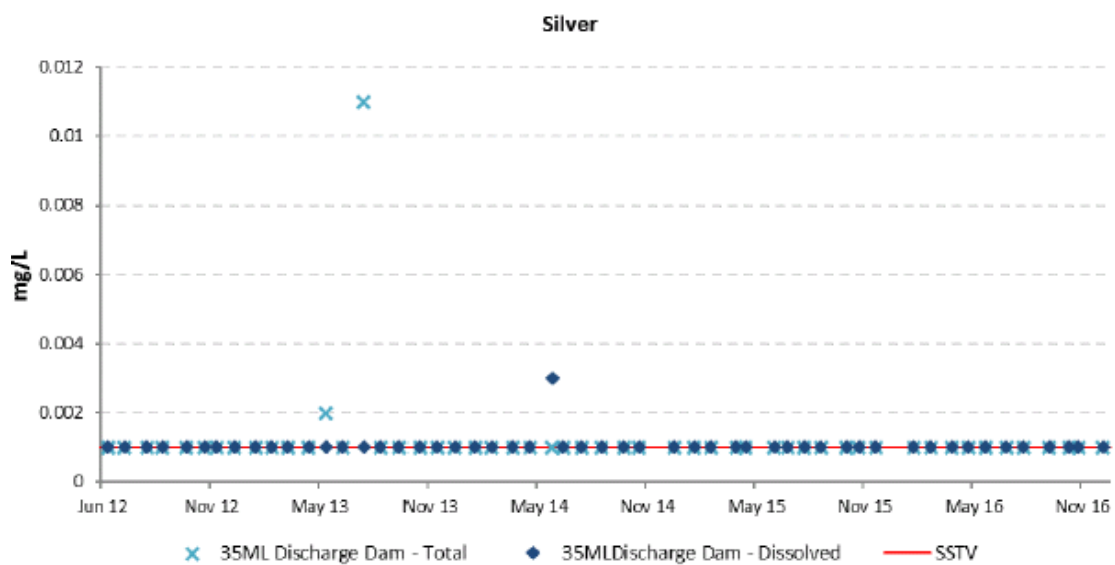
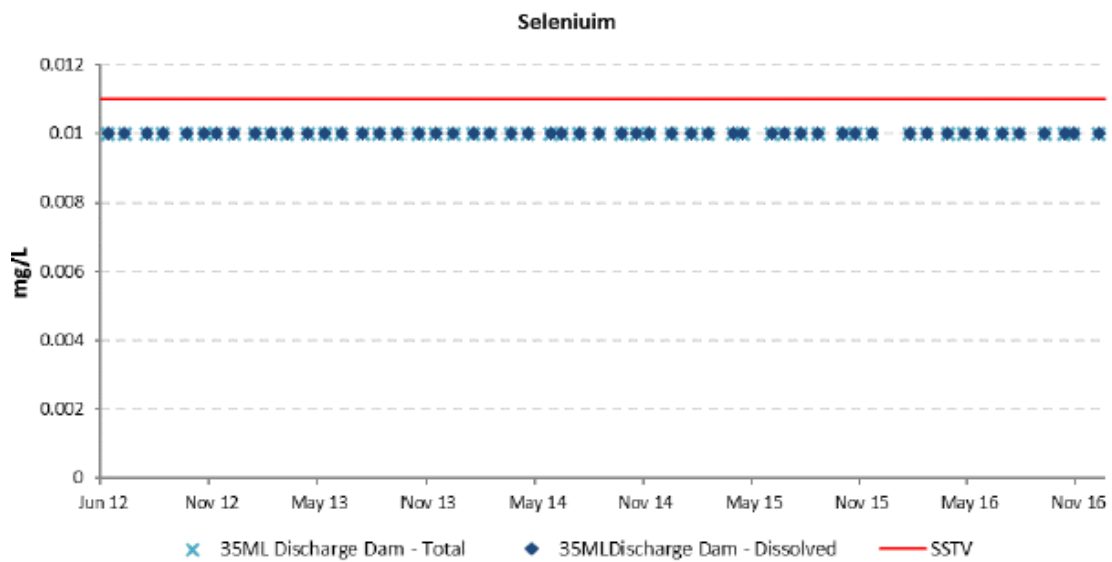
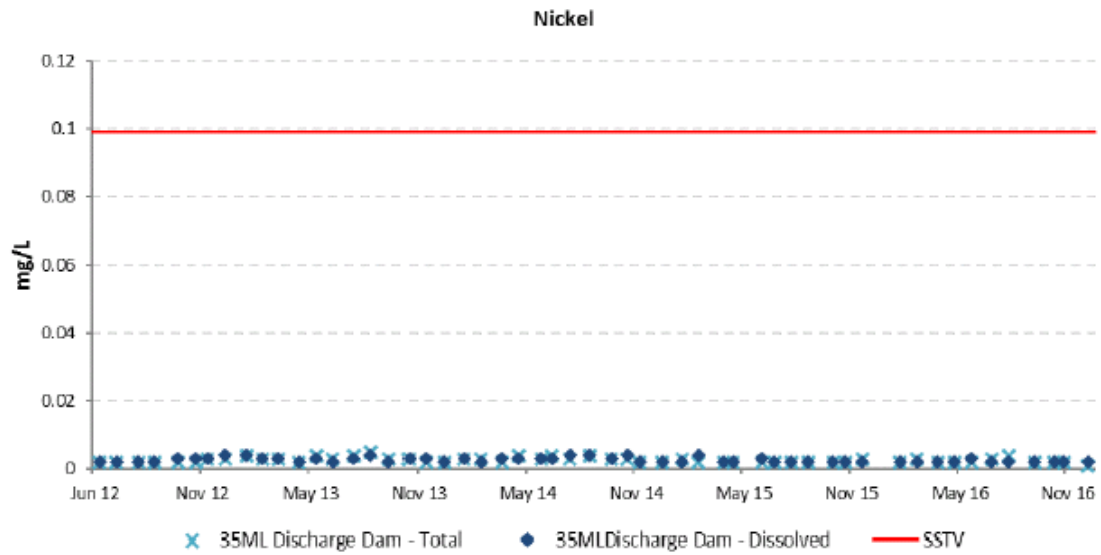


Molybdenum

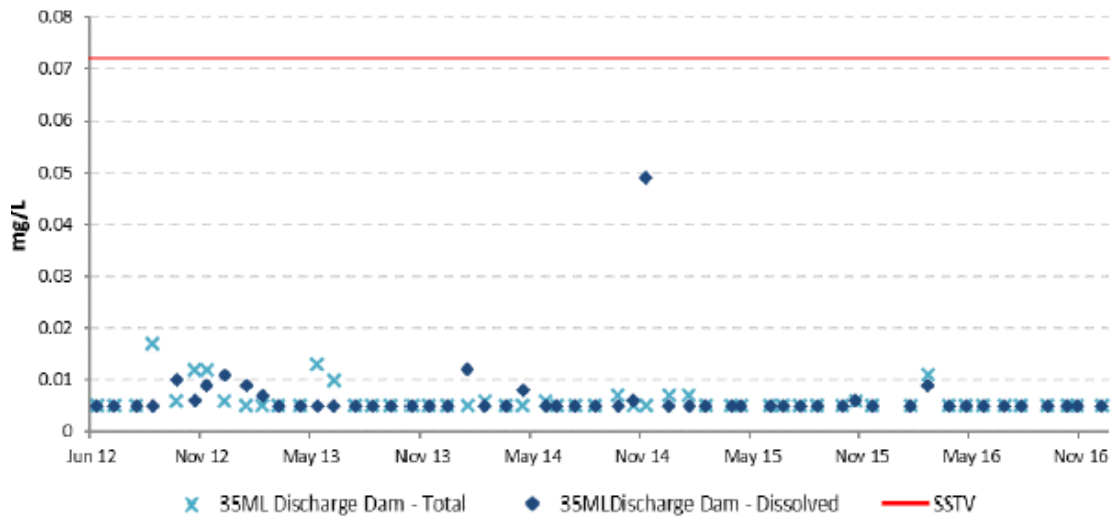


Mercury

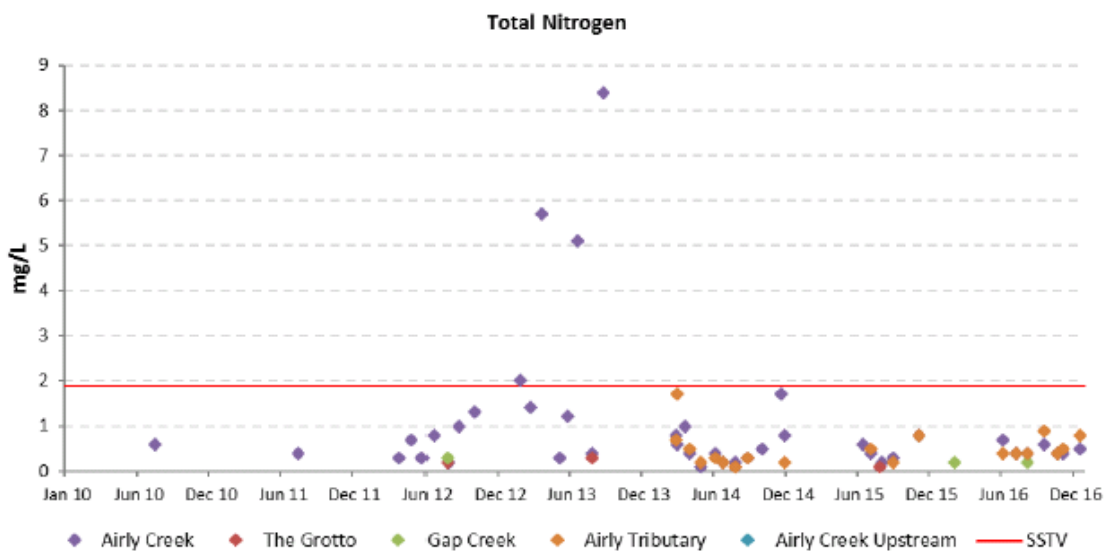
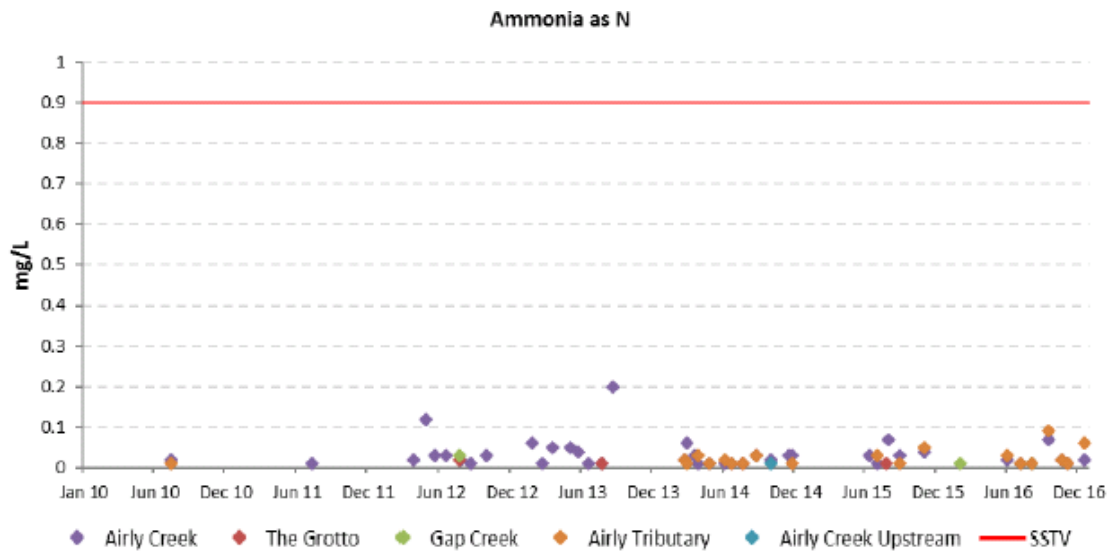
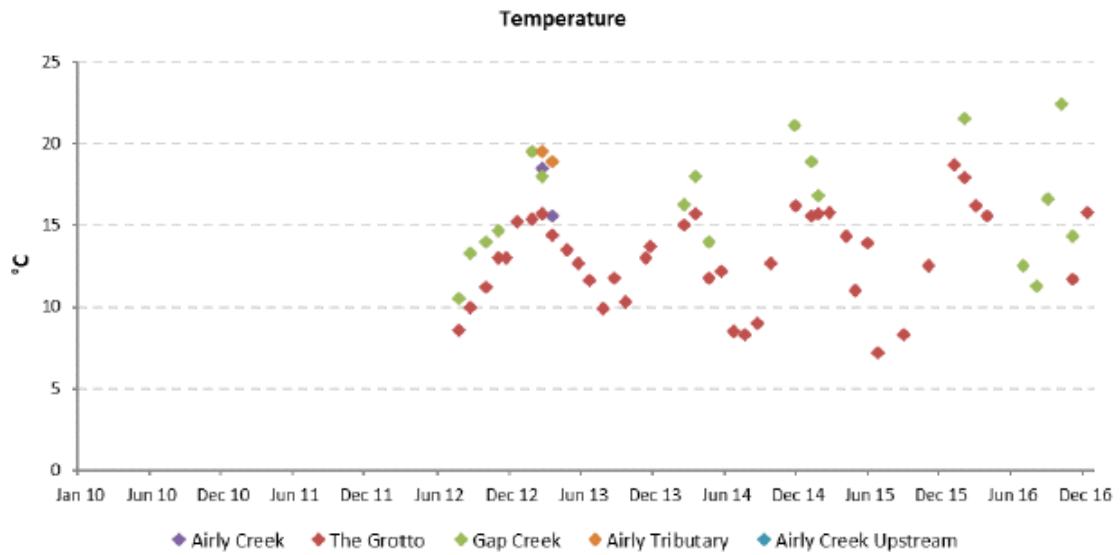


