



Centennial Coal




Springvale Coal Pty Limited Springvale Colliery ANNUAL REVIEW

July 2016



Table 1. Annual Review Title Block

Name of Operation	Springvale Colliery
Name of Operator	Springvale Coal Pty Limited
Development Consent/ Project Approval #	SSD 5594
Mining Lease #	ML1303, ML 1323, ML 1326, ML 1424, ML 1537, ML 1588, ML 1670, MLA 445, MLA 451, MLA 497, CL 377, MPL 314, EL 6974, AUTH 460
Name of Holder of Mining Lease	Centennial Springvale Pty Ltd and Springvale SK Kores Pty Ltd
Water License #	10WA118719 (WAL 36383) 10BL603519 (WAL 36383) 10BL602017 (WAL 36443) 10BL601863 (WAL 36446)
Name of Holder of Water License	Centennial Springvale Pty Ltd
MOP/RMP Start Date	November 2009
MOP/RMP End Date	November 2016
Annual Review Start Date	1 January 2015
Annual Review End Date	31 December 2015
<p>I, Jacques Le Roux, certify that this audit report is a true and accurate record of the compliance status of Springvale Colliery for the period 01/01/2015 to 31/12/2015 and that I am authorized to make this statement on behalf of Springvale Coal Pty Ltd</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	Jacques Le Roux
Title of Authorised Reporting Officer	Mine Manager
Signature of Authorised Reporting Officer	
Date	18/07/2016

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1. STATEMENT OF COMPLIANCE

Compliance status presented into **Tables 2** and **3** considers DRE audit outcomes conducted in December 2015 on CL377, ML1303, ML1323, ML1326, ML1537, ML1588, ML1670, A460 and EL6974.

Table 2. Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	
SSD 5594	No
EPBC 2011/5949	Yes
EPBC2013/6881	Yes
SMP LW 411-418 (04/1673)	Yes
ML 1303	Yes
ML 1323	No
ML 1326	Yes
ML 1424	Yes
ML 1537	Yes
ML 1588	Yes
ML 1670	Yes
CL 377	Yes
MPL 314	No
EL 6974	Yes
AUTH 460	Yes
EPL 3607	No
WAL 36383	Yes
WAL 36443	Yes
WAL 36446	Yes

Table 3. Non-Compliances

Relevant Approval	Condition #	Condition summary	Compliance Status	Comment	Page # addressed in Annual Review
SSD 5594	2a	Generally in accordance with EIS-Manning Numbers	Non-Compliant	Employment exceeds a full time workforce of up to 310	Section 11
ML 1323	4	Compliance Report	Administrative Non-Compliance	Timing of submission	Section 11
MPL 314	4	Compliance Report	Administrative Non-Compliance	Timing of submission	Section 11
EPL 3607	L2.4	Water and Land Concentration limits	Non-complaint	Concentration limit exceeded	Section 11

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)

2. INTRODUCTION

Springvale Mine is an existing underground coal mine producing high quality thermal coal which is supplied to both domestic and international markets. It is located 15 kilometres to the northwest of the regional city of Lithgow and 120 kilometres west-northwest of Sydney in New South Wales (NSW). This is shown in **Figure 1**.

Underground coal mining commenced at Springvale Mine in 1995 following the granting of Springvale Mine’s development consent (DA 11/92) on the 27th of July 1992, pursuant to Section 101 under Part 4 of the NSW Environmental Planning and Assessment Act, 1979 (EP&A Act). Springvale Coal Pty Limited is the operator of Springvale Mine.

On the 21st of September 2015 SSD 5594 was approved by the Department of Planning and Environment. The approval of SSD 5594 allows Springvale to continue underground coal mining operations within the Lithgow Seam at rates up to 4.5 Mtpa until 31 December 2028, with subsequent rehabilitation and closure works. In summary the project includes:

- continued longwall mining operations to extract up to 4.5 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal from the Lithgow Seam;
- continued operation of the mine’s pit top area, support facilities and utilities;
- extension and continued use of the Springvale Delta Water Transfer Scheme, bore dewatering facilities and ventilation infrastructure;
- continued processing (sizing and screening) of ROM coal at the pit top area;
- continued stockpiling of ROM coal (85,000 tonnes (t) capacity);
- continued transportation of processed coal by overland conveyor to Centennial’s Western Coal Services site (WCSS) for further processing or to the Mt Piper Power Station;
- continued transportation of processed coal by road haulage to other local domestic customers (limited to 50,000 tpa); and
- rehabilitation of the pit top area and Newnes Plateau surface infrastructure sites.

A summary of the development consent and mining lease boundary is shown in **Figure 2** and **3**.

The main components of Springvale Mine’s operations are an underground longwall mine, accessed via the Springvale pit top, and supporting surface infrastructure within the pit top area and on Newnes Plateau within the Newnes State Forest. The Newnes Plateau infrastructure areas are accessed for light vehicles via State Mine Gully Road located in north Lithgow, and Old Bells Line of Road though Clarence for light and heavy vehicles Newnes Plateau and Pit Top disturbance Areas are shown in Figure 4 and 5 respectively.

In accordance with SSD 5594 conditions of consent, the Western Projects Biodiversity Strategy will be updated by the end of January 2016. This offset strategy will be developed in accordance with the NSW Biodiversity Offset Policy for Major Projects (or its latest current version).

The contact details for Springvale personnel responsible for environment management and community relations, along with details for community complaints and enquiries have been provided in **Table 4**.

Table 4. Primary Contact Springvale Colliery

Contact	Position	Contact Details
Primary Contacts		
Jacques Le Roux	Mine Manager	T: (02) 6350 1613
		F: (02) 6355 1502
Natalie Gardiner	Environment and Community Co-ordinator	T: (02) 6350 1672
		F: (02) 6355 1502
Community Enquiries/Complaints		
Springvale Enquiries and Community Complaints		T: (02) 6350 1640

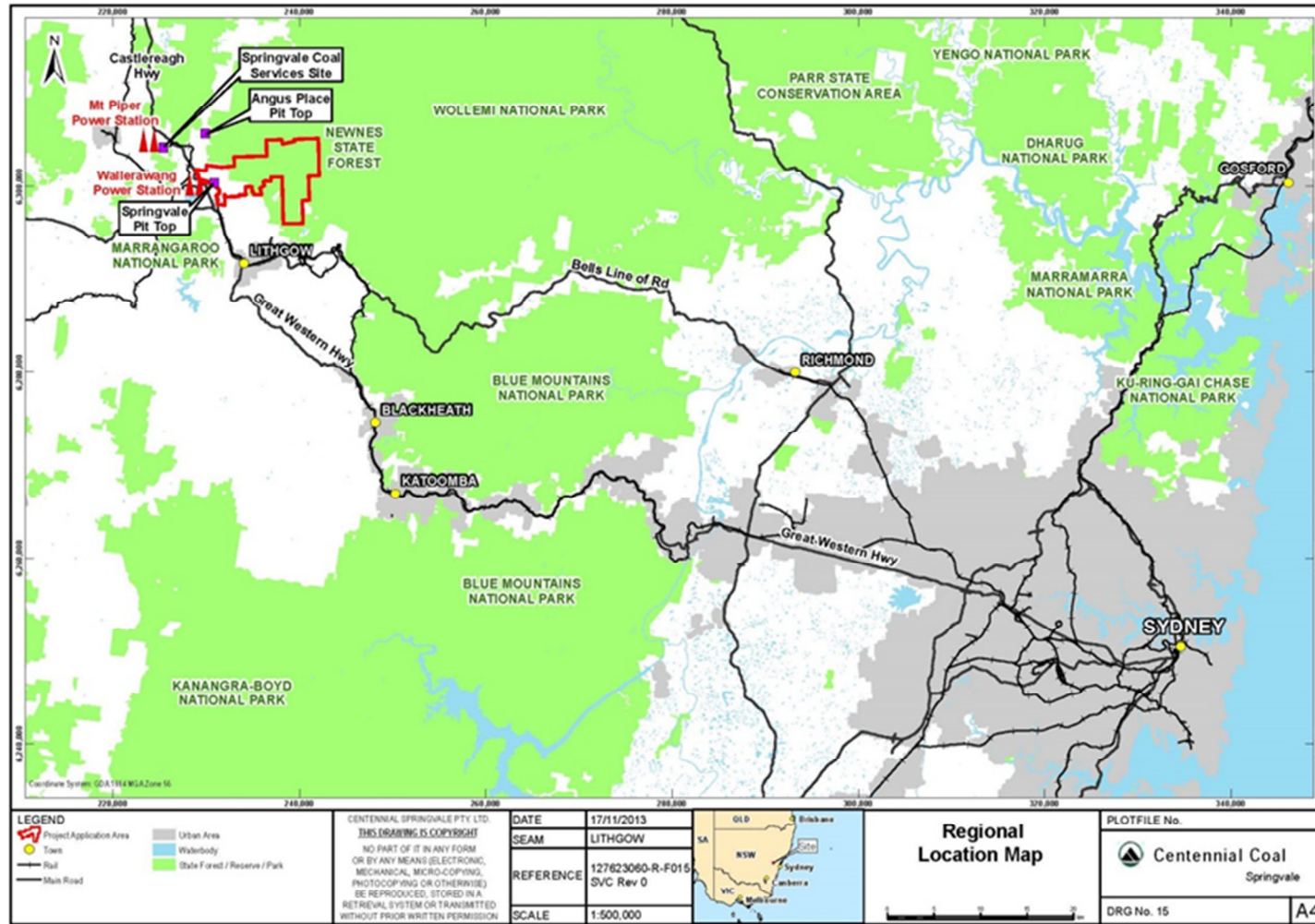


Figure 1 Regional Locality Plan

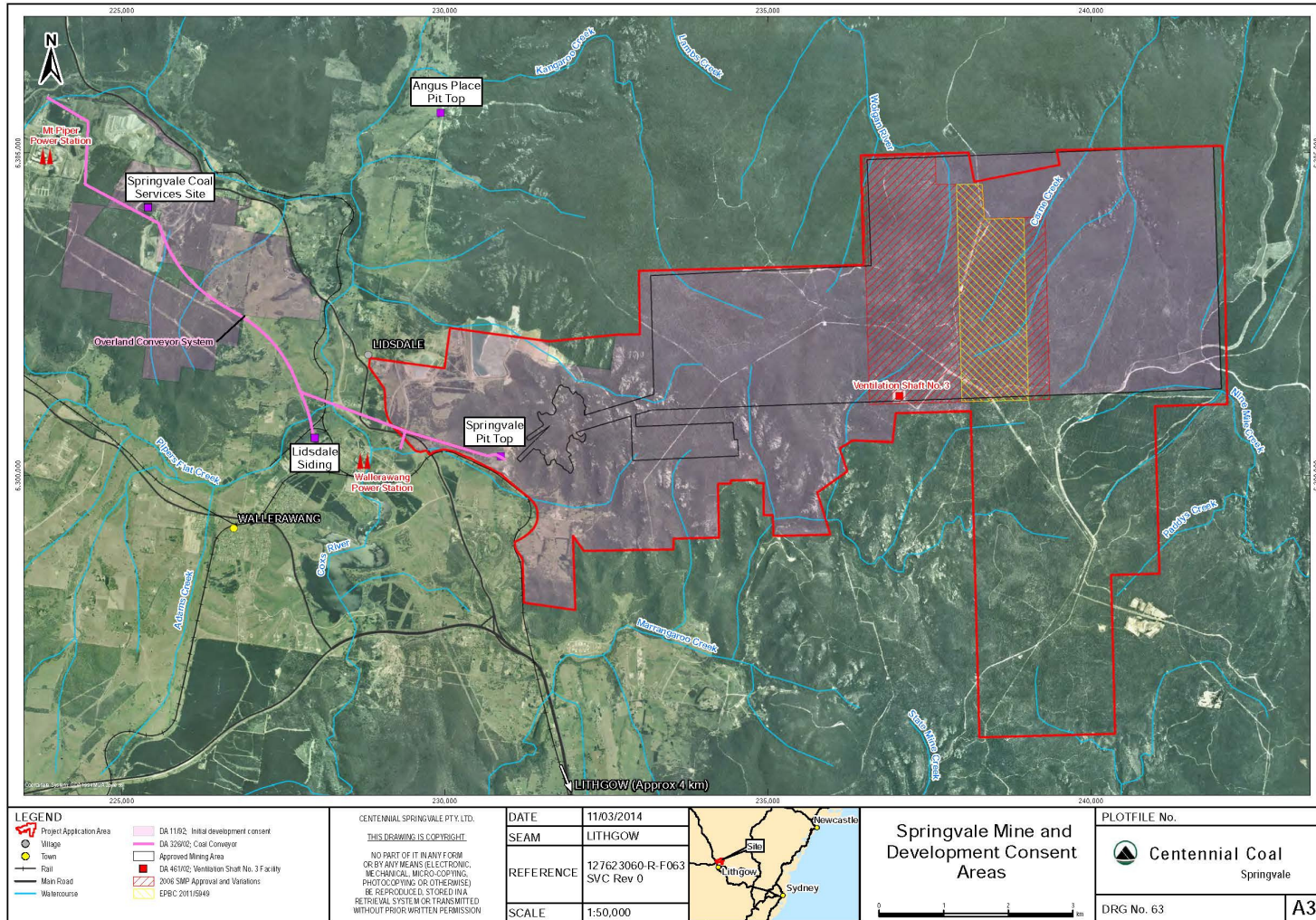


Figure 2 Development Consent Boundary

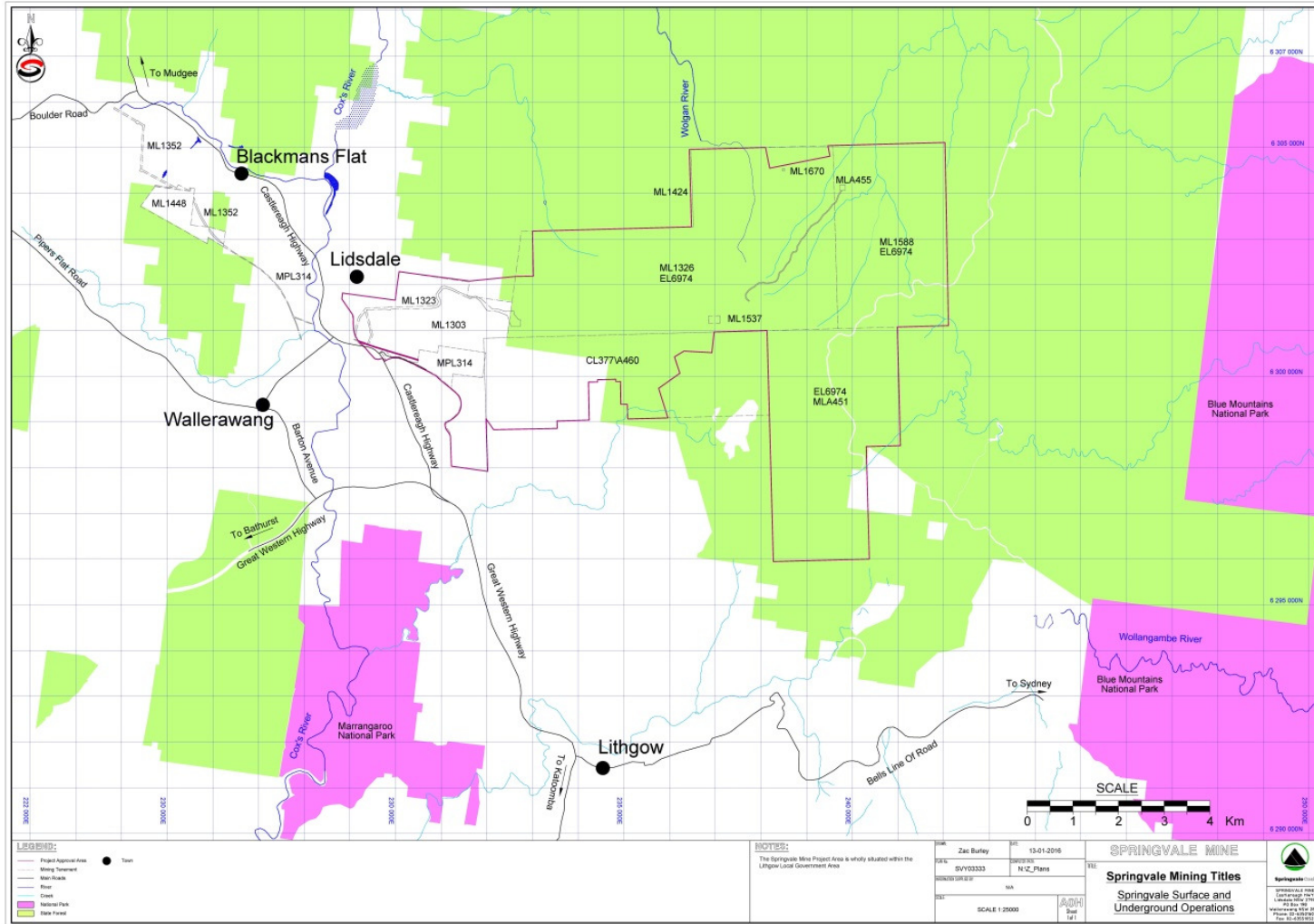


Figure 3 Mining Lease Boundaries

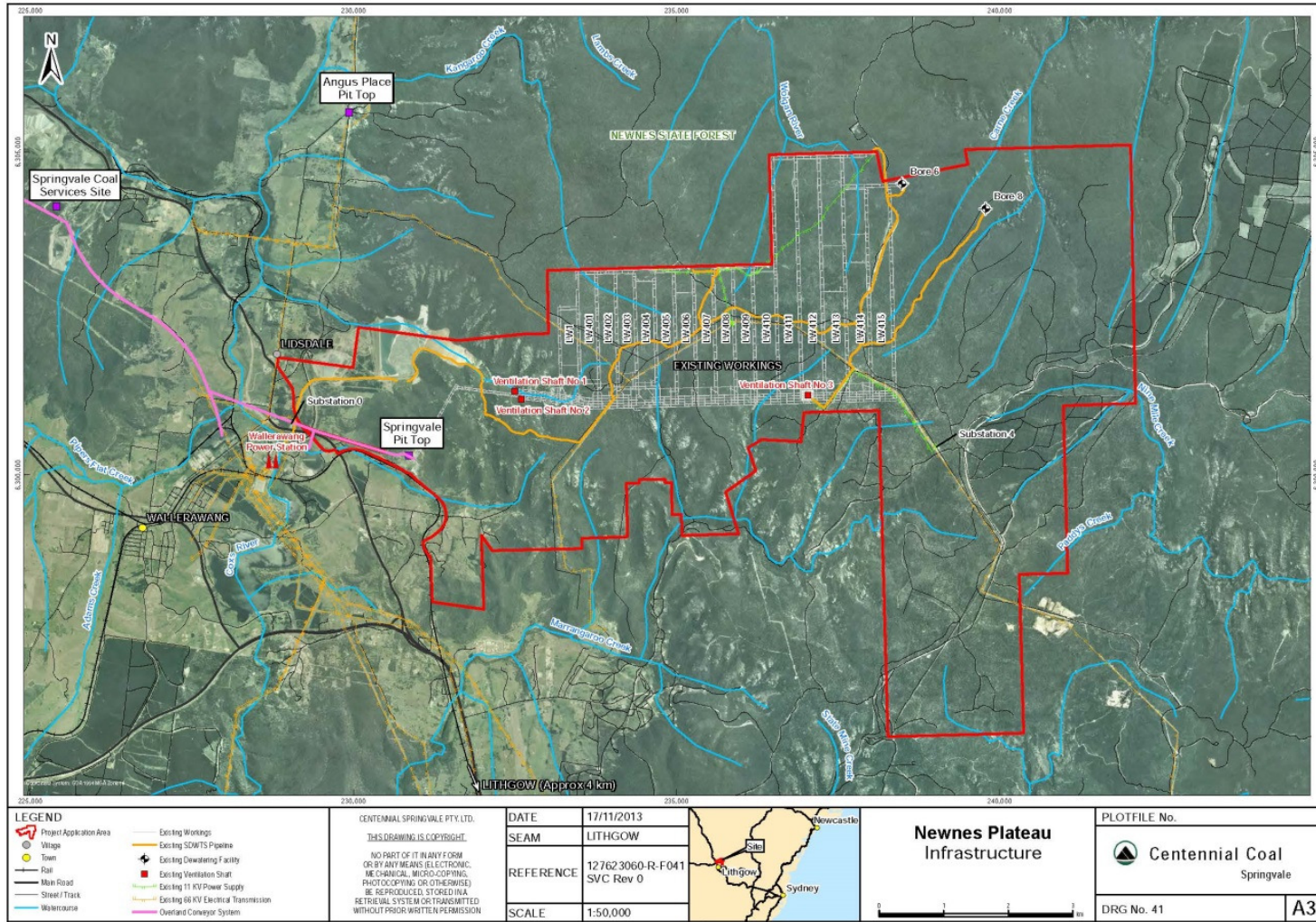


Figure 4 Newnes Plateau Operational Disturbance

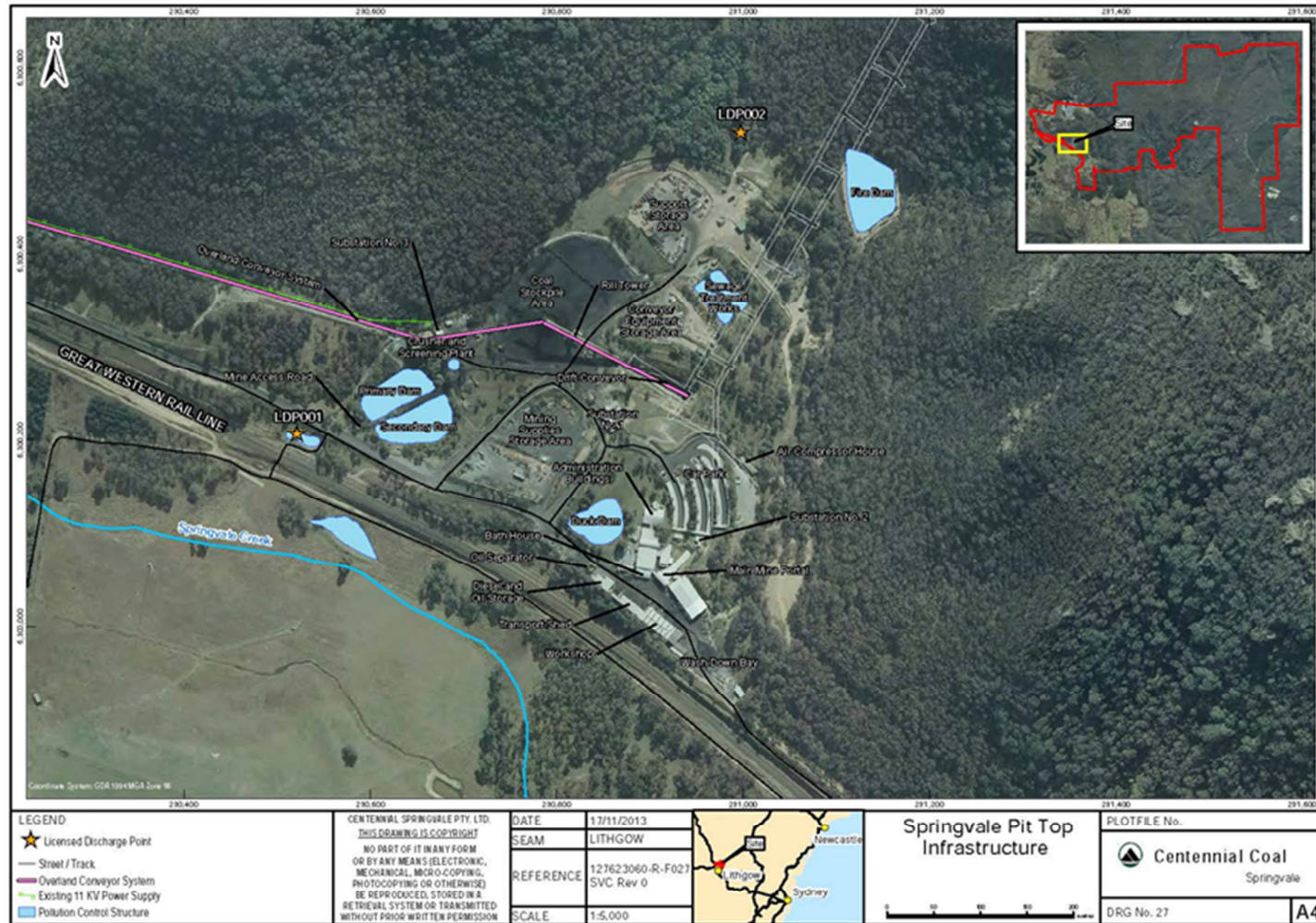


Figure 5 Springvale Pit Top Operational Disturbance

3. APPROVALS

The following sections provide a summary and lists of all approvals held by Springvale Colliery noting changes to those approvals over the reporting period.

3.1. Development Consents and EPBC Approvals

Development Consent SSD 5594 was granted to Springvale on the 21st of September 2015. This consent supersedes the former Development Consent DA 11/92 which will be surrendered by the 21st of September 2016 (in accordance with Schedule 2, Condition 10 of SSD 5594).

Springvale also operates in accordance with two federal approvals under the EPBC Act granted by the Department of Environment (former Department of Sustainability, Environment, Water, Population and Communities). Approval EPBC 2011/5949 was granted on the 14th of March 2012 and allows Springvale to extract coal from Longwalls 415 – 417. A second approval (EPBC 2013/6881) was issued on the 15th of October 2015 to allow secondary extraction associated with the Springvale Mine Extension Project SSD 5594.

Additional detail pertaining to the Springvale Development Consents and EPBC Approvals has been provided in **Table 5**.

Table 5. Development Consents and EPBC Approvals

Approval	Details	Date of Issue	Expiry
SSD 5594	Springvale Mine Extension Project	21 September 2015	31 December 2028
EPBC 2011/5949	Mining of Longwalls 415 – 417.	14 March 2012	19 March 2032
EPBC 2013/6881	Mining associated with the Springvale Mine Extension Project.	15 October 2015	8 October 2035

During the reporting period the Springvale Mine extension project was approved resulting in a new development consent and EPBC approval.

3.2. Authorisations

The Springvale holding includes Mining Lease (ML) 1303, ML 1323, ML 1326, ML 1424, ML 1537, ML 1588, ML 1670, one Coal Lease (CL) (CL 377) and one Mining Purposes Lease (MPL) (MPL 314). Springvale also undertake exploration activities in accordance with Exploration Licence (EL) 6974 and Authorisation (AUTH) 460. On the 29th of October 2012, 15th of May 2013 and 2nd of June 2015 Centennial Springvale Pty Limited submitted Mining Lease Application (MLA) 445, MLA 451 and MLA 497, respectively. MLA 445 is associated with the Bore 8 dewatering facility (and the associated infrastructure corridor), MLA 451 is associated with proposed Longwalls 424 – 432, and MLA 497 is associated with Licenced Discharge Point (LDP) 009. Additional details relating to these mining tenements have been provided in **Table 6**.

Table 6. Mining Tenements

Lease	Date of Issue	Expiry
ML 1303	15 December 1992	15 December 2034
ML 1323	3 August 1993	3 August 2025
ML 1326	28 September 1993	18 August 2024
ML 1424	18 August 2003	18 August 2024
ML 1537	15 June 2003	15 June 2024
ML 1588	19 October 2006	19 October 2027
ML 1670	17 February 2012	17 February 2033
MLA 445	-	-
MLA 451	-	-
MLA 497	-	-
CL 377	24 February 1992	9 March 2025
MPL 314	3 August 1993	3 August 2035
EL 6974	13 December 2012	13 December 2017
AUTH 460	6 June 2010	6 June 2015*

#MLA 445, MLA 451 and MLA 497 were submitted 29 October 2012, 15 May 2013 and 2 June 2015, respectively.

*A renewal application for AUTH 460 was submitted on 08 May 2015. A draft renewal offer was provided by DRE 7 October 2015.

During the reporting period, no new mining leases were obtained.

In May 2005, Springvale submitted a Subsidence Management Plan (SMP) Application to the NSW Department of Primary Industries (now DRE) seeking approval for first workings and secondary extraction within Longwalls 411 – 418. SMP Approval was issued on the 7th of March 2006 (Reference Number 04/1673). Subsequent SMP variations were submitted and approved between 2008 and 2014 allowing various changes to the mining layout within Longwalls 413 – 418.

Additional details pertaining to the SMP Approvals and SMP Variations at Springvale have been provided in **Table 7**.

Table 7. SMP Approvals and Variations

SMP	Issue Date	Description	Purpose of Refinement
Initial SMP Approval 04/1673	2006	SMP for Longwalls 411-418	Mining lease requirement for approved SMP prior to mining and in accordance with the approved dimensions of DA 11/92. Void widths of 315 m and longwalls lengths in excess of 3,750 m.
Section 138 Approval (<i>Coal Mine Regulation Act 1982</i>)	January 2006	-	Approval to extract Longwalls 411 and 412 within the Lithgow Seam.
SMP Variation	November 2008	Reduction in Length of Longwalls 414-418	Longwalls 414 to 418 shortened by 471 m to the south to avoid a geological syncline running through the northern extent of these longwall blocks. Also as a result of this mine design modification, sensitive surface features have been avoided, including hanging swamps and pagodas to the north of Longwalls 416 to 418.
SMP Variation 08/8497	February 2009	Longwall 413 step around and reduction of Longwall 414	Step around of Longwall 413 was approved to avoid existing geological constraints. Longwall 414 shortened by approximately 700 m to the south due to anticipated geological conditions which could potentially lead to dangerous roof control issues and difficult mining conditions within the northern portion of Longwall 414.
SMP Variation 08/8497	August 2009	Changes to Longwall 413 block dimensions	Variation to the take-off face position in Longwall 413.
Clause 88 Approval	October 2009	-	Variation approval to extract Longwall 414 within the Lithgow Seam.
SMP Variation 08/8497	2010	Reduction in length of Longwall 414	Based on monitoring results and feedback from stakeholder consultation, Longwall 414 was shortened by in excess of 1,186 m. Dimensions were modified to avoid significant business interruption and production discontinuity. Another outcome of the shortening of Longwall 414 was the avoidance of Sunnyside Swamp.
SMP Variation 08/8497	2011	Changes in Mine Plan dimensions of Longwalls 416	Change of mine plan to reduce void width of Longwalls 416 and 417 from 315 m to 261 m and increase of chain pillar width from 45 m to 58 m. The new dimensions were to improve underground stability and minimise the

SMP	Issue Date	Description	Purpose of Refinement
		and 417	risk of environmental impact to surface features.
SMP Variation 08/8497	2012	SMP Variation Longwall 415	Change in mine plan to reduce the length of Longwall 415 due to geological conditions.
SMP Variation 11/3964	2012	SMP Variation Longwall 416	Longwall 416 was shortened based upon identification of lithology change, which posed a risk to mine safety, coal quality and production rates. Also as a result of this mine design modification, sensitive surface features have been avoided, including hanging swamps to the north of Longwall 416.
SMP Variation OUT 12/27914 OUT13/37387 OUT14/33055	2013/2014	SMP Variation Longwalls 411-418	Reduction of Longwall 416 Length to current Bore 8 drive age. Subsequent approvals under same variation for Longwalls 417 and 418
SMP Variation OUT13/2174	2013	SMP Variation Longwalls 411-418	Change in mine plan dimensions for Longwalls 411–418. Increase of pillar length to 130 m.
SMP Variation OUT13/1178	2013	Extension in time SMP Approval	Variation to extend relevant SMP approvals until 28 September 2014.
SMP Variation OUT13/21877	2013	SMP Variation Longwalls 411-418	Adjust Longwall 418 void dimensions to be consistent with Longwalls 416-417.
SMP Variation OUT14/9977	2014	SMP Variation Longwalls 411-418	Increase Longwall cutting height up to 3.5 m outside Newnes Plateau Shrub Swamp Buffer Zones (as defined by SEWPaC EPBC approval)
SMP Variation OUT 14/15149	2014	SMP Variation Longwalls 411-418	Extension of time to 30 September 2015.
SMP Variation OUT15/26505	2015	SMP Variation Longwalls 411-418	Extension of time to 30 September 2016.

As shown in **Table 7**, during the reporting period there was an SMP Variation during the reporting period.

3.3. Licences

Environment Protection Licence

Springvale currently operates under Environmental Protection Licence (EPL) 3607, issued under the *Protection of the Environment Operations Act 1997* (POEO Act). There were no changes to EPL 3607 during the reporting period.

Water Licences

Springvale currently holds four groundwater extraction licences as outlined in **Table 8**. Additionally Springvale holds licences for groundwater monitoring bores under the Water Act.

During the reporting period, centennial undertook consultation with the NSW Office of Water and was granted under s61 Zero share component New Water access licences on the 10th of December 2015. Application numbers were D1010807 for nominated works 10MW119322 which is in the Sydney Basin Richmond Groundwater source and D1010811 for nominated works 10MW119322 which is in the Sydney Basin Coxs River Groundwater Source.

Dangerous Goods Licence

Springvale possesses Dangerous Goods Licence (NDG027897 2014 acknowledgement number) for the storage and handling of hazardous chemicals on the premises. There were no changes to the dangerous goods licence over the reporting period.

The Springvale licenses are summarised in **Table 8**.

