

2021 Annual Review

Ulan Coal Mine



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Name of operation	Ulan Coal Mine
Name of operator	Ulan Coal Mines Pty Limited
Development consent / project approval #	PA 08_0184
Name of holder of development consent / project approval	Ulan Coal Mines Pty Limited
Mining lease #	CCL 741, MPL 315, ML 1341, ML1365, ML 1366, ML 1467, ML 1468, ML 1511, ML 1554, ML 1656, ML1754, ML1796, ML1798, ML1799, ML1813, EL 5573, EL 7542, & EL 8687
Name of holder of mining lease	Ulan Coal Mines Pty Limited
Water licence #	WAL41492, WAL19047, WAL37192, WAL41817, WAL41906, WAL42900 & WAL34921 (only allocation Licences listed).
Name of holder of water licence	Ulan Coal Mines Pty Limited
MOP/RMP start date	01/12/2017
MOP/RMP end date	01/12/2024
Annual Review start date	01/01/2021
Annual Review end date	31/12/2021
I, Lucy Stuart, certify that this audit report is a true and accurate record of the compliance status of Ulan Coal Mines Pty Limited for the period of 01 January 2021 to the 31 December 2021 and that I am authorised to make this statement on behalf of Ulan Coal Mines Pty Limited. Note. a) <i>The Annual Review is an 'environmental audit' for the purposes of section 122B (2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person acknowledges that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</i> b) <i>The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).</i>	
Name of authorised reporting officer	Lucy Stuart
Title of authorised reporting officer	Environment and Community Manager
Signature of authorised reporting officer	
Date	31 March 2022

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Attachment A – Attended Noise Monitoring

Attachment B – Air Quality Monitoring Results

Attachment C – Surface Water Monitoring Results

Attachment D – Groundwater Report

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Attachment F – Water Balance

Attachment G – Creek Stability Report

Attachment H – Plans

Attachment I – Mining Lease Environmental Reporting Condition Reference

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Attachment J – Annual Subsidence Report

Attachment K – MOP Completion-Success Criteria Review

Attachment L – Exploration Summary

Attachment M – Monitoring Figures

Attachment N – Meteorological Data

ELECTRONIC COPY

Electronic copy of the 2021 AR emailed to stakeholders, attachments available electronically online via the website: <https://www.glencore.com.au/operations-and-projects/coal/current-operations/ulan-coal/reporting-documents>

1. Statement of Compliance

Compliance Table 1 Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	Yes / No*
PA 08_0184	No
ML's	Yes
EL's	Yes
EPL 394	No
Water Licences	Yes
EPBC Approvals (2009/5252) & (2015/7511)	Yes

Notes:* Refer to Table 3 (Non Compliances), Section 3 (Approvals) Section 11 (Incidence and Non-Compliances) for details

Compliance Table 2 Compliance Status Key

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

Compliance Table 3 Non- Compliances

Relevant Approval	Condition	Compliance Issue	Compliance Status	Comment	Section in AR
EPL394	M4.2	13 January 2021, it was identified that the Meteorological Station EPA ID Number 32 was unavailable for a period of time greater than 48 hours to continuously measure rainfall between December and 12 January 2021.	Non-compliant	Vegetation had lodged in the funnel of the rain gauge, preventing accurate recording of rainfall. Vegetation was removed.	11.2
EPL394	M4.2	10 June 2021, it was identified that the Meteorological Station EPA ID Number 32 was unavailable for a period of time greater than 48 hours to continuously measure rainfall from at least May 25th onwards.	Non-compliant	Communication cables were repaired. A notification has been set up in the Sentinex system to alert when no communications have been received.	11.2
PA08_0184	Sch 3, Con 19	PM ₁₀ dust levels measured by TEOM (EPA Monitoring Site 30 (Sentinex71) exceeded criteria stipulated by PA08_0184, Schedule 3, Condition 19, Table 9. The elevated dust levels occurred for a short duration on the evening of Thursday 14 January 2021.	Non-compliant	The wind direction was WSW, travelling from the monitoring station towards UCMPL. Given the wind direction, Ulan Coal do not consider there to be an operational source for the exceedance.	11.2

2. Introduction

2.1 Report Scope

This 2021 Annual Review¹ (AR) was prepared to satisfy consent conditions and reporting obligations as specified by NSW Department of Planning, Industry and Environment (DPIE). The reporting period for this AR is from 01 January 2021 to 31 December 2021, with the AR due by 31 March 2022². A copy of this AR will be distributed to:

- DPIE;
- DPIE –Resources Regulator (RR);
- NSW Environment Protection Authority (EPA);
- DPIE -Biodiversity, Conservation & Science Directorate (BSC);
- NSW Department of Primary Industries – Division of Water (DPI-Water); and
- Mid-Western Regional Council (MWRC)

Upon approval, this document will be uploaded to the Ulan Coal Mine website for public viewing at www.ulancoal.com.au and issued to Ulan Coal Mine Community Consultative Committee (Ulan Coal CCC).

2.2 Mining Operations and Location

Ulan Coal Mines Pty Limited (UCMPL) is owned by Glencore Coal Assets Australia Pty Limited. UCMPL was granted PA08_0184 under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 15 November 2010 for the *Ulan Coal – Continued Operations Project*.

The Ulan Underground Mine (UUG), the Ulan West Underground mine (UW), the Ulan Open Cut mine, coal processing and train loading facilities and land holdings, including the Bobadeen Irrigation Scheme (BIS), as a collective, are referred to as the Ulan Coal Complex (UCC) (**Figure 2-1**).

The UCC is located in New South Wales approximately 1.5 kilometres from Ulan Village, within the Mid-Western Regional Council (MWRC) Local Government Area (LGA). The project area is approximately 38 kilometres north-north-east of Mudgee and 19 kilometres north-east of Gulgong. The 13,000 hectare (ha) landholding, straddles the Great Dividing Range and is located at the headwaters of the Goulburn and Talbragar River Catchments. Underground and open cut mining and associated infrastructure are approved under PA08_0184 (as modified) (**Figure 2-2**) for:

- Mining operations on site until 30 August 2033;
- Longwall mining of the Ulan Underground Mine (UUG);
- Longwall mining of the Ulan West Underground Mine (UW);
- Open cut mining over a 239 ha area;

¹ The AR was prepared in accordance with the DPIE *Annual Review Guideline October 2015* and the AR reporting requirements contained in Condition 3, Schedule 5 and Statement of Commitments in Appendix 9 of the PA08_0184.

² In accordance with Condition 3, Schedule 5 of Project Approval 08_0184 (PA08_0184).

- Coal Handling and Preparation Plant (CHPP) and rail loadout facilities with total coal production capacity of up to 20 million tonnes per annum (Mtpa) product coal; and
- Surface facilities and ancillary activities to support the above mentioned operations.

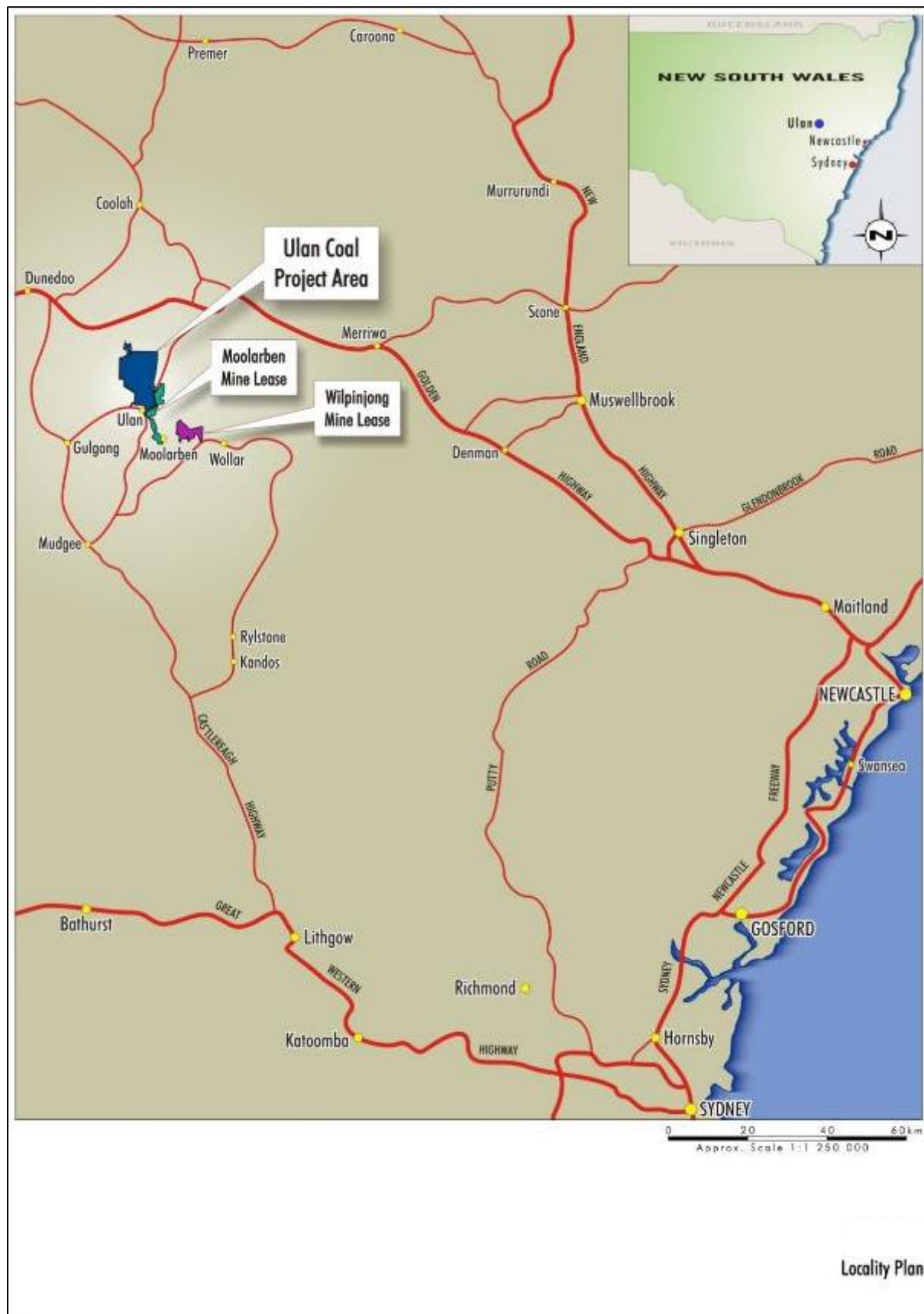
2.3 Mine Contacts

Table 2-1 outlines the contact details for site personnel responsible for mining, coal preparation, rehabilitation, environmental and community management at the end of the reporting period.

Table 2-1 – Ulan Coal Mine Contacts

Name	Position	Contact Details
Charlie Allan	General Manager	Work: 02 6372 5300 Email: charlie.allan@glencore.com.au
Sam Wiseman	Operations Manager – Ulan Surface Operations	Work: 02 6372 5400 Email: sam.wiseman@glencore.com.au
Elliot Baume	Operations Manager – Ulan Underground Operations	Work: 02 6372 5300 Email: elliot.baume@glencore.com.au
David Ribaux	Operations Manager – Ulan West Underground Operations	Work: 02 6370 9200 Email: david.ribaux@glencore.com.au
Lucy Stuart	Environment & Community Manager	Work: 02 6372 5368 Email: lucy.stuart@glencore.com.au

Figure 2-1 – Locality Plan



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Approved Operations

ULAN COAL
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Legend:

- Project Approval Boundary PA08-0184
- Water Treatment Plants
- Existing Surface Facilities Office Buildings-Stores-Workshops-CHPP
- Tailings/Reject Emplacement Areas
- Water Management Area
- Constructed Infrastructure
- Proposed Infrastructure
- Acacia Austfeldii Management Area
- Brokenback Conservation Area Domain
- Spring Gully Cliffline Management Domain
- Bobadeen Quarry
- Approved Open Cut Extension
- Major Roads and Rail
- Exploration Leases
- Mining Leases
- Ulan West Mine Plan
- Ulan Underground Mine Plan
- Durrigere
- Goulburn River National Park

3. Approvals

Table 3-1 presents the Project Approval PA08_0184 (as modified) granted under the EP&A Act, administered by DPIE that UCMPL operates under.

Table 3-1 –Project Approval (as modified)

Project Approval	Description	Approval Date
PA 08_0184	Ulan Coal –Continued Operations Project.	15/11/2010
MOD 1	Longwall extraction of the North 1 mining area. Modify UUG & UW mine plans. Concrete Batching Plant.	07/12/2011
Court Orders	Land & Environment Court Judgement.	April 2012
MOD 2	Modify UW mine plan LW1-5. Remove restrictions on construction blasts Minor amendments to European and natural heritage sites where blasting measures are applicable.	25/05/2012
MOD 3	Modify UW Mine Plan realignment of main headings further to the south.	14/02/2016
MOD 4	Modify UW & UUG Mine Plan - extend the approved longwalls UUG LW30 - LW33 and LW W7-8 and UW LW07 and LW08.	17/07/2019
MOD 5	Administrative modification to amend an error in figures included in the Project Approval	07/08/2020

Table 3-2 presents the mining and exploration authorisations, granted under the *Mining Act 1992*, administered by DPIE-RR, that have been issued to UCMPL.

Table 3-2 – Mining and Exploration Titles

Mining Lease (ML)	Date of Grant	Duration of Approval	Mine Area Applicability
Consolidation Coal Lease (CCL) 741	2/01/1990	15/05/2027	All operations
Mining Purpose Lease 315	3/08/1993	3/08/2035	No. 3 Underground (Surface Lease)
Mining Lease 1341	25/01/1994	25/01/2036	No. 3 Underground
Mining Lease 1365	9/03/1995	9/12/2032	No. 3 Underground (Surface Lease)
Mining Lease 1366	9/03/1995	9/12/2032	No. 3 Underground (Surface Lease)
Mining Lease 1467	17/04/2000	16/04/2042	No. 3 Underground (Surface Lease)
Mining Lease 1468	16/05/2000	16/05/2042	No. 3 Underground
Mining Lease 1511	24/04/2002	23/04/2023	No. 3 Underground (Surface Lease)
Mining Lease 1554	1/09/2004	31/08/2025	No. 3 Underground (Surface Lease)
Mining Lease 1656	03/03/2011	03/03/2032	No. 3 Underground (Surface Lease)
Mining Lease 1697	22/05/2014	22/05/2035	Ulan Open Cut
Mining Lease 1798	19/02/2020	19/02/2041	Ulan West
Mining Lease 1799	26/02/2020	26/02/2041	Ulan Open Cut
Exploration Licence 5573	28/04/1999	28/04/2022*	Ulan Underground
Exploration Licence 7542	6/05/2010	06/05/2026	Ulan West
Exploration Licence 8687	31/01/2018	31/1/2024	Ulan West
MLA 470 (now ML 1813)	24/03/2021	24/03/2042	Ulan Open Cut

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Mining Lease (ML)	Date of Grant	Duration of Approval	Mine Area Applicability
MLA 605	Submitted 17/08/2021	Pending	Ulan West
MLA 609	Submitted 23/11/2021	Pending	Ulan West and Ulan Underground

Notes: * Application for renewal to be submitted in 2022

Attachment I provides a table of compliance with specific ML reporting conditions. Water licences for monitoring bores and wells are listed in **Table 3-3**.

Table 3-3 - Groundwater Licences held under Part 5 of Water Management Act 1912

Licence No.	Description	Works Type	Extraction Limit (ML)	Expiry Date
20BL168100	Monitoring Bores	Monitoring Bore	NA	Perpetuity
20BL172841	Bobadeen Monitoring Network	Monitoring Bore	NA	Perpetuity
20BL172845	Goulburn River Diversion Monitoring Network	Monitoring Bore	NA	Perpetuity
20BL172846	Alluvium Monitoring Network	Monitoring Bore	NA	Perpetuity
20BL172847	Hydrocarbon Monitoring Network	Monitoring Bore	NA	Perpetuity
20BL172850	North Monitoring Network	Monitoring Bore	NA	Perpetuity
20BL172851	Intermittent Monitoring Network	Monitoring Bore	NA	Perpetuity
20WA216193	1977 Cope Road	Stock/Domestic Bore	NA	Perpetuity
80WA706112	2450 Blue Springs Road	Stock/Domestic Bore	NA	Perpetuity

Water licences for dewatering bores, dams, and wells are listed in **Table 3-4**.

Table 3-4 - Water Approvals held under Division 2 of the Water Management Act 2000

Licence No.	Description	Works Type	Extraction Limit* (Shares)	Water Source	Expiry Date
WAL41492 (20AL214787)	Aquifer (Extraction)	Water Allocation Licence	7060	Oxley Basin Coast Groundwater Source	Perpetuity
WAL37192 (20AL723743)	Aquifer (Extraction)	Water Allocation Licence	704	Sydney Basin Murray Darling Basin Groundwater Source	Perpetuity
WAL41906 (80AL724736)	Aquifer (Extraction)	Water Allocation Licence	2215	Sydney Basin Murray Darling Basin Groundwater Source	Perpetuity
WAL42900 (20AL220117)	Aquifer (Extraction)	Water Allocation Licence	4031	Sydney Basin Murray Darling Basin Groundwater Source	Perpetuity
20FW213272	Goulburn River Flood Gates	Levy Licence	NA	NA	21/09/2027
WAL19047 20WA209953	Moolarben Creek Dam/Pump & Baseflow loss	Water Allocation Licence	600	Upper Goulburn River Water source	29/09/2023 WAL allocation Perpetuity
WAL41817	WAL allocation Perpetuity	Yes	Yes	Upper Talbragar River Water Source	Perpetuity
WAL 34921 (80AL716931)	Aquifer (Baseflow loss)	Water Allocation Licence	50	Talbragar Alluvial Groundwater Source	Perpetuity

Notes: *Annual extraction limits against licences provided in **Section 5.3** of this Report

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Table 3-5 presents other approvals and licence issued to UCMPL that Ulan Coal Mine operates under.

Table 3-5 - Other Approvals and Licences

Licence/Approval	Licence/ Approval No.	Authority	Approval/Expires
Environment Protection Licence (EPL)	394	EPA	Anniversary Date 18 November
Mining Operations Plan (MOP)	2017-2024	RR DPIE	Expires 1/12/2024
UW Extraction Plan approval LW1 to LW6^	NA	DPIE	Approval 19/08/2019
UUG Extraction Plan LW30 & W6-W8 (amended)*	NA	DPIE	Approval 01/02/2021
Radiation Management Licence	5061101	EPA	Expires 02/08/2022
Radiation User Licence	5023004	EPA	Perpetuity
Dangerous Goods Notification	NDG023149	WorkCover NSW	Expires Sept 2031
EPBC Approval	2009/5252	DAWE	Expires 1 March 2036
EPBC Approval (MOD 4 extension area)	2015/7511	DAWE	22 December 2015 to Perpetuity
Bobadeen Grinding Groove Conservation Agreement	NA	BCS	Final signed copy received 11 December 2019
Conservation Agreement for Brokenback Conservation Area- Area 1 (UCMPL owned land)	NA	BCS	Final signed copy received 11 December 2019
Conservation Agreement for Bobadeen Vegetation Offset Area (UCMPL owned land)	NA	BCS	Final signed copy received 11 December 2019
Conservation Agreement for Hightett Road Offset Area (UCMPL owned land)	NA	BCS	Gazetted 6 December 2019
Conservation Reservation for Spring Gully Offset Area (Crown owned land)	NSW Government Gazettal No 165	DPIE- Crown Land	Gazetted 6 December 2019

Notes: ^ Revised and resubmitted at the time of preparing the 2021 Annual Review to include LW7 and LW8. * Revised and resubmitted in 2020 to align with MOD4 and scheduled for review in 2022 to include LW31.

3.1.1 Surrender of Consents

Prior to PA08_0184, UCMPL formally operated under four major Development Consents, 18 modifications and 16 other minor development approvals. The final remaining Development Consent DA 113-12-98 was surrendered to DPIE on the 20/10/2017 within 3 months of the completion of LWW3, in accordance with Schedule 2 Condition 9 of PA08_0184. Resubmission was requested by DPIE, this occurred 23/11/17. Finalisation is pending due to one remaining landowner providing their consent for the surrender of DA 113-12-98.

3.2 Changes to Approvals

3.2.1 EPL 394

There were no variations to EPL 394 during the reporting period. The last variation occurred in January 2020 and related to a correction of location descriptions of a monitoring point and a reference correction within the licence.

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3.2.2 Extraction Plans

The Extraction Plan (EP) for Ulan Underground Longwalls LW30 and W6-W8³ was updated to align with the Modification 4 panel extensions and resubmitted to DPIE for approval on 7 August 2020. The amended EP for LW30 and W6-W8 was approved by the DPIE on the 1 February 2021.

During the reporting period the EP for Ulan West Longwalls LW1 to LW6 was revised to include LW7 and LW8. The revised EP, now known as Ulan West Extraction Plan for LW1 to LW8, was submitted for consultation on the 10 December 2021, seeking feedback from the relevant government agencies. The revised EP for Ulan West, as updated to incorporate the relevant government agencies feedback, and was submitted to the DPIE in early 2022 for approval.

3.2.3 Ulan Modification 6

UCMPL progressed with the various specialists assessments for MOD6 and undertook extensive consultation with all relevant stakeholders. MOD6 proposes:

- Extension of Ulan Underground Long Wall (LW) panels LWW9 to LWW11 to the west
- Widening of Ulan Underground LWW11 by approximately 30 metres
- Extension of Ulan West LW9 to LW12 to the north
- Widening of the approved Ulan West LW12 section by approximately 180 metres.

UCMPL is also proposing some minor changes to surface infrastructure to support underground mining activities including provision of:

- 3 ventilation shafts and associated infrastructure corridors
- 5 dewatering bores and associated infrastructure corridors
- Alternate access track, connecting to previously approved access tracks
- Infrastructure corridor and power borehole to the south west of Ulan West.

UCMPL also proposes to relinquish 2 approved ventilation shafts, 1 approved dewatering bore and associated infrastructure corridors. UCMPL are currently in the process of finalising specialist assessments and the Statement of Environmental Effects and anticipate submission to DPIE in May 2022

3.2.4 Ulan Modification 7

UCMPL have secured all approved offset areas, with the exception of the 10 hectare privately owned portion of Brokenback Conservation Area (BCA). UCMPL sought agreement from the landowner to secure the privately owned portion of BCA via a number of mechanisms. However, after lengthy negotiations agreement was unable to be reached on conditions relating to on-going management of the offset area and commercial terms.

In parallel with seeking to reach agreement with the landowner of the private portion of BCA, UCMPL undertook an assessment to identify a suitable alternative offset, in the case that agreement with the

³ PA08_0184 Schedule 3, Condition 26. The Extraction Plan was prepared in accordance with the Draft Guidelines for the Preparation of Extraction Plans version 5 (as issued by the Department of Planning & Environment (DPIE))

privately owned portion of BCA could not be reached. The assessment looked at a number of properties owned by UCMPL and identified one property which was deemed most suitable. Within this property detailed assessment work identified that the proposed alternative offset site provides an improved environmental outcome compared to the privately owned portion of BCA and meets and exceeds the requirements of UCMPL's State and Federal approvals (Project Approval 08_0184 and EPBC approval 2009/5252, respectively).

The proposed alternative offset site has been subject to subsidence from mining. Mining in the area finished in December 2018. Subsidence assessments for the proposed alternative offset site, prepared by UCMPL and SCT Operations Pty Ltd (SCT) concluded that physical subsidence impacts observed at the time of post mining inspections were generally minor in nature and imperceptible. Subsidence movements within the proposal alternative offset area are effectively complete with no further subsidence impacts expected.

UCMPL undertook comprehensive consultation with NSW DPI&E, the Federal DAWE, NSW DPI&E- BCD and NSW Biodiversity Conservation Trust in relation to the proposed alternative offset site. In accordance with the requirements of Condition 4 of EPBC Approval 2009/5252, UCMPL subsequently submitted a request for approval for the alternative offset site to DAWE on 29 January 2021. On 4 March 2021 UCMPL received approval for the Alternative Offset site from DAWE. Following consultation with these Agencies, UCMPL prepared a number of documents in support of an Application to modify PA 08_0184 based on feedback provided by each Agency.

On 8 June 2021 UCMPL submitted an application to modify PA 08_0184 to permit use of the alternative offset site. DPIE approved MOD 7 on 23 March 2022.

UCMPL are in the process of finalising an application for a Biodiversity Stewardship Agreement with NSW BCT and is scheduled to submit in 2022.

3.2.5 Mining Operations Plan

There was one amendment to the Mining Operations Plan (MOP) (Amendment C) during the reporting period. The amendment to the MOP was sought to permit construction of an extension to the existing clean water diversion drain following Grant of Mining Lease 1813 on 24 March 2021 and included a number of other administrative amendments. Extension to the existing clean water diversion drain is required to provide the necessary flood protection to the Ulan West mine. MOP Amendment C was approved by the RR on 16 September 2021.

In 2022 UCMPL will prepare a new Rehabilitation Management Plan (RMP) to replace the MOP as required by Clause 9 of Schedule 8A to the *Mining Regulation 2016*.

3.2.6 First Workings

Ulan West Longwalls 8-12 First Workings Request

On 30 July 2021, UCMPL sought approval for a change to the approved first workings in accordance with Condition 25, Schedule 3 of PA08_0184 within three locations at Ulan West, including:

- On the periphery of the barrier protecting the Brokenback Conservation Area (BBCA) to ensure clifflines and Heritage features within BBCA are protected from subsidence impacts;

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- In the vicinity of the BBKA protection barrier associated with longwall (LW) 8 to improve longwall relocation efficiency; and
- In the vicinity of the southern mains where an additional roadway is required at the end of LW panels 9 to 12 to segregate transport movements during longwall take-off.

Approval by the Secretary regarding this First Workings amendment was granted on the 3 August 2021.

Ulan West Longwall 7 First Workings Request

On the 22 October 2021, UCMPL sought a minor amendment to the First Workings of the Ulan West mine plan in accordance with Condition 25, Schedule 3 of PA08_0184. The First Workings amendment involved the relocation of the installation roadway on the northern end of LW7 to the south due to unfavourable mining conditions being identified at the location of the originally planned installation roadway position, thereby reducing the overall length of LW7 by approximately 255m. Approval by the Secretary regarding this First Workings amendment was granted on the 22 October 2021.

3.2.7 Management Plans

After the submission of the AR 2020, UCMPL revised and resubmitted for approval a number of management plans as required by Condition , Schedule 5 of PA08_084, including the Air Quality & Greenhouse Gas Management Plan (AQMP) (Version 9) , the Biodiversity Management Plan (BMP) (Version 6), the Environmental Management Strategy (EMS) (Version 13), Groundwater Monitoring Program (GWMP) (Version 8), the Heritage Management Plan (HMP), the Noise Management Plan (NMP) (Version 9), the Surface Water & Groundwater Response Plan (SWGWRP) (Version 11), the Surface Water Monitoring Program (SWMP) (Version 9) and the Waste Management Plan (WMP) (Version 13). At the time of preparing the AR, the EMS (Version 13) was approved by the DPIE on the 14/08/2021.

4. Operations Summary

Total product coal for the reporting period was 11,524,000 tonnes. **Table 7** provides an overview of the production schedule for 2021 against the previous reporting year and the forecast for the 2022 reporting period.

Table 4-1– Production Summary

	Unit	Approved limit (specify source)	2020 Reporting Period	2021 Reporting Period	2022 Reporting Period (Forecast)
Waste Rock/Overburden	m ³	NA	0	0	0
ROM Coal	Tonnes	4.1M	0	0	0
- Open Cut	Tonnes	NA	5,806,577	6,961,000	6,844,924
- Underground:	Tonnes	NA	5,360,282	5,550,000	5,485,089
Ulan West					
Ulan Underground					
Coarse Rejects & Tailings	Tonnes	NA	532,491	500, 983	469,812
Fine Tailings	Tonnes	NA	330,976	262, 048	483,000
Product Coal*	Tonnes	20 M	10,303,392	11,524,000	12,000,000

Notes: M = 1 Million Tonnes * Railed

4.1 Other Operational Conditions

4.1.1 Ulan West Underground

Underground mining operations included development of roadways for LW7 and LW8 and the main headings consistent with first workings approvals. LW6 commenced extraction on 11 August 2020 and is forecast for completion on 7 June 2022. Ulan West LW6 had retreated approximately 4933m, with 2067m to zero chainage remaining at the end of 2021. Ulan West produced 6.961 million tonnes of ROM coal during the reporting period (**Table 4-1**). Construction of Vent Fan 3 adjacent to LW8 and associated infrastructure commenced in 2021. Commissioning will occur in 2022.

