YANCOAL
兖煤澳大利亚有限公司

AUSTAR COAL MINE
PART OF THE YANCOAL AUSTRALIA GROUP

# Austar Coal Mine Annual Review

## July 2020 – June 2021

## ANNUAL REVIEW 2021

| | |
|---|---|
| **Name of operation** | Austar Coal Mine |
| **Name of operator** | Yancoal Mining Services Pty Ltd |
| **Development consent / project approval #** | DA 29/95 and PA 08_0111 |
| **Name of holder of development consent / project** | Austar Coal Mine Pty Ltd |
| **Mining lease #** | Refer **Table 3-2** |
| **Name of holder of mining lease** | Austar Coal Mine Pty Ltd |
| **Water licence #** | Refer **Table 7-1** |
| **Name of holder of water licence** | Austar Coal Mine Pty Ltd |
| **MOP start date** | June 2019 |
| **MOP amendment A** | 23 February 2021 |
| **MOP end date** | May 2026 |
| **Annual Review start date** | 1 July 2020 |
| **Annual Review end date** | 30 June 2021 |

**I, William Farnworth, certify that this audit report is a true and accurate record of the compliance status of Austar Coal Mine for the period 1 July 2020 to 30 June 2021 and that I am authorised to make this statement on behalf of Austar Coal Mine Pty Ltd.**

*Note.*

*a) The Annual Review is an 'environmental audit' for the purposes of section 9.39(2) of the Environmental Planning and Assessment Act 1979. Section 9.42 provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.*

*b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or $22,000, or both).*

| | |
|---|---|
| **Name of authorised reporting officer** | William Farnworth |
| **Title of authorised reporting officer** | Mining Engineering Manager |
| **Signature of authorised reporting officer** |  |
| **Date** | 29 September 2021 |

## TABLE OF CONTENTS

## TABLE OF FIGURES



## TABLE OF PLANS



## TABLE OF APPENDICES

# 1 STATEMENT OF COMPLIANCE

**TABLE 1-1 STATEMENT OF COMPLIANCE**

| Were all the conditions of the relevant approval(s) complied with? | |
|---|---|
| Development Consent DA 29/95 | No |
| Project Approval PA 08_0111 | No |
| Environment Protection Licence EPL 416 | No |
| CML 2 | Yes |
| CCL 728 | Yes |
| CCL 752 | Yes |
| DSL 89 | Yes |
| ML 1157 | Yes |
| ML 1388 | Yes |
| ML 1364 | Yes |
| ML 1283 | Yes |
| ML 1345 | Yes |
| ML 1550 | Yes |
| ML 1661 | Yes |
| ML 1666 | Yes |
| ML 1677 | Yes |
| MPL 204 | Yes |
| MPL 217 | Yes |
| MPL 23 | Yes |
| MPL 233 | Yes |
| MPL 269 | Yes |
| WAL 19181 | Yes |
| WAL 41504 | Yes |
| EL 6598 | Yes |

**TABLE 1-2 NON-COMPLIANCES**

| Relevant Approval | Condition # | Condition Description (Summary) | Compliance Status | Comment | Where Addressed in this Annual Review |
|---|---|---|---|---|---|
| EPL 416 | L1.1 | Shall comply with s120 of the POEO Act (pollution of waters) | Non-compliant | During the reporting period there were three reportable incidents that may have caused pollution to waterways being Kitchener SIS sediment basin discharges occurring on 27 July 2020 and 27 March 2021 and pH limit not within criteria on 9 July 2020. Incident reports were submitted to the EPA on 3 August 2020, 26 March 2021 and 16 July 2020, respectively. The incident reports concluded that there was unlikely to have been any material harm caused by the incidents. | **Section 7.3.2, Section 7.3.4 and Section 11** |
| EPL 416 | L2.1 | For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table. | Non-compliant | pH limit not within criteria on 9 July 2020. An incident report was submitted to the EPA 16 July 2020 which concluded that there was unlikely to have been any material harm caused by the incident. | **Section 7.3.2 and Section 11** |
| EPL 416 | L2.2 | Where a pH quality limit is specified in the table, the specified | Non-compliant | As above | **As above** |

| Relevant Approval | Condition # | Condition Description (Summary) | Compliance Status | Comment | Where Addressed in this Annual Review |
|---|---|---|---|---|---|
| | | percentage of samples must be within the specified ranges. | | | |
| EPL 416 | L2.4 | Water and/or Land Concentration Limits | Non-compliant | As above | **As above** |
| PA08_0111 and DA29/95 | Schedule 4, condition 8 and Schedule 3, Condition 5 | The Proponent shall not discharge any water from the site except as may be expressly provided by an EPL, or in accordance with s120 of the POEO Act 1997. | Non-compliant | The sediment dams at Kitchener Surface Infrastructure Site overtopped on two occasions during greater-than-design rainfall events being 27 July 2020 and 27 March 2021. Incident reports were submitted to the EPA on 3 August 2020, 26 March 2021 and 16 July 2020, respectively. The incident reports concluded that there was unlikely to have been any material harm caused by the incidents. | **Section 7.3.4, Section 11** |
| PA08_0111 and DA29/95 | Schedule 7, Condition 3 and Schedule 5, condition 5 | Each year, the Proponent shall review the environmental performance of the mine complex to the satisfaction of the Director-General. | Non-compliant | Excepting air quality results, the 2019-20 Annual Review did not report or present long-term trends in monitoring data over the life of the mine. | **Section 11** |
| PA08_0111 Statement of Commitments | 1.7.2 | The results of groundwater monitoring and a comparison of measured and predicted impacts will be reported annually in the Annual Environmental | Non-compliant | In the 2019-20 Annual Review comments regarding trends are generally limited to the 12-month reporting period only. | **Section 11** |

| Relevant Approval | Condition # | Condition Description (Summary) | Compliance Status | Comment | Where Addressed in this Annual Review |
|---|---|---|---|---|---|
| | | Management Report. | | | |

**TABLE 1-3 COMPLIANCE STATUS KEY FOR TABLE 1-2**

| Risk Level | Colour Code | Description |
|---|---|---|
| High | Non-compliant | Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence |
| Medium | Non-compliant | Non-compliance with:<br>• potential for serious environmental consequences, but is unlikely to occur; or<br>• potential for moderate environmental consequences, but is likely to occur |
| Low | Non-compliant | Non-compliance with:<br>• potential for moderate environmental consequences, but is unlikely to occur; or<br>• potential for low environmental consequences, but is likely to occur |
| Administrative non-compliance | Non-compliant | Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions) |

# 2 INTRODUCTION

## 2.1 Scope

This Annual Review covers the annual reporting period from 1 July 2020 to 30 June 2021 (the reporting period). Austar Coal Mine Pty Limited (Austar) is required to prepare and submit an Annual Review that satisfies the annual reporting requirements under Development Consent DA 29/95, Project Approval PA 08_0111, Mining Leases, Mining Operations Plan (MOP) and management plans required under the various development consents. This Annual Review has been prepared in accordance with the NSW Government *Annual Review Guideline Post-approval requirements for State significant mining developments, October 2015*. Annual water take against water licences is also recorded in this document.

## 2.2 Background

Austar, a subsidiary of Yancoal Australia Limited (Yancoal), operates the Austar Coal Mine, an underground coal mine located approximately 10 kilometres southwest of Cessnock in the Lower Hunter Valley in NSW. Austar Coal Mine incorporates the former Pelton, Ellalong, Cessnock No. 1 (Kalingo) and Bellbird South Collieries and includes coal extraction, handling, processing and rail and road transport facilities. Pit top facilities are located on Middle Road, Paxton, and the Coal Handling and Preparation Plant (CHPP) is located at Wollombi Road, Pelton (**Figure 2-1**).

Development Consent DA29/95 was granted under Section 91 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 14 February 1996 and was most recently modified under Section 75W (repealed) of the EP&A Act on 25 August 2017. DA29/95 relates primarily to the Bellbird South mining area and operational areas.

Project Approval PA08_0111 was granted under Section 75J of the EP&A Act on 6 September 2009 and was most recently modified under Section 75W of the EP&A Act in December 2013. PA08_0111 relates primarily to the Stage 3 mining area. PA08_0111 was declared State Significant Development (SSD) under Clause 6 of Schedule 2 to the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017* via Government Gazette on 15 November 2018.

Surface infrastructure includes the Pit Top facilities (including administration buildings, the main access drift, coal clearance, store, workshop and laydown facilities), No 1 shaft (second egress man winder), No 2 shaft (mine dewatering), Kalingo Infrastructure Area (ventilation fans and underground services), the CHPP area (including CHPP, administration areas, Reverse Osmosis plant, overland conveyor and a number of heritage listed buildings in various states of repair), coarse reject emplacement areas (Aberdare, Area 12 and Area 13) and Kitchener Surface Infrastructure Site (SIS) (ventilation shafts and fans, services borehole/drop hole), along with water management dams, pipelines and powerlines.

The Mining Operations Plan (MOP) was initially approved by the Resources Regulator on 21 August 2019 and covers the period 21 August 2019 to 1 May 2026. The MOP was amended to reflect Austar

Coal Mine's transition to a care and maintenance phase. The MOP amendment was approved by the Resources Regulator on 4 March 2021.

On 26 February 2021, after over 100 years of operation, the decision was made to transition Austar Coal Mine to closure activities. This decision followed a review that evaluated the viability of re-commencing production at Austar. During the reporting period no mining was undertaken at Austar Coal Mine.

During this transition period, Austar is focussing on planning for closure, which is outlined in the current approved Mining Operations Plan (MOP) and summarised in **Section 8.5**.

The location of approved operations is shown in **Figure 2-1**.

## 2.3 Mine Contacts

**Table 2-1** outlines the contact details for site personnel responsible for care and maintenance while transitioning to closure, rehabilitation, environmental and community liaison at Austar.

**TABLE 2-1 SITE PERSONNEL**

| Position | Name | Company | Contact Number |
|---|---|---|---|
| Mining Engineering Manager | William Farnworth | Austar | (02) 4993 7356 |
| Environment & Community Superintendent | Carly McCormack | Austar | (02) 4993 7334 |

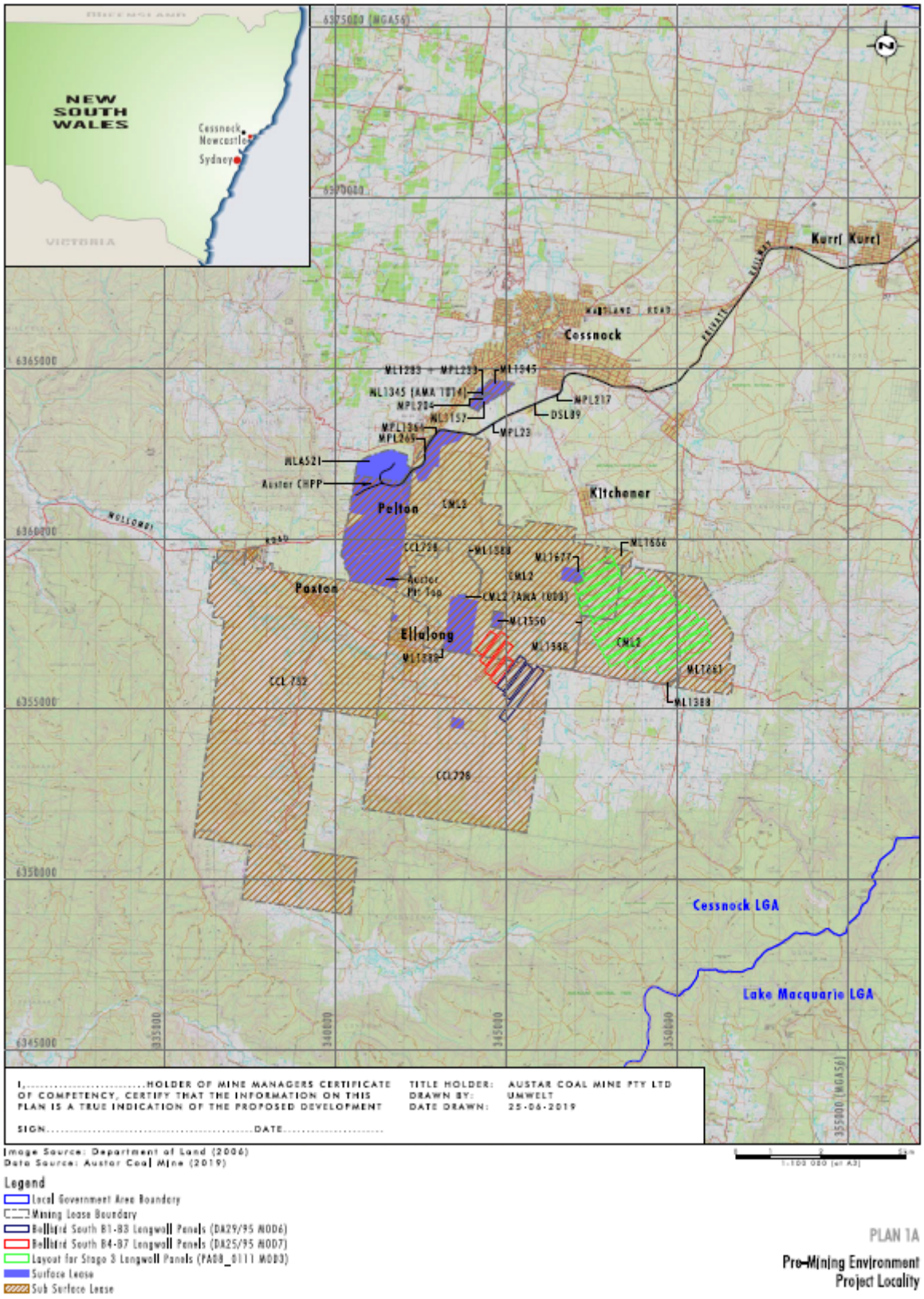



**FIGURE 2-1 LOCALITY PLAN AND APPROVED MINING OPERATIONS**

# 3 APPROVALS

Austar's operations are regulated through various leases, licences, permits and approvals as set out below.

## 3.1 Changes to Approvals during the Reporting Period

During the reporting period Austar responded to a notice issued under section 240 of the *Mining Act 1992* to prepare and submit a MOP amendment to address changes in activities following Austar entering care and maintenance. The MOP update is discussed in Section 3.3.2.

## 3.2 Primary Approvals

### 3.2.1 Development Approval

A summary of Austar's development approvals is outlined in **Table 3-1**.

**TABLE 3-1 DEVELOPMENT CONSENTS HELD BY AUSTAR**

| Consent Description | Date | Expiry | Approval Authority | Summary of Approved Development |
|---|---|---|---|---|
| DA 29/95 | 14 Feb 1996 | 14 Feb 2022 | Minister for Urban Affairs and Planning | Ellalong Colliery Extension into Bellbird South.<br>Extension of underground mining activities into Bellbird South area (CML 2).<br>Mine life of 21 years with a production of 3 Million tonnes per annum (Mtpa).<br>Reject emplacement.<br>Construction and operation of a new infrastructure site including new ventilation shaft and fan(s) (No. 2 Shaft) adjacent to Sandy Creek Road.<br>Use of Pelton CHPP for washing and handling of coal.<br>Provision of a maximum raw coal stockpile of 100,000 t.<br>Reopening of disused Cessnock No. 1 Colliery shafts for ventilation and access, or the sinking of new shafts, as required.<br>Construction of various water management devices including sedimentation and clean water dams and drainage systems. |
| DA 29/95 (Modifications) | 27 September 2006 (MOD 1) | 14 Feb 2022 | Minister for Planning | Extension of Underground Mining Activities into Bellbird South (Ellalong Colliery) – Modification. |

| Consent Description | Date | Expiry | Approval Authority | Summary of Approved Development |
|---|---|---|---|---|
| | 8 Jun 2008 (MOD 2)<br><br>28 May 2009 (MOD 3)<br><br>7 Dec 2010 (MOD 4)<br><br>27 April 2012 (MOD 5)<br><br>29 January 2016 (MOD 6)<br><br>25 August 2017 (MOD 7) | | | Use of long wall top coal caving (LTCC) mining methods in two longwall panels.<br>Installation of a larger capacity fan at the site approved for DA 8/1999/1658.<br>Installation of a new downcast ventilation shaft.<br>Installation of a new 10 MVA substation.<br>Installation of a nitrogen inertisation plant with a 2,000-cubic metre capacity.<br>Provision of a diesel and emulsion fluid storage area and dispatch system.<br>Installation of a tube bundle shed to house electronic monitoring equipment.<br>Upgrade of the existing water treatment plant.<br>Upgrade of water reticulation and pumps.<br>Minor embankment stabilisation works at Kalingo Dam.<br>Longer and wider panels A4 and A5.<br>Extract one additional Longwall Panel A5a (LW A5a).<br>Extension of Longwall Panel A5a<br>Extension to Bellbird South development consent area to include Longwall panels LWB1 to LWB7.<br>Extension of consent to 14 February 2022. |
| Project Approval 08_0111 | 6 Sep 2009 | 31 Dec 2030 | Minister for Planning | Stage 3 Expansion Project - extension to longwall mining area to east of existing operations. Key features:<br>Longwall production from the Greta coal seam from panels A6 to A17 using LTCC.<br>Construction of a new surface infrastructure site south west of Kitchener including ventilation shafts and fans, winders, bath house facilities, a workshop, electricity substation, store and offices. Construction of a new road and intersection at Quorrobolong Road.<br>Coal will continue to be brought to the surface at Austar's existing surface facilities at Paxton. These facilities will continue to be used to take large mining equipment into and out of the mine. |

| Consent Description | Date | Expiry | Approval Authority | Summary of Approved Development |
|---|---|---|---|---|
| | | | | Continued use of Austar's existing water management, coal transport systems, coal preparation plant and rejects emplacement areas. |
| Project Approval 08_0111 (Modifications) | 4 May 2010 (MOD 1)<br><br>13 March 2012 (MOD 2)<br><br>17 Dec 2013 (MOD3) | 31 Dec 2030 | Delegate for Minister for Planning | Minor change to subsidence impact performance measures to built features in Table 1 of Project Approval. The key performance indicator which was amended in the Project Approval requires the project does not cause built features to go beyond safe, serviceable and repairable criteria, unless the landowner agrees in writing.<br>Reorientation of the Stage 3 longwalls. Removal of longwall A6, and extraction of coal in longwalls A7 to A19, which are a reorientation of previously approved longwalls A7 to A17 to more closely align with the direction of principal stress. In addition, the chain pillar widths are increased from 45m to 55m to reduce roadway failure risks which in turn further minimises subsidence. The modification will enable more efficient and safer extraction of coal from the Stage 3 area.<br>Extension of Stage 3 longwalls A7 to A10. |
| DA 74/75/79 | 4 Dec 1975 | Nil expiry | Cessnock City Council (Council) | Development Consent for a coal mine at Ellalong including:<br>Approval for underground coal mining.<br>Construction of a new access drift, upcast shaft and ventilation shaft.<br>Expansion of the Pelton CHPP.<br>Conveyance of coal from the Ellalong pit top to the Pelton CHPP Operation for the washing and handling of coal.<br>Water management systems.<br>Upgrade of the Pelton rail loading facility and railway spur.<br>Reject emplacement underground, open cut areas adjoining Pelton and other abandoned mine sites. |
| DA 118/680/93 | 8 Oct 1980 | Nil expiry | Council | Downcast Ventilation Shaft and Man Access Shaft, Bathhouse and Offices at Ellalong Colliery. |

| Consent Description | Date | Expiry | Approval Authority | Summary of Approved Development |
|---|---|---|---|---|
| DA 118/691/181 | 26 Nov 1992 | Nil expiry | Council | Pelton Open Cut Coal Mine.<br>Approval of an open cut coal mine adjoining Pelton Colliery up to 300,000 tonnes of coal and underground mining of approximately 27,000 tonnes of coal from a section of prior workings south of the proposed open cut. |
| DA 118/691/181 | 11 Jan 1993 | Nil expiry | Council | Pelton Open Cut Coal Mine – Modification.<br>Extension of open cut mining area.<br>Infrastructure and water management modifications. |
| DA 118/691/229 | 7 Jan 1993 | Nil expiry | Council | Pelton Coal Handling Preparation Plant – Raw Coal Handling Facility, Washed Coal Facility and Upgrading of the Water Management System.<br>Upgrade and replacement of coal handling infrastructure such as surge bin, automatic stacking system, reclaim facilities and skyline conveyor.<br>Increase in stockpile capacity.<br>Upgrade to water management system.<br>Extension of the reclaim tunnel.<br>Construction of a mine water transfer pipeline from Ellalong Colliery to Pelton.<br>Provision of underground workings for emergency mine water disposal.<br>Upgrade of lime treatment plant. |
| DA 118/693/42 | 26 Nov 1993 | Nil expiry | Council | Extension of Pelton Open Cut Mine.<br>Extension of open cut mining area including emplacement of overburden in previously mined blocks and extension of the mine's water management system. |
| DA 118/694/120 | 27 Jun 1994 | Nil expiry | Council | Approves the extraction of longwall panels LW13 and LW14 as a minor extension to the Ellalong Colliery within CML2. |
| DA 118/694/152 | 7 Jul 1994 | Nil expiry | Council | Relocatable Office and Temporary Bathhouse at Pelton Colliery. |
| DA 118/695/22 | 12 Jul 1995 | Nil expiry | Council | Establishment of an overburden stockpile for the Pelton Open Cut Operations. |
| DA 118/695/81 | 12 Jul 1995 | Nil expiry | Council | Additions for Bathhouse, office and car park at Ellalong Colliery. |

| Consent Description | Date | Expiry | Approval Authority | Summary of Approved Development |
|---|---|---|---|---|
| | | | | Extension to the bathhouse at the Ellalong drift site.<br>Extension of existing offices or construction of portable offices.<br>Construction of a 4000-square metre car park. |
| DA 8/1999/1658 | 18 Feb 2000 | Nil expiry | Council | Relocation of Ventilation Facilities at Bellbird South Underground Mine.<br>Installation of a ventilation shaft and fan house.<br>Upgrading of the existing access track to the site from the Pelton - Ellalong Road. |
| DA 8/2002/655/1 | 16 Oct 2002 | Nil expiry | Council | Compressor and Pump Enclosure Buildings at Ellalong Colliery. |
| DA 118/695/18 | 21 Feb 1995 | Nil expiry | Council | Relocatable Office at Pelton Colliery. |
| DA 8/2012/503/1 | 19 Dec 2012 | Nil expiry | Council | Extension of car parking area associated with Austar Coal Mine |

### 3.2.2 Mining Authorities

Details of the relevant mining authorities are summarised **Table 3-2**.

**TABLE 3-2 MINING LEASES HELD BY AUSTAR**

| Mining Title (Act) | Date Granted | Expiry Date | Area (ha) | Surface | Depth Restriction |
|---|---|---|---|---|---|
| EL 6598 (1992) | 13/07/2006 | 13/07/2021* | 7,370 | Yes | Various |
| Dam Site Lease 89 (1901) | 04/04/1908 | 04/04/2030 | 3.961 | Yes | Surface to 15.24 metres |
| Mineral Lease No. 1157 (1906) | 8/07/1949 | 08/07/2028 | 10.24 | Yes | Surface to 15.24 metres |
| Mineral Lease No. 1283 (1906) | 13/07/1961 | 13/07/2022* | 1.973 | No (sub-surface) | 7.62 to 15.24 metres |
| Mining Purposes Lease No. 23 (1906) | 17/05/1909 | 17/05/2030 | 2.421 | Yes | Surface to 15.24 metres |
| Mining Purposes Lease No. 204 (1906) | 03/02/1916 | 03/02/2039 | 1.2 | Yes | Surface to 15.24 metres |

| Mining Title (Act) | Date Granted | Expiry Date | Area (ha) | Surface | Depth Restriction |
|---|---|---|---|---|---|
| Mining Purposes Lease No. 217 (1906) | 12/04/1916 | 03/02/2039 | 0.6298 | Yes | Surface to 15.24 metres |
| Mining Purposes Lease No. 233 (1906) | 01/08/1916 | 01/08/2036 | 1.973 | Yes | Surface to 7.62 metres |
| Mining Purposes Lease No. 269 (1906) | 07/12/1917 | 07/12/2039 | 2.79 | Yes | Surface to 6.1 metres below the level of the rails when laid |
| Mining Purposes Lease No. 1364 (1906) | 28/10/1968 | 28/10/2029 | 0.4527 | Yes | Surface to 15.24 metres |
| Consolidated Coal Lease No. 728 (1973) | 10/10/1989 | 30/12/2023* | 3296.8 | Various | Various |
| Consolidated Coal Lease No. 752 (1973) | 23/05/1990 | 30/12/2023* | 3802 | No (Sub-surface) | Various |
| Consolidated Mining Lease No. 2 (1992) | 24/03/1993 | 06/07/2025 | ML – 3406ha, AMA 2.528ha | Various | Various |
| Mining Lease No. 1345 (1992) | 23/03/1995 | 30/12/2023* | ML – 41.9ha, AMA 0.5659 ha | Yes | Surface to 900 metres depth |
| Mining Lease No. 1388 (1992) | 02/04/1996 | 02/04/2038 | 15.12 | No (sub-surface) | 30.48 metres to unlimited depth |
| Mining Lease No. 1550 (1992) | 24/06/2004 | 23/06/2025 | 14.11 | Yes | Surface to 20 metres |
| Mining Lease No. 1661 (1992) | 22/11/2011 | 22/11/2032 | 469.32 | No (sub-surface) | 20 to 900 metres |
| Mining Lease No. 1666 (1992) | 25/01/2012 | 25/01/2033 | 34.13 | No (sub-surface) | 30.48 to 900 metres |
| Mining Lease No. 1677 (1992) | 23/08/2012 | 22/08/2033 | 9.16 | Yes | Surface to 30.48 metres |
| Mining Lease Application No. 521 (1992) | Lodged February 2016 | Pending Approval | 115 | Yes | Surface to 50m |

*Renewal documents lodged

### 3.2.3 Environment Protection Licence

Austar operates in accordance with Environment Protection Licence 416 (EPL 416), issued on 5 April 2000 and last updated on 15 December 2017 by the NSW Environment Protection Authority (EPA), under the authority of the *Protection of the Environment Operations Act 1997*.

## 3.3 Ancillary Approvals

### 3.3.1 Extraction Plans

A summary of Extraction Plan / SMP approvals for Bellbird South (LWB1-LWB7) and Stage 3 mining areas held by Austar is outlined in **Table 3-3**. Previous SMP approvals for the Bellbird South Stage 2 area and the Stage 3 mining area are also shown in **Table 3-3**.

**TABLE 3-3 - SUBSIDENCE MANAGEMENT PLAN / EXTRACTION PLAN APPROVALS HELD BY AUSTAR**

| Description | Date | Expiry Date | Approval Authority | Approval Summary |
|---|---|---|---|---|
| Extraction Plan Approval | 30 May 2013 | 31 Dec 2030 | DPIE | Extraction Plan approval for Austar Coal Mine Longwalls A7 to A10 |
| SMP Approval 13/1876 | 3 June 2013 | 31 May 2020 | DRE | Subsidence Management Plan approval for Austar Coal Mine Longwalls A7 to A10. |
| Extraction Plan Approval | 6 Jan 2014 | 31 Dec 2030 | DPIE | Extraction Plan approval for Austar Coal Mine Longwalls A7 to A10 to correspond to PA08_0111 MOD3 and retraction to LWA8 start position. |
| SMP Variation Approval 13/1876 | 7 Jan 2014 | 31 May 2020 | DRE | Subsidence Management Plan approval for Austar Coal Mine Longwalls A7 to A10 to correspond to PA08_0111 MOD and retraction to LWA8 start position. |
| SMP Variation Approval 13/1876 | 19 Feb 2014 | 31 May 2020 | DRE | Subsidence Management Plan approval for retraction to LWA9 commencing end |
| Extraction Plan LWB1 to LWB3 | 16 May 2016 | Not specified | DPIE | Extraction Plan for Bellbird South Longwalls B1 to B3 was approved on 4 July 2016 |
| Extraction Plan LWB4 to LWB7 | 1 February 2019 | Not specified | DPIE | Extraction Plan for Bellbird South Longwalls B4 to B7 approved on 20 September 2017. Updated to include the shortening of LWB4 was approved on 18 September 2018 and again on 12 February 2019. Other variations to Longwalls B5-B7 were approved on 7 August 2019 |

### 3.3.2 Mining Operations Plan

Pursuant to the *Mining Act 1992*, Austar conducts operations in accordance with an approved Mining Operations Plan (MOP). The MOP covers underground mining, ventilation, required infrastructure, coal handling, reject emplacement, rehabilitation, and other associated activities. The MOP is approved for the period June 2019 to May 2026.

In June 2020 the Resources Regulator issued a notice under s240 of the *Mining Act 1992* to prepare and submit a MOP amendment to address changes in activities following Austar entering care and maintenance. The scope of the amendments to the MOP included:

- Changes in site activities during the period of care and maintenance;
- Management of environmental risks during care and maintenance; and
- Inclusion of a schedule of mine closure planning investigations and studies to be carried out before the end of 2022 (see Section 8.5).

MOP Amendment A was approved on 4 March 2021.

### 3.3.3 Environmental Management Plans

In accordance with DA29/95 and PA08_0111, Austar has developed and implemented a range of environmental management plans. **Table 3-4** outlines the environmental management plans required by each relevant development consent, the determining authority and their approval status.

During the reporting period, all environmental management plans were reviewed and updated to address the transition to closure and lodged for approval with DPIE. Two management plans were approved during the reporting period, the remainder are pending approval.

Operations during this reporting period were undertaken in accordance with the Environmental Management Strategy (EMS) and environmental management plans as listed in **Table 3-4**. Approved environmental management plans are available from the Austar website: www.austarcoalmine.com.au

**TABLE 3-4 ENVIRONMENTAL MANAGEMENT PLANS**

| Plan | DA Requirement | Approval Authority | Approval Date |
|---|---|---|---|
| Environmental Management Strategy, June 2018 | DA29/95 – Schedule 5 Condition 1<br>PA08_0111 - Schedule 7 Condition 1 | DPIE | 1 August 2018 |
| Environmental Monitoring Program, June 2018 | DA29/95 – Schedule 5 Condition 2<br>PA08_0111 - Schedule 7 Condition 1 | DPIE | 1 August 2018 |

| Plan | DA Requirement | Approval Authority | Approval Date |
|---|---|---|---|
| Landscape Management Plan – Kitchener SIS, June 2013 | PA08_0111 – Schedule 6 Condition 4 | DPIE | 22 July 2013 |
| Site Water Management Plan, July 2018 | DA29/95 – Schedule 3 Condition 6-11<br>PA08_0111 – Schedule 4 Condition 9 | DPIE | 1 August 2018 |
| Noise and Vibration Management Plan, June 2018 | DA29/95 – Schedule 3 Condition 13-16<br>PA08_0111 – Schedule 4 Condition 2-3 | DPIE | 1 August 2018 |
| Air Quality and Greenhouse Gas Management Plan, June 2018 | DA29/95 – Schedule 3 Condition 17-20<br>PA08_0111 – Schedule 4 Condition 6-7 | DPIE | 1 August 2018 |
| Aboriginal Cultural Heritage Management Plan, June 2021 | PA08_0111 – Schedule 3 Condition 4 and Schedule 4 Condition 10 | DPIE | 30 June 2021 |
| Historic Heritage Management Plan, April 2021 | PA08_0111 – Schedule 4 Condition 11 | DPIE | 30 June 2021 |

# 4 OPERATIONS SUMMARY

## 4.1 Exploration

There were no physical exploration activities undertaken during the reporting period. Extensive landholder engagement continued to secure Land Access and Compensation Agreements for potential exploration drill sites on private landholdings.

An Annual Exploration Report is lodged yearly covering the period 13 July – 12 July. The report describes exploration activities carried out on or within EL6598 and was lodged with DPIE in August 2021 detailing activities undertaken during this reporting period.

## 4.2 Mining

### 4.2.1 Underground Mining Operations

No mining was undertaken during the 2020 – 2021 reporting period. As Austar is transitioning to closure, underground operations have focussed on maintaining underground safety (statutory inspections), removal of equipment, water management and ventilation.

### 4.2.2 Ventilation

Austar mine is ventilated by two upcast (exhausting) shafts being No. 3 Shaft and No. 5 Shaft. Both shafts are continuously monitored for both flow and gas concentrations. At the end of the reporting period No. 3 Shaft averaged 150$m^3s^{-1}$ with average gas concentrations of 0.08% $CO_2$ and 0.03% $CH_4$ and No. 5 Shaft averaged 150$m^3s^{-1}$ with average gas concentrations of 0.25% $CO_2$ and 0.06% $CH_4$.

As Austar transitions to closure it is planned No. 5 Shaft will be become redundant and be turned off in approximately Q2 2022 and No. 3 Shaft with be turned off late Q4 2022 or early Q1 2023.

### 4.2.3 Production and Forecast Production

Austar Coal Mine is approved by Project Approval PA 08_0111 to extract up to 3.6 Mt of ROM coal from the Austar Coal Mine Complex.

**Table 4-1** provides a summary of coal production and waste generation for the 2020-21 reporting period.

**TABLE 4-1 PRODUCTION AND WASTE SUMMARY**

| Material | Approved Limit (PA 08_0111) | 2019-2020 Previous Reporting Period | 2020-2021 Current Reporting Period | 2021 – 2022 Next Reporting Period (Forecast) |
|---|---|---|---|---|
| Waste Rock / Overburden | N/A | N/A | - | - |

| Material | Approved Limit (PA 08_0111) | 2019-2020 Previous Reporting Period | 2020-2021 Current Reporting Period | 2021 – 2022 Next Reporting Period (Forecast) |
|---|---|---|---|---|
| Fine Reject (Tailings) (ML) | - | 110,127, | - | - |
| Coarse Reject (t) | - | 18,566 | - | - |
| ROM Coal (t) | 3,600,000 | 1,034,297 | - | - |
| Saleable Product (t) | - | 850,275 | - | - |

During the reporting period no coal was mined at Austar or processed at the Austar CHPP. No coal mining is planned for future years. When the closure planning phase is finalised and closure execution activities commence, it is envisaged that material movements will recommence for the purposes of capping and rehabilitating disturbed areas.

### 4.3 Product Coal Transport

No product coal was transported during the reporting period.

### 4.4 Hours of Operation

Care and maintenance activities commenced on 30 March 2020. The site is manned 24 hours per day, seven days a week, with operations undertaken on day shift and afternoon shift during the week, day shift on the weekend, and weekday day shift only at the CHPP.

### 4.5 Waste Management

Waste collected during the reporting period is summarised and compared to the previous reporting periods in **Table 4-2**.

**TABLE 4-2 WASTE MANAGEMENT DATA (TONNES)**

| Year | Paper & Cardboard | Chemical Anchors | Oily Filters | Oily Water | Waste Oil | Timber | Medical & Sanitary | Oily Rags | Mixed Solid Waste | Scrap Metal | Printer Cartridges |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **2020-21** | 3.7 | 0.09 | 0.14 | 4.53 | 13.44 | 0.46 | 0.14 | 0.17 | 116.33 | 289.63 | - |
| **2019-20** | 6.39 | 1.2 | 1.05 | 73.5 | 24.5 | 0.62 | 0.17 | 0.24 | 274.36 | 217.62 | 0.06 |
| **2018-19** | 7.88 | 1.35 | 0.97 | 32.25 | 28.8 | - | 0.2 | 0.18 | 249.75 | 166.89 | 0.17 |
| **2017-18** | 6.88 | 1.94 | 0.97 | 2.31 | 28.50 | 17.64 | 0.16 | 0.20 | 505.8 | 270.55 | 0.156 |

Waste generation generally reduced for all waste streams when compared to the previous reporting period apart from scrap metal which increased by approximately 33%. The general reduction in waste generation may be attributed to the cessation of coal extraction activities. The increase in scrap metal

waste is attributed to a program targeting items which had been stored on the surface for a prolonged period, and not viable for reuse.

Effective waste management remains a focus throughout the care and maintenance and transition to closure at Austar.

Waste contractors undertake regular inspections of waste bins, oil storage areas and spill kits and report any issues to Austar staff. If cross contamination is an ongoing issue, or a waste improvement opportunity is identified, employees and contractors can be educated through toolbox talks and inductions.

### 4.6 Planned Operations Next Reporting Period

Operations during the next reporting period include progressing the mine closure planning strategy as documented in MOP Amendment A and Section 8.5, removal of underground equipment, planning and progressing areas of underground mine sealing, rehabilitation monitoring and maintenance, land management activities including weed management, maintenance of firebreaks and dam desilting will also continue.

# 5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

DPIE reviewed the 2018-19 Annual Review and 'considers it to satisfy the reporting requirements of DA 29/95, as modified, MP08_0111, as modified and the Department's Annual Review Guideline (October 2015)'. No actions were requested by the DPIE in their response dated 25 November 2020. Resources Regulator noted receipt of the 2019-20 Annual Review on 30 September 2020.

Actions committed to by Austar in the 2019-20 Annual Review are provided in **Table 5-1**.

