



***CENTENNIAL COAL  
CHARBON COLLIERY  
ANNUAL REVIEW***

**March 2020**

**Table 1: Annual Review Title Block**

Name of Operation	Charbon Colliery
Name of Operator	Charbon Coal Pty Ltd
Development Consent/ Project Approval #	PA 08_0211 Mod 1
Mining Lease #	CCL732, ML1318, ML1384, ML1501, ML1524, ML1545, ML1647, ML1663, MPL270, MPL499, MPL505, MPL526, MPL670, MPL964
Name of Holder of Mining Lease	Charbon Coal Pty Limited and SK Networks Resources Australia Pty Ltd
Water License #	WAL 27890, WAL 35022, WAL 35023
Name of Holder of Water License	Charbon Coal Pty Limited, SK Australia Pty Limited
MOP Start Date	23 October 2017
MOP End Date	31 December 2025
Annual Review Start Date	1 January 2019
Annual Review End Date	31 December 2019

I certify that this audit report is a true and accurate record of the compliance status of Charbon Colliery for the period 1 January 2019 to 31 December 2019 and that I am authorized to make this statement on behalf of Charbon Colliery.

*Note:*

- a) *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.*
- b) *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).*

Name of Authorised Reporting Officer	
Title of Authorised Reporting Officer	
Signature of Authorised Reporting Officer	
Date	

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## 1. STATEMENT OF COMPLIANCE

**Table 2: Statement of Compliance**

Were all conditions of the relevant approval(s) complied with?	
PA 08_0211	YES
EPBC 2010/5498	YES
CCL726	YES
CCL732	YES
ML1318	YES
ML1384	YES
ML1501	YES
ML1524	YES
ML1545	YES
ML1647	YES
ML1663	YES
EPL 528	NO

**Table 3: Non-Compliances**

Relevant Approval	Condition #	Condition summary	Compliance Status	Comment	Page # addressed in Annual Review
EPL 528	L2.4	Licensed activities must comply with the prescribed concentration limits		Monitoring data is reviewed during discharge events to trend any increases in the pH level as the water level in the dam drops.	38
EPL 528	M2.2	Requirement to monitor concentration of pollutants discharged		The laboratory Project Plan document for Charbon Colliery has been revised.	38

*Note: Compliance Status Key for Table 3*

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

## 2. INTRODUCTION

Charbon Colliery is a joint venture between Charbon Coal Pty Ltd (Centennial) and SK Networks Resources Australia Pty Ltd (5 percent). The Charbon Colliery is located in the Western Coalfields of NSW, approximately 87 kilometres north-west of Lithgow, 4 kilometres south of Kandos and 3km East of Clandulla (refer to Figure 1). The Colliery has been in operation since the 1920's and initially supplied coal for the former Charbon Cement Works.

The mine site in its current state covers an area of approximately 2,692ha and consists of; six open cut mining areas; two historic underground mining areas; rail loop & loading facilities and a coal handling and processing plant (refer to Figure 2). After over 90 years of mining, Charbon has depleted its coal reserves and has ceased mining coal. Mining lease boundaries for Charbon are presented in Figure 3. Underground coal production at Charbon Colliery ceased in April 2014 and open cut coal mining operations ceased during August 2015. Charbon Colliery is currently undertaking rehabilitation activities to address the requirements of mine closure.

**Table 4: Key Contacts**

Position	Key Contact	Contact Details
Mine Manager	David Craft	(02) 6354 8754 Email: <a href="mailto:david.craft@centennialcoal.com.au">david.craft@centennialcoal.com.au</a>
Environment and Community Coordinator	Greg Brown	(02) 6357 9206 Email: <a href="mailto:gregory.brown@centennialcoal.com.au">gregory.brown@centennialcoal.com.au</a>

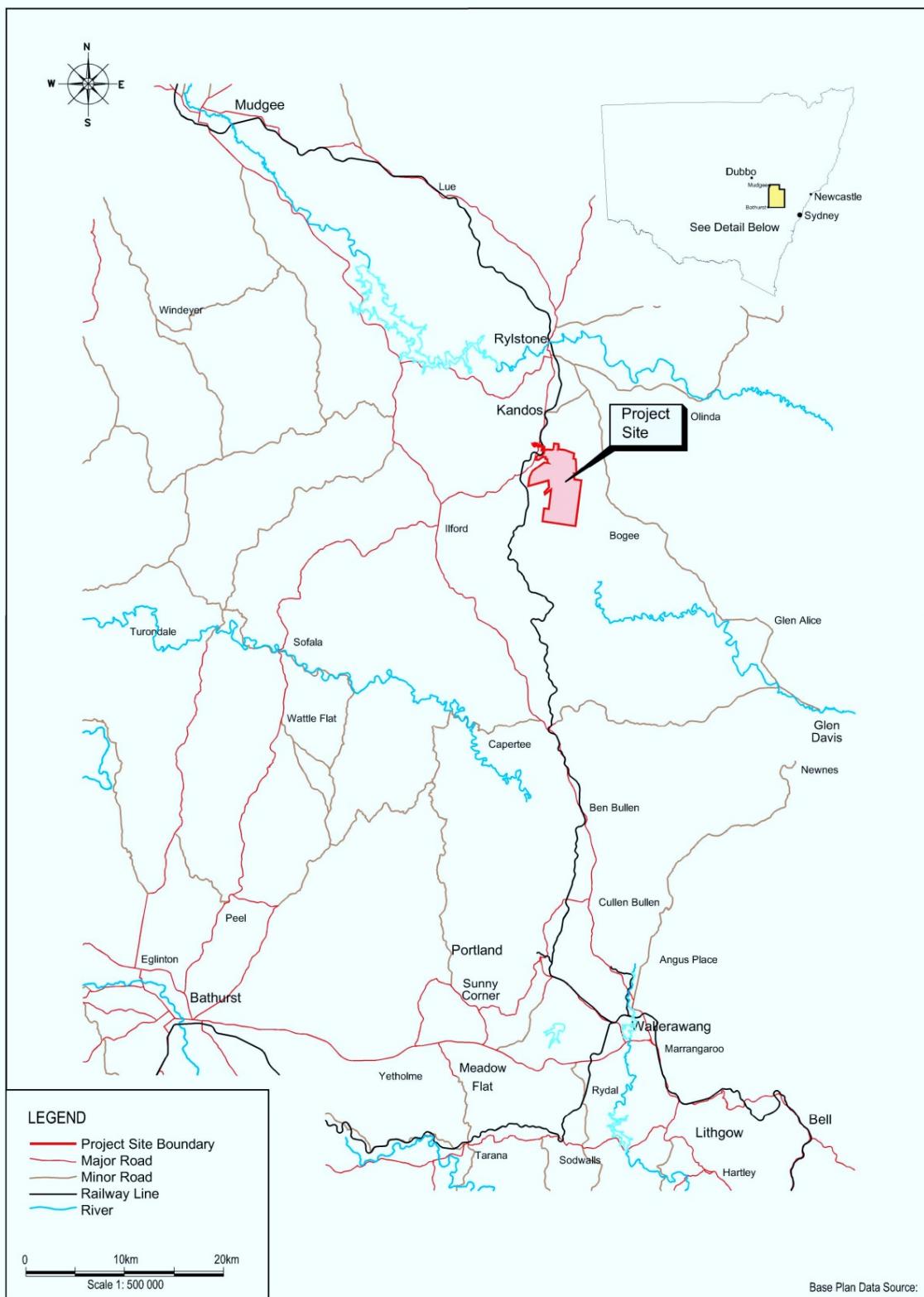
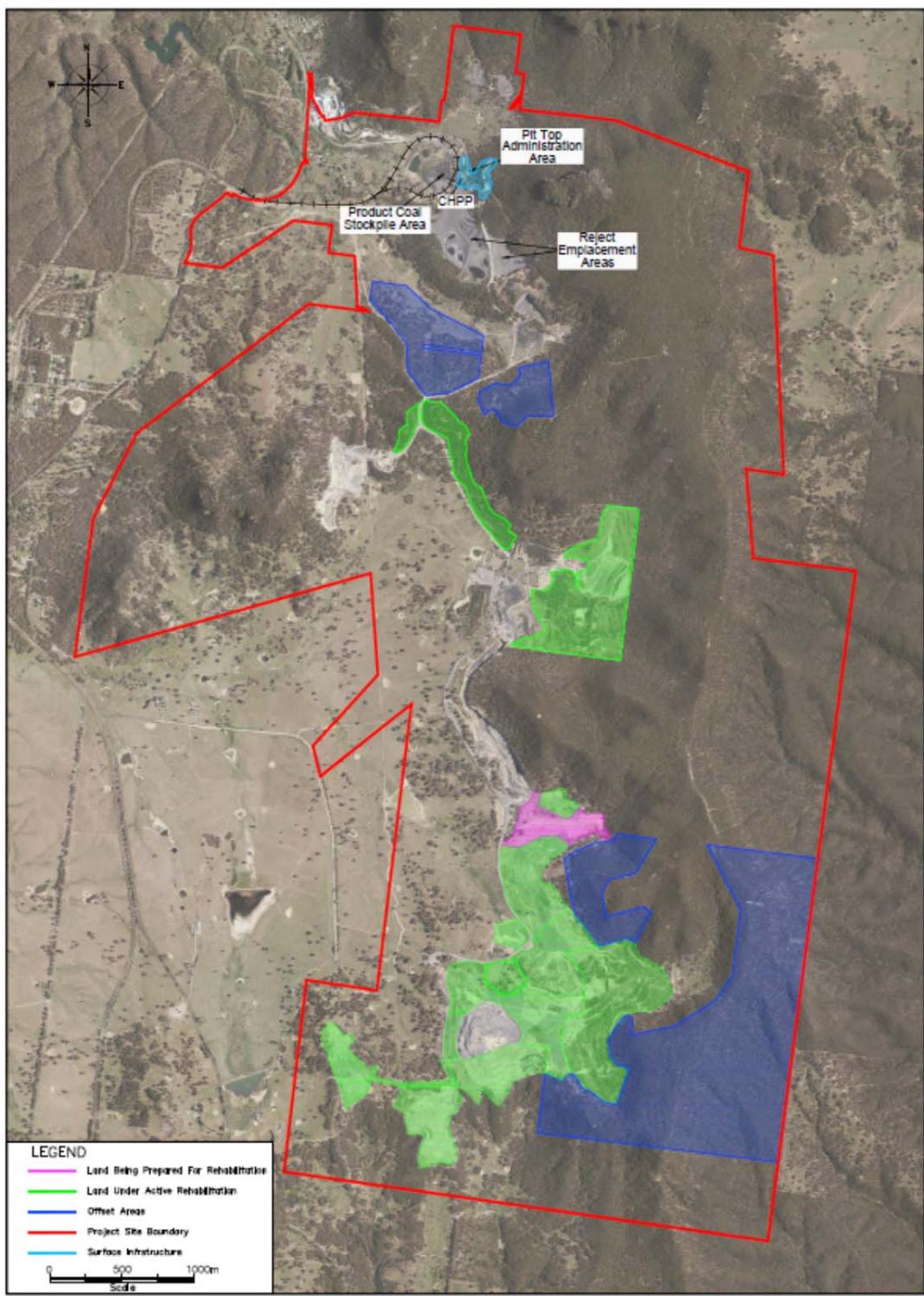


Figure 1 - Project Locality

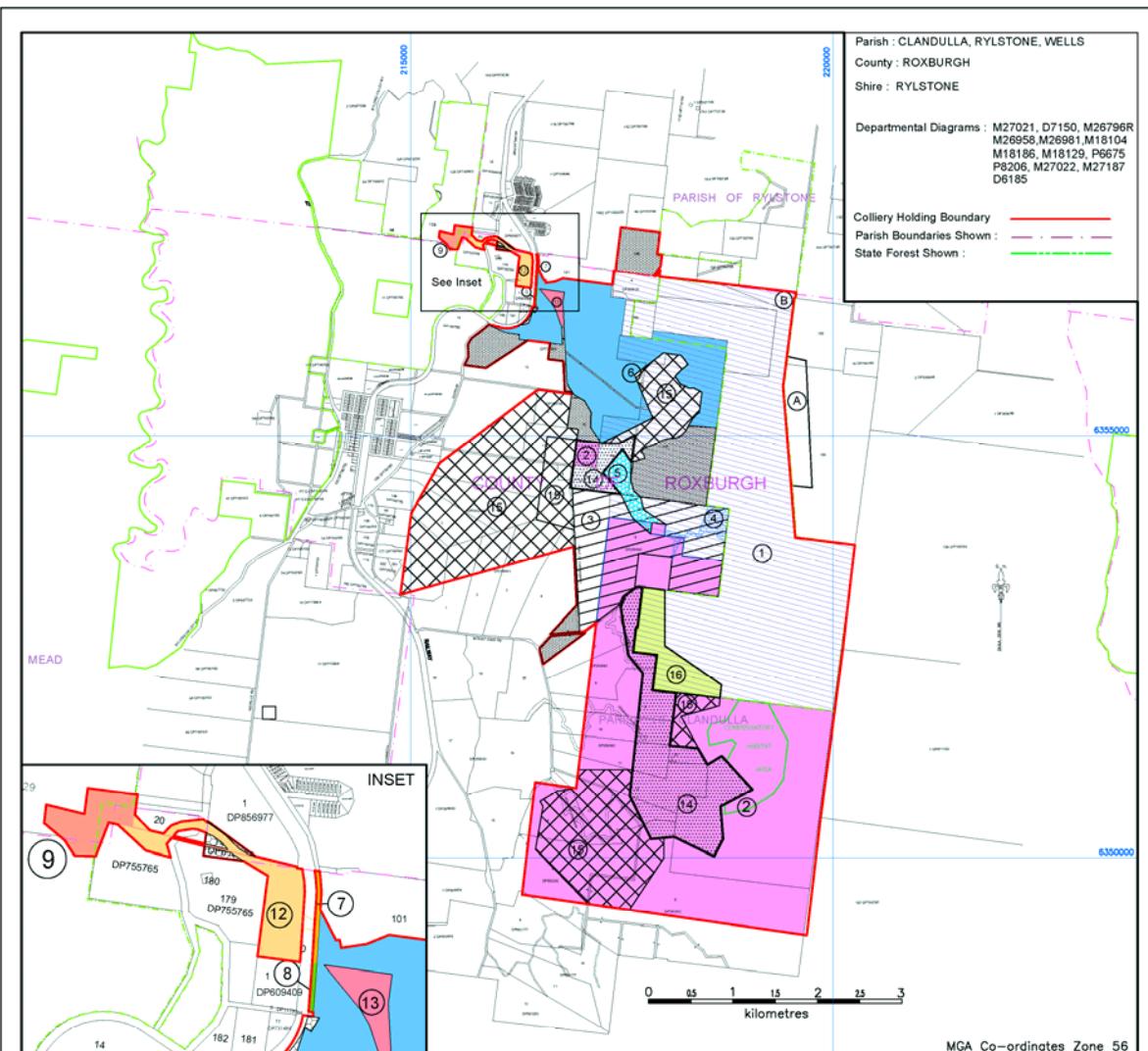
## Figure 1 Charbon Colliery Project Locality



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Charbon 2019 Annual Review  
2019 Rehabilitation

**Figure 2 Rehabilitation and Site Overview**



DETAILS OF MINING TITLES HELD UNDER THE MINING ACT

Plan Ref.	Lease Type	Lease No.	Mining Act	Registered Holder	Lease Date	Expiry Date	Mineral Area (ha) Lease	Surface Area (ha) Holding	Royalty	Comments
1	Consolidated Coal Lease	732	1973	Charbon Coal Pty Limited and SK Energy Australia Pty Limited	13-Dec-89	02-Dec-25	998.7	998.7	35	Total Mine Area = Abt 1024ha less abt 25.3ha where only surface rights are included in CCL
2	Mining Lease	1318	1992	Charbon Coal Pty Limited and SK Energy Australia Pty Limited	29-Jun-93	29-Jun-26	983	983	16.2	
3	Mining Lease	1340	1992	Charbon Coal Pty Limited and SK Energy Australia Pty Limited	29-Jun-93	29-Jun-26	198.5	198.5	0	
4	Mining Lease	1501	1992	Charbon Coal Pty Limited and SK Energy Australia Pty Limited	21-Dec-01	20-Dec-23	13	13	0	
5	Mining Lease	1534	1992	Charbon Coal Pty Limited and SK Energy Australia Pty Limited	28-Oct-02	27-Oct-23	20.26	20.26	11.86	
6	Mining Purposes Lease	270	1973	Charbon Coal Pty Limited and SK Energy Australia Pty Limited	29-Aug-91	29-Aug-26	0	0	213.73	
7	Mining Purposes Lease	499	1908	Charbon Coal Pty Limited and SK Energy Australia Pty Limited	28-May-25	29-May-26	0	0	0.792	
8	Mining Purposes Lease	505	1908	Charbon Coal Pty Limited and SK Energy Australia Pty Limited	11-Aug-25	11-Aug-26	0	0	0.41	
9	Mining Purposes Lease	526	1908	Charbon Coal Pty Limited and SK Energy Australia Pty Limited	14-Dec-25	14-Dec-24	0	0	7.106	
10	Mining Purposes Lease	670	1908	Charbon Coal Pty Limited and SK Energy Australia Pty Limited	26-Mar-30	26-Mar-24	0	0	9.92	
11	Mining Purposes Lease	98	1908	Charbon Coal Pty Limited and SK Energy Australia Pty Limited	20-Nov-39	20-Nov-23	0	0	4.932	
12	Mining Purposes Lease	100	1908	Charbon Coal Pty Limited and SK Energy Australia Pty Limited	19-Jun-04	19-Jun-26	204.05	204.05	204.05	
13	Mining Lease	1545	1992	Charbon Coal Pty Limited and SK Energy Australia Pty Limited	17-Dec-20	17-Dec-31	570.9	570.9	286.7	
14	Mining Lease	1647	1992	Charbon Coal Pty Limited and SK Energy Australia Pty Limited	09-Jun-12	09-Jun-33	52.5	52.5	52.5	Completely underway by CCL732
15	Mining Lease	1663	1992	Charbon Coal Pty Limited and SK Energy Australia Pty Limited			3098.53	3098.53	1099.3	

DETAILS OF SUB-LEASES BENEFITING CHARBON COAL PTY LIMITED

Plan Ref.	Lease Type	Lease No.	Mining Act	Registered Holder	Sub-Lease Date	Expiry Date	Mineral Area (ha) Lease	Surface Area (ha) Holding	Royalty	Comments
A	Part Consolidated Coal Lease	726	1973	Kandos Collieries Pty Limited	29-Jun-82	17-Jan-30	37.17	0	0	Sublease registration expired - No longer included in Colliery Holding

DETAILS OF SUB-LEASES BENEFITING OTHERS

Plan Ref.	Lease Type	Lease No.	Mining Act	Lessee	Sub-Lease Date	Expiry Date	Mineral Area (ha) Lease	Surface Area (ha) Holding	Royalty	Comments
B	Part Consolidated Coal Lease	732	1973	Kandos Collieries Pty Limited	13-Dec-89	02-Dec-25	10.55	0	0	Sublease registration expired

Description	Area (ha)	Remarks
Total Mineral Area under Colliery Holding	3171.49	Approx only - Excludes overlap of leases
Surface Area under Mining Lease with Colliery Holding	1099.30	Approx only
Surface Area under Other Colliery Holding	150.00	
Total Surface Area under Colliery Holding	1149.32	
Total Area of Colliery Holding	3490.43	Approx only

Surface in colliery holding held under threshold 1ha

I, Paul Craig Director of Centennial Coal Company Limited - ACN 003 714 538, do hereby declare under the Surveying Act 2002, to hereby certify that the information shown herein, to the best of my knowledge and belief is correctly represented.

Signed \_\_\_\_\_ Date \_\_\_\_\_

Surveyors Reference: No 8327

PC1806 Charbon Colliery Holding Plan 20170209.pdf

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LOCATION: CHARBON  
SEAM: C.P.T.  
DRAWN: C.P.T.  
CHECKED: P.C.D.  
APPROVED: P.C.D.  
SCALE: 1:25000 @ A1

CENTENNIAL COAL COMPANY LIMITED  
MINING LEASES  
CHARBON COLLIERY  
HOLDING PLAN - SHEET 1 OF 3

Centennial  
Charbon  
DATE: 09-08-2013 | PC1806

Figure 3 Charbon Colliery Mining Lease Boundary

### 3. APPROVALS

**Table 5 Charbon Mine Leases, Licenses and Consent**

Mineral Authority	Approval Date	Expiry Date
CCL732	13 December 1989	02 December 2025
ML1318	29 June 1993	29 June 2026
ML1384	19 January 1996	18 January 2038
ML1501	21 December 2001	21 December 2022
ML1524	28 October 2002	28 October 2023
ML1545	9 January 2004	9 January 2025
ML1647	17 December 2010	17 December 2031
ML1663	9 January 2012	9 January 2033
MPL270	29 April 1991	29 April 2026
MPL499	28 May 1925	28 May 2026
MPL505	11 August 1925	11 August 2026
MPL526	14 December 1925	14 December 2024
MPL670	26 March 1930	26 March 2024
MPL964	20 November 1939	20 November 2023

**Table 6 Consent – Department of Planning, Industry and Environment**

Consent	Summary	Grant Date	Expiry Date
PA 08_0211 MOD 1	Open cut and underground coal mine, tailings dam, progressive rehabilitation of site, use of infrastructure on site for duration of project. Includes the transfer of water by rail to Airly Mine.	30 July 2019	31 August 2025

**Table 7 EPBC Approval – Department of Environment**

Reference	Summary	Grant Date	Expiry Date
2010/5498	Details offset requirements	19 November 2010	2025

**Table 8 Mining Operations Plan (Division of Resources and Geoscience)**

MOP Period	Summary	Grant Date	Expiry Date
2017-2025	Covers mining activities and progressive rehabilitation	23 October 2017	31 December 2025
2015-2022	Covers rehabilitation activities on privately owned lands only	7 December 2015	16 October 2022

**Table 9 Environment Protection Licence (NSW Environment Protection Authority)**

EPL	Summary	Grant Date	Expiry Date
EPL 528	Sets pollution limits for noise, air quality, blasting and water quality	26 June 2001	Renewed Annually

**Table 10 Groundwater Extraction Licenses (Crown Lands and Water Division)**

Reference	Reference/Summary	Grant Date	Expiry Date
WAL 27890	Extraction of up to 30ML per year.	21 November 2012	Perpetuity
80BL243771	Extraction of up to 5ML per year from the Charbon Underground	22 March 2007	Perpetuity
80BL236248	Extraction of 10 ML per year for domestic and stock use	22 February 1995	Perpetuity

**Table 11 Surface Water Licenses (Crown Lands and Water Division)**

Reference	Reference/Summary	Grant Date	Expiry Date
WAL 35022	Extraction of 105 ML per year	13 November 2013	Perpetuity
WAL 35023	Extraction of 231 ML per year	28 October 2013	Perpetuity

**Table 12 EPBC Approval Conditions (Department of Environment)**

Condition	Condition Requirement	Comment
1	The person taking the action must carry out the action in accordance with the conditions of this approval and as described in the referral documentation dated 18 May 2010 and Preliminary Documentation dated 20 October 2010. Where the referral, the Preliminary Documentation and these conditions are contradictory, these conditions shall prevail to the extent of the contradiction.	Addressed by the Compensatory Habitat Management Plan
2	<p>The person taking the action must not clear more than approximately 90ha in the project area (Annexure 1), consisting of no more than:</p> <ul style="list-style-type: none"> <li>a. Approximately 42ha of <b>native vegetation</b> including: <ul style="list-style-type: none"> <li>i. 13.3ha of the listed White Box – Yellow Box – Blakely's Red Gum Grassy Woodlands and Derived native Grasslands ecological community;</li> </ul> </li> <li>b. Approximately 47ha of cleared land; and</li> <li>c. The removal of no more than 40 individual <i>Eucalyptus macrorhyncha</i> subsp. <i>Cannonii</i> (Cannon's Stringybark or Capertee Stringybark).</li> </ul>	<p>The person taking the action did not clear more than approximately 90ha in the project area.</p> <p>A total of 41.47 ha native vegetation has been mapped as cleared. The EPBC Approval allowed for clearing of 42 ha total of vegetation. The project cleared a total of 12.6 ha of White Box – Yellow Box – Blakely's Red Gum Grassy Woodlands and Derived native Grasslands ecological community. The condition allowed for 13 ha to be cleared.</p>
3	<p>To mitigate impacts on the listed White Box – Yellow Box – Blakely's Red Gum Grassy Woodlands and Derived native Grasslands ecological community, the listed Swift Parrot, Regent Honeyeater, Large-eared Pied Bat, Spotted-tail Quoll and Greater Long Eared Bat, the person taking the action must place a legally binding conservation covenant in perpetuity over no less than 253ha of land identified as 'Proposed Additional Compensatory Habitat' on the map dated 29/03/2012 at Annexure 2.</p> <ul style="list-style-type: none"> <li>a. The covenant must be approved in writing by the Minister and placed on the title of the land identified on the map at Annexure 2 as "Proposed Additional Compensatory Habitat" by 19 November 2013.</li> <li>b. Covenant conditions must not allow any development or native vegetation clearing within these areas.</li> </ul>	Charbon Coal has identified approximately 265ha of land for conservation. As of 19 February 2014 a covenant has been placed over this land.
4	<p>Within 12 months of the commencement of Stage One Works, the person taking the action must prepare and submit a Compensatory Habitat Management Plan, for the area identified in Condition 3, for the Minister's approval to provide protection for:</p> <ul style="list-style-type: none"> <li>i. White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands; and</li> <li>ii. Habitat for the Spotted-tail Quoll, Swift Parrot, Regent Honeyeater, Large-eared Pied Bat, Greater Long Eared Bat and Capertee Stringybark;</li> </ul> <p>The Compensatory Habitat Management Plan must include, but not limited to:</p> <ul style="list-style-type: none"> <li>a. Desired outcomes/objective of the plan;</li> <li>b. Management actions including, but not limited to, land rehabilitation and restoration measures, pest management, fencing, weed control, fire management, erosion and sediment control, exclusion of livestock, and restrictions on access that are proposed to protect and enhance areas of:</li> </ul> <ul style="list-style-type: none"> <li>i. White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands; and</li> </ul>	Charbon Colliery, Compensatory Habitat Management Plan approved by SEWPaC on 5 October 2012.

