ULAN COAL

GLENCORE

Annual Review
2020

Name of operation	Ulan Coal Mine
Name of operator	Ulan Coal Mines Propriety Limited
Development consent / project approval #	PA 08_0184
Name of holder of development consent / project approval	Ulan Coal Mines Propriety Limited
Mining lease #	CCL 741, MPL 315, ML 1341, ML1365, ML 1366, ML 1467, ML 1468, ML 1511, ML 1554, ML 1656, ML1754, ML1796, EL 5573, EL 7542, & EL 8687
Name of holder of mining lease	Ulan Coal Mines Propriety Limited
Water licence #	WAL41492, WAL19047, WAL37192, WAL37192, WAL41906, WAL42900 & WAL34921 (only allocation Licences listed).
Name of holder of water licence	Ulan Coal Mines Propriety Limited
MOP/RMP start date	01/12/2017
MOP/RMP end date	01/12/2024
Annual Review start date	01/01/2020
Annual Review end date	31/12/2020

I, Robyn Stoney, certify that this audit report is a true and accurate record of the compliance status of Ulan Coal Mines Limited for the period 2020 and that I am authorised to make this statement on behalf of Ulan Coal Mines Pty Limited.

Note.

a) The Annual Review is an 'environmental audit' for the purposes of section 122B (2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person 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.

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

Name of authorised reporting officer	Robyn Stoney
Title of authorised reporting officer	Environment and Community Manager
Signature of authorised reporting officer	
Date	31 March 2021

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ELECTRONIC COPY

Electronic copy of the 2020 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	Yes
ML's	Yes
EL's	Yes
EPL 394	No*
Water Licences	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
EPL 394	M2.2	EPA identification number 15 (HV1 at Flannery's), failed to collect a valid sample on 6 August as required by M2.2 of the licence.	Non-compliant	The filter paper was found damaged at the time of collection, the cause of damage could not be determined.	**11.2**
EPL 394	M2.2	EPA identification numbers 15 (HV1 at Flannerys) and 29 (HV3 at 331 Cope Road), failed to collect valid samples 3 January 2020, required by condition M2.2 of the licence.	Non-compliant	The canisters were secured into the monitoring equipment incorrectly, personnel will be re-trained if they have not undertaken the task for greater than 6 months.	**11.2**
EPL 394	M4.1	The meteorological monitoring station Sentinex 71 (WS2) did not accurately record rainfall data from 1 December to 31 December 2020.	Non-compliant	Reported to EPA on 13 January when the issue was discovered. The gauge was cleaned and a cleaning maintenance regime implemented to avoid the issue in future.	**6.1.2**

2. Introduction

2.1 Report Scope

This consolidated Annual Review[1] (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 2020 to 31 December 2020, with the AR due by 31 March 2021[2]. In accordance with Condition 3, Schedule 5 of PA08_0184, a copy of this report will be distributed to:

- DPIE;
- DPIE –Resources Regulator (RR);
- DPIE - Environment Energy and Science (EES);
- DPIE – Natural Resources Access Regulator (NRAR);
- Mid-Western Regional Council (MWRC); and
- Ulan Coal Mine Community Consultative Committee (Ulan Coal CCC).

Upon approval, this document will be uploaded to the Ulan Coal website for public viewing at www.ulancoal.com.au

2.2 Mine Ownership and Location

Ulan Coal Mines Propriety Limited (UCMPL) is owned by Glencore Coal Assets Australia Pty Limited. The Ulan Underground Mine, the Ulan West Underground mine, the Open Cut mine and land holdings including the Bobadeen Irrigation Scheme, as a collective, are referred to as the Ulan Coal Complex (UCC).

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 13000 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[3] (**Figure 2-1**) for:

- Operations to 2033;
- Longwall mining of the Ulan Underground Mine (Ulan Underground);
- Longwall mining of the Ulan West Underground Mine (Ulan West Operations);
- Open cut mining over a 239 ha area;
- 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.

[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).
[3] 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. Prior to PA08_0184, UCMPL operated under four major Development Consents, 18 modifications and 16 other minor development approvals.

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
Robyn Stoney	Environment & Community Manager	Work: 02 6372 5368 Email: robyn.stoney@glencore.com.au

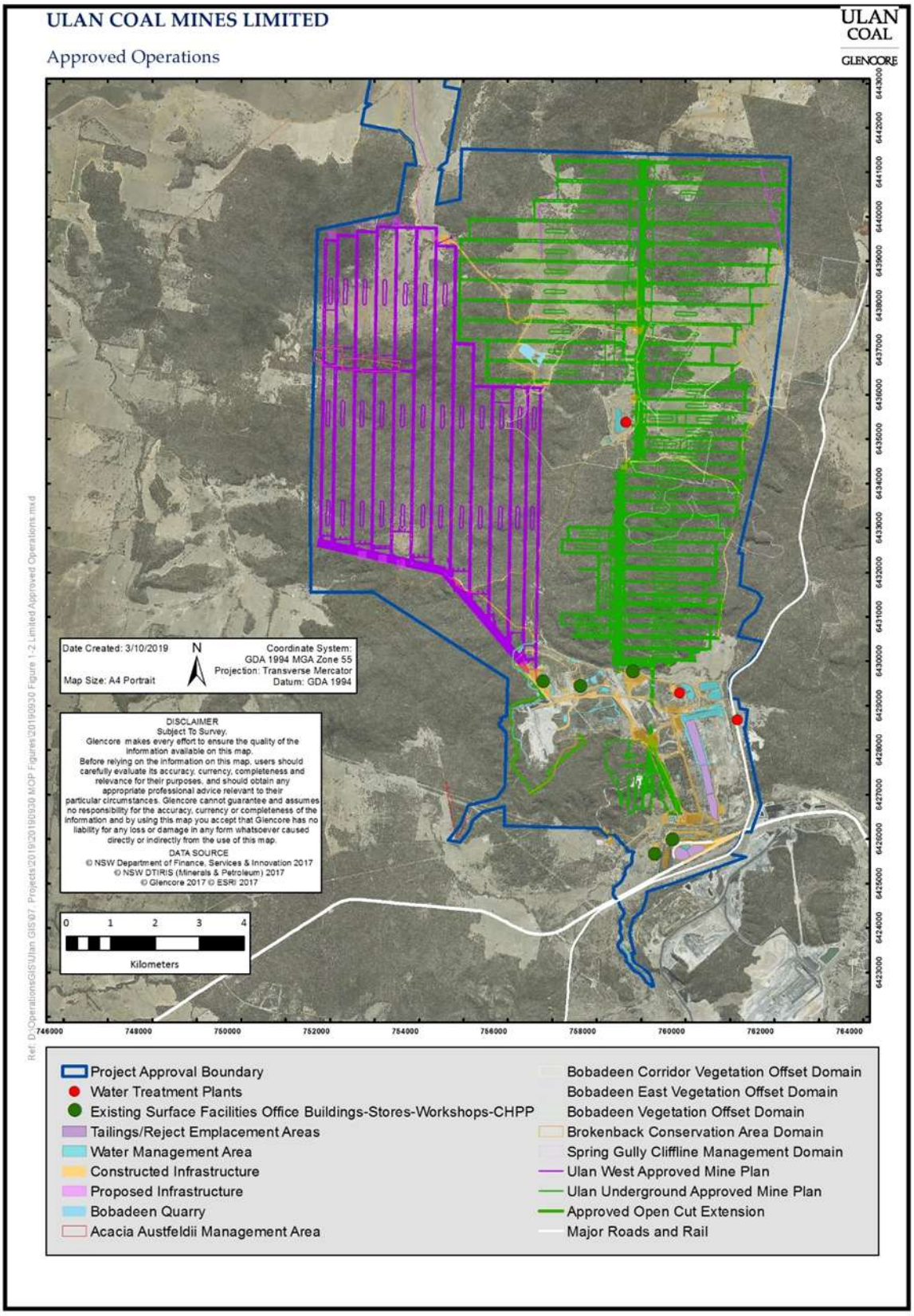


Figure 2-1 - Approved Ulan Complex Operations

3. Approvals

3.1 Detailed Approvals Compliance

3.1.1 Project Approval

Table 3-1 - Current Project Approval [4]