**TABLE 5-1 ACTIONS REQUIRED FROM PREVIOUS REVIEW**

| Action Required from Previous Annual Review | Requested by | Status | Action taken by Austar | Where discussed in Annual Review |
|---|---|---|---|---|
| Progress the closure planning actions in accordance with MOP Amendment A | 2019-20 Annual Review / MOP | Progressing | Austar has put significant resources into progressing closure planning actions as outlined in Section 8.5. | **8.5** |
| Conduct the Independent Environmental Audit (IEA) | DA 29/95 & PA 08_0111 | Complete | SLR Consulting Australia Pty Ltd was engaged to undertake the 2020 IEA. The IEA covered the period from 24 November 2017 to 23 October 2020. The Audit was submitted to DPIE on 22 December 2020 and accepted on 1 July 2021. Recommendations and opportunities for improvement identified through the audit have been implemented as required. | **10** |
| Continue to review and if necessary, update approved management plans to reflect the care and maintenance phase | 2019-20 Annual Review | Lodged with DPIE for approval | All management plans were updated and lodged with the relevant departments for review and approval during the reporting period. Some plans were not approved at the conclusion of the monitoring period. | **3.3.3** |
| Enact the recommendation in the Rehabilitation Monitoring Report | 2019-20 Annual Review | Progressing | Weed management has continued during the reporting period. | **6.9.2, 8.2** |

# 6 ENVIRONMENTAL PERFORMANCE

## 6.1 Environmental Performance Summary

**Table 6-1** outlines the key environmental performance or management aspects encountered at Austar and details how they have been addressed, as well as the implementation of any management measures from the reporting period and proposed improvements for following years.

Where practical, environmental management of the key environmental aspects managed at Austar have been discussed in **Table 6-1**. Where tabulating the information is not practical, further detail is included in the following sections of this report.

**TABLE 6-1 ENVIRONMENTAL PERFORMANCE SUMMARY**

| Aspect | Approval Criteria / EIS Prediction | Performance During the Reporting Period | Trend / Key Management Implications | Implemented / Proposed Management Actions |
|---|---|---|---|---|
| Air Quality (**Section 6.3**) | Refer **Section 6.3** for detail on approval criteria and background levels. | Compliant with DA29/95 and PA08_0111. | Austar received one complaint regarding air quality (odour) during the reporting period however it was determined the source of the odour was unrelated to Austar Coal Mine. Details of the complaint are discussed Section 9.4. | Air Quality will continue to be managed in accordance with the AQGHGMP. |
| Biodiversity (**Section 6.4**) | Refer **Section 6.4** for detail on EIS predictions. | Compliant with DA29/95 and PA08_0111. | No observable impacts as a result of longwall mining were identified. | Ecological monitoring required by the Extraction Plans has been finalised, no further monitoring is required under Austar's management plan requirements. Further biodiversity investigations may be undertaken as part of closure and final land use studies. |
| Vibration and Blasting (**Section 6.5**) | Refer **Section 6.5** for detail on monitoring criteria. | Compliant with DA29/95 and PA08_0111. | No vibration events were recorded during the reporting period as a result of mining. Vibration monitors were removed from service on 18 June 2021. | Vibration and blast monitoring at Austar Coal Mine ceased 18 June 2021 in accordance with the approved NVMP. |

| Aspect | Approval Criteria / EIS Prediction | Performance During the Reporting Period | Trend / Key Management Implications | Implemented / Proposed Management Actions |
|---|---|---|---|---|
| Noise (**Section 6.6**) | Refer **Section 6.6** for detail on approval criteria. | There were no exceedances of EPL noise criteria at the CHPP in the reporting period. | As Austar has moved to a care and maintenance phase, there is reduced noise from operations. | Noise monitoring and management will continue in accordance with the NVMP. |
| Aboriginal Cultural Heritage (**Section 6.7**) | The Aboriginal Cultural Heritage Management Plan provides a consolidated framework and process for managing Aboriginal cultural heritage responsibilities within the Austar Coal Mine in compliance with all Aboriginal cultural heritage management requirements under legislation, guidelines and existing consents. | Compliant with DA29/95 and PA08_0111. | There were no incidents or complaints regarding cultural heritage during this period. | Continue to assess and undertake operations in accordance with the Aboriginal Cultural Heritage Management Plan. |
| Mine Subsidence (**Section 6.8**) | Refer **Section 6.8** for detail on predictions. | Compliant with DA29/95 and PA08_0111. | Final subsidence monitoring was undertaken one year after extraction was completed. Observed subsidence resulting from the extraction of longwall panels LWB2-LWB6 was generally similar to or less than maximum predicted subsidence. Subsidence has been deemed to be substantially complete. | Final subsidence monitoring in accordance with the Extraction Plan Subsidence Monitoring Plan (SMP) has been done and found to be substantially complete. No further subsidence monitoring is required under the SMP. |

| Aspect | Approval Criteria / EIS Prediction | Performance During the Reporting Period | Trend / Key Management Implications | Implemented / Proposed Management Actions |
|---|---|---|---|---|
| Water – Surface Water (**Section 7.3**) | Refer **Section 7.3** for detail on approval criteria and background levels. | Non-compliant with DA29/95, PA08_0111 and EPL 416. One exceedance of pH criteria was reported at SW6 during the reporting period. Details of this incident are presented in Section 7.3.2 and Section 11.<br>Two unlicensed discharge events were recorded at the Kitchener Surface Infrastructure Site (SIS) on 27 July 2020 and 27 March 2021. Details of these incidents are presented in Section 7.3.4 and Section 11. | Monitoring of the Investigation Drainage Line at the CHPP continued in accordance with the EPL PRP.<br>Surface water quality trends indicate no adverse mining impacts on the water quality of Quorrobolong and Cony Creeks.<br>There have been no community complaints made to Austar in relation to water quality during the reporting period. No TARPs under the SWMP were triggered. | Surface water monitoring and management will continue in accordance with the SWMP. |
| Water – Groundwater (**Section 7.3.4.1**) | Refer **Section 7.3.4.1** for detail on approval criteria and background levels. | Compliant with DA29/95 and PA08_0111. | The predictions in groundwater impact assessments from the DA29/95 MOD6 EA, and the DA29/95 MOD7 EA have, in general, been validated by measurements. No TARPs under the SWMP were triggered. | Groundwater monitoring and management will continue in accordance with the SWMP and relevant Extraction Plan Water Management Sub-Plans. |
| Erosion and Sediment Control | PA 08_0111 requires an Erosion and Sediment Control Plan as part of the SWMP. | Two unlicensed discharge events were reported during the reporting period. Results showed that the suspended solids were comparable in upstream and downstream and | Erosion and sediment control is undertaken according to the SWMP. A range of erosion and sediment control measures have been implemented across the mining complex with the | Erosion and sediment controls will continue to be managed in accordance with the SWMP. |

| Aspect | Approval Criteria / EIS Prediction | Performance During the Reporting Period | Trend / Key Management Implications | Implemented / Proposed Management Actions |
|---|---|---|---|---|
| | | dam samples, indicating that the erosion and sediment control may have been adequate. | aim of preventing soil erosion and the entry of sediments into surrounding water bodies. Monthly environmental inspections are undertaken to monitor the sediment control structures for capacity, structural integrity and effectiveness. | |
| Hydrocarbon management | Not applicable. | There were no reportable incidents in relation to hydrocarbon management during the reporting period.<br><br>The hydrocarbon remediation area was managed to ensure no contamination to nearby areas.<br><br>Material in one of the cells was tested and determined suitable for disposal. The material was transferred to East Pit reject emplacement area.<br><br>Spill kits in all hydrocarbon storage areas are monitored weekly by the waste contractor and replenished as necessary. | Hydrocarbon management systems are designed and installed generally in accordance with Australian Standards and EPA guidelines.<br><br>Austar operates a hydrocarbon remediation area at the CHPP to manage hydrocarbon contaminated material recovered from the site. The area is signposted and has three bunded cells for segregation of materials of different ages and source locations. The bunded area was constructed on a disused laydown area and is within the sites mine water catchment. Contaminated materials are | Hydrocarbon management will continue to be undertaken in accordance with internal procedures and general good management practices. |

| Aspect | Approval Criteria / EIS Prediction | Performance During the Reporting Period | Trend / Key Management Implications | Implemented / Proposed Management Actions |
|---|---|---|---|---|
| | | Bunded hydrocarbon storage areas are also monitored weekly by the waste contractor and pump out is scheduled as required. | periodically turned to allow an adequate supply of oxygen to microbes that use the contaminants as a source of food and energy. | |
| Weed and Feral Animal Management and Control | Not applicable. | A Weed Action Plan is being executed across Austar lands which implements weed control operations in a systematic manner.<br><br>The primary targeted weeds which were controlled during the reporting period included Lantana, Mother of Millions and Green Cestrum. Details of weed management are discussed in Section 6.9. | Weed infestations are managed according to the Weed Action Plan. During the next reporting period, weeds will continue to be monitored in monthly inspections and controlled as per the Weed Action Plan recommendations.<br><br>Signs of feral animal infestations are monitored for during monthly inspections. Ad hoc sightings of feral animals are also reported by operational personnel. Feral animal management is undertaken on an as needs basis. | Weeds and feral animals will be treated according to good land management practices and the Weed Action Plan. |
| Visual Amenity and Lighting | Reject emplacement areas will be constructed to minimise | There were no community complaints or non-compliances related to visual impacts or | Visual impacts and lighting will continue to be managed according to the EMS, | Visual Amenity and Lighting will continue to be managed consistent with current good |

| Aspect | Approval Criteria / EIS Prediction | Performance During the Reporting Period | Trend / Key Management Implications | Implemented / Proposed Management Actions |
|---|---|---|---|---|
| | visual impacts upon residents in the vicinity and from roads.<br><br>Emplacement areas may include bunds and buffer zones to minimise visual impact.<br><br>Screening will be used as required.<br><br>Lighting will be positioned to shine into the Kitchener SIS and light shields will be used where practical. | lighting during the reporting period. | guidelines and internal procedures as appropriate. | practice and commitments made in relevant EAs. |
| Historic Heritage | There are a number of heritage items across Austar infrastructure areas that require ongoing management or possible future demolition. | No mining occurred in the Stage 3 area during the reporting period and no impacts were observed on historic heritage items in this area.<br><br>There was no restoration or demolition works on any Austar owned heritage structures during the reporting period.<br><br>Austar commenced heritage assessments for known or | No work on any heritage structure is to occur without prior advice from a heritage consultant and approval from the relevant authority. | Management of historic heritage items will comply with the obligations of the relevant approvals and recommendations received from Cessnock City Council will be considered. |

| Aspect | Approval Criteria / EIS Prediction | Performance During the Reporting Period | Trend / Key Management Implications | Implemented / Proposed Management Actions |
|---|---|---|---|---|
| | | potential historic heritage items at Austar Coal Mine to guide retention/demolition decisions as described in Sections 2.3.9 and 7.2.1 of MOP Amendment A. | | |
| Spontaneous Combustion | Monitoring and response procedures will be used to minimise spontaneous combustion issues. | There were no spontaneous combustion events during the reporting period. | Spontaneous combustion is managed through the reject haulage and emplacement area procedure and routine inspections. Reject emplacement areas will continue to be monitored and managed during the care and maintenance phase. The ROM and clean coal stockpiles have been cleared and remain empty. | Monitoring for outbreaks of spontaneous combustion will continue and outbreaks will be responded to as required. |
| Bushfire | Maintain Asset Protection Zones (APZs) and Strategic Fire Advantage Zones (SFAZs) in accordance with Bushfire Management Plan. | Austar continued to monitor and maintain access tracks, APZs and SFAZs around its key operations. Slashing of APZs is undertaken on a routine basis. | Austar continues to maintain the area around its operations, including pit top facilities, CHPP, remote infrastructure areas and emplacement areas. | Austar will continue to implement the actions identified in the Bushfire Management Plan. |

## 6.2 Meteorological Data

In accordance with DA29/95, PA 08_0111 and EPL 416, Austar operates and maintains a meteorological station located at the CHPP.

This section summarises the meteorological data for the 2020-2021 reporting period.

**TABLE 6-2 WEATHER SUMMARY 2020-2021**

| Month | Rainfall (mm) | Rain days (>0.2mm) | Maximum temperature (°C) | Minimum Temperature (°C) | Mean wind speed (m/s) | Max wind speed (m/s) | Dominant wind direction |
|---|---|---|---|---|---|---|---|
| Jul | 130 | 8 | 21.8 | 1.9 | 1.6 | 12.9 | SW |
| Aug | 52 | 7 | 23.6 | 1.3 | 1.4 | 15.25 | S |
| Sep | 31 | 7 | 28.6 | 3.6 | 1.5 | 16.22 | SW |
| Oct | 111 | 10 | 31.4 | 6.4 | 1.5 | 12 | SW |
| Nov | 59 | 7 | 40.6 | 8.0 | 1.6 | 16.7 | SW |
| Dec | 192 | 19 | 35.7 | 10.5 | 1.5 | 24.4 | SW |
| Jan | 33 | 11 | 37.2 | 10.4 | 1.6 | 11.8 | SW |
| Feb | 113 | 15 | 32.0 | 12.7 | 1.5 | 11.6 | SW |
| Mar | 295 | 14 | 32.6 | 11.6 | 1.4 | 19.6 | SW |
| Apr | 14 | 5 | 27.6 | 3.9 | 1.2 | 13.1 | SW |
| May | 14 | 6 | 24.4 | 2.4 | 1.4 | 10.9 | SW |
| Jun | 46 | 8 | 21.2 | 1.2 | 1.4 | 11.5 | SW |

The total monthly rainfall, number of rain days and cumulative rainfall during the reporting period is shown in **Table 6-2** and **Figure 6-1**. An Annual wind rose is provided in **Figure 6-2.**

A total rainfall of 1090 mm was recorded during the 2020-21 reporting period. This represents an increase of 568 mm from the previous reporting period and is approximately 50% greater than the annual average rainfall for the Cessnock area (729.4mm) (Bureau of Meteorology Cessnock Airport AWS 1968 - 2020). Predominant winds were from the South West for every month of the reporting period except for August which was from the South.

Six months reported rainfall above their long-term average being July, August, October, December, February and March. March recorded the highest rainfall of any month in the reporting period being 295 mm.

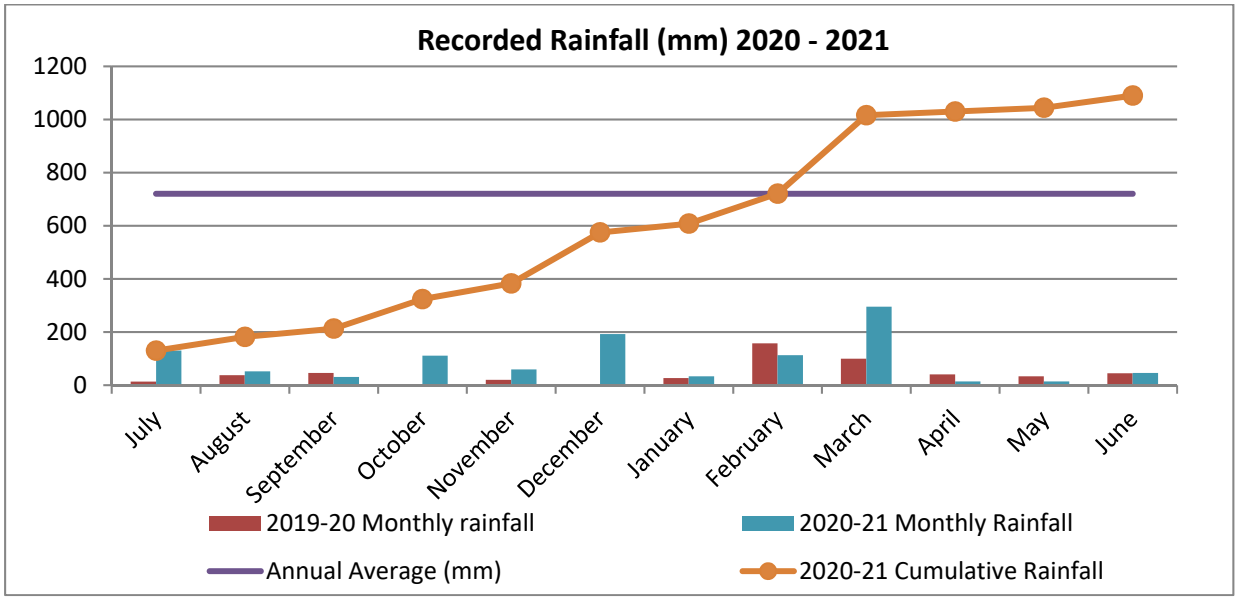



**FIGURE 6-1 RECORDED RAINFALL (MM) AT AUSTAR METEOROLOGICAL STATION 2020-2021**

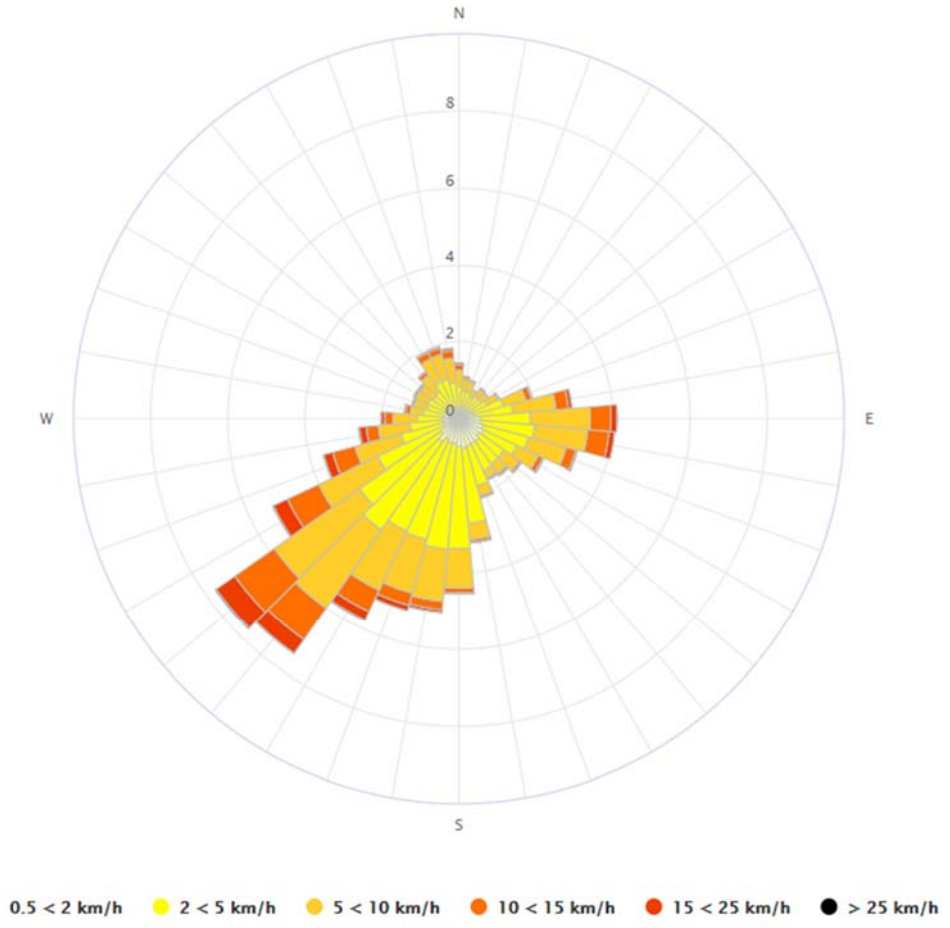



**FIGURE 6-2 ANNUAL AVERAGE WIND ROSE 2020-2021**

## 6.3 Air Quality

### 6.3.1 Environmental Management

Austar implements an Air Quality and Greenhouse Gas Management Plan (AQGHGMP) for the Mine Complex to meet the requirements of PA08_0111 (specifically Schedule 4 Conditions 6 and 7), DA 29/95 and EPL 416. The AQGHGMP was approved by the Department of Planning and Environment (DPE) on 1 August 2018. A revised plan was submitted to DPIE in April 2021 and will be implemented when approved.

During operations, dust generated from traffic around the CHPP, Pit Top, workshop areas, access roads and reject emplacement areas is generally controlled by water cart.

The ROM and clean coal stockpile areas have been cleared and the surface compacted to prevent wind and water erosion. Throughout the care and maintenance phase water carts and water sprays continue to be utilised to minimise dust on roads and stockpile areas where required. It has been observed that the stockpile areas seem to have a crust, and visible dust generation is rare.

The AQGHGMP monitoring program utilises eight depositional dust gauges, three high volume air samplers (HVAS) and one continuous dust monitor; a Tapered Element Oscillating Microbalance (TEOM). The HVAS and TEOM measure for particulate matter less than 10 micrometres (<=10µm), more commonly referred to as $PM_{10}$. Total Suspended Particulates (TSP) is not directly measured but calculated per the methodology outlined in the AQGGMP. The location of Austar's air quality monitoring equipment is listed in **Table 6-3** and shown on **Figure 6-3**.

**TABLE 6-3 LOCATION OF AIR QUALITY MONITORING POINTS**

| ID | Location | Monitoring Equipment |
|---|---|---|
| D1 | Pyne Way, Mount View | DDG, HVAS |
| D2 | Ellalong Road, Pelton Village | DDG, HVAS |
| D3 | Bimbadeen Road, Mount View | DDG |
| D4 | Ellalong Village | DDG |
| D5 | South of No 3 shaft upcast ventilation shaft | DDG |
| D6 | Bimbadeen Road, Mount View | TEOM |
| D7 | Pelton Fire Trail, Quorrobolong | DDG |
| D8 | Coney Creek Lane, Quorrobolong | DDG, HVAS |
| D9 | Kitchener Village | DDG |
| Met Station | CHPP site, Pelton | Meteorological Station |

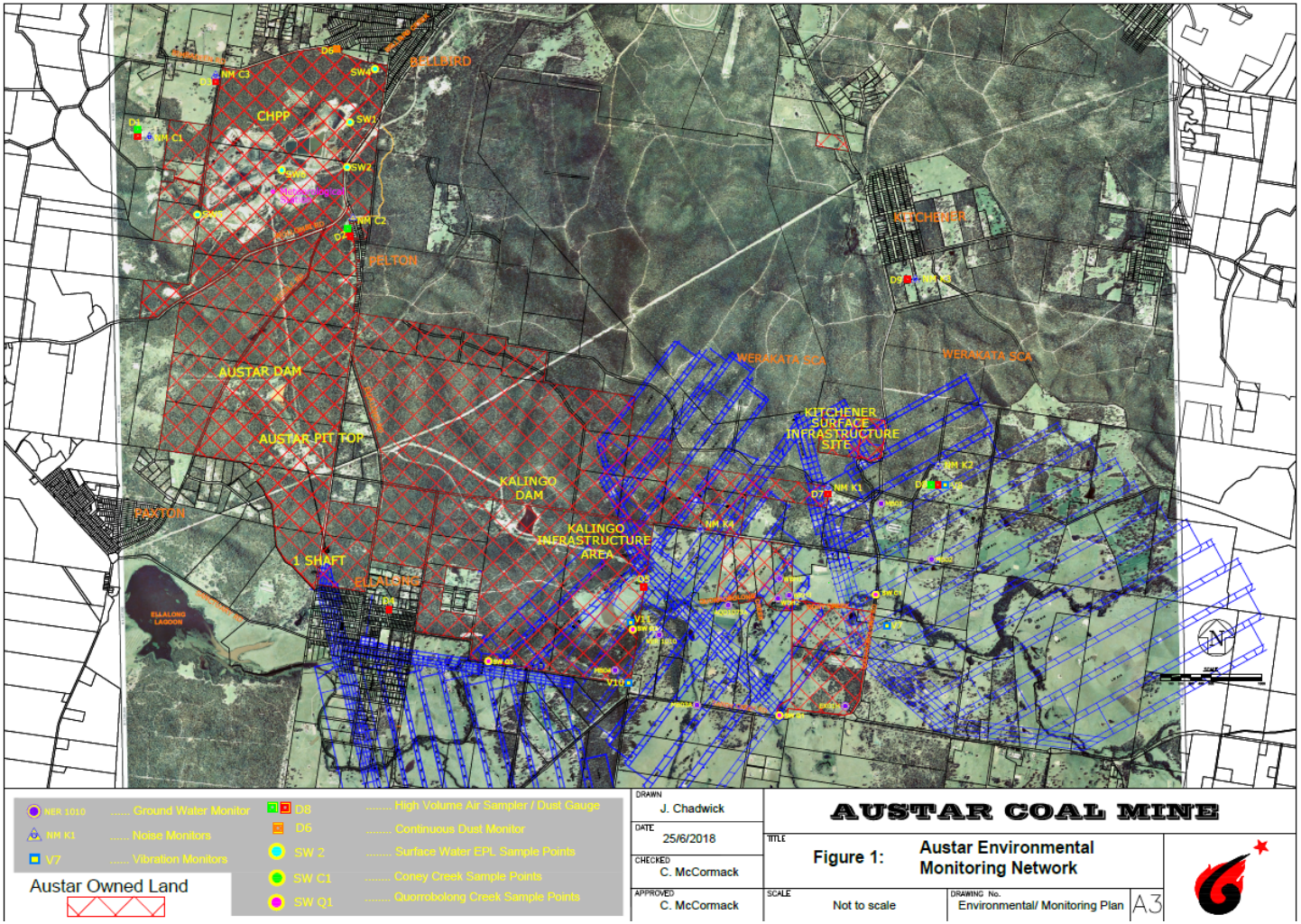



**FIGURE 6-3 AUSTAR ENVIRONMENTAL MONITORING NETWORK**

### 6.3.2 Environmental Performance

During the reporting period, all dust samples were collected by trained technicians and analysed by NATA certified laboratories. This work is carried out in accordance with statutory requirements and relevant standards. Monitoring equipment is maintained in accordance with the manufacturer's specifications by qualified specialists. Dust deposition results and $PM_{10}$ monitoring data for the reporting period is provided below, followed by a summary of exceedances and a commentary on results.

#### 6.3.2.1 Dust Deposition

**Table 6-4** provides a summary of Austar's deposited dust gauge annual average results for insoluble solids during the reporting period, previous reporting periods and against assessment criteria and environmental assessment predictions.

Depositional dust results during the reporting period were all below the annual average criteria of 4 g/m$^2$/month for insoluble solids. All depositional dust gauges reported annual averages below the 2019-2020 reporting year's results except for Dust Gauge D4 which reported an annual average of 1.8 g/m$^2$/month. This represents an increase of 0.2 g/m$^2$/month at this location as shown in **Table 6-4**.

**TABLE 6-4 DEPOSITED DUST GAUGES ANNUAL AVERAGE COMPARED TO PREDICTIONS AND RESULTS OF PREVIOUS YEARS**

| ID | Location | EA Prediction Background Levels – Annual Average (g/m$^2$/ month) | Assessment Criteria | Annual Average Total Insoluble Solids (g/m$^2$/month) | | | | | Change in Deposited Dust 2019-20 to 2020-21 Period (g/m$^2$/ month) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | |
| D1 | Mount View | 0.2 – 2.7* | 4 g/m$^2$ /month (maximum total deposited dust) | 0.8 | 0.9 | 1.2 | 1.4 | 0.9 | -0.5 |
| D2 | Pelton | 0.2 – 2.7* | | 1.4 | 1.1 | 1.5 | 1.9 | 0.9 | -1.0 |
| D3 | Mount View | 0.2 – 2.7* | | 1.1 | 0.7 | 0.8 | 1.3 | 0.6 | -0.7 |
| D4 | Ellalong | n/a | | 1.6 | 1.6 | 1.4 | 1.6 | 1.8 | +0.2 |
| D5 | Kalingo Infrastructure Area | n/a | 2 g/m$^2$ /month (maximum annual increase in deposited dust) | 1.5 | 0.7 | 1.8 | 1.3 | 1.2 | -0.1 |
| D7 | Quorrobolong | 1.5 – 1.65^ | | 0.9 | 1.2 | 1.1 | 1.3 | 0.8 | -0.5 |
| D8 | Quorrobolong | 1.5 – 1.63^ | | 0.9 | 0.9 | 0.7 | 1.4 | 0.6 | -0.8 |
| D9 | Kitchener | n/a | | 0.8 | 1.3 | 0.9 | 1.7 | 0.8 | -0.9 |

***Note:*** *Deposited Dust is assessed as insoluble solids as defined by Standards Australia, 2003 AS3580.10.1 -2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulates – Deposited Matter – Gravimetric Method.*

** Bellbird South EIS (1995)*

*^ Proposed Stage 3 Extension Environmental Assessment (Appendix 17) (Umwelt, October 2008)*

Dust results for the reporting period are consistent with 1995 Environmental Impact Statement (EIS) predictions. Section 4.7.2 of the 1995 EIS states that historical dust depositional data since 1991 ranges between 0.2 to 2.7 g/m$^2$/month.

There were six instances (comprised of three instances each for Dust Gauges D4 and D5) where the monthly dust deposition gauges were contaminated with bird droppings, insects or vegetative matter, and these results were excluded from the annual average calculation.

#### 6.3.2.2 Total Suspended Particulates

The annual average total suspended particulates (TSP) results for the reporting period are provided in **Table 6-5**.

**TABLE 6-5 TSP HVAS AND TEOM RESULT ANNUAL AVERAGES FOR CURRENT AND PREVIOUS YEARS**

| ID | Location | Annual Average TSP (µg/m$^3$) | | | | | |
|---|---|---|---|---|---|---|---|
| | | EA Prediction | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 |
| TEOM | Bimbadeen Road, Mount View | n/a | 25.3 | 28.5 | 33.4 | 56 | 30.75 |
| HVAS1 | Pyne Way, Mount View | n/a | 28.0 | 32.0 | 42.8 | 62.8 | 20.1 |
| HVAS2 | Ellalong Road, Pelton Village | n/a | 30.0 | 39.4 | 47.7 | 62.0 | 20.2 |
| HVAS3 | Coney Creek Lane, Quorrobolong | 32.53 | 24.5 | 29.5 | 39.0 | 53.8 | 18.6 |

The calculated Total Suspended Particulates (TSP) for the reporting period at all monitoring locations is below the annual average criterion of 90µg/m$^3$. The TSP is calculated by multiplying the $PM_{10}$ result by 2.5 in accordance with the method outlined in the AQGHGMP.

#### 6.3.2.3 Particulate Matter - $PM_{10}$ Results

The HVAS units operated on a six-day cycle (in line with the OEH cycle) during the reporting period with the exception of:

- HVAS1 which did not complete its scheduled run on 10/11/2020 due to a blocked filter. A make-up run was completed on 17/11/2020; and
- HVAS3 which ran for a duration less than the required period on 21/05/2021. A make-up run was completed on 31/05/2021.

The annual average $PM_{10}$ and TSP results, as well as 24hr maximum $PM_{10}$, for the reporting period are shown in **Table 6-6.**

A TEOM monitor which measures $PM_{10}$ on a real-time continuous basis is located at monitoring site D6 to the northeast of the CHPP. 24 hour maximum results for the reporting period and graphical representation of the 24 hour and annual average $PM_{10}$ results are provided in **Figure 6-4**, **Table 6-6** and **Table 6-7**.

The annual average $PM_{10}$ result for the 2020-21 reporting period as recorded by the TEOM was 12.3 $\mu g/m^3$, well below the $PM_{10}$ Annual Average Criterion of 30 $\mu g/m^3$.

Total Suspended Particulates and $PM_{10}$ results for HVAS units were also below the annual average criteria at all monitoring locations.

There were no exceedances of the 24-hour short term impact assessment criteria recorded during the reporting period.

Annual Average $PM_{10}$ results are lower than the previous reporting period for all monitoring locations, as shown in **Table 6-7**. This may be attributable to rainfall above the long-term average during the reporting as well as local and regional bushfires during the 2019/20 reporting period contributing to elevated $PM_{10}$ concentrations. All results remain below the $PM_{10}$ Annual Average criterion of 30 $\mu g/m^3$.

**TABLE 6-6 AIR QUALITY CRITERIA FOR PARTICULATE MATTER**

| Description | Pollutant | Averaging Period | Monitor | Criterion (µg/m$^3$) | Result 2019-20 (µg/m3) | Result 2020-21 (µg/m$^3$) |
|---|---|---|---|---|---|---|
| Long Term Impact Assessment Criteria for Particulate Matter | Total Suspended Particulate (TSP) matter | Annual Average | TEOM | 90 | 56 | 30.75 |
| | | | HVAS1 | | 62.8 | 27.0 |
| | | | HVAS2 | | 62.0 | 25 |
| | | | HVAS3 | | 53.8 | 23 |
| | Particulate Matter <10µm ($PM_{10}$) | Annual Average | TEOM | 30 | 22.4 | 12.3 |
| | | | HVAS1 | | 25.1 | 10.8 |
| | | | HVAS2 | | 24.8 | 10.0 |
| | | | HVAS3 | | 21.5 | 9.2 |
| Short Term Impact Assessment Criterion for Particulate Matter | Particulate Matter <10µm ($PM_{10}$) | 24-hour Maximum | TEOM | 50 | 193.5 | 39.5 |
| | | | HVAS1 | | 235 | 32.0 |
| | | | HVAS2 | | 237 | 28.0 |
| | | | HVAS3 | | 217 | 30.0 |

***Note:*** *Methods for sampling and analysis of ambient air as defined by Standards Australia, AS 3580.9.6 -2003: Determination of suspended particulate matter—$PM_{10}$ high volume sampler with size selective inlet—Gravimetric method.*

**TABLE 6-7 $PM_{10}$ HVAS AND TEOM ANNUAL AVERAGES FOR CURRENT AND PREVIOUS YEARS**

| ID | Location | Annual Average $PM_{10}$ (µg/m$^3$) | | | | | |
|---|---|---|---|---|---|---|---|
| | | EA Prediction | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 | 2020-2021 |
| TEOM | Bimbadeen Road, Mount View | n/a | 10.1 | 11.4 | 13.4 | 22.4 | 12.3 |
| HVAS1 | Pyne Way, Mount View | n/a | 11.2 | 12.8 | 17.1 | 25.1 | 10.8 |
| HVAS2 | Ellalong Road, Pelton Village | n/a | 12.0 | 15.8 | 19.1 | 24.8 | 10.0 |
| HVAS3 | Coney Creek Lane, Quorrobolong | 42.07 | 9.8 | 11.8 | 15.6 | 21.5 | 9.2 |

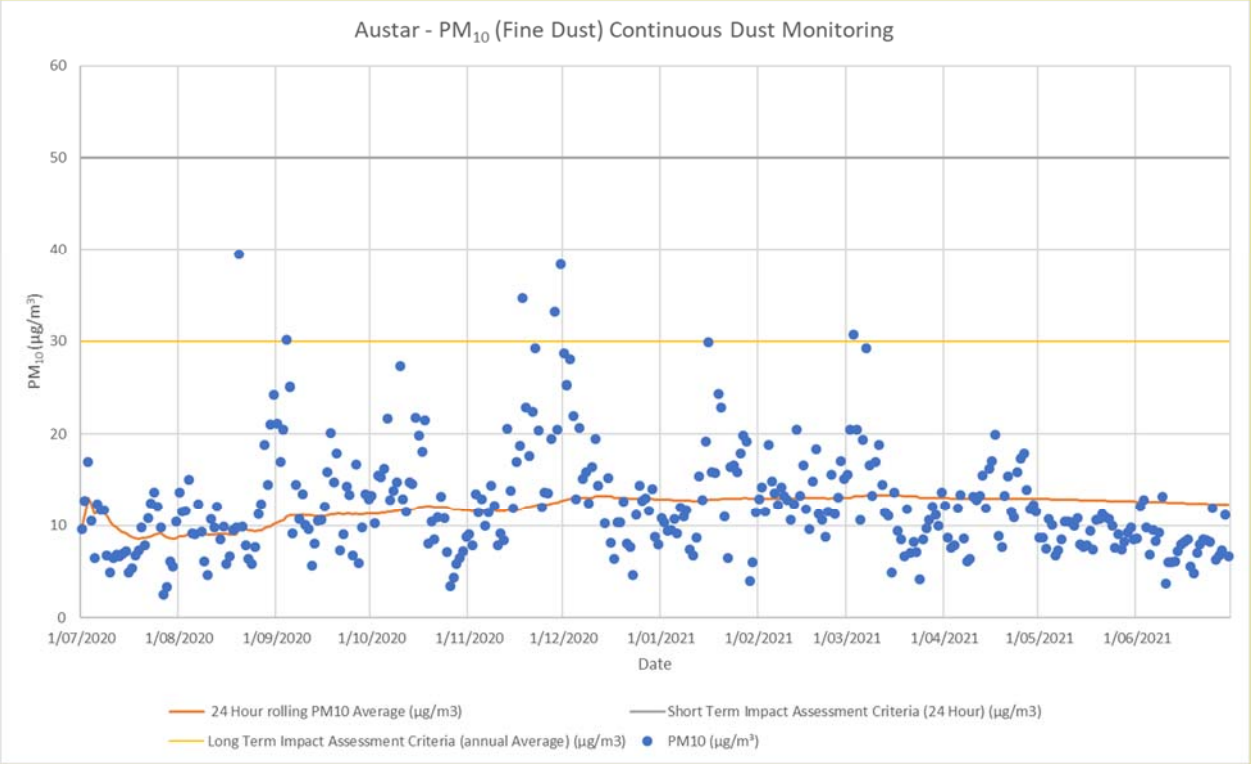



**FIGURE 6-4 AUSTAR TEOM $PM_{10}$ CONTINUOUS DUST MONITORING 2020-2021**

## 6.4 Biodiversity

### 6.4.1 Environmental Management

***Stage 3***

The Stage 3 EA (Umwelt, October 2008) states:

*Subsidence impacts are not expected to have a significant impact on the ecology or ecological communities of the proposed Stage 3 mining area. In addition, due to the depth of cover and relative predicted uniformity of subsidence over the Project area, it is predicted that surface mitigation works along creeks and drainage channels will not be required and hence disturbance of these areas is not likely to be necessary.*

*Mining of the Project area is not expected to significantly impact on runoff regimes, bank stability, channel alignment, in-channel and out of channel ponding or groundwater availability. Drainage line analysis of the predicted subsided landform indicates that all creek systems will remain free draining without mitigation works.*

The EA did not propose any management, mitigation or monitoring measures in relation to biodiversity.