4.1.2 Ulan Underground

Ulan Underground mining operations included development of roadways for LWW8, LW30 and LW31, in accordance with first workings approvals. LWW6 commenced extraction on 8 February 2020 and reached zero chainage at the end of April 2021. LWW7 commenced in June 2021 and had retreated approximately 2452m as of the end of December 2021, with 1133m remaining to zero chainage. Ulan Underground produced 5.550 million tonnes of ROM coal during the reporting period (**Table 4-1**).

4.1.3 Open Cut

The Open Cut mining area has been in care and maintenance since 10 October 2016. No open cut mining activities occurred during the reporting period.

4.1.4 Coal Processing & Rail Movements

The Coal Handling Preparation Plant (CHPP) processed 68.6% of Ulan West ROM coal and 22.8% of Ulan Underground ROM coal. The reject waste produced represents approximately 12.4% of the ROM coal processed by the CHPP; classified as either coarse reject (500,983 tonnes) and emplaced in the Barrier Pit or tailings (249,905 tonnes) emplaced in East Pit Tailings Dam Number 2.

All product coal was transported via rail on the Sandy Hollow rail corridor to the Port of Newcastle during the reporting period. No product coal was transported on the Tallawang to Wallerawang rail corridor in the 2021 reporting period. Approximately 11,513,172 tonnes of product coal was transported to the Port of Newcastle during the reporting period, as required by Schedule 2, Condition 7 of PA08_0184 (**Table 4-2**).

Table 4-2 - Coal Loaded and Train Movements in 2021

Month	Average and Maximum Trains Leaving Site per Day (Maximum allowed 10)		Total Movements for the Month	Coal Loaded for the Month (tonnes)
	Average	Maximum		
January 2021	4	5	126	1,161,838
February 2021	2	6	72	668,564
March 2021	3	6	99	911,883
April 2021	3	6	91	845,363
May 2021	3	6	94	861,533
June 2021	3	5	83	756,824
July 2021	3	6	106	968,023
August 2021	4	6	116	1,072,966
September 2021	4	6	127	1,198,792
October 2021	4	6	111	1,016,979
November 2021	3	5	104	955,663
December 2021	4	5	117	1,094,744

4.1.5 Land Preparation

Land preparation activities, during the reporting period were carried out in accordance with the MOP. Land preparation ahead of mining operations involves the construction of appropriate erosion and sediment control structures, the clearing of vegetation and stripping and stockpiling of topsoil. This applies to major surface disturbance works⁴ and is not limited to open cut mining operations. There was approximately 1.8ha of land disturbed associated with exploration activities, 0.57ha of land disturbed associated with clean water diversion drain extension in the open cut and 17.6 ha of land disturbed associated with MG31 and 83CT surface infrastructure for the UUG.

4.1.6 Bobadeen Basalt Quarry

The Bobadeen Basalt Quarry (the Quarry) produced no Basalt Road Base in 2021 for road works or infrastructure construction. Annual production limit for the Quarry is 100,000 tonnes (EPL394, A1.2).

⁴ Ground Disturbance Permit (GDP) is signed off by Senior Environment personnel and the applicable Mine Surveyor.

5. Actions Required From Previous AR

The 2020 AR was submitted to the DPIE on 31 March 2021 as required under Schedule 5, Condition 3 of PA08_0184.

The DPIE's review of the 2020 AR considered it satisfied the reporting requirements of the approval and the DPIE's Annual Review Guideline (October 2015) in a letter 01 June 2021.

As required by Schedule 5, Condition 10, of PA08_0184, a copy of the 2020 AR is provided at www.ulancoal.com.au

6. Environmental Performance

6.1 Meteorological Monitoring

The weather station (WS1), located adjacent to the USO administration office (**Attachment M**), continuously records meteorological data⁵ using multiple sensors and a data-logging system on a 30 metre tall mast. Logged meteorological parameters are listed in **Table 6-1**. WS1 is linked directly to the Sentinex⁶ repository database providing access to real time weather conditions and rainfall events.

Table 6-1 - EPL 394 Meteorological Monitoring Parameters

Parameter	Unit of Measure	Frequency	Averaging period	Sampling Method
Wind Direction	Degrees	Continuous	15 minute	AM-2 & AM-4
Wind Speed	Metres per second	Continuous	15 minute	AM-2 & AM-4
Sigma Theta	Degrees	Continuous	15 minute	AM-2 & AM-4
Rainfall	Millimetres	Continuous	15 minute	AM-4
Air Temperature	Degrees Celsius	Continuous	1 hour	AM-4
Relative Humidity	Percent	Continuous	1 hour	AM-4

Notes: wind speed at 10, 20 and 30 metres above ground, wind direction at 10, 20 and 30 metres above ground sigma-theta from sampled wind direction measurements, temperature at 2 metres and 10 metres above ground. WS1 was maintained and operated in accordance with 'Approved methods for the sampling and analysis of air pollutants in NSW' (EPA, 2006) which refers to *Australian Standard AS2923 - 1987* (Guide for measurement of horizontal wind for air quality applications).

The rainfall recorded at WS1 for the 2021 reporting period (**Table 6-2**) was 872.5mm, 217.3mm less rainfall than 2020 (**Figure 6-1**) and 200.5 mm above the long term average of 672mm for the region (2009 EA). The majority of rain received was during the first quarter of 2021, with 36.68 percent of the annual total falling within this quarter. The wettest month was November with 204.4mm of rainfall recorded. The driest month was April with 5mm of rainfall recorded.

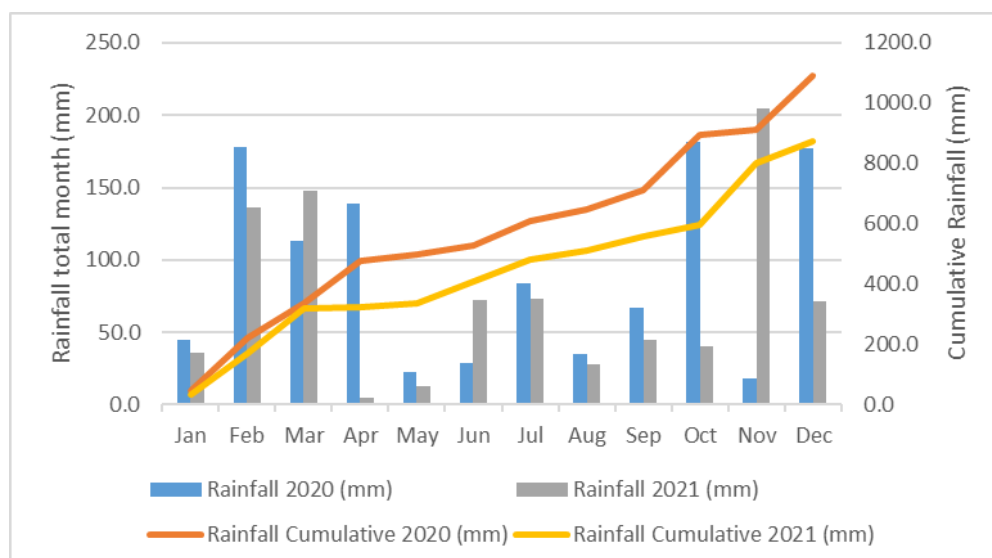


Figure 6-1 - Rainfall comparison to previous reporting period

⁵ Condition 23, Schedule 3 of PA08_0184 and EPL394

⁶ Sentinex is a web-based platform to communicate from monitoring locations

On two occasions during the reporting period, accurate recording of rainfall for part of January and between May and June 2021 was unavailable from WS1. Rainfall data from the Bureau of Meteorology station, located in the township of Ulan approximately 1.2km to the SW of WS1, was used where applicable. For more information regarding the technical issues with WS1 refer to **Section 11.2**. Both these events were reported to the EPA as required.

Monthly minimum and maximum 15-minute temperatures are recorded at WS1 (**Figure 6-2** and **Figure 6-3**). The highest temperature over a 15-minute period of 37.0°C was recorded on 24 January 2021 and the lowest temperature over a 15 minute period of -6.5°C was recorded on 7 July 2021. The maximum and minimum were comparable to previous reporting periods.

Table 6-2 - Summary of Meteorological Conditions

Date	Rainfall (mm)	Rainfall Cumulative (mm)	Temperature Min (°C)^	Temperature Max (°C)^	Prevailing Wind Directions
Jan-21	35.7*	35.7	5.7	37.0	East
Feb-21	136.7	172.4	8.9	32.6	East
Mar-21	147.6	320	7.3	32.1	East
Apr-21	5	325	-2.3	28.1	West South West
May-21	12.8*	337.8	-5.0	24.0	South West
Jun-21	72*	409.8	-3.4	22.2	West
Jul-21	73.2	483	-6.5	21.4	West
Aug-21	28.3	511.3	-3.6	25.5	West
Sep-21	45	556.3	-2.5	26.3	West
Oct-21	40.1	596.4	0.2	33.1	West South West
Nov-21	204.4	800.8	1.8	29.3	East North East
Dec-21	71.7	872.5	4.5	33.5	East

Notes: ^15 minute capture period for data used. * Rainfall data sourced from BOM Station 62036 when not available from WS1

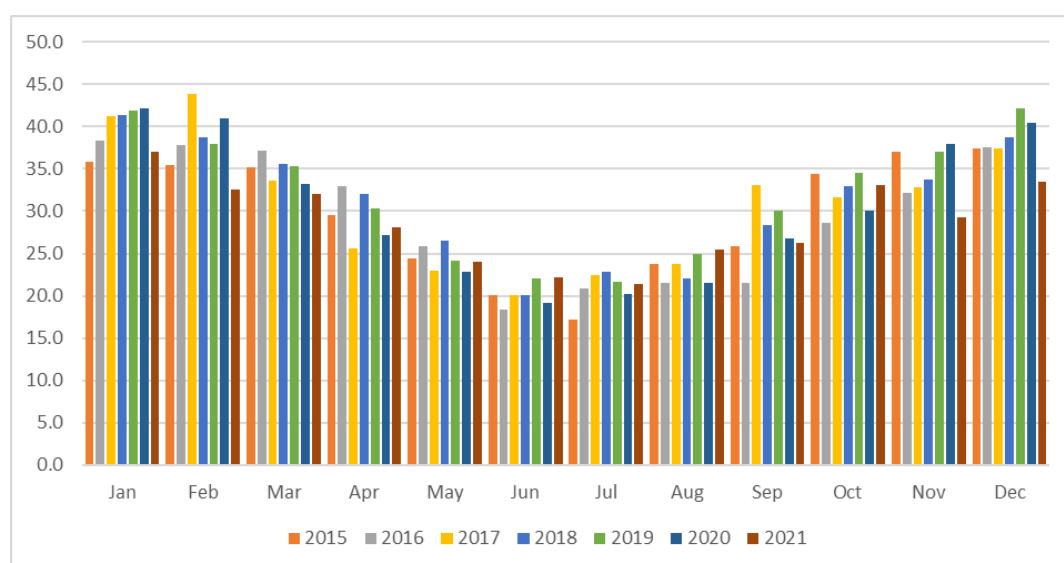


Figure 6-2 - Seven Year Maximum Temperature Trends °C

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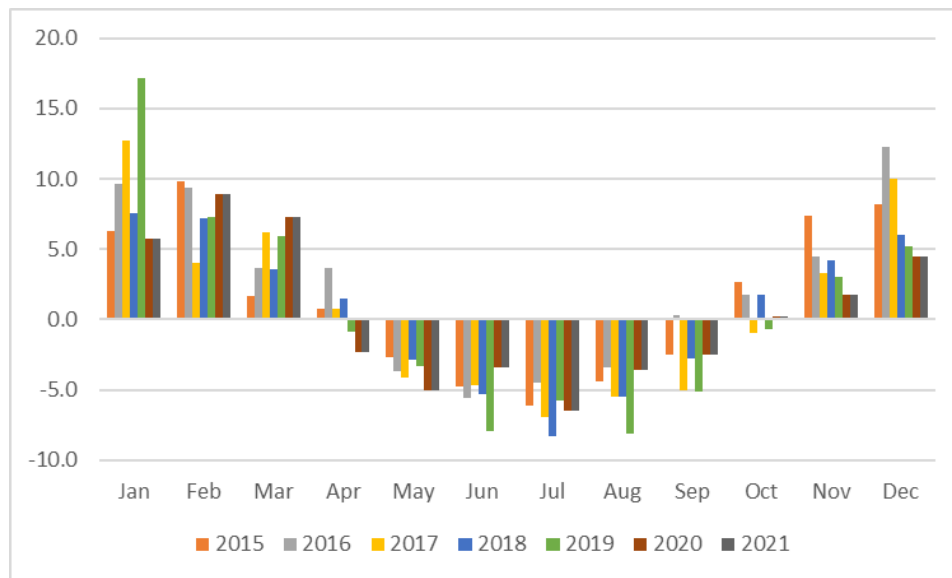


Figure 6-3 - Seven Year Minimum Temperature Trends °C

Prevailing winds were generally from the West during winter and from the East during summer, consistent with the historical data presented in the 2009 EA. A westerly wind pattern is more common during winter through to early spring, in contrast to an easterly wind pattern during summer and autumn. Monthly wind roses for 2021 are presented in **Attachment N**.

6.2 Operational Noise

The Noise Management Plan (NMP)⁷ describes the attended noise monitoring, primarily used for determining compliance against the noise criteria, and unattended or real-time monitoring, which is used for proactive noise management. The locations of the real time noise monitors (which may be relocated as required) and attended noise monitoring is provided in **Attachment M**. Attended noise monitoring⁸ results for June and December 2021 are summarised below in **Table 6-4**, with attended noise monitoring reports provided at **Attachment A**.

Table 6-3 - Attended Noise Monitoring LAeq Maximums (dB) 2011 – 2021

Location	NM2	NM3	NM4	NM6	NM7
Noise Criteria	35	n/a*	35	35	38
2011	48	50	52	42	-
2012	IA	43	30	IA	29
2013	29	50	<20	31	37
2014	20	49	IA	26	<20
2015	20	46	IA	27	IA
2016	<23	53	IA	<25	<27
2017	<25	47	<35	28	25
2018	IA	45	IA	IA	26
2019	IA	44	IA	<20	38
2020	<20	47	IA	26	<25
2021	<20	51	IA	<25	33
General Trend (Stable, Increasing, Decreasing)	Stable	Stable	Stable	Stable	Stable

Notes: IA = Inaudible *NM3 must be acquired on request noise criteria do not apply (n/a).

⁷ NMP (Version 8) as required by PA08_0184 Schedule 3, Condition 9

⁸ Reference methods: NSW Environment Protection Authority, Noise Policy for Industry, 2017. (NPfI,2017) and Australian Standards: AS 1055.1, AS 1055.2 and 1055.3 Acoustics - Description and measurement of environmental noise; AS 2659.1 - Guide to the use of sound measuring equipment; and AS 2659 - Sound level meters.

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Table 6-4 - Attended Noise Monitoring Summary LAeq (15-min) and Maximums (dB) for 2021

Noise Criteria/Predictions						Performance During The Reporting Period						Trends/Key Management Implications
Ulan Monitoring ID/ EPL394 Licenced Monitoring Point	Property Number	DayLAeq,15minute	Evening ¹ LAeq,15minute	Night ¹ LAeq,15minute	Night ¹ LA1,1minute ³	Monitoring Site	Property Number	Maximum Result LAeq 15min dB	Criterion Complies	Maximum Result LA1(1min) dB	Exceedance	Attended noise monitoring occurred on two consecutive days, during June and December, in 2021 as follows: - During the evening and night periods of 21/22 June, and the day periods of 22/23 June 2021; and - During the evening and night periods of 13/14 and 14/15 December 2021. Ulan Complex complied with project specific criteria at all monitoring locations during the June and December 2021 survey (Attachment A). Ulan Public School was in recess and not in use for the entirety of December 2021, therefore monitoring was not undertaken at this location during this survey. Criteria may not always be applicable due to meteorological conditions at the time of monitoring. Stability class data (atmospheric data for wind speed and direction) rendered criteria not applicable on occasion (Attachment A). UCMPL also entered into four noise agreements with Property ID 40, Property ID 110, Property ID 113 and Property ID 276 during construction works associated with MOD 4. There were two noised related complaints in 2021. Five noise complaints were received in 2020, one more than 2019. Noise complaints and responses to the complaints are available on the Ulan Coal Website www.ulancoal.com.au Current attended noise monitoring results for Property ID 274 align with noise levels predicted for Year 12 of the project (Table 8-4 and Appendix 12) in the EA. The trend for attended noise monitoring results over time is considered stable (Table 6-3).
NM2/ 38	60	35	35	35	45	June 2021						
NM3/ -	274	NA	NA	NA	NA	NM2	60	<20	Yes	<20	Nil	
NM4 ² /26	Ulan School ⁴	35	NA	NA	NA	NM3	274	47	NA	50	NA	
NM6/ 38	1	35	35	35	45	NM4	Ulan School	IA/NM	Yes	NA	NA/Nil	
NM7/ 24	254	38	38	37	45	NM6	1	<25	Yes	<20	Nil	
						NM7	254	33	Yes	39	Nil	
						December 2021						
						NM2	60	IA	Yes	IA	Nil	
						NM3	274	51	Yes	55	NA	
						NM4	Ulan School ¹	-	-	-	-	
						NM6	1	IA	Yes	IA	Nil	
						NM7	254	32	Yes	35	Nil	

Notes: ¹ NA indicates criteria is not applicable at this location during this time. ² Criteria for Ulan Public School (internal) ‘when in use’. ³ All LA_{max} results are interchangeable with LA1(1min) for assessment purposes. ⁴ Ulan Public School currently in recess.

The updated noise assessments for Mod 3 and Mod 4, combined with the *Environmental Assessment (2009)* indicate that three private residences are predicted to exceed 35dBA LAeq (15 min) at some stage of the project and have higher criteria limits to allow for short term elevated noise as indicated in the above table. Other residences have since been acquired and are no longer subject to the specified noise criteria.

Notes: IA = Inaudible NA = noise criteria does not apply NM=Not Measurable. ¹ Ulan Public School currently in recess, therefor no monitoring was required at this location in December 2021.

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6.3 Blasting

The Blast Management Plan (BMgtP)⁹ describes the monitoring, blast criteria and mitigation measures regarding blasting activities at the Ulan Complex. No blasts were undertaken at the Ulan Complex in 2021. There have been no blasting activities undertaken by UCMPL since 2018. Therefore, no exceedances of overpressure and vibration criteria¹⁰ (**Table 6-5**) occurred during the reporting period.

Table 6-5 – Blasting Criteria

Location	Airblast Overpressure (dB(Lin Peak))	Ground Vibration (mm/s)	Allowable Exceedance
Residence on privately owned land	115	5	5% of the total number of blasts over a period of 12 months
	120	10	0%

Notes: Blasting criteria for Aboriginal heritage sites in the BMgtP is 100 mm/s peak particle velocity

6.4 Air Quality

The Air Quality & Greenhouse Gas Management Plan (AQMP)¹¹ describes the monitoring, air criteria and mitigation measures to reduce the potential for air quality impacts at the Ulan Complex. Air quality monitoring is carried out using a combination of monitors consisting of two (2) high volume air samplers (HVAS), one Tapered Element Oscillating Microbalance (TEOM), and of one (1) meteorological station (WS1).

Air quality monitoring locations are shown in **Attachment M**. The requirement to monitoring deposition dust was removed by EPL394 in 2020 and subsequently removed in the revision of the AQMP (Version 8), approved on 1 October 2020.

The following summary table (**Table 6-6**) compares the 2021 HVAS and TEOM monitoring results with the air quality impact assessment criteria, predictions in the 2009 EA and monitored dust levels in previous reporting periods. Detailed results are provided in **Attachment B**.

⁹ BMgtP (Version 8) as required by PA08_0184 Schedule 3, Condition 16

¹⁰ PA 08_0184, Schedule 3, Condition 10 and 10A

¹¹ BMgtP (Version 8) as required by PA08_0184 Schedule 3, Condition 16

Table 6-6 – Air Quality Performance for 2021

Air Quality Criteria/Predictions			Performance During The Reporting Period			Trends/Key Management Implications																								
<table><tr><th>Pollutant</th><th>Averaging Period</th><th>Criteria</th></tr><tr><td>Total suspended particulate (TSP) matter</td><td>Annual mean</td><td>^a 90 µg/m³</td></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>Annual mean</td><td>^a 30 µg/m³</td></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>24 hour maximum</td><td>^a 50 µg/m³</td></tr></table> Notes: <i>a</i> Total Impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to other sources). <i>b</i> Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Secretary in consultation with EPA. EA Predicted Impact Year 12: Annual Average TSP 30-50 µg/m³			Pollutant	Averaging Period	Criteria	Total suspended particulate (TSP) matter	Annual mean	^a 90 µg/m³	Particulate matter < 10 µm (PM ₁₀)	Annual mean	^a 30 µg/m³	Particulate matter < 10 µm (PM ₁₀)	24 hour maximum	^a 50 µg/m³	<table><tr><th>TSP</th><th>Flannery's (HV1) µg/m³</th><th>Merlene (HV3) µg/m³</th></tr><tr><td>Capture Rate</td><td>100%</td><td>100%</td></tr><tr><td>Annual Average</td><td>24.1</td><td>19.1</td></tr><tr><td>Maximum Result</td><td>56.8</td><td>53.4</td></tr></table>			TSP	Flannery's (HV1) µg/m³	Merlene (HV3) µg/m³	Capture Rate	100%	100%	Annual Average	24.1	19.1	Maximum Result	56.8	53.4	The annual average TSP concentrations recorded at HV1 and HV2 were below the project specific criteria¹² of 90 µg/m³ in 2021 (Figure 6-5) and in line with predictions provided in the air quality assessment from the 2009 Environmental Assessment. The TSP annual averages for 2021 were lower than those recorded during the previous 2020 monitoring period and the drought periods of 2018 and 2019. For further information and monitoring results for TSP, refer to Attachment B.
Pollutant	Averaging Period	Criteria																												
Total suspended particulate (TSP) matter	Annual mean	^a 90 µg/m³																												
Particulate matter < 10 µm (PM ₁₀)	Annual mean	^a 30 µg/m³																												
Particulate matter < 10 µm (PM ₁₀)	24 hour maximum	^a 50 µg/m³																												
TSP	Flannery's (HV1) µg/m³	Merlene (HV3) µg/m³																												
Capture Rate	100%	100%																												
Annual Average	24.1	19.1																												
Maximum Result	56.8	53.4																												
<table><tr><th>Pollutant</th><th>Averaging Period</th><th>^b Criteria</th></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>Annual mean</td><td>^a 30 µg/m³</td></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>24 hour maximum</td><td>^a 50 µg/m³</td></tr></table> Notes: <i>a</i> Total impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to other sources); <i>b</i> Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed to by the Director-General in consultation with EPA. EA Predicted Impact Year 12: Annual Average PM₁₀ 30-50 µg/m³			Pollutant	Averaging Period	^b Criteria	Particulate matter < 10 µm (PM ₁₀)	Annual mean	^a 30 µg/m³	Particulate matter < 10 µm (PM ₁₀)	24 hour maximum	^a 50 µg/m³	<table><tr><th colspan="2">TEOM PM₁₀ Results</th></tr><tr><td>Capture Rate</td><td>100%</td></tr><tr><td>Annual Average</td><td>11.0 µg/m³</td></tr><tr><td>Annual Average excluding extraordinary events*</td><td>11.0 µg/m³</td></tr><tr><td>Maximum (24hr)</td><td>65.4 µg/m³</td></tr><tr><td>Maximum (24hr) excluding extraordinary events*</td><td>65.4 µg/m³</td></tr></table> Notes:* No extraordinary events in 2021			TEOM PM ₁₀ Results		Capture Rate	100%	Annual Average	11.0 µg/m³	Annual Average excluding extraordinary events*	11.0 µg/m³	Maximum (24hr)	65.4 µg/m³	Maximum (24hr) excluding extraordinary events*	65.4 µg/m³	The annual average PM₁₀ was 11.0 µg/m3, well below the annual average criteria of 30µg/m3. TEOM monitoring data shows that the 24-hour average PM₁₀ concentration exceeded the 24hr 50 µg/m³ impact assessment criteria on 14 January 2021 of 65.4 µg/m³. This was reported to DPIE and the EPA at the time (Section 11.2). Investigations by UCMPL confirmed the wind direction was from the WSW at the time of the exceedance, therefore unlikely to be mining related. The next maximum 24hr result PM₁₀ concentration excluding the 14 January 2021 of 65.4 µg/m³ was 27.4 µg/m³ well below the 24hr 50 µg/m³ impact assessment criteria. For further information and monitoring results for TEOMs, refer to Attachment B.			
Pollutant	Averaging Period	^b Criteria																												
Particulate matter < 10 µm (PM ₁₀)	Annual mean	^a 30 µg/m³																												
Particulate matter < 10 µm (PM ₁₀)	24 hour maximum	^a 50 µg/m³																												
TEOM PM ₁₀ Results																														
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Maximum (24hr) excluding extraordinary events*	65.4 µg/m³																													

¹² Condition 19 of Project Approval PA 08_0184

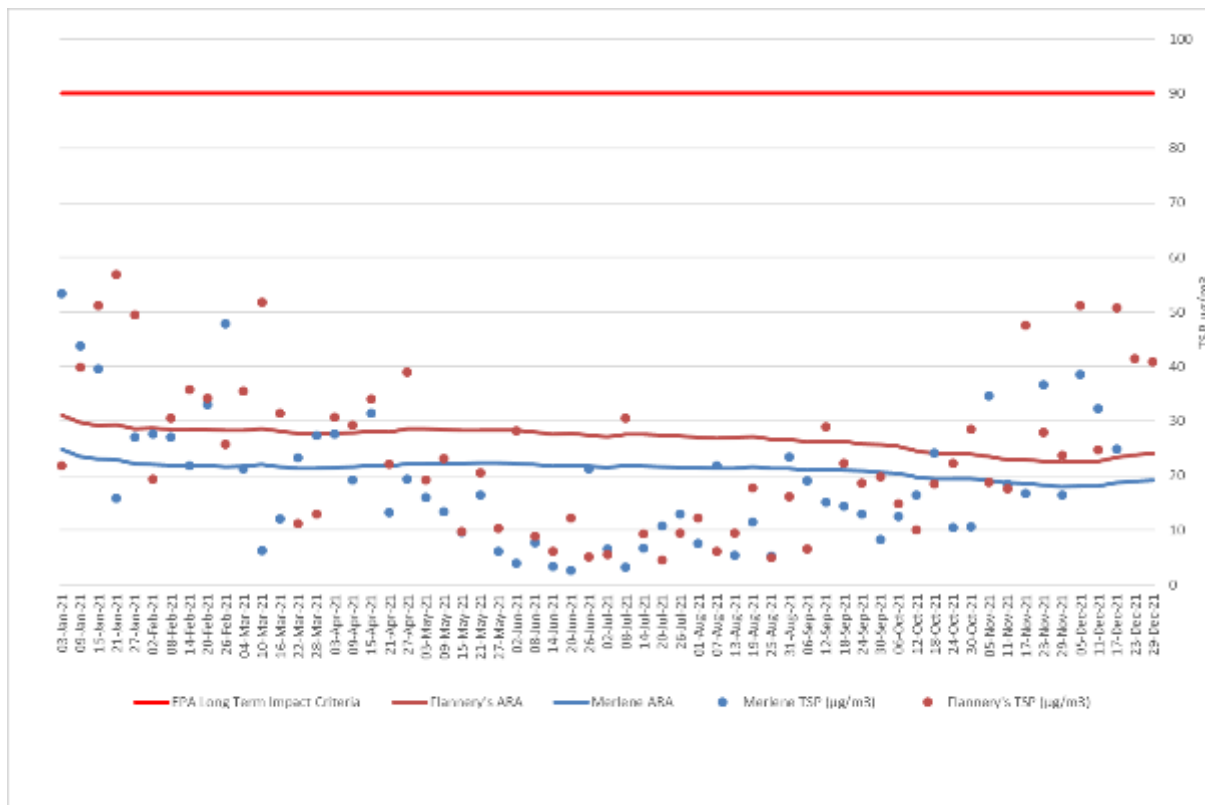


Figure 6-4 – TSP Monitoring Results During Reporting Period

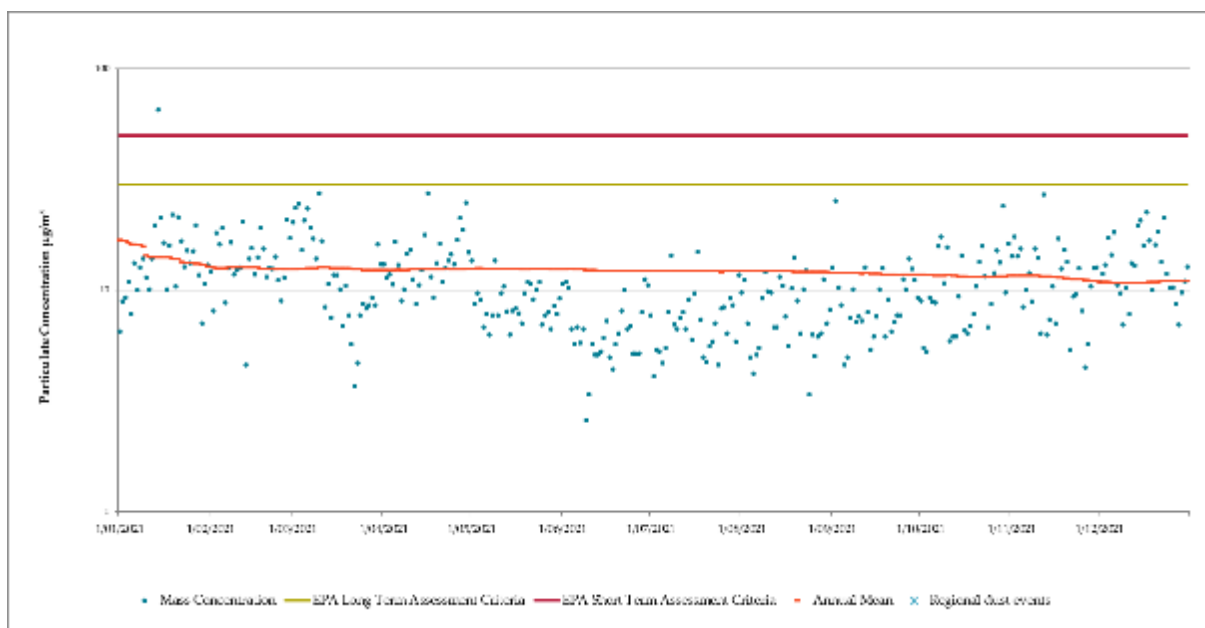


Figure 6-5 – TEOM PM_{10} Monitoring Results During the Reporting Period

6.5 Heritage

6.5.1 Aboriginal Heritage

The Heritage Management Plan (HMP) describes the management and mitigation of the Project impacts on Aboriginal, European and natural heritage. Aboriginal heritage activities undertaken in accordance with the HMP in 2021 included:

- Test excavations were completed at site's 191, 190 and 171 with over 2000 artefacts found at site 190, this site will be salvaged in early 2022;
- Exploration surveys completed as required;
- Inspections of Grinding Grooves at Bobadeen and Valley Way;
- Inspection Brokenback Conservation Area;
- Extension MOD 6 heritage assessment
- Monitoring of Aboriginal rock shelter sites in accordance with the Extraction Plans (**Attachment J**).

