



ANNUAL ENVIRONMENTAL MANAGEMENT REPORT

2019

MAXWELL INFRASTRUCTURE

Annual Environmental Management Report 2019


Name of operation	Maxwell Infrastructure
Name of operator	Maxwell Ventures (Management) Pty Ltd
Development consent / project approvals	PA 06_0202, DA 106-04-00
Name of holder of development consent / project approval	Maxwell Ventures (Management) Pty Ltd
Mining leases	A173, CL229, CL395, ML1531
Name of holder of mining leases	Maxwell Ventures (Management) Pty Ltd
Water licences	20BL171953, 20BL171954, 20BL171955, 20BL171956, 20BL171957, WAL 41559, WAL 41491*
Name of holder of water licences	Maxwell Ventures (Management) Pty Ltd *WAL 41491 is held by AGL Macquarie Pty Ltd
MOP start date	1 July 2015
MOP end date	30 June 2020
Annual Review start date	1 January 2019
Annual Review end date	31 December 2019
<p>I, Robert Hayes, certify that this audit report is a true and accurate record of the compliance status of Maxwell Infrastructure for the period 1 January 2019 to 31 December 2019 and that I am authorised to make this statement on behalf of Maxwell Ventures (Management) Pty Ltd.</p> <p><i>Note.</i></p> <p><i>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.</i></p> <p><i>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).</i></p>	
Name of authorised reporting officer	Robert Hayes
Title of authorised reporting officer	Maxwell Infrastructure Manager
Signature of authorised reporting officer	
Date	30 March 2020

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1 STATEMENT OF COMPLIANCE

A statement of compliance is provided in **Table 1**.

Table 1. Statement of compliance

Were all conditions of the relevant approvals complied with?	
PA 06_0202	Yes
DA 106-04-00	Yes
EPL1323	Yes
CL229	Yes
CL395	Yes
ML1531	Yes
A173	Yes
20BL171953	Yes
20BL171954	Yes
20BL171955	Yes
20BL171956	Yes
20BL171957	Yes
WAL 41559	Yes
WAL 41491	Yes

2 ACRONYMS

Acronym	Definition
°C	Degrees Celsius
A	Authorisation issued under the <i>Mining Act 1973</i>
AC	Alternating current
ACM	Asbestos containing material
AEMR	Annual Environmental Management Report
bcm	Bank cubic metres
CCC	Community Consultative Committee
CHPP	Coal handling and preparation plant
CL	Coal Lease issued under the <i>Mining Act 1973</i> .
dB(A)	A-weighted decibels
DPIE	NSW Department of Planning, Industry and Environment
EA	Drayton Mine Expansion Environmental Assessment 2007
EC	Electrical conductivity
EIS	Environmental Impact Statement
EL	Exploration Licence
EP&A Act	Environmental Planning and Assessment Act 1979
EPL	Environment Protection Licence
FY	Financial year
g/m ² /month	Grams per square metre per month
GJ	Gigajoules
ha	Hectares
IEA	Independent Environmental Audit
L _{A1} (1 min)	A-weighted sound pressure level that is exceeded for one per cent of the 1-minute measurement period
L _{Aeq} (time period)	A-weighted equivalent continuous sound pressure level over the time period
Ltd	Limited
m ²	Square metres
mAHD	Elevation in metres in respect to the Australian Height Datum
mg/L	Milligrams per litre
MI	Megalitres
ML	Mining Lease issued under the <i>Mining Act 1992</i>
MOP	Mining Operations Plan
m/s	Metres per second
mS/cm	Microsiemens per centimetre

Acronym	Definition
MSC	Muswellbrook Shire Council
NGER	National GHG and Energy Reporting
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
pH	Potential hydrogen
PM ₁₀	Particulate matter 10 micrometres or less in diameter
POEO Act	Protection of the Environment Operations Act 1997
ppm	Parts per million
Pty	Proprietary
REC	Recommendation
RCE	Rehabilitation Cost Estimate
ROM	Run of mine
SEARs	Secretary's Environmental Assessment Requirements
sp.	Species
STP	Sewage treatment plant
t	Tonnes
tCO ₂ -e	Tonnes of carbon dioxide equivalent
TDS	Total dissolved solids
TSP	Total suspended particulates
TSS	Total suspended solids
µg/m ³	Micrograms per cubic metre
UHAQMN	Upper Hunter Air Quality Monitoring Network
WAL	Water Access Licence issued under the <i>Water Management Act 2000</i>

3 INTRODUCTION

Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Coal Ltd (Malabar), owns and operates the Maxwell Infrastructure site (formally Drayton Mine) located on Thomas Mitchell Drive, Muswellbrook. Malabar purchased 100 per cent of the site from Anglo American and Anglo American's joint venture partners and took control on 26 February 2018. The Maxwell Infrastructure site includes open cut workings, rehabilitation, coal handling and preparation facilities and the Antiene rail spur and loop.

Open cut coal extraction and mining activities commenced at the Maxwell Infrastructure site in 1983 and ceased in October 2016. The Maxwell Infrastructure site is currently in the rehabilitation phase of mine operations with some maintenance and ancillary activities (such as grading of roads) being undertaken.

The regional context of the site is shown in **Figure 1**. Maxwell Infrastructure is bordered by Mt Arthur Coal to the west and AGL Macquarie's Bayswater and Liddell Power Stations adjoining the eastern and southern boundaries. The Antiene rural residential area exists to the north of the site. The Project Approval (PA) boundary, lease boundaries and biodiversity offset areas for the site are shown in **Figure 2**. This figure also shows the current operational disturbance footprint.

This report details the compliance status of the Maxwell Infrastructure site with respect to development consents and mining leases from 1 January 2019 to 31 December 2019. It has been prepared in accordance with the Annual Review Guideline published by the Department of Planning, Industry and Environment (DPIE) in October 2015. It also fulfils the Annual Review requirements under the conditions of development consents PA 06_0202 and DA 106-04-00 and Annual Environmental Management Report (AEMR) requirements under the conditions of mining leases CL229, CL395, ML1531 and A173. These conditions and where they have been addressed in the report are listed in **Appendix 1**.

Names and contact details of the key personnel who are responsible for environmental management at the Maxwell Infrastructure site are provided in **Table 2**.

Table 2. Site contacts

Name	Role	Contact details
Robert Hayes	Maxwell Infrastructure Manager	(02) 6542 0283 rhayes@malabarcoal.com.au
Donna McLaughlin	Health, Safety, Environment and Community Manager	(02) 6542 0283 dmclaughlin@malabarcoal.com.au

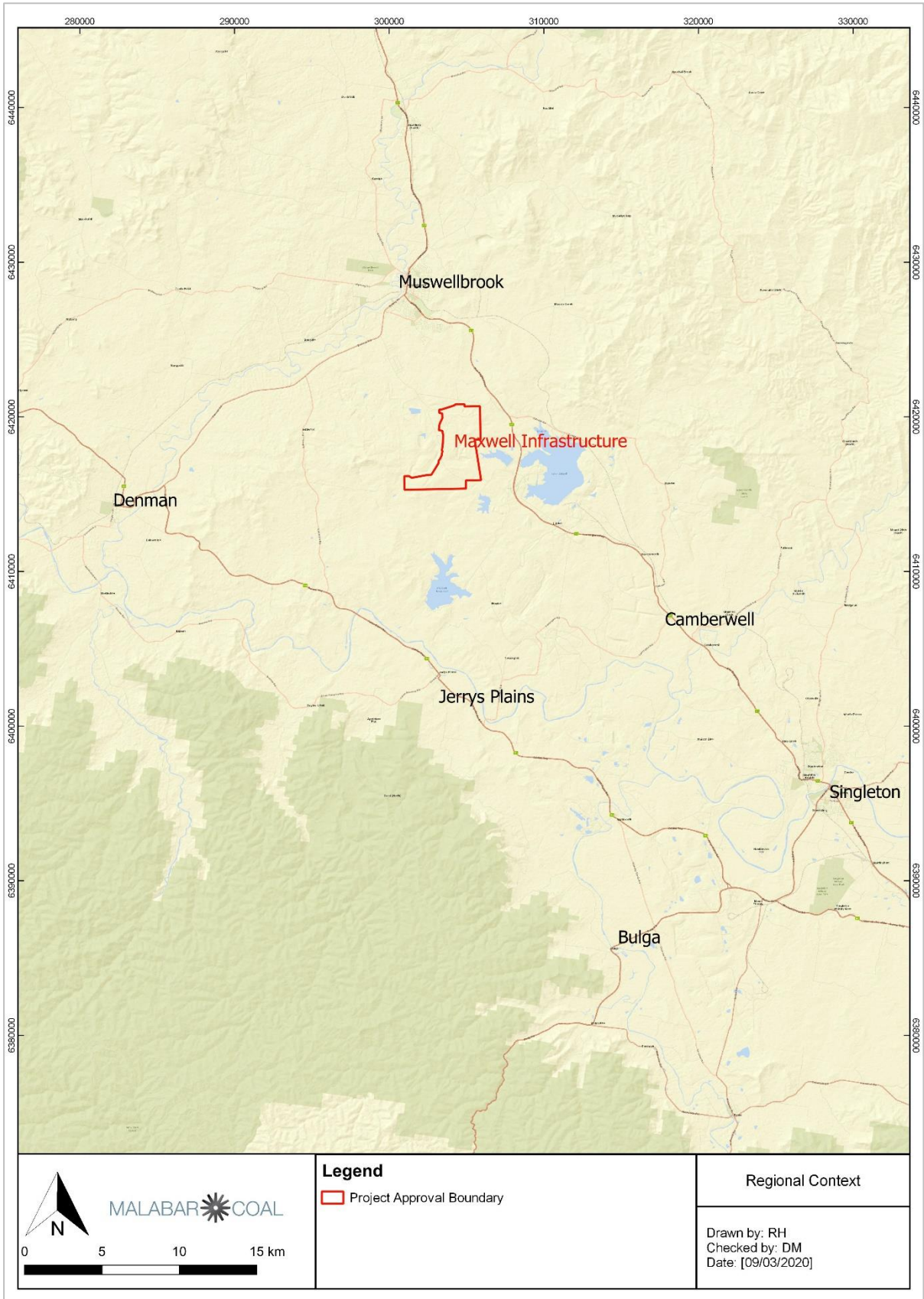


Figure 1. Regional context



Figure 2. Site boundaries

4 APPROVALS

Existing statutory approvals relevant to the Maxwell Infrastructure site are listed in **Table 3**.

In August 2018, Maxwell Ventures (Management) Pty Ltd submitted a request to DPIE for Secretary's Environmental Assessment Requirements (SEARs) for the proposed Maxwell Project. The Maxwell Project would involve development of an underground coal mine within Exploration Licence (EL) 5460 and the utilisation of the substantial facilities that already exist at the Maxwell Infrastructure site. It would also include a transport and services corridor between the Maxwell Project mine entry area and the Maxwell Infrastructure site. SEARs were received in September 2018 and the Maxwell Project Environmental Impact Statement (EIS) went on public display in August 2019. A response to submissions was lodged in November 2019 and it is expected that a determination on the project will be made during the next reporting period. If granted, the project approval would incorporate the development authorised under the existing approval for the Maxwell Infrastructure site resulting in the surrendering of PA 06_0202.

In December 2018, Maxwell Solar Pty Ltd submitted a request to DP&E for SEARs for the proposed Maxwell Solar Farm. The Maxwell Solar Farm would comprise of the installation of a solar plant with a capacity of approximately 25 Megawatts (AC) that would be sited within part of the rehabilitated area of the Maxwell Infrastructure site. SEARs were received in March 2019 and the Maxwell Solar Farm EIS went on public display in December 2019. It is expected that a determination on the project will be made during the next reporting period.

Table 3. Statutory approvals

Statutory Approval Reference	Description
PA 06_0202	Project Approval issued in 2008 under Section 75J of the (now repealed) Part 3A of the <i>Environmental Planning and Assessment Act 1979</i> (EP&A Act) for the Drayton Mine Extension Project.
DA 106-04-00	Development Consent issued in 2000 under Section 76 (A), 9 and 80 of Part 4 of the EP&A Act for use of the existing Drayton Rail Loop and Antiene Rail Spur.
EPL1323	Environment Protection Licence issued in 2000 under Section 55 of the <i>Protection of the Environment Operations Act 1997</i> (POEO Act) for mining for coal and coal works.
CL229	Coal Lease issued in 1992 under the <i>Mining Act 1973</i> .
CL395	Coal Lease issued in 1992 under the <i>Mining Act 1973</i> .
ML1531	Mining Lease issued in 2003 under the <i>Mining Act 1992</i> .
A173	Authorisation issued in 1998 under the <i>Mining Act 1973</i> .
20BL171953	Bore licence issued under the <i>Water Act 1912</i> for a test bore.
20BL171954	Bore licence issued under the <i>Water Act 1912</i> for a test bore.
20BL171955	Bore licence issued under the <i>Water Act 1912</i> for a test bore.

Statutory Approval Reference	Description
20BL171956	Bore licence issued under the <i>Water Act 1912</i> for a test bore.
20BL171957	Bore licence issued under the <i>Water Act 1912</i> for a test bore.
WAL 41559	Water Access Licence issued under the <i>Water Management Act 2000</i> for aquifer water extraction.
WAL 41491	Water Access Licence issued under the <i>Water Management Act 2000</i> for aquifer water extraction.

5 OPERATIONS SUMMARY

5.1 Mining Operations

Under Schedule 2, Condition 5 of Project Approval PA 06_0202, no mining operations can take place at the Maxwell Infrastructure site after 31 December 2017. Mining operations includes coal extraction, processing and transportation activities. As such, approved limits for all materials associated with mining operations during the reporting period are zero, as are the actual and planned production figures. This is shown in the production summary for the reporting period presented in **Table 4**.

Table 4. Production summary (extraction)

Material	Approved limit	Previous reporting period (actual)	This reporting period (actual)	Next reporting period (forecast)
Waste rock / overburden (bcm)	0	0	0	0
ROM coal / ore (t)	0	0	0	0
Coarse reject (t)	0	0	0	0
Fine reject (tailings) (t)	0	0	0	0
Saleable product (t)	0	0	0	0

5.2 Other Operations

No exploration activities were undertaken during the reporting period. A drilling program consisting of coal quality and geotechnical boreholes, test pits and associated works is proposed to be undertaken on EL5460 during the next reporting period.

Although mining operations have ceased at the Maxwell Infrastructure site, rehabilitation of the completed mining areas along with ancillary activities, including upkeep of roads and maintenance of equipment, is progressing.

During the reporting period, site activities occurred during daylight hours, typically on a five days per week basis and occasionally up to seven days. There were no coal processing or coal transport activities during the reporting period. However, the Maxwell Infrastructure rail loop was used on occasion for the temporary stowage of empty rolling stock by Aurizon Operations Ltd. Fixed site infrastructure continued to be preserved under a care and maintenance program.

A contractor was employed to assist with the rehabilitation activities. Typical equipment on site during the reporting period consisted of two excavators (EX2500 and EX1200), five 785B trucks, two 777 trucks, five dozers ranging from D6 to D11, one water cart, one grader and two agricultural tractors. The excavators and trucks ceased operations in October 2019. Other smaller ancillary equipment was brought in on an “as-needed” basis.

During the reporting period, works focused on final landform development and rehabilitation. These activities are discussed in more detail in **Section 9**.

5.3 Next Reporting Period

It is anticipated that during the next reporting period operations will focus on management of the completed rehabilitation areas.

6 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

DPIE - Planning and Assessment provided a letter in April 2019 stating that they had reviewed the 2018 AEMR and considered the report to generally satisfy the requirements of PA 06_0202, DA 106-04-00 and the Department’s Annual Review Guideline (October 2015). One action was requested as an outcome of the review and is listed in **Table 5**.

DPIE - Resources Regulator conducted a site inspection in August 2019 to verify the 2018 AEMR, assess rehabilitation progress and to inspect existing voids and areas associated with the proposed Maxwell Solar Farm. The inspection identified some risks to the successful rehabilitation of the site. Actions as a result of the inspection are listed in **Table 5**.

Improvement measures and 2018 Independent Environmental Audit (IEA) actions reported in the 2018 Annual Review planned for completion during the reporting period are also listed in **Table 5**.

Table 5. Actions required from previous Annual Review

Action required	Requested by	Action taken
Please update Figure 2 to include the development consent boundaries and offset areas.	DPIE – Planning and Assessment	Figure 2 in the 2019 AEMR has been updated to include development consent boundaries and offset areas.
Undertake an assessment of the risks to the rehabilitation of the Site. The Rehabilitation Risk Assessment must identify and evaluate all potential risks to achieving the final land use and the specific measures to be implemented to mitigate those risks and have regard to the AS NZS ISO 31000:2009 Risk Management – Principles and Guidelines to support any rehabilitation risk assessment.	DPIE - Resources Regulator	A Rehabilitation Risk Assessment was undertaken on 28 January 2020, prior to the due date.
Prepare a Draft Maxwell Infrastructure Rehabilitation Risk Assessment Report which encompasses the Rehabilitation Risk Assessment undertaken in Direction 1 and submit it to nswresourcesregulator@service-now.com.	DPIE - Resources Regulator	A draft Rehabilitation Risk Assessment Report was prepared and submitted to DPIE - Resources Regulator on 4 March 2020.

Action required	Requested by	Action taken
Prepare a Final Maxwell Infrastructure Rehabilitation Risk Assessment Report which encompasses the Draft Maxwell Infrastructure Rehabilitation Risk Assessment Report (as described in Direction 2) and its associated feedback from the Regulator. Submit the report to nswresourcesregulator@service-now.com.	DPIE - Resources Regulator	A final Rehabilitation Risk Assessment Report will be developed and submitted to DPIE - Resources Regulator following feedback on the draft. Action due 3 April 2020.
Revise the Rehabilitation Cost Estimate (RCE) for the Authorisations in accordance with ESG1: Rehabilitation Cost Estimate Guidelines (June 2017). To comply with this Direction, you must utilise the Regulator's Rehabilitation Cost Estimate Tool (May 2019).	DPIE - Resources Regulator	Action due 1 May 2020.
Submit the RCE electronically using a Form ESF2: Rehabilitation Completion and/or Review of Rehabilitation Cost Estimate to nswresourcesregulator@service-now.com.	DPIE - Resources Regulator	Action due 1 May 2020.
Update the Blast Management Plan	Maxwell	DPIE approval of a revised Blast Management Plan was received 18 January 2019. See section 7.3 for further details.
Update the Aboriginal Cultural Heritage Management Plan	Maxwell	The Aboriginal Cultural Heritage Management Plan is currently under review. See Section 7.5 for more details.
Document visual impact inspection process	Maxwell	A documented annual visual inspection process has been implemented. See Section 7.8 for further details.
Update the Spontaneous Combustion Management Plan	Maxwell	A revised Spontaneous Combustion Management Plan was submitted for DPIE approval on 20 September 2019. A final version, addressing DPIE comments, was submitted for DPIE approval on 4 December 2019. See section 7.11 for further details.
Implement a weed control program targeted at Galenia, Prickly Pear and Golden Wreath Wattle.	Maxwell	The 2019 weed control program primarily targeted Prickly Pear, Galenia, Golden Wreath Wattle and Coolatai Grass. See Section 9.2 for further details.
Relocate logs for habitat in the Southern Offset Area	Maxwell	Scheduled for the next reporting period.

Action required	Requested by	Action taken
Install nest boxes in the Southern Offset Area	Maxwell	Nest boxes have been purchased and are scheduled to be installed during the next reporting period.
Update the Water Management Plan	Maxwell	A revised Water Management Plan was submitted for DPIE approval on 24 September 2019. A final version, addressing DPIE comments, was submitted for DPIE approval on 8 January 2020. See Section 8 for further details.
Undertake tree planting program on 30 hectares of rehabilitation	Maxwell	Completed
Place woody debris in woodland rehabilitation areas	Maxwell	Completed
Install rock structures to assist in appropriate water management on rehabilitation	Maxwell	Five rock structures were installed in 2019.
Commence remedial works to address areas of poor performing rehabilitation	Maxwell	Approximately 21 hectares of remedial works were completed in 2019.
The Rehabilitation and Offset Management Plan is from 2013 and should be updated. If the current draft MOP amendment that is with DPIE - Planning and Assessment and DPIE - Resource Regulator is approved, the Rehabilitation and Offset Management Plan should be updated for consistency (Recommendation (REC) 5).	Independent Environmental Audit (IEA)	The Rehabilitation and Offset Management Plan is currently under review. This is being undertaken concurrently with the development of a new Mining Operations Plan (MOP). See Section 9 for more details.
Ensure for the next update of the Aboriginal Cultural Heritage Plan, that OEH are included in the consultation (REC 6).	IEA	The Aboriginal Cultural Heritage Management Plan is currently under review. Consultation will be undertaken as a part of this review. See Section 7.5 for more details.
Ensure future copies of the Environmental Management Strategy are prepared in consultation with the Community Consultative Committee (CCC) (REC 11).	IEA	DPIE approval of a revised Environmental Management Strategy, prepared in consultation with the CCC, was received 16 April 2019.
Liaison with DPIE - Resource Regulator and DPIE - Planning and Assessment regarding an agreement on the final landform for the site. Based on the information provided to SLR, the site will continue to complete rehabilitation as per the landform in the approved 2015 MOP unless directed otherwise from DPIE - Resource Regulator or DPIE - Planning and Assessment (REC 16a)	IEA	Ongoing

Action required	Requested by	Action taken
The eastern face of the North tip is an area of rehabilitation that has failed. It is noted the area that has failed is one of the steeper rehabilitated slopes. Implement actions to attempt to rectify this problem including additional work on the landform, use of ameliorants, and a review of seed mix (REC 16e)	IEA	Remedial work on contours commenced mid-2019. Remaining work will be completed in the next reporting period.
Remove any unwanted waste from site. This includes the scrap metal which has been sorted in areas. SLR understands there is a plan in place for this. (REC 19b)	IEA	An initiative that commenced in 2018, continued throughout 2019 to remove unused resources. See Section 7.10 for details.

7 ENVIRONMENTAL PERFORMANCE

Maxwell Infrastructure's Environmental Monitoring Program provides an overview of the site's environmental monitoring. Environmental monitoring is a significant indicator of the site's environmental performance. On 5 June 2019 a revised Environmental Monitoring Program was approved by the Secretary of DPIE. This revision ensured that the Environmental Monitoring Program was consistent with current environmental management plans and statutory requirements.

The locations of all environmental monitoring sites are shown in **Appendix 2**.

7.1 Meteorological Monitoring

Management

Meteorological conditions such as wind speed, wind direction, temperature, rainfall, solar radiation and humidity are monitored at the Maxwell Infrastructure meteorological station (see **Appendix 2**).

Performance

During the reporting period, temperature trends were similar to previous years with a peak in summer and trough in winter. This is shown in **Figure 3**. However, average temperatures were slightly higher than previous years, particularly in the warmer months. This peaked in January when the average temperature recorded was 4.4 degrees Celsius (°C) higher than the average temperature recorded in January for the previous five years.

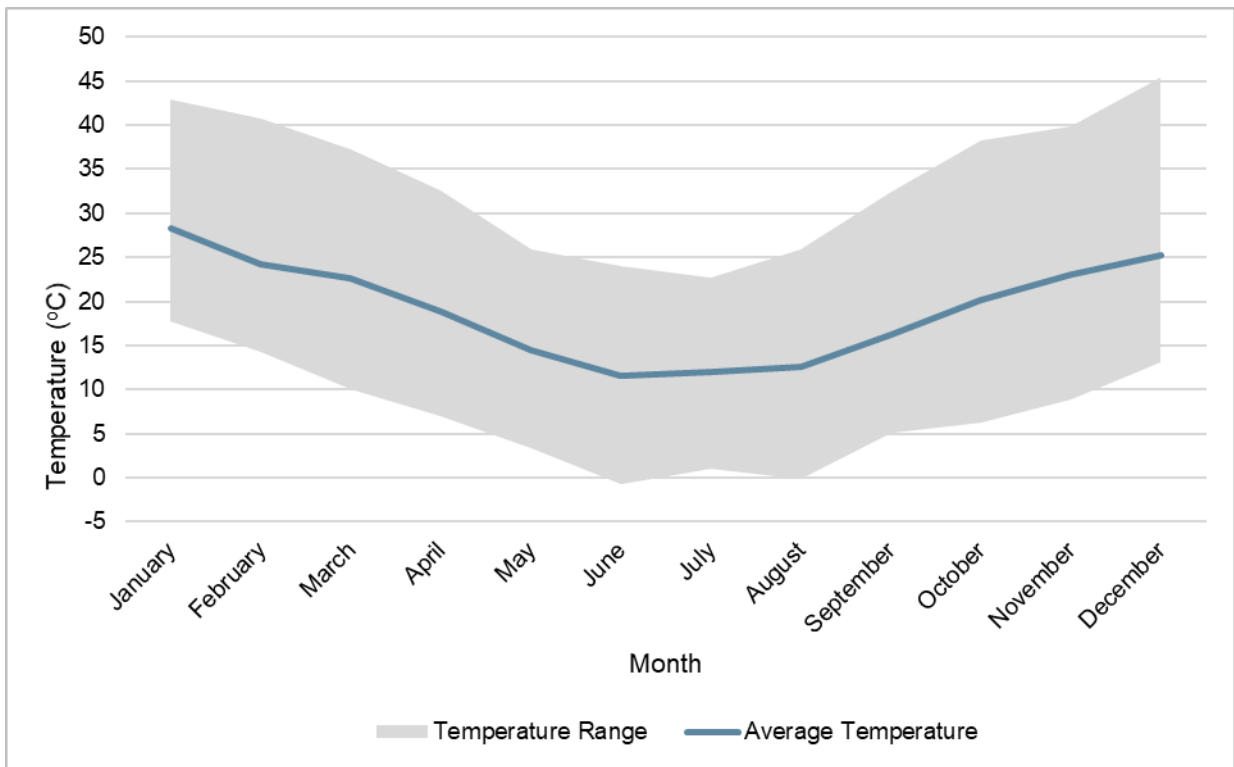


Figure 3. Temperature by month for the reporting period

A summary of wind monitoring over the reporting period is presented in **Figure 4**. Consistent with previous years, and consistent with the geography of the Hunter Valley, the predominant winds were from the south-east and north-west to west-north-west. As in previous years, winds from the south-east generally dominated during the warmer months and winds from the north-west generally dominated during the cooler months. Wind speed throughout the reporting period was predominantly in the range of 0.5 to 4 metres per second (m/s).