Much of the Stage 3 Extraction Plan area (LWA7-LWA10) comprises the Lower Hunter Spotted Gum – Ironbark Forest and Derived Grassland with Scattered Canopy Trees vegetation communities. The Riparian Red Gum Forest within the Stage 3 Mining Area was found to broadly align with the description of the *Threatened Species Conservation Act 1995* listed River-flat Eucalypt Forest Endangered Ecological Community (EEC).

The Stage 3 extraction Plan Biodiversity Management Plan outlines the period biodiversity monitoring will be undertaken:

*Monitoring will be undertaken on a bi-annual basis, preferably with one survey in autumn and one in spring. The cessation of monitoring will be linked with the results of the subsidence monitoring. That is, when the subsidence monitoring reveals that there is no longer any significant ground movement, monitoring will continue for a period of approximately two years.*

The Stage 3 monitoring surveys were a continuation of baseline monitoring established in 2012 and were carried out bi-annually from 2013 to 2020, with no impacts to biodiversity identified during this time. Mining was completed in the Stage 3 Area in June 2015, with monitoring continuing post mining for approximately 5 years. As there is no further significant ground movement, and there have been no identified impacts over this time, monitoring ceased in 2020. No further biodiversity monitoring is required as part of the Stage 3 Extraction Plan.

***Bellbird South Mining Area***

The LWB1-LWB3 Environmental Assessment (Umwelt, November 2015) states:

*Biodiversity values have the potential to be impacted by subsidence related surface cracking in the soil, and by any associated remediation of surface cracking post mining. Secondary impacts associated with hydrological changes are also possible and typically impact greatest on riparian areas*.

*Based on the subsidence and groundwater assessments, the potential for biodiversity impacts is regarded as low, although a monitoring program is recommended.*

The LWB4-B7 Environmental Assessment (Umwelt, May 2017) states:

*While there is not predicted to be any significant adverse impact to ecological features within the LWB4-B7 Modification Area and subsidence remediation is not expected to be required, the BMP will include contingency measures for subsidence remediation works in the unlikely event that subsidence remediation works are required.*

The ecological monitoring program in the LWB1-LWB7 area targets significant vegetation communities in the Bellbird South Mining Area including Lower Hunter Spotted Gum – Ironbark Forest EEC, River-flat Eucalypt Forest EEC and potential Quorrobolong Scribbly Gum Woodland EEC (refer **Figure 6-5**).

The objectives of the ecological monitoring programs are to determine if there is any change in flora and habitat condition as a consequence of mining and associated subsidence.

The LWB4 to LWB7 Extraction Plan outlines the biodiversity monitoring period for this area: *Monitoring will cease 12 months after the cessation of mining, once subsidence monitoring reveals no further significant ground movement*.

Final subsidence monitoring was undertaken in February 2021, with subsidence experts Mine Subsidence Engineering Consultants (MSEC) determining that '*the ongoing long-term residual subsidence effects (i.e. After survey dated 10 February 2021) are expected to be very small and unlikely to result in adverse impacts to the natural environment. MSEC therefore considers that ground monitoring could be ceased as the ongoing subsidence effects are expected to be very small and similar to the order of natural ground movements and survey tolerance*.'

Two monitoring events were undertaken after the cessation of mining, in March 2020 and September 2020.

### 6.4.2 Environmental Performance

Ecological Monitoring was undertaken in the Bellbird South Mining Area in Spring (September) 2020.

The 2020 Ecological Monitoring Report (Umwelt) states 'to date, there is no evident of any impacts on ecological features as a result of longwall mining'. Most sites were found to be in moderate or high condition with persistent vegetation having good canopy health. Biodiversity monitoring commitments under both Extraction Plans have now been met, and no further biodiversity assessment for mining impacts in these mining areas are required.

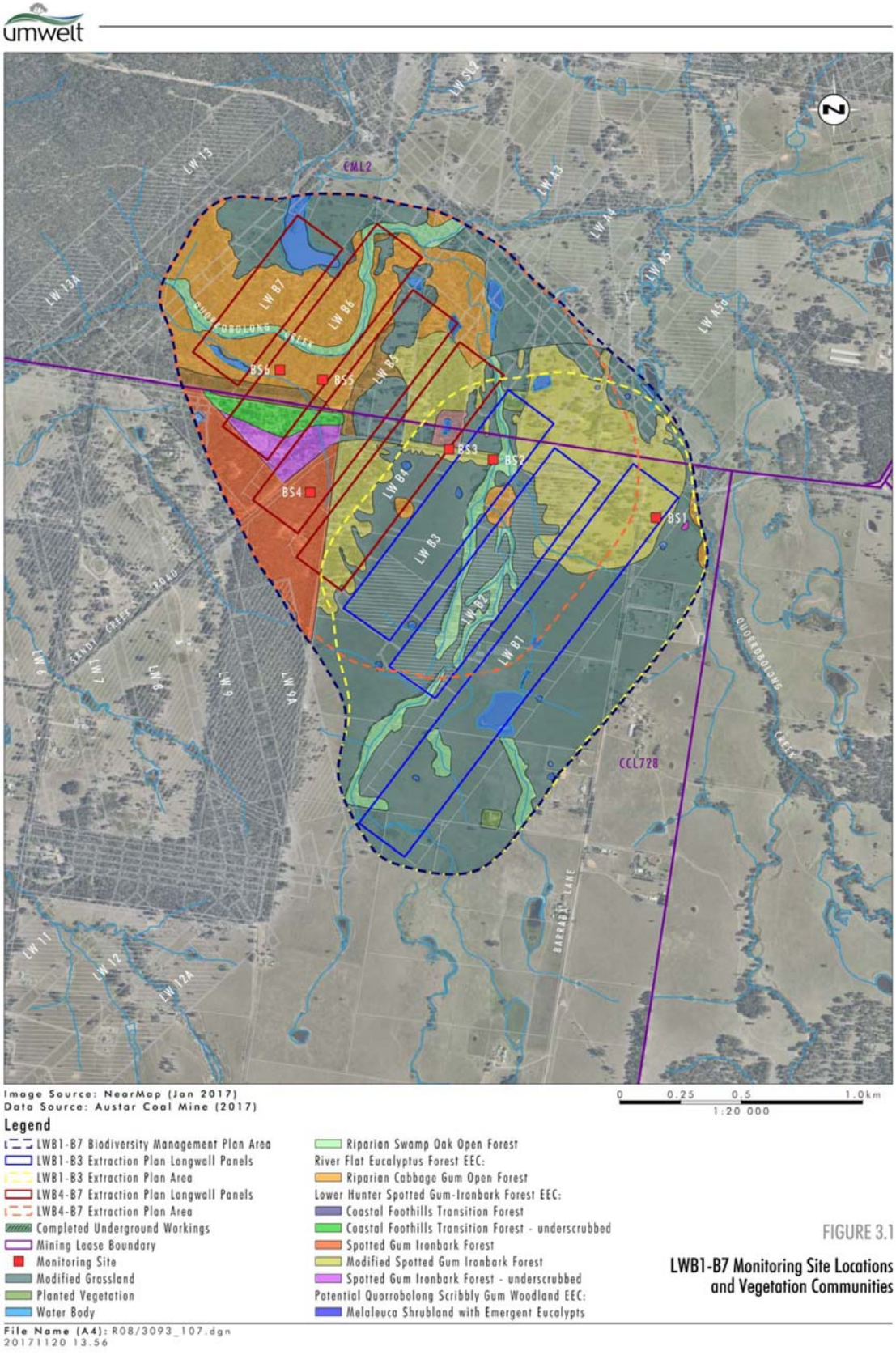



**FIGURE 6-5 LOCATION OF LWB1-B7 ECOLOGICAL MONITORING SITES**

## 6.5 Vibration and Blasting

### 6.5.1 Environmental Management

Austar implements a Noise and Vibration Management Plan (NVMP) prepared in accordance with the requirements of PA08_0111 and DA 29/95. This plan was updated in June 2018 and approved by DPE on 1 August 2018. The location of vibration monitors is shown on **Plan 2**.

The approved NVMP requires vibration monitoring while extraction is occurring. Extraction in the Bellbird South panels ceased in February 2020.

Austar continued to undertake vibration monitoring in three vibration Monitors (V7, V10 and V11) up to 18 June 2021 when the monitors were removed from service.

### 6.5.2 Environmental Performance

In accordance with the NVMP, vibration monitors are set to trigger and record an event when vibration is greater than 1mm/second.

Monitoring undertaken in previous reporting periods has indicated vibration in the mining area is event based, and normally occurs when the longwall equipment is extracting coal. Vibration is typically generated adjacent to the longwall mining area, or from tensile fractures in the overlying strata immediately above and surrounding the longwall mining area. There was no mining undertaken in the reporting period, and no vibration were events recorded (PVS >1mm/s).

## 6.6 Noise

### 6.6.1 Environmental Management

Austar implements a Noise and Vibration Management Plan (NVMP) prepared in accordance with PA08_0111, DA 29/95 and EPL 416. This plan was updated in June 2018 and approved by DPIE on 1 August 2018.

Operational noise impacts are potentially greatest at night when background levels are typically low and the allowable levels are correspondingly low, and this is the period when noise propagation enhancement is most likely. Attended noise monitoring is conducted at night, in accordance with the NVMP.

Periodic noise monitoring is conducted monthly and reported quarterly in accordance with the NVMP by an independent noise consultant. There are seven key monitoring locations representative of surrounding receivers. Monitoring points have been selected as reference locations and form the basis for assessing and evaluating noise emissions from the operation. The locations are listed in **Table 6-8** and presented in **Plan 2**.

**CHPP Noise Pollution Reduction Program**

Austar has been undertaking a voluntary noise PRP in consultation with the EPA for many years. During previous reporting periods, further sound power testing was undertaken on-site at the CHPP, following recommendations of the sound power review. A noise control options analysis was completed and the CHPP noise model updated. Austar transitioned to a care and maintenance phase before the model could be validated. As such there was no progress on the PRP during the current reporting period. A variation to the EPL will be lodged during next reporting period and may modify the PRP.

**TABLE 6-8 NOISE IMPACT ASSESSMENT CRITERIA AND GOALS**

| Receiver | Location | Receiver Description | Criteria/Goal |
|---|---|---|---|
| ***Nearest Potentially Affected Receivers to CHPP (EPL 416)*** | | | |
| **C1** | South of Bimbadeen Road, Mt View | West of CHPP | $L_{A90}$ 40 dB |
| **C2** | Pelton Village | South East of CHPP | $L_{A90}$ 43 dB |
| **C3** | Bimbadeen Road, Mt View | North-west of CHPP | $L_{A90}$ 37 dB |
| ***Nearest Potentially Affected Receivers to Kitchener Surface Infrastructure Site (PA08_0111)*** | | | |
| **K1** | Pelton Road, Quorrobolong | South of SIS | $L_{Aeq}$ 35 dB / $L_{A1}$ 45 dB |
| **K2** | Coney Creek Lane, Quorrobolong | East of SIS | $L_{Aeq}$ 35 dB / $L_{A1}$ 45 dB |
| **K3** | Richmond Street, Kitchener | North of SIS | $L_{Aeq}$ 35 dB / $L_{A1}$ 45 dB |
| ***Nearest Potentially Affected Receivers to Kalingo Infrastructure Area (DA29/95)*** | | | |
| **K4** | Nash Lane, Quorrobolong | East of Kalingo Infrastructure Area | $L_{Aeq}$ 35 dB |

### 6.6.2 Environmental Performance

A summary of results from attended noise monitoring undertaken during the 2020-21 reporting period is provided in **Table 6-9, Table 6-10** and **Table 6-11**. All monitoring results were within compliance criteria during the reporting period.

Austar complied with relevant noise limits during the reporting period.

Since the transition to care and maintenance, the noise monitoring program has continued unchanged and in accordance with the NVMP and EPL Noise PRP requirements.

Noise sources have reduced since mining ceased with the mine coal conveyor system including coal bins not operational. The CHPP raw and clean coal systems, trains and loading infrastructure, stockpile dozers and reject trucks are also not operational. The mine ventilation fans continue to operate 24 hours per day, 7 days per week.

**TABLE 6-9 NOISE GENERATED BY THE AUSTAR CHPP AGAINST PROJECT CRITERIA**

| Quarter | Period | Austar CHPP Only $L_{A90\ (15min)}$ (dB) | | |
|---|---|---|---|---|
| | | C1 | C2 | C3 |
| | Noise Criteria | 40 | 43 | 37 |
| Q3 2020 | Night | IA | <25 | IA |
| | | NM | 29 | <25 |
| | | <25 | NM | NM |
| Q4 2020 | Night | <25 | 21 | IA |
| | | IA | 26 | NM |
| | | IA | IA | IA |
| Q1 2021 | Night | <25 | <25 | IA |
| | | <25 | NM | IA |
| | | IA | IA | IA |
| Q2 2021 | Night | <25 | <25 | NM |
| | | NM | 29 | IA |
| | | IA | IA | IA |

*NM – Not measurable*
*IA – Inaudible*
*These are results for Austar CHPP in the absence of all other noise sources.*

**TABLE 6-10 NOISE GENERATED BY KITCHENER SIS AGAINST SPECIFIC PROJECT CRITERIA**

| Quarter | Period | Kitchener SIS Only $L_{Aeq, 15\ min}$ (dB) | | | Kitchener SIS Only, $L_{A1\ (1min)}$ | | |
|---|---|---|---|---|---|---|---|
| | | K1 | K2 | K3 | K1 | K2 | K3 |
| | Noise Criteria | 35 | 35 | 35 | 45 | 45 | 45 |
| Q3 2020 | Night | IA | <20 | <25 | IA | <20 | <25 |
| | | 27 | <25 | <20 | 32 | <25 | <20 |
| | | 27 | <25 | <25 | 31 | <25 | <25 |
| Q4 2020 | Night | <20 | IA | IA | <20 | IA | IA |
| | | IA | <20 | <25 | IA | <20 | <25 |
| | | IA | IA | IA | IA | IA | IA |
| Q1 2021 | Night | IA | IA | IA | IA | IA | IA |
| | | IA | IA | IA | IA | IA | IA |
| | | IA | IA | IA | IA | IA | IA |
| Q2 2021 | Night | IA | IA | IA | IA | IA | IA |
| | | <25 | <25 | IA | <25 | <25 | IA |
| | | 27 | <25 | IA | 33 | <25 | IA |

*NM – Not measurable*
*IA – Inaudible*
*These are results for Austar Kitchener SIS in the absence of all other noise sources.*

**TABLE 6-11 NOISE GENERATED BY KALINGO INFRASTRUCTURE AREA AGAINST SPECIFIC PROJECT CRITERIA, SITE K4**

| Quarter | Period | Austar KIA Only $L_{Aeq, 15\ min}$ (dB) |
|---|---|---|
| | | Noise Criteria 35 |
| **Q3 2020** | Night | <25 |
| | | 28 |
| | | 28 |
| **Q4 2020** | Night | 22 |
| | | 25 |
| | | <20 |
| **Q1 2021** | Night | <25 |
| | | IA |
| | | <20 |
| **Q2 2021** | Night | IA |
| | | <25 |
| | | 29 |

*NM – Not measurable*
*IA – Inaudible*
*These are results for Austar Kalingo Infrastructure Area in the absence of all other noise sources.*

## 6.7 Heritage

### 6.7.1 Environmental Management

Austar implements an Aboriginal Cultural Heritage Management Plan (ACHMP). During the reporting period the version of the ACHMP dated June 2018 was approved up to 30 June 2021. The ACHMP was updated in June 2021 to reflect the closed status of Austar and was approved by DPIE on 30 June 2021. The ACHMP provides a consolidated framework and process for managing Aboriginal cultural heritage responsibilities within the Austar Coal Mine in compliance with all Aboriginal cultural heritage management requirements under legislation, guidelines and existing consents.

The ACHMP (2021) provides mechanisms for the management of activities undertaken by or on behalf of Austar that have the potential to impact cultural heritage. Section 5.3 of the ACHMP provides management measures for surface disturbance works and provides different strategies for areas subject to prior survey and those that have not been surveyed.

The Austar CHPP property is heritage listed, and contains heritage items in varying states of repair, including the old store and stable building, office blocks and boiler tanks. Historic heritage assessments were commenced during the reporting period to assist with closure planning and are scheduled for completion during the next reporting period.

### 6.7.2 Environmental Performance

During the reporting period Austar commenced preliminary heritage assessments for known or potential historic heritage items at Austar Coal Mine to guide retention/demolition decisions, as committed to in MOP Amendment A. These assessments will be finalised during the next reporting period. Upon completion of this assessment, Austar Coal mine will consult with Cessnock City Council regarding the findings of the Heritage assessment and seek appropriate heritage approvals prior to demolition (if applicable).

No aboriginal cultural heritage works were undertaken in the reporting period.

## 6.8 Mine Subsidence

### 6.8.1 Environmental Management

In accordance with PA08_0111 Schedule 3 Condition 4, and DA29/95 Schedule 3 Condition 3A, Austar is required to prepare and implement an Extraction Plan prior to the commencement of any second workings in their respective mining areas.

Mining in the Bellbird South area ceased in February 2020. Mining in this area was approved under the Bellbird South LWB4-B7 Extraction Plan (initially approved 25 August 2017 and revised and approved 12 February 2019).

Other approved Extraction Plans are listed in **Section 3.3.1**.

The predicted conventional subsidence parameters for the proposed longwalls have been obtained using the Incremental Profile Method. The subsidence model has been calibrated and reviewed using the available ground monitoring data above the previously extracted longwalls at Austar. The maximum predicted mine subsidence movements due to the extraction of the proposed Longwalls B4 to B7 are: 1,350 mm vertical subsidence; 5.5 mm/m tilt (i.e. 0.55 %, or 1 in 180); 0.05 $km^{-1}$ hogging curvature (20 km minimum radius) and 0.06 $km^{-1}$ sagging curvature (17 km minimum radius).

No mining was undertaken in the reporting period, with a final subsidence monitoring undertaken one year after cessation of mining in the Bellbird South LWB4-LWB7 area. Subsidence monitoring was undertaken in accordance with the Subsidence Monitoring Program which forms part of the Extraction Plan.

The overall framework for subsidence monitoring and management of impacts can be described as a subsidence monitoring program (actual measured subsidence, and inspections for environmental consequences of subsidence to compare against predicted impacts) which may trigger a response or

set of responses. The response is commensurate with the nature of the measurement or the impact which has been identified. The Extraction Plans for Bellbird South LWB1-B3 and LWB4-B7 rely on a set of individual management plans which are intended to address impacts to environmental or built features within the Extraction Plan areas.

### 6.8.2 Environmental Performance

During the reporting period, Austar did not extract coal from any underground workings.

A final subsidence survey was undertaken in February 2021, and results analysed by Mine Subsidence Engineering Consultants (MSEC). An excerpt of the MSEC report is reproduced below:

> The maximum measured total vertical subsidence shortly after the completion of longwall mining (i.e. survey carried out on 11 March 2020, approximately one month after completion of LWB6) is 792 mm. The maximum measured total vertical subsidence one year after the completion of mining (i.e. survey carried out on 10 February 2021) is 819 mm. The change in the maximum measured total vertical subsidence over this period therefore is 27 mm. The maximum change in vertical subsidence anywhere along the SCR1-Line (i.e. not just in the location of maximum subsidence) is 35 mm, which represents an increase of 4 % over this period of one year.
>
> Long-term residual subsidence in the order of 5 % to 10 % is generally observed in the first year after the completion of longwall mining in the NSW coalfields. This is caused by the consolidation of the goaf and the development of equilibrium in the overburden. The additional subsidence measured along the SCR1-Line between March 2020 and February 2021 is therefore within expectations.
>
> The changes in the measured strains along the SCR1-Line in the first year after the completion of mining (i.e. between the surveys carried out on 11 March 2020 and 10 February 2021) are typically less than 0.2 mm/m (i.e. 90 % of the survey bays), which is in the order of survey tolerance, i.e. the changes are not measurable. There is a tensile-compressive strain pair of ±0.7 mm/m either side of Mark S04 but this is likely to be due to this survey mark being disturbed. Elsewhere, the measured strains are less than ±0.4 mm/m tensile and compressive.
>
> The changes in vertical subsidence and strain in the first year after the completion of mining in the Bellbird South mining area are very small and are unlikely to be sufficient to result in physical impacts, i.e. changes in surface water drainage, surface cracking or fracturing of exposed bedrock. It is understood that Austar has not identified adverse physical impacts to the natural environment due to the mining in the Bellbird South mining area.
>
> The ongoing long-term residual subsidence effects (i.e. after the survey dated 10 February 2021) are expected to be very small and unlikely to result in adverse physical impacts to the natural environment. MSEC therefore considers that ground monitoring could be ceased as the ongoing subsidence effects are expected to be very small and similar to the order of natural ground movements and survey tolerance.

There were no subsidence related mitigation measures undertaken during the reporting period.

## 6.9 Weed Management

### 6.9.1 Environmental Management

In August 2020 a land management consultant undertook inspections of Austar owned lands. The inspections were undertaken for the purpose of understanding the locations and species of problematic weeds and to develop a Weed Action Plan.

Due to the large areas owned by Austar Coal Mine, focus locations were selected for future maintenance. These locations were typically in areas previously disturbed by site works, rehabilitation areas, known problematic areas, or naturally formed areas such as creek lines that are prone to exotic weed infestations. It was noted during the inspections that large undisturbed areas outside of the designated focus points were typically clear of exotic weed infestations and maintained healthy unobstructed native growth.

The Weed Action Plan identifies environmental weeds found on site, and outlines locations, area covered, a summary of the weed characteristics, recommended actions and optimum season for treatment.

### 6.9.2 Environmental Performance

During the reporting period, over 51 hectares of weeds were treated. Species and approximate areas treated include *Acacia saligna (<1 ha)*, *Agave Americana* (<1 ha), Blackberry (*Rubus Fruticosis*) (2 ha), Camphor Laurel (*Cinnamomum camphora)* (2 ha), Castor Oil (*Ricinus Communis) (*<1 ha), Cotoneaster (*Cotoneaster glaucophyllus) (*2 ha), Green Cestrum (*Cestrum parquai*) (2 ha), Lantana (*Lantana sp*) (41 ha), Mother of Millions (*Chrysanthemoides Monilifera*) (2 ha), Oleander (*Nerium oleander*) (<1 ha), Pampas Grass (*Cortaderia sp) (*<1 ha), Peppercorn (*Schinus sp)* (<1 ha), Privet (*Ligustrum sp)* (<1 ha), Tobacco Bush (*Solanum Mauritianum*) (<1 ha) and Yucca (*Yucca aloifolia)* (<1 ha). Weed treatment was prioritised to address areas where weeds may spread offsite – including boundary fences and waterways, and rehabilitation areas where weeds could compromise rehabilitation outcomes.

The Weed Action Plan will continue to be implemented over the coming years, and progress will be reported in Annual Reviews.

# 7 WATER MANAGEMENT

Site water management at Austar is complex. The three main components of the water management system are the:

- Underground mine water management system;
- Pelton CHPP site water management system; and
- Surface water storage and management system.

Pelton CHPP site water management system includes a Reverse Osmosis water treatment plant, coal processing system, and stormwater runoff and management system. Treated water is used in the CHPP and underground and may also be discharged to Bellbird Creek in accordance with EPL 416. The Reverse Osmosis Plant was turned off indefinitely in May 2021. It may be turned on if required to manage surplus water as required.

There are several underground water storage areas, as outlined in the SWMP.

The surface water storage and management system is used to ensure the underground workings can be dewatered as required to allow for continual access to all necessary parts of the underground operation, as well as manage surface water runoff during rain events. Further information on site water management can be found in the approved SWMP.

## 7.1 Water Licences

#### 7.1.1.1 Water Licences

Austar holds water licences for monitoring and dewatering bores across the operation. Austar's current water licences issued under Part 5 of the *Water Act 1912* and the *Water Management Act 2000* are provided in **Table 7-1.**

**TABLE 7-1 WATER LICENCES HELD BY AUSTAR**

| Licence Held | Licence Number | Validity of Licence | Purpose of Licence | Extraction Limit |
|---|---|---|---|---|
| Bore Licence Certificate | 20BL171361 | 17 May 2007 - Perpetuity | Monitoring Bore (AQD1077) | N/A |
| Bore Licence Certificate | 20BL172524 | 20 July 2010 - Perpetuity | Monitoring Bore (NER1010) | N/A |
| Bore Licence Certificate | 20BL172852 | 7 June 2011 - Perpetuity | Monitoring Bore (WBH1, WBH2, WBH3) | N/A |
| Bore Licence Certificate | 20BL173843 | 1 Oct 2014 - Perpetuity | Monitoring Bore (BB1, BB2, BB3) | N/A |

| Licence Held | Licence Number | Validity of Licence | Purpose of Licence | Extraction Limit |
|---|---|---|---|---|
| Bore Licence Certificate | 20BL173878 | 8 Dec 2014 - Perpetuity | Monitoring Bore (MB01) | N/A |
| Bore Licence Certificate | 20BL173891 | 19 Mar 2015 - Perpetuity | Monitoring Bore (MB02) | N/A |
| Water Access Licence | WAL19181 / 20AL210298 | Continuing | Unregulated River Water Licence | Hunter Unregulated and Alluvial Water Sources - Upper Wollombi Water Source - Congewai Creek Management Zone.<br>10 shares |
| Water Access Licence | WAL41504 / 20AL217003 | Continuing | Aquifer - Industrial dewatering<br>16CT pump station<br>No 2 Shaft<br>No 2 Shaft Borehole | Sydney Basin – North Coast Groundwater Source. North Coast Fractured and Porous Rock Groundwater Sources 2016.<br>Extraction limit of 770ML in any 12-month period commencing 1 July |

## 7.2 Water Take

**TABLE 7-2 WATER TAKE 2020-21**

| Water Licence # | Water sharing plan, source and management zone (as applicable) | Entitlement | Passive take / inflows (ML) | Active pumping (ML) | TOTAL (ML) |
|---|---|---|---|---|---|
| WAL19181 * | Hunter Unregulated and Alluvial Water Sources - Upper Wollombi Water Source - Congewai Creek Management Zone. | 10 shares | 0 | 0 | 0 |
| WAL41504 | Sydney Basin – North Coast Groundwater Source. North Coast Fractured and Porous Rock Groundwater Sources 2016. | Extraction limit of 770ML in any 12-month period commencing 1 July | 533.1 | 0 | 533.1 |

** this WAL is not utilised at present by Austar*

## 7.3 Surface Water

### 7.3.1 Environmental Management

The Austar SWMP has been prepared in accordance with the requirements of development consent DA29/95, Project Approval PA08_0111 and EPL 416, and includes a surface water monitoring program. The SWMP was revised in June 2018 was approved by the DPE on 1 August 2018. A revised SWMP was lodged with DPIE in April 2021 for approval.

Austar have two licenced discharge points (LDPs) – SW1 is an emergency wet weather discharge point, and SW6 which is permitted to discharge 5,000 kilolitres per day (as an annual average) of permeate (treated water from the Reverse Osmosis Plant).

Austar have engaged an environmental monitoring specialist to undertake routine surface water sampling and analysis in accordance with the SWMP. Austar's surface water monitoring program includes:

- Five (5) EPL monitoring sites (three creek sites and two discharge points); and
- Four (4) creek monitoring sites (three (3) sites in Quorrobolong Creek and one (1) site in Cony Creek).

The surface water monitoring locations are presented in **Table 7-3** and shown on **Plan 2**.

**TABLE 7-3 SURFACE WATER MONITORING LOCATIONS AND EPL CRITERIA**

| Area | Monitoring Location | Parameters | EPL Limits /Criteria |
|---|---|---|---|
| CHPP – EPL Points | **SW1** – Emergency Dam Spillway, **EPL Point 1** | pH<br>EC<br>Fe<br>TDS<br>TSS<br>Volume | 6.5-8.5<br>N/A<br>1 mg/L<br>6,000 mg/L<br>50 mg/L<br>2,000 KL/day |
| | **SW2** – Bellbird Creek Pinch Bridge, **EPL Point 2**<br>**SW4** – Bellbird Creek Eastern Boundary Downstream of CHPP, **EPL Point 4**<br>**SW5** – Unnamed Creek Western Boundary Upstream of CHPP, **EPL Point 5** | EC<br>pH<br>Fe<br>TSS | N/A<br>N/A<br>N/A<br>N/A |
| | **SW6** – 1ML tank discharge to Bellbird Creek, **EPL Point 6** | EC<br>pH<br>Fe<br>TSS<br>Volume | 600 µS/cm<br>6.5-8.5<br>1 mg/L<br>50 mg/L<br>5,000 KL/day as annual average |

| Area | Monitoring Location | Parameters | EPL Limits /Criteria |
|---|---|---|---|
| Creeks – Underground Mining Areas | **SWQ1** – Quorrobolong Creek (Sandy Creek Road)<br>**SWQ2** – Quorrobolong Creek (Austar Owned land)<br>**SWQ3** – Quorrobolong Creek (Austar Owned Land)<br>**SWC1** – Cony Creek (Quorrobolong Rd) | EC<br>pH<br>Fe<br>TSS | N/A<br>N/A<br>N/A<br>N/A |

### 7.3.2 Environmental Performance

A summary of surface water monitoring is presented in **Appendix A**.

Only EPL licensed discharge points SW1 and SW6 have water quality limits. Other locations are monitored for baseline data, or to observe any changes in water quality in the Bellbird South and Stage 3 mining areas.

There was no discharge event from SW1 (emergency overflow dam) during the reporting period. A total of 540ML was discharged from the Reverse Osmosis water treatment plant, via the 1ML tank to SW6 over the reporting period. This was an average of approximately 1.5 ML/day. The Reverse Osmosis (RO) plant ceased operation on 18 May 2021. A maintenance regime has been implemented on the RO plant so water treatment and discharge may recommence as required during the transition to closure. Due to the ephemeral nature of Bellbird Creek, the licensed discharge generated from the water treatment plant provided the main flow in Bellbird Creek during normal fair-weather conditions.

During the reporting period water quality samples were collected from SW6 on a monthly basis with the exception of June 2020 as the RO plant had ceased discharging to Bellbird Creek and the creek was dry at this time. Water quality results for all tested parameters (pH, EC, TSS and Fe) were within EPL limits with the exception of pH sampled on 3 July 2020 which reported a result of 6.29 (pH concentration limit as prescribed by EPL 416 is 6.5-8.5). Following receipt of this result SW6 was resampled on 10 July 2020 which reported a pH result of 6.72. Further information regarding this exceedance can be found in **Section 11**.

For the background CHPP creek monitoring points (SW2, SW4 & SW5):

- pH measured at individual sites remained relatively constant during the reporting period ranging between pH 5.60 (SW2) to pH 7.28 (SW2), which was similar to the 2019-20 range of pH 5.61 to ph7.78 and the 2018-19 range of pH 6.13 to pH 7.52;
- EC ranged between 266 µS/cm (SW2) and 7590µS/cm (SW5). EC values during the reporting period were generally similar to those of the 2019-20 and 2018-19 reporting periods except for SW5 samples collected in May 2021 (4330 µS/cm) and June 2021 (7590 µS/cm). The results reported at SW5 for May 2021 and June 2021, however, are not outside of the historical range

as three consecutive EC values being June, July and August 2017, were reported to be 8450 µS/cm, 9340 µS/cm and 9870 µS/cm, respectively.

- TSS ranged between <5 mg/L at all sites to 28 mg/L (SW2) for the reporting period, which was similar to the 2019-20 range of <5 mg/L to 16 mg/L and the 2018-19 range of <5 mg/L to 18 mg/L; and

- Fe (Iron) ranged between <0.05 mg/L (SW2) and 4.9 mg/L (SW5), which is comparable to the 2019-2020 range of <0.05 mg/L - 2.2 mg/L and 2018-19 range of <0.05 mg/L – 3.3 mg/L.

Refer to **Appendix A** for surface water quality graphs.

Bellbird Creek is ephemeral at sampling location SW5 upstream boundary to CHPP. Historically, water sampling at SW5 has been somewhat influenced by a potable water leak in the Hunter Water reservoir just upstream of the sample location, which may have also influenced the water quality results at this location. Following repair of the reservoir leak in October 2019, this monitoring location has predominantly remained dry. Samples were collected from SW5 during five sampling events out of twelve being August 2020, January, April, May and June 2021.

Samples were collected from SW2 and SW4 during all twelve sampling events. Bellbird Creek was flowing during all sampling events except for March and June 2021.

Natural fluctuations in water quality in Quorrobolong and Cony Creeks were observed, with sample points generally reporting results within historical ranges.

No environmental impacts upon surface waters from mining have been interpreted.

For the Quorrobolong and Cony Creek monitoring points (SWQ1, SWQ2, and SWQ3 & SWC1):

- Quorrobolong Creek was generally flowing throughout this reporting period. Twelve samples were collected from SWQ1, eleven samples were collected from SWQ2, and ten samples were collected from SWQ3. The sampling location on Coney Creek is in a deep pool, twelve samples were collected from SWC1 during the reporting period. It is difficult to compare this reporting period to others in Quorrobolong Creek, as between November 2017 and March 2020 only three samples were collected from SWQ1, SWQ2 and SWQ3, collectively due to drought conditions. During this time samples were collected from SWC1 on all but one sampling event (February 2018).

- pH ranged between 6.28 (SWQ2) and 8.28 (SWQ1) which generally aligns with results reported in the last two periods however the maximum pH reported this year is the highest recorded in Quorrobolong Creek by Yancoal. Historical pH results were pH 5.45 – 7.50 in the 2019-20 reporting period and pH 3.78 - 7.99 in the 2018-2019 reporting period.

- EC results ranged between 130 µS/cm (SWQ2) and 2000 µS/cm (SWQ2) during the reporting period. This generally aligns with the range of the 2019-20 reporting period being 342 – 3350 µS/cm.

- TSS ranged from <5 mg/L to 84 mg/L which generally aligns with the range reported in the 2019-20 reporting period being 6 mg/L to 73 mg/L.

- Fe (Iron) results ranged from 0.79 mg/L to 14.5 mg/L during the reporting period. This generally aligns with results of the previous 2 reporting periods being 0.98 mg/L to 16 mg/L in 2019-2020 and 0.6 mg/L to 13.9 mg/L in 2018-2019.

- With only 5 samples taken from Quorrobolong creek monitoring points over the preceding two years due to drought conditions, water quality trends in 2020-21 cannot be compared to results of the last few reporting periods. See **Appendix A** for graphs.

### 7.3.3 CHPP Investigation Drainage Line

Orange staining/residue was observed in a clean water drainage line at the CHPP during 2017 and reported as an incident to the EPA.

The drainage line is ephemeral and mainly dry. Austar commenced a monitoring program to investigate the source of the orange staining / residue and advised relevant regulators. Monitoring has continued during the reporting period in accordance with conditions U3 and E2 of EPL 416. These conditions were added on 15 December 2017 as part of a PRP specifically to address the orange staining issue in the drainage line at the CHPP.

Condition U3.3 requires the submission of an updated monthly report containing the monitoring results required by Condition U3.2. Condition U3.2 requirements include sampling of surface water in the Investigation Drainage Line; sampling of groundwater from the groundwater bore adjacent to the Investigation Drainage Line; and photos taken at specific locations along the Investigation Drainage Line. Reports have been submitted each month to the EPA and DPIE Compliance Branch for the reporting period.

Condition E2 requires that the orange staining / residue within the clean water drain must be fully contained with the premises at all times. Any discharges to waters of this residue must comply with Condition L1.1 of the EPL which states that the licensee must comply with Section 120 of the *Protection of the Environment Operations Act 1997*. A bunded containment area at the downstream extent of the Investigation Drainage Line has been installed to address this condition. Water captured is pumped from this containment area into the CHPP mine water system. Additionally, water below the Investigation Drainage Line can be captured within Doyle Street Dam and pumped back to the mine water system if required.