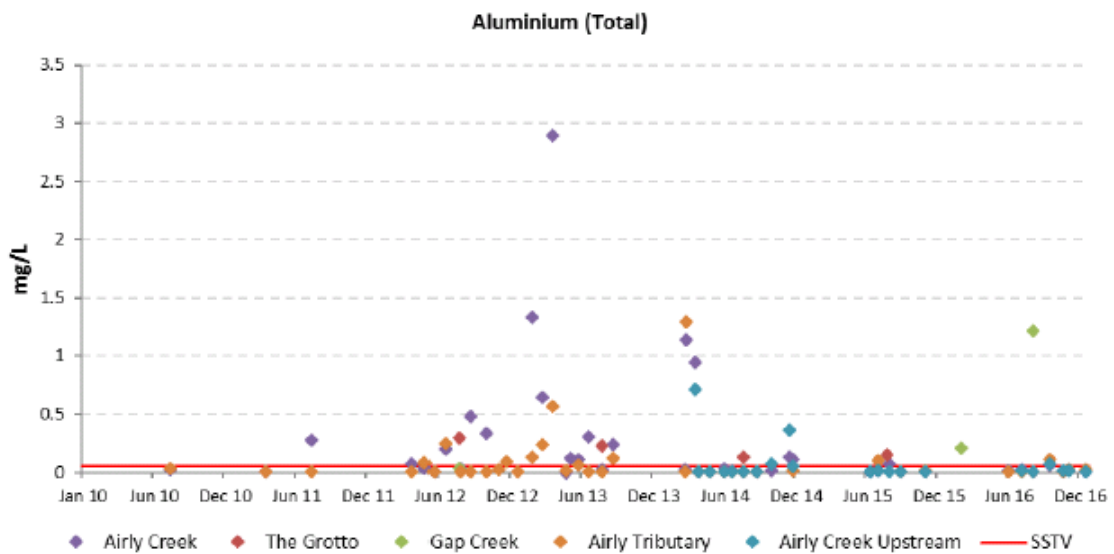
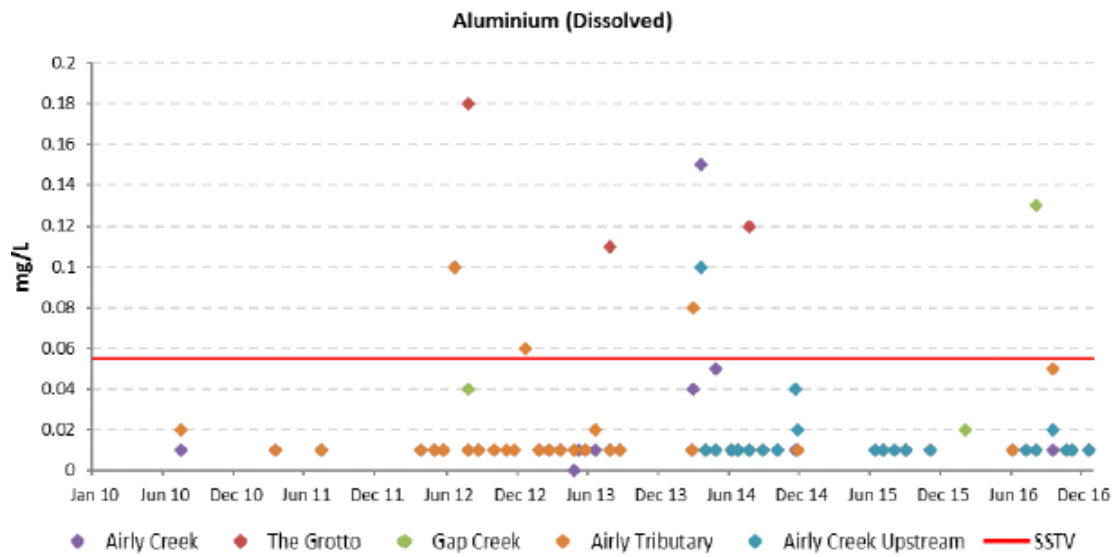
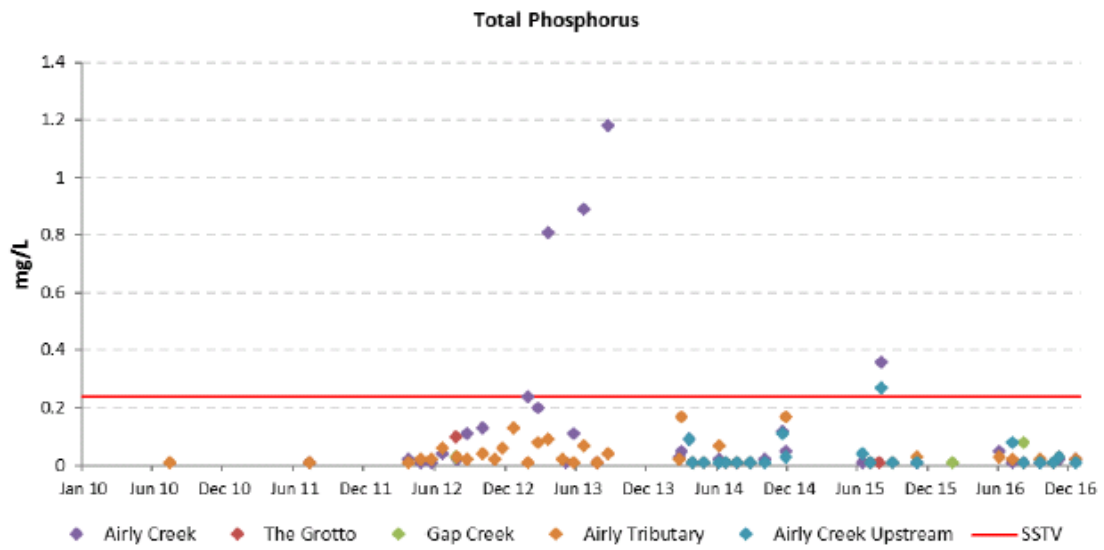


Zinc

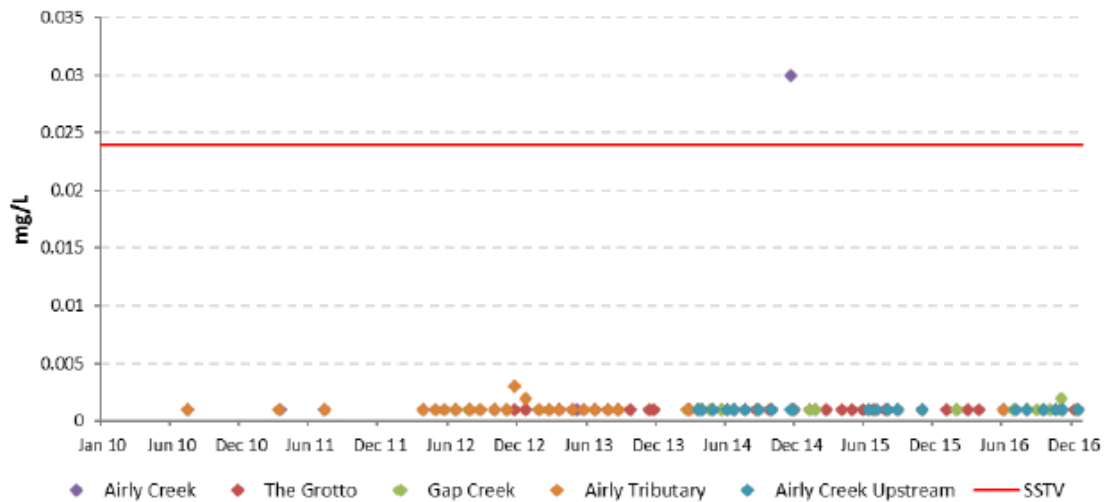


Appendix B – Surface Water Quality: *Airly Creek, Airly Creek Upstream, Airly Tributary, The Grotto, & Gap Creek*
- *Additional Water Quality Data*