Condition	Condition Requirement	Comment
	<ul style="list-style-type: none"> <li>ii. Habitat for the Spotted-tail Quoll, Swift Parrot, Regent Honeyeater, Large-eared Pied Bat, Greater Long Eared Bat and Capertee Stringybark;</li> <li>c. Measures to monitor subsidence and thresholds of detected subsidence rates that will trigger remedial action and the remedial works in relation to subsidence;</li> <li>d. Measures for the protection of these areas in perpetuity;</li> <li>e. The development and implementation of a monitoring program, including, but not limited to, performance criteria and thresholds for review and amendment of management actions;</li> <li>f. A description of the potential risks to management and rehabilitation in the compensatory habitat areas, and a description of the contingency measures that would be implemented to mitigate these risks;</li> <li>g. The timing of and person(s) responsible for undertaking the actions identified in condition 4; and</li> <li>h. The approved Compensatory Habitat Management Plan must be implemented.</li> </ul>	
5	For the first five years after the approval of the Compensatory Habitat Management Plan by the Minister, the person taking the action must submit to the Department a report detailing the implementation of the approved Compensatory Habitat Management Plan, as component of Condition 10.	This condition has been addressed by this Annual Review.
6	For the period following the first five years after the approval of the Compensatory Habitat Management Plan by the Minister, the person taking the action must submit to the Department a report detailing the implementation of the approved Compensatory Habitat Management Plan. Reports must be submitted every three years as a component of Condition 10, until the Minister notifies the person taking the action that he or she is satisfied that the Compensatory Habitat Management Plan has been fully implemented and reporting is no longer required.	Not yet triggered.
7	To offset impacts to the listed White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands ecological community, the listed Swift Parrot, Regent Honeyeater, Large-eared Pied Bat and Greater Long Eared Bat, the person taking the action must provide protection for no less than 120ha of land, including at least 80ha of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands ecological community, located at Nullo Mountain, County of Phillip, NSW and described as Lot 3 DP1172889 and provided at Annexure 3 (Nullo Mountain offset area). The Nullo Mountain offset area must be transferred to the NSW Minister for the Environment on condition that it is reserved as a state conservation area under the <i>National Parks and Wildlife Act 1974 (NSW)</i> , within 12 months of the date of this variation notice and provide evidence to the Department within 10 days of the transfer. The person taking the action must use all reasonable endeavours to ensure that the Nullo Mountain offset area is reserved as a State Conservation Area under the <i>National Parks and Wildlife Act 1974 (NSW)</i> within 12 months of the date of this variation notice and provide evidence to the department within 10 days of registering the Nullo Mountain offset area as a State Conservation Area.	Offset land has been gifted to NPWS for management.
8	To offset impacts to the Regent Honeyeater, the person taking the action must donate \$5000 to the Hawkesbury – Nepean Catchment Management Authority for Regent Honeyeater habitat restoration.	Charbon Coal presented a cheque for \$5000 to the Hawkesbury – Nepean Catchment Management Authority in September 2011.

Condition	Condition Requirement	Comment
9	Within 10 business days of substantial commencement, the person taking the action must advise the Department in writing the actual date of commencement.	Substantial commencement of works was 24 November 2011. The Department was advised of commencement in writing within 10 business days.
10	By 31 March of each calendar year, the person taking the action must submit to the Department a report addressing compliance with the conditions of the approval, for the previous calendar year. Annual reports must be provided until the Minister is satisfied that the person taking the action has complied with all conditions of approval.	This condition has been addressed by this Annual Report.
11	Upon the direction of the Minister, the person taking the action must ensure that an independent audit of compliance with the conditions of this approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.	Not yet triggered.
12	If the person taking the action wishes to carry out any activity otherwise than in accordance with the plans, reports or strategies referred to in the above conditions the person taking the action must submit for the Minister's approval a revised version of any such plan, report or strategy. The varied activity shall not commence until the Minister has approved the varied plan, report or strategy in writing. If the Minister approves such a revised plan, report or strategy, that plan, report or strategy must be implemented in place of the plan, report or strategy originally approved.	Not yet triggered.
13	If the Minister believes that it is necessary or desirable for the better protection of listed threatened species and ecological communities and listed migratory species to do so, the Minister may request that the person taking the action make specified revisions to the plans, reports or strategies approved pursuant to the above conditions and submit the revised plan, report or strategy for the Minister's approval. The person taking the action must comply with any such request. The revised approved plan, report or strategy must be implemented. Unless the Minister has approved the revised plan, report or strategy, then the person taking the action must continue to implement the plan, report or strategy originally approved, referred to in the above conditions.	Not yet triggered
14	If, at any time after 3 years from the date of this approval, the Minister notifies the person taking the action in writing that the Minister is not satisfied that there has been substantial commencement of the action, the action must not thereafter be commenced without the written agreement of the Minister.	Not yet triggered
15	The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the above conditions of approval, including measures taken to implement the management plans required by this approval, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media.	In accordance with the requirement of this Condition, accurate records are maintained to substantiate activities relevant to this Approval by the Environment and Community Department.

## 4. OPERATIONS SUMMARY

**Table 13 Production Summary**

Material	Approved Limit (and source)	Previous Reporting Period (Actual) (t)	This Reporting Period (Actual) (t)	Next Reporting Period (Forecast) (t)
Waste Rock/Overburden	N/A	Nil	Nil	Nil
ROM Coal	1,500,000	Nil	Nil	Nil
Coarse reject	N/A	Nil	Nil	Nil
Fine reject (Tailings)	N/A	Nil	Nil	Nil
Saleable product	1,500,000	Nil	Nil	Nil

### 4.1. Other Operations

**Table 14 Operations Summary**

	Approved Limit (and source)	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Comment (if applicable)
Hours of operation	Open cut mining (see Table 6).	As per and within the approved hours of operation.	N/A	No open cut mining was undertaken during the reporting period.
	Underground mining, coal processing, run-of-mine coal management and maintenance (see Table 15).	As per and within the approved hours of operation.	N/A	No underground mining, coal processing, run-of-mine coal management or maintenance was undertaken during the reporting period.
	Blasting (see Table 15).	N/A – No blasting was conducted.	N/A	No blasting was conducted during the reporting period.
	Vegetation clearing and soil handling (see Table 15).	As per and within the approved hours of operation.	7am -5pm	Conducted earthworks on existing water management structures within previously disturbed areas. Rehabilitation earthworks undertaken in the area of the Southern Open Cut and 8 Trunk.

	<b>Truck dispatch</b> (see Table 15).	As per and within the approved hours of operation.	N/A	N/A
	<b>Train loading and dispatch</b> (see Table 15).	As per and within the approved hours of operation.	N/A	Train loading and dispatch was undertaken during the reporting period for the transfer of water to Airly Mine.
<b>Transport (road)</b>	250,000 tonnes product coal	Nil	Nil	No coal was transported on public roads during the reporting period.

## 4.2. Next Reporting Round

Charbon Colliery has ceased coal mining and is currently undertaking rehabilitation activities to facilitate closure of the mine site. Charbon will continue working in the area of the Southern Open Cut and 8 Trunk during the next reporting period.

Further details of the proposed actions for the next reporting period are provided in Section 15.

## 5. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

### 5.1. Annual Review

The 2018 Annual Review Report satisfied all the requirements of the Project Approval according to correspondence issued by the Department of Planning and Environment on 9 May 2019.

**Table 15 Actions from 2018 Annual Review Letter**

Actions Required	Charbon Response	Section Reference
Nil	Nil	Nil

## 6. ENVIRONMENTAL PERFORMANCE

**Table 16 Environmental Performance**

Aspect	Approval criteria/ EIS prediction	Performance during the reporting period (actual)	Trend/ key management implications	Implemented / proposed management action
Noise	As per Schedule 3, Condition 1 of PA 08_0211 Mod 1 and Condition L4 of EPL528.	Compliant with approval criteria. See section 6.1	Results trending down. Mining and processing operations have ceased.	Continue to maintain compliance with all relevant approvals.
Blasting	As per Schedule 3, Condition 10-18 of PA 08_0211 Mod 1 and Condition L5 of EPL528.	Charbon Colliery did not conduct any blasts within the reporting period.	Charbon Colliery has ceased blasting.	Charbon Colliery has ceased blasting.
Air Quality	As per Schedule 3, Condition 19-22 of PA 08_0211 Mod 1.	Compliant with approval criteria. See section 6.3	Mining and processing operations have ceased.	Continue to maintain compliance with all relevant approvals.
Biodiversity	As per Schedule 4, Condition 1-3 of PA 08_0211 Mod 1 and Charbon EPBC Approval 2010/5498.	Review of monitoring activity undertaken during 2012, 2014, 2016, 2017 and 2018 within the Compensatory Habitat Management Areas.	Continue with management actions including control of weeds and pest fauna.	Charbon will continue with weed spraying campaigns and management of pest fauna during 2020.

Aspect	Approval criteria/ EIS prediction	Performance during the reporting period (actual)	Trend/ key management implications	Implemented / proposed management action
Heritage	As per Schedule 3, Condition 34 of PA 08_0211 Mod 1.	Approval of the Western Region Aboriginal Cultural Heritage Management Plan on 27 October 2017.	Charbon operations update provided at Western Aboriginal Cultural Heritage Committee Meetings held on 15 May 2019 and 27 November 2019.	Continue to engage with Aboriginal stakeholder groups.
Surface Water	As per Schedule 3, Condition 27-32 of PA 08_0211 Mod 1 and Condition L2 of EPL528.	Non-compliant with licence conditions. See Section 7.1	One water quality non-compliance and one sampling non- compliance with EPL 528 as a result of discharges from LDPs.	Continue to maintain water management structures on site.
Groundwater	As per Schedule 3, Condition 33 of PA 08_0211 Mod 1.	Monitored groundwater from two bores located in the CHPP area.	The quality is typical of groundwater from within the Shoalhaven Group.	Continue to monitor ground water from two bores located in the CHPP area.

## 6.1. Noise

Noise monitoring is undertaken to measure the ambient noise levels at the focus receptor locations (potentially worst affected) surrounding the mine in accordance with Condition 1 of Schedule 3 in Project Approval 08\_0211 Mod 1 and Condition L4 of EPL528. The Noise Management Plan at Charbon Colliery was reviewed during 2018 and was approved by the Department of Planning and Environment on 29 June 2018. The revised noise monitoring program requires monitoring to be undertaken annually at location H, location L, location P and location Q.

Quarterly noise surveys undertaken prior to approval of the revised monitoring program comprised of operator attended monitoring in 15 minute intervals coinciding with day, evening and night-time periods. Statistical indices recorded include  $L_{Amax}$ ,  $L_{A1}$ ,  $L_{A10}$ ,  $L_{A90}$  and  $L_{Aeq}$ . The results of the annual noise monitoring conducted at Charbon Colliery during August 2019 are shown below under the relevant sub-headings. The location of the focus receptors is provided in Figure 42.

**Table 17 Charbon Noise Criteria (Project Approval 08\_0211 Mod 1)****Impact Assessment Criteria**

1. The Proponent **must** ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land or on more than 25 per cent of any privately-owned land.

Table 1: Noise Impact Assessment Criteria dB(A)  $L_{Aeq(15min)}$ 

Location	Day	Evening	Night	<i>Night</i> ( $L_{A1(1\ min)}$ )
Residence P	35	39	39	45
All residences within 150 m of, and including, Residence Q	38	38	38	45
Residence M	36	37	35	45
All remaining locations	35	35	35	45

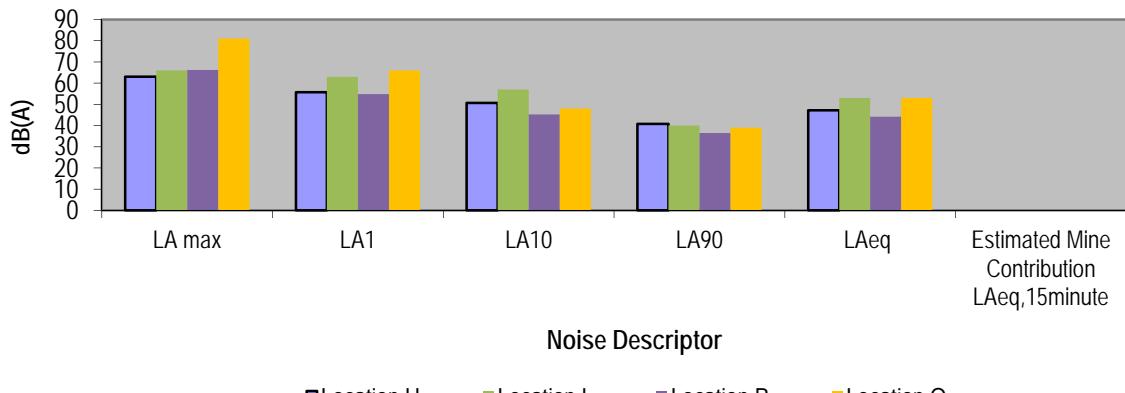
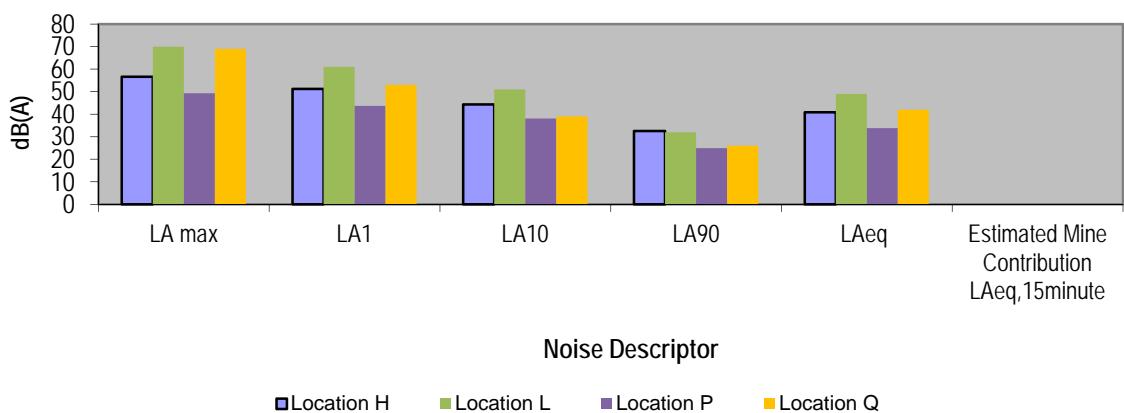
**Notes:**

- To determine compliance with the  $L_{Aeq(period)}$  noise limits, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the project is impractical, alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy) may be accepted. The modification factors in Section 4 of the NSW Industrial Noise Policy **must** also be applied to the measured noise levels where applicable.
- To determine compliance with the  $L_{A1(1\ minute)}$  noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy) may be accepted.
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level,
determined in accordance with the NSW Industrial Noise Policy, including that exceedances of the criteria must be "systemic".
- For the locations of residences/properties named in this approval, see Appendices 1 and 4.
- These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.

## 6.1.1 Annual Noise Monitoring Results – August 2019

**Table 18 2019 Annual – Daytime Noise Monitoring Results**

<b>Data Published:</b>				<b>Licensee:</b>		Charbon Coal Pty Ltd			
<b>Data Sampled:</b>		22/08/19		<b>Address:</b>		Charbon Rd Charbon NSW 2848			
<b>Data Obtained:</b>				<b>EPL No.</b>		528			
<b>Measured Noise Levels dB(A)</b>									
Day	LA <sub>max</sub>	LA <sub>1</sub>	LA <sub>10</sub>	LA <sub>90</sub>	LA <sub>eq</sub>	Estimated Mine Contribution LA <sub>eq</sub> (15 minute)	Consent Noise Limits LA <sub>eq</sub> (15 minute)	Description of Noise Emissions	Date/Start Time/Weather
Location H	63	56	51	41	47	Not Discernible	35	Wind in foliage = 44 to 57 dBA	22/08/2019 13:41 W = 7.1m/s Temp = 11.8°C VTG = -1.6°C/100m
Location L	66	63	57	40	53	Not Discernible	35	Birds = up to 38 dBA Dogs barking = up to 45 dBA Wind in foliage = 44 to 46 dBA	22/08/2019 13:41 W = 7.1m/s Temp = 11.8°C VTG = -1.6°C/100m
Location P	66	55	45	37	44	Not Discernible	35	Distant road traffic = 43 to 47 dBA Wind in foliage = 35 to 64 dBA	22/08/2019 14:06 W = 5.6m/s Temp = 12.1°C VTG = -1.6°C/100m
Location Q	81	66	48	39	53	Not Discernible	38	Birds = 45 to 55 dBA Dogs barking = 72 to 81 dBA Wind in foliage = 42 to 57 dBA	22/08/2019 14:06 W = 5.6m/s Temp = 12.1°C VTG = -1.6°C/100m

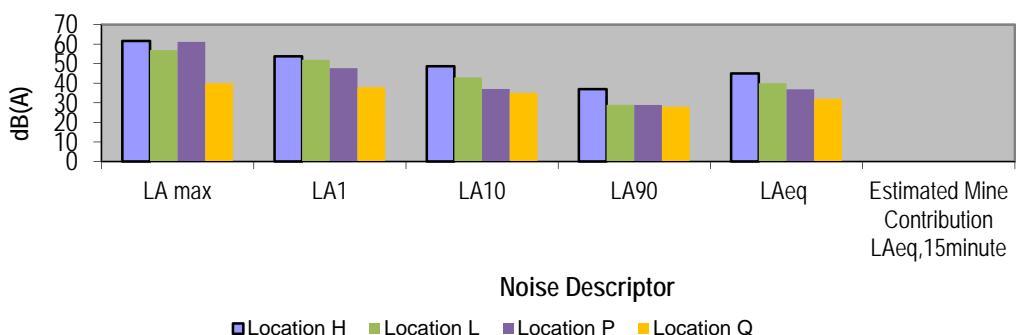
**Day Noise Monitoring, Charbon Colliery, 22/08/2019****Figure 4 2019 Annual – Daytime Noise Monitoring Results****Evening Noise Monitoring, Charbon Colliery, 21/08/2019****Figure 5 2019 Annual – Evening Noise Monitoring Results**

**Table 19 2019 Annual – Evening Noise Monitoring Results**

<b>Data Published:</b>			<b>Licensee:</b>	Charbon Coal Pty Ltd					
<b>Data Sampled:</b>	21/08/19		<b>Address:</b>	Charbon Rd Charbon NSW 2848					
<b>Data Obtained:</b>			<b>EPL No.</b>	528					
<b>Measured Noise Levels dB(A)</b>									
Day	LA <sub>max</sub>	LA <sub>1</sub>	LA <sub>10</sub>	LA <sub>90</sub>	LA <sub>eq</sub>	Estimated Mine Contribution LA <sub>eq</sub> (15 minute)	Consent Noise Limits LA <sub>eq</sub> (15 minute)	Description of Noise Emissions	Date/Start Time/Weather
Location H	57	51	44	33	41	Not Discernible	35	Birds = 39 to 42 dBA Wind in foliage = 31 to 53 dBA	21/08/2019 18:01 W = 4.3m/s Temp = 10.8°C VTG = -1°C/100m
Location L	70	61	51	32	49	Not Discernible	35	Local road traffic = up to 71 dBA Wind in foliage = 54 to 57 dBA Dogs barking = 46 to 51 dBA	21/08/2019 18:07 W = 4.2m/s Temp = 10.7°C VTG = -1°C/100m
Location P	49	44	38	25	34	Not Discernible	39	Distant road traffic = 29 to 47 dBA Insects / frogs = 26 to 28 dBA Dogs barking = 30 to 32 dBA	21/08/2019 18:29 W = 4.5m/s Temp = 10.7°C VTG = -1°C/100m
Location Q	69	53	39	26	42	Not Discernible	38	Local road traffic = up to 69 dBA Distant road traffic = 29 to 38 dBA Insects / frogs = < 27 dBA Dogs barking = 37 to 46 dBA Wind in foliage = 27 to 45 dBA	21/08/2019 18:38 W = 3.8m/s Temp = 10.5°C VTG = -1°C/100m

**Table 20 2019 Annual – Night Noise Monitoring Results**

<b>Data Published:</b>		<b>Licensee:</b>	Charbon Coal Pty Ltd						
<b>Data Sampled:</b>	21/08/19	<b>Address:</b>	Charbon Rd Charbon NSW 2848						
<b>Data Obtained:</b>		<b>EPL No.</b>	528						
<b>Measured Noise Levels dB(A)</b>									
Day	LA <sub>max</sub>	LA <sub>1</sub>	LA <sub>10</sub>	LA <sub>90</sub>	LA <sub>eq</sub>	Estimated Mine Contribution LA <sub>eq</sub> (15 minute)	Consent Noise Limits LA <sub>eq</sub> (15 minute)	Description of Noise Emissions	Date/Start Time/Weather
Location H	62	54	49	37	45	Not Discernible	35	Wind in foliage = 36 to 56 dBA	21/08/2019 22:00 W = 4.9m/s Temp = 9.9°C VTG = -1°C/100m
Location L	57	52	43	29	40	Not Discernible	35	Insects / frogs = < 30 dBA Wind in foliage = 30 to 57 dBA	21/08/2019 22:00 W = 4.9m/s Temp = 9.9°C VTG = -1°C/100m
Location P	61	48	37	29	37	Not Discernible	39	Distant road traffic = up to 34 dBA Dogs barking = 35 to 42 dBA Wind in foliage = 29 to 42 dBA	21/08/2019 22:26 W = 5.3m/s Temp = 9.9°C VTG = -1°C/100m
Location Q	40	38	35	28	32	Not Discernible	38	Dogs barking = up to 37 dBA Wind in foliage = 30 to 40 dBA	21/08/2019 22:28 W = 5.3m/s Temp = 9.9°C VTG = -1°C/100m

**Night Noise Monitoring, Charbon Colliery, 21/08/2019****Figure 6 2019 Annual – Night Noise Monitoring Results**

All locations at all times for the annual noise monitoring undertaken during August 2019 were compliant. A summary of noise monitoring results, consent conditions and compliance with consent conditions, can be seen in Table 21 below.

**Table 21 2019 Noise Monitoring – Summary of Compliance**

Measurement location	Period <sup>1</sup>	Measured noise level $L_{Aeq}$ (15minute) dBA	Relevant criteria $L_{Aeq}(15\text{minute})$ dBA SSD 5579 and EPL 21229	Compliance
H	Day	Not discernible	35	Yes
	Evening	Not audible	35	Yes
	Night	Not audible	35	Yes
L	Day	Not discernible	35	Yes
	Evening	Not audible	35	Yes
	Night	Not audible	35	Yes
P	Day	Not discernible	35	Yes
	Evening	Not audible	39	Yes
	Night	Not audible	39	Yes
Q	Day	Not discernible	35	Yes
	Evening	Not audible	38	Yes
	Night	Not audible	38	Yes

Note 1: Day is defined as the period from 7 am to 6 pm Monday to Saturday and 8 am to 6 pm Sundays and Public Holidays. Evening is defined as the period from 6 pm to 10 pm. Night time is defined as the period from 10 pm to 7 am Monday to Saturday and 10 pm to 8 am Sundays and Public Holidays.

Note 2: The noise criteria in are to apply under all meteorological conditions except the following:  
 (a) During rain and wind speeds (at 10 m height) greater than 3 m/s; and  
 (b) Under "non-significant weather conditions"

Note 3: The EPA NSW Industrial Noise Policy (INP 2000) states: A development will be deemed to be in non-compliance with a noise consent or licence condition if the monitored noise level is more than 2 dB above the statutory noise limit specified in the consent or licence condition.

