



2019 Annual Review

Wilpinjong Coal Mine

Table 1 Annual Review Title Block

Name of operation	Wilpinjong Coal Mine
Name of operator	Wilpinjong Coal Pty Limited
Development consent/project approval #	SSD-6764
Name of holder of development consent/project approval	Wilpinjong Coal Pty Limited
Mining lease #	ML1573, ML1779 & ML1795
Name of holder of mining lease	Wilpinjong Coal Pty Limited
Water licences #	WAL21499, WAL19045, WL19055, WL19057, WL19058, WL19426, WAL19425, WAL19430, WAL36398, WAL9476, WAL39785, WAL41548, WAL41549, WAL41550, WAL41551
Name of holder of water licence	Wilpinjong Coal Pty Limited
MOP start date	01 January 2019
MOP end date	31 December 2020
Annual review start date	01 January 2019
Annual review end date	31 December 2019

I, Kieren Bennetts, certify that this audit report is a true and accurate record of the compliance status of the Wilpinjong Coal Mine for the period 01 January 2019 to 31 December 2019 and that I am authorised to make this statement on behalf of Wilpinjong Coal Pty Limited.

Note.

a) The Annual Review is an 'environmental audit' for the purposes of section 122B(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	Kieren Bennetts
Title of authorised reporting officer	Environment & Community Manager
Signature of authorised reporting officer	
Date	31 March 2020

This 2019 Annual Review (AR) (this Report) presents a summary of regulatory compliance, environmental performance and community engagement activities for the *review period* from 1 January 2019 to 31 December 2019.

This Report provides the results and assessment of environmental performance relevant to the current development consent approval SSD-6764 for the *review period*.

This AR has been prepared to satisfy the requirements of Condition 4, Schedule 5 of Development Consent (SSD-6764) requiring the preparation of an Annual Review and conditions within Mining Lease (ML) ML1573, ML1779, ML1795 and EPBC Approval 2015/7431. The AR was developed to align with the *Annual Review Guideline (October 2015)* issued by the NSW Department of Planning, Infrastructure and Environment (DPIE).

Copies of this Report will be provided to the following stakeholders:

- NSW Department of Planning, Infrastructure and Environment (DPIE);
- DPI&E – Resource Regulator (DPIE - RR)¹;
- NSW Environment Protection Authority (EPA);
- NSW Department of Primary Industries – Division of Water (DPI – Water);
- The Environment, Energy and Science (EES) Group²;
- Mid-Western Regional Council (MWRC);
- NSW Health;
- Department of Agriculture, Water and the Environment³; and
- The Mine’s Community Consultative Committee (CCC).

In addition, a copy will be made publicly available on the Peabody website: <http://www.peabodyenergy.com/content/427/australia-mining/new-south-wales/wilpinjong-mine/approvals-plans-and-reports-wilpinjong-mine> in accordance with Condition 12(a), Schedule 5 of Development Consent (SSD-6764).

¹ Formally the Division of Resources and Geosciences (DRG)

² Formally the NSW Office of Environment and Heritage (OEH).

³ Formally the Department of the Environment and Energy (DoEE);

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1.0 STATEMENT OF COMPLIANCE

Table 2 Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	Yes / No*
SSD-6764	No
ML1573	Yes
ML1779	Yes
ML1795	Yes
EL6169 & EL7091	Yes
EPL12425	No
Water Licences	Yes
EPBC Approval 2015/7431	Yes

Notes:* Refer to **Table 3** and **Section 11** for details

Table 3 Non-Compliances

Relevant Approval	Condition	Condition Description	Compliance Status	Comment	Section in AR
SSD-6764	Con. 61, Sch 3	Within 6 months of the commencement of development under this consent, unless the Secretary agrees otherwise, the Applicant must prepare a Rehabilitation Strategy to the satisfaction of the Secretary	Non-compliance	Comments received by DPIE in late 2019 and WCPL progressing finalisation and resubmission of the Rehabilitation Strategy expected in early 2020.	Section 11
	Con 30(d)(iii), Sch 3	A SWMP that includes a plan to respond to any exceedances of the trigger levels.	Non-compliance	Notification to relevant government agencies did not occur in the nominated time frame. Initial investigations by WCPL identified the potential source of the trigger exceedances to be non-mine related due to run off from the unsealed section of the Ulan Wollar Road which enters Cumbo Creek at this location.	
	Con 30(d)(iv), Sch 3	A GWMP that includes a plan to respond to any exceedances of the trigger levels.	Non-compliance	Notification to relevant government agencies did not occur in the nominated time frame. Initial investigations by WCPL identified the potential source of the trigger exceedances to be non-mine related due to extreme ongoing climatic conditions experienced in 2019.	
EPL12425	M2.2	Air Monitoring Requirements (PM10)	Non-compliance	Two PM10 dust samples were not collected and analysed at monitoring point 13 (HV1), due to planned/unplanned power outages and instrument fault.	

Relevant Approval	Condition	Condition Description	Compliance Status	Comment	Section in AR
	M2.2	Air Monitoring Requirements (PM10)	Non-compliance	Five PM10 dust samples were not collected and analysed at monitoring point 20 (HV4), due to planned/unplanned power outages and instrument fault.	
	M2.2	Air Monitoring Requirements (PM10)	Non-compliance	Two PM10 dust samples were not collected and analysed at monitoring point 27 (HV5), due to planned/unplanned power outages and instrument fault.	
	M2.2	Air Monitoring Requirements (PM10)	Non-compliance	For the reporting period 18.4% of the continuous PM10 dust monitoring did not occur at monitoring point 25 (TEOM 3). Major cause was instrument error. Other minor causes included general maintenance (including calibrations) and planned/unplanned power outages.	
	M2.2	Air Monitoring Requirements (PM10)	Non-compliance	For the reporting period 1.2% of the continuous PM10 dust monitoring did not occur at monitoring point 28 (TEOM 4). General maintenance (including calibrations), instrument failure/repair, and planned/unplanned power outages.	
	M2.2	Air Monitoring Requirements (PM2.5)	Non-compliance	For the reporting period 18.4% of the continuous PM2.5 dust monitoring did not occur at monitoring point 29 (TEOM 2.5). Major cause was unknown instrument fault causing inaccurate data. General maintenance (including calibrations), instrument failure/repair, and planned/unplanned power outages.	
	M4.2	Weather Monitoring	Non-compliance	For the reporting period the percentage of continuous monitoring that did not occur for: (i) air temperature, and (ii) wind speed/direction, lapse rate, rainfall and humidity, was 0.8%. General maintenance (including calibrations) or equipment failure/repair.	

Table 4 Compliance Status Key

Risk Level	Colour Code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> • potential for moderate environmental consequences, but is unlikely to occur; or • potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-compliant	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)

2.0 INTRODUCTION

2.1 Mining Operations

The Wilpinjong Coal Mine (the Mine) is owned by Wilpinjong Coal Pty Limited (WCPL), a wholly owned subsidiary of Peabody Australia Pty Ltd (Peabody). The Mine is an existing open cut coal mining operation situated approximately 40 kilometres (km) north-east of Mudgee, near the Village of Wollar, within the Mid-Western Regional Local Government Area, in central New South Wales (NSW) (**Figure 1**). The mine produces thermal coal products which are transported by rail to domestic customers for use in electricity generation and to the Port of Newcastle for export. Open cut mining operations and associated mobile equipment movements are undertaken 24 hours per day, seven days per week.

WCPL and Peabody Pastoral Holdings Pty Ltd are a major landholder owning adjacent rural properties and land to the east and south-east of the mine. Land to the west of the mine is owned by adjacent mining companies, whilst the National Parks and Wildlife Service estate own significant land to the north and south-west of the Mine.

Private properties are located predominantly in and around the Wollar Village approximately 1.5 km to the east of the Mine and along Mogo Road to the north of the Mine.

The Mine originally operated under Project Approval (PA 05-0021) that was granted by the Minister for Planning under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) on 1 February 2006. On 24 April 2017, WCPL was granted Development Consent (SSD-6764) for the Wilpinjong Extension Project (WEP) that provides for the continued operation of the Mine at rates of up to 16 million tonnes per annum (Mtpa) of run-of-mine (ROM) out to 2033, and access to approximately 800 hectares (ha) of open cut extensions. Development Consent (SSD-6764) has superseded the Project Approval (Project Approval 05-0021)⁴. WCPL commenced development under Development Consent SSD-6764 on the 19 September 2017.

The approximate extent of the WEP approved open cut and contained infrastructure area at Wilpinjong Coal Mine is shown on **Figure 2**. Major components include open cut pits, an elevated waste rock emplacement in Pit 2, ROM pads/coal stockpiles, water management infrastructure, CHPP, product coal stockpiles and rail and other associated infrastructure areas. Open cut mining targeting the Ulan Coal Seam and Moolarben Coal Member (within ML1573, ML1779 & ML1795) and the handling and processing of ROM coal at the CHPP is currently approved to operate 24 hours per day, seven days per week.

2.2 Mine Contact Details

Contact details for key personnel responsible for environmental management at the Mine are in **Table 5**.

Table 5 Mine Contact Details

Name	Position	Contact Details
Blair Jackson	General Manager	Email: bjackson@peabodyenergy.com
Kieren Bennetts	Environment & Community Manager	Email: kbennetts@peabodyenergy.com
Clark Potter	Senior Environmental Advisor	Email: cpotter@peabodyenergy.com

The street, postal address and contact telephone numbers for the Mine are as follows:

Street Address

1434 Ulan-Wollar Road
WOLLAR NSW 2850

Postal Address

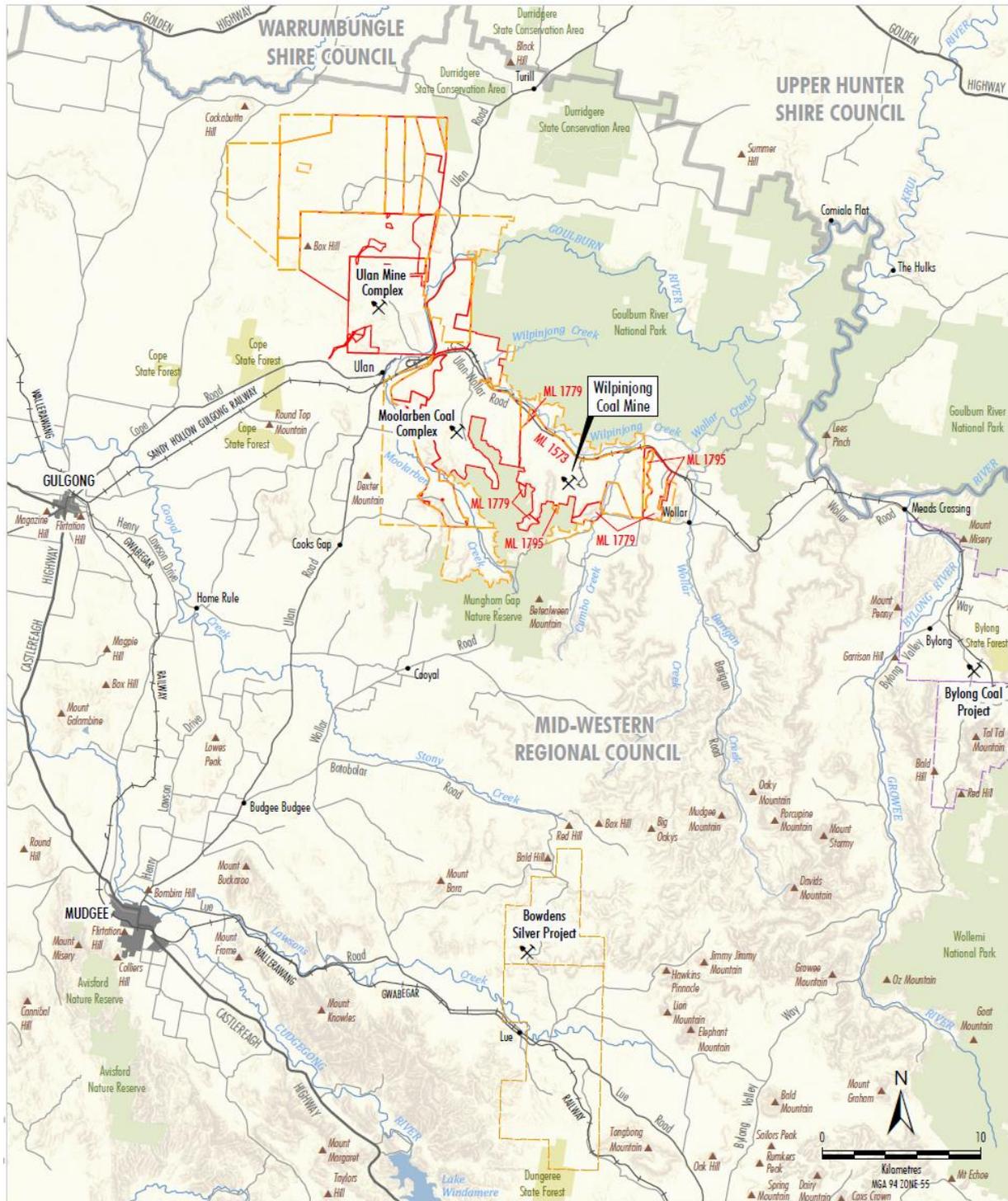
Locked Bag 2005
MUDGE E NSW 2850

Phone Number

Ph:(02) 6370 2500

⁴ Condition 9, Schedule 2 of SSD-6764 (Surrender of Existing Project Approval). Notice of Surrender PA05_0021 was submitted 31 May 2019 in accordance with the time extension granted by DPIE. At the request of DPIE, WCPL are currently addressing a *Possessory Title Application* associated with the Notice of Surrender.

Figure 1 Locality Plan

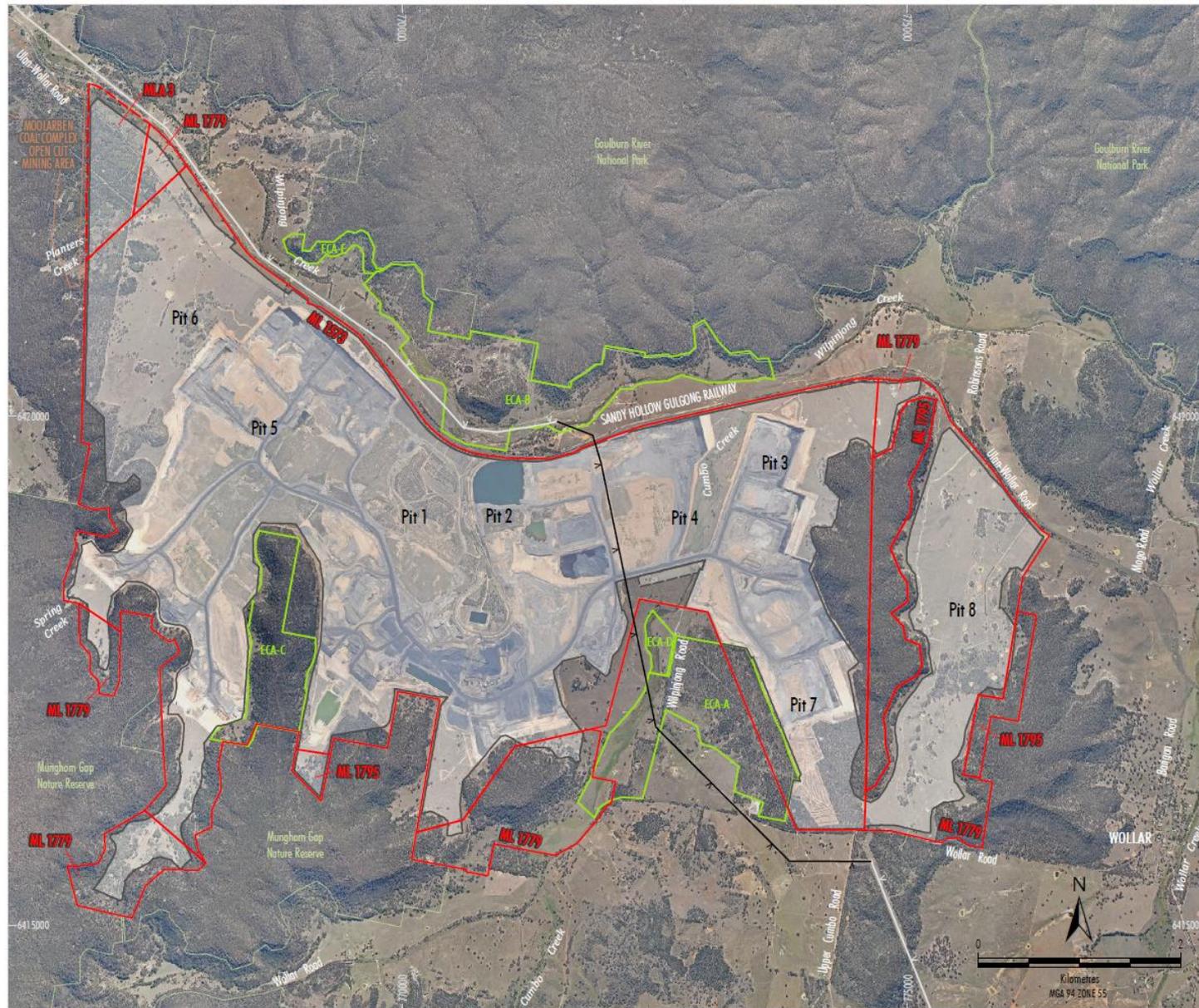


- LEGEND**
- Mining Lease Boundary
 - Exploration Licence Boundary
 - Authorisation Boundary
 - Local Government Boundary
 - NSW State Forest
 - National Park, Nature Reserve or State Conservation Area
 - ✂ Coal Mining Operation

Source: WCPL (2019); Office of Environment & Heritage NSW (2019); NSW Land & Property Information (2017); NSW Dept of Industry (2019); Geoscience Australia (2011)

Peabody
WILPINJONG COAL MINE
 Regional Location

Figure 2 The Approved WEP Layout and Surrounds



- LEGEND**
- Mining Lease Boundary
 - Mining Lease Application Boundary
 - Approved/Existing Open Cut and Contained Infrastructure Area *
 - Relocated Block Bank and Cumbo Creek Disturbance Area
 - Enhancement and Conservation Area
 - Approved TransGrid 330 kV ETL Deviation
 - Existing TransGrid 330 kV ETL

* Inclusive of the agreed minor change to the area confirmed by DPIE on 23rd August 2019.

Source: WCPL (2019); NSW Dept of Industry (2019)
Orthophoto: WCPL (March 2018)

Peabody
WILPINJONG COAL MINE
General Arrangement

3.0 APPROVALS

Table 6 presents the current approvals, leases and licences that the Mine operates under.

Table 6 Mine Approvals, Leases and Licences

Relevant Authority	Instrument	Approval/Licence No.	Expiry Date
DP&E	Development Consent	SSD-6764*	28 years from commencement of Project Approval (i.e. 2033)
DRG	Mining Lease	ML1573	February 2027
	Mining Lease	ML1779	20 December 2039
	Mining Lease	ML1795	Section 3.2
	Mining Lease Application 3	(yet to be lodged)	(yet to be lodged)
	Exploration Licence	EL 6169	28/11/2017^
	Exploration Licence Mine within Wilpinjong B Notification Area	EL 7091	03/03/2019^
		ML 1573	Endorsed DSC 19 February 2013 Approved 24 January 2014
	Mining Operations Plan (MOP) As Amended	MOP A Approved on the 26 November 2019	31 December 2020
	Tailings Emplacement	Section 101 – TD1 and TD2 (approv. No. 07/1226)	February 2006 (Facility decommissioned)
	Tailings Emplacement	TD3 and TD4 (High Risk Activity Notification)	December 2011 (Facility decommissioned)
	Tailings Emplacement	TD5 (High Risk Activity Notification)	December 2013 (Facility decommissioned)
	Tailings Emplacement	Section 100 – TD6 (approv. No. 08/9006)	31 January 2016
	Tailings Emplacement	Section 101 - Decommission TD2 (approv. No. 09/2396)	29 April 2009 (Facility decommissioned)
Tailings Emplacement	Section 101 - Decommission TD1 (approv. No. 09/2396)	28 October 2011 (Facility decommissioned)	
EPA	Environment Protection Licence (EPL)	EPL 12425	Until the licence is surrendered, suspended or revoked. The licence is subject to review every 3 years
	NSW Radiation Control Act 1990 Registration	Licence Number 5061384	02 January 2021
	Explosives Licence	NSW Explosives Act 2003 Part 3 Licence (Licence Number XSTR200024)	24 March 2023
DPI-Water	Water Licences	Refer to Table 22 & Table 23 in Section 7.1	Refer to Table 22 & Table 23 in Section 7.1

Note: Copies of the Development Consent (SSD-6764), EPL 12425 and ML 1573, 1779 & 1795 are available on the Peabody Energy website (<http://www.peabodyenergy.com>) * WCPL have sought approval from the DP&E to extend the extension to time for surrendering PA05_0021. ^ Renewal applications lodged with DPIE 13 November 2017 for EL 6169 & 28 February 2019 for EL 7091.

3.1 Ulan Road Strategy (Summary of Actions 2020)

The Ulan Road Strategy (the Strategy) defines the program for upgrading and maintenance of Ulan Road between Mudgee and the entrance to the underground surface facilities of Ulan Coal Complex over the next 21 years and was approved by NSW Planning and Environment on 25 May 2013. The operation of the Strategy relies upon the *Funding and Delivery of Ulan Road Upgrade and Maintenance Deed* (the Deed) made between the Mines and Mid-Western Regional Council (MWRC) (Appended, clause 19 extracted). Contributions to the Strategy by the Mines in accordance with the deed are mandatory under

project approval consent conditions, as modified over the past 5 years. The Strategy also provides for the completion of noise attenuation works at the eighteen identified properties along Ulan Road.

In 2019, fifteen of the identified eighteen properties have their respective noise mitigation measures completed. One property has declined noise mitigation works and two properties were in the process of finalising agreements their noise mitigation measures. Subject to the finalisation of these remaining two agreements and their respective noise mitigation measures, all identified properties wishing to have noise mitigation measures under the Strategy is expected to be completed during 2020.

All associated works regarding the road capital upgrades for Ulan Road and Cope Road in line with the Strategy and managed by MWRC have been 100% completed, with the maintenance period now triggered in accordance with the Strategy (maintenance period ongoing for the Wilpinjong Coal Project).

3.2 Changes to Approvals

There was one variation to EPL 12425 during the review period. Licence variation notice 1578395 was issued on the 11 April 2019 by the EPA to remove the PRP U1 and Special Conditions E1, E2 due to completion.

On the 29 March 2019, WCPL consulted with the Department of Planning, Infrastructure & Environment (DPIE) to request a minor variation to amend the disturbance footprint associated with the Pit 3 to Pit 8 haul road and associated ridge cutting. This was triggered by the detailed design of the required ridge cutting. On the 23 April 2019, WCPL received approval from the DPIE that the proposed minor changes to the haul road footprint area are generally in accordance with the WEP and project approval. Accordingly, WCPL have updated and in the process of re-submission all relevant management plans required by SSD-6764 to reflect this change (Figure 2), as discussed with the DPIE.

On the 8 August 2019, WCPL commenced consultation with the Department of Planning, Infrastructure & Environment (DPIE) to request a minor variation to increase the disturbance footprint and open cut boundary to Pit 8, arising from refinement to the Pit 8 detailed design. On the 23 August 2019, WCPL received approval from the DPIE that the proposed minor changes to the footprint area of Pit 8 are generally in accordance with the WEP and project approval. Accordingly, WCPL have updated and in the process of re-submission all relevant management plans required by SSD-6764 to reflect this change (Figure 2), as discussed with the DPIE.

A new two-year Mining Operations Plan (MOP) was developed and submitted to the DRG and relevant stakeholders in April 2019 to align with the approved BVT performance and completion criteria and the recently issued ML1779. The MOP also reflected the approved changes to the Pit 3 to Pit 8 haul road footprint. The new MOP was approved by the DRG 11 June 2019.

The MOP was revised and resubmitted (i.e. MOP Amendment A) on the 3 November 2019 to the DRG and other relevant stakeholders. MOP Amendment A was sought to include the recent granting ML1795 from MLA515. MOP Amendment A included updating the MOP text, figures, MOP plans (Plan 3A & 3B) to reflect the changes in the mining and rehabilitation scheduled and the minor variation to the Pit 8 boundary. MOP Amendment A was approved by the DRG on the 26 November 2019.

3.3 Mining Lease Application

The WEP extended into three new Mining Lease Application (MLA) areas within both EL 6169 and EL 7091. Two MLA's including MLA510 and MLA515 have now been granted approval and converted to ML1779 and ML1795 respectively (**Figure 2**). During the previous reporting period ML1779 was approved on the 20 December 2018. During this reporting period ML1795 was approved on the 27 September 2019.

No mining activities will occur in the MLA3 area until a new ML is issued, and the current MOP and Wilpinjong's Colliery Holding Boundary is amended and approved by the DRG.

WCPL will also renew existing ELs and ML1573 as required during the life of the Mine. WCPL submitted ELA5804 (Tralee) Application on the 9 May 2019 under operational allocation.

3.4 Management Plans

WCPL operates an Environmental Management System to manage compliance and advance continual improvement across the Mine. During the review period several management plans were revised and updated accordingly and submitted for re-approval as required by SSD-6764. A summary of the status of management plans required by SSD-6764 is presented in **Table 7**.

Table 7 Status of Environmental Management Plans

Management Plan	Schedule 3 of SSD-6764	Approval Status
Noise Management Plan [^]	Condition 5	Version 3 approved on 4 August 2017
Blast Management Plan [^]	Condition 14	Version 5 approved on 28 Sept 2018
Air Quality Management Plan [^]	Condition 20,	Version 4 approved on 8 Sept 2018
Water Management Plan [^]	Condition 30	Version 4 approved on 8 Sept 2018
Site Water Balance [^]	Condition 30(d)(ii)	Version 3 approved on 4 August 2017
Surface Water Management Plan [^]	Condition 30(d)(iii)	Version 2 approved on 4 August 2017
Groundwater Management Plan [^]	Condition 30(d)(iv)	Version 3 approved on 4 August 2017
Biodiversity Management Plan [^]	Condition 42	Version 5 approved on 4 August 2017
Aboriginal Cultural Heritage Management Plan [^]	Condition 47	Version 5 approved on 4 August 2017
Spontaneous Combustion Management Plan [^]	Condition 20(g)	Version 4 approved on 4 August 2017
Historic Heritage Management Plan [^]	Condition 49	Version 2 approved on 4 August 2017
Rehabilitation Management Plan [^]	Condition 64	Approved as the MOP
Environmental Management Strategy [^]	Condition 1, Schedule 5	Version 5 approved on 4 August 2017
Social Impact Management Plan	Condition 63	Version 1 approved 21 October 2019

Notes: [^]Revised and resubmitted for approval in September 2019 to address Pit 8 boundary change and granting of ML1795

During the reporting period, WCPL was in consultation with the relevant agencies and stakeholders developing and progressing, but not limited to the following;

- The Wilpinjong Coal Mine Social Impact Management Plan (SIMP) as required by Condition 63, Schedule 3 of the Development Consent SSD-6764:
 - SIMP approved in October 2019.
- BVT performance and completion criteria as required by Condition 37, Schedule 3 of Development Consent SSD-6764 (now approved):
 - BVT performance and completion criteria approved in April 2019.
- The Rehabilitation Strategy as required by Condition 61, Schedule 3 of the Development Consent SSD-6764:
 - Comments received by DPIE and WCPL progressing finalisation and resubmission of the Rehabilitation Strategy expected in early 2020.

The status of the above plans, strategies and performance criteria will be provided in the next AR. In accordance with Schedule 5, Condition 5 of SSD-6764, WCPL will review and if necessary revise the strategies, plans and programs required under the consent within three months of the submission of this Report to relevant government regulators.

In accordance with Schedule 5, Condition 12 of SSD-6764, relevant management plans have been made available to the public on the Peabody Energy website www.peabodyenergy.com

4.0 OPERATIONS SUMMARY

Table 8 displays the production summary for 2019 and the forecast production summary for 2020.

Table 8 Production Summary

Material	SSD-6764 Approved Limit	This Reporting Period (actual)	Next Reporting Period (forecast)
Waste Rock/Overburden	NA	45.52Mbcm	51.32Mbcm
ROM Coal	16 Mtpa	15.12Mt	14.68Mt
Coarse Reject & Tailings (TFP)*	NA	2.31Mt	2.34Mt
Fine Tailings	NA	0	0
Product Coal	NA [#]	12.791Mt [#]	12.680Mt [#]

Notes: *Tailings Filter Press⁵, Million tonnes per annum = (Mtpa), Million bank cubic meters = (Mbcm). [#] Product coal railed.

4.1 Other Operational Conditions

At the end of the 2019 review period, open cut mining operations were located in Pit 1, Pit 2, Pit 3, Pit 4, Pit 5, Pit 6 and Pit 7 as identified in Plan 3B of MOP Amendment A (**Figure 2**).

In accordance with Condition 51, Schedule 3 of SSD-6764, WCPL maintains records of the amount of coal transported from the site each year, and the number of coal haulage train movements generated by the Mine on a daily basis.

12.791Mt of product coal was transported from the Mine via rail during the 2019 Annual Review period and involved an average of approximately four train movements per day during 2019 (**Appendix 1**).

Train loading is available on a continuous basis, 24 hours a day and 7 days per week, with a maximum of 10 laden coal trains leaving the site per 24-hour period and an average of six train movements per day when calculated over one calendar year (Condition 7, Schedule 2 of SSD-6764).

No overburden material was supplied (or requested) to regional infrastructure projects in the vicinity of the Mine.

Construction activities in the reporting period included relocation of the 330KV transmission line, minor alterations to existing administration buildings, relocation of demountable crib huts, extensions to the main car parking area and refinements to the water treatment facility.

4.2 Next Reporting Period

The proposed mining locations for the 2020 review period are Pit 1, Pit 2, Pit 3, Pit 4, Pit 5, Pit 6, Pit 7 and Pit 8. The approved MOP Amendment A accommodates the recently issued ML1779 which allows open cut mining activities to proceed in Pit 8.

The revised indicative mining schedule and sequence of open cut mining operations are provided MOP Amended A Plans 3A and 3B.

⁵ In 2015 the Belt Press Filter (BPF) commenced at the CHPP. The BPF and associated transfer conveyor allows for co-disposal of tailings with coarse reject/overburden and improved recovery of water from tailings.

5.0 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

Both the DPIE and DRG accepted and approved the 2018 Annual Review on the 22 June 2019 and the 12 July 2019 respectively. There were no specific actions to be addressed in relation to the 2018 Annual Review other than providing a copy on the Peabody Energy website www.peabodyenergy.com

Table 9 Actions Required from Previous Annual Review

Action required from previous 2018 Annual Review	By Who	Action taken by WCPL
<p>In accordance with Condition 12 of Schedule 5 of the consent and Condition 11 of Schedule 5 of the approval the Applicant is required to make a copy of the documents listed by this condition publicly available on the company website and ensure that these documents are up-to-date.</p> <p>It is requested that the Annual Review is uploaded within one month of the date of this letter.</p>	<p>DPIE</p>	<p>2018 Annual Review is available to the public on the Peabody Energy website www.peabodyenergy.com</p>

6.0 ENVIRONMENTAL PERFORMANCE

Environmental management measures undertaken during the 2019 review period have been conducted as required by the MOP (as amended), relevant management plans and monitoring programs developed for the Mine in accordance with SSD-6764 and EPL12425. The 2019 Annual Review provides the results and assessment of environmental performance relevant to development consent approval SSD-6764. The locations of environmental monitoring undertaken throughout the 2019 review period are provided in **Appendix 3**.

6.1 Meteorological Monitoring

Local meteorological data for 2019 was recorded by the Mine's meteorological station and was operated in accordance with SSD-6764 and EPL 12425. The meteorological station monitors a number of parameters, including temperature, humidity, rainfall, wind speed and wind direction. The location of the meteorological station and associated tables and graphs are provided in **Appendix 3A**.

The month with the highest total rainfall recorded was 108.8mm in March 2019. The least amount of rainfall was recorded in December with 3mm for the month. The total cumulative annual rainfall recorded for 2019 was 265.6mm. This is well below the average long-term cumulative annual average rainfall (in the vicinity of the Mine) ranging from 587.7mm to 651.5mm (WEP EA) and well below the annual rainfall record of 487.8mm in 2018 and 531.4mm recorded in 2017. The total cumulative annual rainfall recorded for 2019 was also below the on-site weather station's average short-term (i.e. year 2006 to 2015) cumulative annual average rainfall of 649.7mm (WEP EA). The majority of the Central Western region of NSW, including the Wilpinjong and Wollar area were declared either in 'drought' or 'intense drought' during 2019 by the NSW Department of Primary Industries (www.dpi.nsw.gov.au).