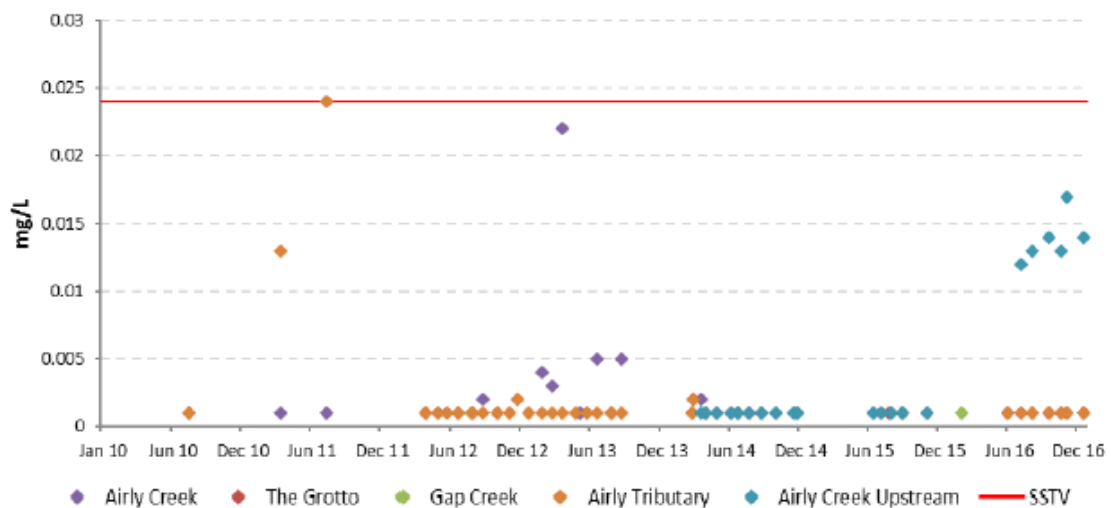




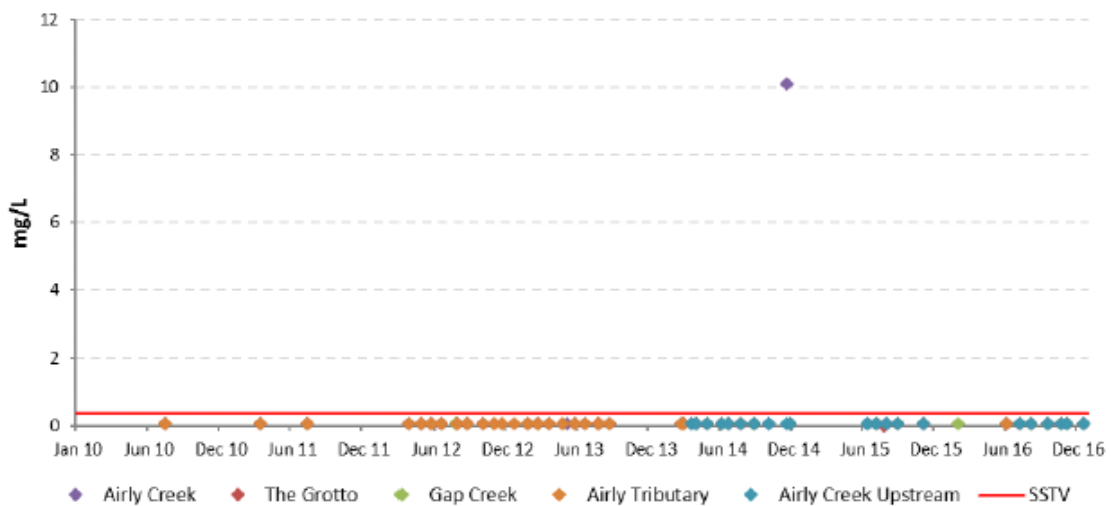
Arsenic (Dissolved)

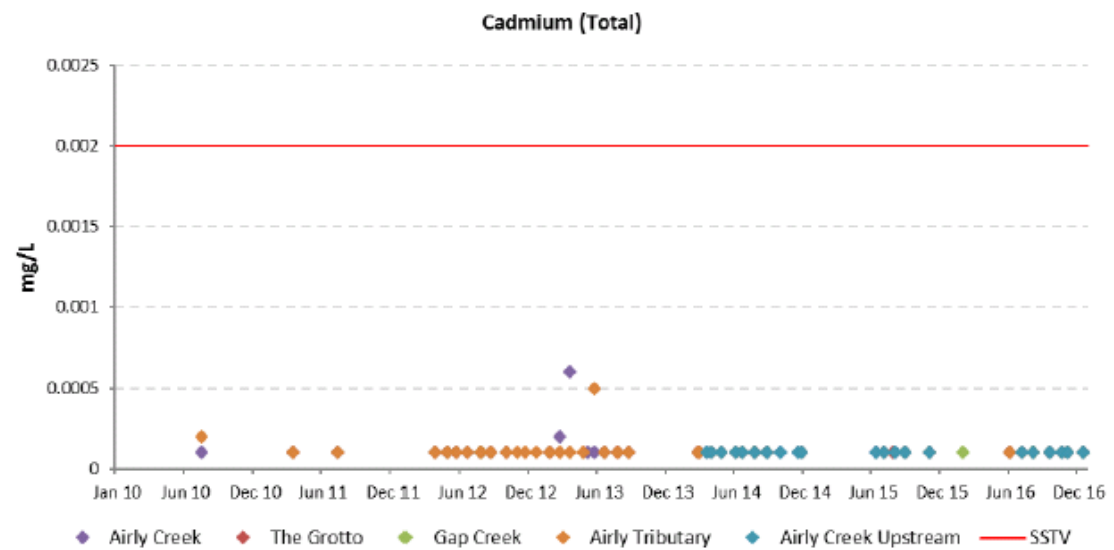
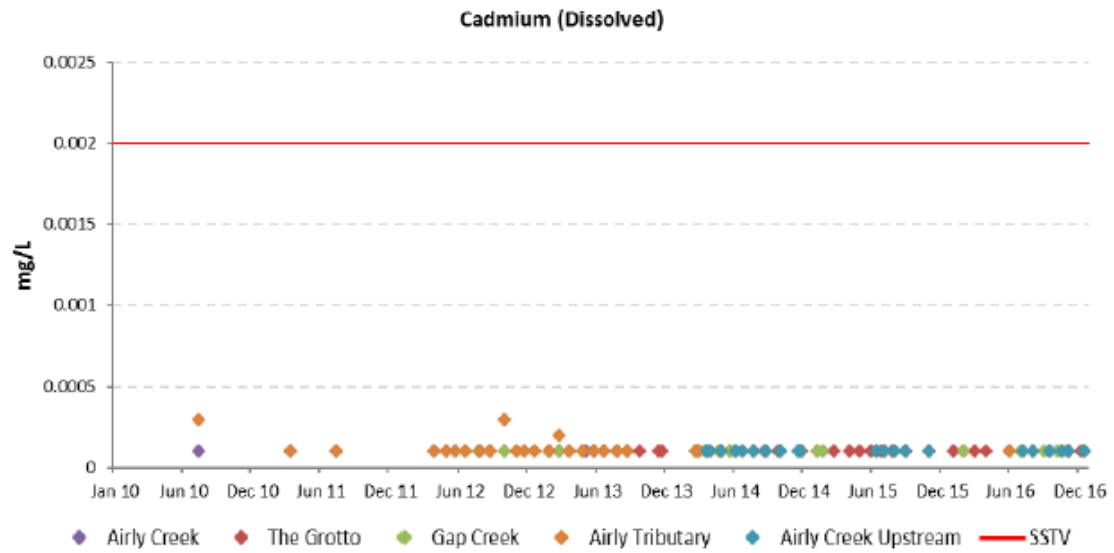
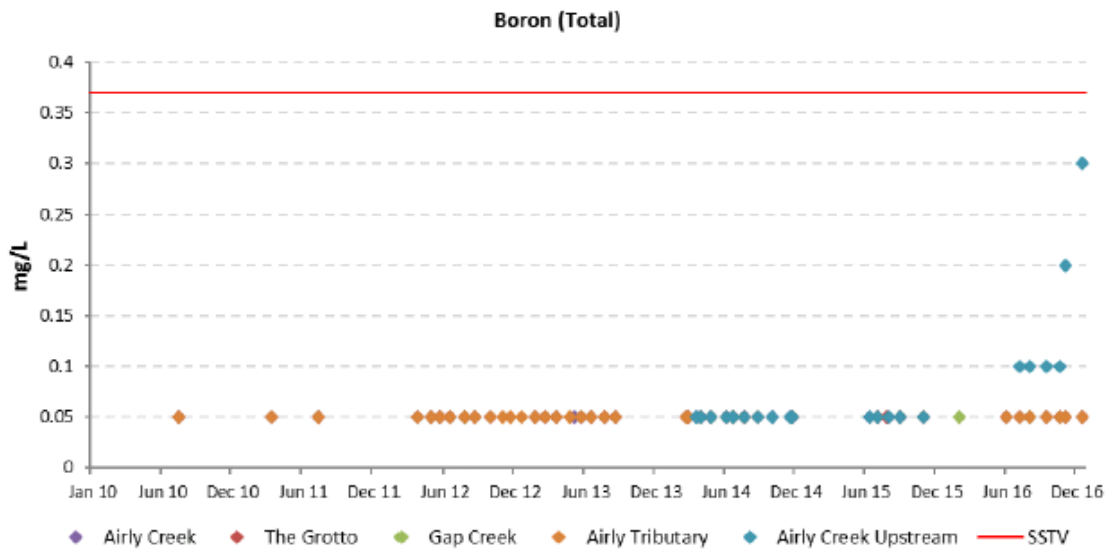


Arsenic (Total)

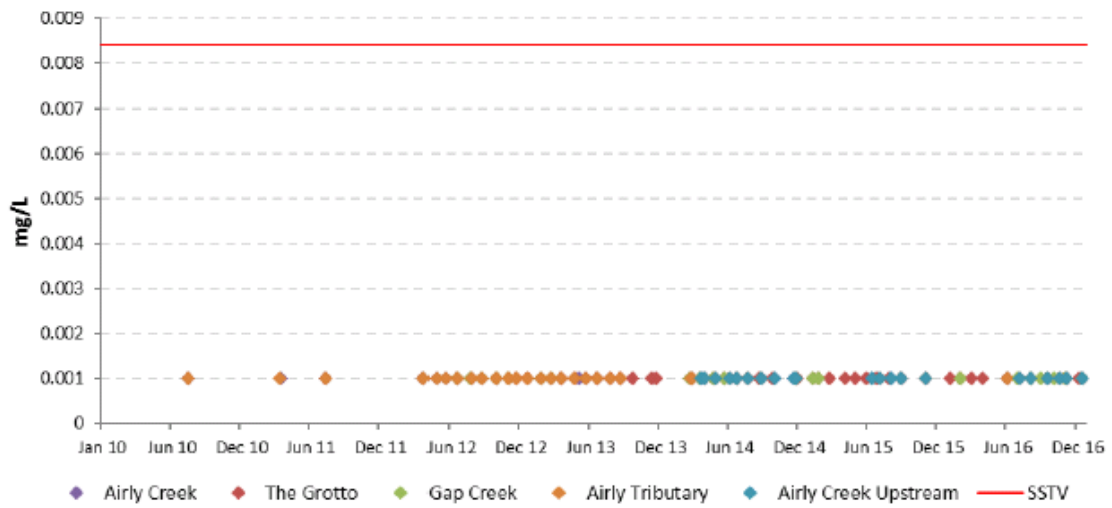


Boron (Dissolved)