Table 8. Licences

Licence	Date of Issue	Expiry
EPL 3607	17 May 2000	Renewed Annually
Groundwater Licence 10WA118719 (WAL 36383)	5 August 2013	Perpetuity
Groundwater Licence 10BL603519 (WAL 36383)	25 February 2010	Perpetuity
Groundwater Licence 10BL602017 (WAL 36443)	4 September 2007	Perpetuity
Groundwater Licence 10BL601863 (WAL 36446)	4 September 2007	Perpetuity
Dangerous Goods Licence	16 February 2012	Perpetuity

3.4. Other Approvals

Occupation Permit

The Newnes State Forest is located above the majority of the Springvale underground workings. Springvale has established a Level 3 Occupation Permit with the Forestry Corporation of NSW (FCNSW) to operate under the forest and to build infrastructure and other surface facilities. The permit allows for infrastructure construction and ongoing maintenance on the surface to support below ground operations, including ventilation, dewatering and electricity supply infrastructure. Level 2 Occupation permits will be discussed with the FCNSW with regards to short term duration activities such as exploration drilling. Details of the Occupation Permit have been provided in **Table 9**.

Section 95 Certificate

Springvale currently holds two Section 95 Certificates by the OEH allowing for the hand removal of weeds within Newnes Plateau Shrub Swamp, and to undertake remediation works in East Wolgan Swamp which is a Newnes Plateau Shrub Swamp. Newnes Plateau Shrub Swamps are listed as an Endangered Ecological Community (EEC) under the *Threatened Species Conservation Act 1995* (TSC Act). Previous certificates have been granted for geotechnical and geophysical investigations in addition to the installation of monitoring equipment. The certifications were issued under the TSC Act, pursuant to Section 95(2). Additional details for the Section 95 Certificates have been provided in **Table 9**.

Table 9. Occupation Permits and Section 95 Certificates

Licence	Date of Issue	Expiry	Details
Level 3 Occupation Permit – Infrastructure	17 December 2012	1 February 2018	Approval from FCNSW allowing to operate and build surface infrastructure/facilities on the surface within the Newnes State Forest to support below ground operations.
Section 95 Certificate Document No 1111270	27 June 2013	30 June 2020	Approval from OEH to allow the hand removal of weeds from within East Wolgan Swamp and Narrow Swamp.
Section 95 Certificate Document No C0000077	25 November 2013	30 June 2024	Approval from OEH to allow geotechnical/geophysical investigations and the installation of monitoring equipment within EEC.

4. OPERATIONS SUMMARY

Springvale has approval for the extraction of up to 4.5 million tonnes per annum (Mtpa) of ROM coal from the Lithgow Seam underlying the Project Application Area. Coal processing and distribution is managed at the Springvale Coal Services site in accordance with the Western Coal Services Project (State Significant Development 12_5579). The exception for this is the transport of up to 50,000 tonnes per annum of coal from the Springvale pit top to local domestic customers by road haulage

Table 10 presents a production summary as applicable to SSD 5594 only.

Table 10. Production Summary

Material	Approved Limit (and source)	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
Waste Rock/Overburden	NIL	Not Applicable	Not Applicable	Not Applicable
ROM Coal	4.5 million tonnes per calendar yr (Source: SSD5594 S2 C6)	3.487621 Mt	3.531844	4.5Mt
Coarse reject	NIL	Not Applicable	Not Applicable	Not Applicable
Fine reject (Tailings)	NIL	Not Applicable		
Saleable product	NIL	Not Applicable	Not Applicable	Not Applicable

There are no inconsistencies between approved limits and actual production.

4.1. Other Operations

All operational management of coal processing and transport facilities is undertaken by the Western Coal Services Project (State Significant Development 12_5579), except for the transport of up to 50,000 tonnes per annum of coal from the Springvale pit top to local domestic customers by road haulage which is needed to be authorised by SSD 5594.

Springvale's operational summary is presented in **Table 11**. Operations relating to the Western Coal Services Project are reported in the Western Coal Services Annual Review.

Table 11. Operations Summary

	Approved Limit (and source)	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Comment (if applicable)
Hours of operation	24 hours a day, 7 days a week (Source: SSD5594 S2 C7)	24 hours a day, 7 days a week	24 hours a day, 7 days a week	No change
Transport (rail)	NIL	Not Applicable	Not Applicable	Not Applicable
Transport (road)	50,000 tonnes of ROM Coal per calendar year (Source: SSD 5594 S2 C8)	2,775.00	2, 799.50 tonnes	Within approved limits

4.2. Next Reporting Period

The following activities are planned to be undertaken by Springvale in 2016:

- Completion of the Extraction of Longwall 418;
- Extraction Plan consultation and approval for Longwall 419;
- Commencement of Longwall 419;
- Preparation and consultation of Management Plans required under SSD 5594;
- Approved construction activities e.g. Bore 9;
- Independent Audit 2016; and
- New Mining Operations Plan.

5. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

Table 12. Actions from previous Annual Review

Requested By	Action Required	Action Taken	Where addressed in Annual Review
DRE	2014 AEMR section 1.1: Confirm all leases are included	Leases are outlined in Table 6 and shown in Figure 3	Table 6, Pg 14 and Figure 3, Pg 10
	2014 AEMR section 2.0: First column should be Activities Proposed in, not undertaken in	Noted- Annual Review Guideline Followed for 2015 rather than AEMR guideline	Noted- Annual Review Guideline Followed for 2015 rather than AEMR guideline
	2014 AEMR section 2.8 and Appendix 5: Ensure consistency naming of dams in text, table 12 and site plans	Noted- Annual Review Guideline Followed for 2015 rather than AEMR guideline	Noted- Annual Review Guideline Followed for 2015 rather than AEMR guideline
	2014 AEMR section 3.6 and 3.7: These sections should be combined of information clearly separated	Noted- Annual Review Guideline Followed for 2015 rather than AEMR guideline	Noted- Annual Review Guideline Followed for 2015 rather than AEMR guideline
	2014 AEMR Rehabilitation: Need consistent totals in Section C and E within the same columns	Noted- Annual Review Guideline Followed for 2015 rather than AEMR guideline	Noted- Annual Review Guideline Followed for 2015 rather than AEMR guideline
	2014 AEMR Plans: Need to show more clearly location of rehabilitation completed as covered in table 43 and some hard copies should be increased in size	Noted- Annual Review Guideline followed for 2015 rather than AEMR guideline	Figure 12, Pg 51
DPE	Production Data revision request	A response on the 15 th of June 2015 was provided to the department on the listed items with relevant references to information and documents provided. There no comments received from the department on the response provided	Noted- Annual Review Guideline Followed for 2015 rather than AEMR guideline
	Comments regards LDPs 2, 6, and 7		
	Information regarding research and trials being undertaken regarding removal of soluble arsenic from the discharge waters		
	Request for copy of specialist reports in relation to Low Frequency Noise		

6. ENVIRONMENTAL PERFORMANCE

Table 13 below outlines requirements and performance as per the DPE Annual Review Guideline (October 2015) Reporting Framework. While the table includes monitoring results over the entire 2015 reporting period, the approval criteria limits are aligned to SSD 5594, granted on the 21st of September 2015. Further analysis of environmental performance has been included in Section 6 in order to satisfy requirements in accordance with SSD 5594, principally Schedule 6, Condition 12.

The Subsidence Management Status Reports prepared and submitted by Springvale present in-depth results as required under SMP LW411-418.

Table 13. Environmental Performance

Aspect	Approval criteria/ EIS prediction ¹					Performance during the reporting period (Max Result)					Trend/ key management implications	Implemented / proposed management action
	Location receiver number	Day (L _{AEQ15min})	Evening (L _{AEQ15min})	Night (L _{AEQ15min})	Night (L _{A1 1min})	Location receiver number	Day (L _{AEQ15min})	Evening (L _{AEQ15min})	Night (L _{AEQ15min})	Night (L _{A1 1min})		
Noise	S1	44	44	46	52	S1	40	41	41	49	Results are within the criteria and are not significantly different from previously obtained results	During 2016 Centennial will submit a Western Region Noise Management Plan
	S2	43	43	46	53	S2	39	44	48	51		
	S3	35	35	35	60	S3	<30	<30	<30	Inaudible		
	All other Privately owned Land	35	35	35	45	All other Privately owned Land	30	34	34	34		
Air quality	Pollutant	Averaging Period	Criterion			Pollutant	Averaging Period	Max Result			Results are within the criteria and are not significantly different from previously obtained results	During 2016 Centennial will submit a Western Region Air Quality and Greenhouse Gas Plan
	PM ₁₀	Annual	30			PM ₁₀	Annual	25				
	PM ₁₀	24 hour	50			PM ₁₀	24 hour	25				
	TSP	Annual	90			TSP	Annual	55				
	Deposited Dust	Annual	2g/m ² /month	4g/m ² /month		Deposited Dust	Annual Average	DG1: 1.53/m ² /month				

Aspect	Approval criteria/ EIS prediction ¹			Performance during the reporting period (Max Result)			Trend/ key management implications	Implemented / proposed management action	
						DG2 0.68/m ² /month			
Biodiversity	Ecology	No significant impacts are predicted on threatened species or EECs; and			Complaint- Flora monitoring concludes the monitoring data indicates that prolonged dry and warm conditions on the Newnes Plateau are having a substantial impact on swamp condition and is likely to be acting independent of any mining related impacts.			Monitoring demonstrates compliance with the performance criteria and condition of SMP Approval. Results obtained are not considered significantly different from previous year	Monitoring and management will continue to be undertaken in accordance with the SMP approval and future extraction plan requirements.
		No significant impacts are predicted on aquatic habitats, flora, fauna or stygofauna			Complaint-Monitoring has been undertaken in accordance with approved monitoring programs and conclude no discernible impacts from underground mining at Springvale Colliery on fauna. Flora monitoring concludes the monitoring data indicates that prolonged dry and warm conditions on the Newnes Plateau are having a substantial impact on swamp condition and is likely to be acting independent of any mining related impacts.			Monitoring demonstrates compliance with the performance criteria and condition of SMP Approval. Results obtained are not considered significantly different from previous year	Monitoring and management will continue to be undertaken in accordance with the SMP approval and future extraction plan requirements.
	Conservation Areas	The nearest conservation reserve, the Gardens of Stone National Park and the wider Blue Mountain World Heritage Area, will not experience any measurable subsidence movements as a result of the Project.			Not Applicable			Not Applicable	Not Applicable

Aspect	Approval criteria/ EIS prediction ¹		Performance during the reporting period (Max Result)	Trend/ key management implications	Implemented / proposed management action
	Swamps	Longwall mining by the Project is unlikely to have a significant impact on swamps.	Compliant- Springvale has undertaken mining activities and monitoring activities in accordance with SMP 411-418 approval requirements	Monitoring demonstrates compliance with the performance criteria and condition of SMP Approval. Results obtained are not considered significantly different from previous years.	Monitoring and management in accordance with 411-418 SMP EMP approval requirements which includes the LW 418 THPSS MMP
Heritage	Aboriginal Heritage	Subsidence at site 45-1-0002 may cause the sandstone where the grinding groove is or was located to fracture and damage the site should it still remain. The recent survey was unable to find any evidence remaining of the site, probably due to the extensive vehicle traffic; and	Complaint- Subsidence has not been experienced at these site locations due to current mining position	There has been no aboriginal heritage items impacted by subsidence by Springvale	Monitoring and management in accordance with Western region Cultural Heritage Management Plan
		Predicted subsidence at sites 45-1-0005 and 45-1-0065 is not expected to damage	Complaint- Subsidence has not been experienced at these site locations due to current mining position	There has been no aboriginal heritage items impacted by subsidence by Springvale	Monitoring and management in accordance with Western region Cultural Heritage Management Plan

Aspect	Approval criteria/ EIS prediction ¹		Performance during the reporting period (Max Result)	Trend/ key management implications	Implemented / proposed management action
	Historic heritage sites	No historic heritage items and/or National Heritage Places have been identified within the Project Application Area or assessed to be impacted upon by the Project. As such, there are no historic heritage impacts associated with the Project.	Not Applicable	Not Applicable	Not Applicable

6.1. Meteorological Monitoring

Springvale mine is required to operate a meteorological station on-site in accordance with EPL 3607. A summary of meteorological data collected from Springvale Colliery during 2015 is presented in **Table 14**.

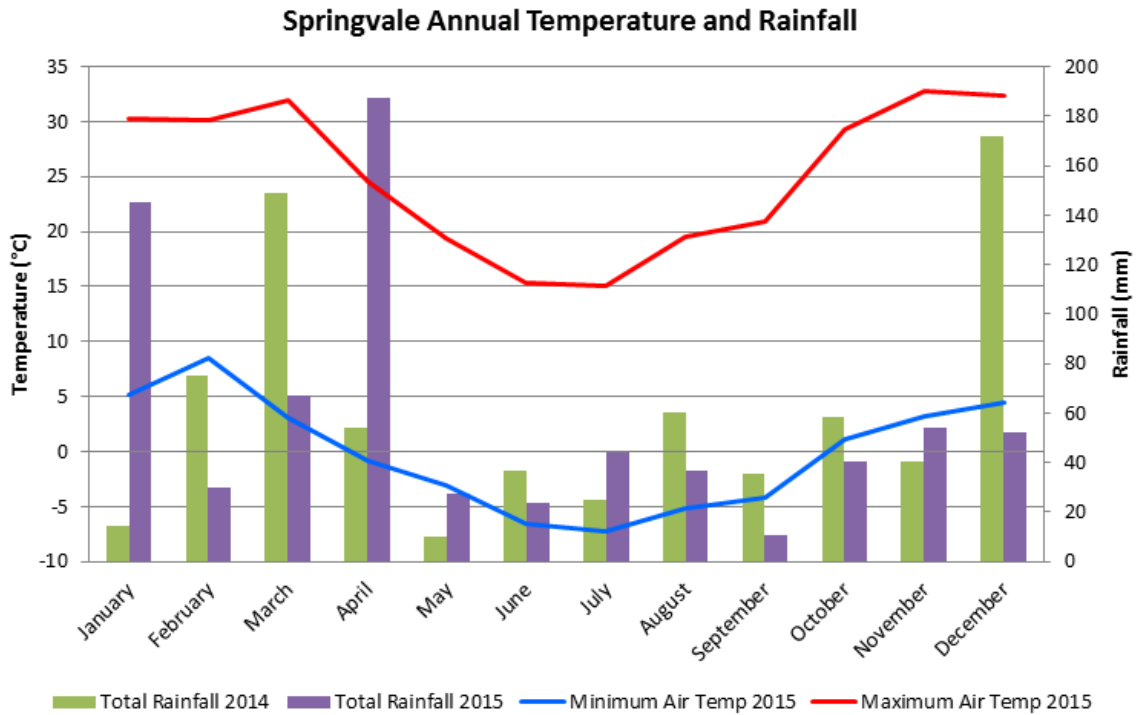
Table 14. Site Weather Data

Month	Minimum Air Temp. (°C)	Maximum Air Temp. (°C)	Total Rainfall (mm)
January	5.1	30.3	145.2
February	8.5	30.1	30
March	3.1	32	67
April	-0.9	24.6	187.6
May	-3.1	19.4	27.4
June	-6.5	15.4	23.6
July	-7.3	15	44.6
August	-5.1	19.56	37
September	-4.14	20.98	11
October	1.06	29.34	40.2
November	3.17	32.72	54
December	4.41	32.29	52.4

The minimum temperature recorded on-site during the reporting period was -7.3°C in July and the maximum temperature recorded was 32.72°C in November. Temperature variation during 2015 was generally greater compared to 2014. Minimum temperatures were considerably lower and maximum temperatures remained higher, especially during the winter months.

Annual temperature and rainfall is presented in **Figure 6**, with 2014 rainfall data included for comparative purposes. Total rainfall decreased by 10mm from 730.6mm in 2014 to 720mm in 2015. Lower rainfall through winter and spring 2015 was generally consistent with 2014, while significant rainfall events in 2015 came earlier in the year, peaking in April, compared to peaks in December and March in 2014.

Figure 6 Annual Temperature and Rainfall



An annual wind velocity and direction wind rose is presented in **Figure 7**. Both parameters are consistent with 2014 averages, with the predominant wind speed and wind direction during the reporting period 1.72m/sec and south east respectively.

Figure 7 Annual Wind Rose

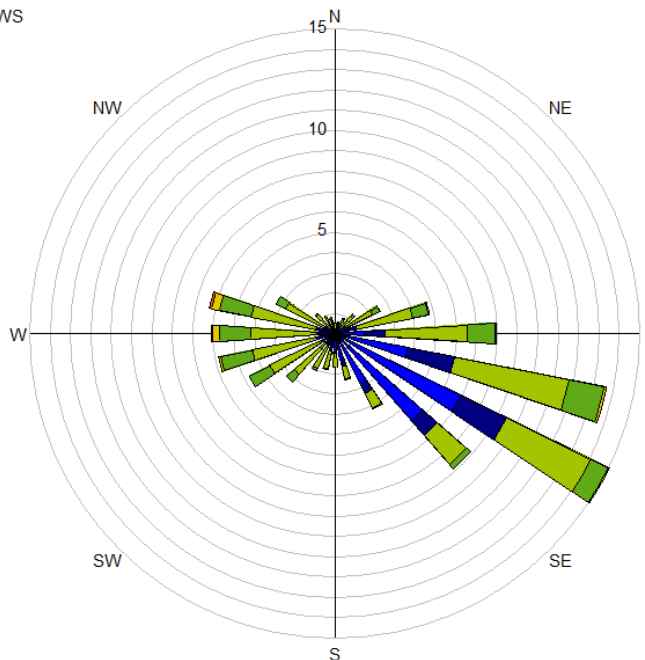
ALS Water Resources Group Queensland

HYWROSE V76 Output 13/07/2016

Site SVAWS001 Springvale AWS
 Start Time 00:00_01/01/2015
 End Time 00:00_01/01/2016

Wind Direction as Percentage of Time

- 0-0.5 m/s
- 0.5-1.0 m/s
- 1.0-3.0 m/s
- 3.0-5.0 m/s
- 5.0-7.0 m/s
- 7.0-10.0 m/s
- >10.0 m/s



6.2. Noise

Project specific noise goals that were established for the Environmental Assessment (refer Section 75W Modification to Development Consent DA 11/92, dated October 2013) have now been adopted in SSD 5594 and EPL 3607. These criteria levels are produced in **Table 15**.

Noise monitoring during the reporting period was undertaken in accordance with Springvale Colliery's Noise Management Plan and the results obtained during the reporting period were all within performance criteria limits. A specialist consultant has been engaged to undertake Low Frequency Noise investigations.

Table 15. Noise Criteria dB(A)

Receiver Location*	Day	Evening	Night	
	LAeq (15minute)	LAeq (15minute)	LAeq (15minute)	LA1 (1minute)
S1	44	44	46	52
S2	43	43	46	53
S3	35	35	35	60
All other privately-owned land	35	35	35	45

*These locations are shown in **Figure 8**.

6.2.1. Noise Monitoring

Operator attended noise monitoring was conducted at five locations during the reporting period. Monitoring at locations S1 and S2 continued from the previous reporting period while monitoring of locations S3, S4 and S5 commenced in July 2015 (Quarter 2) in accordance with the revised requirements under SSD 5594 and EPL 3607.

Location 1 (S1) represents the residence off Springvale Lane, located approximately 620 metres southwest of the closest activities on the mine site and approximately 140 metres east of the Castlereagh Highway.

Location 2 (S2) represents the residence at 31 Springvale Lane, located approximately 640 metres southwest of the closest activities on the mine site and approximately 330 metres east of the Castlereagh Highway.

Location 3 (S3) represents the residence off Wolgan Road, located approximately 2 kilometers west of the closest activities on the site and approximately 200 meters north of the Castlereagh Highway.

Location 4 (S4) represents the residence off Springvale Lane, approximately 900 metres southwest of the closest activities on the site and approximately 1.4 kilometers east of the Castlereagh Highway.

Location 5 (S5) represents the residence off Springvale Lane, approximately 1.2 kilometres southwest of the closest activities on the site and approximately 1.7 kilometers east of the Castlereagh Highway.

Table 16 below compares the results of the operator attended noise monitoring with relevant noise goals. Compliance with the noise criteria goals was achieved at all noise monitoring locations during all monitoring periods. It is noted that monitoring conducted at S2 in Q1/Q2 evening and Q2 night was greater than the noise goal, however as per the Industrial Noise policy Section 11.1.3, “A development will be deemed to be in non-compliance with a noise consent or licence if the monitored noise level is more than 2 dB above the statutory noise limit specified in the consent of licence condition.”

Results are also shown graphically in Appendix 4.

Table 16. Noise Monitoring Results Summary 2015

Location	Q1	Q2	Q3	Q4	Noise Goal
Day					
S1 (EPL ID No. 11)	33	38	36	40	44
S2 (EPL ID No. 12)	33	38	35	39	46
S3 (EPL ID No. 13)	NA	Inaudible	Inaudible	Inaudible	35
All other privately-owned land					35
S4 (EPL ID No. 14)	NA	30	<30	Inaudible	35
S5 (EPL ID No. 14)	NA	<30	Inaudible	Inaudible	35
Evening					

Location	Q1	Q2	Q3	Q4	Noise Goal
S1	34	41	30	40	44
S2	44	44	31	38	43
S3		Inaudible	Inaudible	Inaudible	35
All other privately-owned land					35
S4	NA	34	Inaudible	<25	35
S5	NA	31	Inaudible	Inaudible	35
Night					
S1	41	41	<30	39	46
S2	39	48	32	40	46
S3		Inaudible	Inaudible	Inaudible	35
All other privately-owned land					35
S4	NA	33	Inaudible	Inaudible	35
S5	NA	31	Inaudible	Inaudible	35

6.3. Air Quality

Potential dust sources from the Springvale Colliery operations include unsealed or dirty traffic areas, coal stockpiles, ventilation fans, and coal being conveyed. Dust controls used on unsealed or dirty traffic areas include the use of water carts, water cannons\sprinklers, and regular road sweeping. In December 2010 Springvale installed and commissioned a High Volume Air Sampler (HVAS) capable of measuring both Total Suspended Particles (TSP) and PM10. The unit is located on an adjoining property on Springvale Lane. The system operates automatically for a 24 hour period every 6 days in accordance with Australian Standards. There is no requirement for Springvale to monitor TSP and PM10, however this unit is providing valuable baseline data.

There is no recent history of fugitive dust complaints from adjoining residents nor has there been any regulatory notices issued requiring surface dust suppression. The Springvale Environmental Management System provides a platform for the maintenance and operation of dust control measures. Compliance monitoring is undertaken for due diligence and compliance purposes using independent contractors.

The Springvale Colliery pit top is situated against the Newnes State Forest and therefore is largely enclosed by native forest. Coal delivered to the ROM stockpile is wet with moisture levels ranging from 10-12% which acts to reduce particulate emissions. Other measures which are routinely employed at the Springvale Colliery to reduce emissions of particulate matter are the implementation of speed limits on internal roads, the enclosure of coal crushing and screening processes and material transfer by conveyor, the application of water sprays on the ROM stockpile and on open areas at the site. In addition, paved and bitumen covered pit top areas are swept with a street sweeper twice per week to minimise dust loading.

6.3.1. Dust Monitoring

Depositional Dust

Air quality monitoring has been undertaken during the reporting period in accordance with SSD 5594 and EPL 3607 requirements. The results obtained were significantly below the criteria levels specified in SSD 5594.

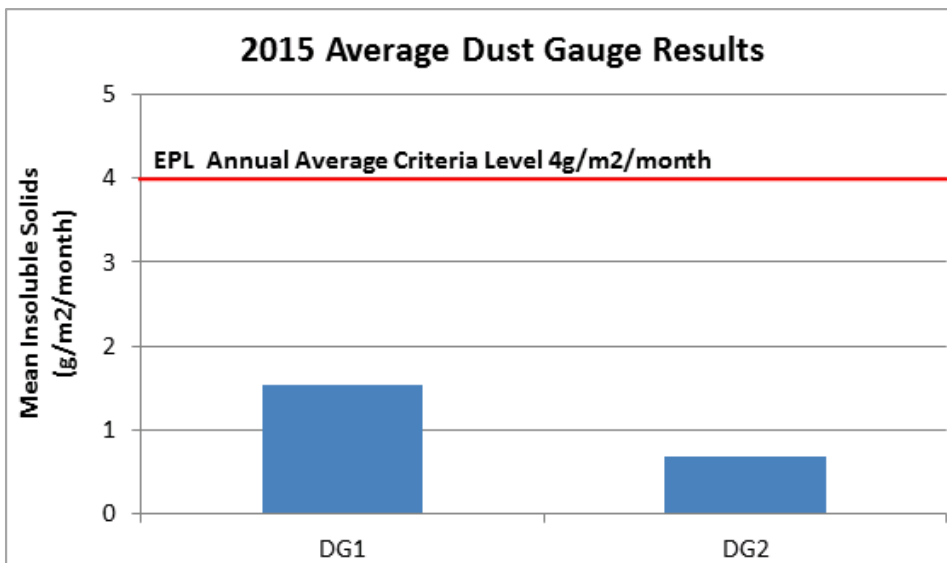
Table 17 presents a summary of dust results obtained during the reporting period. **Figure 9** shows the mean result of both the dust gauges.

Air quality results are also presented graphically in Appendix 1.

Table 17. 2015 Monthly Dust Gauge Results

Month	DG1	DG2
January	1.0	0.2
February	2.4	0.8
March	1.6	1.8
April	0.5	<0.1
May	1.9	0.2
June	1.9	0.5
July	3.7	0.7
August	1.3	0.3
September	1.0	0.9
October	0.4	0.7
November	0.9	0.5
December	1.8	0.9

Figure 9 2015 Average Dust Gauge Deposits



A comparison of the 2012 - 2015 dust monitoring results is presented in **Table 18**.

Table 18. Annual Average Dust Monitoring Results

Springvale Dust Gauge	2012	2013	2014	2015
DG1	1.55	1.63	1.44	1.53
DG2	1.16	1.09	0.51	0.68
AVERAGE	1.35	1.36	0.99	1.11

Dust results during 2015 were slightly above 2014 results, however were still less than recorded 2012 and 2013 results. The annual average insoluble solids for all dust gauges in the reporting period were well below the annual average of the EPL 4g/m²/month guideline.

Total Suspended Particulates (TSP) and Particulate Matter (PM10)

The HVAS monitoring system was commissioned in late 2010. A comparison of the 2012 - 2015 average results is displayed in **Table 19**.

Table 19. HVAS Average Results

AVERAGE	TSP (µg/m ³)	PM10 (µg/m ³)
2012	24	9
2013	17	7
2014	15	7
2015	14	8

The annual average for TSP and PM10 is well below guideline limits of 90µg/m³ and 30µg/m³ respectively and has decreased since 2012.

EIS (1992) Predictions \ Recommendations

The EIS predicted that Wallerawang Power Station would contribute 1g/m²/month deposited dust in the area, which is located approximately 1.5km from Springvale Pit Top. The main dust generating sources identified within the EIS area as follows:

- Coal product and reject stockpiles;
- Scraper, dozer and grader movements on overburden;
- Areas exposed prior to rehabilitation;
- Coal loading and hauling operations; and
- Vehicle movements on unpaved roads.

Additionally, road and traffic, residential developments and agricultural activities were predicted as being generally localised in area and duration and may contribute to deposited dust levels for Springvale Coal. The principle sources of airborne dust may potentially arise from the storage and transport of coal, which will be transported to the power station by conveyor soon after extraction. It is however noted that dust emanating from the transported coal is largely controlled as the coal has a moisture content of approximately 8%.

Airborne dust control measures recommended within the EIS are as follows:

- Water sprays fitted to the main coal stacking gantries and activated automatically to apply 2L/m²/hour of water over stockpile areas when wind speeds exceed 20–25 km/hr;
- Conveyor system (three-quarter's enclosed) and the section running past Duncan Street will be fully enclosed;
- Pit top access road will be sealed to restrict dust generation due to vehicle movements;
- The access road to the Washery site will be gravel and watered on an irregular basis given the low expected usage;
- Regular watering of the reject emplacement area; and
- Progressive rehabilitation of the reject emplacement area.

The results for 2015 show all dust gauges are well below the 4g/m²/month annual average criteria. Based on the EIS prediction of Wallerawang Power Station contributing 1g/m²/month to the surrounding area, it may be viewed that the impact of Springvale Coal on air quality is minor, with the annual average for DG1 – DG2 being 1.11 g/m²/month during 2015.

During the reporting period control measures implemented included watering of unsealed roads & coal stockpiles, vacuum sweeping of sealed surfaces (both on an as required basis), plus the use of a predominately (fully) enclosed conveyor system. The current controls were assessed to be appropriate during the site specific particulate matter control best practice assessment conducted during 2012 and are deemed effective in controlling airborne dust during the reporting period.

6.4. Biodiversity

A comprehensive environmental monitoring program has been prepared which covers the LW411-418 SMP Area in accordance with relevant conditions of the SMP Approval. Additional Management Plans also exist under EPBC 2011/5949 and EPBC 2013/6881. Monitoring and management of biodiversity impacts has been undertaken in accordance with these documents. Results are presented in the SMSR and EPBC Annual Report and concur that no significant impact has been observed.

6.5. Heritage

6.5.1. Aboriginal Heritage

The first aboriginal heritage site projected to be undermined, as applicable to SSD 5594, is an isolated artefact (Site #45-1-2739) which is located above Longwall 419 (due for commencement in 2016). The only potential effect on this site is from subsidence and potential impact that it will be located at a slightly lower elevation than that at which it now exists. The extent of this will be dependent on the site's location in relation to the longwalls. The monitoring and management of this artefact will be undertaken in accordance with the Heritage Management Plan prepared under Schedule 3 Condition 10h.

In 2014 Centennial Coal prepared a Western Region Aboriginal Cultural Heritage Management Plan in consultation with relevant stakeholders. This document aims to provide Centennial and Springvale with a consistent approach to consultation with local Aboriginal communities regarding Aboriginal cultural heritage identification as well as identify consistent minimum standards and processes for aboriginal cultural heritage identification, monitoring and management across Centennial's western operations. The plan was approved by the Department of Environment on the 23rd October 2014 and was thus in effect during the reporting period.

EIS (1992) Predictions \ Recommendations

The archaeological survey undertaken as part of the EIS predicts that the shelters above the area proposed for Longwall mining are not at risk from subsidence. It is recommended that shelter sites be included in any subsidence monitoring programs as a check on their stability.

During the reporting period, no noticeable damage to these shelter sites was observed, nor damage caused by subsidence. These findings are representative of those predicted within the EIS.

6.5.2. Natural and European Heritage

Newnes State Forest occupies the area above the Springvale underground coal leases. The area is currently managed by Forests NSW who regularly carries out logging activities of both its pine plantations and native forests. In addition to logging activities, tracks are maintained by Forests NSW which attracts a large number of 4WD and trail bike riders. The area is also very popular for campers and bushwalkers. In 2006, the Newnes State Forest was gazetted as a hunting area for Bow Hunters.

An historical heritage assessment has been completed including a review of relevant Commonwealth, State and local historic heritage registers. The review of relevant registers included the National Heritage List, Commonwealth Heritage List, State Heritage Register, State Government Agency Heritage and Conservation Register and the Lithgow City Local Environmental Plan. No historic heritage items and/or National Heritage Places have been identified within the Springvale Colliery holding.

6.6. Waste

The major waste streams from the mine include water, packaging material including plastic, paper and cardboard, wood, waste oil, oil filters, oil drums, scrap metal, hoses, bottles (plastic and glass), sewage effluent, as well as general putrescible rubbish.

General waste is disposed of to landfill by licensed waste contractors. Recyclable materials, for example, plastic, paper and cardboard products, are recycled whenever possible at the site. Oil drums and filters are recycled with other waste metals, and are removed from site by a metal recycling company. Waste oil collected in the workshop is stored in an underground collection sump before being removed off site by a licensed contractor for recycling. Sewage is treated and applied to land in the on-site sewage treatment plant

Paper, plastic and cardboard are recycled both from bulk packaging from the store and site offices, either at the pit top or other infrastructure areas or transferred to a recycling facility.

Non-production waste is managed in accordance with the EIS and existing Mining Operations Plan, with all potentially hazardous material stored and/or banded appropriately in accordance with relevant standards. Where possible, all quantities of waste or recyclable material are quantified and recorded for benchmarking and continuous improvement purposes as well as reporting in accordance with the National Greenhouse and Energy Reporting Scheme.

During the reporting period a recycling rate of 39.78% (Total offsite waste tonnes / Recycled waste) was achieved. This represents an increased recycling rate, comparing to 32.16% in 2014.

Waste management practices are therefore considered effective at Springvale Colliery.

A summary of the waste removed and recycled is presented in **Figures 10** and **11**.