During the reporting period orange staining was observed in the Investigation Drainage Line during the August 2020 and the January, February, March, April and June 2021 inspections. Prior to last August, orange staining had not been prevalent in the Investigation Drainage Line since April 2018.

Monitoring of the Investigation Drainage Line will continue in the following reporting period.

### 7.3.4 Kitchener Sediment Dam Discharges

The Kitchener SIS contains established infrastructure including an upcast and downcast ventilation fan, services borehole/drop hole, pipelines, powerlines and electrical substation, as well as vegetated stockpiles that will be used for the rehabilitation of the site. There are several sedimentation dams on the site designed to catch sediment laden runoff from disturbed areas. Most disturbed areas have been revegetated.

As outlined in the SWMP, the sediment dams are designed to catch runoff for up to the 90$^{th}$ percentile 5-day rainfall events. Any rainfall event of greater intensity will cause the dams to overflow, with runoff reporting to the headwaters of Black Creek. There were two overflow events during the reporting period, described below.

#### 7.3.4.1 Overflow event, 27 July 2020

Prior to the commencement of this rainfall event the eastern sediment basin and lower water storage dam were empty, ensuring they could operate in accordance with design criteria. A total of 111.4 mm of rainfall was received at Kitchener SIS from 5:45 PM 25 July 2020 to 2:45 PM 28 July 2020 causing the sediment dams to discharge water from site. Rainfall received was greater than the 42.8mm 5-day design size of the sediment dams.

Austar enacted the Pollution Incident Response Management Plan (PIRMP) and reported the event to relevant authorities as per the PIRMP notification protocol on 27 July on the basis there was potential to cause pollution of waters through sediment discharge. Water samples were collected for laboratory analysis during the discharge event. Discharge flow rates were observed to be low, with water moving slowly and overland discharge flow shallow. Based on the review of water sampling results, there was unlikely to be any material harm caused by the incident.

A written incident report was submitted to the EPA, DPIE and Resources Regulator on 3 August 2020. DPIE and the Resources Regulator advised no further action would be taken at that time and NSW EPA have not responded.

#### 7.3.4.2 Overflow event, 20 March 2021

Prior to the commencement of this rainfall event the eastern sediment basin and lower water storage dam were empty, ensuring they could operate in accordance with design criteria. A total of 238 mm of rainfall was received at Kitchener SIS from 2:45 PM 16 March 2021 to 4:00 PM 23 March 2021 causing the sediment dams to discharge water from site. Rainfall received was greater than the 42.8 mm 5-day design size of the sediment dams.

Austar reported the event to the authorities, being NSW EPA, DPIE and the Resources Regulator on 20 March. Water samples were collected for laboratory analysis during the discharge event. Discharge flow rates were observed to be low, with water moving slowly and overland discharge flow shallow. Based on the review of water sampling results, there was unlikely to be any material harm caused by the incident.

A written incident report was submitted to the authorities on 26 March 2021. DPIE and the Resources Regulator advised no further action would be taken at that time and NSW EPA have not responded.

## 7.4 Ground Water

### 7.4.1 Environmental Management

The SWMP has been prepared in accordance with the requirements of development consent DA29/95 and Project Approval PA08_0111 and includes a groundwater water monitoring program. The SWMP was approved by the DPIE on 1 August 2018. A revised SWMP was lodged with DPIE in April 2021 for approval.

An environmental monitoring specialist is engaged by Austar to undertake quarterly groundwater monitoring and analysis in accordance with the SWMP, utilising nine piezometers (MB01, MB02, MB03A, MB04, AQD1073a, NER1010, WBH1, WBH2 and WBH3) to assess impacts on groundwater levels in the Bellbird South, Stage 2 and Stage 3 mining areas. The locations of these monitoring sites are presented in **Plan 2**.

Austar's groundwater monitoring program also includes monitoring of underground flows, water quality and pressure for operational purposes. Groundwater level data from EX01H is downloaded quarterly.

Groundwater resources in the vicinity of Austar are detailed in the SWMP.

### 7.4.2 Environmental Performance

**Appendix B** illustrates the groundwater monitoring results at Austar during the reporting period. The graphs illustrate groundwater depth, rainfall, pH and conductivity. Trends from the monitoring program are summarised below:

- Groundwater elevation in sandstone monitoring bore NER1010 increased gradually between July 2020 and June 2021; coincident with increased regional rainfall and an increasing Cumulative Rainfall Departure (CRD). Groundwater elevation in NER1010 shows a strong correlation with the CRD (see **Appendix B, Figure 12.1**);

- Groundwater elevations in Stage 2 and Bellbird South alluvial and WaterNSW bores increased slightly during the reporting period, with sudden increases in groundwater elevation coinciding with significant rainfall events. Above average rainfall since January 2020 has

continued to recharge the alluvium, following below average rainfall from mid-2017. Data for WaterNSW monitoring bores GW080974 and GW080975 was not available for the Q2 2021 monitoring period (see **Appendix B, Figure 12.2)**;

- Groundwater elevation in Stage 3 monitoring bore MB01 increased gradually during the reporting period (see **Appendix B, Figure 12.3)**.

- Groundwater elevation in Stage 3 monitoring bore MB02 increased during the recent monitoring period (see **Appendix B, Figure 12.4**). This increase is attributed in part to a gradual recovery following airlift development in October 2019. Groundwater elevation during Q1 and Q2 2021 have reached similar levels recorded prior to airlift development. Pressure Transducer (PT) data in MB02 was erroneous until Q4 2020 (discussed further in Maintenance Works section);

- VWP sensor no.1 (above predicted height of connected subsidence cracking), no.2 (within predicted height of connected subsidence cracking) and no.3 (below predicted height of connected subsidence cracking) piezometric heads remained stable throughout the recent monitoring period. VWP sensor no.4 (coal roof seam) recorded a decrease in piezometric head in July 2020, stabilising thereafter (see **Appendix B, Figure 12.5**);

- VWP sensors no.5 (coal seam centre) and no.6 (coal seam floor) recorded an increase in piezometric head in July 2020 (coincident with VWP sensor no.4 increased piezometric head), before gradually decreasing for the remainder of the monitoring period (see **Appendix B, Figure 12.6**). There is no definitive response to overall piezometric heads from rainfall within the period of monitoring. Monitoring results are consistent with predicted impacts;

- Sensors no. 5 and no.6 show that the coal seam and its surrounding units have been depressurised. That said, the head in sensor no.6 is higher than the head in no.5 indicating that the unit underlying the coal seam has not been depressurised to the extent of the coal seam, which is to be expected of a unit that has not been extracted;

- Historically, pH in sandstone monitoring bore NER1010 has fluctuated significantly; however, during the reporting period groundwater pH in this bore decreased only slightly and recorded minimal fluctuation. Remaining Stage 2 and Bellbird South alluvial pH values were stable during the monitoring period. Measured pH fluctuations are attributed to natural variation (see **Appendix B, Figure 12.7**);

- Stage 3 monitoring bores MB01 and MB02 recorded generally stable groundwater pH values in the reporting period (see **Appendix B, Figure 12.8**).

- Groundwater EC in Stage 2 and Bellbird South alluvial monitoring bores decreased or remained stable during the monitoring period. Monitoring bore AQD1073a recorded a sharp decline in EC in Q3 2020, recording stable EC values for the remainder of the reporting period

(see **Appendix B, Figure 12.9**). The decrease in EC can be attributed to increased rainfall and an increasing CRD during the reporting period;

- Groundwater EC in Stage 3 monitoring bore MB01 recorded a slight decrease in the reporting period. Monitoring bore MB02 EC steadily decreased during the reporting period (see **Appendix B, Figure 12.10**).; and

- Laboratory samples from each monitoring bore were taken during Q1 2021. Results are consistent with historical laboratory data.

There are no new trends in groundwater quality or water levels that indicate impact conditions that require enactment of the SWMP Response Plan triggers. Monitoring indicates that mining impacts are within EA predictions, and there is no evidence of impacts outside of established predictions.

Trends for 5-year monitoring period are summarised below:

- Groundwater elevation in sandstone bore NER1010 decreased between April 2016 and September 2019, increasing thereafter. NER1010 groundwater elevation correlates strongly with the CRD and rainfall recharge (see **Appendix B, Figure 12.11)**;

- Groundwater elevation within alluvial Stage 2 and Bellbird South monitoring bores declined between April 2016 and March 2020. Groundwater elevations increased in response to significant rainfall recharge during 2020 and 2021(see **Appendix B, Figure 12.12)**;

- Groundwater elevation in Stage 3 monitoring bore MB01 declined suddenly in 2016, declining from 36.32 mAHD in June 2016 to 28.58 mAHD in September 2016. Groundwater elevation continued to decline between 2016 and 2018. PT data recorded between 21 June 2019 and 4 November 2019 has since been shown to be erroneous and has been removed from the dataset. Increased groundwater elevation recorded during this time was due to the PT falling downhole. Data subsequent to retrieval of the PT (i.e., after 4 November 2019) is consistent with manual measurements. Groundwater elevation has been relatively stable in MB01 since May 2019 (see **Appendix B, Figure 12.13)**;

- Excepting a sharp decrease in November 2019, groundwater elevation in MB02 was stable between 2016 and October 2019. This sharp decrease in 2019 is attributed to airlift development, with the bore recharging rapidly thereafter. Erroneous PT data recorded between July 2020 and December 2020 was the result of increased pressure head on the data logger due to rapid recharge in the bore. The depth of the data logger has since been adjusted and PT groundwater elevation data is now synchronous with manual groundwater level measurements (see **Appendix B, Figure 12.14**);

- VWP sensors no.1 (above predicted height of connected subsidence cracking), no.2 (within predicted height of connected subsidence cracking) and no.3 (below predicted height of connected subsidence cracking) piezometric heads have been generally stable since the start of 2018. Sensor no. 4 (coal seam roof) pressure head has fluctuated throughout the five-year monitoring period (see **Appendix B, Figure 12.15**). Sensors no.5 (seam centre) and no.6 (seam floor) piezometric heads have continued to decrease since April 2016 (see **Appendix B, Figure 12.16**). The monitoring results between April 2016 and May 2021 are consistent with predicted impacts;

- Stage 2 and Bellbird South alluvial pH values have remained generally stable during the five-year period to May 2021 (see **Appendix B, Figure 12.17**);

- Groundwater pH in sandstone bore NER1010 fluctuated throughout the monitored period (July 2016 to May 2021); ranging from pH 7.70 in September 2019 to pH 11.53 in June 2018. Following airlift development in October 2019, pH values have changed from hyper-alkaline to slightly alkaline (see **Appendix B, Figure 12.17**). Elevated pH in NER1010 (and MB02 - see below) pre-airlift development has been attributed to stagnant water in the bore casing;

- Stage 3 monitoring bore MB01 pH was generally stable during the 5-year monitoring period. MB02 recorded stable, yet elevated, pH values until September 2019, before decreasing rapidly following airlift development in the December 2019 monitoring period. Following this sharp decrease, pH values in MB02 have slightly increased (see **Appendix B, Figure 12.18**). Elevated pH in MB02 prior to airlift development has been attributed to stagnant water in the bore casing;

- Groundwater EC in Stage 2 and Bellbird south alluvium was variable. MB04 and MB03A recorded decreasing EC values in recent times due to significant rainfall recharge. AQD1073a and NER1010 EC fluctuated throughout the five-year reporting period. EC values in AQD1073a have returned below 1000 µS/cm following consecutive readings above 5000 µS/cm from Q3 2016 to Q3 2020. The sharp decrease in EC in September 2020 was coincident with an increasing CRD. WBH1, WBH2 and WBH3 EC was generally stable during the five-year monitoring period, with slight fluctuations recorded during that time (see **Appendix B, Figure 12.19**); and

- Groundwater EC in Stage 3 monitoring bore MB01 has remained generally stable during the five-year period. MB02 recorded stable EC values until September 2019, increasing rapidly following airlift development in October 2019. EC in MB02 has since been returning to values which are similar to historical data, with EC declining each quarter since September 2020 (see **Appendix B, Figure 12.20**).

#### 7.4.2.1 Maintenance Works

Maintenance work was undertaken at monitoring bore MB02 during the Q4 2020 monitoring round. It was noted in Q3 2020 that the PT data was likely erroneous from early July 2020 onwards. The inaccurate readings were caused by a fault with the PT due to recharge and an increased column of water in the bore following airlift development in late 2019. The PT was repositioned higher in the water column (to 25 mBGL) during the Q4 monitoring round to reduce head pressure on the PT. PT data and manual groundwater measurements were synchronous during both Q1 2021 and Q2 2021 monitoring rounds.

The cement headworks at monitoring bore MB04 were repaired in Q4 2020.

Monitoring bores will continue to be inspected throughout the next reporting period. The bore network is currently considered effective with no further maintenance recommended. Recommendations will continue to be addressed as required in future reporting periods.

# 8 REHABILITATION

Rehabilitation and land management activities were undertaken in accordance with the approved MOP. Consistent with the rehabilitation schedule in the MOP, there were no areas of rehabilitation relinquished or signed off by Resources Regulator during the reporting period.

In June 2020 the Resources Regulator issued a notice under s240 of the *Mining Act 1992* to prepare and submit a MOP amendment to address changes in activities following Austar entering care and maintenance. The scope of the amendments to the MOP included:

- Changes in site activities during the period of care and maintenance;
- Management of environmental risks during care and maintenance; and
- Inclusion of a schedule of mine closure planning investigations and studies to be carried out before the end of 2022 (see Section 8.5).

MOP Amendment A was approved on 4 March 2021.

The MOP defines rehabilitation phases for each domain, and the completion criteria for each phase. For each domain, specific performance indicators have been established to allow the progress of rehabilitation to be measured.

## 8.1 Rehabilitation of Disturbed Land

During the reporting period rehabilitation activities included:

1. maintaining and enhancing existing rehabilitation areas at Aberdare Extended Emplacement Area, Area 12 and Area 13. This was primarily achieved through:
    - the implementation of a Weed Action Plan targeting specific species and infestation areas;
    - infill of minor subsidence holes in Area 12.

2. Carrying out mine closure planning activities in accordance with the MOP schedule including completing a rehabilitation materials inventory (**Section 8.1.3**). The status of closure planning studies is reported in **Section 8.5**.

A rehabilitation monitoring program is undertaken annually and is further discussed in **Section 8.2**. Recommended activities from the 2020 Rehabilitation Monitoring Report include weed management, supplementary planting, infill of sink holes, controlling unauthorised access and litter removal. All recommendations have been addressed within the reporting period except for maintenance seeding, which will be undertaken in the following reporting period. Controlling littering and unauthorised access is an ongoing challenge and is addressed as required each year. All areas within reject emplacements that have reached final design height have been capped and rehabilitated to ecosystem and land use establishment phase. All other areas of the mine remain in the Active Phase.

### 8.1.1 Underground Mining Area (Extraction Plan)

No mining impacts have been observed that require remediation of land in the Bellbird South LWB1-LWB7 Extraction Plan area.

### 8.1.2 Exploration

There were no surface exploration works undertaken during this reporting period. All previous exploration boreholes drilled by Austar have been rehabilitated. During the reporting period, rehabilitation approval forms (ESF2 forms) were submitted to the Resources Regulator for 43 exploration boreholes that have been fully rehabilitated. There have been 34 exploration boreholes signed off by the Resources Regulator, with nine boreholes pending approval. Three boreholes are outstanding – pending either final photos or landholder sign off.

### 8.1.3 Materials Inventory

In accordance with MOP commitments (MOP Amendment A Table 2-4) a capping and materials inventory was completed in February 2021 and submitted to the Resources Regulator.

All stockpiles were surveyed and photographed. The volumes of stockpiled material were calculated using CAD and figures prepared using GIS. West Pit capping material is an estimate based on historic pit floor records, coarse reject emplacement records and current surveys to estimate potential capping volume. Further investigation is planned to verify material type and volume and assess

suitability for use as capping material. The outcomes of the inventory assessment are provided in Table 8-1.

**TABLE 8-1 - MATERIALS INVENTORY**

| Stockpile Name | Material Type & Volume ($m^3$) | | | | Comments |
|---|---|---|---|---|---|
| | Capping Material | Shaft Cuttings (Overburden Material) | Growth Media | Topsoil | |
| Area 12 | | | 2,101 | | Material is suitable as growth media over capping. |
| West Pit W2 | 1,338,284 | | | | Further investigation is planned to verify material type and volume and assess suitability for use as capping material. |
| Kitchener 1 - A | | 18,324 | | | Combined stockpile of shaft cuttings (overburden) material and topsoil. |
| Kitchener 1 - B | | | | 1,428 | |
| Kitchener 2 | | 4,762 | | | Stockpile of shaft cuttings (overburden) material. |
| Kitchener 3 | | | | 1,960 | Stockpile of topsoil. |
| **Total** | **1,338,284** | **23,086** | **2,101** | **3,388** | |

Austar acknowledges that there is a potential deficit in suitable materials available for capping and rehabilitation activities at the site and is undertaking several actions to address this. These include:

- A final land use assessment to review the post mining land uses;
- Refining completion criteria and objectives in line with the post mining landuse assessment;
- Reviewing final landform designs to ensure they can sustain the nominated final land uses and meet the rehabilitation objectives;
- Reviewing the capping designs for tailings dams and reject emplacement areas;
- Characterising available materials to confirm suitability for capping and use in rehabilitation; and
- Developing a strategy to investigate and procure alternative sources of materials such as topsoils (and/or substitutes) along with other rehabilitation materials such as clays, suitable weathered rock, hard rock, organics, etc.

Mine closure planning works are discussed further in **Section 8.5**.

## 8.2 Rehabilitation Monitoring

In accordance with the MOP, reject emplacement areas where rehabilitation has been undertaken to grassland, are to be monitored on an annual basis until they are self-sustaining and no longer require management.

A rehabilitation monitoring program is undertaken annually, with results compared to the completion criteria in the MOP and recommendations provided to progress towards the completion criteria.

Consistent with previous years, key to progression of all monitoring locations is a reduction in weed cover and a reduction in human interference (such as rubbish, bike tracks and burnt out cars).

Results of the monitoring were compared to Performance Criteria for the Ecosystem and Landuse Establishment and Sustainability phases (**Table 8-2**) and the trigger action response plan (TARP) (**Table 8-3**) from the approved MOP.

Recommendations arising from the 2021 annual rehabilitation monitoring report are discussed below, along with proposed actions to address the recommendations:

- Weed management – weed infestations require management and control in all rehabilitation areas. Weeds identified include Camphor Laurel, Lantana, Green Cestrum Purple top, Fireweed and Blue heliotrope. A Weed Action Plan was developed for the site incorporating the rehabilitation areas and is being executed over a number of years. Weed management in the rehabilitation areas is ongoing, with weed works focussing on rehabilitated areas during the reporting period.
- Maintenance Seeding – maintenance seeding should be undertaken in any areas subject to weed management that are subsequently left unvegetated. Any plantings of these areas should comprise groundcover species provided in Appendix 2 of the MOP. Maintenance seeding is planned in areas of Aberdare Emplacement Area in spring 2021. Follow up inspections of areas sprayed for weeds in the last reporting period has not identified significant bare patches. Monitoring of these areas will continue, and maintenance seeding will be done where required.
- Remediation of dirt bike paths - Dirt-bike paths have formed rivets in rehabilitated areas of Aberdare REA, particularly in the north. Remediation of these tracks is recommended so that the subsurface is not exposed. This area will be lightly scarified or graded to remove tracks, and seeded during next Spring.
- Supplementary planting of these areas may be required following remediation, however given the narrow width, it is likely that ground cover would naturally re-establish along these paths over time.
- Prevention of unauthorised access – Evidence of unauthorised access (such as rubbish dumping, 4WD tracks, motorbike tracks and burnt-out vehicles) were identified across each of these REAs. Given proximity to urban areas, such aspects are difficult to control. However, unauthorised access raises a significant threat to rehabilitated areas, primarily in terms of

physical damage to establishing vegetation, fire outbreak (from unauthorised burning practices), and potential for introduction and spread of weeds. Preventing unauthorised access is an ongoing challenge at Austar Coal Mine, with security patrols, ongoing fencing repair and improvement, and placement of barriers in access areas. This will continue during the next reporting period.

- Domestic goat control - A large herd of goats has been observed at Area 13. The goats have not been observed to be causing damage to vegetation other than grazing of the tips of the abundant grasses. Goats will be monitored over the coming few years and managed as required.
- Rubbish removal –Removal of the rubbish in Area 12 should occur. This will act as discouragement against further littering. In Kalingo East, various old building footings are present throughout, as are concrete walls, piers etc. Potential historic/heritage value should be considered, otherwise loose surface debris should be removed.

Performance criteria and monitoring requirements for the site are being reviewed and refined as part of the detailed mine closure planning work currently being undertaken (**Section 8.5**).

**TABLE 8-2 MOP PERFORMANCE CRITERIA ASSESSMENT**

| | Area 12 | Area 13 | Aberdare REA | Aberdare REA North | Kalingo East | Kalingo West |
|---|---|---|---|---|---|---|
| **All Phases** | | | | | | |
| Minor rilling only (less than 30 cm by 30 cm), within areas that landform works have been undertaken | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Ecosystem and Land-Use Establishment Phase** | | | | | | |
| **Pasture** | | | | | | |
| Ground cover comparable to pre-mining environment is re-established following remediation activities | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Remediation areas revegetated with species selected based on the existing land use (i.e. pasture) and surrounding vegetation | • | • | • | ✓ | • | • |
| Ecosystem function is rehabilitated to that existing pre-mining and consistent with the surrounding landform | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Ecosystem and Land-Use Sustainability Phase** | | | | | | |
| **Pasture** | | | | | | |
| Revegetation is progressing towards a sustainable ecosystem and only requires maintenance that is consistent with the intended final land use | • | • | • | • | • | • |
| For Grassland areas, groundcover targets:<br>- 0-20% canopy | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| - 70-100% groundcover | ✓ | ✓ | • | ✓ | ✓ | ✓ |
| Weeds identified on-site are actively controlled and/or removed using appropriate weed control techniques to meet the final land use criteria. | • | • | • | ✓ | ✓ | ✓ |
| Weeds are absent from canopy and understorey | • | • | • | ✓ | • | • |

| | Area 12 | Area 13 | Aberdare REA | Aberdare REA North | Kalingo East | Kalingo West |
|---|---|---|---|---|---|---|
| Weeds comprise no more than 20% of ground cover vegetation | ✓ | • | • | ✓ | • | ✓ |

- • - *Management Actions Required* ✓ - *Management Actions Successful*

**TABLE 8-3 COMPARISON OF MONITORING RESULTS TO TRIGGER, ACTION RESPONSE PLAN**

| Trigger (MOP Extract) | Comment | Remediation Action |
|---|---|---|
| Hazardous Materials (asbestos) Inappropriately removed during demolition of heritage structures, leading to soil contamination and/or health impact | No hazardous materials identified. | Not required |
| Landform not in accordance with DRE requirements (i.e. not within MOP completion criteria including capping material depth) | Landform is generally in accordance with final landform. | Not required |
| Erosion / poor water quality from rehabilitation areas (in excess of target criteria identified in **MOP Table 6.1**). | No erosion identified.<br>However, remediation of dirt bike tracks in Aberdare REA required to maintain the quality of rehabilitation. | Remediation of dirt bike tracks in Aberdare REA will be undertaken in the next reporting period. |
| Lack of vegetation establishment or dieback of rehabilitated areas resulting in inability to meet vegetation criteria targets specified in **MOP Table 6.1**. | No substantial dieback identified. | Not required |
| Weed infestation threatening rehabilitation success (weeds in excess of identified criteria level (refer to **MOP Table 6.1**). | Weed infestation threatens each of the REAs. | Implement weed management and control actions as required. Re-seed utilising appropriate species as per target final land use where necessary. Weed management works are undertaken annually according to the weed action plan. |
| Significant damage to rehabilitation areas by feral animals, resulting in inability to meet vegetation criteria targets specified in **MOP Table 6.1** | Low levels of rabbit presence but not causing significant damage.<br>Goats identified in Area 13 from adjacent property | Not required for rabbits.<br>Goat population will be monitored, and appropriate actions taken as required. No specific actions currently required. |
| Acid leachate identified from rehabilitated reject emplacement areas, potentially resulting in offsite water impact and/or dieback of revegetation, resulting in inability to meet vegetation criteria targets specified in **MOP Table 6.1** | No evidence of acid leachate identified. | Not required |
| Spontaneous combustion of rehabilitation area | No evidence of spontaneous combustion observed. | Not required |

## 8.3 Rehabilitation Trials and Research

A number of geotechnical studies have previously been undertaken in relation to capping of reject emplacement areas. These studies have been used to inform the material characterisation and capping design works currently being undertaken as part of detailed mine closure planning. Phase 1 desktop assessments and site inspections have been completed, with the subject matter experts providing recommendations on required actions to close any knowledge gaps and allow execution of closure works. Phase 2 detailed assessments are currently being scoped.

## 8.4 Rehabilitation Summary

During the reporting period rehabilitation was managed generally in accordance with the MOP. Mining and rehabilitation status is presented in **Table 8-4.** Rehabilitation activities at Aberdare Emplacement Area and West Pit are shown on **Plan 3B** and **Plan 3C**. Rehabilitation in Areas 12 and 13 are shown on **Plan 3E**. Rehabilitation at Kalingo is shown on **Plan 2D**.

**TABLE 8-4 REHABILITATION SUMMARY**

| Mine Area Type | Previous Reporting Period (ha) | This Reporting Period (ha) | Next Reporting Period (ha) |
|---|---|---|---|
| | **2019-20** | **2020-21** | **2021-22** |
| Total Mine Footprint | 187.9 | 187.9 | 187.9 |
| Total Active Disturbance | 141.3 | 141.3 | 141.3 |
| Land being Prepared for Rehabilitation | 0 | 0 | 0 |
| Land under active Rehabilitation | 46.6 | 46.6 | 46.6 |

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

***Total active disturbance*** *includes all areas ultimately requiring rehabilitation such as: on-lease exploration areas, stripped areas ahead of mining, infrastructure areas, water management infrastructure, sewage treatment facilities, topsoil stockpile areas, access tracks and haul roads, active mining areas, waste emplacements (active/unshaped/in or out-of-pit), and tailings dams (active/unshaped/uncapped).*

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

***Land under active rehabilitation*** *- includes areas under rehabilitation and being managed to achieve relinquishment – includes the following rehabilitation phases as described in the DPIE-DRG MOP/RMP Guidelines – "ecosystem and land use establishment" (area seeded OR surface developed in accordance with final land use) and "ecosystem and land use sustainability" (revegetation assessed as showing signs of trending towards relinquishment OR infrastructure development).*

***Completed rehabilitation*** *– requires formal sign-off by DPIE-DRG that the area has successfully met the rehabilitation land use objectives and completion criteria.*

## 8.5 Closure Planning

Mine closure planning has progressed significantly during the reporting period with the completion of the following aspects:

- Stakeholder identification and mapping and commencement of consultation
- Risks to relinquishment risk assessment
- Obligations Register
- Data collection, collation and review
- Specialist study desktop assessments and development of treatment plans (Phase 1)

Detailed specialist studies (Phase 2) are currently being scoped, with the intention of these studies being to address knowledge gaps identified in Phase 1 and to inform development of an executable mine closure plan.

Mine closure planning aligns with the commitments made in Table 2-4 of MOP Amendment A**.** Table 8-5 provides details on the status of these commitments.

**TABLE 8-5 MINE CLOSURE PLANNING STRATEGY STATUS UPDATE**

| # | Aspect | Description | Nominated Timing in MOP Amendment A | Status as at September 2021 |
|---|---|---|---|---|
| Base Case: Final Land Use, Completion Criteria and Rehabilitation Objectives | | | | |
| 1 | Final land use assessment | Undertake a final land use assessment, as described in **Section 4.2 (of MOP Amendment A)**. Final land uses are those approved in Austar's various consents, however may be refined prior to mine closure. | Q3, 2021 | Consultant engaged to undertake final land use assessment. |
| 2 | Mine closure risk assessment | Undertake an Environmental Risk Assessment focused on mine closure preparedness and specifically risks to achieving the final land use, as described in **Section 3.2 (of MOP Amendment A)**.<br>NB the risk register will be reviewed following completion of the mine closure risk assessment | Completed | Initial risk assessment completed. Mid-term risk assessment completed. |
| 3 | Completion criteria and rehabilitation objectives | Refine the completion criteria and objectives in **Table 6-1 (of MOP Amendment A)** after final land uses confirmed, as described in **Section 6 (of MOP Amendment A)**. | Q3, 2021 | Completion criteria and rehabilitation objectives being refined as part of aspect specific studies. |

| # | Aspect | Description | Nominated Timing in MOP Amendment A | Status as at September 2021 |
|---|---|---|---|---|
| 4 | Final landform design | Review the final landform designs to ensure it can sustain the nominated final land uses and meet the rehabilitation objectives in **Section 4.3 (of MOP Amendment A)**. | Q4, 2022 | Final landform design being considered in relevant aspect specific studies. |
| | | Prepare detailed slope and drainage designs for the final landform to ensure long-term stability. | Q4, 2022 | |
| **Knowledge Base: Gap analysis and initial mine closure planning studies** | | | | |
| 5 | Rehabilitation resources balance | Establish an inventory of materials available for capping and rehabilitation (in an appropriate spatial format), as described in **Section 3.3.7 (of MOP Amendment A)**. | End of February 2021 | Completed. See detail in **Section 8.1.3** |
| | | Characterise available materials to confirm suitability for rehabilitation. | Q4, 2022 | • Phase 1:<br>o Desktop assessment and site inspections completed.<br>• Phase 2:<br>o Site investigation plan being developed (volumes, characterisation).<br>o Scope being prepared for remaining detailed assessment. |
| | | In the case of a material deficit, develop a strategy to investigate and procure alternative sources of materials such as topsoils (and/or substitutes) and other rehabilitation materials such as clays, suitable weathered rock, hard rock, etc. | Q4, 2022 | |
| | | The material balance will be reviewed following confirmation of rejects and tailings capping designs prior to decommissioning. | Prior to decommissioning | |
| 6 | Historic heritage assessments | Undertake/review heritage assessments for known or potential historic heritage items at Austar Coal Mine to guide retention/demolition decisions, as described in **Sections 2.3.9** and **7.2.1 (of MOP Amendment A)**. | Q4, 2021 | Completed. |
| | | Consult with Cessnock City Council heritage advisors and or the NSW Heritage Office (if required) to confirm approach and to seek appropriate heritage approvals prior to demolishing heritage items. | Q4, 2021 | Planned for Q3/Q4 2021. |
| 7 | Derelict / redundant infrastructure decommissioning strategy | Prepare an infrastructure decommissioning strategy for progressive decommissioning of redundant, derelict or hazardous buildings, structures, machinery, plant and equipment. | Q4, 2021 | Hazmat/demolition specialist engaged. Site visit and development of strategy scheduled for Q4 2021. |

| # | Aspect | Description | Nominated Timing in MOP Amendment A | Status as at September 2021 |
|---|---|---|---|---|
| | | Consult with Cessnock City Council heritage advisors and or the NSW Heritage Office (if required) to confirm approach and to seek appropriate heritage approvals prior to demolishing heritage items. | Q4, 2021 | Planned for Q3/Q4 2021. |
| 8 | Infrastructure retention strategy | Identify infrastructure that could be retained post closure (i.e. internal roads, access tracks, dams, buildings, services), subject to approval, to support the final land use or to retain heritage value. | Q4, 2021 | Hazmat/demolition specialists engaged. Site visit and development of strategy scheduled for Q4 2021. |
| 9 | Mine water dam decommissioning strategy | Prepare a preliminary strategy for decommissioning of redundant mine water dams. | Q4, 2022 | • Phase 1:<br>o Desktop assessment, site inspection and workshop completed.<br>• Phase 2:<br>o Scope being prepared. |
| | | Prepare a strategy, in consultation with Dams Safety NSW, for decommissioning prescribed dams (i.e. Kalingo Dam). | Q4, 2022 | |
| 10 | Tailings storage facilities and reject emplacement area decommissioning and capping strategy | Prepare strategy for progressive decommissioning of the tailings storage facilities and reject emplacement areas. | Q4, 2022 | • Phase 1:<br>o Desktop assessment completed.<br>o Currently engaging additional specialist input (geochemistry, combustibility).<br>o Independent auditor engaged.<br>• Phase 2:<br>o Detailed site investigation plan being prepared. |
| | | Review capping techniques, as described in **Section 7.2.2 (of MOP Amendment A)**. | Q4, 2022 | |
| 11 | Water management | Review the existing groundwater information to consider aspects related to closure of the mine. | Q4, 2022 | • Phase 1:<br>o Technical expert advisor to study engaged.<br>o Groundwater desktop assessment completed.<br>• Phase 2:<br>o Groundwater model plan being developed.<br>o GW Model development Q1 2022.<br>o Independent model peer reviewer engaged. |
| | | Review the site water balance and any post closure water management requirements, including management of acid mine drainage. | Q4, 2022 | • Phase 1:<br>o Surface water desktop assessment and site inspection completed.<br>• Phase 2:<br>o Scope being prepared for detailed assessment. |
| | | Review post closure water licensing requirements. | Q4, 2022 | |

| # | Aspect | Description | Nominated Timing in MOP Amendment A | Status as at September 2021 |
|---|---|---|---|---|
| 12 | Exploration borehole sealing | Undertake desktop and field surveys of borehole sealing status. | Q1, 2021 | Completed. |
| | | Prepare and commence implementation of the exploration borehole sealing strategy. | Q1, 2022 | Audit and sealing complete.<br>ESF2 applications submitted for all but three holes, which are waiting on landholder signoff or access for final rehabilitation photos. |
| 13 | Underground mine sealing | Prepare mine sealing designs for all shafts, portals and operational boreholes. | Prior to decommissioning | • Review of historic and current entries completed.<br>• Specialist engaged; concept sealing designs completed.<br>• Site geotechnical investigations being scoped for Q4 2021 / Q1 2022. |
| 14 | Subsidence remediation works | Prepare a plan for post closure remediation of subsidence-related impacts to natural and built features, as described in **Section 3.3.4 (of MOP Amendment A)**. | As per approved Extraction Plan. | • Consultant engaged for a subsidence assessment:<br>o ID and mapping.<br>o Analysis and model development.<br>o Monitoring and management. |
| 15 | Contaminated land assessments | Undertake a Phase 1 contaminated lands assessment focusing on surface infrastructure areas to identify any remediation requirements. | Q4, 2021 | Desktop Assessment (Preliminary Site Investigation - PSI) completed. |
| | | Undertake full Land Quality investigations and prepare a remediation action plan | Prior to mine closure – to be included in final mine closure plan | • Contamination auditor engaged.<br>• Contamination sampling plan commenced development (SAQP).<br>• Scope being prepared for remaining Phase 2 requirements (Detailed Site Investigation - DSI, Remediation Action Plan - RAP). |
| 16 | Hazardous materials assessment | Undertake assessments of hazardous materials and chemicals and develop registers and management strategies. | Q4, 2021 | Hazmat/demolition specialists engaged. Site visit and development of strategy scheduled for Q4 2021. |
| 17 | Demolition waste disposal strategy | Identify volumes of waste streams and options to dispose on site or at licenced facilities. | Prior to decommissioning – to be included in final mine closure plan | Hazmat/demolition specialists engaged. Site visit and development of strategy scheduled for Q4 2021. |
| | | Develop strategy to segregate and manage waste streams on site during demolition. | Prior to decommissioning – to be included in final mine closure plan | |

| # | Aspect | Description | Nominated Timing in MOP Amendment A | Status as at September 2021 |
|---|---|---|---|---|
| 18 | Environmental Management Plans | Review/ update the environmental management plans listed in **Section 3.3 (of MOP Amendment A)** to reflect mine closure activities. | Prior to mine closure – to be included in final mine closure plan | Commenced – initial revisions submitted to DPIE. To be updated as required during closure planning and execution. |
| 19 | Post-closure Monitoring and Maintenance | Identify post-closure environmental monitoring requirements, including monitoring of rehabilitation, subsidence and water quality. | Prior to mine closure – to be included in final mine closure plan | Commenced – development of execution QA/QC and post closure monitoring is included in scope of all specialist studies. |
| | | Identify post-closure maintenance requirements such as weed and feral animal control, bushfire management and maintenance of safety signage/fencing to control public access. | Prior to mine closure – to be included in final mine closure plan | Commenced – development of execution QA/QC and post closure monitoring is included in scope of all specialist studies. |
| 20 | Approvals and mining lease relinquishment strategy | Prepare an approvals and mining lease relinquishment strategy that considers the timing and process for relinquishing approvals following mine closure (e.g. EPL, Project Approval and MLs). | Prior to mine closure – to be included in final mine closure plan | Commenced. |
| 21 | Human resources strategy | Prepare a human resources strategy to identify opportunities to stage the release of employees and contractors and to support redeployment where appropriate. | Prior to mine closure – to be included in final mine closure plan | Completed. |
| 22 | Community management strategy | Prepare a community management strategy to minimise any adverse socio-economic effects of mine closure. | Q2, 2021 | Integrated with Stakeholder Engagement Strategy. |
| 23 | Stakeholder engagement strategy | Prepare a stakeholder engagement strategy to guide communication and engagement during mine closure. | Q2, 2021 | Completed. |

## 8.6 Rehabilitation Actions for the Next Reporting Period

The following actions are proposed for the 2021-22 reporting period:

- Implement the recommendations of the rehabilitation monitoring report as detailed in **Section 8.1.3**.
- Maintain and enhance existing rehabilitated areas at Aberdare reject emplacement area, Area 12 and Area 13.
- Progress the mine closure planning strategy, as documented in MOP Amendment A and discussed in Section 8.5.