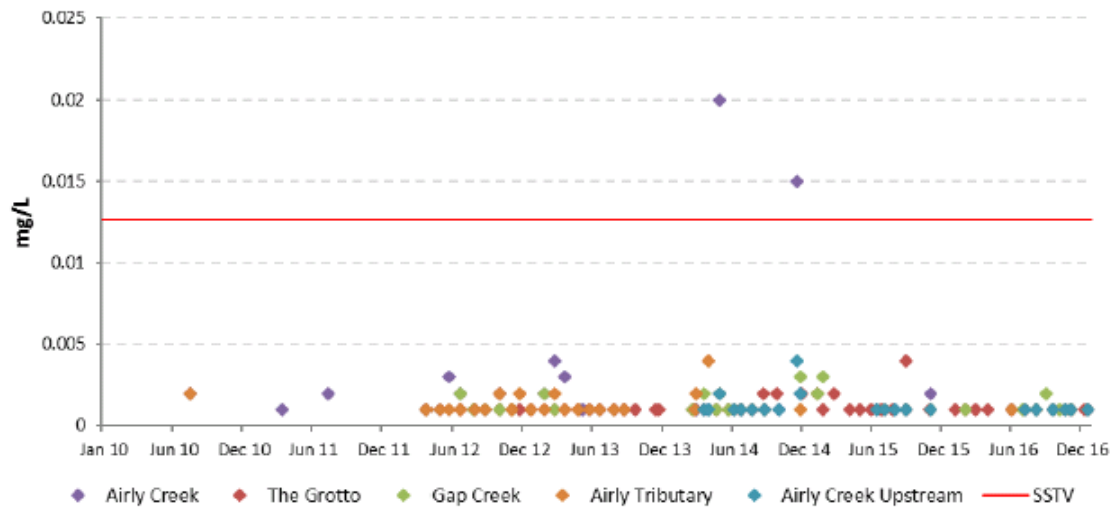




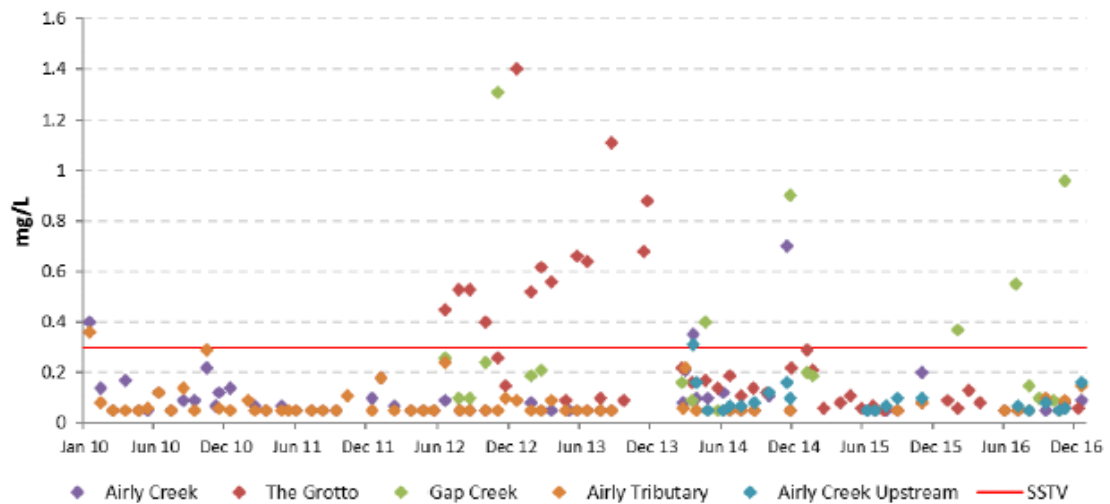
Chromium (Dissolved)

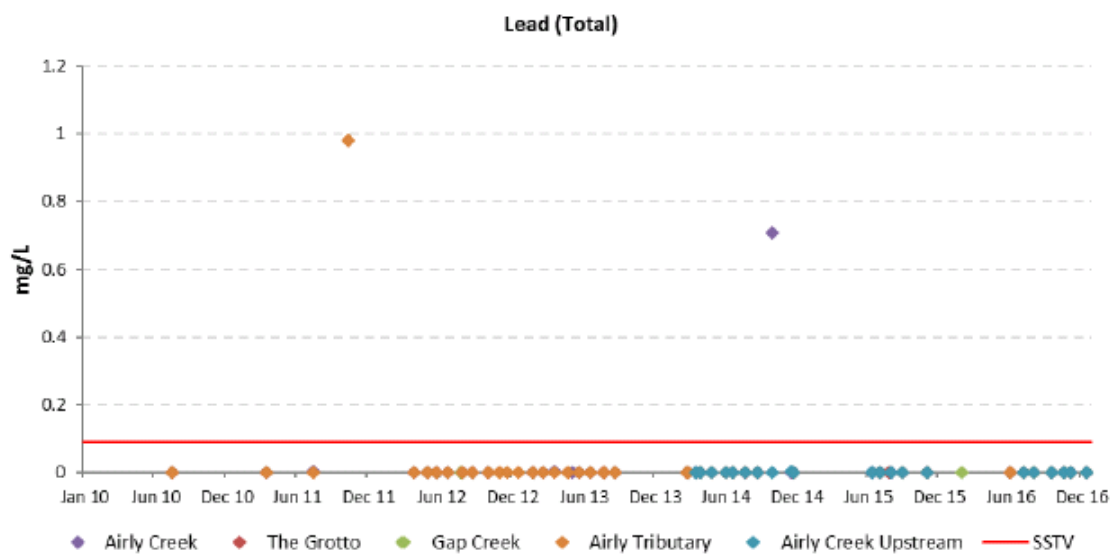
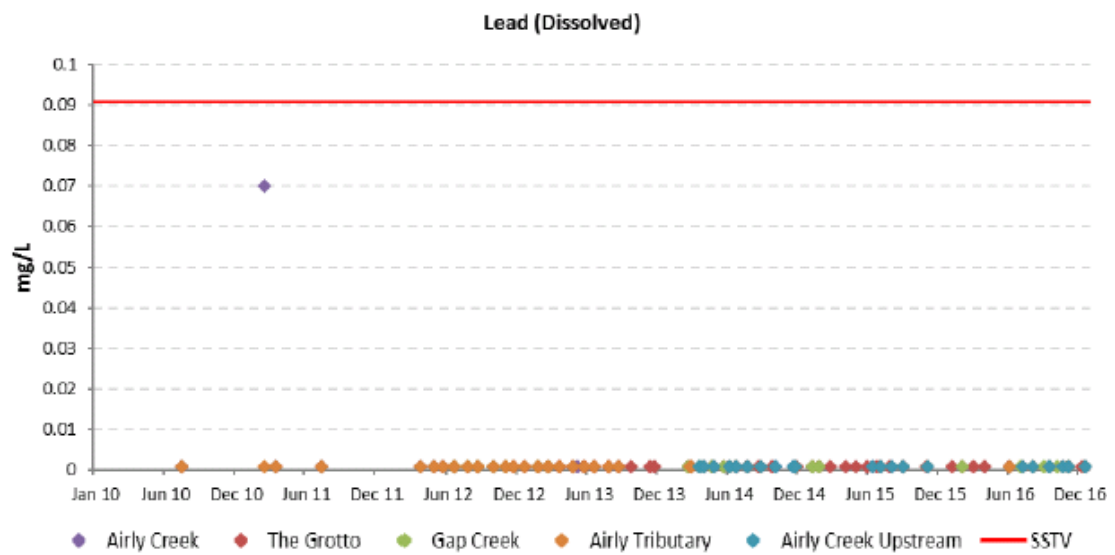
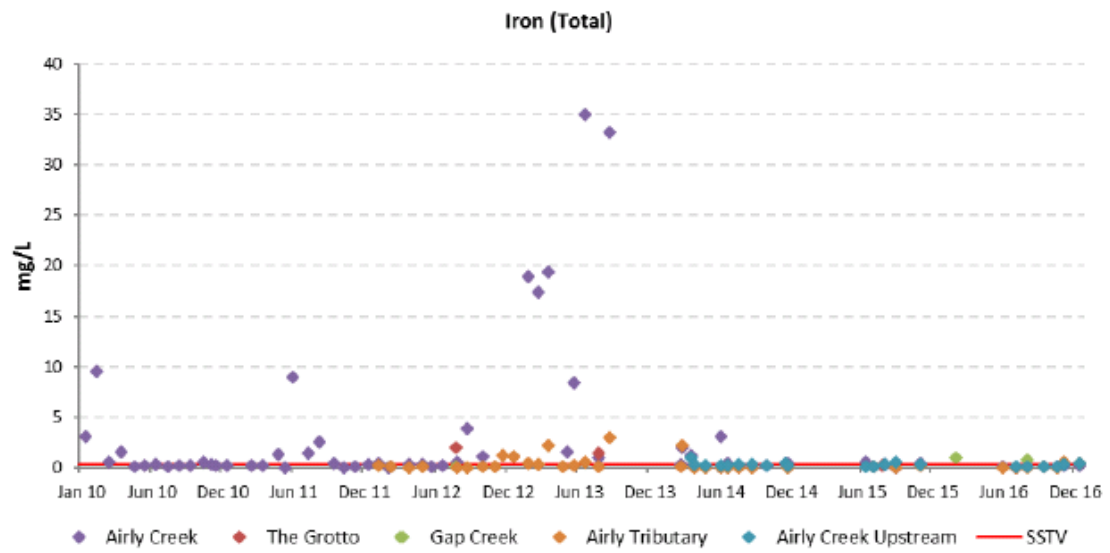


Copper (Dissolved)

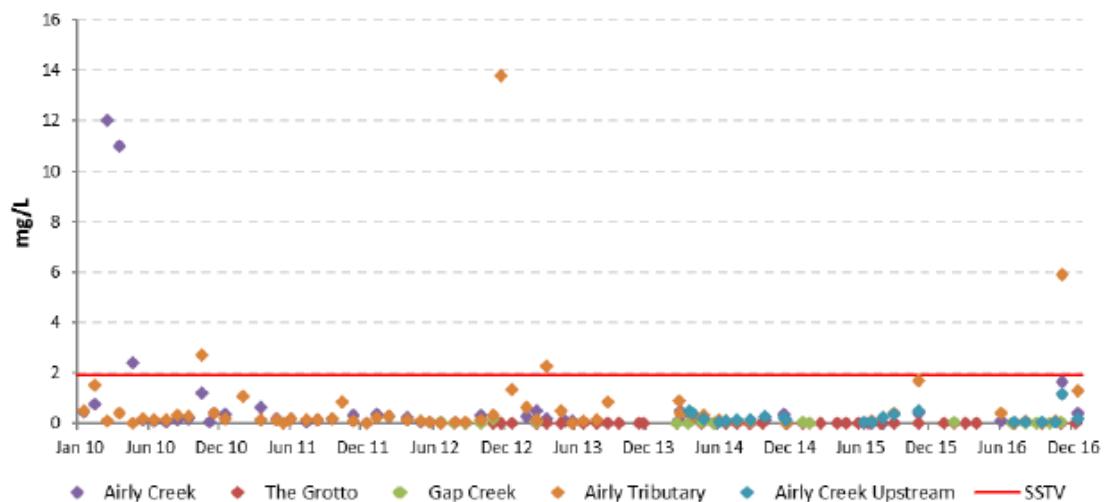


Iron (Dissolved)