Approval	Modifications	Description	Approval Authority	Approval Date	Were all conditions of the approval complied with?
PA 08_0184	PA 08_0184	Ulan Coal –Continued Operations Project	DPIE	November 2010	Yes
	PA 08_0184 MOD 1	Longwall extraction of the North 1 mining area Modify Ulan Underground & Ulan West mine plans Concrete Batching Plant	DPIE	December 2011	Yes
	PA 08_0184 Court Orders	Land & Environment Court Judgement	DPIE	April 2012	Yes
	PA 08_0184 MOD 2	Modify Ulan West mine plan LW1-5 Remove restrictions on construction blasts Minor amendments to European and natural heritage sites where blasting measures are applicable	DPIE	May 2012	Yes
	PA 08_0184 MOD 3	Modify Ulan West Mine Plan- realignment of main headings further to the south.	DPIE	14 March 2016	Yes
	PA 08_0184 MOD 4	Modify Ulan West and Ulan Underground Mine Plan - extend the approved longwalls Ulan Underground LW30 - LW33 and LW W7-8 and Ulan West LW07 and LW08.	DPIE	17 July 2019	Yes

[4] DA 113-12-98 was surrendered to DPIE 20/10/17 in accordance with Schedule 2 Condition 9, within 3 months of the completion of LWs 26, West 2, and West 3. Resubmission was requested by DPIE, this occurred 23/11/17. Finalisation is pending the remaining landowners providing their consent for the surrender of DA 113-12-98.

3.1.2 Mining Leases & Exploration Licences

Mining and exploration authorisations are issued in accordance with the *Mining Act 1992* and regulated by RR. UCMPL's Mining Tenure is detailed in **Table 3-2** and displayed in **Figure 3-1**. A look up table (Attachment I) provides section references for compliance with specific ML reporting conditions.

Table 3-2 - Mining & Exploration Titles

Instrument	Authority	Date of Grant	Duration of Approval	Mine Area Applicability	Were all conditions of the approval complied with?
Consolidation Coal Lease (CCL) 741	RR	2/01/1990	15/05/2027	All operations	Yes
Mining Purpose Lease 315	RR	3/08/1993	3/08/2035	No. 3 Underground (Surface Lease)	Yes
Mining Lease 1341	RR	25/01/1994	25/01/2036	No. 3 Underground	Yes
Mining Lease 1365	RR	9/03/1995	9/12/2032	No. 3 Underground (Surface Lease)	Yes
Mining Lease 1366	RR	9/03/1995	9/12/2032	No. 3 Underground (Surface Lease)	Yes
Mining Lease 1467	RR	17/04/2000	16/04/2021	No. 3 Underground (Surface Lease)	Yes
Mining Lease 1468	RR	16/05/2000	15/05/2021	No. 3 Underground	Yes
Mining Lease 1511	RR	24/04/2002	23/04/2023	No. 3 Underground (Surface Lease)	Yes
Mining Lease 1554	RR	1/09/2004	31/08/2025	No. 3 Underground (Surface Lease)	Yes
Mining Lease 1656	RR	03/03/2011	03/03/2032	No. 3 Underground (Surface Lease)	Yes
Mining Lease 1697	RR	22/05/2014	22/05/2035	Ulan Open Cut	Yes
Mining Lease 1798	RR	19/02/2020	19/02/2041	Ulan West	Yes
Mining Lease 1799	RR	26/02/2020	26/02/2041	Ulan Open Cut	Yes
Exploration Licence 5573	RR	28/04/1999	27/02/2018*	Ulan Underground	Yes
Exploration Licence 7542	RR	6/05/2010	06/05/2020	Ulan West	Yes
Exploration Licence 8687	RR	31/01/2018	31/1/2024	Ulan West	Yes
Mining Lease Application 470	RR	Submitted 13/02/2014	Application Pending	Ulan Open Cut	NA

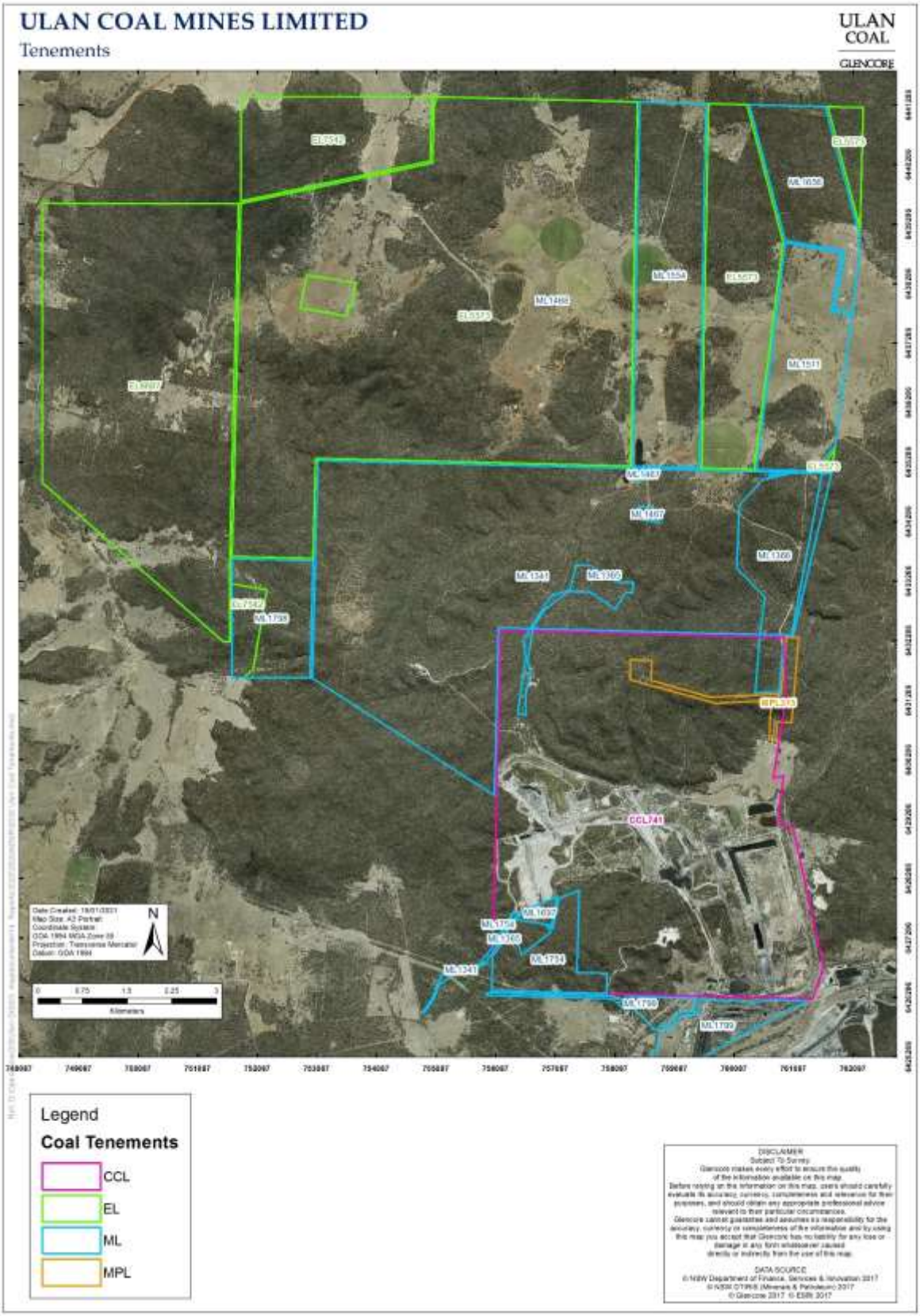


Figure 3-1 Ulan Coal Tenements

3.1.3 Water Licences

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

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

Licence No.	Description	Works Type	Extraction Limit (ML)	Expiry Date	Were all conditions of the approval complied with?	
					Water Financial Year	Calendar year
20BL168100	Monitoring Bores	Monitoring Bore	NA	Perpetuity	Yes	Yes
20BL172841	Bobadeen Monitoring Network	Monitoring Bore	NA	Perpetuity	Yes	Yes
20BL172845	Goulburn River Diversion Monitoring Network	Monitoring Bore	NA	Perpetuity	Yes	Yes
20BL172846	Alluvium Monitoring Network	Monitoring Bore	NA	Perpetuity	Yes	Yes
20BL172847	Hydrocarbon Monitoring Network	Monitoring Bore	NA	Perpetuity	Yes	Yes
20BL172850	North Monitoring Network	Monitoring Bore	NA	Perpetuity	Yes	Yes
20BL172851	Intermittent Monitoring Network	Monitoring Bore	NA	Perpetuity	Yes	Yes
20WA216193	1977 Cope Road	Stock/Domestic Bore	NA	Perpetuity	Yes	Yes
80WA706112	2450 Blue Springs Road	Stock/Domestic Bore	NA	Perpetuity	Yes	Yes