A maximum temperature of 41.7°C (at 10m) was recorded in December 2019. The lowest minimum temperature was -3.6°C (at 10m) recorded in June. The 2019 average minimum of 4.7°C was slightly higher than the short term (i.e. year 2006 to 2015) average minimum of 3.0°C. The 2019 average maximum of 31.2°C was slightly lower than the short-term average maximum of 31.7°C.

Wind speed recorded during the 2019 review period displayed an average monthly wind speed range between 1.1 metres per second (m/s) to 3.0m/s. The average windspeed in 2019 appeared to be slightly greater than 2018 with average monthly wind speed ranging between 1.3 m/s to 2.3m/s. A maximum wind speed of 11.9m/s was recorded in November 2019.

6.2 Air, Blast & Noise Monitoring

Air Quality Monitoring

The Mine has developed and implemented an Air Quality Management Plan (AQMP) (**Table 7**). Criteria for airborne particulate matter (i.e. dust) are specified in Condition 17, Schedule 3 of SSD-6764. During the 2019 review period, the Mine carried out dust monitoring in accordance with the AQMP at the locations in **Appendix 3B** and at the frequency displayed in **Table 10**.

Table 10 Summary of Air Quality Monitoring Program

Monitoring Parameter	Monitoring Locations	Frequency
Dust Deposition	DG4, DG5, DG8, DG10, DG11 & DG15	Monthly
	DG12 [#] , DG13 [#] and DG14 [#]	Monthly (mining < 1 km of the site)
High-Volume Air Sampling	HV1, HV4 & HV5	Continuous six day cycle
TSP	HV3 [^]	Continuous six day cycle
TEOM (PM10)	TEOM 1 [^] , TEOM 3 & TEOM 4	Continuous (24 hour average)
TEOM (PM2.5)	TEOM 5	Continuous (24 hour average)*

Notes: [^] Data from DG10, HV3 and TEOM1 are not for compliance purposes but utilised for management purposes only. [#] Aboriginal rock art site monitoring Sites 72, 152 and 153.) * TEOM_{2.5} installed and operating prior to 31/12/2017.

Table 12 contains the air quality monitoring results, as well as a discussion of the results for the review period. Further air quality monitoring results for 2019 review period are provided in **Appendix 3B**.

HV3 is located in Pit 8 of the approved WEP mining area. Data from HV3 is recorded for management purposes only and is not a compliance-based monitor, as described in the AQMP. The annual average TSP concentration for 2019 is below the criterion of 90µg/m³ for all HVAS run days and excluding extraordinary event days in 2019 (**Appendix 3B**).

Spontaneous Combustion

The Mine has developed and implemented a Spontaneous Combustion Management Plan (SCMP) (**Table 7**) as Appendix 3 of the AQMP. WCPL had a temporary ambient air quality monitoring station in the Village of Wollar as a key management measure⁶ to monitor specified pollutants for spontaneous combustion, during the removal of Keylah Dump. The removal of Keylah Dump was completed during 2017. Monitoring of the specified pollutants for spontaneous combustion in the Village of Wollar was discontinued in January 2018.

There were no reportable incidents as a result of spontaneous combustion in 2019, however two unverified odour complaints were received during 2019 (**Section 9**).

Follow up checks by WCPL in response to the odour complaints were unable to detect the presence or verify the odour.

An assessment of the spontaneous combustion performance indicators as required by the SCMP is provided in **Table 11**.

Refer to **Section 6.7** for ambient air monitoring program. WCPL will continue to implement the SCMP in 2019.

Table 11 Assessment of Spontaneous Combustion Performance Indicators

Performance Indicator	2019 Target	2019 Performance
Number of verified complaints received relating to spontaneous combustion	0	0*
Number of incidents relating to spontaneous combustion	0	0
Number of times operations have been shut down as a result of complaints/incidents relating to spontaneous combustion	0	0

Notes: * Community complainant declined to speak with WCPL staff. WCPL investigated odour complaint and could not determine or verify the likely cause of the odour (refer to **Section 9.0** for further details).

⁶ Formally required under Special Condition 9, E1 Spontaneous Combustion Air Monitoring within EPL 12425.

Table 12 Air Quality Monitoring Environmental Performance

Approved Criteria ^D	WEP Predictions	Performance During the Reporting Period	Trend/Key Management Implications
Deposited Dust ^C			
<p>4 g/m²/month ^E</p> <p><i>(at any residences on privately owned land)</i></p>	<p>1.5g/m²/month</p> <p>(for DG4, DG5, DG8, DG11 & DG15)</p>	<ul style="list-style-type: none"> With the exception of DG4, annual average dust deposition results for compliance purposes were below the approved criteria of 4 g/m²/month at compliance monitoring sites: <ul style="list-style-type: none"> DG4 (Ave: 5.3 g/m²/month) DG5 (Ave: 2.7 g/m²/month) DG8 (Ave: 2.3 g/m²/month) DG11 (Ave: 3.1 g/m²/month) DG15 (Ave: 1.6 g/m²/month) The annual average dust deposition results at compliance sites for 2019 recorded increases, compared to the annual average dust deposition results for 2018. 2019 was another year of below average rainfall and numerous regional dust events were also noted (Table 13). The region was declared in drought during 2019. 	<ul style="list-style-type: none"> Annual average dust deposition results for DG5 (2.7g/m²/month) and DG15 (1.6g/m²/month) are at locations nearest to private and mined owned land were below the approved criteria of 4 g/m²/month (Graph 1) and generally within WEP model predictions (Todoroski, 2020) (Appendix 3B). DG4 recorded a level of 41.9 g/m²/month in November. The inclusion of the November measurement greatly influences the annual average calculation. The DG4 annual average level would reduce to 1.9 g/m²/month with the exclusion of the November record. The Certificate of Analysis (CoA) shows a high concentration of organic matter in DG4 (approx.85%). Livestock were also present in the adjacent paddock during November which may be a contributing factor. The annual average measured levels in 2019 are generally higher than the model predictions for most of the deposited dust gauges. We note that deposited dust gauge readings can be significantly influenced by very local sources and this cannot be reasonably factored in any modelling. In addition, drought conditions and extraordinary events would have impacted the background deposited dust levels in 2019 (Todoroki, 2020) (Appendix 3B).
PM₁₀ (24hr Average Concentrations)			
<p>50 µg/m³ ^{AF}</p>	<p>15-30 µg/m³</p> <p>(for Village of Wollar)</p>	<ul style="list-style-type: none"> There were a number of results exceeding the maximum 24hour average PM₁₀ approved criteria of 50 µg/m³ during for the 2019 reporting period, the maximum recorded PM₁₀ results for 2019 are as follows: <ul style="list-style-type: none"> HV1 (Max: 196 µg/m³)* (Max: 40.3 µg/m³)^ HV4 (Max: 207 µg/m³)* (Max: 38.0 µg/m³)^ HV5 (Max: 195 µg/m³)* (Max: 61.0 µg/m³)^ TEOM 3 (Max: 242.8 µg/m³)* (Max: 40.1 µg/m³)^ TEOM 4 (Max: 273.1 µg/m³)* (Max: 101.7 µg/m³)^ * Includes extraordinary events ^ excludes extraordinary events Elevated PM₁₀ levels due to high regional dust levels associated with either a bushfire/ regional dust storm (Table 13). TEOM 4 & HV5 also appear to have been occasionally impacted by localised dust generated from traffic along the unsealed Araluen Road under temperature inversion conditions. 	<ul style="list-style-type: none"> The 24-hour average PM₁₀ concentrations were above the relevant criterion of 50µg/m³ for a significant number of days in 2019. The majority of these days were considered to be extraordinary events due (e.g. bushfires, dust storms, etc) which are excluded from the air quality criteria (Table 13). The rolling annual average levels in general show a trend of increasing levels, with the monitors all showing a sudden increase in levels at the end of 2019 associated with the 2019/2020 NSW bushfires. The general trend of increasing dust levels over the period is considered to be predominantly due to worsening drought conditions. Generally, the measured 2019 24-hour average PM₁₀ levels are higher than the predicted incremental impacts. It needs to be noted that short term, 24-hour average dust levels are heavily influenced by background dust levels which can vary greatly day to day and year to year (say in a drought year), for example the 24-hour average dust level at TEOM 4 was impacted on occasion by dust from traffic along the unsealed road trapped under temperature inversion conditions (Todoroki, 2020) (Appendix 3B).

Approved Criteria ^D	WEP Predictions	Performance During the Reporting Period	Trend/Key Management Implications
PM₁₀ (Annual Average Concentrations)			
30 µg/m ³ ^{AE}	16-20 µg/m ³ (for Wollar Road & Village of Wollar)	<ul style="list-style-type: none"> • Annual average PM₁₀ results complied with the approved criteria of 30 µg/m³ during for the 2019 reporting period. The average recorded PM₁₀ results for 2019 are as follows: <ul style="list-style-type: none"> - HV1 (Ave: 29 µg/m³)* (Ave: 16.1 µg/m³)[^] - HV4 (Ave: 33.4 µg/m³)* (Ave: 17.8 µg/m³)[^] - HV5 (Ave: 37.1 µg/m³)* (Ave: 23.8 µg/m³)[^] - TEOM 3 (Ave: 27.9 µg/m³)* (Ave: 14.6 µg/m³)[^] - TEOM 4 (Ave: 32.9 µg/m³)* (Ave: 22.9 µg/m³)[^] - * Includes extraordinary events [^] excludes extraordinary events • Table 13 shows the majority of the elevated PM₁₀ levels were identified at the time, to be due to high regional dust levels associated with either a bushfire/ regional dust storm. • Annual average PM₁₀ concentrations excluding extraordinary events were below the criteria of 30µg/m³ in 2019 at the relevant compliance monitors. 	<ul style="list-style-type: none"> • The measured 2019 annual average PM₁₀ data excluding extraordinary events superimposed over the dispersion modelling contours for the Year 2020. The measured and predicted data in the figure include dust levels from WCM and other sources (Todoroki, 2020) (Appendix 3B). • There is generally a good correlation between the modelling results and the recorded levels at the air quality monitors excluding the extraordinary events in 2019 (Todoroki, 2020) (Appendix 3B). • The analysis shows that there was generally good agreement between the annual average modelling predictions and the measured results excluding extraordinary event days in 2019 (Todoroki, 2020) (Appendix 3B). • This report has also presented a review of the 2019 data against the latest five years of data. The analysis shows that the annual levels were generally high compared with previous years and that there was an increase in the number of exceedances of the short term PM₁₀ and PM_{2.5} criteria in 2019, due to the large number of extraordinary events (the 2019/2020 bushfires in particular). The annual average levels excluding extraordinary events were generally similar to the previous year results and below the relevant annual criteria (Todoroki, 2020) (Appendix 3B).
PM_{2.5} (24hr & Annual Average Concentrations)			
No criteria established	3-4 µg/m ³ (for Village of Wollar)	<ul style="list-style-type: none"> • The 2019 annual average PM_{2.5} concentration for “all days” was above the relevant criterion of 8µg/m³ but was below the criterion when extraordinary events were excluded. The 24-hour average PM_{2.5} concentrations were above the relevant criterion of 25µg/m³ for a significant number of days in 2019: <ul style="list-style-type: none"> - Ave (Annual): * 15.2 µg/m³ [^] 6.8 µg/m³ - Max (24hr): * 196.5 µg/m³ [^] 23.0 µg/m³ - No. Days >25µg/m³ * 32 [^] 0 - * Includes extraordinary events [^] excludes extraordinary events 	<ul style="list-style-type: none"> • The measured levels are higher than the modelled results by approximately 3 to 4µg/m³. The PM_{2.5} monitor is located in the village of Wollar and will be influenced by non-modelled local PM_{2.5} sources such as combustion engines, transport movements and various human activities (Todoroki, 2020) (Appendix 3B). • The analysis shows that the annual levels were generally high compared with previous years and that there was an increase in the number of exceedances of the short term PM₁₀ and PM_{2.5} criteria in 2019, due to the large number of extraordinary events (the 2019/2020 bushfires in particular). The annual average levels excluding extraordinary events were generally similar to the previous year results and below the relevant annual criteria (Todoroki, 2020) (Appendix 3B).
<p>Notes: g/m²/month = grams per square metre per month. µg/m³ = micrograms per cubic metre. (A) Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources); (B) Incremental impact (i.e. incremental increase in concentrations due to the development on its own); (C) Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method; and (D) Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Director-General. (E) Annual Averaging Period. (F) 24 Hour Averaging Period.</p>			

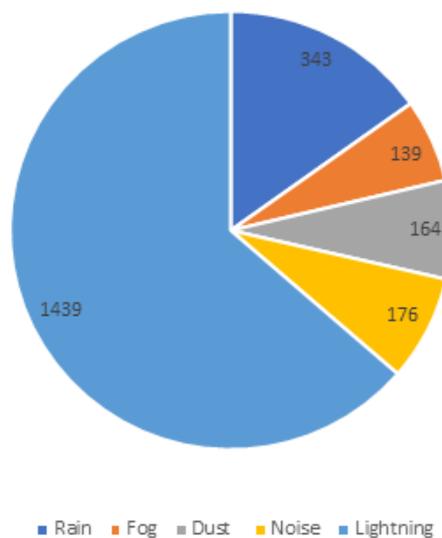
Table 13 Summary of Elevated 24-hour average PM₁₀ Levels During 2019

Date	Monitor(s) affected	Likely cause of Elevated Reading
13/02/2019	TEOM 3, TEOM 4, HV1, HV4 & HV5	Regional dust event
19/02/2019	TEOM 4 & HV4	Regional dust event
5/03/2019	TEOM 4	Regional dust event & temperature inversion trapping dust generated by traffic on the unsealed Araluen Road
6/03/2019	TEOM 3 & TEOM 4	Regional dust event
11/03/2019	TEOM 4	Regional dust event & temperature inversion trapping dust generated by traffic on the unsealed Araluen Road
31/03/2019	TEOM 4	Regional dust event
6/09/2019	TEOM 3 & TEOM 4	Regional dust event
7/10/2019	TEOM 4	Regional dust event & temperature inversion trapping dust generated by traffic on the unsealed Araluen Road
19/10/2019	TEOM 4	Regional dust event
25/10/2019	TEOM 3 & TEOM 4	Regional dust event
26/10/2019	TEOM 3 & TEOM 4	Regional dust event
29/10/2019	TEOM 4, HV1, HV4 & HV5	Bushfire smoke
30/10/2019	TEOM 4	Bushfire smoke
31/10/2019	TEOM 4	Bushfire smoke
1/11/2019	TEOM 4	Bushfire smoke
2/11/2019	TEOM 4	Bushfire smoke
7/11/2019	TEOM 4	Regional dust event
8/11/2019	TEOM 3 & TEOM 4	Regional dust event
12/11/2019	TEOM 3 & TEOM 4	Bushfire smoke
17/11/2019	TEOM 4	Bushfire smoke
19/11/2019	TEOM 4	Bushfire smoke
20/11/2019	TEOM 3 & TEOM 4	Bushfire smoke
21/11/2019	TEOM 3 & TEOM 4	Bushfire smoke
22/11/2019	TEOM 3, TEOM 4 HV1, HV4 & HV5	Bushfire smoke
23/11/2019	TEOM 3 & TEOM 4	Bushfire smoke
26/11/2019	TEOM 3 & TEOM 4	Regional dust event
28/11/2019	TEOM 4, HV1 & HV5	Bushfire smoke
29/11/2019	TEOM 3 & TEOM 4	Bushfire smoke
30/11/2019	TEOM 3 & TEOM 4	Bushfire smoke
1/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
2/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
6/12/2019	TEOM 4	Bushfire smoke
7/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
8/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
9/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
10/12/2019	TEOM 3, TEOM 4, HV1, HV4 & HV5	Bushfire smoke
11/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
12/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
13/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
15/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
16/12/2019	TEOM 3, TEOM 4, HV1, HV4 & HV5	Bushfire smoke
17/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
18/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
19/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
20/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
21/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
22/12/2019	TEOM 3, TEOM 4, HV1, HV4 & HV5	Bushfire smoke
23/12/2019	TEOM 3	Bushfire smoke
24/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
26/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
27/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
28/12/2019	TEOM 3, TEOM 4, HV1, HV4 & HV5	Bushfire smoke
30/12/2019	TEOM 3 & TEOM 4	Bushfire smoke
31/12/2019	TEOM 3 & TEOM 4	Bushfire smoke

Implemented/Proposed Management Actions (Air Quality)

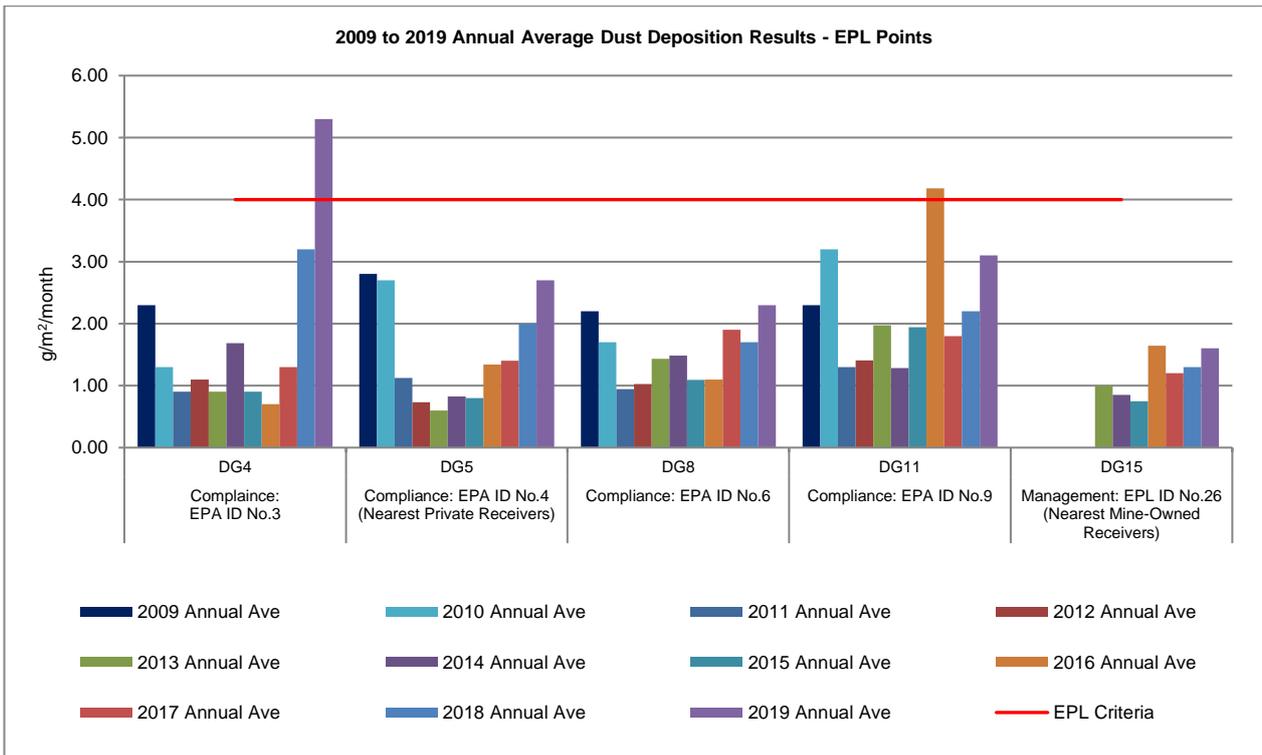
- The Mine rehabilitated approximately 121ha of mine waste rock emplacement areas in 2019;
- The Mine is scheduled to complete approximately 138ha of mine waste rock rehabilitation in 2020.
- In 2019 there were 5 complaints in response to dust, a reduction from 7 complaints recorded during the 2018 reporting period.
- On review of the dates when each complaint was recorded, they do mostly coincide with a regional dust event as identified in **Table 13** and visual mining activities occurring in Pit 7 close to the Ulan-Wollar Road.
- In consideration of the extraordinary dust events recorded in 2019 (**Table 13**), the effectiveness of the adopted control measures as described in the AQMP, WCPL were able to achieve compliance against the Air Quality Assessment Criteria Table 17, Schedule 3 of SSD-6764.
- In accordance SSD-6764, WCPL will review, and if necessary revise, the AQMP within three months of the submission of this Annual Review with reference to the development of PM_{2.5} trigger values, as WCPL have now collected twelve months of data.
- All dust related complaints were responded to in accordance with the Complaints Management Procedure.
- During the review period the following control measures were implemented in accordance with the MOP and AQMP.
 - Mine managed in response to dust alarms from TEOMs;
 - Metrological condition assessed prior to blasting;
 - Active haul roads and traffic areas were watered on an appropriate basis using water carts; and
 - Water sprays were utilised on the ROM coal bins, and recently stripped areas as required.
- In 2019, approximately 164hrs of lost time hours associated with implementation of dust management strategies (**Figure 3**).

Figure 3 Breakdown of Lost Time Hours 2019 (Dust)



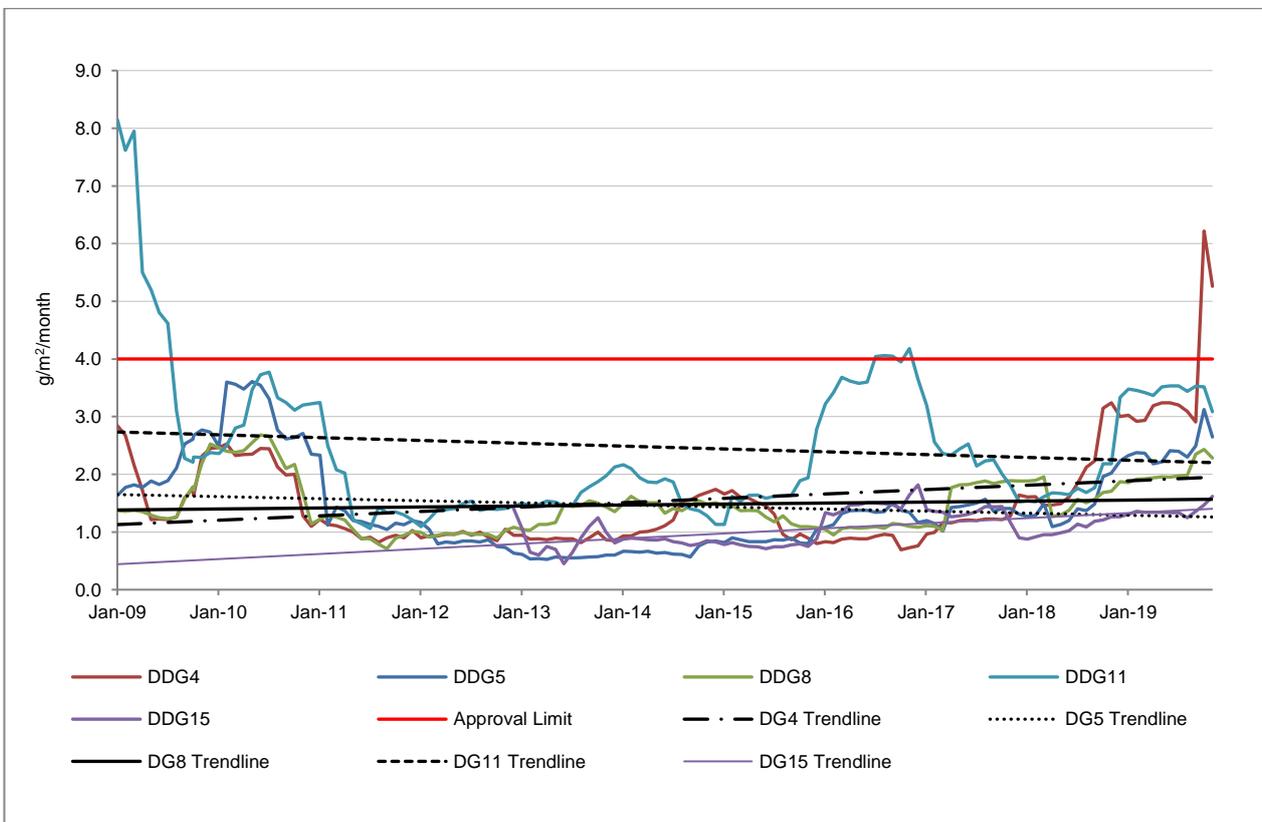
Notes: The increase in lost hours due to lightning in 2019 is a result of implementation of a new Lightning TARP and the occurrence of more frequent electrical thunderstorms (mainly dry lightning) in 2019.

Graph 1 Compliance Annual Average Dust Deposition Results 2009 – 2019

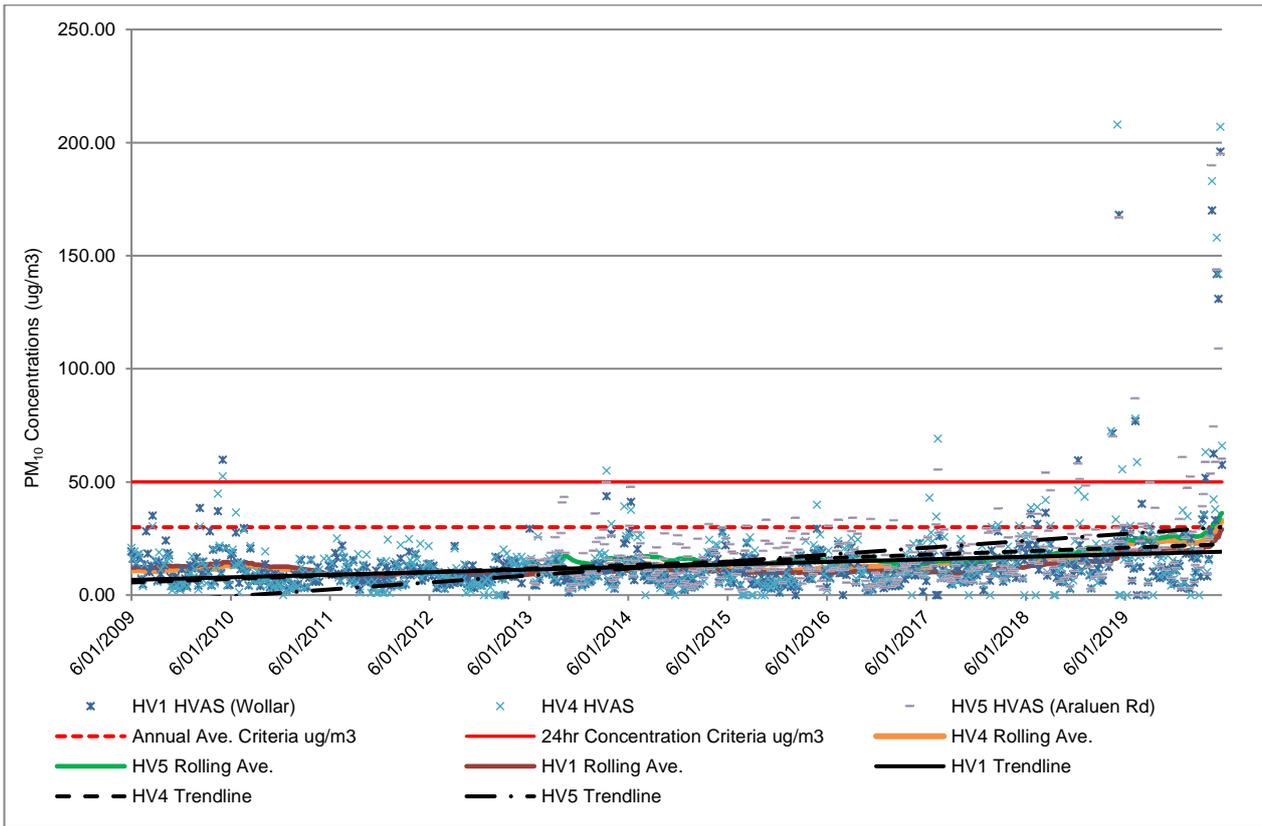


Notes: Based on the positioning of the compliance monitors at WCM, it can be assumed that the DDG8 monitor is sufficiently away from mining activity and is generally represented of background levels for the area. On this basis, the potential incremental contribution from WCM can be estimated as the level recorded at the compliance monitors minus the level at DDG8 (Todoroki, 2019). Except for DG4 (refer to **Table 12**), the resulting incremental levels would below the relevant criterion of 2g/m²/month and indicate compliance with the criterion.