Aboriginal Heritage Meetings were held in July and December 2021. Items discussed included:

- UCMPL Operational updates;
- Bungaba updates;
- Mine closure workshop;
- Community funding;
- HMP updates;
- MOD 6 reports and update;
- Alternate Offset Area; and
- The upcoming 2022 program of heritage works.

6.5.2 Bobadeen and Valley Way Grinding Groove Conservation Areas

Inspections of the Bobadeen and Valley Way Grinding Groove Conservation Areas were undertaken 2021 (December inspection was complete with RAP's present). A small area of erosion above the Bobadeen Grinding Grooves which was identified in 2020 is still present but has not increased in size and appears to be stable and is not impacting upon the site, pig activity was observed at both sites and a tree had fallen over grinding grooves at Valley Way but no impact on groves.

6.5.3 European and Natural Heritage

Monthly inspection of the Bobadeen Homestead was undertaken, including maintenance of gardens and surrounds in accordance with the Bobadeen Homestead Management Plan¹³ to reduce the risk of a bushfire further damaging the house and associated out buildings.

6.6 Biodiversity

Flora, terrestrial and aquatic fauna/stream health monitoring was completed consistent with the Biodiversity Management Plan (BMP), which includes the Offset Management Plan (OMP). The annual flora and fauna monitoring reports prepared by Eco Logical Australia (ELA) for the reporting period are provided in **Attachment E** and summarised below. The locations of the 2021 flora and fauna monitoring sites are displayed in **Attachment M**.

6.6.1 Floristic Monitoring

ELA was engaged by UCMPL to undertake floristic monitoring during autumn and spring during 2021 in accordance with the requirements of the BMP. The 2021 floristic monitoring results included assessment against specific completion / success criteria for Domain B – Rehabilitation Area, Domain C – Goulburn River Diversion, Domain D – Rehabilitation Area, Domain F – Bobadeen Vegetation Offset Area and Domain G – Salinity Offset Area.

The 2021 floristic monitoring also comprised of floristic based subsidence (FBS) monitoring undertaken above seven longwall panels during autumn and spring with the results assessed against the relevant subsidence performance measure and indicator from the BMP (**Attachment E**). In addition to the 2021 flora monitoring results assessed against completion criteria and subsidence performance measures and indicators, an assessment of the Glencore Coal Assets Australia (GCAA) Rehabilitation Report Card (RRC) for Domain B and Domain D was undertaken. A summary of the 2021 floristic monitoring results by ELA (ELA, 2022) as follows:

- **Domain B** is currently achieving all relevant Ecosystem and Land Use Establishment Phase and Ecosystem and Land Use Sustainability Phase completion criteria. Assessment against the TARP provided in the BMP, where relevant, concluded that no response is required and to continue the monitoring program.
- **Domain C** is currently achieving both Ecosystem and Land Use Establishment Phase completion criteria, and none of the Ecosystem and Land Use Sustainability Phase completion criteria. Increasing perennial groundcover and large woody debris is required to satisfy Ecosystem and Land Use Sustainability Phase completion criteria.
- **Domain D** is currently achieving two (2) out of three (3) relevant Ecosystem and Land Use Establishment Phase completion criteria and none of the relevant Ecosystem and Land Use Sustainability Phase completion criteria. Completion criteria relating to canopy tree densities, fauna habitat and flora species assemblages have not yet been achieved and infill planting may be required.

¹³ PA08_0184, Schedule 3, Condition 47 (d) and ULN SD EXT 0094 April 2011, revised scope of works ULN SD EXT 0135 January 2014

- **Domain F** is currently achieving all relevant Growth Medium Development Phase, Ecosystem and Land Use Establishment Phase and Ecosystem and Land Use Sustainability Phase completion criteria. Assessment against the TARP provided in the BMP, where relevant, concluded that no response is required and to continue the monitoring program.
- **Domain G** is currently achieving all relevant Ecosystem and Land Use Establishment Phase and Ecosystem and Land Use Sustainability Phase completion criteria. Assessment against the TARP provided in the BMP, where relevant, concluded that no response is required and to continue the monitoring program.
- Subsidence impacts to threatened species, populations, habitat or ecological communities were negligible and did not trigger a response from the TARP.
- Assessment against the Glencore Rehabilitation Report Card (RRC) indicate that overall:
 - All Domain D (Upper Hunter Native Forest) polygons scored 'maintenance', mostly due to low tree stem densities (Polygon 5 and Polygon 6) or very high tree stem densities (Polygon 19), and associated canopy cover.
 - Four (4) Domain B (Non-specific Native Forest) polygons scored 'monitor'. The remaining ten (10) polygons scored 'maintenance'. Similarly, tree stem density was the lowest performing attribute, followed by native species composition which was driven down by the high cover and abundance of exotic annual species present at time of monitoring.

6.6.2 Fauna

ELA was engaged by UCMPL to undertake fauna monitoring in accordance with the requirements of the BMP. The 2021 Fauna Monitoring Report (**Attachment E**) details the results of autumn and spring feral pest monitoring, spring targeted threatened bird monitoring, and spring nest box monitoring.

The target threatened bird species *Tyto novaehollandiae* (Masked Owl) was not recorded during 2021 surveys, with this species yet to be recorded within the UCMPL complex. An assessment was undertaken at Floristic-based subsidence (FBS) monitoring sites located above previously undermined longwalls (Ulan West Longwalls 4 and 5) and which contain potential nesting hollows for the species. The assessment found that potential hollows above undermined longwalls remain intact and as such, the relevant subsidence performance measure for the Masked Owl has been met (ELA, 2022).

An assessment of potential foraging habitat for *Anthochaera Phrygia* (Regent Honeyeater) and *Lathamus discolor* (Swift Parrot) was also undertaken at FBS monitoring sites located above undermined longwalls and which contain key and supplementary feed trees for these species. The assessment found that percent foliage cover (PFC) of feed trees at monitoring sites had not declined by >10% and as such, the relevant subsidence performance measure for these two threatened bird species has been met (ELA, 2022).

A total of 98 nest boxes were monitored, of which 96% remained fit for use, with 35% of all nest boxes monitored demonstrating signs of use. Two fauna species were present amongst 3% of boxes, with *Cormobates leucophaea* (White-throated Treecreeper) and/or its eggs recorded in two 'Treecreeper' nest boxes, and *Chalinolobus gouldii* (Gould's Wattled Bat) recorded in one 'Bat' nest box. Two nest boxes had fallen off their host tree and require replacement (ELA, 2022).

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In addition to the large quantity of data collected during formal surveys, a total of eight threatened bird species listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were opportunistically recorded. Given the successful implementation of the UCMPL fauna monitoring program in 2021 and the results detailed in this report, UCMPL is considered to be compliant with their relevant Project Approval conditions (ELA, 2022).

6.6.3 Microbat Monitoring

ELA was engaged by UCMPL to undertake microbat monitoring in accordance with the requirements of the BMP and the Extraction Plans.

The 2021 Microbat Monitoring Report (**Attachment E**) details the results of microbat monitoring of 20 general fauna monitoring sites and targeted cliffline monitoring of eight control sites and 21 impact sites across the Ulan Coal Complex (UCC) during November and December 2021. General fauna monitoring was undertaken to record microbat species assemblages across the various UCC monitoring areas and management zones. Targeted cliffline monitoring was undertaken to target the presence and activity of threatened cave-roosting microbat species *Chalinolobus dwyeri* (Large-eared Pied Bat) and *Miniopterus orianae oceanensis* (Large Bent-winged Bat) (ELA, 2022).

In total, 11 microbat species from four separate families were definitively recorded across all general fauna sites, with a further seven species potentially recorded. At least two and potentially five threatened species listed under the NSW Biodiversity Conservation Act 2016 (BC Act) and/or the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) were also recorded at general fauna sites. The diversity of microbat species and families recorded across all monitoring areas and management zones confirms adherence to the monitoring objectives and completion criteria detailed in the BMP (ELA, 2022).

The Large-eared Pied Bat was recorded via acoustic call detection at all control sites, with the exception of BD6 and BD9, whilst the Large Bent-winged Bat was recorded at all sites, with the exception of BD6. The consistent recording of both target threatened cave-roosting species in relatively high quantities at these sites, confirms their suitability for use as control sites. A total of 30 Large-eared Pied Bats were captured in harp trapping across control sites, the highest quantity ever recorded at these sites. Lactating and post-lactating adult females as well as juveniles were recorded amongst the trapped individuals at these sites. The continued breeding activity and substantial quantity of Large-eared Pied Bats recorded in 2021 provides a positive indication regarding the habitat the UCC provides for this threatened cave-roosting species (ELA, 2022).

The Large-eared Pied Bat was recorded via acoustic call detection at 17 of 21 impact sites, whilst the Large Bent-winged Bat was recorded at 18 of 21 impact sites. Two impact sites, where the Large-eared Pied Bat had previously been captured, UGLWW3 and UGLWW4a, were again subject to harp trapping during 2021, with both sites recording the highest quantity of captures recorded to date. This abundance of Large-eared Pied Bats, combined with their continued breeding more than five years since undermining, is a positive result with regards to the important habitat the UCC continues to provide for this species (ELA, 2022).

2021 was the second year of the two-year post-mining monitoring period for UWLW5. However, the assessment of performance indicators to determine potential subsidence impacts on threatened target cave-roosting microbat species was unable to be undertaken as planned as pre-mining data was unavailable due to it being withheld by previous consultants undertaking monitoring. Despite this, all available data was utilised to analyse control and impact site call activity between the corresponding UWLW5 pre- (2018-2019) and post-mining (2020-2021) periods. This analysis recorded increased call activity at both control and impact sites in the post-mining period, compared to the pre-mining period, for both Large-eared Pied Bat and Large Bent-winged Bat (ELA, 2022).

An assessment was also made of pre- and post-mining call activity of the two target species using data from all available previously mined longwall panels (UGLWW3, UGLWW4, UWLW3, UWLW4 and UWLW5). This assessment demonstrated substantial increases in call activity post-mining for both species, indicating their continued relatively high level of activity at previously undermined sites within the UCC (ELA, 2022).

Of the other LWs monitored in 2021, neither UWLW6 nor UWLW7 have completed their two-year post-mining monitoring period and hence are not yet able to be assessed against the relevant performance measures (ELA, 2022).

Given the successful implementation of the monitoring program in 2021 and the results detailed in this report, UCMPL is considered to be compliant with their relevant project approval conditions (ELA, 2022).

6.6.4 Aquatic Monitoring

ELA was engaged by UCMPL to undertake aquatic monitoring in accordance with the requirements of the BMP.

The 2021 monitoring program was undertaken following average rainfall conditions in the preceding months and above average rainfall in the days leading up to the survey period, with substantial rainfall events occurring in the days preceding and during the monitoring period (BOM, 2021). Sixteen sites were sampled in spring 2021, including two sites (AQ23 and AQ24) which were established this season (2021). Relatively high flow at the UCMPL upstream monitoring site (SW01) during and preceding the monitoring period indicates that natural flows were present in the target catchments at the time of monitoring, allowing for 15 of 16 sites to be sampled (ELA, 2022).

Aquatic macroinvertebrate taxonomic richness in 2021 ranged from 8 to 20 taxa at sites upstream of UCMPL licensed discharge points (LDPs), and 9 to 27 taxa at downstream sites. SIGNAL2 scores ranged from 2.4 to 4.0 at upstream sites and 3.5 to 5.0 at downstream sites. All sites surveyed in 2021, with the exception of one site (AQ13), had average SIGNAL 2 scores slightly higher than the long-term average for each respective site. Overall, however, SIGNAL2 scores continue to be reflective of moderate to severely disturbed systems. Across all years, macroinvertebrate results indicate that historical landscape disturbances (e.g. agriculture and forestry), in conjunction with prevailing climatic conditions, remain the key factors influencing macroinvertebrate communities (ELA, 2022).

The 2021 Riparian Channel and Environmental (RCE) Inventory scores were consistent with previous years for each site. Five (5) sites scored RCE inventories of Good, six sites scored Very Good with the

remaining five (5) sites scoring RCE inventories of Excellent. Sites located in the Goulburn River Diversion have increased RCE scores since 2016 when remediation works commenced, maintaining scores recorded in 2020. The only notable differences in RCE scores recorded in 2021 and supported by photo comparisons of each site, relate to increased water levels and macrophyte cover. Overall, the RCE results indicate that the riparian environment is not subject to any ongoing adverse effects resulting from mining operations and are rather, reflective of historical regional land use practices in the catchment (ELA, 2022).

Water quality was sampled at 15 monitoring sites, with alkalinity and pH results remaining consistent across monitoring years. Turbidity exceeded ANZECC and ARMCANZ (2000) guidelines at seven sites, however, comparison with previous years data and UCMPL surface water monitoring site data across 2021 indicate that these elevated levels are the temporary result of high rainfall events. Electrical Conductivity (EC) was overall relatively high at sites both upstream and downstream of LDPs, indicating the contribution of naturally saline groundwater in the catchment (ELA, 2022).

DO (% saturation) was well below ANZECC and ARMCANZ (2000) guidelines at all sites surveyed during 2021. Results from both upstream and downstream sites and across multiple years show high variability, with low DO also recorded in 2020. Low and variable DO results were also recorded at UCMPL surface water monitoring sites throughout 2021, supporting previous conclusions of naturally low and variable DO within the catchment at both temporal and spatial scales. There was no correlation evident between DO and macroinvertebrate results in 2021 (ELA, 2022).

6.6.5 Pest and Weed Monitoring

Feral pest remote camera monitoring recorded six feral animal species, of which five are listed as feral pest species in the Central Tablelands Regional Strategic Pest Management Plan 2018-2023 (Local Land Services 2018). All six feral species have been previously recorded within the UCMPL complex. Activity of *Lepus europaeus* (Brown Hare), *Sus scrofa* (Feral Pig) and *Vulpes vulpes* (Red Fox) increased in 2021, compared to both 2020 and 2018, when the same two remote camera transects were last monitored. It is recommended that the Open Cut Rehabilitation Area be a focus of control works for the above species. Both Feral Pigs and Red Fox were also recorded during feral pest nocturnal surveys, with an additional species *Sturnus vulgaris* (Common Starling), also recorded opportunistically during 2021 monitoring (ELA, 2022).

During the reporting period UCMPL carried out feral pig baiting on UCMPL controlled land in August 2021. Wild dog baiting in conjunction with Local Land Services is scheduled for aerial baiting across UCMPL controlled lands in 2022. Weed control in 2021 included spaying for Blue Heliotrope, Bathurst Burr, St John's Wort, Prickly Pear, Blackberry and Khaki Burr within UCMPL's offset areas and surrounds.

6.7 Conservation Area Monitoring

Conservation Area (CA) monitoring was completed by ELA during the 2021 reporting period. The locations of UCMPL's CA is provided in **Attachment M**. A summary by ELA of the CA monitoring in 2021 is provided below and **Attachment E**. The monitoring and reporting of the newly approved Alternate Offset Area -22 in 2021 (**Section 3.2.4**) will be provided in the next Annual Review.

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6.7.1 Bobadeen Conservation Area (BCA)

Trends for each site cannot be determined as only three years of data is available; however, discussion regarding change since the 2017 monitoring period on a site basis within each PCT is provided below. Furthermore, due to the small sample size, statistically vigorous analysis to determine trends for each PCT and the broader Offset Area cannot be undertaken. A number of attributes including native species richness, ground cover grasses PFC, ground cover shrubs PFC and ground cover other PFC are extremely sensitive to rainfall and survey timing, with all attributes subject to small variations year to year due to observer interpretation.

The 2021 monitoring period observed an overall increase in ground cover attributes while canopy and mid-storey PFC remained largely consistent with previous monitoring results. Some sites saw a minor increase in exotic cover within the Offset Area, also attributable to the climatic conditions experienced in 2020/2021, however others saw substantial decreases potentially influenced by the high native cover. Overall, the Offset Area remains ecologically stable with the condition of the vegetation within the Offset Area remaining consistent with monitoring undertaken during 2017 and with PCT descriptions provided in the Conservation Agreement (UCMPL 2019). Fluctuations in the cover of both native and exotic species from 2017 through 2021 were observed throughout the Offset Area. This can be attributed to the intense drought conditions experienced throughout 2018 and 2019 (DPI 2020) followed by above average rainfall throughout 2020 and early 2021.

6.7.2 Brokenback Conservation Area 1 (BCA1)

Trends for each site cannot be determined as only three years of data is available; however, discussion regarding change from the previous monitoring period on a site by site basis within each PCT is provided below. Furthermore, due to the small sample size, statistically vigorous analysis to determine trends for each PCT, and the broader Conservation Area cannot be undertaken. The results of attributes including native species richness, ground cover grasses PFC, ground cover shrubs PFC and ground cover other PFC are sensitive to rainfall and survey timing, with each of these attributes also subject to small additional variations year to year due to observer interpretation.

Overall, the Conservation Area remains ecologically stable with the condition of the vegetation monitored in 2021 remaining consistent with the results previous monitoring and with PCT descriptions provided in the Brokenback Conservation Area – Area 1 Conservation Agreement.

6.7.3 Brokenback Conservation Area (BCA 3)

Trends for each site cannot be determined as only three years of data is available; however, discussion regarding change from the 2020 monitoring period on a site basis within each PCT is provided below. Furthermore, due to the small sample size, statistically vigorous analysis to determine trends for each PCT and the broader Conservation Area cannot be undertaken. Attributes including native species richness, ground cover grasses PFC, ground cover shrubs PFC and ground cover other PFC are extremely sensitive to rainfall and survey timing, with all attributes subject to small variations year to year due to observer interpretation.

Overall, the Conservation Area remains ecologically stable with the condition of vegetation remaining consistent with previous monitoring and consistent with the PCT descriptions provided in the Conservation Agreement (UCMPL 2019a). Incremental changes were observed across all sites for all attributes; however, these are most likely linked to seasonal variation caused by rainfall and survey timing. This is particularly applicable to ground cover PFC and exotic PFC.

6.7.4 Spring Gully Cliffline Conservation Area (SGCA)

Trends for each site cannot be determined as only three years of data is available; however, discussion regarding change from the 2017 and 2021 monitoring period on a site basis within each PCT is provided below. Furthermore, due to the small sample size statistically vigorous analysis to determine trends for each PCT, and the broader Conservation Area cannot be undertaken. Because of this, data is not representative of large-scale processes affecting the Conservation Area. Attributes including native species richness, ground cover grasses projected foliage cover (PFC), ground cover shrubs PFC and ground cover other PFC are extremely sensitive to rainfall and survey timing, with all attributes subject to small variations year to year likely due to observer interpretation.

Overall, the Spring Gully Conservation Area remains ecologically stable with the condition of the vegetation within the Conservation Area remaining consistent with previous monitoring and with PCT descriptions provided in the Conservation Agreement (UCML 2019). Native species richness increased at seven (7) of the eight (8) monitoring sites during the 2021 period. Canopy PFC decreases were recorded at five (5) out of eight (8) monitoring plots within the Conservation Area, indicating canopy dieback may be continuing. However, this may be attributed to observer variations, and observations within the monitoring plots and the wider study area indicate vegetation regeneration post intense drought conditions experienced throughout the region from 2017 to early 2020.

6.7.5 Highett Road Conservation Area (HRCA)

Trends for each site cannot be determined as only three years of data is available; however, discussion regarding change from the 2017 monitoring period on a site basis within each PCT is provided below. Furthermore, due to the small sample size, statistically vigorous analysis to determine trends for each PCT, and the broader Conservation Area cannot be undertaken. Attributes including native species richness, ground cover grasses PFC, ground cover shrubs PFC and ground cover other PFC are extremely sensitive to rainfall and survey timing, with all attributes subject to small variations year to year likely due to observer interpretation.

Overall, the Conservation Area remains ecologically stable with the condition of vegetation remaining consistent with previous monitoring and with the PCT descriptions provided in the Conservation Agreement (UCMPL 2019). A minor increase in canopy PFC was recorded at one site and a minor decline in another site within the Conservation Area, with the remaining 2 sites remaining stable. There was an overall increase in native ground cover, which can be attributed to intense drought conditions occurring late 2019 through to early 2020 (DPI 2020) and subsequent above average rainfall across the region in the preceding 12 months to the 2021 monitoring period.

6.8 Energy and Greenhouse Gas

Greenhouse Gas (GHG) emissions for Ulan Coal Mine triggers the individual facility threshold¹⁴. GHG emissions are reported¹⁵ under the parent company, AZSA Holding Pty Ltd. The total emissions for Scope 1 and Scope 2 as calculated for the 2020-2021 Financial Year (FY) is provided in **Table 6-7**. Scope 1 and Scope 2 emissions for the previous three Financial Years remain lower than predicted in the 2009 EA, with no significant variation to the overall trend.

Table 6-7 - Summary Scope 1 and 2 emissions Statistics for 2021

	FY18/19	FY19/20	FY20/21	EA prediction for year 8 to 11 of the project
Fossil Fuels tCO ₂ -e	17,395	13,748	14,236	
Fugitive Emissions tCO ₂ -e	42,410	26,668	26,918	
Scope 1 Total	59,805	40,416	41,154	
Electricity From Grid tCO ₂ -e	133,908	147,216	151,559	
Scope 2 Total tCO₂-e	133,908	147,216	151,559	
Total Scope 1 and Scope 2 tCO₂-e	193,713	187,632	192,713	230,934

6.9 Mine Subsidence

Underground mining activities at UW and UUG during the reporting period are outlined in **Section 4.1**. Subsidence monitoring at UW and UUG is undertaken in accordance with the relevant Extraction Plan for each underground operation (**Section 3.2.2**). The scope of the subsidence monitoring includes subsidence effects monitoring and environmental, heritage, land management, built features and public safety monitoring programs, to evaluate the potential subsidence impacts and environmental consequences from the secondary extraction of longwalls.

6.9.1 Subsidence Effects Monitoring

UCMPL engage SCT Operations Pty Ltd (SCT) to undertake a review of the subsidence monitoring conducted for the 2021 review period, including a comparison of observed behaviour with subsidence forecasts (**Table 6-6**) and assessments of compliance with the subsidence performance measures (**Table 6-9**). **Table 6-6** compares the maximum forecast values of primary subsidence parameters for conventional subsidence behaviour from LW6 at UW and LWW6 and LWW7 at UUG with the subsidence movements measured on the C, D and H Lines for the 2021 reporting period.

¹⁴ > 25,000 tonnes of carbon dioxide equivalent (t CO₂-e) generated and/or > 100 terajoules (TJ) of energy consumed NGER 2007 (Cth)

¹⁵ PA 08_0184 Schedule 3, Condition 22, Air Quality and Greenhouse Gas Management Plan)

Table 6-8 – Summary of Primary Subsidence Parameters Measured 2019-2021

Subsidence Monitoring Lines:	D Line (UW)		C Line (UW)		H Line (UUG)	
2021: Longwalls 6 at UW and Longwalls W6 and W7 at UUG						
Subsidence (m)	1.29	1.6	^	1.6-1.7	1.30	1.7
Tilt (mm/m)	21	40-55	^	40-55	11	50
Tensile Strain (mm/m)	9	15-20	^	15-20	4	15
Compressive Strain (mm/m)	4	20-25	^	20-25	3	20
2020: Longwalls 5 and 6 at UW and Longwalls W5* at UUG						
Subsidence (m)	1.37	1.6-1.7	1.44	1.6-1.7	1.27	1.6
Tilt (mm/m)	20	40-55	19	40-55	20	10-20
Tensile Strain (mm/m)	6	15-20	6	15-20	4	5-15
Compressive Strain (mm/m)	5	20-25	5	20-25	8	5-15
2019: Longwall 5 at UW and Longwalls W4* at UUG						
Subsidence (m)	1.37	1.6-1.7	1.44	1.6-1.7	1.47	1.6
Tilt (mm/m)	20	40-55	19	40-55	20	10-20
Tensile Strain (mm/m)	9	15-20	6	15-20	6	5-15
Compressive Strain (mm/m)	3	20-25	3	20-25	7	5-15

Notes: *End of Panel Measure Values ^C Line not undermined during 2021 Forecast Values Measured Values

The subsidence monitoring conducted during the 2021 calendar year indicates that the observed subsidence behaviour is consistent with expectation and subsidence effects are less than forecasts made to inform the EA for the UCCO Project, the EP for Longwalls LW1 to LW6 at UW and the EP for Longwalls 30 and W6-W8 at UUG (SCT, 2022). For further details refer to **Attachment J**.

SCT undertook a site visit on 23 and 24 February 2022 to inspect the surface areas above the longwall panels mined during 2021. Overall, subsidence impacts have been within the range previously observed at the UC and less than the maximum forecast in the EPs for the areas mined by longwalls during 2021 (SCT, 2022).

6.9.2 Subsidence Monitoring

UCMPL completed environmental, heritage, land, built features and public safety monitoring during the reporting period as required by the Extraction Plans for UW and UUG, to evaluate the potential subsidence impacts and environmental consequences. A summary of subsidence monitoring undertaken by UCMPL in 2021 includes:

- Monthly inspections above LW6, LWW6 and LWW7;
- Cliff line and heritage monitoring above LW6 and LWW7 and BCA (**Section 6.9.2**);
- Floristic based-subsidence (FBS) plots (**Section 6.6.1**);
- Targeted cliff line monitoring for microbats (**Section 6.6.3**);
- Property inspections on privately owned land with the landowner above LWW7;
- Property inspections on privately owned land above LW6;
- Ulan Creek monitoring (**Section 7.9**);
- Tributary monitoring above Ulan West (**Section 7.10**);

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- Groundwater and private bore monitoring (**Section 7.11**);
- Built feature monitoring (**Section 6.9.2**).