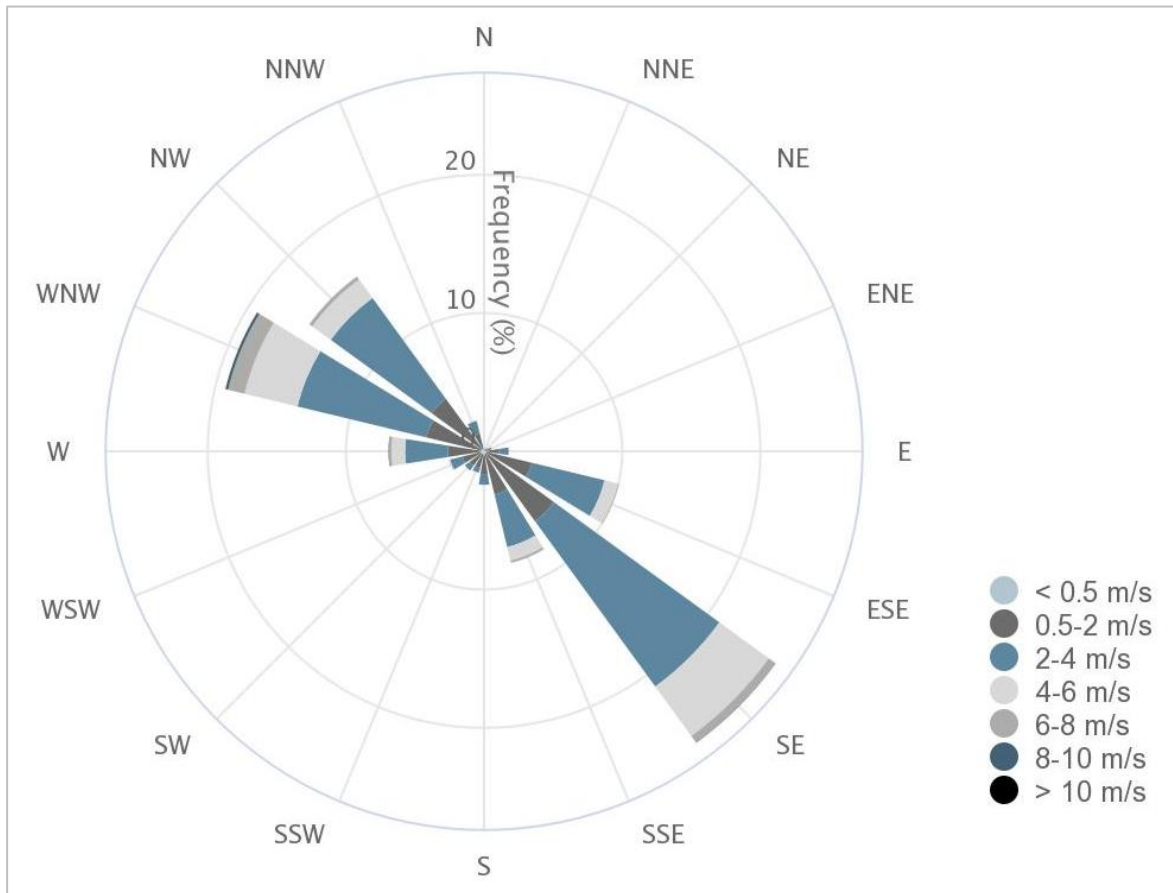


Figure 4. Wind speed and direction for the reporting period

Rainfall recorded during the reporting period was below average. This can be seen in **Figure 5**, which shows monthly rainfall during the reporting period compared to the average monthly rainfall for the previous 10 years. The decrease in rainfall was consistent with the [NSW State Seasonal Update for December 2019](#), published by the NSW Department of Primary Industries Climate Unit, which noted that the Combined Drought Indicator for 12 months to 31 December 2019 in the local area was at an Intense Drought level. Consistent with previous years, rainfall peaked in March, however, the higher seasonal rainfall typically seen in the warmer months did not occur in the reporting period.

No changes to meteorological monitoring are planned for the next reporting period.

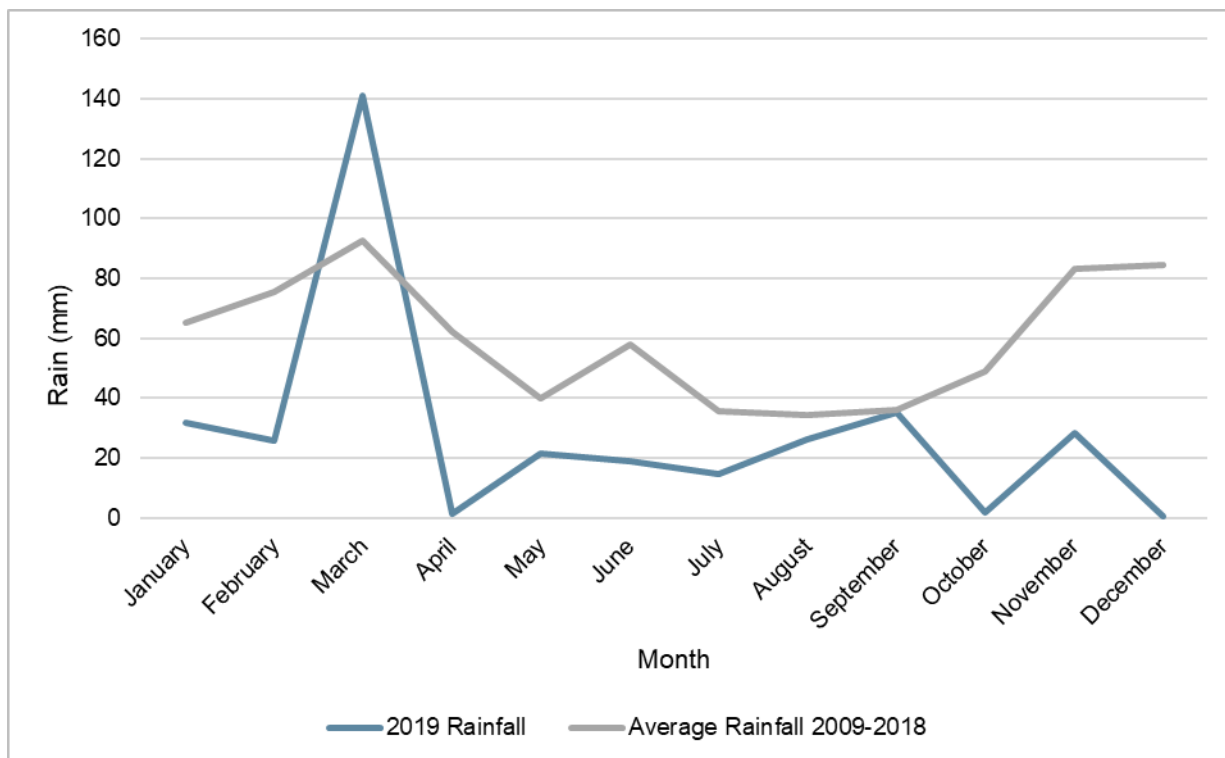


Figure 5. Rain by month for the reporting period with historic comparison

7.2 Noise

Management

Potential noise impacts from Maxwell Infrastructure are managed in accordance with the Noise Management Plan. The purpose of the Noise Management Plan is to ensure that statutory requirements are met and to outline the controls to be implemented for the management of noise aspects associated with the Maxwell Infrastructure site and the Antiene rail spur.

Operations at the Maxwell Infrastructure site were restricted to daylight hours during the reporting period and were undertaken on weekdays and occasional weekends. This schedule limited potential noise impacts to the less sensitive times for potential receptors.

Performance

Attended noise monitoring and modelling was conducted during the reporting period to assess noise impacts and determine compliance to approval criteria. Noise monitoring and modelling locations and are shown in **Appendix 2**. Noise impacts were assessed for the following periods:

- Day:
 - 7 am to 6 pm Monday to Saturday
 - 8 am to 6 pm Sundays and public holidays
- Evening:
 - 6 pm to 10 pm
- Night:
 - 10 pm to 7 am Monday to Saturday
 - 10 pm to 8 am Sundays and public holidays

Attended noise monitoring was conducted on a 6-monthly basis during the reporting period in accordance with the Noise Management Plan. Attended noise monitoring results were used to model noise impacts and assess compliance to approval criteria at relevant locations. Results for the reporting period are summarised in **Table 16** and **Table 17** in **Appendix 3**.

Approval criteria was not exceeded for any noise monitoring parameter at any location in the reporting period. Noise generated by the Maxwell Infrastructure site alone was consistently inaudible and too low to be measured. This is below the EA predictions but was expected. Similarly, cumulative noise impacts were too low to measure and, therefore, below approval criteria. Maximum noise levels from the Maxwell Infrastructure site are compared to maximum noise levels recorded over the previous five years in **Figure 19** in **Appendix 3**. Results show that there has been a reduction in noise levels since mining operations ceased in late 2016.

The noise model used for the noise assessment in the EA was validated for the reporting period by an acoustic consultant, as best as possible given the non-operational status of the mine, by comparing actual attended noise monitoring data in the reporting period with the predictions made in the noise model.

Proposed Improvements

Given Maxwell Infrastructure's performance in relation to noise impacts, no further measures to reduce the noise generated by the project have been identified.

No changes to noise management are planned for the next reporting period.

7.3 Blasting

Management

Potential blast impacts from the Maxwell Infrastructure site are managed in accordance with the Blast Management Plan. On 18 January 2019 a revised Blast Management Plan was approved by DPIE. The revised Blast Management Plan was designed to reflect the change from active mining to the current rehabilitation phase of operations and the subsequent significant reduction in blasting activities. Blasting may still be required from time to time to assist with landform shaping.

Performance

No blasting was undertaken during the reporting period.

Proposed Improvements

No changes to blast management are planned for the next reporting period.

7.4 Air Quality

Management

Potential air quality impacts from the Maxwell Infrastructure site are managed in accordance with the Air Quality and Greenhouse Gas Management Plan. Areas of disturbance were revegetated during the reporting period to reduce the risk of wind-blown dust. Obsolete roads have been rehabilitated and haul road watering of remaining roads and hard stand areas has continued as required in order to maintain wheel generated dust to acceptable levels.

In accordance with the Air Quality and Greenhouse Gas Management Plan, a combination of depositional dust gauges and a tapered element oscillating microbalance (TEOM) monitor were used at Maxwell Infrastructure during the reporting period to:

- monitor air quality surrounding Maxwell Infrastructure;
- assist air quality management; and
- assess compliance to air quality impact limits specified by approval conditions.

These monitoring locations are shown in **Appendix 2**.

On-site E-Samplers also provide an indication of air quality conditions and assist with the management of potential PM₁₀ (particulate matter 10 micrometres or less in diameter) emissions from operations.

Performance

A summary of air quality monitoring results during the reporting period are presented below including an assessment of compliance to approval criteria, a comparison to predictions made in the EA and consideration of long-term trends.

During the reporting period, one complaint was received regarding air quality. Details of this complaint are provided in **Section 10.1**.

Total Suspended Particulates (TSP)

In accordance with the Air Quality and Greenhouse Gas Management Plan, TSP levels were calculated during the reporting period based on PM₁₀ results recorded at the TEOM monitor. This was a change from previous years, when TSP was calculated from results recorded at a, now decommissioned, high volume air sampler.

As shown in **Table 6**, the annual TSP level was lower than the impact assessment criterion and the EA prediction for year 10 of operations.

Table 6. Monitoring summary – TSP (µg/m³)

Monitor	Averaging period	Approval criterion	EA year 10 prediction	Current reporting period result (2019)
TEOM	Annual*	90	68.3	63.7

The long-term trend for the annual TSP level, over a 10-year period, is shown in **Figure 6** and shows an upward trend, particularly since 2015. This trend is likely to be associated with regional air quality, consistent with drought conditions, and not attributable to impacts from the Maxwell Infrastructure site, where activities have decreased significantly since mining ceased in October 2016. TSP is not recorded across the region by the Upper Hunter Air Quality Monitoring Network (UHAQMN), however PM₁₀ levels monitored by the UHAQMN, which can generally be correlated with TSP levels, have shown a similar upward trend across the region since 2015.

The exception to this is the annual TSP result recorded by Maxwell Infrastructure in 2018, which was particularly high. An investigation into the 2018 result found the elevated levels were being influenced by a leasee feeding cattle in an exposed area immediately adjacent to and were not attributable to impacts from the Maxwell Infrastructure site nor indicative of regional conditions. The monitor used to calculate TSP is no longer located near this source.

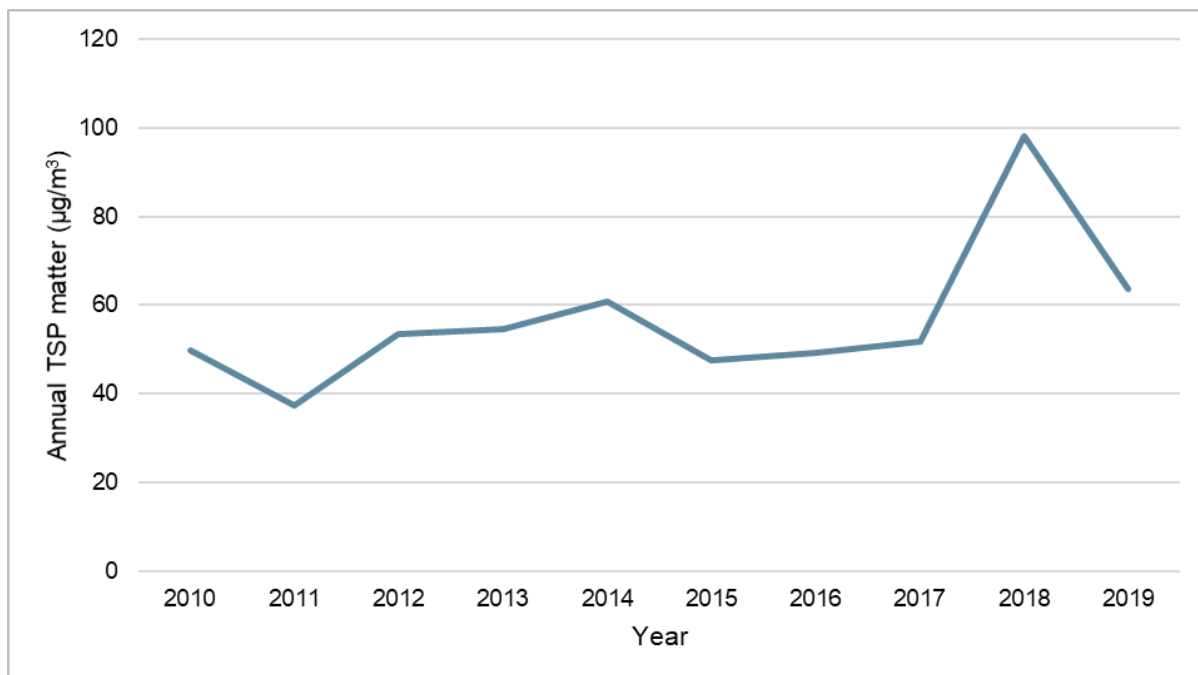


Figure 6. Long-term results for TSP

Note: Following investigations, it was determined that the elevated 2018 result was not attributable to impacts from the Maxwell Infrastructure site.

PM₁₀

As shown in **Table 7**, the annual PM₁₀ level remained below the annual impact assessment criterion but above the EA prediction for year 10 of operations.

The long-term trend in annual PM₁₀ levels, shown in **Figure 7**, illustrates an upward trend since 2015. This trend is likely to be associated with regional air quality, consistent with drought conditions, and not attributable to impacts from the Maxwell Infrastructure site, where activities have decreased significantly since mining ceased in October 2016. PM₁₀ levels monitored by the UHAQMN have shown a similar upward trend across the region since 2015.

PM₁₀ results recorded in the reporting period at both the Maxwell Infrastructure TEOM and by the UHAQMN were unusually high from late October 2019 until the end of the reporting period when regional air quality was broadly recognised to be impacted by bushfires. These elevated PM₁₀ levels resulted in an annual average higher than EA predictions for year 10 of operations.

Table 7. Monitoring summary – PM₁₀ matter (µg/m³)

Monitor	Averaging period	Approval criterion	EA year 10 prediction	Current reporting period result (2019)
TEOM	Annual	30	21.4	25.5

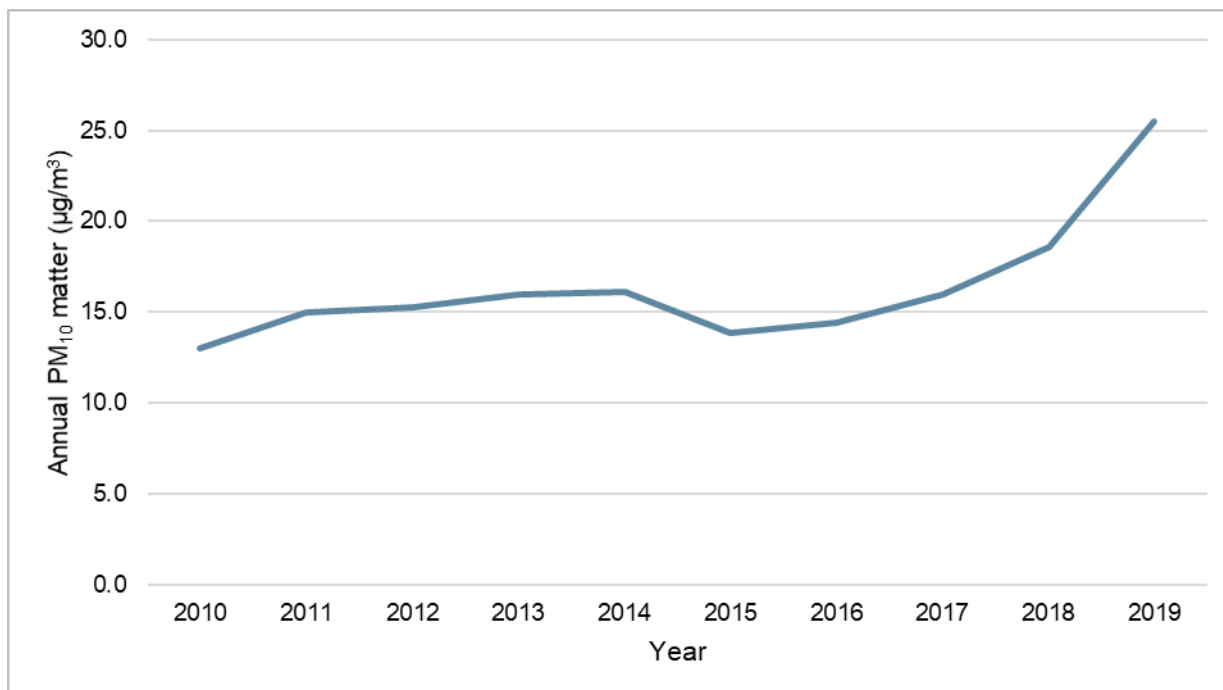


Figure 7. Long-term results for PM₁₀

All 24-hour PM₁₀ levels for the reporting period are presented in **Appendix 4**. The 24-hour criterion of 50 µg/m³ was exceeded on 43 days during the reporting period. Investigations into each of these exceedances determined that these results occurred on days when the monitor was not generally downwind of the operation. Rather, the exceedances were on days where there was a regional dust event or impacts from bushfires and not attributable to operations at the Maxwell Infrastructure site. Whilst exceedances were not attributable to the Maxwell Infrastructure site, the results have still been included in the long-term annual PM₁₀ data. Details of these exceedances are provided in **Section 11.2**.

Deposited Dust

Deposited dust results were less than impact assessment criteria for both the maximum increase in dust level and maximum total deposited dust. This can be seen in the summary of results presented in **Table 8** and **Table 9**.

However, **Table 9** shows that annual average deposited dust results were higher in the reporting period than EA predictions for year 10 of operations. Operational activity during the reporting period was significantly less than that modelled in the EA, which suggests that background levels of deposited dust are higher than was expected in the EA model.

Table 8. Monitoring summary - increase in deposited dust (g/m²/month)

Monitor	Averaging period	Approval criterion	Previous reporting period result (2018)	Current reporting period result (2019)
2230	Annual	2	0.0	0.0
2247			0.1	0.1
2235			0.1	0.1
2175			0.1	0.1

Table 9. Monitoring summary - total deposited dust (g/m²/month)

Monitor	Averaging period	Approval criterion	EA year 10 prediction	Current reporting period result (2019)
2230	Annual	4	1.5	2.9
2247			1.4	2.8
2235			1.3	3.2
2175			1.3	2.8

The long-term trend in annual average deposited dust levels are shown in **Figure 8**. Like other air quality parameters, deposited dust results have shown an upward trend since 2015. This trend is likely to be associated with regional air quality, consistent with drought conditions, and not attributable to impacts from the Maxwell Infrastructure site, as activities have decreased significantly since mining ceased in October 2016.

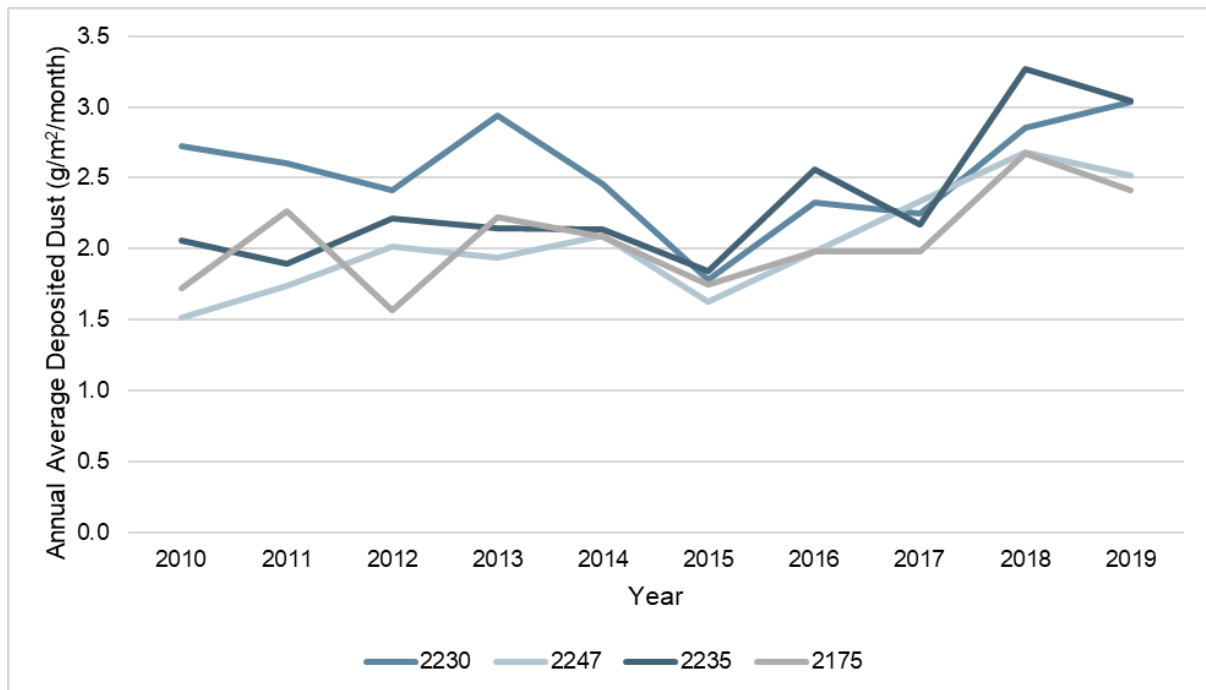


Figure 8. Long-term results for deposited dust

Proposed Improvements

No changes to air quality management are planned for the next reporting period.