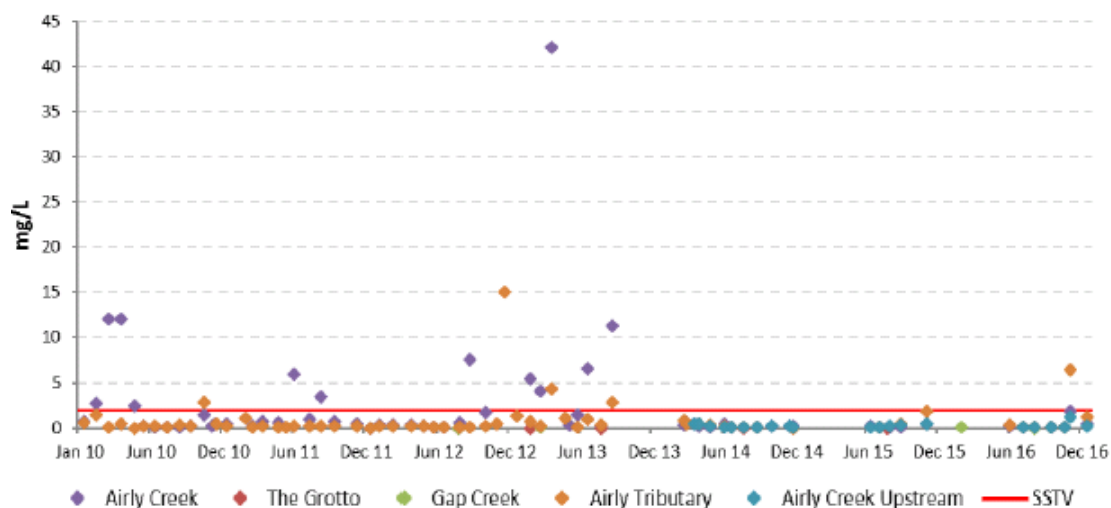




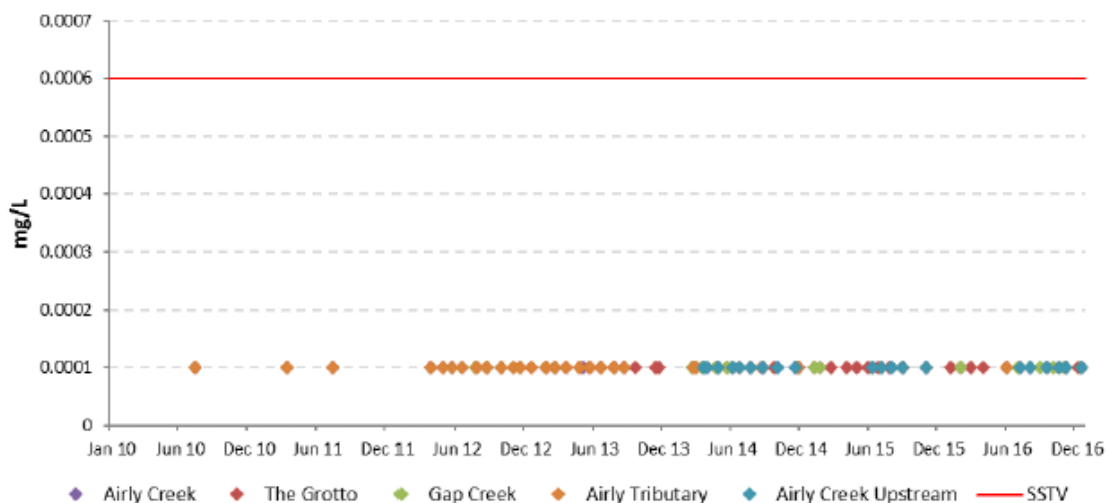
Manganese (Dissolved)

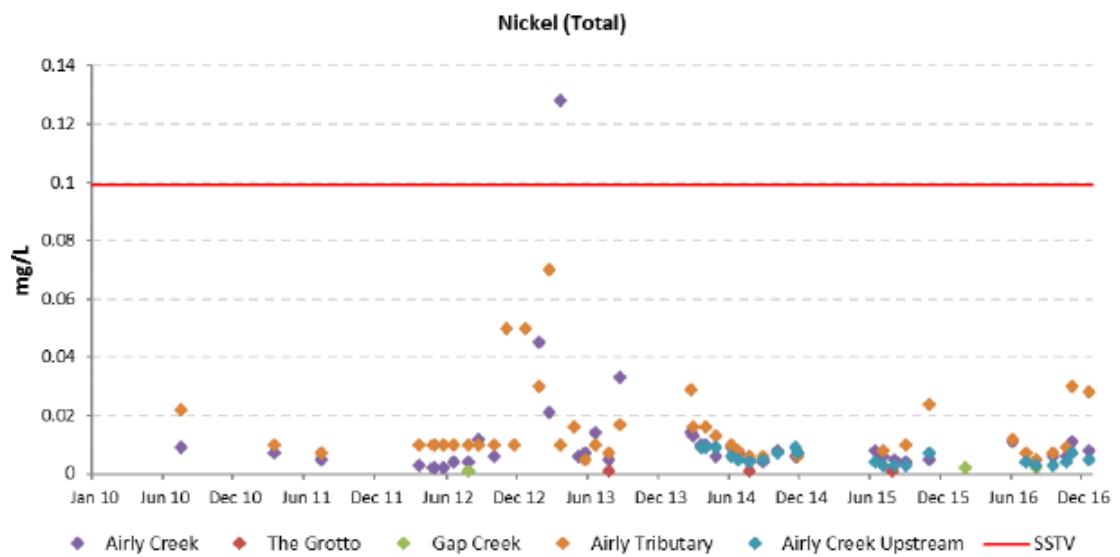
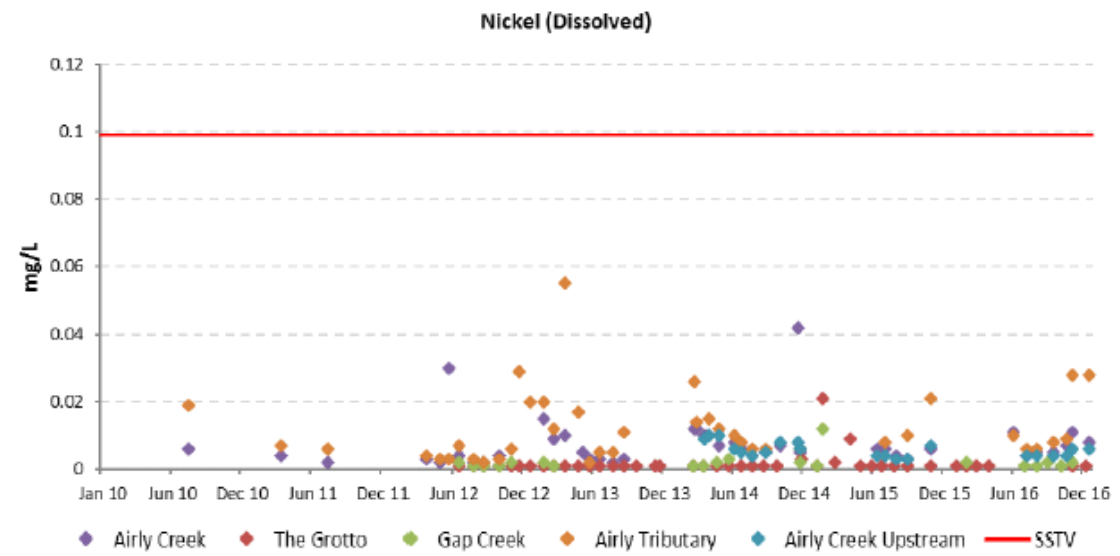
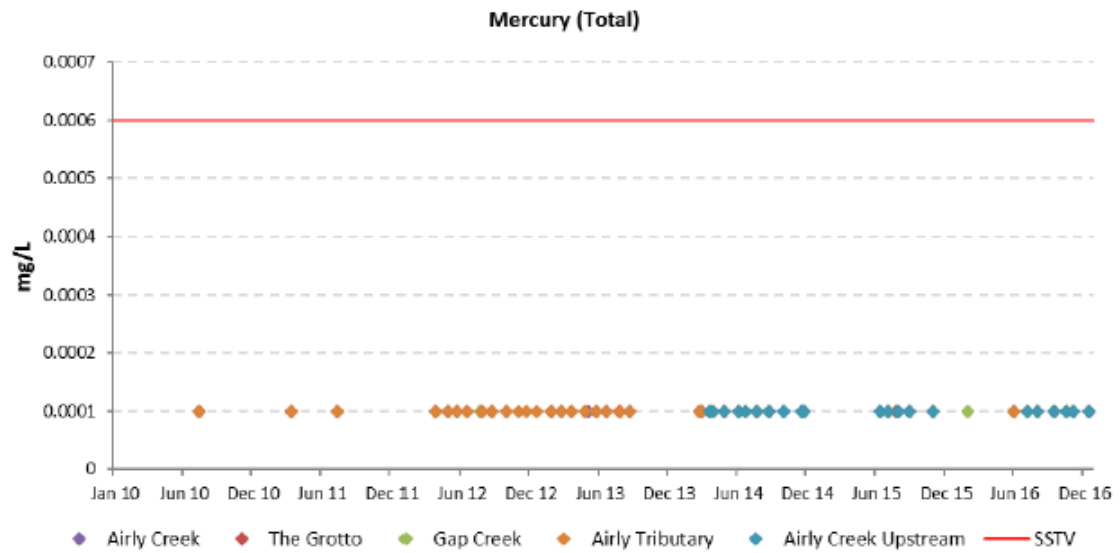