Table 6-9 summarises the subsidence performance measures outlined in Table 14 of PA08_0184 and assessment against the status of compliance expected for the 2021 reporting period.

Table 6-9 – PA08_0184 Subsidence Performance Measures

Subsidence Performance Measures		Compliance Yes/No	Assessment of Performance Measure
Water			
Ulan, Mona & Cockabutta Creeks	No greater environmental consequences than predicted in the EA	Yes	Ulan Creek, Mona Creek and Cockabutta Creeks were not undermined during the reporting period by LW6, LWW6 and/or LWW7 (SCT, 2022) (Attachment J).
Biodiversity			
Threatened species, populations, habitat or ecological communities	Negligible impact	Yes	Subsidence impacts to threatened species, populations, habitat or ecological communities were negligible and did not trigger a response from the TARP (ELA, 2022) (Section 6.6.1 and Attachment E). The assessment found that potential hollows above undermined longwalls remain intact and as such, the relevant subsidence performance measure for the Masked Owl has been met (ELA, 2022) (Section 6.6.2 and Attachment E). The assessment found that percent foliage cover (PFC) of feed trees at monitoring sites had not declined by >10% and as such, the relevant subsidence performance measure for these two threatened bird species has been met (ELA, 2022) (Section 6.6.2 and Attachment E). An assessment was also made of pre and post-mining call activity of the two target species using data from all available previously mined longwall panels (UGLWW3, UGLWW4, UWLW3, UWLW4 and UWLW5). This assessment demonstrated substantial increases in call activity post-mining for both species, indicating their continued relatively high level of activity at previously undermined sites within the UCC (ELA, 2022) (Section 6.6.3 and Attachment E). Of the other LWs monitored in 2021, neither UWLW6 nor UWLW7 have completed their two-year post-mining monitoring period and hence are not yet able to be assessed against the relevant performance measures (ELA, 2022) (Section 6.6.3 and Attachment E).
Land			
Cliffs in the Brokenback Conservation Area	Nil environmental consequences	Yes	Assessment by Pacific Environmental (PE 2022) demonstrates compliance. Recent mining too remote from this area to cause impacts (SCT, 2022) (Attachment J).
Other cliffs	Minor environmental consequences	Yes	Approximately 8.0% of subsidence induced rockfalls occurring above cliff lines undermined by UW LW1-6 and UUG LWW4-LWW7, indicating the combined rock falls are lower than the 20% predicted in the 2009 EA (PE, 2022) (Attachment J). Assessment by Pacific Environmental (PE 2022) and UCM demonstrates compliance (SCT, 2022) (Attachment J).

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Subsidence Performance Measures		Compliance Yes/No	Assessment of Performance Measure
Heritage			
Aboriginal sites	Nil impact in the Brokenback Conservation Area, Grinding Groove Conservation Areas; and on Mona Creek Rock Shelter Sites	Yes	Aboriginal heritage sites within the Brokenback Conservation Area, Grinding Groove Conservation Areas and on Mona Creek Rock Shelter Sites were not undermined by LW6, LWW6 and/or LWW7 during the reporting period. Inspection of the Mona Creek rocks shelters Ulan ID#180 to 187, confirmed that no impact has occurred. No impacts observed at Brokenback cliffs (PE 2022). Recent mining too remote to cause impacts (SCT, 2022) (Attachment J).
Talbragar Fish Fossil Reserve	Negligible impact	Yes	Recent mining too remote to cause impacts (SCT, 2022) (Attachment J).
Other Heritage Sites	No greater impact than predicted in the EA	Yes	Aboriginal heritage sites required for monitoring by the Extraction Plan for Ulan West included Ulan ID#599, ID#843, ID#977 and ID #1002. Although there were no observed rock falls at these sites, minor cracking was noted at Ulan ID#977 and ID#599 (Attachment J). Subsidence effects are less than forecast in EP (SCT, 2022) (Attachment J).
Built Features			
All built features	Safe, serviceable and repairable unless the owner agrees otherwise in writing	Yes	LW6 and LWW7 undermined a section of two private properties, with the management and monitoring of impacts completed as required by each applicable Private Property Subsidence Management Plan (PPSMP). Repairs of surface cracking on roads above LWW7 on private property and on private property above LW6 was undertaken during the reporting period as required by the PPSMP. Repairs to other surface cracking associated with LW6 and LWW7 is scheduled for 2022 in consultation with each relevant landowner as required by the PPSMP. Impacts managed via provisions of Built Features Management Plan (BFMP) and Private Property Subsidence Management Plans (PPSMP) (SCT, 2022) (Attachment J).
Public Safety			
Public Safety	No additional risk due to mining	Yes	There were no reportable safety incidents as a result from subsidence due to LW6, LWW6 and LWW7. A majority of the land undermined is UCMPL controlled land with restricted access. Land access to private properties undermined during the reporting period is managed by the private landowner. Where applicable signage, fencing and locked gates are in place and maintained by UCMPL.

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Subsidence Performance Measures		Compliance Yes/No	Assessment of Performance Measure
			Hazards managed via Public Safety Management Plan (PSMP) and (PPSMP) (SCT, 2022) (Attachment J).

Notes: Whilst Ulan West Longwall 5 (UWLW5) completed its two-year post-mining monitoring period in 2021, the performance measures for this LW were unable to be completed as planned given the unavailability of pre-mining data from 2018 to 2019, which has been withheld by previous consultants undertaking monitoring. Of the other LWs monitored in 2021, neither UWLW6 nor UWLW7 have completed their two-year post-mining monitoring period and hence are not yet able to be assessed against the relevant performance measures (ELA, 2022).

6.10 Waste Management

Disposal and tracking protocols for waste, processes for identifying and minimising waste generation, controls to mitigate waste impacts and responsibilities for waste management are described in the Waste Management Plan (WMP)¹⁶. A licensed waste contractor provides off-site waste disposal and recycling. A summary of waste performance is provided in **Table 6-10**¹⁷. Collectively, approximately 60% of waste was recycled including oil filters, waste grease, scrap metal, timber, paper and cardboard, and empty drums. Waste contained onsite for disposal in accordance with EPL 394, included 69 tonnes of concrete. UCMPL are permitted to dispose of 400 tonnes of concrete per year as required by Condition L4.1. Waste statistics including recycling trends since 2019 are provided in **Table 6-11**.

Table 6-10 - Summary of Monthly Waste Statistics for 2021

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
USO	Total Offsite Waste (T)	2.76	9.64	4.71	7.44	13.68	7.11	17.37	3.80	11.77	2.26	6.27	8.50	95.30
	Recycled Waste (T)	35.29	70.25	15.68	21.65	40.53	69.21	62.57	35.78	27.94	36.05	26.37	15.99	457.31
	Recycling %	92.75	87.93	76.89	74.43	74.76	90.68	78.27	90.41	70.37	94.11	80.79	65.28	82.75
UUG	Total Offsite Waste (T)	23.75	51.42	23.93	24.31	28.08	27.58	35.78	28.97	34.20	45.03	27.97	40.74	391.75
	Recycled Waste (T)	46.56	28.20	46.72	55.38	40.63	92.72	71.39	50.13	50.17	44.80	51.65	40.95	619.32
	Recycling %	66.22	35.42	66.13	69.50	59.13	77.07	66.62	63.37	59.47	49.87	64.87	50.13	61.25
UWO	Total Offsite Waste (T)	26.30	56.72	35.82	61.53	70.91	57.14	68.00	41.55	45.02	43.13	60.01	36.72	602.86
	Recycled Waste (T)	28.28	43.41	39.44	43.44	38.24	47.80	46.70	44.86	97.75	36.22	43.29	31.21	540.64
	Recycling %	51.81	43.35	52.41	41.38	35.03	45.55	40.71	51.91	68.47	45.65	41.91	45.94	47.28

Table 6-11 - Summary of Annual Waste Statistics for 2019 - 2021

		2019 Totals	2020 Totals	2021 Totals
USO	Total Offsite Waste (T)	319.5	448.9	95.3
	Recycled Waste (T)	253.75	24.26	457.31
	Recycling %	79.4	77.09	82.75
UUG	Total Offsite Waste (T)	972.3	970.02	391.75
	Recycled Waste (T)	583.2	651.89	619.32
	Recycling %	63	67.2	61.25
UWO	Total Offsite Waste (T)	98.6	1156.42	602.86
	Recycled Waste (T)	590.3	511.83	540.64
	Recycling %	44.1	44.26	47.28

¹⁶ PA 08_0184 Schedule 3, Condition 54, and SoC 6.15.1 and EPL 394.

¹⁷ PA 08_0184 Schedule 5, Condition 3.

7. Water Management

The Water Management Plan (WMP)¹⁸ provides a framework for the management of water and outlines the interaction between the various policies, plans, programs and procedures. The WMP clarifies requirements for surface water and groundwater management during construction and operational phases. The WMP includes a number of sub plans and systems including:

- Site Water Balance;
- Erosion and Sediment Control Plan (ESCP);
- Surface Water Monitoring Program (SWMP);
- Groundwater Monitoring Program (GWMP);
- Surface Water and Groundwater Response Plan (SWGWRP);
- Goulburn River Diversion Remediation Plan (GRDRP); and
- Goulburn River Diversion Erosion & Sediment Control Plan.

7.1 Overview of Mine Water Management System

The mine water management system includes mine dewatering systems, water storages, the Bobadeen Irrigation Scheme (BIS), water treatment facilities, sedimentation and retention basins, settling and tailings ponds, clean water diversion drains and dirty water catch drains, levee banks and earth bunding around stockpiles, hardstand areas and refuelling areas. The key objectives of the water management system include:

- preventing the contamination of clean water by mining and related activities;
- reducing the discharge of pollutants from the mine to the environment;
- minimising adverse effects on the Goulburn River and Ulan Creek;
- managing approved water discharges to meet EPL394 licence conditions;
- segregating mine impacted water from better quality water to minimise the volume of impacted water that requires recycling and treatment; and
- managing the inventory of water on-site in order to meet the requirements of the mining operation.

Open cut mine surface runoff and pit water is directed to the mine water management system to control and treat runoff from site.

7.2 Water Balance

The water balance¹⁹ consists of micro water balances for discrete operational areas of the water circuit (detailed in **Attachment F**). The micro balances are summed to provide the overall water inputs and outputs (**Table 7-1**). Water sources are rainfall on dams and disturbed areas, groundwater inflows to underground mines and the potable water supply. Water is lost through product coal, the Bobadeen

¹⁸ PA08_0184 Schedule 3, condition 34, EA 2009, EPL394

¹⁹ In accordance with Condition 34, Schedule 3 of the PA08_0184

irrigation scheme, dust suppression, evaporation, supply to external parties and potable water use. Water in excess of operational needs is discharged from licenced discharge points.

During the 2021 calendar year inflow to the Ulan Underground workings averaged 10.69/day, whilst inflow to the Ulan West Underground workings averaged 3.30ML/day. 15.65ML of potable water was supplied during 2021 from an external licenced local water supplier. Additional potable water, approximately 35M was sourced from the PB1C bore and treated at the Millers Water Treatment Facility (Millers WTF), reducing the need for external water supply.

UCMPL had planned to decommission the Millers WTF during 2021, however this did not occur and is rescheduled for decommissioning in 2022. Supplemental potable water using the permeate from the NSWDT WTF, is planned for usage by UCMPL to improve water efficiencies and further reduce the need for external suppliers of potable water.

Table 7-1 - Water Balance Calculation 2021 Reporting Period

Water Balance Period ²⁰	Total Inputs ²¹	Total Outputs ²²	Net Water Balance ²³
2021	9791 ML (26.82ML/day)	10890 ML (29.84ML/day)	1099ML (3.01ML/day)

7.3 Salt Balance

The GoldSIM water model estimates a Net Salt gain of 3,417 tonnes for the 2021 reporting year. Approximately 4,897 tonnes of salt have been discharged from the system during 2021.

Table 7-2 - Water Balance Calculation 2021 Water Year

Site	Salt tonnes (1 Jan 2021)	Salt tonnes (31 Dec 2021)	Net Salt balance 2021 Tonnes
Water Management System	8504	11921	3417

7.4 Baseflow Offsets

Baseflow loss to the Goulburn River catchment was originally estimated by groundwater modelling at 0.05 ML/day, equivalent to 18.25 ML/ year²⁴.

An average 21.53 ML/day of treated water was discharged to the Goulburn River in 2021. Flow at the downstream gauging station (SW02) ranged between 19.24 ML/day and 1306.9 ML/day²⁵. There was increase rainfall during February to March and November 2021 and higher flow in March and November 2021 and therefore any streamflow losses would be less evident in such a period.

A review of baseflow losses was undertaken by Hydro Engineering & Consulting (HEC) during 2020 which concluded there was no clear evidence consistent loss of flow which could be attributed to the

²⁰ 1 January to 31 December.

²¹ Includes rainfall, seepage from groundwater, coal & spoil, groundwater & water from dewatering bores & runoff/drainage from tailings.

²² Includes water used in the CHPP, dust suppression, irrigation, licensed discharge, evaporation, moisture bound to coal, rejects and tailings, onsite potable water use & seepage to spoil.

²³ Total inputs less total outputs

²⁴ PA08_0184, Schedule 3, Condition 29

²⁵ Flow at SW02 augmented by licenced water discharge.

effects of mining. It was recommended to undertake periodic gauging at SW02 and adjust the ratings curve if required, continue to collect data and re-assess in the next 12 months.

Further to the recommendation provided by HEC, one gauging at SW02 was undertaken in late 2021, which did not provide adequate data to adjust the ratings curve. UCMPL will endeavour further gaugings when creek flows are available in 2022.

The groundwater model estimates baseflow losses in the Talbragar catchment at 0.22 ML/day or 80 ML/year. UCMPL has secured WALs to offset the Talbragar Baseflow losses as follows:

- WAL 41817 provides 50 units in the Upper Talbragar River Water Source²⁶; and
- WAL 34921 provides 30 units in the Talbragar Alluvium Water Source²⁹.

Water levels in Triassic and Permian units are monitored at key locations (PZ24, PZ29, TAL-1 and TAL-2) to inform ongoing assessment of baseflow loss to the Goulburn and Talbragar Rivers. In 2021, water levels measured at these locations were generally stable within the Triassic indicating no apparent change in the modelled baseflow losses in either the Goulburn or the Talbragar.

7.5 Water Extraction Licence Compliance

Water Balance indicates total groundwater extraction of 5407.3 ML (

²⁶ Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012

Table 7-3) for the 2021 Water Year (1 July 2020 to 30 June 2021), of which;

- 1892.21ML of groundwater was extracted from the Oxley Basin Coast Groundwater Sources²⁷ (WAL41492 provides 7060 units of allocation). This was withdrawn under work approval 20AL214787 including various dewatering locations (**Attachment M**) throughout the Ulan Complex, none of which are in alluvial sediments;
- 3396.68 ML of groundwater was extracted from the Sydney Basin of the Murray Darling Basin (MDB) Groundwater Source²⁸ (WAL37192 704 units, WAL41906 2215 units and WAL42900 4031 units of allocation respectively).
- A total of 139.37 ML of entitlement under water access licence WAL19047 was used during the reporting period 0.54ML of water was extracted via a small pump, 99.19 was used to offset baseflow losses³¹ to the Upper Goulburn River Water Source and 39.36 ML was evaporated during the reporting period.
- 200ML were transferred to Moolarben Coal during the 2021 water year.

²⁷ Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016

²⁸ Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011

Table 7-3 – Water Extraction & Assessment of Compliance

Water Licence	Water sharing plan, source and management zone (as applicable)	Entitlement (Unit Shares)	Shares in ML for 2021 Water Year	Passive take / outflows	Active pumping	TOTAL	Complies (Yes/No)
WAL41492 (20AL214787, Dewatering / Water Supply Groundwater Goulburn River Catchment of Hunter Catchment)	Oxley Basin Coast Groundwater Source, Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016	7060	7060ML	0	1892.21	1892.21	Yes
WAL37192	Sydney Basin Groundwater Source Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011	704	880*	0	0	0	Yes
WAL41906	Sydney Basin Murray Darling Basin Groundwater Source	2215	2768*	0	0	0	Yes
WAL 42900	Sydney Basin Groundwater Source Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011	4031	5038*	0	3369.68	3396.68	Yes
WAL19047** (20WA209953 ,Moolarben Creek Dam / Pump / Water Supply) ²⁹	Upper Goulburn River Water Source Water Sharing Plan for the Hunter Unregulated & Alluvial Water Sources 2009.	400	400ML	138.82	0.54	139.37	Yes
WAL 34921	Castlereagh Groundwater Source Water Sharing Plan for Talbragar Alluvial Groundwater Source 2000	30	30	0	16.57	16.57	Yes
WAL 41817	Macquarie Bogan Unregulated Rivers Water Sources Water Sharing Plan for Upper Talbragar River Water Source 2012	50	50	0	0	0	Yes

Notes: *As per changes to legislation, 1.25 ML is available per unit share of the access licence share. **Includes 0.54ML water extraction via small pump, 99.2 ML offset baseflows to Goulburn River, 39.63 ML annual evaporation from Moolarben Dam, 200ML Transferred to Moolarben Coal.

²⁹ Works approval 20WA209953 requires riparian flow of 7 L/second. 260.30 ML was released to Moolarben Creek in 2021.

7.6 Licenced Water Discharge

Water treatment and discharge facilities were operated in accordance with EPL 394 during the reporting period. Discharges were made from:

- The Bobadeen Irrigation Scheme (BIS)³⁰;
- The Bobadeen Water Treatment Facility (LDP6)³¹; and
- The North West Sediment Dam Water Treatment Facility (LDP19)³².

Approximately 693ML of water with an average EC of 1200µS/cm was applied to the BIS in 2021, with 44% of the modelled offset capacity used during 2021 and 77% of Total offset capacity to date. Ecological performance of the offset is described in **Section 6.6.1** and groundwater monitoring results are provided in **Section 7.11.3.3**.

Discharge of blended product water from the Bobadeen Water Treatment Facility to Ulan Creek via LDP6 occurred on 343 days with an average daily discharge volume of 6,002 KL/day. Measured pH, EC and TSS concentrations were within EPL394 limits (**Table 7-7**). The maximum discharge volume on any day was 12,651 KL on the 7/01/2021 (EPL394 volume limit 15,000 KL/day) (**Attachment C**).

Discharge of blended product water from the Northwest Sediment Dam Water Treatment Facility to Ulan Creek near the Goulburn River (LDP19) occurred on 363 days with an average daily discharge volume of 15,525 KL/day and a maximum discharge on any day of 21.027 KL on 31/7/2021 (**Attachment C**) (EPL394 volume limit 30,000 KL/day). Measured pH, EC and TSS concentrations were within EPL 394 limits (**Table 7-7**). The maximum combined discharge of 27,950 KL, on 27 December 2021, was below the 30,000 KL limit. Monitoring summaries are provided in (**Table 7-4**) & (**Attachment C**).

Table 7-4 - 2021 Calendar Year Discharge Volumes

Location	Licence Limit (ML/year)	Discharged Volume (ML/year)	2021 Discharge Compliance with Annual Discharge Limits
Effluent Storage Dam (LDP1)	31	0	No discharge
Millers Dam (LDP2)	219	0	No discharge
Rowans Dam (LDP3)	3,650	0	No discharge
Truckfill Dam (LDP4)	730	0	No discharge
Discharge to Ulan Creek (LDP 6)	5,475	2190.9	Yes
Discharge to Ulan Creek (LDP 19)	10,950	5666.8	Yes
Discharge to Ulan Creek (LDP3, LDP6, and LDP19)	10,950	7857.7	Yes
Discharge through irrigation scheme (BIS)	No applicable volume limit ³³	693.1	Yes

³⁰ The BIS (operating since 2004) utilises five central irrigating pivots to irrigate approximately 242ha of pasture.

³¹ The BWTF (commissioned 2006) uses microfiltration and reverse osmosis water treatment and discharges to EPL 394 LDP 6.

³² The North West Sediment Dam WTF (initially commissioned April 2011) uses a reverse osmosis water treatment process and discharges to EPL394 LDP19. Commissioning of the expanded NWSDWTF occurred on the 28 October 2014.

³³ Salinity offset requirement EPL394 E 1.1 b) The Salinity Offset Program must offset the residual salinity loads generated by the Bobadeen Irrigation Area over the life of the Bobadeen Irrigation Program, and its associated salinity load impacts, and when fully implemented, must achieve an offset ratio of 1:1.5.

No discharges from LDP1 (Millers Dam), LDP2 (Effluent Dams) LDP3 (V-notch weir plate at the end of the discharge channel at Rowans Dam) or LDP4 (Truckfill Dam) occurred during the reporting period.

Monitoring was conducted at the Goulburn River Gauging Station Downstream (LMP18), the Goulburn River Gauging Station Upstream (LMP33) and Ulan West Box Cut clean water drain (LDP23) (**Section 7.8** and **Attachment C**).

7.7 Compensatory Water Supply

As required by Schedule 3 Condition 30 of Project Approval PA08_0184, UCMPL must provide a compensatory water supply to any owner of privately-owned land whose supply is adversely impacted as a result of UCMPL activities. In accordance with the Alternative Water Supply Agreement entered into for a landholder in 2019, a new groundwater bore was constructed to a greater depth in response to dry conditions and poor performance of their existing bore, which was potentially impacted by predicted groundwater drawdown.

An Alternative Water Supply Agreement is in place for another landholder regarding a spring fed dam undermined by Ulan West LWW5 and LWW6, and a bore which will be undermined in 2022, however, as the dam has been refilled from regular rain events since 2020, no compensatory water required during the reporting period was necessary.

7.8 Surface Water Monitoring Results

The Surface Water Monitoring Program (ULNCX-111515275-1642) (SWMP)³⁴ details surface water monitoring to measure and assess changes in stream health (including base flows) and channel stability that could be attributable to mining activities. The locations of surface water (SW) monitoring and Licenced Discharge Point (LDP) sites are shown in **Attachment M**. For details on parameters sampled, sampling method and sampling frequency of each monitoring site see **Attachment C**.

SW01 and SW02 are monitored for pH and EC ($\mu\text{S}/\text{cm}$) via a continuous monitor. Monthly grab samples are also collected **Figure 7-1 - Figure 7-7** show the daily average real time water quality results for SW01 and SW02 for 2021 and historical results since 2012. **Figure 7-4** and **Figure 7-8** shows flow at SW01 and SW02 during the reporting period.

The creeks in the vicinity of the operation are ephemeral. Surface monitoring sites SW03 to SW11 are sampled monthly if flow is present and following any rainfall event greater than 30 mm in a 24hr period. Automatic sampling stations are installed at SW06, SW07, SW10 and SW11. Samples are collected and sent to a NATA Accredited laboratory for analysis of pH, EC ($\mu\text{S}/\text{cm}$), TSS (mg/L), TDS (mg/L) and Turbidity (NTU). **Figure 7-9** to **Figure 7-11** provide water quality results for SW03 to SW11 within the reporting period compared with the historical average (2011-2020).

The 2021 average, maximum and minimum sampling result for each surface water sampling site are compared against the adopted trigger values (detailed in the SWMP) in **Table 7-5**. **Table 7-6** provides

³⁴ Condition 34, Schedule 3 of the PA08_0184 and EPL 394, plan approved by DPIEDPIE on 29 September 2011, a component of the WMP (ULN SD PLN 0017).

a summary of investigations undertaken where results exceeded trigger values in 2021. Results of monitoring for EPL 394 licence discharge points are reported in the EPL Annual Return.

Table 7-5 - Adopted Trigger Values for Key Water Quality Parameters

Water Quality Variable	Goulburn River Upstream (SW01)	Goulburn River Downstream (SW02) ⁴	Ulan Creek Upstream of LDP6 (SW03) ⁹	Ulan Creek at Old Ulan (SW04) ¹⁰	Ulan Creek at Pleuger Road (SW05) ¹¹	Talbragar River ³ (SW09)	Watercourses flowing to Goulburn River (SW06, SW07, SW08)	Watercourses flowing to Talbragar River ⁶ (SW10, SW11)	Clean Water Diversion/ System SW12, SW13 (EPL23), SW14, SW15
pH	6.5 – 8.0 ¹	6.4 – 8.1 ³	6.5 – 7.9 ⁹	6.5 – 8.5 ⁸	6.5 – 8.5 ⁸	6.5 – 8.5 ⁵	6.5 – 8.0 ⁶	6.5 – 8.0 ⁵	6.5 – 8.0 ⁶
EC (µS/cm)	680 ²	854 ²	1126 ⁹	900 ⁸	900 ⁸	125 – 2200 ⁵	30 – 350 ⁶	30 – 350 ⁵	30 – 350 ⁶
TSS (mg/L)	111 ²	53 ²	64 ⁹	83 ¹⁰	50 ⁷	50 ⁷	50 ⁷	50 ⁷	50 ⁷

Notes: **1** ANZECC (2000) default trigger value range for lowland east flowing coastal rivers in NSW. **2** 80th percentile based on historical data for the Goulburn River. **3** Range within Historical data for Goulburn River Downstream. **4** SW02 is downstream of the Ulan Mine Complex and as such water quality at this location can be influenced by other developments in the catchment outside of UCML influence. **5** Interim trigger values based on ANZECC (2000) default trigger values for lowland rivers in NSW. Site-specific trigger values will be developed as monitoring data becomes available. **6** Interim trigger values based on ANZECC (2000) default trigger values for upland rivers in NSW. Site-specific trigger values will be developed as monitoring data becomes available. **7** Interim trigger values based on Volume 1 of Managing Urban Stormwater: Soils and Construction (Landcom, 2004). **8** Trigger level reflects upstream discharge limit approved under EPL394. **9** 80th percentile of SW03 baseline (31 samples taken between February 2012 and September 2017). **10** 80th percentile of SW04 baseline (24 samples taken between February 2012 and November 2017). **11** 80th percentile of SW05 baseline (30 samples between November 2010 and November 2017).

SW12 and SW15 are located in the Clean Water System, a series of drains that captures runoff from rehabilitated land around the mine operations. The water is not subject to the influence of mining activities and flows into and remains in Peanut Dam. Water sampling of SW12 and SW15 occurred during 2021 with no sites triggering their applicable adopted values as displayed in **Table 7-5. (Attachment C)**.

SW13 (EPL23) and SW14 are located in the Clean Water Diversion Drain, a drain that captures the runoff from natural bush land around the mine operations. The water is not subject to the influence of mining activities and flows into a tributary of Ulan, then flows into Ulan Creek and into the Goulburn River. Water sampling of SW13 and SW14 occurred during 2021 with no sites triggering their applicable adopted values as displayed in **Table 7-5 (Attachment C)**.

Table 7-6 - Surface Water Monitoring Result TARP Activation

Site	Date of sample	Trigger	Action	Result
SW01	Average monthly real time data above criteria (June to October)	Elevated EC	Regular Inspections of the site undertaken. Probe within calibration. Review of water quality parameters from grab samples	This site is upstream of UCC operations and discharge. Discharge EC was within limits. Increased rainfall may have resulted in increased run off and subsequent increase in EC. Moolarben Dam (freshwater dam) and freshwater creeks outside of UCC operational impact area influencing values.

Site	Date of sample	Trigger	Action	Result
			indicated consistency of results.	
SW03	3 Consecutive Monthly samples (April – June) and 5 Consecutive Months (July – November). 4 months of exceedance of the water quality TARP.	Elevated EC and pH	Inspection of Site and review of flow and real time data and LDP6 data (immediately downstream).	SW03 is a small pool in Ulan Creek, upstream of LDP6. When there is very limited flow from the pool, the EC increases. When there is rain and significant flow, the EC drops, indicating that EC rises as water from the pool evaporates. No exceedance of the LDP 6 EPL data occurred. Increases in pH may have been a result from increased run off from increased rainfall. No exceedance of LDP6 pH data occurred. The pH is still within the ANZECC trigger for water courses of this nature, and consistent with results from surrounding creek lines.
SW09	3 Consecutive readings (November – December)	Elevated TSS	Inspection of Site, review of field sheet comments and review of data.	There was one trigger of the SWGWPR for TSS following prolonged rain with a maximum TSS recorded of 1,820 µS/cm following heavy rainfall on the 22 November. Flooding events in the River, across agricultural farmed paddocks immediately upstream of the sampling point, during this time period. Sampling point upstream of the incoming Mona Creek which intersects UCC Operations.
SW11	3 Consecutive readings (July – November)	Low pH	Inspection of Site, review of field sheet comments and review of data.	Historical data from this creek has low pH, still in process of collecting baseline data. Ephemeral creek. No mining activities in the area.