### 6.1.2 Historic Noise Monitoring Results

Charbon Colliery noise monitoring data from 2015 - 2018 has been graphically compared to the 2019 noise monitoring results. Although the noise monitoring results recorded during 2019 showed increased noise levels, the noise contributions from Charbon Colliery complied with the Project Approval and Environment Protection Licence at all the monitoring locations and during all time periods (Day, Evening and Night).

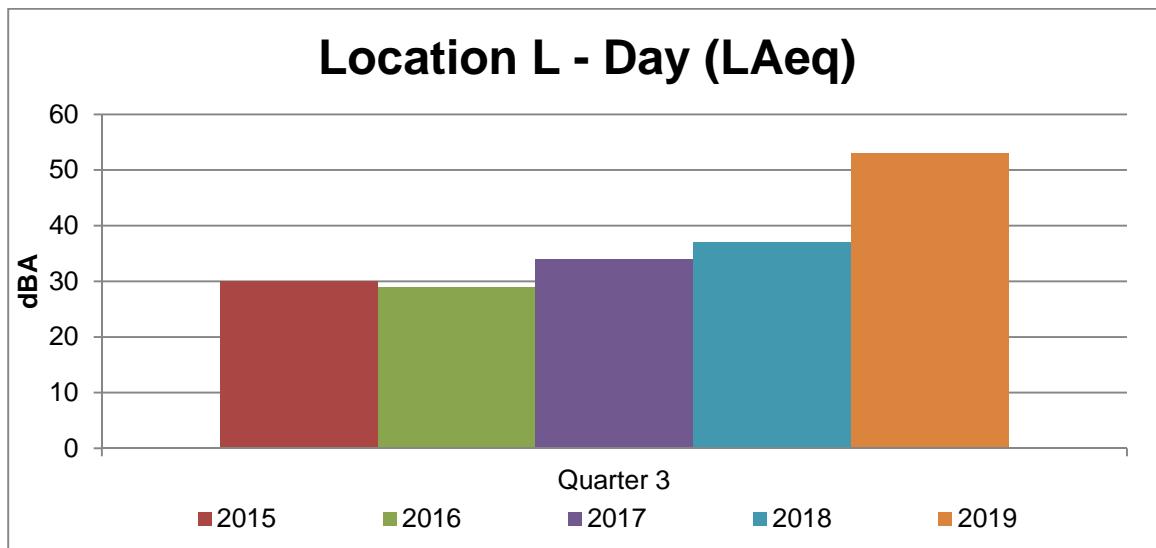


Figure 7 Location L – Daytime Noise Monitoring Results, 2015 – 2019

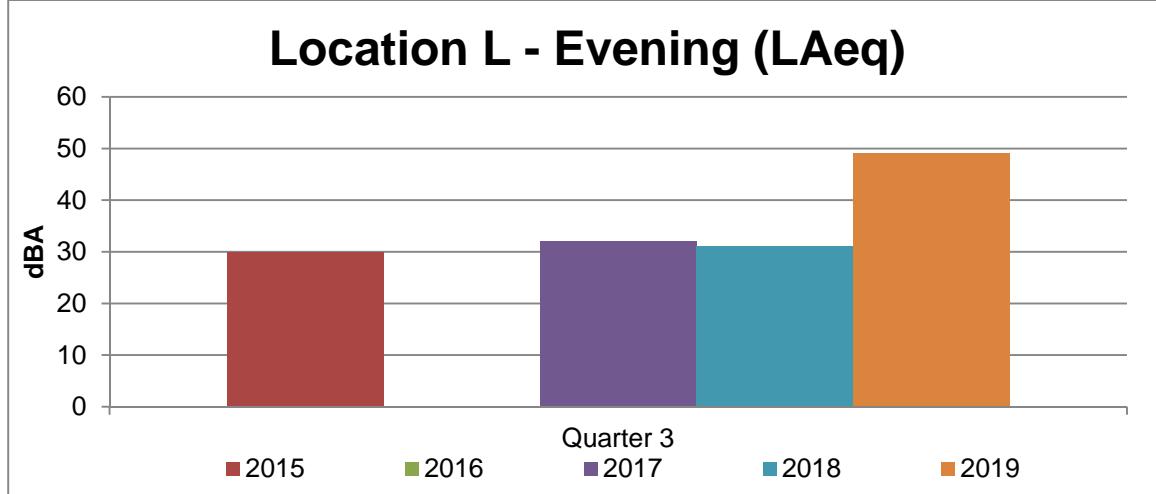


Figure 8 Location L – Evening Noise Monitoring Results, 2015 – 2019

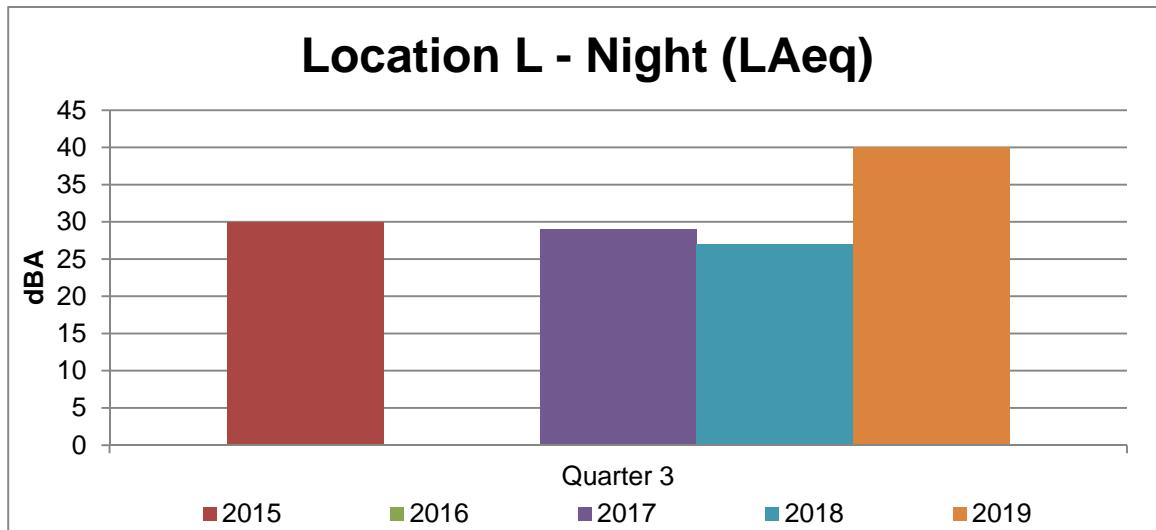


Figure 9 Location L – Night Noise Monitoring Results, 2015 – 2019

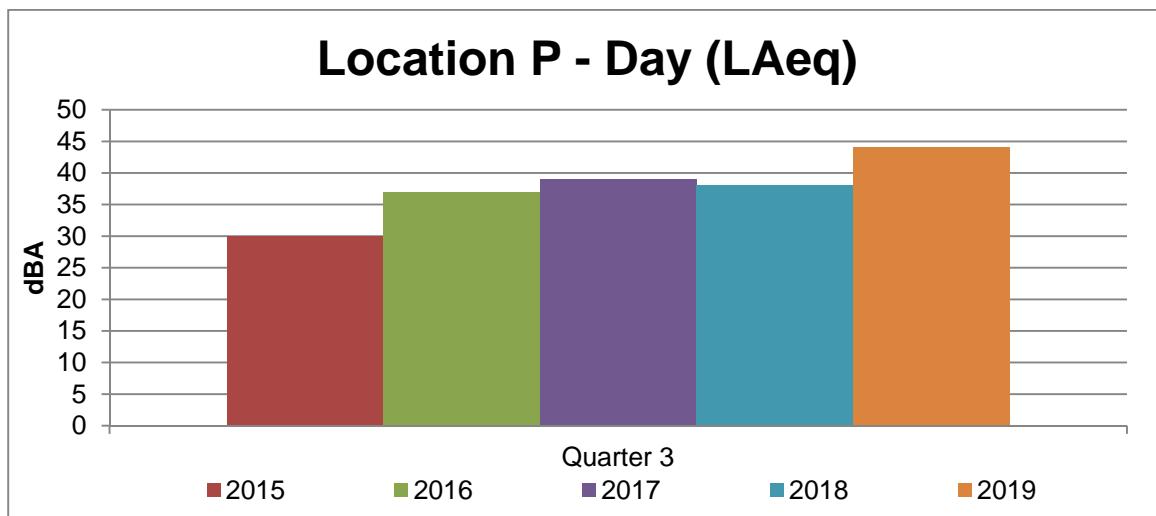
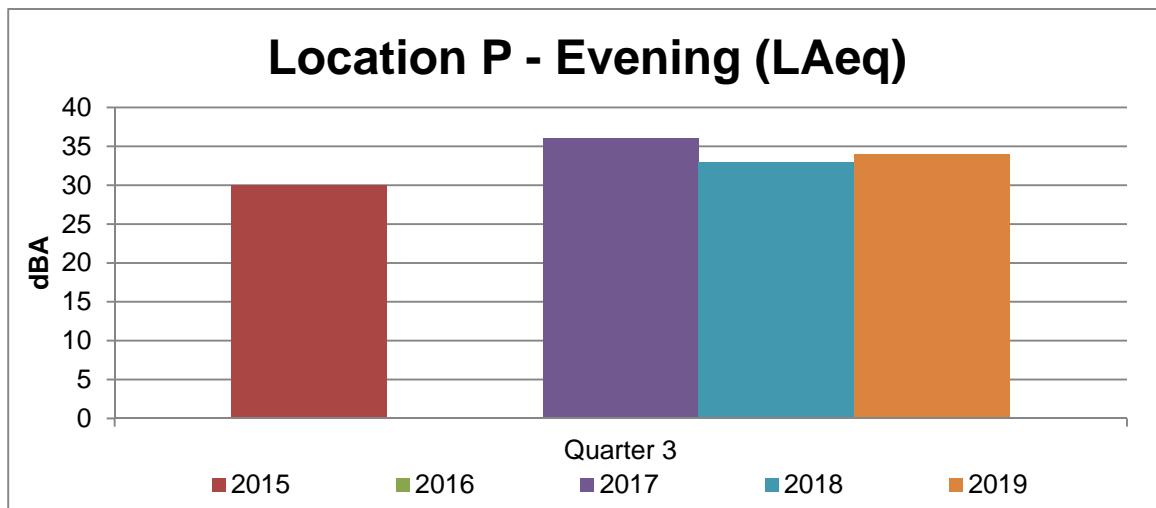
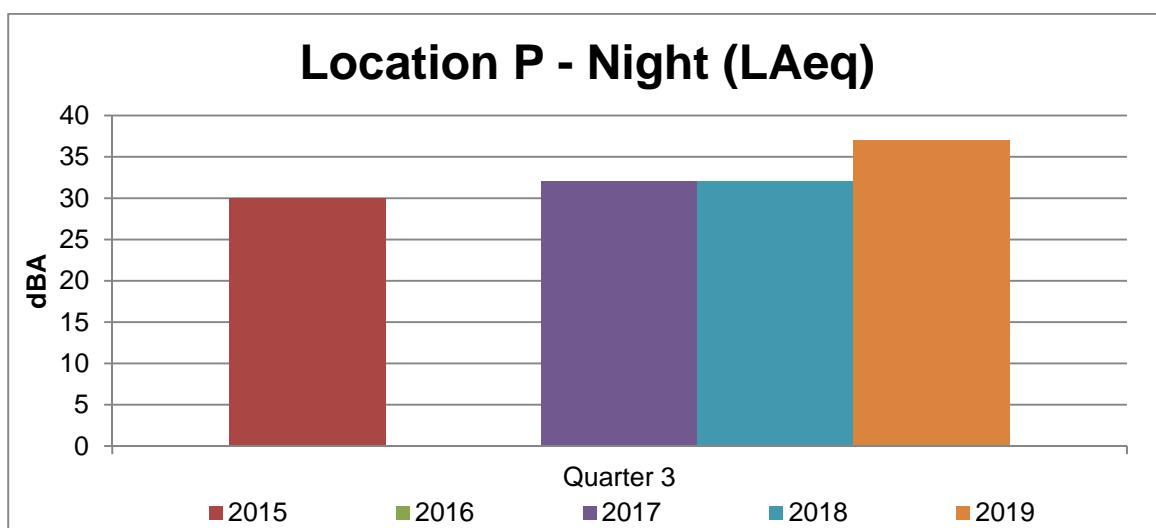


Figure 10 Location P – Daytime Noise Monitoring Results, 2015 – 2019



**Figure 11 Location P – Evening Noise Monitoring Results, 2015 – 2019**



**Figure 12 Location P – Night Noise Monitoring Results, 2015 – 2019**

## 6.2. Blasting

Blasting did not occur at Charbon during the 2019 reporting period. Blasting commenced at Charbon in November 2006 and occurred periodically until 2010, with the last blast occurring on 20 August 2010. Blast monitoring and compliance results for Charbon Colliery can be found within previous Annual Reviews.

### 6.3. Air Quality

Operations at Charbon Colliery are undertaken to minimise the generation of airborne dust. Water trucks continually operate during adverse weather conditions to ensure that dust from workings and haul roads is controlled.

Schedule 3, Condition 19 of PA 08\_0211 Mod 1 requires that the air pollution generated by the development does not exceed the criteria listed in Table 22. Schedule 3, Condition 22 of PA 08\_0211 Mod 1 requires High Volume Air Sampler (HVAS) and depositional dust monitoring. PA 08\_0211 Mod 1 limits are adopted as the impact assessment criteria in the Air Quality Management Plan (AQMP). The Air Quality Management Plan at Charbon Colliery was approved by the Department of Planning and Environment on 29 June 2018.

The Air Quality Monitoring Program at Charbon Colliery consists of the following:

- Four depositional dust gauges;
- One on-site Automatic Weather Station (AWS);
- One HVAS (measuring Total Suspended Particulate [TSP] matter and Particulate Matter  $<10\mu\text{m}$  [ $\text{PM}_{10}$ ]).

**Table 22 Charbon Air Quality Criteria**

Pollutant	Period	Criterion
Total Suspended Particulate (TSP) matter	Annual mean	$90\mu\text{g}/\text{m}^3$
Particulate Matter $<10\mu\text{m}$ ( $\text{PM}_{10}$ )	Annual mean	$25\mu\text{g}/\text{m}^3$
	24 hour max.	$50\mu\text{g}/\text{m}^3$
Deposited Dust	Monthly max.(annual average)	$4\text{g}/\text{m}^2/\text{mth}$
	Maximum increase on previous year (annual average)	$2\text{g}/\text{m}^2/\text{mth}$

#### 6.3.1 Depositional Dust Monitoring Results – 2019

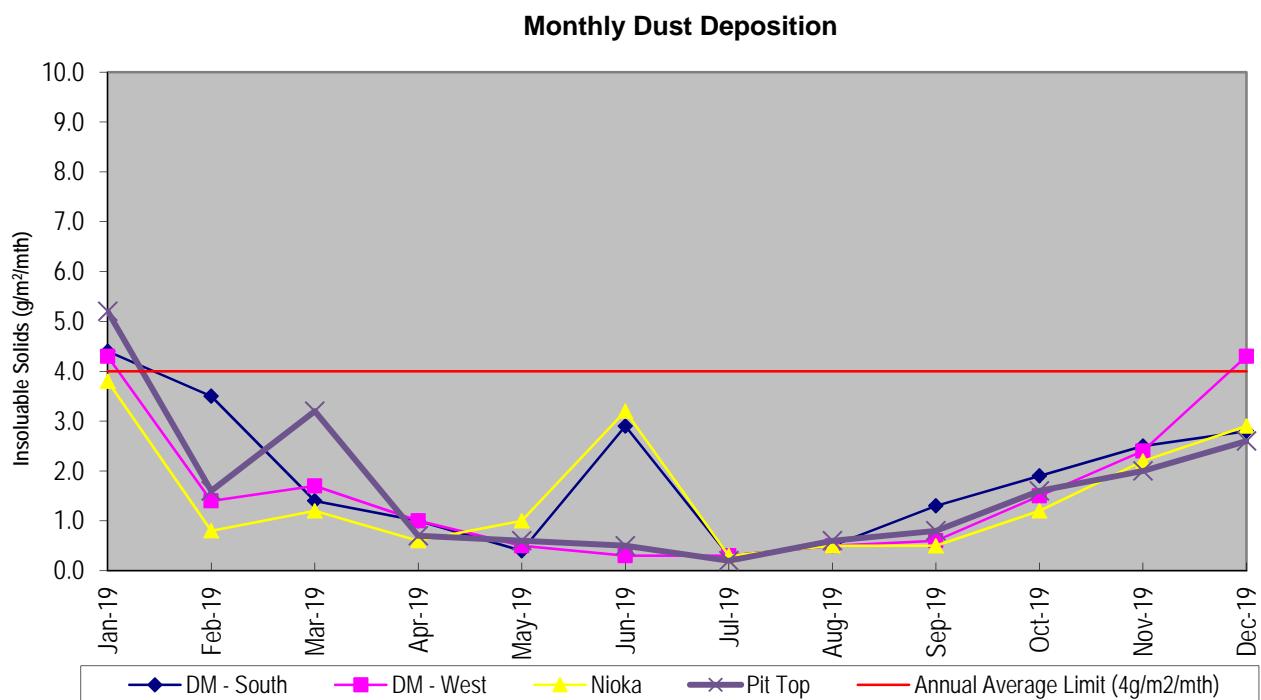
Depositional dust ( $\text{g}/\text{m}^2/\text{mth}$ ) results (insoluble solids) for 2019 are shown in Table 23 below. Monthly depositional dust ( $\text{g}/\text{m}^2/\text{mth}$ ) results for 2019 are shown graphically in Figure 13.

EPL 528 does not include a licence limit for depositional dust, however a rolling average air quality criteria of  $4\text{ g}/\text{m}^2/\text{mth}$  is commonly used for comparison purposes. Regional dust events contributed to the higher dust levels recorded during January and December 2019.

Detailed monitoring results are described in monthly environmental data reports published on the Charbon Colliery website. Depositional dust gauge monitoring locations are shown in Figure 42.

**Table 23 Charbon Depositional Dust Monitoring Results 2019**

Location	Jan 19	Feb 19	Mar 19	Apr 19	May 19	Jun 19	Jul 19	Aug 19	Sep 19	Oct 19	Nov 19	Dec 19
DM - South	4.4	3.5	1.4	1.0	0.4	2.9	0.3	0.5	1.3	1.9	2.5	2.8
DM - West	4.3	1.4	1.7	1.0	0.5	0.3	0.3	0.5	0.6	1.5	2.4	4.3
Nioka	3.8	0.8	1.2	0.6	1.0	3.2	0.3	0.5	0.5	1.2	2.2	2.9
Pit Top	5.2	1.6	3.2	0.7	0.6	0.5	0.2	0.6	0.8	1.6	2.0	2.6
Annual Average Limit (4g/m <sup>2</sup> /mth)	4	4	4	4	4	4	4	4	4	4	4	4

**Figure 13 Depositional Dust Monitoring Results 2019**

### 6.3.2 Historic Depositional Dust Monitoring Results

Depositional dust monitoring results from 2015-2018 have been graphically compared to the 2019 depositional dust results in Figures 14 to 17. As shown in Figure 18 below, all annual average depositional dust results from 2015 to 2019 are below the annual average limit of 4g/m<sup>2</sup>/mth and the 2g/m<sup>2</sup>/mth maximum increase.

Detailed air quality monitoring results can be found within the monthly environmental data reports located on the Charbon Colliery website.