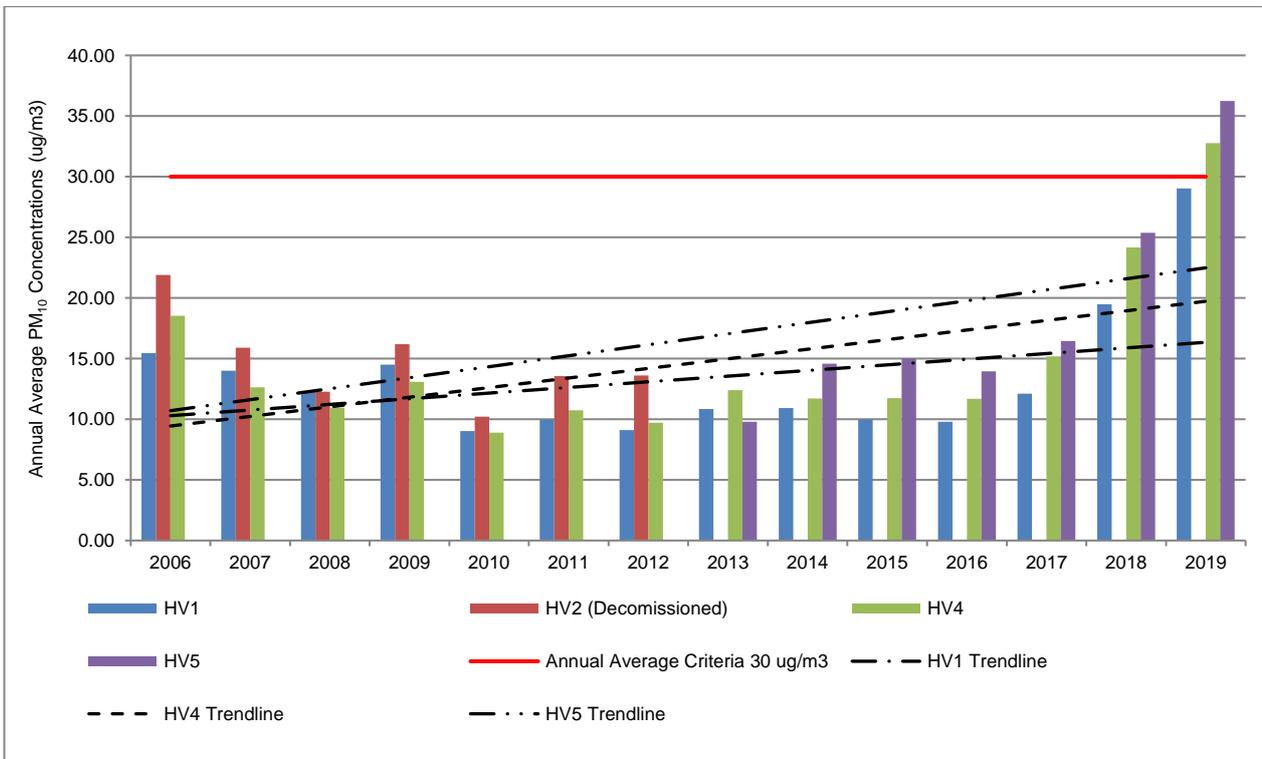
Graph 2 Compliance Dust Deposition Trends (Rolling Averages) 2009-2019



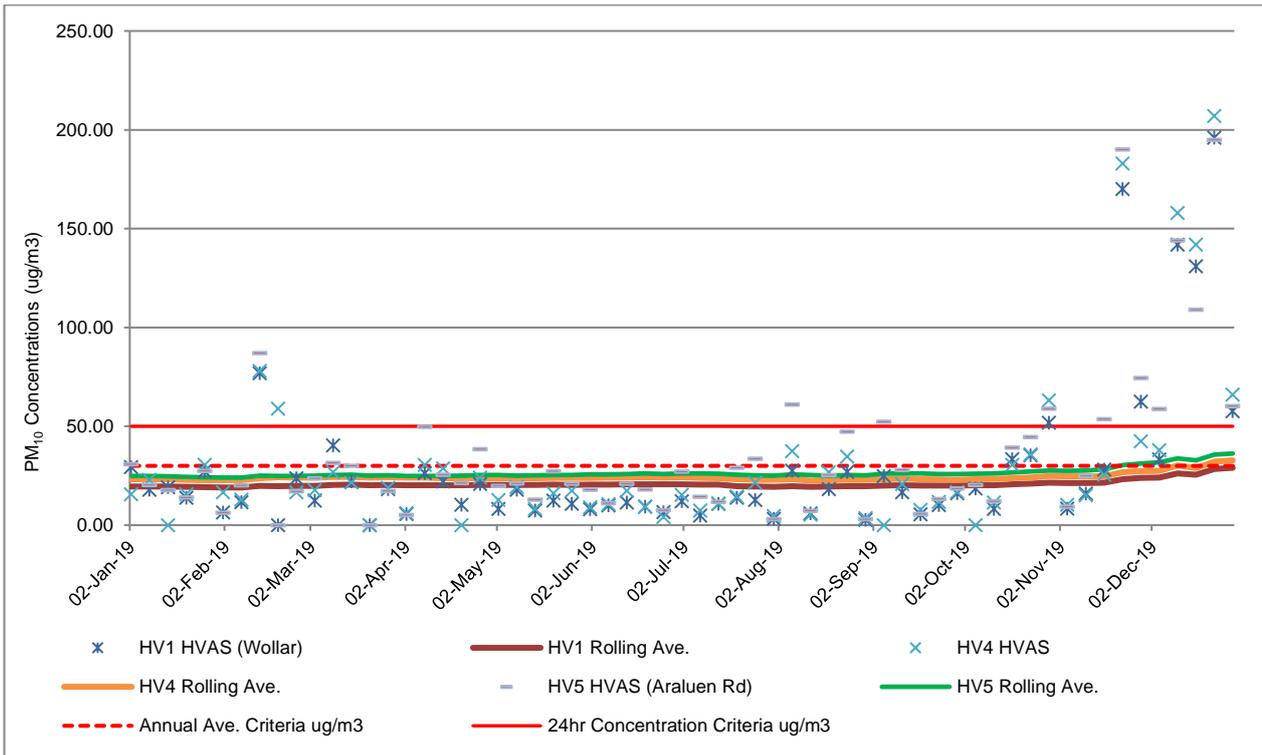
Graph 3 Compliance HVAS PM₁₀ Results and Trends (Rolling Averages) 2009 - 2019



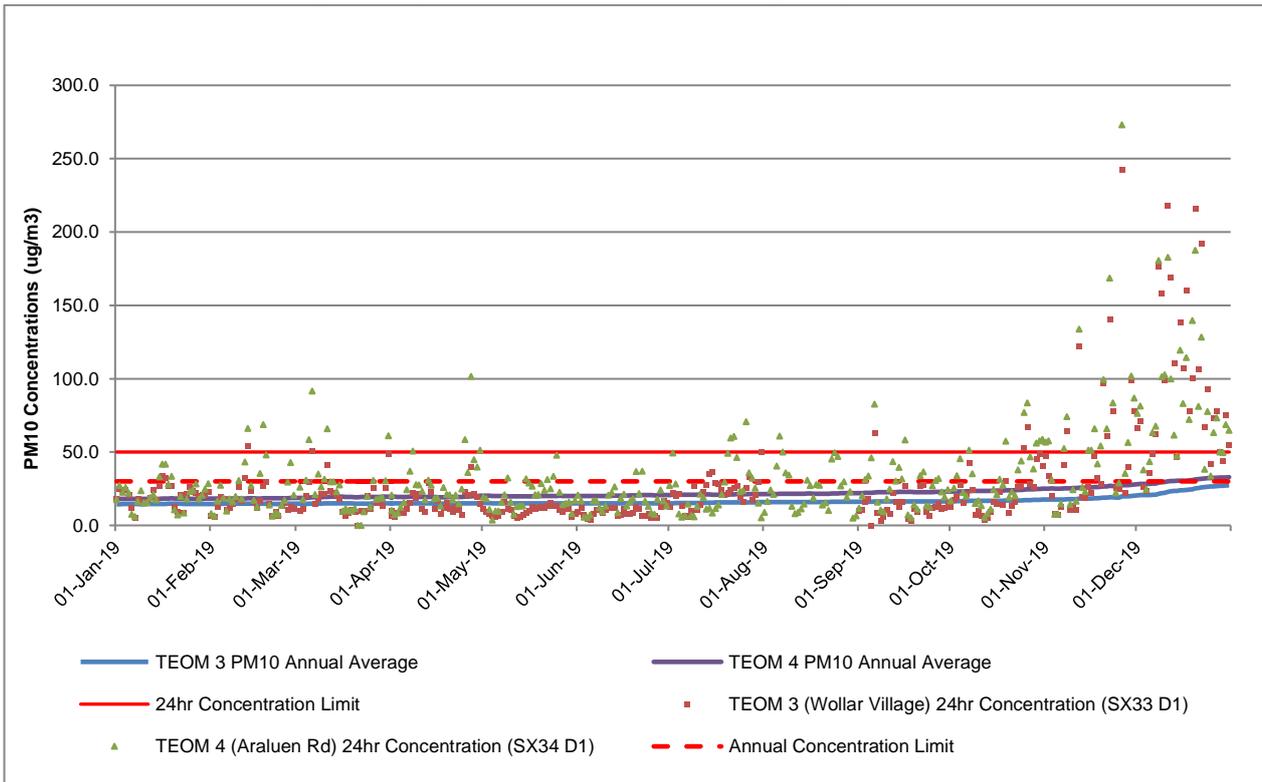
Graph 4 Compliance HVAS Annual Average PM₁₀ Results and Trends 2009 – 2019



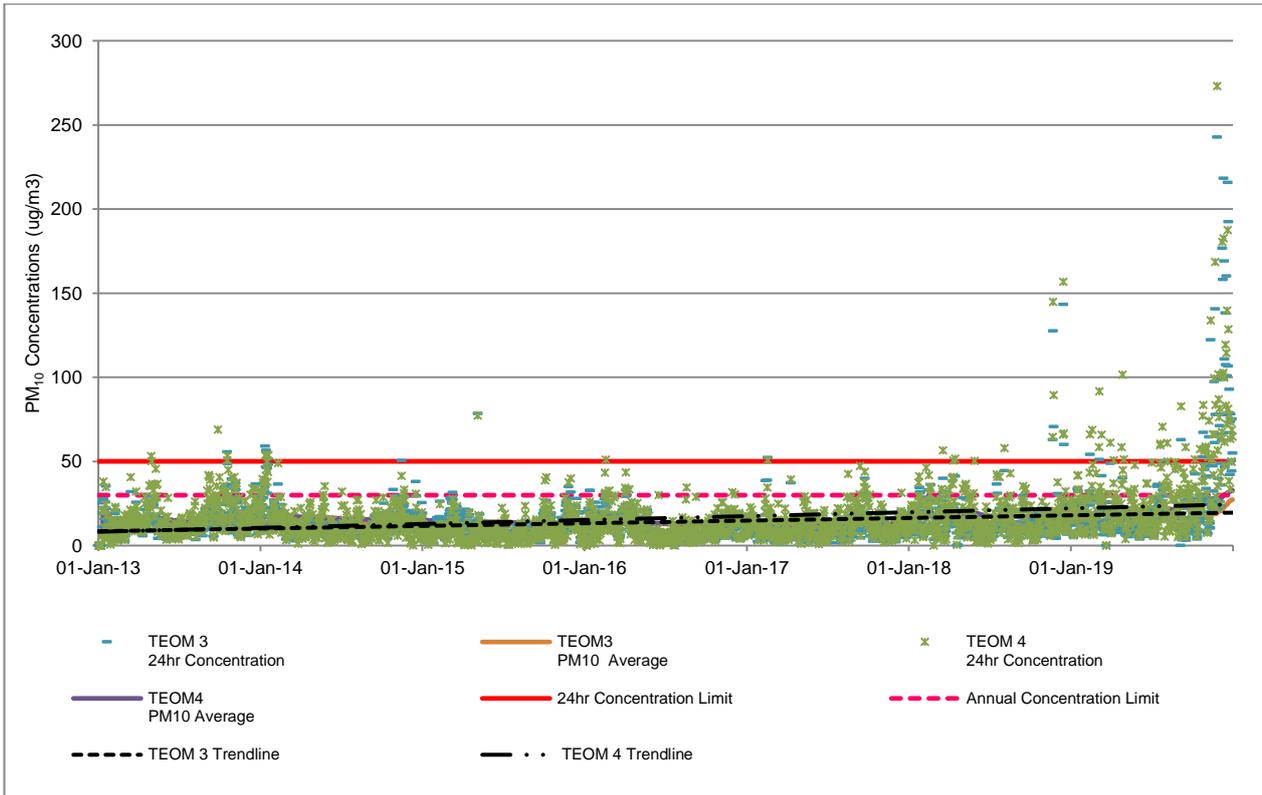
Graph 5 Compliance HVAS 24hr & Annual Average PM₁₀ Results 2019



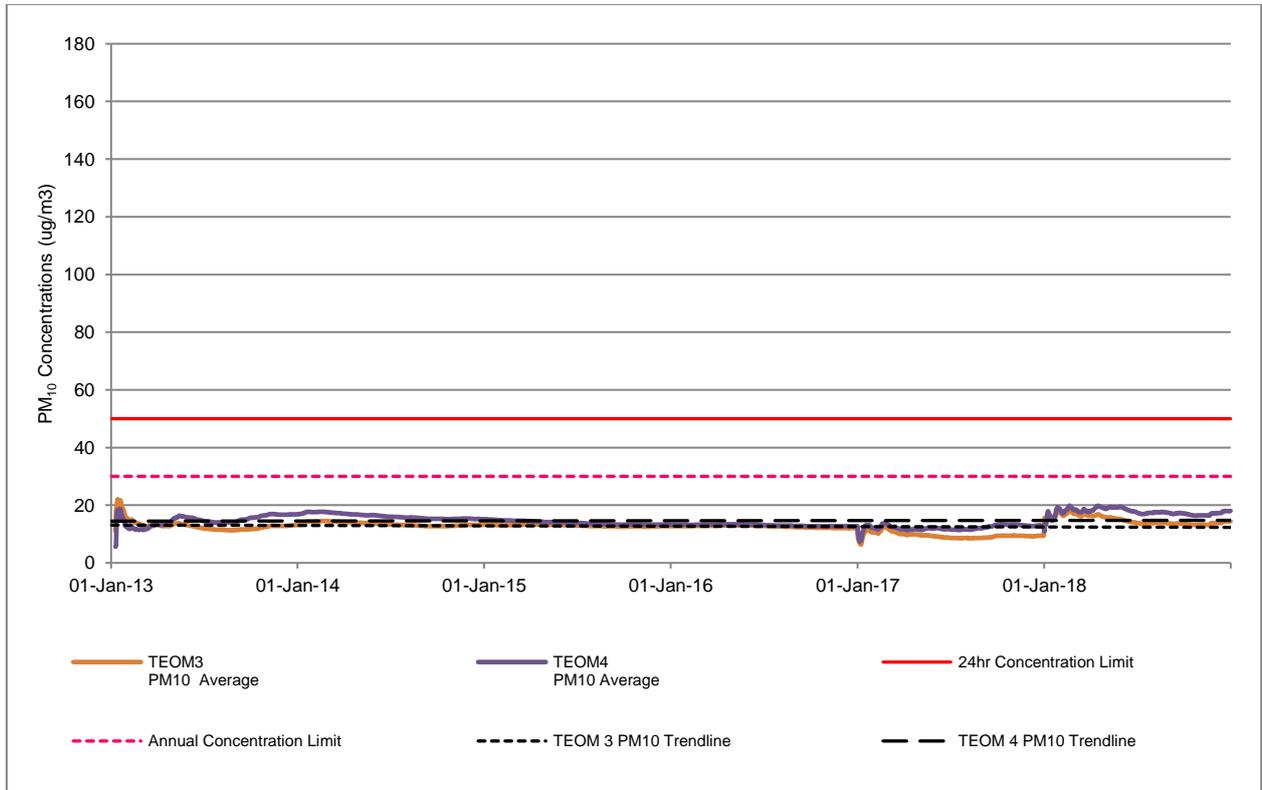
Graph 6 Compliance TEOM 24hr & Annual Average PM₁₀ Results 2019



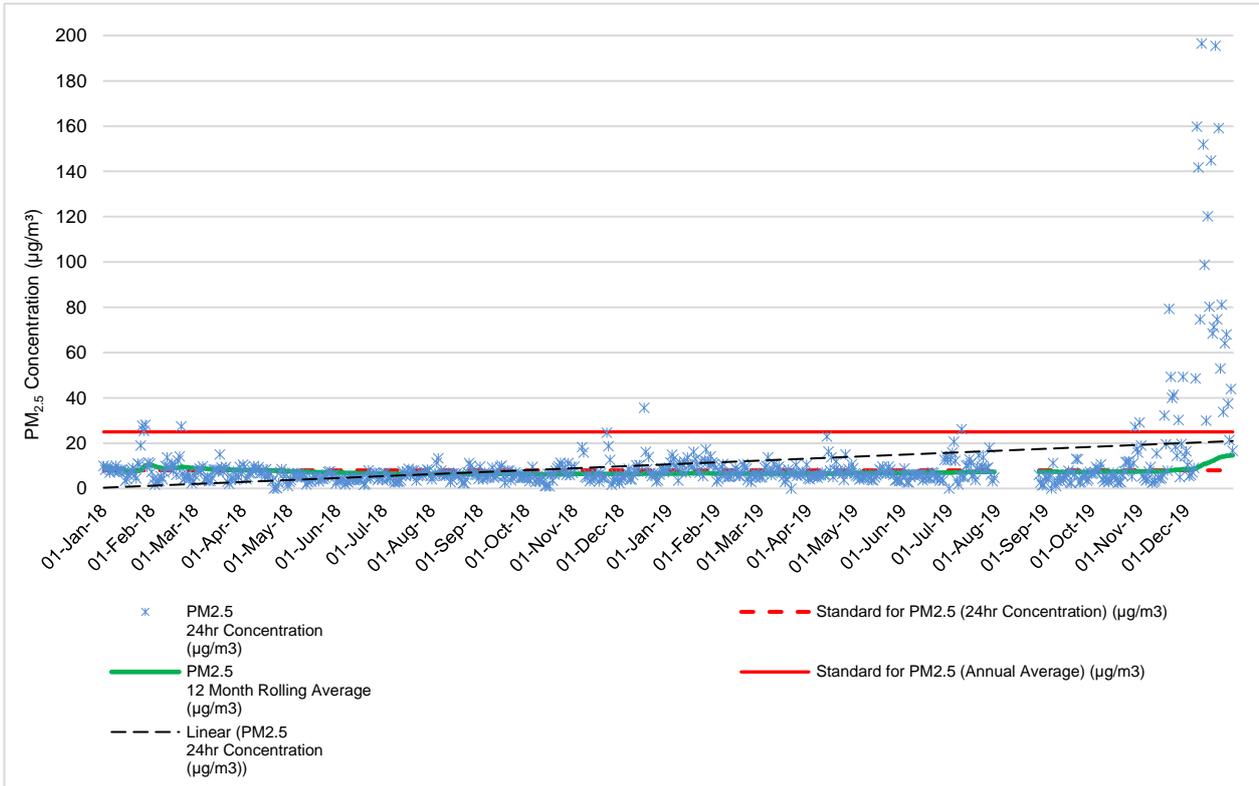
Graph 7 Compliance TEOM PM₁₀ 24hr Results and Trends (Rolling Averages) 2013 - 2019



Graph 8 Compliance TEOM PM₁₀ Rolling Averages 2013 - 2019



Graph 9 Compliance TEOM PM_{2.5} 24hr Results and Trends (Rolling Averages) 2018-2019



Blast Monitoring

The Mine has developed and implemented a Blast Management Plan (Table 7). Blasting vibration, overpressure limits, the time and frequency of blasting are specified in Conditions 7, 8 and 9, Schedule 3 of SSD-6764. During the 2019 review period, the Mine carried out vibration and overpressure monitoring in accordance with the Blast Management Plan (BMgtP) at the locations in Appendix 3E and at the frequency displayed in Table 14.

Table 14 Summary of the Blasting and Vibration Monitoring Program

Location	Type	Frequency
Wollar Public School	Airblast Overpressure and Ground Vibration	Every blast
Aboriginal rock art sites: 72, 152 & 153	Ground Vibration	Every blast within 1km of Aboriginal rock art sites.
Archaeological sites: WE7, WE10, WCP535, WE76^ & WE77^	Ground Vibration	Every blast within 1km of Aboriginal sites
Historical Mine Adit	Ground Vibration	Every blast within Pit 8*
Railway Line/ Culvert	Ground Vibration	Every blast within 350m of railway culverts and 100m of railway lines
Ulan-Wollar Road	Ground Vibration	Every blast within 100m of the Ulan-Wollar Road
TransGrid Powerline Suspension Towers	Ground Vibration	Every blast within 100 of TransGrid powerline suspension towers*
Tailings Dam 3, 4, 5 or 6	Ground Vibration	Every blast within the DSC Approval area.

Notes: * During the reporting period monitoring was not required as the trigger for blast monitoring was not either within the range. ^ To date unable to relocate sites therefore monitoring of sites was not able to occur. Investigations with WCPL archaeologist ongoing to locate the sites in 2020.

Table 15 Blast Monitoring Environmental Performance (Wollar School)

Approved Criteria ³				Performance During the Reporting Period	Trend/Key Management Implications
Location	Airblast ¹ overpressure (dB(Lin Peak))	Ground ² vibration (mm/s)	Allowable exceedance	<ul style="list-style-type: none"> Blast monitoring results for the reporting period complied (Graph 10) with the approved criteria of 115dB (<120dB) and 5mm/s (<10mm/s) at privately owned residences i.e. <p><u>Wollar Public School:</u></p> <ul style="list-style-type: none"> Max: 115.8 dBL Max: 2.52 mm/s <ul style="list-style-type: none"> No blasts exceeded the 120dBL limit. One blast was greater than 115dBL limit or 0.4% of the allowable exceedance of 5%. The one recorded overpressure greater than 115dBL of 115.8dBL was on the 12 July 2019. 	<ul style="list-style-type: none"> All blast monitoring on privately owned land was undertaken in accordance with the Blast Management Plan in 2019; There were 6 blasting related community complaints in 2019 compared to 10 complaints in 2018. All blasting events during the review period occurred during the approved times of 9.00am to 5.00pm. No blasting occurred on a Sunday or on a Public Holiday during the 2019 review period. There were no more than two blasts per day (max. of 2 allowed) and an average of 4.8 blasts per week (max. of 5 per week allowed). In accordance with Condition 13(c), Schedule 3 of PA05-0021 and Condition 12(d), Schedule 3 of SD6764, WCPL co-ordinated the timing of blasting with the adjoining Moolarben Coal Mine and Ulan Coal Mine to minimise the potential cumulative blasting impacts of the three mines. There were a total of 218 blasts for the 2019 reporting period.
Residence on privately owned land	115	5	5% of the total number of blasts over a rolling period of 12 months		
	120	10	0%		
All public infrastructure	-	50 <i>(or a limit determined by the structural design methodology in AS 2187.2-006, or its latest version, or other alternative limit for public infrastructure, to the satisfaction of the Secretary)</i>	0%		
<p>Note: However, these criteria do not apply if the Applicant has a written agreement with the relevant owner to exceed these criteria, and has advised the Department in writing of the terms of this agreement.</p> <p>Notes: 1) dB (Lin Peak) = decibel linear in peak 2) mm/s = millimetres per second 3) SSD-6764 Table 4 Blast Criteria</p>					

Table 16 Blast Monitoring Environmental Performance (Public Infrastructure)

Approved Criteria			Performance During the Reporting Period	Trend/Key Management Implications
Location	Ground vibration (mm/s)	Allowable exceedance		
Tailings Dam ¹	50	0%	<ul style="list-style-type: none"> Blast monitoring results for the reporting period complied with the approved criteria of 100mm/s at Main Rail Culvert (Pit 3): <ul style="list-style-type: none"> – Max: 32.43 mm/s – Ave: 1.27 mm/s Blast monitoring results for the reporting period complied with the approved criteria of 100mm/s at Main Rail Culvert (Pit 5): <ul style="list-style-type: none"> – Max: 16.66 mm/s – Ave: 0.62 mm/s Blast monitoring results for the reporting period complied with the approved criteria of 200mm/s at Main Rail Line: <ul style="list-style-type: none"> – Max: 32.43 mm/s – Ave: 1.27 mm/s No blasting monitoring was required at TD6 during the reporting period as all blasts during 2019 were outside the DSC Approval Area. 	<ul style="list-style-type: none"> All blast monitoring of public infrastructure was undertaken in accordance with the Blast Management Plan; No vibration results were above the ground vibration criteria as approved by ARTC of 100mm/s as monitored at Main Road Culverts (Pit 3 and Pit 4); No vibration results were above the ground vibration criteria as approved by ARTC of 200mm/s as monitored at Main Rail Line; The blast monitoring requirements were not triggered during reporting period for monitoring the following public infrastructure for: <ul style="list-style-type: none"> – Transgrid Powerline. The blast monitoring requirements were not triggered during reporting period for monitoring the following WCPL infrastructure for: <ul style="list-style-type: none"> – TD6.
Railway Lines ²	200	-		
Railway Culverts ³	100	-		
Public Road ⁴	200	-		
Public Road ⁵	100	-		
Transgrid Powerline ⁶	50	-		

1) Dam Safety Committee approved 2) As agreed with ARTC when blasting within 100m 3) As agreed with ARTC when blasting within 300m 4) As agreed with MWRC when blasting within 100m 5) As agreed with MWRC when blasting within 350m 6) As agreed with Transgrid when blasting within 100m of a tower.

Note: However, these criteria do not apply if the Applicant has a written agreement with the relevant owner to exceed these criteria, and has advised the Department in writing of the terms of this agreement.

Table 17 Blast Monitoring Environmental Performance (Heritage Sites)

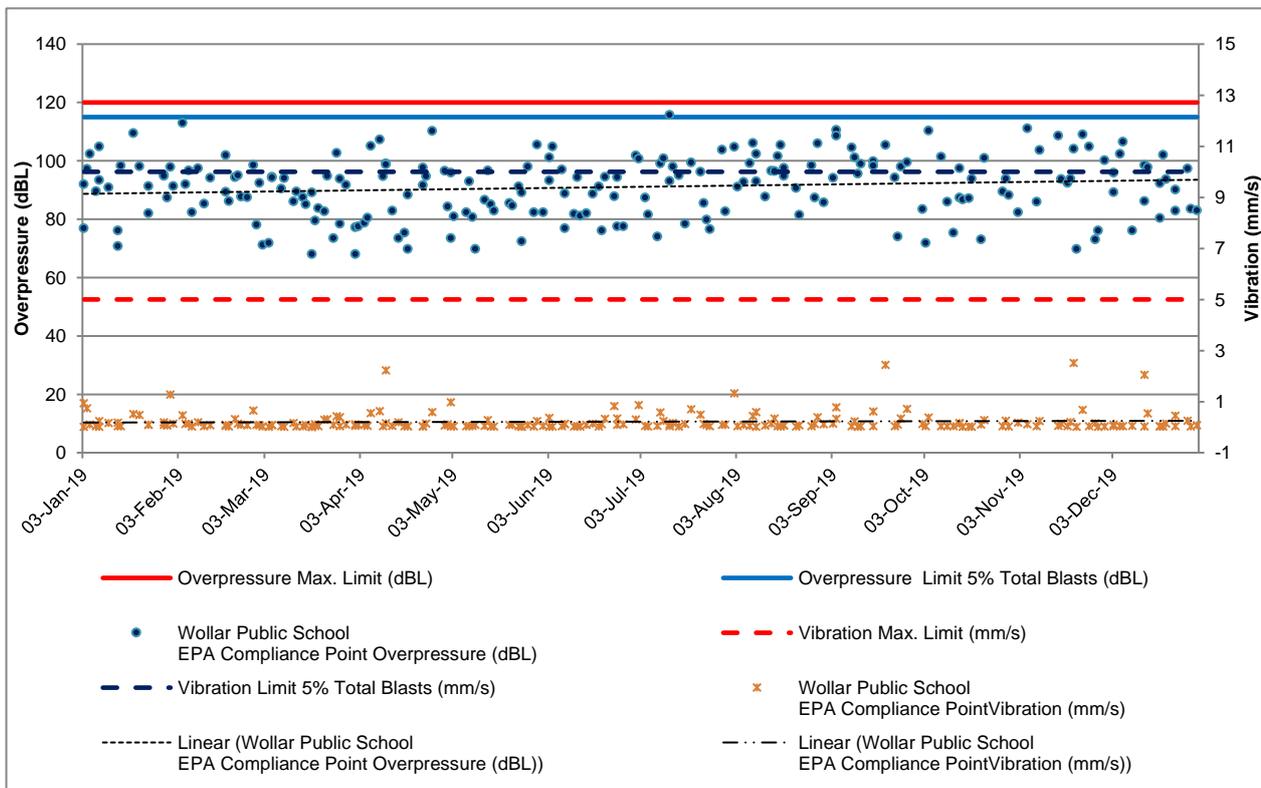
Approved Criteria		Performance During the Reporting Period	Trend/Key Management Implications
Archaeological Sites 72, 152 and 153 within ML	<i>Performance Indicator</i>	80 ¹	<ul style="list-style-type: none"> Blast monitoring results for the reporting period complied with the approved criteria of 80mm/s at Archaeological Sites 72, 152, 153. WE7, WE10 & WCP535: <ul style="list-style-type: none"> (Site 72) Max: 7.94 mm/s (Site 72) Ave: 0.62 mm/s (Site 152) Max: 9.72 mm/s (Site 152) Ave: 0.79 mm/s (Site 153) Max: 14.66 mm/s (Site 153) Ave: 1.29 mm/s (Site WE7) Max: 34.44 mm/s (Site WE7) Ave: 2.02 mm/s (Site WE10) Max: 20.29 mm/s (Site WE10) Ave: 1.09 mm/s (Site WCP535) Max: 13.71 mm/s (Site WCP535) Ave: 1.10 mm/s All blast monitoring of Aboriginal Heritage Sites was undertaken in accordance with the Blast Management Plan in 2019; All blast monitoring of Aboriginal Heritage Sites was undertaken in accordance with the Heritage Management Plan in 2019; The blast monitoring requirements were not triggered during reporting period at the Historical Mine Adit as no blasting occurred within Pit 8 in 2019, as there were no mining activities undertaken; No vibration results were above the performance criteria of damage criteria of 80mm/s and/or 250mm/s respectively for Archaeological Sites 72, 152, 153. WE7, WE10 & WCP535 in 2019; and The blast monitoring requirements were not triggered during reporting period at sites WE76 and WE77 as sites could not be relocated for monitoring since surveyed for the WEP.
	<i>Damage Criteria</i>	250 ¹	
Archaeological Sites WE7, WE10 & WCP535 in the Munghorn Gap Nature Reserve	<i>Performance Indicator</i>	80 ²	
	<i>Damage Criteria</i>	250 ²	
Archaeological Sites WE76 & WE77 in the Munghorn Gap Nature Reserve	<i>Performance Indicator</i>	80 ²	
	<i>Damage Criteria</i>	250 ²	
Mine Adit	-	80 ³	

1) When blasting within 1 km 2) Representative site when blasting within 1 km 3) When blasting in Pit 8

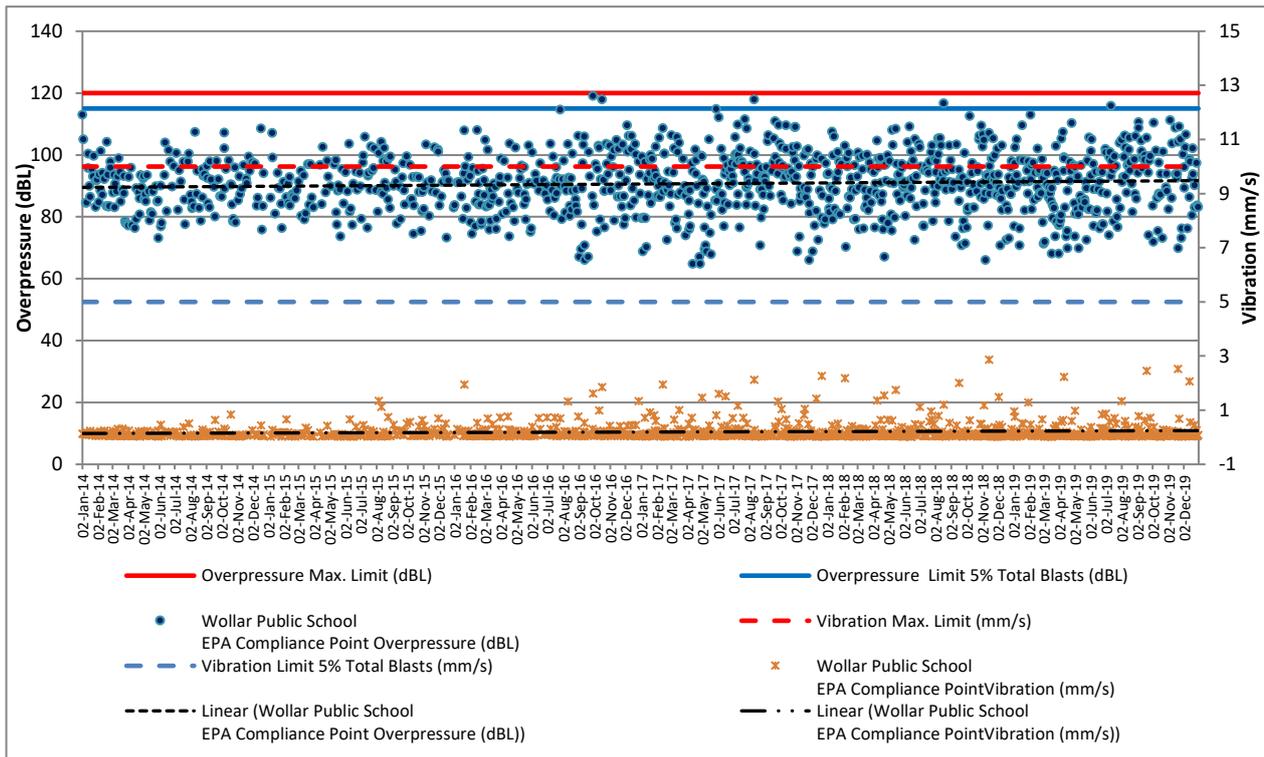
Implemented/Proposed Management Actions (Blasting)

- In accordance with the Blast Management Plan the control strategies were implemented at the Mine in order to minimise the potential for exceedances of the relevant blasting criteria.
- As discussed in Section 9.0, all blasting complaints were responded to, as required by WCPL’s Complaints Management Procedure.
- In accordance with Condition 5, Schedule 5 of SD-6764, WCPL will review, and if necessary revise, the Blast Management Plan within three months of the submission of this Annual Review.
- There was a decrease in blasting related complaints in 2019 with a total of 6 complaints, as opposed to 10 complaints in the 2018 reporting period. There has been an overall decrease in blast related complaints since 2012.
- WCPL has complied with the blasting requirements of SD-6764 and on this basis will continue to implement the Blast Management Plan and review blasting performance in next review period.
- Blast monitoring requirements were not triggered during the 2019 reporting period at the Historical Mine Adit as no blasting and/or mining activities occurred within Pit 8 in 2019.
- Blast monitoring of the Historical Mine Adit may be triggered, in accordance with the Blast Management Plan, due to scheduled mining activities to commence in Pit 8 during 2020.
- Updated notification process to include blast notice at Wollar Store.
- Installed video and vibration monitoring at the Shale Oil Mine Adit for the purposes of monitoring any potential blasting impacts upon the structural integrity of the adit and micro bat response to vibration.
 - Video monitoring occurred 5 minutes prior to and after blasts for Pit 3, 7 and 8 due to proximity – no evidence from video footage of blasts causing bats to leave the adit. Stabilisation of the adit entrance occurred in December 2019.
- A review of the Blast Management Plan as undertaken in late 2019 which included an update of figures to reflect the approved increase of the disturbance footprint and open cut boundary in Pit 8 and ML1779, revision of the Blast Fume Management Strategy which included an update to Figure 4 and blast controller checklist.