Table 7-7 - Concentration Limits for Licensed Discharge Points

Location	LDP	Discharge Limits								2021 Discharge Compliance with Discharge Limits
		Iron (mg/L)	Conductivity (µS/cm)		Oil & Grease (mg/L)	pH	Zinc mg/L	TSS mg/L	Volume kL/ day	
			50th Percentile	100th Percentile						
Effluent Storage Dam	1	-	-	810	-	6.5-8.5	-	-	85	No discharge
Millers Dam	2	5	-	900	10	6.5-8.5	5	50	600	No discharge
Rowans Dam to Ulan Creek	3	5	800	900	10	6.5-8.5	5	50	10,000	No discharge
Truckfill Dam	4	5	-	900	10	6.5-8.5	5	50	2000	No discharge
Bobadeen WTF	6	-	800	900	-	6.5-8.5	-	50	15,000	Compliant
Goulburn River Gauging Station Downstream	18	-	-	-	-	-	-	-	-	Compliant
North West Sediment Dam WTF	19	-	800	900	-	6.5-8.5	-	50	30,000	Compliant
Ulan West Box Cut clean water	23	-	-	-	-	-	-	-	-	Compliant

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Location	LDP	Discharge Limits								2021 Discharge Compliance with Discharge Limits
		Iron (mg/L)	Conductivity (µS/cm)		Oil & Grease (mg/L)	pH	Zinc mg/L	TSS mg/L	Volume kL/ day	
			50th Percentile	100th Percentile						
Goulburn River Gauging Station Upstream	33	-	-	-	-	-	-	-	-	Compliant
Ulan Creek Cumulative Discharge Limit^	3 & 6 & 9	-	-	-	-	-	-	-	30,000	Compliant

Note: [^] The combined daily discharge from LDP 3, 6 and 19 must not exceed 30,000 kL/day

Table 7-8 - 2021 Sampling Result Summary

SW Sites	pH			EC (µS/cm)			TSS (mg/L)		
	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave
SW01	6.50	7.20	6.87	72.00	925.00	400.63	3.00	218.00	41.89
SW02	6.80	8.00	7.67	266.00	754.00	564.26	1.00	107.00	135.35
SW03	7.50	8.30	7.96	332.00	1280.00	882.33	1.00	52.00	10.78
SW04	7.20	8.50	8.32	213.00	802.00	707.41	1.00	580.00	41.29
SW05	7.40	7.80	7.63	258.00	876.00	703.94	1.00	18.00	4.72
SW06	6.50	7.70	7.28	119.00	522.00	321.00	6.00	112.00	40.50
SW07	6.90	7.40	7.28	110.00	196.00	150.50	10.00	190.00	69.50
SW08	6.40	6.70	6.55	85.00	203.00	144.00	6.00	99.00	52.50
SW09	7.70	8.80	8.31	325.00	942.00	659.29	13.00	1820.00	158.76
SW10	6.10	7.40	6.84	81.00	254.00	138.20	4.00	281.00	66.60
SW11	5.60	6.50	6.01	85.00	158.00	123.63	2.00	84.00	20.75
SW12	7.00	7.60	7.30	176.00	570.00	307.67	2.00	83.00	43.75
SW13	6.40	6.60	6.56	107.00	296.00	162.80	5.00	19.00	11.40
SW14	6.40	6.60	6.53	86.00	129.00	105.50	5.00	24.00	12.83
SW15	6.10	9.00	7.23	99.00	294.00	176.38	8.00	184.00	46.75

Notes: Bold results are outside the adopted trigger values. SW01 and SW02 pH and EC from real time monitoring. Elevated results generally associated with a heavy rain fall events. Average Daily Result for pH, EC at SW01, SW02 and SW03.

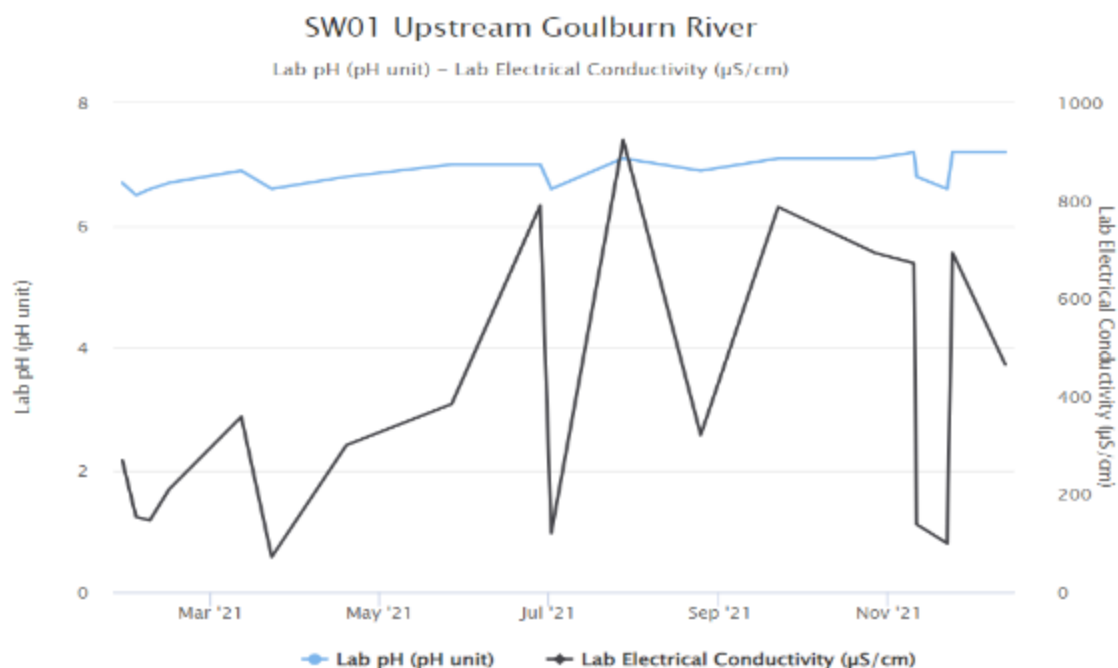


Figure 7-1 - SW01 Upstream Goulburn River Monitoring Results 2021

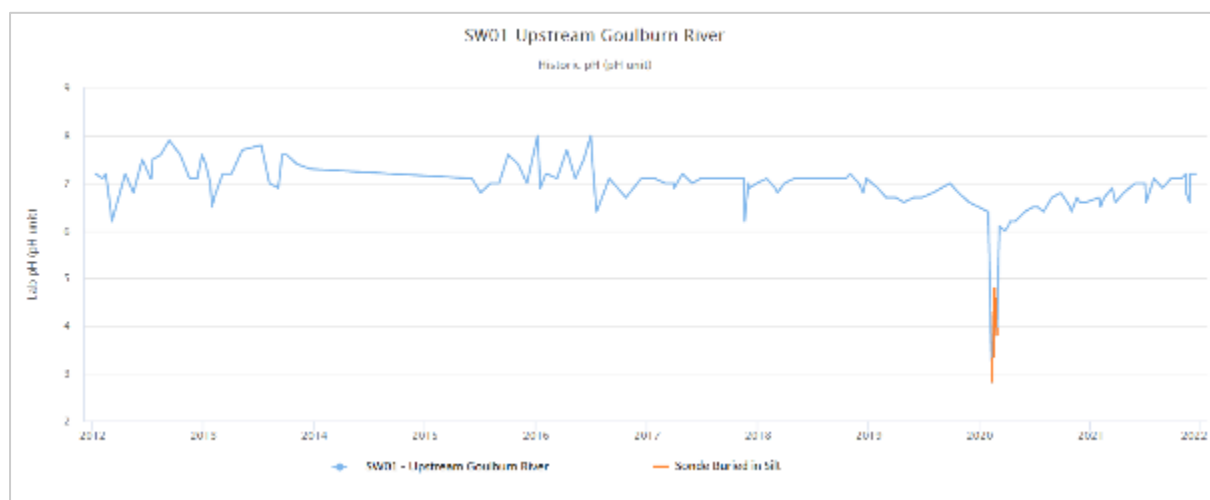


Figure 7-2 - SW01 Upstream Goulburn River Historical pH (2012 - 2021)

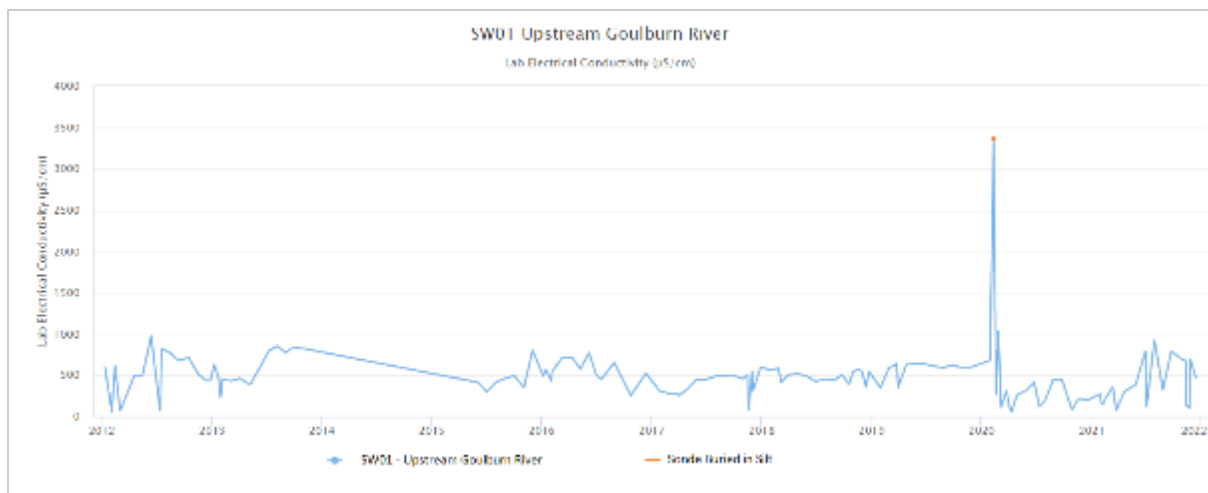


Figure 7-3 - SW01 Upstream Goulburn River Historical EC (2012 - 2021)

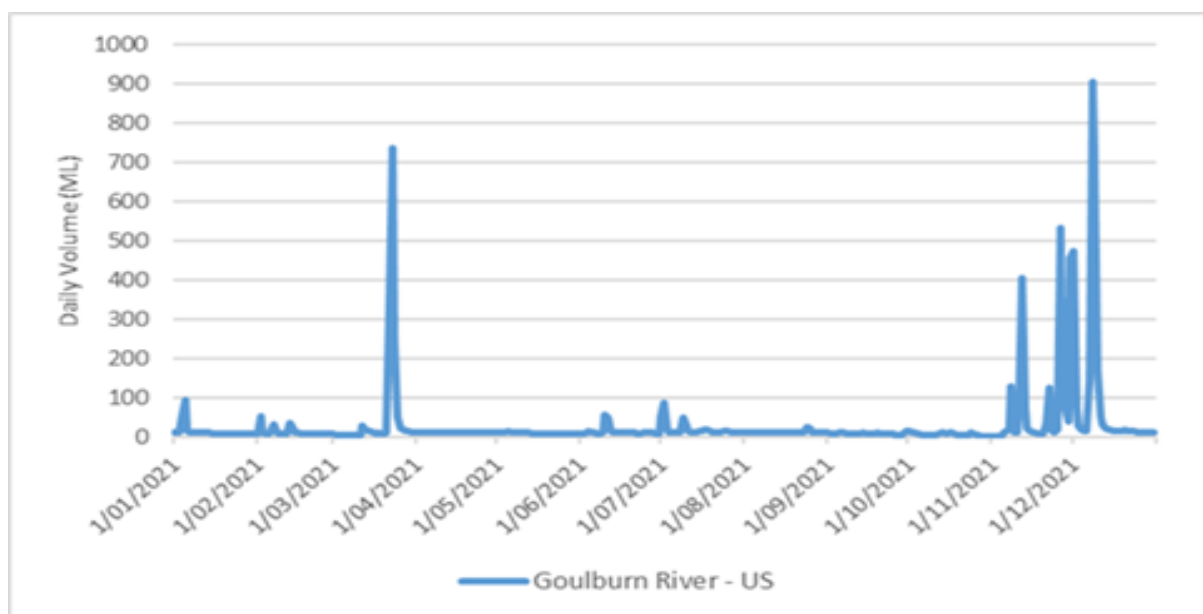


Figure 7-4 - SW01 Goulburn River Upstream Flow 2021

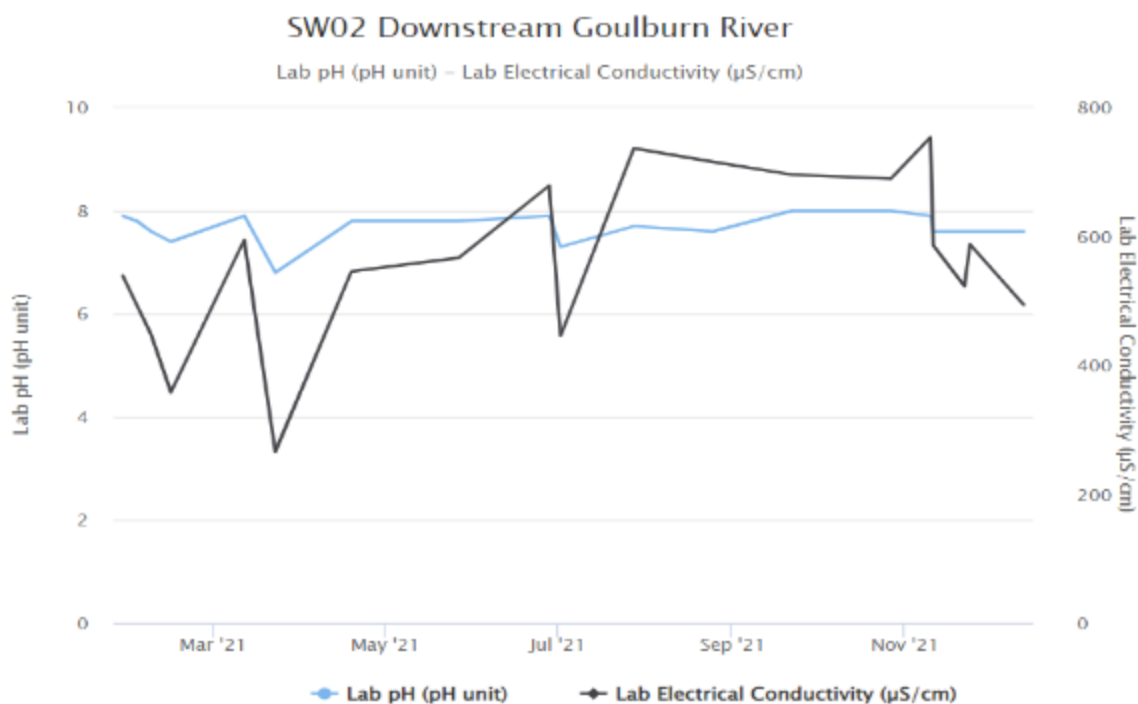


Figure 7-5 - SW02 Goulburn River Downstream Monitoring Results 2021

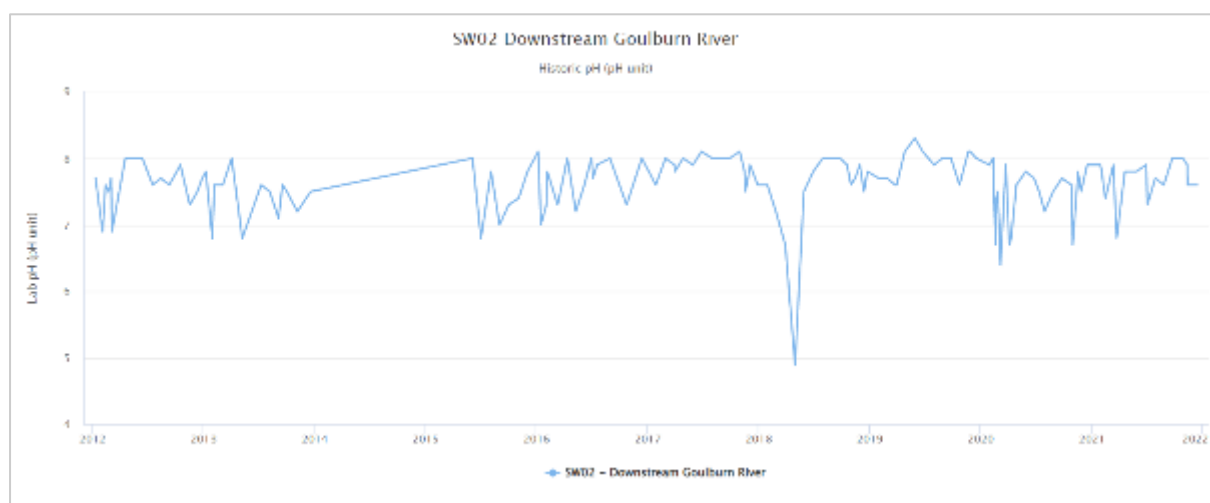


Figure 7-6 - SW02 Goulburn River Downstream Historical pH (2012 - 2021)

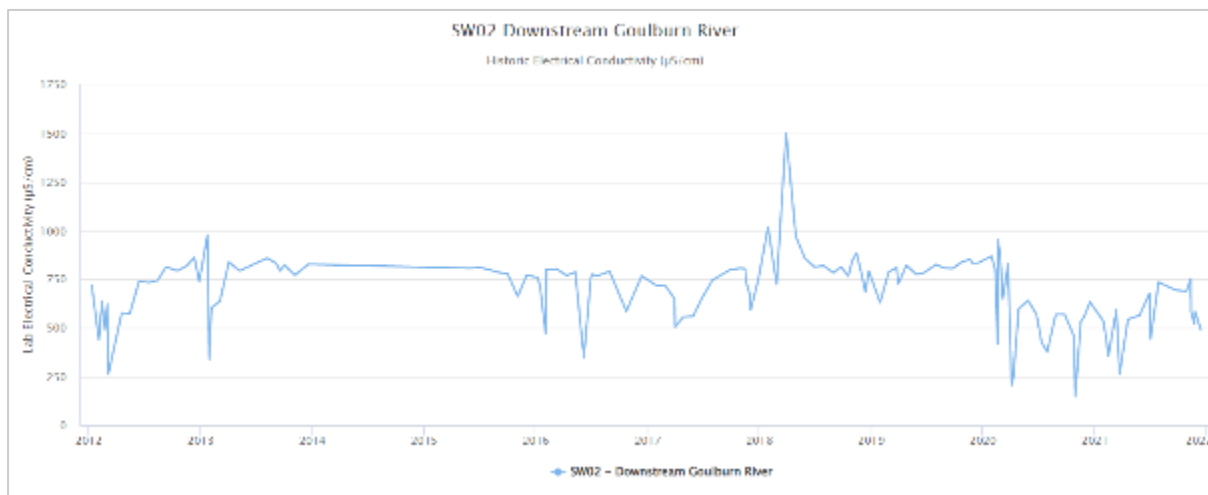


Figure 7-7 - SW02 Goulburn River Downstream Historical EC (2012 - 2021)

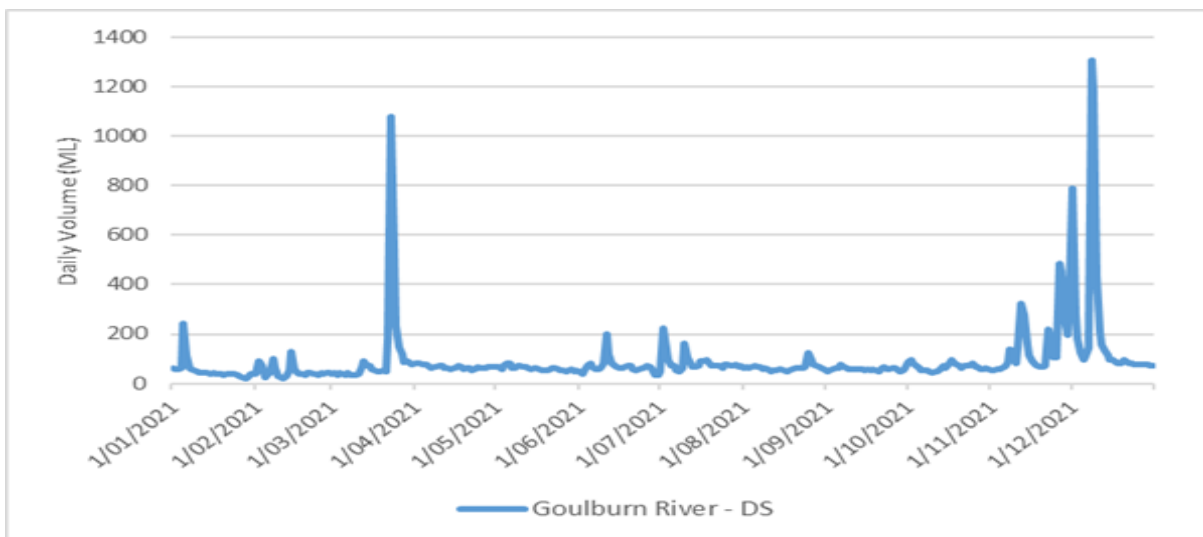


Figure 7-8 - SW02 Goulburn River Downstream Flow 2021



Figure 7-9 - Comparison 2021 to Historic Average pH Monitoring Results

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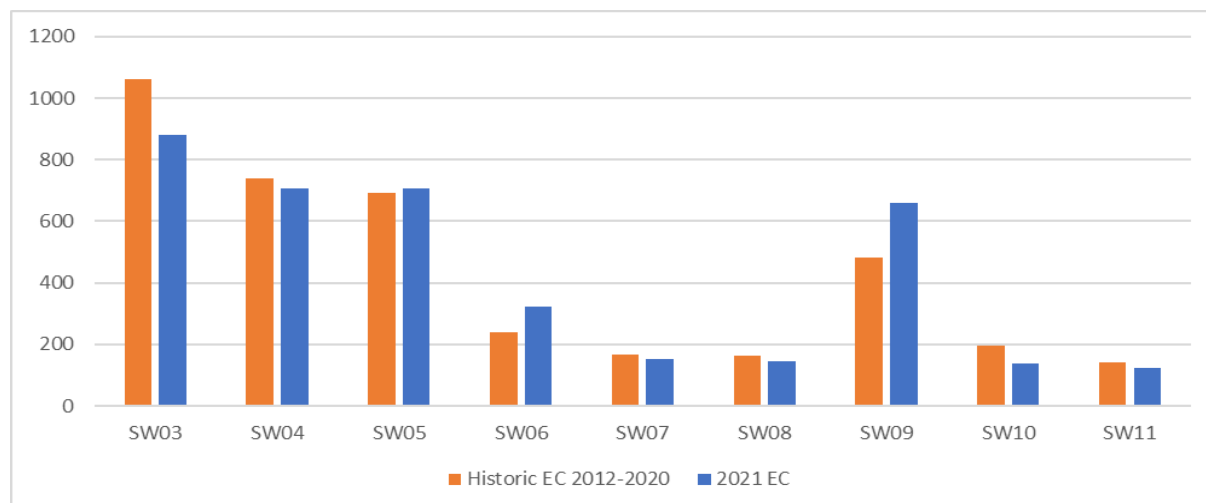


Figure 7-10 - Comparison 2021 to Historic Average EC Monitoring Results

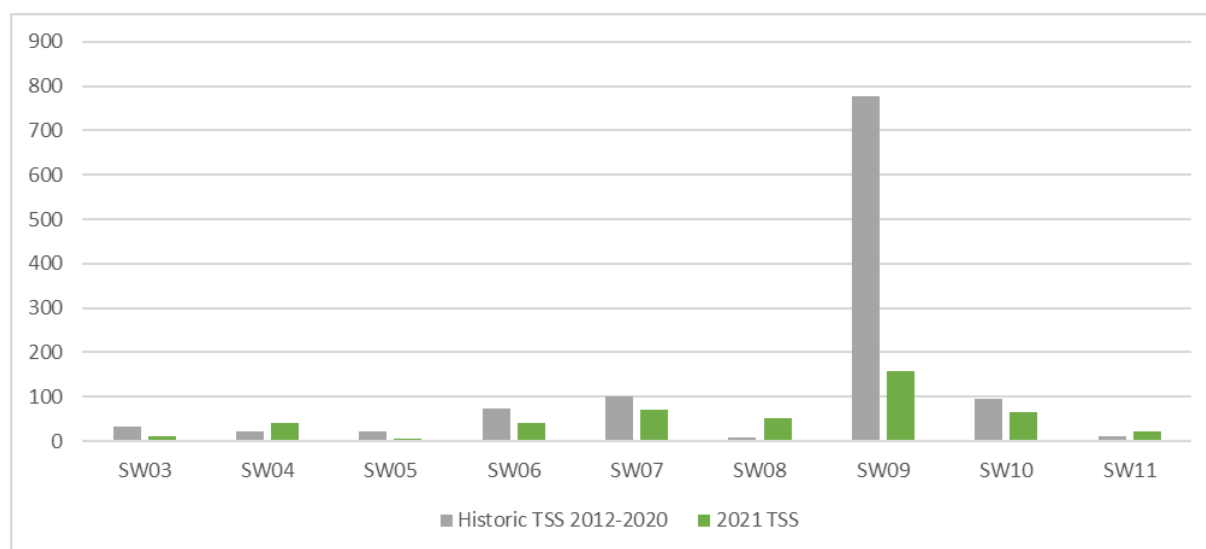


Figure 7-11 - Comparison 2021 to Historic Average TSS Monitoring Results

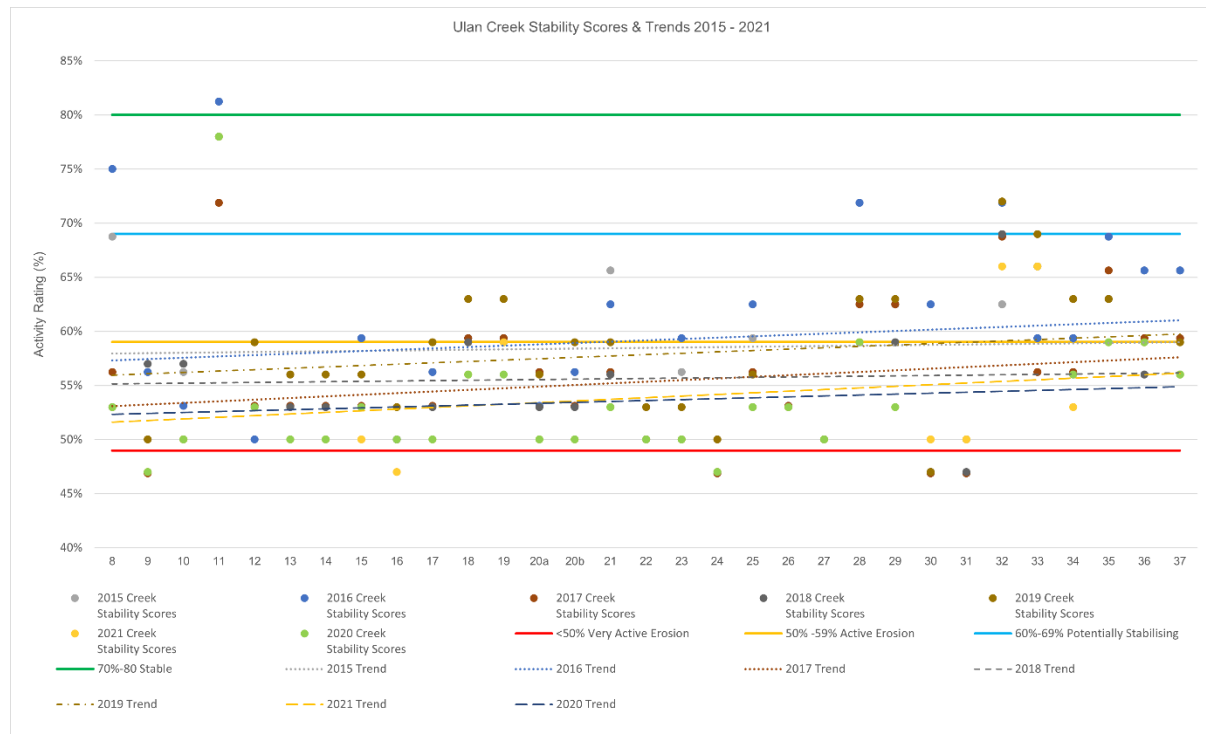
7.9 Channel Stability Monitoring

Channel stability monitoring of creeks scheduled to be undermined and predicted to be impacted by subsidence is required by the SWMP and Extraction Plans. Channel stability monitoring is to be completed before mining and annually for a period of 24 months post mining. Channel stability monitoring is also completed at regular intervals along the Goulburn River diversion to monitoring the stability of the diversion profile as required by the SWMP.