7.5 Aboriginal Cultural Heritage

Management

Aboriginal cultural heritage at the Maxwell Infrastructure site is managed in accordance with the Aboriginal Cultural Heritage Management Plan. As described in the management plan, 47 sites were salvaged at Maxwell Infrastructure prior to the reporting period. All salvaged artefacts remain stored on the premises in a secure location. Thirteen known sites remain conserved in-situ.

Performance

A field survey was undertaken in the reporting period at Maxwell Infrastructure with Registered Aboriginal Parties over a 145 hectare (ha) parcel of land consisting mostly of mine rehabilitation as part of the Aboriginal Cultural Heritage Assessment for the proposed Maxwell Solar Farm. No Aboriginal cultural heritage sites or objects were identified at the Maxwell Infrastructure site during the survey.

There was no disturbance of any existing or new Aboriginal cultural heritage sites or objects during the reporting period.

Proposed Improvements

A revision of the Aboriginal Cultural Heritage Management Plan is planned for the next reporting period.

7.6 Non-Aboriginal Heritage

Management

No statutory-listed non-Aboriginal heritage sites have been identified within the Maxwell Infrastructure project area. However, one site, outside of the previously mined area, was noted in the EA as having high local significance and is fenced to protect it from disturbance.

Performance

The locally significant heritage site was not impacted during the reporting period and remains fenced to protect it from disturbance.

Proposed Improvements

No improvements to the management of non-Aboriginal heritage are proposed for the next reporting period.

7.7 Transport

Management

Coal transportation activities from Maxwell Infrastructure were not permissible during the reporting period under Project Approval PA 06_0202. The rail loop remains under care and maintenance and relevant conditions of the approval remain in place. This includes:

- reporting requirements;
- communications with Mt Arthur Coal on the rail loop and Antiene rail spur; and
- the continuation of the Joint Community Consultative Committee (CCC) with Mt Arthur Coal.

Performance

No coal transportation activities were undertaken from Maxwell Infrastructure during the reporting period however the Maxwell Infrastructure rail loop was used for the temporary stowage of empty rolling stock by Aurizon Operations Ltd.

The number of train movements and the date and time of each train movement is provided in **Appendix 5**.

Proposed Improvements

Routine maintenance work on sections of the Antiene Rail Spur, including track reconditioning and rerailling will be undertaken during the next reporting period.

No coal transportation activities are planned for the next reporting period.

7.8 Visual Impact

Management

A formalised annual visual inspection process was implemented during the reporting period. The inspection requires photographs to be taken towards the site from four designated vantage points and compared to EA predictions.

As predicted in the EA, the Maxwell Infrastructure site has minimal visual impact. Woodland remnants have been retained around and throughout the site and mature trees actively screen infrastructure and buildings.

In addition, operations at the Maxwell Infrastructure site have occurred during daylight hours only, negating the need for mobile lighting equipment.

Performance

A comparison of photomontages of predicted views in year 10 of operations with the current views from the same or a similar vantage points indicates that visual impacts are low and are consistent with EA predictions. These comparisons are provided in **Appendix 6**.

Two small gaps in the tree screen along the northern boundary on Thomas Mitchell Drive were noted during the reporting period. It was confirmed that trees have been planted in these two areas and, with further growth, would provide a more adequate screen in the future.

Proposed Improvements

No improvements to the management of visual impacts are proposed for the next reporting period.

7.9 Greenhouse Gas and Energy Efficiency

Management

Maxwell Infrastructure manages greenhouse gas (GHG) and energy efficiency in accordance with the Air Quality and Greenhouse Gas management Plan. GHG emissions attributable to Maxwell Infrastructure operations, including emissions from fuel and energy consumption, are regularly quantified. This information is then used to manage GHG emissions and energy consumption to the minimum practicable level.

Performance

Annual estimations of GHG emissions and energy use at the Maxwell Infrastructure site are calculated over financial years (FY), in line with National GHG and Energy Reporting (NGER) obligations.

GHG emissions and energy consumption were below NGER thresholds for the FY19 period. Approximately 71,186 gigajoules (GJ) of energy was consumed during FY19 and approximately 5,944 tonnes of carbon dioxide equivalent (tCO₂-e) were emitted from site activities. Of this, 4,576 tCO₂-e were scope 1 emissions and 1,368 tCO₂-e were scope 2 emissions.

GHG emissions in FY19 were significantly lower than the 82,533 tCO₂-e predicted for year 10 of operations in the EA as this prediction was based on fuel and energy demands of an active mine and included fugitive emissions from coal mining.

As shown in **Figure 9**, GHG emissions and energy use decreased substantially following the cessation of mining during FY17. In FY19, GHG emissions and energy consumption remained low, but there was an increase in scope 1 emissions and energy use from the previous reporting period. This was due to an increase in the movement of material to achieve final landforms, which required greater diesel use. Diesel use is expected to decrease during the next reporting period as less movement of material is required, resulting in a reduction of GHG emissions and energy use.

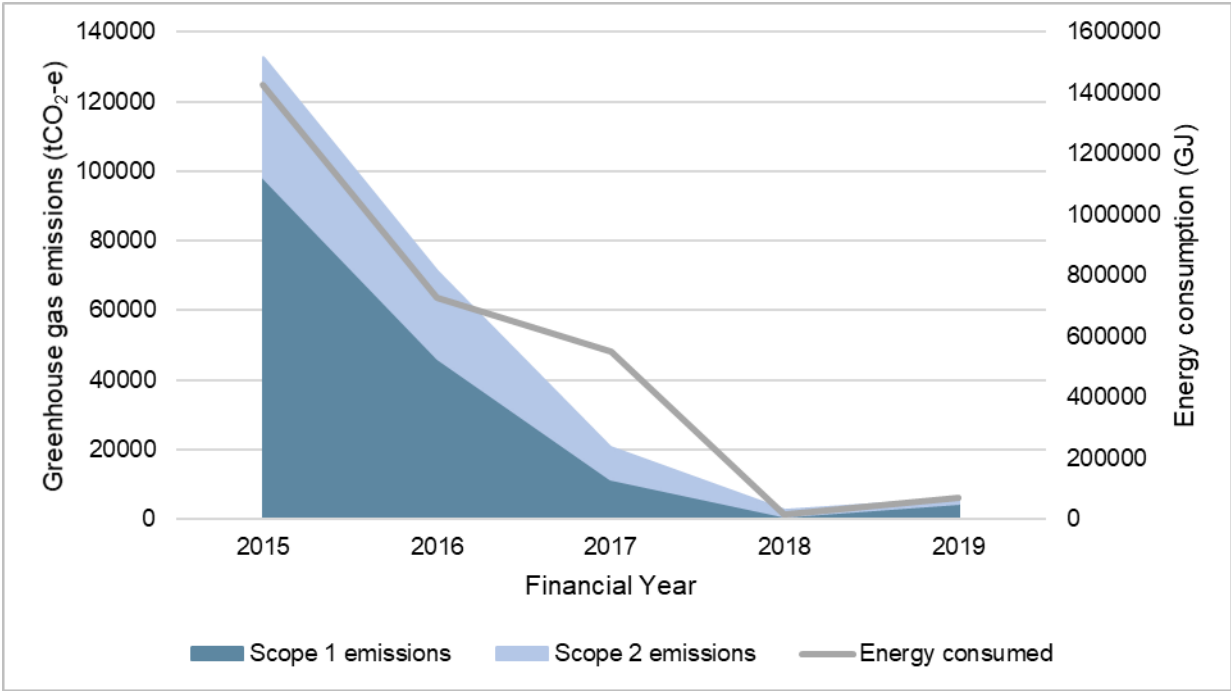


Figure 9. Long-term greenhouse gas emissions and energy consumption

Proposed Improvements

No changes to greenhouse gas and energy management are planned for the next reporting period.

7.10 Waste

Management

Waste is managed at the Maxwell Infrastructure site in accordance with the Waste Management Plan. Where appropriate, spent resources are reused or recycled in preference to being disposed of as waste.

A site initiative, that commenced in late 2018, continued throughout 2019 to remove unused resources, particularly around infrastructure areas and recycle materials where possible.

Performance

Waste and recycling streams are monitored monthly at the Maxwell Infrastructure site. Quantities of the major waste and recycling streams over the past 10 years are shown in **Figure 10**. This comparison shows that waste significantly reduced with the cessation of mining in late 2016. This is commensurate with the reduction in resource use associated with the reduced operational activity at the site. During this reporting period, there was an increase in waste disposed compared to the previous reporting period. This was due to a focus on removing unused resources on site.

No predictions were made in the EA in relation to waste quantities.

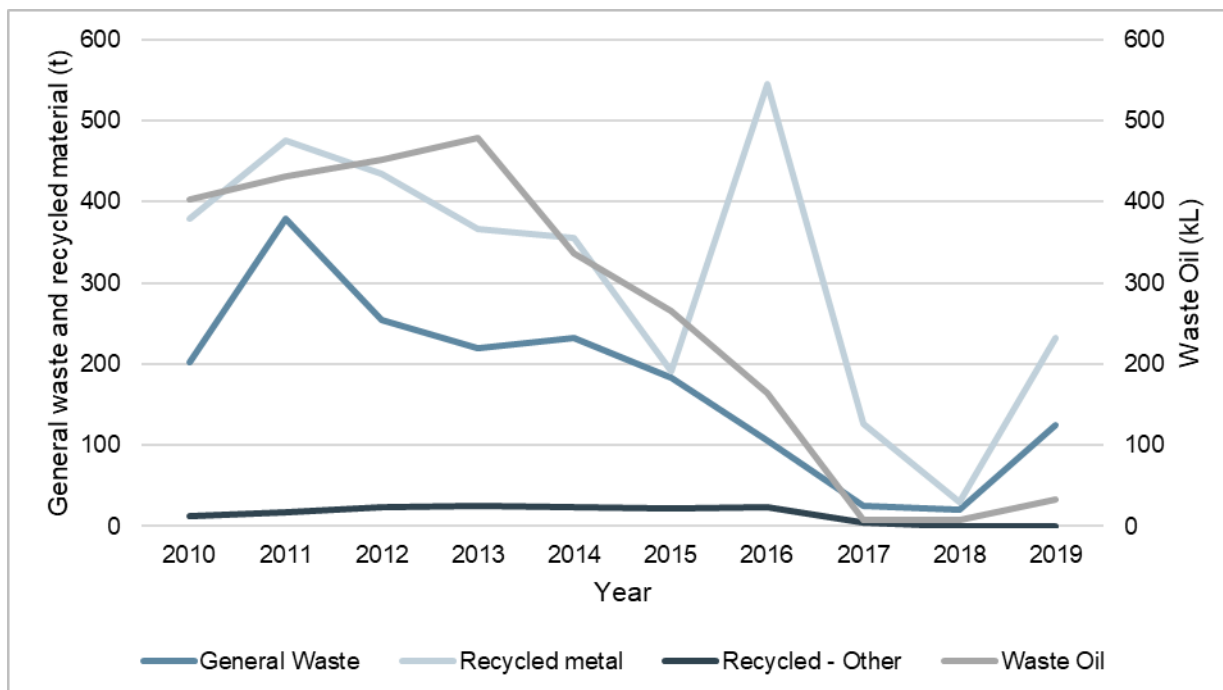


Figure 10. Long-term waste stream quantities

Maxwell Infrastructure has a sewage treatment plant (STP) for effluent generated on-site. From the STP, treated effluent is pumped to settlement ponds. Previously, overflow from the ponds was applied to land. However, due to the low number of people on site and reduced volume of effluent, the treated effluent now evaporates from the first pond.

Maxwell Infrastructure also maintains a bioremediation area for the remediation of material contaminated by hydrocarbons. A small amount of material, from the clean-out of sumps in the industrial area, was placed in the bioremediation area in the reporting period. No material was removed from the bioremediation area during the reporting period.

A small amount of Mixed Waste Organic Outputs (MWO) is stockpiled at the Maxwell Infrastructure site. MWO was previously used on during rehabilitation activities. In October 2018, the NSW Environment Protection Authority (EPA) revoked all general and specific resource recovery orders and exemptions for the application of MWO to land. The Maxwell Infrastructure site is currently awaiting further advice from the EPA regarding appropriate disposal mechanisms.

Proposed Improvements

No changes to waste management are planned for the next reporting period.

7.11 Spontaneous Combustion

Management

Spontaneous combustion at the Maxwell Infrastructure site is managed in accordance with the Spontaneous Combustion Management Plan. The management of spontaneous combustion is focused on the monitoring of previously capped areas along with the capping of any new outbreaks.

Along with regular inspections conducted as part of the general site activities, formal monthly spontaneous combustion inspections are conducted. A thermal imaging camera is utilised to assist the identification of areas where ground surface temperatures are above background levels. The surface area exhibiting smoke or steam emissions is estimated for each detected outbreak.

In addition, an annual aerial survey using a fixed wing aircraft fitted with infrared detection is used to identify the presence of hot spots on a site-wide basis. This survey was conducted in July 2019.

Spontaneous combustion monitoring supports the planning of activities to prevent and remediate spontaneous combustion outbreaks. These management activities include reprofiling, track rolling and the application of inert capping.

A revised Spontaneous Combustion Management Plan, that addressed comments received from its initial submission for approval in September 2019, was submitted for review and approval by the Secretary of DPIE in December 2019. This final revision included amendments to reflect ownership and operational changes since the last review, removal of requirements duplicated in other management plans, a separation from the Spontaneous Combustion Principal Hazard Management Plan and other improvements to the management of spontaneous combustion.

Performance

Spontaneous combustion locations are categorised in accordance with the following intensity criteria:

- Minor - visible steam or smoke exists, however, the area affected is 200 m² or less.
- Moderate - exhibiting continuous visible smoke or steam and / or has an area of greater than 200 m².
- Major - exhibiting naked flames, regardless of the area affected.

As shown in **Figure 11**, all spontaneous combustion outbreaks identified during the reporting period were inactive or of a minor intensity. A major outbreak of approximately 9,000 square metres (m²) in size, unrelated to site activities, occurred during the reporting period in Area 192. Through the application of inert capping, this outbreak was reduced to a minor intensity outbreak impacting approximately 100 m² at the end of the reporting period.

Remedial works were also undertaken at areas 191, 1A, 288, 295, 302 and 305 during the reporting period. Works involved pushing out carbonaceous material and capping with inert material. These areas were all inactive at the end of the reporting period. In addition, as a preventative measure, during rehabilitation activities, approximately 61 ha of land was capped with inert material prior to the application of soil ameliorants and seeding.

As shown in **Table 10**, approximately 320 m² was estimated to be affected by spontaneous combustion outbreaks across the site at the end of the reporting period. This is less than previous years and reflects the extensive preventative and remedial works undertaken. The annual aerial infrared survey in July 2019 also showed a substantial decrease of 5,894m² in heated areas overall across the site compared to the same survey in September 2018.



Figure 11. Locations affected by spontaneous combustion

Table 10. Long-term area affected by spontaneous combustion

Year	Area Affected (m ²)
2010	1,170
2011	1,070
2012	1,160
2013	1,180
2014	810
2015	870
2016	810
2017	1,150
2018	1,170
2019	320

Proposed Improvements

The area affected by spontaneous combustion is expected to continue to decrease during the next reporting period.

The revised Spontaneous Combustion Management Plan, submitted for approval by the Secretary of DPIE in December 2019 will be implemented in the next reporting period, following its approval.

7.12 Biodiversity

Management

Biodiversity at the Maxwell Infrastructure site and its offset areas is managed in accordance with the Flora and Fauna Management Plan and the Rehabilitation and Offset Management Plan.

Routine ecological monitoring is conducted across Maxwell Infrastructure's offset areas and rehabilitated lands. The ecological monitoring program was streamlined in 2018 as some sites were replicates located in discrete locations and non-target vegetation types. The streamlined monitoring program maintains the spatial distribution required to provide representative data. Monitoring is undertaken annually, with each site monitored every second year.

During the reporting period the following measures were implemented to improve biodiversity at the Maxwell Infrastructure site:

- Annual walkover inspection;
- Revised seed mix for pasture to increase diversity;
- Revised woodland seed mix to target locally occurring vegetation communities;
- Continuation of the grazing trial on mine rehabilitation; and
- Implementation of a targeted weed management program.

Performance

Ecological monitoring was undertaken during November and December 2019 at sites shown in **Appendix 2**. Monitoring consisted of:

- Biometric vegetation sampling;
- Recording of closure criteria features;
- Evidence of pest animals; and

- Rehabilitation walkover inspections.

There are no predictions in the EA to compare against performance during the reporting period. Instead, performance is compared to closure criteria and to performance since 2016, when these criteria were implemented. As the monitoring frequency of sites is 2-yearly, the most recent monitoring shown for comparison is from 2017. These results are detailed in **Table 19** to **Table 21** in **Appendix 7**.

As shown in **Table 19** the regeneration of species from all structural layers was recorded at all reference sites monitored in 2019 and species composition was generally similar to previous years.

The total cover of invasive weeds remained consistent in the Northern Offset and western side of the Wildlife Refuge, however the eastern side of the Wildlife Refuge had an increase in Creeping Pear. Invasive weeds remain moderate to high in the Southern Offset Area and North, East and South rehabilitation areas. An intensive weed control program was established in the offset areas and mine rehabilitation areas during the reporting period and work will continue in these areas in 2020.

Pasture rehabilitation sites monitored during the reporting period are shown in **Table 20**. The species listed in the MOP are being naturally supplemented by non-target perennial grass species. Ecological monitoring identified a good cover of perennial grass species in the North and South rehabilitation areas. The East rehabilitation area, which is a westerly facing slope, showed a poor cover of perennial grasses and was likely impacted by hot and dry conditions.

Woodland rehabilitation sites (which includes the Southern Offset area) that were monitored during the reporting period are shown in **Table 21**.

Monitoring results indicate that the ground cover was generally trending towards the reference sites, however, the shrub and canopy layers require further management to assist with establishment. All reference sites are located on natural ground and have not been impacted by mining operations.

The diversity of canopy and mid-storey species, particularly at the Southern Offset area, were moderately representative of the reference sites, however foliage cover was low. Low foliage cover provides open areas for invasive groundcover species to establish. To remediate this issue, further development of a canopy and mid-storey cover through infill planting, and appropriate weed control will occur during the next reporting period.

Proposed Improvements

Table 11 identifies the management measures planned to be implemented in offset areas during the next reporting period. Measures planned for rehabilitation areas are discussed in **Section 9.3**.

Table 11. Measures planned for offset areas in the next reporting period

Location	Management measure
Drayton Wildlife Refuge and Northern Offset Area	Weed control program targeted on Creeping Pear
Southern Offset Area	Weed control program targeted at Galenia and Prickly Pear
Southern Offset Area	Relocation of logs on site for habitat
Southern Offset Area	Installation of nest boxes
Southern Offset Area	Infill planting

A revised Flora and Fauna Management Plan was submitted for review and approval by the Secretary of DPIE in February 2020. This revision includes amendments to reflect ownership and operational changes since the last review and the removal of requirements duplicated in other management plans. The revised Flora and Fauna Management Plan is expected to be approved by the Secretary of DPIE and implemented in the next reporting period.

The Offset Strategy and Rehabilitation and Offset Management Plan will also be revised in the next reporting period.

8 WATER MANAGEMENT

8.1 Water Take

Maxwell Infrastructure does not actively draw water from any ground or surface water sources. Consequently, it does not hold any water licences for this purpose. Maxwell Infrastructure holds Water Access Licences, WAL 41559 and WAL 41491, for the passive intake of aquifer water associated with the mine excavation.

Although mining has ceased, the EA predicts that ground water will continue to flow into the mine voids until it stabilises. **Table 12** shows the calculated passive water take in accordance with the conditions of WAL 41559 and WAL 41491. This estimated passive inflow was calculated by consultants specialising in water management and modelling. The inflow of 547 MI estimated for the reporting period is less than the 985 MI per year (or 2.7 MI/day) that was predicted for year 10 of operations in the EA. It is also less than the total entitlement of 1,387 MI held under WAL 41559 and WAL 41491.

Table 12. Water take July 2018 - June 2019

Water Licence #	Water sharing plan, source and management zone	Entitlement	Passive take inflows	Active pumping	TOTAL
WAL 41559	North Coast Fractured and Porous Rock Groundwater Sources	985 MI	547 MI	0 MI	547 MI
WAL 41491	New England Fold Belt Coast Groundwater Source	402 MI			

8.2 Water Consumption

During the reporting period, Maxwell Infrastructure consumed approximately 20 MI of raw water from dams on site. This water was used in the industrial area primarily for vehicle and equipment wash-down and for dust suppression during mine rehabilitation. During the reporting period, 1.6 MI of potable water was also used. With the exception of the occasional use of potable water to assist seedlings planted to establish, potable water use is generally restricted to the administration areas for people to use for purposes such as toilets, washing and consumption. In addition, approximately 0.4 MI was delivered in the reporting period to tanks supplying cattle troughs.

As **Figure 12** shows, water consumption has reduced substantially over the long-term, particularly since mining ceased in 2016. The associated reduction in operational activity has decreased raw water demand and the reduction in the number of people on site has decreased demand for potable water.

Water stored on site in storages increased from approximately 12,024 MI to 12,826 MI in the reporting period, indicating that water consumption was well within the limits required to maintain the site’s closed raw water system, with no active intake or output of water. This is also demonstrated by the input-output statement of the water accounting framework in **Appendix 8**.

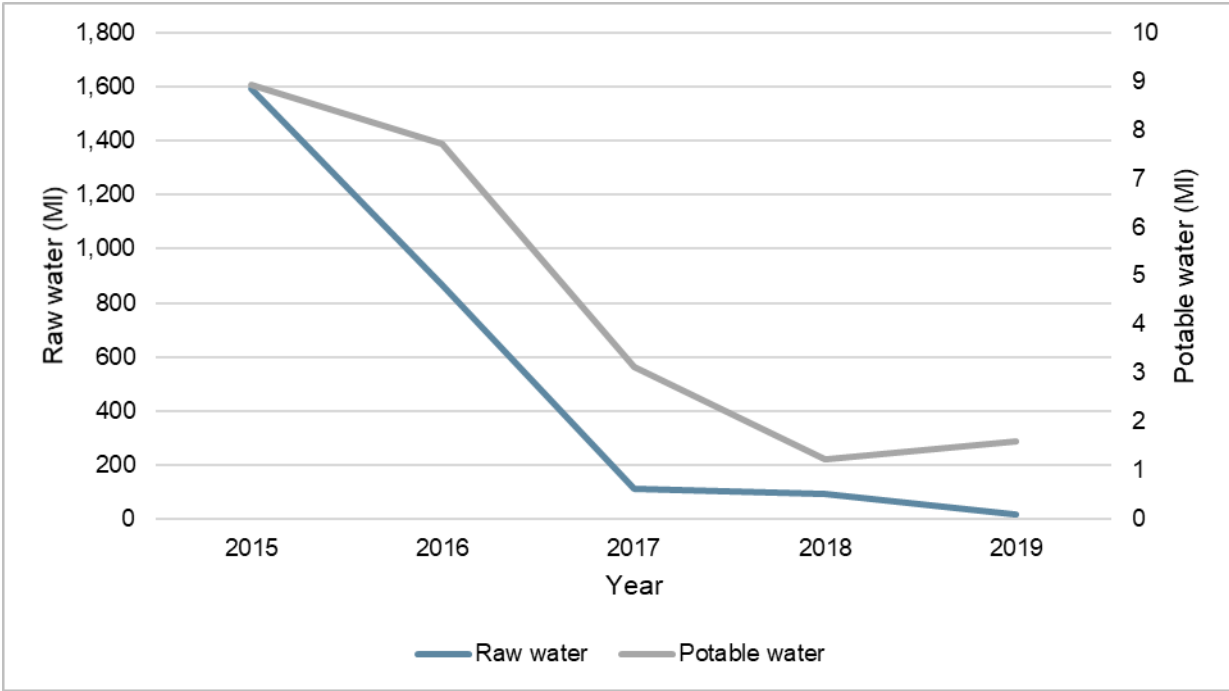


Figure 12. Long-term water consumption

8.3 Groundwater

Management

Groundwater impacts at the Maxwell Infrastructure site are managed in accordance with the Water Management Plan. As a part of this plan, groundwater levels and quality are regularly monitored. Monitoring locations are shown in **Appendix 2**. A revised Water Management Plan, that addressed comments received from its initial submission for approval in September 2019, was submitted for review and approval by the Secretary of DPIE on 8 January 2020 and approved on 18 February 2020.

Four new monitoring bores were constructed in the reporting period. These have been incorporated into the groundwater monitoring program of the approved Water Management Plan.

Performance

Groundwater Levels

Groundwater levels, measured monthly at Maxwell Infrastructure, have remained stable over the reporting period. The long-term groundwater levels at monitoring locations over the past 10 years is displayed in **Figure 13**. This shows that, consistent with the predicted “cone of depression” around the mine area, groundwater levels have lowered or remained stable at monitoring locations surrounding the mine over this time.

The elevation of groundwater levels has also remained above the elevation of the water surface in the voids, indicating that there is likely to be an inflow of aquifer water into the voids as predicted in the EA and supported by the site water balance model discussed in **Section 8.1**.