Figure 10 2015 Waste Management Summary

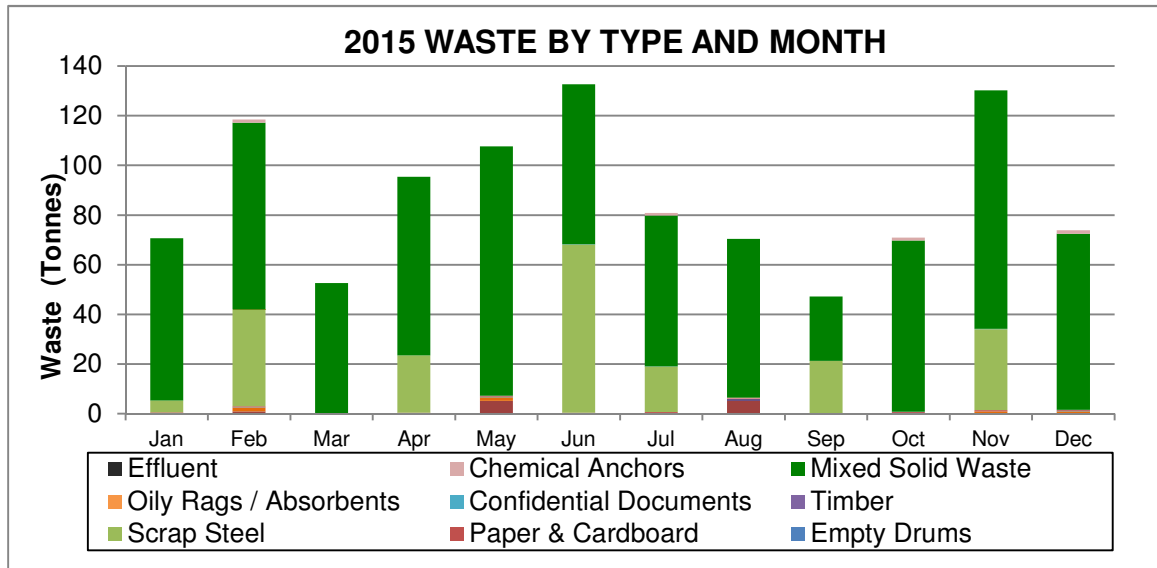
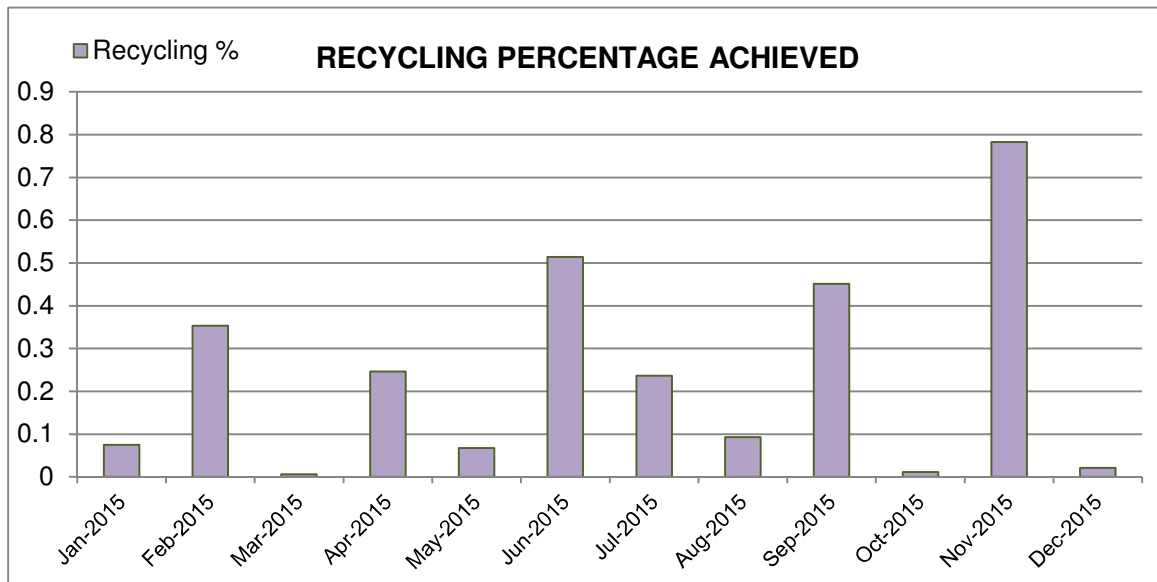


Figure 11 Recycling Percentage Summary



6.7. Contaminated Land

Major potential sources of groundwater pollution around the pit-top area are from hydrocarbon storage and dispatch. To eliminate this risk the underground fuel tanks were decommissioned and validated in 2009. They have subsequently been replaced with fully self-contained above ground storage facilities. A comprehensive Phase 2 hydrocarbon contamination assessment was undertaken during 2011. Field work and laboratory analysis has been completed and a final report prepared by the consultants.

6.8. Hydrocarbon Contamination

Fuels and oils are stored in purpose built facilities with appropriate bunding and firefighting provisions. Diesel is stored in above ground bunded tanks from where it is transferred to diesel pods for underground use or direct to machinery. A licenced contractor is engaged to remove and recycle and/or dispose of used oil and grease products at licensed facilities.

6.9. Spontaneous Combustion

The Lithgow coal seam has a low propensity for spontaneous combustion with no spontaneous combustion issues in relation to in-situ or for processed Lithgow seam coal. The highest risk of spontaneous combustion in relation to Lithgow seam coal appears to be during stockpiling for periods greater than approximately 1 year. Springvale coal is generally stockpiled for less than 1 year. There have been no incidences of spontaneous combustion in the life of Springvale mine.

EIS (1992) Predictions \ Recommendations

As predicted within the EIS, no occurrences of spontaneous combustion were observed during the reporting period.

6.10. Bushfire

The majority of the land within the Springvale holding has been identified as Bushfire Prone Land. Fire history data from the Forestry Corporation of NSW indicates that the majority of bushfires in the area spread from the north and east of Springvale Mine due to the direction of dominant winds throughout the bushfire season. A number of fire trails exist across the Newnes Plateau, namely Sunnyside Ridge Road, Campbells Track and Maiyngu Marragu Trail. These act as containment lines mitigating a degree of bushfire risk to Springvale Mine's infrastructure.

Springvale Mine has established a Bushfire Management Plan (SV-MS-029 (2013)) and the associated Bushfire Management Procedure (SV-MS-029-WP-568 (2011)) in consultation with the NSW Rural Fire Service. These documents identify both the risks posed by bushfire to Springvale Mine assets, and control strategies to mitigate these risks.

In 2013 the devastating State Mine fire burnt through more than 46,000 hectares. The bushfire caused power outage and minor damage to mine infrastructure located on the Newnes Plateau. Several flora monitoring plots on the Springvale lease were affected by the bushfire.

In 2015 there were no bushfires affecting Springvale Colliery.

EIS (1992) Predictions \ Recommendations

The EIS details the requirement for firefighting services to access water at the Pit Top and Washery in the event of a bushfire. Current bushfire controls include the Springvale-Delta Transfer Scheme, which pumps up to 30ML per day from Springvale Coal and Angus Place Colliery to Wallerawang Power Station. Along the pipelines length, fire hydrant points have been installed for use by fire services.

6.11. Mine Subsidence

The Springvale Subsidence Management Plan (SMP) was approved and issued by DRE on the 7th of March 2006 for first and secondary extraction within Longwalls 411 – 418. Subsequent SMP variations have been submitted and approved since, with a variation completed and approved in 2015 for an extension of the approved period of mining.

During the reporting period the extraction of Longwall 417 was completed in July and following the longwall move, extraction of Longwall 418 commenced in October.

No anomalous surface movements were detected during the reporting period that warranted investigation.

Longwall 417

Extraction of Longwall 417 (LW417) commenced on the 11th of October 2014 and was completed on the 4th of July 2015. The total retreat was 2488metres.

The subsidence and environmental monitoring program conducted throughout the extraction period determined that impacts to surface infrastructure, flora, fauna and groundwater were in line with SMP predictions and represented a minor to negligible impact.

The measured subsidence effects across the Temperate Highland Peat Swamps on Sandstone (THPSS) due to LW417 were within predicted ranges for smooth and discontinuous subsidence profiles. None of the measured subsidence effects to-date has caused any surface cracking or erosion impacts to the swamps or cliff lines to the east. It is assessed that there have been no anomalous surface movements or impacts across the study area due to LW417.

No impacts on surface quality were apparent during the reporting period. Groundwater levels generally reflected historic levels and climatic patterns. Flora and fauna monitoring undertaken show there has been no significant variation in flora or fauna detected as a result of the extraction of LW417.

Longwall 418

Extraction of Longwall 418 (LW418) commenced on the 22nd of October 2015 and continued for the remainder of 2015. The retreat of LW418 as at the 31st of December 2015 was 881metres.

Subsidence and environmental monitoring results indicated that there were no observed subsidence impacts or incidents during the reporting period. Any impacts have been in line with SMP predictions and represented a minor to negligible impact.

Data analysis has demonstrated that there have been no significant differences in habitat characteristics at fauna monitoring sites and no significant difference in fauna species richness values within the SMP area. Threatened species also continue to be recorded at monitoring locations. Flora observations made at trigger and reference sites support that cofounding environmental factors are active within the mining area.

EIS (1992) Predictions \ Recommendations

Subsidence monitoring results are within predictions detailed in the EIS. These predictions for subsidence are detailed below:

- 33 (potential) longwall panels;
- Panels 1 – 2 to experience subsidence range from 40% of mined thickness (i.e. 1.2m) to 65% (i.e. 1.95m) and tensile strain between 5mm/m and 13mm/m;
- Panels 3 – 25 to experience similar subsidence levels (40 – 65%), although the depth of cover increases from panel 3 – 19 (e.g. panels 3 – 7 between 310 – 355m and panels 8 – 25 between 295 – 420m);
- Maximum subsidence over panels 3 – 19 (i.e. 40% of mined thickness or 1.44m); and Subsidence to occur within 6 – 9 months post extraction, with the majority of subsidence occurring within 4 months of the longwall passing a particular point.

6.12. Methane Drainage / Ventilation

The Lithgow coal seam is particularly low in methane gas content and therefore no active management such as methane drainage is required. However, for mine safety reasons monitoring is carried out for mine ventilation gasses.

6.13. Public Safety

Springvale Mine also has an approved Public Safety Management Plan to manage public safety in all surface infrastructure areas. This has been developed during Subsidence Management Plan applications and updated where required.

These Plans include the following controls:

- providing, where practical, fencing and warning signage around the pit top area, and security staff patrols on a regular basis; and
- Should subsidence pose a potential public safety risk, warning signs will be erected and subsidence repairs will be completed as soon as practicable. All actions will be completed as per the Trigger Action Response Plan.

During 2015 there were no variations in Springvale's approach to managing aspects associated with public safety.

6.14. Weeds

Major weed threats include Blackberry, Scotch Thistle, St. Johns Wart, which are targeted by the noxious weed control program within the monthly surface maintenance program. Weeds are targeted during the autumn and spring seasons. The weed control program mainly focuses on controlling weeds on the Pit Top, Overland Conveyor and Coal Services Sites.

A s95 certificate has been granted by OEH to enable weed control works (including hand removal of weeds) to be undertaken in both the East Wolgan and Narrow Swamps as a result of activities associated with previous mine dewatering operations. A suitably qualified contractor (Bush Doctor) undertakes these works as required.

Weed control works are carried out where required, as identified during the inspections of the Pit Top and disturbance areas of the Newnes Plateau. Weed species identified will be targeted for eradication.

6.15. Erosion and Sediment Control

There are minimal exposed earthen areas at Springvale and most activities at the pit top are undertaken on relatively flat areas. In addition, high activity areas are sealed (e.g. car park areas). Internal unsealed roads are maintained to prevent dust, primarily through dust suppression sprays and water carts. Sediment fences are installed where required to filter sediment from drainage / seepage. Sediment is controlled by a series of dams and water treatment facilities at the Springvale pit top and at Newnes Plateau infrastructure sites. Water discharged is monitored for suspended solids.

6.16. Feral Animals

There were no issues of concern regarding feral animal control during the reporting period.

7. WATER MANAGEMENT

7.1. Water Licences

The following table presents water take for Springvale 2014/2015 FY. It is important to note that **Table 20** reports on the WATER YEAR which is from the 1st of July to the 30th of June, not the calendar year.

Table 20. Water Take

License #	Water Sharing Plan, source and management zone (as applicable)	Entitlement	Passive take / inflows	Active pumping	TOTAL
WAL 36383	Sydney Basin Richmond Groundwater Source	5,958	N/A	4950.7 ML	4950.7 ML
WAL 36446	Sydney Basin Coxs River Groundwater Source	3,300	N/A	451.1 ML	451.1 ML
WAL 36443	Sydney Basin Coxs River Groundwater Source	585	N/A	177.6 ML	177.6 ML

Volume is reported in annual megalitres (ML).

7.2. Surface Water Monitoring

Surface water monitoring is undertaken in accordance with EPL 3607. Results of the monitoring are reported on an annual basis to the OEH via the EPA Annual Return. The following tables provide a summary of results obtained during the reporting period.

Springvale will prepare a Site Water Management Plan in 2016, as required under SSD 5594 Schedule 4 Condition C14.

7.2.1. Water Quality

Water quality results for LDP001 and LDP009 are presented in **Tables 21** and **22** below.

LDP water quality results are also presented graphically in Appendix 2.

Table 21. LDP001 Quality

Pollutant	Unit of measure	Lowest sample value	Mean of sample	Highest sample value	Limit
Conductivity	microsiemens per centimetre	184	910.62	1136	NA
Filterable iron	milligrams per litre	<0.05	0.021	0.13	NA

Pollutant	Unit of measure	Lowest sample value	Mean of sample	Highest sample value	Limit
Filterable manganese	milligrams per litre	<0.001	0.005	0.02	NA
Oil and Grease	milligrams per litre	<5	0.67	8	10
pH	pH	7.07	8.34	8.92	6.5-9.0
Total suspended solids	milligrams per litre	<5	1.15	8	30

EC ranged from 184µS/cm to 1136µS/cm with an average of 910.62µS/cm. This is slightly lower than the 2014 average of 936µS/cm, however generally consistent with previous years.

Filterable iron ranged from <0.05 to 0.13mg/L with an average of 0.021mg/L. This is slightly lower than the 2014 average of 0.048mg/L, however generally consistent with previous years.

Filterable manganese ranged from <0.001mg/L to 0.02mg/L with an average of 0.005mg/L. This is slightly lower than the 2014 average of 0.0501mg/L, however generally consistent with previous years.

Oil and grease results were generally below the detection limit for the reporting period. The maximum result recorded was 8mg/L, which is below the EPL criteria of 10mg/L.

The pH of discharged water from LDP001 ranged between 7.07 and 8.92, with an average of 8.34. An upgraded acid dosing system has been in place since 2014 at LDP001 utilising real time technology to adjust to varying flow and pH levels. One pH exceedance was recorded in the previous reporting period, however all recorded results for this reporting period were within EPL criteria limits.

TSS ranged from <5mg/L to 8mg/L with an average of 1.15mg/L. This is markedly lower than the 2014 average 9.86mg/L. One TSS exceedance was recorded in the previous reporting period, however all recorded results for this reporting were well below the EPL criteria level of 30mg/L.

Table 22. LDP009 Quality

Pollutant	Unit of measure	Lowest sample value	Mean of sample	Highest sample value	Limit
Aluminium (dissolved)	milligrams per litre	<0.01	0.03	0.17	0.45
Arsenic (dissolved)	milligrams per litre	0.006	0.013	0.026	0.024
Boron (dissolved)	milligrams per litre	<0.05	0.06	0.08	0.37

Pollutant	Unit of measure	Lowest sample value	Mean of sample	Highest sample value	Limit
Conductivity	microsiemens per centimetre	1098	1180.04	1310	1200
Copper (dissolved)	milligrams per litre	<0.001	0.001	0.014	0.007
Fluoride	milligrams per litre	1.10	1.23	1.4	1.8
Iron (dissolved)	milligrams per litre	<0.05	0.01	0.39	0.4
Manganese (dissolved)	milligrams per litre	<0.001	0.006	0.017	1.7
Nickel (dissolved)	milligrams per litre	0.001	0.003	0.004	0.047
Oil and Grease	milligrams per litre	<5	0.2	10.0	10
pH	pH	7.61	7.88	8.08	6.5-9
Zinc (dissolved)	milligrams per litre	<0.005	0.012	0.044	50

Results for Aluminium, Boron, Fluoride, Iron, Manganese, Nickel, Zinc as well as Oil and Grease were all within EPL criteria limits for the reporting period, consistent with the previous reporting periods results.

Arsenic results ranged from 0.006mg/L to 0.026mg/L with an average of 0.013mg/L. While the average result had decreased from 0.022mg/L to 0.013mg/L since the previous reporting period, one exceedance of the EPL criteria level was recorded at this site in January. The 0.002mg/L exceedance was caused by the mobilisation of naturally occurring minerals triggered by the dewatering of the underground goaf water storage. A ferric chloride water treatment system has been installed at the Bore 940 site (an LDP009 water source) for the removal of soluble arsenic. No further exceedances were recorded in the reporting period.

Copper results ranged from <0.001 to 0.014mg/L with an average of 0.001mg/L. While the results are consistent with the previous reporting periods, one exceedance of the EPL criteria level was recorded at this site during February. The 0.007mg/L exceedance was also caused by the mobilisation of naturally occurring minerals triggered by the dewatering of the underground goaf water storage. An investigation was undertaken and water extraction rates were subsequently modified to achieve compliance. No further exceedances were recorded in the reporting period.

EC results ranged from 1098µS/cm to 1310µS/cm with an average of 1180.04µS/cm. This represents a slight increase from the previous reporting period, where the average was 1131.04µS/cm. A number of exceedances against the EPL criteria level of 1200µS/cm were recorded during the reporting period. The increased EC levels and exceedances have been attributed to the increased exposure of mine water with goaf material. Specialist assessments

have been undertaken which have concluded that there have been no adverse impacts from the elevated EC levels.

Further details regarding the non-compliances are outlined in Section 11 of this report and are available via the EPA Annual Return available online through the EPA website link:

<http://epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=3607&id=3607&option=licence&searchrange=licence&range=POEO licence&prp=no&status=Issued>

Licensed Discharge Points 6 and 7 are not associated with SSD 5594 and no discharges from Licensed Discharge Points 4, 5 and 10 occurred during the reporting period. No water quality results have therefore been included for these points.

EIS (1992) Predictions \ Recommendations

An extensive Surface Water Management System has been developed as part of the Springvale Coal Environmental Management System (SV-MS-027). This document, along with the Springvale Coal Subsidence Environmental Monitoring Program (SV-MS-036), identifies, describes and details the requirements which Springvale Coal must meet for surface water monitoring, analysis and reporting.

7.2.2. Water Volume

Water volume for the reporting period was monitored through flowmeters located at discharge points LDP001, LDP002 and LDP009. Daily discharge volumes are measured against EPL 3607 volume limits and reported on monthly in the EPL 3607 Environmental Monitoring Report published on the Springvale website. Annual discharge volumes are outlined in **Table 23**.

Table 23. Water Volume

Licensed Discharge Point	Annual Total (kilolitres)
LDP001	259929.66
LDP002	7642.1
LDP004	No discharge
LDP005	No discharge
LDP009	8224950.15
LDP010	No discharge

7.3. Groundwater Monitoring

7.3.1. Groundwater Monitoring Strategy

As part of the environmental management plans for Springvale Colliery, an intensive monitoring programme has been implemented on the Newnes Plateau to detect any impacts from underground mining on the groundwater regime, and in particular the Newnes Plateau Shrub Swamps (NPSS). The greater monitoring programme incorporates NPSS and groundwater monitoring locations above both Springvale Colliery and the adjacent Angus Place Colliery. The monitoring locations within the Springvale mining lease boundary include the following main aspects:

- Groundwater levels monitored in 10 swamps, with a total of 24 swamp piezometers;
- Flow from Junction Swamp monitored through a v-notch weir, and flows in Sunnyside Swamp and Carne West Swamp indicated by pool depth monitors;
- Groundwater levels in the regional shallow aquifer measured in 22 piezometers, which are

installed on the ridges between the swamps;

- Hydrogeological conditions in the geological sequence above the working seam are monitored by multi-level piezometer arrays, installed in 11 boreholes across the entire spatial extent of mining lease boundary;
- A basic weather station providing climatic data on the Newnes Plateau;
- Water quality data recorded in 10 piezometers across 4 swamps.

Data is recorded at various frequencies as follows:

- Swamp and aquifer piezometer data automatically recorded every three hours;
- Surface water level data in pools and weirs automatically recorded every hour;
- Multilevel piezometers generally record data once per day;
- Dipped aquifer piezometers are measured at each data collection trip (monthly);
- Barometric data recorded automatically every three hours for correction of piezometer data;
- Swamp water quality data recorded monthly.

7.3.2. Swamp Water Levels

Overall, the water level patterns recorded in swamps which have been undermined, and those which have not been undermined show similar trends. A characteristic Type A trend and a characteristic Type C trend is identifiable from the hydrographs. These two trends remain the same whether the swamp has been undermined or not.

Water level fluctuations in the monitored swamps (both undermined and baseline) are largely attributable to rainfall and climatic patterns and it can be said that mining at Springvale has not led to any identifiable significant water level impacts on the monitored swamps, and that all undermined swamps display water levels which can be likened to baseline behavior.

Refer Appendix 3 for RPS graph outputs.

The following sections provide an overview of data trends for swamp water levels as per the current SMP Area.

Sunnyside West Swamp

There is one piezometer installed in Sunnyside West Swamp, the details of which are shown in **Table 31**.

Table 31: Sunnyside West Swamp Piezometer Information

Piezometer	Mined Status	Swamp Type	Monitoring Commencement
SW1	LW413B and LW414	Type A	26/07/2007

Water levels at SW1 correlate closely to rainfall patterns and intensity. The swamp is generally observed to show no deviation from expected responses given rainfall and climatic conditions.

The following was noted during the reporting period.

- Water levels were observed to be dropping with declining CRD between June to September. This response is typical of SW1 and can be seen in previous observations.
- Water levels fluctuated by over 1m with rainfall between October to December. This response is typical of SW1 and can be seen in previous observations. If above average rainfall conditions are not maintained following large rainfall events the water levels quickly decline to the base of the piezometer.

Sunnyside Swamp

There are four piezometers installed in Sunnyside swamp, the details of which are shown in **Table 32**.

Table32: Sunnyside Swamp Piezometer Information

Piezometer	Mined Status	Swamp Type	Monitoring Commencement
SS1	Not Undermined	Type C	12/05/2005
SS2	Not Undermined	Type C	12/05/2005

Water levels at SS1 and SS2 correlate closely to rainfall events and follow expected responses given rainfall and climatic conditions. Both showed marginal increases in water levels in response to rainfall events in January and April.

The following was also noted during the reporting period.

- SS1 shows a fairly consistent groundwater gradient while SS2 shows marginal declines in groundwater gradient after rainfall events. Water levels at SS1 and SS2 are still however within expected responses.
- SS1 displayed a more subdued response to rainfall events between October and December, however is still within expected responses.

Sunnyside East Swamp

Three piezometers are installed into Sunnyside East Swamp as shown in **Table 33**.

Table33: Sunnyside East Swamp Piezometer Information

Piezometer	Mined Status	Swamp Type	Monitoring Commencement
SSE1	Not Undermined	Type A	12/03/2010
SSE2	Not Undermined	Type C	12/03/2010
SSE3	Not Undermined	Type C	12/03/2010

Sunnyside East swamp piezometers generally correlate closely with rainfall patterns and intensity. Over the reporting period water levels are observed to remain predominantly at or below the base of the piezometers.

SSE1 is the deepest of the three piezometers installed at Sunnyside East and has shown water levels to be typically 0m to 0.1m above the logger throughout 2015. These levels indicate that the sensors are measuring trapped water in the base of the piezometers and that the measurements are not representative of the water level in the surrounding horizon. Historically this site has shown some strong responses to rainfall but only after prolonged rainfall and higher than average seasonal rainfall. No response to rainfall was observed in SSE1 in 2015. This is not uncommon for this piezometer as frequently in previous years the water level in the piezometer has remained unresponsive for durations of 8 to 10 months.

The water level in SSE2 has showed a continued decline which started in March 2013. For the majority of the reporting period water levels were at or below the base of SSE2, responding marginally to rainfall events throughout the year. Small fluctuations marginally above the base of the piezometer were detected towards the end of the reporting period; however there were no responses to significant rainfall events.

SSE3 water levels have shown a very similar pattern to those in SSE2 with a decline from approximately ground level during the latter half of 2012. SSE3 can be seen responding closely to rainfall throughout the reporting period. Water levels however decline to or below the bottom of the piezometer between these periods of rainfall. This trend throughout the reporting period is consistent with previous data.

Carne West Swamp

There are four piezometers installed into Carne West Swamp as shown in **Table 34**.

Table 34 Carne West Piezometer Information

Piezometer	Mined status	Swamp Type	Monitoring Commencement
CW1	Not undermined	Type C	12/05/2005
CW2	Not undermined	Type C	12/05/2005
CW3	Not undermined	Type A	14/10/2011
CW4	Not undermined	Type A	14/10/2011

CW1 and CW2 show uncharacteristic declines since early 2014 with no apparent recovery. CW1 remained dry over the reporting period, only responding marginally to high rainfall in April. Water levels in CW2 steadily declined over the reporting period, however two periods of increasing water levels were recorded associated with rainfall in January and April. Water levels continued to decline between the rainfall events.

For the Type A section of Carne West (CW3 and CW4), no water levels were recorded in these piezometers in 2015. Since monitoring was initiated in these piezometers, these monitoring points have only responded to significant and prolonged rainfall events. Characteristic responses for these piezometers comprise rapid rises and subsequent declines in water level to a depth below the base of the piezometer. CW3 and CW4 showed declining water levels during 2013 and have remained below the base of the piezometers since then. No responses to rainfall events were observed over the reporting period. Hydrographs indicate that the influence of a prolonged period of below average rainfall between March 2013 and March 2014 was significant enough to lower water levels to a point where the water levels have remained below the base of the CW3 and CW4 piezometers.

Carne Central Swamp

There is one piezometer installed in Carne Central Swamp as shown in **Table 35**.

Table35 Carne Central Swamp Piezometer Information

Piezometer	Mined status	Swamp Type	Monitoring Commencement
GG1	Not Undermined	Type C	14/10/2011

Water levels measured at the Carne Central piezometer (CC1) have shown a steady trend at around ground level since data collection commenced in 2011. Sampling events are evident in the data set with sampling frequency increasing from June 2013, as such; interpretation of this data should be undertaken with consideration of monthly maximums. Groundwater levels remained relatively stable for the duration of 2015 apart from a slight decline and recovery in October and November respectively. The current intensity of water sampling appears to be impacting on the quality of data recorded and consideration is being given to reverting to the original monitoring frequency.

East Wolgan Swamp

East Wolgan Swamp is located above the eastern extent of the current Angus Place longwalls and has been undermined by Angus Place Colliery longwalls 960 and 970. The swamp is the down gradient extension of the Junction Swamp above the neighbouring Springvale Colliery, and is a licensed discharge point (LDP004) for Springvale. LDP004 is currently only used for emergency discharge. There were no recorded discharge events into the East Wolgan Swamp during the review period.

The water level at East Wolgan swamp is monitored at WE1 and WE2 and water levels closely resemble rainfall patterns and intensity. Since early 2009 the responses have declined to short duration spikes in water level and since mid-2009 WE1 and WE2 water levels have generally remained at or below the base of piezometer. WE1 and WE2 both responded to rainfall in January

and April during the reporting period. WE1 remained mostly dry between these rainfall events while WE2 further responded to a rainfall event in July then also remained mostly dry for the remainder of the reporting period.

7.3.3. Regional Shallow Aquifer Water Levels

Standpipe piezometers monitoring water levels in the regional shallow aquifer generally display stable trends which fluctuate with rainfall and climatic conditions in the same manner as previous years. No identifiable mining impacts in the shallow aquifer have been recorded.

Manually Monitored Standpipe Piezometers

The manually dipped piezometer (RSE) is shown in **Table 36**.

Table 36 Manually Dipped piezometer locations

Monitoring Point	Easting	Northing	Monitoring Frequency	Monitoring Commence Date	Monitoring Depth (mbgl)	Data Recording Method
RSE	236840	6304191	Every two months	20/12/2005	Unknown	Manual dip

The RSE standpipe piezometer is situated in the north-west region of the site and is monitored by manual measurements approximately bimonthly.

The RSE standpipe piezometer remained at a stable average 49.71 mbgl between January and May, fluctuating with rainfall in January and April. The groundwater level was then reported dry during monitoring rounds between June to December. The water level at RSE has always hovered close to the bottom of the piezometer and the recent dry measurements are likely a delayed response from low rainfall conditions since early 2014.

Continuously Monitored Piezometers

Standpipe piezometers equipped with water level pressure transducers and data loggers are installed over a large spatial extent of Springvale mining lease boundary. Some of the standpipe piezometers at Springvale are located next to multilevel vibrating wire piezometer installations, while several stand-alone standpipe piezometers have also now been installed. The continuously monitored piezometers are listed in **Table 37**.

Table 37 Continuously Monitored piezometer locations

Monitoring Point	Easting	Northing	Monitoring Commence Date	Hole Depth (mbgl)	Data Recording Method
SPR1111	240404	6303692	14/12/2011	60.9	Pressure transducer
SPR1112	240852	6302995	15/12/2011	50.0	Pressure transducer
SPR1113	240625	6302160	13/02/2012	60.6	Pressure transducer
SPR1109	239186	6303314	14/12/2011	60.1	Pressure transducer
SPR1108	241045	6301305	04/11/2011	76.1	Pressure transducer
SPR1107	239739	6302330	04/11/2011	55.6	Pressure transducer
SPR1110	238699	6302635	14/12/2011	65.8	Pressure transducer
SPR1101	238484	6303627	14/11/2011	47.4	Pressure transducer
SPR1106	239980	6304227	15/12/2011	86.2	Pressure transducer

Monitoring Point	Easting	Northing	Monitoring Commence Date	Hole Depth (mbgl)	Data Recording Method
SPR1104	239746	6303184	04/11/2011	47.0	Pressure transducer
SPR1210	239677	6300052	31/05/2013	131.2	Pressure transducer
SPR1211	239677	6300052	31/05/2013	133.8	Pressure transducer
SPR1301	239275	6299271	26/05/2014	86.7	Pressure transducer
RSS	238072	6303500	01/12/2005 to 14/12/2011	Unknown	Manual Dip
			14/12/2011		Pressure transducer

The following trends were noted during the reporting period:

- Water levels at SPR1108, SPR1111 and SPR1113 were generally stable to slightly declining over the reporting levels. The decline follows a groundwater high over 2012 and 2013. Towards the end of the reporting period the declines appear to have stabilised.
- A slight declining trend was observed in SPR1104 with a slightly increased rate towards the end of the reporting period. This trend is also apparent on a regional scale.
- Water levels at SPR1107 show the continuation of a gradual decline over the reporting period. The decline follows a groundwater high over 2012 and 2013. As with SPR1104 a slightly increased rate in the decline was observed towards the end of the reporting period.
- Water levels at SPR1109 showed the continuation of a gradual decline generally consistent with background trends. As the piezometer was undermined by LW418 a rapid water level drop occurs with water levels declining by approximately 4m. After the decline, relatively stable water levels are observed with a slight declining trend continuing.

Standpipe Water Level Interpretation

Water levels in the standpipe piezometers monitoring regional shallow aquifer display trends that fluctuate as normal and in the same manner as in previous years.

The following trends were noted during the reporting period:

- Groundwater in RSS has remained stable averaging 29.95 mbgl fluctuating with rainfall in January and April.
- The SPR1101 replacement bore SPR1401 (water levels dropped below the base of the SPR1101 piezometer) initially showed a decline due to subsidence equilibration from LW417 but stabilised and has remained stable over the reporting period. Levels showed a slight decline towards the end of the reporting year associated with the passing of LW418.
- Water levels at SPR1110 showed a decline from December 2012 to December 2013 to below the base of the piezometer. Over the reporting period levels have remained below the base of the piezometer.

Vibrating Wire Piezometers

Multi-level vibrating wire piezometers (VWPs) have been installed in boreholes across the mining lease boundary area to monitor pore pressures at various levels in the overburden and coal measures lithologies. Most of the VWPs are located in the centre of the current workings at Springvale Colliery, in the area that is currently being mined, or areas that will be mined over the next few years.

For the analysis and interpretation of groundwater levels in this report, only VWP monitoring points in the vicinity of the active longwall extraction during 2015 have been analysed, these being SPR36, SPR66, SPR67, SPR1106 and SPR1210, as shown in **Table 38**.

Table 38 Vibrating Wire Piezometer Locations

Monitoring Point	Easting	Northing	Monitoring Frequency	Monitoring Commence Date	No.of Functioning Piezometers	VWP Setting Depth (mbgl)
SPR36	239358	6303496	Twice Daily	11/2015	8	35, 75, 130, 146, 274, 320, 376, 389
SPR66	239824	6301994	Daily	30/09/2009	8	35, 80, 130, 180, 230, 290, 348, 372
SPR67	238709	6302283	Daily	28/09/2009	8	35, 50, 70, 90, 110, 160, 200, 260
SPR1106	239982	6304225	Daily	05/05/2012	8	123, 164, 252, 262, 277, 324, 342, 363
SPR1210	239694	6300051	Daily	25/09/2012	7	76, 160, 225, 309, 327, 377, 389

The following trends were noted during the reporting period:

- SPR36 showed a stepped drop in piezometric pressure in December as a result of bed separation and increased storage. The majority of piezometers show stabilisation since the passing of LW418, however, piezometer #3 located about 60m above the longwall shows a continued decline. The shallowest piezometer a 35m shows no change in piezometric pressure.
- SPR66 showed a slight drop in piezometric pressure in the deeper piezometers (#1, #2, #3 and #4) in May and June with a lesser decline in the shallow piezometers. The decline in piezometric pressure is considered to be associated with the extraction of LW418.
- SPR67 piezometer #1 and piezometers #2 and #3 were damaged by LW416 subsidence at the end of 2014 and start of 2015 respectively. Piezometers #4 and #5 continue to show declining water levels with #5 showing a secondary depressurisation response around August.
- SPR1106 showed a gradual decline in piezometric pressure in December. The decline is apparent in all sensors, which are all located beneath the Mt York Claystone geological sequence. The most pronounced response is observed at sensor #7 located approximately 25m above the seam. These trends are in response to the mining of LW418.
- SPR1210 water levels remained stable at all sensors during the reporting period. A battery malfunction resulted in the data logger being removed for inspection/maintenance in June and reinstated in August.