Monitoring of Ulan Creek occurred in October 2021. Ulan Creek is outside the immediate zone of subsidence from the first longwall panel (i.e. LW1) of the Ulan West underground mine, approximately 80m from the goaf edge of LW1. Longwall mining of LW1 was completed by Ulan West 01 May 2015. As with previous monitoring of Ulan Creek since 2015, there were no obvious signs of subsidence related impacts from the Ulan West underground mine on Ulan Creek in 2021. The 2021 Ulan Creek stability assessment results indicate a similar deteriorating trend in the overall creek stability from Site

UC08 to UC37 (**Figure 7-12**). There is the possibility of at least one damaging high flow event in the monitoring period on the 22 March 2021, which is likely to have further exacerbated the existing erosion observed along the creek from sites UC08 to UC37. Several sites along the inspected creek line continued to display signs of mass wasting, particularly Site UC 20b (**Attachment G**).

Figure 7-12 Ulan Creek Stability Monitoring Assessment Scores



Source: 2021 Channel Stability Monitoring Report (Pacific Environmental 2022)

7.10 Tributary Monitoring – Ulan West

UCMPL completed the pre and post mining monitoring of selected ephemeral tributaries of Ulan Creek and a section of Brokenback Creek (BBC) above the Ulan West Underground Mine (Ulan West) for signs of predicted subsidence induced impacts including cracking, erosion, ponding and out of channel flows, as required by the Ulan West Extraction Plan for LW1 – LW6 (The Extraction Plan).

The post mining monitoring of ephemeral tributaries and a creek above Ulan West occurred on 20 October 2021, during the retreat of LW6. The observational surveys along UCFL4, UCFL2 and BBC in 2021 identified a range of predicted subsidence induced impacts. Identified impacts to date have included cracking of bedrock material within the channel bed, surface cracking across the channel, ponding and nick point erosion. Other than several nick point erosion sites, most impacts have not deteriorated further during the two or more years of monitoring (**Attachment J**).

SCT completed their assessment of subsidence monitoring at UCMPL in the previous monitoring period, which included a review of the ‘nick point’ erosion, particularly observed along points within UCFL4. As described by SCT in their *2020 Annual Review of Subsidence Monitoring at Ulan West and Ulan Underground Mines* (March, 2021) impacts to surface water courses were consistent with expectation.

7.11 Groundwater Monitoring Results

The Groundwater Monitoring Program (GWMP) (ULNCX-111515275-1643)³⁵ describes methods to monitor trends in groundwater levels, compare groundwater depressurisation inflows against modelled predictions and identify potential impacts to private licensed bores. Collected data is used to calibrate and update the groundwater model. Monitoring focusses on the alluvial and hard rock/coal measures aquifers in the region:

- Alluvial, Triassic, coal seam and interburden aquifers;
- Base flows to the Goulburn and Talbragar Rivers and associated creeks;
- Groundwater bores, springs and seeps on privately owned land; and
- 'The Drip', a groundwater dependant natural site, east of the operations.

7.11.1 Groundwater Sampling Procedure

Groundwater monitoring was undertaken in accordance with the following:

- ULNCX-111515275-1643 Groundwater Monitoring Program;
- Approved Methods for the Sampling and Analysis of Water pollutants in NSW (Department of Environment and Conservation, 2004);
- Groundwater Monitoring Guidelines for Mine Sites within the Hunter Region (Department of Infrastructure, Planning and Natural Resources, 2003);
- AS/NZS 5667.1:1998 Water Quality – Sampling – Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples; and
- AS/NZS 5667.10:1998 Water Quality – Sampling – Guidance on Sampling of Waste Waters.

7.11.2 Maintenance of Groundwater Monitoring Network

The groundwater monitoring network is reviewed annually with additional monitoring wells and Vibrating Wire Piezometers (VWP) installed (when required) as the mine advances to the North and West. Six additional monitoring bores were constructed during 2020 to provide groundwater monitoring points nearby Mona Creek.

7.11.3 Groundwater Monitoring Results

Australasian Groundwater and Environmental Consultants Pty Ltd (AGE) were commissioned by UCMPL to prepare the annual groundwater review for the 2021 (**Attachment D**). A summary of the 2021 groundwater monitoring review by AGE is provided below. The 2021 observed groundwater drawdown was compared to predicted levels. The review indicates the model predictions are generally in line with observed changes during 2021 (AGE, 2022).

7.11.3.1 Observed and Predicted Groundwater Inflows and Levels

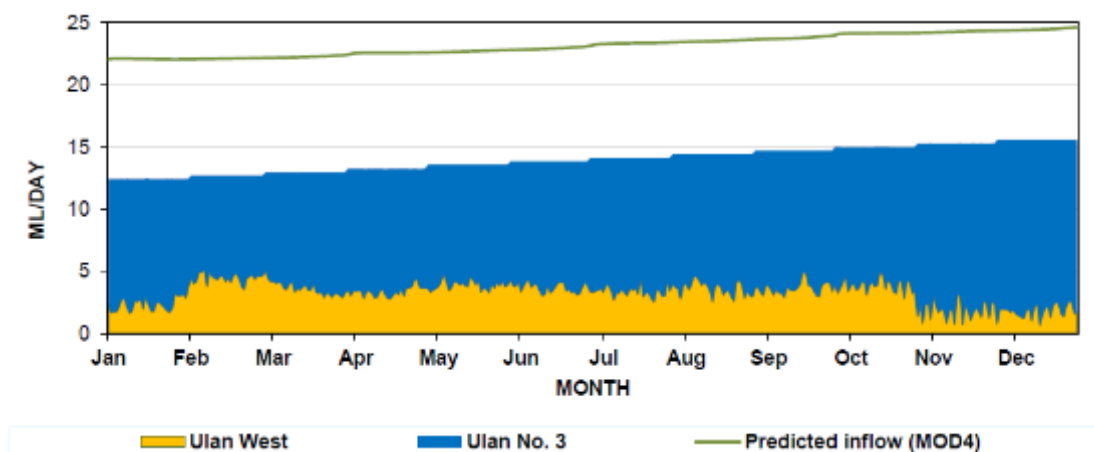
Monthly 2021 abstraction for Ulan West and Ulan No.3 is shown on Figure 8.1. Abstracted volumes from each operation comprised Ulan West (24%) and Ulan No. 3 (76%) during 2021. Daily extracted water ranged between 12.4 ML/day and 15.6 ML/day, with a combined average of 14.0 ML/day. The total volume extracted during 2021 was 5.10 GL. The mine inflows are within approval limits (AGE,

³⁵ Condition 34, Schedule 3 of PA08_0184, a component of the WMP (ULN SD PLN 0017)

2022). The most recent calibrated model for approved operations at Ulan Mine was developed in 2018 as part of the Modification 4 groundwater impact assessment by AGE (2018). The model was developed to predict future groundwater inflows to Ulan No. 3 and the Ulan West Mine. **Figure 7-13** shows the modelled inflow combined for the two mine areas and indicates that actual inflows are less than the modelled inflows for 2021 (AGE, 2022).

The likely reason for this is the difference between how the model simulates groundwater inflow volumes and how the actual mine dewatering system operates. The model has been developed to estimate the volume of groundwater required to be abstracted and the potential impacts that dewatering and mining may cause. It has not been developed as a mine water management tool. The model does not simulate advanced dewatering by bore abstraction, rather it simulates the desaturation of the longwall panels as they are mined (AGE, 2022).

Figure 7-13 - Comparison of Modelled and Calculated Groundwater Inflows to the Underground



Source: 2021 Groundwater Monitoring Report (AGE 2022)

7.11.3.2 North Monitoring Network

North Monitoring Network (NMN) is UCMPL's largest network of environmental monitoring bores and consists of 38 monitoring standpipes (SPs) from which groundwater level and quality data is collected at 18 locations, 1 data logger to collect water level data and 13 VWPs with multiple sensors from which groundwater pressure data is collected (**Attachment D**).

Monitoring bores, intersecting Jurassic sediments, recorded varied trends with no exceedances identified, indicating no mine related impacts. Monitoring bores and VWPs intersecting Triassic units over 2 km from the mine recorded either stable or slightly elevated groundwater levels. Monitoring bores intersecting the Triassic units within 1 km of the mine area generally recorded less than 0.5 m decline in groundwater levels. Exceptions to this were PZ10A and PZ11B which recorded greater decline in groundwater level but did not exceed established trigger levels.

The only Triassic monitoring bore to experience an exceedance was monitoring bore PZ08C. This bore continues a long-term declining trend that was investigated in 2020, with the exceedance deemed likely related to the proximity of the bore to the underground operations and the abstraction bore MG26 creating a localised cone of depression. Nearby bores did not experience a similar drawdown.

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Groundwater within the Permian coal measures declined in the majority of monitoring bores over the monitoring period, in agreement with model predictions. One new groundwater level exceedance was identified in PZ12B, which was below its trigger level from Q1 2021 onwards (AGE, 2022). The cause of this exceedance will be investigated.

Multiple VWP's recorded pore pressure decline greater than predicted in the groundwater model for 2021. This was observed at DDH270, PZ29 and UW1. Seven sensors in total exceeded modelled pressure predictions (two at DDH270, four at PZ29, and one at UW1). These exceedances may be due to a divergence from the original mine plan or differences in modelled / extrapolated potentiometric surfaces and actual geological unit elevations. This is especially possible for PZ29 given its higher susceptibility to cumulative mining impacts given proximity to Moolarben Mine. One new GWMP exceedance was highlighted with respect to VWP readings; the 61 m Permian sensor within the TAL-1 array northwest of the Ulan Mine footprint (AGE, 2022). The cause of this exceedance will be investigated.

Numerous groundwater quality exceedances were observed within the NMN. This included pH exceedances at PZ14C, PZ24A and PZ28B. However, these exceedances were not part of three or more consecutive exceedances and therefore TARP protocol is not triggered at this stage. Exceedances in pH were also flagged in PZ06C and PZ08C, but these were investigated in 2020 and confirmed not to be mining related. Multiple EC exceedances were identified including at PZ06A, PZ06C, PZ08C, PZ09C and PZ14A. These were all reviewed in the 2020 exceedance investigation report and again confirmed not to be mining related. Only two new exceedances in NMN groundwater quality arose in 2021; consecutive pH exceedances in PZ09C and PZ14A (AGE, 2022). These will be investigated. Groundwater triggers of the SWGWRP from 2021 are included in **Attachment D**.

7.11.3.3 Bobadeen Monitoring Network

Land above Ulan Underground is irrigated with reused mine water as part of the Bobadeen Irrigation Scheme (BIS). Assessment of groundwater level and quality in standpipes IMW01 to IMW09 is undertaken quarterly. The standpipes range between 1 and 11.5 meters below ground level (mbgl) and intersect unconsolidated sediments within the upper catchments of Mona Creek, Ulan Creek, and Spring Gully Creek. The results from the 2021 sampling confirm that the averages for pH and EC fall within the standard deviation and are considered representative of historical data.

7.11.3.4 Mona Creek Monitoring Bores

Groundwater level data was collected from the Mona Creek monitoring bores during the March and December (Q1 and Q4) groundwater monitoring campaigns in 2021 (Table 7.5). MCMB01B, installed into sandstone, remained dry throughout 2021. MCMB03A (unconsolidated sediments) was also measured as dry at the year-end. Monitoring bore MCMB01A recorded minor groundwater level increase across the year, whereas MCMB03B recorded just over 1 m in groundwater decline. MCMB04A was steady over 2021, and MCMB04B groundwater elevation increased (AGE, 2022).

7.11.3.5 Private Bore Monitoring

Monitoring of the private bores is conducted annually, dependent on granting of access by private landholders. During the 2021 monitoring period, 26 private bores were measured for groundwater

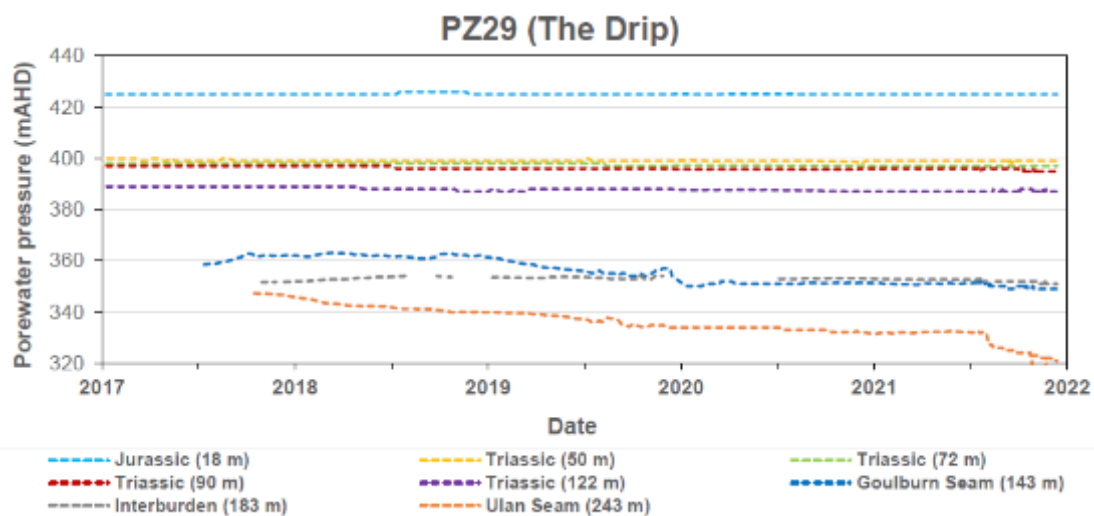
level and water quality pH and EC. (AGE, 2022). Several groundwater quality exceedances (EC and pH) were identified within the PBMN. No Stage 1 EC exceedances that occurred were part of three or more consecutive results. New Stage 2 EC exceedances that trigger the Ulan TARP protocol were observed in PB05, and PB29. SWGWRP level triggers were not exceeded in any private bores over the year (AGE, 2022). No complaints related to private bores were received in 2021.

7.11.3.6 The Drip Monitoring Program

The Drip is located within a Triassic sandstone gorge along the Goulburn River and is recognised for its cultural significance and potential to sustain groundwater dependent ecosystems. The Drip is located to the east of Ulan, on the northern banks of the Goulburn River. Due to the incised nature of the gorge, it acts as a discharge area for the Triassic sandstone (AGE, 2022). VWP PZ29 monitors groundwater pressures nearby to The Drip. The porewater pressure trends have been stable for over 4 years, are consistent with natural variation, and indicate that there is limited to no mining related drawdown in the Triassic sediments (AGE, 2021).

Analysis of the water quality results indicate The Drip water quality exhibits a major ion composition common to some Triassic sediments away from the cliff exposure, but not all. Minor fluctuations in groundwater pore pressure in surficial strata monitored nearby to The Drip is attributed to natural variation and no mining related impacts have been observed (AGE, 2022).

Figure 7-14 PZ79 Porewater Pressure



Source: 2021 Groundwater Monitoring Report (AGE 2022)

7.11.3.7 Pleuger Monitoring Network

The PMN comprises nine active dewatering bores (E20, MG23, MG26, MG27, MG28, MG29, UW TG1, LW A+B and UW TG6) and six decommissioned dewatering bores (East 7, 9, 10, 15, 18 and MG21). Monthly groundwater level elevations are collected at the six decommissioned dewatering bores within the PMN. The groundwater hydrograph presented shows most groundwater levels were either relatively stable or slightly increased throughout 2021. The exception to this was MG21, in which groundwater elevation declined (AGE, 2022).

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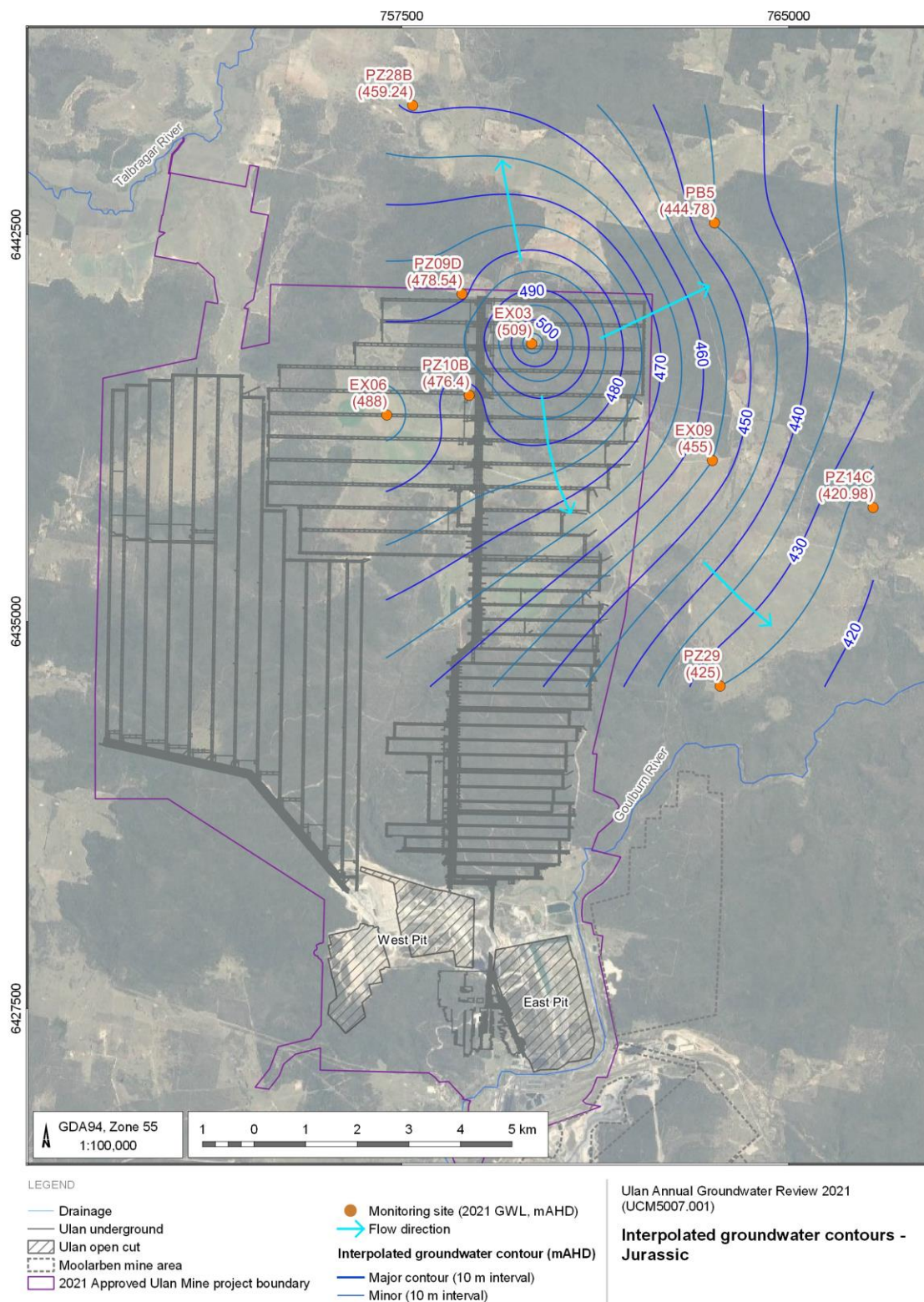
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Figure 7-15 - Interpolated Groundwater Contours - Jurassic Sediments December 2021



Source: 2021 Groundwater Monitoring Report (AGE 2022)

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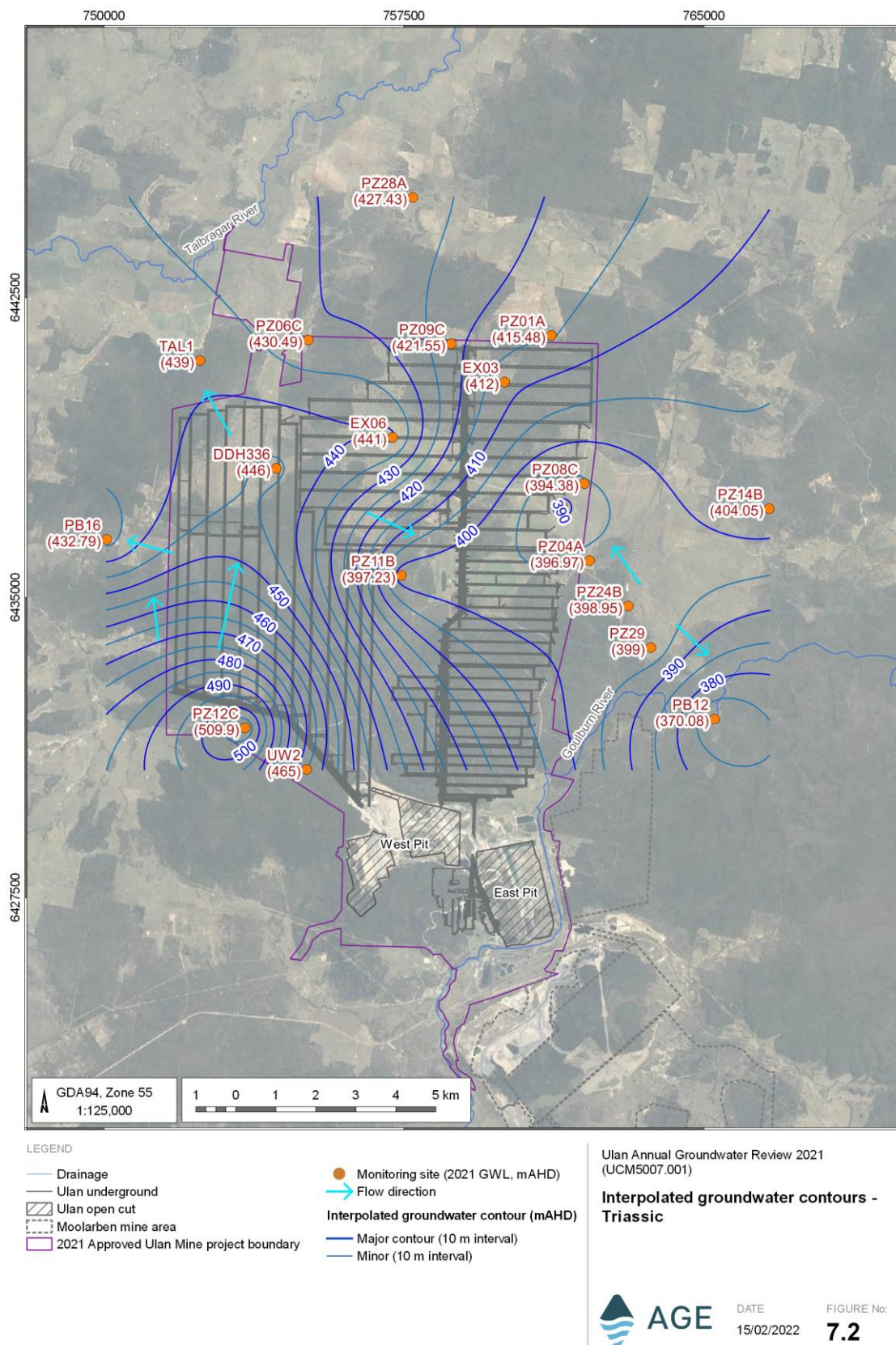
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Figure 7-16 - Interpolated Groundwater Contours - Triassic Sediments December 2021



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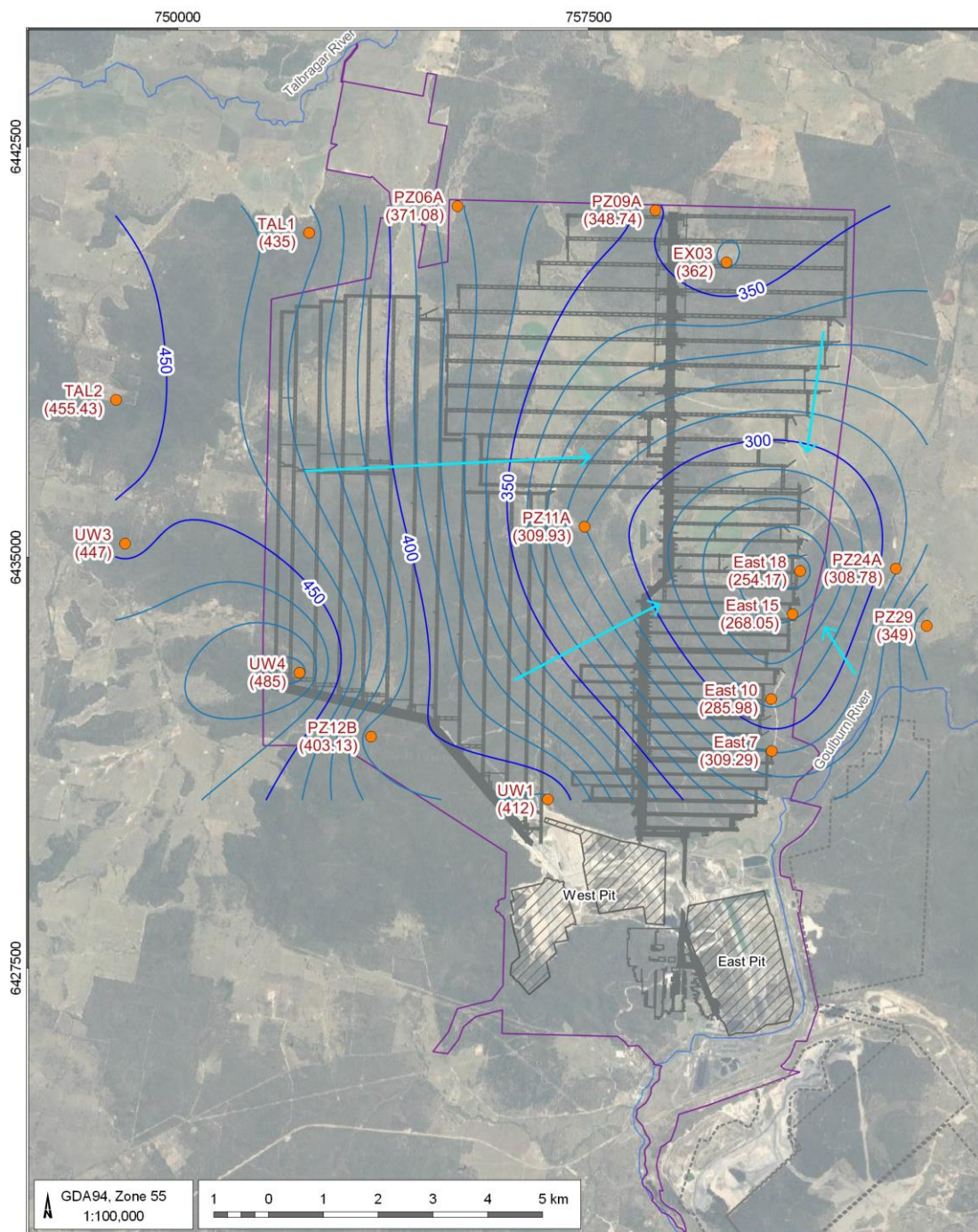
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Figure 7-17 - Interpolated Groundwater Contours – Ulan Seam for December 2021



- LEGEND**
- Drainage
 - Ulan underground
 - ▨ Ulan open cut
 - ▤ Moolarben mine area
 - ▭ 2021 Approved Ulan Mine project boundary
 - Monitoring site (2021 GWL, mAHD)
 - Flow direction
 - Interpolated groundwater contour (mAHD)
 - Major contour (50 m interval)
 - Minor (10 m interval)

Ulan Annual Groundwater Review 2021
(UCM5007.001)

Interpolated groundwater contours - Permian



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8. Rehabilitation

8.1 Objectives and Final Land Use

The primary objective of rehabilitation is to create a stable final landform, with self-sustaining native vegetation communities characteristic of the pre-mining composition, with a post mining land use capability Class VI landscape. UCMPL will rehabilitate and revegetate the open cut to self-sustaining native vegetation communities, as proposed in the 2009 EA including (**Figure 8-1**):

- Grey Box Woodland and Ironbark Open Forest Complex on Sandstone communities which are characteristic of the pre-mining composition within the Open Cut Extension Area; and
- A mix of Woodland and Open Woodland within previous areas rehabilitated or disturbed areas of the open cut prior to the approval of PA08_0184.