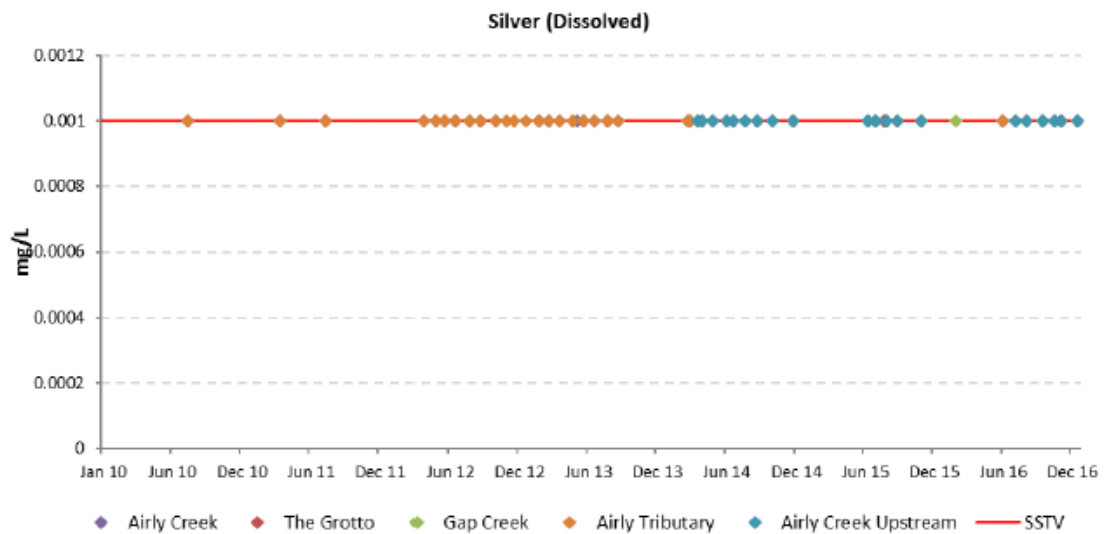
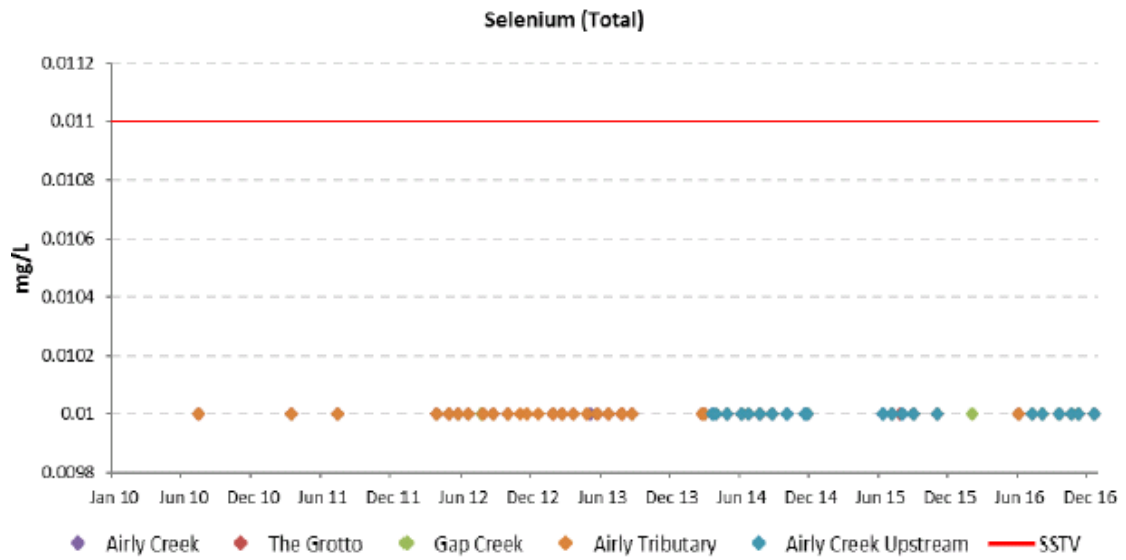
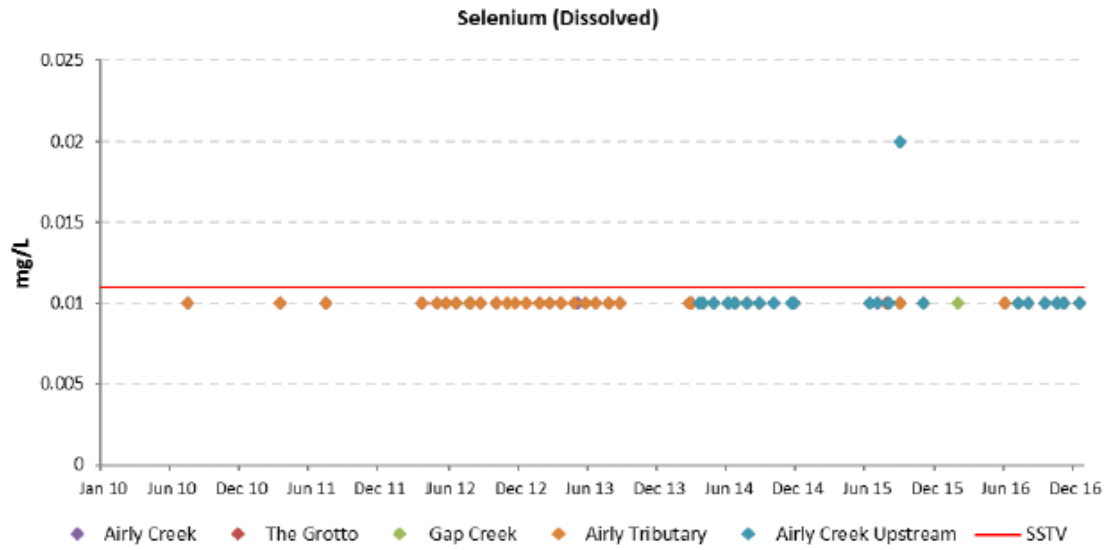
Manganese (Total)

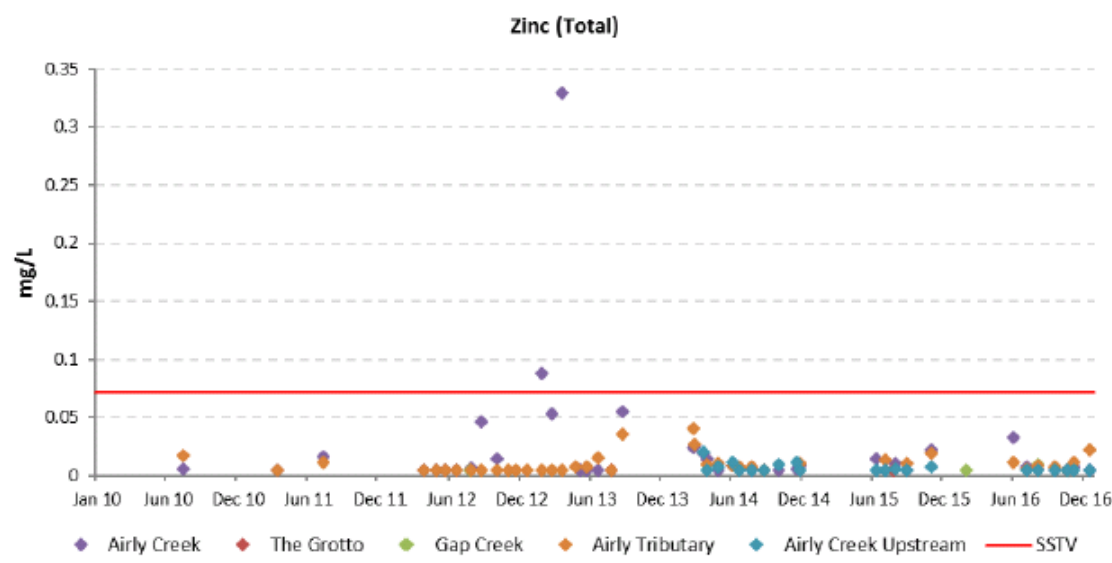
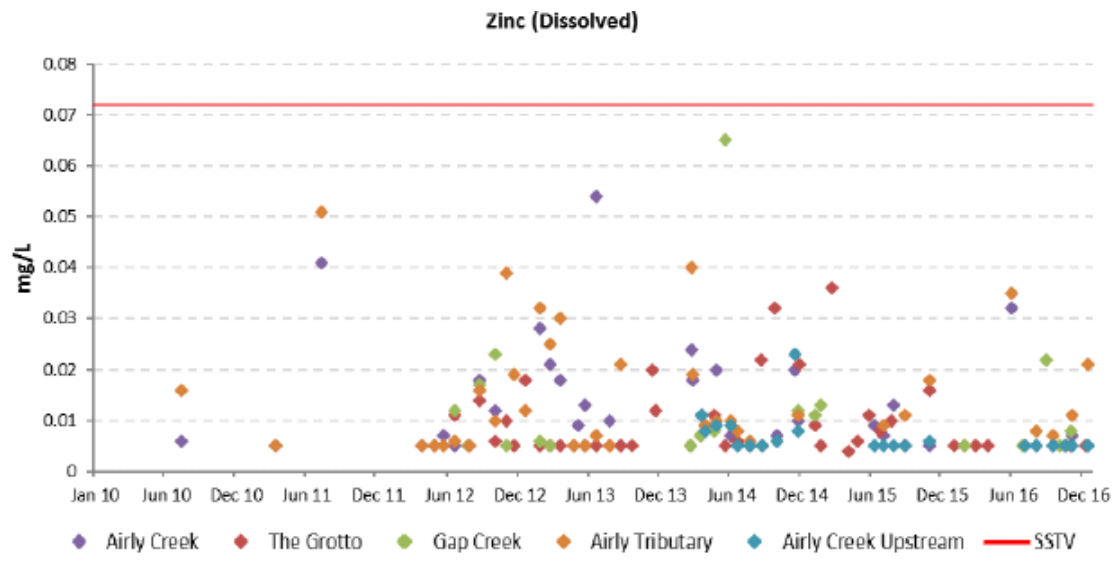
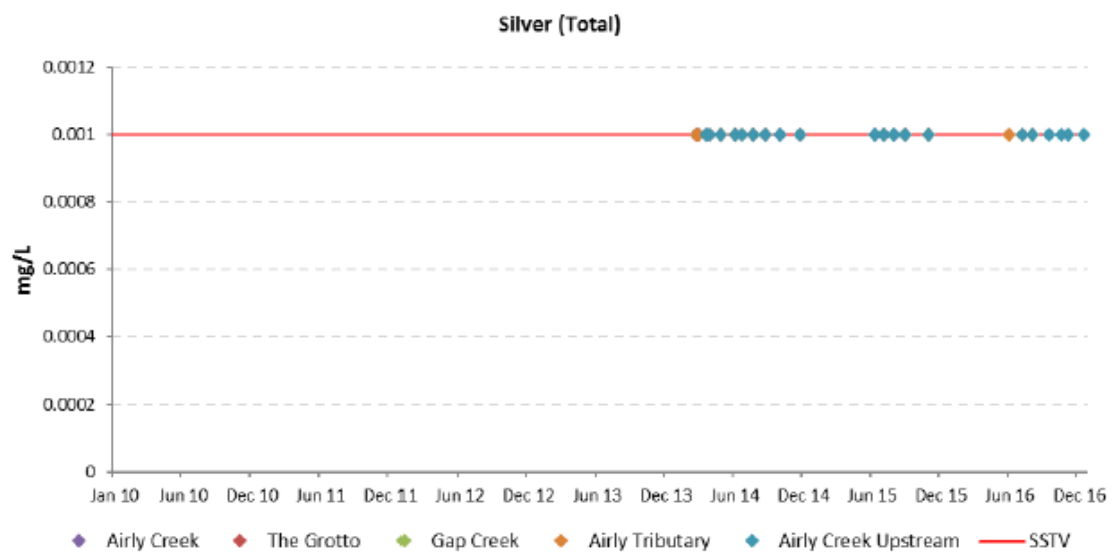


Mercury (Dissolved)