8. REHABILITATION

8.1. Rehabilitation in 2015

Springvale has adopted a progressive approach to rehabilitation to reduce and mitigate potential environmental impacts. Facilities no longer required, for example, exploration sites, or ventilation and dewatering facilities, are rehabilitated soon after decommissioning, to return disturbed land to the original landform. Rehabilitation is followed up with periodic inspections and maintenance as necessary based upon evidence of endemic regrowth, weeds and soil disturbance. Rehabilitation acceleration techniques are undertaken as required following approval from the Forestry Corporation of NSW (FCNSW) and in accordance with the Springvale – FCNSW Level 3 Occupation Permit.

Due to the underground nature of mining operations at Springvale, surface disturbance and the need for progressive rehabilitation is relatively minor compared to that required at an open cut mining operation. No major rehabilitation of the pit top and Newnes Plateau infrastructure is anticipated until site closure.

During the reporting period no rehabilitation or disturbance was undertaken. Additionally, there has been no change in disturbance footprint in 2015.

The status of mining and rehabilitation as at the end of 2015 is presented in **Table 24** and **Figure 12**.

Table 24. Rehabilitation Status

Mine Area Type	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
	Year 2014 (ha)	Year 2015 (ha)	Year 2016 (ha)
A. Total mine footprint¹	68.5	68.5	80.9
B. Total active disturbance²	61.5	61.5	67.1
C. Land being prepared for rehabilitation³	0	0	6.8
D. Land under active rehabilitation⁴	7	7	7
E. Completed rehabilitation⁵	0	0	0

The 7 ha of land under rehabilitation as at the end of 2015 relates to the Bore 1 – Bore 4 dewatering facilities, services corridor to the Bore 8 dewatering facility, Old Fire Dam and the Settlement Pond Site.

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

8.2. Rehabilitation Monitoring

Rehabilitation monitoring was undertaken during 2015 on the Newnes Plateau and at the Pit Top. Five rehabilitation monitoring sites were established:

- SPR 1 – this rehabilitation site was previously used as a dam. The Old Fire Dam has since been infilled with soil and or seeded with native vegetation;
- SPR 2 – this rehabilitation site on the Newnes Plateau is associated with the infrastructure corridor to the Bore 8 Dewatering Facility;
- SPR 3 – rehabilitation site on the Newnes Plateau at the previous Bore 1 Dewatering Facility;
- SPR 4 – analogue site for the Pit Top located upslope from SPR 1; and
- SPR 5 – analogue site on the Newnes Plateau.

A summary of monitoring results at the rehabilitation sites is provided below:

SPR 1

This site was found to be performing well in terms of stability and retention of materials (according to landscape organisation indices and soil surface indices). Despite the favourable scores, numerous bare soil patches were visible on the steeper sections of the transect during the 2015 survey. These exposed areas appeared to be stable, however it was noted that they would likely benefit from some additional soil protection to avoid future erosion.

The vegetation on this site was well established and contained a relatively high diversity of native species. It was noted that the site is dominated by wattle (*Acacia*) and Dogwood regrowth in the canopy and understorey strata. This is often encountered on rehabilitation sites and may resolve naturally as *Acacia* individuals die off (lifespan generally 10 - 15 years) or may be 'progressed' by thinning some of the *Acacia* vegetation and introducing long stem planting of native eucalypts.

No exotic plant species were observed at this site. Future weed growth problems were noted as being unlikely.

SPR 2

Native plant regeneration on this site is expected to continue naturally. It was noted that the thick cover of logs and woody debris dispersed across the site may retard seed germination rates and seedling establishment in its early stages (when seeds require space and sun exposure to germinate). Nonetheless, it was noted as apparent that native plants are readily growing between the woody debris and this growth is expected to increase.

There was no evidence of any significant erosion on the site and therefore no further soil surface management was required. No exotic plant species were observed at this site.

SPR 3

The native vegetation on this site was noted as being in good health and had already reached the species diversity of the respective analogue site (SPR 5). Similar to the other rehabilitation sites, no problematic erosion was apparent and material retention was noted as likely to increase as vegetation becomes more established. No further soil surface management was required.

No exotic plant species were observed at this site.

8.3. Agreed Post-Rehabilitation Land Use

Following the cessation of mining operations at Springvale, the pit top and all rehabilitated areas on the Newnes Plateau will be rehabilitated to woodland commensurate with the adjacent remnant vegetation. The *Springvale Mine Extension Project Decommissioning and Rehabilitation Strategy* (SLR 2014) prepared as a component of the EIS commits to the final land use for these areas becoming 'environmental protection works' which is consistent with the surrounding land use of forestry within the Newnes State Forest. Additionally the final land

use aligns with the current Lithgow Local Environmental Plan (LEP) 1994, the Draft Lithgow LEP 2013 and the Lithgow Draft Land Use Strategy 2010 – 2030.

8.4. Rehabilitation Maintenance

East Wolgan Swamp was impacted over a period of years by a combination of regulator approved mine water discharge and potential subsidence effects.

The East Wolgan Swamp major slump and the piping area were rehabilitated in accordance with the s95 Certificate issued by OEH with major works completed through 2014 by The Bush Doctor swamp rehabilitation specialist. A joint inspection with OEH, Bush Doctor and Centennial was undertaken on the 10th of December 2014 as per the s95 Certificate. Work continued on with final brush-matting activities into the New Year in January 2015. A report on that phase of the rehabilitation was provided to OEH in February 2015 with an interim report in May 2015, and a further routine report to follow in February 2016. A range of regulatory inspections were undertaken in 2015 by DRE, OEH, DP&E and Federal Department of the Environment. These inspections were linked to the Springvale approval and other mandatory inspections. Centennial Coal will continue to enhance the re-hydration and revegetation efforts in East Wolgan Swamp.

8.5. Renovation/Removal of Buildings

No permanent buildings were removed during the reporting period.

8.6. Exploration and Construction Works

No exploration or construction activities were conducted during the reporting period.

8.7. Rehabilitation Sign Off from the DRE

No rehabilitation areas received formal sign-off from DRE that they were completed to a standard suitable for lease relinquishment during the reporting period.

8.8. Variations in Activities from the MOP

A new MOP was developed for the site during the reporting period. This document covered rehabilitation activities from November 2015 to October 2022. There were no variations to the MOP that required notification to DRE.

8.9. Key Issues Affecting Successful Rehabilitation

The MOP identified a number of issues that have the potential to affect rehabilitation at Springvale. These included:

- Greater than anticipated subsidence impacts;
- Erosion and sedimentation;
- Poor topsoil quality;
- Subsidence impacts on steep slopes; and
- Bushfire.

None of these issues were encountered during the reporting period. Consequently no management measures were required to be implemented to address these issues.

8.10. Next Reporting Period

Rehabilitation at Springvale will be undertaken progressively and will involve partial rehabilitation of the following disturbed areas after completion of construction on Newnes Plateau. Rehabilitation and disturbance in 2016 is summarized in **Table 24**, and includes:

- 5.6 ha of disturbance associated with construction of the Mine Services Borehole, Bore 9 Dewatering Facility and associated infrastructure corridors (11.6 ha), as well

as the Booster Pump Station 1 (0.4 ha) and the infrastructure corridor from the Borehole Pump Station to Booster Pump Station 2 (0.4 ha); and

- In 2016 6.8 ha of land will be prepared for rehabilitation, post construction works. These areas include the infrastructure corridors to the Mine Services Borehole and Bore 9 Dewatering Facility (6.4 ha), and the infrastructure corridor from Borehole Pump Station to Booster Pump Station 2 (0.4 ha).

In 2016 work is planned to be undertaken to continue re-hydration and revegetation of East Wolgan Swamp with a commitment to working on the most severely affected areas of the upland swamp community in alignment with the s95 Certificate issued in response to the s91 condition: *The rehabilitation works will also include a significant commitment to ongoing monitoring and maintenance.* This work will include the monitoring and where required, maintenance of structures used as part of the works, removal of weeds, and where appropriate redesign and implementation of further structures, coir logs and associated materials. Restoration works will be performed in accordance with the ‘Save Our Swamp’ soft engineering solutions for swamp remediation (SOS 2010). The 2016 budgeted works will focus on the implementation of further structures, coir logs and associated materials with the intent of further hydrating and revegetating the swamp. Considerable negative stakeholder scrutiny has been placed on the state of bare areas of the swamp especially between the slump and the piped areas and rehabilitation works in these zones will be of priority.

9. COMMUNITY

9.1. Environmental Complaints

One community complaint was received in relation to Springvale Colliery during the reporting period. The complaint was made to the colliery regarding a vehicle entering the highway from the mine access road at 5:30 am on the 28th of September. It is unknown whether the vehicle has come from the colliery. Springvale apologised to the complainant and explained such behaviour was not condoned and should be reported to authorities. The mine committed to logging the incident as a complaint although as it a public road it was not known whether the vehicle has come from the colliery. A toolbox talk was issued to the workforce in relation to road safety.

Trends in community complaints are documented in **Table 25**.

Table 25. Community Complaint Trends

	2012	2013	2014	2015
Number	0	2	2	1
Category	-	2 Noise	2 Low Frequency Noise	1 Traffic

As evidenced from the table above, there is no apparent trend from the traffic related complaint received during the reporting period.

9.2. Community Engagement

9.2.1. Community Consultative Committee

A Community Consultative Committee (CCC) has been established to monitor the operations and provide a forum whereby the community can communicate with the mine operators and be kept up to date with the progress of the mine.

In 2012 the established Angus Place CCC was combined to also include Springvale. Furthermore in October 2014 the CCC was also expanded to include Western Coal Services.

The combined Angus Place, Springvale and Western Coal Services CCC aims to facilitate a single channel of communication regarding current operations in the area.

The committee is composed of:

- An independent chairperson;
- Four representatives from Centennial Coal, including the Environment and Community Officer;
- One representative from Council; and
- At least three representatives from the local community.

Two CCC meetings were held during the reporting period (1st of April and 14th of October). Minutes from the meeting are available on the Centennial Coal website.

The Western Region Consultative Committee meets on a regular basis to find the best solution(s) to the following challenges:

- Respecting the local and regional environment;
- Minimising adverse impacts of mine operations on people, homes, and businesses;
- Supporting the economic, social and cultural life of the area; and
- Maintaining profitable and efficient mine operations that meet regulatory requirements.

Meetings will continue to be held during 2016.

9.2.2. Community Contributions

Centennial continued to support local community projects/events/citizens during the reporting period. In 2015 this included but was not limited to:

- Support for the 2015 Show (Lithgow Show Society);
- Camp (Australian Air League NSW Boy's Group City of Lithgow Squadron);
- Solar Panels (Pied Piper Preschool);
- Daffodils at Rydal 2015 (Rydal Village Association Inc);
- ANZAC Service (Wallerawang ANZAC Service Committee);
- NAIDOC Day Celebrations (Mingaan Wiradjuri Aboriginal Corporation); and
- Lithgow Team Kar 350 (Kidney Kar Rally - Team Lithgow).

9.2.3. Community Activities

Centennial continued participate in local community activities during the reporting period. Activities included but were not limited to Daffodils at Rydal, Wallerawang ANZAC Service, NAIDOC Day celebrations and Portland Central School presentations.

9.2.4. Community Enhancement

As required under Schedule 2, Condition 15 of SSD 5594, Centennial shall pay a community contribution to Lithgow City Council (LCC) of \$0.03 per saleable tonne of coal produced from Springvale, Angus and Airly mines, capped at \$200,000. They contribution is due by the 31st of March each year commencing on the 31st of March 2016.

LW418 commenced on the 15th of October following receipt of the EPBC 2013/6881. For the period 15th of October to 31st of December 2015 a payment of \$32,095.50 will be made.

Centennial looks forward to finalising with Council how this annual community contribution will be allocated for long term community activities and projects. Future annual reviews will provide an update on long term community activities and projects agreed with by Centennial and LCC as required under the conditions of consent.

10. INDEPENDENT AUDIT

As required under SSD 5594 Schedule 5 Condition 3, prior to the 30th of June 2016, and every 3 years thereafter unless the Secretary directs otherwise, Springvale will commission and pay the full cost of an Independent Audit of the development. No independent audits were therefore conducted on SSD 5594 during the reporting period.

11. INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

The following tables provide a summary of non-compliances identified in Section 1 of the Annual Review (this document).

Table 26. Table SSD 5594 Manning

Nature of the incident/non-compliance	Site manning numbers
Date of incident/ non-compliance (if known; if not known state not known)	2015
The location of the incident/ non-compliance (include a figure if appropriate), if known	Springvale Operation
Detail the cause of the incident/non-compliance	Increased production as a result of Angus Place being on Care and Maintenance
Detail action that has been, or will be, taken to mitigate any adverse effects of the incident/ non-compliance	No adverse effects to the community as a result of increased workforce
Detail action that has been, or will be, taken to prevent recurrence of the incident/ non-compliance	A modification to SSD 5594 is currently being prepared for Springvale to align manning with current and future site demands.

Table 27. Mining Lease Compliance Report

Nature of the incident/non-compliance	Timing of Submission Compliance Report
Date of incident/ non-compliance (if known; if not known state not known)	2015
The location of the incident/ non-compliance (include a figure if appropriate), if known	Not Applicable- Leases shown in Figure 3
Detail the cause of the incident/non-compliance	Variation in reporting dates across different leases held by the operation
Detail action that has been, or will be, taken to mitigate any adverse effects of the incident/ non-compliance	Compliance Report has been submitted for relevant leases
Detail action that has been, or will be, taken to prevent recurrence of the incident/ non-compliance	On the 11 th of December 2015, Springvale submitted to DRE a request to align the compliance reporting across leases which cover the operation

The following tables summaries EPL3607 non-compliances during the reporting period as relevant to SSD5594.

Table 28. EC Exceedance LDP009

Nature of the incident/non-compliance	Electrical Conductivity (EC) exceedance at LDP009
Date of incident/ non-compliance (if known; if not known state not known)	27/01/15 1310µS/cm 06/01/15 1250µS/cm 13/01/15 1229µS/cm 20/01/15 1290µS/cm 10/02/2015 1240µS/cm 17/02/2015 1270µS/cm 3/11/2015 1204µS/cm 10/11/15 1205µS/cm 17/11/15 1246µS/cm 24/11/15 1275µS/cm 1/12/2015 1218µS/cm 8/12/2015 1232µS/cm 15/12/2015 1220µS/cm 22/12/2015 1305µS/cm 29/12/2015 1288µS/cm
The location of the incident/ non-compliance (include a figure if appropriate), if known	Centennials Springvale Water Transfer System bypass point east of Kerosene Vale Ash Dam.
Detail the cause of the incident/non-compliance	Increased exposure of mine water make with goaf material
Detail action that has been, or will be, taken to mitigate any adverse effects of the incident/ non-compliance	Various specialist assessments have been undertaken as part of the Springvale mine extension project which concluded that there are no adverse impacts from elevated EC levels.
Detail action that has been, or will be, taken to prevent recurrence of the incident/ non-compliance	Centennial is currently undertaking a holistic review of water management activities within the western Region with the objective of meeting the agreed requirements of the Springvale mine Extension Project. The Cox River Action Plan will be prepared by the 30th of June 2016 in accordance with the Springvale Mine.

Table 29. Arsenic Exceedance LDP009

Nature of the incident/non-compliance	Arsenic Exceedance at LDP009
Date of incident/ non-compliance (if known; if not known state not known)	13/01/15 0.026mg/L
The location of the incident/ non-compliance (include a figure if appropriate), if known	Centennials Springvale Water Transfer System bypass point east of Kerosene Vale Ash Dam.
Detail the cause of the incident/non-compliance	Mobilisation of naturally occurring minerals within the geological sequence as a result of goaf water storage and subsequent dewatering of the mine
Detail action that has been, or will be, taken to mitigate any adverse effects of the incident/ non-compliance	Ferric chloride water treatment system has been installed at the Bore 940 site for the removal of soluble arsenic.
Detail action that has been, or will be, taken to prevent recurrence of the incident/ non-compliance	Centennial is currently undertaking a holistic review of water management activities within the western Region with the objective of meeting the agreed requirements of the Springvale mine Extension Project. The Cox River Action Plan will be prepared by the 30th of June 2016 in accordance with the Springvale Mine.

Table 30. Copper Exceedance LDP009

Nature of the incident/non-compliance	Copper Exceedance at LDP009
Date of incident/ non-compliance (if known; if not known state not known)	25/02/15 0.014mg/L
The location of the incident/ non-compliance (include a figure if appropriate), if known	Centennials Springvale Water Transfer System bypass point east of Kerosene Vale Ash Dam.
Detail the cause of the incident/non-compliance	Mobilisation of naturally occurring minerals within the geological sequence as a result of goaf water storage and subsequent dewatering of the mine
Detail action that has been, or will be, taken to mitigate any adverse effects of the incident/ non-compliance	An investigation was undertaken into the source of water contributing to the discharge point which caused elevated level of copper to be detected at the discharge point. The rates of extraction were subsequently modified to achieve compliance with the prescribed criteria.
Detail action that has been, or will be, taken to prevent recurrence of the incident/ non-compliance	Centennial is currently undertaking a holistic review of water management activities within the western Region with the objective of meeting the agreed requirements of the Springvale mine Extension Project. The Cox River Action Plan will be prepared by the 30th of June 2016 in accordance with the Springvale Mine.

Table 31. Summary of Reportable Incidents and Regulatory Actions

Compliance Type	Agency	Number	Response
Incidents	Not Required	0	Springvale Colliery in 2015 did not have an incident which caused or threatened material harm and/or exceeds the limits or performance measures/criteria in SSD 5594
Caution Notices	EPA	1	
Warning Letters	EPA	1	
Penalty Notices	Not Required	0	Not Required
Prosecutions	Not Required	0	Not Required

The caution notice was received from the EPA on the 16th of February 2015. The offence was a result of an incident involving a discharge of coal fines on the 12th of September 2014 from licensed discharge point 1 (LDP001) at Springvale Coal mine. The EPA has determined that the incident occurred either due to a singular effect or combination of the pipe within the

drainage channel becoming blocked and/or placement of coal fines on the ROM pad. Mitigation measures undertaken to prevent re-occurrence include more regular inspections of the coal stockpile drainage system by operators and independent contractors, upgrades to crusher dam pumping system, a review of dam excavation and placement of coal fines in the stockpile area. Clean water from the fire dam was also enclosed in a pipe past the stockpile area.

A formal warning was received on the 10th of February 2015 from the EPA regarding two incidents that occurred on the 2nd and 12th of September 2014 involving discharges of mine water on the Newnes Plateau from the Springvale Delta Water Transfer Scheme (SDWTS). The EPA determined that the location of the SDWTS is vulnerable to damage by heavy vehicles and roadwork activity. Springvale has installed signs along the SDWTS at vulnerable locations to improve communication of the infrastructure installed.

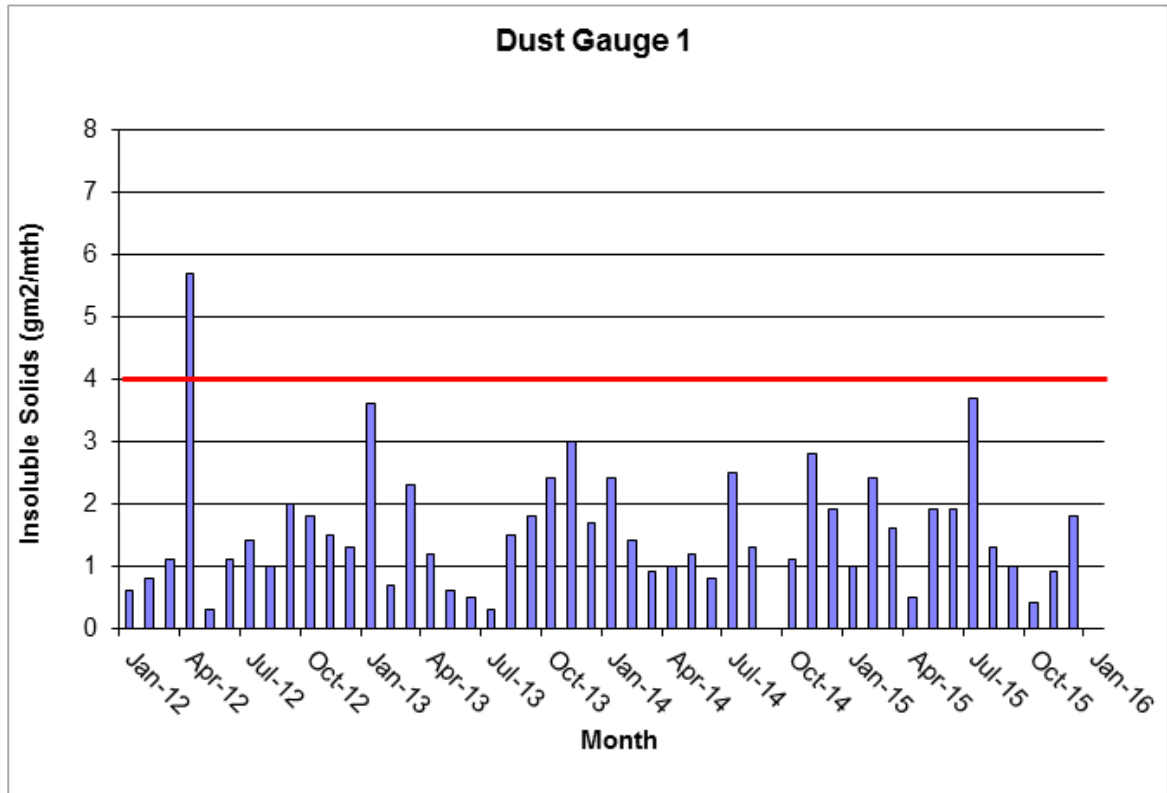
12. ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

The following activities are planned to be undertaken by Springvale in 2016:

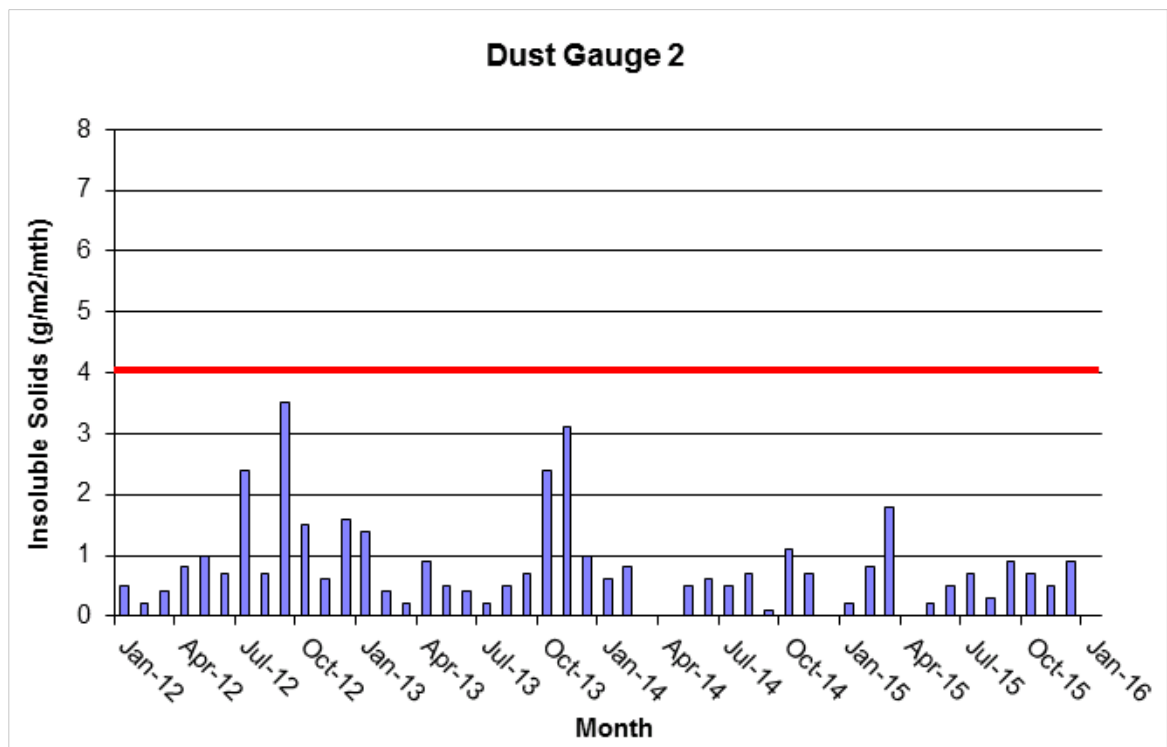
- Completion of the Extraction of Longwall 418;
- Extraction Plan consultation and approval for Longwall 419;
- Commencement of Longwall 419;
- Preparation and consultation of Management Plans required under SSD 5594;
- Approved construction activities e.g. Bore 9;
- Independent Audit 2016; and
- New Mining Operations Plan.

Appendix 1 – Air Quality Monitoring Results

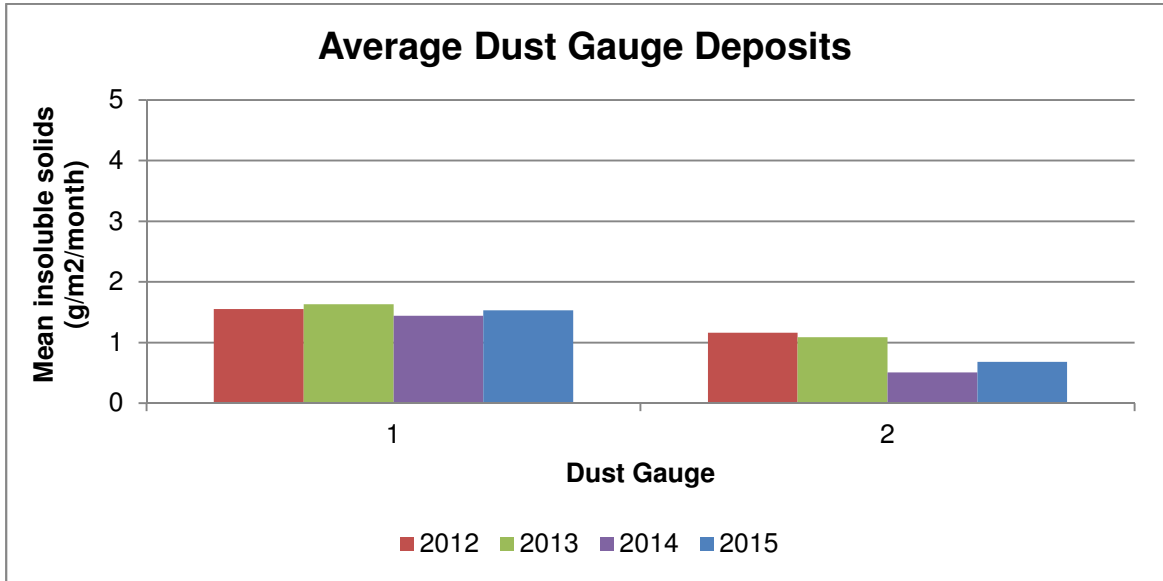
Graph 1 Dust Gauge 1 Jan 2012 to Dec 2015



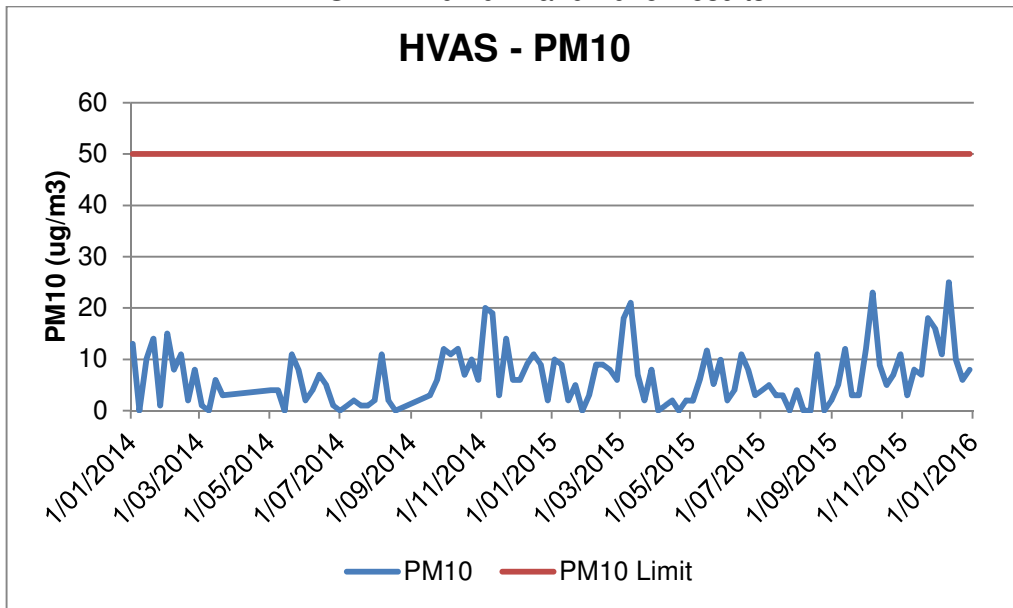
Graph 2 Dust Gauge 1 Jan 2012 to Dec 2015



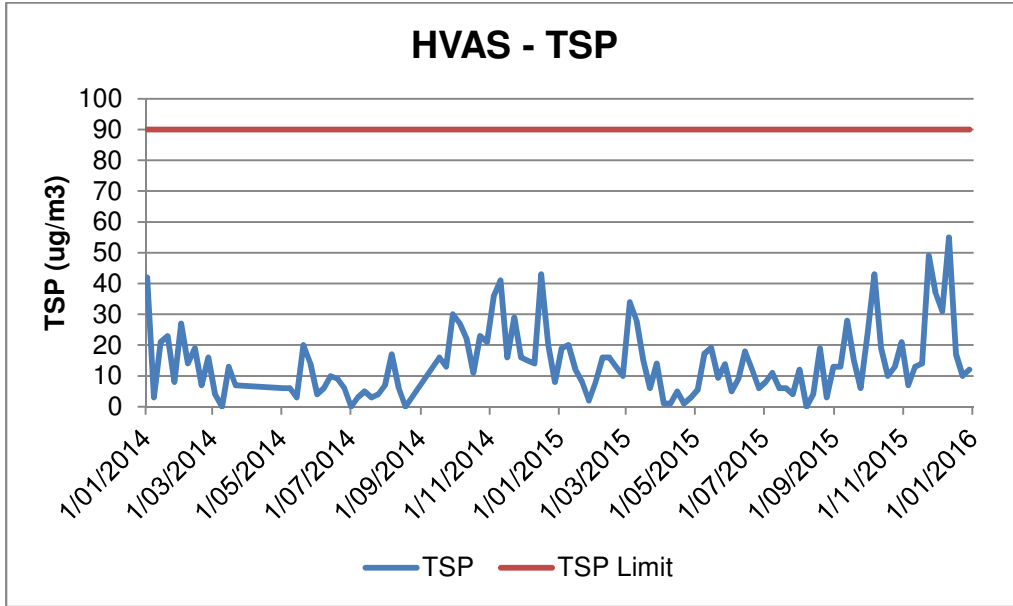
Graph 3 Annual Mean Comparison 2012 to 2015