8.2 Rehabilitation Performance

8.2.1 Status of Rehabilitation

The Ulan Coal Mining Operations Plan 2017 to 2024 (MOP)³⁶ details the proposed mining, processing and rehabilitation of disturbed areas. In 2021 UCMPL were into Year 4 as it relates to the material production and rehabilitation phases scheduled during the MOP Term.

Section 7 of the MOP provides the rehabilitation plan for the MOP period. **Table 8-1** presents a summary of current rehabilitation and disturbance areas. The Open Cut remained in care and maintenance in 2021 and no further areas within the Open Cut were available for rehabilitation.

Table 8-1 - Rehabilitation and Disturbance Summary

	2021 (ha)	2022 (ha)	2023 Forecast (ha)
A. Total mine Footprint	1321.5	1324.5	1327.5
B. Total Active disturbance	720.3	723.3	726.3
C. Land being prepared for rehabilitation	0	2	0
D. Land under active rehabilitation	551	553	553
E. Completed rehabilitation³⁷	0	0	0

8.2.2 Summary of Rehabilitation Activities During 2021

In order for rehabilitation planning to address the complexity of different land uses and rehabilitation objectives, the Open Cut is divided into eight (8) Primary Domains based on current and life of mine operational land use and secondary domains based on post mining land use. The status of mining and rehabilitation at the end of the 2021 reporting period are presented in **Figures 8-1** and **8-2**.

³⁶ Required by mining lease conditions under the Mining Act 1992 and was prepared to satisfy PA08_0184, Schedule 3, Condition 57 - Rehabilitation Management Plan (RMP).

³⁷ 50ha completed in 2020 (refer to **Section 8.2.7**)

During 2021 UCMPL were into Year 4 as it relates to the material production and rehabilitation phases scheduled during the MOP Term. Rehabilitation phases applicable to Year 4 of the MOP are primarily associated with Ecosystem and Land Use Sustainability activities within Domain 6 Rehabilitated Area – Final Landforms (**Figure 8-1**). As described in the MOP, Domain 6 will see maintenance activities undertaken in accordance with monitoring results and recommendations (**Section 8.2.3**).

8.2.3 Rehabilitation Monitoring – GCAA Report Card

Rehabilitation Areas 1 to 18 (**Figure 8-3**) within Domain 6 were created to facilitate tracking of rehabilitation performance as per GCAA Report Card. The areas were formed by grouping rehabilitation areas with a similar age, connectivity structure and species composition.

GCCA aims to standardise monitoring and completion criteria based on Resource Regulator feedback, using the RRC monitoring and assessment process.

In 2021 ELA completed monitoring program within Domain 6 utilising the GCAA Report Card. Key issues that would affect the successful rehabilitation of the areas as identified through the ecological monitoring programs and the annual site walkover inspections are summarised in **Table 8-2**.

The results of the 2021 annual inspection and long-term rehabilitation monitoring rehabilitation area performance is classified into one of the following categories³⁸;

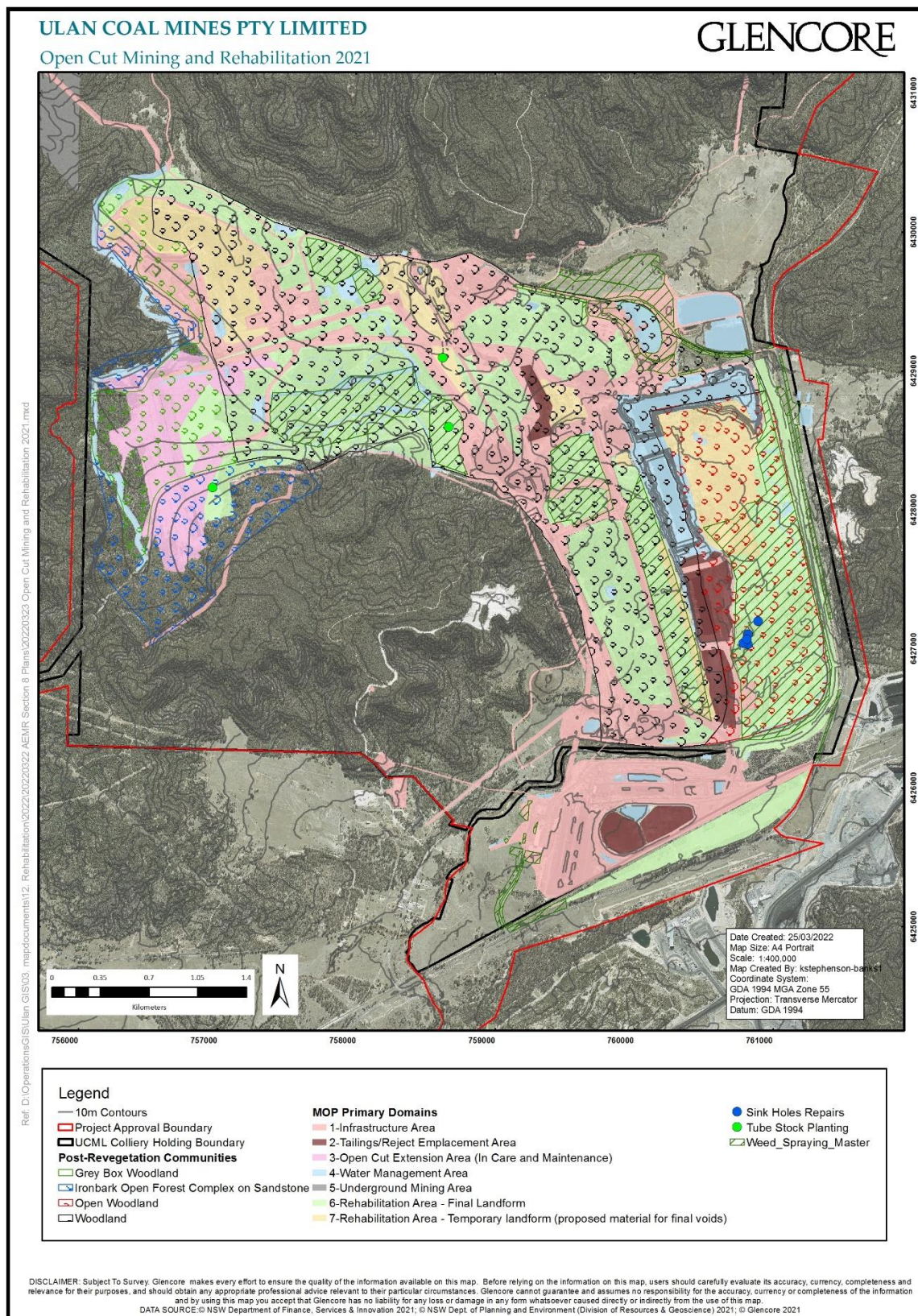
- **Rework-** Does not meet completion criteria. Extensive rework required that would not typically form part of a rehabilitation maintenance program (e.g. slopes do not comply with approval requirements, bare areas >0.1ha, large erosion gullies).
- **Maintenance-** Does not meet completion criteria. Routine rehabilitation maintenance works required (e.g. weed control, infill seeding/plantings, repair of minor erosion, fertiliser application).
- **Monitor-** Trajecting towards completion criteria but does not meet all criteria. No intervention required but continue to monitor (e.g. ecologically young areas, variable soil results).
- **Acceptable-** Meets completion criteria and ready for sign off by stakeholders. Continue to manage and monitor to maintain status until sign off is sought.

Performance indicators and completion/relinquishment criteria for the rehabilitation areas of the Ulan Complex are outlined in Section 6 of the MOP. Performance indicators are used to track the progress of rehabilitation areas and highlight any areas where further remediation/improvement works may be required to progress rehabilitation areas to meet completion/relinquishment criteria (**Table 8-2**).

ELA was engaged by UCMPL to undertake floristic monitoring during autumn and spring during 2021 in accordance with the requirements of the BMP. The 2021 floristic monitoring results included assessment against specific completion / success criteria for Domain B – Rehabilitation Area, Domain C – Goulburn River Diversion, Domain D – Rehabilitation Area. The completion criteria relevant to Domains B, C and D is from Appendix A of the BMP. A summary of assessment against the completion / success criteria and application of the TARP triggers for 2021 is provided in **Table 8-3**.

³⁸ Categories taken from the Glencore Coal Assets Australia Guideline 11.6 Completion Criteria and Rehabilitation Monitoring

Figure 8-1 – Open Cut Rehabilitation and Disturbance 2021



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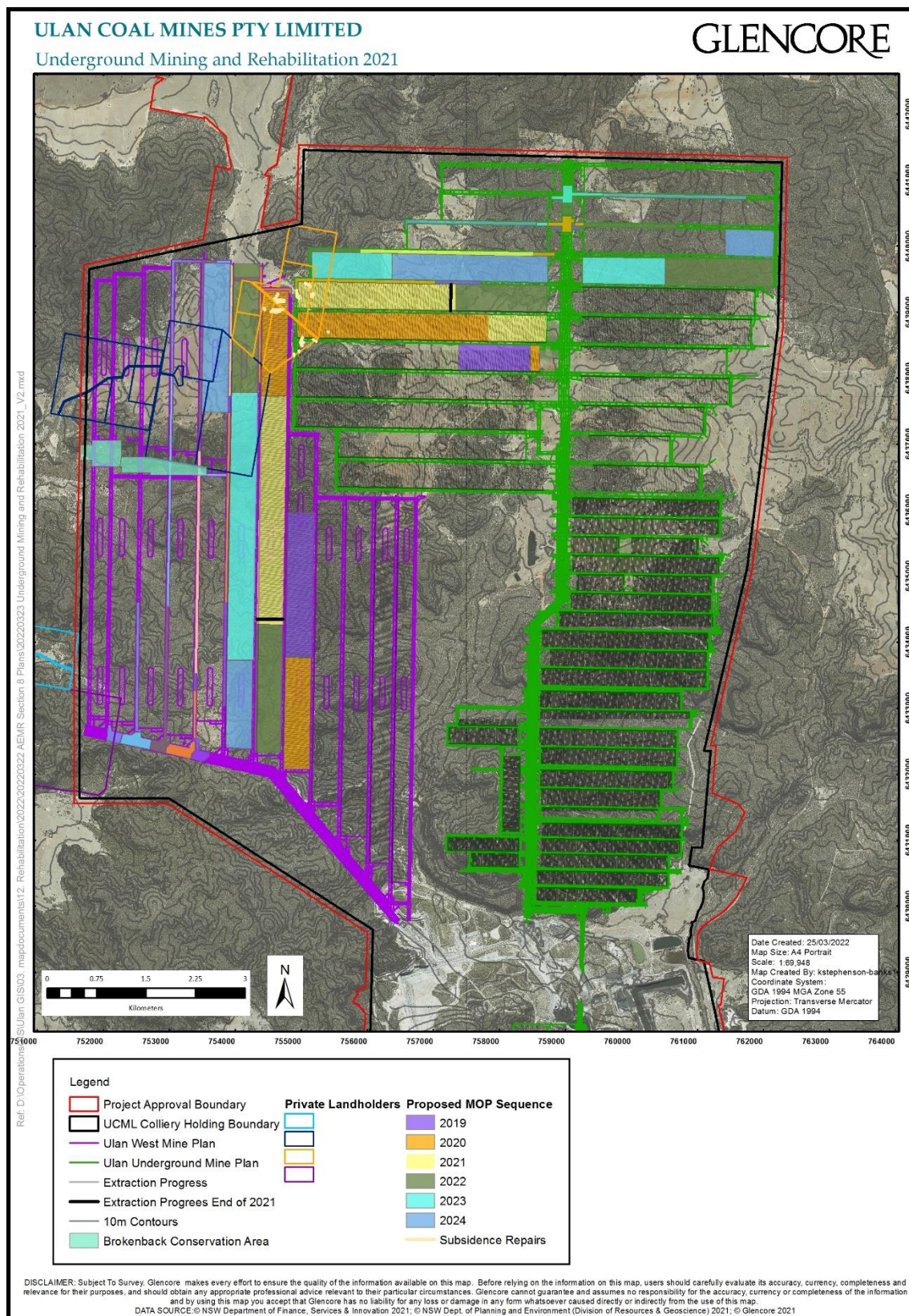
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Figure 8-2 – Underground Mining and Rehabilitation 2021



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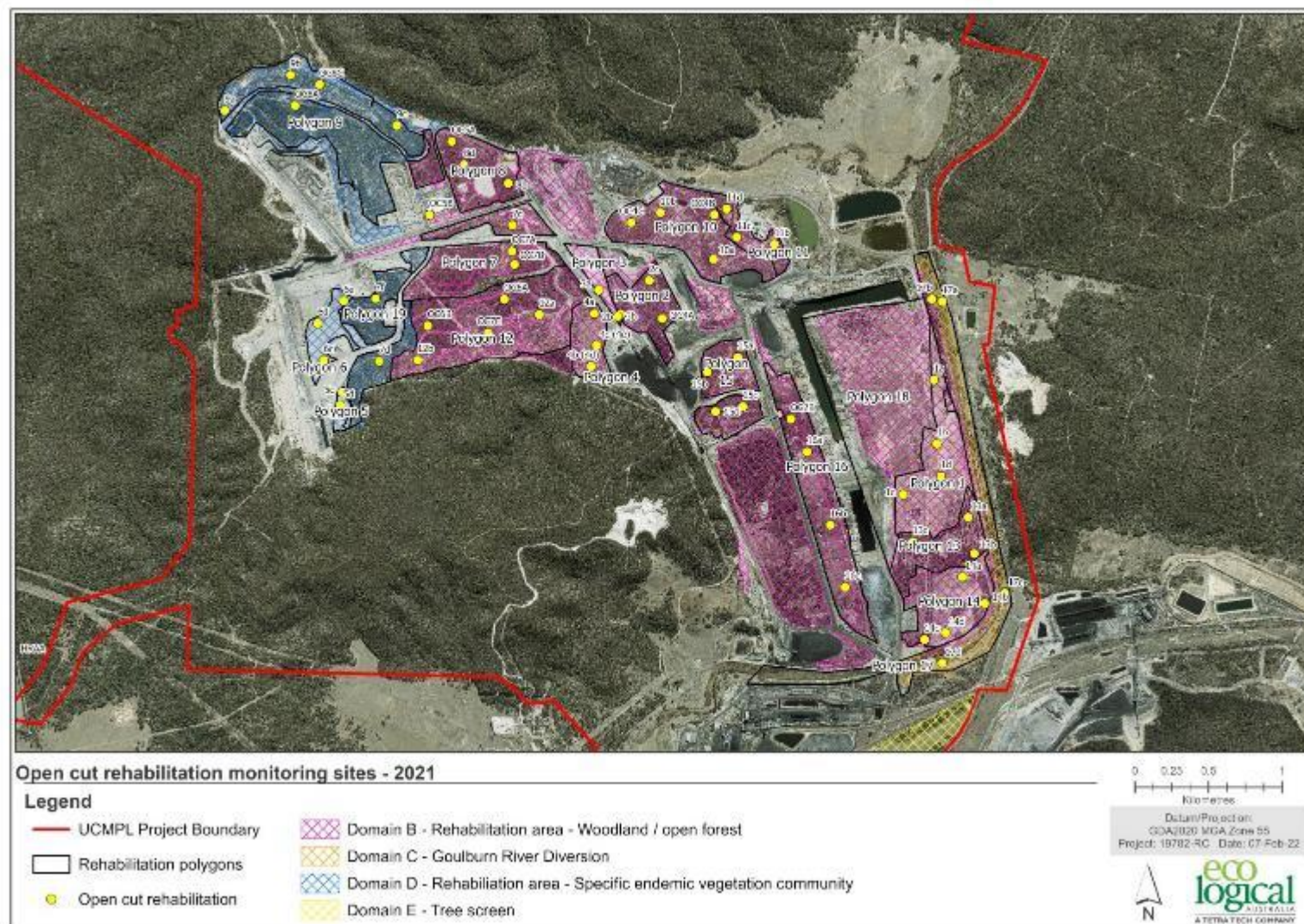
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Figure 8-3 – Open Cut Rehabilitation Monitoring 2021



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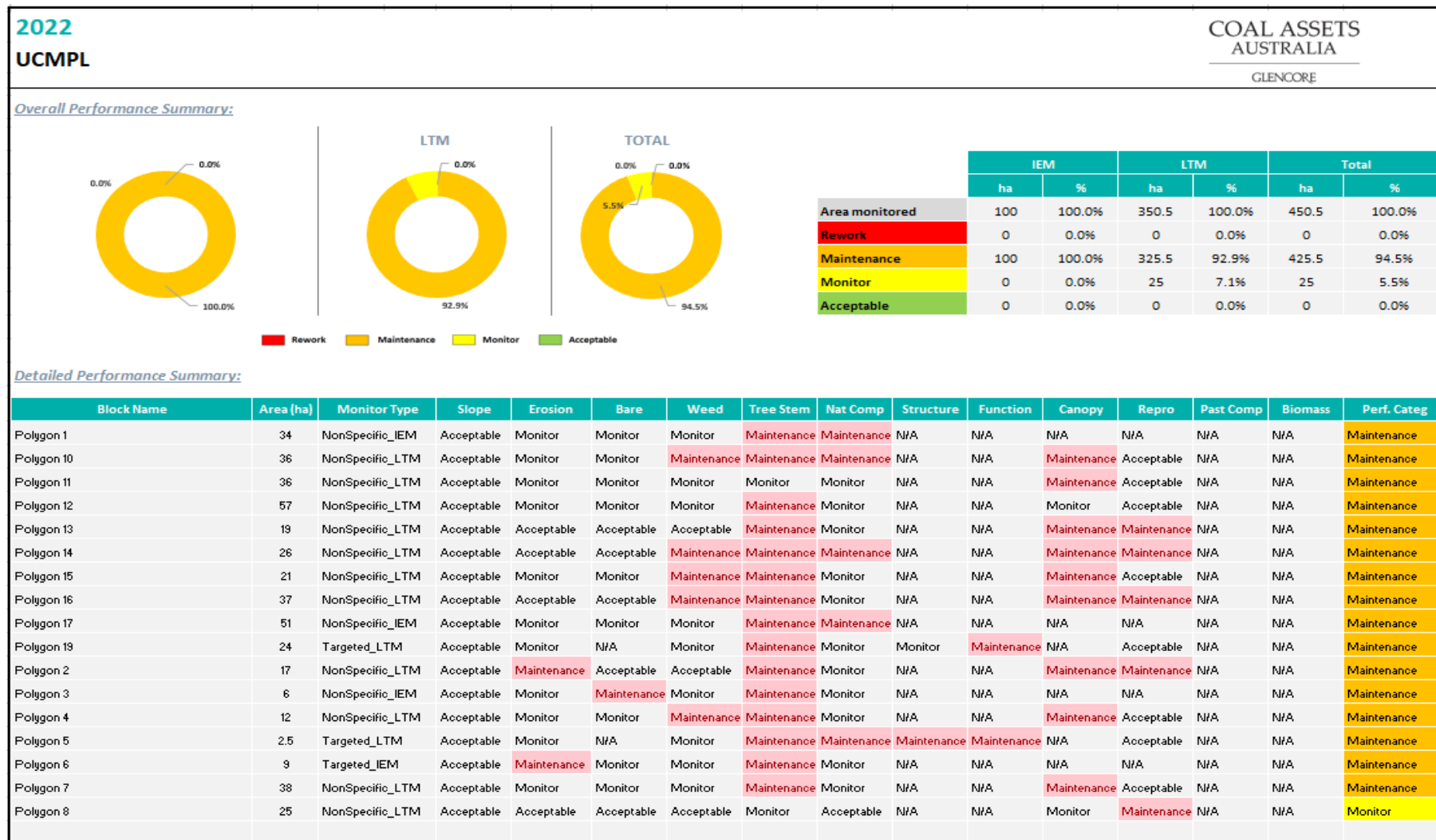
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Figure 8-4 Rehabilitation Report Card Calculator 2021



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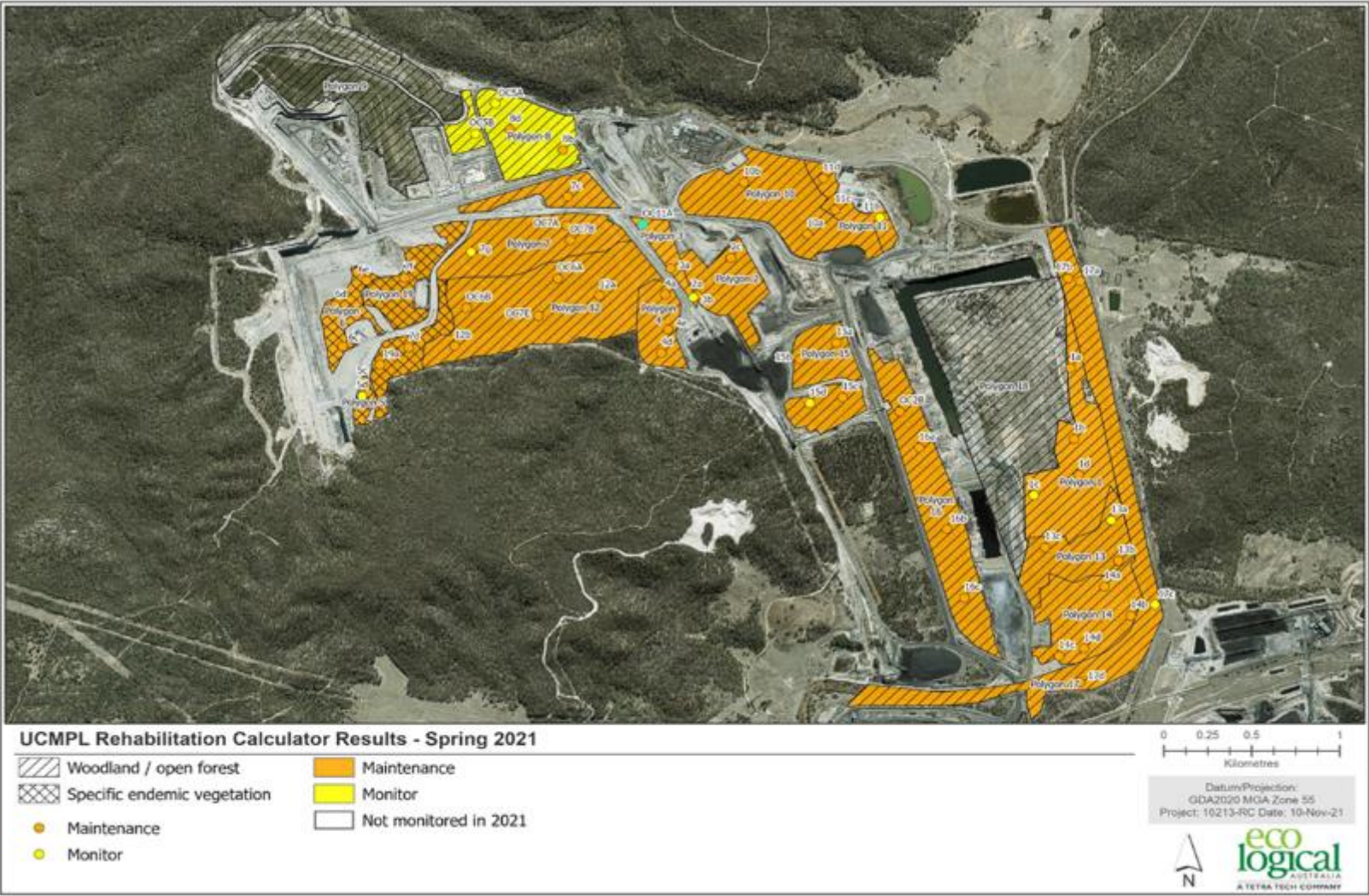
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Figure 8-5 Rehabilitation Report Card Findings



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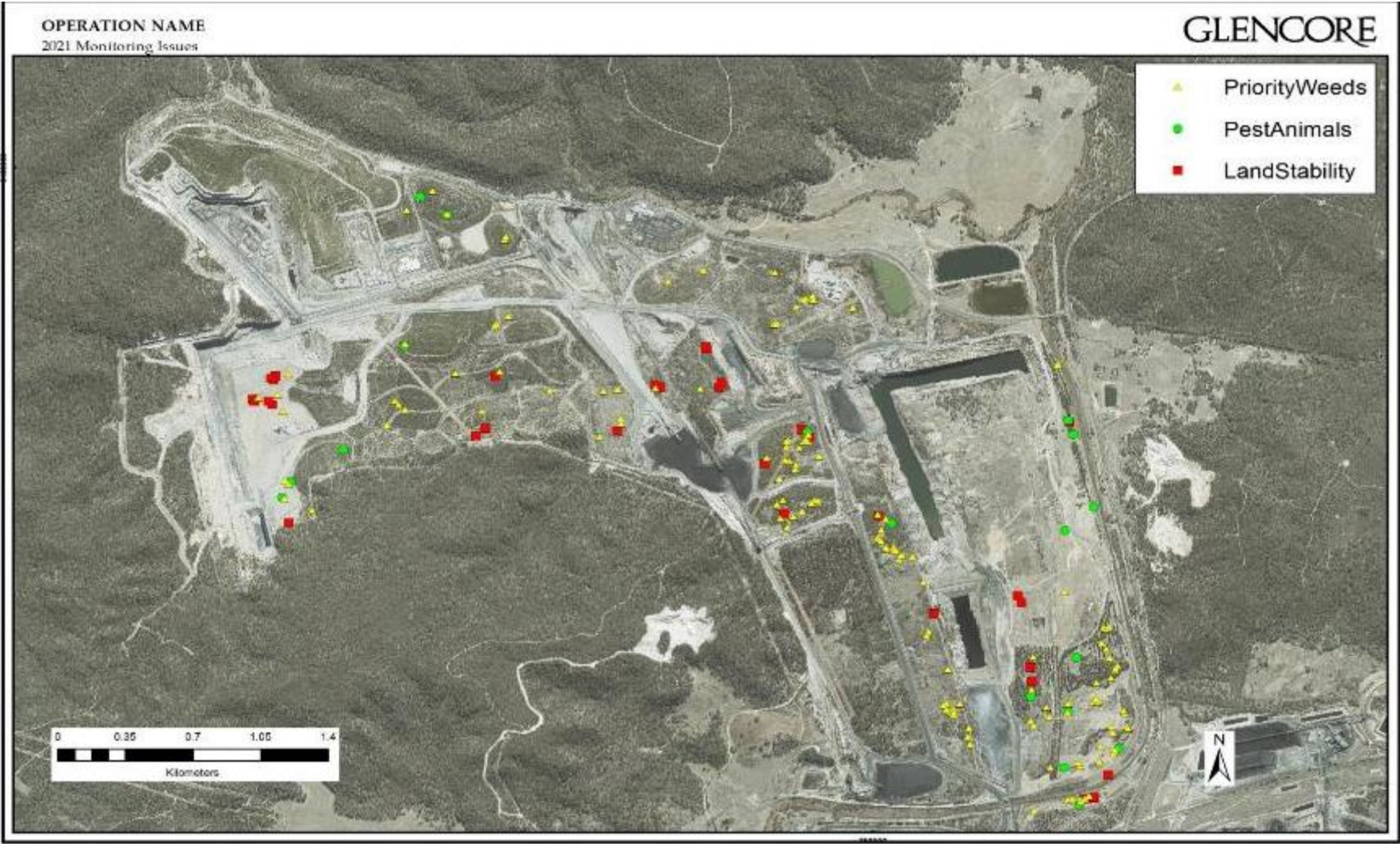
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Figure 8-6 - 2021 Rehabilitation Inspection - Issues Identified



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Table 8-2 – Summary of Assessment Against Completion Criteria and TARP Triggers

Domain	Phase	Domain Objective	Completion Criteria	Completion Criteria Status	TARP Outcome
All domains	Ecosystem and Land Use Establishment Phase	Weed species do not present a risk to rehabilitation	Ensure priority weeds (as per LLS Central Tablelands Strategic Weed Management Plan 2017- 2022) do not exceed 10% of plant cover.	Achieved Priority weeds do not exceed 10% of plant cover throughout the UCMPL Complex. During monitoring in 2021, several infestations of <i>Hypericum perforatum</i> were recorded throughout the UCMPL Complex, specifically within the Bobadeen VOA.	No response required. Continue monitoring program.
Domain B	Ecosystem and Land Use Establishment Phase	Rehabilitation area floristics and structure is representative of a native woodland / open forest Native fauna habitat present within rehabilitation area	Indicative final minimum total native canopy tree densities for seeded areas to be 60 stems/ha. It is recognised that small open grassy areas add to the biodiversity of this woodland / open forest area.	Achieved All areas monitored during 2021 recorded a stem density greater than 60 stems / ha. Rehabilitation areas are achieving the vegetation density criteria for Phase 4 of rehabilitation.	No response required. Continue monitoring program.
			Revegetation areas contain>75% of native flora species which are locally indigenous to the Kerrabee IBRA subregion.	Achieved Rehabilitation area achieving the Ecosystem Composition Criteria for Phase 4 of rehabilitation (>75% of native flora species indigenous to the Kerrabee IBRA subregion).	No response required. Continue monitoring program.
			Monitoring confirms rehabilitated areas provide a range of vegetation structural habitats (e.g., eucalypts, shrubs, ground cover, developing litter layer, etc.) to encourage use by native fauna species.	Achieved A range of structural habitats, including groundcover, shrub and canopy cover, rock, litter and LWD are present throughout Domain B.	No TARP trigger
	Ecosystem and Land Use Sustainability Phase		Revegetation areas contain flora species assemblages of each Growth Form indigenous to the surrounding Kerrabee IBRA subregion.	Achieved Rehabilitation areas contain flora species assemblages of each growth form indigenous to the surrounding Kerrabee IBRA subregion.	No response required. Continue monitoring program.
			Native rehabilitation areas provide a range of structural features (e.g., trees, shrubs, ground cover, developing litter layer etc.)	Achieved A range of structural habitats, including groundcover, shrub and canopy cover, rock, litter and LWD are present throughout Domain B.	No TARP trigger
			Rehabilitation monitoring verifies flowering, seeding or second-generation juveniles for trees and shrubs are present or likely to be.	Achieved Regeneration in the form of canopy species seedlings or saplings were recorded within all rehabilitation polygons. Flowering and / fruiting of shrubs was recorded at all rehabilitation polygons, except Polygon 1 which is too young for reproduction.	No TARP trigger
Domain C	Ecosystem and Land Use Establishment Phase	Improve ecological function	Vegetation contains a diversity of shrubs and juvenile tree species that is endemic to the surrounding native vegetation (comprising	Achieved Domain C contains several shrub and juvenile tree species endemic to the Kerrabee IBRA Subregion.	No response required. Continue monitoring program.