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	Were all conditions of the approval complied with?[5]	
						Water Financial Year	Calendar year
WAL41492 (20AL214787)	Aquifer (Extraction)	Water Allocation Licence	7060	Oxley Basin Coast Groundwater Source	Perpetuity	Yes	Yes
WAL37192 (20AL723743)	Aquifer (Extraction)	Water Allocation Licence	704	Sydney Basin Murray Darling Basin Groundwater Source	Perpetuity	Yes	Yes
WAL 41906 (80AL724736)	Aquifer (Extraction)	Water Allocation Licence	2215	Sydney Basin Murray Darling Basin Groundwater Source	Perpetuity	Yes	Yes
WAL42900 (20AL220117)	Aquifer (Extraction)	Water Allocation Licence	4031	Sydney Basin Murray Darling Basin Groundwater Source	Perpetuity	Yes	Yes
20FW213272	Goulburn River Flood Gates	Levy Licence	NA	NA	21/09/2027	Yes	Yes
WAL19047 20WA209953	Moolarben Creek Dam/Pump & Baseflow loss	Water Allocation Licence	600	Upper Goulburn River Water source	29/09/2027 WAL allocation Perpetuity	Yes	Yes
WAL41817	Aquifer (Baseflow loss)	Water Allocation Licence	50	Upper Talbragar River Water Source	Perpetuity	Yes	Yes
WAL 34921 (80AL716931)	Aquifer (Baseflow loss)	Water Allocation Licence	30	Talbragar Alluvial Groundwater Source	Perpetuity	Yes	Yes

[5] Extraction against licences provided in Section 5.3 of this report.

3.1.4 Other Approvals

Table 3-5 - Other Approvals and Licences

Licence/Approval	Licence/ Approval No.	Authority	Approval/Expires	Were all conditions of the approval complied with?
Environment Protection Licence (EPL)	394	EPA	Anniversary Date 18 November	No[6]
Ulan Mining Operations Plan (MOP)	2017-2024	RR DPIE	Expires 1/12/2024	Yes
Ulan Underground SMP/EP approval LW27-29 & W4-5	OUT11/23905 SO4/01722	RR DPIE	Approval (LW27-29 & W4-W5) 23/05/2013, SMP Expiry 31/05/2020	Yes
Ulan West Extraction Plan approval LW1 to LW6	NA	DPIE	Approval 1/02/2019	Yes
Ulan Underground Extraction Plan LW30 & W6-W8	NA	DPIE	Approval 19/08/2019	Yes
Radiation Management Licence	5061101	EPA	Expires 29/08/2021	Yes
Radiation User Licence	5023004	EPA	Expires 04/06/2021	Yes
Dangerous Goods Notification	NDG023149	WorkCover NSW	Perpetuity	Yes
EPBC Approval	2009/5252	Federal DE&E	Expires Sept 2031	Yes
EPBC Approval (MOD 4 extension area)	2015/7511	Federal DE&E	Expires 1 March 2036	Yes
Bobadeen Grinding Groove Conservation Agreement	NA	EES	22 December 2015 to Perpetuity	Yes
Conservation Agreement for Brokenback Conservation Area- Area 1 (UCMPL owned land)	NA	EES	Final signed copy received 11 December 2019	Yes
Conservation Agreement for Bobadeen Vegetation Offset Area (UCMPL owned land)	NA	EES	Final signed copy received 11 December 2019	Yes
Conservation Agreement for Highett Road Offset Area (UCMPL owned land)	NA	EES	Final signed copy received 11 December 2019	Yes
Conservation Reservation for Spring Gully Offset Area (Crown owned land)	NSW Government Gazettal No 165	DPIE- Crown Land	Gazetted 6 December 2019[7]	Yes

[6] Annual Return submitted to the NSW EPA on 13 January 2020 details three technical non-compliances in the reporting period 18/11/19-17/11/2020: The Flannery (EPA ID No. 15) and Merlene (EPA ID No. 29) high volume air samplers failed to collect valid samples on 3 January 2020.; One high volume air sampler failed to collect a valid sample on 6 August 202), and the meteorological monitoring station Sentinex 71 (WS2) did not accurately record rainfall data from 1 December to 31 December 2020.

[7] Crown Reserves Gazetted on 6 December 2019 are awaiting registration on Title

Licence/Approval	Licence/ Approval No.	Authority	Approval/Expires	Were all conditions of the approval complied with?
Conservation Reservation for Brokenback Conservation Area- Area 2 (Crown owned land)	NSW Government Gazettal No 165	DPIE- Crown Land	Gazetted 6 December 2019	Yes
Conservation Reservation for Valley Way Grinding Grove Conservation Area (Crown owned land)	NSW Government Gazettal No 165	DPIE- Crown Land	Gazetted 6 December 2019	Yes

3.2 Changes to Approvals in 2020

3.2.1 Subsidence Management & Extraction Plans

An Extraction Plan (EP) for Ulan Underground Longwalls LW30 and W6-W8[8] was updated to align with the Modification 4 panel extensions to LW30 and LWW7 and LWW8 and resubmitted to DPIE for approval on 7 August 2020. Further consultation with DPIE-NRAR and DPIE-RR resulted in a resubmission to address recommendations in January 2021. The amended EP for Ulan Underground Longwalls LW30 and W6-W8 was subsequently approved by DPIE on 2 February 2021.

3.2.2 Ulan Modification 5

Modification 5 (MOD 5) was approved by DPIE on 7 August 2020. This was a minor modification under S4.55(1) of the EP&A Act to amend a miss-description of the approved longwall recovery positions within Ulan West LW 6 and 8, as shown in Figures provided in Appendix 2 to 7 of PA08_0184.

3.2.3 Mining Operations Plan

The Mining Operations Plan was amended in 2020 to account for Grant of MLs 1798 and 1799, to account for a change of name to Ulan Coal Mines Pty Ltd and to refer to a commitment made to undertake a risk assessment to address matters identified during an inspection of the Ulan Coal Mine Tailings Storage Facility by RR inspectorate inspectors on 10 March 2020. The MOP amendment was approved by the RR on 15 May 2020.

3.2.4 First Workings

A request to modify first workings[9] for LW8 at Ulan West was made on 1 July 2020 to provide ventilation and safe access during recovery of the longwall supports from LW8. This was approved by DPIE on 17 July 2020.

4. Operations Summary

4.1 Exploration

Surface exploration included drilling[10] of 4 partly-cored borehole at Ulan Underground, 4 partly-cored and 3 chipped boreholes at Ulan West and 2 partly-cored borehole and 1 fully cored borehole at Bungaba (EL8687) (**Table 4-1**) for mine design characterisation (geotechnical, coal quality). One borehole at Ulan Underground was drilled to approximately 91m and one at Ulan West was drilled to approximately 6m before heavy rainfall made the locations unsafe. The boreholes were cased and the casing grouted. These boreholes are in a condition to return and continue drilling once site conditions are deemed suitable in 2021.

Of 2457m drilled, 663m was open hole drilling and 1794m was core drilling. Cored holes were chipped down to approximately 20m above the Ulan Seam, and then cored to total depth. Core is logged in

[8] 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)
[9] PA08_0184 Schedule 3, condition 25
[10] Authorised Surface Disturbance Notification (SDN) is required from the DPIE-RR for drilling in exploration licence areas outside of the mining lease.

the field and stored in the Ulan core shed. Exploration holes were geophysically logged, surveyed by site surveyors and then sealed and rehabilitated consistent with the requirements of the Exploration Code of Practice: Rehabilitation.[11] One vibrating wire piezometer (VWP) was installed to a borehole. Coal quality testing results are positive to mining and the geological model was updated. No prospecting operations were undertaken in environmentally sensitive areas of state significance or exempted areas as defined by the *Mining Act 1992*.