HVAS – PM10 2014 and 2015 Results

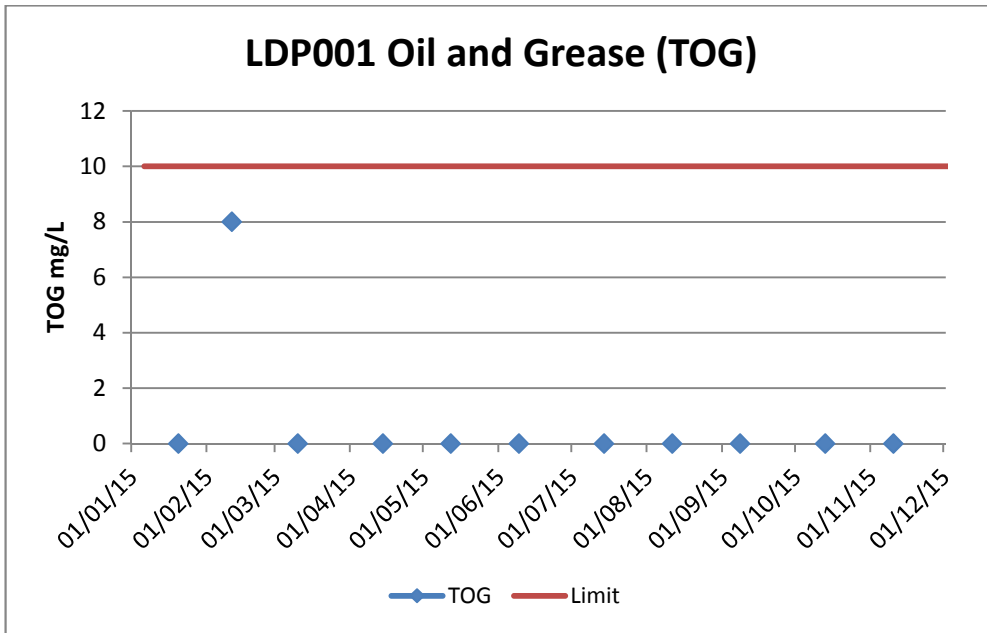


HVAS – TSP 2014 and 2015 Results

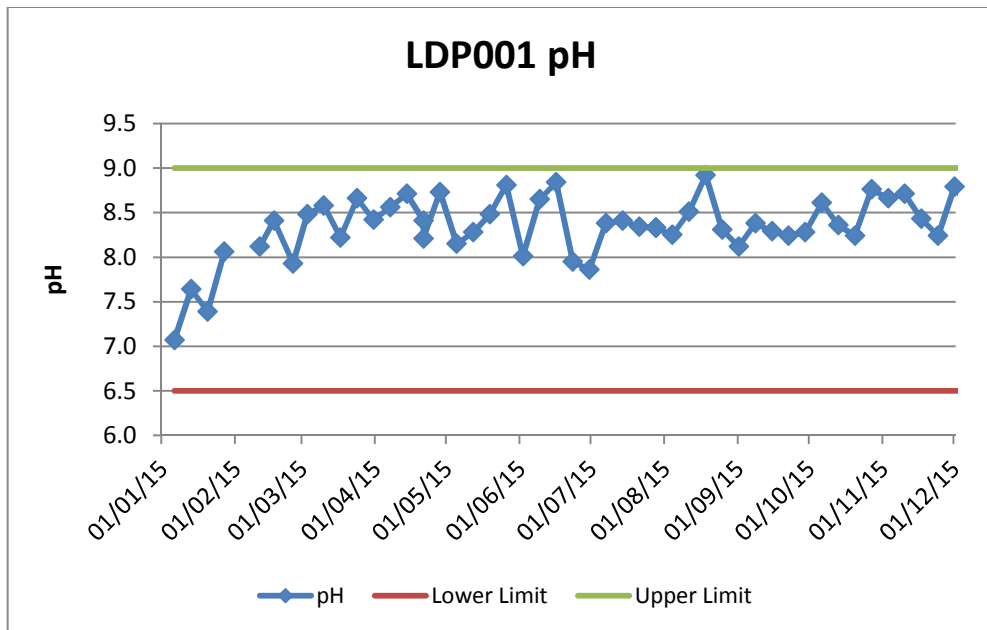


Appendix 2 – LDP Water Quality Monitoring Results

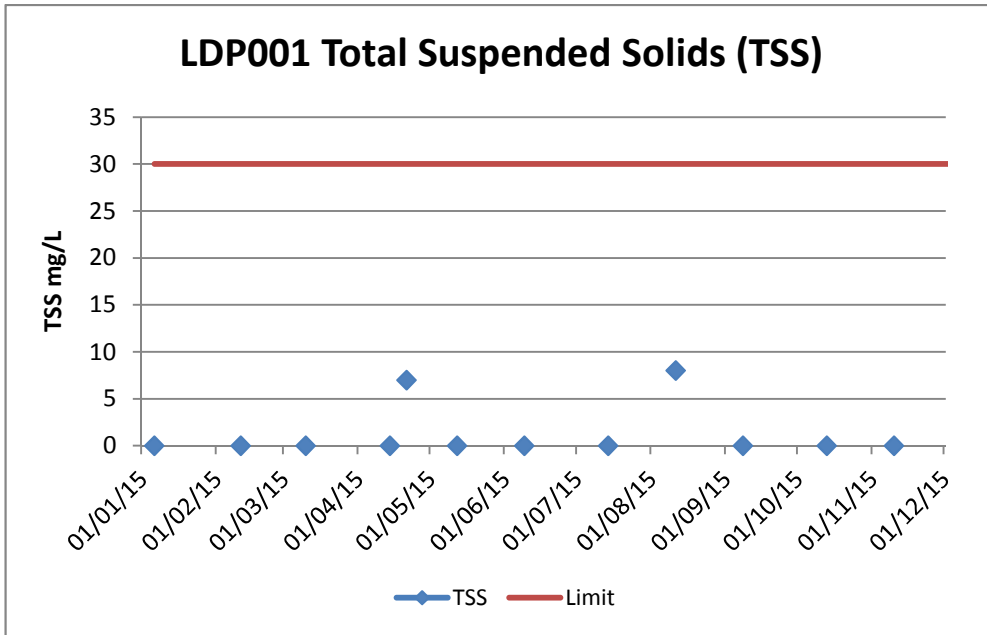
LDP001 Oil and Grease 2015



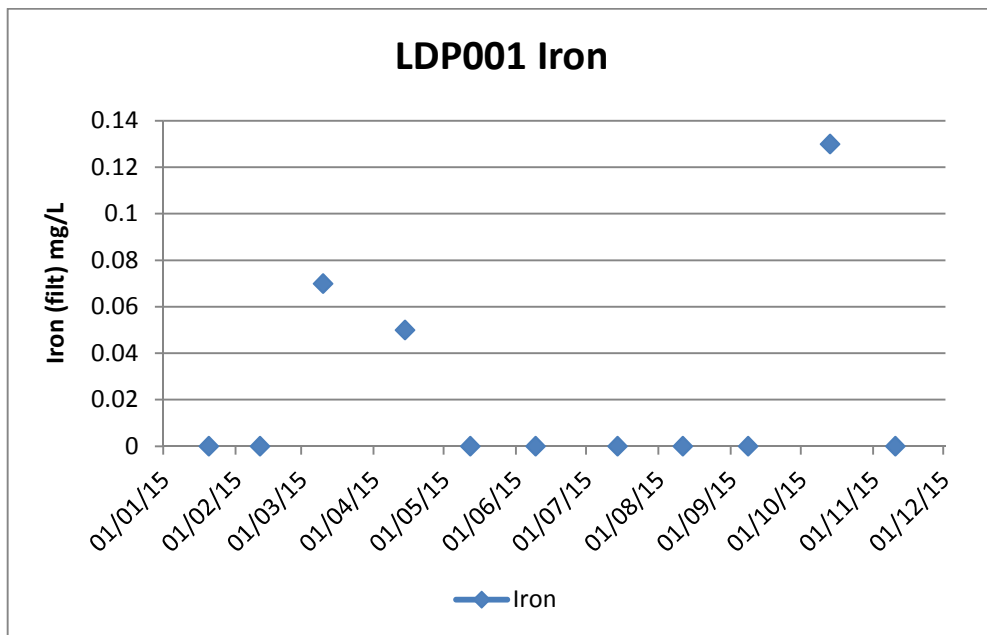
LDP001 pH 2015



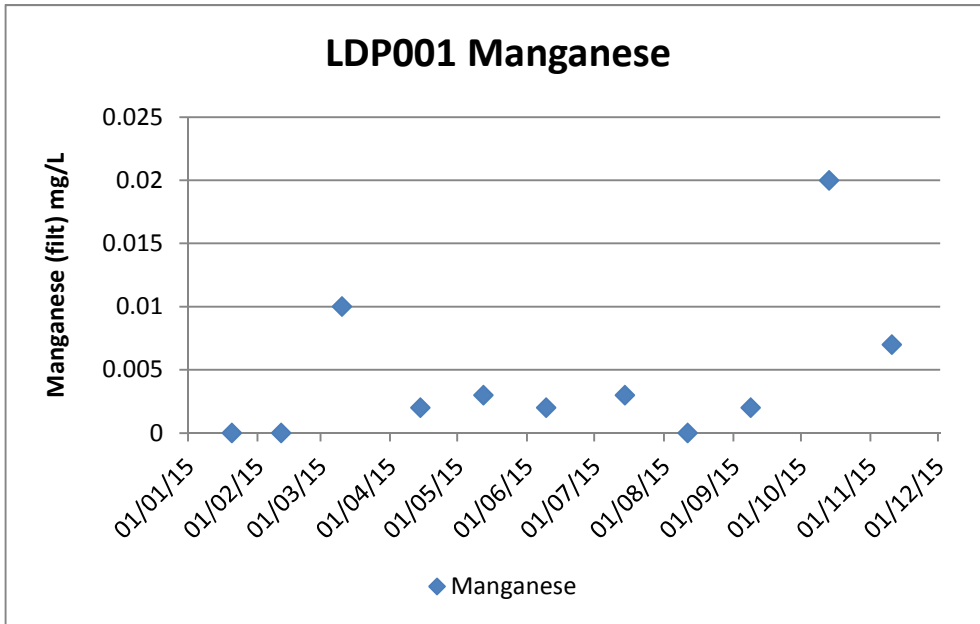
LDP001 Total Suspended Solids 2015



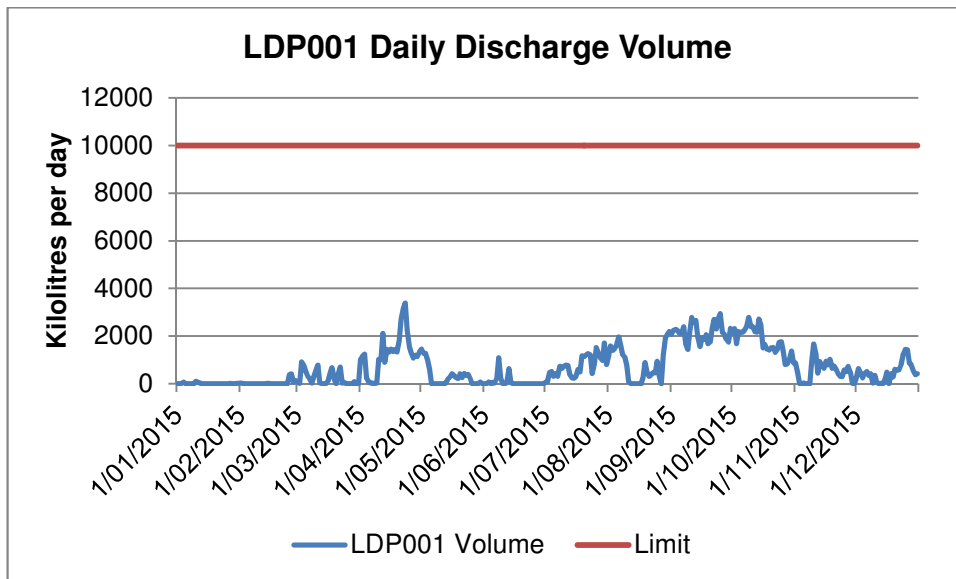
LDP001 Iron 2015



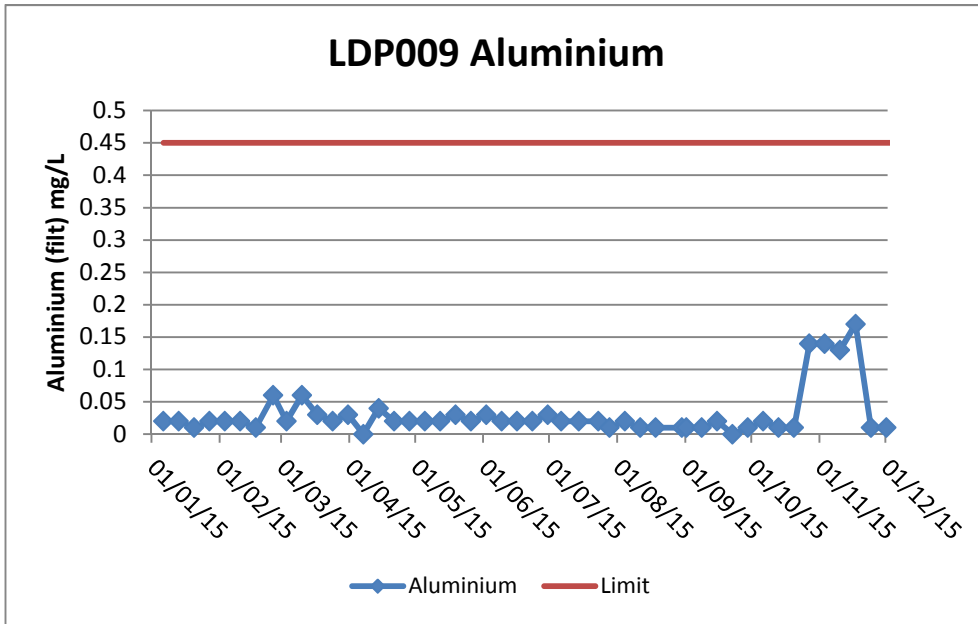
LDP001 Manganese 2015



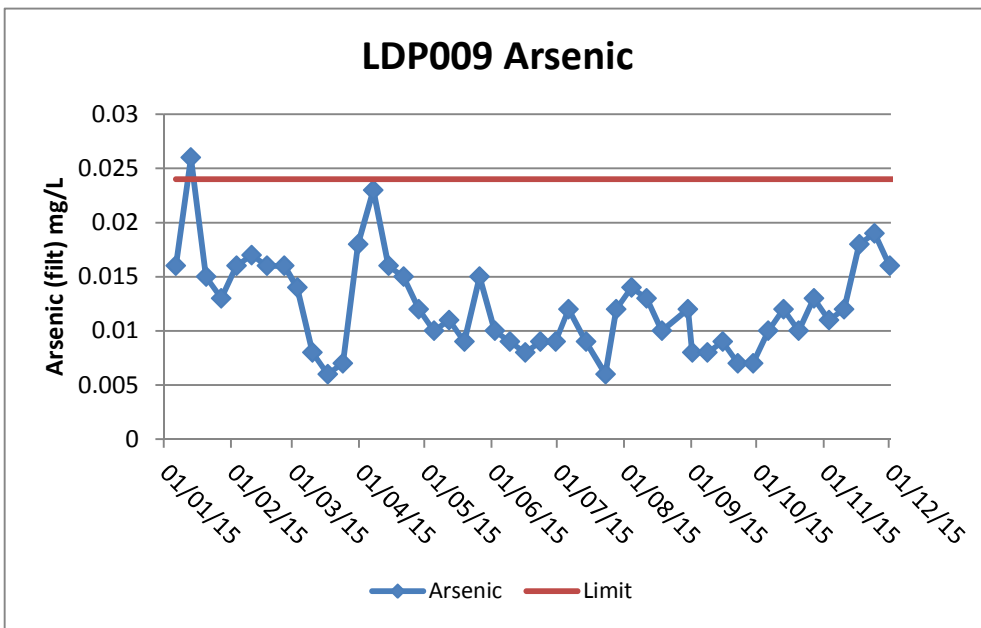
LDP001 Discharge Volume 2015



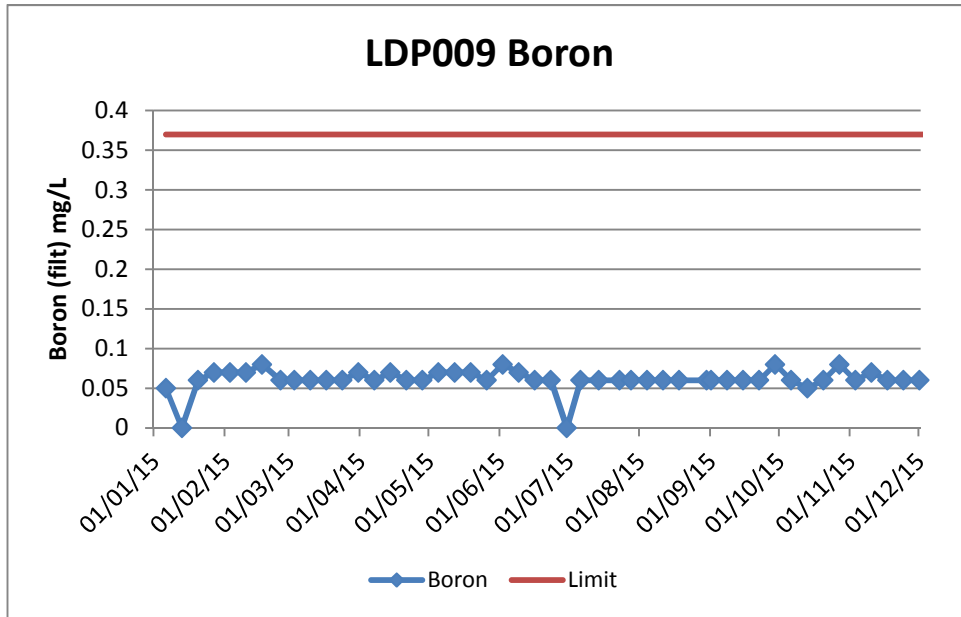
LDP009 Aluminum 2015



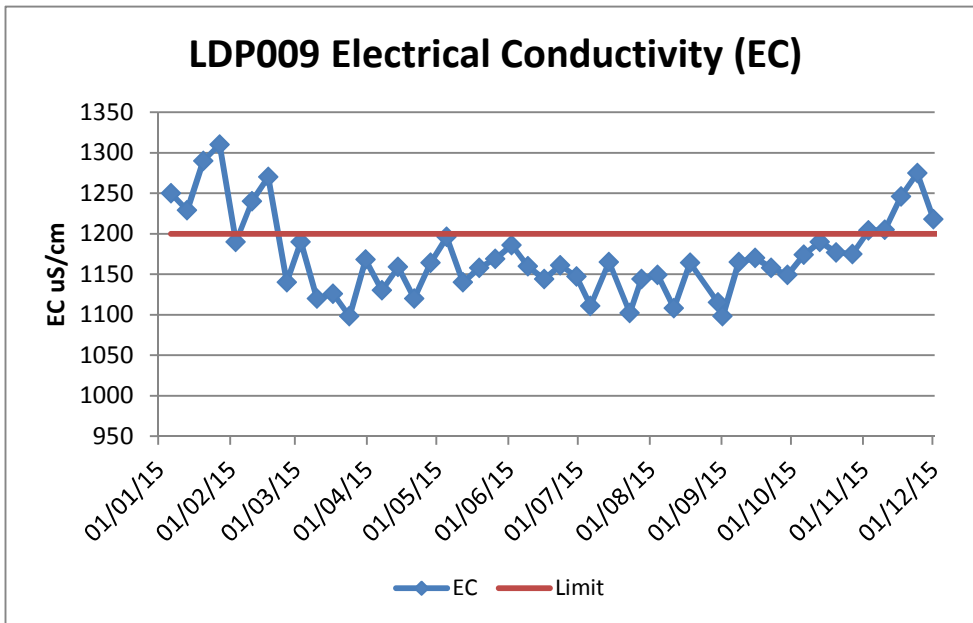
LDP009 Arsenic 2015



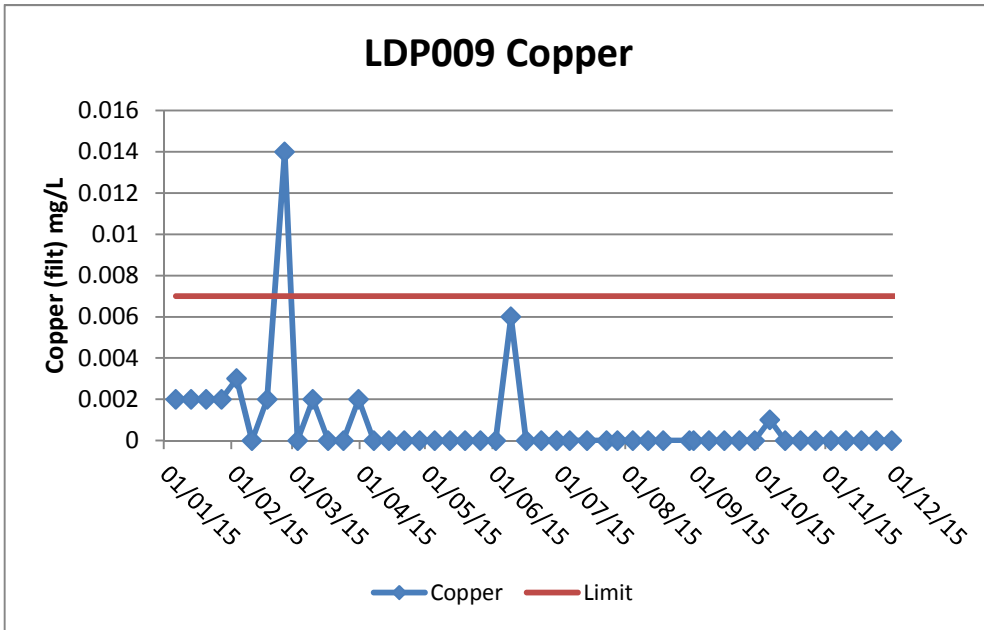
LDP009 Boron 2015



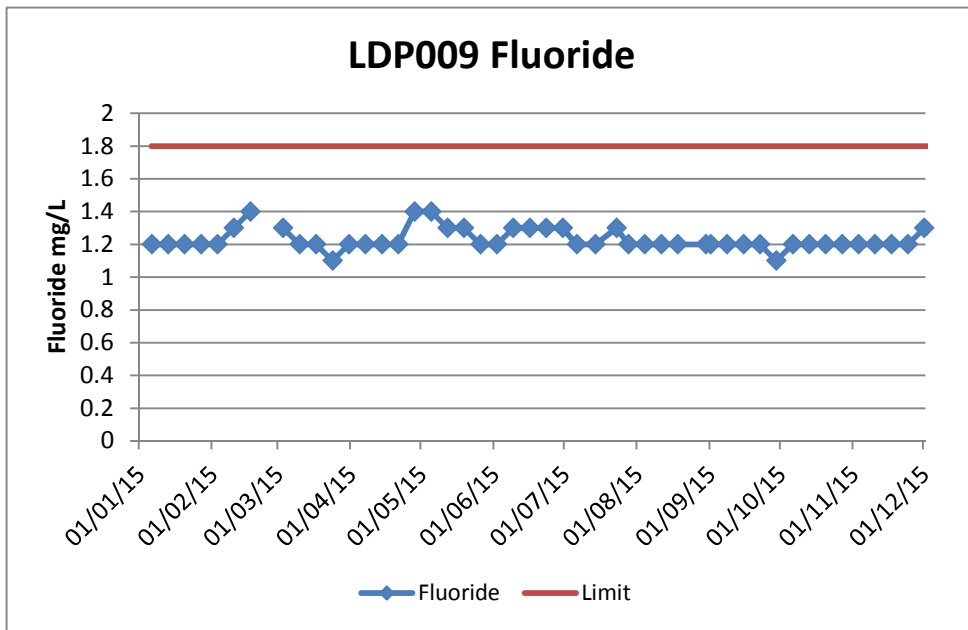
LDP009 Conductivity 2015



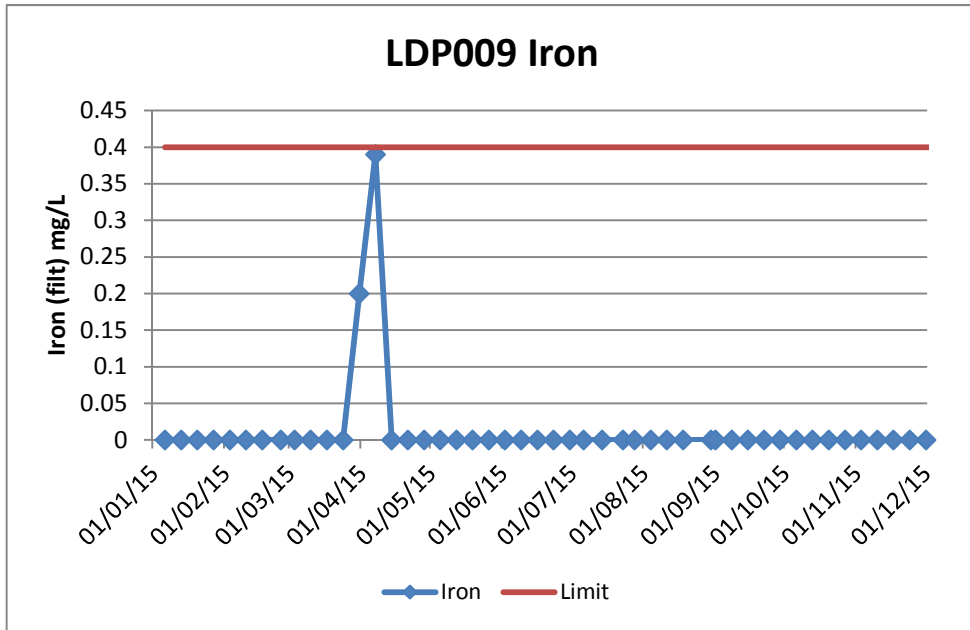
LDP009 Copper 2015



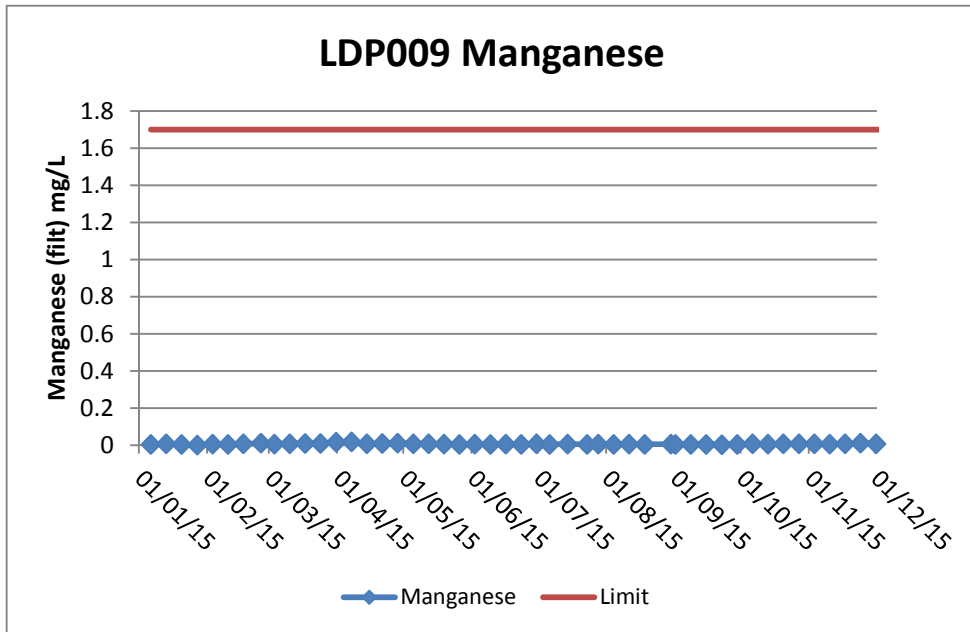
LDP009 Fluoride 2015



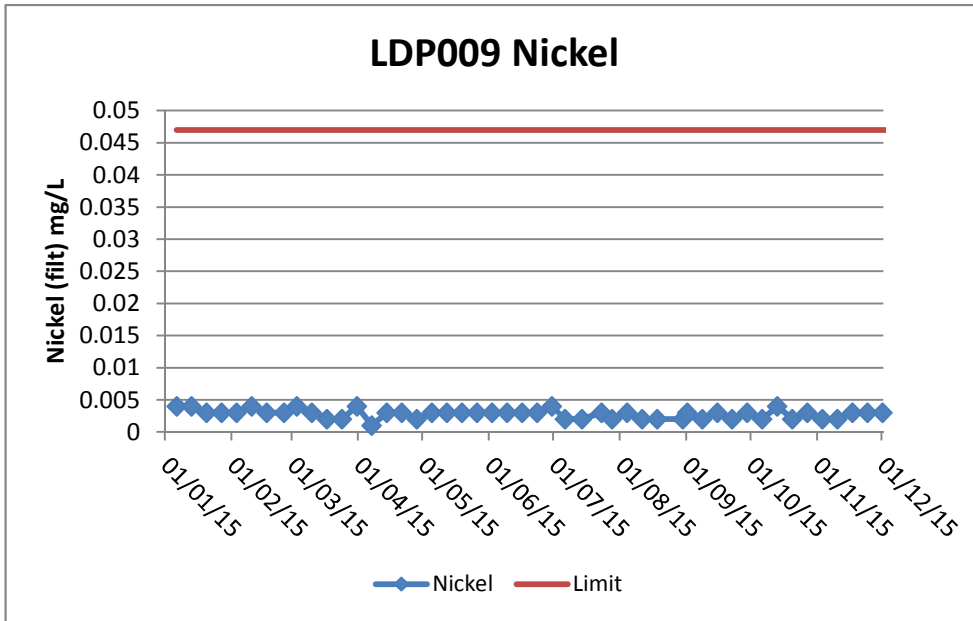
LDP009 Iron 2015