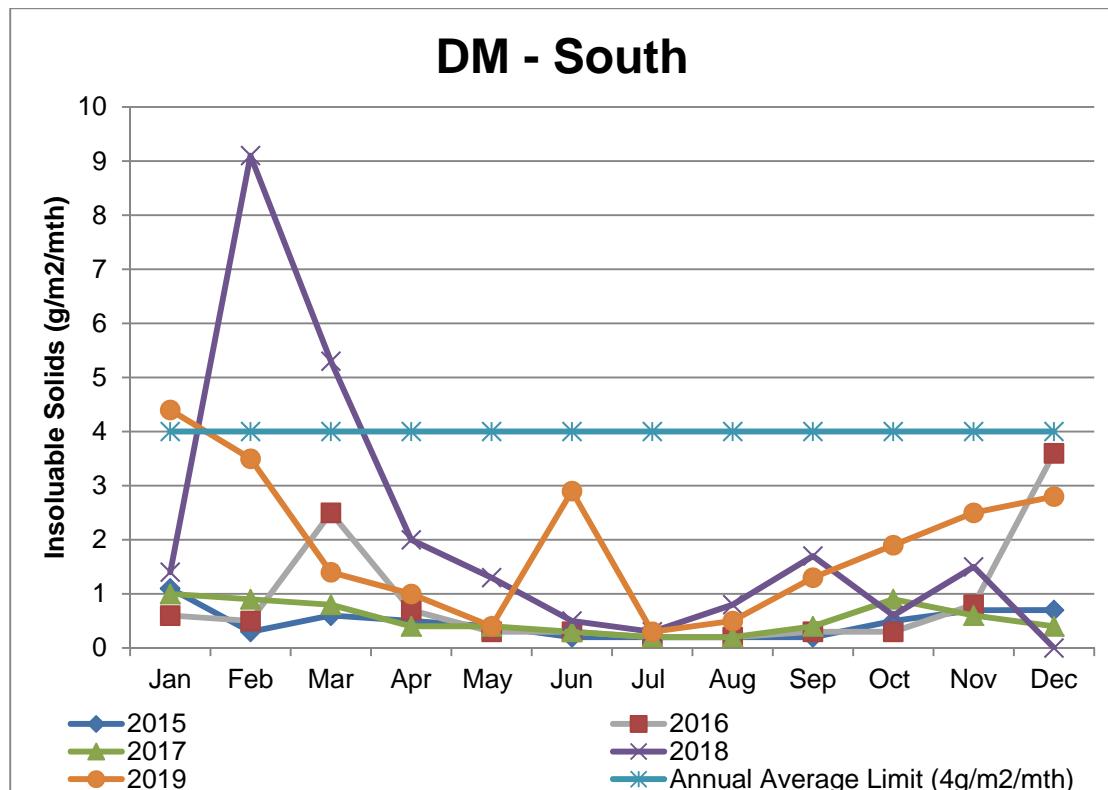


Figure 14 Depositional Dust Monitoring Comparison for DM-South, 2015 - 2019

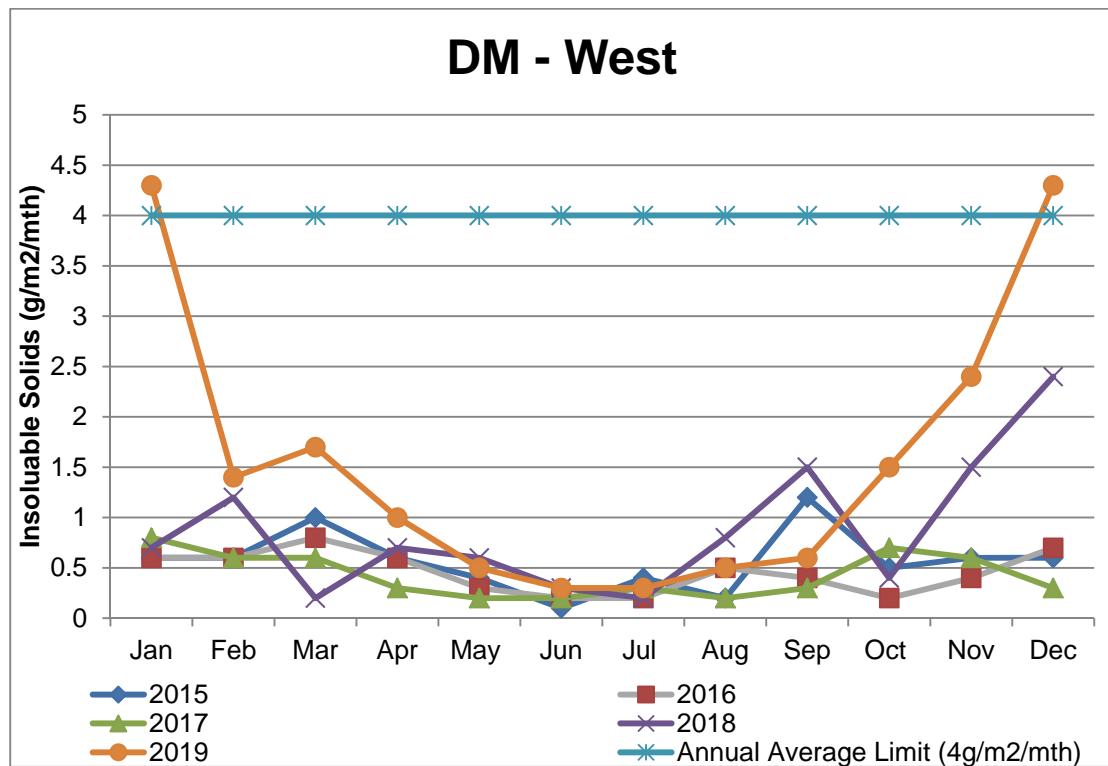


Figure 15 Depositional Dust Monitoring Comparison for DM-West, 2015 - 2019

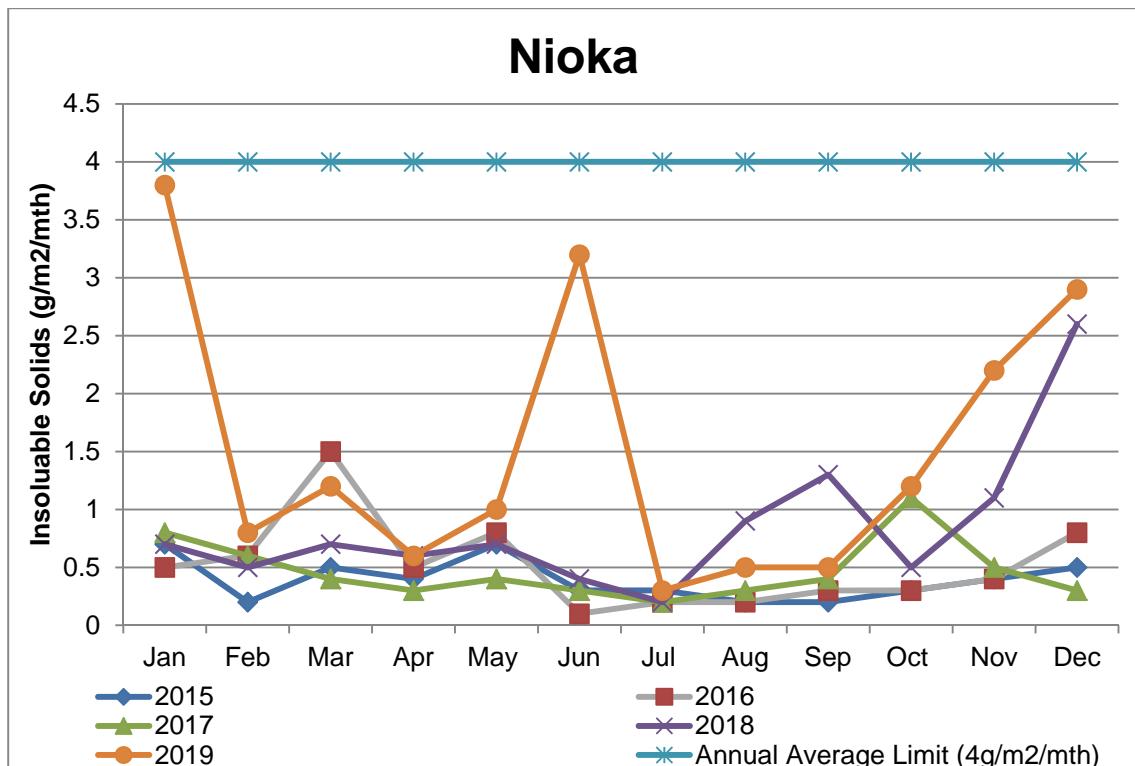


Figure 16 Depositional Dust Monitoring Comparison for Nioka, 2015 - 2019

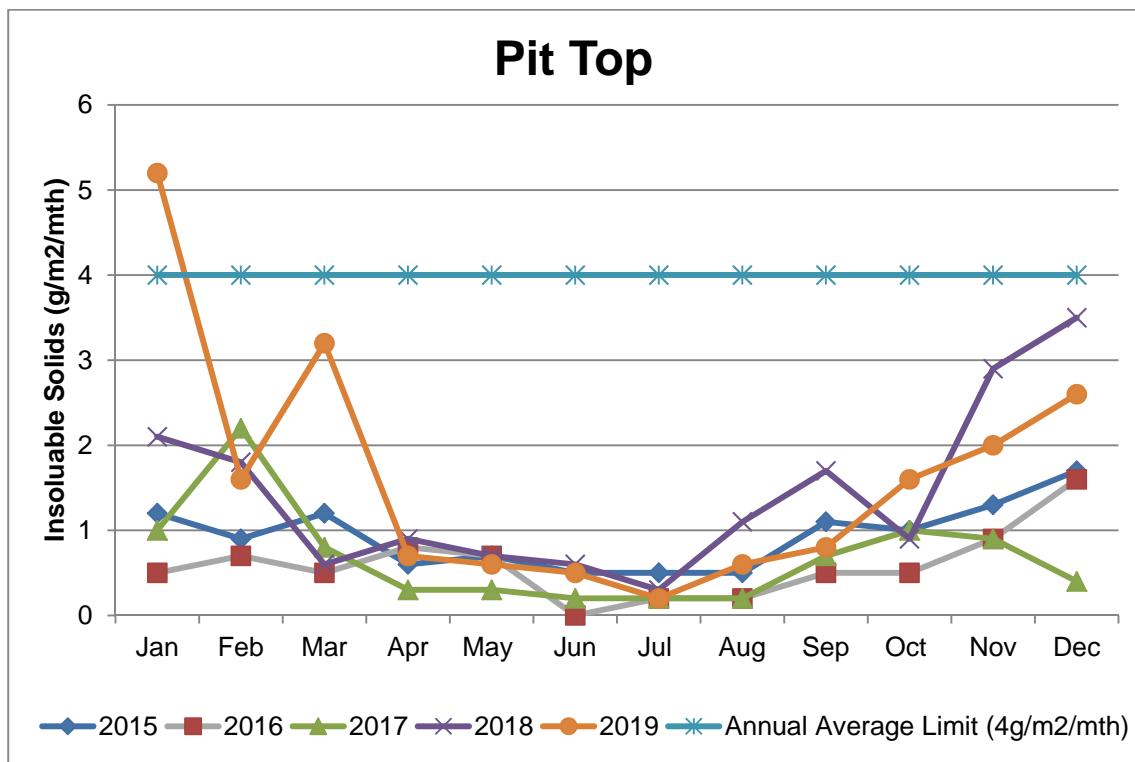
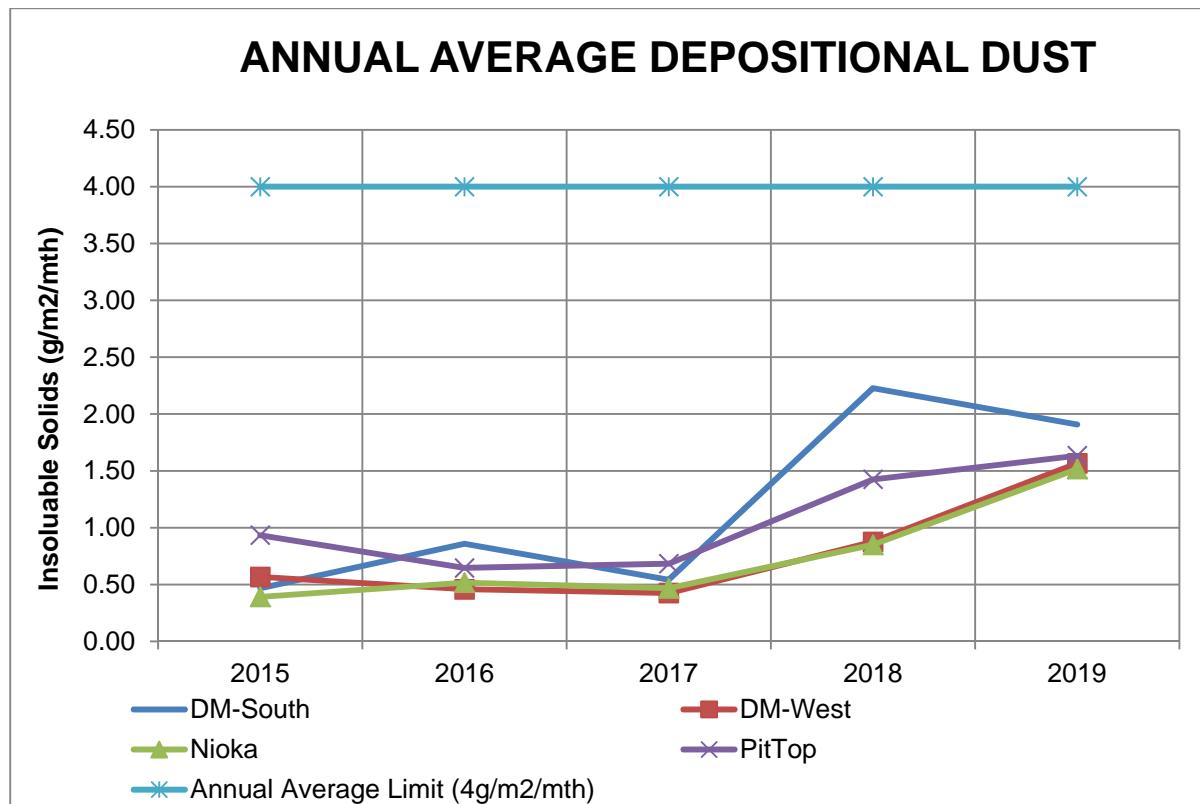


Figure 17 Depositional Dust Monitoring Comparison for Pit Top, 2015 - 2019



**Figure 18 Annual Average Depositional Dust Results, 2015 - 2019**

### 6.3.3 HVAS Monitoring Results - 2019

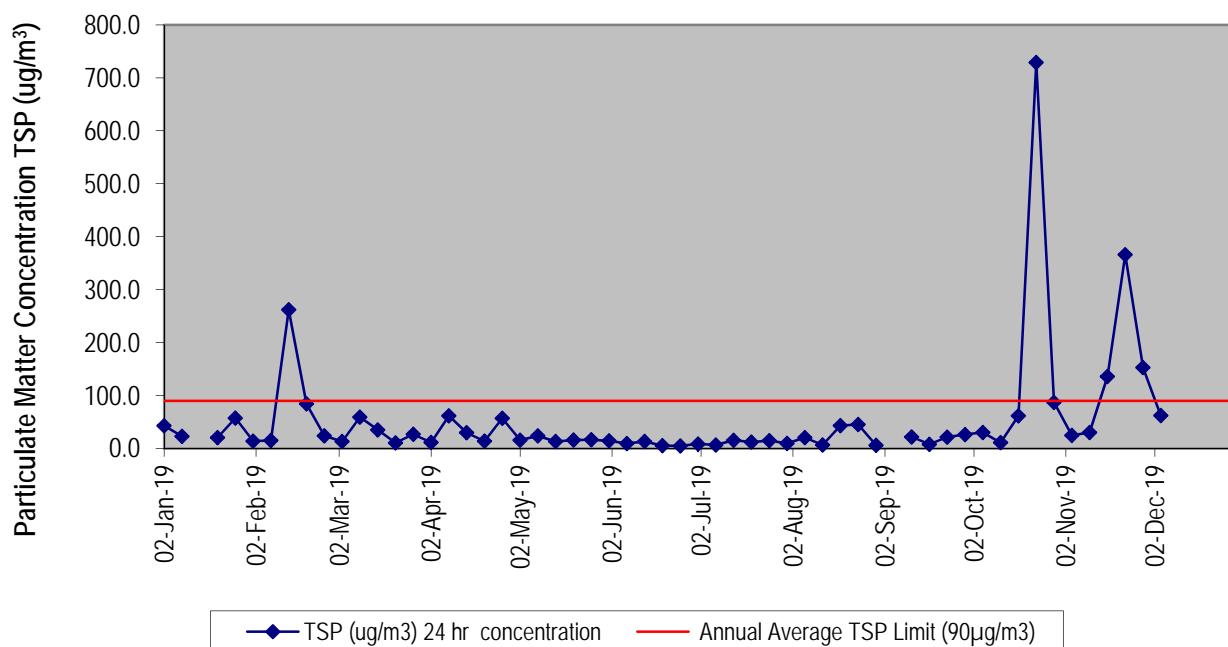
High volume air samplers (HVAS) monitored particulate concentrations (less than 10 micrometres in size [PM10] and Total Suspended Particulates [TSP]) during the reporting period. A summary of monitoring results for 2019 is provided below in tables 24 and 25 and figures 19 and 20.

**Table 24 Charbon HVAS TSP Monitoring Results 2019**

Data Sampled	January – December 2019				Licensee:		Charbon Coal Pty Ltd			
					Address:		Charbon Rd Charbon NSW 2848			
					EPL No.		528			
Date	02/01/2019	08/01/2019	14/01/2019	20/01/2019	26/01/2019	01/02/2019	07/02/2019	13/02/2019	19/02/2019	25/02/2019
TSP (ug/m <sup>3</sup> ) 24 hr concentration	43.0	23.1	*	20.5	57.5	14	15	262	84.3	23.9
Annual Average TSP Limit (90ug/m <sup>3</sup> )	90	90	90	90	90	90	90	90	90	90

Date	09/03/2019	15/03/2019	21/03/2019	27/03/2019	02/04/2019	08/04/2019	14/04/2019	20/04/2019	26/04/2019	02/05/2019	08/05/2019
TSP (ug/m <sup>3</sup> ) 24 hr concentration	59.1	35.2	10.6	26.9	11.4	61.8	29.9	13.8	57.1	15.8	23.8
Annual Average TSP Limit (90ug/m <sup>3</sup> )	90	90	90	90	90	90	90	90	90	90	90
Date	14/05/2019	20/05/2019	26/05/2019	01/06/2019	07/06/2019	13/06/2019	19/06/2019	25/06/2019	01/07/2019	07/07/2019	13/07/2019
TSP (ug/m <sup>3</sup> ) 24 hr concentration	13.2	16.0	16.6	14.5	9.4	13.3	5.3	4.9	8.5	6.7	15.5
Annual Average TSP Limit (90ug/m <sup>3</sup> )	90	90	90	90	90	90	90	90	90	90	90
Date	19/07/2019	25/07/2019	31/07/2019	06/08/2019	12/08/2019	18/08/2019	24/08/2019	30/08/2019	05/09/2019	11/09/2019	17/09/2019
TSP (ug/m <sup>3</sup> ) 24 hr concentration	12.1	14.8	9.7	20.5	6.7	43.3	45.2	6.2	*	21.9	7.9
Annual Average TSP Limit (90ug/m <sup>3</sup> )	90	90	90	90	90	90	90	90	90	90	90
Date	23/09/2019	29/09/2019	05/10/2019	11/10/2019	17/10/2019	23/10/2019	29/10/2019	04/11/2019	10/11/2019	16/11/2019	22/11/2019
TSP (ug/m <sup>3</sup> ) 24 hr concentration	21.6	26.4	30.3	11.1	61.8	729	87.2	24.9	30.1	136	366
Annual Average TSP Limit (90ug/m <sup>3</sup> )	90	90	90	90	90	90	90	90	90	90	90
Date	28/11/2019	04/12/2019	10/12/2019	16/12/2019	22/12/2019	28/12/2019					
TSP (ug/m <sup>3</sup> ) 24 hr concentration	153	62.4	236	97.9	123	*					
Annual Average TSP Limit (90ug/m <sup>3</sup> )	90	90	90	90	90	90					

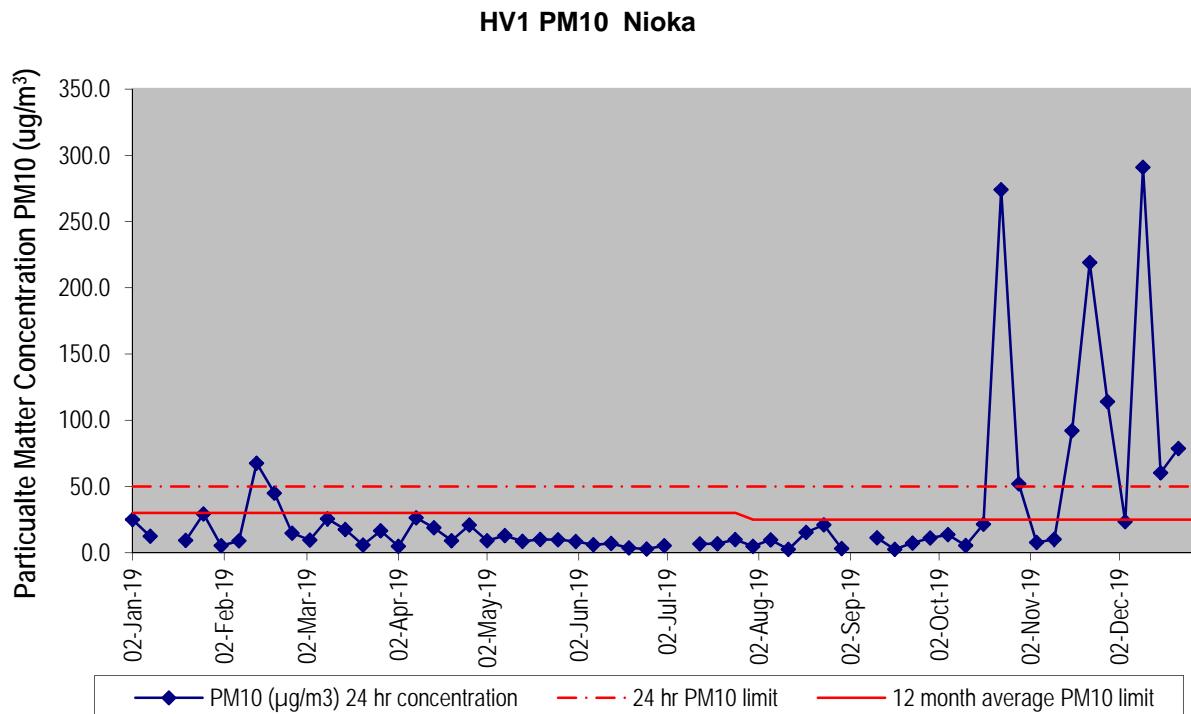
\*Power supply to units is intermittent and run times and flow could not be determined.

**HV1 TSP Nioka****Figure 19 HVAS TSP Results for 2019****Table 25 Charbon HVAS PM10 Monitoring Results 2019**

Data Sampled	January – December 2019					Licensee:		Charbon Coal Pty Ltd		
						Address:		Charbon Rd Charbon NSW 2848		
						EPL No.		528		
Date	02/01/2019	08/01/2019	14/01/2019	20/01/2019	26/01/2019	01/02/2019	07/02/2019	13/02/2019	19/02/2019	25/02/2019
PM10 (ug/m <sup>3</sup> ) 24 hr concentration	25.0	12.4	*	9.3	29.3	5.3	8.9	67.6	45.0	14.8
24 hr PM10 limit	50	50	50	50	50	50	50	50	50	50
12 month average PM10 limit	30	30	30	30	30	30	30	30	30	30
Date	09/03/2019	15/03/2019	21/03/2019	27/03/2019	02/04/2019	08/04/2019	14/04/2019	20/04/2019	26/04/2019	02/05/2019
PM10 (ug/m <sup>3</sup> ) 24 hr concentration	25.6	17.5	5.8	16.5	4.8	26.4	18.8	9.1	20.9	9.1
24 hr PM10 limit	50	50	50	50	50	50	50	50	50	50
12 month average PM10 limit	30	30	30	30	30	30	30	30	30	30

Date	14/05/2019	20/05/2019	26/05/2019	01/06/2019	07/06/2019	13/06/2019	19/06/2019	25/06/2019	01/07/2019	07/07/2019	13/07/2019
PM10 (ug/m <sup>3</sup> ) 24 hr concentration	8.6	10.0	9.8	8.5	6.0	7.0	3.6	2.8	5.3	*	6.6
24 hr PM10 limit	50	50	50	50	50	50	50	50	50	50	50
12 month average PM10 limit	30	30	30	30	30	30	30	30	30	30	30
Date	19/07/2019	25/07/2019	31/07/2019	06/08/2019	12/08/2019	18/08/2019	24/08/2019	30/08/2019	05/09/2019	11/09/2019	17/09/2019
PM10 (ug/m <sup>3</sup> ) 24 hr concentration	6.8	9.9	4.8	9.7	2.5	15.4	21.0	3.2	*	11.2	2.5
24 hr PM10 limit	50	50	50	50	50	50	50	50	50	50	50
12 month average PM10 limit	30	30	25	25	25	25	25	25	25	25	25
Date	23/09/2019	29/09/2019	05/10/2019	11/10/2019	17/10/2019	23/10/2019	29/10/2019	04/11/2019	10/11/2019	16/11/2019	22/11/2019
PM10 (ug/m <sup>3</sup> ) 24 hr concentration	7.3	11.1	13.6	5.4	21.5	274	52.0	7.7	10.1	92.1	219
24 hr PM10 limit	50	50	50	50	50	50	50	50	50	50	50
12 month average PM10 limit	25	25	25	25	25	25	25	25	25	25	25
Date	28/11/2019	04/12/2019	10/12/2019	16/12/2019	22/12/2019	28/12/2019					
PM10 (ug/m <sup>3</sup> ) 24 hr concentration	114	23.4	291	60.3	78.6	*					
24 hr PM10 limit	50	50	50	50	50	50					
12 month average PM10 limit	25	25	25	25	25	25					

\*Power supply to units is intermittent and run times and flow could not be determined.



**Figure 20 HVAS PM10 Results for 2019**

In accordance with Schedule 3 Condition 19 of Project Approval 08\_0211 Mod 1, Total Suspended Particulates (TSP) have an annual average limit of  $90 \mu\text{g}/\text{m}^3$  for a 24 hour period, whilst particulate matter less than 10 micrometres in size (for  $\text{PM}_{10}$ ) have a 24 hour limit of  $50 \mu\text{g}/\text{m}^3$  and an annual average limit of  $25 \mu\text{g}/\text{m}^3$ , respectively.

A regional dust event contributed to the air quality result recorded during February 2019. Regional dust events and smoke from the Kerry Ridge bush fire in the Wollemi National Park contributed to the air quality results recorded during October, November and December 2019. Detailed monitoring results are described in monthly environmental data reports on the Charbon Colliery website.

### 6.3.4 Historic HVAS Monitoring Results

HVAS results for TSP and  $\text{PM}_{10}$  have been graphically represented, in Figure 21 and Figure 23 respectfully, to show trends in monthly average results from 2015 to 2019. Annual average comparisons in TSP and  $\text{PM}_{10}$  are shown in Figure 22 and Figure 24 respectively.