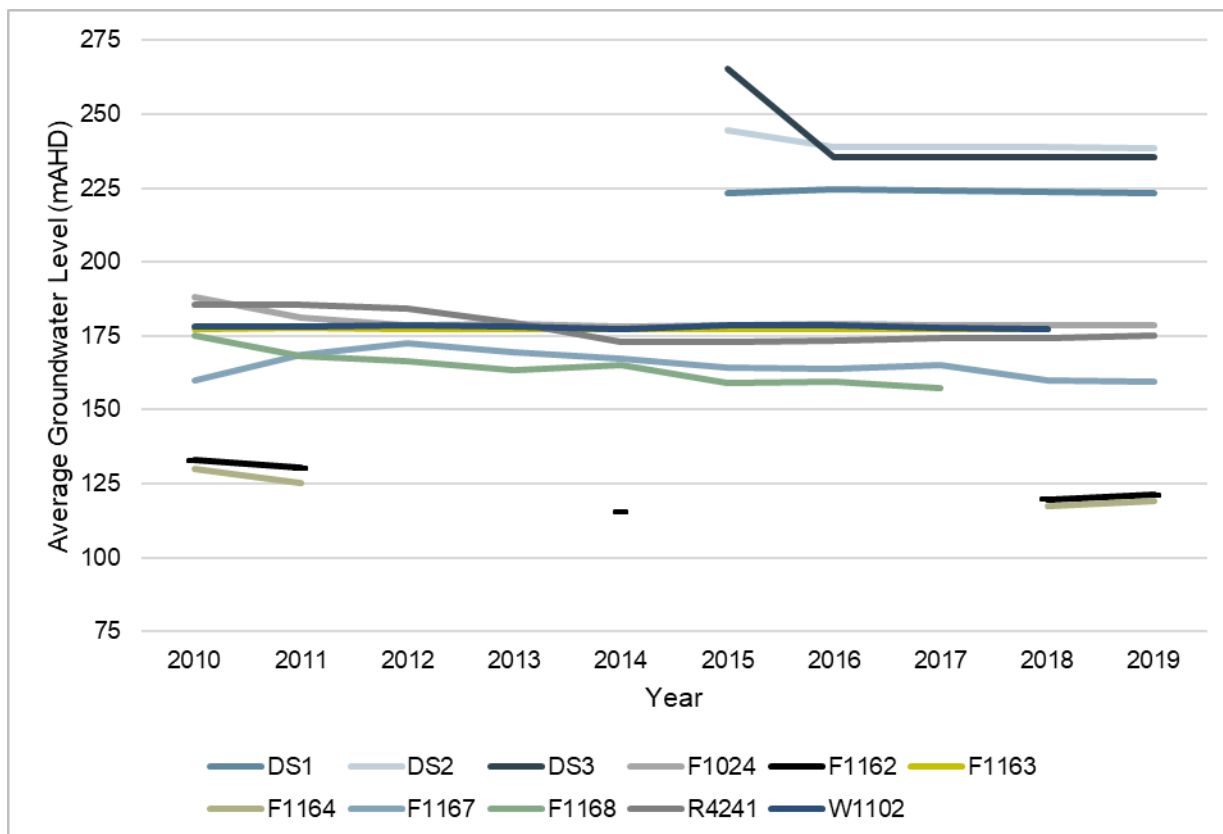


Figure 13. Long-term groundwater levels

Groundwater Quality

The quality of groundwater at the Maxwell Infrastructure site is analysed at least bi-annually. However, samples were unable to be obtained at this frequency from all monitoring locations in the reporting period:

- F1024, F1162, F1164, and F1167 had insufficient water to collect a sample for water quality analysis;
- F1168 was unable to be sampled as it remained blocked (as reported in the 2017 AEMR); and
- W1102 and F1163 were unable to be sampled because they were inaccessible.

Average groundwater quality results for the reporting period are provided in **Appendix 9** along with a comparison to average results recorded for the previous five years, where available. Results in the reporting period were generally consistent with those recorded previously. This supports the prediction in the EA that the project would not impact groundwater quality.

Proposed Improvements

A revised Water Management Plan, that addressed comments received from its initial submission for approval in September 2019, was submitted for review and approval by the Secretary of DPIE on 8 January 2020. This revised Water Management Plan will be implemented in the next reporting period, following its approval.

In addition to amendments to reflect ownership and operational changes since the last review, changes in the revised Water Management Plan, related to groundwater management, include the addition of metals and nutrients analysis to the monitoring program, a commitment to review the analyte suite routinely monitored, an increase in the frequency of water quality monitoring from 6-monthly to quarterly, and a decrease in water level monitoring from monthly to quarterly. Non-functioning and inaccessible groundwater monitoring bores and incident-specific bores, DS2 and DS3, were also removed from the monitoring program. Four new bores were added, and a commitment was made to construct

a new monitoring bore within the Permian sequence south of the open cut mining area. This bore will be constructed in the next reporting period.

8.4 Surface Water

Management

Surface water impacts at the Maxwell Infrastructure site are managed in accordance with the Water Management Plan. This includes monthly water quality monitoring at locations shown in **Appendix 2**.

Performance

The quality of surface water at Maxwell Infrastructure is analysed monthly. Samples were unable to be obtained at some monitoring locations during the reporting period:

- Savoy Dam (1609) was not sampled in February and September due to low water levels creating a safety risk;
- SW13 was not sampled from May to December and Far East Tip (1895) was not sampled during the reporting period as they were not accessible due to being located on land not owned by Malabar;
- Antiene Dam (2221) could not be sampled any month, with the exception of May, as there was insufficient water; and
- OPC Dam could not be sampled in December as there was insufficient water.

Average surface water quality results for the reporting period are provided in **Appendix 10** along with a comparison to the average results recorded for the previous five years. Results in the reporting period were generally consistent with those recorded previously with the following exceptions:

- Low pH values were recorded in the last two reporting periods at Antiene Dam (2221). Water levels at this site were extremely low during the reporting period due to below average rainfall. There was only sufficient water in Antiene Dam to sample on one occasion in the reporting period. Water quality in this dam is not impacted by activities at Maxwell Infrastructure as it is off-site and not connected to the site's water management system.
- An increase in magnesium, chloride, potassium, sodium, sulphate, total dissolved solids and electrical conductivity was recorded at Savoy Dam (1609). Savoy Dam was not connected to the site's water management system in the reporting period and, except for cattle grazing, no activities occurred in the dam's catchment area, which consists of natural ground and land rehabilitated to pasture. Water levels subsequently reduced by approximately one metre due to evaporation which is likely to have reduced dilution in the dam and increased the proportion of available ions, which is reflected in the results recorded.
- An increase in chloride and electrical conductivity was recorded at V-Notch Dam. This is a very small dam to temporarily capture seepage from the Access Road Dam and runoff from natural ground. It is not a water storage, and any water captured is pumped to the Access Road Dam (2081), which recorded results consistent with previous years.

Proposed Improvements

Surface water will be managed in accordance with the revised Water Management Plan approved on 18 February 2020. Changes in the revised Water Management Plan, related to surface water management, include aligning monitoring for both water quality and dam capacities to quarterly and the removal of monitoring sites that are inaccessible or not connected to the site's water management system. The ES Void was also added to the surface water monitoring program.

9 REHABILITATION

9.1 Management

Rehabilitation at the Maxwell Infrastructure site is managed in accordance with the MOP and Rehabilitation and Offset Management Plan. The MOP has also been approved by the Secretary of DPIE as addressing the requirements of the Final Void Management Plan and Mine Closure Plan.

The key objectives for post rehabilitation land use are:

- Integrate mine planning to minimise areas of disturbance.
- To progressively rehabilitate disturbed areas with the aim of establishing as much of original floristic diversity as possible.
- To create a stable, free-draining post mining landform which is compatible with the surrounding landscape and which is capable of a productive land use that achieves a land capability to equal that of pre mining conditions.
- To create a post-mining landform which enhances the local and regional habitat corridor as presented in the *Synoptic Plan: Integrated Landscapes for Coal Mine rehabilitation in the Hunter Valley of New South Wales*.

Whilst the rehabilitation at Maxwell Infrastructure is progressing, no areas of rehabilitation have been formally signed off by DPIE as meeting the land use objectives and completion criteria.

9.2 Performance

During the reporting period, final landform development and growth medium development were the focus of operations at the Maxwell Infrastructure site.

Buildings and Infrastructure

No buildings or infrastructure were decommissioned or demolished during the reporting period.

Internal wall and ceiling linings within the Pringle's core shed and the coal handling and preparation plant (CHPP) bathroom were removed due to the identification of asbestos containing material (ACM). The ACM was removed in accordance with the requirements of the *Code of Practice: How to Safely Remove Asbestos* (Safe Work Australia 2016).

Landform Design

During the reporting period, reshaping activities of overburden and exposed areas were undertaken by D11 dozers. Where possible, landform designs were modified to more natural landscapes, incorporating dams and natural drainage lines.

Up to two metres of inert material was then placed on the reshaped areas that were assessed as being prone to spontaneous combustion. Inert material has been stockpiled around the site for use in the management of spontaneous combustion. Approximately 61 ha of land was capped with inert material prior to the application of soil ameliorants and seeding.

Drainage

Contour drains were installed on rehabilitated slopes. All drains had a longitudinal gradient of 1 to 1.5 per cent. Deep ripping across the contour was also undertaken on steeper slopes.

Seven drop structures totalling over 2,200 m were installed during the reporting period. The structures assist with water movement between contours and water storages.

Soil Amelioration

Due to historic site practices, good quality topsoil for use during rehabilitation is minimal. Soil ameliorants were used during the reporting period to increase soil organic matter, improve soil nutrient levels and promote vegetation growth.

Biosolids, which are a by-product of the wastewater treatment process, were used as a soil ameliorant in pasture areas. Compost made up of garden organics and biosolids was used as a soil ameliorant in some woodland areas where topsoil was limited.

Gypsum was applied to all areas at a rate of 7 tonnes per hectare using a mix of fine and coarse grade recycled gypsum product.

Seeding

Both woodland and pasture seed mixes and rates were continually reviewed during the reporting period.

The pasture seed mix was modified in the previous reporting period to increase species diversity. Cover crop rates were reduced to allow the establishment of perennial species. The pasture seed was blended with 200 kilograms per hectare of fertiliser and applied with a tractor and seeder combination.

The woodland seed mix was based on a Spotted Gum-Ironbark-Grey Box Woodland. The seed mix targeted species that were more likely to germinate and successfully grow using the methods and equipment available. There were some minor variations in seed quantities throughout the reporting period due to drought impacts on availability.

Native species that required heat treatment to break dormancy mechanisms were treated with either boiling or smoke water. Seed was chemically treated to limit ant predation and inoculated with mycorrhiza to promote faster establishment. All woodland areas were seeded by hand.

Rehabilitation of Disturbed Land

During the reporting period, Maxwell Infrastructure completed 86 hectares of new rehabilitation across 11 areas of the site. Of the 86 hectares, 17 hectares were seeded to woodland rehabilitation and 72 hectares were seeded to pasture rehabilitation. There were some minor variations in the locational distribution of rehabilitation, compared to what was proposed in the current MOP. The locations of rehabilitation activities are shown in **Figure 14**.

The 2016 MOP approved by Department of Industry – Resources and Energy (now DPIE - Resource Regulator) required 218 hectares of rehabilitation to be completed during the reporting period. This assumed that the site would go into a closure phase and did not take into consideration the proposed Maxwell Underground Project and utilisation of substantial existing facilities at Maxwell Infrastructure. As stated in the 2018 AEMR, the revised rehabilitation target for the reporting period was 86 hectares.

It is anticipated that 30 hectares of rehabilitation will be seeded during the next reporting period. Rehabilitation activities will also focus on tree planting within the woodland corridor.

A summary of the rehabilitation status is provided in **Table 13**. A reconciliation of the rehabilitation status for the Maxwell Infrastructure site identified nine hectares of existing rehabilitation that had not been previously captured. It also identified that the Southern Offset (which is located on mine rehabilitation) had not been included as land under active rehabilitation. These errors have been addressed and corrected in **Table 13**.

Table 13. Rehabilitation status

Mine Area Type	Previous reporting period (actual) Year 2018 (ha)	This reporting period (actual) Year 2019 (ha)	Next reporting period (forecast) Year 2020 (ha)
A. Total mine footprint¹	1,238	1,238	1,238
B. Total active disturbance²	514	419	389
C. Land being prepared for rehabilitation³	86	30	0
D. Land under active rehabilitation⁴	733*	819	849
E. Completed rehabilitation⁵	0	0	0

¹ Total mine footprint includes all areas within the mining lease that either have at some point in time or continue to pose a rehabilitation liability due to mining and associated activities.

² Total active disturbance includes all areas ultimately requiring rehabilitation.

³ Land being prepared for rehabilitation includes the sum of mine disturbed land that is under the following rehabilitation phases – decommissioning, landform establishment and growth medium development.

⁴ Land under active rehabilitation includes areas under rehabilitation and being managed to achieve relinquishment.

⁵ Completed rehabilitation requires formal sign-off by the Resource Regulator that the area has successfully met the rehabilitation land use objectives and completion criteria.

* Number reported in the 2018 AEMR was 645 hectares however a reconciliation identified an additional 9 hectares of completed rehabilitation and 79 hectares of rehabilitation at the Southern Offset area that was not previously included.

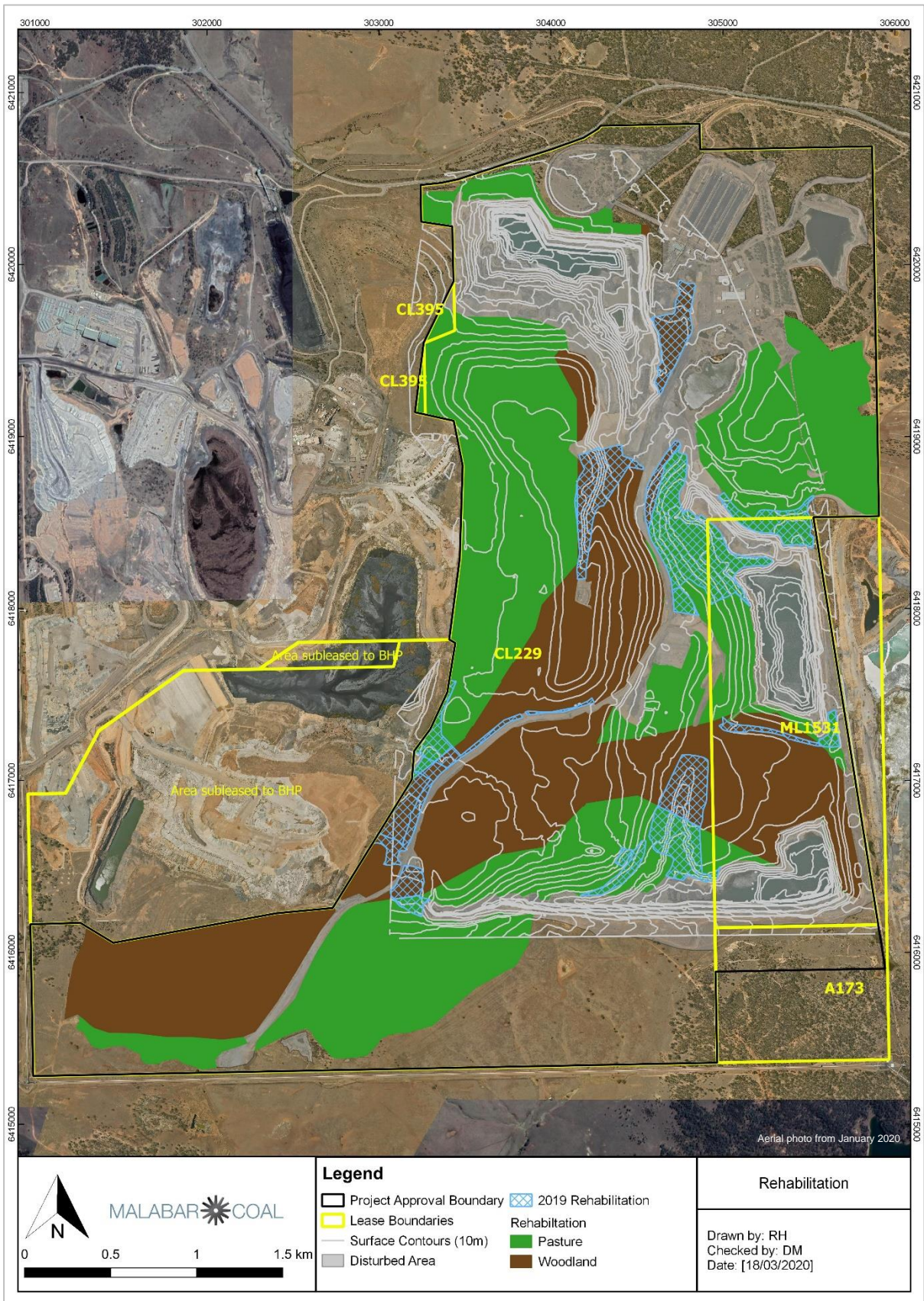


Figure 14. Location of rehabilitation activities

Other Rehabilitation Activities

During the reporting period, some remedial works were undertaken on two areas of existing pasture rehabilitation. Works included capping of minor spontaneous combustion outbreaks, cleaning out of contours, deep ripping and reseeding of areas.

Two tree planting programs were undertaken during the reporting period. The programs targeted a total of 21 hectares of existing mine rehabilitation within the conceptual woodland corridor. Tree and shrub species consistent with the Spotted Gum Ironbark Woodland, Red Gum Woodland and White Box Woodland vegetation communities were planted. Approximately 22,000 plants were installed using a growth promoting compound and immediately watered in with a minimum of one litre per plant. Follow-up watering was undertaken for several months after installation due to drier than normal conditions in Autumn and Spring.

The culling of kangaroos was undertaken during the reporting period to reduce grazing pressure and minimise the impacts to native groundcover species from the digging of day beds under trees and shrubs in rehabilitation areas.

Weed control activities during the reporting period occurred on the Southern and Eastern Tip rehabilitation areas and areas planned for tree planting during the next reporting period. Control activities primarily targeted Prickly Pear, Galenia, Golden Wreath Wattle and Coolatai Grass.

Trials

Cattle Grazing Trial

A grazing trial commenced on rehabilitation at the Southern Tip during November 2018. The trial involved the introduction of 50 head of cattle onto pasture rehabilitation to improve grass species diversity.

The cattle grazing trial continued during the reporting period and cattle were strategically rotated between three paddocks of which two were located on mine rehabilitation. The cattle will be sold to market during the next reporting period and the paddocks will be rested and monitored for new vegetation growth and diversity. Results so far are demonstrating that Maxwell Infrastructure can create a post mining landscape that is compatible with the surrounding landscape and capable of sustaining a productive land use.

Native Grass Trial

A native grassland establishment trial was undertaken at Maxwell Infrastructure during 2013. The trial involved seeding a small area on the North Tip with locally collected grassland species from Dartbrook. The seed mix was dominated by Red Grass (*Bothriochloa macra*) and Queensland Blue Grass (*Dichanthium sericeum*). The trial was monitored in 2013 and determined to be unsuccessful due to poor germination. A follow-up inspection during 2018 showed the area to be dominated by native grasses, particularly Lobed Bluegrass (*Bothriochloa biloba*) and Queensland Bluegrass.

Queensland Blue Grass was then included into the pasture mix as a trial on a 24 ha parcel of land that was rehabilitated during 2018. Due to the dry conditions only a small number of Queensland Blue Grass were found during the reporting period, however, the area will continue to be monitored over the coming years.

Geofluv Trial

During 2013, an area of 11.5 hectares of mine rehabilitation was designed and built using the Geofluv™ natural landform software. The design included four main channels with six side channels to drain water from the slope. The area, which was seeded with native shrubs and a cover crop, has high erosional stability and now contains a dense cover of grass species.

The remaining areas of rehabilitation at the Maxwell Infrastructure site have not been designed or constructed using the Geofluv™ natural landform software. However, where possible, landform designs are modified to create more natural looking landscapes that are safe, stable and non-polluting.

9.3 Actions for the Next Reporting Period

The following activities will occur during the next reporting period:

- Thirty hectares of additional rehabilitated land;
- Two tree planting programs covering 50 hectares of existing mine rehabilitation within the conceptual woodland corridor;
- Continued installation of rock structures to assist in appropriate water management;
- Remedial works to address areas of poor performing rehabilitation; and
- A weed control program targeted at Galenia, Prickly Pear and Golden Wreath Wattle.

The existing MOP period ends at the end of June 2020. A new MOP, for financial years FY20 to FY21, is currently underway and is expected to be approved by DPIE – Resources Regulator and implemented in the next reporting period. It is planned that the Mine Closure Plan and Final Void Management Plan will be separated from this MOP, to exist as new stand-alone documents that will be approved by the Secretary of DPIE and implemented in the next reporting period. The Rehabilitation and Offset Management Plan will also be revised in the next reporting period to ensure consistency with the new MOP.

10 COMMUNITY

10.1 Complaints

The Maxwell Infrastructure site maintains a 24-hour community hotline (1800 653 960) for any issues or enquiries. The community hotline number is advertised in the local newspapers and on the [Malabar Coal website](#). In addition to the community hotline, the Maxwell Infrastructure site can also be contacted by email (info@malabarcoal.com.au).

During the reporting period, one complaint was received regarding air quality. On 20 February 2019, Maxwell Infrastructure received a request from DPIE – Planning and Assessment to investigate a complaint regarding dust in the general Muswellbrook area during the afternoon of 18 February 2019. An investigation showed no elevated PM₁₀ results at the time of the complaint and air quality monitoring results for this day below regulatory criteria.

The number of complaints received during the reporting period was consistent with the previous three years as shown in **Figure 15**.

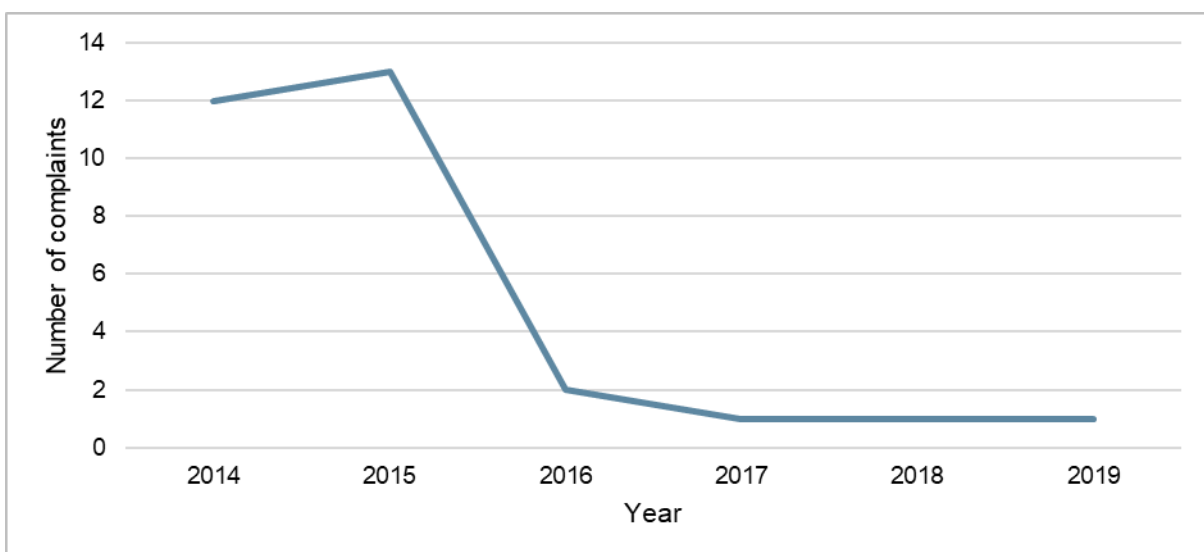


Figure 15. Long-term number of complaints

10.2 Engagement

The Maxwell Infrastructure Community Consultative Committee (CCC) met on four occasions during the reporting period. During these meetings the CCC reviewed the site's environmental performance and discussed community issues. The meetings were held on the following days:

- 13 March 2019
- 12 June 2019
- 11 September 2019
- 11 December 2019

Two meetings were also held for the Antiene Rail Spur, Joint CCC. These were attended by CCC representatives from Maxwell Infrastructure and Mt Arthur Coal. During these meetings the CCC reviewed the environmental performance of the Antiene Rail Spur which is a shared asset between the two sites. The meetings were held on the following days:

- 12 June 2019
- 11 December 2019

In September 2018, the Maxwell Infrastructure CCC was also endorsed by DPIE – Planning and Assessment to be the CCC for the proposed Maxwell Underground Project given the Maxwell Project is located within the general vicinity of the Maxwell Infrastructure site.

Information on environmental management and performance, as well as relevant approvals, can be accessed by the community through the [Malabar Coal website](#).

10.3 Contributions

Malabar Coal regularly donates to local community groups, charities, schools, scholarships and sporting teams within Muswellbrook, Denman and the surrounding areas. During the reporting period, over \$46,000 was donated to the local community. Categories of the contributions are detailed below in **Figure 16**.