Graph 10 Blasting Monitoring Results for 2019 (Wollar School)



Graph 11 Blasting Monitoring Trends 2014 to 2019 (Wollar School)



Noise Monitoring

The Mine has developed and implemented a Noise Management Plan (NMP) (Table 7). During the 2019 review period a combination of attended and unattended noise monitoring was undertaken to assess the performance of the Mine against the Noise Criteria. Attended noise monitoring is used for determining compliance against the Noise Criteria whilst unattended or real-time monitoring is primarily utilised as a proactive noise control system; providing noise alerts when predetermined noise levels are triggered so mining operations can be modified to lower the noise impacts on receptors. A summary of the noise monitoring program is presented in Table 18. A summary of noise monitoring results is provided in Table 19. Further noise monitoring results for 2019 review period, including figures with noise monitoring locations are provided in Appendix 3F.

Table 18 Summary Noise Monitoring Program

Location	Monitoring Site	Parameter	Frequency
St Laurence O’Toole Church^	N6	Attended Noise	Monthly
Coonaroo^	N13	Attended Noise	Monthly
Tichular	N14	Attended Noise	Monthly
Wollar Village	N15	Attended Noise	Monthly
Araluen Rd*	N16	Attended Noise	Monthly
Mogo Rd	N17	Attended Noise	Monthly
Barrigan Valley*	N18	Attended Noise	Monthly
Mogo Rd	N19	Attended Noise	Monthly
Ringwood Rd	N20	Attended Noise	Monthly
Wandoona	N21	Attended Noise	Monthly
WCPL Rail Loop	-	Meteorology & Inversion	Continuous
Wollar Village	-	Real-Time Noise - Fixed	Continuous
Araluen Rd*	-	Real-Time Noise - Fixed	Continuous
Mogo Rd	-	Real-Time Noise - Fixed	Continuous
Ringwood Rd	-	Real-Time Noise - Fixed	Continuous
Wandoona	-	Real-Time Noise - Mobile	Continuous

Notes: * Removed from the noise monitoring program as a result of SSD-6764 and the revised Noise Management Plan. ^ Owned by WCPL.

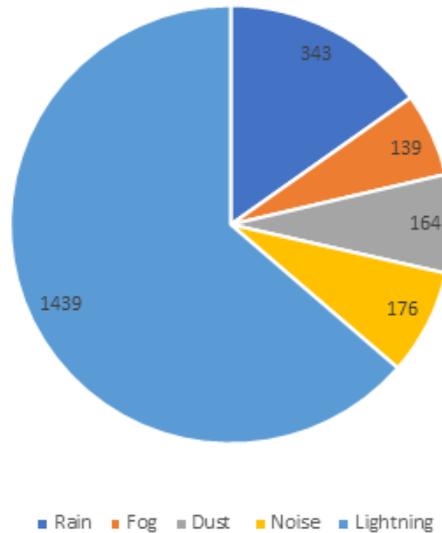
Table 19 Noise Monitoring Environmental Performance

Approved Criteria					Performance During the Reporting Period	Trend/Key Management Implications
Property ID & Location ¹	Day ²	Evening ³	Night ⁴		<ul style="list-style-type: none"> Attended noise monitoring during 2019 was undertaken monthly during: <ul style="list-style-type: none"> 21/22 January 4/5 February 11/12 March 1/2 April 13/14 May 17/18 June 1/2 July 1/2 August 10/11 September 1/2 October 18/19 November 9/10 December Attended monitoring noise levels from WCPL complied with approved criteria and EPL noise limits at all sites during attended noise monitoring undertaken in 2019 (Appendix 3F). Low frequency assessments were carried out in accordance with the EPA 'Noise Policy for Industry' (NPII). Low frequency modification factors, where applicable, where applied and did not result in any exceedances of WCP noise limits (Appendix 3F). 	<ul style="list-style-type: none"> All noise monitoring was undertaken in accordance with the Noise Management Plan in 2019; The frequency of attended monitoring was monthly during the 2019 review period; Attended monitoring at these locations indicated that the mine complied with noise consent limits during the 2019 review period. It is noted that the approved criteria may not always be applicable due to meteorological conditions at the time of monitoring. In 2019 there was approximately 176 hours lost time (i.e. lost time only captured for primary dig implements such as dozers, excavators and loaders) as a direct result of modifying the operations to remain compliant with relevant noise criteria. Validation report of real time noise monitoring is now conducted monthly and provided in Appendix 3F. Attended noise trend analysis from 2013 to 2019 was undertaken by WCPL's noise specialist. The results are provided in Appendix 3F.
	LAeq (15 minute)	LAeq (15 minute)	LAeq (15 minute)	LA1 (1 minute)		
102	36	36	38	45		
Wollar Village – Residential ⁵	36	37	37	45		
All other privately owned land	35	35	35	45		
901 – Wollar School	35 (internal) 45 (external) When in use			-		
150A – St Luke's Anglican Church ⁶ 900 – St Laurence O'Toole Catholic Church ⁶	40 (internal) When in use			-		
<p>Notes: 1) To interpret the locations refer to Table 18 and Appendix 3F. 2) Day is defined as the period from 7 am to 6 pm Monday to Saturday and 8 am to 6 pm Sunday and Public Holidays. 3) Evening is defined as the period 6 pm to 10 pm. 4) Night is defined as the period from 10 pm to 7 am Monday to Saturday and 10 pm to 8 am Sunday and Public Holidays. 5) Wollar Village EPL intrusive noise limits are currently day 36dBA, evening 35dBA and night 35dBA. 6) Both Properties 150A and 900 are owned by WCPL. Both buildings have been deconsecrated and are no longer places of worship.</p>						

Implemented/Proposed Management Actions (Noise)

- In accordance with Condition 5, Schedule 5 of SD-6764, WCPL will review, and if necessary revise, the Noise Management Plan within three months of the submission of this Annual Review.
- Continue to implement the Noise Management Plan (NMP) in accordance Condition 5, Schedule 3 of SSD-6764.
- As discussed in Section 9.0, all noise complaints were responded to as required by WCPL Complaints Management Procedure.
- A review of the Noise Management Plan as undertaken in late 2019 which included an update of figures to reflect the approved increase of the disturbance footprint and open cut boundary in Pit 8 and display ML1779.
- There was a decrease of noise complaints in 2019. A total of 6 noise complaints were recorded in 2019, as opposed to 28 complaints in 2018.
- In 2019 there was approximately 176 hours lost time (i.e. lost time only captured for primary dig implements such as dozers, excavators and loaders) as a direct result of modifying the operations to remain compliant with relevant noise criteria (**Figure 4**).

Figure 4 Breakdown of Lost Time Hours 2019 (Noise)



Notes: The increase in lost hours due to lightning in 2019 is a result of implementation of a new Lightning TARP and the occurrence of more frequent electrical thunderstorms (mainly dry lightning) in 2019.

6.3 Heritage

The Mine has developed and implemented an Aboriginal Cultural Heritage Management Plan (ACHMP) (**Table 7**). Four Cultural Heritage meetings were undertaken in 2019 (inclusive of RAPCC) on March, June, September and December. Key heritage and environmental issues that were raised during consultation included summary of mining operations, exploration, review of Aboriginal Cultural Heritage Management Plan (ACHMP), management of Aboriginal heritage including rock shelters and salvage works program.

The September 2019 review of the ACHMP (Version 6) included revised figures with ML1779, updating references and figures regarding Pit 8 boundary changes and minor changes to Section 2.2.3 and 3.4.2.

During the 2019 review period, a number of archaeological surveys, due diligence surveys, surface salvage works and other programs and investigations were carried out, including but not limited to:

- Pit 5 – WEP Area C31/38 and WCP525(PAD) (subsurface testing and salvage);
- WCP85 - (Rock Shelter) (subsurface testing and salvage);
- Pit 6 – polypipe easement (surface clearance); and
- Exploration areas (surface clearance).

WCPL are required to assess and report on the following performance indicators as described in the ACHMP:

- (Nil) Number of complaints received regarding Aboriginal cultural heritage management at the Mine;
- (Nil) Number of incidents or non-compliances recorded regarding Aboriginal cultural heritage at the Mine

In 2019 WCPL did not exceed the performance indicators as described in the ACHMP i.e. no complaints were received, and no incidents or non-compliance occurred.

The Mine has developed and implemented a Historic Heritage Management Plan (HHMP) in accordance with Condition 49, Schedule 3 of SSD-6764, the HHMP includes a program and description of the measures/procedures that would be implemented for historic heritage management at the Wilpinjong Coal Mine.

In accordance with the HHMP, WCPL are to report on the performance of monitoring the Shale Oil Mine Adit in relation to blasting. In 2019, there was no blasting in Pit 8 therefore no monitoring of the Shale Oil Mine Adit was required under the Blast Management Plan.

In December 2017, WCPL resubmitted the HHMP with the Archaeological Research Design (ARD) for the test and salvage excavation required at the potential caretaker's cottage site in Pit 8. DPIE approved this revised management plan in July 2018.

In November 2019, WCPL implemented the ARD for the test and salvage excavation required at the potential caretaker's cottage site in Pit 8. As a result of the ARD, no archaeological remains of the cottage or associated structures were found. These results can be understood that this location was either not the location of the caretaker's cottage or that this structure was built of insubstantial materials which have left no archaeological remains.

6.4 Biodiversity

A Biodiversity Management Plan (BMP) (**Table 7**) has been prepared and implemented for the Mine. The BMP outlines strategies for the management of flora and fauna, threatened species, rehabilitated areas, regeneration areas, biodiversity offset areas (BOA's) and the Enhancement and Conservation Areas (ECA's) (**Appendix 5**). A summary report on the Biodiversity Offset requirements and progress against the 3-year Management Schedule is provided in **Appendix 5**.

The Biodiversity Offset Strategy (**Appendix 5**) in the BMP comprises a package of BOA's that will be set aside for conservation and managed in perpetuity, and WCPL's rehabilitation strategy. In addition, the Biodiversity Offset Strategy includes a number of ECA's and residual Regeneration Areas associated with the original Wilpinjong Coal Project that will strengthen the linkages between the rehabilitation areas and the Goulburn River National Park and Munghorn Gap Nature Reserve.

In addition, the Biodiversity Offset Strategy also includes on-site rehabilitation to establish the biometric vegetation types (BVTs) and fauna habitat as required by Schedule 3, Condition 37 of the Development Consent SSD-6764.

In April 2019, WCPL finalised the BVT performance and completion criteria⁷ in consultation with OEH, DoEE and DPIE and accordingly the BMP was comprehensively updated as required to reflect the new criteria and resubmitted in June 2019.

WCPL's Biodiversity Monitoring Program in the BMP includes annual monitoring of flora and fauna, and a range of landscape function indicators. This monitoring program is used to evaluate ecosystem function and performance and the success of specific management actions implemented across the various Management Domains⁸.

A summary of the 2019 flora and fauna monitoring results are provided below. A summary of the monitoring within rehabilitation areas is provided in **Section 8.2**. For the complete 2019 biodiversity monitoring reports, prepared by Ecological Australia (ELA) and Fly By Night Bat Surveys, refer to **Appendix 5**.

Biodiversity monitoring was undertaken during Autumn and Spring under the methodology prescribed in the BMP. Monitoring was undertaken at established monitoring sites across the Management Domains, including Biodiversity Offset Areas, Enhancement and Conservation Areas, Regeneration and Rehabilitation areas. A series of Reference sites were monitored to provide comparative results.

Monitoring results have been analysed and compared against Performance and Completion criteria prescribed by the BMP to measure the progress of the Management Domains towards biodiversity targets.

Vegetation monitoring was undertaken within all Management Domains and Reference sites during 2019. Five Western Slopes Dry Sclerophyll Forest sites and six Western Slopes Grassy Woodland sites achieved the Interim Performance Target (IPT) for their overall Site Value Scores (SVS), however, most SVS declined in comparison to the 2018 results, potentially attributable to below average rainfall during 2019. No sites achieved the IPT for all site attribute scores. Most sites achieved the attribute targets for Native Overstorey Cover, Exotic Cover and Number of Trees with Hollows.

Monitoring results from Reference sites during both Autumn and Spring 2018 continue to add to the dataset to be used for comparison against vegetation monitoring results within the Management Domains. Ongoing monitoring data collected at the Reference sites in 2019 will be used to develop more relevant, locally based benchmark values against which future monitoring data would be analysed. Additional Reference sites specific to rehabilitation BVTs were established in 2019 and a review is currently underway to determine their suitability as locally based benchmarks.

Landscape Organisation Index scores, developed through analysis of the data collected from Landscape Function Analysis monitoring, were high across all monitoring sites, although most sites had decreased marginally compared to 2018 results. Similarly, low levels of erosion observed throughout previous monitoring seasons can be correlated with the high Soil Surface Assessment stability scores and the absence of any substantial erosion recorded since 2015. This is consistent with 2019 results, with only two sites not yet reaching the stability completion criteria. Overall these combined data sets demonstrate that consistently stable landforms occur across the WCM Management Domains.

Fauna monitoring undertaken in 2019 recorded 141 fauna species, including 118 birds, one amphibian, 12 reptiles and ten mammals (including ten positively identified microbat species). Fourteen species (11 bird species and three positively identified microbat species) listed as threatened under the NSW *Biodiversity Conservation Act 2016* and/or the Commonwealth *Environmental Protection and Biodiversity Act 1999* were recorded. Long term analysis of consistent monitoring data is required to determine if the results are attributed to management practices, seasonal variation or are indicative of a long-term trend across the landscape.

⁷ As discussed in the 2018 AR, the 2018 Biodiversity Monitoring Program utilised the previously approved completion criteria and interim performance targets in the currently approved BMP (Version 4).

⁸ Mine closure or rehabilitation domains are identified in the WCPL's MOP.

Slate Gully Mine Adit Monitoring

An underground oil shale mine at Slate Gully, supports colonies of two microbats, the Eastern Horseshoe Bat (*Rhinolophus megaphyllus*) and Large Bent-winged Bat (*Miniopterus orianae oceanensis*, formerly known as Eastern Bentwing-bat *Miniopterus schreibersii oceanensis*). Monitoring undertaken since April 2017 indicates that less than 50 Eastern Horseshoe Bats inhabit the mine workings throughout the year. From exit counts, numbers of this species do not vary substantially throughout the year. Numbers of the Large Bent-winged Bat inhabiting the mine vary considerably more, with up to 700 individuals present.

A number of separate surveys were completed in during 2019 of the disused oil shale mine adit in Slate Gully by Fly By Night Bat Surveys (**Appendix 5**). A summary of the results is provided below.

Automated echolocation call detection worked successfully at Slate Gully for estimating the activity of the two microbat species roosting within the disused oil shale mine workings. The pattern of activity broadly mirrored numbers of bats recorded leaving the adit from hand counts undertaken over several years (Fly By Night 2017-2019). Activity of the Eastern Horseshoe Bat peaked during the winter months before decreasing to a low over the summer period. In contrast, activity of the Large Bent-winged Bat decreased through winter to a low in November. From late November, females of this species migrate to select maternity roosts to give birth (Hoye & Hall 2008). This accounts for the low numbers present during the summer months. The pattern of decline in the activity of the Large Bent-winged Bat during winter at Wilpinjong mimics that recorded at roosts in culverts in urban areas of Newcastle and Sydney (Hoye & Spence 2004).

The activity of the Large Bent-winged Bat recorded at the detector was broadly comparable with the hand counts undertaken simultaneously at the adit. Activity of the Eastern Horseshoe recorded at the detector correlated much more poorly with the headcounts. This can be attributed to the small population of Eastern Horseshoe Bats resident in the workings throughout the year compared with that of the Large Bent-winged Bat. The activity patterns of the Eastern Horseshoe Bat (lots of coming and going) also impacts the suitability of the index. These results suggest that monitoring of the colony at Slate Gully through nightly recording of echolocation calls provides a feasible means of monitoring use of the disused workings by the two microbat species. Mean monthly activity for the two species can be compared prior to mining taking place in adjacent areas with that post mining.

In accordance with the Biodiversity Management Plan, Eastern-Bentwing Bat Management Strategies were undertaken in 2019. To mitigate the potential for future collapse of the Oil Shale Adit entrance, rock debris was removed with a section of 1000mm diameter steel pipe culvert inserted into the Adit to ensure access/egress for bats into the Adit. The area surrounding the pipe was then backfilled as to minimise the potential for rockfall to collapse the pipe (**Plate 1**). With these works completed in 2019, monitoring will continue throughout 2020 to evaluate bat activity and the effectiveness of the restructured Adit entrance.



Plate 1 Culvert Support of the Oil Shale Adit 2019

6.5 Waste Management

The Mine has developed and implemented a Waste Management Plan (**Table 7**) to ensure that waste at the Mine is minimised and effectively managed. The WMP was developed, but not limited to, address the relevant requirements of the SSD-6764, EPL 12425, identify waste streams, waste monitoring and tracking procedures and ensure the generation of waste is minimised and recycling of waste is maximised where practicable.

As required by Condition 58(f), Schedule 3 of SSD-6764, WCPL are required to report on waste management and minimisation (**Table 20 & Graph 12**) in the 2019 Annual Review. During the reporting period approximately 82% of the total waste removed from the Mine was recycled. The percentage of waste recycled in 2019 was slightly lower than the 84% in 2018. **Appendix 3G** has the complete summary of waste statistics for the 2019 annual review period.

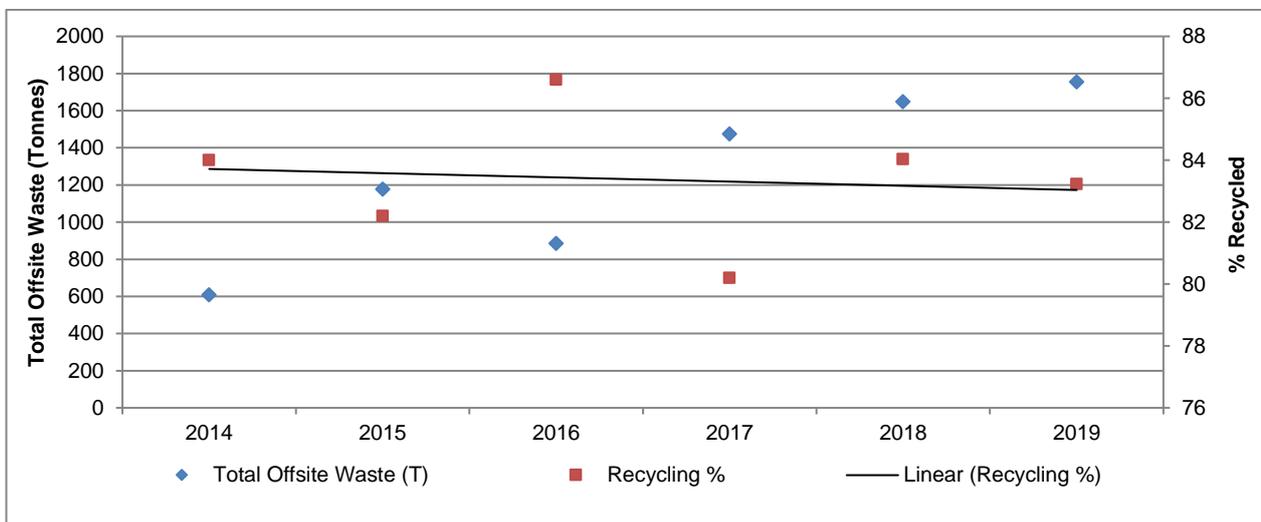
Approximately 298 tonnes of tyres were buried in Pit during 2019. Thirty-two tyres were buried in Pit 6 and fifty-five tyres were buried in Pit 2.

WCPL are permitted to dispose of building and demolition waste in-pit, in accordance with EPL 12425. In 2019 there was no disposal of building and demolition waste, no demolition of onsite farm houses occurred in the 2019 reporting period.

Table 20 Summary of Monthly Waste Statistics for 2019

Totals	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Totals
Total Offsite Waste (T)	146.3	110.9	139.1	177.0	137.4	139.1	161.1	153.6	150.6	134.8	185.2	119.9	1,755.2
Recycled Waste (T)	120.7	97.5	119.1	153.0	109.0	114.3	137.1	120.9	125.2	100.3	165.6	97.9	1,460.9
Recycling %	79.9	68.9	86.5	73.3	85.1	84.5	83.4	82.6	85.9	90.3	89.5	87.2	84.0%

Graph 12 Waste Statistics and Trends



6.6 Greenhouse Gas

Greenhouse gas management measures for the Mine are outlined in the AQMP. Diesel and electricity usage was recorded during the 2019 review period, which allows for the calculation of carbon dioxide (CO₂) equivalent emissions. The primary source (approximately 80%) of greenhouse gas emissions at the Mine is due to the release of carbon dioxide (CO₂) and methane (CH₄) during the combustion of diesel fuel during mining operations. Fugitive emissions of CH₄ and CO₂ from the coal seam as the coal is mined and CO₂

released during the use of explosives make up approximately 20% of greenhouse gas emissions at the Mine. Greenhouse gas emission (i.e. Scope 1 & Scope 2) estimates for the 2019 review period are presented in **Table 21**.

Table 21 Estimated Wilpinjong Coal Mine Greenhouse Gas Emissions

Year	ROM Coal (Mt)	Electricity Consumed (kWh)	Diesel Consumed (kL)	CO ₂ -e Electricity Usage (t)	CO ₂ -e Diesel Usage (t)	CO ₂ -e Fugitive Emissions (t)	Total CO ₂ -e Emissions (t)	Total CO ₂ -e Emissions (t) Predicted (MOD3)/(MOD5)
2012	14.48	26,328,000	30,202	23,432	80,673	651,633*	755,738	120,978
2013	14.9	32,730,368	39,444.3	29,130	105,360	6702.3**	141,193	120,978
2014	15.4	31,580,001	33,194	27,318	89,049	10,747	127,114	154,395^
2015	12.6	31,713,000	28,325	26,639	75,990	10,046	112,675	148,628^
2016	13.5	31,850,068	30,033	26,754	81,383	11,200	119,337	145,488^
2017	13.6	29,929,870	32,976	25,141	89,356	12,809	127,306	167,977#
2018	14.2	32,940,513	38,360	27,341	103,948	13,828	145,117	182,002#
2019	15.1	32,037,969	43,647	26,272	118,270	12,980	152,522	180,302#

Notes: kWh = kilowatt hours and kL = kilolitre. * A NSW default factor was used to calculate these values. ** The change in tonnes CO₂e estimated for 2013 at Wilpinjong results from moving to Open Cut Emissions Method 2/3 (a measurement of seam gas contents, followed by model development and then emission calculation) in line with ACARP Methodology C20005, from NGER Open Cut Emissions Method 1 (default measurement factors for NSW * ROM tonnes).^ MOD5 predictions.# Scope 1 and 2 predicted emissions from the WEP for 2017 based on 15.5Mt ROM coal.

Greenhouse gas emissions from the Wilpinjong Coal Mine would continue to be monitored and reported annually in accordance with Peabody Energy's obligations under the *Commonwealth Government National Greenhouse and Energy Reporting System*. Peabody Energy and WCPL will also comply with any obligations under the *Commonwealth Clean Energy Act, 2011*.

6.7 Ambient Air Quality Monitoring

Condition 16, Schedule 3 of PA05-0021 and Condition 16, Schedule 3 of SSD-6764 requires WCPL to ensure that no offensive odours are emitted from the site, as defined under the *Protection of the Environment Operations Act, 1997*.

There was no requirement to undertake ambient air monitoring programs in 2019. Previous monitoring occurred in the Wollar Village up to April 2018 for the following pollutants that can be released during spontaneous combustion events, including Oxides of Nitrogen (NO_x), Sulfur Dioxide (SO₂), Hydrogen Sulfide (H₂S), Benzene, Toluene and *p*-Xylene.

An air quality monitoring station was situated in the Village of Wollar to monitor for the above mentioned pollutants during the removal of Keylah Dump, as required by the SCMP and the Keylah Dump Removal Management Plan. The removal of Keylah Dump was completed during 2017. Therefore, this air quality monitoring station in the Village of Wollar specific for the dump removal, was no longer required and subsequently removed in May 2018.

Spontaneous combustion propensity testing is scheduled for 2020 when suitable areas become available.

7.0 WATER MANAGEMENT

WCPL have prepared and implemented a Water Management Plan (WMP) (**Table 7**). Several key component management plans and programs that support the WMP include the Surface Water Monitoring Program (SWMP), the Groundwater Monitoring Program (GWMP) and Surface Water and Groundwater Response Plan (SGWRP).

7.1 Water Licences

Table 22 lists the water licences held by WCPL and provides a summary of performance for the ‘water year’ from 01 July 2018 to 30 June 2019 (SLR, 2020).

Table 23 lists the converted water entitlement licenses to Water Access License (WAL) that occurred during October 2017.

Table 22 Water Take Licence

LICENSE	Pit	Limit ML/A	Inferred Groundwater Inflow [ML]															
			2012-2013	2013-2014	2014-2015	2015-2016		2016-2017		2017-2018		2018-2019						
					WRM inflow pro-rata w/ modelled	Modelled inflow (HS, 2015b)	Pit License Consolidated		Hatch (2017)	Modelled inflow (HS, 2015b)	WRM inflow (2018)	Modelled inflow (HS, 2015b)	WRM Inflow (2019)	Modelled inflow (HS, 2015b)	Licence Consolidated – WAL418623		WRM Inflow (2019)	Modelled inflow (HS, 2020)
20BL173517	Pit 1	1	0	0	6-11	13	Pit License Consolidated		1600	1043	1009	1033	815	980	Licence Consolidated – WAL418623		730	797
20BL173516	Pit 2	190	<1	<1	4-7	9	Pit License Consolidated											
20BL173515	Pit 3	680	38-54	890-1270	210-351	433	Pit License Consolidated											
	Pit 7		10 to 16#	10 to 16#	20#	Pit License Consolidated												
20BL173514	Pit 4	350	136-273	345-695	100-168	207	Pit License Consolidated											
20BL176513	Pit 5	800	160-453	140-405	347-579	714	Pit License Consolidated											
	Pit 6		Not yet mined (commencement in 2019)										Licence Consolidated – WAL418623		730	797		
Dewatering Bores		770	No pumping recorded at bores										Licence Consolidated – WAL418623		56.1			
TOTAL		2,021 (pits) + 770 (bore)	335-780	1380-1794	678-1133	1397	Pit License Consolidated		1600	1043	1009	1033	815	980	Licence Consolidated – WAL418623		786	848
Full year (or scaled full year) of pumping data assessed: Compliant (based on available pumping data)																		

Pit 7 inflow should be considered under the Pit 3 license (680 ML/a) *Volume of water pumped from dewatering bores [ML] for the water year 2018-19, refer to Sections **Error! Reference source not found.** and **Error! Reference source not found.** for license conditions in SLR Report (**Appendix 3D**).

Table 23 Summary of WAL Held by WCPL

WAL	AL #	Water Source	Category	Entitlement*	Holder	Work Approval	Expiry date
21499	20AL211215	Wollar Creek	Aquifer	474 Unit shares	Peabody Pastoral Holdings Pty Ltd/Wilpinjong Coal Pty Limited as 100/374 share	20CA211216	31/7/2022
19045	20AL209956	Upper Goulbourn	Unregulated	183 Unit shares	Peabody Pastoral Holdings Pty Ltd	20CA209957	12/11/2022
19055	20AL209954	Upper Goulbourn	Unregulated	50 Unit shares	Peabody Pastoral Holdings Pty Ltd	20CA209955	31/7/2022
19057	20AL209966	Upper Goulbourn	Unregulated	110 Unit shares	Peabody Pastoral Holdings Pty Ltd	20CA209967	7/2/2024
19058	20AL209974	Upper Goulbourn	Unregulated	168 Unit shares	Peabody Pastoral Holdings Pty Ltd	20CA209975	19/11/2022
19426	20AL210793	Wollar Creek	Unregulated	40 Unit shares	Peabody Pastoral Holdings Pty Ltd	20CA210794	31/7/2022
19423	20AL210790	Wollar Creek	Domestic & stock	2 ML	Peabody Pastoral Holdings Pty Ltd	20WA210792	31/7/2022
19425	20AL210795	Wollar Creek	Domestic & stock	1 ML	Peabody Pastoral Holdings Pty Ltd	20WA210796	31/7/2022
19430	20AL210798	Wollar Creek	Domestic & stock	5 ML	Peabody Pastoral Holdings Pty Ltd	20WA210799	31/7/2022
36398	20AL212799	Wollar Creek	Domestic & stock	1 ML	Peabody Pastoral Holdings Pty Ltd	20WA212768	30/7/2023
9476	N/A	Macquarie/Cudgegong	Regulated (General Security)	790 Unit shares	Wilpinjong Coal Pty Limited	No nominated work	
41862	N/A	Sydney Basin - North Coast Groundwater	Aquifer	3121 Unit shares	Wilpinjong Coal Pty Limited	20MW065002	N/A

*Note: Water entitlement held under NSW Water Management Act, 2000 is granted in perpetuity. One unit is currently equivalent to 1.0 ML as per the Available Water Determination Order for Various NSW Unregulated and Alluvial Water Sources (No. 1) 2013

7.2 Estimated Groundwater Take

WCPL holds a WAL41862 to cover the extraction of water from all open cut pits. The total authorised volume of groundwater extraction for Water Year from 1 July 2018 to 30 June 2019 is 3,121 ML/year. Both WRM and SLR completed a review of estimated groundwater take for the 2018/2019 Water Year (**Table 22**). The following summary is provided from SLR's (**Appendix 3D**) review:

- Given that the simulated mine plans differ slightly between the (2015) and the (2020) model versions the models are in good agreement for most years with respect to estimated groundwater take. Minor exceptions occur for the 2016-2017 and 2017-2018 water year with simulated inflows differ by 30 and 22 percent respectively.
- For the 2018-2019 water year both models predict similar inflows with the previous model (HydroSimulations, 2015) predicting 905.9 ML/a, and the current model (SLR, 2020) estimating 848 ML/a (including dewatering bores extraction).
- These estimates are marginally greater than the 730 ML/a estimated by WRM for the 2018-2019 water year (WRM, 2019) (or 786 ML/a including the dewatering bores extraction⁹). Although the values are close, the current model performs better in predicting inflows, and is therefore more appropriate for use in predicting impacts to groundwater from WCM.
- Inflows predicted by both models and the independent water balance assessment (WRM, 2019) are all below the licenced 'take' of 3,121 ML/a.

⁹ Water supply bores during the 2018-19 water year produced a total of 56.1 ML (refer to **Appendix 3D**)

For the 2018-2019 water year the additional alluvial water loss, over and above what occurs naturally, is estimated to be about 0.20 ML/day from Wilpinjong Creek alluvium and about 0.16 ML/day from Cumbo Creek alluvium.

This gives a predicted alluvial groundwater take of about 131 ML/year. WCPL holds 374 Units of aquifer licence under WAL21499 (total license limits of 474 Units of which 100 Units is held by Peabody Pastoral Holdings).

For more information refer to **Appendix 3D**.

7.3 Water Licence Conditions

Appendix 3D contains a detailed review against licence conditions 2, 3, 4 and 8 for pit extraction for the period 1 July 2018 to 30 June 2019 (2018/19 Water Year), undertaken by SLR.

WCPL can demonstrate compliance against the relevant conditions, with actions to be developed in 2020 in regards to the groundwater trigger exceedances identified during 2019 (**Table 29** and **Appendix 3D**).

WCPL will consider the recommendations provided by SLR for improvements in the next reporting period in regards to licence Condition 6.3.6 (**Section 7.6**).

7.4 Water Management System

Water management activities were undertaken during the 2019 review period in accordance with the Mine's water management system outlined in the MOP and the WMP. In summary, water management for the Mine is based on the containment and re-use of mine water as well as the control of sediment laden water that may be potentially carried with runoff from disturbed areas. The mine water management system is shown in schematic form on **Appendix 3C**. The key components of the Mine's water management system include:

- Collection and re-use of surface runoff from disturbed areas;
- Capture and on-site containment of mine water, comprising groundwater inflows and incident rainfall-runoff to operational areas;
- Re-use of contained mine water for dust suppression over active surfaces (e.g. haul roads).
- Recycling of mine water associated with the CHPP and tailings disposal areas;
- Consumption of contained waters in the Mine water supply system;
- Management of treated sewage effluent in accordance with the OEH's *Environmental Guidelines for the Utilisation of Treated Effluent*;
- Standby-operation of an evaporative spray system on the eastern bank of Pit 2 (West); and
- Discharge of treated water via a water treatment facility to Wilpinjong Creek in accordance with EPL 12425.

7.5 Erosion and Sediment Control

An Erosion and Sediment Control Plan (ESCP) has been developed (**Table 7**) for the Mine. During the 2019 review period water management structures were either implemented or maintained to contain potentially sediment laden water from mining activities in Pit 3, Pit 4, Pit 5, Pit 6, Pit 7 and Pit 8 within the Mine's water management system.