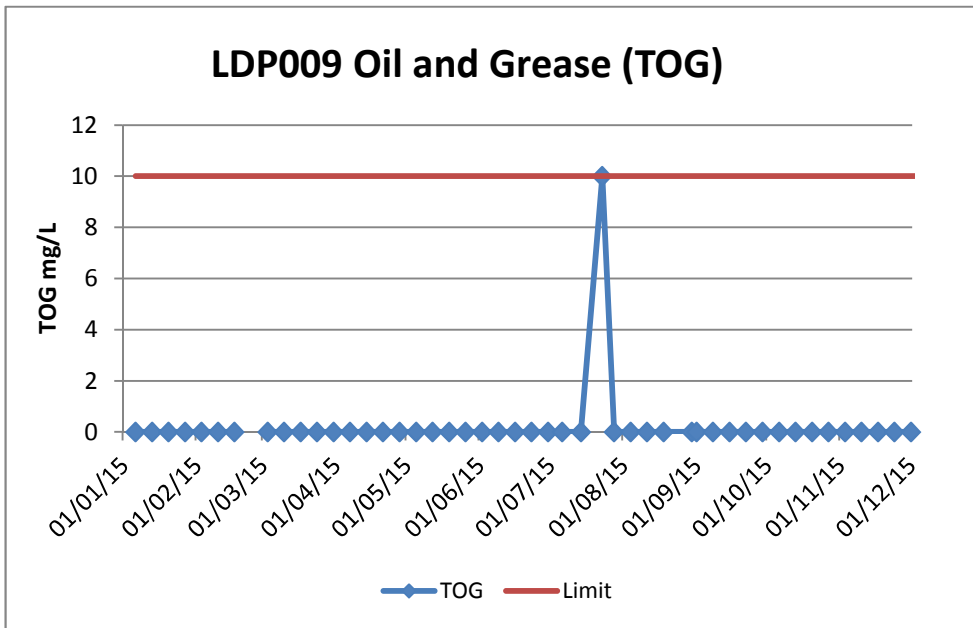
LDP009 Manganese 2015



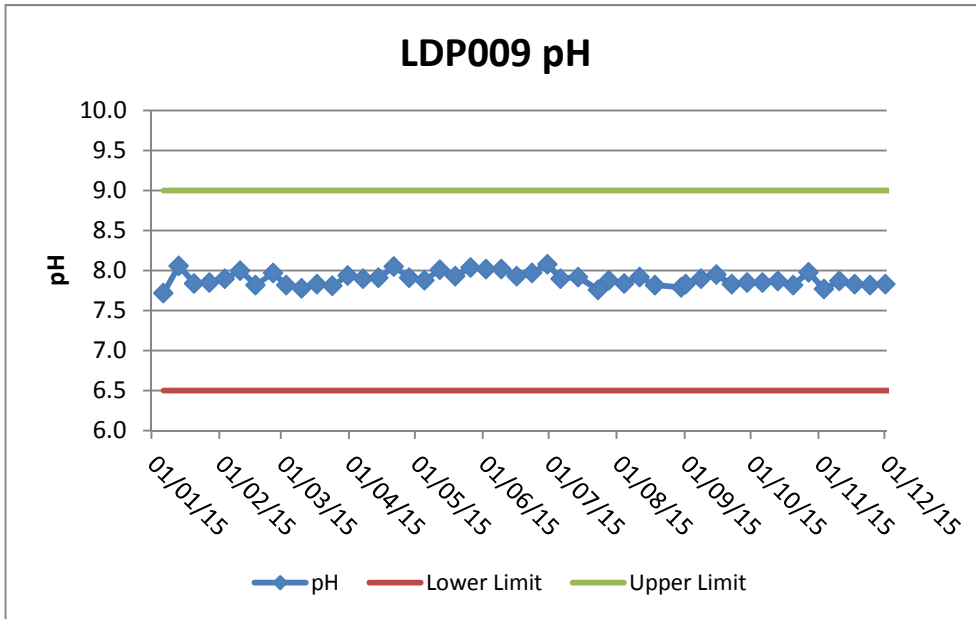
LDP009 Nickel 2015



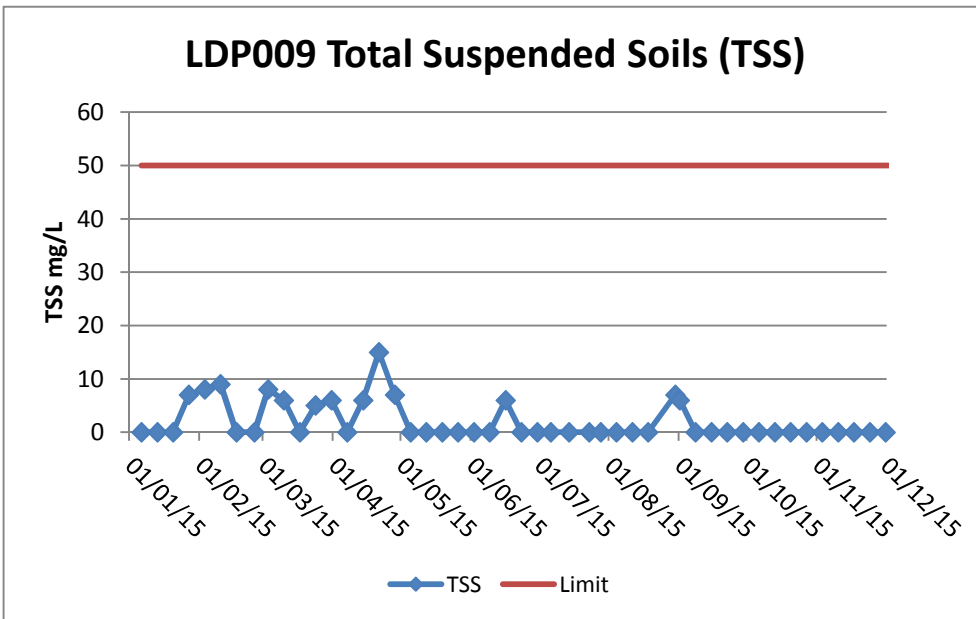
LDP009 Oil and Grease 2015



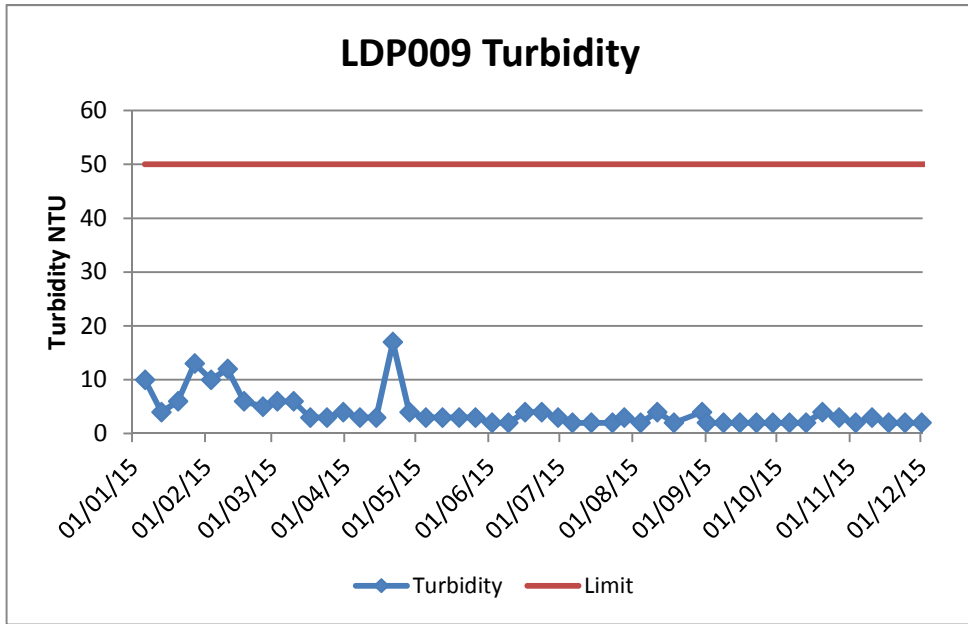
LDP009 pH 2015



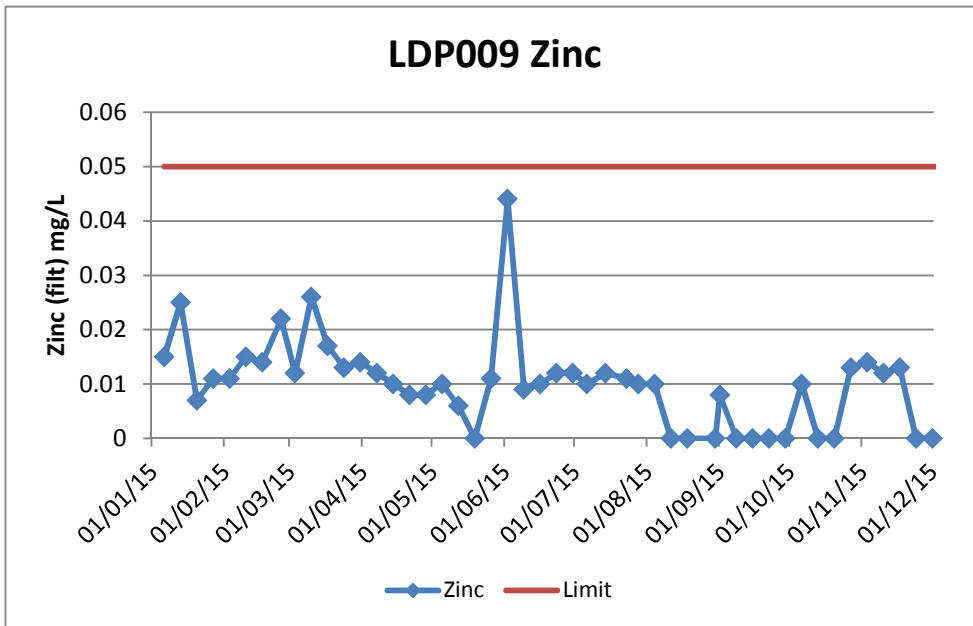
LDP009 Total Suspended Solids 2015



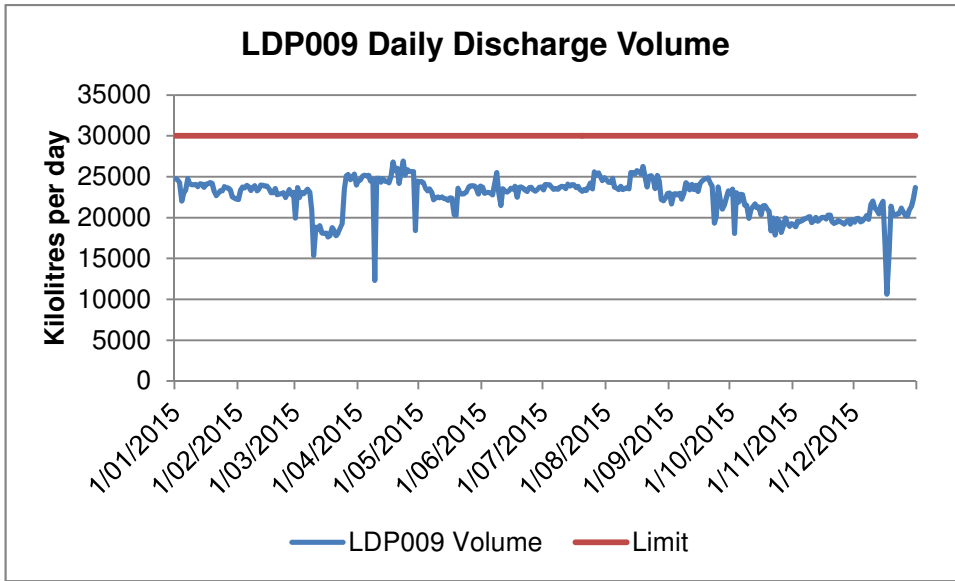
LDP009 Turbidity 2015



LDP009 Zinc 2015

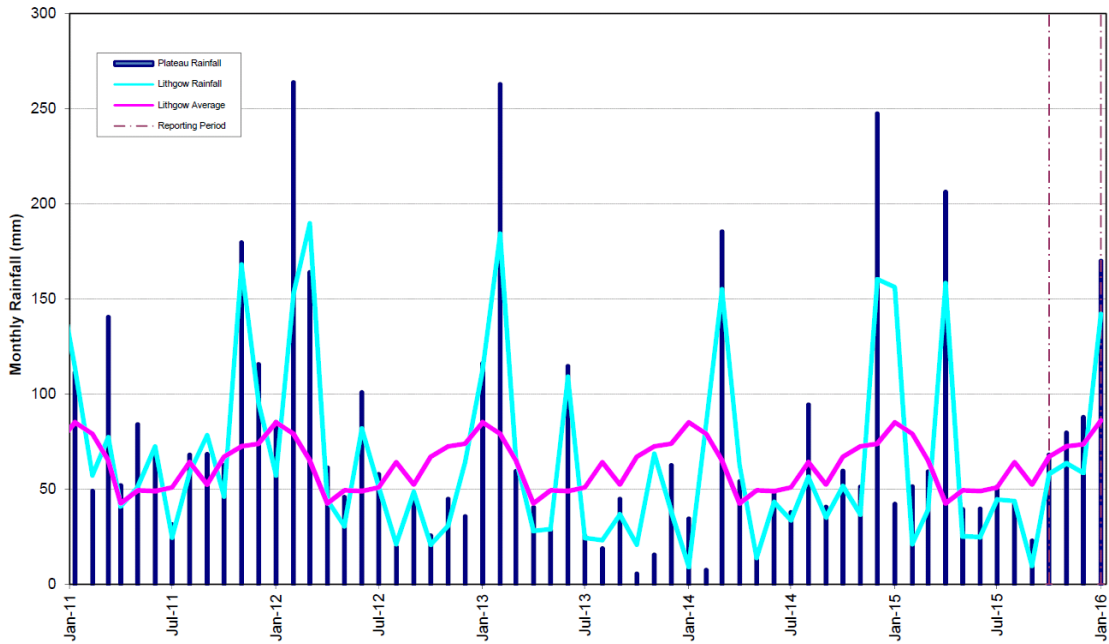


LDP009 Discharge Volume 2015

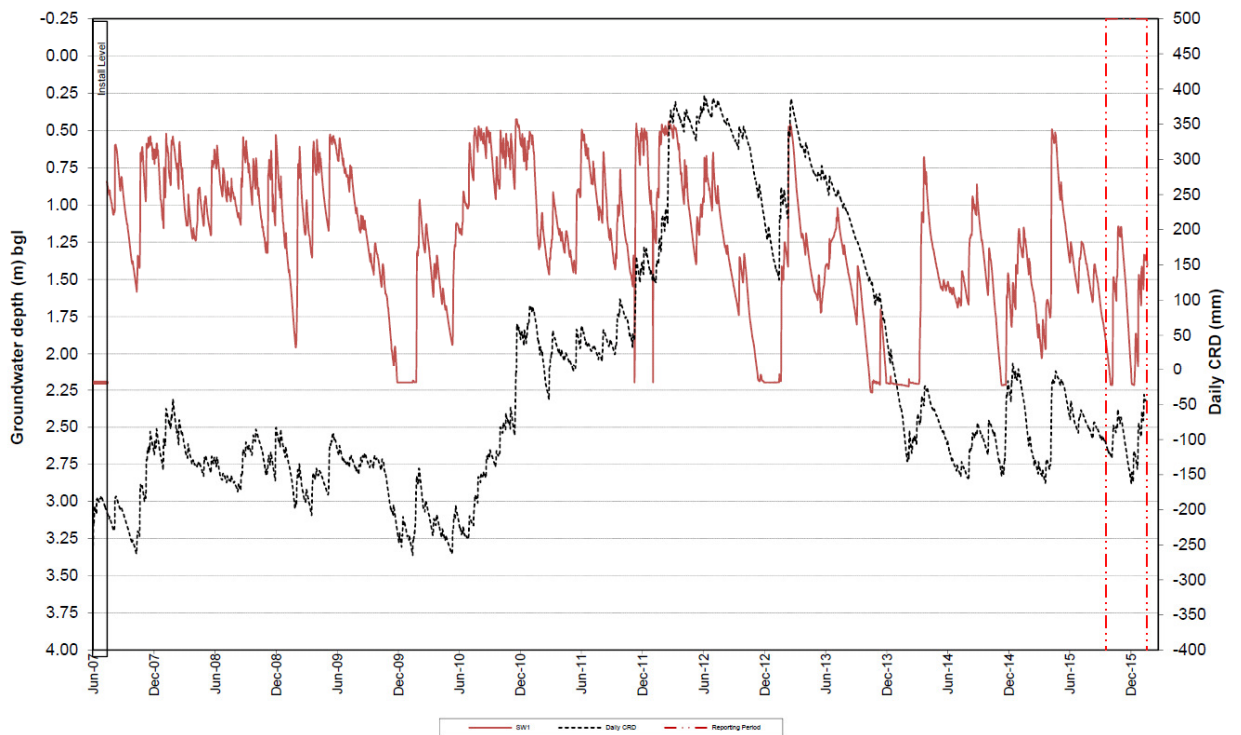


Appendix 3 – Newnes Plateau Results

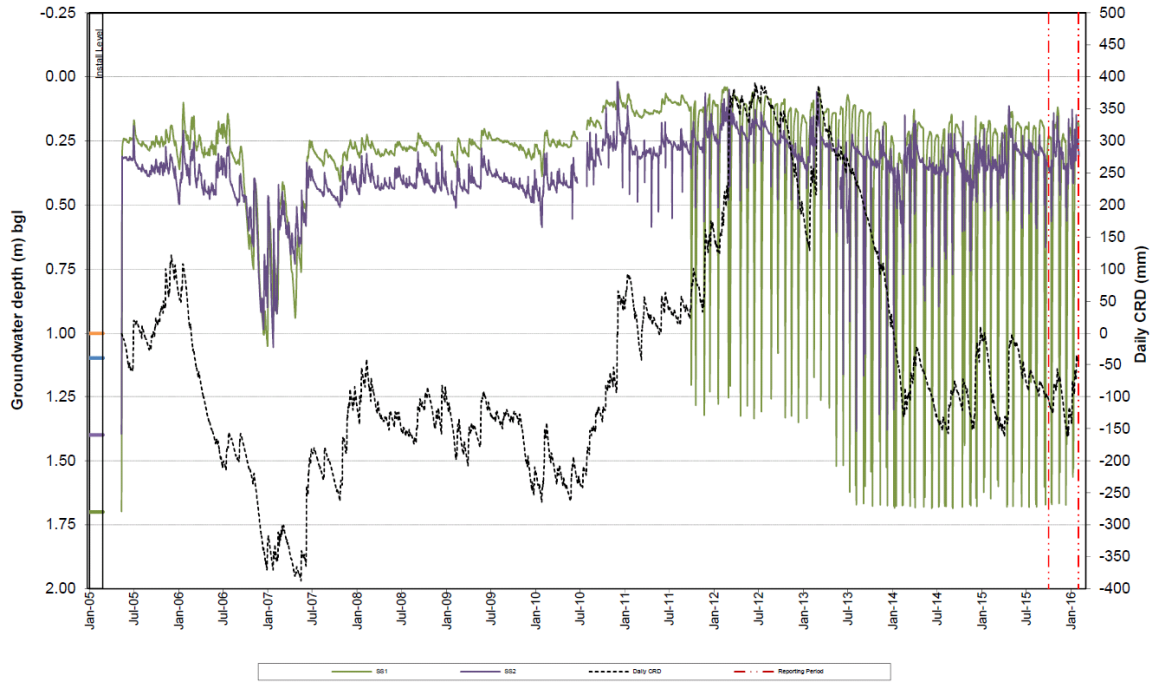
Monthly Rainfall



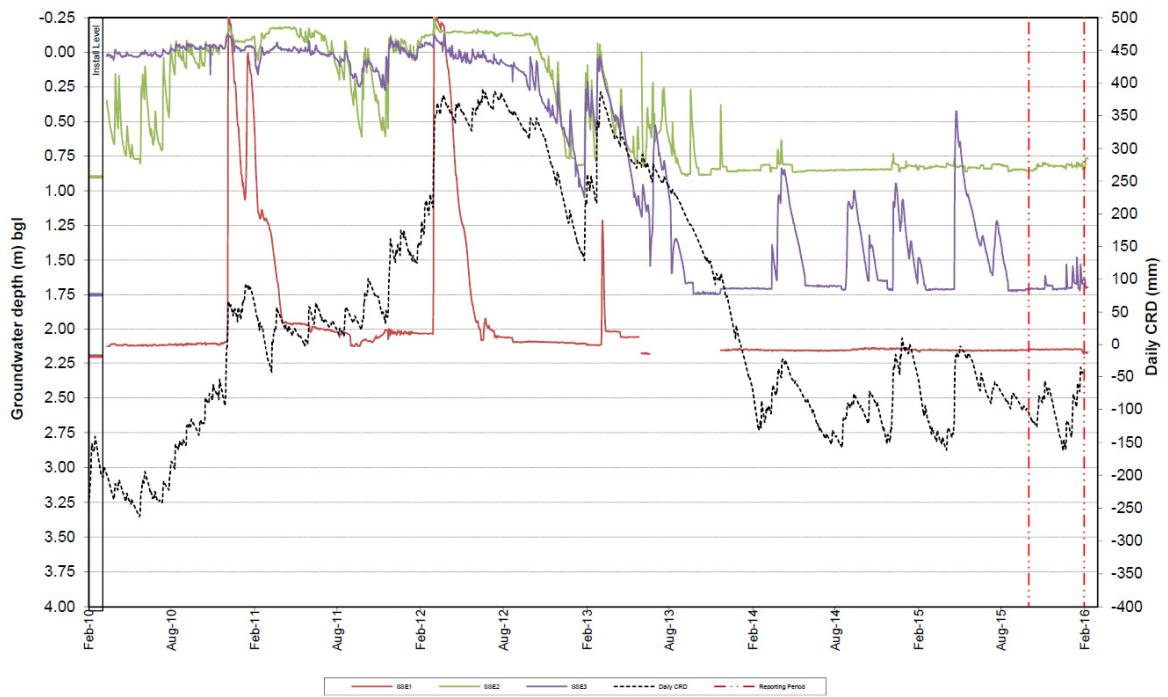
Sunnyside West Swamp Piezometer Hydrograph



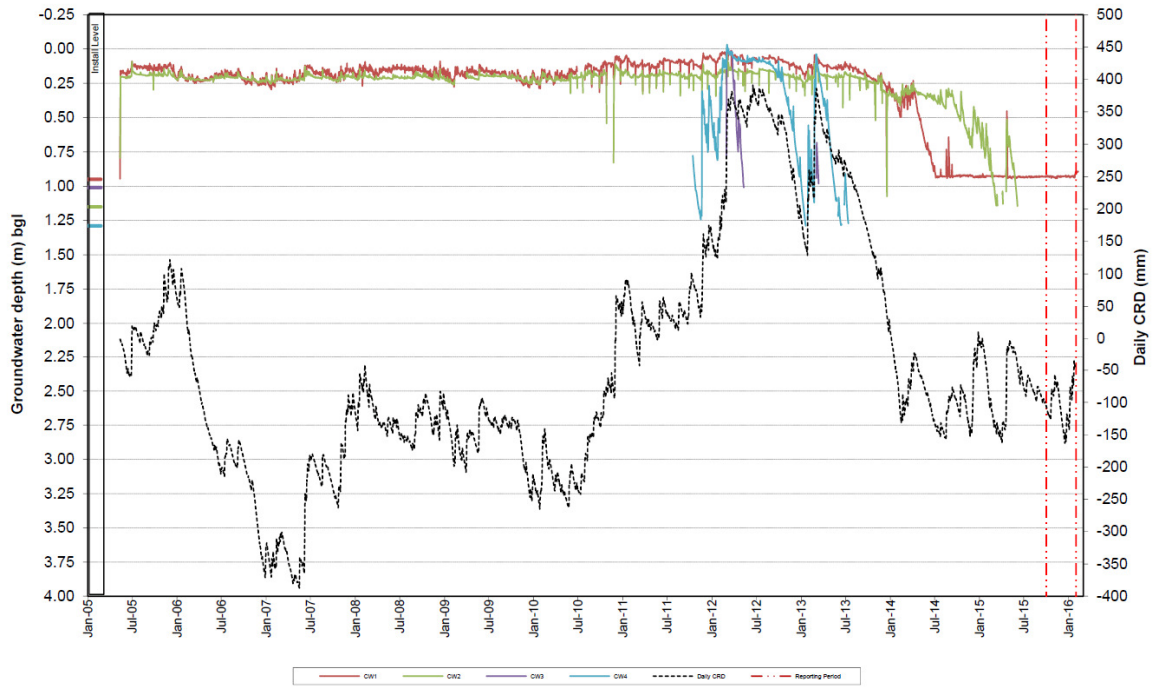
Sunnyside Swamp Piezometer Hydrograph



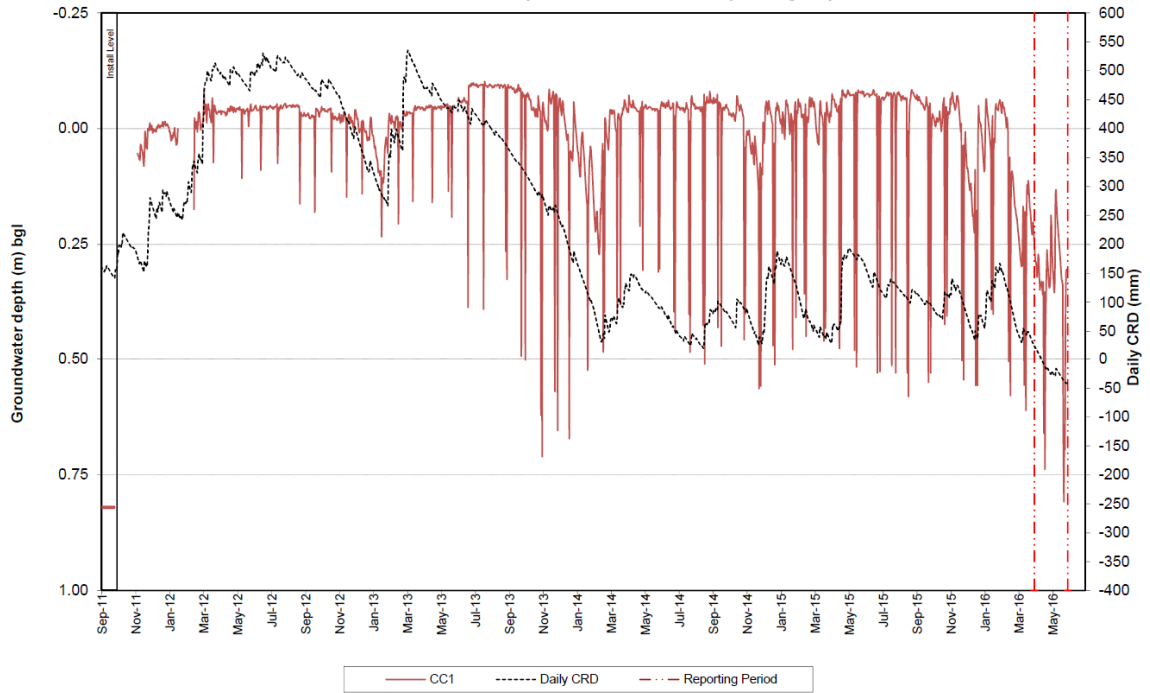
Sunnyside East Swamp Piezometer Hydrograph



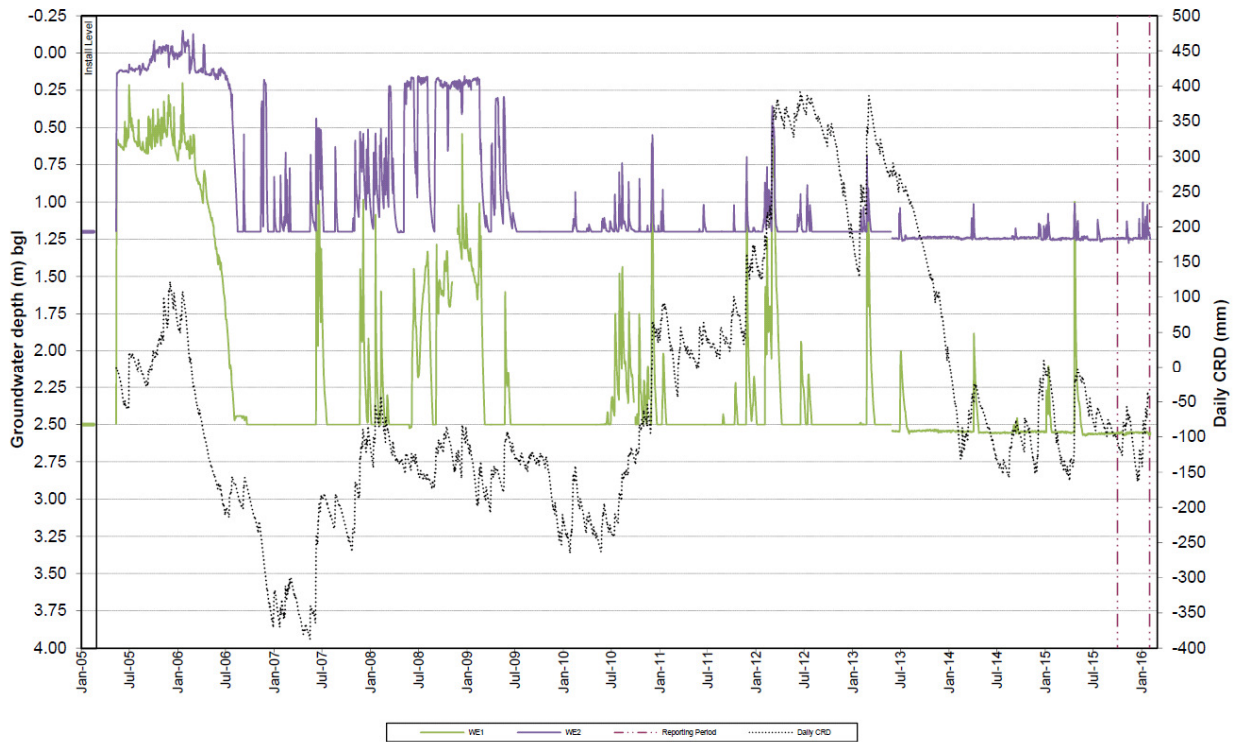
Carne West Swamp Piezometer Hydrograph



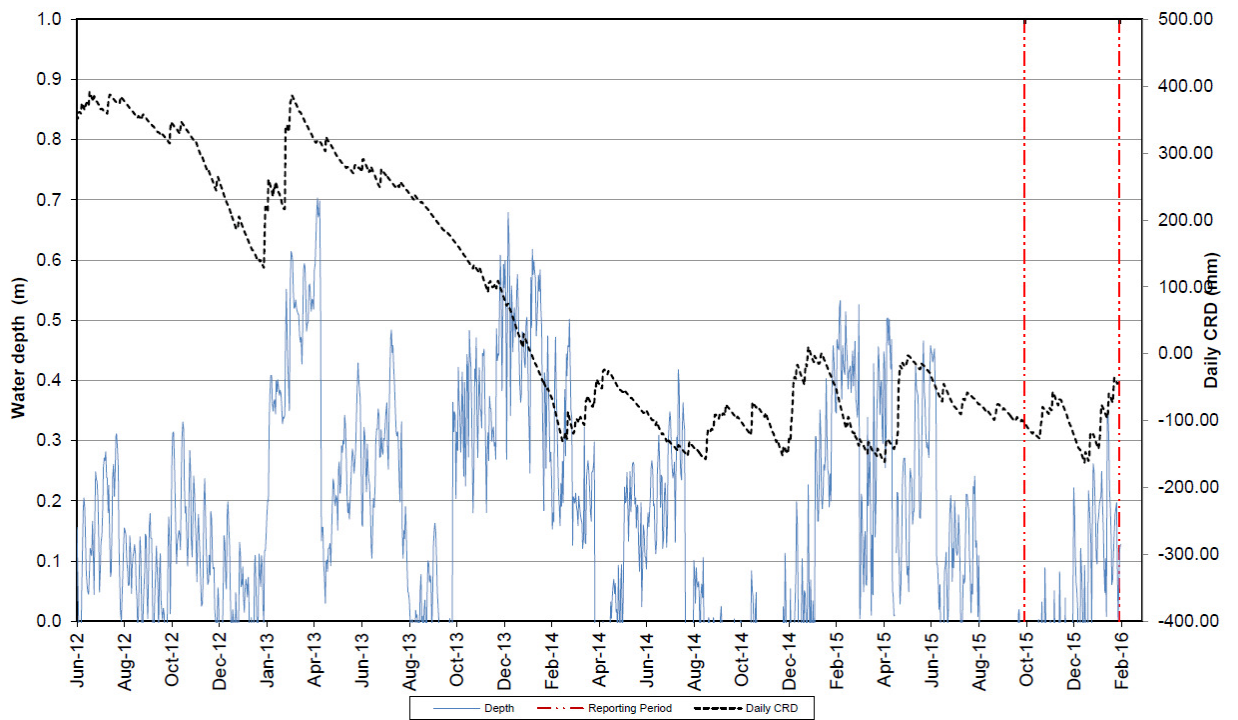
Carne Central Swamp Piezometer Hydrograph