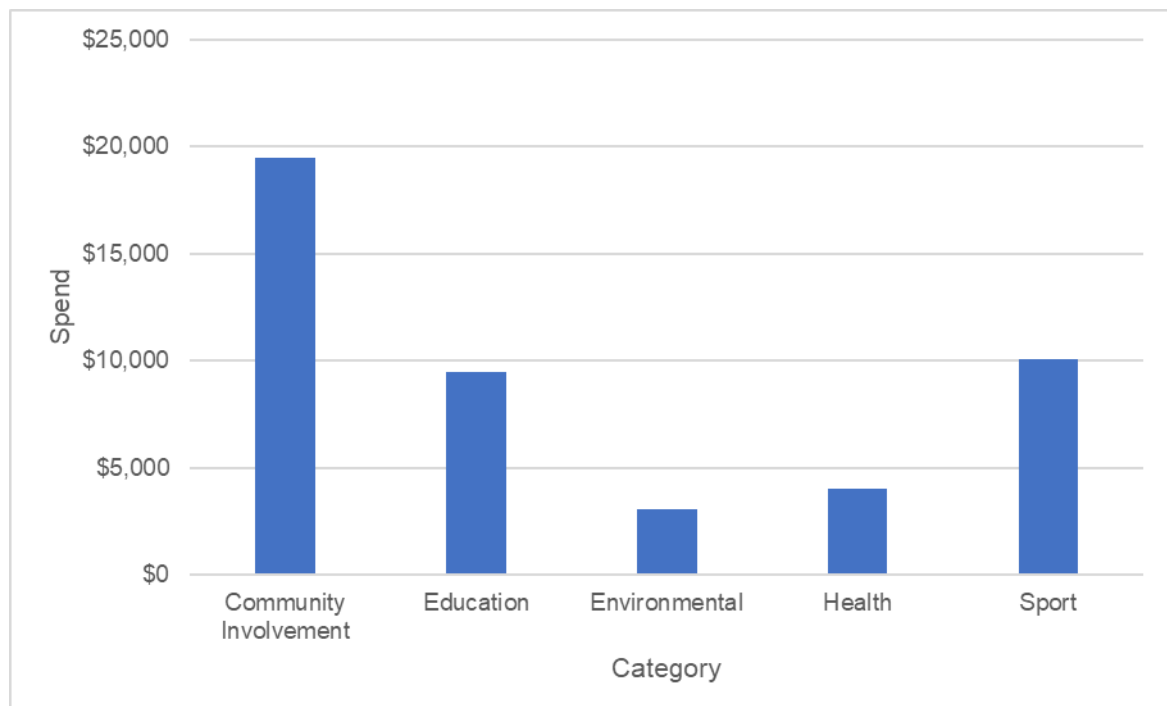


Figure 16. Community contributions in the reporting period

11 INCIDENTS AND NON-COMPLIANCES

11.1 Incidents

No reportable environmental incidents occurred during the reporting period.

11.2 Exceedances

Instances where monitoring results exceeded approval criteria are listed in **Table 14** with subsequent investigation details.

Table 14. Monitoring result exceedances

Date	Monitor	Parameter	Averaging period	Result ($\mu\text{g}/\text{m}^3$)	Calculated Contribution ($\mu\text{g}/\text{m}^3$)	Approval criteria ($\mu\text{g}/\text{m}^3$)	Investigation details
16/01/2019	TEOM	PM ₁₀	24-hour	50.16	4.8	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site for nine per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (63.6 $\mu\text{g}/\text{m}^3$) indicating a regional dust event.
10/02/2019	TEOM	PM ₁₀	24-hour	51.19	14.9	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site for 25 per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (59.0 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. No operations were undertaken at Maxwell Infrastructure on 10 February 2019.
13/02/2019	TEOM	PM ₁₀	24-hour	74.92	9.4	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site for eight per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (101.5 $\mu\text{g}/\text{m}^3$) indicating a regional dust event.
19/02/2019	TEOM	PM ₁₀	24-hour	57.35	7.4	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east or from the west to north west with the monitor located downwind of the site for 12 per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (141.0 $\mu\text{g}/\text{m}^3$) indicating a regional dust event.
31/03/2019	TEOM	PM ₁₀	24-hour	56.69	0.8	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the north west with the monitor located downwind of the site for five per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (64.9 $\mu\text{g}/\text{m}^3$) and Camberwell (72.0 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. No operations were undertaken at Maxwell Infrastructure on 31 March 2019.
6/09/2019	TEOM	PM ₁₀	24-hour	66.65	0.9	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the west to north west with the monitor located downwind of the site for six per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (73.4 $\mu\text{g}/\text{m}^3$) and Camberwell (114.5 $\mu\text{g}/\text{m}^3$) indicating a regional dust event.

Date	Monitor	Parameter	Averaging period	Result ($\mu\text{g}/\text{m}^3$)	Calculated Contribution ($\mu\text{g}/\text{m}^3$)	Approval criteria ($\mu\text{g}/\text{m}^3$)	Investigation details
7/10/2019	TEOM	PM ₁₀	24-hour	53.33	2.8	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the west to north west with the monitor located downwind of the site for three per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (63.3 $\mu\text{g}/\text{m}^3$) and Camberwell (61.5 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. No operations were undertaken at Maxwell Infrastructure on 7 October 2019.
26/10/2019	TEOM	PM ₁₀	24-hour	71.09	2.0	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the west to north west with the monitor located downwind of the site for three per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (102.4 $\mu\text{g}/\text{m}^3$) and Camberwell (177.3 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. No operations were undertaken at Maxwell Infrastructure on 26 October 2019.
27/10/2019	TEOM	PM ₁₀	24-hour	57.91	16.5	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was highly variable, largely ranging from south east to north west with the monitor located downwind of the site for 25 per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (57.4 $\mu\text{g}/\text{m}^3$) and Camberwell (53.3 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. No operations were undertaken at Maxwell Infrastructure on 27 October 2019.
28/10/2019	TEOM	PM ₁₀	24-hour	57.43	4.3	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site for 11 per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (57.9 $\mu\text{g}/\text{m}^3$) and Camberwell (53.0 $\mu\text{g}/\text{m}^3$) indicating a regional dust event.
30/10/2019	TEOM	PM ₁₀	24-hour	64.15	9.6	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the north west with the monitor located downwind of the site for 14 per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (68.5 $\mu\text{g}/\text{m}^3$) and Camberwell (100.0 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. On 30 October 2019 the NSW Rural Fire Service released a smoke advisory stating that smoke was affecting large parts of NSW due to large bush fires burning on the north coast and northern NSW. In response to a notification of the elevated result, DPIE acknowledged that on 30 October 2019 smoke was affecting large parts of NSW, including the Hunter Valley.

Date	Monitor	Parameter	Averaging period	Result ($\mu\text{g}/\text{m}^3$)	Calculated Contribution ($\mu\text{g}/\text{m}^3$)	Approval criteria ($\mu\text{g}/\text{m}^3$)	Investigation details
31/10/2019	TEOM	PM ₁₀	24-hour	52.68	2.1	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the north west in the morning and from the south east for the remainder of the day with the monitor located downwind of the site for seven per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (58.5 $\mu\text{g}/\text{m}^3$) and Camberwell (90.6 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. On 31 October 2019 the NSW Rural Fire Service released a smoke advisory stating that smoke was affecting large parts of NSW due to large bush fires burning on the north coast and northern NSW. In response to a notification of the elevated result, DPIE – Planning and Assessment noted that regional air quality may have been impacted by bushfires.
1/11/2019	TEOM	PM ₁₀	24-hour	76.62	4.1	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site for seven per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (80.6 $\mu\text{g}/\text{m}^3$) and Camberwell (65 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. On 1 November 2019 air quality in the region continued to be affected by bushfire smoke. In response to a notification of the elevated result, DPIE – Planning and Assessment noted that regional air quality may have been impacted by bushfires.
7/11/2019	TEOM	PM ₁₀	24-hour	59.33	0.0	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the north west to west with the monitor located downwind of the site for seven per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (80.5 $\mu\text{g}/\text{m}^3$) and Camberwell (127.1 $\mu\text{g}/\text{m}^3$) indicating a regional dust event.
8/11/2019	TEOM	PM ₁₀	24-hour	56.64	6.8	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the north west to west with the monitor located downwind of the site for three per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (87.2 $\mu\text{g}/\text{m}^3$) and Camberwell (114.3 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. In response to a notification of the elevated result, DPIE – Planning and Assessment acknowledged that on 8 November 2019 raised dust and bushfire smoke was affecting large parts of NSW, including the Hunter Valley.

Date	Monitor	Parameter	Averaging period	Result ($\mu\text{g}/\text{m}^3$)	Calculated Contribution ($\mu\text{g}/\text{m}^3$)	Approval criteria ($\mu\text{g}/\text{m}^3$)	Investigation details
12/11/2019	TEOM	PM ₁₀	24-hour	75.92	1.6	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the north west to west with the monitor located downwind of the site for two per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (112.6 $\mu\text{g}/\text{m}^3$) and Camberwell (145.9 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A large number of bushfires occurred throughout NSW on 12 November 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region. This included a grass fire that occurred in the afternoon and evening near Bimbadeen Drive, Muswellbrook, up-wind of the TEOM.
16/11/2019	TEOM	PM ₁₀	24-hour	60.41	6.8	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site for 13 per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (58.8 $\mu\text{g}/\text{m}^3$) and Camberwell (62.4 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. No operations were undertaken at Maxwell Infrastructure on 16 November 2019.
17/11/2019	TEOM	PM ₁₀	24-hour	59.16	6.1	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site for ten per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (56.7 $\mu\text{g}/\text{m}^3$) and Camberwell (66.5 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 17 November 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
20/11/2019	TEOM	PM ₁₀	24-hour	64.16	0.0	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site at no time during this day. The UHAQMN also recorded elevated readings at Muswellbrook (56.8 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 20 November 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region. In response to a notification of the elevated result, DPIE – Planning and Assessment noted that regional air quality was impacted by bushfires.

Date	Monitor	Parameter	Averaging period	Result ($\mu\text{g}/\text{m}^3$)	Calculated Contribution ($\mu\text{g}/\text{m}^3$)	Approval criteria ($\mu\text{g}/\text{m}^3$)	Investigation details
21/11/2019	TEOM	PM ₁₀	24-hour	86.71	14.7	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east until about 8 pm, after which, wind direction was predominantly from the west to north west with the monitor located downwind of the site at for 12 per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (114.1 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 21 November 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region. In response to a notification of the elevated result, DPIE – Planning and Assessment noted that regional air quality was impacted by bushfires.
22/11/2019	TEOM	PM ₁₀	24-hour	103.87	15.5	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the west to north west until about 5 pm, after which, wind direction was predominantly from the south east with the monitor located downwind of the site at for 13 per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (108.3 $\mu\text{g}/\text{m}^3$) and Camberwell (143.9 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 22 November 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region. In response to a notification of the elevated result, DPIE – Planning and Assessment noted that regional air quality was impacted by bushfires.
23/11/2019	TEOM	PM ₁₀	24-hour	61.11	2.0	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site at for three per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (65.7 $\mu\text{g}/\text{m}^3$) and Camberwell (49.8 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 23 November 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region. In response to a notification of the elevated result, DPIE – Planning and Assessment noted that bushfire smoke was affecting large parts of NSW, including the Hunter Valley. No operations were undertaken at Maxwell Infrastructure on 23 November 2019.

Date	Monitor	Parameter	Averaging period	Result ($\mu\text{g}/\text{m}^3$)	Calculated Contribution ($\mu\text{g}/\text{m}^3$)	Approval criteria ($\mu\text{g}/\text{m}^3$)	Investigation details
26/11/2019	TEOM	PM ₁₀	24-hour	162.74	4.7	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the north west to west with the monitor located downwind of the site at for eight per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (231.3 $\mu\text{g}/\text{m}^3$) and Camberwell (294.4 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 26 November 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
27/11/2019	TEOM	PM ₁₀	24-hour	79.34	13.9	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site at for 18 per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (64.6 $\mu\text{g}/\text{m}^3$) and Camberwell (47.2 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 27 November 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
28/11/2019	TEOM	PM ₁₀	24-hour	64.92	7.7	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site at for ten per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (84.0 $\mu\text{g}/\text{m}^3$) and Camberwell (79.8 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 28 November 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
29/11/2019	TEOM	PM ₁₀	24-hour	103.53	9.8	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east until about 2:30 pm, after which wind direction was predominantly from the north west with the monitor located downwind of the site at for seven per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (104.1 $\mu\text{g}/\text{m}^3$) and Camberwell (150.4 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 29 November 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.

Date	Monitor	Parameter	Averaging period	Result ($\mu\text{g}/\text{m}^3$)	Calculated Contribution ($\mu\text{g}/\text{m}^3$)	Approval criteria ($\mu\text{g}/\text{m}^3$)	Investigation details
30/11/2019	TEOM	PM ₁₀	24-hour	55.71	0.6	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the north west until about 4:00pm, after which wind direction was predominantly from the south east with the monitor located downwind of the site at for one per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (67.7 $\mu\text{g}/\text{m}^3$) and Camberwell (112.1 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 30 November 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
2/12/2019	TEOM	PM ₁₀	24-hour	70.16	0.3	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the west to north west with the monitor located downwind of the site at for one per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (102.0 $\mu\text{g}/\text{m}^3$) and Camberwell (208.1 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 2 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
6/12/2019	TEOM	PM ₁₀	24-hour	71.04	1.0	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the west to north west with the monitor located downwind of the site at for one per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (84.6 $\mu\text{g}/\text{m}^3$) and Camberwell (134.4 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 6 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
7/12/2019	TEOM	PM ₁₀	24-hour	104.35	19.1	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site at for one per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (118.0 $\mu\text{g}/\text{m}^3$) and Camberwell (97.3 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 7 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.

Date	Monitor	Parameter	Averaging period	Result ($\mu\text{g}/\text{m}^3$)	Calculated Contribution ($\mu\text{g}/\text{m}^3$)	Approval criteria ($\mu\text{g}/\text{m}^3$)	Investigation details
8/12/2019	TEOM	PM ₁₀	24-hour	53.24	0.0	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site at no time on this day. The UHAQMN also recorded elevated readings at Muswellbrook (57.5 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 8 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
9/12/2019	TEOM	PM ₁₀	24-hour	86.07	8.9	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site at for six per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (98.5 $\mu\text{g}/\text{m}^3$) and Camberwell (73.5 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 9 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
10/12/2019	TEOM	PM ₁₀	24-hour	98.51	7.9	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the west to north west, except for before 3:30 am and after 8:00 pm, when winds were from the south east with the monitor located downwind of the site at for ten per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (109.4 $\mu\text{g}/\text{m}^3$) and Camberwell (112.7 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 10 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
11/12/2019	TEOM	PM ₁₀	24-hour	106.96	0.0	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site at no time on this day. The UHAQMN also recorded elevated readings at Muswellbrook (96.9 $\mu\text{g}/\text{m}^3$) and Camberwell (90.4 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 11 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
12/12/2019	TEOM	PM ₁₀	24-hour	63.69	0.0	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site at no time on this day. The UHAQMN also recorded elevated readings at Muswellbrook (59.7 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 12 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.

Date	Monitor	Parameter	Averaging period	Result ($\mu\text{g}/\text{m}^3$)	Calculated Contribution ($\mu\text{g}/\text{m}^3$)	Approval criteria ($\mu\text{g}/\text{m}^3$)	Investigation details
15/12/2019	TEOM	PM ₁₀	24-hour	50.45	5.0	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the west to north west with the monitor located downwind of the site for nine per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (60.7 $\mu\text{g}/\text{m}^3$) and Camberwell (63.5 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 15 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
16/12/2019	TEOM	PM ₁₀	24-hour	109.73	2.1	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the north west until about 9 am, after which wind was predominantly from the south east with the monitor located downwind of the site for three per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (91.5 $\mu\text{g}/\text{m}^3$) and Camberwell (76.6 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 16 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
19/12/2019	TEOM	PM ₁₀	24-hour	101.31	0.0	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the north with the monitor located downwind of the site at no time on this day. The UHAQMN also recorded elevated readings at Muswellbrook (121.5 $\mu\text{g}/\text{m}^3$) and Camberwell (133.2 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 19 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
20/12/2019	TEOM	PM ₁₀	24-hour	62.05	0.0	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site at no time on this day. The UHAQMN also recorded elevated readings at Muswellbrook (52.7 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 20 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.

Date	Monitor	Parameter	Averaging period	Result ($\mu\text{g}/\text{m}^3$)	Calculated Contribution ($\mu\text{g}/\text{m}^3$)	Approval criteria ($\mu\text{g}/\text{m}^3$)	Investigation details
21/12/2019	TEOM	PM ₁₀	24-hour	96.4	3.9	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east until about 6 am, after which wind direction was predominantly from the west to north west with the monitor located downwind of the site for seven per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (112.2 $\mu\text{g}/\text{m}^3$) and Camberwell (114.9 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 21 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
22/12/2019	TEOM	PM ₁₀	24-hour	83.78	0.0	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site at no time on this day. The UHAQMN also recorded elevated readings at Muswellbrook (55.5 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 22 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region.
29/12/2019	TEOM	PM ₁₀	24-hour	54.71	4.0	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east and north west with the monitor located downwind of the site for 13 per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (60.8 $\mu\text{g}/\text{m}^3$) and Camberwell (49.1 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 29 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region. No operations were undertaken at Maxwell Infrastructure on 29 December 2019.
30/12/2019	TEOM	PM ₁₀	24-hour	70.21	11.2	50	This monitor is located to the north east of the site. Wind direction during the 24-hour period was predominantly from the south east with the monitor located downwind of the site for 18 per cent of the day. The UHAQMN also recorded elevated readings at Muswellbrook (84.7 $\mu\text{g}/\text{m}^3$) and Camberwell (71.3 $\mu\text{g}/\text{m}^3$) indicating a regional dust event. A number of bushfires occurred throughout NSW on 30 December 2019 and smoke from these fires is likely to have contributed to elevated PM ₁₀ levels in the region. No operations were undertaken at Maxwell Infrastructure on 30 December 2019.

12 ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

The measures listed in **Table 15** will be implemented during the next reporting period to continue to improve the environmental or community performance at the Maxwell Infrastructure site.

Table 15. Improvement measures planned for next reporting period

Reference Number	Measure	Planned Timing
01	Update the Aboriginal Cultural Heritage Management Plan	Sep 2020
02	Implement a revised Spontaneous Combustion Management Plan (approved in February 2020)	Mar 2020
03	Implement a weed control program targeted at Galenia, Prickly Pear, Creeping Pear and Golden Wreath Wattle. This will include targeting Creeping Pear in the Drayton Wildlife Refuge and Northern Offset area and Galenia and Prickly Pear in the Southern Offset area.	Mar to Nov 2020
04	Relocate logs for habitat in the Southern Offset Area	Jun 2020
05	Install nest boxes in the Southern Offset Area	Jun 2020
06	Infill plant in the Southern Offset Area	Sep 2020
07	Implement a revised Flora and Fauna Management Plan, once approved	Jun 2020
08	Implement a revised Water Management Plan (approved in February 2020)	Mar 2020
09	Construct a new monitoring bore within the Permian sequence south of the open cut mining area, in consultation with DPIE – Water, and incorporate it into the groundwater monitoring program.	Dec 2020
10	Review the analyte suite routinely monitored in the groundwater monitoring program in consultation with DPIE – Water.	Dec 2020
11	Seed 30 hectares of additional rehabilitation.	Mar to May 2020
12	Undertake a tree planting program in existing mine rehabilitation within the conceptual woodland corridor.	Sep 2020
13	Continue to install rock structures to assist in appropriate water management.	Mar to Jun 2020
14	Complete remedial works to address areas of poor performing rehabilitation.	Dec 2020
15	Complete and implement an approved MOP for FY21-FY22	Jun 2020
16	Create and implement an approved, stand-alone Mine Closure Plan.	Jun 2020
17	Create and implement an approved, stand-alone Final Void Management Plan.	Jun 2020
18	Revise and update the Rehabilitation and Offset Management Plan	Sep 2020
19	Revise and update the Offset Strategy	Sep 2020

APPENDIX 1. APPROVAL CONDITIONS RELEVANT TO THE ANNUAL REVIEW

Condition	Description	Report Section
PA 06_0202		
Schedule 3 Condition 7	The Proponent shall: (a) implement all reasonable and feasible noise mitigation measures; (b) investigate ways to reduce the noise generated by the project, including maximum noise levels which may result in sleep disturbance; and (c) report on these investigations and the implementation and effectiveness of these measures in the AEMR.	7.2
Schedule 3 Condition 44	The Proponent shall: (a) keep records of the: <ul style="list-style-type: none"> • amount of coal transported from the site each year; and • number of coal haulage train movements generated by the project (on a daily basis); • date and time of each train movement generated by the project; and (b) include these records in the AEMR.	7.7 and Appendix 5
Schedule 3 Condition 47	The Proponent shall: ... (e) report on waste management and minimisation in the AEMR,	7.10
Schedule 5 Condition 5	Within 12 months of this approval, and annually thereafter, the Proponent shall submit an AEMR to the Director-General and relevant agencies. This report must: (a) identify the standards and performance measures that apply to the project; (b) describe the works carried out in the last 12 months; (c) describe the works that will be carried out in the next 12 months; (d) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years; (e) include a summary of the monitoring results for the project during the past year; (f) include an analysis of these monitoring results against the relevant: <ul style="list-style-type: none"> • limits/criteria in this approval; • monitoring results from previous years; and • predictions in the EA; (g) identify any trends in the monitoring results over the life of the project; (h) identify and discuss any non-compliance during the previous year; and (i) describe what actions were, or are being, taken to ensure compliance.	0, 8 and 9 5.1 and 5.2 5.3 10.1 0, 8 and 9 0, 8 and 9 0, 8 and 9 1 and 11 11 and 12

Condition	Description	Report Section
Appendix 3 Statement of Commitments Ref 21	[Maxwell Infrastructure] will prepare and submit to relevant regulatory departments an AEMR which will discuss monitoring results and include a discussion on predictions and commitments made within this EA.	0, 8 and 9
DA 106-04-00		
Schedule 2 Condition 5.1b	The Applicant shall: ... (iii) provide all results and analysis of air quality monitoring in the AEMR including a determination of the annual dust deposition rate in gm/m ² /month, which shall be plotted in the AEMR.	7.4 and Appendix 4
Schedule 2 Condition 5.3.2c	The Applicant shall also: ... (ii) include a summary of noise monitoring results in the AEMR.	7.2 and Appendix 3
Schedule 2 Condition 8.1a	The Applicant shall, throughout the life of the rail loading facility and rail loop and for a period of at least three years after the completion of operations in the DA area, prepare and submit an Annual Environmental Management Report (AEMR), which may be incorporated into the existing Drayton AEMR to the satisfaction of the Director- General. The AEMR shall include a review of the performance of coal transportation against the Environmental Management Strategy, the conditions of this consent, and other licences and approvals relating to the coal transport operations. To enable ready comparison with the predictions of the EIS, diagrams and tables, the report shall include, but not be limited to, the following matters: (i) an annual compliance review of the performance of the project against conditions of this consent and statutory approvals; (ii) a review of the effectiveness of the environmental management of the coal transport operations in terms of EPA, DMR, and MSC requirements; (iii) results of all environmental monitoring required under this consent or other approvals, including interpretations and discussion by a suitably qualified person; (iv) identify trends in monitoring results over the life of coal transport operations; (v) a listing of any variations obtained to approvals applicable to the subject area during the previous year; and (vi) environmental management targets and strategies for the next year, taking into account identified trends in monitoring results.	1 and 11 7.7 0, 8 and 9 0, 8 and 9 4 12
Schedule 2 Condition 8.1b	In preparing the AEMR, the Applicant shall: (i) respond to any request made by the Director-General for any additional requirements; and (ii) comply with any requirements of the Director-General or other relevant government agencies.	6 6

Condition	Description	Report Section
Schedule 2 Condition 9.2a	The environmental coordinator employed by [Maxwell Infrastructure] (refer condition 2.1) shall be responsible: ... (ii) for providing a report of complaints received with respect to the Drayton coal transportation operations every six months throughout the life of the project to the Director-General, MSC, EPA, DMR, and CCC, or as otherwise agreed by the Director-General. A summary of this report shall be included in the AEMR (condition 8.1(a)).	10.1
CL 229, CL 395 and ML 1531		
Condition 3	<p>(1) Within 12 months of the commencement of mining operations and thereafter annually or, at such other times as may be allowed by the Director-General, the lease holder must lodge an Annual Environmental Management report (AEMR) with the Director-General.</p> <p>(2) The AEMR must be prepared in accordance with the Director-General's guidelines current at the time of reporting and contain a review and forecast of performance for the preceding and ensuing twelve months in terms of:</p> <ul style="list-style-type: none"> (a) the accepted Mining Operations Plan; (b) development consent requirements and conditions; (c) Environment Protection Authority and Department of Land and Water Conservation (or Department of Environment and Conservation and Department of Planning) licences and approvals; (d) Any other statutory environmental requirements; (e) Details of any variations to environmental approvals applicable to the lease area; and (f) Where relevant, progress towards final rehabilitation objectives. 	<p>All</p> <p>9</p> <p>0, 8 and 9</p> <p>0, 8 and 9</p> <p>0, 8 and 9</p> <p>4</p> <p>9</p>