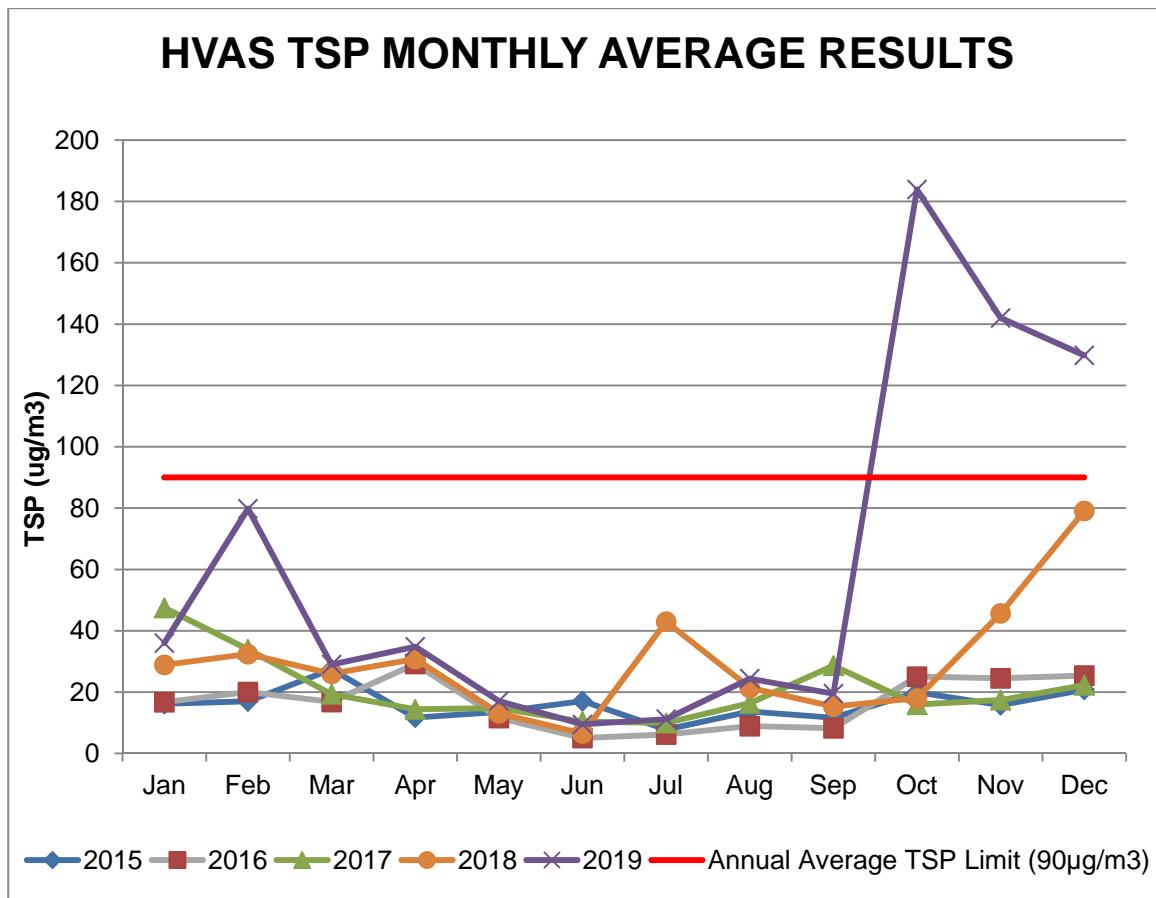


Figure 21 HVAS TSP Monthly Average Comparison, 2015 – 2019

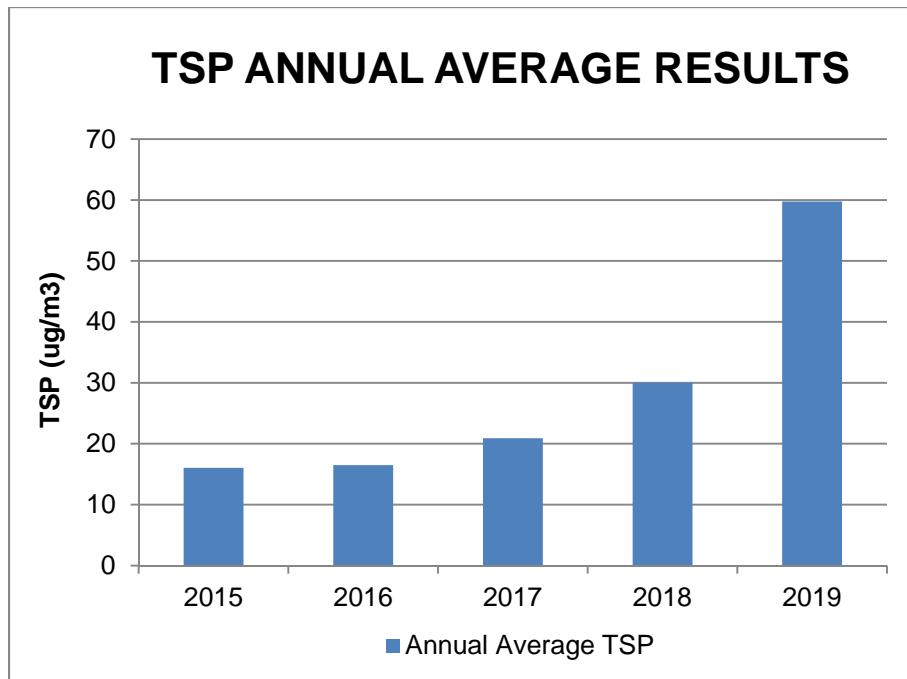


Figure 22 HVAS TSP Annual Average Comparison, 2015 – 2019

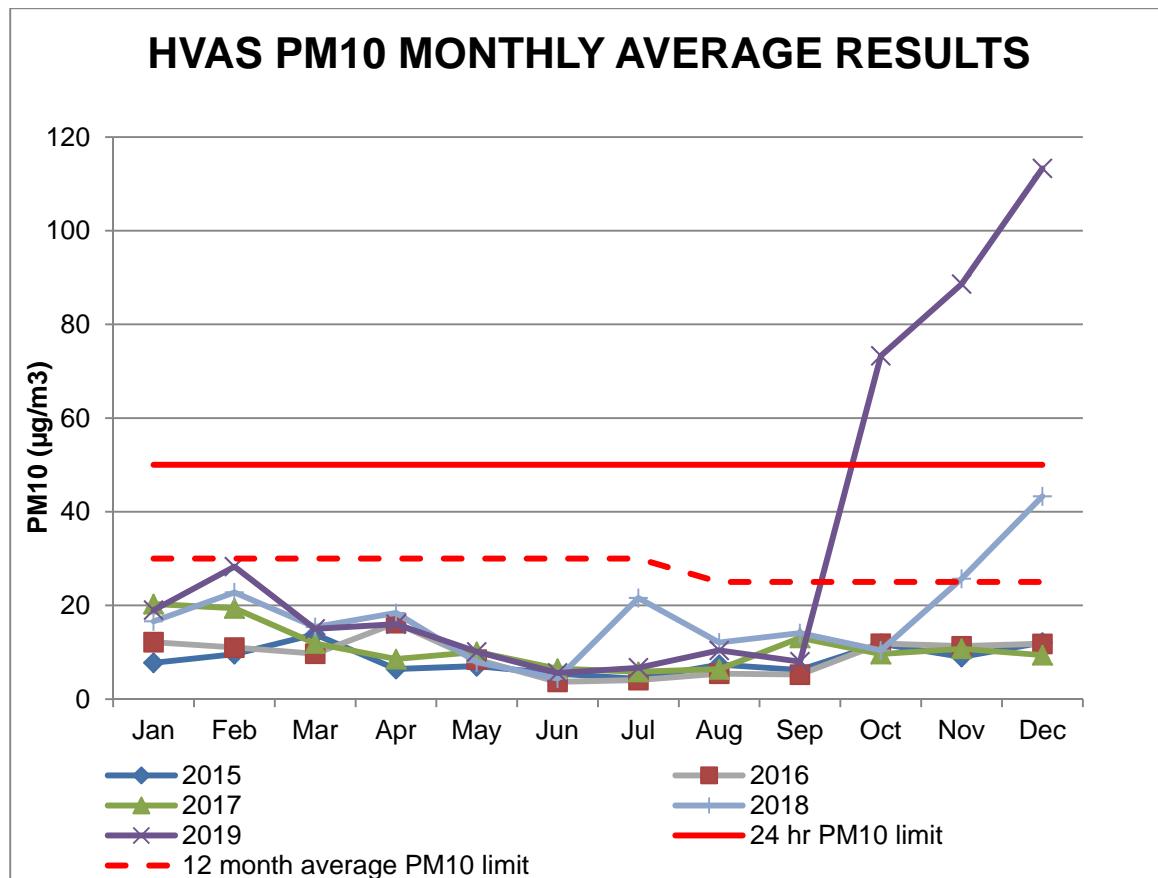


Figure 23 HVAS PM10 Monthly Average Comparison, 2015 – 2019

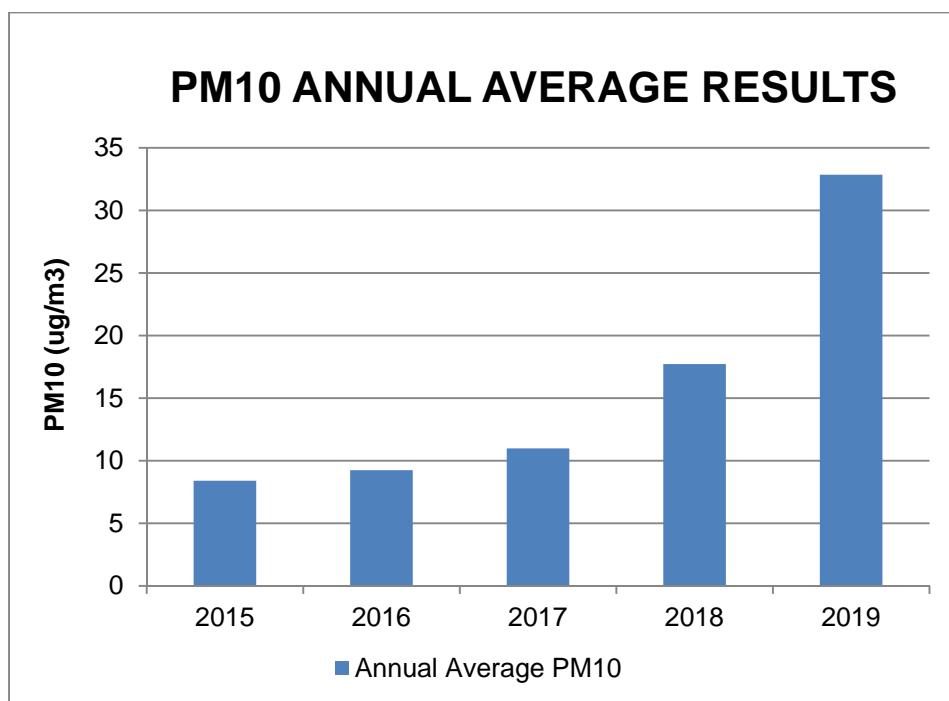


Figure 24 HVAS PM10 Annual Average Comparison, 2015 – 2019

## 7. WATER MANAGEMENT

Note that Table 26 below reports on the WATER YEAR which is from 1 July 2018 to 30 June 2019. Approximately 80ML of water (Upper Cudgegong River Source) was transferred to Airy Mine by rail during 2019.

**Table 26 Water Take**

License #	Water Sharing Plan, source and management zone (as applicable)	Entitlement	Passive take / inflows	Active pumping	TOTAL
80BL243771	Sydney Basin – MDB Groundwater Source	5ML	N/A	0	0
WAL35023	Macquarie Bogan Unregulated and Alluvial Water Sources Upper Cudgegong River Source	231ML	N/A	0	0
WAL27890	Sydney Basin - MDB Groundwater Source	30ML	N/A	0	0

Note: Volume is reported in megalitres (ML)

### 7.1. Surface Water

The pollutants included in Table 27 below are monitored at Licensed Discharge Points LDP002, LDP003, LDP004, LDP005 and LDP006 daily during discharge in accordance with the requirements of the Environment Protection Licence (EPL528).

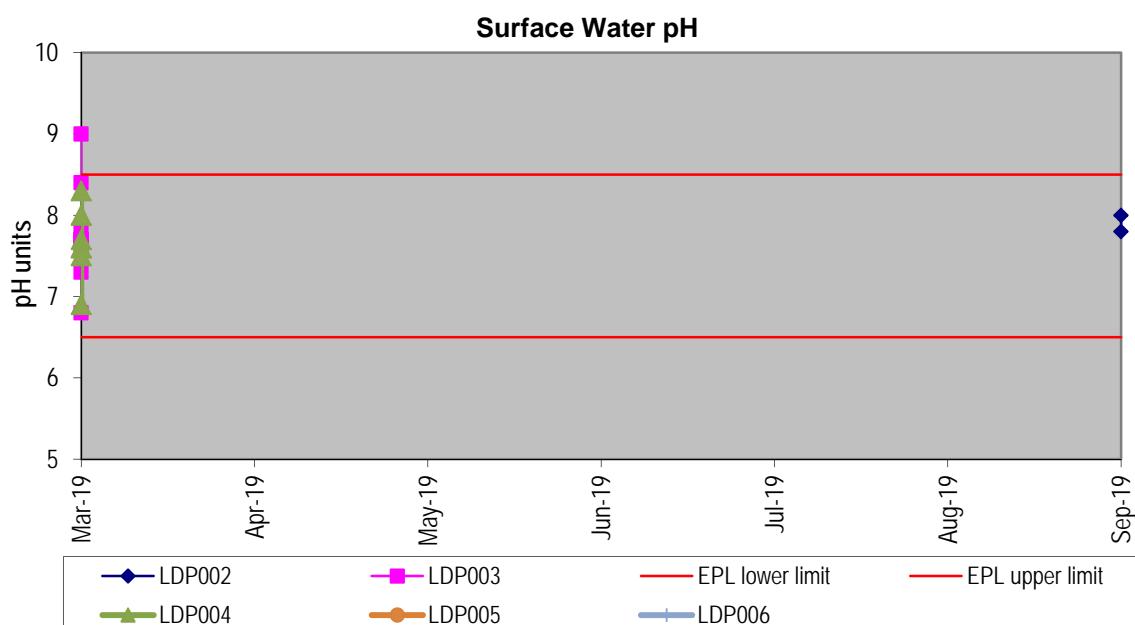
Table 27 below is a summary of the water quality monitoring results that were determined as required by EPL 528. The data displayed has been sampled for the reporting period from 1 January 2019 to 31 December 2019. The water discharged at LDP004 was sampled on the 4<sup>th</sup> March 2019; however, the sample was not tested for oil and grease levels as required in EPL 528. The water discharged at LDP003 on the 14<sup>th</sup> March 2019 exceeded the pH limit prescribed in EPL 528. The water discharged at LDP002 during September 2019 complied with the water quality parameters prescribed in EPL 528. There were no discharges of water from LDP005 and LDP006 during 2019.

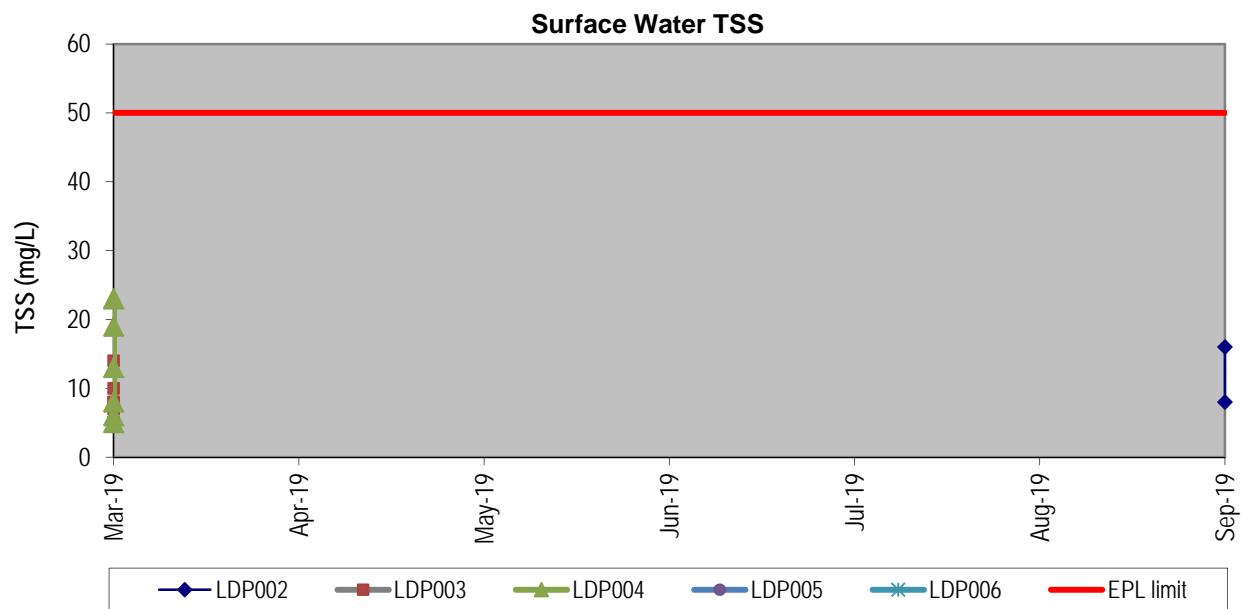
**Table 27 Charbon Colliery Water Quality Summary, Jan 2019 – Dec 2019**

Licenced Discharge Point (LDP)	Pollutant	Unit of measure	No. of samples required	No. of samples collected and analysed	Lowest sample value	Mean of sample	Highest sample value	Licence Limit
LDP002	Conductivity	microsiemens per centimetre	2	2	464	481	498	N/A
	Oil and Grease	milligrams per litre	2	2	<5	<5	<5	10

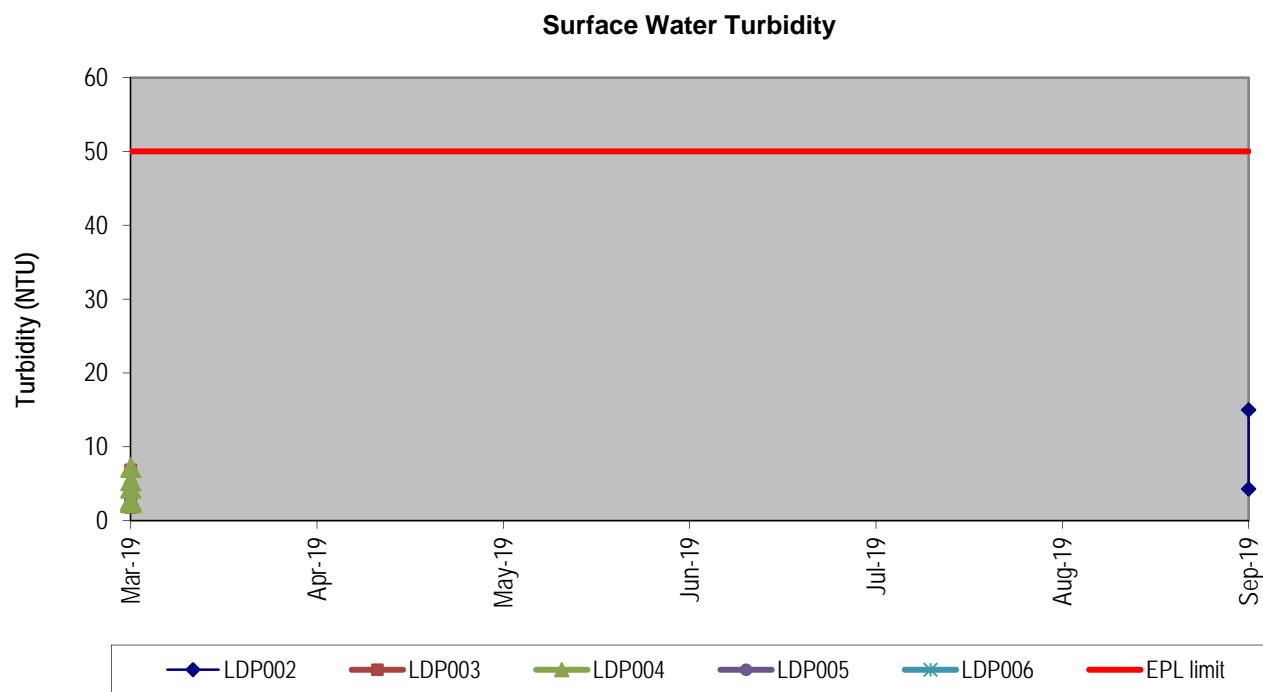
Licenced Discharge Point (LDP)	Pollutant	Unit of measure	No. of samples required	No. of samples collected and analysed	Lowest sample value	Mean of sample	Highest sample value	Licence Limit
	pH	pH	2	2	7.8	7.9	8.0	6.5-8.5
	TSS	milligrams per litre	2	2	8	12	16	50
	Turbidity	nephelometric turbidity units	2	2	4.3	9.7	15	50
LDP003	Conductivity	microsiemens per centimetre	9	9	616	647	681	N/A
	Oil and Grease	milligrams per litre	9	9	2	<5	<5	10
	pH	pH	9	9	6.8	7.8	9.0	6.5-8.5
	TSS	milligrams per litre	9	9	<5	7.4	14	50
	Turbidity	nephelometric turbidity units	9	9	1.8	4	7	50
LDP004	Conductivity	microsiemens per centimetre	7	7	1910	1951	2020	N/A
	Oil and Grease	milligrams per litre	7	6	<5	<5	<5	10
	pH	pH	7	7	6.9	7.7	8.3	6.5-8.5
	TSS	milligrams per litre	7	7	<5	13.9	23	50
	Turbidity	nephelometric turbidity units	7	7	2.4	3.9	7.2	50
LDP005	Conductivity	microsiemens per centimetre	0	0	0	0	0	N/A
	Oil and Grease	milligrams per litre	0	0	0	0	0	10

Licenced Discharge Point (LDP)	Pollutant	Unit of measure	No. of samples required	No. of samples collected and analysed	Lowest sample value	Mean of sample	Highest sample value	Licence Limit
	pH	pH	0	0	0	0	0	6.5-8.5
	TSS	milligrams per litre	0	0	0	0	0	50
	Turbidity	nephelometric turbidity units	0	0	0	0	0	50
LDP006	Conductivity	microsiemens per centimetre	0	0	0	0	0	N/A
	Oil and Grease	milligrams per litre	0	0	0	0	0	10
	pH	pH	0	0	0	0	0	6.5-8.5
	TSS	milligrams per litre	0	0	0	0	0	50
	Turbidity	nephelometric turbidity units	0	0	0	0	0	50

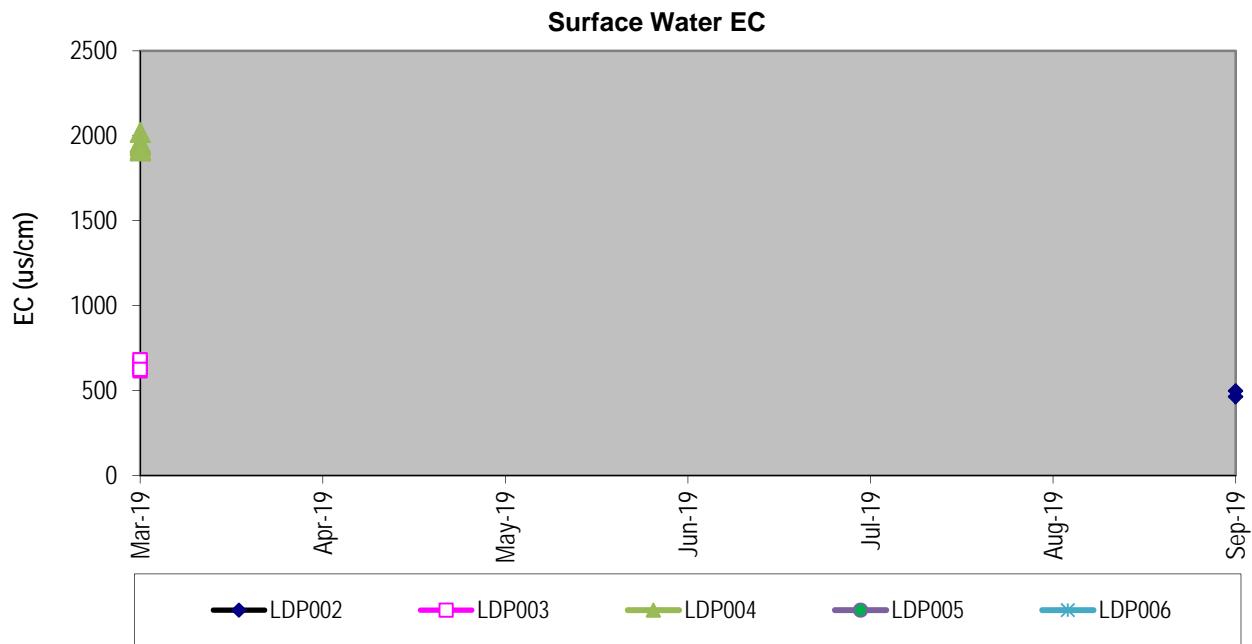
**Figure 25 Surface Water pH Results 2019**



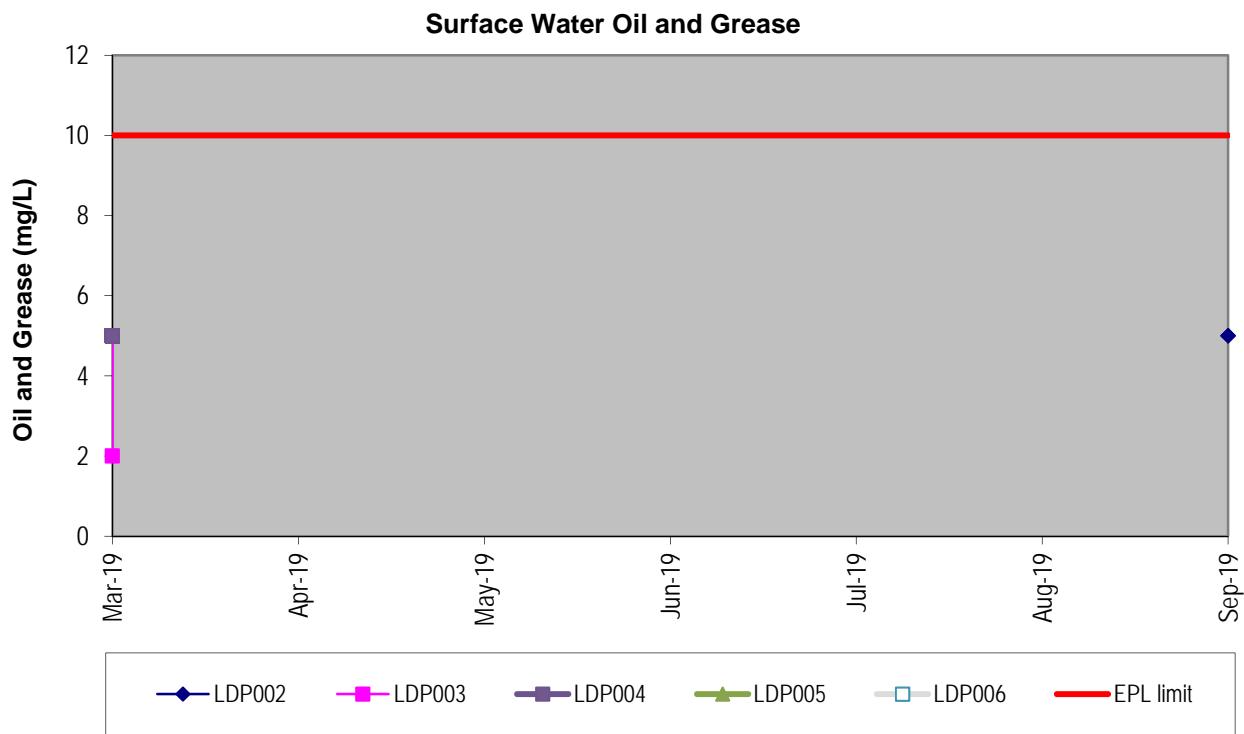
**Figure 26 Surface Water Total Suspended Solids (TSS) Results 2019**