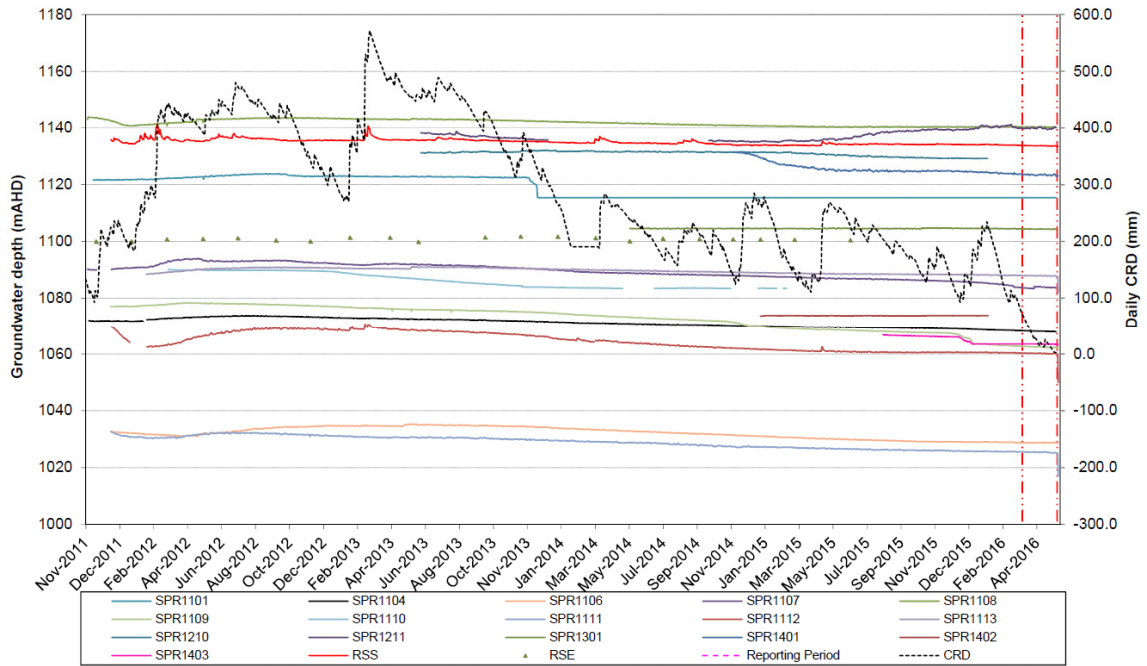
East Wolgan Swamp Piezometer Hydrograph



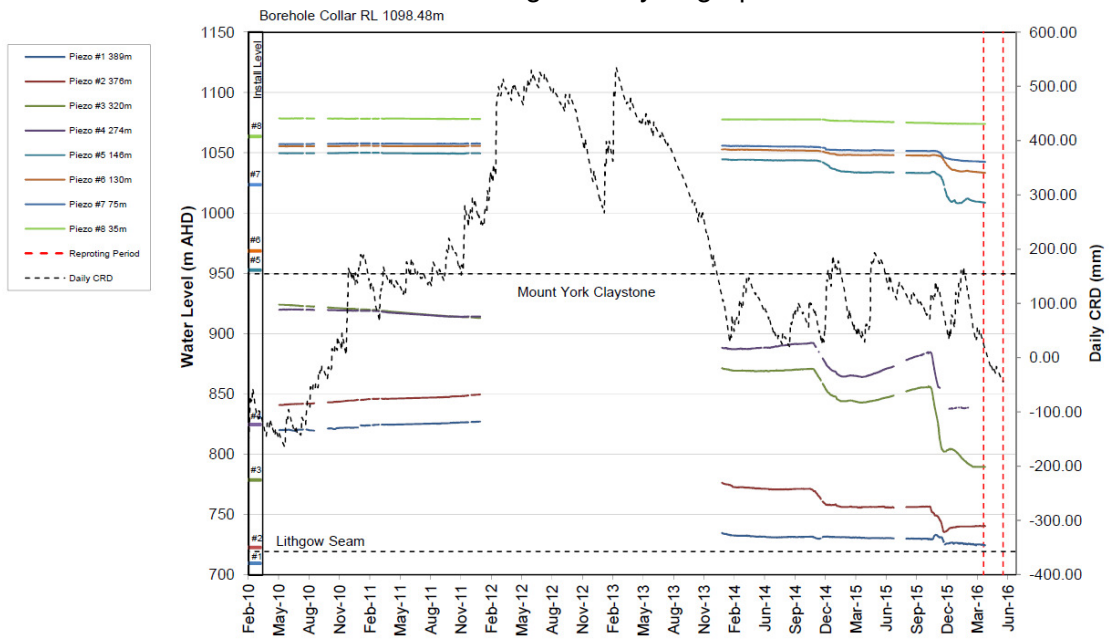
Carne West Pool Hydrograph



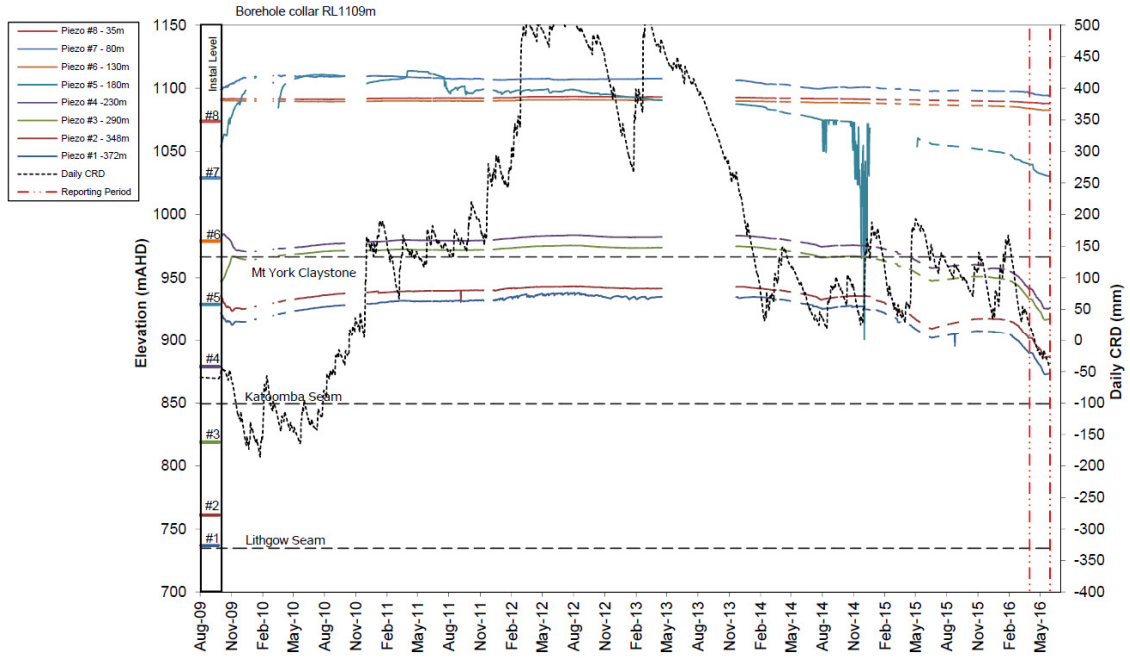
Ridge Piezometer Hydrograph



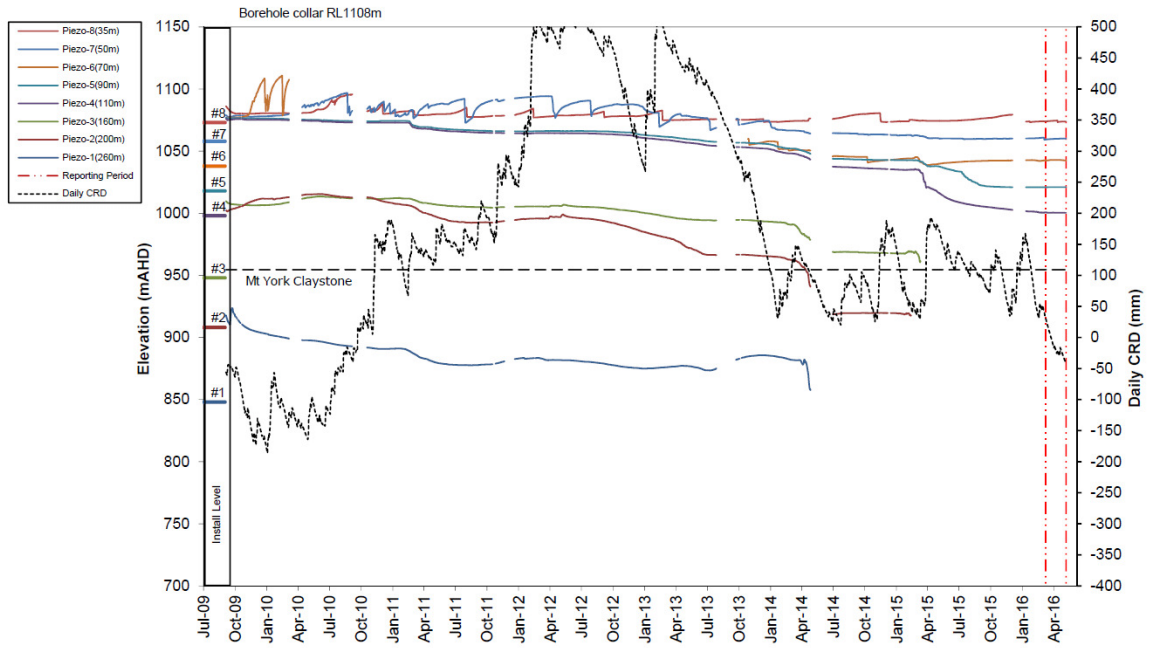
SPR36 Vibrating Wire Hydrograph



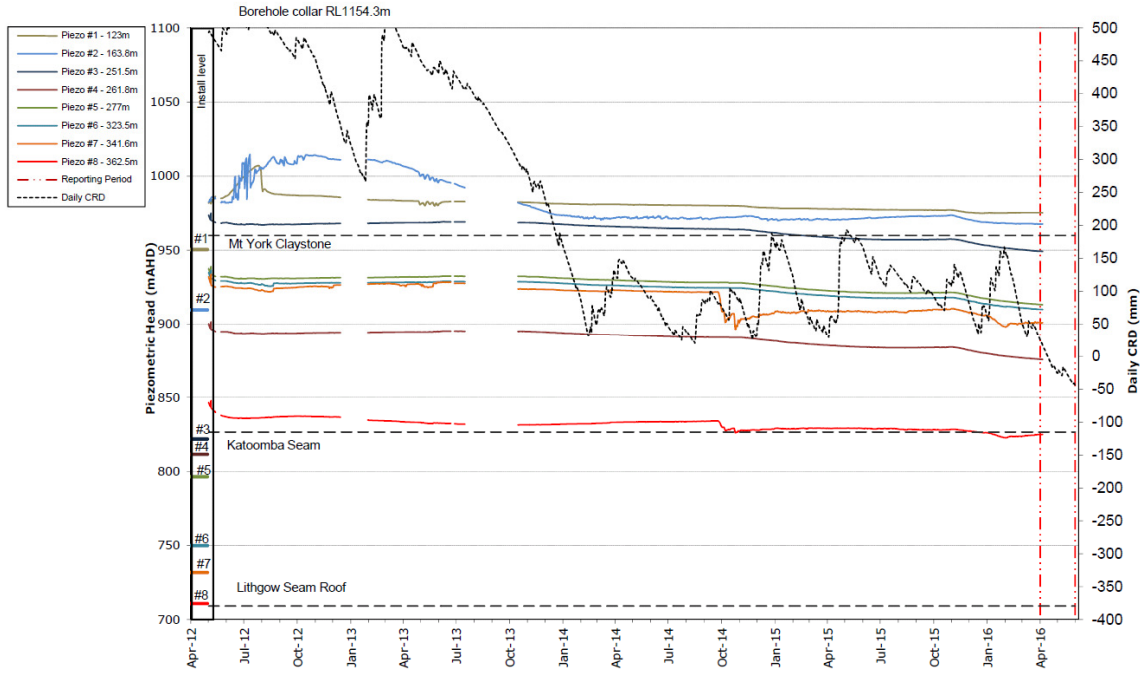
SPR66 Vibrating Wire Hydrograph



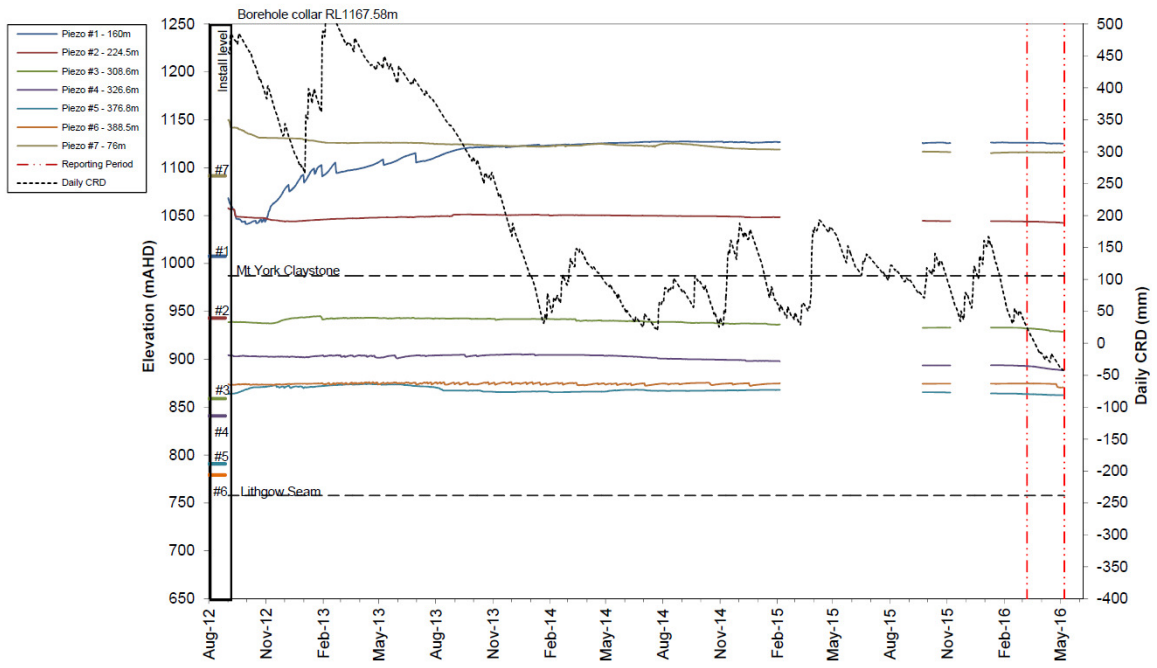
SPR67 Vibrating Wire Hydrograph



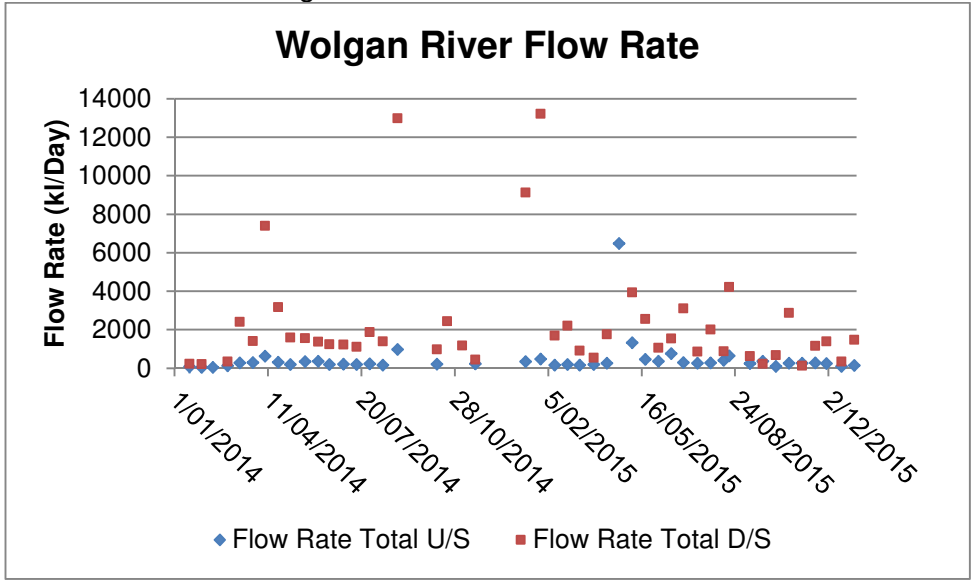
SPR1106 Vibrating Wire Hydrograph



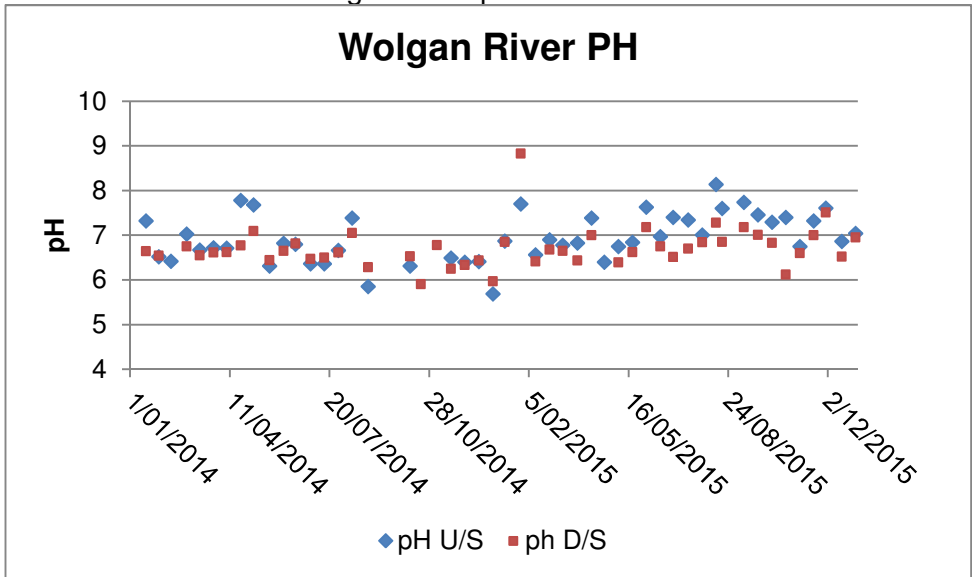
SPR1210 Vibrating Wire Hydrograph



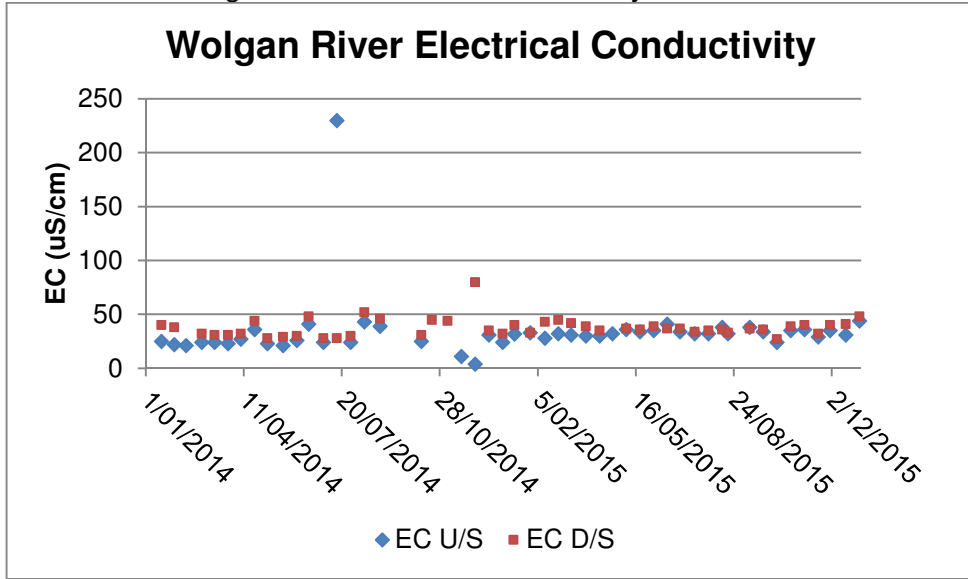
Wolgan River Flow Rate 2014 - 2015



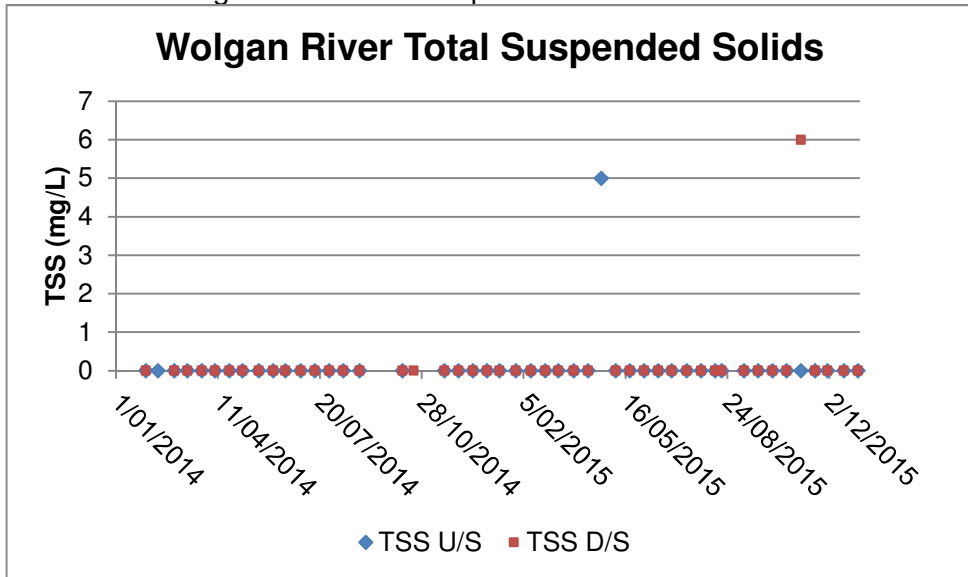
Wolgan River pH 2014 - 2015



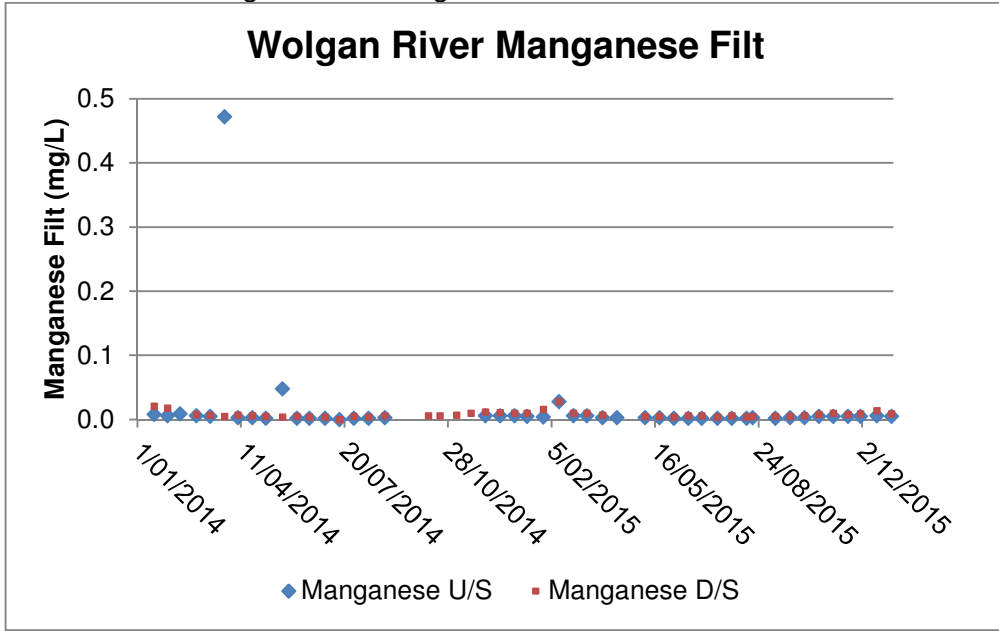
Wolgan River Electrical Conductivity 2014 - 2015



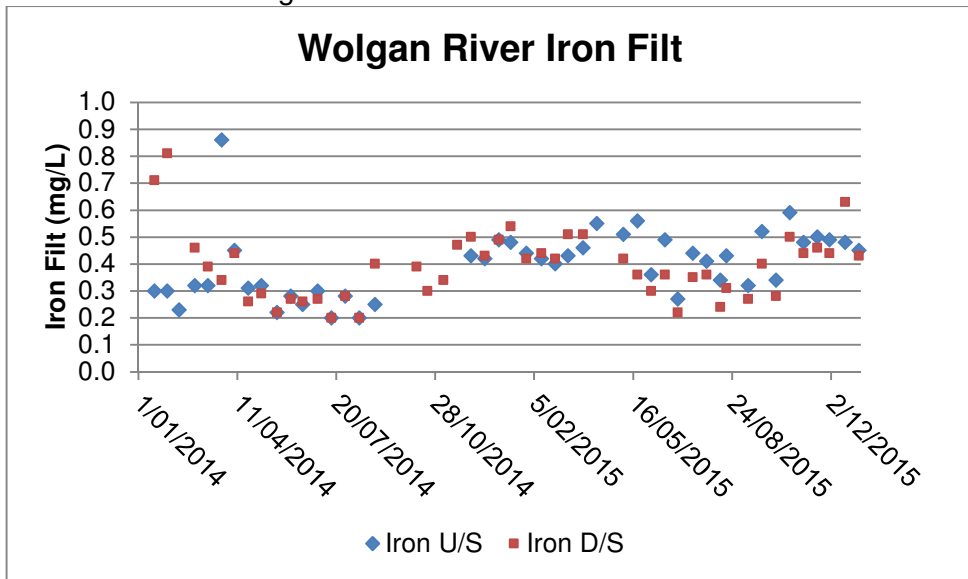
Wolgan River Total Suspended Solids 2014 - 2015



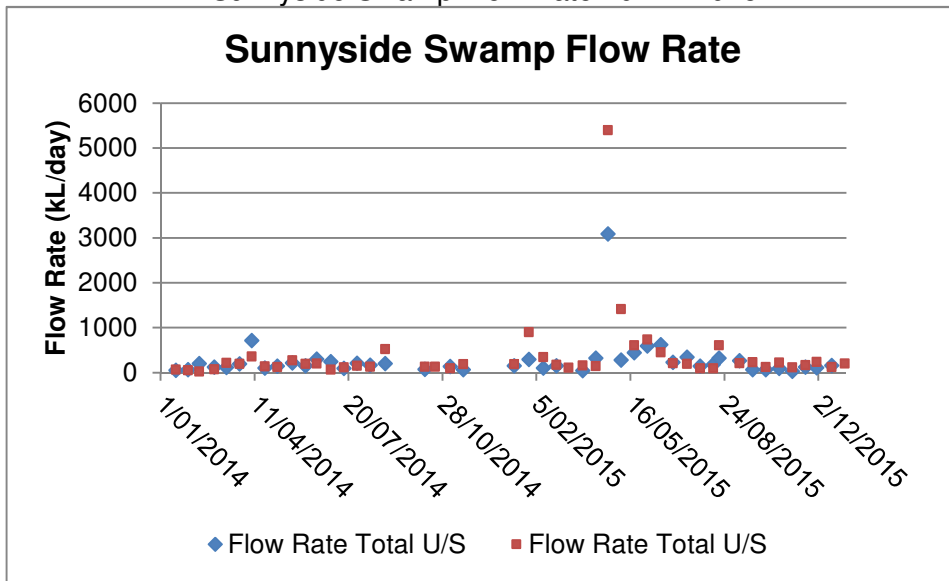
Wolgan River Manganese Filterable 2014 - 2015



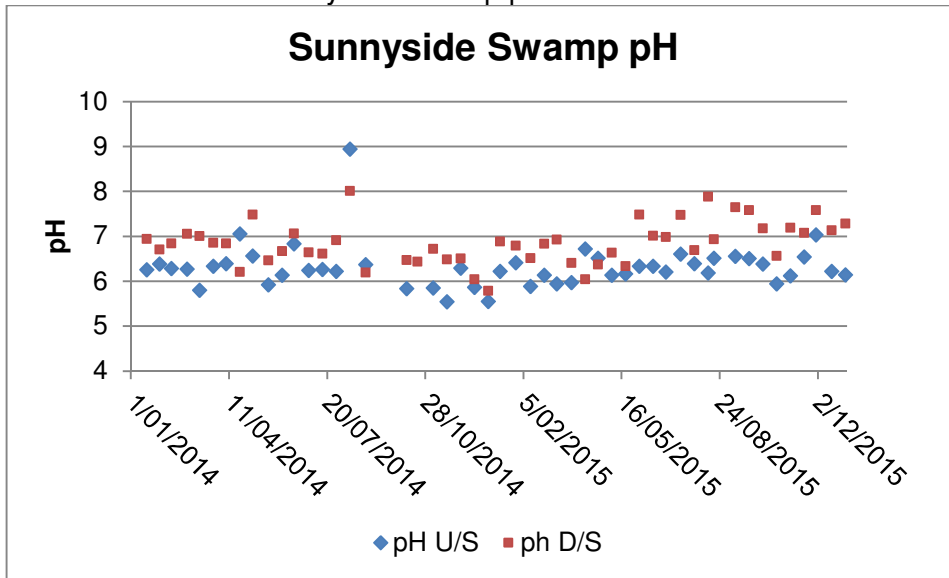
Wolgan River Iron Filterable 2014 - 2015



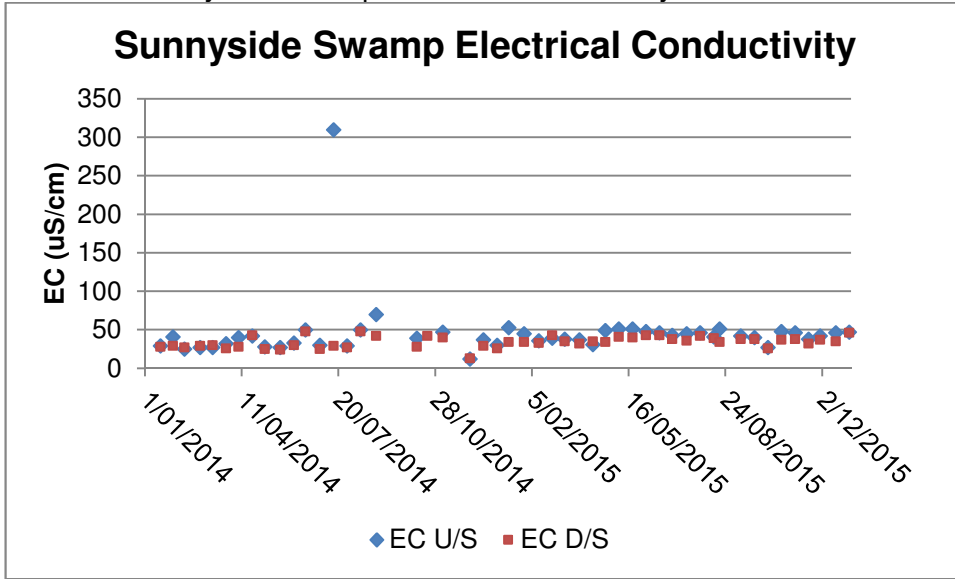
Sunnyside Swamp Flow Rate 2014 - 2015



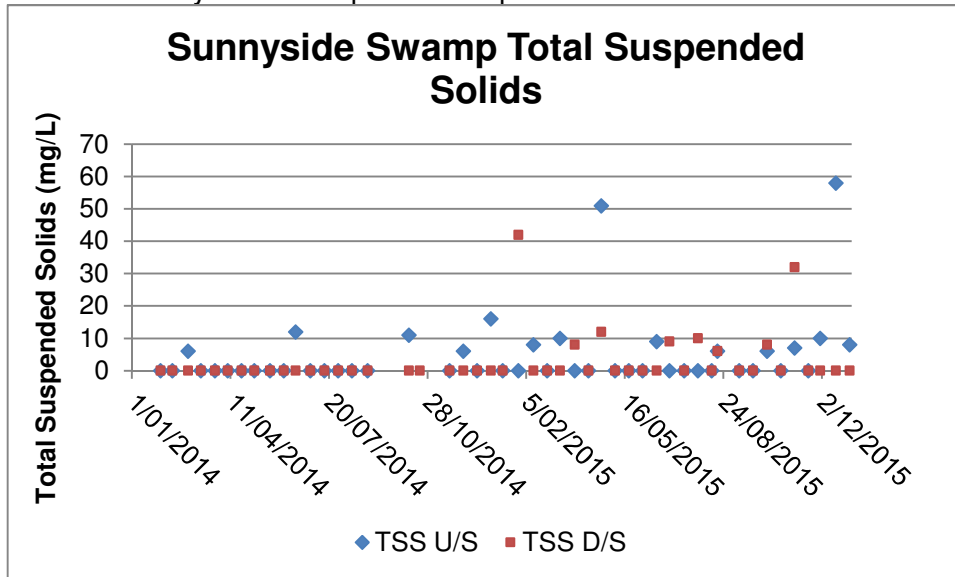
Sunnyside Swamp pH 2014 - 2015



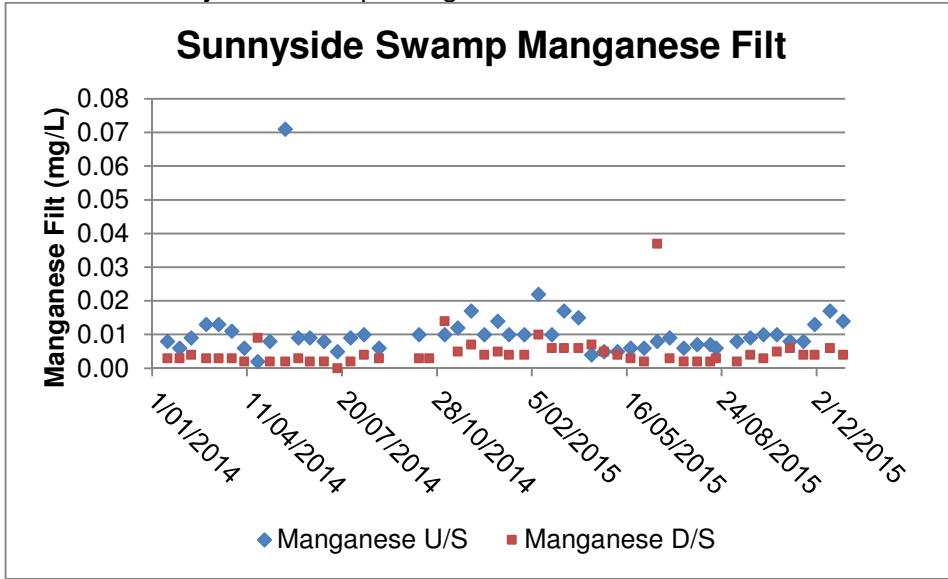
Sunnyside Swamp Electrical Conductivity 2014 - 2015



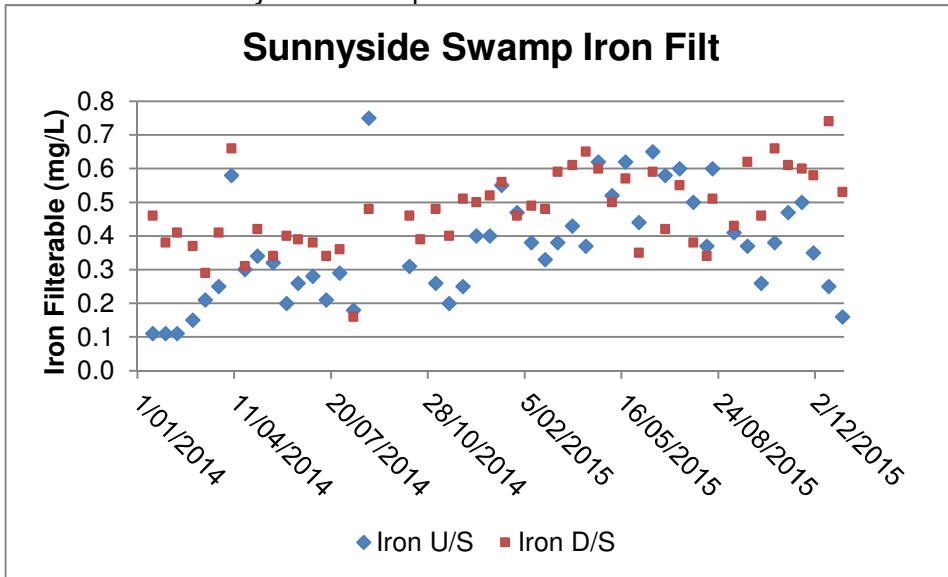
Sunnyside Swamp Total Suspended Solids 2014 - 2015



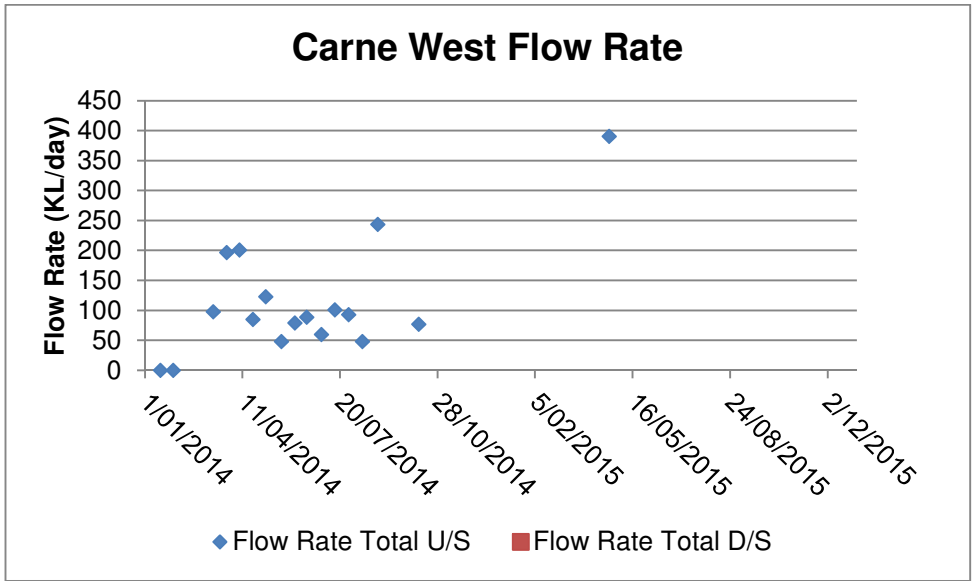
Sunnyside Swamp Manganese Filterable 2014 - 2015