Other activities included routine removal of sediment from sumps, drains and sediment dams located in the Mining Infrastructure Area (MIA) and CHPP. There were no reportable incidents in relation to erosion and sediment control in the 2019 review period.

In 2019, WCPL completed a review of the SWMP to include a detailed description of the assessment process for not adopting clean water diversions, based on further specialist reviews that can clearly identify

when a clean water diversion is not adopted by WCPL. This review of the clean water diversions was completed by WRM in early 2019.

WCPL annually review the site water balance if diversions are not adopted to account for in each annual review of the site water balance and calculation of harvestable rights.

Clean water diversion structures were under construction within Pit 8 during the 2019 reporting period. The majority of Pit 6 remains free draining as limited mining activities have occurred during 2019 and most of this area is considered not disturbed.

WCPL are scheduled to continue revegetation of the visual bunds currently under construction along the northern boundary of the Mine. Another section of the visual bund of Pit 5 was hydromulched in 2019.

7.6 Surface Water

A summary of the surface water monitoring program is presented in **Table 24**. A summary of the surface water monitoring results assessed against each relevant water quality impact criteria from the SWMP is provided in **Table 25**. Further water monitoring results for 2019 review period, including figures with surface water quality monitoring locations are provided in **Appendix 3C**.

Table 24 Surface Water Monitoring Program

Monitoring Locations		Frequency	Parameters ¹
Wilpinjong Creek	Licenced Discharge Point No. 24	Continuous (during discharge)	Volume of water discharged ⁶ , EC and pH
		Weekly (during discharge)	Oil & Grease and TSS ⁷
	WIL-U, WIL-U2, WIL-PC, WIL-NC, WIL-D and WIL-D2 ²	Monthly	Field pH and EC, turbidity ³ , and SO ₄
		Quarterly [^]	Copper, Zinc, Iron, Aluminium, Nickel, Manganese, Barium, Strontium, Lead, Arsenic and Selenium
	WILGSU and WILGSD (gauging stations) ²	Continuous	Flow rate, pH, EC and temperature
		Monthly	Field pH and EC, turbidity ³ , and SO ₄
		Following significant rainfall events ⁴	pH, EC, TDS, TSS and sulphate
	WC1, WC2, WC3, WC4, WC5, WC6, WC7, WC8 ⁵	Annually	Stream health monitoring
Forty-nine survey points along Wilpinjong Creek ⁵	Annually	Channel stability monitoring (photo-points, description, stability)	
Cumbo Creek	CC1, CC2 and CC3 ²	Monthly	Field pH and EC, turbidity ³ , and SO ₄
		Quarterly [^]	Copper, Zinc, Iron, Aluminium, Nickel, Manganese, Barium, Strontium, Lead, Arsenic and Selenium
	CC3 ²	Following significant rainfall events ⁴	pH, EC, TDS, TSS and sulphate
	CCGSU and CCGSD (gauging station) ²	Continuous	Flow rate, pH, EC and temperature
		monthly	Field pH and EC, turbidity ³ , and SO ₄
		Following significant rainfall events ³	pH, EC, TDS, TSS and sulphate
	CC1, CC2 ⁵	Annually	Stream health monitoring
Nine survey points along Cumbo Creek ⁵	Annually	Channel stability monitoring	
Wollar Creek	Monthly	Field pH and EC, turbidity, and SO ₄	

Monitoring Locations		Frequency	Parameters ¹
	WOL 1 and WOL 2 ²	Quarterly [^]	Copper, Zinc, Iron, Aluminium, Nickel, Manganese, Barium, Strontium, Lead, Arsenic and Selenium
	WO1, WO2, WO3 ⁵	Annually	Stream health monitoring
Slate Gully Creek	SGC_1 ²	Monthly	Field pH and EC, turbidity, and SO ₄
		Quarterly	Copper, Zinc, Iron, Aluminium, Nickel, Manganese, Barium, Strontium, Lead, Arsenic and Selenium
		Following significant rainfall events ⁴	pH, EC, TDS, TSS and sulphate

Notes: 1) Parameters will be analysed provided water samples can be collected. 2) Monitoring locations are illustrated in Appendix 3C. 3) Turbidity indicates the potential downstream water quality effects caused by suspended solids. 4) Greater than 20 millimetres (mm) in 24 hours. 5) Monitoring locations are illustrated on Figure 21. 6) Volume to monitored using flow meter and continuous logger. 7) Grab samples. ^ Quarterly under PA05-0021 then monthly under SSD-6764. Shaded cells indicate added to the water monitoring program as a result of SSD-6764 and the revised Surface Water Management Plan.

Table 25 Surface Water Performance

Location		Approved Criteria ^{1,2}	Performance During the Reporting Period	Trend/Key Management Implications
Wilpinjong Creek Sites: <ul style="list-style-type: none"> • WIL_NC • WIL_D • WIL_D2 	EC (µS/cm)	If recorded value at the monitoring site is greater than 3,440 µS/cm for 3 consecutive readings at Wilpinjong Creek Downstream Sites	No exceedance of triggers ^{1,2} Notes: EC observations above defined trigger level, but high EC values also observed at upstream monitoring locations. Trigger not exceeded.	<p>Wilpinjong Creek Downstream During 2019, EC observations at the upstream sites ranged from 3750-6000 µS/cm, reasonably consistent with observations at downstream sampling points, indicating the increase in EC is unlikely to be related to Wilpinjong mining activity (SLR, 2020a);</p> <p>Turbidity observations at monitoring sites in the Wilpinjong Creek downstream area show some variability during 2015 (10-1000 NTU), and gradually decline during 2016 and 2017 (0.5-30 NTU), before increasing in turbidity during 2018 and 2019, to levels more consistent with 2015 observations (1-500 NTU). While there are turbidity observations above the trigger level in 2019, no trigger exceedance is recorded as 3 consecutive observations above the trigger level (SLR, 2020a);</p> <p>Aside from a single observation with a low pH (~pH4), pH observations during 2019 have been stable and do not exceed defined trigger levels (SLR, 2020a).</p>
	Turbidity (NTU)	If recorded value at the monitoring site is greater than 24 NTU for 3 consecutive readings at Wilpinjong Creek Downstream Sites	No exceedance of triggers ^{1,2}	
	pH (lower)	If recorded value at the monitoring site is less than 6.9 pH for 3 consecutive readings at Wilpinjong Creek Downstream Sites	No exceedance of triggers ^{1,2}	
	pH (upper)	If recorded value at the monitoring site is greater than 7.7 pH for 3 consecutive readings at Wilpinjong Creek Downstream Sites	No exceedance of triggers ^{1,2}	
Cumbo Creek (Downstream) Site: <ul style="list-style-type: none"> • CC1 	EC (µS/cm)	If recorded value at the monitoring site is greater than 7,510 µS/cm for 3 consecutive readings at Cumbo Creek Downstream Sites	No exceedance of triggers ^{1,2}	<p>Cumbo Creek Downstream There are no exceedances of the EC trigger recorded in the Cumbo Creek Downstream area over the past four year (SLR, 2020a);</p> <p>The source of this increased turbidity at the Cumbo Creek Downstream area is likely to be a combination of low/no-flow conditions in Cumbo Creek, in conjunction with an increase of sediment to the creek. The CC-1 surface water monitoring site is directly adjacent to the unsealed Ulan-Wollar Road (SLR, 2020a);</p> <p>From 2015 to early 2019, pH observations at Cumbo Creek Downstream monitoring sites are consistently below the trigger level of around pH 7. They are also generally lower than pH observations from Cumbo Creek Upstream monitoring sites. While these observations constitute an exceedance of the pH trigger level, all observations are within the pH 6.5-8 range defined in the ANZECC (2000) guidelines for the protection of aquatic ecosystems and do not pose a threat to the health of the system.</p>
	Turbidity (NTU)	If recorded value at the monitoring site is greater than 77 NTU for 3 consecutive readings at Cumbo Creek Downstream Sites	Yes exceedance of triggers ^{1,2} Notes: Proximity of monitoring site to unsealed Ulan-Wollar Road and ongoing dry conditions may all be contributing to exceedances.	
	pH (lower)	If recorded value at the monitoring site is less than 7.5 pH for 3 consecutive readings at Cumbo Creek Downstream Sites	Yes exceedance of triggers ^{1,2} Notes: pH near-neutral and within ANZECC (2000) Guideline Trigger Values. Trigger not likely related to mining.	
	pH (upper)	If recorded value at the monitoring site is greater than 8.2 pH for 3 consecutive readings at Cumbo Creek Downstream Sites	No exceedance of triggers ^{1,2}	

Note: ¹ Trigger is only considered to have been exceeded if the recorded value at monitoring site is greater than (or less than for lower pH Trigger) all values from the upstream monitoring sites sampled on the same day. In the event that a single result is recorded above/below the 80th/20th percentile value, WCPL will undertake a preliminary investigation to ascertain whether the result was caused by an obvious anomaly or whether further testing is required. ² Trigger is only considered to be exceeded if recorded value at the monitoring site is greater than (or less than for lower pH trigger) for 3 consecutive readings.

Implemented/Proposed Management Actions (Water)

- WCPL will continue to implement the approved Water Management Plan and component plans of the Water Management Plan in accordance with Condition 30, Schedule 3 of SSD-6764.
- In accordance with Condition 5, Schedule 5 of SD-6764, WCPL will review, and if necessary revise, the Water Management Plan within three months of the submission of this Annual Review;
- Implementation of the Surface Water Management Measures (Section of the SWMP) to comply with the water management performance measures (Appendix 3C) in Table 6 of the Development Consent SSD-6764.
- Develop interim triggers in 2019 for concentrations of Mo, Se and As for inclusion of the next revision of the SWMP.
- WCPL will review, and if necessary revise, the SWMP within three months of the submission of this Annual Review and in consideration of recommendations by SLR.

Implemented/Proposed Management Actions (Groundwater)

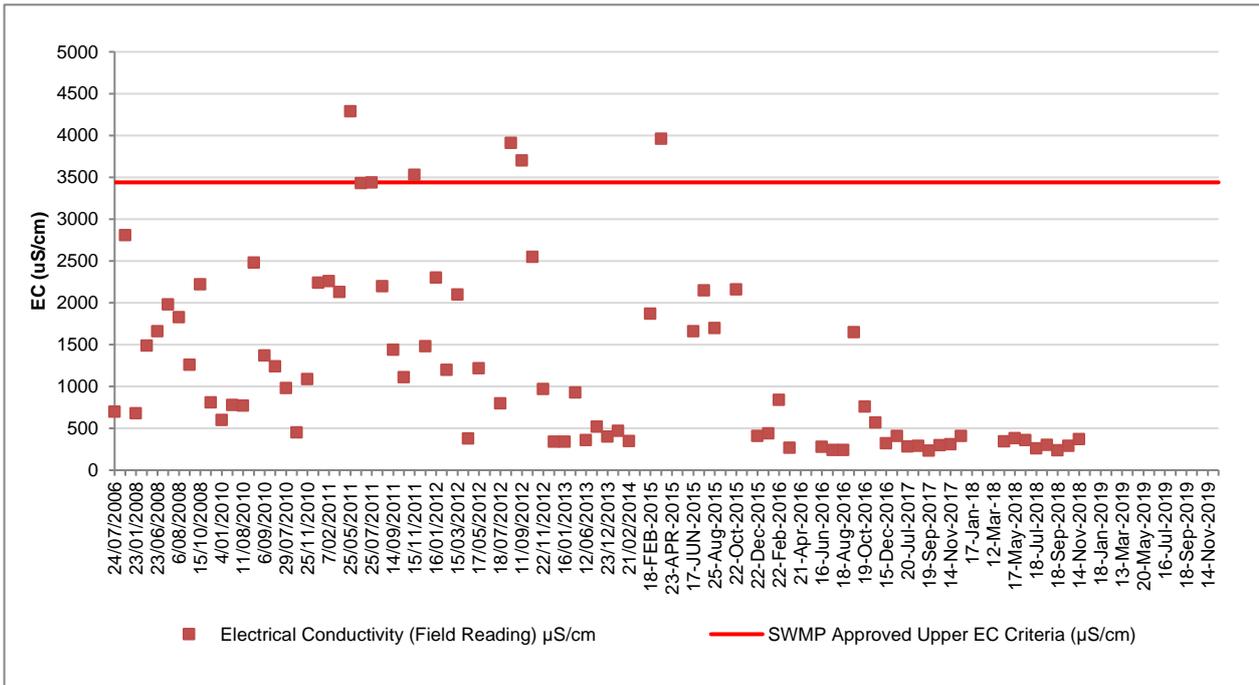
- WCPL will continue to implement the approved Water Management Plan and component plans of the Water Management Plan in accordance with Condition 30, Schedule 3 of SSD-6764.
- WCPL will continue to monitor and evaluate the groundwater system over the 2020 review period.
- In accordance with Condition 5, Schedule 5 of Development Consent SSD-6764, WCPL will review and, if necessary, revise the GWMP within three months of the submission of this Annual Review.
- Consider investigation into the functionality of bore GWA1;
- Re-instatement of trigger level within Groundwater Management Plan for GWA6 now complete and will be provided in forthcoming GWMP review;
- Drilling of deeper bores at alluvial locations that are frequently observed as dry (GWA1, GWA3, GWA6);
- Based on the assessment of model performance for the prediction of groundwater levels at both alluvial and coal bores located around WCM, SLR makes the following recommendations:
 - Due to the difficulty of separating mining from climatic related declines in groundwater level for the past 3 Annual Review reports (2017, 2018, 2019), SLR recommends that a trigger investigation be undertaken that incorporates monitoring data following the February 2020 rainfall event. This investigation should revise the cause and effect analysis provided in this report to incorporate additional data from early 2020 and will provide an indication of the likely cause of recent trigger exceedances.

Table 26 Summary of Surface Water Monitoring Result 2015-2019

SW Monitoring Point	EC (µS/cm)			pH			SO4 (mg/L)			Turbidity (NTU)		
	Min	Max	Ave.	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave
Summary of Surface Water Monitoring Result 2019												
CC1 [^]	432.0	697.0	564.5	7.3	9.1	8.2	56.0	102.0	79.0	663.0	2310.0	1486.5
CC2	3240.0	9910.0	7207.1	7.7	8.0	7.9	884.0	3760.0	2716.3	2.0	16.0	5.1
CC3	5850.0	5850.0	5850.0	7.9	7.9	7.9	2670.0	2670.0	2670.0	4.4	4.4	4.4
WIL (U)*	-	-	-	-	-	-	-	-	-	-	-	-
WIL (U2)	3840.0	5850.0	4428.3	3.6	6.3	4.2	287.0	578.0	400.3	0.9	45.0	11.2
WIL (PC)*	-	-	-	-	-	-	-	-	-	-	-	-
WIL (NC) ^{^A}	-	-	-	-	-	-	-	-	-	-	-	-
WIL (D) [^]	1440.0	6420.0	4192.9	4.0	7.4	6.7	521.0	1960.0	1273.3	9.7	95.2	44.4
WIL (D2) ^{^A}	-	-	-	-	-	-	-	-	-	-	-	-
WOL1	1180.0	4780.0	2877.5	7.9	8.5	8.1	240.0	1510.0	752.5	0.8	5.2	3.3
WOL2	1690.0	5610.0	3545.8	7.0	8.2	7.5	311.0	808.0	641.4	1.7	43.7	16.1
SGC_1*	-	-	-	-	-	-	-	-	-	-	-	-
Summary of Surface Water Monitoring Result 2018												
CC1 [^]	308	1280	688	6.7	7.3	7.0	48	384	166	20	5520	2383
CC2	364	6100	3232	7.6	7.9	7.75	67	2960	1513.5	28.8	499	263.9
CC3	40	40	40	7.6	7.6	7.6	67	67	67	499	499	499
WIL (U)*	-	-	-	-	-	-	-	-	-	-	-	-
WIL (U2)	4360	4380	4370	3.5	5.3	4.4	358	446	402	19.3	45.7	32.5
WIL (PC)*	-	-	-	-	-	-	-	-	-	-	-	-
WIL (NC) ^{^A}	345	345	345	6.7	6.7	6.7	358	358	358	0.9	0.9	0.9
WIL (D) ^{^A}	629	2020	1205.5	5.2	8.0	6.85	36	553	261.5	1.3	27	9.1
WIL (D2) ^{^A}	507	569	538	4.2	7.7	5.95	37	204	120.5	1.6	358	179.8
WOL1	499	1420	1030	7.8	8.4	8.07	37	494	321.3	1.5	358	120.5
WOL2	2370	2850	2680	7.2	7.7	7.4	209	740	506.3	1.9	3.8	2.6
SGC_1*	-	-	-	-	-	-	-	-	-	-	-	-
Summary of Surface Water Monitoring Result 2017												
CC1 [^]	279	5380	2392.3	7.0	8.3	7.58	45	1790	787	4.4	1970	600.9
CC2	5470	8230	6306	7.7	8.3	7.99	1700	3170	2145	0.6	15.8	4.1
CC3	4100	4990	4520	8.30	8.5	8.4	1490	1920	1688	0.6	1.8	1.2
WIL (U)*	-	-	-	-	-	-	-	-	-	-	-	-
WIL (U2)	1360	3890	2851.7	5.4	8.0	6.58	13	121	20.9	2.4	70.8	20.9
WIL (PC)*	-	-	-	-	-	-	-	-	-	-	-	-
WIL (NC) ^{^A}	230	411	313.2	6.8	8.3	7.27	10	85	48.1	0.2	15.2	3.7
WIL (D) ^{^A}	248	1480	493.5	7.3	7.8	7.55	7	87	46.4	2.2	5.6	3.8
WIL (D2) ^{^A}	256	650	386.8	7.3	7.9	7.53	2	83	47.7	1.7	31.9	10.3
WOL1	336	1490	872.4	8.1	8.6	8.25	19	184	97.2	0.9	6.1	2.9
WOL2	1800	2950	2133.6	7.4	8.0	7.82	184	440	304.2	0.4	21.1	3.2
SGC_1*	-	-	-	-	-	-	-	-	-	-	-	-
Summary of Surface Water Monitoring Result 2016												
CC1 [^]	170	4470	2802.9	7.1	7.9	7.41	28	1710	978.9	4.6	6270	936
CC2	3020	7540	5036.3	7.5	8.0	7.84	920	2940	1738.8	0.5	26.4	5
CC3	80	4860	2771.7	7.4	8.4	8.18	8	1920	972.5	0.7	126	25.1
WIL (U)	520	950	632	6.2	7.4	6.94	13	83	36.8	5.8	43.5	21.2
WIL (U2)	440	4420	2140	6.5	7.6	7.04	14	102	34.8	3.3	153	34.8
WIL (PC)	260	1340	682	6.9	7.4	7.16	7	48	28.6	9.7	64.6	38.3
WIL (NC) ^{^A}	240	1650	560.8	7.1	7.8	7.39	8	265	64.5	8.6	201	54.2
WIL (D) ^{^A}	580	3030	1189.2	6.8	8.0	7.46	12	603	165.5	1.2	39.4	10
WIL (D2) ^{^A}	390	1840	796.1	6.9	8.1	7.50	9	466	159.1	3.9	323	43.8
WOL1	780	2220	1226.3	7.8	8.3	8.11	104	475	205.8	1.3	11.2	5
WOL2	740	3160	1693.3	7.2	8.0	7.56	97	650	303.1	0.9	70.7	15.3
SGC_1*	-	-	-	-	-	-	-	-	-	-	-	-
Summary of Surface Water Monitoring Result 2015												
CC1 [^]	120	4380	2316.3	6.6	7.8	7.31	13	1660	237.7	3.3	13000	3415.4
CC2	350	5970	3591.4	7.3	7.9	7.67	1400	2290	1977.8	0.4	20.8	4.7
CC3	150	5130	2220	7.0	8.4	7.93	17	2100	946	1.2	359	93.7
WIL (U)	1650	7550	4306.7	4.8	6.8	5.93	38	146	99	7.4	263	77.0
WIL (U2)	790	5580	3353.8	5.6	7.4	6.71	22	118	41.9	1.5	158	41.9
WIL (PC)	1170	6100	3256.3	6.8	7.9	7.23	3	42	16	1.8	222	90.4
WIL (NC) ^{^A}	410	3960	1987.1	6.6	7.8	7.31	4	106	43	1.2	1440	284.5
WIL (D) ^{^A}	340	5880	2713	7.1	8.1	7.67	29	607	253.2	2.6	363	63.1
WIL (D2) ^{^A}	500	6520	2457.5	7.5	8.2	7.73	16	693	148.4	7.5	557	113.2
WOL1	160	5540	2223	7.5	8.2	7.96	208	956	445.8	1.1	61.8	13.3
WOL2	400	5550	1830	7.3	7.8	7.54	262	822	532.8	0.6	486	53.9
SGC_1*	-	-	-	-	-	-	-	-	-	-	-	-

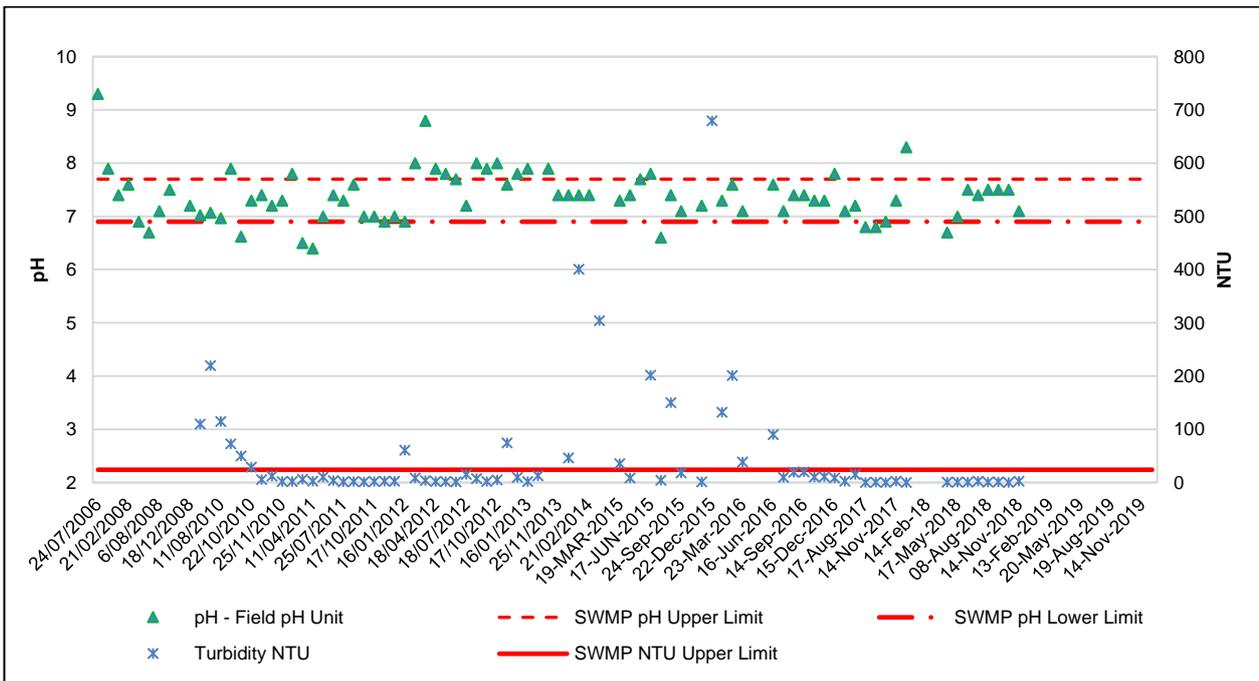
Notes: * Dry & unable to sample ^Surface Quality Impact Assessment Criteria “applicable”

Graph 13 Long-term EC Water Quality Results at WIL_NC



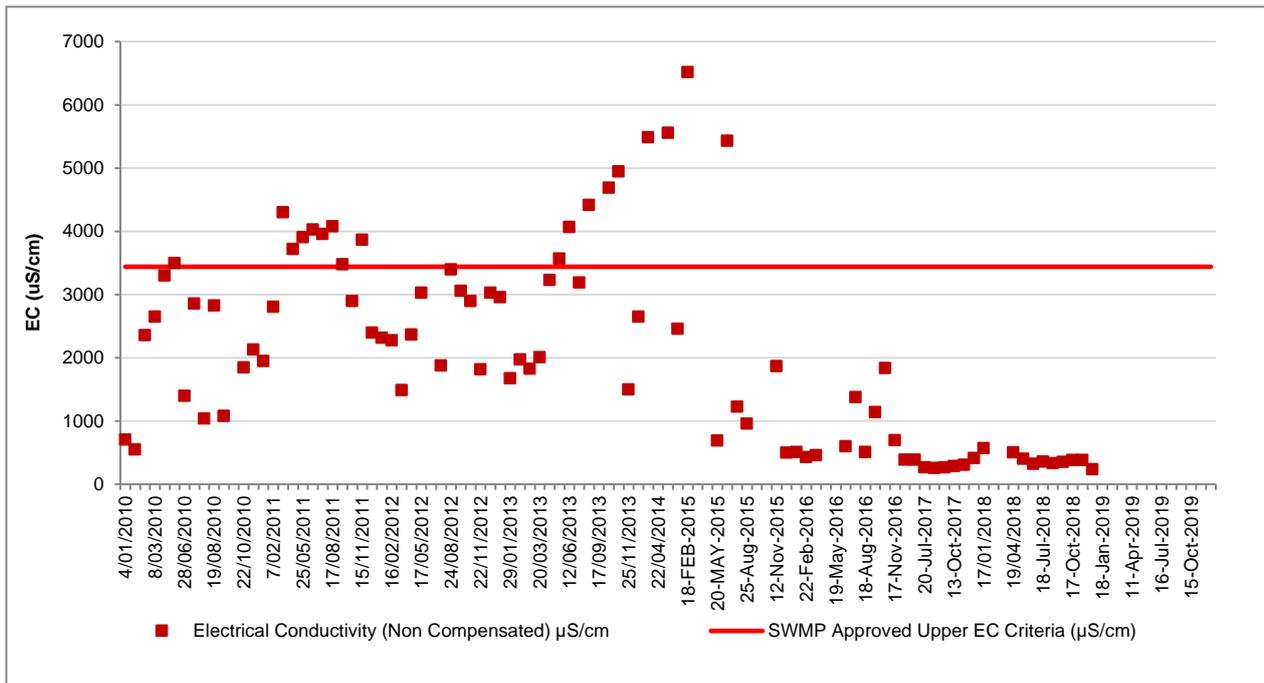
Notes: No available water samples at WIL_NC during the 2019 reporting period where available for sampling due to the prolonged drought conditions, therefore no long-term EC trend analysis can be accurately displayed on graph. Overall trends for EC at WIL_NC since late 2016 have shown decreasing trends.

Graph 14 Long-term pH & NTU Water Quality Results at WIL_NC



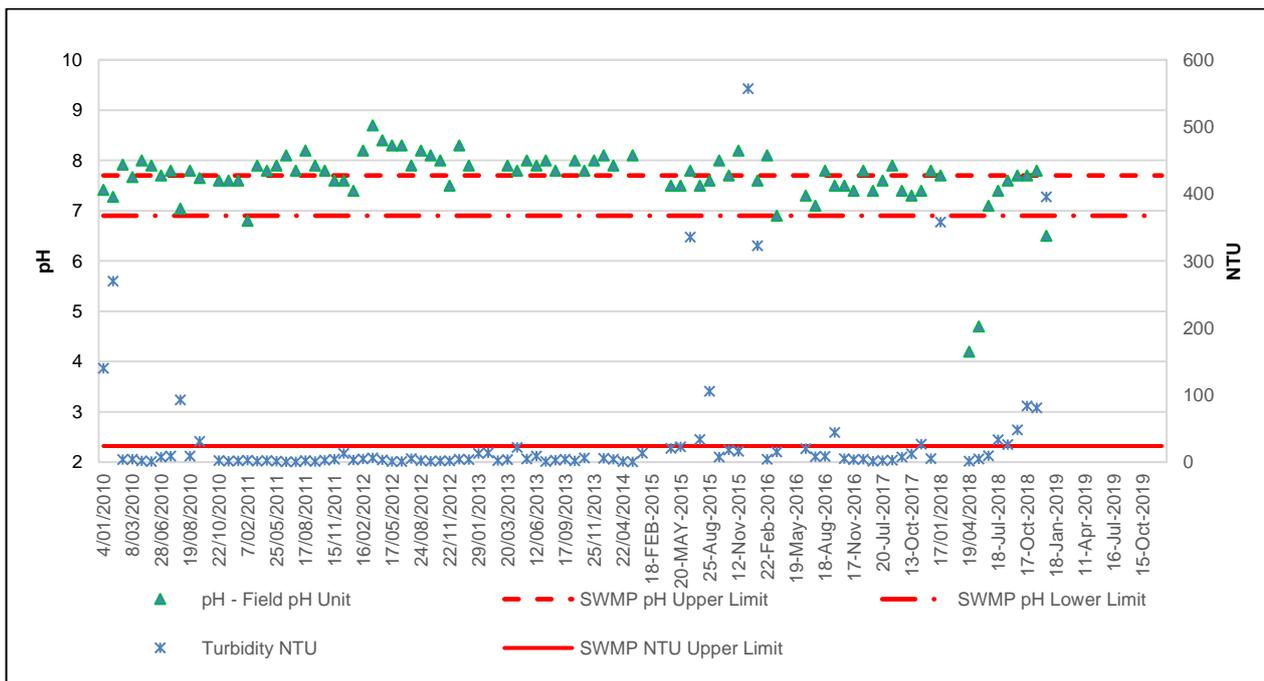
Notes: No available water samples at WIL_NC during the 2019 reporting period where available for sampling due to the prolonged drought conditions, therefore no long-term pH and turbidity trend analysis can be accurately displayed on graph. Overall trends for turbidity at WIL_NC since 2016 have shown decreasing trends. Overall trends for pH at WIL_NC have generally been consistent since 2015 and mostly within criteria.

Graph 15 Long-term EC Water Quality Results at WIL_D2



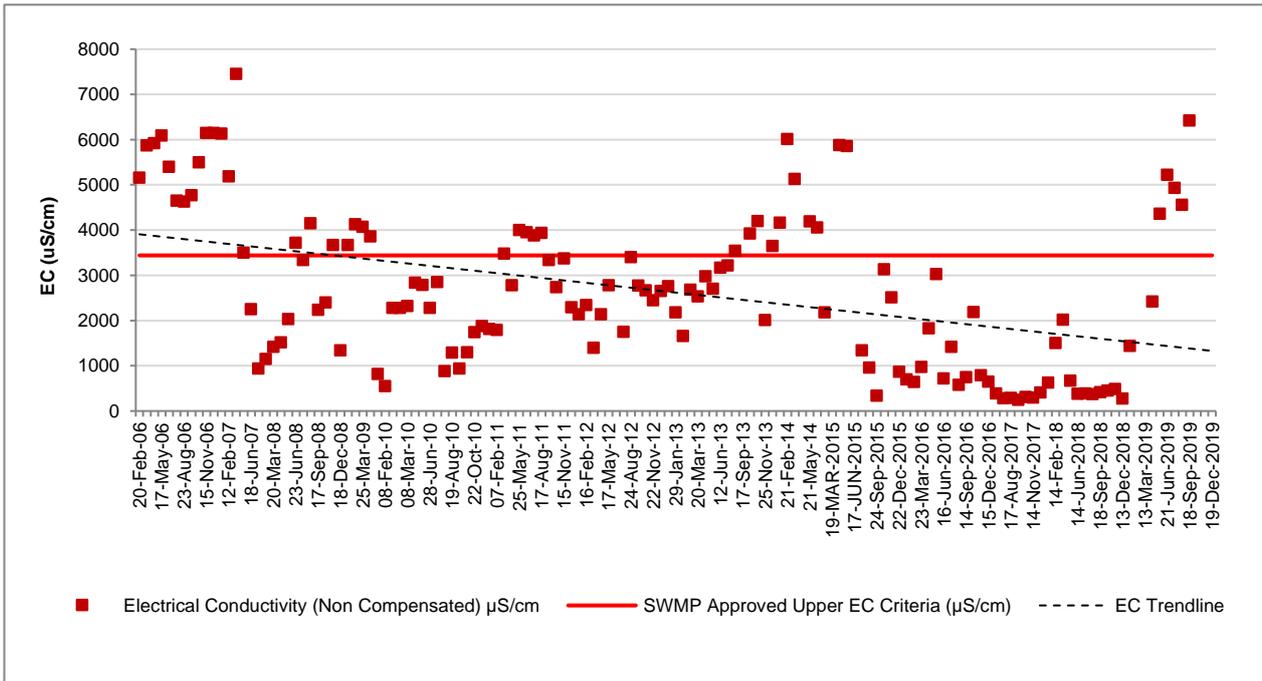
Notes: No available water samples at WIL_D2 during the 2019 reporting period where available for sampling due to the prolonged drought conditions, therefore no long-term EC trend analysis can accurately be displayed on graph. Overall trends for EC at WIL_D2 since late 2016 have shown decreasing trends.