**Figure 27 Surface Water Turbidity Results 2019**



**Figure 28** Surface Water Electrical Conductivity (EC) Results 2019



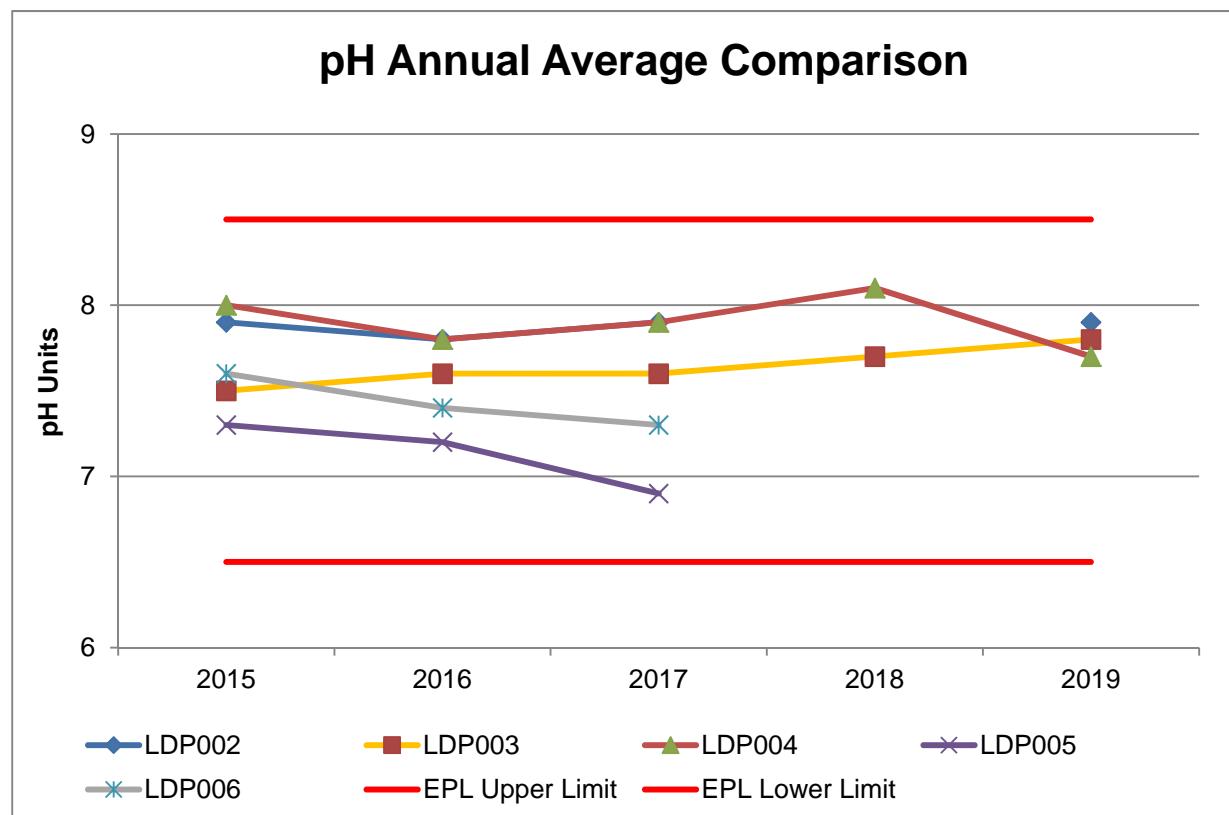
**Figure 29** Surface Water Oil and Grease Results 2019

**Table 28 Charbon Colliery – Total Water Volume Discharged 2019**

Licenced Discharge Point (LDP)	Total Water Volume (ML) Discharged for Reporting Period (1 Jan 2019 – 31 Dec 2019)
LDP002	1.1
LDP003	10.7
LDP004	8.8
LDP005	0
LDP006	0

### 7.1.1 Historic Surface Water Results

Annual surface water quality results for pH, Total Suspended Solids, Oil and Grease, Turbidity and Electrical Conductivity from 2015 to 2019 have been graphically represented below. These comparisons are calculated from the annual average result for each water quality parameter during discharge events. Gaps in data are due to nil discharge during that period or data not being required under EPL528 at that point in time.

**Figure 30 Surface Water pH Results, 2015 – 2019**

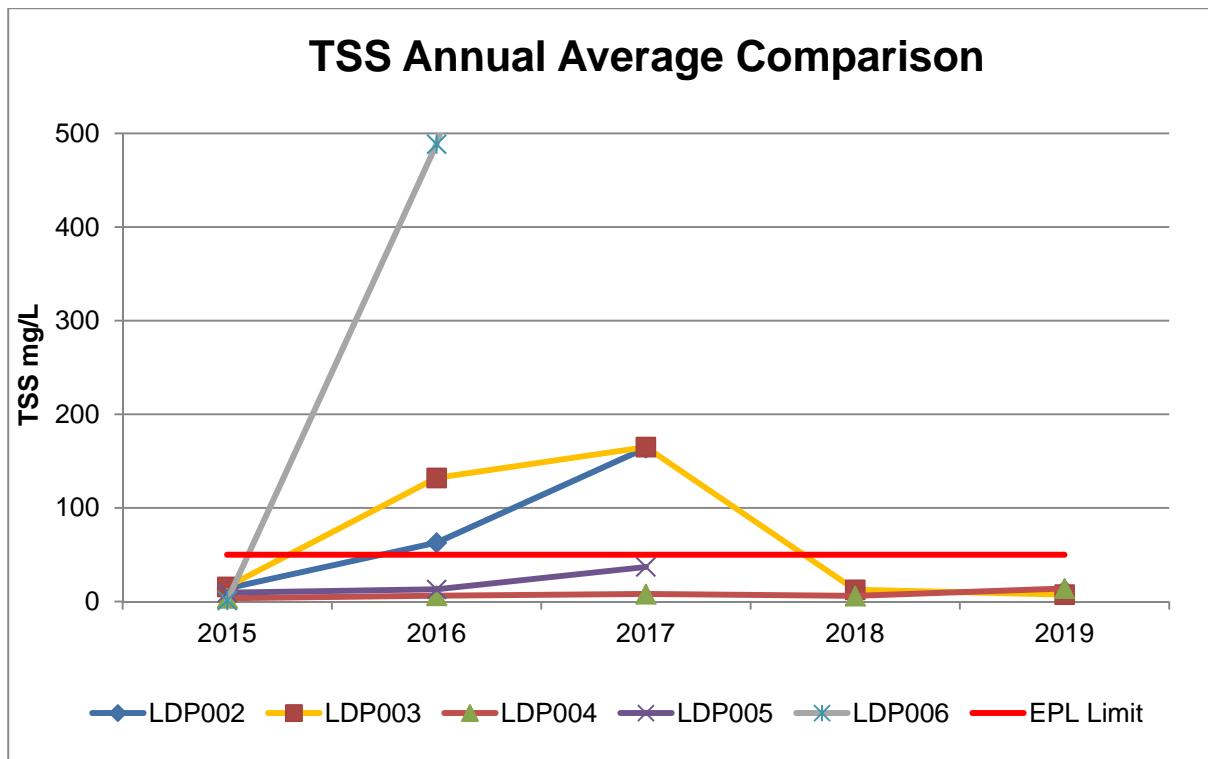


Figure 31 Surface Water Total Suspended Solids (TSS) Results, 2015 – 2019

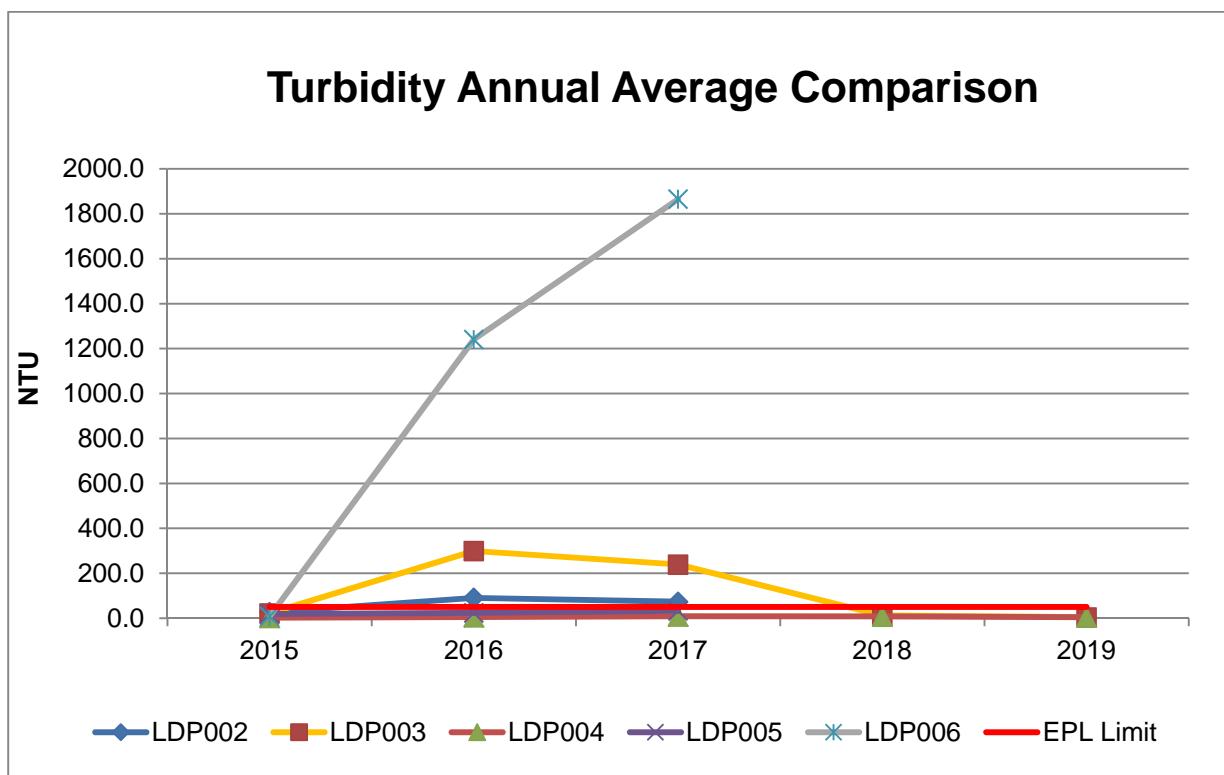


Figure 32 Surface Water Turbidity Results, 2015 – 2019

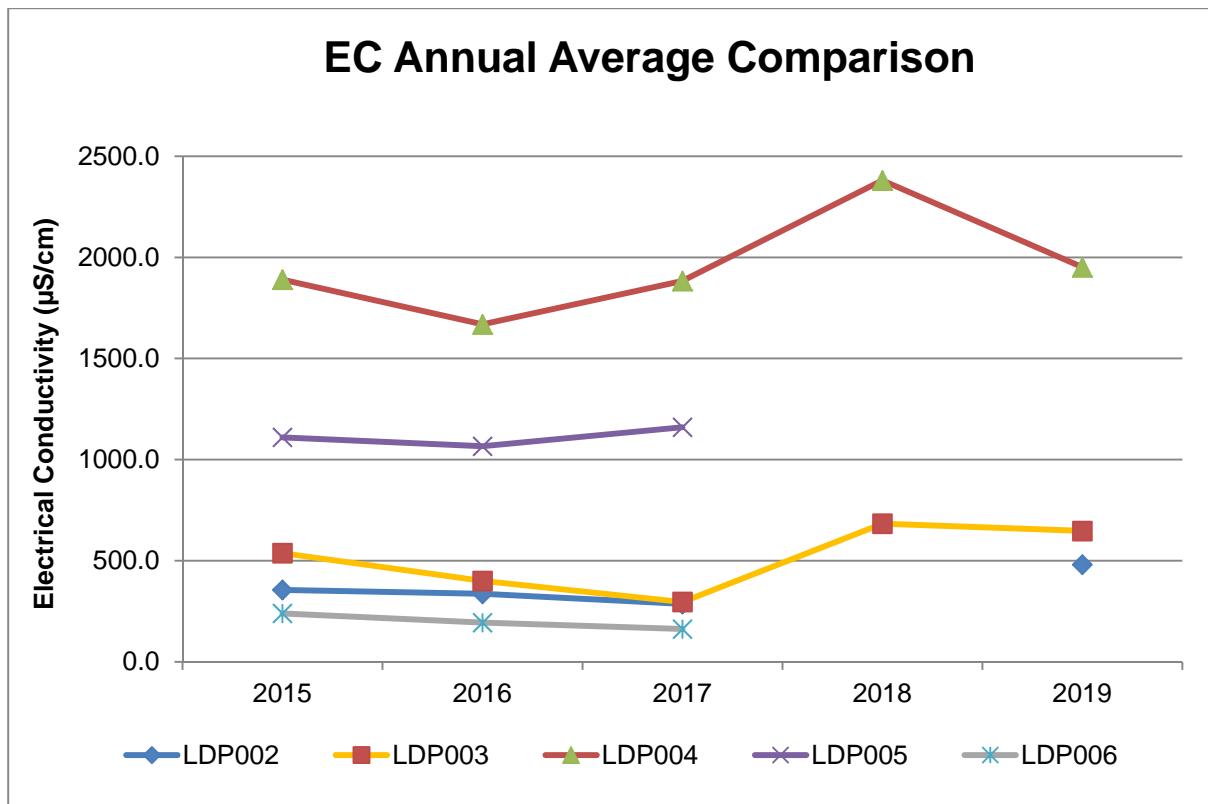


Figure 33 Surface Water Electrical Conductivity (EC) Results, 2015 – 2019

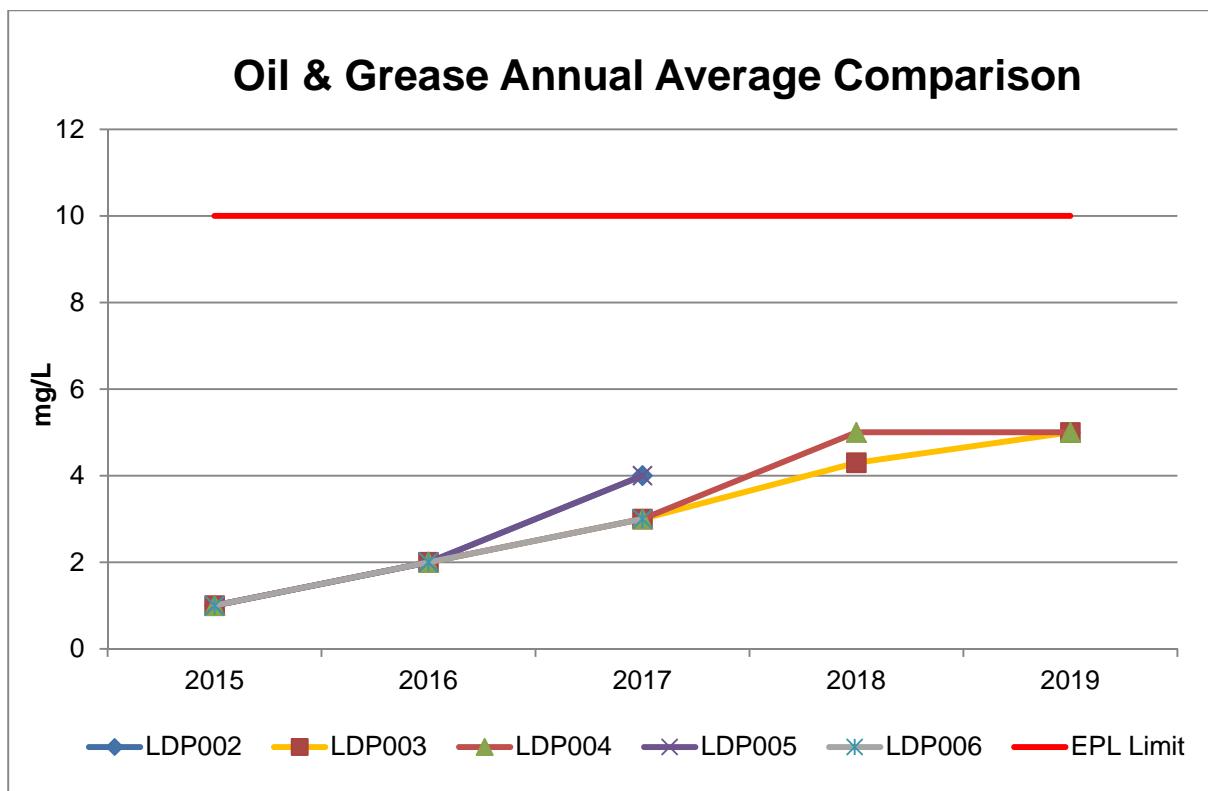


Figure 34 Surface Water Oil and Grease Results, 2015 – 2019

## 7.2 Groundwater

The Groundwater quality monitoring results for 2019 at borehole PB2 and borehole PB3 are presented in Table 29 below. Water monitoring cannot be undertaken at borehole GW800781 as there are pump lines within the privately owned bore.

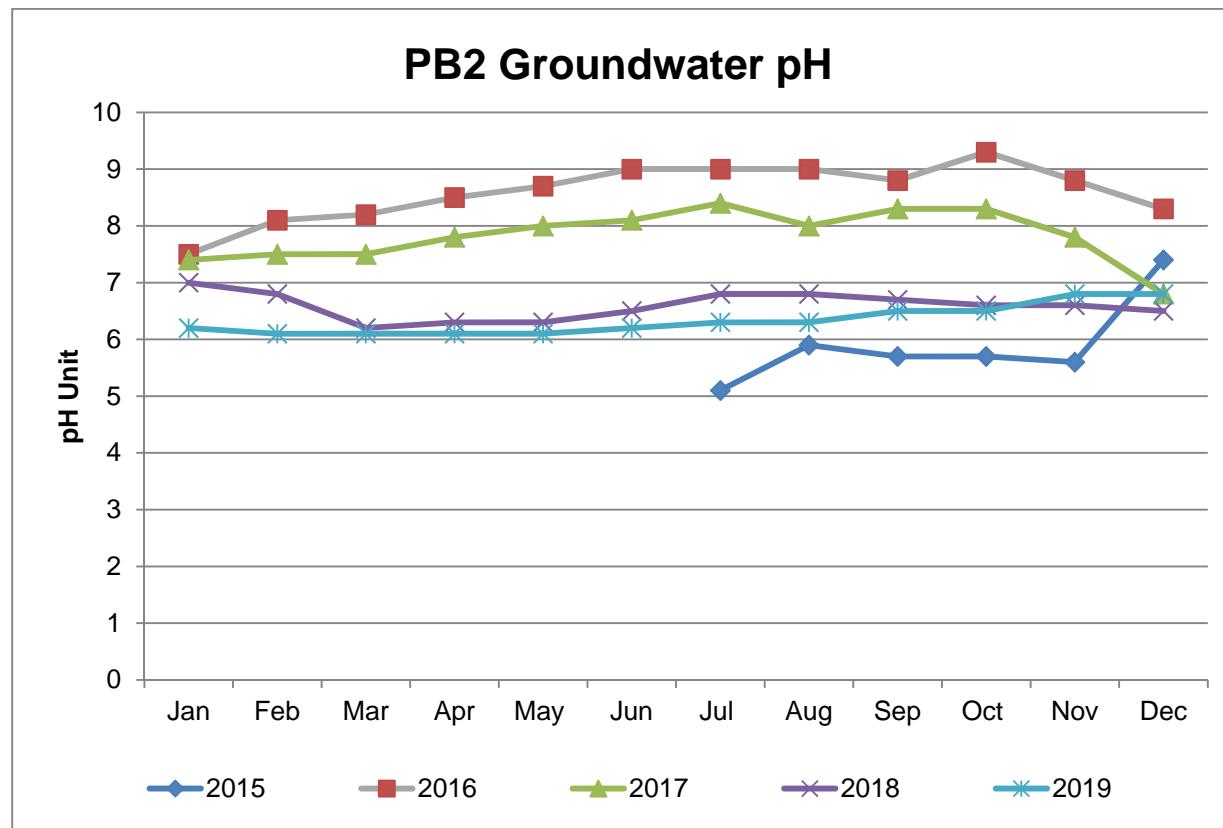
A revised site Water Management Plan was submitted to the Department of Planning, Industry and Environment on 30 October 2019.

**Table 29 Groundwater Monitoring 2019**

Parameter	Unit	Borehole PB2			Borehole PB3		
		Minimum	Median	Maximum	Minimum	Median	Maximum
<b>Physicochemical parameters</b>							
EC	µS/cm	3300	3409	3500	1410	3253	3460
pH	pH units	6.1	6.3	6.8	6.2	6.3	6.3
TSS	mg/L	20	62	108	4	9	18
Turbidity	NTU	116	314	659	42	87	151
<b>Major anions</b>							
Bicarbonate alkalinity	mg/L	1	91	275	1	136	166
Carbonate alkalinity	mg/L	1	1	1	1	1	1
Hydroxide alkalinity	mg/L	1	1	1	1	1	1
Total alkalinity	mg/L	40	91	275	1	136	166
Chloride	mg/L	64	76	91	129	137	151
Sulfate	mg/L	1420	2055	2320	1700	1996	2320
<b>Major cations</b>							
Calcium	mg/L	208	228	239	325	364	386
Magnesium	mg/L	266	286	303	261	279	297
Potassium	mg/L	6	6	7	12	13	15
Sodium	mg/L	97	103	109	88	94	99
<b>Nutrients</b>							
Ammonia	mg/L	0.05	0.35	0.49	0.14	0.32	0.45
Nitrate	mg/L	0.01	0.08	0.10	0.03	0.10	0.11
Nitrite	mg/L	0.01	0.08	0.10	0.01	0.03	0.10
Total Kjeldahl nitrogen	mg/L	0.2	0.4	0.6	0.3	0.4	0.6
Total nitrogen	mg/L	0.2	0.4	0.6	0.3	0.5	0.7
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.01
<b>Dissolved metals</b>							
Aluminium	mg/L	0.01	0.07	0.20	0.01	0.01	0.01
Arsenic	mg/L	0.001	0.001	0.001	0.001	0.002	0.004
Boron	mg/L	0.05	0.05	0.09	0.05	0.06	0.17
Cadmium	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Chromium	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Copper	mg/L	0.001	0.001	0.001	0.001	0.001	0.001

Lead	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Manganese	mg/L	10.4	15.9	19.6	7.1	7.8	9.4
Mercury	mg/L	0.0001	0.0001	0.0002	0.0001	0.0001	0.0001
Nickel	mg/L	0.002	0.037	0.075	0.071	0.076	0.082
Selenium	mg/L	0.01	0.01	0.01	0.01	0.01	0.01
Silver	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Zinc	mg/L	0.01	0.01	0.03	0.25	0.28	0.35

Graphical representations are presented below for pH and Electrical Conductivity to show data trends at borehole PB2 and borehole PB3.