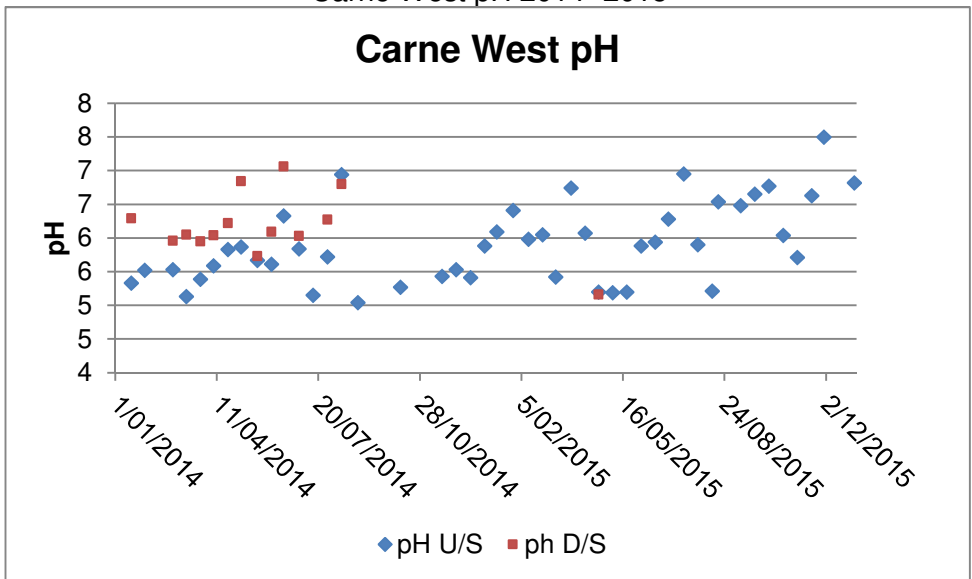
Sunnyside Swamp Iron Filterable 2014 - 2015



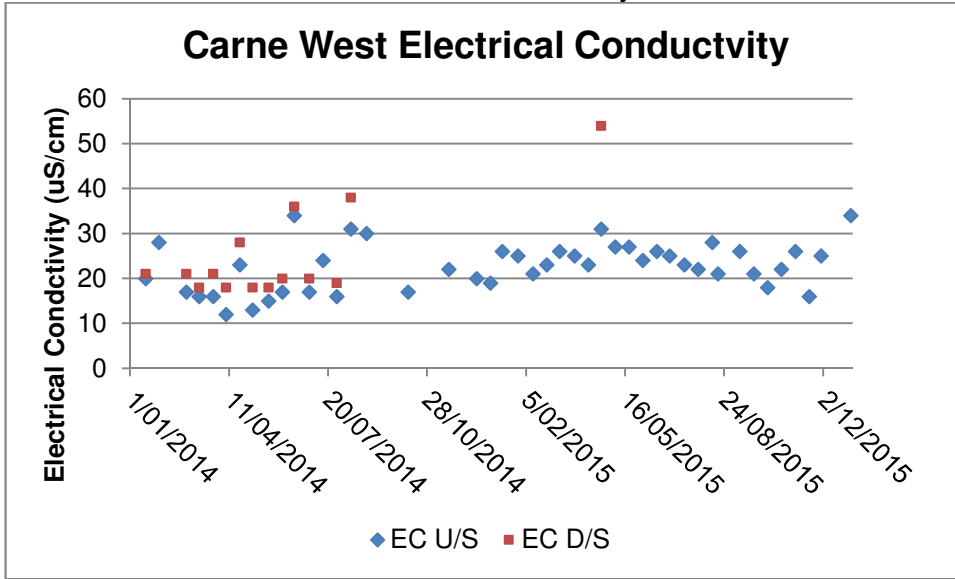
Carne West Flow Rate 2014 -2015



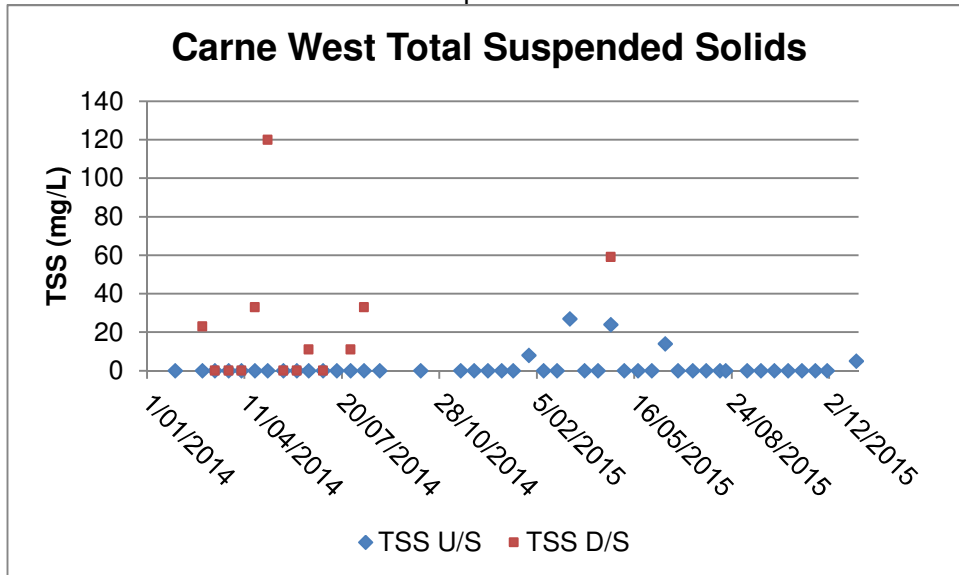
Carne West pH 2014 -2015



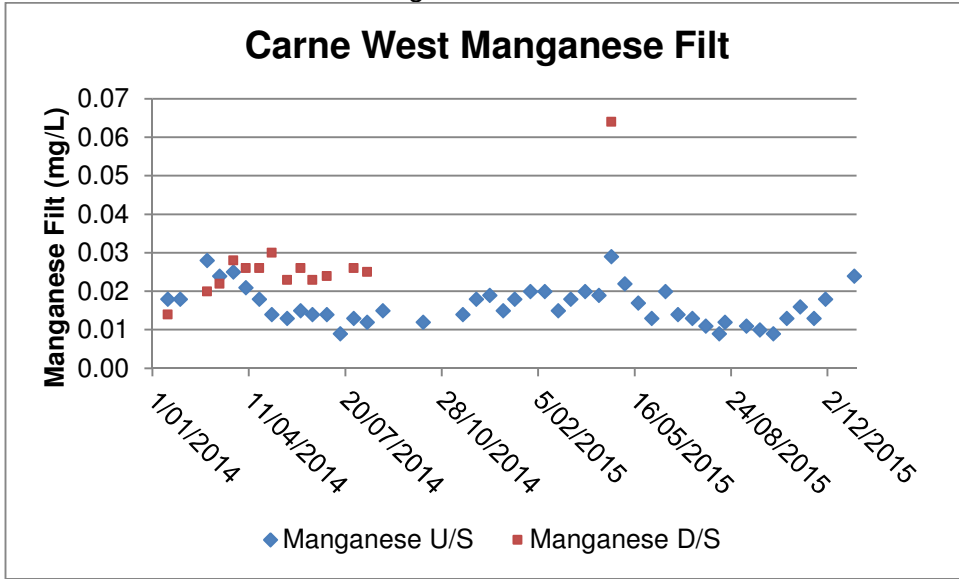
Carne West Electrical Conductivity 2014 -2015



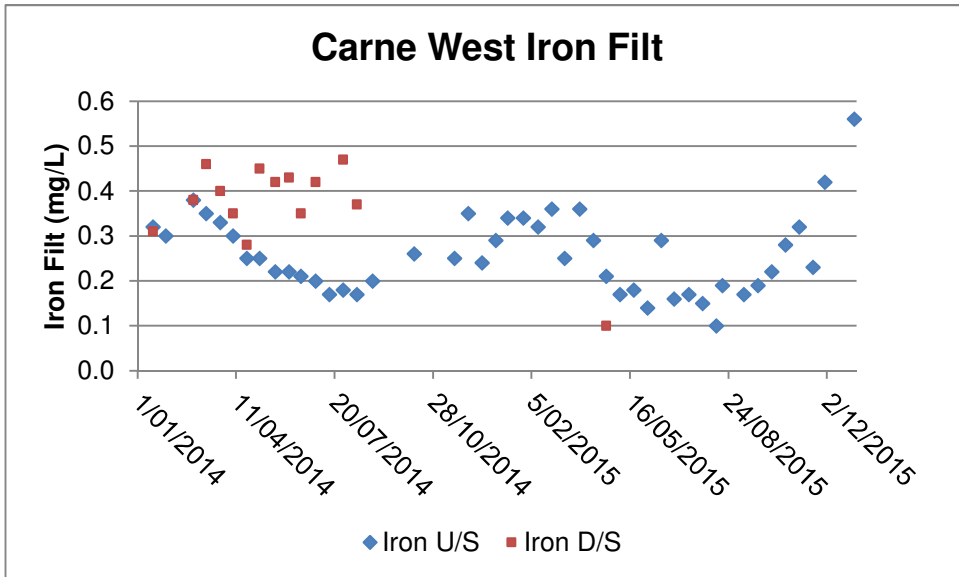
Carne West Total Suspended Solids 2014 -2015



Carne West Manganese Filterable 2014 -2015

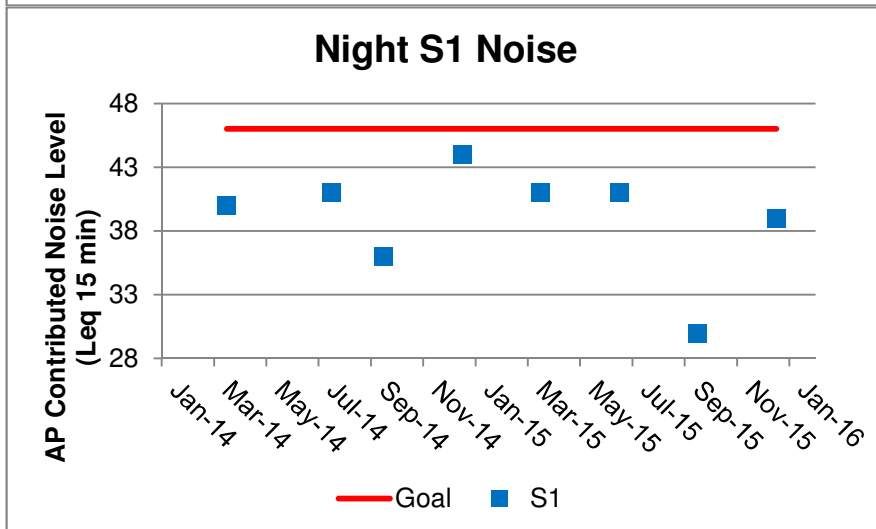
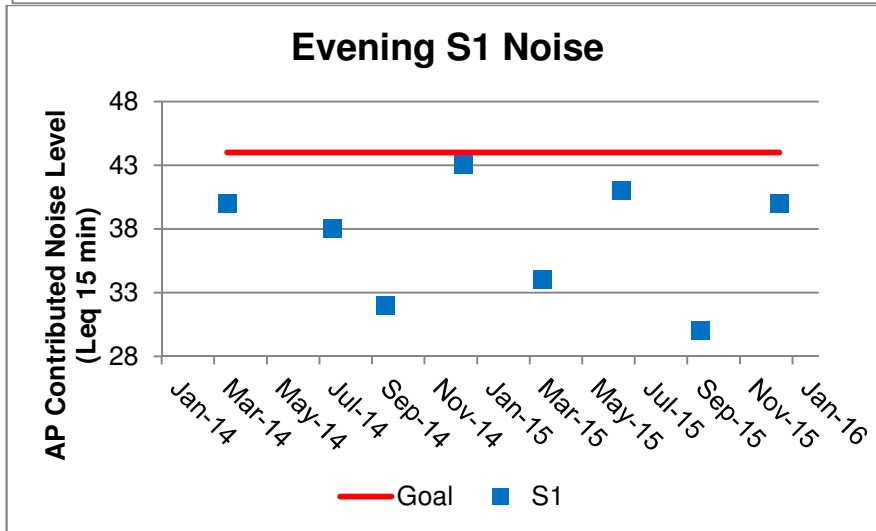
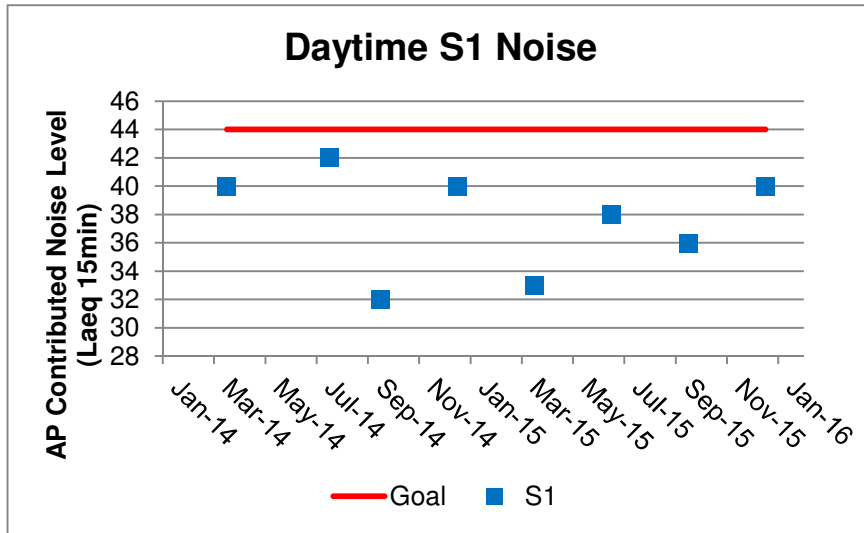


Carne West Iron Filterable 2014 -2015

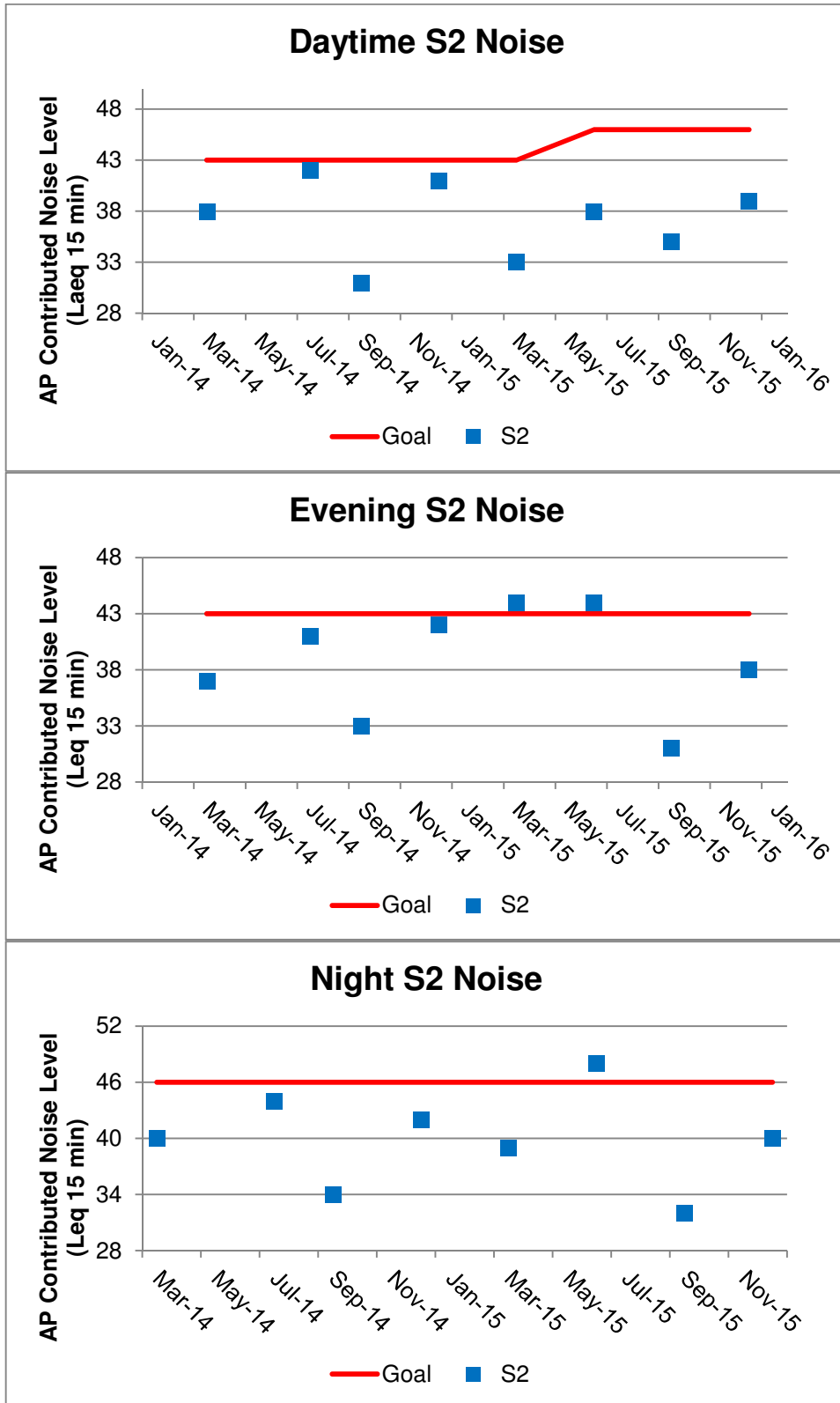


Appendix 4 – Noise Monitoring Results

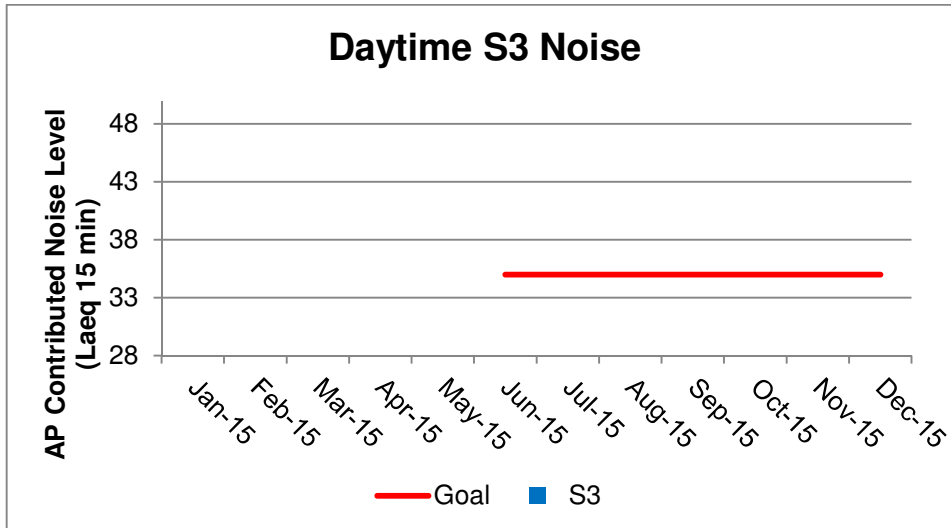
Noise Monitoring Location S1 (EPL Identification Number 11)



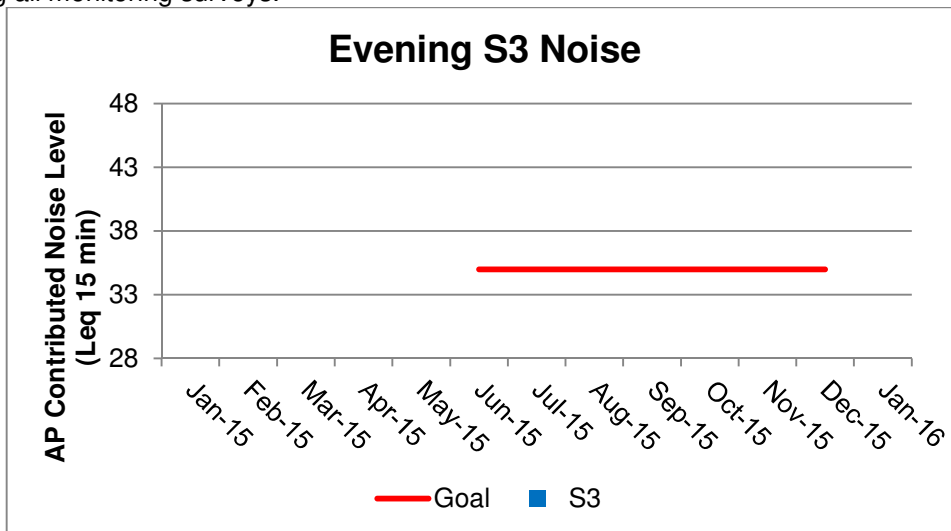
Noise Monitoring Location S2 (EPL Identification Number 12)



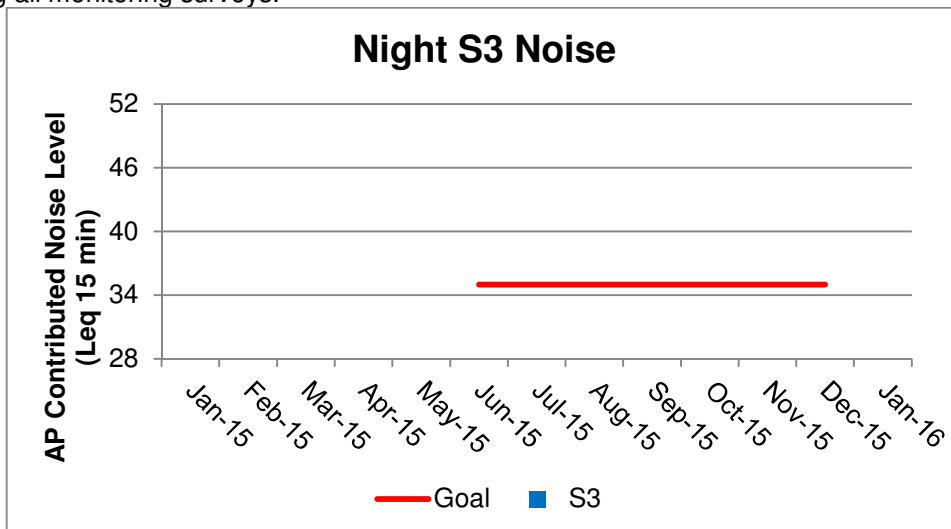
Noise Monitoring Location S3 (EPL Identification Number 13)



Note: Monitoring of this location commenced in Q2 2015. Springvale operations inaudible during all monitoring surveys.

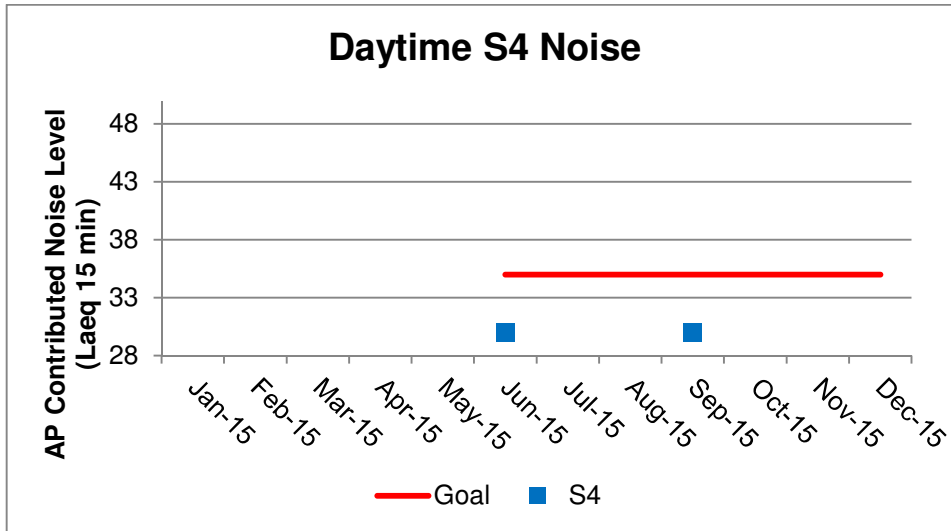


Note: Monitoring of this location commenced in Q2 2015. Springvale operations inaudible during all monitoring surveys.

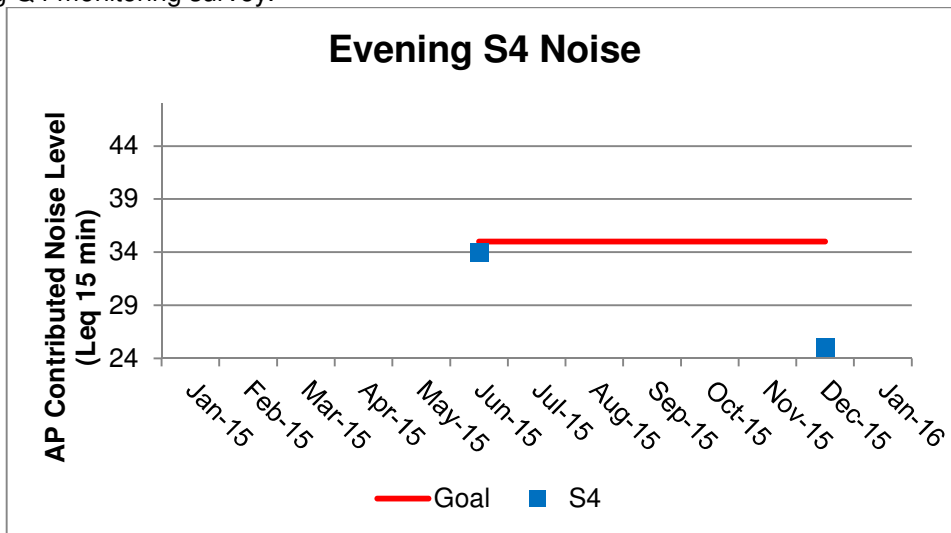


Note: Monitoring of this location commenced in Q2 2015. Springvale operations inaudible during all monitoring surveys.

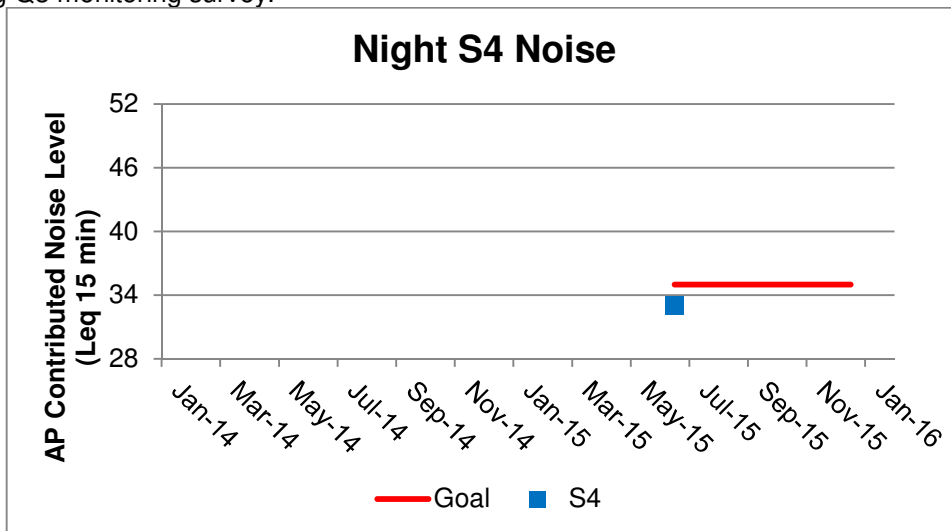
Noise Monitoring Location S4 (EPL Identification Number 14)



Note: Monitoring of this location commenced in Q2 2015. Springvale operations inaudible during Q4 monitoring survey.

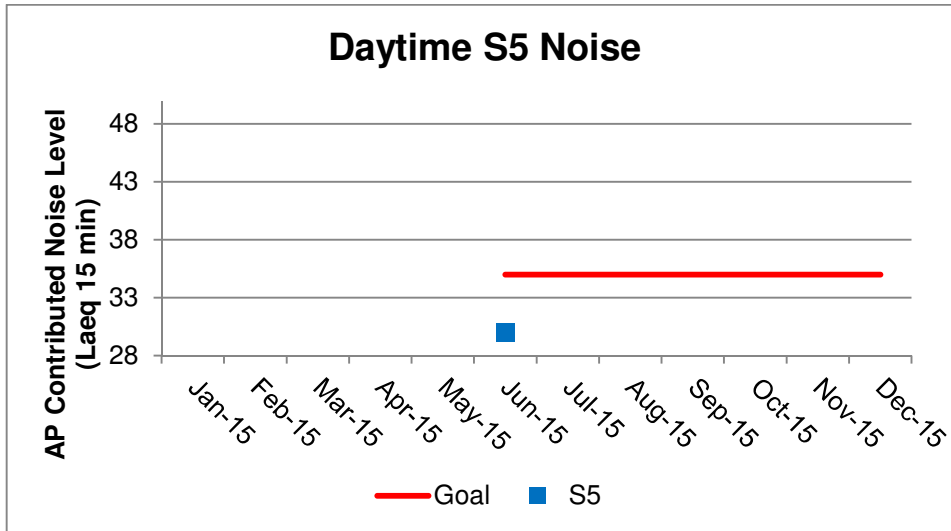


Note: Monitoring of this location commenced in Q2 2015. Springvale operations inaudible during Q3 monitoring survey.

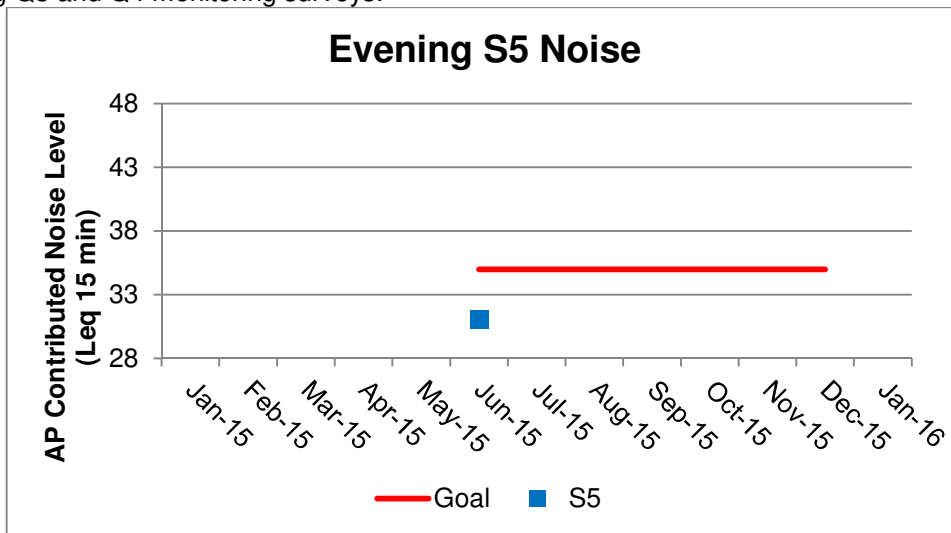


Note: Monitoring of this location commenced in Q2 2015. Springvale operations inaudible during Q3 and Q4 monitoring surveys.

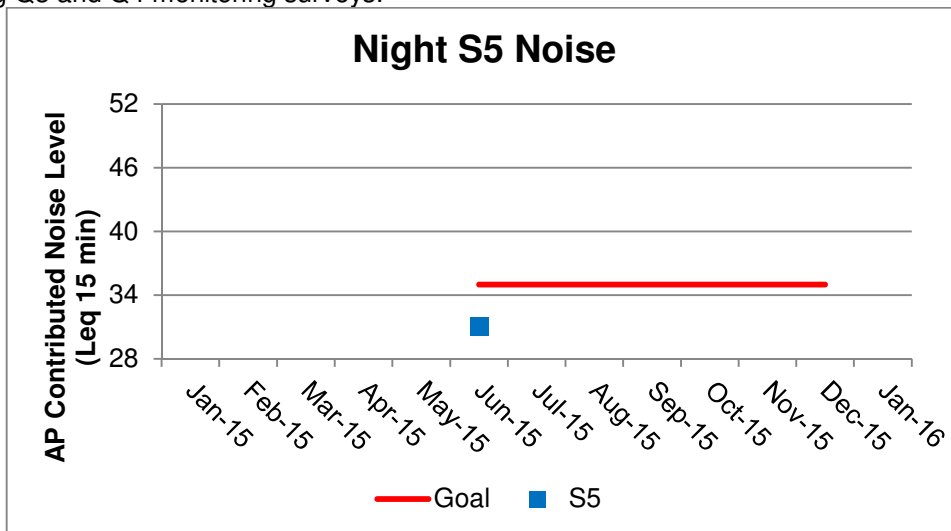
Noise Monitoring Location S5 (EPL Identification Number 14)



Note: Monitoring of this location commenced in Q2 2015. Springvale operations inaudible during Q3 and Q4 monitoring surveys.



Note: Monitoring of this location commenced in Q2 2015. Springvale operations inaudible during Q3 and Q4 monitoring surveys.



Note: Monitoring of this location commenced in Q2 2015. Springvale operations inaudible during Q3 and Q4 monitoring surveys.



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