Graph 16 Long-term pH & NTU Water Quality Results at WIL_D2



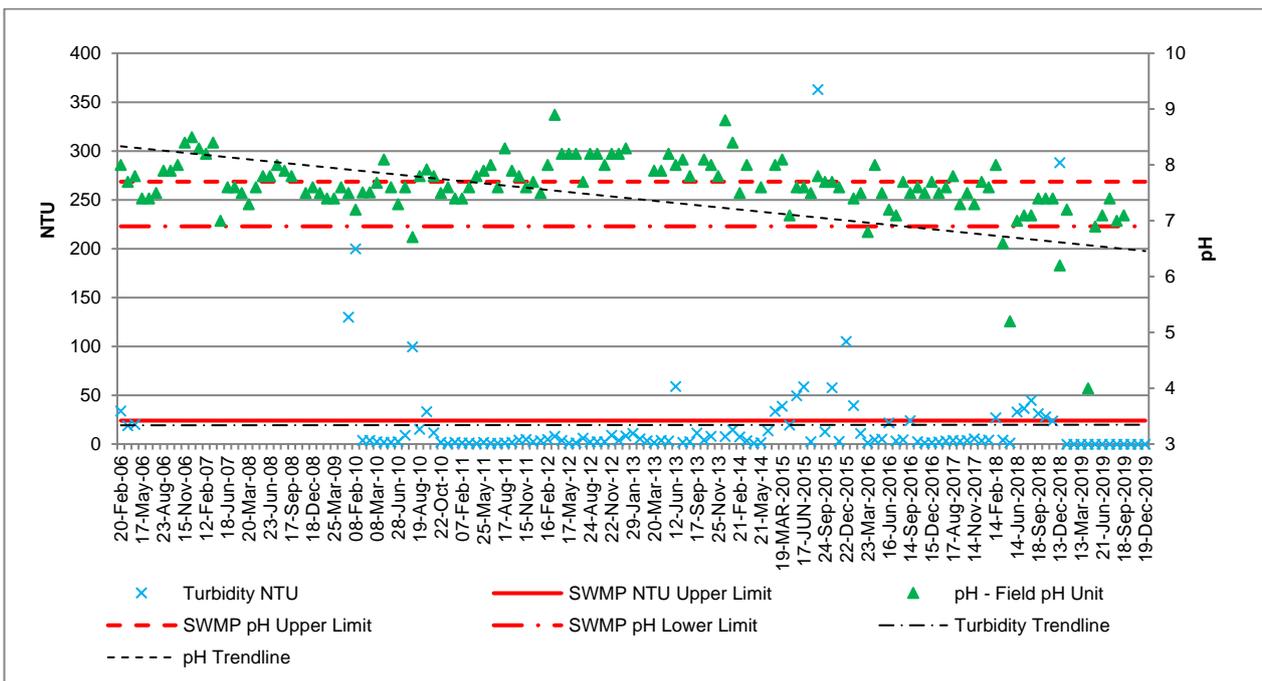
Notes: No available water samples at WIL_D2 during the 2019 reporting period where available for sampling due to the prolonged drought conditions, therefore no long-term pH and turbidity trend analysis can be accurately displayed on graph. Overall trends for turbidity at WIL_D2 since 2016 have shown decreasing trends. Overall trends for pH at WIL_D2 have generally been consistent since 2016 and mostly within criteria.

Graph 17 Long-term EC Water Quality Results at WIL_D



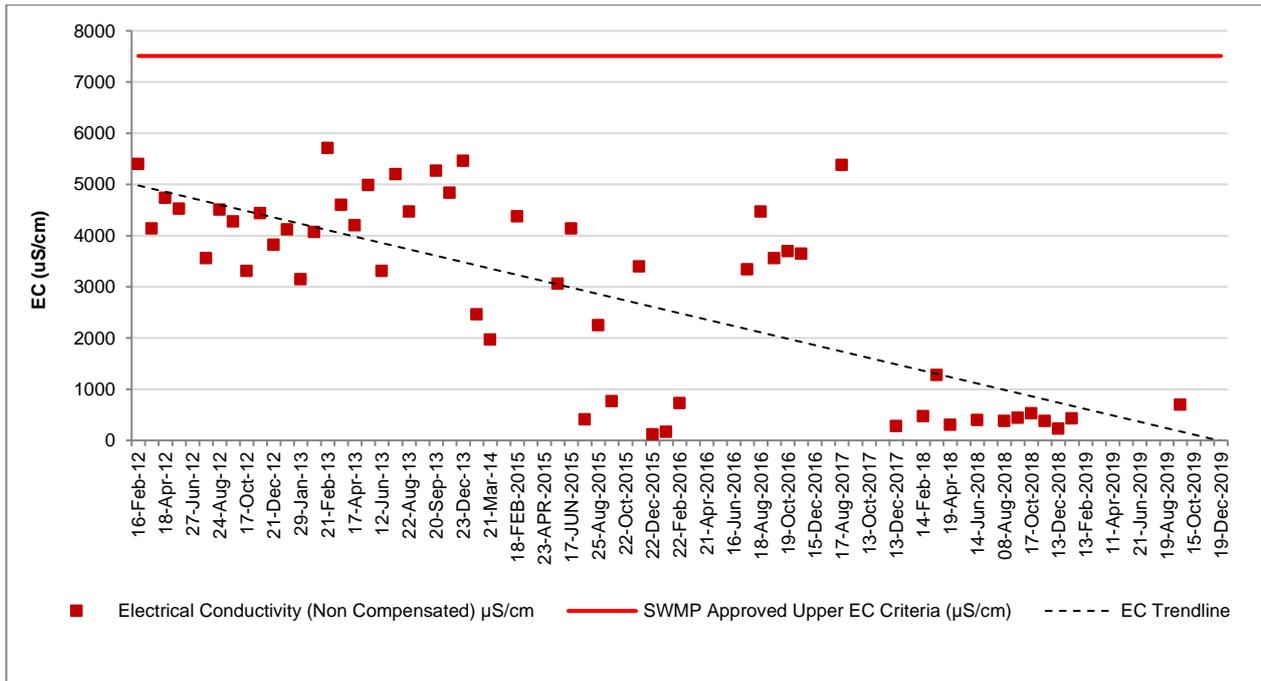
Notes: Overall trends for EC at WIL_D since late 2016 have shown decreasing trends. During 2019, EC observations at the upstream sites ranged from 3750-6000 µS/cm, reasonably consistent with observations at downstream sampling points, indicating the increase in EC is unlikely to be related to Wilpinjong mining activity.

Graph 18 Long-term pH & NTU Water Quality Results at WIL_D



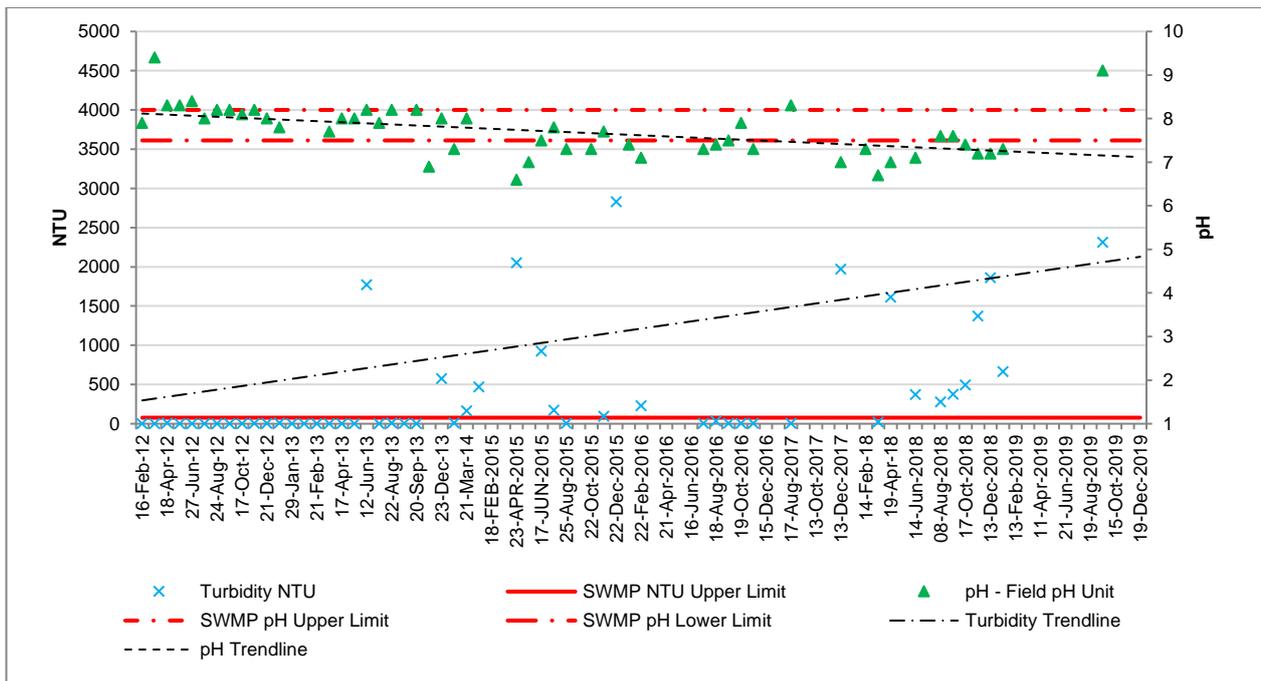
Notes: Overall trends for turbidity at WIL_D since 2016 have shown stable trends. Overall trends for pH at WIL_D have generally been decreasing and consistent since 2016, mostly within criteria.

Graph 19 Long-term EC Water Quality Results at CC_1



Notes: Overall trends for EC at CC_1 since late 2017 have shown decreasing trends.

Graph 20 Long-term pH & NTU Water Quality Results at CC_1



Notes: Overall trends for turbidity at CC_1 have increased since 2016. The source of this increased turbidity at the Cumbo Creek Downstream area is likely to be a combination of low/no-flow conditions in Cumbo Creek, in conjunction with an increase of sediment to the creek, most likely from the nearby unsealed Ulan-Wollar Road. Overall trends for pH at CC_1 have generally been decreasing and consistent since 2016, mostly below criteria. While these observations constitute an exceedance of the pH trigger level, all observations are within the pH 6.5-8 range defined in the ANZECC (2000) guidelines for the protection of aquatic ecosystems and do not pose a threat to the health of the system.

7.7 Site Water Balance

A Site Water Balance (SWB) (**Table 7**) has been prepared for the Mine. WRM Water & Environment (WRM) investigated the behaviour of the Wilpinjong site water inventory for a three-year period, from 2019 to 2021. Two scenarios were assessed for the reporting period 2019 to 2021:

- Scenario 1: the Water Treatment Facility (WTF) will operate when the total inventory exceeds ~3,000 ML at a maximum discharge rate of 3 ML/d.
- Scenario 2: the WTF will be offline for the duration of the reporting period.

Figure 5 shows the forecasted total site water inventory for the period between 1 August 2019 and 31 December 2021 for WTF Scenario 1. The following is of note:

- For the 1%ile results (very wet climatic conditions), the total site water inventory increases by 3,629 ML, to reach a volume of 5,353 ML by 31 December 2021.
- For the 50%ile results (median climatic conditions), the total site water inventory increases by 932 ML, to reach a volume of 2,657 ML by 31 December 2021.
- For the 99%ile results (very dry climatic conditions), the total site water inventory decreases by 347 ML, to reach a volume of 1,377 ML by 31 December 2021.

Figure 5 Forecasted total site water inventory (WTF Scenario 1)

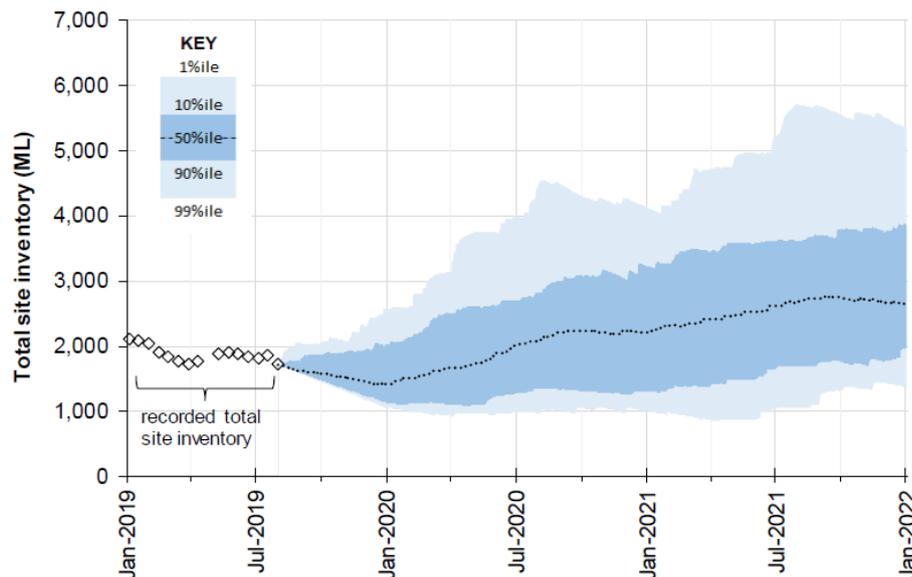
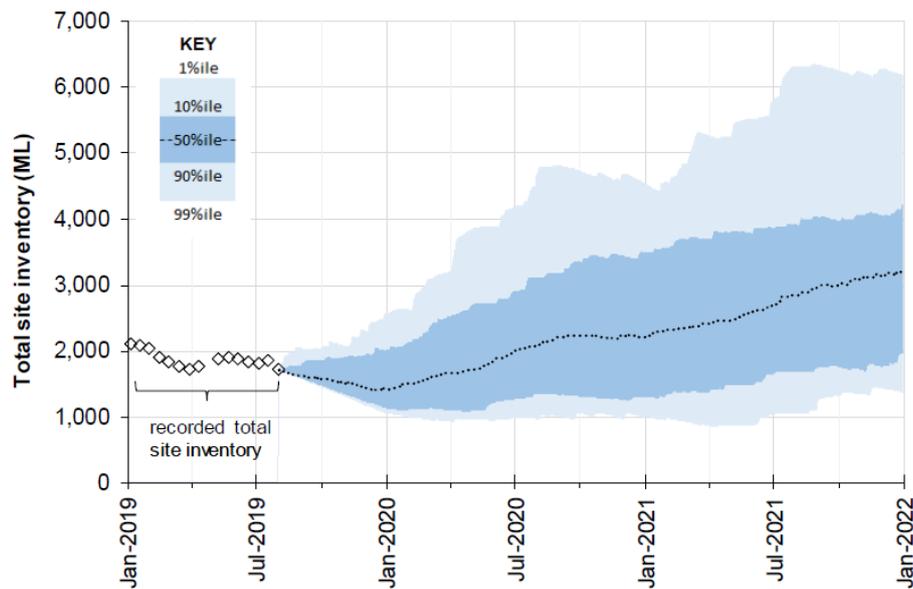


Figure 6 shows the forecasted total site water inventory for the period between 1 August 2019 and 31 December 2021 for WTF Scenario 2. The following is of note:

- For the 1%ile results (very wet climatic conditions), the total site water inventory increases by 4,450 ML, to reach a volume of 6,175 ML by 31 December 2021.
- For the 50%ile results (median climatic conditions), the total site water inventory increases by 1,472 ML, to reach a volume of 3,197 ML by 31 December 2021.
- For the 99%ile results (very dry climatic conditions), the total site water inventory decreases by 347 ML, to reach a volume of 1,377 ML by 31 December 2021.

Figure 6 Forecasted total site water inventory (WTF Scenario 2)



No external water supply sources were required for the 2019 period.

7.8 Water Treatment Facility

Construction of the Water Treatment Facility (WTF) was completed in June 2012 and approved water releases commenced on 16 June 2012 in accordance with EPL 12425. Under EPL 12425, WCPL are approved to discharge treated water from Licensed Discharge Point 24 (LDP24).

As a result of the EPL variation in January 2017 to increase the daily discharge limit from 5ML/day to 15ML/day, the maximum volume of water discharge shall not exceed 15ML/day¹⁰.

Water quality concentration limits (i.e. 100 percentile concentration limit) for LDP24 include:

- Electrical conductivity (EC) not to exceed 500 $\mu\text{S}/\text{cm}$ (continuous monitoring);
- Oil and grease (O&G) not to exceed 10mg/L (grab sample weekly during any discharge);
- pH range of 6.5 to 8.5 (continuous monitoring); and
- Total suspended solids (TSS) not to exceed 50mg/L (grab sample weekly during any discharge).

In the 2019 reporting period, there were no discharges to Wilpinjong Creek from the WTF.

7.9 Stream Health & Channel Stability Monitoring

Channel Stability Monitoring

In accordance with the SWMMP, channel stability monitoring is undertaken along sections of Wilpinjong and Cumbo Creeks. Channel stability monitoring was undertaken in 2019 by ELA (**Appendix 3C**) to provide an assessment of overall riparian stability and health within the Wilpinjong Coal Mine (WCM) and surrounds.

Fifty-nine (59) permanent survey sites were monitored along Wilpinjong and Cumbo Creeks. Monitoring assessed channel stability indicators including bank height and angle, streambank protection and riparian

¹⁰ Until 31 December 2019 when the daily discharge limit reverts back to the original 5ML/day.

vegetation cover. Channel Stability ratings at monitoring sites along Wilpinjong Creek ranged from Moderately Unstable to Highly Stable, and Stable to Highly Stable along Cumbo Creek.

Comparison of monitoring data from 2016 through to 2019 found that the stability rating has either improved or remained constant for most monitoring sites (53 of 59) across both Wilpinjong and Cumbo Creeks. This reflects the overall stable nature of both creeks in what has been a prolonged dry period.

Sites with a decline in channel stability between 2018 and 2019 are related to reduced vegetation cover, particularly of instream macrophytes. This reduction has been observed both upstream and downstream of WCM and is also related to the ongoing prolonged dry period.

Channel stability issues evident within Wilpinjong and Cumbo creeks relate primarily to both historic and existing agricultural practices, including vegetation clearing and stock access to the riparian zone.

Revegetation and remediation works have commenced along Wilpinjong Creek, with further works planned for both Wilpinjong and Cumbo creeks in 2020. Areas experiencing lateral erosion, including designated erosion points, should be prioritised for revegetation and remediation works.

Stream Health Monitoring

Stream health monitoring was undertaken during spring 2019 within the WCM and surrounding catchments. A total of twelve (12) permanent sites were monitored along Wilpinjong, Wollar and Cumbo creeks, however, only four (4) sites were able to be monitored for water quality and macroinvertebrates, due to low water levels.

The aquatic habitat assessment recorded mid-range scores, typical of catchments in the region. Results were largely consistent with previous years, with minor differences attributable to changes in stream bed macrophyte and groundcover, as a result of fluctuating water levels and climatic conditions.

Water quality results were poor and reflected the low water level and lack of flow present at each monitoring site sampled in 2019. This resulted in high temperature, electrical conductivity and turbidity results and low dissolved oxygen results, comparative to previous assessment years and Australian and New Zealand Environmental and Conservation Council (ANZECC) guidelines. Water quality results are consistently outside of ANZECC guidelines and fluctuate considerably across monitoring periods, stream flow levels and at various sites upstream and downstream of the WCM licensed discharge point. As such, these results indicate that natural factors rather than mining operations are key factors determining water quality in the catchments surrounding the WCM.

Macroinvertebrate results recorded in 2019 were poor, with overall low taxa diversity and low SIGNAL scores, indicative of pollution. SIGNAL scores were the lowest recorded for all sites surveyed in 2019 (excluding WO2), however; do not trigger further investigation under Section 5.3 of the WCPL Surface Water Management and Monitoring Plan (WCPL, 2017a). The comparison of previous years data for sites surveyed in 2019 shows a decline in SIGNAL scores since 2017, coinciding with a prolonged period of below average rainfall, regional drought subsequently leading to a decrease or minimal stream flow. This pattern was observed both upstream and downstream of the WCM licensed discharge point, indicating that climatic factors along with past and present agricultural practices are the attributing main factors influencing stream health.

A revegetation program involving the planting of native riparian species has commenced within Wilpinjong Creek. The continuation of this program, along with the addition of in-stream retention devices such as large-woody debris, are worthwhile restoration works, aimed at improving the stream health of the catchments surrounding the WCM.

7.10 DPI Water Recommendations

DPI Water recommended a number of additional investigations as part its review of the updated SWMP in 2017. **Table 27** provides a status of these recommendations. At the end of the reporting period all outstanding recommendations were completed.

Table 27 Status of Remaining DPI Water Recommendations

DPI Water Recommendations	Status of Recommendations
Development of a salinity assessment strategy that considers geomorphic influences on salt migration and expression to surface waters in infilled and incised phases of Wilpinjong Creek.	Completed
Preparation of a detailed drainage line and rehabilitation plan for the Wilpinjong project area by a suitably consultant with geomorphological experience (note Alluvium has been engaged to prepare this study as described in Section 5.5).	Completed
Preparation of a mass salt and water balance for the upstream and downstream stream gauges that includes consideration of the volume and concentration of discharge from the RO Plant, relative salinity of the Wilpinjong and Cumbo Creek catchments and associated salt contributions	Completed
A review of the construction and operation of the upstream and downstream gauging stations on Wilpinjong Creek against the requirements of the Bureau of Meteorology (2013) <i>National Industry Guidelines for Hydrometric Monitoring</i> . Following completion of the review, WCPL would provide a report to DP&E outlining any material differences (if any) between the guideline and the streamflow monitoring undertaken at the Wilpinjong Coal Mine.	Completed
A review of stream health monitoring methodology by a suitably qualified and experienced person (including consideration of statistical design and power analysis inclusive of reference sites) to identify any recommendations for future stream health monitoring to detect potential changes due to mine expansion.	Completed

7.11 Groundwater

A Groundwater Monitoring Program (**Table 7**) has been prepared by WCPL. A summary of the groundwater monitoring program is presented in **Table 28**. A summary of the groundwater monitoring results is provided in **Table 29**. Further groundwater monitoring results for 2019 review period, including figures with groundwater monitoring locations are provided in **Appendix 3D**.

Table 28 Groundwater Monitoring Program

	Monitoring Locations	Frequency	Parameters ^{1,2}
Open Cut Operations	<ul style="list-style-type: none"> Main pit sump(s) 	Monthly	<ul style="list-style-type: none"> Volume of water extracted.
		Quarterly	<ul style="list-style-type: none"> pH, EC, TDS, Na, K, Mg, Ca, Cl, HCO₃, CaCO₃, SO₄ and Metals (Cu, Zn, Fe, Al, Ni, Mn, Ba, Sr, Pb, As and Se).
Water Supply Bores³	<ul style="list-style-type: none"> GWs10, GwS11, GWs12, GWs14, GWs15 	Monthly (During Extraction)	<ul style="list-style-type: none"> Water level, field pH and EC. Volume of water extracted.
Alluvial Bores	<ul style="list-style-type: none"> GWa10, GWa11, GWa12, GWa14, GWa15, GWa16, GWa22, GWa32 	12 Hr (logger)	<ul style="list-style-type: none"> Water level, Pressure, Temperature
		Monthly	<ul style="list-style-type: none"> Water level, temperature field pH and EC.
	<ul style="list-style-type: none"> GWa1, GWa2, GWa3, GWa4, GWa5, GWa6, GWa7⁵, GWa8⁵, GWa9, GWa10, GWa11, GWa12, GWa14, GWa15, GWa16, GWa22, GWa32, GWa33⁵ 	Quarterly	<ul style="list-style-type: none"> TDS, Na, K, Mg, Ca, Cl, HCO₃, CaCO₃, SO₄ and Metals (Cu, Zn, Fe, Al, Ni, Mn, Ba, Sr, Pb, As and Se).
Coal Measures Bores	<ul style="list-style-type: none"> GWc10, GWc11, GWc12, GWc14, GWc15, GWc16, GWc17, GWc18, GWc22, GWc23, GWc24, GWc25, GWc26, GWc27, GWc28, GWc29, GWc30, GWc31, GWc32⁵ 	Daily (logger)	<ul style="list-style-type: none"> Water level, Pressure, Temperature

Monitoring Locations	Frequency	Parameters ^{1,2}
<ul style="list-style-type: none"> GWc1, GWc2, GWc3, GWc4⁵, GWc5⁵, GWc10, GWc11, GWc12, GWc14, GWc15, GWc16, GWc17, GWc18, GWc19, GWc20, GWc22, GWc23, GWc24, GWc25, GWc26, GWc27, GWc28, GWc29, GWc30, GWc31, GWc33, GWc32⁵, GWc34, GWc35 	Monthly	<ul style="list-style-type: none"> Water level, temperature, field pH and EC.
	Quarterly	<ul style="list-style-type: none"> TDS, Na, K, Mg, Ca, Cl, HCO₃, CaCO₃, SO₄ and Metals (Cu, Zn, Fe, Al, Ni, Mn, Ba, Sr, Pb, As and Se).
Landholder bores, wells and waterholes⁴	As required	<ul style="list-style-type: none"> To be determined

Notes: 1) Parameters will be analysed provided sufficient volumes of water can be collected. 2) Na = Sodium, Ca = Calcium, HCO₃ = Bicarbonate, SO₄ = Sulphate, K = Potassium, Mg = Magnesium, Cl = Chloride and Total Fe = Total Iron. 3) Water supply bores not currently in operation. 4) Monitoring may be undertaken, as required, in consultation with individual landholders. Parameters to be monitored will be determined following consideration of the landholder's concerns. 5) Regional bore – not expected to be affected by mining.

7.12 Compensatory Water Supply

In accordance with Condition 24, Schedule 3 of SSD-6467 WCPL shall compensate potentially affected landowners with privately owned groundwater bore within the predicted drawdown impact zone identified in the EA. During the 2019 review period this condition was not triggered. There are no privately-owned bores within this predicted impacted zone.

7.13 Groundwater Monitoring Review

SLR Consulting Australia Pty Ltd (SLR) was commissioned by WCPL to conduct the 2019 review of key groundwater level and groundwater quality data (**Appendix 3D**) including:

- Cause and effect analysis (summary provided in **Section 7.13**);
- Review against applicable trigger level criteria (**Table 29**); and
- Groundwater modelling verification (**Section 7.14**).

Trends from the entire period of observation (2006-2019) were also been assessed to provide context for the 2019 monitoring period.

Summary of Groundwater Level Data

Based on the analysis of the hydrographs in **Appendix 3D**, some mining effects (i.e. groundwater level decrease) are considered to have occurred or be ongoing at the following bores located in the Wilpinjong alluvium and Cumbo Creek alluvium (albeit these effects are minor and therefore are difficult to discern from climatic variations) at GWA1, GWA3, GWA14, GWA5, GWA4, GWA15, GWA6, GWA10, GWA11 and GWA12.

The other bore hydrographs from the Wilpinjong Creek alluvium (e.g. GWA2, GWA7, GWA8) show no discernible mining effects.

Mining effects on monitored coal groundwater levels are noted at the following bores GWc1, GWc11, GWc12, GWc2, GWc14, GWc3, GWc15, GWc4 and GWc33.

Summary of Groundwater Quality Data

Groundwater electrical conductivity (EC) statistics have been computed from 1,680 measurements from April 2006 to December 2019 (**Appendix 3D**). The median value of the measurements at the 13 monitoring sites is about 2,500 micro Siemens per centimetre (µS/cm). The average for all monitoring sites is approximately 4,100 µS/cm, considerably higher than the median. However, the standard deviation of approximately 3,400 µS/cm is commensurate with the mean.

The lowest mean salinity in the alluvium holes is 1,500 µS/cm at GWA2, whereas the highest mean is 10,600 µS/cm at GWA5. The lowest mean salinity in the coal holes is 1,200 µS/cm at GWc2, whereas the highest mean is 5,100 µS/cm at GWc5. Overall, the alluvial groundwaters are more saline than the coal seam

waters. This suggests that the alluvial waters are sourced from Permian sediments and are concentrated through evapotranspiration which is expected to be an active process.

Review Against Applicable Trigger Level Criteria

Table 29 presents the occurrence of trigger level exceedances for the 2019 monitoring period and briefly examines trigger exceedances of alluvial monitoring bores to identify whether their cause can be attributed to a climatic or mining effect.

Table 29 Groundwater Performance

Location		Approved Criteria		Performance During the Reporting Period			Trend/Key Management Implications
Groundwater Monitoring (Alluvium)				Assessment of Triggers			
	Water Levels (mAHD)	EC (µS/cm)	pH	Water Level (mAHD)	EC (µS/cm)	pH	
GWa1^	#	12,272	7.2	No data 2019			<ul style="list-style-type: none"> • GWa2: No discernible mining effect is identified at this location. It is likely that the groundwater level trigger exceedance at GWa2 is being caused by the reduced rainfall since 2017. • GWa3: As this decline in groundwater level correlates with the extended period of below average rainfall also observed over this period, the exceedance of the groundwater level trigger at GWa3 has likely occurred due to both climatic and mining effects. • GWa4: The AR for 2017 concluded that the drawdown at this bore had likely occurred as a result of mining at Pit 3, with the period of below average rainfall during 2017 exacerbating this drawdown (SLR, 2018). As the below average rainfall conditions have continued during 2019 it is likely that this conclusion remains true. • GWa5: Response to rainfall is still observable at this bore with small fluctuations occurring due to local rainfall events being recorded throughout 2018 and beginning of 2019. It is likely that the groundwater level trigger exceedance at GWa5 is being exacerbated by the reduced rainfall throughout the 2019 monitoring period. • GWa11: A mining effect due to Pit 4 could influence the decrease in groundwater levels however the below average rainfall since mid-2017 likely drives the bore to be dry and induces exceedances in groundwater level at GWa11. • GWa14: The exceedances recorded during 2019 are expected to have resulted due to impacts from mining at Pit 4, along with the reduction in rainfall events throughout the year. • GWa15: The exceedance of the groundwater level at GWa15 in 2019 is likely due to a combination of mining effect from Pit 4 and climatic influences. • No trigger exceedances in EC at alluvial bores occurred during the 2019 reporting period. • The increases in EC observed at GWc1 and GWc5 appear to be occurring independently of climatic and groundwater level influences. • No Exceedances of pH trigger levels were observed during the 2019 monitoring period.
GWa2	373.4	2,280	7.0	Y	✓	✓	
GWa3^	360.5	1,970	7.3	Y	^	^	
GWa4^	353.8	2,596	7.1	Y	^	^	
GWa5^	372.8	13,926	7.1	Y	^	^	
GWa6^	#	6,720	7.6	#	^	^	
GWa7^	#	10,126	7.0	#	^	^	
GWa8	353.3	2,898	7.4	✓	✓	✓	
GWa10	367.1	#	#	✓	#	#	
GWa11^	365.2	#	#	Y	#	#	
GWa12^	362.3	#	#	Y	#	#	
GWa14^	358.0	#	#	Y	#	#	
GWa15	355.0	#	#	Y	#	#	
Groundwater Monitoring (Coal)							
GWc1	#	2,844	7.2	#	Y	✓	
GWc2	#	1,290	7.7	#	✓	✓	
GWc3	#	3,304	7.3	#	Y	✓	
GWc4	#	2,412	7.1	#	✓	✓	
GWc5	#	4,798	7.0	#	Y	✓	
Groundwater Production Bores							
GWs10	346	#	#	Water supply bores during the 2018-19 water year produced a total of 56.1 ML (refer to Appendix 3D)			
GWs11	348.5	#	#				
GWs12	332.5	#	#				
GWs14	319.5	#	#				
GWs15	314.5	#	#				

Notes: (✓) Represent no trigger exceedance, # = Not applicable, Y= Yes (trigger exceedance recorded), ^ Bore was dry/ goes dry during 2019

7.14 Groundwater Model Verification

The numerical groundwater model (SLR, 2020) was recently updated from the (HydroSimulations, 2015b) groundwater model. The changes undertaken in included:

- Updated the rainfall-recharge and evapotranspiration series utilised in the model to reflect the actual rainfall and evapotranspiration experience in the years following the creation of the model in 2015.
- Updated the simulated mining schedule to more closely reflect the actual schedule and extent of mining in the years following the creation of the model in 2015.

- Updated simulated MODFLOW River (RIV) stage heights to reflect time-series observations made in the years since the creation of the model in 2015.
- Incorporated pumping from existing approved and installed water supply bores, pumping rates based on available site data.
- Update the observation target file with any additional bores and recent groundwater level data (observed data).