Table 4-1 - Summary of 2020 Exploration Drilling

	Ulan underground	Ulan West	Bungaba	Total
Tenement	EL7542 (1) ML1468 (3 complete, 1 incomplete)	ML1468	EL8687	
Core Boreholes	4 x Partially cored 1 x suspended	3 x Partially cored 1 x Suspended	2 x Partially cored 1x Fully cored	12
Meters Drilled	901m	574m	319m	1794m
Non-Core Boreholes	Nil	3	Nil	3
Meters Drilled	0	663m	0m	663m
Total Meters Drilled	901m	1237m	319m	2457m
Boreholes Grouted	4 borehole grouted	3 boreholes grouted	2 boreholes grouted	**9**
Boreholes Rehabilitated	2	3 2 boreholes cased for RIM survey. Sites rehabilitated	2 borehole rehabilitated 1 borehole to be grouted, delay wet access	**9**

The 2021 exploration program is outlined in **Figure 4-1**; this program is subject to change based on operational requirements. There are 80 boreholes planned to be drilled within the next reporting period. These boreholes will be drilled to characterise areas of geological and geotechnical concern.

4.2 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 works[12] and is not limited to open cut mining operations.

The Ulan Open Cut did not operate during the reporting period; hence 0 ha of land within the Open Cut extension was cleared in 2020. Approximately 3.47 ha of land was cleared for infrastructure projects within the UCC during the 2020 reporting period.

[11] NSW Department of Planning and Environment, Division of Resources and Geoscience (2015) *Exploration Code of Practice: Rehabilitation*

[12] G*CAA Ground Disturbance Permit (GDP) (CAA HSEC PER 0004)* is signed off by Senior Environment personnel and the Mine Surveyor.

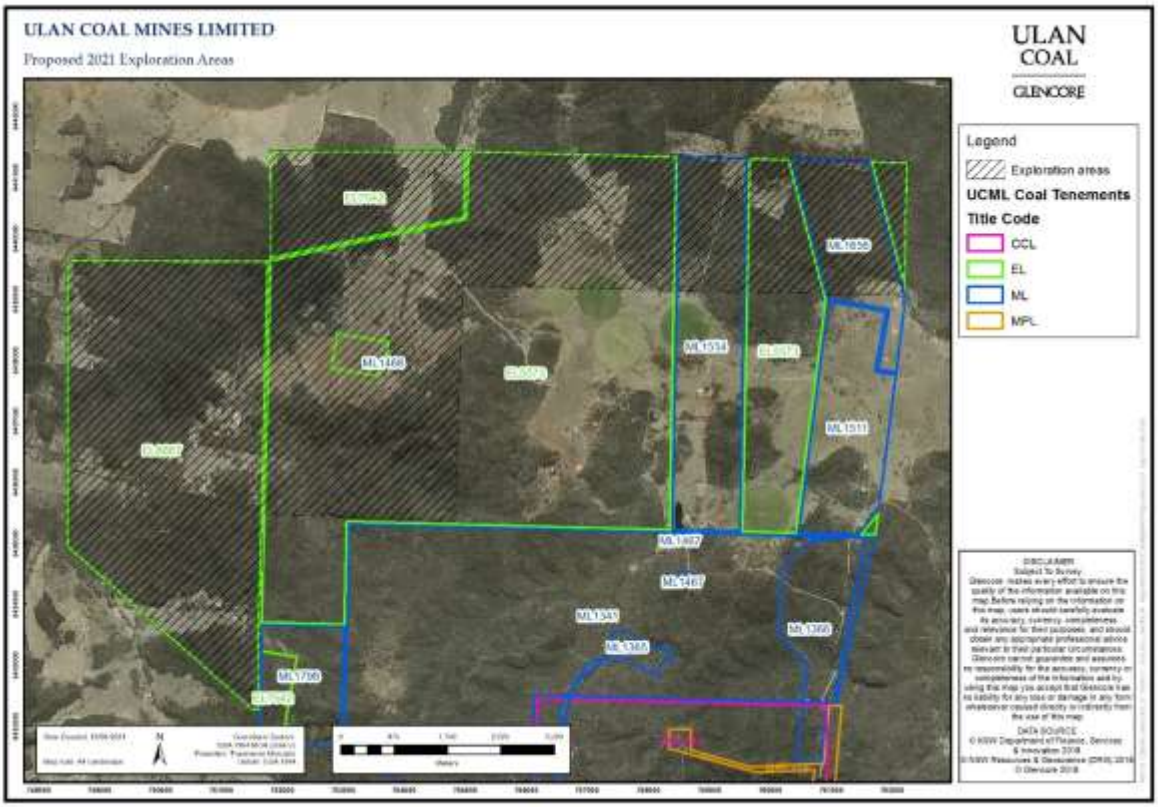


Figure 4-1 Proposed 2021 exploration program

4.3 Mining activities

4.3.1 Ulan Underground

Ulan Underground mining operations[13] included development of roadways for LWW7 and LWW8, in accordance with first workings approvals. Extraction of Ulan Underground LWW5 was in accordance with the SMP for Longwalls 27-29 & LWW4 to LWW5. LWW5 was completed in January 2020 with the extraction of the final 141m of that panel. Extraction of Ulan Underground LWW6 was in accordance with EP[14] for Longwalls LW30 and LWW6 to LWW8[15]. LWW6 commenced extraction on 8 February 2020 [16] and had retreated 2,904m by 31 December 2020. Ulan Underground produced 5.370 million tonnes of ROM coal during the reporting period (**Table 4-2**).

4.3.2 Ulan West Underground

Underground mining operations[17] included development of roadways for LW6, LW7, LW8 and the main headings consistent with first workings approvals. Secondary extraction of LW5[18] commenced 1 March 2019 and was completed on 19 June 2020. LW6 commenced extraction on 11 August 2020 and

[13] Standard longwall mining methods to mine D Working Section (DWS), the lower 3m of the Ulan seam, thermal coal. Development is undertaken using continuous miners and shuttle cars to drive roadways to access to the mine. The longwall is approximately 400m wide.
[14] PA08_0184 Schedule 3, condition 26.
[15] Approved by DPIEDPIE 2 February 2021.
[16] Approved EP UUG LW30 and LWW6 to LWW8 (2 February 2021).
[17] Ulan West uses longwall methods to mine the DWS. Longwall 1: 250m wide, LW2: 303m wide, remaining blocks are 400m wide.
[18] The approved EP, required by PA08_0184, Schedule 3, Condition 26,: LW1 to LW2 (25 March 2014), LW3 to LW4 (30 May 2016), and LW5 to LW6 (25 January 2019).

is forecast for completion on 7 June 2022. LW6 had extracted 1290m by the end of 2020. Ulan West produced 5.796 million tonnes of ROM coal during the reporting period (**Table 4-2**). Infrastructure construction of LW6 End of Block ventilation and dewatering facilities continued in 2020 and was commissioned in line with LW6 mining schedule.

4.3.3 Open Cut

The Open cut mining area[19] has been in care and maintenance since 10 October 2016.

4.3.4 Saleable Production

Total product coal for the reporting period was 10,303,392 tonnes. **Table 4-2** provides an overview of the production schedule for 2020 against the previous reporting year and the forecast for the 2021 reporting period.

Table 4-2 - 2020 Cumulative Production

	Unit	Approved limit (specify source)	2019 Reporting Period	2020 Reporting Period	2021 Reporting Period **(Forecast)**
Topsoil Stripped	m^3	NA	0	0	0
Topsoil Used/Spread	m^3	NA	0	0	0
Overburden Moved	m^3	NA	0	0	0
Open Cut	m^3	NA	0	0	0
ROM Coal Mined					
Ulan West	tonnes	NA	6,496,341	5,806,577	6,922,450
Open Cut	tonnes	4,100,000[20]	0	0	0
Ulan Underground	tonnes	NA	6,127,499	5,360,282	5,838,864
Total ROM	tonnes	NA	12,623,841	11,166,859	12,283,786
Process Waste Course Rejects	tonnes	NA	239,149	532,491	320,129
Process Waste Tailings	tonnes	NA	180,999	330,976	240,000
Product	tonnes	20,000,000[21]	12,623,841	10,303,392	12,277,257

4.3.5 Bobadeen Basalt Quarry

The Bobadeen Basalt Quarry[22] produced no Basalt Road Base in 2020 for road works or infrastructure construction.