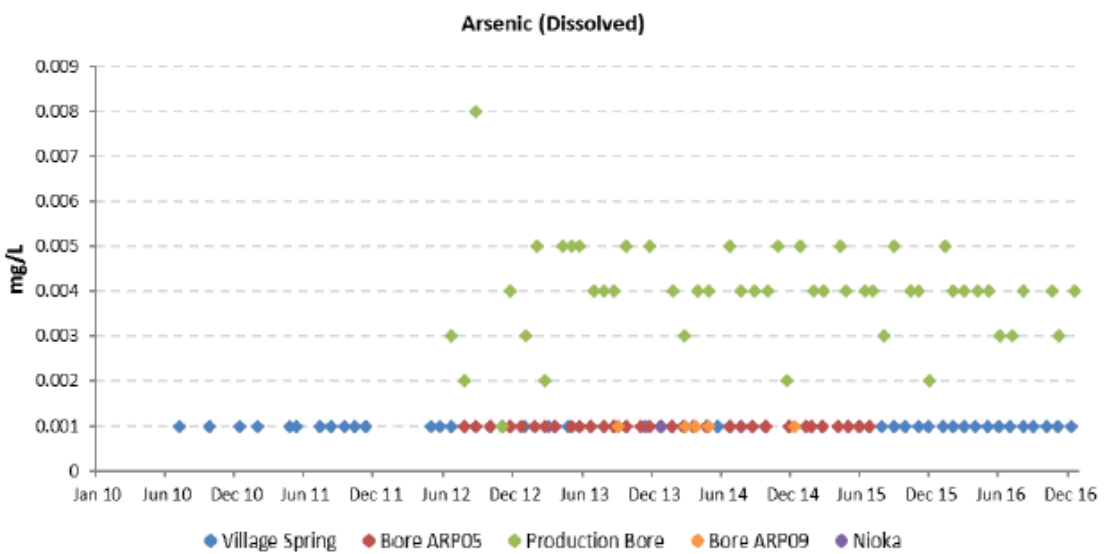
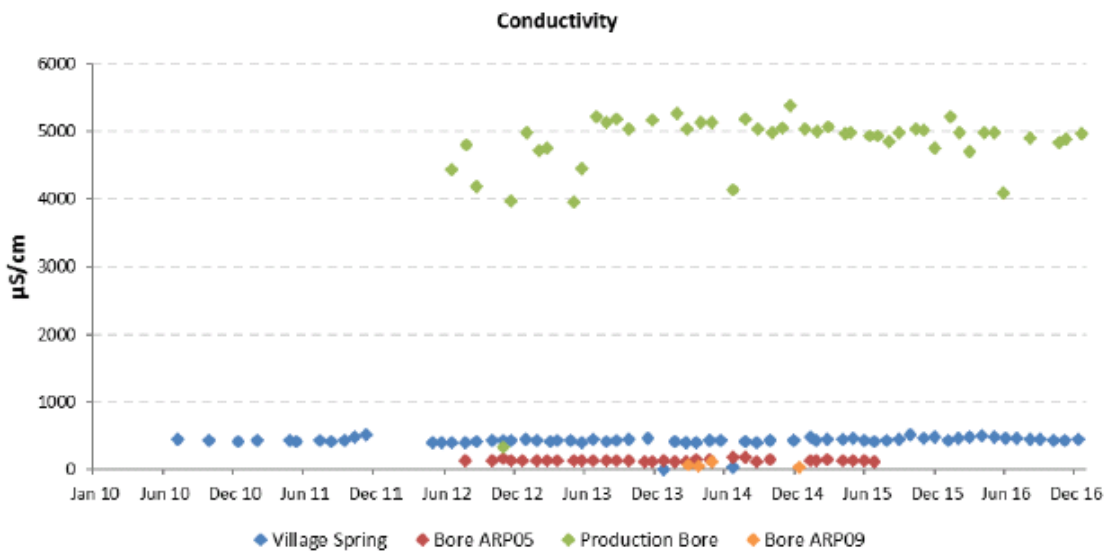
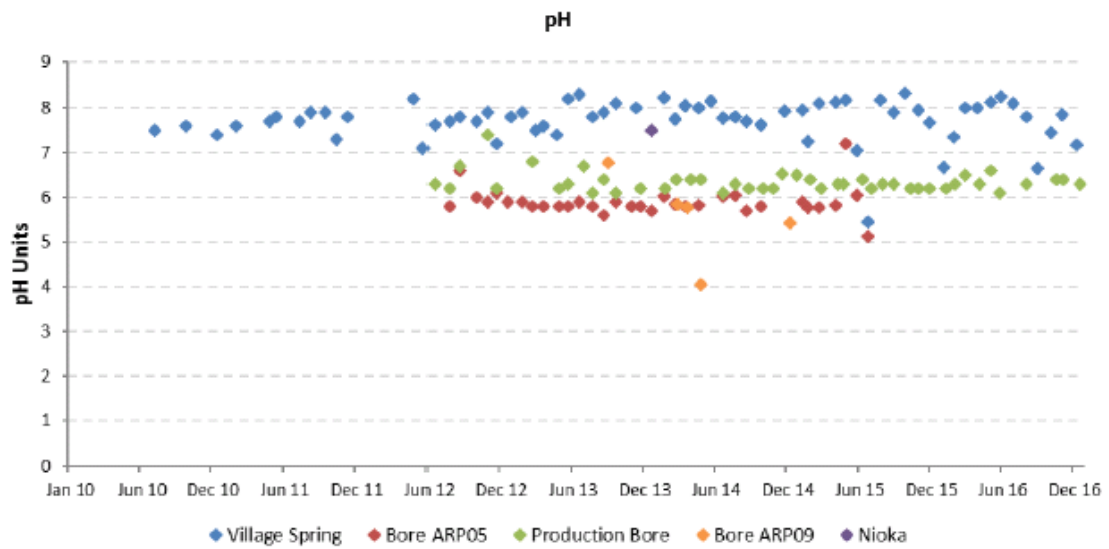




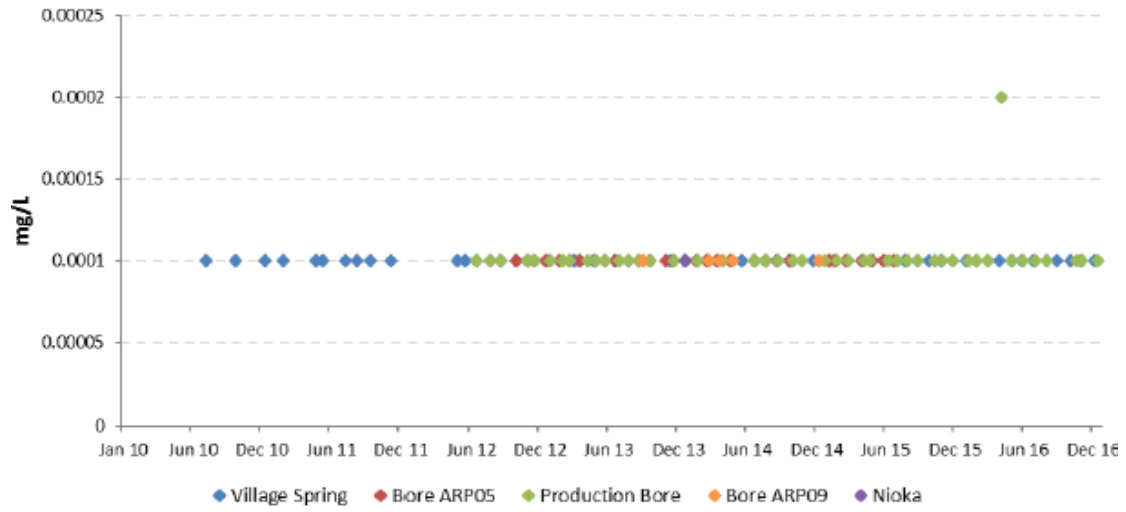




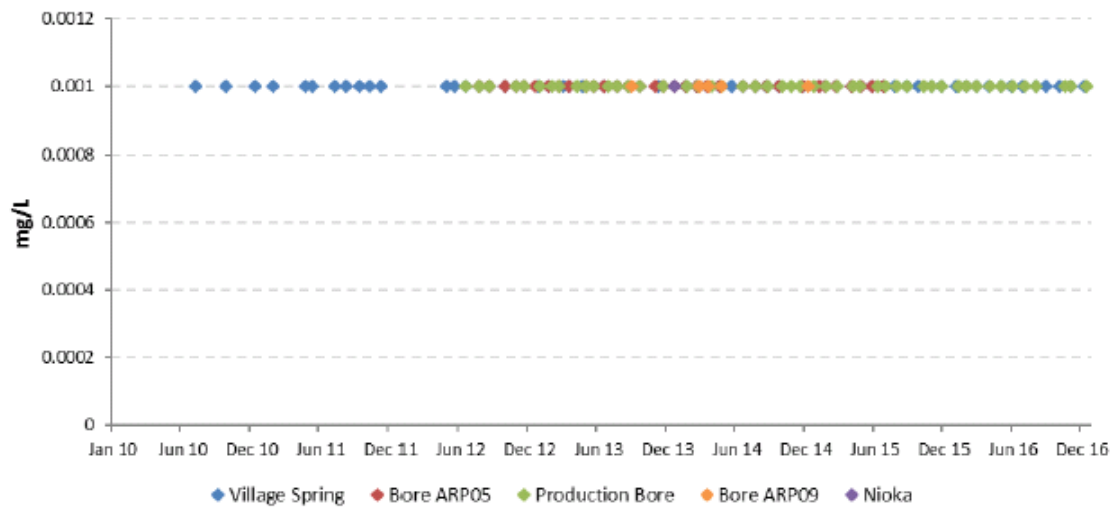
Appendix C – Groundwater Quality: *Village Spring, ARP05, Production Bore, ARP09, Nioka - Additional Water Quality Data*



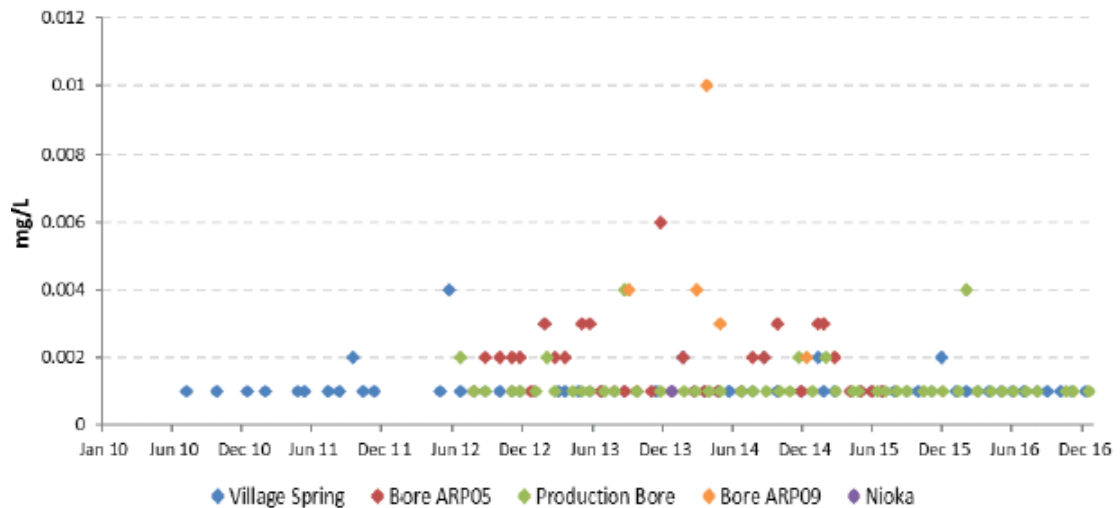
Cadmium (Dissolved)