The SLR (2020) modelling predictions are consistent with HydroSimulations (2015) predictions at the alluvial monitoring sites along Wilpinjong Creek, with approximately 1m drawdown for the life of approved mining (GWA6 has the maximum predicted drawdown in an alluvial monitoring bore of ~1.5 m occurring in 2029). However, substantial drawdowns in excess of 2 m are expected at most of the coal monitoring bores.

The alluvial bores examined have been identified from the cause and effect analysis or the trigger level analysis as likely to show a Wilpinjong Coal Mine mining effect. The performance of the model at these sites can be seen in **Appendix 3D**.

The timing of the mining effects modelled at the alluvial bores shows good correlation with the observed effect and often indicates a repressed response to rainfall that is also seen in the observed data. Most of the modelled groundwater levels at the alluvial bores respond to the new modelled rainfall recharge series included into the model. The performance of the (SLR, 2020) model has improved at GWA3 (Wilpinjong Creek) and GWA6 (Cumbo Creek) where modelled groundwater level better captures the observed groundwater responses to rainfall recharge after 2015.

Amplitudes and overall base levels are generally well represented for the alluvium monitoring bores along Wilpinjong Creek, e.g. GWA1, GWA2 (in the west) through GWA10, GWA12, GW14 and GWA15.

Groundwater levels along Cumbo Creek are generally well represented in the alluvium (GWA5 and GWA6), although the recent drawdown at GWA5 due to Pits 3 and 7 is not replicated to the full degree by the model.

The observed drawdown is often greater (e.g. GWA5, GWA12, GWA14) than is seen in the (SLR, 2020) modelled data. This may be attributed to the hydraulic and storage properties using the (HydroSimulations, 2015b) model into the (SLR, 2020) model, some improvements to model performance may be made by making minor revisions to the aquifer properties of the alluvium. A calibration exercise could be undertaken in the future.

8.0 REHABILITATION

8.1 Rehabilitation Activities

To minimise the area of disturbance at any one time, rehabilitation occurs progressively at the Mine as ancillary disturbance areas and final mine landforms become available for revegetation. The mine waste rock emplacements behind the advancing open cut are constructed to approximate the pre-mining topography or the final landform was initially approved by Project Approval PA 05-0021.

The Development Consent (SSD-6764) has superseded the Project Approval (05-0021). WCPL are finalising a revised Rehabilitation Strategy to address Condition 61, Schedule 3 of Development Consent (SSD-6764) which will present a revised final landform that builds on the rehabilitation objectives in Table 11 of Development Consent (SSD-6764). Subject to approval by the DPIE (refer to **Section 3.4**), the current approved MOP (as amended)¹¹ will be revised accordingly in 2020 to incorporate the revised Rehabilitation Strategy.

As part of the WEP EIS, WCPL identified an opportunity to prioritise woodland establishment within the existing mine rehabilitation areas where rehabilitation to date has focussed on the establishment of productive pasture for grazing since 2008. WCPL conducted a re-evaluation of the previous rehabilitation areas against contemporary BVT classifications to prioritise Regent Honeyeater¹² habitat establishment within existing mine rehabilitation areas. Therefore, the revised entire post mining land use is now woodland.

Until the performance and completion criteria for BVT and Regent Honeyeater habitat relevant to the Mine's rehabilitation areas was approved on the 24 April 2019, cover crops (**Table 33**) were established as a way of providing stabilisation and soil improvement during this transition¹³. Of the historical completed landforms to date (**Figure 5**) that are currently under pasture or considered not woodland, these landforms will be progressively upgraded with relevant woodland species to meet the BVT requirements.

8.1.1 Summary of Performance

The MOP is a two-year MOP (as amended), which outlines the forecasted rehabilitation commitments for calendar years 2019 and 2020. Mining and progressive rehabilitation activities over the term of this MOP are shown in **Plans 3A to 3B**. At the completion of the MOP term, a total of approximately 259ha of waste rock emplacement areas is proposed to be rehabilitated.

During the MOP term, WCPL are scheduled to rehabilitate selected areas of waste rock emplacements areas (i.e. Domain 5) located in Pit 1, Pit 2, Pit 3, Pit 4, Pit 5, Pit 6, Pit 7 and rehabilitate TD3 (i.e. Domain 6). A summary of the rehabilitation performance against the MOP forecast rehabilitation is provided in **Table 30** as of the 31 December 2019 and displayed in **Figure 6**.

Table 30 Status of Proposed MOP Rehabilitation

Year	MOP Proposed Rehabilitation	Status of Rehabilitation	Comments
Year 1 - 2019	121ha	121ha	Rehabilitation of Overburden emplacement areas in Pit: 1, 3, 4, 5, 6, 7, TD3 and TD4*
Year 2: 2020	138ha	Next AR	Proposed rehabilitation of overburden emplacement areas in Pit: 1, 2, 3, 5, 6, 7 and TD5*.

Note: * Although previously rehabilitated, required additional rehabilitation activities in some areas.

¹¹ A new 2-year MOP for 2019 and 2020 was approved by the DRG on the 11/6/19 to incorporate the new BVT performance and completion criteria approved in April 2019. MOP Amendment A was submitted in 1/11/2019 and approved 26/11/2019. MOP Amendment A was sought to update MOP text, figures and MOP plans accordingly due to the granting of ML1795 on the 27/9/2019 and adjust the mining and rehabilitation areas as identified in MOP Plans 3A and 3B.

¹² In accordance with Schedule 3, Condition 37 of the Development Consent SSD-6764

¹³ Transition = Period between WEP Approval in April 2017 and the approval of the performance and completion criteria for BVT and Regent Honeyeater habitat approval in April 2019.

Figure 7 2019 Rehabilitation Status

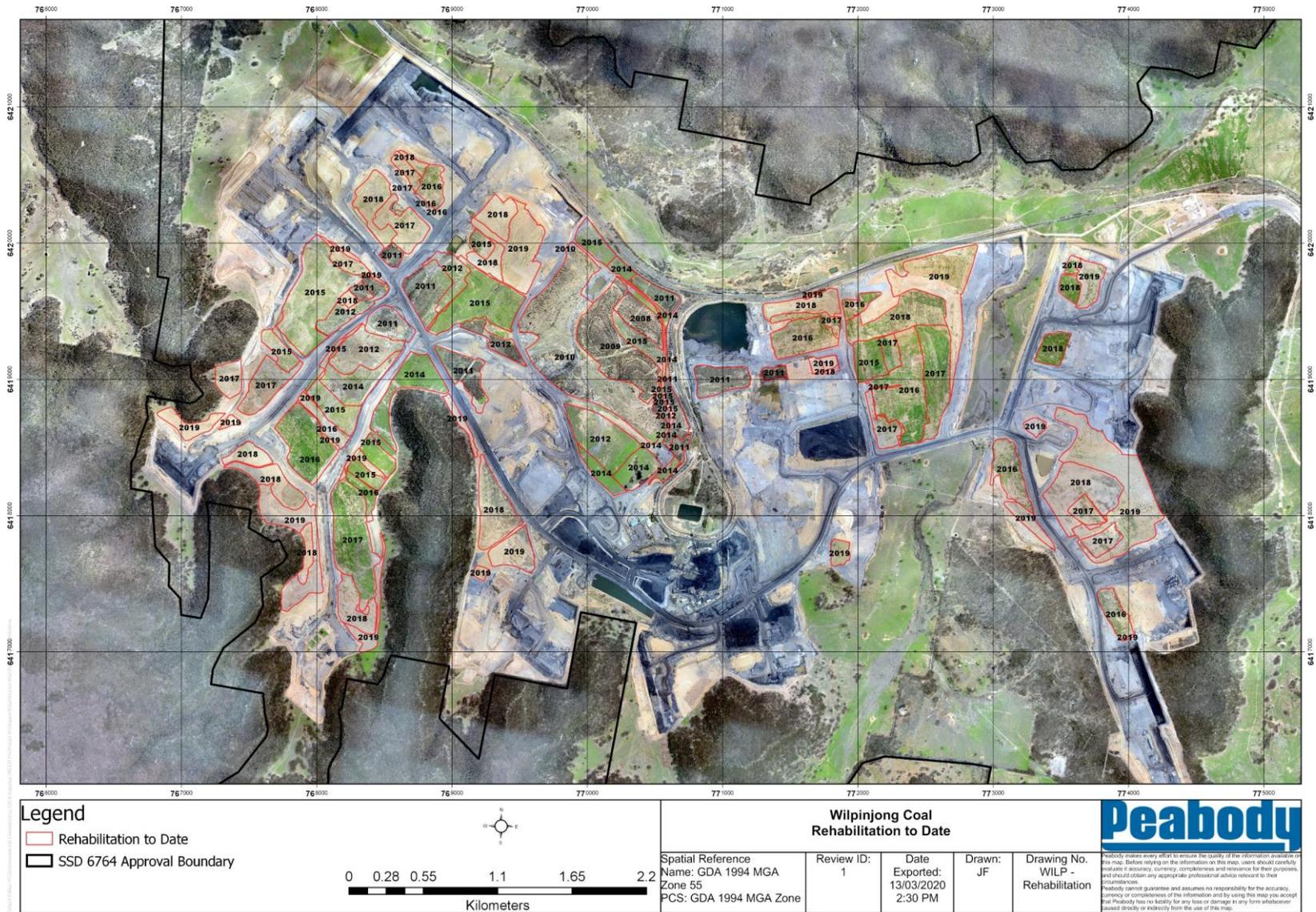
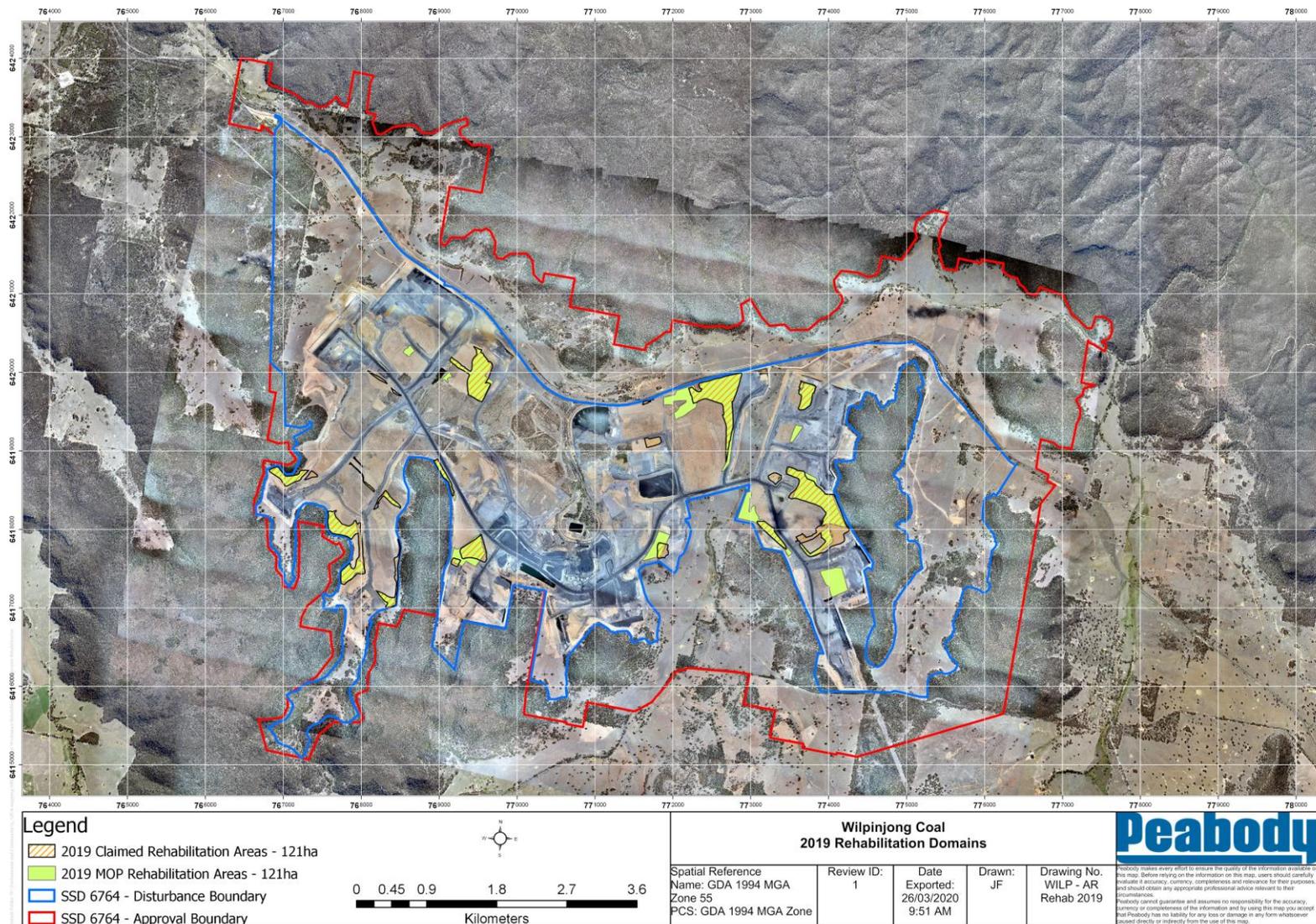


Figure 8 Rehabilitation Proposed and Completed in the MOP Term Year 1



There were only minor changes to rehabilitation areas completed in 2019, as proposed in Year 1 of the MOP. These changes relate to variances in the completed rehabilitated surface areas at several rehabilitation locations, which did not affect the total hectares completed against the hectares proposed in the MOP (**Figure 6**) and considered generally consistent with the rehabilitation scheduled and targets proposed in the MOP for Year 1. WCPL consider the approved rehabilitation program proposed in the current approved MOP has been achieved for Year 1 and rehabilitation targets will be achieved for Year 2 of the MOP in 2020 (**Table 30** and **Table 31**).

As displayed in **Table 31**, approximately 677ha of completed landforms have been rehabilitated as of the 31 December 2019 (**Figure 5**). No rehabilitated landforms are yet considered ready for formal sign off by the DRG in terms of meeting the relevant completion criteria as provided in the MOP. As discussed in **Section 8.1**, WCPL have transition to a BVT performance and completion criteria relevant to the rehabilitation areas which were developed in accordance with Schedule 3, Condition 37 of the Development Consent SSD-6764.

Table 31 Rehabilitation Status

Mine Area Type	2015 Reporting Period (Actual)	2016 Reporting Period (Actual)	2017 Reporting Period (Actual)	2018 Reporting Period (Actual)	2019 Reporting Period (Actual)	Next Reporting Period (Forecast)
A. Total Mining Lease footprint (ha)	2857.34	2857.34	2857.34	2857.34	3725.30*	3725.30*
B. Total active disturbance (ha)	1148.6	1147.4	1297.4	1441.2	1627.2	1770.2
C. Land being prepared for rehabilitation (ha)	43	70	82	98	121	138
D. Land under active rehabilitation (ha)	304	374	456	556	677	815
E. Completed rehabilitation (ha)	0	0	0	0	0	0

Notes: * Increase in total mine footprint now incorporates the additional hectares in ML1779 and ML1795

Other rehabilitation commitments in the MOP term included:

- Construction of the Elevated Waste Dump in Pit 2 to RL450m then back down to RL430m;
- Temporarily vegetating a number of selected batters for several long term mine waste rock emplacement areas including Duffy Dump and Pit C Dump; and
- Commencing a series of upslope water diversion banks.

Due to changes in the long term mine plan, construction of Elevated Waste Dump in Pit 2 to RL450m then back down to RL430m is still unlikely to occur during this MOP term. However Elevated Waste Dump in Pit 2 will continue to receive lower than predicted volumes of overburden material during the MOP term.

Other commitments including temporarily vegetating a number of selected batters for several long term mine waste rock emplacement areas were scheduled to occur in 2019, however due to unfavourable ongoing drought conditions the temporary vegetation of the batters was postponed. WCPL are developing an action plan which includes studies such as soil testing on emplacement areas and identifying flora species required to be used in the temporary works, with works to commence in 2020.

A series of upslope clean water diversions i.e. separation of undisturbed and disturbed area runoff using upslope diversions, in accordance with the approved SWMP were originally scheduled for construction. Further investigations and assessments regarding the diversions were carried out in 2019, which subsequently resulted in a review of the SWMP in 2019. For more details refer to **Section 7.5**.

8.1.2 Summary of Rehabilitation Activities During the Reporting Period

The MOP describes the proposed rehabilitation phases within Primary Domains during the MOP term. In accordance with the MOP, landform establishment, growth medium development, ecosystem establishment

was undertaken during 2019 in Domain 5 (i.e. Waste Rock Emplacement Areas) and Domain 6 (i.e. Tailings Emplacement Areas).

Photos of rehabilitation activities during the reporting period are provided in **Appendix 7**. Ecosystem Development in the form of monitoring and minor maintenance activities were completed in Domain 8 and Domain 9.

The following rehabilitation phases during 2019 within Domains 5 and 6 included:

8.1.2.1 Decommissioning

There were no decommissioning¹⁴ of mining related infrastructure activities undertaken at the Mine in 2019.

8.1.2.2 Landform Establishment

- All 2019 rehabilitation landforms were designed in accordance with the approved MOP. All rehabilitation areas were developed with carbonaceous material being progressively placed back in-pit once the coal has been mined before a minimum of a 2m inert encapsulation layer is placed on top. This formation stage, Final Surface Layer (FSL) is -3m to previous landform contour. With the encapsulation layer placed, topsoil is then placed on top at a depth of 100mm to 300mm. This is followed by the spreading of initial vegetation cover species such as millet, clovers, oats and sorghum.
- Mine waste dumps were constructed using existing mine equipment including truck dumped material before being shaped using the Mine dozer fleet using Lecia technology to design. Overburden and interburden material was progressively placed back into mined out voids. This included reject material from the CHPP being hauled back into the mine and deposited below the natural surface in the mined-out voids as close to the pit floor as practically possible. Reject material is dispersed throughout the overburden within the mine waste rock emplacements to manage its geochemical characteristics.
- All rehabilitated slopes constructed during the 2019 reporting period were shaped to no greater than 1:6 (10 degrees or 17%) across areas. The surface of mine waste rock emplacements were constructed to approximate the existing topographic form of the shallow valleys which drain the Mine area. Mine waste rock emplacement surfaces are ripped to a depth of approx. 150mm to ensure the topsoil was bounded with the underlying inert material and allow infiltration of water into the constructed landform.
- During 2019, a combination of approximately 121ha across Domain 5 and Domain 6 of final landforms were completed in preparation for topsoil placement, ripping and seeding.

8.1.2.3 Growth Medium Development

- Topsoil placement involved utilising dozers and graders to spread to the desired depth, as well as direct placement by scrapers. Topsoil is to be placed on top of the final landform to act as germination medium for vegetation and as a seed source from the natural seed bank present at the time of topsoil stripping. Topsoil placement shall only proceed once the final landform and major drainage works (i.e. graded banks, drainage channels and rock waterways if required) have been completed. All topsoil was sourced from existing topsoil stockpiles or via direct placement during topsoil stripping activities.
- In consideration for soil ameliorates required for rehabilitation areas, topsoil sampling was undertaken across all proposed rehabilitation area with results indicating the requirement for ameliorates in all areas.

¹⁴ However, works were completed in 2018 for demolition of disused and vacant farm buildings situated in offset areas. Asbestos removal was undertaken prior to demolition by licensed contractors. All demolition activities were undertaken in compliance with WCPL *Waste Management Plan –WI-ENV-MNP-0030 Version 1 – January 2016*. Refer to **Section 6.5** for further details.

- Soil results in 2019 indicated a deficiency in P, K, Mg, K, Ca, Mn, B and organic matter. Appropriate recommendations have been received including the application of lime, organic matter and fertiliser at the following average rates of:

- Lime @ 1.2tonnes/ha; Fertiliser @ 0.1tonnes/ha

8.1.2.4 Ecosystem Establishment

- As discussed in **Section 8.1.1**, cover crops (**Table 33**) were established as a way of providing stabilisation and soil improvement during the transition from pasture/woodland to woodland in the two years since approval of the WEP. Of the historical completed landforms to date (**Figure 5**) that are currently under pasture or considered not woodland, these landforms will be progressively upgraded with relevant woodland species to meet the appropriate BVT species.
- During 2019, a combination of approximately 121ha across Domain 5 and Domain 6 were seeded under a cover crop (**Figure 6**). The cover crops include various combination of legumes (cow peas, clover), sorghum, millet, and oats. Typically species and sowing rates are shown in **Table 32**.
- WCPL maintains a native seed inventory partly collected from locally native seed sources carried out by suitably qualified personnel which will be used in rehabilitation activities. Seed stores comply with the BVT performance and completion criteria.
- As outlined in the MOP, WCPL will be seeding future landforms with the appropriate BVT species due to finalisation of the BVT performance and completion criteria in 2019.
- Commencing in 2020, the scheduled 138ha targeted for Year 2 of the MOP will be sown with the appropriate BVT species.
- In addition, WCPL are proposing to sow some of the historical rehabilitation areas with the appropriate BVT species in 2020.

Table 32 Typical Cover Crop Species and Rates

Pasture Species	Average Rates (kg/ha)
Chicory	4kg
Cowpea	12kg
Sorghum	6kg
Jap Millet	6kg
Sudan Grass	10kg
Oates	60kg
Clovers	15kg

The use of the cover crop provides the following benefits:

- Stability of the landforms;
- Increased organic matter and soil nutrients;
- Nitrogen fixation;
- Soil cover (erosion, dust etc);
- Improved soil moisture;
- Low cost (reduction in agrochemicals, transportation, labour etc); and
- Weed control.

8.1.2.5 Ecosystem Sustainability

- During 2019, Ecosystem Sustainability activities occurred across Domain 8 (i.e. Rehabilitation Areas Pre-MOP) which primarily included monitoring, applying Biometric assessments as described below and minor maintenance activities.

- Existing rehabilitation domains were monitored in accordance with the BMP and compared to Approved WEP BVT Performance and Completion Criteria (Approved by DPIE, April 2019). Irrespective of the monitoring results, all rehabilitation areas across WCPL are required to be 're-worked' to develop these sites from agricultural and non-specific Plant Community Types to prescribed BVT Communities aligning to Project Approval conditions.
- Monitoring and maintenance activities are ongoing with the results assessed and used to refine rehabilitation techniques. WCPL has developed measurable, quantitative interim Completion Criteria that will support the agreed final land use for the Mine.
- Performance Targets have been developed to ensure that the Mine is progressing towards the Completion Criteria and overall mine closure objectives and are outlined in the Biodiversity Management Plan (BMP).
- Progress towards the Performance and Completion Criteria is also measured using Landscape Function Analysis (Tongway & Hindley 2004) and the BioMetric methodology (WCPL 2014).
- During 2019, Wilpinjong undertook monitoring in accordance with the current BMP. The complete report and result are attached as **Appendix 5**, a summary of the LFA results from 2019 include:
 - Six LFA monitoring sites are located within rehabilitation areas, including R6; R8; R9; R10; R11 and R13. The LOI and SSA results for the sites are presented in **Error! Reference source not found.**
 - Spring 2019 monitoring results indicate that all rehabilitation area transects with exception to R10 experienced a drop in LOI scores in comparison to Spring 2018 results probably due to increasing amounts of bare soil across these sites.
 - The Soil Stability scores recorded at sites R6, R8, R9, R10, and R13 exceeded the Completion Criteria.
 - Site R11 experienced a decline of -4.6 from Spring 2018 and whilst it is currently below the Completion Criteria it is still approaching the score of 50.
 - The Soil Infiltration and Nutrients scores for all the rehabilitation area transects were below the Completion Criteria, although R9 and R10 are tracking towards the Infiltration completion criteria and R9 is tracking towards nutrient cycling.
- Variations from the 2018 monitoring results may be a result of a reduction in grass cover due to drier field conditions in 2019, with the 2019 period experiencing 382.3mm less rain than the historical average. Infiltration is affected by litter decomposition, surface roughness and surface nature. Nutrient Cycling may be affected by perennial vegetation cover, litter cover and extent of decomposition, cryptogam cover and soil surface roughness;
- **Error! Reference source not found. 33** present the individual site attribute and site value scores for each 2019 rehabilitation monitoring site. **Table 33** presents both comparison of sites against the approved WCPL BVT Performance Criteria and presents comparison of sites against OEH BVT Benchmarks (taken from OEH 2017). A colour coding system has been applied to all site attribute results:
 - **GREEN** indicates site attributes that have met the relevant PTs (indicating that no additional management intervention is required).
 - **AMBER** indicates site attributes that have not met the relevant PTs, but are within 50 - <100% of the IPTs and do not show a substantial decrease compared to the previous year's monitoring results (indicating a requirement to monitor closely, management intervention may be required)

-
- **RED** indicates site attributes that are <50% of the relevant PTs or show a substantial decline compared to the previous year's monitoring results (indicating that management intervention is required).

Table 33 Assessment against Performance Criteria* for Rehabilitation Sites within their respective BVT

BVT	Season	Site	Vegetation condition	SVS	Site attributes (% cover)										
					NSR	NOC	NMC	NGCG	NGCS	NGCO	EC	NTH (Count)	OR	FL (M)	
HU824	Autumn	R6	MOD-GOOD-POOR	35	13	0	0.9	0	0	0	0	44	0	1	0
	Spring	R8	LOW	22	21	0	0	4	0	0	26	0	0	0	
	Autumn	R9	MOD-GOOD-GOOD	66	13	6.2	7.3	0	0	0	24	0	1	26	
HU732	Spring	R10	MOD-GOOD-POOR	35	7	0	0	0	0	0	8	0	0	15	
	Spring	R11	LOW	30	7	0	2	0	0	0	38	0	0	1	

SVS = Site Value Score, NSR = Native Plant Species Richness, NOC = Native Overstorey Cover, NMC = Native Midstorey Cover, NGCG = Native Ground Stratum Cover (grasses), NGCS = Native Ground Stratum Cover (shrubs), NGCO = Native Ground Stratum Cover (other), EC = Exotic Plant Cover, NTH = Number of Trees with Hollows, OR = Overstorey Regeneration and FL = Length of Fallen Logs *Performance Criteria was approved by DPIE on 23 April 2019, and is incorporated into the updated BMP (WCPL 2019), which is pending approval from DPIE

Assessment against BVT Benchmarks* for Rehabilitation Sites within their respective BVT

BVT	Season	Site	Vegetation condition	SVS	Site attributes (% cover)									
					NSR	NOC	NMC	NGCG	NGCS	NGCO	EC	NTH (Count)	OR	FL (M)
HU824	Autumn	R6	LOW	18	13	0	0.9	0	0	0	44	0	1	0
	Spring	R8	LOW	11	21	0	0	4	0	0	26	0	0	0
	Autumn	R9	LOW	28	13	6.2	7.3	0	0	0	24	0	1	26
HU732	Spring	R10	LOW	9	7	0	0	0	0	0	8	0	0	15
	Spring	R11	LOW	11	7	0	2	0	0	0	38	0	0	1

SVS = Site Value Score, NSR = Native Plant Species Richness, NOC = Native Overstorey Cover, NMC = Native Midstorey Cover, NGCG = Native Ground Stratum Cover (grasses), NGCS = Native Ground Stratum Cover (shrubs), NGCO = Native Ground Stratum Cover (other), EC = Exotic Plant Cover, NTH = Number of Trees with Hollows, OR = Overstorey Regeneration and FL = Length of Fallen Logs *BVT Benchmarks are taken from OEH (2017)

There were three sites that scored MOD-GOOD for SVS under the WCPL Performance Criteria. All sites within HU824 met the performance criteria for NSR. Both sites within HU732 met the performance criteria for NMC, as well as site R9. All sites met the performance criteria for EC, NTH and OR. NGCO did not meet the performance criteria at any site across the rehabilitation areas. Comparison against these BVT Performance Criteria is temporary until sites are reworked to adhere to their target BVT.

All rehabilitation area sites scored LOW for SVS, with the highest SVS recorded at R9. Across the rehabilitation areas the attributes frequently not meeting the BVT Benchmark were NSR, NOC, NGCG, NGSG, NGCO, NTH and FL. Site R11 met the BVT benchmark for NMC, and sites R6 and R9 met the benchmark for OR. All sites met the benchmark for EC. Comparison against these BVT Benchmarks is temporary until sites are reworked to adhere to their target BVT

8.1.3 Summary of Activities Next Reporting Period

WCPL are scheduled to complete and rehabilitate a total of 138ha of mine waste rock emplacements during Year 2 (Domain 5) within Pit 1, Pit 2, Pit 3, Pit4, Pit 5 and Pit 7 (**Figure 6** and **Appendix 8**).

As discussed in **Section 8.1.1**, WCPL have completed MOP rehabilitation targets for Year 1 as of the end of December 2019 and are scheduled to complete the remaining rehabilitation target on 138ha for Year 2 in 2020 (**Figure 6**).

Commencing in 2020, the scheduled 138ha targeted for Year 2 of the MOP will be sown with the appropriate BVT species. In addition, WCPL are proposing to sow some of the historical rehabilitation areas with the appropriate BVT species in 2020.

The rehabilitation progress against the MOP will provided in the next Annual Review.

8.2 Other Rehabilitation Activities

Ozothamnus tessellatus

WCPL commenced undertaking a seed collection campaign in late 2018 to harvest *Ozothamnus tessellatus* seed from areas within WCPL owned land. *Ozothamnus tessellatus* is listed as 'Vulnerable' under both the TSC Act and EPBC Act. Seeds of the threatened *Ozothamnus tessellatus* will be collected and propagated for use in the Rehabilitation and Regeneration Areas in accordance with the BMP.

WCPL also collaborated with the University of Wollongong (UoW) to assist with seed collection and research on this data deficient species. UoW was contracted by the Australian Botanic Garden to assist with seed collection of this species and to undertake scientific research on the species such as propagation trials and viability testing. WCPL will continue to assist UoW in this study.

Propagation trials commenced in 2019 by WCPL in germination trays with various soils and treatments. As this species produces thistle-type seeds, tube stock is anticipated to be the most appropriate method for propagation. In summary:

- 3 grams of *Ozothamnus tessellatus* seeds were harvested in 2019;
- 1 gram of *Ozothamnus tessellatus* seeds were sown to grow seedlings in 2019 (**Plate2**);
- On 26 September 2019, 30 *Ozothamnus tessellatus* seedlings were planted in ECA_C;
- Grazing pressure from native/feral animals and the ongoing drought resulted in 100% mortality; and
- The *Ozothamnus tessellatus* propagation and planting trial will continue in 2020.



Plate 2 *Ozothamnus tessellatus* propagated seedlings 2019

Exploration

Following the completion of drilling, rehabilitation of exploration site are in accordance with *WI-EXP-PRO-0031 Wilpinjong Exploration Site Rehabilitation Procedure*. Inspections of drill sites are approximately every 6 months until the site has reached a stable state. During 2019, a number of drill sites were inspected for rehabilitation progress, including:

- Return of vegetation; and
- Any evidence of weed or pest invasion.

Microbes

WCPL is investigating the use of microbes within areas which have had green manure crops established. WCPL believes this be a natural beneficial process to assist in breaking down this newly created organic matter leading to building improved soil structure. Initial testing has been completed with results indicating levels of desirable activity.

Tree Planting

A three-year management schedule is provided in Appendix 6 of the BMP. This management schedule includes re-vegetation and erosion control strategies along sections of Cumbo and Wilpinjong Creeks. During 2019, WCPL developed the *Wilpinjong Creek Management Strategy (Year 1)*. The aim was to increase the riparian vegetation along a section of Wilpinjong Creek within an Environment Conservation Area (ECA-B) and to improve the stability of the creek. WCPL completed selective planting 1400 trees and erosion control site at key locations along approximately 1.7 km (or 9ha) of the creek line in November 2019 (**Figure 7**) & (**Plate 3**). Due to intense grazing pressures and the ongoing drought there was approximately 50% mortality rate. WCPL are planning to replace the trees that were either eaten or perished in 2020.