# 9 COMMUNITY RELATIONS

Austar is committed to minimising the impacts of its operations and is an active participant and contributor to community projects that benefit local people.

## 9.1 Community Support Program

Yancoal's corporate Community Support Program (CSP) is ongoing and supports organisations in the Hunter Valley. The aim of Yancoal's Community Support Program is to invest in community projects and local initiatives with the potential to make a positive difference.

## 9.2 Community Sponsorship

In addition to the Community Support Program, Yancoal sponsors local community initiatives. In the 2020-2021 reporting year sponsorship included:

- Cessnock High School; and
- Cessnock Rugby League Football Club.

While no longer operating, Austar is still a part of the Cessnock community and will continue to support some long-term partnerships while transitioning to closure.

## 9.3 Community Liaison

Yancoal continues to maintain close relationships with neighbouring properties and nearby communities as part of normal business. This is mainly done through individual contacts with neighbours, and the Community Consultative Committee (CCC), as described below.

### 9.3.1 Community Consultative Committee

The Austar CCC continued to operate during the 2020-2021 reporting period. The CCC is conducted generally in accordance with the DPIE's Community Consultative Committee Guideline (January 2019). CCC meetings are held every six months. Current members of the CCC are listed in **Table 9-1**. During the reporting period Austar held two CCC meetings, which occurred on the following dates:

- 26 August 2020; and
- 24 March 2021

Austar coordinates these meetings, and provides information on mining progress, community programs and environmental performance. The annual review of the CCC and meeting minutes are located on the Austar coal website: http://www.austarcoalmine.com.au. The major discussion points from the Austar meetings in 2020-2021 were:

- Mining operations – underground, CHPP, Exploration, Bellbird South Area progress, Stage 3 progress, staff reductions, transition to Care and Maintenance, closure planning activities;
- Environmental monitoring, results and incidents;

- Community complaints; and
- Community sponsorships.

**TABLE 9-1 AUSTAR COMMUNITY CONSULTATIVE COMMITTEE (CCC) DURING THE REPORTING PERIOD**

| Organisation/Representative | Name |
|---|---|
| Independent Chairperson | Ms Margaret MacDonald-Hill |
| Cessnock Council Representative | Councillor Mark Lyons |
| Community Representatives | Mr Alan Smith<br>Ms Ashlee Baker<br>Mr John Rayner<br>Mr Peter Sturrock<br>Chief Inspector Michael Gorman |
| Company Representatives | Mr William Farnworth<br>Ms Carly McCormack<br>Ms Julie McNaughton |

### 9.3.2 Resident Consultation

During the reporting period, Austar consulted with individual residents who live in areas potentially affected by Austar's operations as required. This consultation was often conducted informally, in a manner that allowed the residents to openly discuss issues of importance to them.

On 4 March 2021 stakeholders including landholders and infrastructure owners over the Stage 2 mining area, Stage 3 mining area, Bellbird South mining area, EL6598 as well as relevant NSW Government Departments were provided with an update by letter to inform of the decision made by Yancoal to transition the Austar Mine to closure.

During the next reporting period, there will be further communication with the community regarding closure activities and the potential impacts to persons and/or property.

## 9.4 Community Complaints

Austar's Environmental Management Strategy (EMS) includes a procedure for receiving, investigating, responding and reporting complaints received from the community. Austar maintains a 24-hour-a-day, 7 days a week, free call number 1800 701 986 to receive environmental complaints and other enquiries.

Consistent with the previous reporting year, in the 2020-21 reporting period one complaint was received regarding offensive sulphur odours potentially being emitted from the coal stockpile area.

Details of the complaint are provided in **Table 9-2**.

**TABLE 9-2 COMMUNITY COMPLAINTS SUMMARY**

| Date | Category | Detail | Follow Up Actions |
|---|---|---|---|
| 25/09/2020 (phone call from EPA) | Air Quality | On 25/09/2020 the Austar Environment and Community (E&C) Superintendent was made aware of a complaint reported to the EPA regarding an offensive sulphur odour potentially being emitted from the Austar coal stockpile area. | Following receipt of the complaint on the afternoon of 25/9/2020 all CHPP infrastructure areas, including empty coal stockpile pads and reject emplacement areas, were inspected for any signs of spontaneous combustion or sulphur odour. No spontaneous combustion or sulphur odour was observed to be emitted from Austar. Fresh bitumen was observed to have been applied to the Council roadside drain on Kendall Street nearby the complainant's property. Based on this observation it was concluded the source of the odour was the fresh bitumen. |

## 10 INDEPENDENT ENVIRONMENTAL AUDIT

An Independent Environmental Audit was conducted by SLR Consulting in October 2020. The audit assessed the following key approvals:

- Stage 3 Project Approval (PA08_0111);
- Bellbird South Development Consent (DA 29/95);
- Environment Protection Licence 416;
- Mining Lease (18 leases assessed); and
- Water Access Licences.

There were twelve actions agreed upon by auditors and Austar personnel, five of which have been completed. The outstanding actions from the audit are listed in **Table 10-1**.

**TABLE 10-1 INDEPENDENT ENVIRONMENTAL AUDIT FINDINGS 2020 – ONGOING ACTIONS**

| Rec No | Independent Environmental Audit Recommendations | Austar Coal Mine Responses to DPIE | Status |
|---|---|---|---|
| 2 | Consider the status of rehabilitated areas within the Kitchener SIS area. If rehabilitation can be signed off as complete clean water runoff from the rehabilitated areas above the sediment dams may be diverted and the catchment reporting to the dams reduced. This may reduce overtopping during rainfall events. | 1. Develop a program to sample clean water runoff from rehabilitated areas of Kitchener SIS, including runoff in drains and regular sampling of sedimentation dams and of Black Creek when flowing.<br>2. Use the baseline water quality data to develop a plan to allow water flow offsite for consultation with agencies. Consider whether water should be diverted away from sediment dams or allowed to flow through them and be discharged. | Progressing. There are few occasions when water flows in Black Creek, but this is monitored, and samples taken if practical. With surface disturbance works proposed as part of the closure process, this action may not be appropriate until following final rehabilitation of the site. |

| Rec No | Independent Environmental Audit Recommendations | Austar Coal Mine Responses to DPIE | Status |
|---|---|---|---|
| | | 3. Undertake consultation | |
| IREC 1 | With regard to potential leakage from pipelines it is recommended that Austar carry out a risk assessment considering potential failure modes, and the adequacy of current arrangements. | Review surface water risk assessments and procedures and assess the need for further risk assessment or controls in relation to pipeline management and add to SWMP if required. | Progressing. Current risk assessments have been reviewed, along with procedures and inspections. Risk assessments may be revised in the next reporting period. |
| IREC 2 | Continue to negotiate with the EPA regarding appropriate noise limits or goals for the site. It is recommended that consideration be given to setting noise goals for the site based on the noise levels achievable by the site with the implementation of reasonable and feasible noise mitigation measures. Negotiate with EPA regarding suspension of PRP during Care and Maintenance phase. | Austar will continue to negotiate with EPA to suspend the Noise PRP while in care and maintenance; or agree on noise goals for the CHPP that would be achievable when production resumes, based on current PRP reports. | Austar will liaise with the EPA on the best way to approach this finding in relation to the transition to closure and closure execution phase during the next reporting period. |
| IREC 6 | With concurrence of EPA develop suitable TARPS for management of staining under the Water Management Plan. | 1. Consider the findings of the 2020 orange drainage line study, develop TARPS if feasible and consult with EPA.<br>2. work with groundwater specialists to consider the addition of TARPs to SWMP and reporting graphs. | Progressing. |

The Independent Audit report can be found on the Austar website.

The next Independent Environmental Audit is scheduled to be undertaken during Q4 2023.

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

During the reporting period, there were three events reported to the EPA, DPIE and Resources Regulator. These are described in **Table 11-1**. Compliance findings identified in the 2020 IEA are discussed in section 10.

**TABLE 11-1 INCIDENT REPORTS 2020-2021**

| Incident No. | Date | Incident Details | Follow Up Actions |
|---|---|---|---|
| 1 | 9 July 2020 | pH exceedance recorded at SW6/LDP6 | Following receipt of the lab result of 6.2pH units on 9 July 2020 the EPA, DPIE and Resources Regulator were notified via email. Multiple pH readings were also taken with a calibrated handheld pH meter for water discharging from SW6/LDP6 and recorded 6.85-7.91 pH units (within EPL 416 concentration limits). A second sample to retest discharge water at SW6/LDP6, was collected and sent to the laboratory for analysis on 10 July 2020. The laboratory analysis of the second sample returned a pH result of 6.72, also within EPL 416 concentration limits. An investigation found that pH probes used in the RO plant may have been faulty and have been replaced. |
| 2 | 27 July 2020 | Kitchener SIS Unlicensed Discharge | Austar activated the Pollution Incident Response Management Plan (PIRMP) and notified the relevant authorities. Water samples were collected from the discharge points of the sediment basins and at upstream and downstream locations to the site for laboratory analysis on both 27 and 28 July 2020. Based on the review of water sampling results, there was unlikely to be any material harm caused by the incident. |
| 3 | 20 March 2021 | Kitchener SIS Unlicensed Discharge | In response to the incident Austar notified the EPA, DPIE and Resources Regulator. Water samples were collected from the discharge points of the sediment basins and at upstream and downstream locations to the site for laboratory analysis on 20 March 2021. Based on the review of water sampling results, there was unlikely to be any material harm caused by the incident. |

## 12 ACTIVITIES TO BE COMPLETED FOR THE NEXT REPORTING PERIOD

During the reporting period, the focus at Austar has been updating documentation and processes including management plans for a care and maintenance phase, completing the IEA and implementing the ensuing recommendations and progressing the closure planning actions outlined in MOP Amendment A.

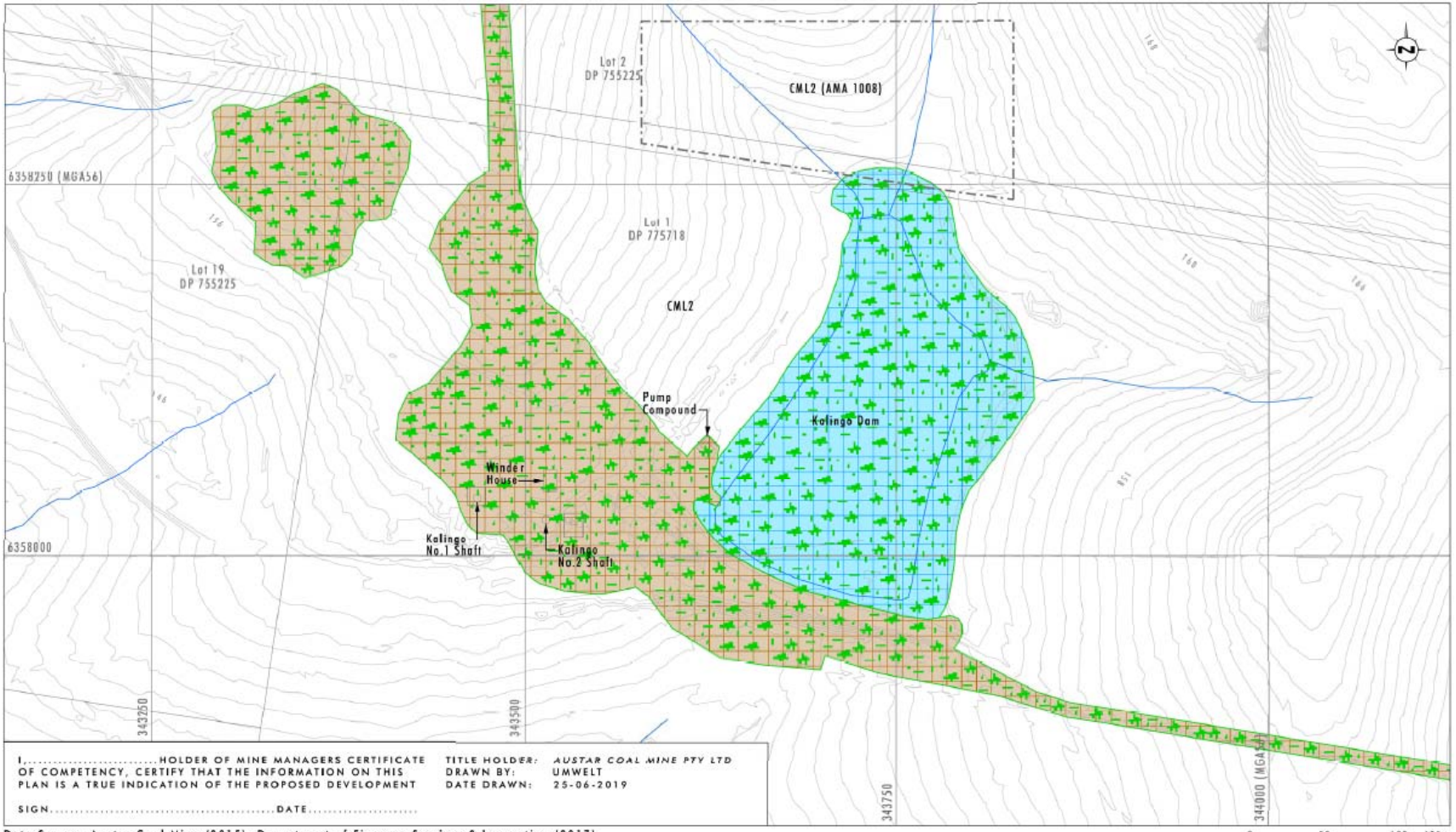
The focus in the next reporting period will again be progressing the closure planning actions outlined in MOP Amendment A and closing out outstanding actions required by various Extraction Plans.

Yancoal endeavours to carry out the activities during the 2021 - 2022 reporting period, as outlined in **Table 12-1**.

**TABLE 12-1 PROPOSED ACTIVITIES FOR 2021-2022 REPORTING PERIOD**

| | Activities Proposed in the 2019-20 Reporting Period |
|---|---|
| 1 | Progress the mine closure planning strategy as documented in MOP Amendment A and Section 8.5. |
| 2 | Implement the recommendations from the IEA |
| 3 | Continue to review and if necessary, update approved management plans to reflect the transition to closure |
| 4 | Enact the recommendations in the Rehabilitation Monitoring report |
| 5 | Close outstanding actions from Extraction Plans |

# Plans


umwelt
Lot 2
DP 755225
CML2 (AMA 1008)
6358250 (MGA56)
Lot 1
DP 775718
Lot 19
DP 755225
CML2
Pump
Compound
Kalingo Dam
Winder
House
Kalingo
No.1 Shaft
Kalingo
No.2 Shaft
6358000
343250
343500
343750
344000 (MGA56)
I,.....HOLDER OF MINE MANAGERS CERTIFICATE OF COMPETENCY, CERTIFY THAT THE INFORMATION ON THIS PLAN IS A TRUE INDICATION OF THE PROPOSED DEVELOPMENT
SIGN.....DATE.....
TITLE HOLDER: AUSTAR COAL MINE PTY LTD
DRAWN BY: UMWELT
DATE DRAWN: 25-06-2019
Data Source: Austar Coal Mine (2015), Department of Finance, Services & Innovation (2017)
Note: 1m Contour Interval
0 50 100 125m
1:2500 (at A3)
Legend
Mining Lease Boundary
Drainage Line
Contour Line
Cadastral Line
Primary Domain
1 - Infrastructure Area
3 - Water Management Area
Secondary Domains
Rehabilitation Area - Grassland
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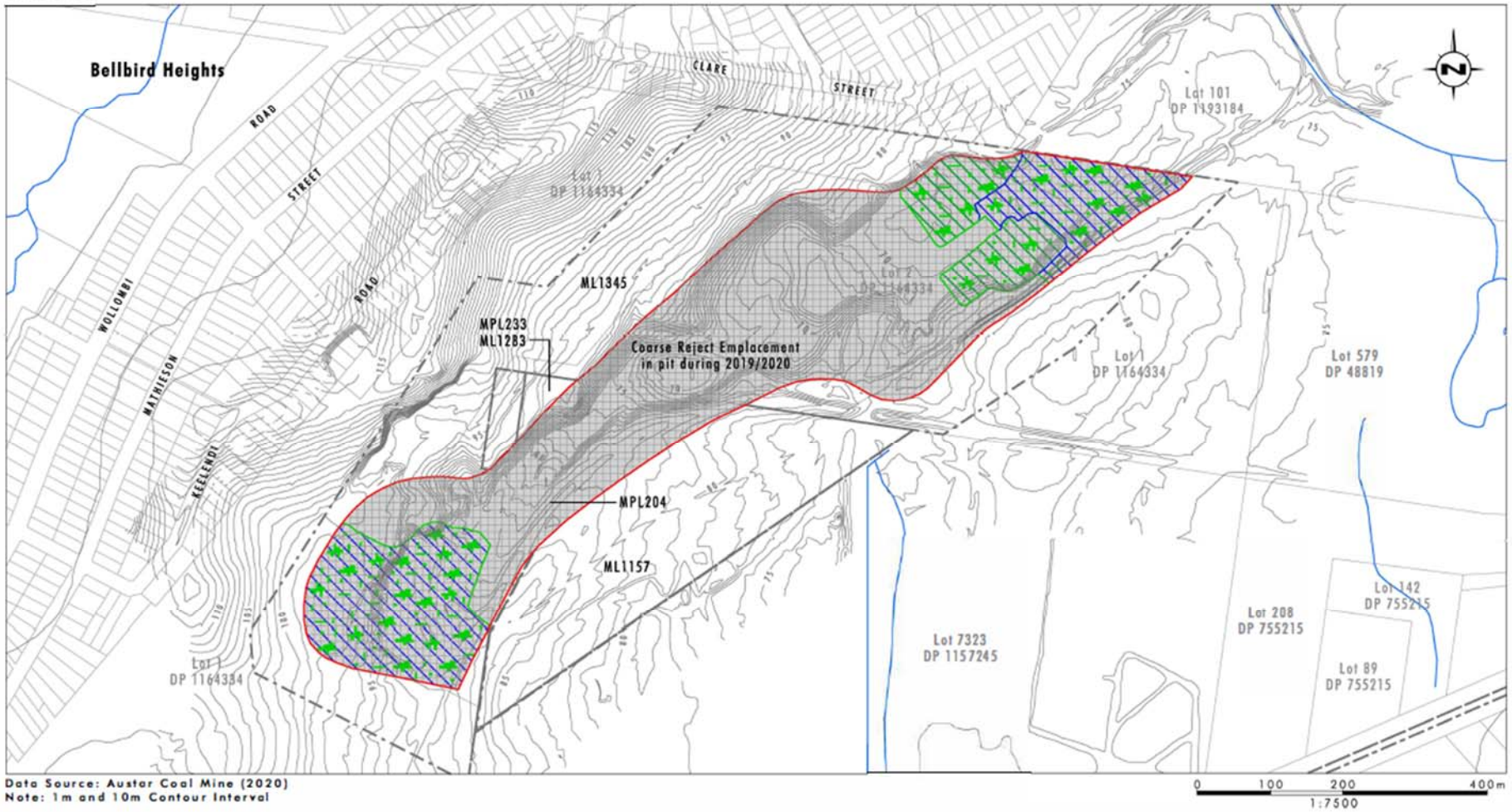
20190625 15.18
PLAN 2D
Kalingo Site

umwelt




Data Source: Austar Coal Mine (2020)
Note: 1m and 10m Contour Interval

**Legend**

- Mining Lease Boundary
- Reject Emplacement Area
- Drainage Line
- Contour Line
- Cadastral Line

Primary Domain:
- 2 - Tailings & Reject Emplacement Area

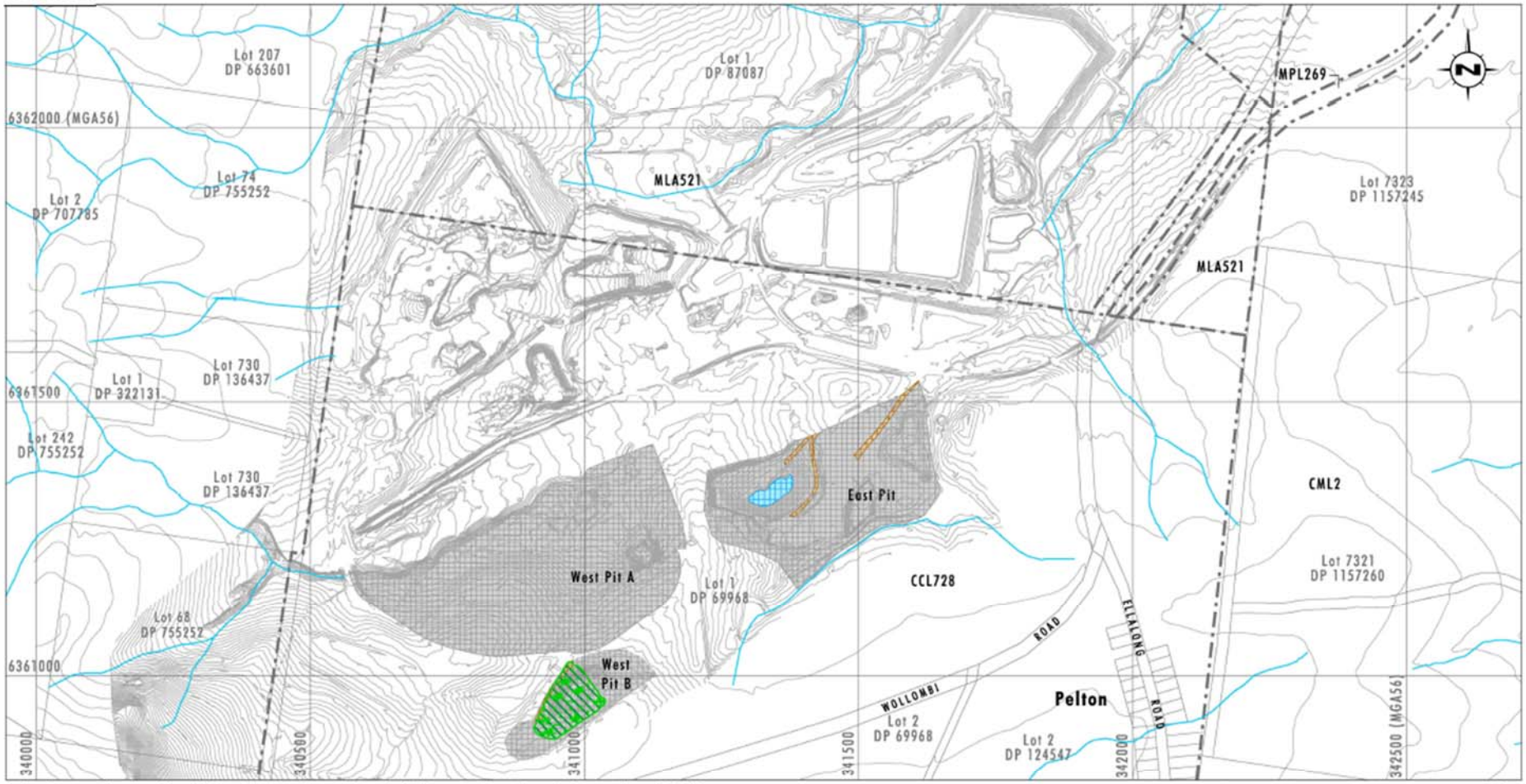
Secondary Domain:
- Rehabilitation Area - Grassland

Rehabilitation Phase:
- Ecosystem and Land Use Sustainability
- Ecosystem and Land Use Establishment 2019/2020

PLAN 3B

**Aberdare Extended Emplacement Area Mining and Rehabilitation 2020/2021**

umwelt




Data Source: Austar Coal Mine (2020), Department of Finance, Services & Innovation (2017)
Note: 1m and 10m Contour Interval

**Legend**

- Mining Lease Boundary
- Drainage Line
- Contour Line
- Cadastral Line

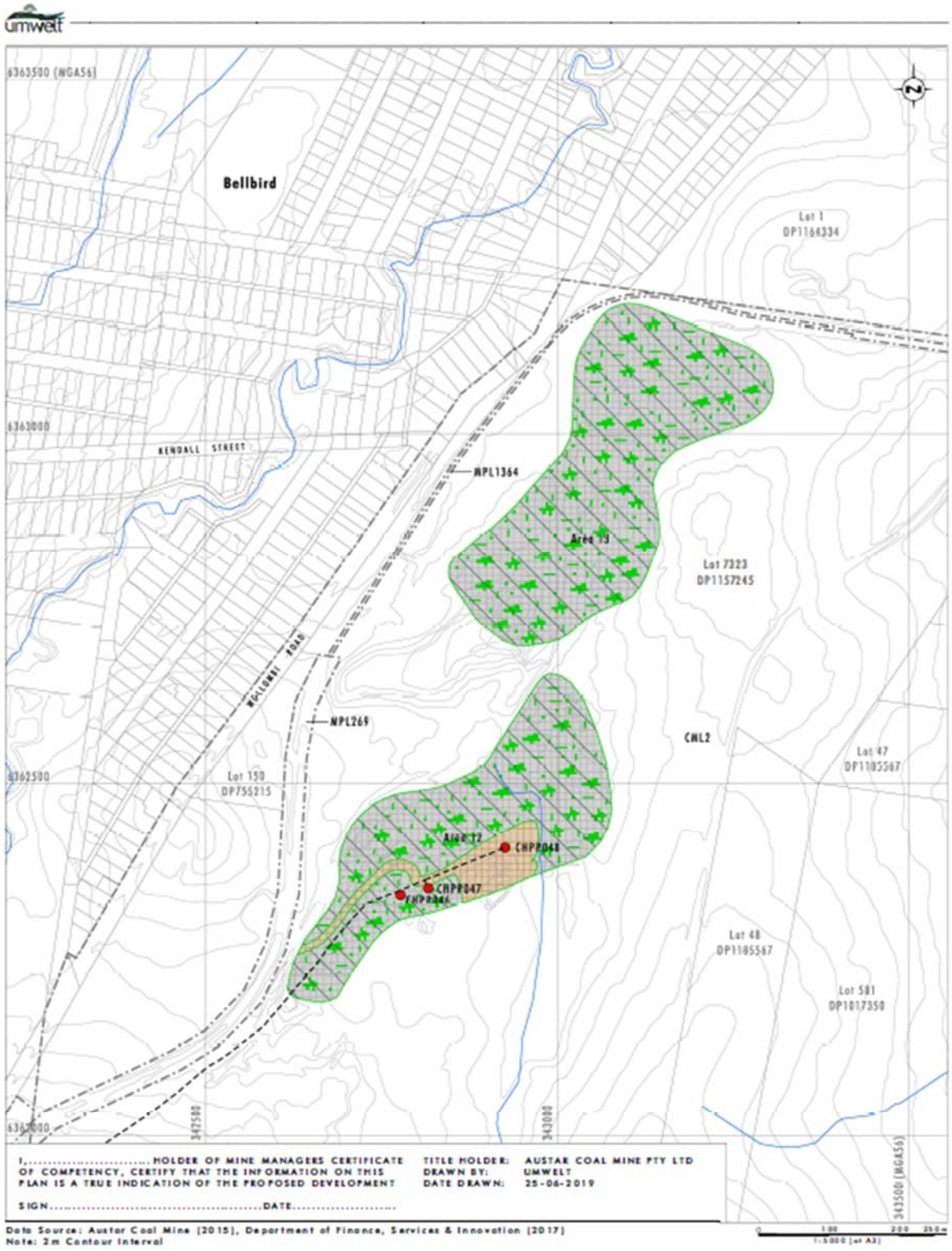
Primary Domains:
- 1 - Infrastructure Area
- 2 - Tailings & Reject Emplacement Area
- 3 - Water Management Area

Secondary Domains:
- Rehabilitation Area - Grassland

Rehabilitation Phase:
- Ecosystem and Land Use Establishment

PLAN 3C

**Austar CHPP**
**Mining and Rehabilitation 2020/2021**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6363500 (MGA56)
Bellbird
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KENDALL STREET
MPL1364
Area 13
Lot 7323
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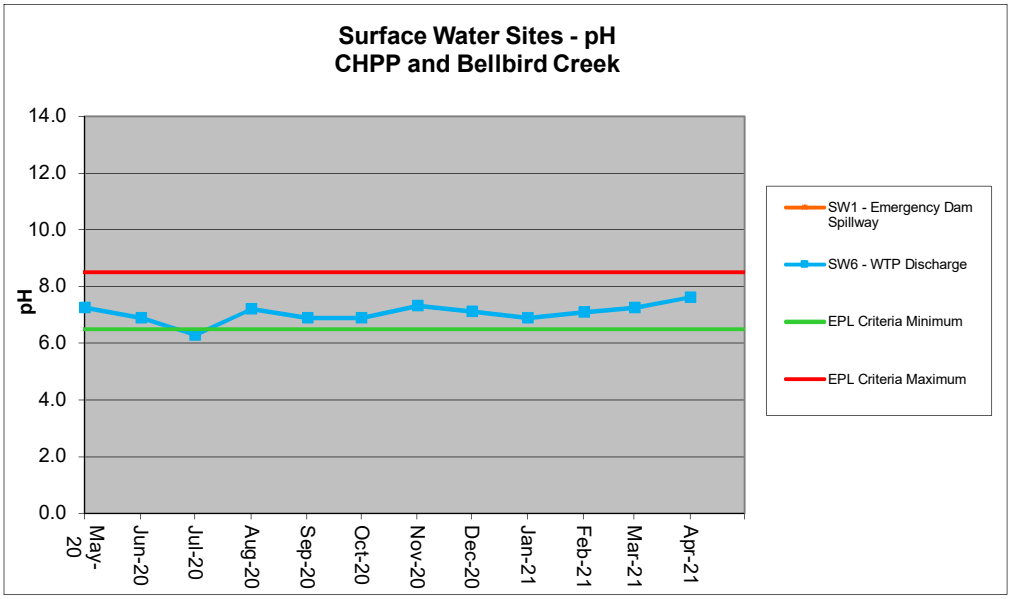
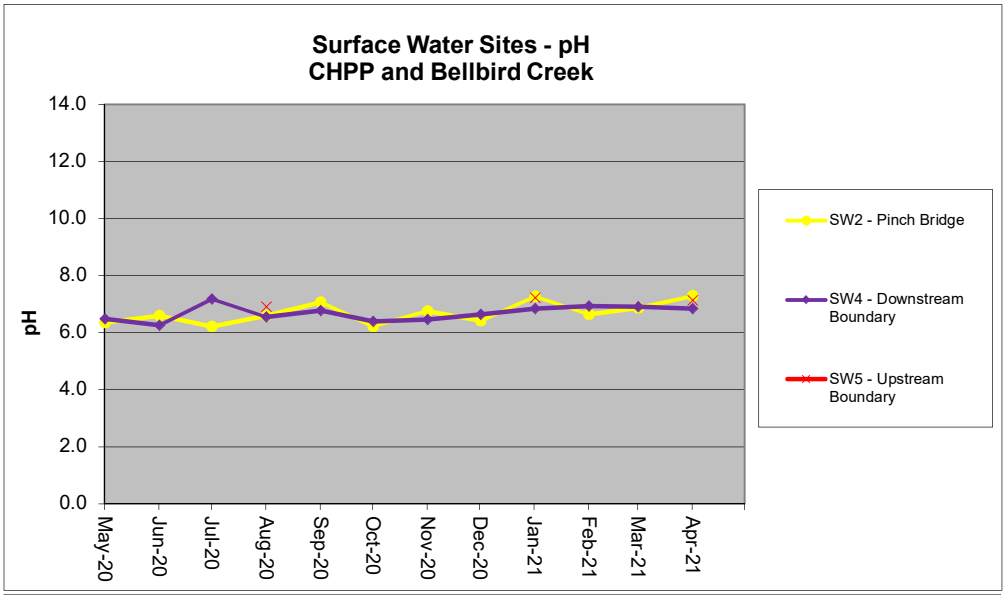
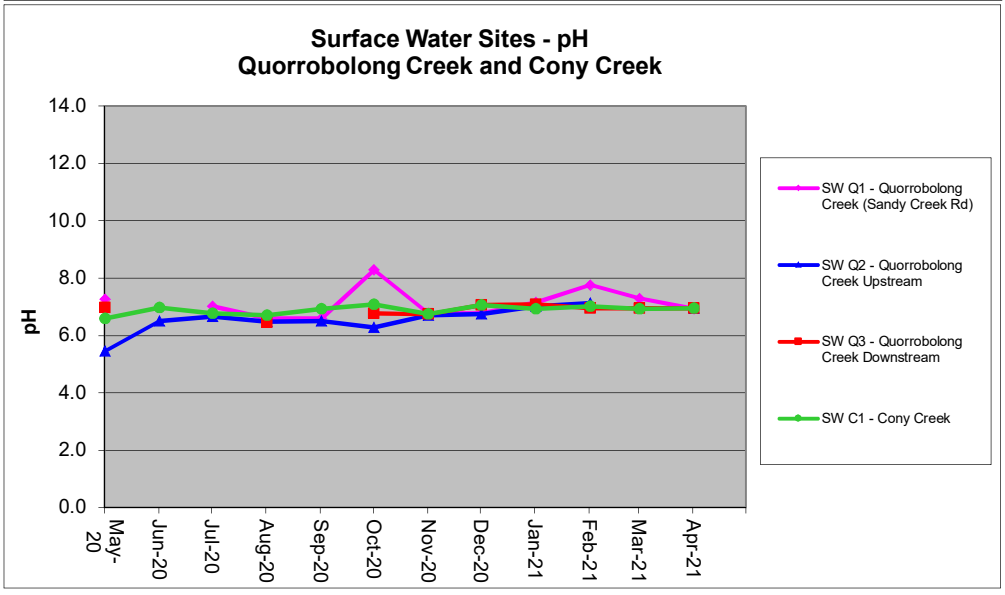
WOLLOMBI ROAD
MPL269
CML2
Lot 47
DP1185567
6362500
Lot 150
DP755215
Area 12
CHPP048
CHPP047
CHPP046
Lot 48
DP1185567
Lot 581
DP1017350
342500
343000
343500 (MGA56)
6362000
I,.....HOLDER OF MINE MANAGERS CERTIFICATE OF COMPETENCY, CERTIFY THAT THE INFORMATION ON THIS PLAN IS A TRUE INDICATION OF THE PROPOSED DEVELOPMENT
SIGN.....DATE.....
TITLE HOLDER: AUSTAR COAL MINE PTY LTD
DRAWN BY: UMWELT
DATE DRAWN: 25-06-2019
Data Source: Austar Coal Mine (2015), Department of Finance, Services & Innovation (2017)
Note: 2m Contour Interval
0 100 200 250m
1:5000 (at A3)
Legend
Mining Lease Boundary
Dewater Pipeline
Brine Borehole
Drainage Line
Contour Line
Cadastral Line
Primary Domains
1 - Infrastructure Area
2 - Tailings Storage Facility
Secondary Domains
Rehabilitation Area - Grassland
Rehabilitation Phase:
Ecosystem and Land Use Establishment
PLAN 3E
Aberdare Emplacement Areas 12 and 13
Mining and Rehabilitation 2020/2021