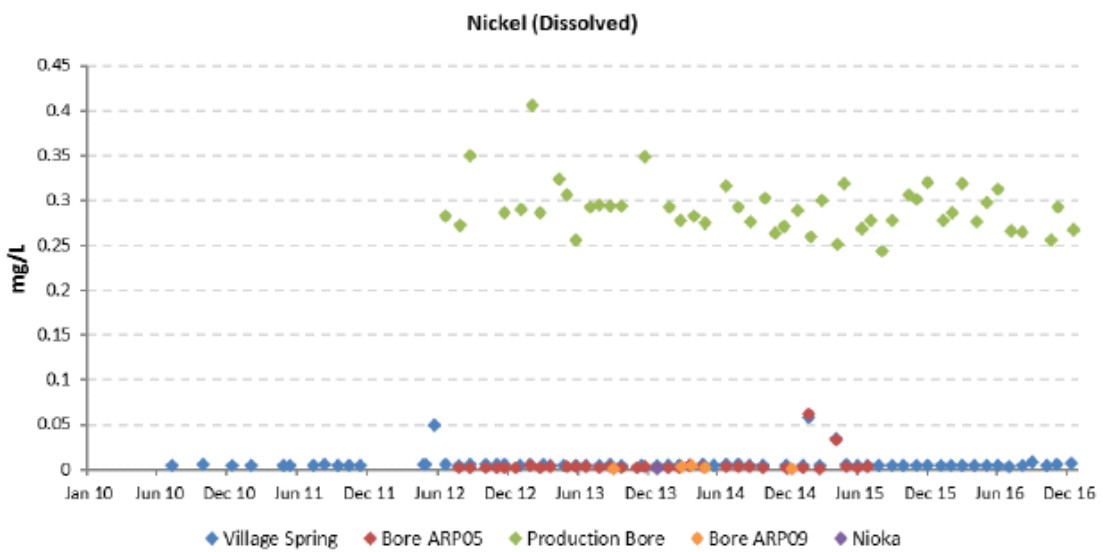
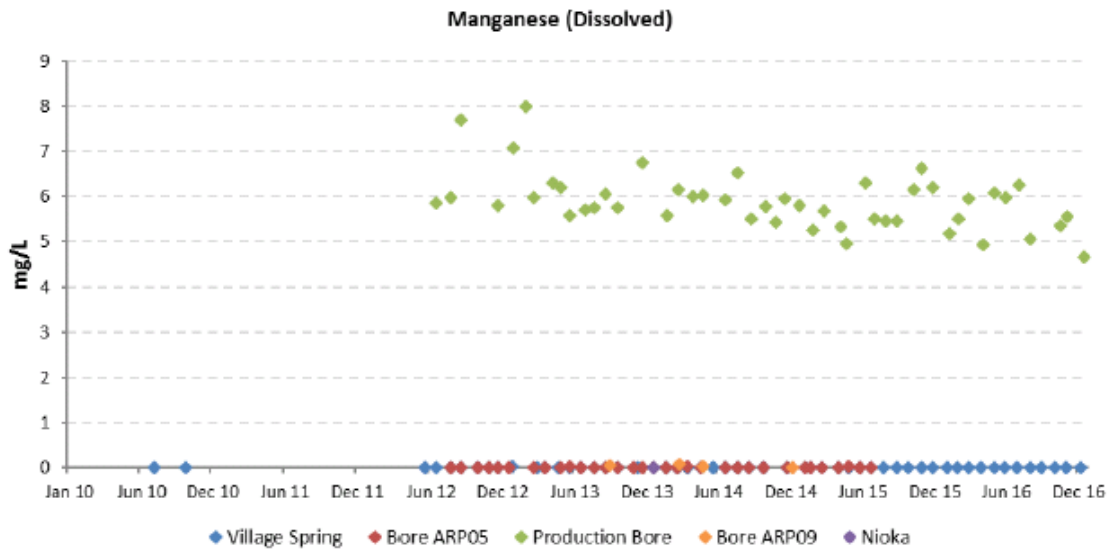
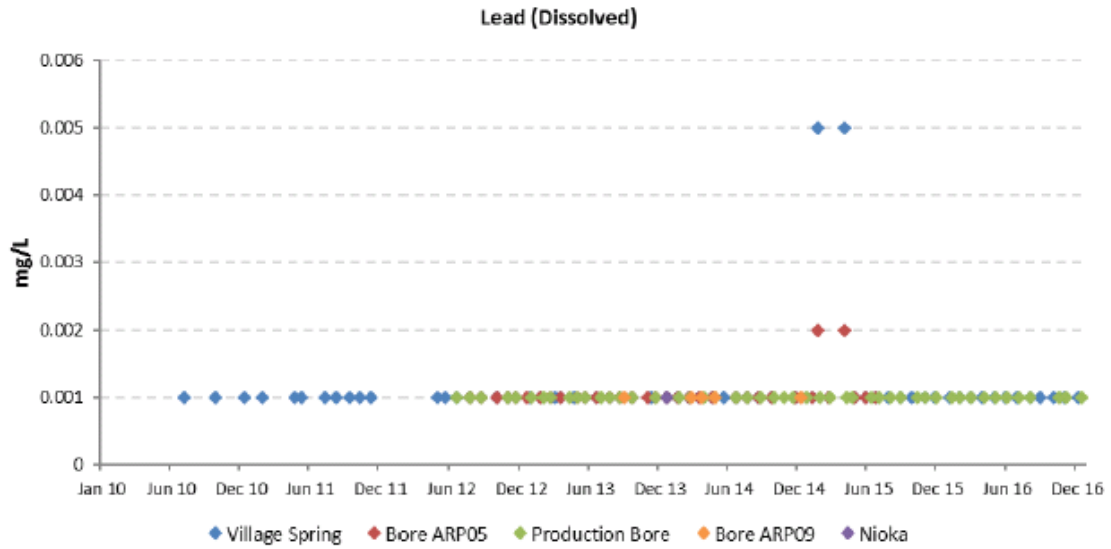


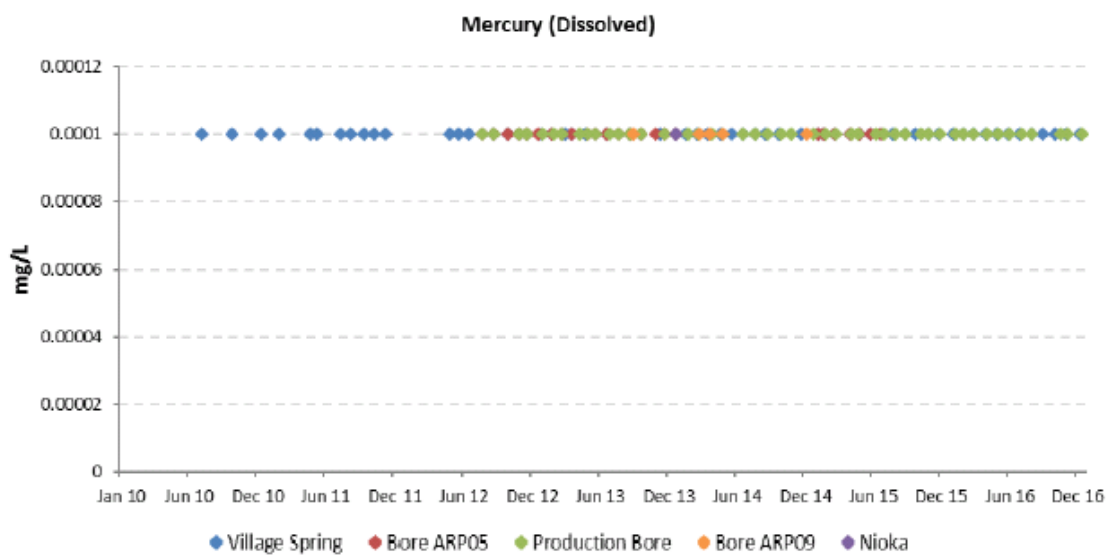
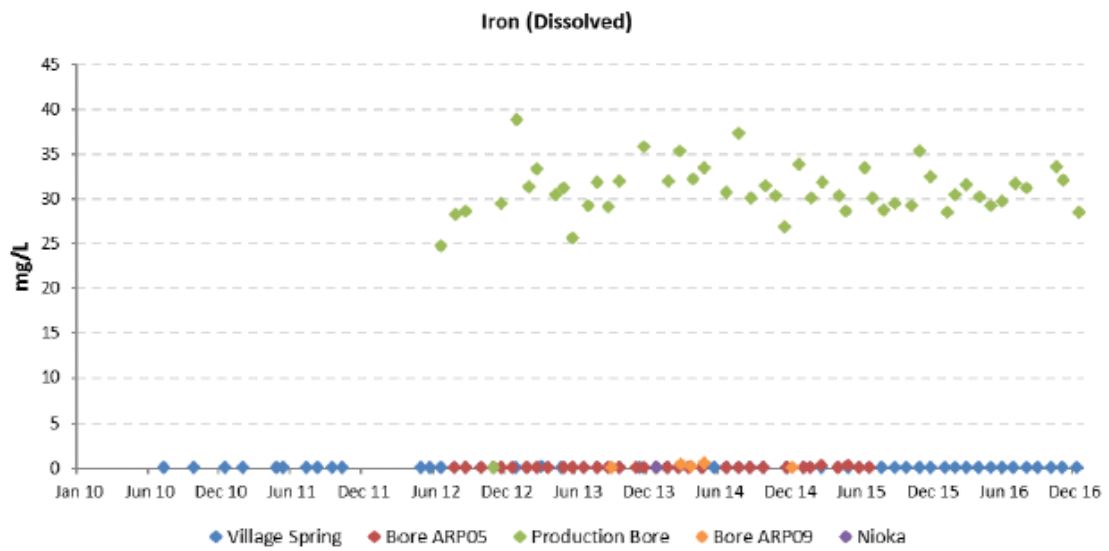
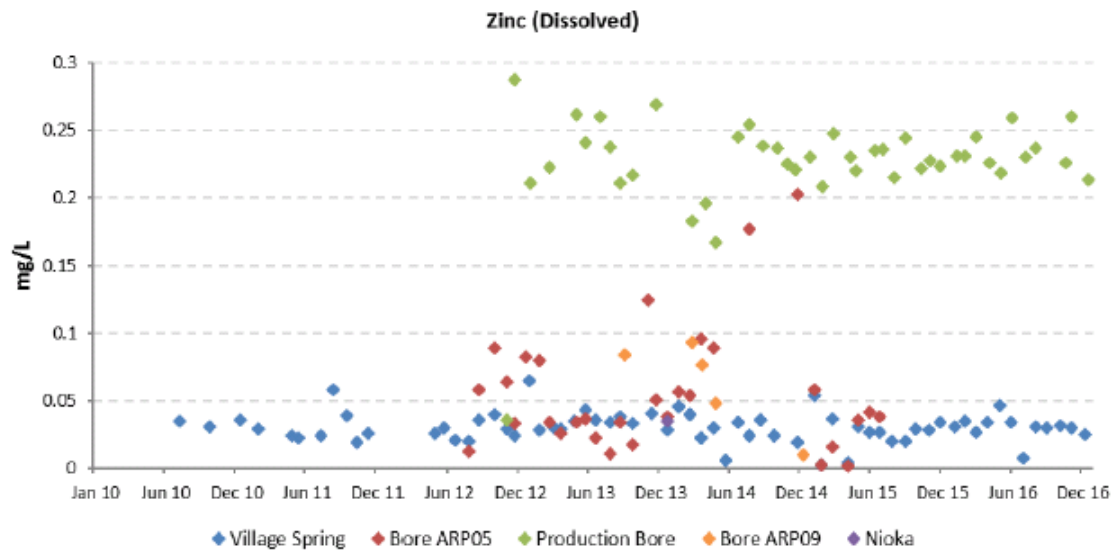
Chromium (Dissolved)



Copper (Dissolved)









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