4.4 Coal Handling and Processing

4.4.1 Mining Waste

The CHPP, located at the USO, washed 49.8% of Ulan West ROM and 34.9% of Ulan Underground ROM. The reject waste produced represents approximately 18.7% of the ROM coal processed in the plant; classified as either coarse reject (558,464 tonnes) and emplaced in the Barrier Pit or tailings (330,976 tonnes) emplaced in East Pit tailings dam number 2. [23]

[19] When operating, the Open Cut utilises a dragline to strip mine overburden and trucks, excavators and loaders for coal mining.
[20] PA08_0184,S2,6(a)
[21] PA08_0184,S2,6(b)
[22] Annual production limit of 100,000 tonnes (EPL394, A1.2).
[23] High Risk Activity (HRA) Notification 25 March 2018.

4.4.2 Coal Loaded and Rail Movements

Product coal transported via rail[24] on the Sandy Hollow rail corridor to the Port of Newcastle[25] during the reporting period was 10,547,220tonnes.[26] No movements occurred on the Tallawang to Wallerawang rail corridor in the 2020 reporting period.[27] Coal movements are summarised below.

Table 4-3- Coal Loaded and Train Movements in 2020

Month	Average and Maximum Trains Leaving Site per Day (Maximum allowed 10[28])	Total Movements for the Month	Coal Loaded for the Month
January 2020	4 -6	126	1,141,906
February 2020	4 – 6	105	896,846
March 2020	4 – 7	120	1,065,953
April 2020	4 – 6	106	945,266
May 2020	3 – 5	84	762,930
June 2020	3 – 5	77	712,466
July 2020	3 – 6	82	707,885
August 2020	3 - 5	102	918,813
September 2020	3 – 5	98	874,451
October 2020	4 – 7	128	1,157,200
November 2020	2 – 5	74	673,582
December 2020	3 - 6	78	689,920

5. 2019 Annual Review Feedback

The 2019 AR was submitted on 31 March 2020.[29] The 2019 AR was deemed to satisfy the reporting requirements of the approval and the Department's Annual Review Guideline (October 2015) by DPIE, in a letter dated 4 May 2020.

[24] PA08_0184 Schedule 2 Condition 7(a)
[25] Product coal is stacked onto product stockpiles and reclaimed by a rail mounted bucket wheel reclaimer to the rail load out bin.
[26] PA08_0184 Schedule 2 Condition 6 (b)
[27] PA08_0184 Schedule 2 Condition 7(b)
[28] PA08_0184 Schedule 2 Condition 7(c)
[29] PA08_0184 Schedule 5, Condition 3

6. Environmental Performance

6.1 Meteorological Monitoring

6.1.1 Meteorological Overview

The weather station (WS1), located adjacent to the USO administration office, continuously records meteorological data[30] 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 Sentinex[31] 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).

6.1.2 Rainfall Summary

The rainfall recorded at WS1 for the 2020 reporting period (**Table 6-2**) was 1089.8mm, 737.2mm more rainfall than 2019 and 417.8 mm above the long term average of 672mm for the region (2009 EA). The majority of rain received was during the fourth quarter of 2020, with 34.58 per cent of the annual total falling within this quarter. The wettest month was October with 181.7mm of rainfall recorded. The driest month was May with 22.5mm of rainfall recorded.

Due to unknown vegetation lodging in the funnel of the rain gauge, accurate recording of rainfall for the month of December was unavailable from WS1. Data from the Bureau of Meteorology station located in the township of Ulan 1.2km to the WSW of WS1 has been used as the alternative weather monitoring data for the period 1 December 2020 to 13 January 2021. This was reported as a non-compliance against the EPL in January 2021, when the issue was identified.

6.1.3 Temperature

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 42.1°C was recorded on 4 January 2020 and the lowest temperature over a 15 minute period of -5.3°C was recorded on 6 August 2020. The maximum and minimum were comparable to previous reporting periods.

[30] Condition 23, Schedule 3 of PA08_0184 and EPL394
[31] Sentinex is a web-based platform to communicate from monitoring locations

Table 6-2 - Summary of Meteorological Conditions

Date	Rainfall (mm)	Rainfall Cumulative (mm)	Temperature Min (°C)^	Temperature Max (°C)^	Prevailing Wind Directions
Jan-20	45.2	45.2	11.8	42.1	East
Feb-20	178.2	223.4	8	41	East
Mar-20	113.6	337	7.6	33.2	East
Apr-20	138.8	475.8	2.3	27.2	West South West
May-20	22.5	498.3	-2.6	22.8	West
Jun-20	28.8	527.1	-3.2	19.2	West South West
Jul-20	83.7	610.8	-4.3	20.2	West
Aug-20	35.5	646.3	-5.3	21.5	West
Sep-20	66.7	713	-1.1	26.8	West South West
Oct-20	181.7	894.7	0.9	30	East North East
Nov-20	18.3	913	5.3	38	East
Dec-20	176.8*	1089.8	6.1	40.4	East

Notes: ^15 minute capture period for data used. * Rainfall data sourced from BOM Station 62036