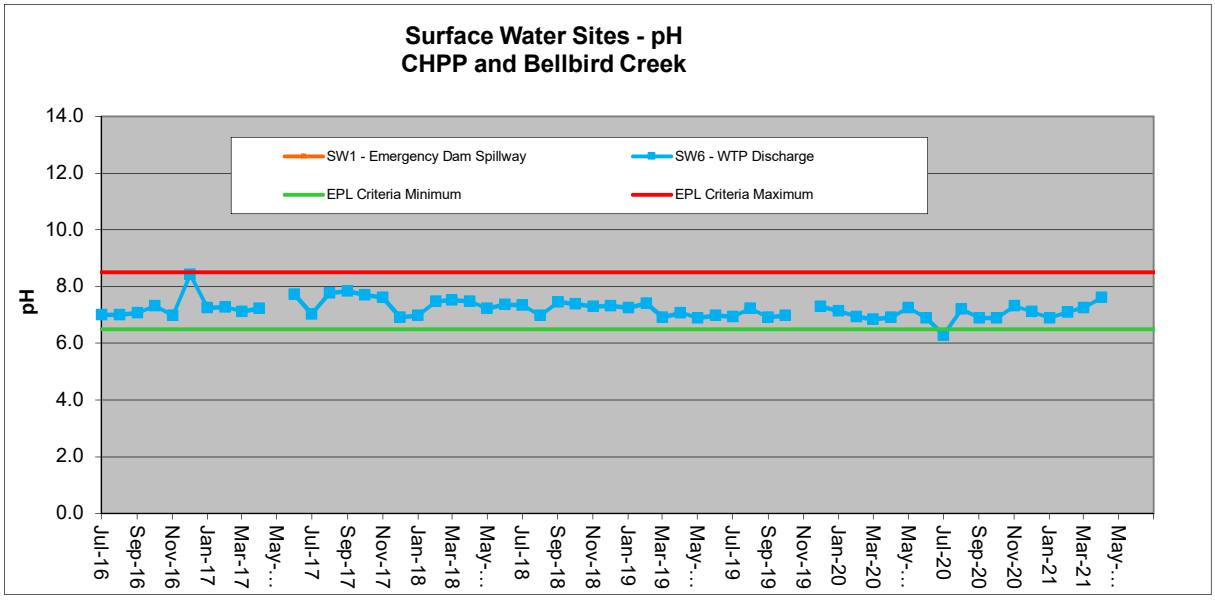
# Appendices

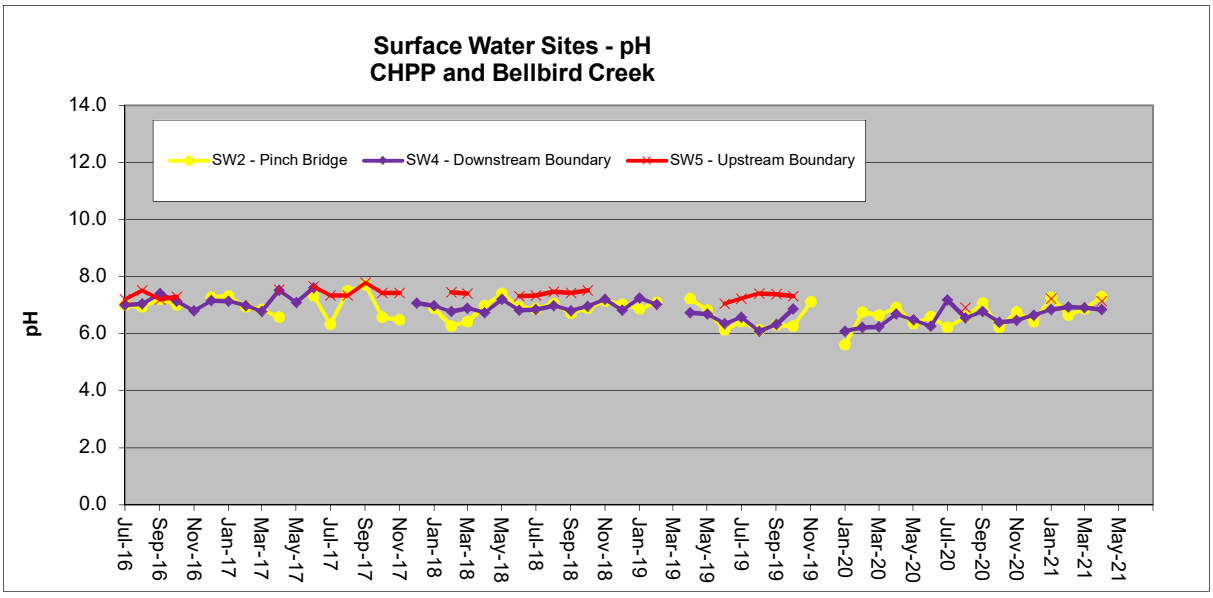
# Appendix A. Surface Water Quality Graphs

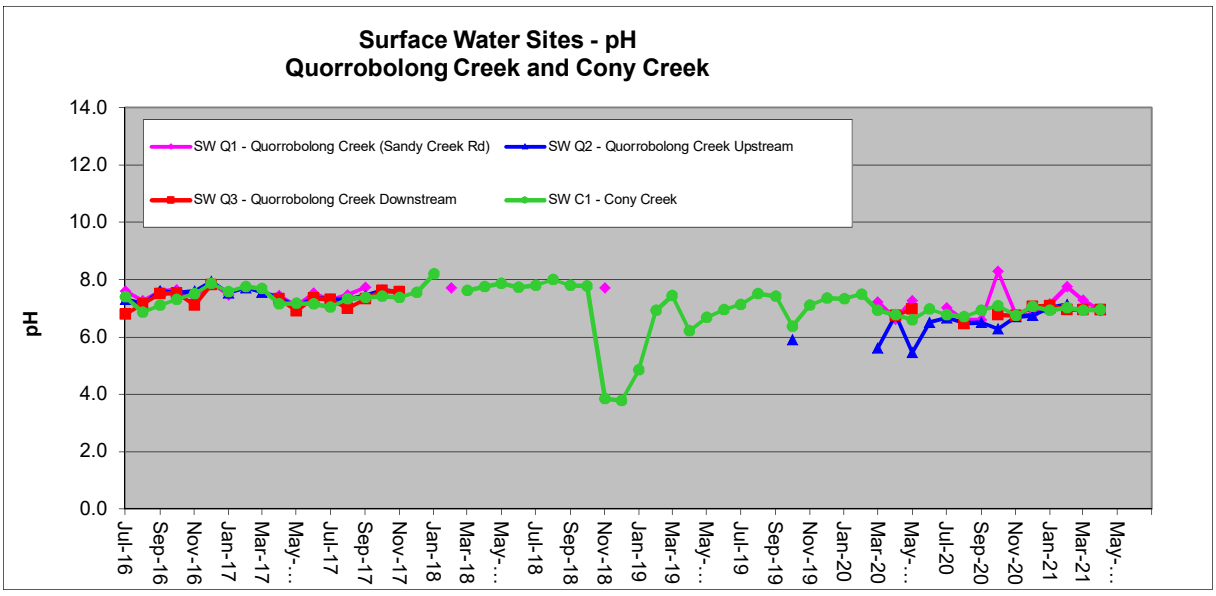

Surface Water Sites - pH
CHPP and Bellbird Creek
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria Minimum
EPL Criteria Maximum

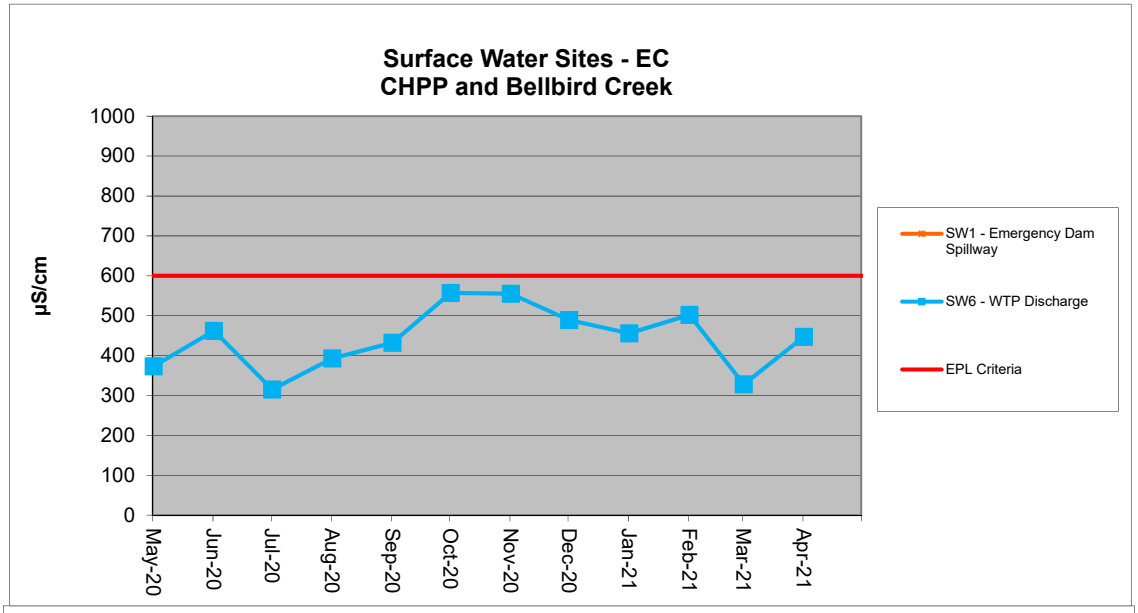

Surface Water Sites - pH
CHPP and Bellbird Creek
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
SW2 - Pinch Bridge
SW4 - Downstream Boundary
SW5 - Upstream Boundary

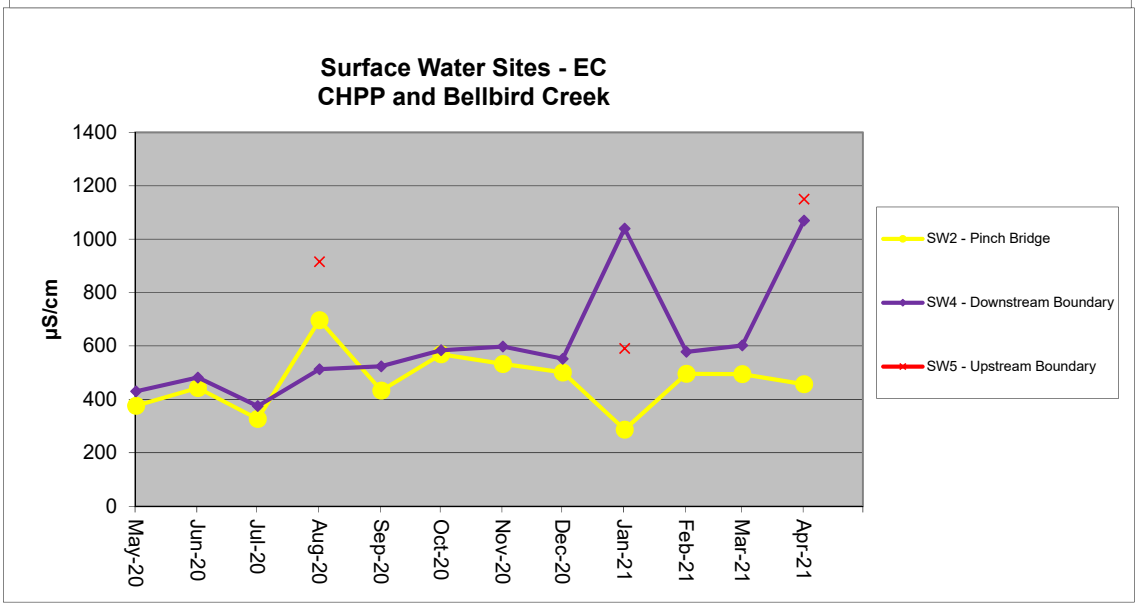

Surface Water Sites - pH
Quorrobolong Creek and Cony Creek
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
SW Q1 - Quorrobolong Creek (Sandy Creek Rd)
SW Q2 - Quorrobolong Creek Upstream
SW Q3 - Quorrobolong Creek Downstream
SW C1 - Cony Creek

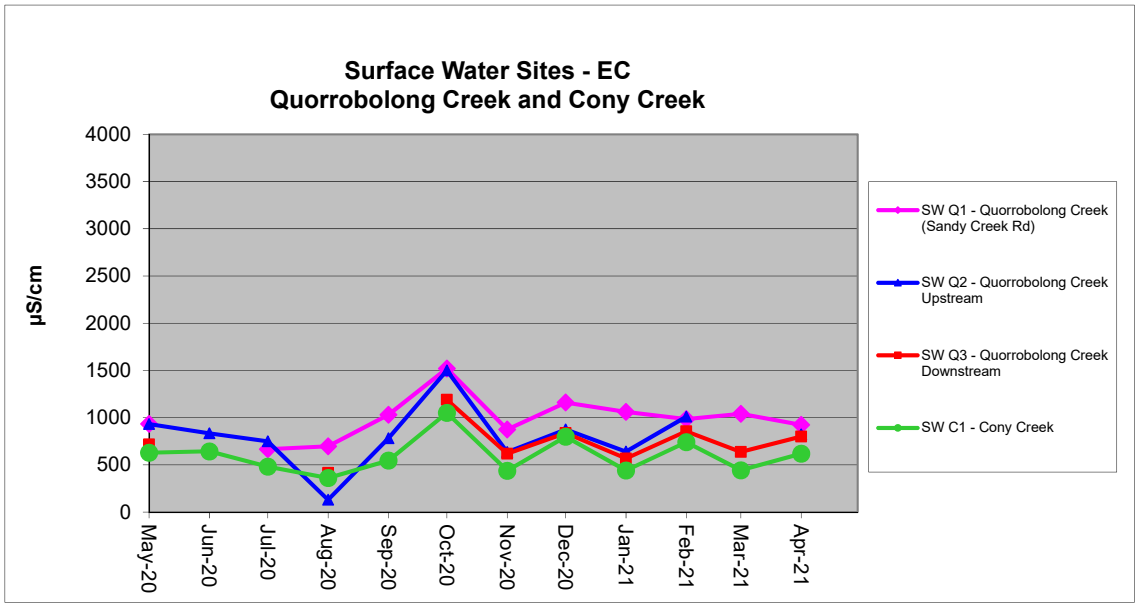

Surface Water Sites - pH
CHPP and Bellbird Creek
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria Minimum
EPL Criteria Maximum
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jul-16
Sep-16
Nov-16
Jan-17
Mar-17
May-...
Jul-17
Sep-17
Nov-17
Jan-18
Mar-18
May-...
Jul-18
Sep-18
Nov-18
Jan-19
Mar-19
May-...
Jul-19
Sep-19
Nov-19
Jan-20
Mar-20
May-...
Jul-20
Sep-20
Nov-20
Jan-21
Mar-21
May-...

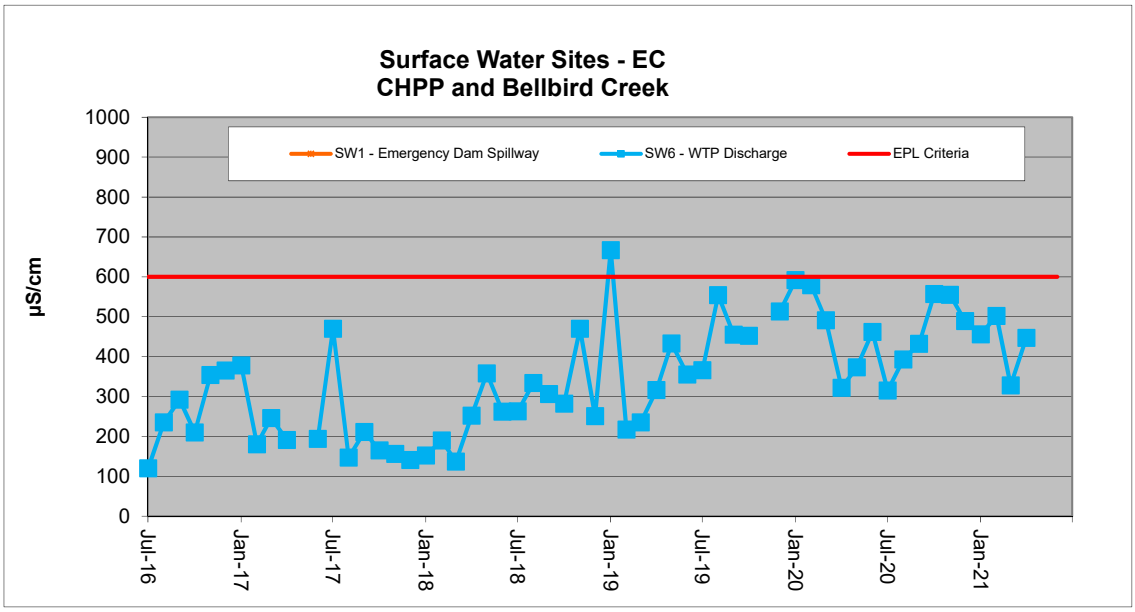

Surface Water Sites - pH
CHPP and Bellbird Creek
SW2 - Pinch Bridge
SW4 - Downstream Boundary
SW5 - Upstream Boundary
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jul-16
Sep-16
Nov-16
Jan-17
Mar-17
May-17
Jul-17
Sep-17
Nov-17
Jan-18
Mar-18
May-18
Jul-18
Sep-18
Nov-18
Jan-19
Mar-19
May-19
Jul-19
Sep-19
Nov-19
Jan-20
Mar-20
May-20
Jul-20
Sep-20
Nov-20
Jan-21
Mar-21
May-21

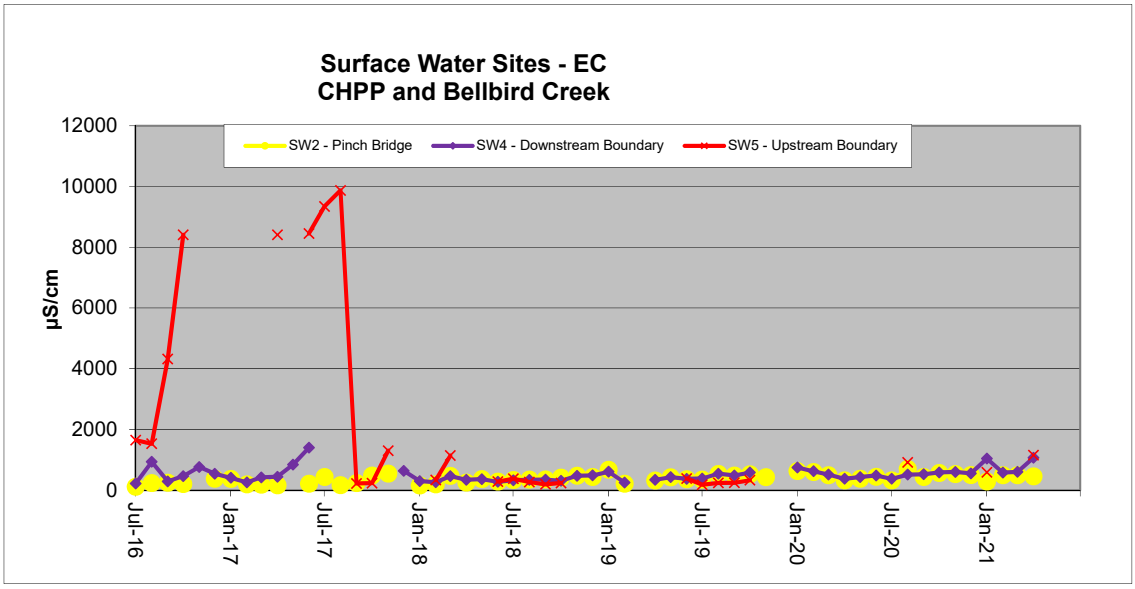

Surface Water Sites - pH
Quorrobolong Creek and Cony Creek
SW Q1 - Quorrobolong Creek (Sandy Creek Rd)
SW Q2 - Quorrobolong Creek Upstream
SW Q3 - Quorrobolong Creek Downstream
SW C1 - Cony Creek
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jul-16
Sep-16
Nov-16
Jan-17
Mar-17
May-...
Jul-17
Sep-17
Nov-17
Jan-18
Mar-18
May-...
Jul-18
Sep-18
Nov-18
Jan-19
Mar-19
May-...
Jul-19
Sep-19
Nov-19
Jan-20
Mar-20
May-...
Jul-20
Sep-20
Nov-20
Jan-21
Mar-21
May-...

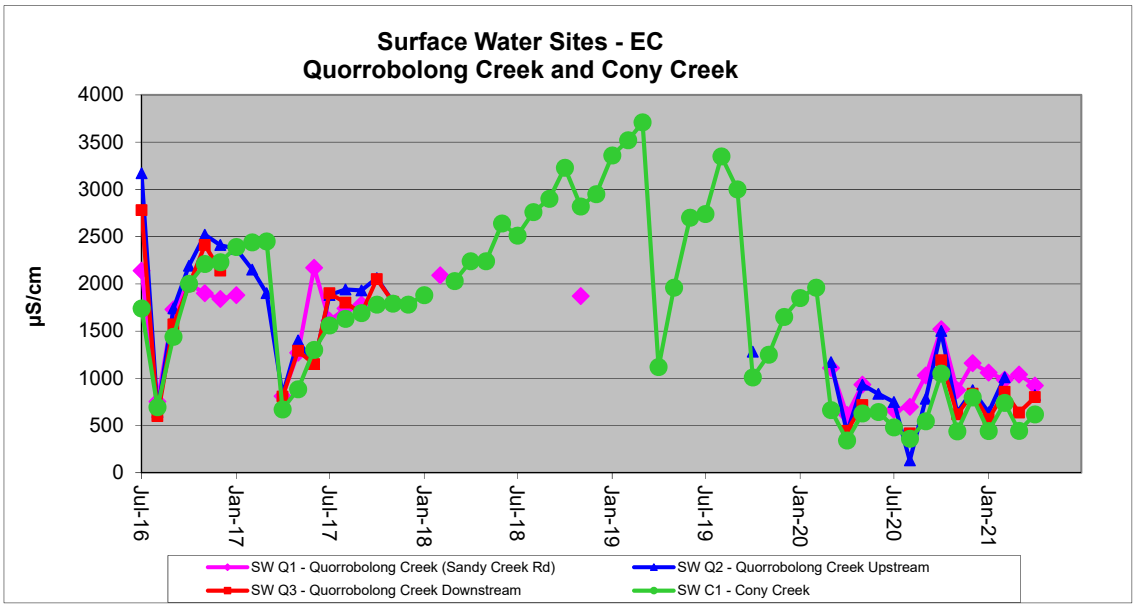

Surface Water Sites - EC
CHPP and Bellbird Creek
µS/cm
1000
900
800
700
600
500
400
300
200
100
0
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria

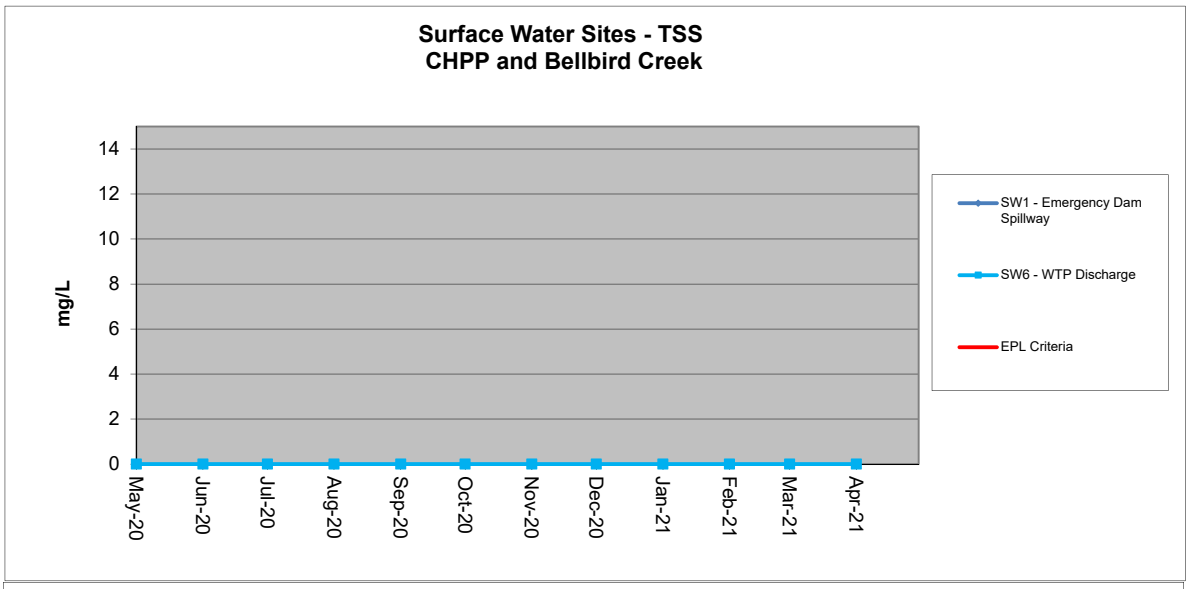

Surface Water Sites - EC
CHPP and Bellbird Creek
µS/cm
1400
1200
1000
800
600
400
200
0
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
SW2 - Pinch Bridge
SW4 - Downstream Boundary
SW5 - Upstream Boundary

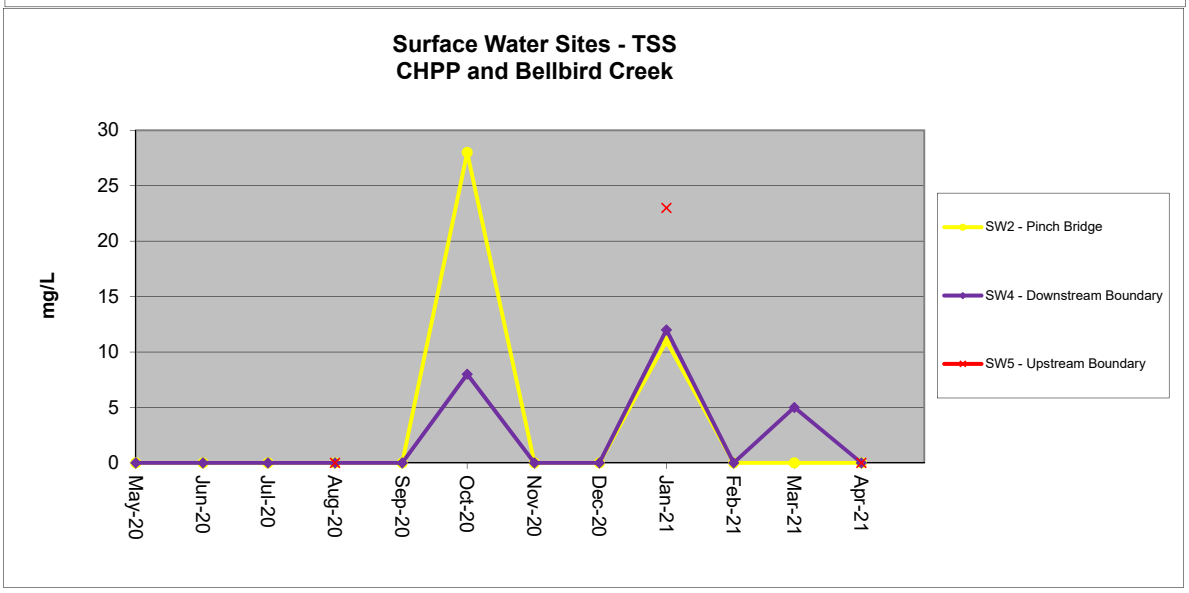

Surface Water Sites - EC
Quorrobolong Creek and Cony Creek
µS/cm
4000
3500
3000
2500
2000
1500
1000
500
0
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
SW Q1 - Quorrobolong Creek (Sandy Creek Rd)
SW Q2 - Quorrobolong Creek Upstream
SW Q3 - Quorrobolong Creek Downstream
SW C1 - Cony Creek

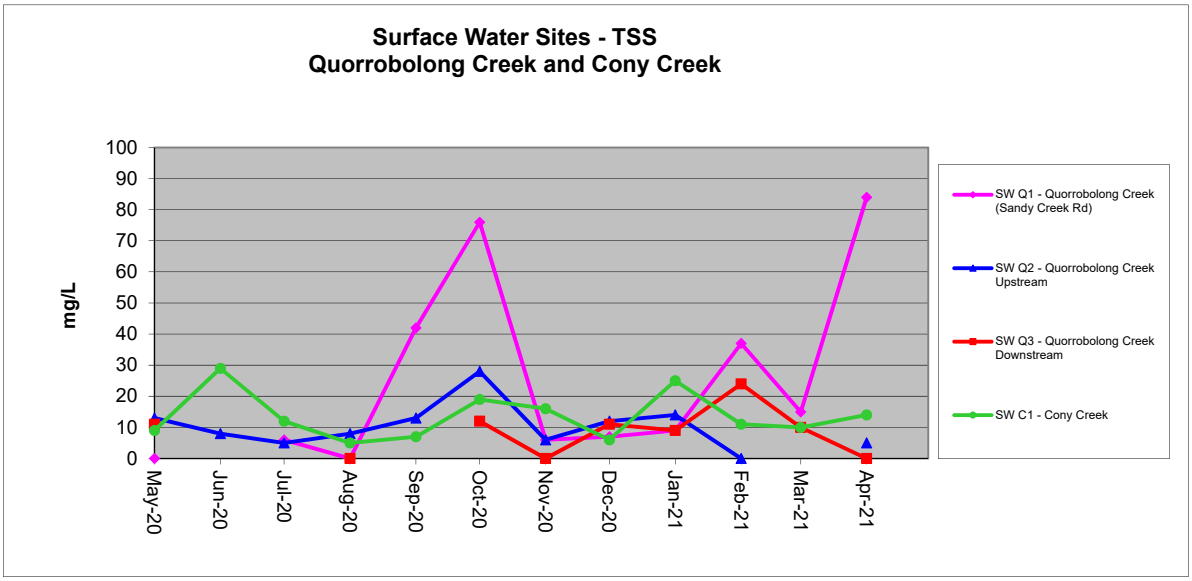

Surface Water Sites - EC
CHPP and Bellbird Creek
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria
µS/cm
1000
900
800
700
600
500
400
300
200
100
0
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21

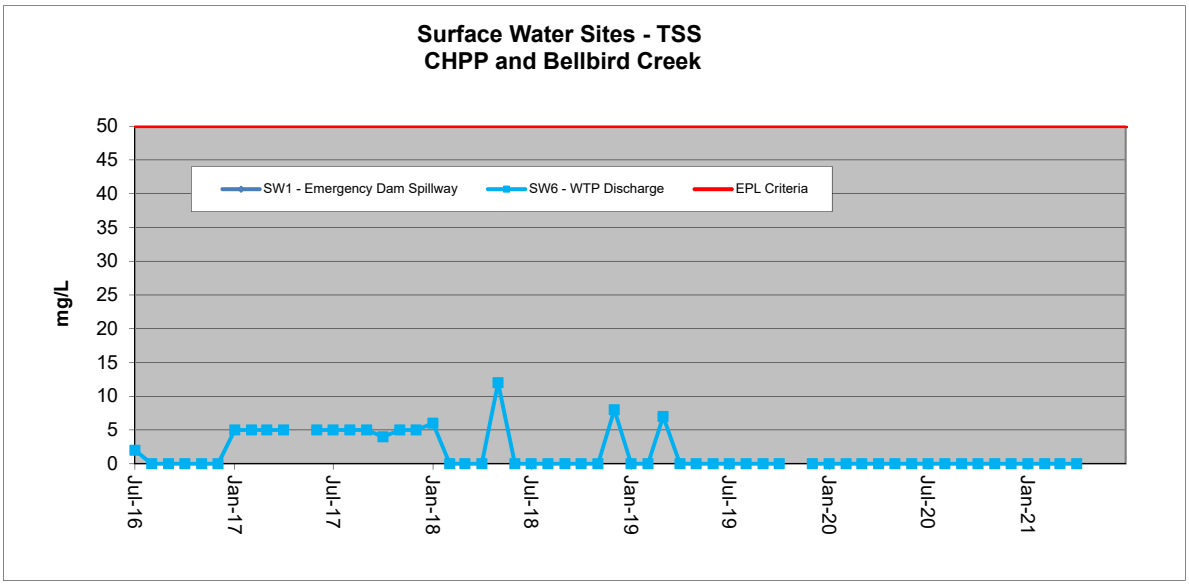

Surface Water Sites - EC
CHPP and Bellbird Creek
SW2 - Pinch Bridge
SW4 - Downstream Boundary
SW5 - Upstream Boundary
µS/cm
12000
10000
8000
6000
4000
2000
0
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21

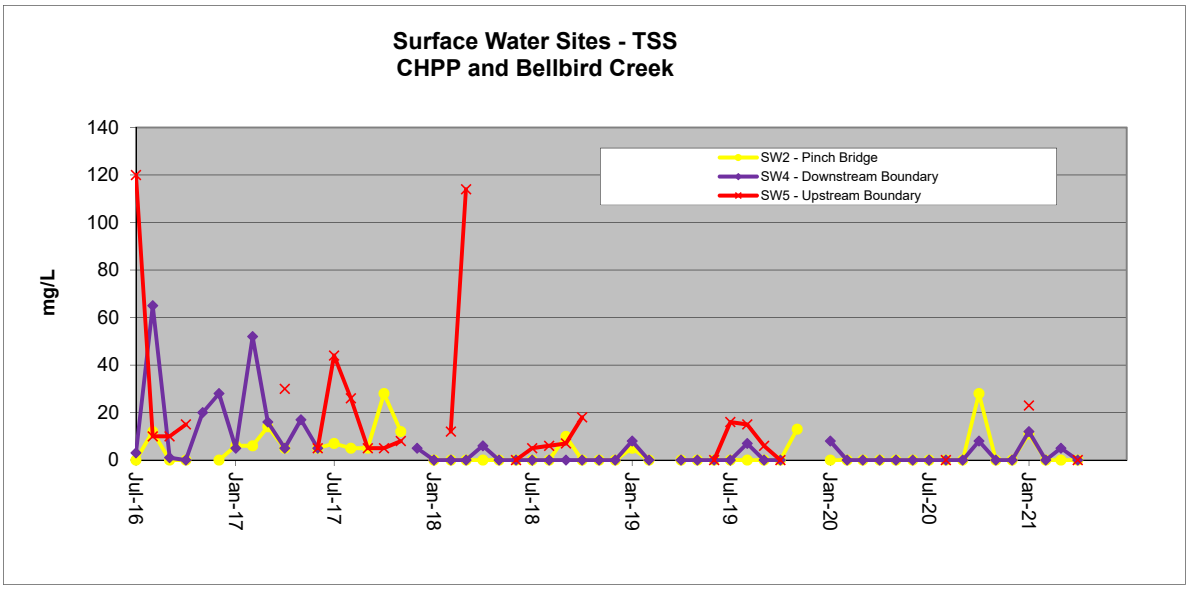

Surface Water Sites - EC
Quorrobolong Creek and Cony Creek
µS/cm
4000
3500
3000
2500
2000
1500
1000
500
0
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
SW Q1 - Quorrobolong Creek (Sandy Creek Rd)
SW Q2 - Quorrobolong Creek Upstream
SW Q3 - Quorrobolong Creek Downstream
SW C1 - Cony Creek

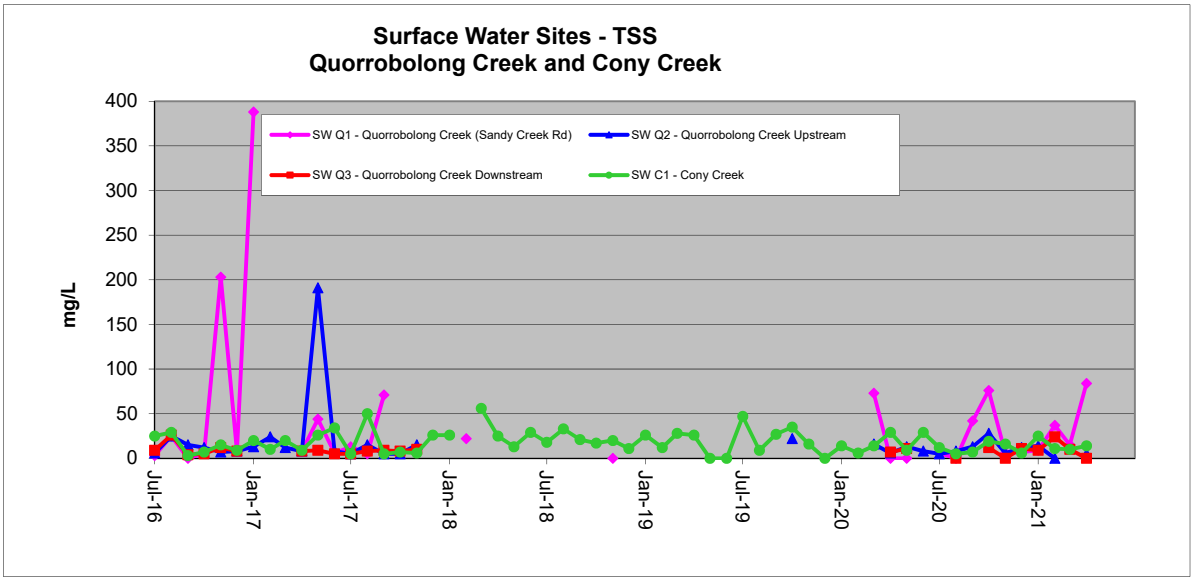

Surface Water Sites - TSS
CHPP and Bellbird Creek
mg/L
14
12
10
8
6
4
2
0
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria

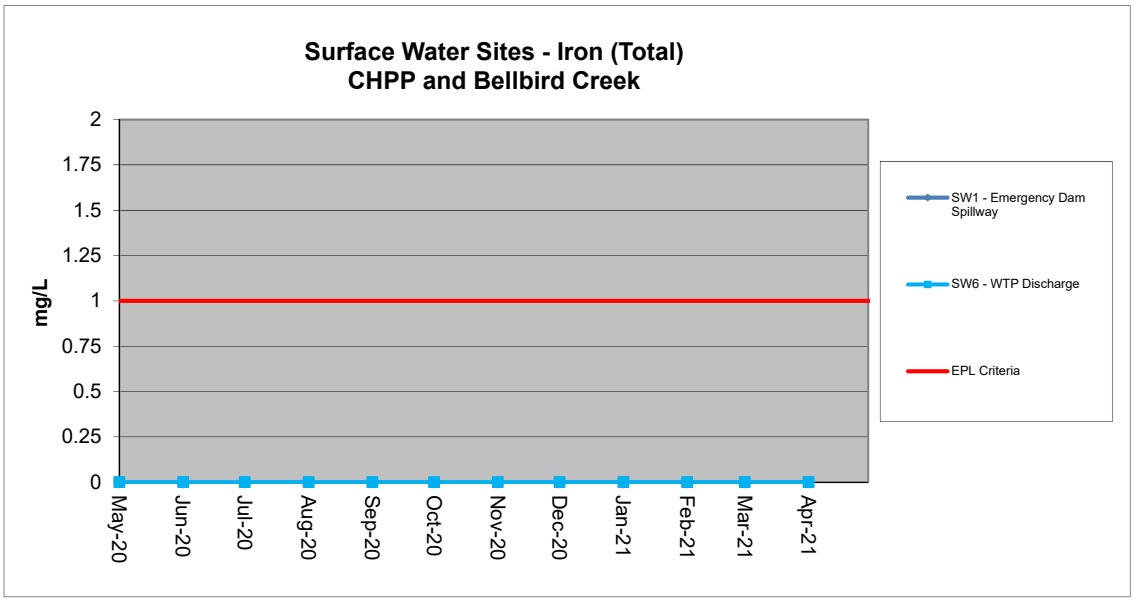

Surface Water Sites - TSS
CHPP and Bellbird Creek
mg/L
30
25
20
15
10
5
0
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
SW2 - Pinch Bridge
SW4 - Downstream Boundary
SW5 - Upstream Boundary

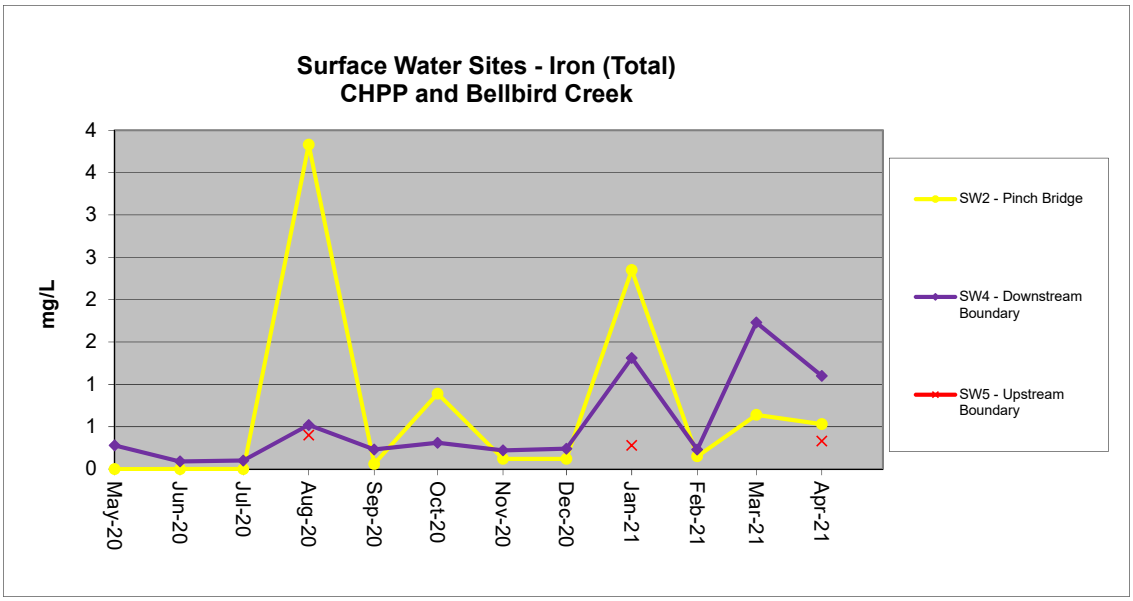

Surface Water Sites - TSS
Quorrobolong Creek and Cony Creek
mg/L
100
90
80
70
60
50
40
30
20
10
0
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
SW Q1 - Quorrobolong Creek (Sandy Creek Rd)
SW Q2 - Quorrobolong Creek Upstream
SW Q3 - Quorrobolong Creek Downstream
SW C1 - Cony Creek

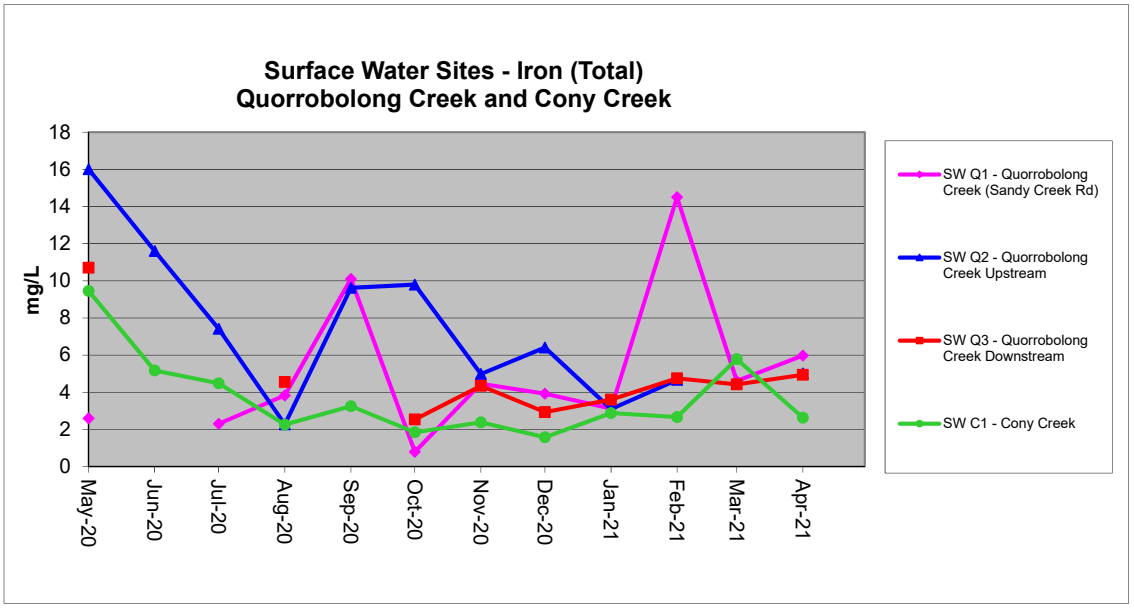

Surface Water Sites - TSS
CHPP and Bellbird Creek
mg/L
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria
50
45
40
35
30
25
20
15
10
5
0
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21

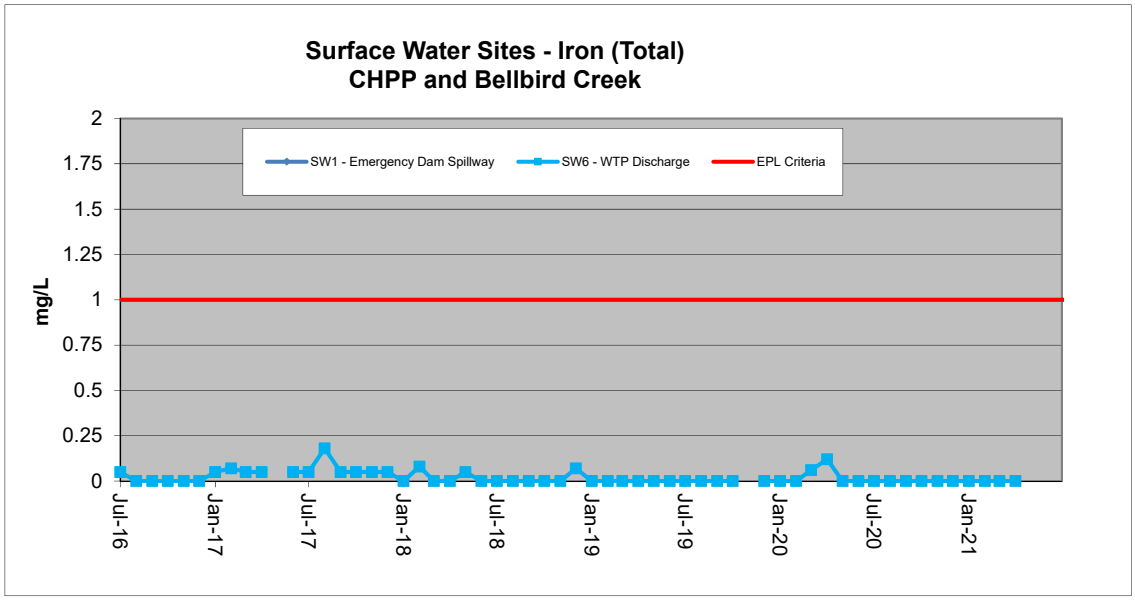

Surface Water Sites - TSS
CHPP and Bellbird Creek
mg/L
SW2 - Pinch Bridge
SW4 - Downstream Boundary
SW5 - Upstream Boundary
140
120
100
80
60
40
20
0
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21

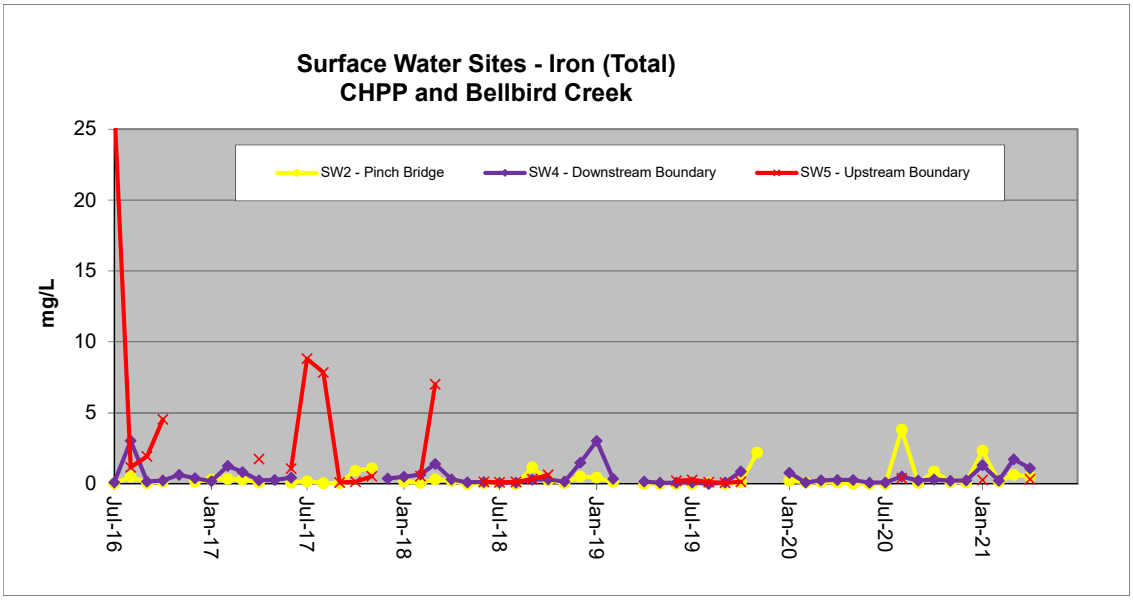

Surface Water Sites - TSS
Quorrobolong Creek and Cony Creek
mg/L
SW Q1 - Quorrobolong Creek (Sandy Creek Rd)
SW Q2 - Quorrobolong Creek Upstream
SW Q3 - Quorrobolong Creek Downstream
SW C1 - Cony Creek
400
350
300
250
200
150
100
50
0
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21

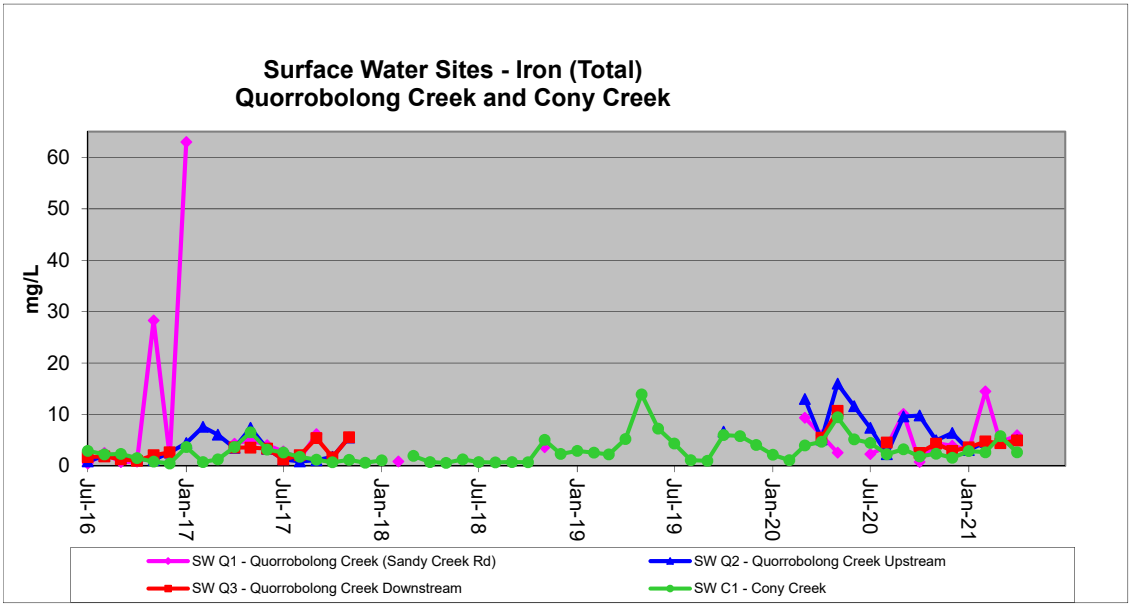

Surface Water Sites - Iron (Total)
CHPP and Bellbird Creek
mg/L
2
1.75
1.5
1.25
1
0.75
0.5
0.25
0
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria


Surface Water Sites - Iron (Total)
CHPP and Bellbird Creek
mg/L
4
4
3
3
2
2
1
1
0
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
SW2 - Pinch Bridge
SW4 - Downstream Boundary
SW5 - Upstream Boundary


Surface Water Sites - Iron (Total)
Quorrobolong Creek and Cony Creek
mg/L
18
16
14
12
10
8
6
4
2
0
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
SW Q1 - Quorrobolong Creek (Sandy Creek Rd)
SW Q2 - Quorrobolong Creek Upstream
SW Q3 - Quorrobolong Creek Downstream
SW C1 - Cony Creek


Surface Water Sites - Iron (Total)
CHPP and Bellbird Creek
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria
mg/L
2
1.75
1.5
1.25
1
0.75
0.5
0.25
0
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21


Surface Water Sites - Iron (Total)
CHPP and Bellbird Creek
SW2 - Pinch Bridge
SW4 - Downstream Boundary
SW5 - Upstream Boundary
mg/L
25
20
15
10
5
0
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21


Surface Water Sites - Iron (Total)
Quorrobolong Creek and Cony Creek
mg/L
60
50
40
30
20
10
0
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
SW Q1 - Quorrobolong Creek (Sandy Creek Rd)
SW Q2 - Quorrobolong Creek Upstream
SW Q3 - Quorrobolong Creek Downstream
SW C1 - Cony Creek