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Domain	Phase	Domain Objective	Completion Criteria	Completion Criteria Status	TARP Outcome
			local species of the Kerrabee IBRA Subregion).		
	Ecosystem and Land Use Sustainability Phase		Native grasses/shrubs emerging on remediated batters.	Achieved / ongoing Native grasses are emerging on remediated batters.	No TARP trigger.
			Vegetation contains a density of species trending to that of the local remnant vegetation.	Achieved / ongoing Vegetation density is comparable to MZ1 Grassy Woodland sites (remnant comparable vegetation). Trends cannot be discerned as there is only two (2) years of comparable data.	No TARP trigger.
			70% or greater perennial plant groundcover.	Not yet achieved. There is, on average, less than 70% perennial groundcover; however, the landform is stable as evidenced by average bare soil and litter cover across monitoring sites at 6% and 51% respectively.	No TARP trigger.
			5 of more hollow logs per ha in remediated areas (river batters exempt).	Not yet achieved. No hollow logs were recorded across monitoring sites during 2021.	No TARP trigger.
Domain D	Ecosystem and Land Use Establishment Phase	Rehabilitation area floristics and structure is comparable to analogue native vegetation community Native fauna habitat present within rehabilitation area	Indicative final minimum total native canopy tree densities for seeded areas to be >60 stems/ha. It is recognised that small open grassy areas add to the biodiversity of this woodland / open forest area.	Achieved All areas recorded a stem density greater than 60 stems / ha. Rehabilitation areas are achieving the vegetation density criteria for Phase 4 of rehabilitation.	No response required. Continue monitoring program.
			Revegetation areas contain >75% of native flora species (trees/shrubs) consistent with the target vegetation community.	Achieved 100% of the native flora species recorded within Polygon 5 of Domain D are consistent with the target vegetation community.	No response required. Continue monitoring program.
			Monitoring confirms rehabilitated areas provide a range of vegetation structural habitats (e.g., eucalypts, shrubs, ground cover, developing litter layer, etc.) to encourage use by native fauna species.	Not yet achieved Vegetation structure remains undeveloped with no canopy cover recorded at Polygon 5 or Polygon 6 during 2021.	No TARP trigger
	Ecosystem and Land Use Sustainability Phase		Revegetation areas contain flora species assemblage’s characteristic of the target vegetation community.	Not yet achieved No eucalypt species were recorded within Polygon 5 of Domain D during 2021.	No TARP trigger.
			Native rehabilitation areas provide a range of structural features (e.g., trees, shrubs, ground cover, developing litter layer etc.).	Not yet achieved Vegetation structure remains undeveloped within no canopy cover recorded during 2021.	No TARP trigger

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8.2.4 Open Cut Rehabilitation

No areas were available and no rehabilitation was undertaken within the Open Cut. Monitoring and maintenance activities associated with Ecosystem and Land Use Sustainability within Domain 6 Rehabilitated Area – Final Landforms was carried out (**Section 8.2.7**) during 2021.

8.2.5 Underground Rehabilitation

During the reporting period UCMPL completed several rehabilitation projects to repair subsidence cracking on UCMPL owned land and on privately owned land (**Figure 8-2**).

8.2.6 Maintenance Activities Rehabilitation areas

Rehabilitation maintenance (**Figure 8-1**) identified in the annual walk over inspection consisted of:

- Soil sampling in polygon 16;
- Infill tube stock planting polygons 3 & 4;
- Removal of rubbish; and
- Weed spraying and slashing conducted throughout the year.

8.2.7 Infrastructure Decommissioning/Building Removal

There was no infrastructure decommissioned or buildings removed in 2021. Ulan Underground relocated a transformer from LW26 to LW30.

No other building removal or decommissioning of infrastructure occurred during the 2021 reporting period.

8.2.8 Other Environmental Management Areas

No material changes with respect to erosion and sediment, contaminated land, visual and landscape management, spontaneous combustion, bushfire, methane drainage/ventilation or waste management.

8.2.9 Relinquishment of Rehabilitated Areas

A 50ha native Woodland area, rehabilitated from the mid-1980s through to 1997, has sufficient land stability, soil composition and richness of flora and fauna to meet completion criteria for a self-sustaining landform (**Figure 8-8**). Monitoring results within the area recorded;

- 55 flora species, 45 of which are from the surrounding area; and
- 130 fauna species including 12 threatened species.

As such a rehabilitation completion form was submitted to the Resources Regulator and approved in June 2020.

UCMPL is currently investigating the potential certification of three rehabilitation polygons (**Figure 8-7**), totalling an area of 103.2 Ha. Flora, fauna and soil investigations have all commenced for potential rehabilitation certification areas (**Figure 8-8**). The areas of certification include:

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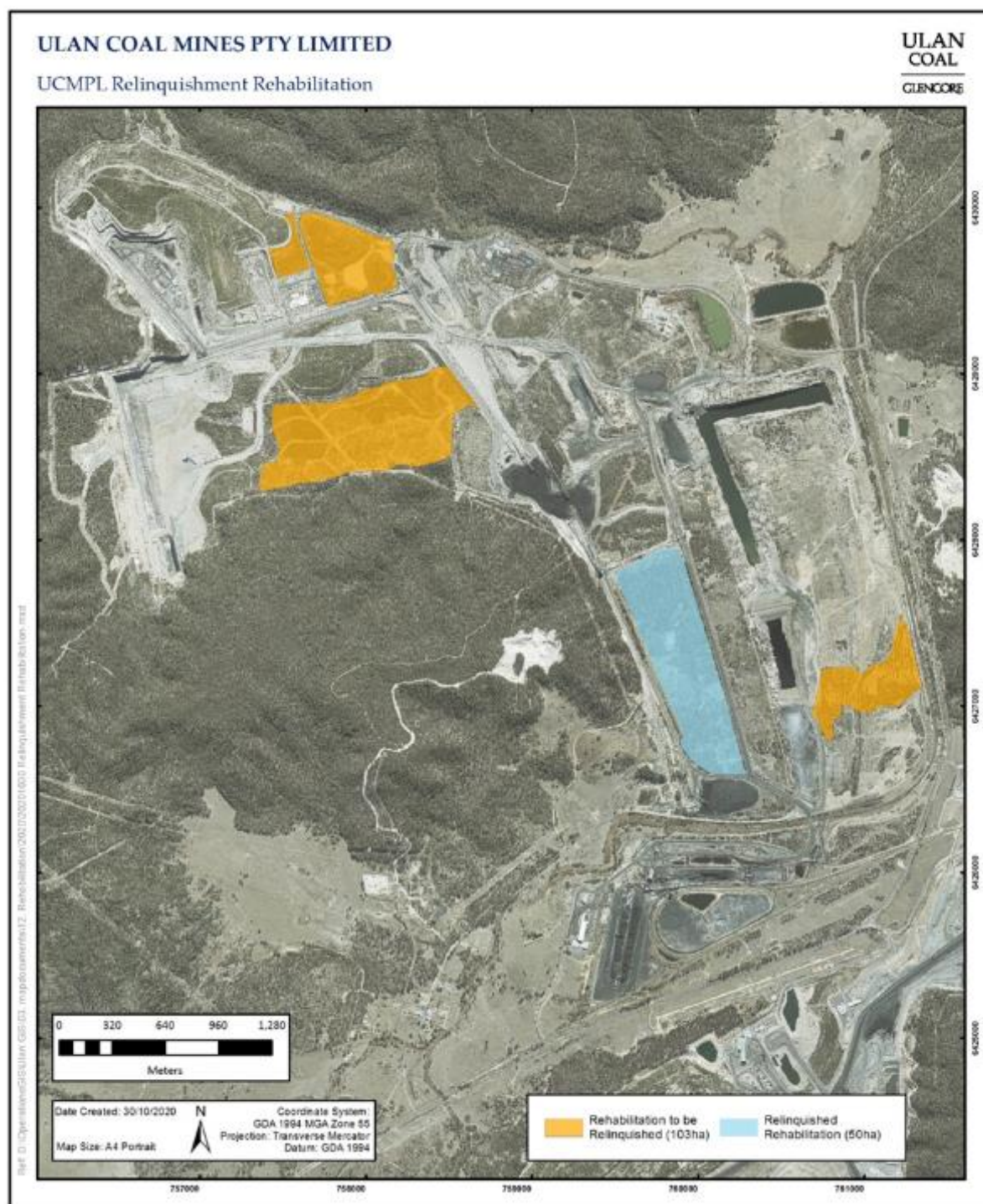
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- Polygon 8 (26.4 Ha) has been rehabilitated with more contemporary methods and locally relevant species. The vegetation is described as dense *Eucalyptus* sp. (4-8 m in height) > 100 stems per ha.
- Polygon 12 (57.1 Ha) has been rehabilitated with more contemporary methods and locally relevant species. The vegetation is described as a mixture of Dense *Eucalyptus* sp. (4-8 m in height) > 100 stems per ha and dense *Acacia linearifolia* (+/- sparse *Eucalyptus* stands).
- Polygon 13 (19.7 Ha) is an area of historic rehabilitation in the East Pit Open Cut. It was rehabilitated using a range of forestry species similar to areas already certified. The vegetation is described as non-local native species advanced rehabilitation. It is similar to East Pit A2.

Figure 8-7 - Rehabilitation Certification Areas Under Investigation



Figure 8-8 - Rehabilitation Relinquishment Areas



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8.2.10 Rehabilitation Trials and Research

In 2018, UCMPL commenced a trial within Polygon 3 that focused on broadcast seeding of native trees in spoil (no topsoil) with a compost substrate, due to the extreme drought conditions experienced in the region at the time. In 2018, the site was ameliorated with lime gypsum and compost applied, sowed with cover crop and native seed mix. In 2021 tube stock infilling and reseeded of some areas was undertaken (**Figure 8-1**). UCMPL continue to monitoring the site with the area displaying stability and plant diversity.



Polygon 3 Rehab trial undertaken 2018 with no topsoil (Photo 2019)



Polygon 3 Rehab trial undertaken 2018 with no topsoil, (Photo 2021)

UCMPL is participating in providing historical monitoring data from its biodiversity offset areas to assist with an ACARP project entitled *Review of Best Practice Management and Performance Assessment of Biodiversity Offset Areas*. The overall aim of the project is to produce industry toolkits (guides/frameworks supported by decision support tools) to:

- Select Biodiversity Offset Area (BOA) management measures that are evidence based, best suited to site circumstances and most likely to provide the best achievable biodiversity outcomes;
- Select monitoring and evaluation techniques that reliably measure the achievement of desired biodiversity outcomes and support adaptive management; and
- Consider any emerging bushfire risks associated with BOA stewardship and identify options for management.

9. Community

9.1 Ulan Coal CCC Meetings

Four meetings of the Ulan Coal Community Consultative Committee (CCC) were held on the 18 March, 3 June, 23 September and 2 December 2021. Operational progress and activities, community complaints, monitoring results and environmental performance were presented at each meeting. The 2021 meetings also presented and discussed activities and interactions with other mines both proposed and existing in the region, the exploration program, proposed modifications to the Project Approval, results of the Annual Review, additional community consultation and the community investment program.

For the complete 2021 CCC presentations refer to the Ulan Coal website <https://www.glencore.com.au/operations-and-projects/coal/current-operations/ulan-coal/community-documents>

9.2 Exploration Consultation

The exploration program for EL8687 and EL7542 in 2021 was announced in advertisement placed in Mudgee Guardian Mining Notice Classifieds 22 January 2021 and 29 January 2021 advising intention to drill in Bungaba area, providing contact details for further information (**Attachment L**).

Letters were sent on 21 January 2020 to all residents within 2km of EL8687 (those within potential audible range of drilling activities) regarding re-commencement of drilling operations for the 4 remaining boreholes from the 2019 exploration program.

Throughout the 2021 reporting period prior to drilling operations occurring within EL8687 adjacent landholders/residents were notified via phone of the schedule for drilling. Notification letters and exploration newsletter updates were delivered to landholders within 5km of the operations, indigenous stakeholder groups, Mudgee Local Aboriginal Land Council, Ulan Coal CCC Members, Bungaba Progress Association, Mid Western Regional Council and the NSW government local Member of Parliament. Two community information sessions were held for residents, landholders and other interested stakeholders (**Section 9.5**).

9.3 Community Sponsorship

GCAA invests in Health, Arts and Culture, Education and Enterprise, Environment and the Community, including, as an example, education grants to NSW Government Schools. Examples of community investment and support in 2021 included:

- Mid-Western Rural Fries Services (Donation support to purchase 12-seater bus, first aid training equipment and fireground radios);
- Lions Club of Mudgee (Laptop, wood deliveries);
- Mudgee Show Society (2021 Show);
- Gulgong Show Society (2021 Show);
- Mudgee PCYC (Hydrochlorinator for therapy pool);
- Mudgee Fine Foods;

- Mudgee Playgroup (Playgroup facilities);
- Mid-Western Regional Council (Roadside Clean Up);
- Mudgee Junior Rugby League (Field buggy);
- Mudgee High School (Synthetic turf repairs);
- Mudgee Gulgong Wolves (Video equipment);
- North East Wiradjuri Co Ltd (Storage trailer);
- Lue Public School (Replacement and relocation of playground equipment);
- Kandos Public School (Technology upgrades);
- Gulgong Public School (Breakfast club);
- Watershed Landcare (Working Together Projects);
- Bungaba Progress Association (Improvement works to Neville Williams Hall);
- McGrath Foundation;
- Black Dog Institute;
- Mudgee 1st Scout Group (Leadership and skills training);
- Mudgee Headquarters Bushfire Brigade (Potable safety lighting);
- Kanandah Retirement (Video conferencing equipment); and
- Mudgee & Districts Seniors Week Committee (2022 Seniors Week).



Figure 9-1 – Community Activities (Mudgee Little Athletics –High Jump Equipment)



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Figure 9-2 – Community Activities (North West Falcons – Goals at Billy Dunn Oval)



Figure 9-3 – Community Activities (Mid-Western RFS – Toyota Hiace 12 Seater Bus)



Figure 9-4 – Community Activities (Woodfire Donation)

9.4 Community Complaints

Of the seven (7) complaints received during the 2021 reporting period, two were due to noise, one odour, one relating to vehicular generated dust on a public road, two relating to the Bungaba exploration program and one due to notification not provided prior to a boundary survey. Community complaints from 2013 are presented in **Figure 9-5**.

Historical and the 2021 community complaint summary register is available from the Ulan Coal Website <https://www.glencore.com.au/operations-and-projects/coal/current-operations/ulan-coal/community-documents>.

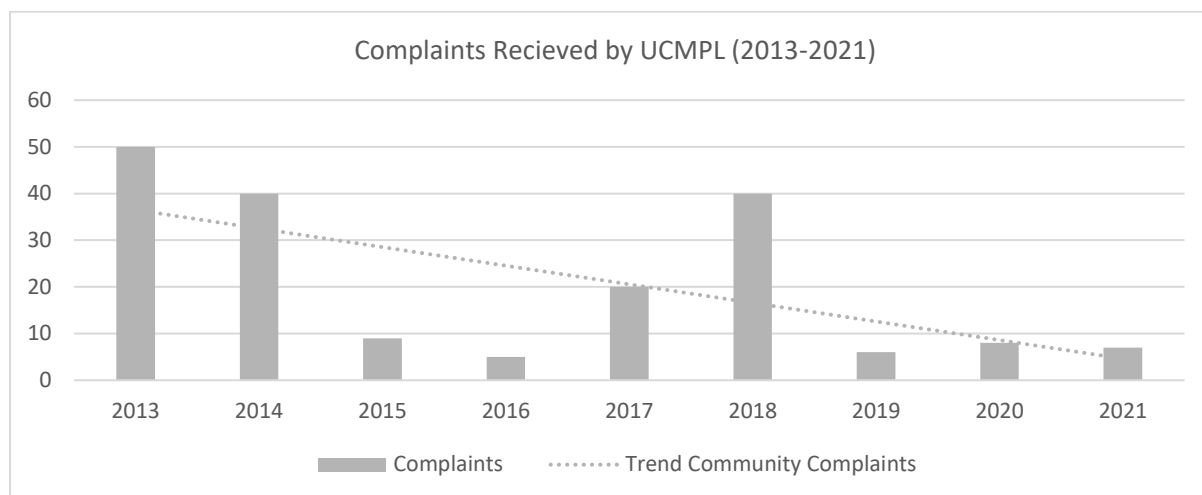


Figure 9-5 – Community Complaints (2013-2021)

9.5 Bungaba Community Consultation Program

UCMPL held two community information sessions in March and December 2021 to provide the community with both operational and exploration activities, with a focus regarding the Bungaba Project Area and current and proposed exploration activities associated with EL8687. For the 2021 Bungaba Community Newsletters and the Ulan Coal Community Newsletter refer to the Ulan Coal website <https://www.glencore.com.au/operations-and-projects/coal/current-operations/ulan-coal/community-documents>

9.6 Ulan Road Noise Mitigation Strategy

In 2020, all fifteen properties within the zone for noise mitigation measures have had their respective noise mitigation measures completed. The last remaining properties to finalise noise agreements and complete their noise mitigation measures occurred in April and July 2020. One property has declined noise mitigation works and two properties are outside the zone for noise mitigation measures.

In 2021, UCMPL were informed one property owner within the zone for noise mitigation measures that not all the agreed noise mitigation measures had been completed. UCMPL in consultation with the other neighbouring mines will follow up this matter with the property owner in 2022 to ensure all agreed noise mitigation measures are implemented.

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

9.7 Ulan Road Traffic Management

Employees, including contractors, are trained and reminded (through site inductions, environmental management systems training, training day presentations and toolbox talks) of each person's responsibility to maintain legal and considerate behaviour during passage to and from the mine site. Key messages communicated include considerate and legal behaviour, minimising road use where possible, litter avoidance and reporting unsafe behaviour.

10. Independent Compliance Audit

An Independent Environmental Audit (IEA), as required by Schedule 5 Condition 8 of PA08-0184, is conducted every three years by a suitably qualified, experienced and independent team, who has been endorsed by the Secretary.

The previous IEA was conducted in 2019 with the next IEA scheduled for 2022. A summary of the audit outcomes and any recommendations from the 2022 IEA will be provided in the next AR.

A copy of previous IEA reports and responses to IEA recommendations can be found on the Ulan Coal website at <https://www.glencore.com.au/operations-and-projects/coal/current-operations/ulan-coal/reporting-documents>

11. Incidents & Non-compliances

UCMPL must notify the EPA, DPIE and other relevant agencies immediately on becoming aware of a notifiable incident³⁹.

11.1 Reportable Incidents

There were no reportable incidents during the 2021 reporting period.

11.2 Non-Compliances

There was a total of three non-compliances, as identified in **Compliance Table 2** for the 2021 reporting period. A summary of non-compliances, the nature and cause of the non-compliances and actions to address the non-compliances is provided in **Table 11-1** below. UCMPL exceeded the short-term criterion for particulate matter (limit 50 µg/m³) at EPL Monitoring Site 30 on 14 January 2021 (i.e. PM₁₀ of 65.4 µg/m³ measured over 24 hour period). Review of wind conditions and the Moolarben Coal Operations TEOM, located closer to the Ulan Complex, indicated that the exceedance was an isolated incident at the monitoring site and not related to the Ulan Mine Complex. A site inspection of the monitoring site did not reveal an obvious source; however, slashing had recently occurred in the area. The exceedance was reported to EPA and DPIE in on 18 January 2021.

Table 11-1 – Details of Non Compliances

Relevant Approval	Date	Details of Non-Compliance Issue	Cause of Non-Compliance	Actions to Address Non-Compliance
EPL394	13 Jan 2021	13 January 2021, it was identified that the Meteorological Station EPA ID Number 32 was unavailable for a period of time greater than 48 hours to continuously measure rainfall between December and 12 January 2021.	Vegetation had lodged in the funnel of the rain gauge, preventing accurate recording of rainfall.	Vegetation had lodged in the funnel of the rain gauge, preventing accurate recording of rainfall. Vegetation was removed.
EPL394	25 May – 10 Jun 2021	10 June 2021, it was identified that the Meteorological Station EPA ID Number 32 was unavailable for a period of time greater than 48 hours to continuously measure rainfall from at least May 25th onwards.	The rain gauge was observed to be working, however, the communications cable was identified as broken at two clear locations.	Communication cables were repaired. A notification has been set up in the Sentinex system to alert when no communications have been received.
PA08_0184	14 Jan 2021	PM ₁₀ dust levels measured by TEOM (EPA Monitoring Site 30 (Sentinex71) exceeded criteria stipulated by PA08_0184, Schedule 3, Condition 19, Table 9. The elevated dust levels occurred for a short duration on the evening of Thursday 14 January 2021.	The wind direction was WSW, travelling from the monitoring station towards UCMPL. Given the wind direction, Ulan Coal do not consider there to be an operational source for the exceedance.	The wind direction was WSW, travelling from the monitoring station towards UCMPL. Given the wind direction, Ulan Coal do not consider there to be an operational source for the exceedance.

³⁹ PA 08_0184 Schedule 5, Condition 6 and Protection of the Environment Operations Act 1997, Section 153 - Pollution Incident Response Management Plan (PIRMP, ULNCX-111515275-2432, tested on 18/05/21 and subsequently updated on 22/8/2021).

12. Activities Planned for 2022

Operational activities planned for 2022

- The Ulan Underground will continue to develop roadways for LWW8, LW30 and LW31 in 2022 as well as advancing the Main Headings. Longwall mining will continue in LWW7 until late May when, following a Longwall relocation, mining will commence and continue in LW30 for the remainder of 2021.
- Ulan West Operations will continue to develop roadways for LW7 and LW8 in 2021. Longwall mining of LW6 will continue until May 2022 when, following Longwall relocation, mining will commence in LW7. The Ulan West Operations will continue installation of new ventilation infrastructure (shaft) above Mains roadways adjacent to LW9B which will support Life of Mine ventilation requirements.
- The Ulan Open Cut is not expected to operate in 2022. Finalisation of the clear water drain is expected in 2022. Mining could occur in response to operational requirements.
- Handling and processing of coal from the ROM stockpiles to the train load out.
- Blasting and extraction of rock material from the Bobadeen Basalt Quarry, if required for operational projects.
- Exploration at both Ulan West and Ulan Underground will continue with approximately 14 and 7 holes respectively to be drilled in 2022.
- Exploration for Bungaba will continue with approximately 15 holes to be drilled in 2022

Independent Environmental Audit 2022

- Undertake the Independent Environmental Audit 2022 (IEA 2022) as required by PA08-0184.

Water Management Plan

- Incorporation of sub-plans (groundwater, surface water and response plan into overarching WMP to reduce duplication).

Groundwater Monitoring Program

- Response to recommendations from the 2021 Groundwater monitoring report.
- Recalibration of the Groundwater Model and Site Water Balance.

Rehabilitation/Remediation/Offset Areas/Goulburn River

- Management actions as for identified issues within the rehabilitation/remediation and offset areas.
- Prepare to plant within revised Bobadeen East Offset area (subject to the installation of a new power line easement proposed by a Public Utility).
- Progress the rehabilitation relinquishment (**Section 8.2.9**) and identify other areas that meet completion criteria.
- Commence implementation of GCAA report card recommendations including East Pit rehabilitation remediation/maintenance works.

The following heritage works are planned for 2022:

- Completion of MOD survey work.
- Exploration sites (as required).
- Rock shelters testing /salvage 171,190,192.
- Complete Southern and Northern survey gaps.

Management Plan/Extraction Plan revisions planned for 2022 include:

- Revision of the relevant Ulan Coal Management Plans following the submission of this Annual Review; including the incorporation of the implemented recommendations from the following reports:
 - Annual Groundwater Report.
 - Ulan Creek Stability Report.
 - Ulan West Annual Subsidence Report.
 - Annual Biodiversity Reports.
 - Biodiversity Management Plan.
- Revision of Extraction Plan for LW30 and LWW6-LW8 to include LW31.
- Preparation of a new Rehabilitation Management Plan (RMP) to replace the MOP.

Approval Modifications

- Proposed Modification 6 to extend Ulan Underground LWW9 to LWW11 and widen LWW11 and extend Ulan West LW9 to LW12. The Modification will include minor changes to surface infrastructure. There are no proposed changes to extraction limits, the mining method, coal processing or transportation.

Community

- Consultation for the 2022 Exploration Program within EL8687, EL7542 and EL9363 via newspaper ad, community newsletters, exploration newsletters, emails, letter drops, telephone calls and face to face meetings.
- Negotiate private property access agreements with landholders for exploration within ML1468, EL8687, EL7542 and EL9363.
- Provide support to the local community through Community Investment Program via sponsorship support, community projects and in-kind donations.

13. References

Environmental Noise Monitoring – December 2021, Global Acoustics Pty Ltd (January 2022)

Environmental Noise Monitoring – June 2021, Global Acoustics Pty Ltd (August 2021)

UCMPL Aquatic Monitoring Report 2021, Eco Logical Australia (March 2022)

UCMPL Fauna Monitoring Report 2021, Eco Logical Australia (March 2022)

Floristic Monitoring - Annual Report 2021, Eco Logical Australia (March 2022)

UCMPL Microbat Monitoring Report 2021, Eco Logical Australia (March 2022)

UCMPL Bobadeen Vegetation Offset Area Monitoring Report 2021, Eco Logical Australia (September 2021)

UCMPL Brokenback Conservation Area - Area 1 Monitoring Report 2021, Eco Logical Australia (September 2021)

UCMPL Brokenback Conservation Area - Area 2 Monitoring Report 2021, Eco Logical Australia (March 2022)

UCMPL Highett Road Acacia ausfeldii Management Area Monitoring Report 2021, Eco Logical Australia (September 2021)

UCMPL Spring Gully Cliffline Management Area Monitoring Report 2021, Eco Logical Australia (March 2022)

2021 Annual Review of Subsidence Monitoring at Ulan West and Ulan Underground Mines, SCT Operations Pty Ltd (March 2022)

2021 Monitoring of Creeks and Tributaries, Pacific Environmental Pty Ltd (March 2022)

2021 Ulan Creek Stability Monitoring Report, Pacific Environmental Pty Ltd (March 2022)

2021 Cliff Line Monitoring Report, Pacific Environmental Pty Ltd (March 2022)

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