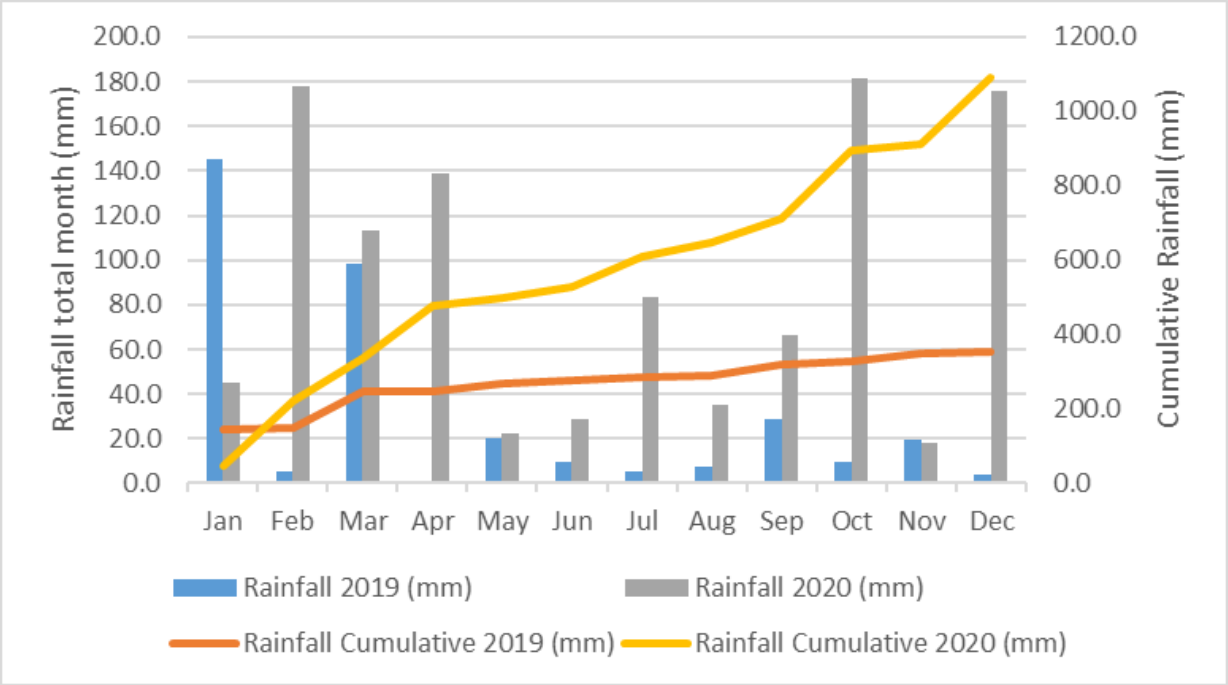


Figure 6-1 Rainfall comparison to previous reporting period

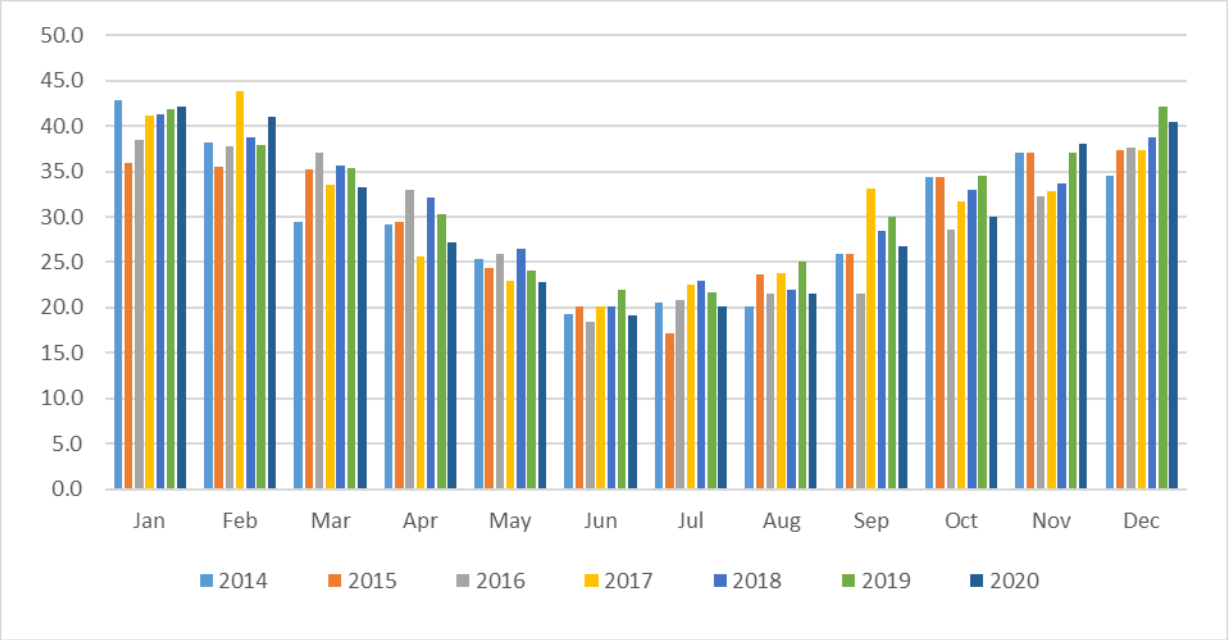


Figure 6-2 Seven Year Maximum Temperature Trends

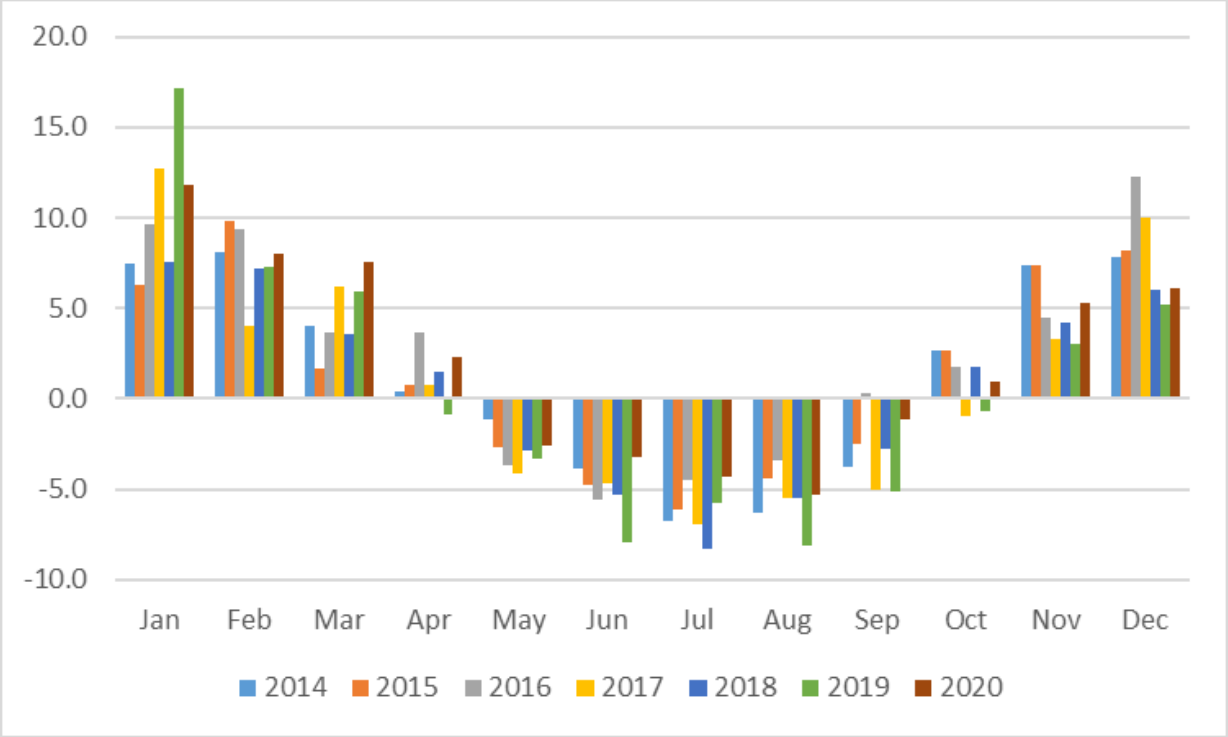


Figure 6-3 Seven Year Minimum Temperature Trends

6.1.4 Wind Speed and Direction

Prevailing winds were generally from the West during winter and from the East during summer, consistent with the historical data presented in the 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 2020 are presented in **Figure 6-4** on the following page.

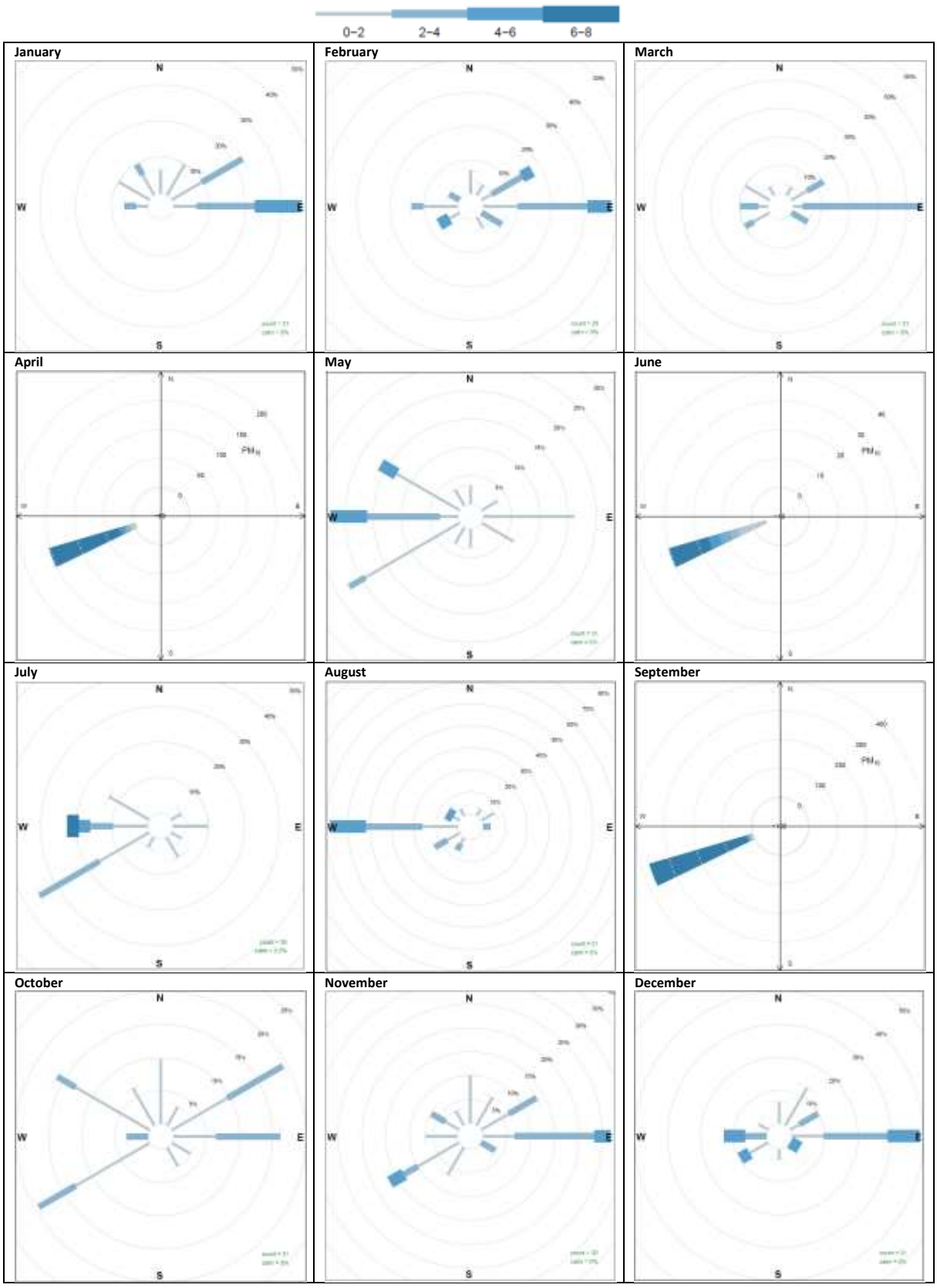


Figure 6-4 Monthly Wind Roses

6.2 Operational Noise

The Noise Management Plan (NMP) (ULNCX-111515275-232)[32] 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. **Figure 6-5** displays the locations of the real time noise monitors (which may be relocated as required) and attended noise monitoring. Attended noise monitoring[33] results are summarised below in **Table 6-3**, with attended noise monitoring reports provided at **Attachment A**.