**Figure 35 PB2 Groundwater pH data, 2015 – 2019**

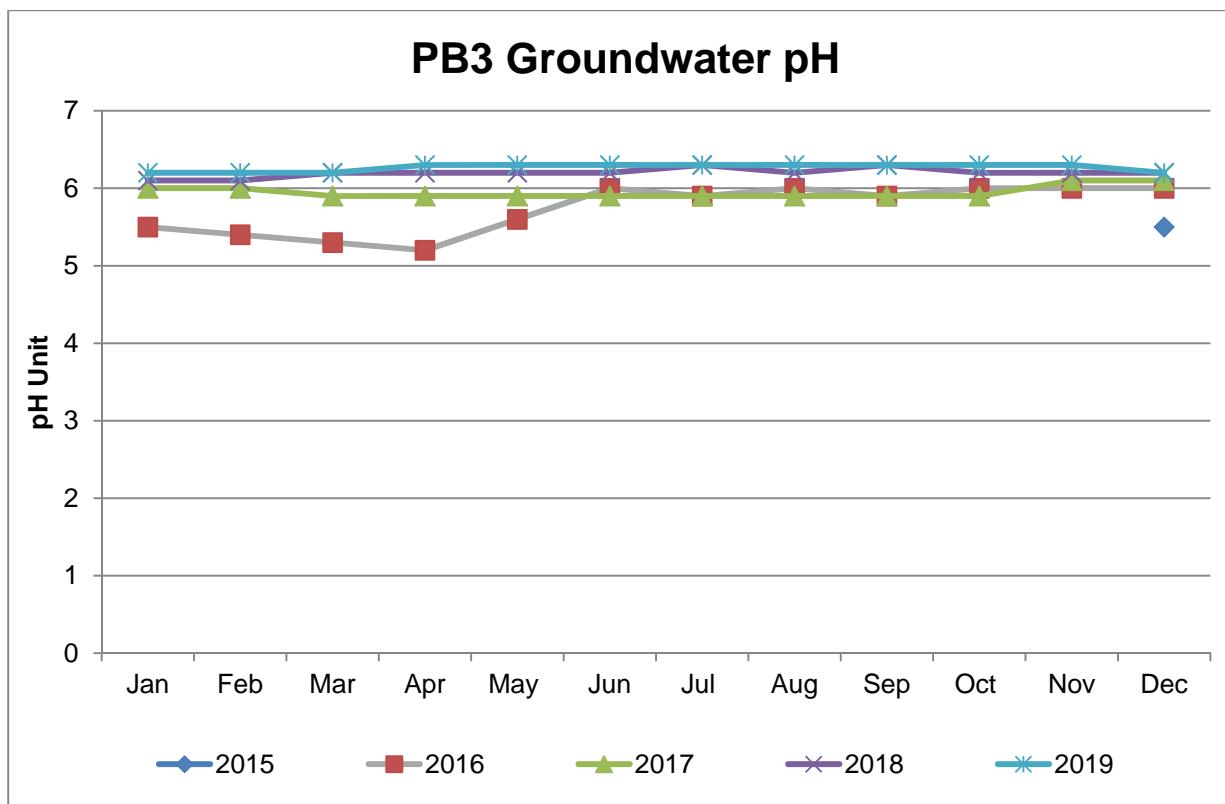


Figure 36 PB3 Groundwater pH data, 2015 – 2019

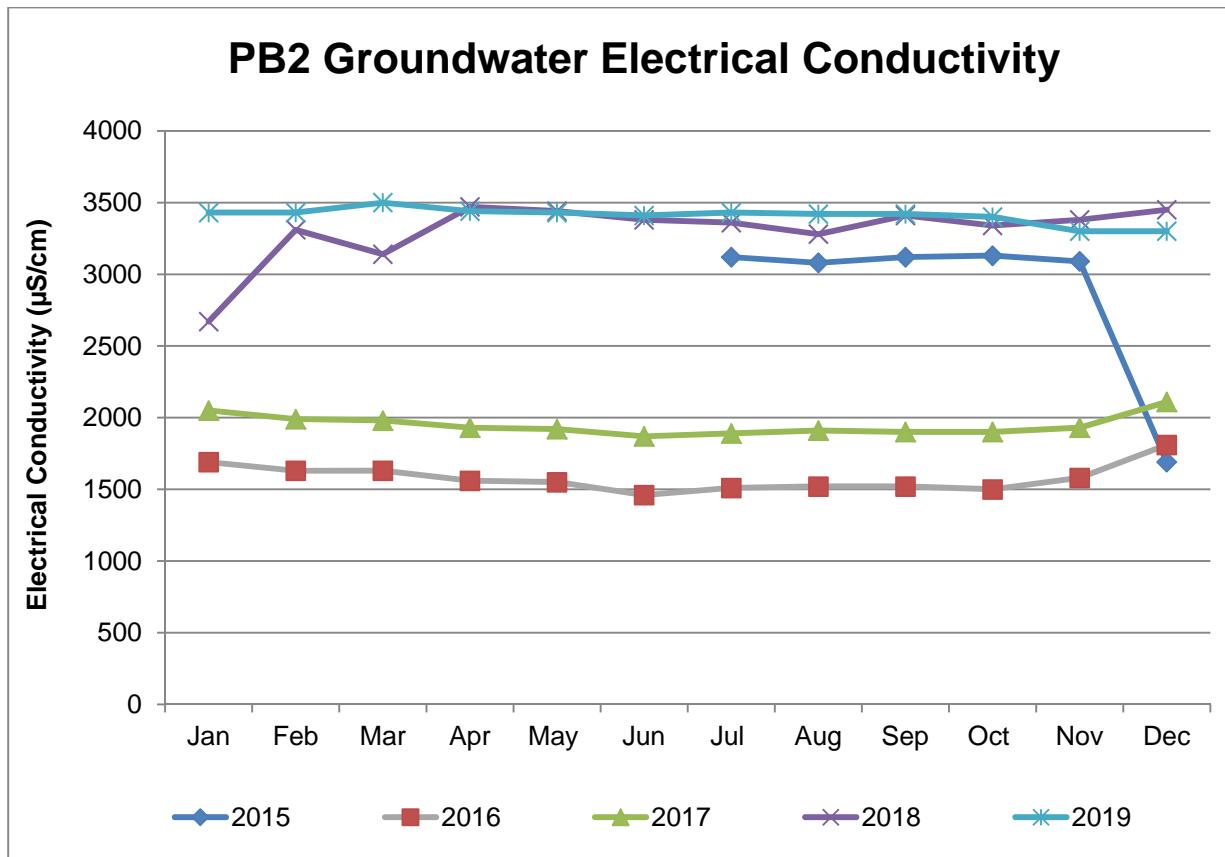
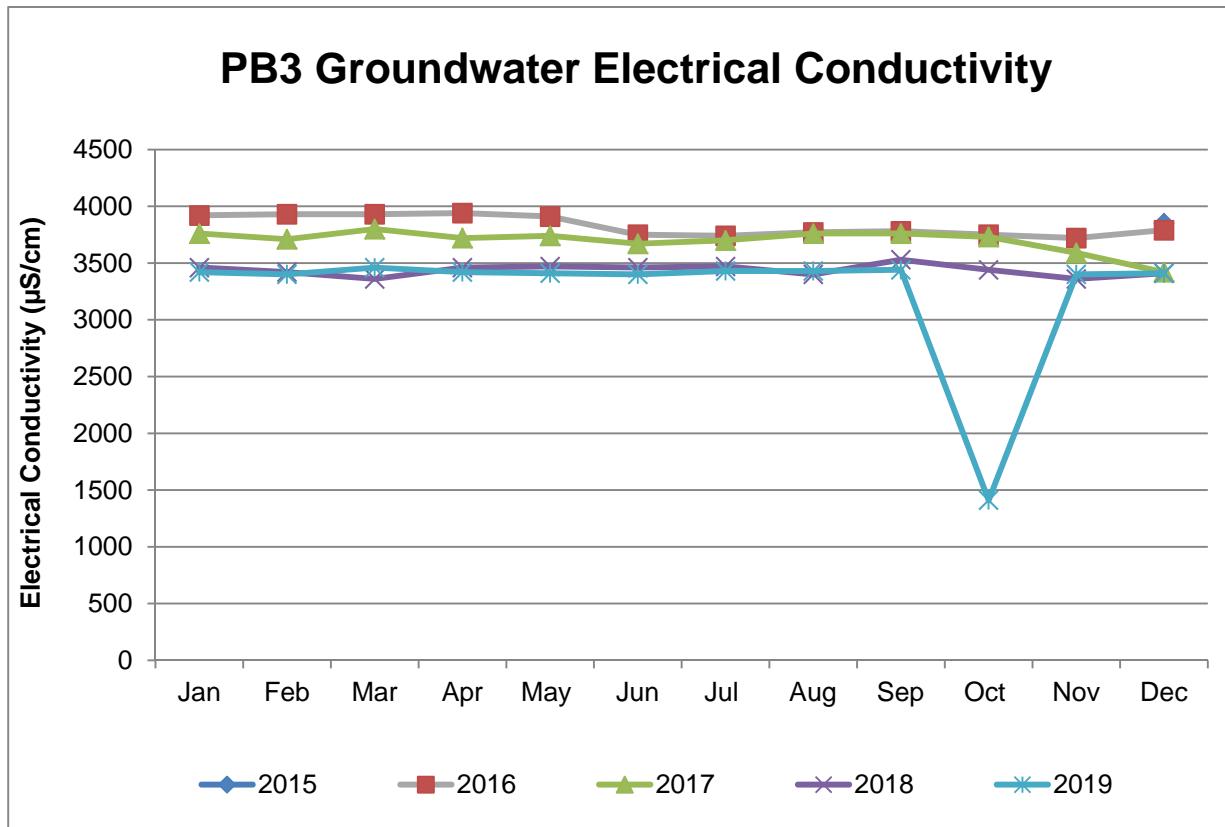


Figure 37 PB2 Groundwater Electrical Conductivity data, 2015 – 2019



**Figure 38 PB3 Groundwater Electrical Conductivity data, 2015 – 2019**

The groundwater quality at borehole PB2 and borehole PB3 is typical of groundwater within the Shoalhaven Group. This rock formation was deposited in a marine environment and therefore the quality is brackish to saline and the chemistry makes the groundwater very hard being magnesium/calcium – sulfate dominant. Some metals in the groundwater are naturally elevated.

## 8. REHABILITATION

In accordance with the requirements of the Project Approval Charbon Colliery is required to rehabilitate the mine site to the satisfaction of the Department of Planning, Industry and Environment. Underground coal production at Charbon Colliery ceased in April 2014 and open cut coal mining operations ceased during August 2015. Charbon Colliery is currently undertaking rehabilitation activities to address the requirements of mine closure.

### 8.1 Rehabilitation Monitoring

Rehabilitation monitoring was undertaken during 2019 to monitor the progress of rehabilitation against the objectives and criteria outlined in the Rehabilitation and Closure Mining Operations Plan (MOP) Amendment C. Rehabilitation monitoring during 2019 was also undertaken on privately owned land and a Charbon POL Rehabilitation Monitoring Report was prepared to provide an overview of the status of rehabilitation on privately owned land.

The 2019 Rehabilitation Monitoring Report for Charbon Owned Lands provided an overview of the current status of rehabilitation sites and a comparison with control sites commensurate with the surrounding landscape. Measurements of ecosystem composition, landform structure and soil surface characteristics were made at each rehabilitation site and will be used to track performance over the life of the rehabilitation and monitoring program.

Currently, all rehabilitation sites appear to be stable with various levels of vegetation growth. At this early stage of rehabilitation monitoring, it is not clear how rapid natural regeneration is or what limits to rehabilitation may arise in the future. Although the rehabilitation appears to be progressing (is not failing), a selection of management actions will be considered on an as required basis to improve rehabilitation success and enhance vegetation growth.

Generally, rehabilitation at all rehabilitation monitoring sites is progressing and showing early stages of native woodland regeneration. Assuming that the native vegetation that is currently established at rehabilitation sites continues to grow and become established (with subsequent seeding and regeneration), and associated improvements in soil function, it is likely that the ecosystem composition and structure will progress further towards completion criteria over the coming years. The level of vegetation cover may be attributed to a lack of adequate rainfall or impacts of grazing from native animals during 2019. A summary of the rehabilitation objectives and completion criteria for each of the rehabilitation monitoring sites is provided in Table 30 below.

**Table 30 MOP Rehabilitation Objectives and Completion Criteria Assessment**

<b>MOP Rehabilitation Objectives &amp; Criteria</b>	<b>CHRI</b>	<b>CHR2</b>	<b>CHR3</b>	<b>CHR4</b>
Suitable topsoil depth	Achieved	Achieved	Achieved	Achieved
Amelioration required	No	No	No	No
Soil parameters	N/A	N/A	N/A	N/A
Landform is stable and non-polluting	Achieved	Achieved	Achieved	Achieved
Erosion control structures have been installed	Achieved	Achieved	Achieved	Achieved
There is no significant erosion (that comprises land capability or intended final land use)	Achieved	Achieved	Achieved	Achieved
There is no active gully or tunnel erosion, or rills >300 mm depth	Achieved	Achieved	Not Achieved	Achieved
Bushfire mitigation actions are implemented in accordance with the Bushfire Management Plan	N/A	N/A	N/A	N/A
Drainage structures are performing as designed	Achieved	Achieved	Achieved	Achieved
No significant weed infestations and weeds do not comprise a significant proportion of the species in any stratum (weed presence)	Not Achieved (recently remediated)	Achieved	Achieved	Achieved
Noxious weeds are controlled in accordance with the MOP and relevant legislation (weed presence)	Achieved	Achieved	Achieved	Achieved
Pests/feral species do not occur in substantial numbers or visibly affect the development of planted species (feral animal density indicator)	Achieved	Achieved	Achieved	Achieved
Evidence of reproduction in tree/shrub species through presence of viable seed, flowers or presence of seedlings	N/A (recently remediated)	Achieved	Not Achieved	Achieved
More than 75% of trees are healthy and growing as indicated by rehabilitation monitoring at Year 5 following establishment (vegetation health indicator)	N/A (recently remediated)	Achieved	N/A (only year 4)	Achieved
Rehabilitation monitoring verifies second generation tree seedlings are present or likely to be, based on monitoring in comparable older rehabilitation sites (regeneration/resilience indicator)	N/A (recently remediated)	Achieved	Not achieved	Not achieved
Species diversity for each stratum is generally comparable to control sites (species composition indicator)	N/A (recently remediated)	Not achieved	Not achieved	Not achieved
There is a diversity of vertebrate species which is consummate to that recorded in analogue sites (vertebrate species indicator)	Not Achieved	Achieved	Not Achieved	Not Achieved
Feral and pest animal species are controlled in accordance with relevant legislation and the MOP (feral animal density)	N/A (recently remediated)	Achieved	Achieved	Achieved
Landscape Function Analysis Nutrient Index is generally comparable to relevant control sites (nutrient recycling indicator)	N/A (recently remediated)	Achieved	Achieved	Achieved

The 2019 Charbon POL Rehabilitation Monitoring Report provided an overview of the current status of rehabilitation sites and a comparison with control sites commensurate with the surrounding landscape. The report included an assessment of soil conditions, landform condition, sediment control structures, microorganisms, revegetation rates, plant health and weed infestation.

The vegetation within the POL rehabilitation areas is in its early stages of development with vegetation growth consisting mainly of exotic herbs and grasses. The level of vegetation cover may be attributed to a lack of adequate rainfall or impacts of grazing from native animals during 2019. A summary of the rehabilitation domain objectives and completion criteria for rehabilitation of privately owned land is provided in Table 31 below.

**Table 31 POL MOP Completion Criteria – Relevant to Vegetation Assessment**

Domain Objective	Performance Indicator	Completion Criteria	Achieved (2017)
<b>All Primary Domains</b>			
Woodland rehabilitation areas species diversity is comparable to analogue native vegetation community	Species Selection	A mixture of native trees, shrubs and grasses representative of regionally occurring woodland is present.	N/A (third year of monitoring)
	Vegetation Health	Rehabilitation monitoring verifies more than 75% of trees are healthy and growing as indicated by rehabilitation monitoring at Year 5 following establishment.	N/A (Year 5 goal)
	Species Composition	Rehabilitation monitoring verifies species diversity for each stratum is comparable to analogue sites at Year 5 following establishment.	N/A (Year 5 goal)
	Tree Density	Tree density is commensurate with that observed in the analogue forest site.	NA (third year of monitoring)
<b>Domain Woodland Rehabilitation</b>			
Effective maintenance and management of rehabilitation areas	Species Selection	A mixture of native trees, shrubs and grasses representative of regionally occurring woodland is present.	N/A (third year of monitoring)
Woodland rehabilitation areas species diversity is comparable to analogue native vegetation community.	Vegeatation Health	Rehabilitation monitoring verifies more than 75% of trees are healthy and growing as indicated by rehabilitation monitoring at Year 5 following establishment.	N/A (Year 5 goal)
	Species composition	Rehabilitation monitoring verifies species diversity for each stratum (canopy, mid storey and ground cover) is commensurate with relevant analogue sites at Year 5 following establishment.	N/A (Year 5 goal)
<b>Domain Forest Rehabilitation</b>			
Weeds and feral animals that present a risk to rehabilitation success at the site will be managed.	Weed presence.	Rehabilitation monitoring verifies weed presence is broadly comparable to analogue sites and does not present a risk to rehabilitation.	Achieved. No significant infestations of priority weeds were identified in the rehabilitation areas.

Ecosystem health and sustainability	Vegetation Health	Rehabilitation monitoring verifies that more than 75% of trees are healthy and growing as indicated by rehabilitation monitoring.	Achieved
	Species Composition	Rehabilitation monitoring verifies that species diversity for each stratum (canopy, mid storey and ground cover) is generally comparable to relevant analogue sites.	Not Achieved (only third year of monitoring)
	Reproduction	Rehabilitation monitoring verifies second generation tree seedlings are present or likely to be based on monitoring in comparable older rehabilitation sites.	Not Achieved (only third year of monitoring)
	Resilience	Evidence of reproduction in tree/shrub species through presence of viable seed, flowers or presence of seedlings.	Partially Achieved (only third year of monitoring)

## 8.2 Next Reporting Period

Rehabilitation works are planned to continue to be undertaken in the 8 Trunk area at Charbon Colliery during 2020. The data included in Table 33 below has been revised following commencement of the Rehabilitation and Closure Mining Operations Plan Amendment C which was approved 25 September 2019. Rehabilitation will be achieved through progressive reshaping, spreading of topsoil and seeding as described below:

### 1. Re-contouring

Reshaping of mine overburden areas required to reduce both the height of dumps and grades to achieve a MOP compliant final landform and allow final rehabilitation activities to occur.

### 2. Overburden material transport

Overburden material movement by excavator and truck fleet to construct the design MOP compliant final landform as required.

### 3. Soil material movement

Soil material transport by excavator and truck fleet is required from stockpile to final location and subsequent spread on final landform by bulldozer.

### 4. Erosion Control

Implementation of erosion control structures in the form of in-slope berms and stilling basins.

### 5. Contour Ripping

Ripping on the contour by bulldozer to provide a land profile to reduce runoff and erosion and facilitate infiltration of rainfall to allow plant establishment and development of a self-sustaining vegetation cover.

### 6(a). Hand Application of Fertilizer and Seed

On completion of all prior rehabilitation earthworks activities areas including ripping to prepare the seedbed, hand application of fertilizer and seed could be undertaken on key areas.

### 6(b). Helicopter Application of Fertilizer and Seed

On completion of all prior rehabilitation earthworks activities areas including ripping to prepare the seedbed, helicopter application of fertilizer and seed could be undertaken on areas not completed by hand seeding.

### 7. Seeding of Specific Areas

The land-uses proposed following rehabilitation of the mine site include Woodland and Forest. There are specific areas identified for seeding to facilitate the establishment of either a Woodland or Forest Community.

The rehabilitation of areas of disturbance is undertaken in accordance with the schedule outlined in Table 32 below. The area of rehabilitation undertaken during 2019 and the forecast area to be rehabilitated during 2020 is outlined in Table 33.

**Table 32 Rehabilitation Schedule**

Rehabilitation Area	Date for Completion	Status
Strips 9 & 10 large open cut void	30 December 2019	Active Rehabilitation
8 Trunk workshop void & 8 Trunk stockpile base	30 December 2020	Ongoing
Strip 8 South area	30 December 2021	Ongoing
Strip 8 North area	30 December 2022	Ongoing
Strip 8 Central & West areas	30 December 2023	Ongoing
Areas 6 & 7, Haystack, CHPP, REAs & Main Stockpile. Rehabilitation of Southern Open Cut erosion resistant capping material source area.	30 December 2025	Ongoing

**Table 33 Rehabilitation Status**

Mine Area Type	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
	Year 2018 (ha)	Year 2019 (ha)	Year 2020 (ha)
<b>A. Total mine footprint<sup>1</sup></b>	1452.08	1452.08	1452.08
<b>B. Total active disturbance<sup>2</sup></b>	170.2	157.4	151.5
<b>C. Land being prepared for rehabilitation<sup>3</sup></b>	35.1	12.8	5.9
<b>D. Land under active rehabilitation<sup>4</sup></b>	192.9	228	240.8
<b>E. Completed rehabilitation<sup>5</sup></b>	0	0	0

The total mine footprint for the reporting period includes the area subjected to subsidence from underground coal mining.

<sup>1</sup> **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.

<sup>2</sup> **Total Active Disturbance:** includes all areas requiring rehabilitation

<sup>3</sup> **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)

<sup>4</sup> **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)

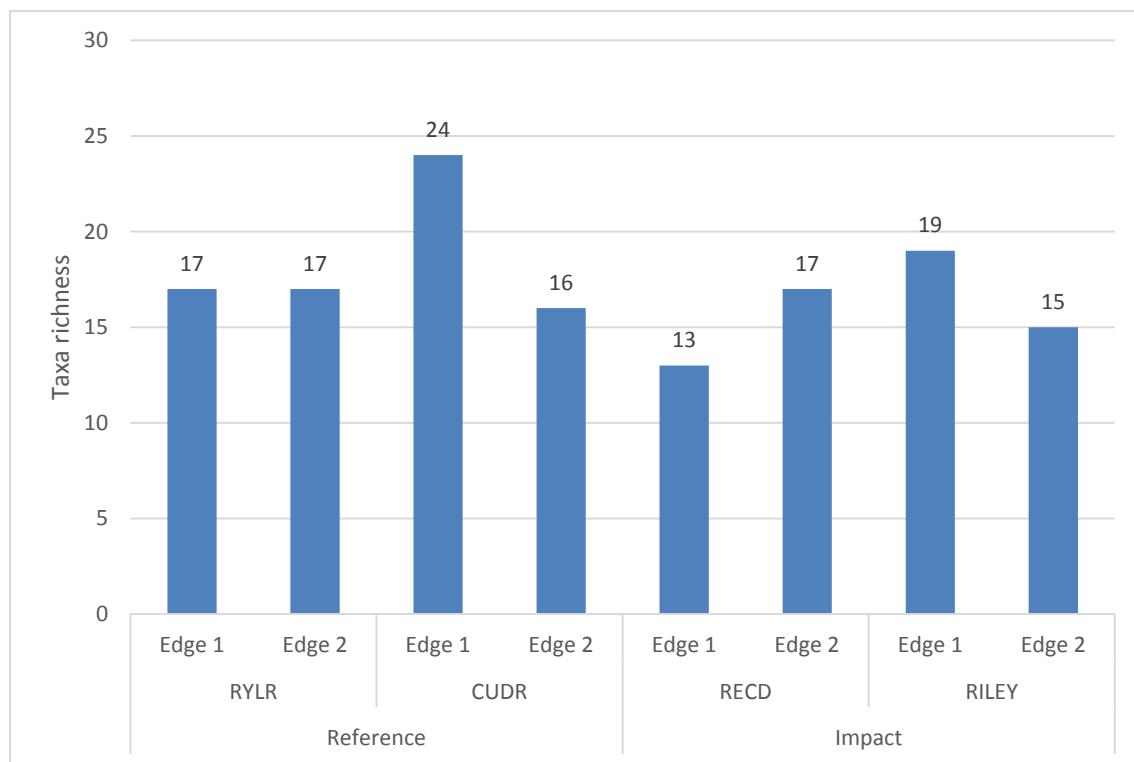
<sup>5</sup> **Completed rehabilitation:** requires formal sign off from DRE that the area has successfully met the rehabilitation land use objectives or completion criteria

## 9. AQUATIC ECOLOGY

### 9.1 Aquatic Ecology Monitoring

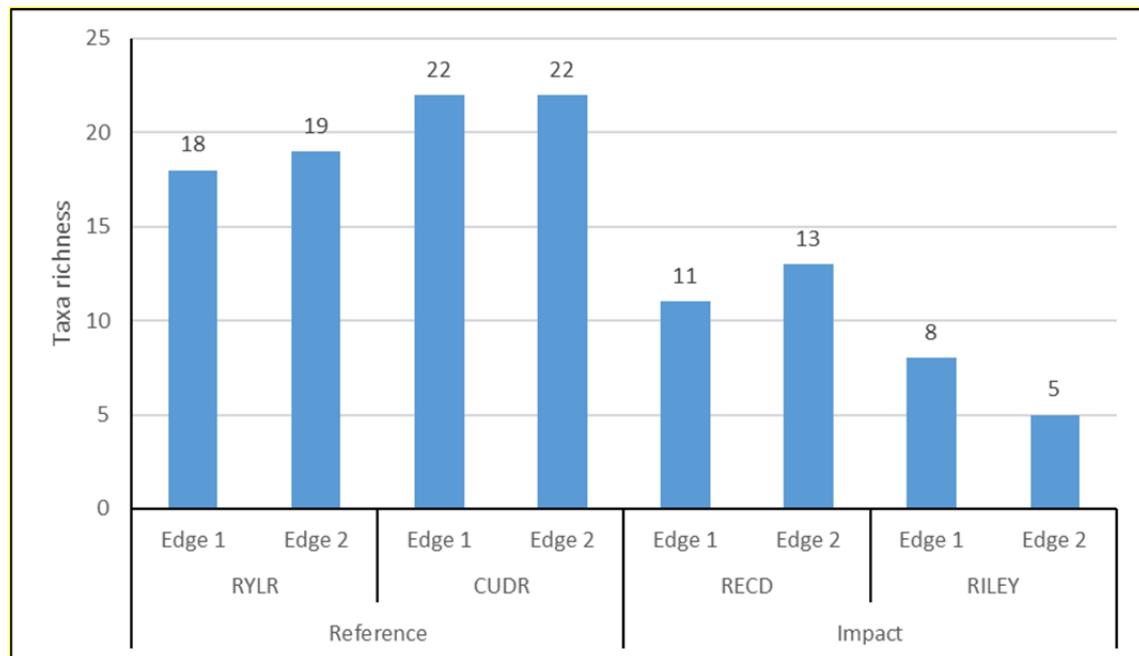
Aquatic Ecology Monitoring was undertaken during the months of March and October in 2019. The monitoring was undertaken in waterways with the potential to be impacted by discharges of water from licenced discharged points at Charbon Colliery. The monitoring program undertaken in 2019 involved the assessment of two reference sites and two impact sites. Water quality, sediment quality and macroinvertebrate samples were collected as part of the monitoring program.