APPENDIX 2. ENVIRONMENTAL MONITORING LOCATIONS



Figure 17. Environmental monitoring locations

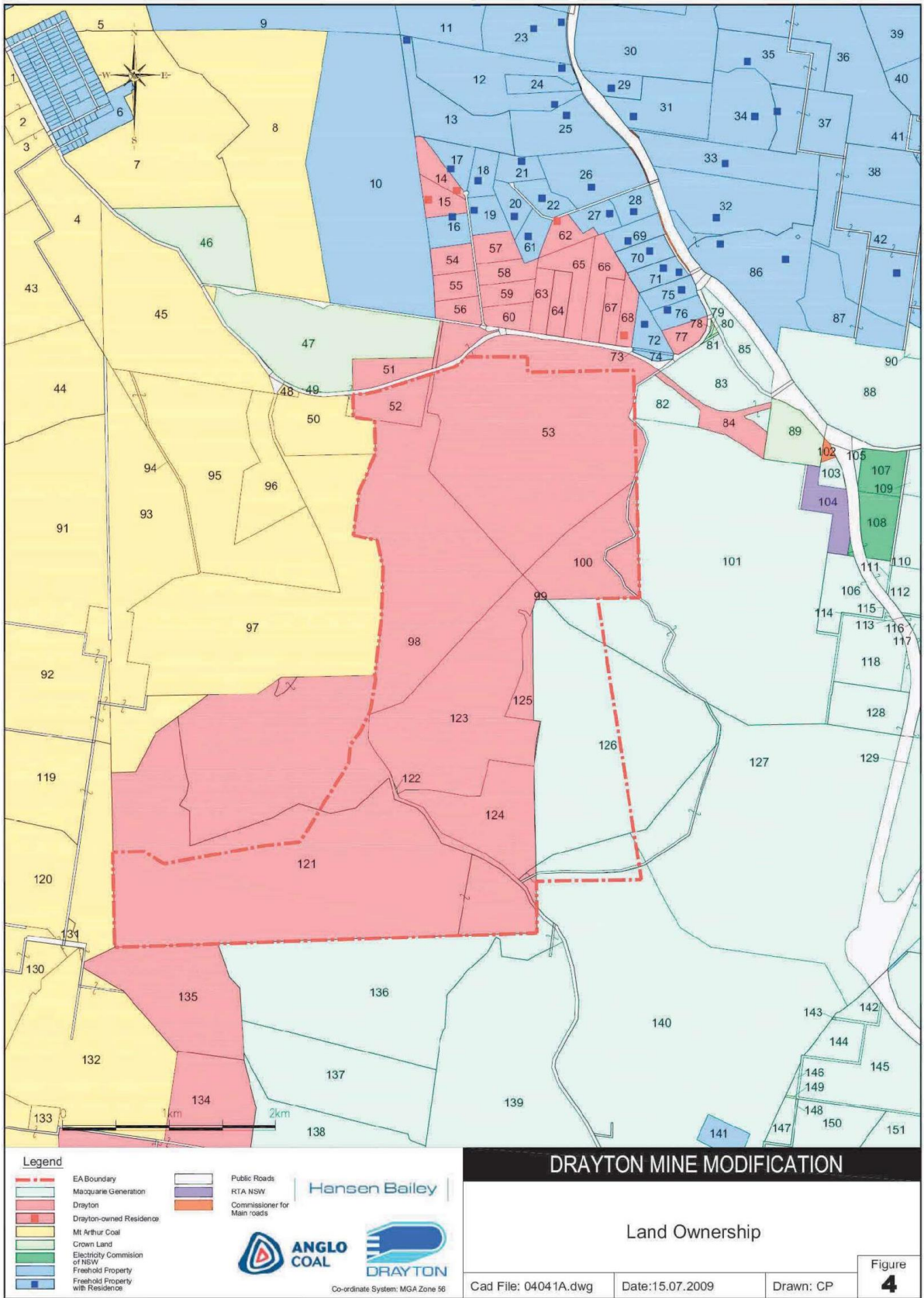


Figure 18. Noise modelling locations (land ownership)

APPENDIX 3. NOISE MONITORING RESULTS

Table 16. Modelled noise generated by the project alone (L_{Aeq} (15 min))

Location	Approval criterion (dB(A))			EA year 10 prediction (dB(A))			2019 maximum result (dB(A))		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
34	35	35	39	<30	<30	34	<20	<20	<20
29	35	35	36	32	33	34	<20	<20	<20
31	35	35	37	32	34	35	<20	<20	<20
33	35	35	38	<30	32	36	<20	<20	<20
86	35	35	38	30	31	38	<20	<20	<20
32	35	35	40	30	33	39	<20	<20	<20
71	35	35	41	32	35	40	<20	<20	<20
75*	35	35	41	32	34	40	<20	<20	<20
70	35	36	41	33	36	40	<20	<20	<20
76*	35	36	42	33	35	42	<20	<20	<20
28	35	37	40	33	36	39	<20	<20	<20
69	35	37	41	34	36	40	<20	<20	<20
13	36	36	35	35	34	33	<20	<20	<20
12	36	36	36	34	35	35	<20	<20	<20
25*	36	37	37	34	35	35	<20	<20	<20
26	36	37	38	34	36	37	<20	<20	<20
27	36	37	39	34	36	38	<20	<20	<20
72*	36	37	42	34	36	42	<20	<20	<20
17	37	38	36	36	37	36	<20	<20	<20
21	38	38	38	36	37	37	<20	<20	<20
22	38	38	38	36	37	37	<20	<20	<20
18	38	39	38	37	38	37	<20	<20	<20
20	39	40	39	38	39	39	<20	<20	<20
61*	39	40	39	37	39	39	<20	<20	<20
14	40	39	39	38	39	38	<20	<20	<20
19	40	40	39	39	40	39	<20	<20	<20
16*	41	41	39	40	41	39	<20	<20	<20
23	35	35	35	32	33	33	<20	<20	<20
35*	35	35	35	<30	30	34	<20	<20	<20
42*	35	35	35	<30	<30	31	<20	<20	<20
37	35	35	35	<30	<30	33	<20	<20	<20

* Measured: Doherty (16), Skinner (61), Robertson (72), Shaman (75) and Holder (76)

Table 17. Monitoring summary - cumulative noise

Location	Approval criterion (dB(A))			EA year 10 prediction (dB(A))	2019 maximum result (dB(A))		
	Day (L _{Aeg} (11 hr))	Evening (L _{Aeg} (4 hr))	Night (L _{Aeg} (9 hr))		Day (L _{Aeg} (11 hr))	Evening (L _{Aeg} (4 hr))	Night (L _{Aeg} (9 hr))
Doherty (16)	50	45	40	n/a	<20	<20	<20
Skinner (61)					<20	<20	<20
Robertson (72)					<20	<20	<20
Sharman (75)					<20	<20	<20
Horder (76)					<20	<20	<20

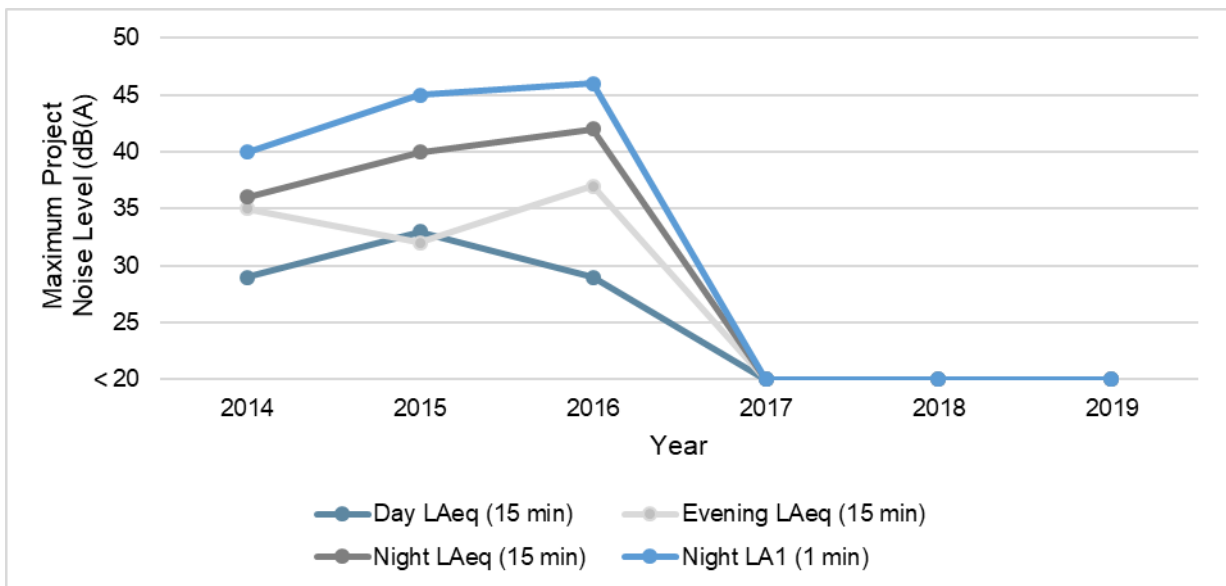


Figure 19. Long-term maximum project noise levels

APPENDIX 4. AIR QUALITY MONITORING RESULTS

Table 18. PM₁₀ matter 24-hour results for the reporting period

Date	PM ₁₀ 24-hour result (µg/m ³)	Date	PM ₁₀ 24-hour result (µg/m ³)	Date	PM ₁₀ 24-hour result (µg/m ³)
1/01/2019	20.08	12/02/2019	30.22	26/03/2019	33.92
2/01/2019	37.46	13/02/2019	74.92	27/03/2019	25.73
3/01/2019	31.07	14/02/2019	21.82	28/03/2019	19.53
4/01/2019	27.06	15/02/2019	25.28	29/03/2019	22.27
5/01/2019	27.47	16/02/2019	19.59	30/03/2019	14.65
6/01/2019	10.31	17/02/2019	18.00	31/03/2019	56.69
7/01/2019	8.80	18/02/2019	29.60	1/04/2019	10.04
8/01/2019	20.19	19/02/2019	57.35	2/04/2019	6.3
9/01/2019	27.25	20/02/2019	32.41	3/04/2019	9.96
10/01/2019	23.34	21/02/2019	11.92	4/04/2019	13.62
11/01/2019	18.91	22/02/2019	14.26	5/04/2019	14.29
12/01/2019	16.41	23/02/2019	9.76	6/04/2019	10.41
13/01/2019	27.51	24/02/2019	16.88	7/04/2019	13.45
14/01/2019	23.69	25/02/2019	18.95	1/04/2019	10.04
15/01/2019	34.85	26/02/2019	22.30	2/04/2019	6.3
16/01/2019	50.16	27/02/2019	16.11	3/04/2019	9.96
17/01/2019	44.00	28/02/2019	11.88	4/04/2019	13.62
18/01/2019	34.08	1/03/2019	16.97	5/04/2019	14.29
19/01/2019	32.49	2/03/2019	15.21	6/04/2019	10.41
20/01/2019	13.76	3/03/2019	16.31	7/04/2019	13.45
21/01/2019	12.53	4/03/2019	22.89	8/04/2019	28.01
22/01/2019	22.98	5/03/2019	23.51	9/04/2019	28.08
23/01/2019	29.75	6/03/2019	39.09	10/04/2019	20.99
24/01/2019	28.92	7/03/2019	26.97	11/04/2019	15.34
25/01/2019	26.73	8/03/2019	23.20	12/04/2019	13.24
26/01/2019	31.80	9/03/2019	3.43	13/04/2019	15.14
27/01/2019	38.86	10/03/2019	11.86	14/04/2019	27.99
28/01/2019	29.96	11/03/2019	34.37	15/04/2019	17.19
29/01/2019	34.02	12/03/2019	30.67	16/04/2019	14.91
30/01/2019	31.54	13/03/2019	33.68	17/04/2019	11.94
31/01/2019	29.67	14/03/2019	22.95	18/04/2019	13.62
1/02/2019	18.23	15/03/2019	18.93	19/04/2019	17.13
2/02/2019	8.49	16/03/2019	12.33	20/04/2019	12.66
3/02/2019	15.37	17/03/2019	5.37	21/04/2019	15.12
4/02/2019	28.51	18/03/2019	4.54	22/04/2019	19.1
5/02/2019	25.32	19/03/2019	8.75	23/04/2019	13.46
6/02/2019	12.08	20/03/2019	17.47	24/04/2019	16.41
7/02/2019	15.64	21/03/2019	12.6	25/04/2019	19.07
8/02/2019	20.35	22/03/2019	12.09	26/04/2019	25.23
9/02/2019	9.75	23/03/2019	14.36	27/04/2019	35.68
10/02/2019	51.19	24/03/2019	14.84	28/04/2019	16.85
11/02/2019	24.00	25/03/2019	18.72	29/04/2019	28.98

Date	PM ₁₀ 24-hour result (µg/m ³)
30/04/2019	24.94
1/05/2019	22.91
2/05/2019	31.91
3/05/2019	13.15
4/05/2019	1.52
5/05/2019	7.37
6/05/2019	5.94
7/05/2019	5.94
8/05/2019	14.47
9/05/2019	11.11
10/05/2019	14.36
11/05/2019	9.2
12/05/2019	10.08
13/05/2019	16.04
14/05/2019	14.88
15/05/2019	19.67
16/05/2019	15.93
17/05/2019	25.87
18/05/2019	20.95
19/05/2019	16.81
20/05/2019	12.14
21/05/2019	9.18
22/05/2019	11.61
23/05/2019	20.79
24/05/2019	17.4
25/05/2019	12.45
26/05/2019	16.66
27/05/2019	18.67
28/05/2019	13.56
29/05/2019	12.07
30/05/2019	8.36
31/05/2019	6.95
1/06/2019	17.05
2/06/2019	20.96
3/06/2019	7.1
4/06/2019	4.87
5/06/2019	5.53
6/06/2019	5.75
7/06/2019	21.49
8/06/2019	21.9
9/06/2019	9.76

Date	PM ₁₀ 24-hour result (µg/m ³)
10/06/2019	7.72
11/06/2019	8.65
12/06/2019	9.82
13/06/2019	13
14/06/2019	10.17
15/06/2019	13.66
16/06/2019	16.66
17/06/2019	12.83
18/06/2019	7.24
19/06/2019	8.38
20/06/2019	13.85
20/06/2019	13.85
21/06/2019	17.76
22/06/2019	13.87
23/06/2019	12.64
24/06/2019	6.36
25/06/2019	5.94
26/06/2019	8.08
27/06/2019	10.31
28/06/2019	9.35
29/06/2019	6.98
30/06/2019	11.9
1/07/2019	13.42
2/07/2019	22.69
3/07/2019	20.1
4/07/2019	6.8
5/07/2019	8.58
6/07/2019	6.32
7/07/2019	8.9
8/07/2019	4.92
9/07/2019	3.01
10/07/2019	4.04
11/07/2019	11.3
12/07/2019	9.74
13/07/2019	10.84
14/07/2019	8.91
15/07/2019	8.96
16/07/2019	7.71
17/07/2019	6.12
18/07/2019	6.72
19/07/2019	12.67

Date	PM ₁₀ 24-hour result (µg/m ³)
20/07/2019	10.75
21/07/2019	18.78
22/07/2019	14.82
23/07/2019	16.51
24/07/2019	15.07
25/07/2019	20.59
26/07/2019	17.04
27/07/2019	20.41
28/07/2019	20.22
29/07/2019	18.17
30/07/2019	13.33
31/07/2019	14.79
1/08/2019	18.02
2/08/2019	13.33
3/08/2019	11.47
4/08/2019	19.22
5/08/2019	14.50
6/08/2019	12.55
7/08/2019	14.44
8/08/2019	29.69
9/08/2019	35.75
10/08/2019	12.53
11/08/2019	11.38
12/08/2019	5.93
13/08/2019	9.26
14/08/2019	12.45
15/08/2019	15.08
16/08/2019	14.85
17/08/2019	23.95
18/08/2019	19.48
19/08/2019	39.05
20/08/2019	14.00
21/08/2019	13.22
22/08/2019	17.50
23/08/2019	29.92
24/08/2019	23.67
25/08/2019	29.11
26/08/2019	31.88
27/08/2019	24.16
28/08/2019	18.64
29/08/2019	21.94

Date	PM ₁₀ 24-hour result (µg/m ³)
30/08/2019	5.19
31/08/2019	3.75
1/09/2019	6.91
2/09/2019	11.96
3/09/2019	13.24
4/09/2019	24.44
5/09/2019	19.33
6/09/2019	66.65
7/09/2019	20.28
8/09/2019	10.36
9/09/2019	12.4
10/09/2019	12.76
11/09/2019	19.07
12/09/2019	18.53
13/09/2019	32.28
14/09/2019	22.27
15/09/2019	16.02
16/09/2019	23.95
17/09/2019	10.39
18/09/2019	3.62
19/09/2019	12.28
20/09/2019	12.18
21/09/2019	19.91
22/09/2019	26.64
23/09/2019	14.9
24/09/2019	14.56
25/09/2019	15.99
26/09/2019	24.2
27/09/2019	24.65
28/09/2019	26.88
29/09/2019	23.19
30/09/2019	23.78
1/10/2019	20.2
2/10/2019	22.82
3/10/2019	26.25
4/10/2019	36.64
5/10/2019	18.73
6/10/2019	18.14
7/10/2019	53.33
8/10/2019	37.49
9/10/2019	21.87

Date	PM ₁₀ 24-hour result (µg/m ³)
10/10/2019	24.29
11/10/2019	18.01
12/10/2019	6.71
13/10/2019	12.64
14/10/2019	16.68
15/10/2019	30.99
16/10/2019	30.97
17/10/2019	41.84
18/10/2019	36.21
19/10/2019	29.16
20/10/2019	27.58
21/10/2019	28.18
22/10/2019	22.74
23/10/2019	25.65
24/10/2019	29.53
25/10/2019	23.21
26/10/2019	71.09
27/10/2019	57.91
28/10/2019	57.43
29/10/2019	44.5
30/10/2019	64.15
31/10/2019	52.68
1/11/2019	76.62
2/11/2019	42.52
3/11/2019	28.72
4/11/2019	13.88
5/11/2019	8.15
6/11/2019	11.46
7/11/2019	59.33
8/11/2019	56.64
9/11/2019	20.79
10/11/2019	24.52
11/11/2019	17.67
12/11/2019	75.92
13/11/2019	43.6
14/11/2019	37.09
15/11/2019	26.53
16/11/2019	60.41
17/11/2019	59.16
18/11/2019	42.19
19/11/2019	38.81

Date	PM ₁₀ 24-hour result (µg/m ³)
20/11/2019	64.16
21/11/2019	86.71
22/11/2019	103.87
23/11/2019	61.11
24/11/2019	25.54
25/11/2019	30.2
26/11/2019	162.74
27/11/2019	79.34
28/11/2019	64.92
29/11/2019	103.53
30/11/2019	55.71
1/12/2019	44.92
2/12/2019	70.16
3/12/2019	48.34
4/12/2019	- ¹
5/12/2019	- ¹
6/12/2019	71.04
7/12/2019	104.35
8/12/2019	53.24
9/12/2019	86.07
10/12/2019	98.51
11/12/2019	106.96
12/12/2019	63.69
13/12/2019	36.86
14/12/2019	49.17
15/12/2019	50.45
16/12/2019	109.73
17/12/2019	34.63
18/12/2019	45.22
19/12/2019	101.31
20/12/2019	62.05
21/12/2019	96.37
22/12/2019	83.78
23/12/2019	33.08

¹ 24-hour PM₁₀ results recorded on 4 & 5 December 2019 were invalid due to the annual calibration process. Valid results could not be calculated since less than 75 per cent valid 1-hour results were recorded on these days

APPENDIX 5. TRAIN MOVEMENTS

Date	Total train movements per day	Time of train movements (24 hr)	Total tonnage per day
01-Jan-19	0	-	0
02-Jan-19	0	-	0
03-Jan-19	0	-	0
04-Jan-19	0	-	0
05-Jan-19	0	-	0
06-Jan-19	0	-	0
07-Jan-19	0	-	0
08-Jan-19	0	-	0
09-Jan-19	0	-	0
10-Jan-19	0	-	0
11-Jan-19	0	-	0
12-Jan-19	0	-	0
13-Jan-19	0	-	0
14-Jan-19	0	-	0
15-Jan-19	0	-	0
16-Jan-19	0	-	0
17-Jan-19	0	-	0
18-Jan-19	0	-	0
19-Jan-19	0	-	0
20-Jan-19	0	-	0
21-Jan-19	0	-	0
22-Jan-19	0	-	0
23-Jan-19	0	-	0
24-Jan-19	0	-	0
25-Jan-19	0	-	0
26-Jan-19	0	-	0
27-Jan-19	0	-	0
28-Jan-19	0	-	0
29-Jan-19	0	-	0
30-Jan-19	0	-	0
31-Jan-19	0	-	0
01-Feb-19	0	-	0
02-Feb-19	0	-	0
03-Feb-19	0	-	0
04-Feb-19	0	-	0
05-Feb-19	0	-	0
06-Feb-19	0	-	0
07-Feb-19	0	-	0
08-Feb-19	0	-	0
09-Feb-19	0	-	0
10-Feb-19	0	-	0
11-Feb-19	0	-	0
12-Feb-19	0	-	0

Date	Total train movements per day	Time of train movements (24 hr)	Total tonnage per day
13-Feb-19	0	-	0
14-Feb-19	0	-	0
15-Feb-19	0	-	0
16-Feb-19	0	-	0
17-Feb-19	0	-	0
18-Feb-19	0	-	0
19-Feb-19	0	-	0
20-Feb-19	0	-	0
21-Feb-19	0	-	0
22-Feb-19	0	-	0
23-Feb-19	0	-	0
24-Feb-19	0	-	0
25-Feb-19	0	-	0
26-Feb-19	0	-	0
27-Feb-19	0	-	0
28-Feb-19	0	-	0
01-Mar-19	0	-	0
02-Mar-19	0	-	0
03-Mar-19	0	-	0
04-Mar-19	0	-	0
05-Mar-19	0	-	0
06-Mar-19	0	-	0
07-Mar-19	0	-	0
08-Mar-19	0	-	0
09-Mar-19	0	-	0
10-Mar-19	0	-	0
11-Mar-19	0	-	0
12-Mar-19	0	-	0
13-Mar-19	0	-	0
14-Mar-19	0	-	0
15-Mar-19	0	-	0
16-Mar-19	0	-	0
17-Mar-19	0	-	0
18-Mar-19	0	-	0
19-Mar-19	0	-	0
20-Mar-19	0	-	0
21-Mar-19	0	-	0
22-Mar-19	0	-	0
23-Mar-19	0	-	0
24-Mar-19	0	-	0
25-Mar-19	0	-	0
26-Mar-19	0	-	0
27-Mar-19	0	-	0
28-Mar-19	0	-	0
29-Mar-19	0	-	0

Date	Total train movements per day	Time of train movements (24 hr)	Total tonnage per day
30-Mar-19	0	-	0
31-Mar-19	0	-	0
01-Apr-19	0	-	0
02-Apr-19	0	-	0
03-Apr-19	0	-	0
04-Apr-19	0	-	0
05-Apr-19	0	-	0
06-Apr-19	0	-	0
07-Apr-19	0	-	0
08-Apr-19	1	11:30	0
09-Apr-19	0	-	0
10-Apr-19	0	-	0
11-Apr-19	0	-	0
12-Apr-19	1	10:30	0
13-Apr-19	0	-	0
14-Apr-19	1	12:00	0
15-Apr-19	1	12:00	0
16-Apr-19	1	12:00	0
17-Apr-19	0	-	0
18-Apr-19	0	-	0
19-Apr-19	0	-	0
20-Apr-19	1	12:00	0
21-Apr-19	0	-	0
22-Apr-19	0	-	0
23-Apr-19	0	-	0
24-Apr-19	0	-	0
25-Apr-19	0	-	0
26-Apr-19	0	-	0
27-Apr-19	0	-	0
28-Apr-19	0	-	0
29-Apr-19	0	-	0
30-Apr-19	0	-	0
01-May-19	0	-	0
02-May-19	0	-	0
03-May-19	0	-	0
04-May-19	0	-	0
05-May-19	0	-	0
06-May-19	0	-	0
07-May-19	0	-	0
08-May-19	0	-	0
09-May-19	0	-	0
10-May-19	0	-	0
11-May-19	0	-	0
12-May-19	0	-	0
13-May-19	0	-	0