6.3 Blasting

No blasts[34] were undertaken at the Ulan Complex in 2020. Hence there were no exceedances of overpressure and vibration criteria[35] or the predicted impacts, as modelled in the 2009 EA, including the 100mm/s for Aboriginal Heritage sites or 10mm/s criterion for European heritage sites (**Table 6-5**).

[32] PA08_0184 schedule 3, condition 9
[33] 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.
[34] If blasting was undertaken it would need to be within the hours 9:00am to 5:00pm Monday – Saturday as per EPL394, condition L6.2. No blasting activities may be undertaken on Sundays or Public Holidays.
[35] PA 08_0184, Schedule 3, Condition 10A

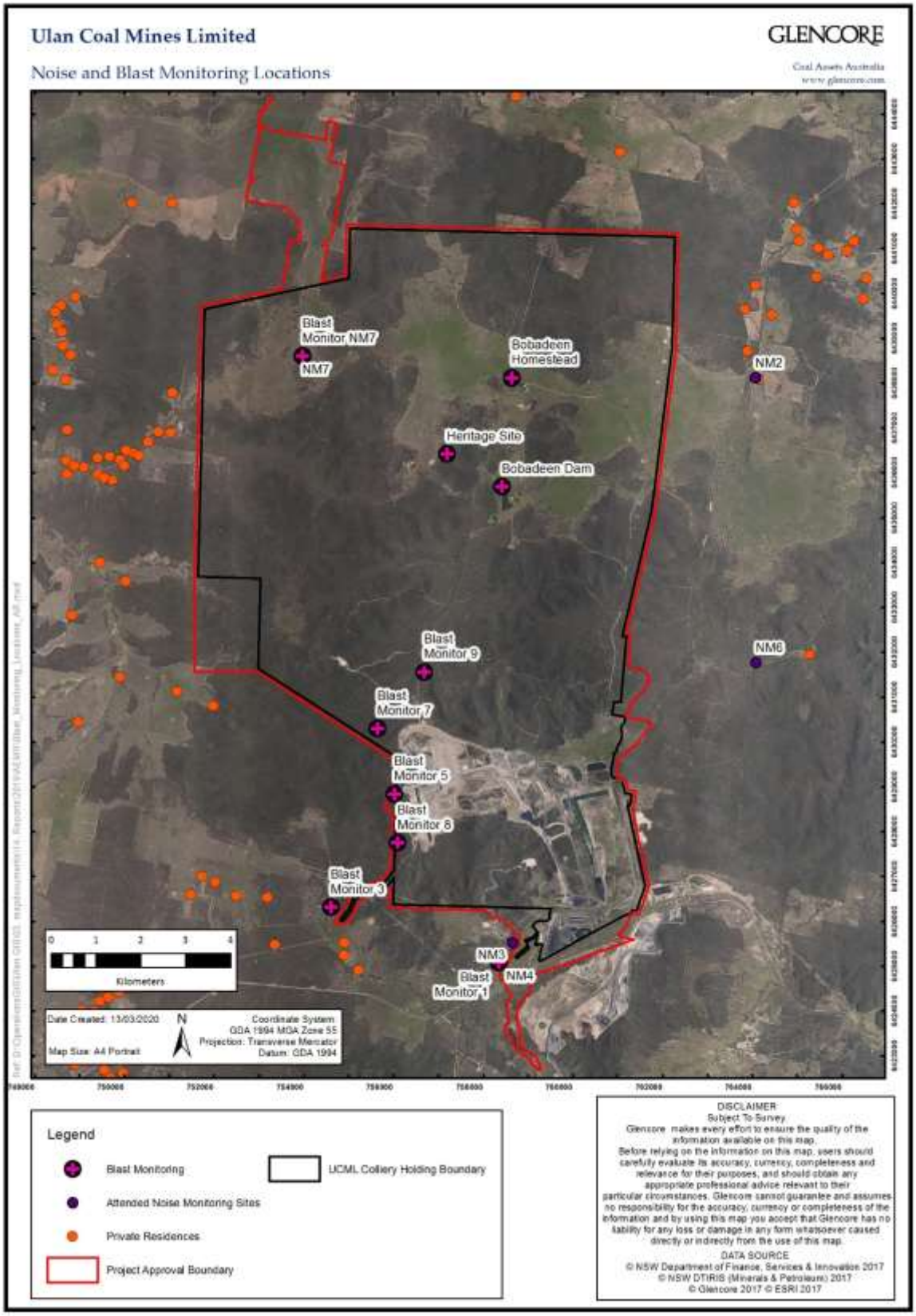


Figure 6-5 Noise and Blast Monitoring Locations

Table 6-3 - Attended Noise Monitoring Summary LAeq (15-min) and Maximums (dB) 2020

Criteria/prediction*

Ulan Monitoring ID/ Licenced EPL394 Monitoring Point	Property Number	DayLAeq,15minute	Evening[1] LAeq,15minute	Night[1] LAeq,15minute	Night[1] LA1,1minute[3]
NM2/ 38	60	35	35	35	45
NM3/ -	274	NA	NA	NA	NA
NM4[2]/26	Ulan School	35	NA	NA	NA
NM6/ 38	1	35	35	35	45
NM7/ 24	254	38	38	37	45

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

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 table above. Other residences have since been acquired and are no longer subject to the specified noise criteria;

Performance during reporting period

Attended Noise Monitoring – June Results

Monitoring Locations	Property Number	Maximum Result LAeq 15min dB	Complies	Maximum Result LA1(1min) dB	Exceedance
NM2	60	<20	Yes	<20	Nil
NM3	274	52	NA	56	NA
NM4[2]	Ulan School	40[2]	Yes	NA	Nil
NM6	1	31	Yes	38	Nil
NM7	254	42	No	36	Nil

2. Criteria for Ulan Public School apply 'when in use'

Attended Noise Monitoring – December Results

Monitoring Locations	Property Number	Maximum Result LAeq 15min dB	Complies	Maximum Result LA1(1min) dB	Exceedance
NM2	60	<20	Yes	<20	Nil
NM3	274	47	Yes	52	Nil
NM4[2]	Ulan School	IA	Yes	NA	Nil
NM6	1	26	Yes	30	Nil
NM7	254	<25	Yes	<25	Nil

IA = Inaudible NA = noise criteria does not apply 2. Criteria for Ulan Public School apply 'when in use'

Trends/Key Management Implications

- Attended noise monitoring occurred on two consecutive days, during June and December, in 2020[36] as follows:
  - During the evening and night periods of 16 & 17 June, and the day periods of 16 and 17 June 2020; and
  - During the evening and night periods of 8, 9 and 10 December, and the day periods of 9 and 10 December 2020;
- Noise from Ulan Coal was inaudible during 2% of measurements in June and 40% in December;
- Ventilation fan continuum from Ulan West was audible resulting in a measured LAeq of 42 dB at NM7 (an exceedance of 4dB). A second measurement of less than 35dB was obtained within 75 minutes, which demonstrated compliance to conditions in accordance with the section 4.1.1 of the UCMPL NMP.
- The measured LAeq 15-min and LAmax (assessing LA1(1-min)) noise emission levels from Ulan Coal complied with applicable noise limits;
- Stability class data (atmospheric data for wind speed and direction) rendered criteria not applicable on occasion (as documented in the consultants reports);
- 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 are within or below levels predicted for year 8 of the project (Section 5.9.1.4 and Appendix 12) in the EA. The trend for attended noise monitoring results over time is stable (**Table 6.4)**.