Taxa richness for samples collected during autumn 2019 is presented in Figure 39 below. The highest taxa richness was observed in a sample collected from the Cudgegong River whilst the lowest taxa richness was observed in a sample collected from the Reedy Creek Dam.



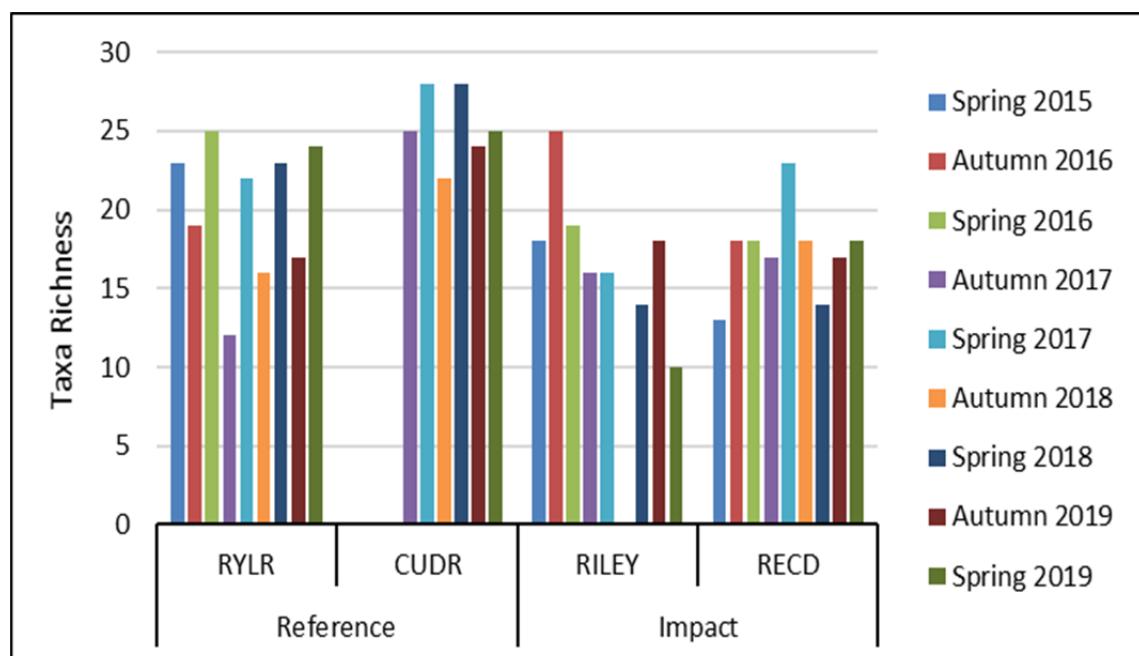
**Figure 39 Taxa richness in macroinvertebrate samples, autumn 2019**

Taxa richness for samples collected during spring 2019 is presented in Figure 40 below. The highest taxa richness was observed in samples collected from the Cudgegong River whilst the lowest taxa richness was observed in a sample collected from Riley's Creek at Brogans Creek Road.



**Figure 40 Taxa richness in macroinvertebrate samples, spring 2019**

Taxa richness for samples collected between spring 2015 and spring 2019 is presented in Figure 41 below. Analysis identified that taxa richness at the Cudgegong River and Rylstone Reservoir sites was higher for spring sampling events compared to autumn sampling events. Taxa richness has been highest at the Cudgegong River sampling site since monitoring began. The lowest taxa richness was observed at the Riley's Creek monitoring site during spring 2019.



**Figure 41 Spatial and temporal variation in taxa richness**

## 10. TERRESTRIAL ECOLOGY

### 10.1 Terrestrial Ecology Monitoring

Annual terrestrial flora and fauna monitoring surveys over compensatory habitat areas has been carried out in prior years as required by the EPBC Approval. During 2019 a report was prepared that reviewed the implementation of the Compensatory Habitat Management Plan and the outcomes of the annual monitoring surveys that were undertaken during 2012, 2014, 2016, 2017 and 2018. The report made the following recommendations for future management of the compensatory habitat areas:

- Maintain access management for people and livestock,
- Continued review of management actions,
- Continued pest fauna management,
- Continuation of exotic weed species management,
- Continued surveillance of bushfire risk,
- Continued monitoring and maintenance of sediment control structures.

### 10.2 Weed Management

A Weed Action Plan (WAP) designed to guide the management of weeds at Charbon Colliery was prepared during 2019. The plan although specific to this 1 year period was structured with long term weed control in mind. The main focus of the plan was to manage declared noxious weeds first followed by invasive environmental weeds which are posing a threat to the vegetation of the site including regeneration, pasture and riparian areas. Consideration of environmental impacts was also high, with the plan guiding weed control in a manner which would enhance the natural vegetation communities and safety at the site.

Monitoring is a key component of the Weed Action Plan. The weed survey which forms the basis of the Weed Action Plan also provides the basis for ongoing weed monitoring at the site. Monitoring inspections at Charbon Colliery were undertaken on 11 March 2019, 20 June 2019, 17 September 2019 and 20 December 2019. The survey's focused on inspecting areas where weeds were present in 2018 and control works were subsequently undertaken.

## 11 COMMUNITY

Charbon Colliery held Community Consultative Committee (CCC) Meetings on 19 March 2019 and 24 September 2019. The focus of the CCC meetings was to outline the mine closure process and provide an update on rehabilitation activities. A copy of the minutes to these meetings can be found on the Centennial Coal website:

<http://www.centennialcoal.com.au/Operations/OperationsList/Charbon.aspx>.

Charbon Colliery made the following community contributions during the reporting period:

- Kandos High school – sponsorship;
- Rylstone Show – sponsorship;
- Negotiations continued with the Kandos museum to host community/tourism tours of the 2 Trunk High Wall.

There were no complaints received by Charbon Colliery during 2019 as shown in Table 33 below. Complaints are also listed on the Complaints Register on the Centennial Coal - Charbon website.

**Table 34 Complaints Register for Charbon Colliery 2019**

Data Sampled:		Licensee: Charbon Coal Pty Ltd											
		Address: Charbon Rd Charbon NSW											
		EPL No. 528											
	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Total
Air	0	0	0	0	0	0	0	0	0	0	0	0	0
Water	0	0	0	0	0	0	0	0	0	0	0	0	0
Noise	0	0	0	0	0	0	0	0	0	0	0	0	0
Flora & Fauna	0	0	0	0	0	0	0	0	0	0	0	0	0
Subsidence	0	0	0	0	0	0	0	0	0	0	0	0	0
Waste	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
													0

**Table 35 Complaints Register for Charbon Colliery 2004 – 2018**

Year	Number of Complaints	Date	Complainant	Issue
2018	1	20/08/2019	Neighbouring Landholder	Other
2017	1	11/01/2017	Neighbouring Landholder	Water
2016	2	18/01/2016	Neighbouring Landholder	Flora & Fauna
		02/11/2016	Neighbouring Landholder	Water
2015	5	17/02/2015	Neighbouring Landholder	Noise
		18/02/2015	Neighbouring Landholder	Noise
		28/03/2015	Neighbouring Landholder	Noise
		13/04/2015	Neighbouring Landholder	Noise
		17/04/2015	Neighbouring Landholder	Noise
2014	1	15/7/2014	Distant Landholder (5.3km away)	Noise
2013	22	07/01/2013		Noise & dust
		22/01/2013		Noise & dust
		06/03/2013		Noise
		07/03/2013		Dust
		08/03/2013	Neighbouring Residents	Noise
		11/03/2013		Noise
		13/03/2013		Noise
		15/03/2013		Noise
		18/03/2013		Noise

Year	Number of Complaints	Date	Complainant	Issue
		18/03/2013		Dust
		25/03/2013		Dust
		25/03/2013		Dust
		22/04/2013		Noise
		27/04/2013		Noise & dust
		11/05/2013		Noise
		11/05/2013		Noise
		24/05/2013		Noise
		27/05/2013		Noise
		12/06/2013		Noise
		21/06/2013		Noise
		26/06/2013		Noise
		25/07/2013		Feral Pigs
2012	1	18/10/2012	Neighbouring Residents	Noise
2011	0	-	-	-
2010	0	-	-	-
2009	2	20/02/2009 20/03/2009	Neighbouring Residents	Noise
2008	5	15/02/2008 08/04/2008 12/06/2008 01/08/2008 26/11/2008	Neighbouring Residents	Noise Blasting Blasting Dust Noise
2007	6	07/08/2007 08/08/2007 28/08/2007 03/11/2007 07/11/2007 15/12/2007	Neighbouring Residents	Dust Dust Dust Noise No Issue Noise
2006	1	27/10/2006	Neighbouring Resident	Stray Light/Hours of Operation
2005	2	22/01/2005 01/04/2005	Neighbouring Residents	Dust Stray Light/Hours of Operation
2004	1	31/08/2004	Neighbouring Resident	Hours of Operation

## 12 INDEPENDENT AUDIT

An Independent Environmental Audit was undertaken at Charbon Colliery during January 2018, as required under Schedule 5 Condition 8 of the Charbon Coal Project Approval (PA 08\_0211). Table 44 below provides Charbon Colliery's response to the recommendations outlined in the 2018 Independent Environmental Audit Report.

**Table 36 Charbon Colliery's Response to the 2018 Independent Environmental Audit**

Condition	Description	Risk	Charbon Coal Response
Schedule 3 Condition 29 of PA 08_0211	Continue to discuss with DPE the need for the revised Water Management Plan to be approved along with its contained Erosion and Sediment Control Plan, Surface Water and Groundwater Monitoring Programs.	Medium	Centennial will consult with DPE regarding the approval of the Water Management Plan currently being assessed by the department.
Schedule 3 Condition 29 of PA 08_0211	Continually review the performance of the site in managing surface waters and meeting discharge criteria so as to assess the ongoing performance of the implementation of measures introduced under the PRP. If required, consider and implement further controls to maintain discharge water within EPL discharge criteria.	Medium	Centennial will continue to undertake inspections to identify the capacity of water management dams and will continue to report on water discharged at licenced discharge points in monthly Environmental Monitoring Data reports.
Schedule 3 Condition 29 of PA 08_0211	Given the high reliance of manual intervention to manage water in dams across the site; consider how more automation could be included into the system to reduce this reliance.	Medium	Centennial will consider options to install monitoring equipment with remote access to data at licenced discharge points located at water management dams at Charbon.
Schedule 3 Condition 29 of PA 08_0211	Improve drainage within and below the Trunk 2 ROM stockpile area to fix ongoing erosion and sedimentation in the catchment.	Medium	Centennial has constructed diversion drains and a sediment basin at the Trunk 2 ROM stockpile area.
Schedule 5 Condition 4 of PA 08_0211	Reviews of strategies, plans and programs should be documented regardless of whether or not a revision is required. Charbon to ensure revisions are in line with requirements of the condition.	Low	Noted.

Condition	Description	Risk	Charbon Coal Response
Schedule 5 Condition 4 of PA 08_0211	Continue to discuss with DPE the need for the revised Management Plans to be approved.	Low	Centennial will consult with DPE regarding the approval of management plans currently being assessed by the department.
Schedule 3 Condition 19 PA 08_0211	Charbon to consider if further actions are required to ensure monitoring is able to be consistently undertaken by the HVAS.	Not Verified	The power supply to the HVAS was reconfigured during 2017. The HVAS will continue to be audited and calibrated.
Schedule 3 Condition 19 PA 08_0211	Either ensure the dust depositional gauge is operational at DM-HL or secure another monitoring location.	Not Verified	The Air Quality Management Plan currently being assessed by the department does not include a dust deposition gauge at DM-HL.
Erosion and Sediment Control	Improvements in drainage in the 2 Trunk Stacker area are considered to be required in order to reduce erosion and sedimentation in this area.	Improvement	Centennial has constructed diversion drains and a sediment basin at the 2 Trunk Stacker area.
Erosion and Sediment Control	Long term solutions to erosion of the former waste rock dump upstream of the Stacker Sediment Dam Lower is required to gain a stable landform.	Improvement	Noted. This area is identified to be rehabilitated in the Rehabilitation and Closure MOP for Charbon Colliery.
Weed Control	Consider proactive control of the woody weed (possibly African Box Thorn) which is prolific at the site entrance administration building.	Improvement	The control of weeds will continue to be undertaken at Charbon Colliery.
Environmental Management Strategy	That the EMS be updated with the most recent approvals following approval by the Department of the management plans submitted for approval during 2017 e.g. the most recently approved MOP (2017) for Charbon.	Improvement	Centennial will update the Environmental Management Strategy with the most recent approvals following approval by the Department of the management plans submitted during 2017.

Condition	Description	Risk	Charbon Coal Response
Air Quality Management Plan	Continue to liaise with DPE on the need for the revised Air Quality Management Plan to be approved.	<b>Improvement</b>	Centennial will consult with DPE regarding the approval of the Air Quality Management Plan currently being assessed by the department.
Noise Management Plan	Incorporate recent variations of the EPL into the Noise Management Plan (specifically changes in the specified EPL noise limit criteria). Following the update resubmit the Noise Management Plan to DPE for approval.	<b>Improvement</b>	Centennial will update the Noise Management Plan with the recent variations to the noise limit criteria prescribed in the EPL and submit the Noise Management Plan to DPE for approval.
Water Management Plan	Continue to liaise with DPE on the need for the revised Water Management Plan, along with the Erosion and Sediment Control Plan, to be approved.	<b>Improvement</b>	Centennial will consult with DPE regarding the approval of the Water Management Plan currently being assessed by the department.
Water Management Plan	In subsequent revisions to the Water Management Plan, fully reflect variations of the EPL into the Plan (specifically changes in the rainfall event criteria and LDP discharge volume limits).	<b>Improvement</b>	Noted.
Water Management Plan	Consider periodic monitoring of LDP4 discharges (given that this is the higher risk catchment containing the Reject Emplacement Area) for a broad spectrum of analytes to verify that the pollution of waters by any pollutant other than those specified in the EPL is not occurring.	<b>Improvement</b>	Monitoring of discharged water at LDP4 will be undertaken in accordance with the monitoring requirements outlined in the Water Management Plan currently being assessed by the department.
Rehabilitation	Continue rehabilitation monitoring to ascertain rehabilitation performance of each area of rehabilitation; so that performance can be assessed and modifications made to ongoing rehabilitation efforts as required.	<b>Improvement</b>	Noted. The current monitoring program is undertaken to monitor the progress of rehabilitation against the rehabilitation objectives outlined in the Rehabilitation and Closure MOP for Charbon Colliery.

Condition	Description	Risk	Charbon Coal Response
Rehabilitation	Continue ongoing implementation of the two MOPs as required.	Improvement	Noted.
Greenhouse Gas and Energy Management Plan	Continue to discuss with DPE the need for the revised Greenhouse Gas and Energy Management Plan to be approved.	Improvement	Centennial will consult with DPE regarding the approval of the Greenhouse Gas and Energy Management Plan currently being assessed by the department.
Environmental Management Strategy	Continue to liaise with DPE to gain approval of the updated Environmental Management Strategy	Improvement	Centennial will consult with DPE regarding the approval of the Environmental Management Strategy currently being assessed by the department.
Access to Information	Consider including on the website the EPBC Approval (Commonwealth), Mining Leases, Water Licences, revised 2015 Annual Review, proponent's response to 2012 IEA and the Community Complaints Register prior October 2016.	Improvement	Noted. Centennial will continue to maintain access to information as prescribed Condition 7 of Schedule 5 in Project Approval 08_0211.

## 13 WASTE MANAGEMENT AND MINIMISATION

In accordance with Condition 46 of Schedule 3 in the Project Approval (PA 08\_0211) waste management and minimization at Charbon Colliery is monitored and reported.

Underground coal production at Charbon Colliery ceased in April 2014 and open cut coal mining operations ceased during August 2015. Charbon Colliery is currently undertaking rehabilitation activities to address the requirements of mine closure. Hence, all waste produced at Charbon during 2019 was related to the rehabilitation and maintenance of the mine site. A summary of waste produced on site is detailed in Table 37.

### 13.1 Sewage Treatment and Disposal

Sewage and other waste water from the bathhouse and site offices within the surface facilities area is treated using an approved biocycle treatment facility. Treated water is used to irrigate landscaped areas via LDP001 (which allows for the discharge of effluent from the onsite sewage treatment system via irrigation) and is authorized under EPL 528.

### 13.2 Oil and Grease Containment and Disposal

The diesel storage facility at Charbon Colliery is located in the area of the Coal Handling and Preparation Plant at the mine site. This facility comprises of one above ground tank and is compliant with *Australian Standard AS1940-2004 – The Storage and Handling of Flammable and Combustible Liquids*. Bulk diesel is delivered to the mine site by a licensed contractor as required. Hydrocarbons are stored in bunded areas at the mine site. Waste oil and grease is collected from site by the licensed contractor for waste management

### 13.3 General Waste Disposal

General waste is collected in industrial waste containers that are serviced by a licensed contractor. Scrap metal is collected in a separate bin and recycled. Paper and cardboard is also collected in a separate bin and recycled.

**Table 37      Waste Summary**

	2015	2016	2017	2018	2019
Hazardous Recycled (Waste Oil, Waste Grease / kL)	14.5	10.1	0.2	10.0	91.2
Non-Hazardous Recycled (Paper & Cardboard, Scrap Steel / tonnes)	52.6	2.8	71.4	819.7	1.2
Hazardous Disposal (Oily Rags / tonnes)	0	0	0	8.2	1.3
Non-Hazardous Disposal (Mixed Solid Waste / tonnes)	17.9	3.9	27.2	1.9	0.9
<b>TOTAL OFFSITE WASTE</b>	<b>85.0</b>	<b>16.7</b>	<b>98.8</b>	<b>839.9</b>	<b>94.7</b>
<b>TOTAL RECYCLED WASTE</b>	<b>67.1</b>	<b>12.9</b>	<b>71.6</b>	<b>829.7</b>	<b>92.5</b>
<b>PERCENTAGE WASTE RECYCLED</b>	<b>78.9%</b>	<b>76.9%</b>	<b>72.4%</b>	<b>98.8%</b>	<b>97.7%</b>

## 14 INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

**Table 38 Summary of Reportable Incidents and Regulatory Actions**

Compliance Type	Agency	Number	Response
Development Control Order	DPIE	1	A Development Control Order was received on 12 June 2019 to undertake rehabilitation works on all existing areas of disturbance at the Premises.

**Note:** This table includes actions taken by DPIE, DRG and the EPA during the reporting period.

**Table 39 Incident/Non-Compliance Summary**

Nature of the incident/non-compliance	Water discharging from LDP3 exceeded the pH limit (6.5 – 8.5) stipulated in Section L2.4 of EPL 528. The discharged water had a pH level of 9.0 on 14 March 2019.
Date of incident/ non-compliance (if known; if not known state not known)	14 March 2019
The location of the incident/ non-compliance (include a figure if appropriate), if known	LDP3
Detail the cause of the incident/non-compliance	Water was discharged through LDP3 with a pH level higher than the EPL limit.
Detail action that has been, or will be, taken to mitigate any adverse effects of the incident/ non-compliance	Water samples were collected of the discharge event on 14 March 2019.
Detail action that has been, or will be, taken to prevent recurrence of the incident/ non-compliance	Monitoring data will be reviewed during future discharge events to trend any increases in the pH level as the water level in the dam drops.

**Table 40 Incident/Non-Compliance Summary**

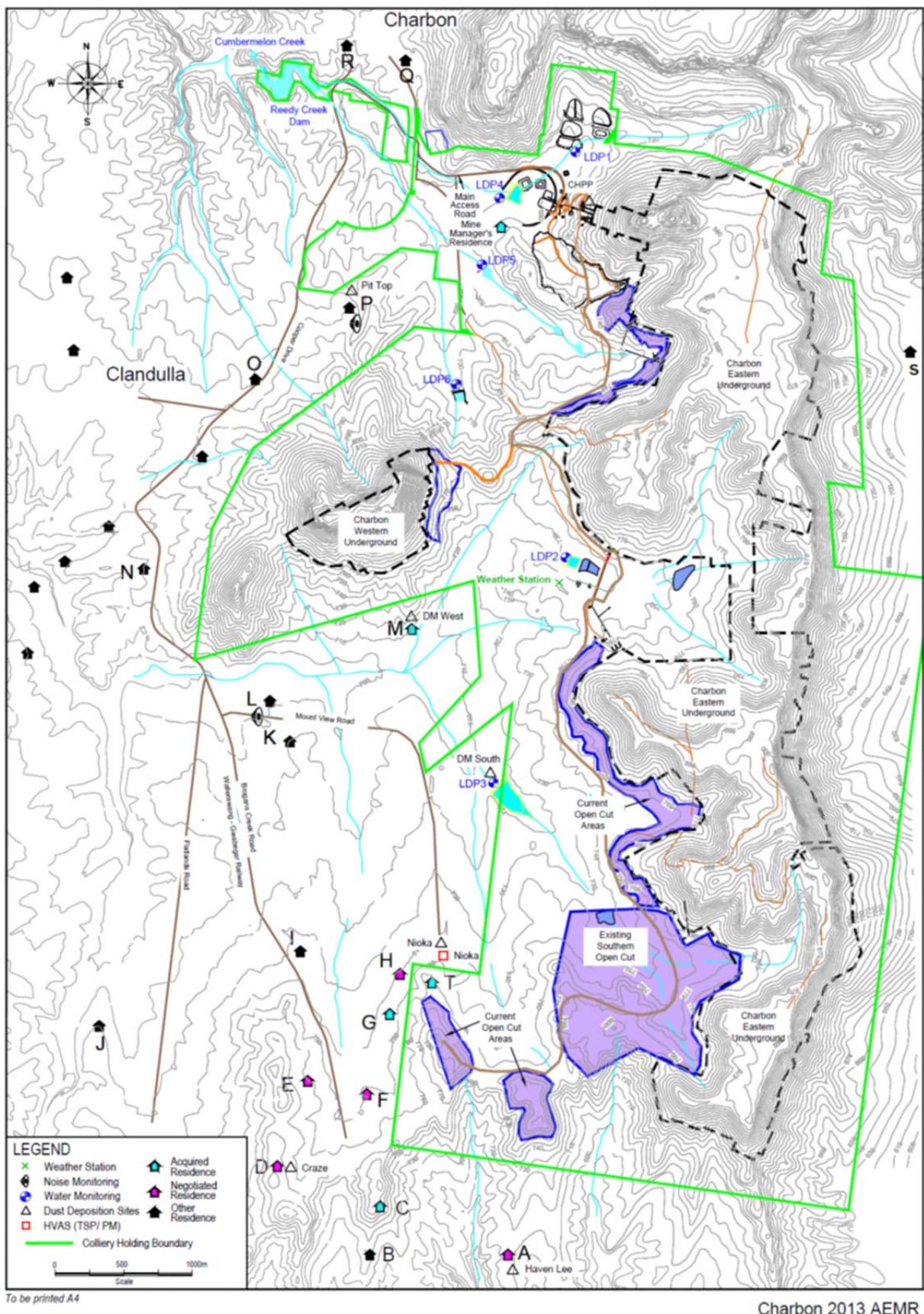
Nature of the incident/non-compliance	Water discharging from LDP4 was not analysed for oil and grease.
Date of incident/ non-compliance (if known; if not known state not known)	4 March 2019
The location of the incident/ non-compliance (include a figure if appropriate), if known	LDP4
Detail the cause of the incident/non-compliance	Water samples were not analysed for oil and grease and hence did not comply with condition M2.2 in EPL 528.
Detail action that has been, or will be, taken to mitigate any adverse effects of the incident/ non-compliance	Nil due to this being a laboratory oversight that occurred at the time of the discharge event.
Detail action that has been, or will be, taken to prevent recurrence of the incident/ non-compliance	The laboratory Project Plan document for Charbon Colliery has been revised.

## 15 ACTIVITES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

Charbon Colliery has ceased coal mining and is currently undertaking rehabilitation activities to facilitate closure of the mine site. Charbon will continue working in conjunction with State and Federal agencies and technical consultants during the 2020 reporting period. The activities proposed for 2020 are summarised in Table below:

**Table 41 Activities proposed to be completed in the next reporting period**

Activities proposed for 2020	Proposed timing of completion
Proposed rehabilitation of the Southern Open Cut and Partial 8 Trunk areas	2020
Implementation of the Rehabilitation and Closure Mining Operations Plan	2020
Implement the Water Management Plan	2020
Implement the Air Quality Management Plan	2020
Implement the Noise Management Plan	2020
Implement the Environmental Management Strategy	2020



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Charbon 2013 AEMR  
Sensitive Receiver and Monitoring Locations

Figure 42 Charbon Colliery Sensitive Receiver and Monitoring Locations



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