Date	Total train movements per day	Time of train movements (24 hr)	Total tonnage per day
14-May-19	1	06:00	0
15-May-19	1	09:00	0
16-May-19	0	-	0
17-May-19	0	-	0
18-May-19	0	-	0
19-May-19	0	-	0
20-May-19	1	15:00	0
21-May-19	0	-	0
22-May-19	0	-	0
23-May-19	1	10:30	0
24-May-19	0	-	0
25-May-19	0	-	0
26-May-19	0	-	0
27-May-19	0	-	0
28-May-19	0	-	0
29-May-19	0	-	0
30-May-19	0	-	0
31-May-19	0	-	0
01-Jun-19	0	-	0
02-Jun-19	0	-	0
03-Jun-19	0	-	0
04-Jun-19	0	-	0
05-Jun-19	0	-	0
06-Jun-19	0	-	0
07-Jun-19	0	-	0
08-Jun-19	0	-	0
09-Jun-19	0	-	0
10-Jun-19	0	-	0
11-Jun-19	1	12:00	0
12-Jun-19	0	-	0
13-Jun-19	0	-	0
14-Jun-19	0	-	0
15-Jun-19	0	-	0
16-Jun-19	0	-	0
17-Jun-19	0	-	0
18-Jun-19	1	12:00	0
19-Jun-19	0	-	0
20-Jun-19	0	-	0
21-Jun-19	0	-	0
22-Jun-19	0	-	0
23-Jun-19	0	-	0
24-Jun-19	0	-	0
25-Jun-19	0	-	0
26-Jun-19	0	-	0
27-Jun-19	0	-	0

Date	Total train movements per day	Time of train movements (24 hr)	Total tonnage per day
28-Jun-19	0	-	0
29-Jun-19	0	-	0
30-Jun-19	1	17:00	0
01-Jul-19	0	-	0
02-Jul-19	0	-	0
03-Jul-19	0	-	0
04-Jul-19	0	-	0
05-Jul-19	0	-	0
06-Jul-19	0	-	0
07-Jul-19	1	12:00	0
08-Jul-19	0	-	0
09-Jul-19	0	-	0
10-Jul-19	0	-	0
11-Jul-19	0	-	0
12-Jul-19	1	08:00	0
13-Jul-19	0	-	0
14-Jul-19	0	-	0
15-Jul-19	0	-	0
16-Jul-19	0	-	0
17-Jul-19	0	-	0
18-Jul-19	1	12:00	0
19-Jul-19	0	-	0
20-Jul-19	0	-	0
21-Jul-19	0	-	0
22-Jul-19	0	-	0
23-Jul-19	0	-	0
24-Jul-19	0	-	0
25-Jul-19	0	-	0
26-Jul-19	0	-	0
27-Jul-19	0	-	0
28-Jul-19	0	-	0
29-Jul-19	0	-	0
30-Jul-19	0	-	0
31-Jul-19	0	-	0
01-Aug-19	0	-	0
02-Aug-19	0	-	0
03-Aug-19	0	-	0
04-Aug-19	0	-	0
05-Aug-19	0	-	0
06-Aug-19	1	06:30	0
07-Aug-19	0	-	0
08-Aug-19	0	-	0
09-Aug-19	0	-	0
10-Aug-19	0	-	0
11-Aug-19	0	-	0

Date	Total train movements per day	Time of train movements (24 hr)	Total tonnage per day
12-Aug-19	0	-	0
13-Aug-19	0	-	0
14-Aug-19	0	-	0
15-Aug-19	0	-	0
16-Aug-19	0	-	0
17-Aug-19	0	-	0
18-Aug-19	0	-	0
19-Aug-19	0	-	0
20-Aug-19	1	08:00	0
21-Aug-19	0	-	0
22-Aug-19	0	-	0
23-Aug-19	1	17:00	0
24-Aug-19	0	-	0
25-Aug-19	0	-	0
26-Aug-19	0	-	0
27-Aug-19	1	16:00	0
28-Aug-19	1	19:00	0
29-Aug-19	0	-	0
30-Aug-19	0	-	0
31-Aug-19	0	-	0
01-Sep-19	0	-	0
02-Sep-19	0	-	0
03-Sep-19	0	-	0
04-Sep-19	0	-	0
05-Sep-19	1	15:00	0
06-Sep-19	0	-	0
07-Sep-19	0	-	0
08-Sep-19	0	-	0
09-Sep-19	0	-	0
10-Sep-19	0	-	0
11-Sep-19	0	-	0
12-Sep-19	0	-	0
13-Sep-19	0	-	0
14-Sep-19	0	-	0
15-Sep-19	0	-	0
16-Sep-19	0	-	0
17-Sep-19	0	-	0
18-Sep-19	0	-	0
19-Sep-19	0	-	0
20-Sep-19	0	-	0
21-Sep-19	0	-	0
22-Sep-19	1	13:51	0
23-Sep-19	0	-	0
24-Sep-19	0	-	0
25-Sep-19	0	-	0

Date	Total train movements per day	Time of train movements (24 hr)	Total tonnage per day
26-Sep-19	0	-	0
27-Sep-19	0	-	0
28-Sep-19	0	-	0
29-Sep-19	0	-	0
30-Sep-19	0	-	0
01-Oct-19	0	-	0
02-Oct-19	0	-	0
03-Oct-19	1	15:00	0
04-Oct-19	0	-	0
05-Oct-19	0	-	0
06-Oct-19	0	-	0
07-Oct-19	0	-	0
08-Oct-19	0	-	0
09-Oct-19	0	-	0
10-Oct-19	0	-	0
11-Oct-19	0	-	0
12-Oct-19	0	-	0
13-Oct-19	0	-	0
14-Oct-19	0	-	0
15-Oct-19	0	-	0
16-Oct-19	0	-	0
17-Oct-19	0	-	0
18-Oct-19	0	-	0
19-Oct-19	0	-	0
20-Oct-19	0	-	0
21-Oct-19	0	-	0
22-Oct-19	0	-	0
23-Oct-19	0	-	0
24-Oct-19	0	-	0
25-Oct-19	1	15:00	0
26-Oct-19	0	-	0
27-Oct-19	0	-	0
28-Oct-19	1	18:00	0
29-Oct-19	1	01:41	0
30-Oct-19	1	00:01	0
31-Oct-19	0	-	0
01-Nov-19	1	05:00	0
02-Nov-19	0	-	0
03-Nov-19	0	-	0
04-Nov-19	0	-	0
05-Nov-19	0	-	0
06-Nov-19	0	-	0
07-Nov-19	0	-	0
08-Nov-19	0	-	0
09-Nov-19	0	-	0

Date	Total train movements per day	Time of train movements (24 hr)	Total tonnage per day
10-Nov-19	0	-	0
11-Nov-19	0	-	0
12-Nov-19	0	-	0
13-Nov-19	0	-	0
14-Nov-19	0	-	0
15-Nov-19	0	-	0
16-Nov-19	0	-	0
17-Nov-19	1	02:00	0
18-Nov-19	1	15:13	0
19-Nov-19	0	-	0
20-Nov-19	0	-	0
21-Nov-19	0	-	0
22-Nov-19	0	-	0
23-Nov-19	0	-	0
24-Nov-19	0	-	0
25-Nov-19	1	12:00	0
26-Nov-19	1	17:00	0
27-Nov-19	0	-	0
28-Nov-19	0	-	0
29-Nov-19	0	-	0
30-Nov-19	0	-	0
01-Dec-19	0	-	0
02-Dec-19	0	-	0
03-Dec-19	0	-	0
04-Dec-19	0	-	0
05-Dec-19	0	-	0
06-Dec-19	0	-	0
07-Dec-19	0	-	0
08-Dec-19	0	-	0
09-Dec-19	0	-	0
10-Dec-19	0	-	0
11-Dec-19	1	18:30	0
12-Dec-19	0	-	0
13-Dec-19	0	-	0
14-Dec-19	0	-	0
15-Dec-19	0	-	0
16-Dec-19	0	-	0
17-Dec-19	1	18:00	0
18-Dec-19	0	-	0
19-Dec-19	0	-	0
20-Dec-19	1	17:30	0
21-Dec-19	1	23:30	0
22-Dec-19	0	-	0
23-Dec-19	0	-	0
24-Dec-19	2	11:21; 20:31	0

Date	Total train movements per day	Time of train movements (24 hr)	Total tonnage per day
25-Dec-19	0	-	0
26-Dec-19	0	-	0
27-Dec-19	2	07:20; 13:00	0
28-Dec-19	0	-	0
29-Dec-19	0	-	0
30-Dec-19	0	-	0
31-Dec-19	0	-	0

APPENDIX 6. VISUAL IMPACT RESULTS

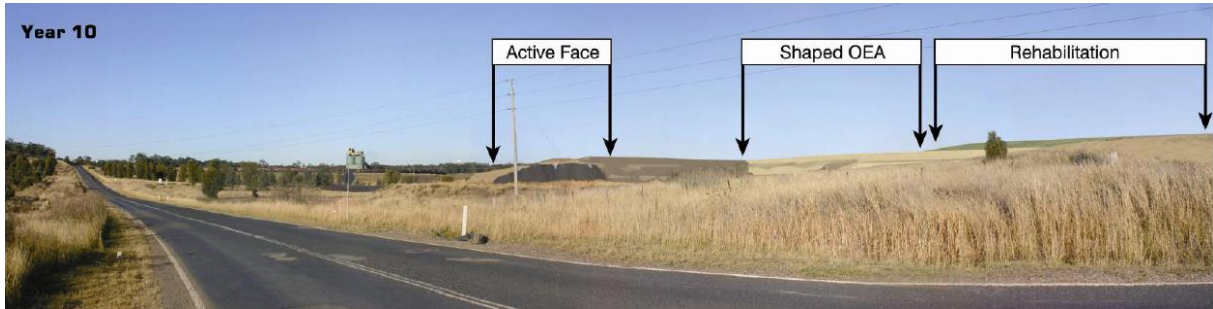


Figure 20. EA photomontage from Thomas Mitchell Drive in year 10



Figure 21. Current view from Thomas Mitchell Drive



Figure 22. EA photomontage from Hassall Rd in year 1 (final landform)



Figure 23. Current view from Hassall Rd

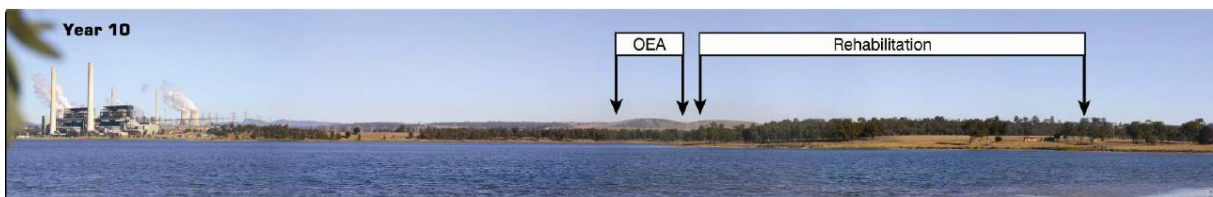


Figure 24. EA photomontage from Lake Liddell in year 10

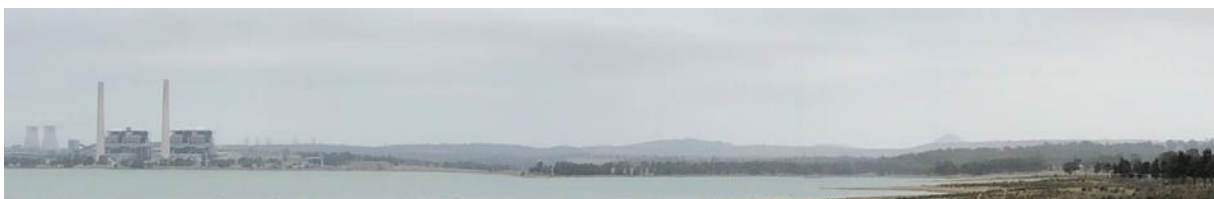


Figure 25. Current view from Lake Liddell

Note. Due to access restrictions the photo in Figure 25 has been taken from a higher vantage.

Year 10



Figure 26. EA photomontage from New England highway in year 10



Figure 27. Current view from New England Highway

APPENDIX 7. BIODIVERSITY MONITORING RESULTS

Table 19. Performance of reference sites

Performance Criteria	Site No.	2016			2017			2019 [#]		
		Canopy	Mid-storey	Ground	Canopy	Mid-storey	Ground	Canopy	Mid-storey	Ground
There is regeneration of species from all structural layers	1b	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	3b	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes
	3c	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Species (sp.) composition does not decrease by more than 10 per cent from year to year	1b	34 sp.			28 sp.			15 sp. (-54%)		
	3b	37 sp.			41 sp.			24 sp. (-59%)		
	3c	25 sp.			23 sp.			16 sp. (-70%)		
Total cover of invasive weed species is less than 5 per cent	1b	0%			0%			30%		
	3b	2%			0%			0%		
	3c	1%			0%			0.2%		

[#] Results heavily influenced by drought conditions

Table 20. Performance of pasture rehabilitation sites

Performance Criteria	Site No.	2016	2017	2019 [#]
Ground cover is between 90-100 per cent	11d	50	88	95
	11i	92	88	10
	12c	-	-	56
Appropriate seed mix (5 species from FY16-FY20 MOP Table 29)	11d	Yes	Yes	No
	11i	Yes	Yes	No
	12c	-	-	No
More than 80 per cent target species	11d	38	28	14
	11i	14	11	6
	12c	-	-	11
Less than 40 per cent cover of a single species	11d	35	50	40
	11i	40	80	2
	12c	-	-	40
Five to six perennial species per square metre	11d	3 sp./m ²	3 sp./m ²	3 sp./m ²
	11i	2 sp./m ²	3 sp./m ²	1 sp./m ²
	12c	-	-	2 sp./m ²
Less than 20 per cent significant weed cover	11d	-	-	41
	11i	-	-	2
	12c	-	-	43
Weeds have been actively managed	11d	-	-	N
	11i	-	-	N
	12c	-	-	N

Performance Criteria	Site No.	2016	2017	2019 [#]
Cover of perennial grasses*	11d	-	-	82%
	11i	-	-	1%
	12c	-	-	51%
Total number of flora species*	11d	-	-	28 sp.
	11i	-	-	17 sp.
	12c	-	-	19 sp.

* No performance criteria

[#] Results heavily influenced by drought conditions

Table 21. Performance of woodland sites

Performance Criteria	Site No.	2016			2017			2019 [#]		
		Canopy	Mid-storey	Ground	Canopy	Mid-storey	Ground	Canopy	Mid-storey	Ground
Ground cover is establishing evenly with bare areas not greater than analogue sites. (i.e. 14 per cent)	7b	10%			8%			10%		
	8b	6%			16%			30%		
	10d	8%			16%			13%		
	12b	-			-			20%		
80 per cent of species from each stratum are represented (Average reference site native canopy composition is 2 species so 80 per cent is more than 1 species)	7b	1 sp.	2 sp.	9 sp.	0 sp.	5 sp.	9 sp.	1 sp.	6 sp.	3 sp.
	8b	2 sp.	1 sp.	2 sp.	1 sp.	0 sp.	2 sp.	0 sp.	0 sp.	0 sp.
	10d	2 sp.	0 sp.	11 sp.	1 sp.	0 sp.	6 sp.	2 sp.	0 sp.	6 sp.
	12b	-	-	-	-	-	-	1 sp.	8 sp.	8 sp.
An average of 100 stems/ha surviving in woodland/forest rehabilitation	7b	75 stems/ha			-			n/a*		
	8b	95 stems/ha			-			0 stems/ha		
	10d	n/a			-			5 stems/ha		
	12b	-			-			n/a*		
Exotic weeds form less than 10 per cent of the species cover	7b	44%			76%			29%		
	8b	92%			62%			72%		
	10d	-			-			70%		
	12b	-			-			7		
Total ground coverage of noxious and nationally significant weeds (High Threat Exotic) is less than 10per cent	7b	-			-			25%		
	8b	-			-			25%		
	10d	-			-			5%		
	12b	-			-			3.2%		

* 7b and 12 b were direct seeded, not planted

[#] Results heavily influenced by drought conditions

Key

	Met performance criteria		Did not meet performance criteria
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APPENDIX 8. WATER ACCOUNTING FRAMEWORK INPUT – OUTPUT STATEMENT

Reporting Period	Date	Storage (MI)
Start	01/01/2019	12,024
Finish	31/12/2019	12,826

INPUTS-OUTPUTS

Input-Output	Element (Source / Destination)	Sub-element (Inputs/Outputs)	Water Quality			Sub-element Total (MI)	Measured, Estimated, Simulated	Accuracy
			Category 1 (MI)	Category 2 (MI)	Category 3 (MI)			
Inputs	Surface Water	<i>Precipitation and Runoff</i>		680		680	Simulated	Medium
		<i>Rivers and Creeks</i>						
		<i>External Surface Water Storage</i>						
	Groundwater	<i>Aquifer Interception</i>			547	547	Estimated	Medium
		<i>Bore Fields</i>						
		<i>Entrainment</i>			219	219	Estimated	Medium
	Seawater	<i>Estuary</i>						
		<i>Sea/Ocean</i>						
	Third Party Water	<i>Contract</i>						
		<i>Wastewater</i>						
<i>Other</i>		2				Measured	High	
TOTAL INPUTS			2	680	547	1,446		
Outputs	Surface Water	<i>Discharge</i>						
		<i>Environmental Flows</i>						
	Groundwater	<i>Seepage</i>						
		<i>Reinjection</i>						
	Seawater	<i>Discharge to Estuary</i>						
		<i>Discharge to Sea/Ocean</i>						
	Supply to Third Party							
	Other	<i>Evaporation</i>	644			644	Simulated	Medium
<i>Entrainment</i>								
<i>Other (potable, misc)</i>								
TOTAL OUTPUTS			644			644		