Figure 9 Revegetation Plan for Wilpinjong Creek (Year 1)

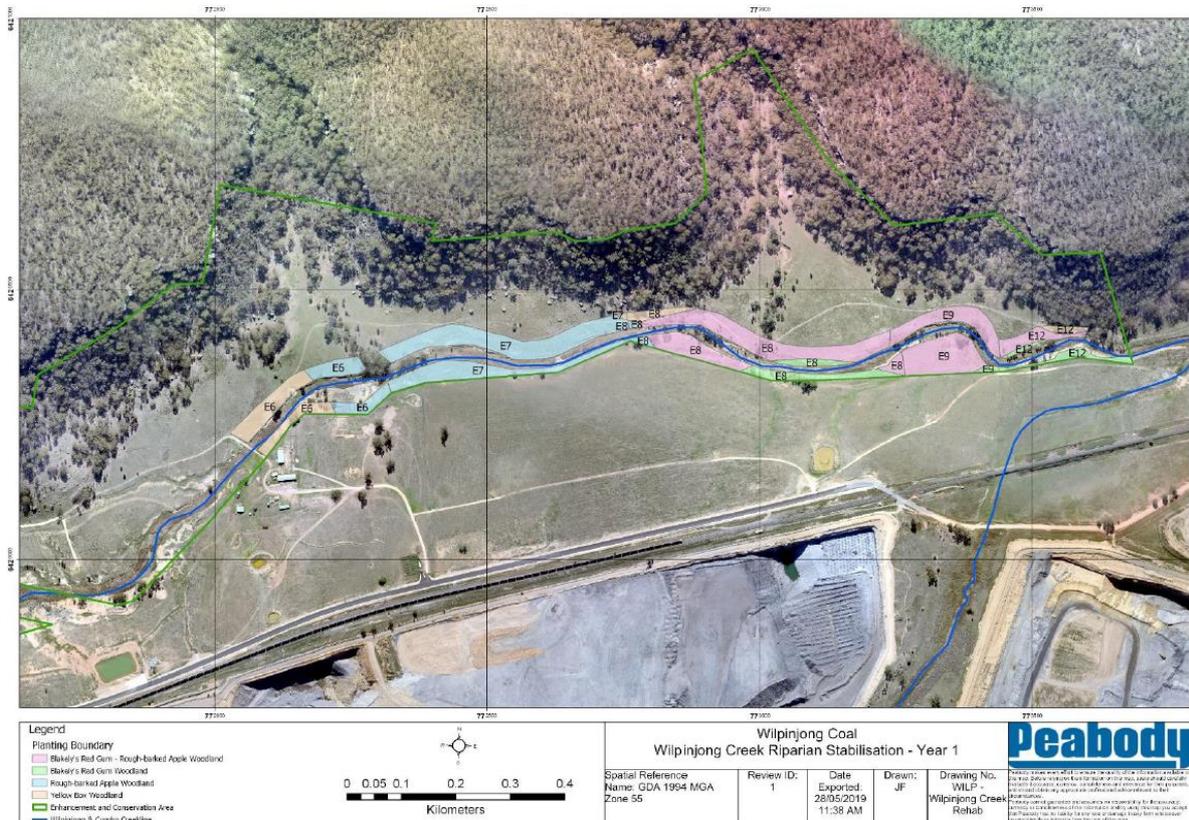


Plate 3 Wilpinjong Creek Management Strategy (Year 1)



In addition to planting 1400 trees within the *Wilpinjong Creek Management Strategy (Year 1)* area being a mix of Yellow Box, Blakey's and Rough Barked Apple communities, 65 Rough Barked Apple eucalypts were planted in ECA_C.

Habitat Augmentation

To meet the requirements of the BMP, WCPL continued with the relocation of surplus trees removed from the mining footprint for mine site rehabilitation and re-establishment as log habitat and the establishment of nest boxes. During 2019 approximately 100 nest boxes were installed (**Plate 4**) (refer to figure in **Appendix 7**) in Regen Areas 5 and 9 and ECA_B.

Plate 4 Nest Box Installations in 2019



8.3 Land Management Activities

Pest and Weed Management

WCPL completed pest management works on WCPL owned properties during 2019 including BOA's, Regeneration and ECA areas. Works included:

- Targeted pest species management included feral pig trapping along Wilpinjong Creek and fox and wild dog control in conjunction with the local wild dog group;
- Aerial dog bating. This program was coordinated by Local Land Services (LLS) as a result of know wild dog activity in the local area; and
- Lessees across the broader company landholdings also undertake ongoing vertebrate pest management.

WCPL has undertaken extensive weed spraying in response to regular internal inspections and annual MWRC inspections using selective herbicides (refer to weed control figure in **Appendix 7**).

- Sweet Briar;
- African Box Thorn; and
- Blackberry.

9.0 COMMUNITY

A protocol for the management and reporting of community complaints has been developed as a component of the Mine’s EMS. In accordance with Condition M6.1 of EPL 12425, a dedicated telephone number (ph.: **1300 606 625**) for the provision of comments or complaints is maintained by WCPL. In addition, a separate hotline for blasting information is also maintained by WCPL (ph.: **1800 649 783**).

In accordance with Condition M6.2 of EPL 12425, these telephone lines are advertised in local newspapers quarterly, via the Wilpinjong Community Newsletter, via the Wilpinjong Community Consultative Committee and on the Peabody website:

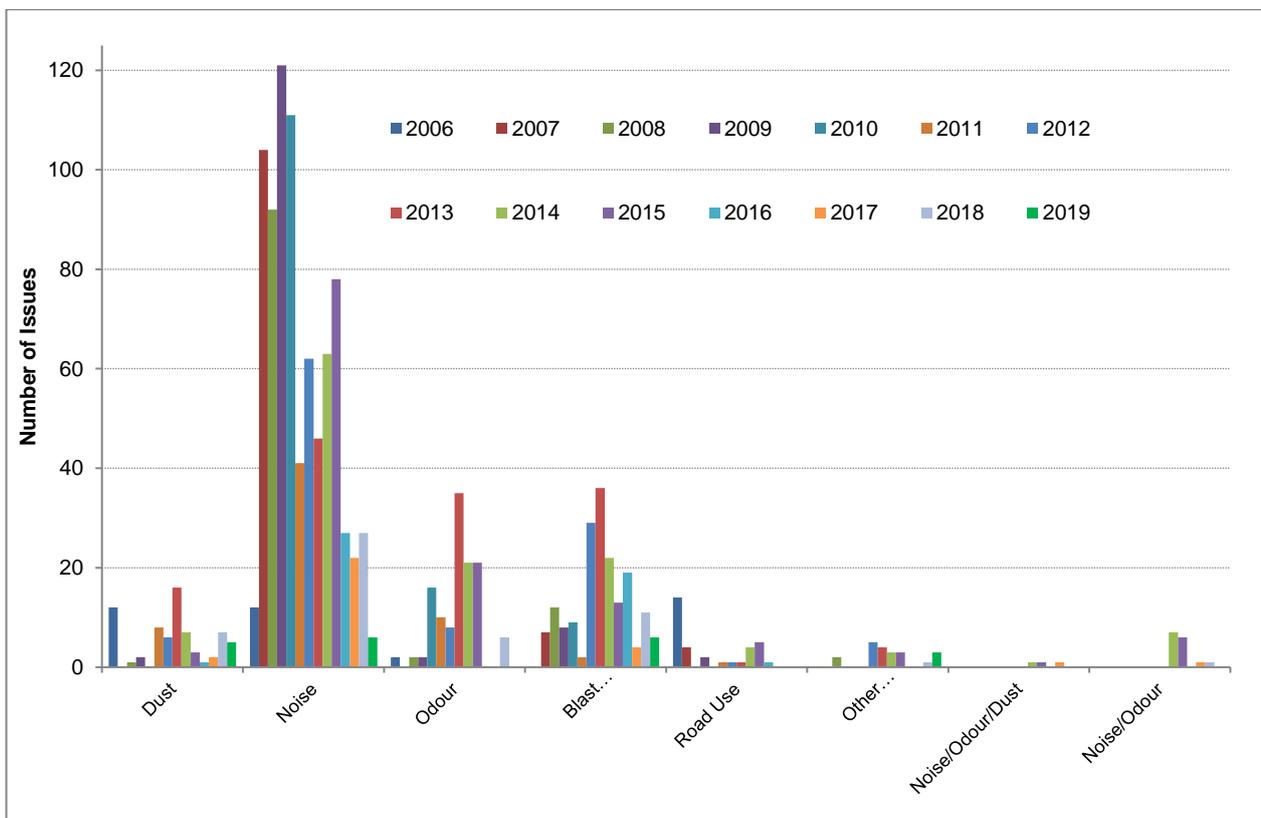
<https://www.peabodyenergy.com/Operations/Australia-Mining/New-South-Wales-Mining/Wilpinjong-Mine>

WCPL records and responds to all complaints and maintains a complaints register on its website. The complaints are managed in accordance with the WCPL Complaints Management Procedure. The Complaints Management Procedure outlines WCPL reporting requirements as follows:

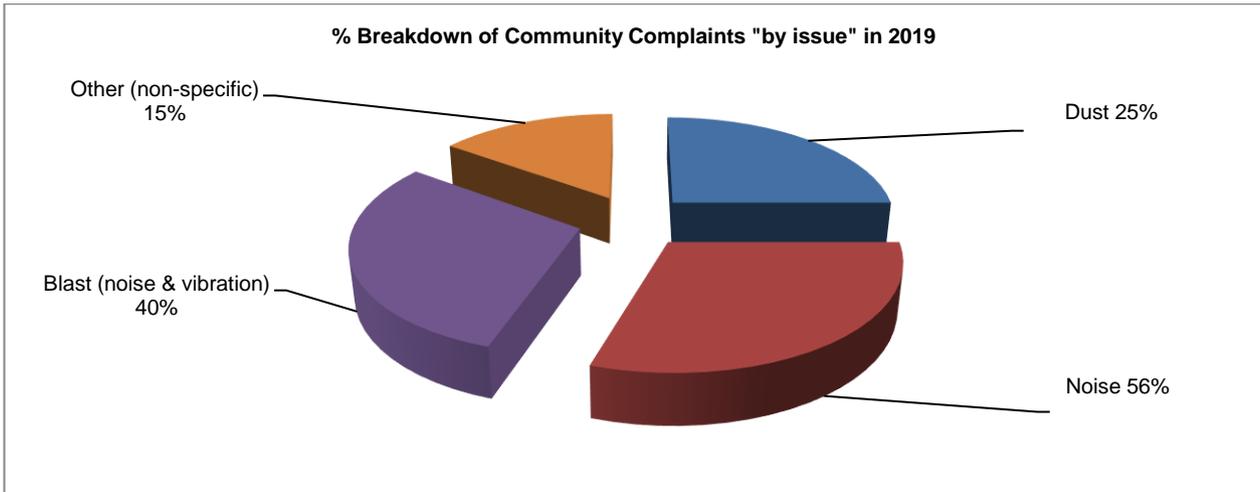
- A summary of complaints received is reported monthly on the Peabody website;
- A summary of complaints received and actions taken is presented to the WCPL CCC as part of the operational performance review;
- A summary of complaints received and actions taken is included in the Annual Review and the Annual Return to the EPA.

During the 2019 review period, 20 community complaints were received by WCPL (**Appendix 6**) as opposed to 53 community complaints in 2018. **Graph 21** presents a comparison of the environmental complaints received by WCPL over the period 2006 to 2019. **Graph 22** indicates an overall declining trend in community complaints from 2006 to 2019.

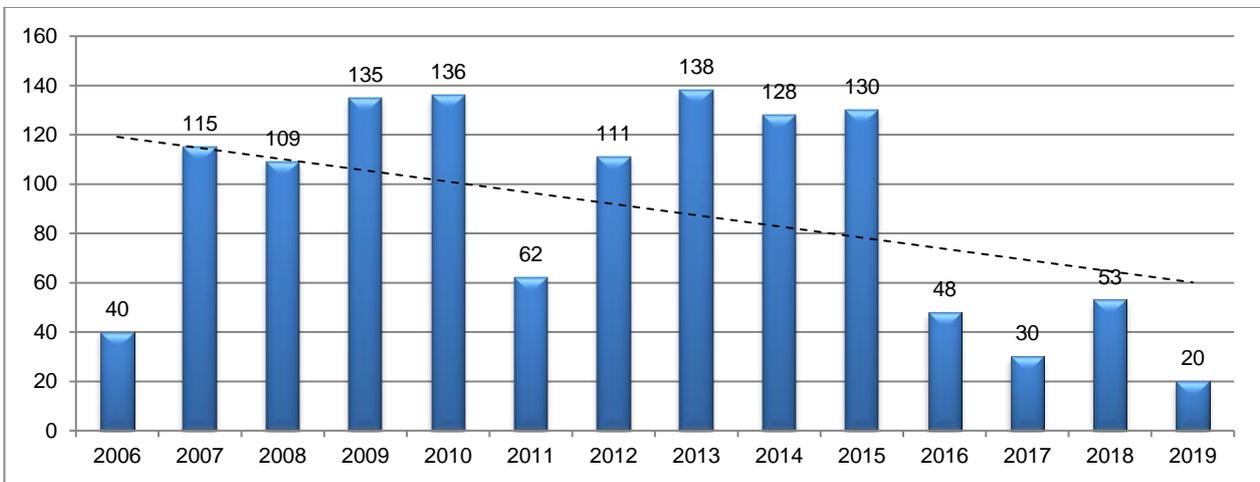
Graph 21 Summary of Community Complaints and Issues Raised by Complainants 2006 – 2019



Graph 22 Percentage Breakdown of Community Complaints in 2019



Graph 23 Total Annual Complaints 2006 - 2019



Community Consultative Committee

In accordance with Condition 7, Schedule 5 of SSD-6764, the Community Consultative Committee (CCC) (Table 34) continued to meet during the 2019 review period.

The CCC for the Mine is operated in general accordance with the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects* (Department of Planning, 2007).

Consistent with the requirements of the CCC Guidelines, the committee is comprised of one independent chairperson, and representatives of the MWRC, NPWS, WCPL and members of the general community.

Consultation regarding the WEP was undertaken at the CCC meetings in March, June, September and December 2019.

WCPL has undertaken individual consultation with private landholders and lessees that reside in the vicinity of the mine to discuss the ongoing development of the Wilpinjong Coal Mine and the WEP. Table 35 provides a summary of the CCC meetings held during the 2019 review period.

Table 34 CCC Members for the 2019

Name	Organisation
Des Kennedy	Mid Western Regional Council
Lisa Andrews	CCC Independent Chair Person
Colin Faulkner	Community Representative
Scott Lillis	Community Representative
Brian McDermott	Community Representative
Bev Smiles	Community Representative and Mudgee District Environmental Group Representative
Bruce Hughes	Community Representative
Kim Peach	Community Representative
Lisa Menke	NSW National Parks and Wildlife Service Representative

Table 35 Summary of CCC Meetings in 2019

Date	Key Outcomes
11 March	Environmental monitoring results, reviewed complaints since last CCC, operational downtime, EMS & Management Plan Update, Rehabilitation, 2019 Exploration Program and Community Donations and Consultation.
3 June	Environmental monitoring results, reviewed complaints since last CCC, operational downtime, EMS & Management Plan Update, Rehabilitation, 2019 Exploration Program and Community Donations and Consultation. Mining Lease Applications, Infrastructure Projects, Tralee EL Application, SIMP, Rehabilitation, Wollar Store and Property Management.
6 September	Environmental monitoring results, reviewed complaints since last CCC, operational downtime, Rehabilitation, 2019 Exploration Program and Community Donations and Consultation. Mining Lease Applications, Pit 8 Boundary Modification, Tralee EL Application, SIMP, Wild Dog Control.
2 December	Environmental monitoring results, MOP, reviewed complaints since last CCC, operational downtime, Rehabilitation, TD5 Capping, 2019 Exploration Program and Community Donations and Consultation. Mining Lease Applications, Water Sharing with MCO, Pit 3 to Pit 8 Ridge Cutting, Tralee EL Application, RFS Participation, SIMP, Rehabilitation Strategy.

Community Support Program

During the 2019 reporting period, WCPL continued its support of local community groups and sporting associations, schools and charitable organisations (total amount in 2019 was approximately \$120,000.00), including local schools, Community Groups, Charities and sporting groups. More information regarding WCPL's community support program is provided in **Appendix 6**.

Have a Chat Meeting

WCPL also provided an information newsletter regarding upcoming 'have a chat' sessions, held at the Wollar Store 1st Thursday of the month from 1:30pm to 4:30pm. The initiative aims at providing the community a casual setting to ask questions or raise concerns relation to the Mine's operations.

Access to Information

Condition 12, Schedule 5 of SSD-6764 details the requirements for access to information applicable to the Mine, and outlines the documents required by the Project Approval to be made publicly available on the Peabody website www.peabodyenergy.com

Employment Status

At the end of the 2019 reporting period there were 459 full time equivalent employees at WCPL, 99 staff and 138 full time equivalent contractors.

10.0 INDEPENDENT AUDIT

10.1 Independent Environmental Audit

As required by Condition 10, Schedule 5 of SSD-6764, Wilpinjong Coal Pty Limited (WCPL) are required to complete an Independent Environmental Audit (the IEA) of the development within a year of commencing the development.

The Notice of Commencement to the DPIE, as required by Condition 8, Schedule, 2 of SSD-6764 was confirmed by WCPL with its intention to commence the approved development on the 19 September 2017.

In consultation with the DPIE, AECOM Australia (AECOM) were endorsed by the Secretary on the 12 June 2018 to undertake the IEA in accordance with Condition 10, Schedule 5 of SSD-6764.

AECOM were officially commissioned by WCPL to carry out the IEA on the 27 July 2018. The site inspection component of the IEA was completed on the 22nd, 23rd and 24th August 2018 by AECOM's endorsed audit team and relevant specialist.

As required by Condition 11, Schedule 5 of SSD-6764, WCPL submitted a copy of the IEA to the Secretary (**Appendix 9**) and a response to any recommendations contained in the IEA, with a timetable for implementation (**Appendix 9**) within 3 months of commissioning the IEA on the 26 October 2018.

Table 38 provides an update of the remaining actions from the 2018 IEA.

11.0 INCIDENTS & NON-COMPLIANCES

11.1 Reportable Incidents

There were no reportable incidents during the 2019 review period. However, the DPIE and EPA were notified¹⁵ in regard to elevated dust levels as a result of extraordinary events as listed in **Table 13** and **Appendix 3B**.

11.2 Non-Compliances

There were a total of ten non-compliances as identified in **Table 36** and **Table 37**, identified during the 2019 review period.

- Three administrative non-compliances were identified against SSD 6764; and
- Seven non-compliances were identified against EPL 12425.

Table 36 Non-compliance SSD-6764

Relevant Approval	Date of	Details of Non-Compliance	Cause of Non-Compliance	Action to Address Non-Compliance
Con. 61, Sch 3	2019 Reporting Period	The Rehabilitation Strategy was not finalised.	Ongoing consultation with departments in 2019. As of the end of the 2019 reporting period The Rehabilitation Strategy was not finalised.	Comments received from DPIE in late 2019 and WCPL are now progressing finalisation and resubmission of the Rehabilitation Strategy expected in early 2020.

¹⁵ Additional elevated 24-hour average PM₁₀ levels caused by non-mining related events (for example influence of unsealed Araluen Road and Regional Dust events) were not further communicated to the DPIE and EPA due to the frequent nature of these occurrences (refer to the Air Quality report **Appendix 3B**) given the extreme drought conditions experienced in 2019, and such events are considered "Extraordinary" as per WCPL's Development Consent (SSD-6764) Schedule 3 Condition 17.

Relevant Approval	Date of	Details of Non-Compliance	Cause of Non-Compliance	Action to Address Non-Compliance
Con 30(d)(iii), Sch 3	2019 Reporting Period	Turbidity and pH readings exceeded the triggers during 2019 at Cumbo Creek downstream.	Notification to relevant government agencies did not occur in the nominated time frame. Initial investigations by WCPL identified the potential source of the trigger exceedances to be non-mine related due to run off from the unsealed section of the Ulan Wollar Road which enters Cumbo Creek at this location.	Further investigations to be undertaken as recommended by SLR. SLR concluded, proximity of monitoring site to unsealed Ulan-Wollar Road, and ongoing dry conditions may all be contributing to exceedances. Update TARP in the SWMP as required.
Con 30(d)(iv), Sch 3	2019 Reporting Period	Climatic conditions have resulted in exceedances of the trigger levels for groundwater monitoring in alluvial material.	Notification to relevant government agencies did not occur in the nominated time frame. Initial investigations by WCPL identified the potential source of the trigger exceedances to be non-mine related due to extreme ongoing climatic conditions experienced in 2019.	Due to the difficulty of separating mining from climatic related declines in groundwater level for the past 3 Annual Review reports (2017, 2018, 2019), SLR recommends that a trigger investigation be undertaken that incorporates monitoring data following the February 2020 rainfall event. This investigation should revise the cause and effect analysis provided in this report to incorporate additional data from early 2020, and will provide an indication of the likely cause of recent trigger exceedances. Update TARP in the GWMP as required.

Table 37 Details of Non-Compliances (EPL12425)

Relevant Approval	Date of	Details of Non-Compliance	Cause of Non-Compliance	Action to Address Non-Compliance
M2.2	19 Feb 2019 21 Mar 2019	Two PM10 dust samples were not collected and analysed at monitoring point 13 (HV1).	The high-volume air sampler (HV1) did not operate due to planned/unplanned power outages and instrument fault.	HV1 checked after every sample date and following power outage and/or instrument fault.
M2.2	14 Jan 2019 21 Mar 2019 20 Apr 2019 05 Sep 2019 05 Oct 2019	Five PM10 dust samples were not collected and analysed at monitoring point 20 (HV4).	The high-volume air sampler (HV4) did not operate due to planned/unplanned power outages and instrument fault.	HV4 checked after every sample date and following power outage and/or instrument fault.
M2.2	19 Feb 2019 21 Mar 2019	Two PM10 dust samples were not collected and analysed at monitoring point 27 (HV5).	The high-volume air sampler (HV5) did not operate due to planned/unplanned power outages and instrument fault.	HV5 checked after every sample date and following power outage and/or instrument fault.
M2.2	2019 Reporting Period	For the reporting period 18.4% of the continuous PM10 dust monitoring was rejected or did not occur at monitoring point 25 (TEOM 3).	Major cause was unknown instrument fault causing inaccurate data.. Other minor causes included general maintenance (including	TEOM3 checked: each month, remotely each day and following power outage and/or repair work.

Relevant Approval	Date of	Details of Non-Compliance	Cause of Non-Compliance	Action to Address Non-Compliance
			calibrations) and planned/unplanned power outages.	
M2.2	2019 Reporting Period	For the reporting period 1.2% of the continuous PM10 dust monitoring did not occur at monitoring point 28 (TEOM 4).	General maintenance (including calibrations), instrument failure/repair, and planned/unplanned power outages.	TEOM4 checked: each month, remotely each day and following power outage and/or repair work.
M2.2	2019 Reporting Period	For the reporting period 18.4% of the continuous PM2.5 dust monitoring did not occur at monitoring point 29 (TEOM 2.5).	Major cause was unknown instrument fault causing inaccurate data. General maintenance (including calibrations), instrument failure/repair, and planned/unplanned power outages.	TEOM2.5 checked: each month, remotely each day and following power outage and/or repair work.
M4.2	2019 Reporting Period	For the reporting period the percentage of continuous monitoring that did not occur for: (i) air temperature, and (ii) wind speed/direction, lapse rate, rainfall and humidity, was 0.8%.	General maintenance (including calibrations) or equipment failure/repair.	Meteorological equipment checked remotely each day, following any repair work and during annual inspection.

Table 38 IEA Update of Actions

Relevant Approval	Date of	Details of Non-Compliance	Cause of Non-Compliance	Action to Address Non-Compliance	Action Completed (Yes/No)
Schedule 3 Condition 19(a)	22/08/2018	WCPL received a formal warning letter on 08 February 2018 from the EPA following an unannounced visit to site on 17 January 2018. The EPA officer identified excessive dust emissions from the mine as a result of activities being undertaken in pit 7 and pit 4. The inspection also identified a dust haze in the area around the mine when compared to that of the Ulan area.	This condition was found to be non-compliant on the basis that the EPA found WCPL to be in breach of EPL 12425 requirements O3.1 which requires the following, <i>“All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises”</i> .	<p>Although no recommendations were made by the Auditors based on WCPL’s current dust management measures considered satisfactory during the IEA, WCPL do however proposed the following additional actions to ensure ongoing improvements in relation to air quality management. These actions include:</p> <p>A review of the existing Air Quality Management Plan (AQMP) and Spontaneous Combustion Management Plan (SCMP) to reflect the current monitoring conducted in relation to spontaneous combustion. Remove reference to monitoring requirements relating to the Keylah Dump Removal.</p> <p>Refresher training for operational personnel in the form of Tool Box Talks regarding dust management and responsibilities</p>	<p>Yes: In 2019 the AQMP and SCMP were reviewed and resubmitted for re-approval into the DPIE.</p> <p>DPIE reviewed AQMP and SCMP with only minor corrections to be addressed on 10 February 2020.</p> <p>WCPL were addressing the DPIE comments with a scheduled re-submission of the AQMP and SCMP in early 2020.</p> <p>Refresher training was provided to applicable employees in 2019.</p>
Schedule 3, Condition 31	22/08/2018	The audit team’s surface water specialist reviewed management measures in place on site at WCPL during the audit site inspection. The surface water specialist concluded that there are some discrepancies between the approved SWMP, and its implementation on site. In particular relating to sediment basins and up-stream diversions that are depicted in the SWMP but have not been constructed.	Operations on site appeared to manage water effectively with minimal risk for offsite transport of water, however on the basis that the approved SWMP did not reflect the current operations, this Condition has been assessed as non-compliant.	<p>WCPL propose the following actions to the Water Management Plan (WMP). These actions include:</p> <p>A review of the existing Surface Water Management Plan (SWMP) to include a detailed description of the assessment process for not adopting clean water diversions, based on further specialist reviews that can clearly identify when a clean water diversion is not adopted by WCPL , this decision can demonstrate the least net impact on the environment or presents the lowest longer term risk; and</p> <p>A review of the Site Water Balance if diversions are not adopted to account for in each annual review of the site water balance and calculation of harvestable right.</p>	<p>Yes: In 2019 the SWMP was reviewed and resubmitted for re-approval into the DPIE.</p> <p>DPIE reviewed SWMP with only minor corrections to be addressed on 10 February 2020.</p> <p>The Site Water Balance was also reviewed to integrate the latest review of the site water balance model completed in October 2019.</p> <p>WCPL were addressing the DPIE comments with a scheduled re-submission of the SWMP and SWB in early 2020.</p>

Relevant Approval	Date of	Details of Non-Compliance	Cause of Non-Compliance	Action to Address Non-Compliance	Action Completed (Yes/No)
*Schedule 3, Condition 37	22/08/2018	<p>WCPL submitted Draft BVT Performance and Completion Criteria for the BVTs listed in Tables 8 and 9 of the Development Consent and Regent Honeyeater Habitat to OEH, DoEE for consultation on the 19.02.18.</p> <p>DoEE responded by email dated 13.03.18 that it was not commenting on the Draft Performance and Completion Criteria at this time.</p> <p>OEH provided comments on the Draft Performance and Completion Criteria including recommendations by letter dated 14.03.18.</p> <p>WCPL made amendments to its Proposed BVT Performance and Completion Criteria and provided this together with its response to each of the OEH comments to the DPE by letter dated 19.03.18 (within six months of the commencement of development). At the time of writing (October 2018) the DPE was yet to respond.</p>	<p>On the basis that confirmation of the satisfaction of the DPE was not received within 6 months of the commencement of the development (March 2018), this condition is considered noncompliant.</p> <p>It is noted that the DPE has had the revised Draft Criteria for seven months and has not provided further feedback or approval of the Criteria and this has led to the timeframe not being met.</p> <p>WCPL personnel indicated they believed the intent of this Condition was to submit the Draft BVT Performance and Completion Criteria within six months of the commencement of development.</p>	<p>WCPL propose the following actions to the Biodiversity Management Plan (BMP). These actions include:</p> <p>Continue to work with DP&E and OEH to finalise the BVT Performance and Completion Criteria;</p> <p>Update the BMP accordingly to reflect the final and agreed BVT Performance and Completion Criteria once approved by the Secretary; and</p> <p>Review the Mining Operations Plan (the MOP) to align with the BVT Performance and Completion Criteria once approved by the Secretary and resubmit the MOP for approval by the DRG.</p>	<p>Yes: In April 2019 the BVT Performance and Completion Criteria was approved, subsequently the BMP was reviewed and resubmitted for approval in 30 June 2019 and later again on the 27 September 2019 to address changes to Pit 8 boundary and ML1795.</p> <p>DPIE reviewed BMP with no corrections to be addressed on 10 February 2020.</p>
*Schedule 3, Condition 61	22/08/2018	<p>A Rehabilitation Strategy (March 2018) was prepared and submitted to the DPE for approval on the 19 March 2018. At the time of writing, (October 2018) WCPL was yet to receive confirmation from the DPE that the Strategy was prepared to its satisfaction. and on this basis, this Condition has been assessed as non-compliant.</p>	<p>WCPL was yet to receive confirmation from the DPE that the Strategy was prepared to its satisfaction. and on this basis, this Condition has been assessed as non-compliant. WCPL personnel indicated they believed the intent of this Condition was to submit the Draft Rehabilitation Strategy within six months of the commencement of development.</p>	<p>WCPL propose the following actions to the Rehabilitation Strategy. These actions include:</p> <p>Continue to work with the DP&E to obtain feedback on whether the Rehabilitation Strategy has been prepared to the DP&E's satisfaction; and</p> <p>Review the Mining Operations Plan (the MOP) to align with the Rehabilitation Strategy, once approved by the Secretary, and resubmit the MOP for approval by the DRG.</p>	<p>No: During the reporting period, WCPL was in consultation with the relevant agencies progressing The Rehabilitation Strategy as required by Condition 61, Condition 3 of the Development Consent SSD-6764 (ongoing).</p> <p>As of the end of the 2019 reporting period The Rehabilitation Strategy was not finalised.</p> <p>Comments received by DPIE in late 2019 and WCPL progressing finalisation and resubmission of the Rehabilitation Strategy expected in early 2020</p>

12.0 ACTIVITES FOR NEXT REPORTING PERIOD

Activities proposed to be carried out by WCPL at the Mine during the 2020 review period (i.e. 1 January 2020 to 31 December 2020)¹⁶ include the following:

- Construction of the WEP related infrastructure;
- Finalise Rehabilitation Strategy;
- Revise the BMP accordingly;
- Continued exploration activities in EL 6169 and EL 7091;
- Continued exploration drilling within MLs (including both infill drilling and lower density drilling).
- Continuation of rehabilitation works in completed mined areas;
- Inspection and review of rehabilitation areas to assess maintenance requirements;
- Continued weed and animal pest control across WCPL-owned land.
- Continued stock exclusion in the ECAs to promote regeneration.
- Ongoing demolition of derelict houses, including in-pit disposal of inert building material.
- Continued consultation with surrounding landholders.
- Ongoing CCC meetings, including continued publication of the meeting minutes on the Peabody website.
- Continuation of Wollar “Have-a-chat” sessions on a monthly basis;
- Undertake geochemical analysis through the geological profile;
- Continue the Spontaneous Combustion Propensity testing regime;
- Complete 138ha of rehabilitation in 2020 – in accordance with approved Mine Operations Plan.
- In accordance with Condition 5, Schedule 5 of Development Consent SSD-6764 WCPL will review, and if necessary, revise the strategies, plans and programs required under the Project Approval within three months following submission of this Annual Review and Environmental Management Report or as otherwise specified in the Project Approval.

¹⁶ Subject to the controls in place to manage the risk of Coronavirus. This may limit achieving the activities in 2020. WCPL will continue to consult with the relevant government departments on this matter.

13.0 REFERENCES

- Wilpinjong Coal Mine – 2019 Annual Biodiversity Monitoring Report, Eco Logical Australia Pty Ltd (March 2020)
- Wilpinjong Coal Mine – Stream Health Monitoring, Eco Logical Australia Pty Ltd (March 2020)
- Wilpinjong Coal Mine – 2019 Channel Stability Monitoring Report, Eco Logical Australia Pty Ltd (March 2020)
- Environmental Noise Monitoring (January 2019 to December 2019), Global Acoustics Pty Ltd
- Air Quality Monitoring Data Review Wilpinjong 2019, Todoroski Air Sciences (March 2020)
- Groundwater Wilpinjong Review, SLR (March 2020)
- Wilpinjong Coal Mine – Surface Water 2019 Annual Monitoring Review, SLR (March 2020)
- Wilpinjong Mine – Site Water Balance Review for 2019 Annual Review, WRM (February 2019)

Appendices

Appendix 1	Rail Haulage
Appendix 2	Exploration
Appendix 3	Environmental Performance
Appendix 3A	Meteorological Data
Appendix 3B	Air Quality Monitoring Data
Appendix 3C	Surface Water Monitoring Data
Appendix 3D	Groundwater Monitoring Data
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