# Appendix B. Groundwater Level and Quality Graphs

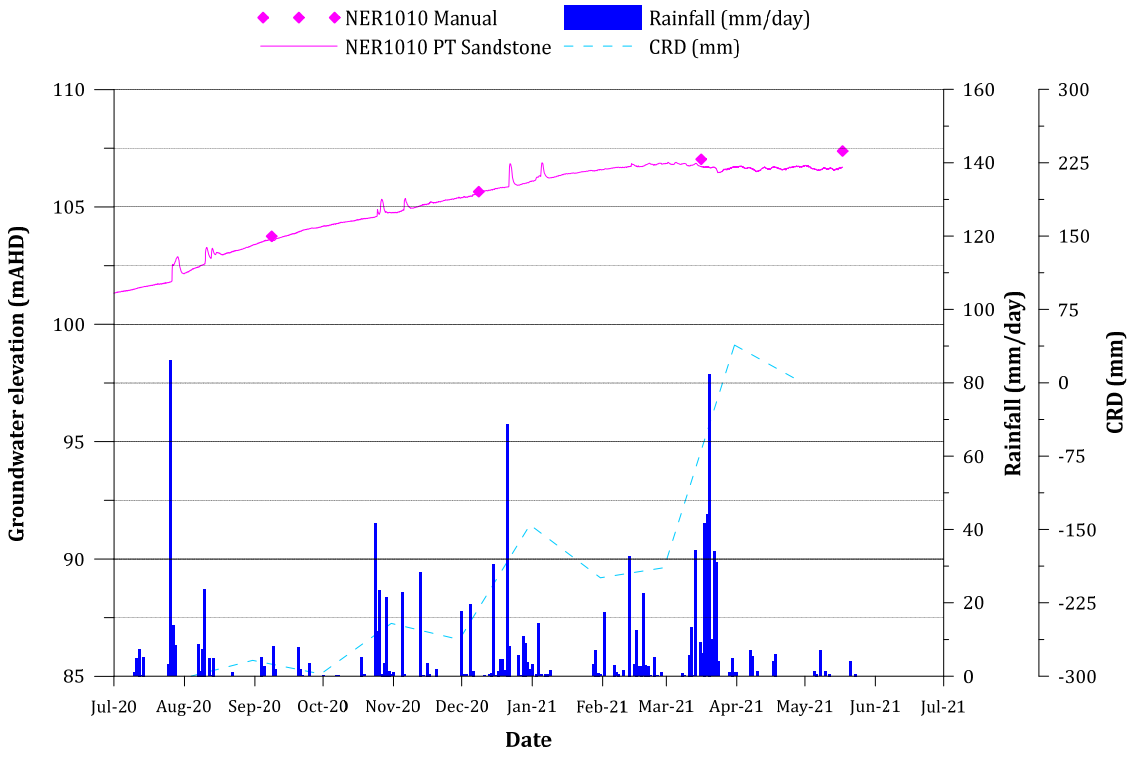



FIGURE 12-1 NER1010 GROUNDWATER LEVEL HYDROGRAPH

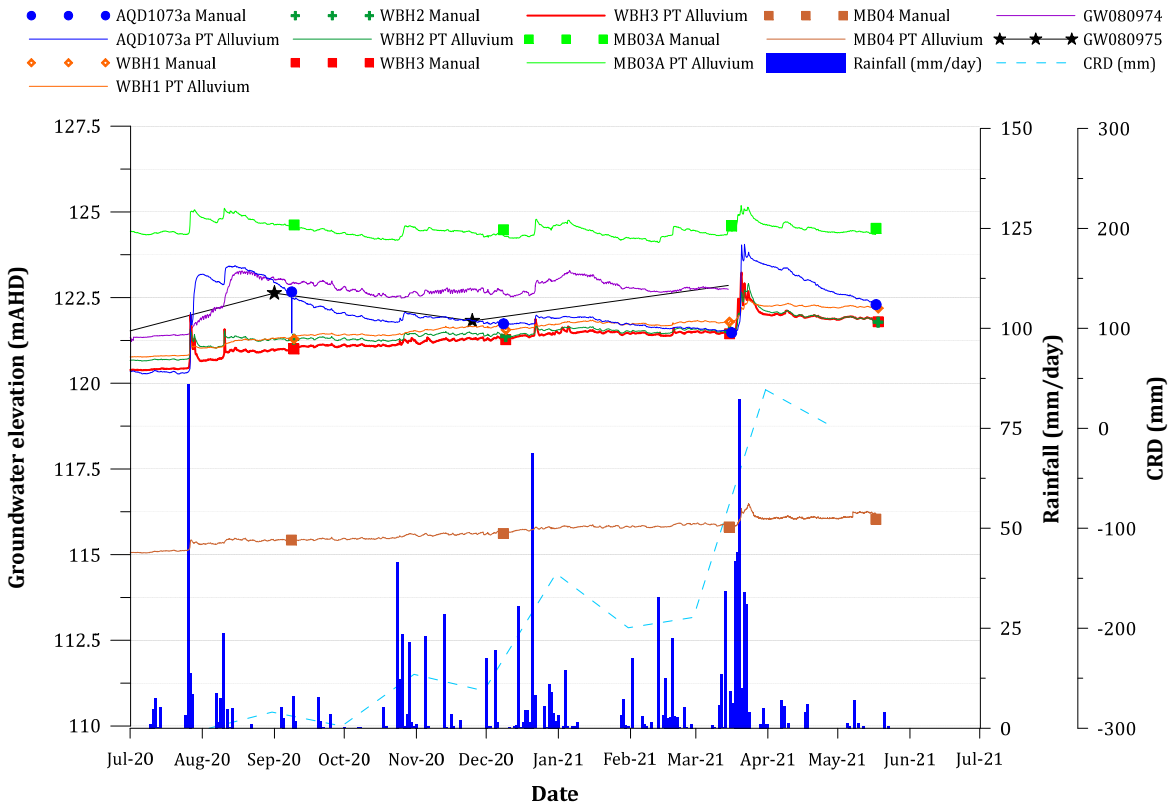



FIGURE 12.2 STAGE 2 AND BELLBIRD SOUTH ALLUVIUM AND WATERNSW GROUNDWATER LEVEL HYDROGRAPHS

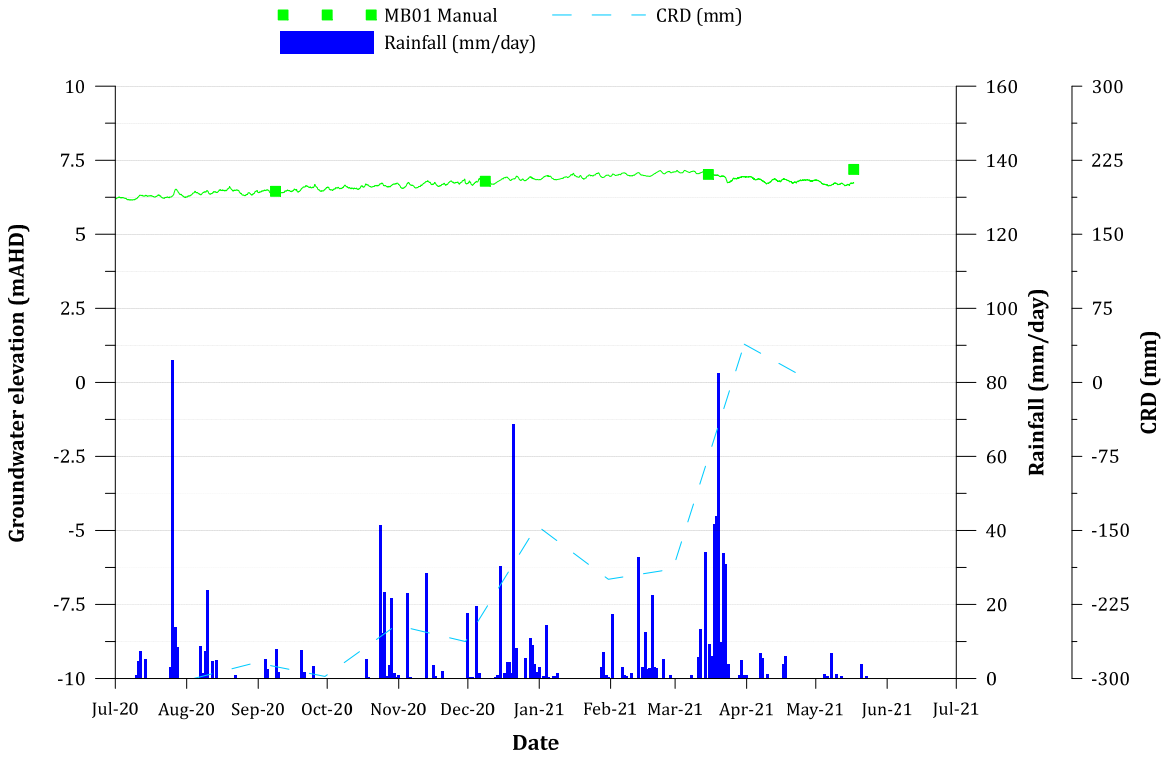



**FIGURE 12.3 STAGE 3 MB01 SANDSTONE AQUIFER GROUNDWATER LEVEL HYDROGRAPH**

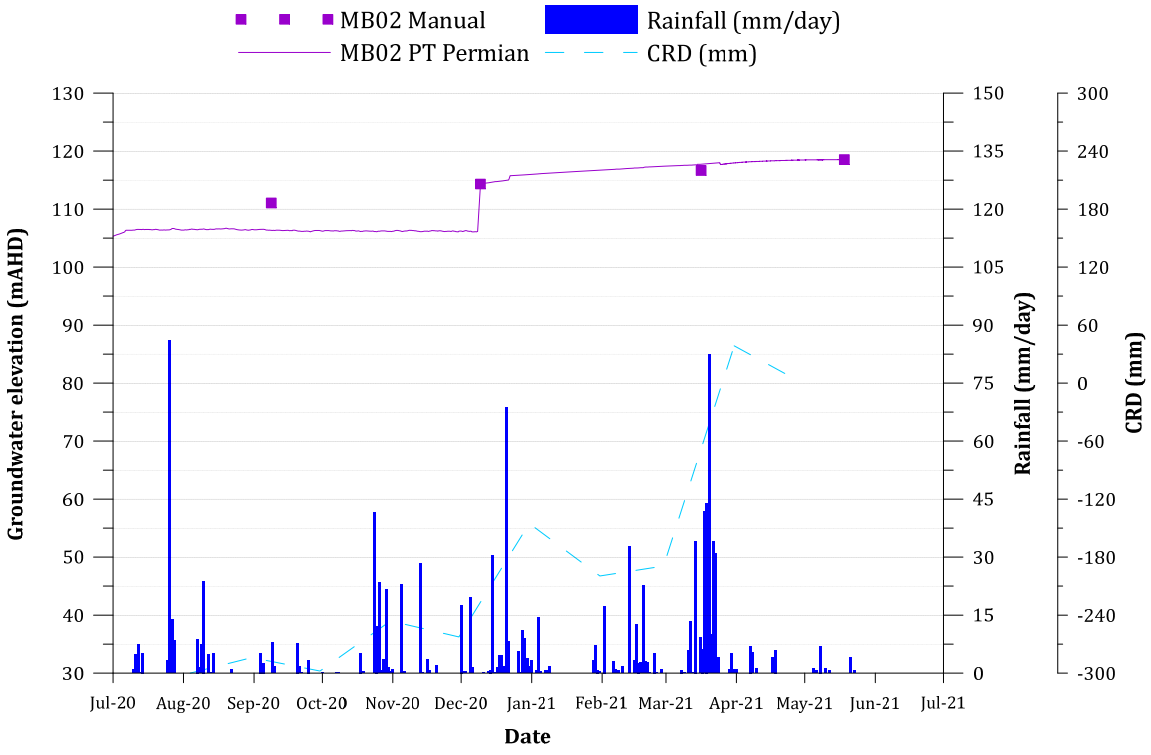



**FIGURE 12.4 STAGE 3 MB02 SANDSTONE AQUIFER GROUNDWATER LEVEL HYDROGRAPH**

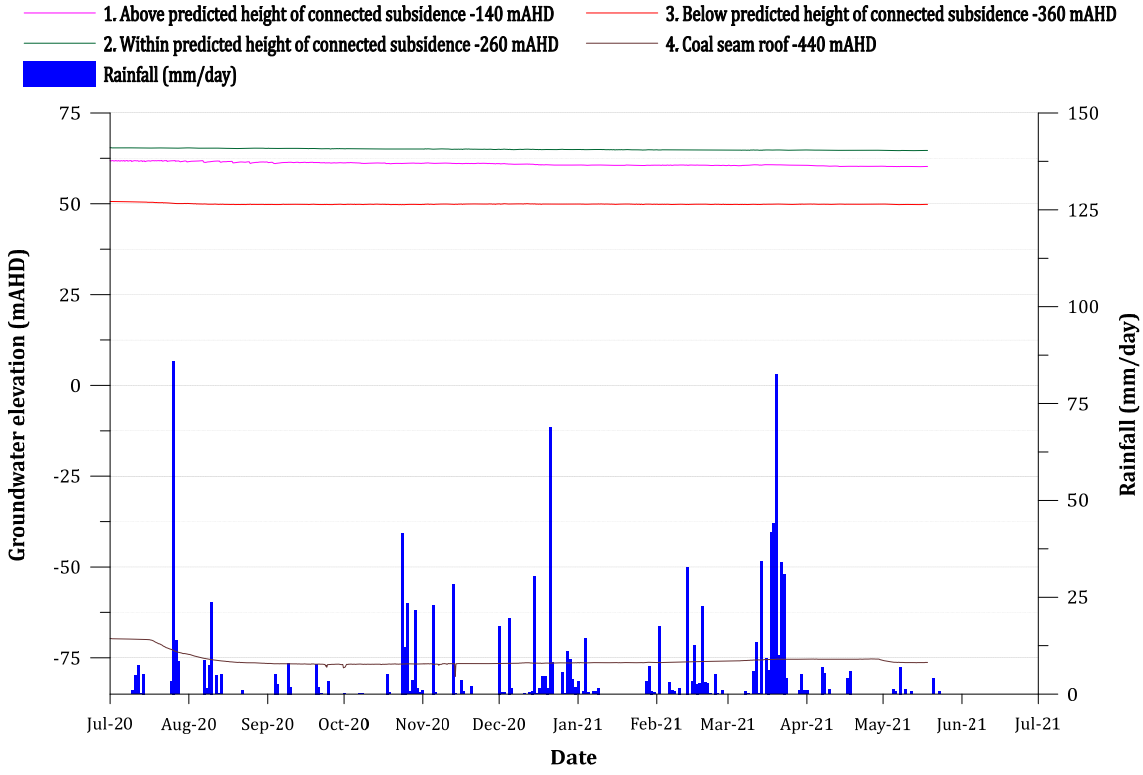



FIGURE 12.5 EX01H PIEZOMETRIC HEAD MEASUREMENTS: SENSORS NO.1 TO NO.4

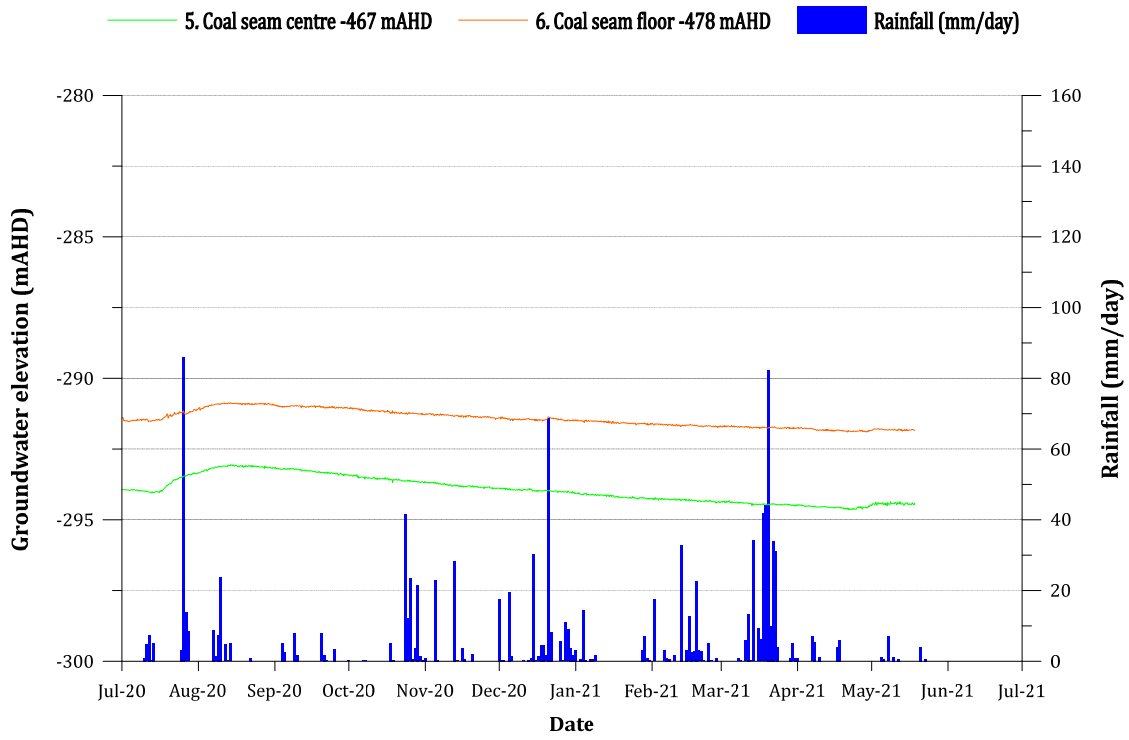



FIGURE 12.6 EX01H PIEZOMETRIC HEAD MEASUREMENTS: SENSORS NO.5 AND NO.6

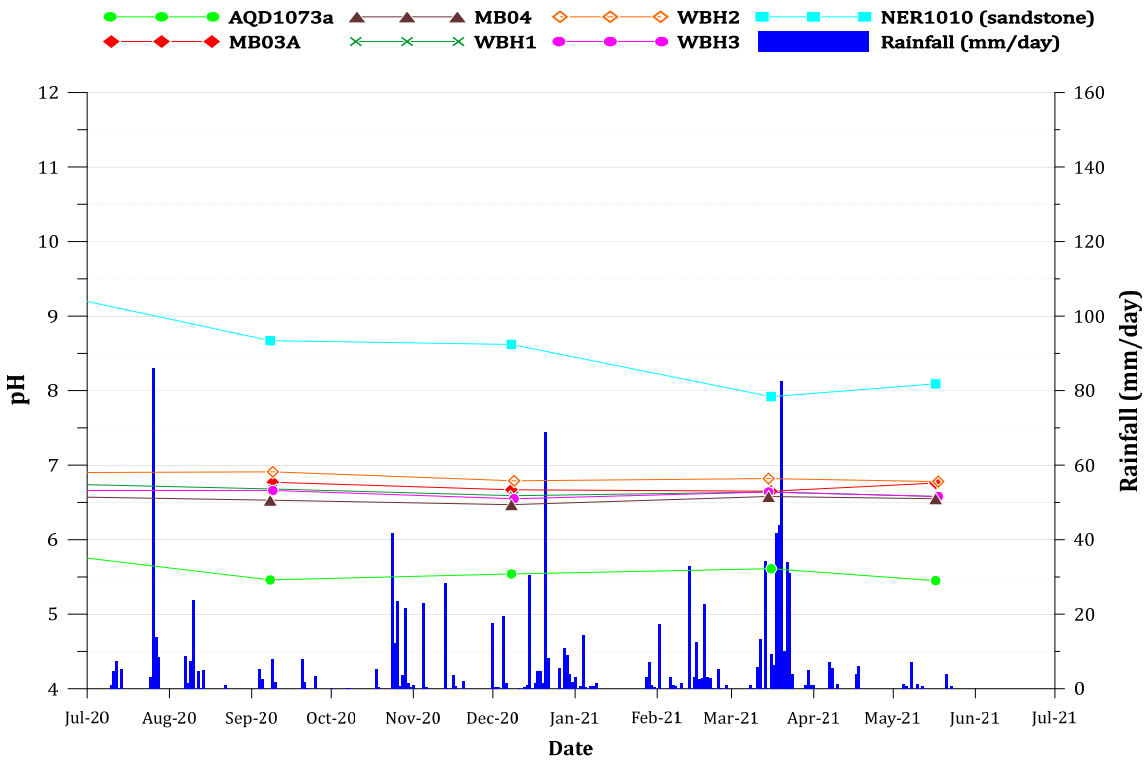



FIGURE 12.7 STAGE 2 AND BELLBIRD SOUTH ALLUVIUM AND SANDSTONE AQUIFER PH TRENDS

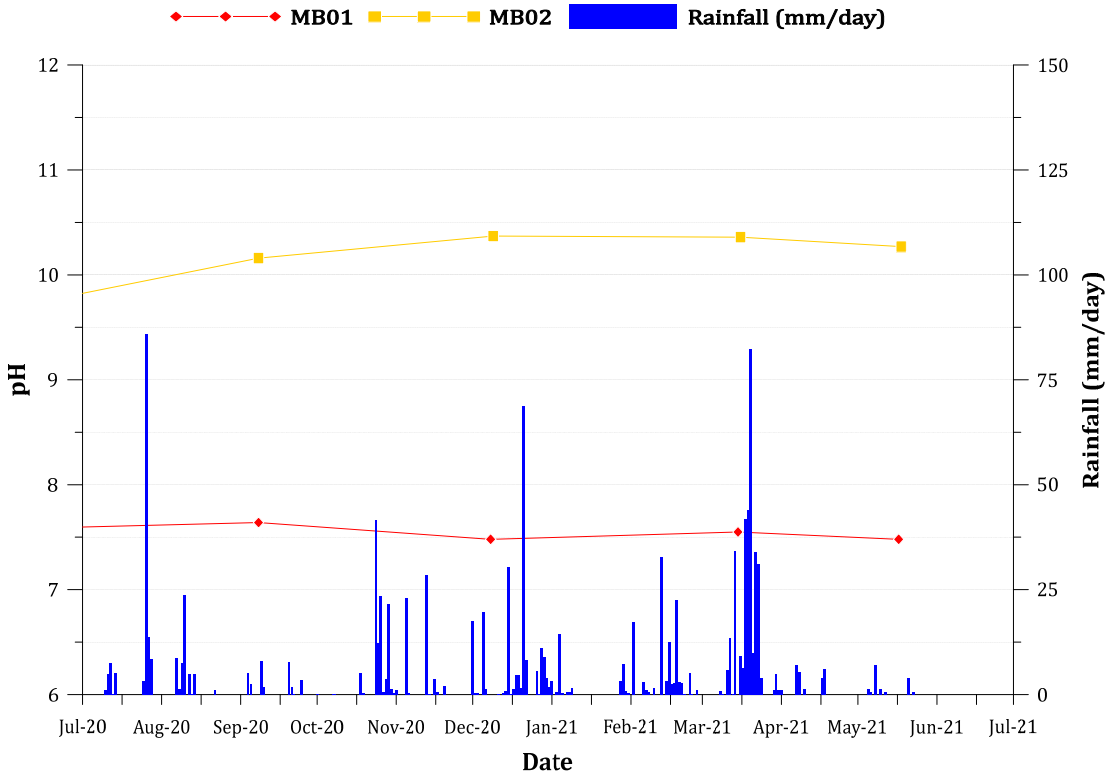



FIGURE 12.8 STAGE 3 SANDSTONE AQUIFER PH TRENDS

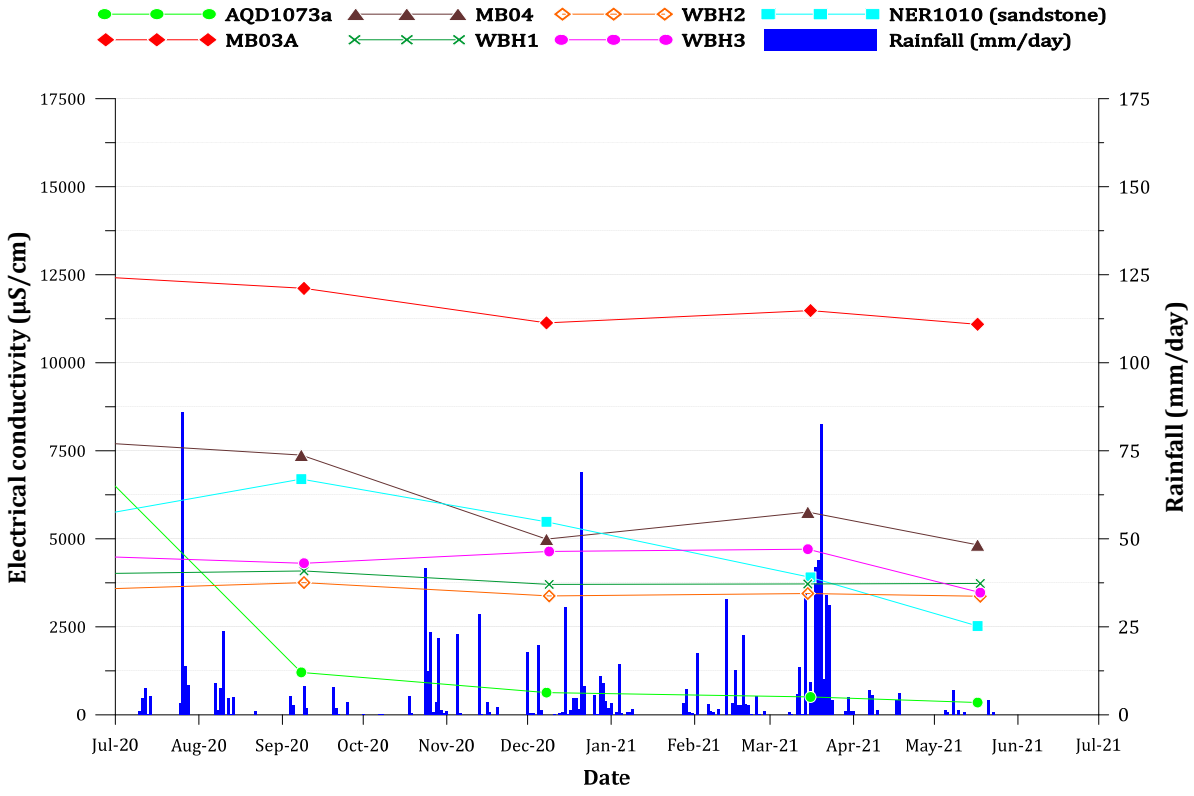



FIGURE 12.9 STAGE 2 AND BELLBIRD SOUTH ALLUVIUM AND SANDSTONE AQUIFER EC TRENDS

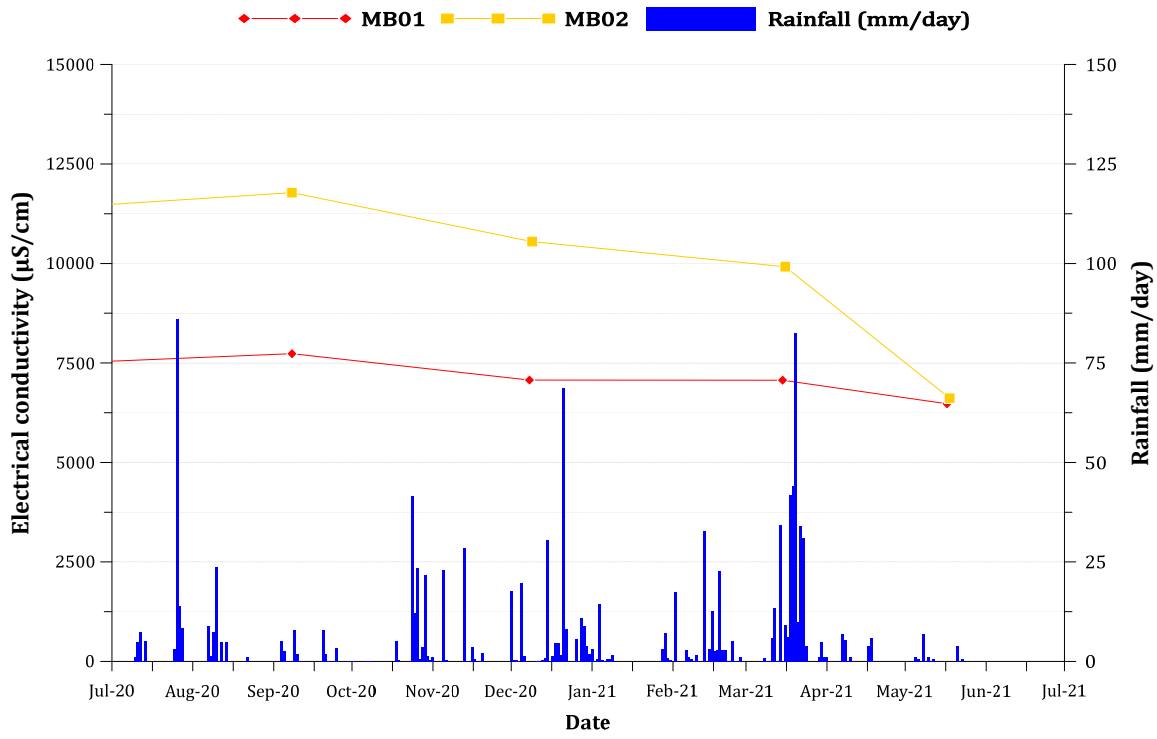



FIGURE 12.10 STAGE 3 SANDSTONE AQUIFER EC TRENDS

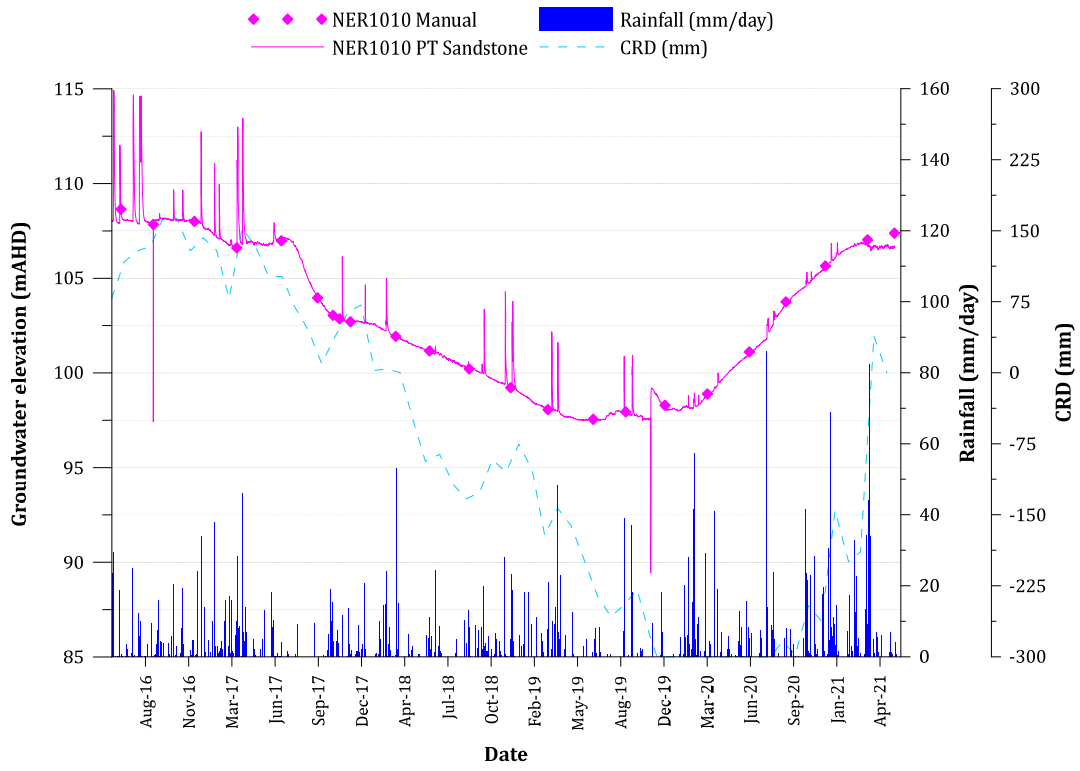



FIGURE 12.11 5-YEAR NER1010 GROUNDWATER LEVEL HYDROGRAPH

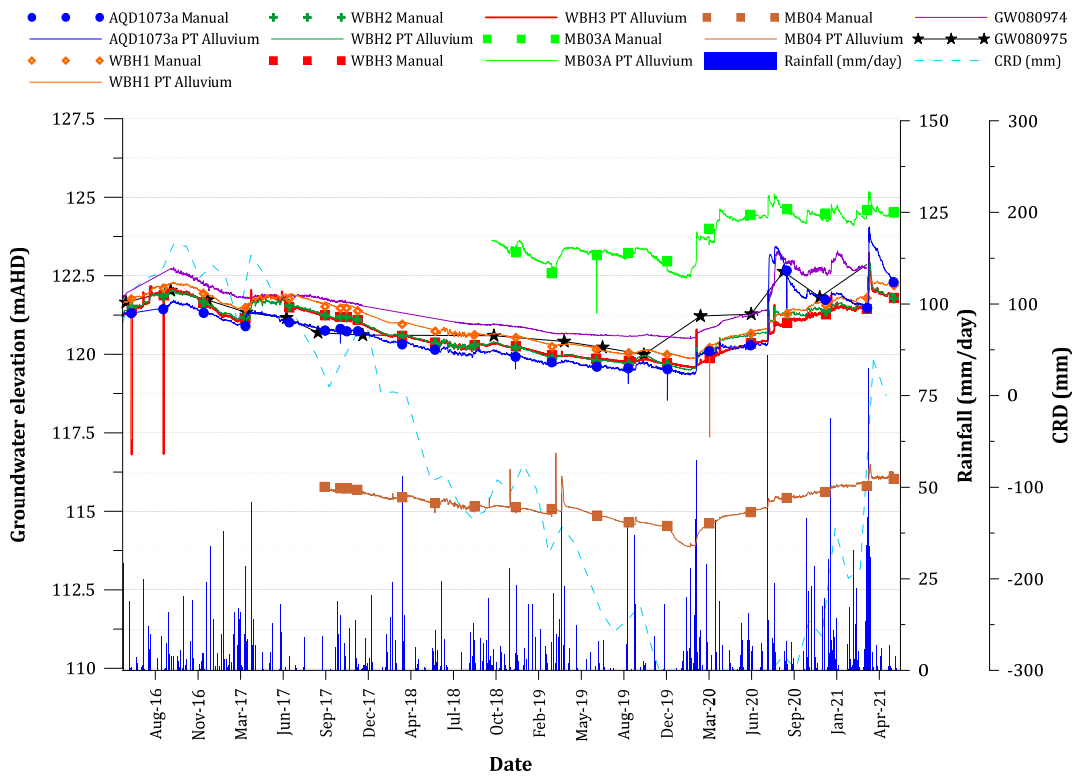



FIGURE 12.12 5-YEAR STAGE 2 AND BELLBIRD SOUTH ALLUVIUM AND WATER NSW GROUNDWATER LEVEL HYDROGRAPHS

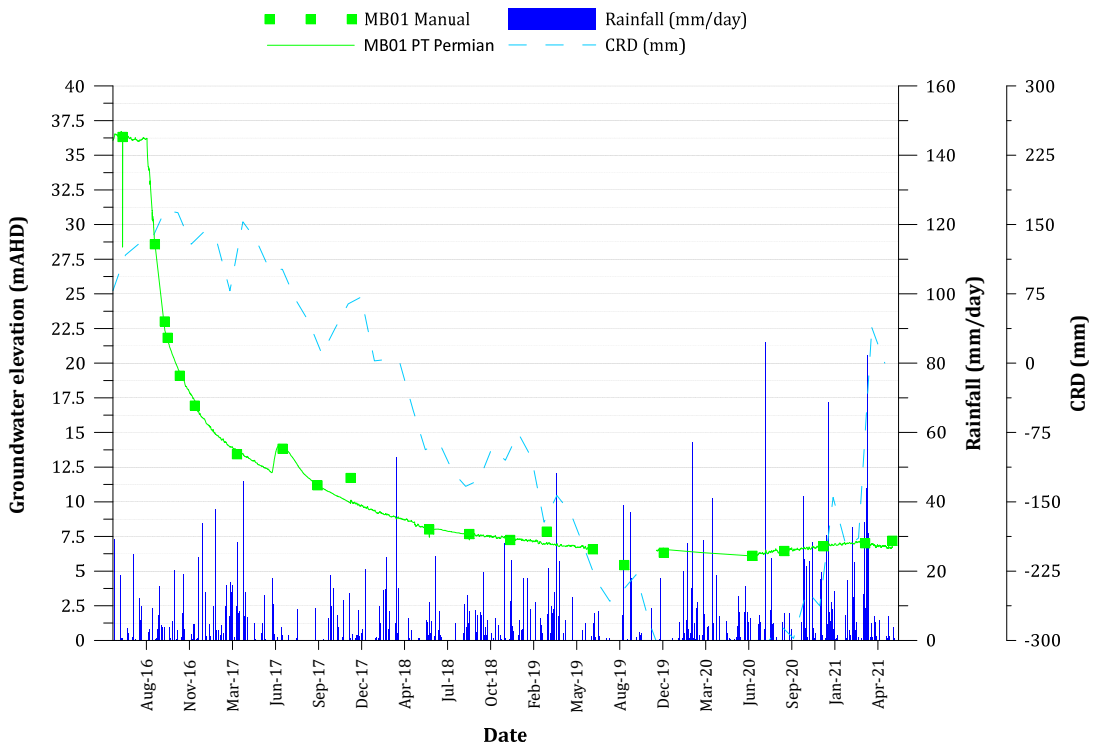



FIGURE 12.13 5-YEAR STAGE 3 MB01 SANDSTONE AQUIFER GROUNDWATER LEVEL HYDROGRAPH

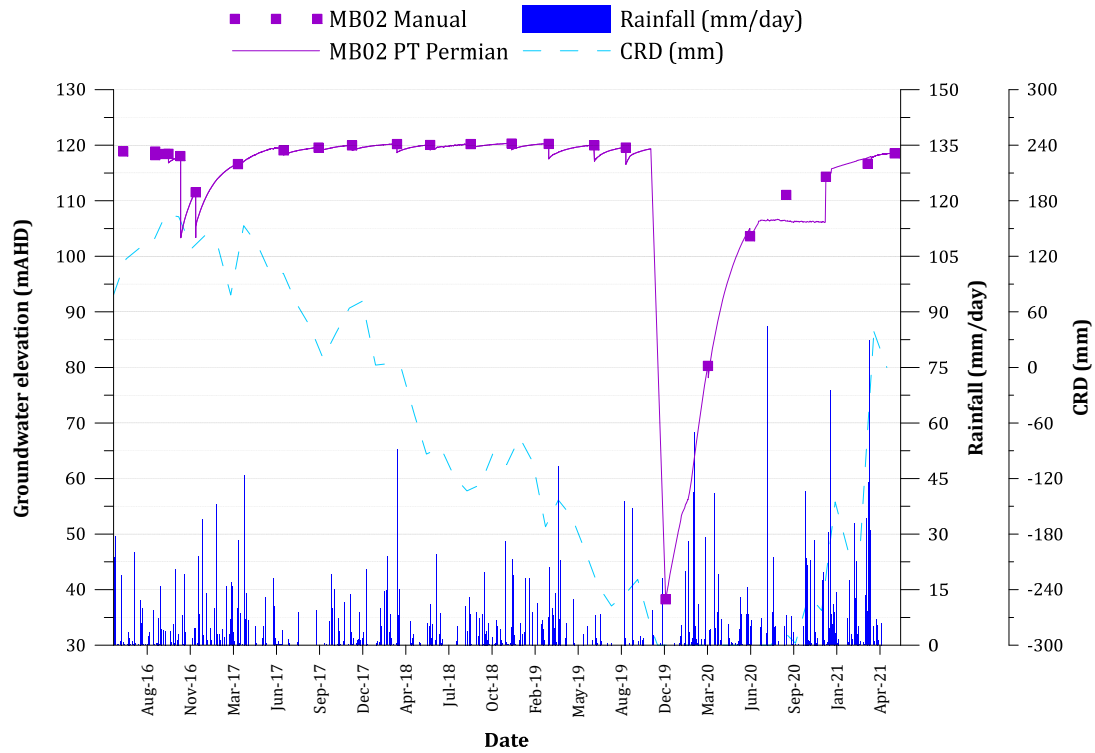



FIGURE 12.14 5-YEAR STAGE 3 MB02 SANDSTONE AQUIFER GROUNDWATER LEVEL HYDROGRAPH

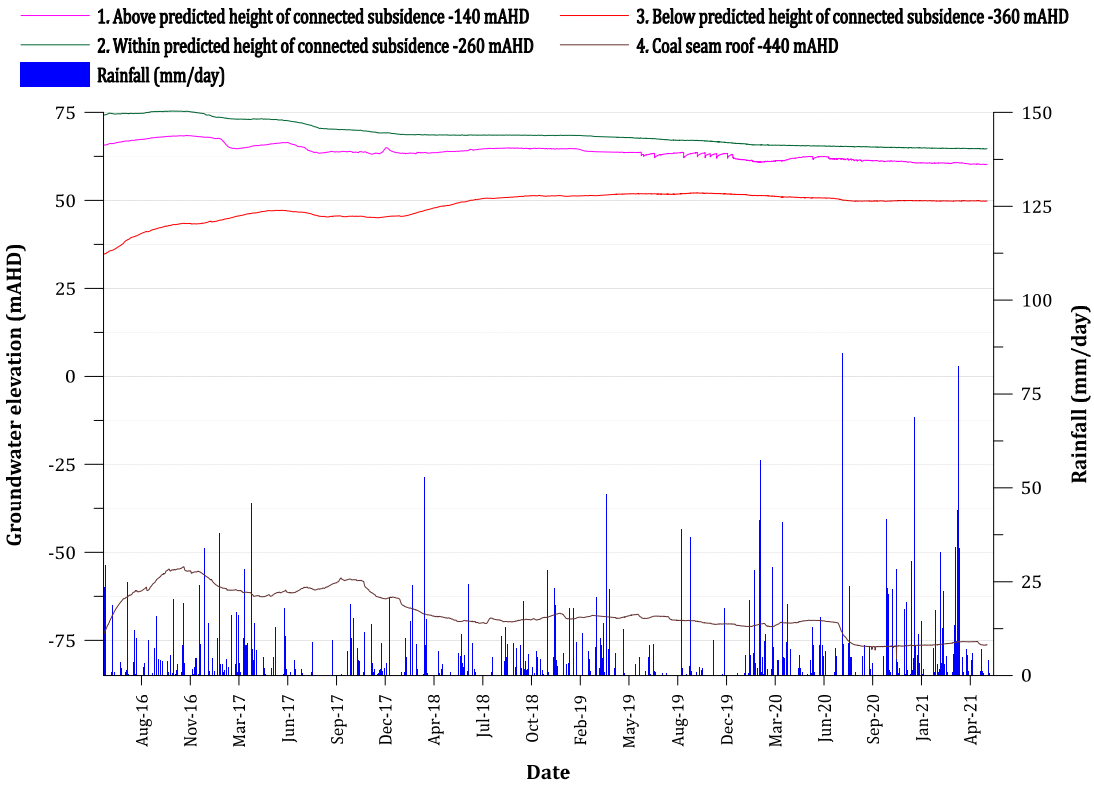



FIGURE 12.15 5-YEAR EX01H PIEZOMETRIC HEAD MEASUREMENTS: SENSORS NO.1 TO NO.4

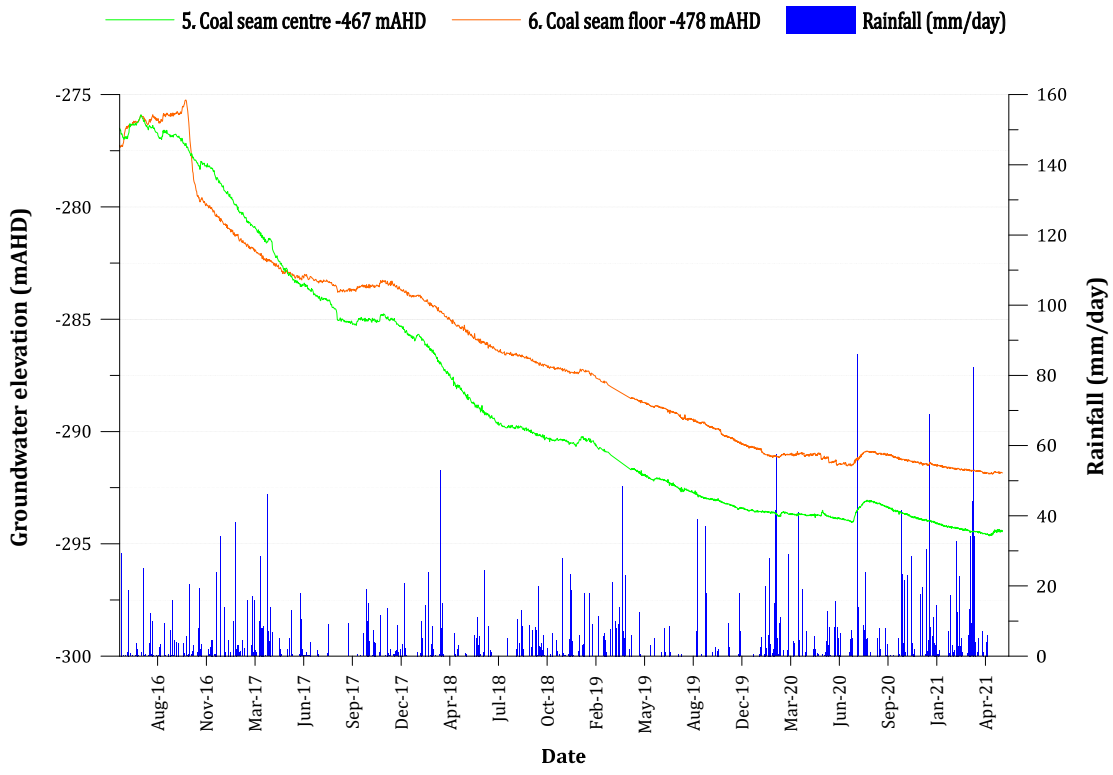



FIGURE 12.16 5-YEAR EX01H PIEZOMETRIC HEAD MEASUREMENTS: SENSORS NO.5 AND NO.6

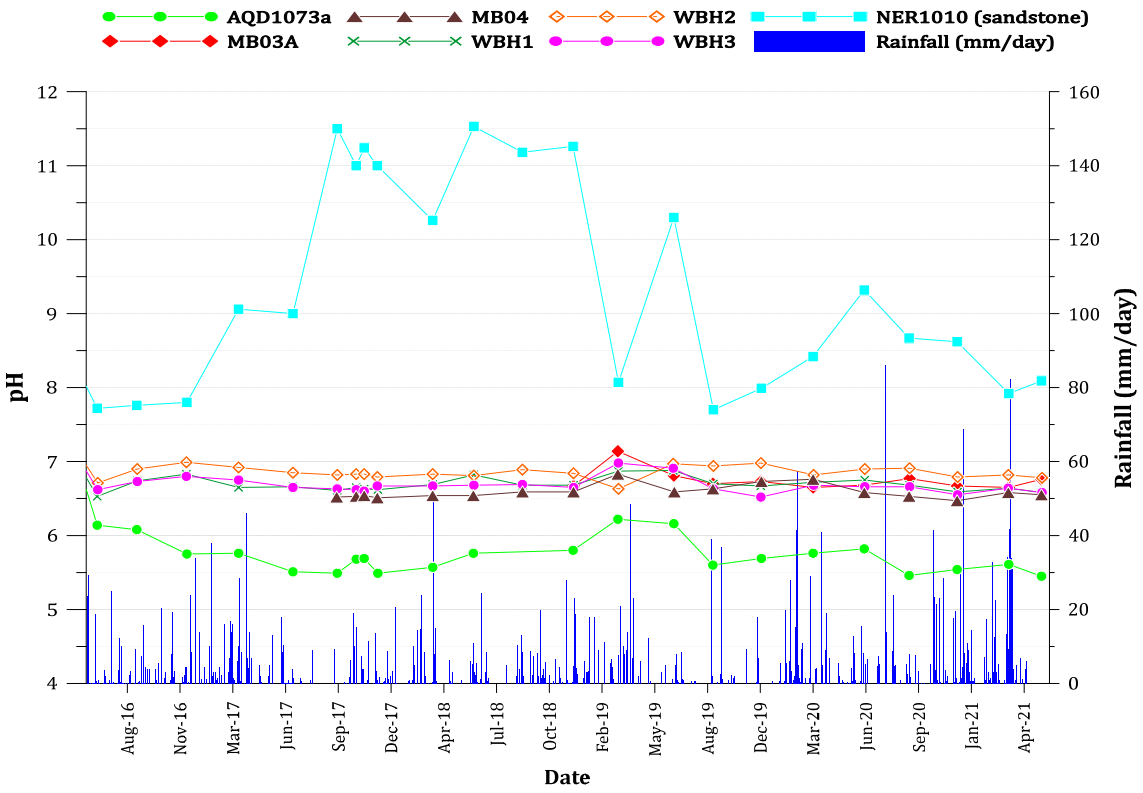



FIGURE 12.17 5-YEAR STAGE 2 AND BELLBIRD SOUTH ALLUVIUM AND SANDSTONE AQUIFER PH TRENDS

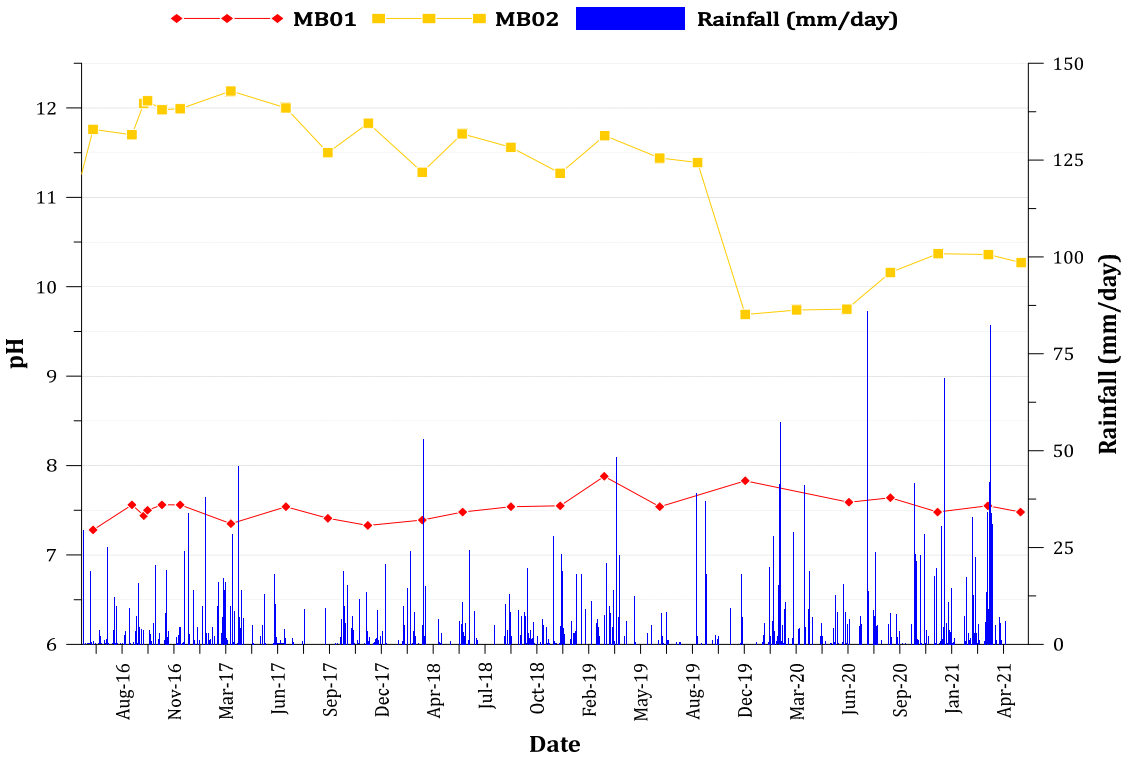



FIGURE 12.18 5-YEAR STAGE 3 SANDSTONE AQUIFER PH TRENDS

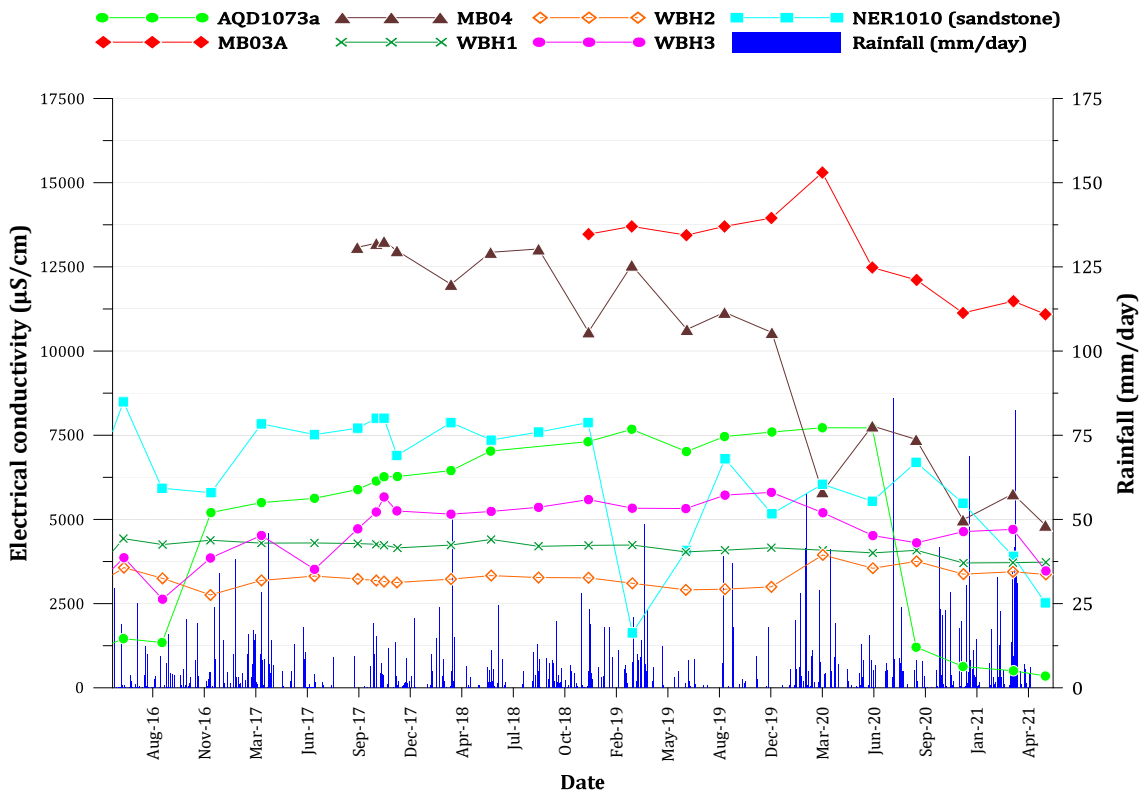



FIGURE 12.19 5-YEAR STAGE 2 AND BELLBIRD SOUTH ALLUVIUM AND SANDSTONE AQUIFER EC TRENDS

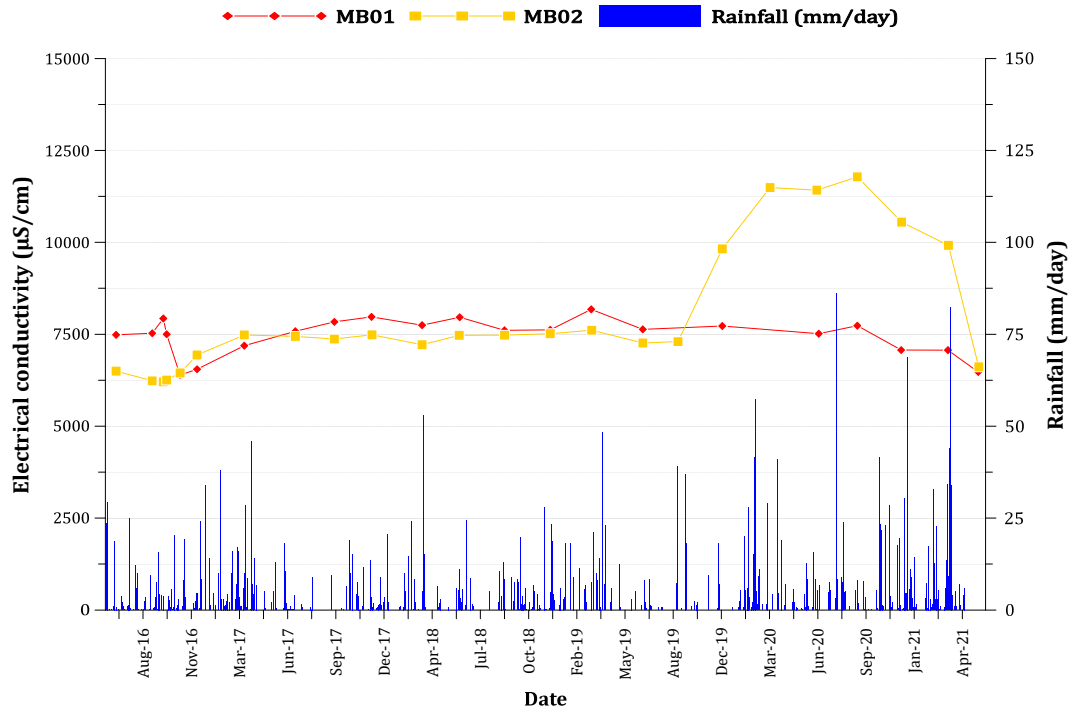



FIGURE 12.20 5-YEAR STAGE 3 SANDSTONE AQUIFER EC TRENDS

Ms Julie McNaughton
Environment and Community Coordinator
Austar Coal Mine Pty Ltd

By email only: Julie.mcnaughton@yancoal.com.au

22/10/2021

Dear Ms McNaughton

**Austar Coal Mine (MP08_0111)**
**Annual Review 2020/2021**

Reference is made to your post approval matter, MP08_0111-PA-45, Austar Coal Mine Annual Review (AR) for the period 1 July 2020 to 30 June 2021, submitted as required by Schedule 5, Condition 5 of DA 29/95 as modified (the consent) and Schedule 7, Condition 3 of MP08_0111 as modified (the approval) to the Department of Planning, Industry and Environment (the Department) on 29 September 2021.

The Department has reviewed AR 2020/2021 and considers it to satisfy the reporting requirements of the approval, the consent, and the Department's *Annual Review Guideline* (October 2015). Please make publicly available a copy of AR 2020/2021 on the company website.

Please note that the Department's acceptance of AR 2020/2021 is not an endorsement of the compliance status of the project. It is noted that non-compliances with the approval and the consent identified in the Annual Review have been previously assessed by the Department and no further action is proposed.

Should you need to discuss the above, please contact Ann Hagerthy, Senior Compliance Officer on (02) 6575 3407 or email compliance@planning.nsw.gov.au .

Yours sincerely

Joel Curran
A/ Team Leader Northern
Compliance

As nominee of the Planning Secretary