APPENDIX 9. GROUNDWATER QUALITY RESULTS

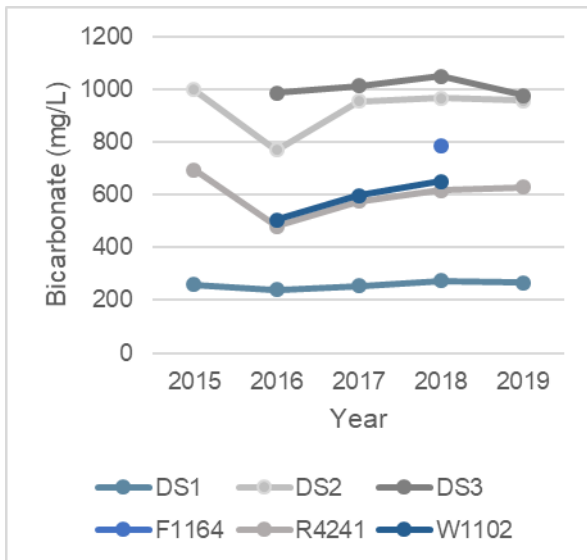


Figure 28. Long-term groundwater bicarbonate

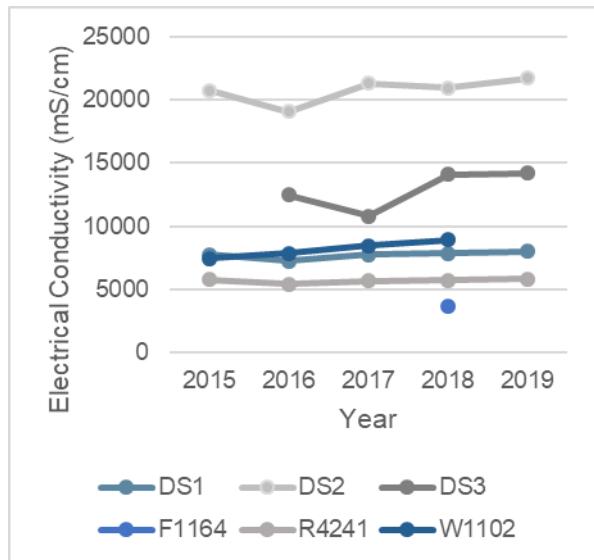


Figure 31. Long-term groundwater EC

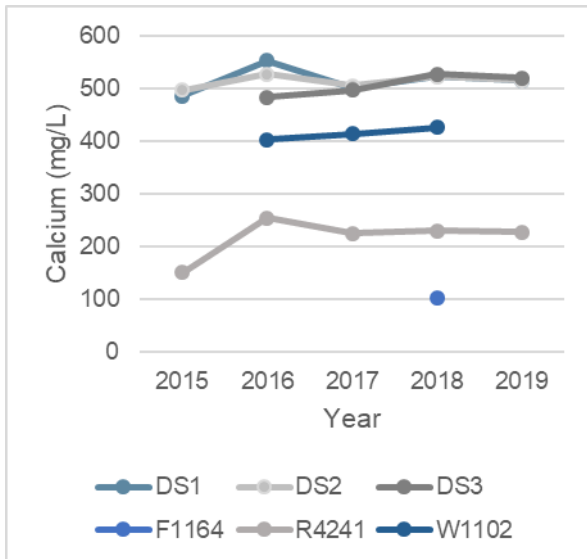


Figure 29. Long-term groundwater calcium

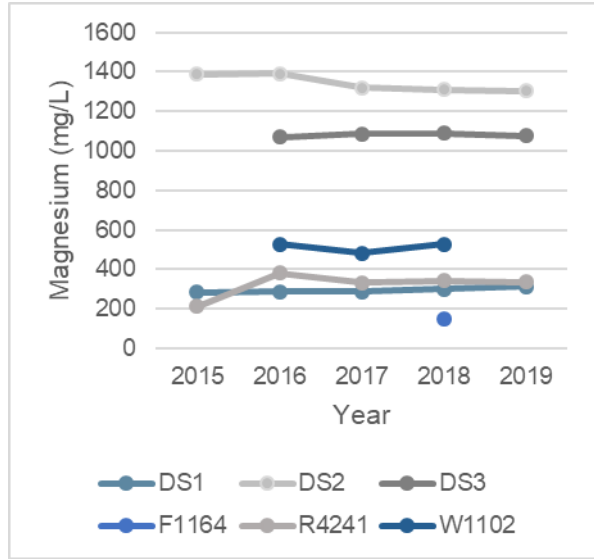


Figure 32. Long-term groundwater magnesium

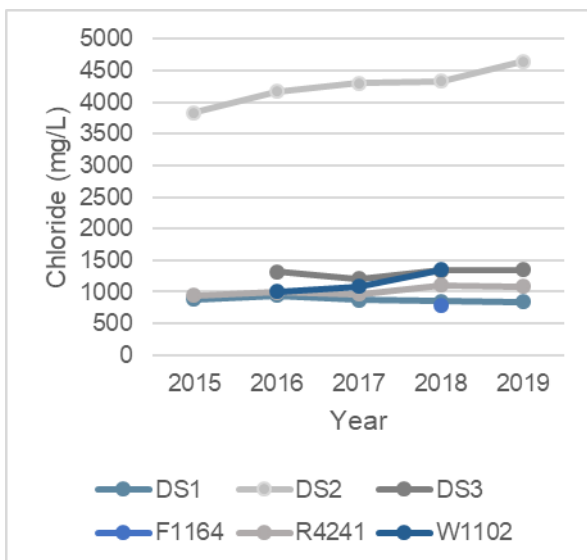


Figure 30. Long-term groundwater chloride

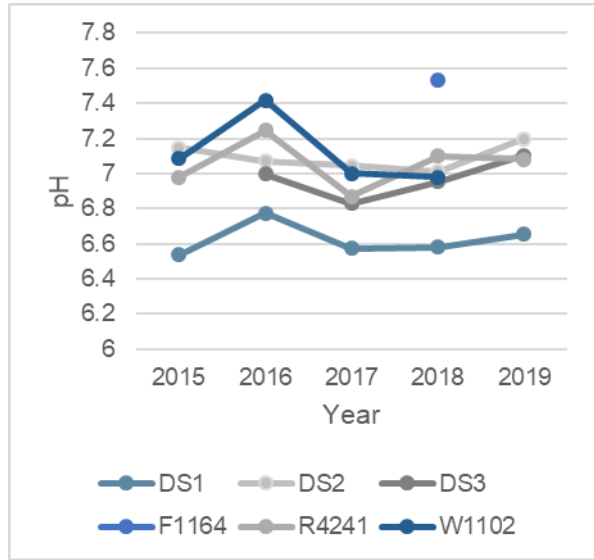


Figure 33. Long-term groundwater pH

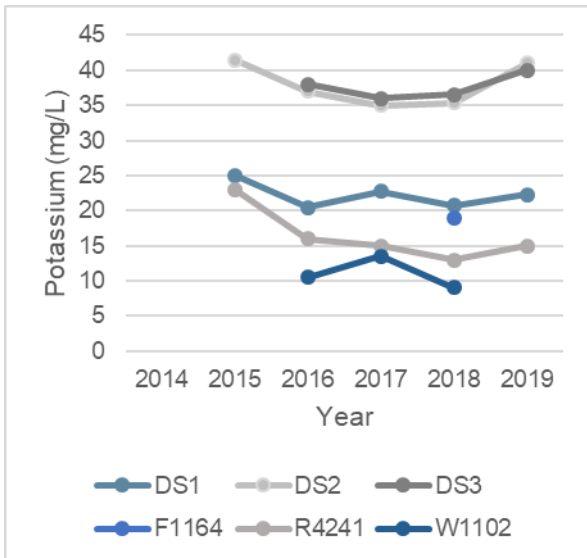


Figure 34. Long-term groundwater potassium

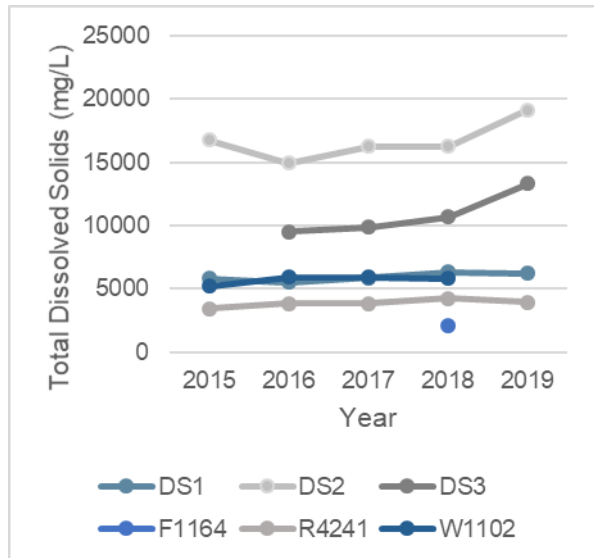


Figure 37. Long-term groundwater TDS

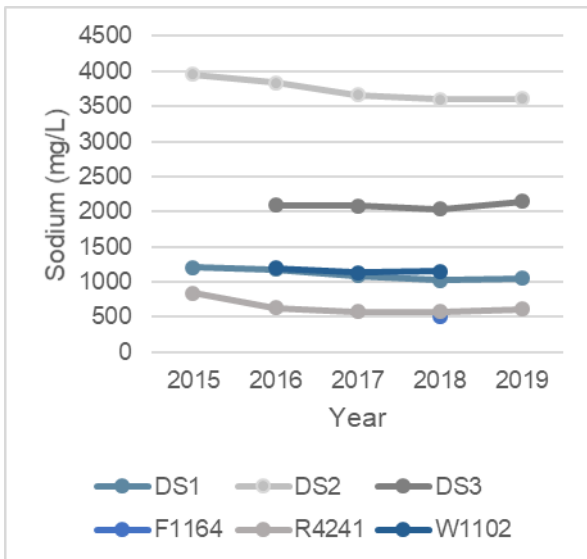


Figure 35. Long-term groundwater sodium

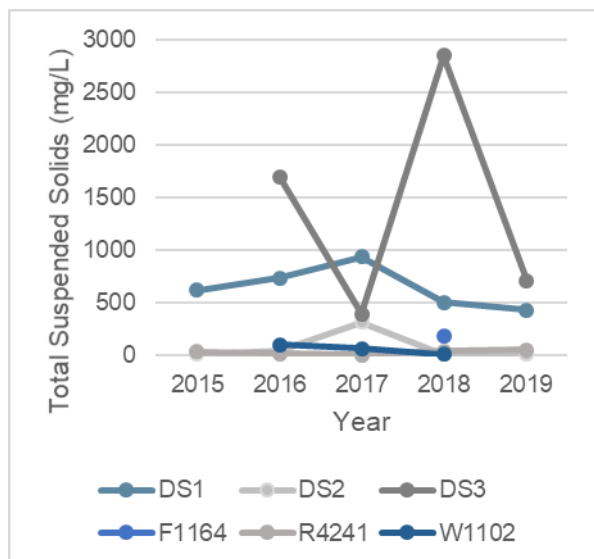


Figure 38. Long-term groundwater TSS

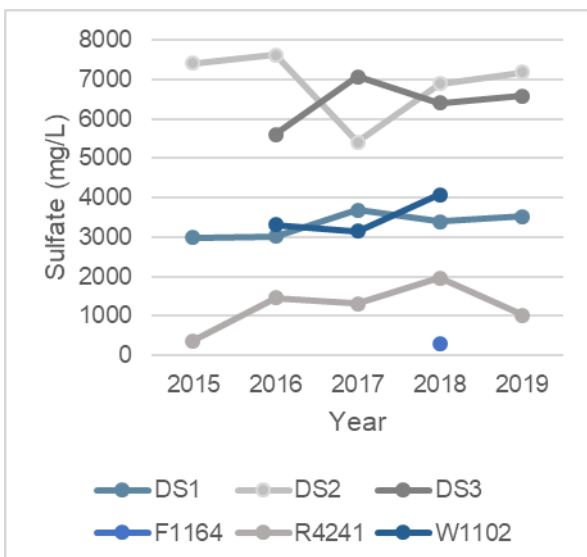


Figure 36. Long-term groundwater sulfate

APPENDIX 10. SURFACE WATER QUALITY RESULTS

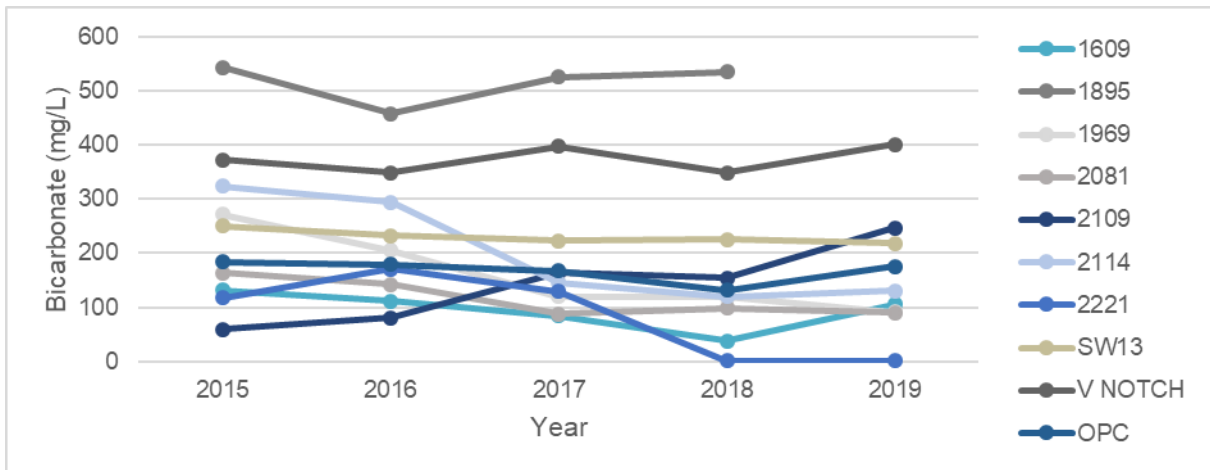


Figure 39. Long-term surface water bicarbonate

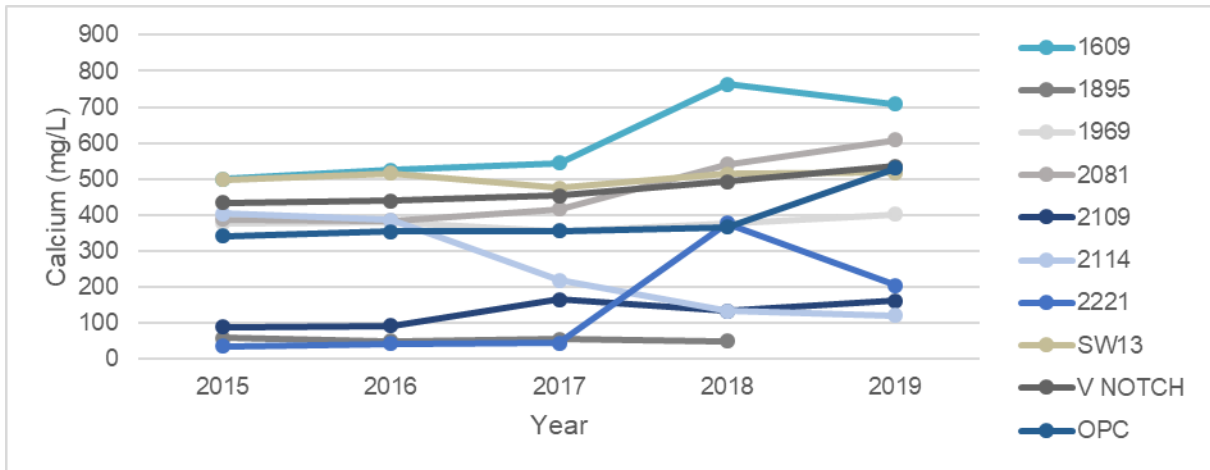


Figure 40. Long-term surface water calcium

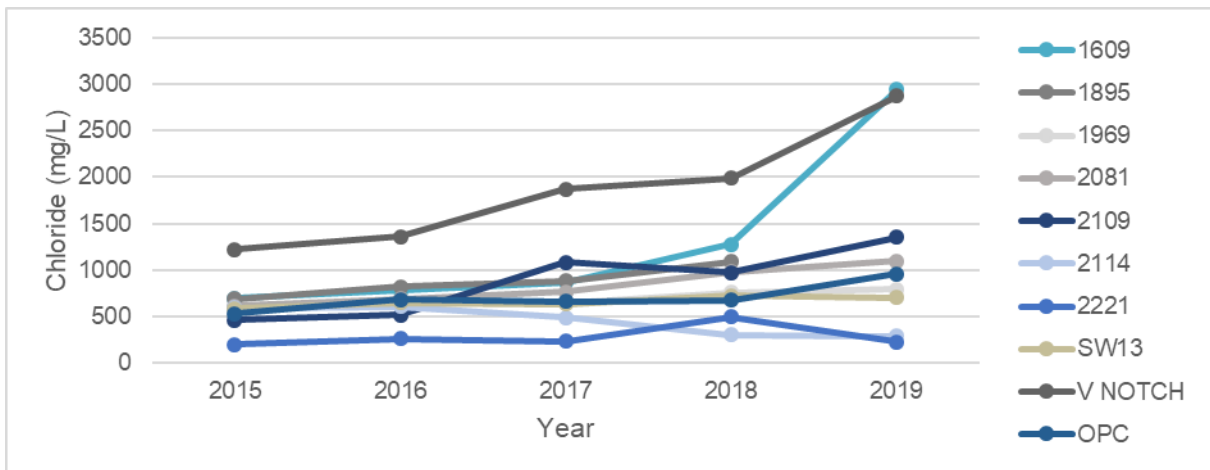


Figure 41. Long-term surface water chloride

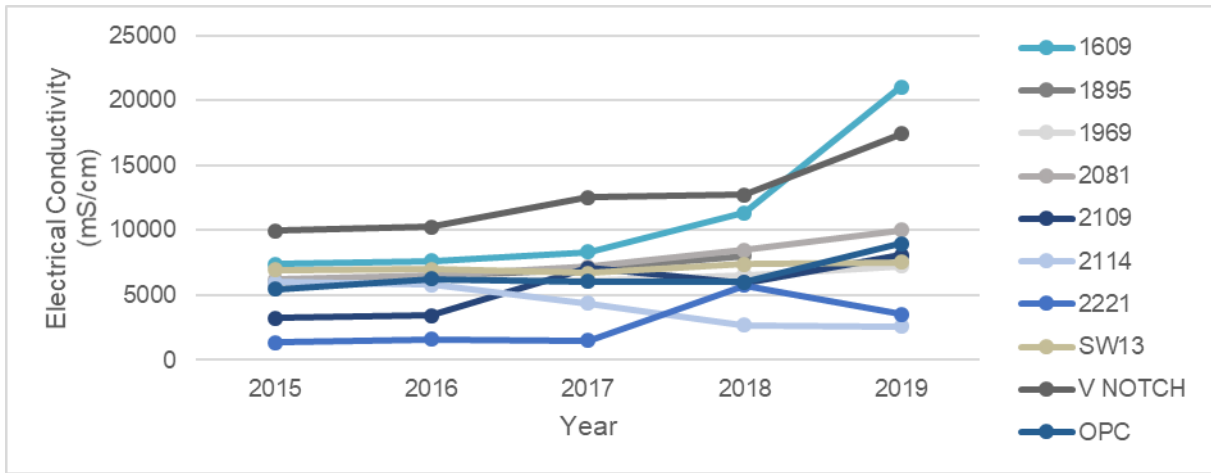


Figure 42. Long-term surface water electrical conductivity

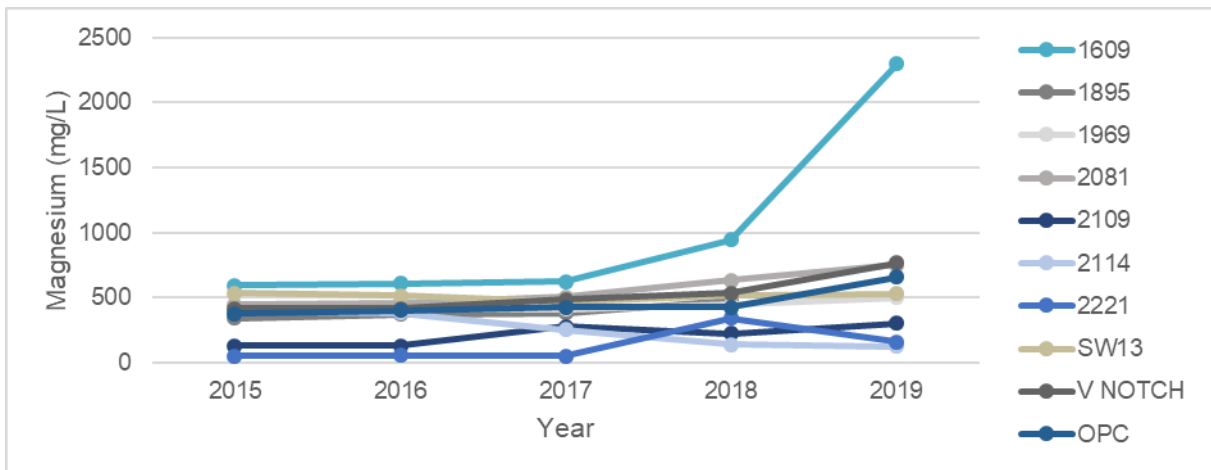


Figure 43. Long-term surface water magnesium

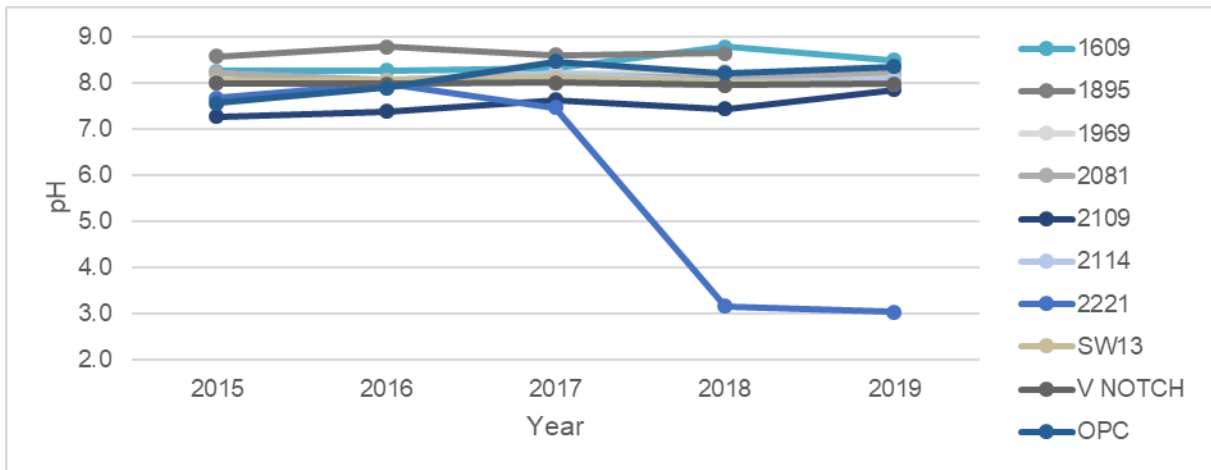


Figure 44. Long-term surface water pH

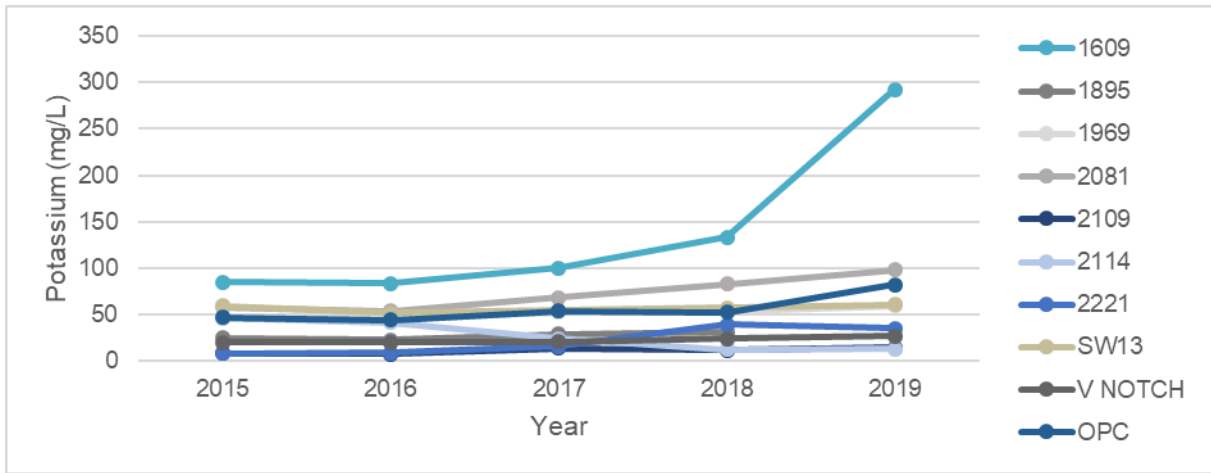


Figure 45. Long-term surface water potassium

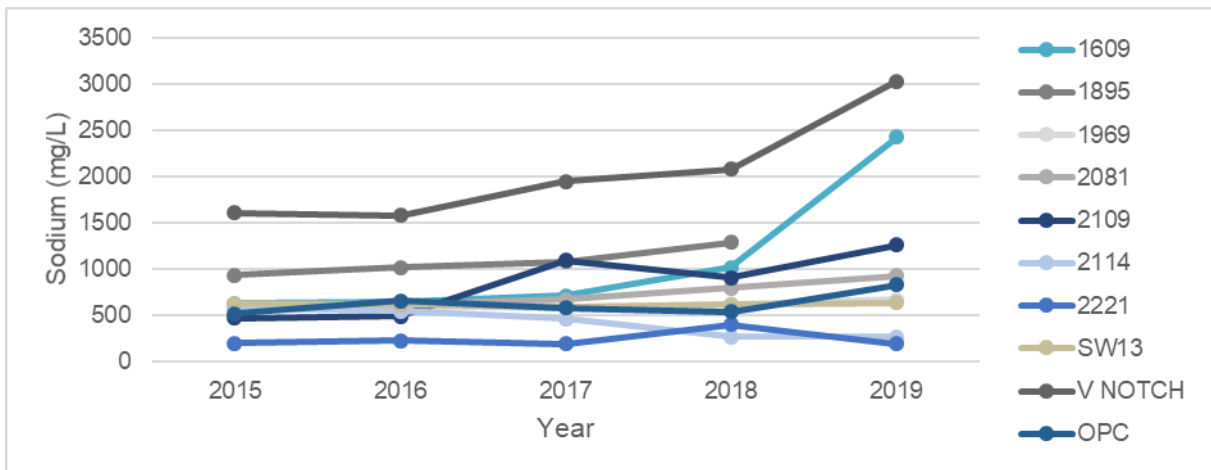


Figure 46. Long-term surface water sodium

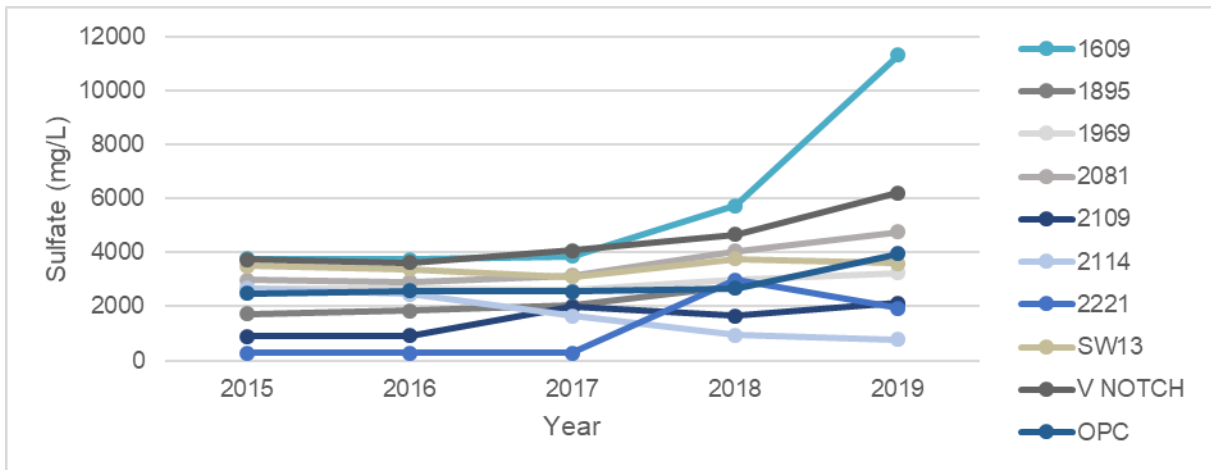


Figure 47. Long-term surface water sulfate

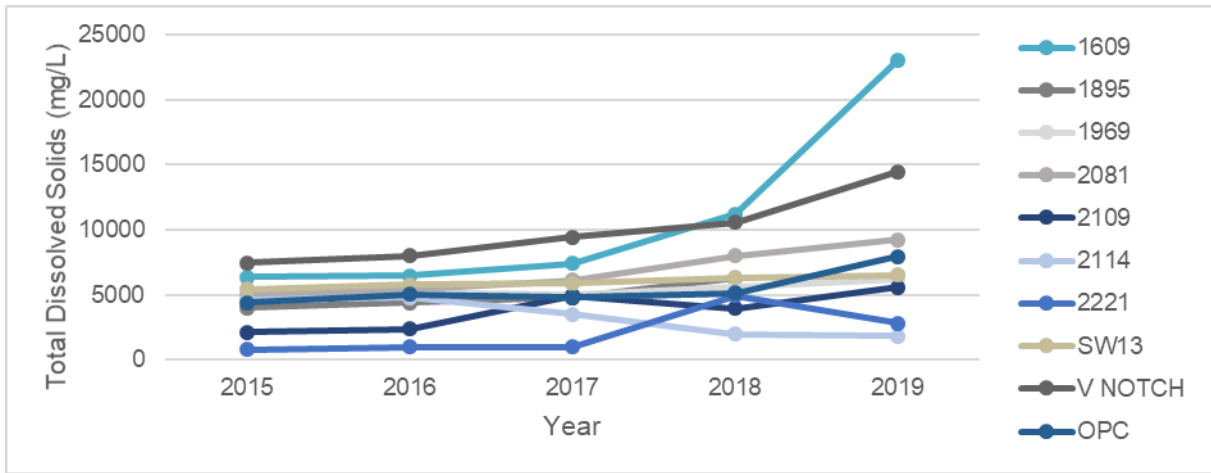


Figure 48. Long-term surface water total dissolved solids

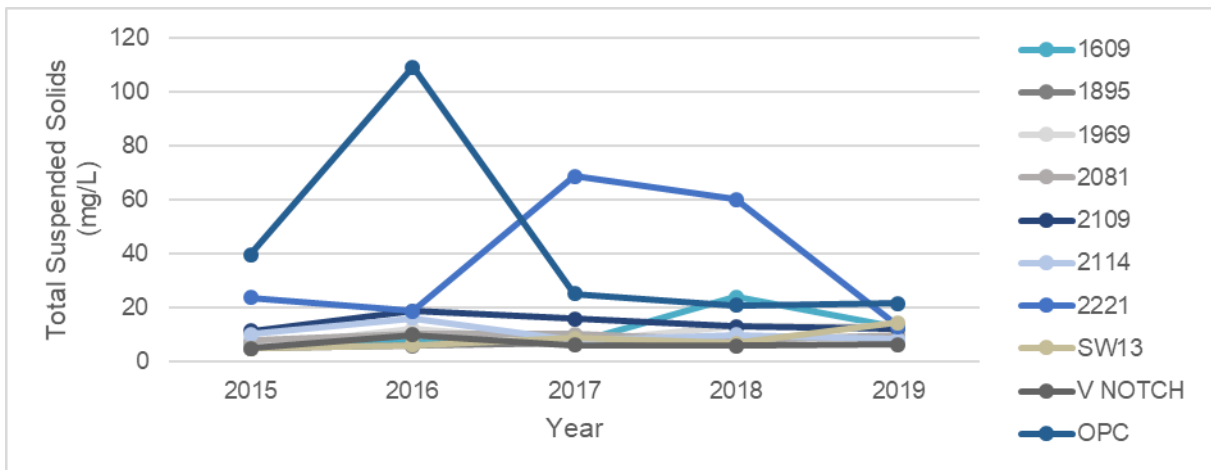


Figure 49. Long-term surface water total suspended solids

*Note. Further information on 2019 results recorded at monitoring locations 2221, 1609 and V NOTCH are provided in **Section 8.4***