[36] NMP, Section 4.1

Table 6-4 - Attended Noise Monitoring LAeq Maximums (dB) 2011 – 2020

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
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).

Table 6-5 - External Overpressure & Vibration Monitoring

		Overpressure (dB)		Vibration (mm)	
		AVE	MAX	AVE	MAX
Year 7 Predictions	BM1	105	118	1.05	2.65
	BM3	110	123	2.62	6.62
2013 Blast Results	BM1	100.35	113.5	0.23	1.17
	BM3	101.23	115.5	0.23	1.17
2014 Blast Results	BM1	98.8	110.7	0.52	1.51
	BM3	98.7	108.5	0.43	1.94
2015 Blast Results		No Blasts			
2016 Blast Results	BM1	96.62	101.6	0.17	0.29
	BM3	93.48	102.2	0.11	0.15
2017 Blast Results	BM1	*	94.3	*	0.01
	BM3	NA	NA	NA	NA
	NM7	<100	<100	<0.03	<003
2018 Blast Results	BM1	**	**	**	**
	BM3	**	**	**	**
	NM7	**	**	**	**
2019 Blast Results		No Blasts			
2020 Blast Results		No Blasts			

Note: No blasts were undertaken during the 2015, 2019 or 2020 period. *Two blasts in 2017, on 23/03/2017 did not trigger reading at either monitor. NA-monitor not required for Bobadeen Quarry Blasts. #NM7 required to be monitored for Bobadeen Quarry Blast criteria 115dBL and 5mm/s, temporary monitor did not trigger a recording for either event. ** Blast on 10/05/2018 did not trigger reading at any monitoring station.

6.4 Air Quality

The following summary table compares the 2020 monitoring results with impact assessment criteria, predictions in the EA and monitored dust levels in previous reporting periods. Air quality monitoring locations are shown in **Figure 6-6**. Detailed results are provided in **Attachment B**.

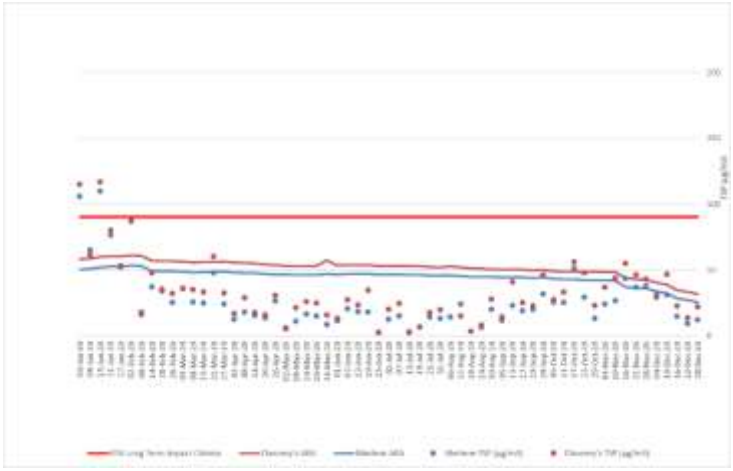
Table 6-6 - Compliance Summary Air Quality Monitoring

<table>
<tr><th>Criteria/ prediction*</th><th>Performance during reporting period</th><th>Assessment of Performance</th><th>Data capture/ sample comments</th><th>Compliant</th></tr>
<tr>
<td>Total Suspended Particulate (TSP)

PA criteria

Annual Criterion 90 µg/m³

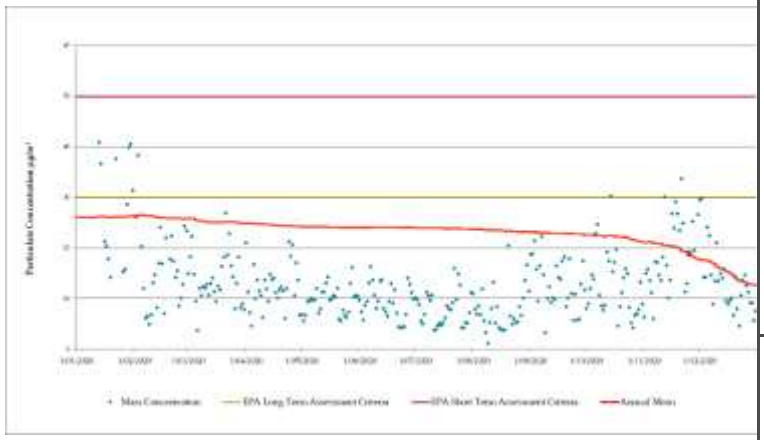
EA predictions Y7

No residences to be affected by annual average of >90 µg/m³</td>
<td>
<table>
<tr><th></th><th>Flannery's (HV1) µg/m³</th><th>Merlene (HV3) µg/m³</th></tr>
<tr><td>Capture rate</td><td>96.72%</td><td>98.36%</td></tr>
<tr><td>Annual Average</td><td>33.2</td><td>26.9</td></tr>
<tr><td>Maximum result</td><td>117</td><td>110</td></tr>
</table>

Notes: ARA – Annual Running Average
</td>
<td>The annual average TSP concentrations recorded at HV1 or HV2 were below the project specific criteria of 90 µg/m³ in 2020.

The TSP results for 2020 were in line with predictions provided in the air quality assessment from the 2009 Environmental Assessment.

The TSP annual averages for 2020 were lower than those recorded during the drought period of 2018 and 2019.</td>
<td>2 HV1 and 2 HV3 samples exceeded 90 µg/m3. Regional air quality events were occurring at the time of elevated readings.

Elevated readings due to regional dust events are excluded from the Annual Average to provide representative results. (Attachment B).</td>
<td>Yes</td>
</tr>
</table>

<table>
<tr><th>Criteria/ prediction*</th><th>Performance during reporting period</th><th>Assessment of Performance</th><th>Data capture/ sample comments</th><th>Compliant</th></tr>
<tr><td>Tapered Element Oscillating Microbalance (TEOM)
Particulate matter <10µm (PM_{10})
PA Criteria: Annual average 30 µg/m³
EA predictions Y7
30 – 50 µg/m³</td><td> 

<table>
<tr><th>Reporting Period</th><th colspan="2">TEOM PM_{10} Results</th></tr>
<tr><td rowspan="3">2020</td><td>Capture Rate</td><td>100%</td></tr>
<tr><td>Annual Average</td><td>13.4 µg/m³</td></tr>
<tr><td>Maximum (24hr)</td><td>48.3µg/m³</td></tr>
</table></td><td>The annual average PM_{10} was 13.4 µg/m³, below the annual average criteria of 30µg/m³.

Measured annual average PM10 in 2020 was lower than predicted in the EA and the lowest since 2016.</td><td>Data collected during regional dust storms in January, February and August 2020,[37] is excluded from the Annual Average calculations consistent with DPIE advice pertaining to specific dates in 2020 that were deemed “extraordinary events”[38]</td><td>Yes</td></tr>
<tr><td>PA Criteria
24 hour average
50 µg/m³</td><td>The 24 hour average PM_{10} concentration exceeded the 50µg/m³ impact assessment criteria a total of 14 times in 2020. All of these exceedances coincided with regional dust events. These results were omitted from the calculation of the annual average and the graph presented (Attachment B).</td><td>100% of 1 hour average PM_{10} results were captured during 2020. Regional dust storms occurred on 1, 2, 4 to 6, 10 to 12, 20, 23 and 25 January, 2 and 19 February and 19 August 2020,[39] when measured PM10 was greater than the 24 hour criteria of 50 µg/m³. On each occasion an exceedance occurs, investigation is undertaken and the results provided to DPIE and EPA. The measured values on the abovementioned dates are not considered exceedances consistent with the DPIE advice (ref 38)</td><td>Yes</td></tr>
</table>

Notes: *Refer to Condition 19 of Project Approval PA 08_0184 for notes and further details on Criteria

[37] Confirmed using Upper Hunter Air Quality monitoring reports for the 2020 period, other NSW air quality monitoring reports for the 2020 period and BOM climate summaries
[38] Email received from DPIE nominee of Secretary on Tuesday 2 February 2021
[39] Confirmed using Upper Hunter Air Quality monitoring reports for the 2020 period, other NSW air quality monitoring reports for the 2020 period and BOM climate summaries

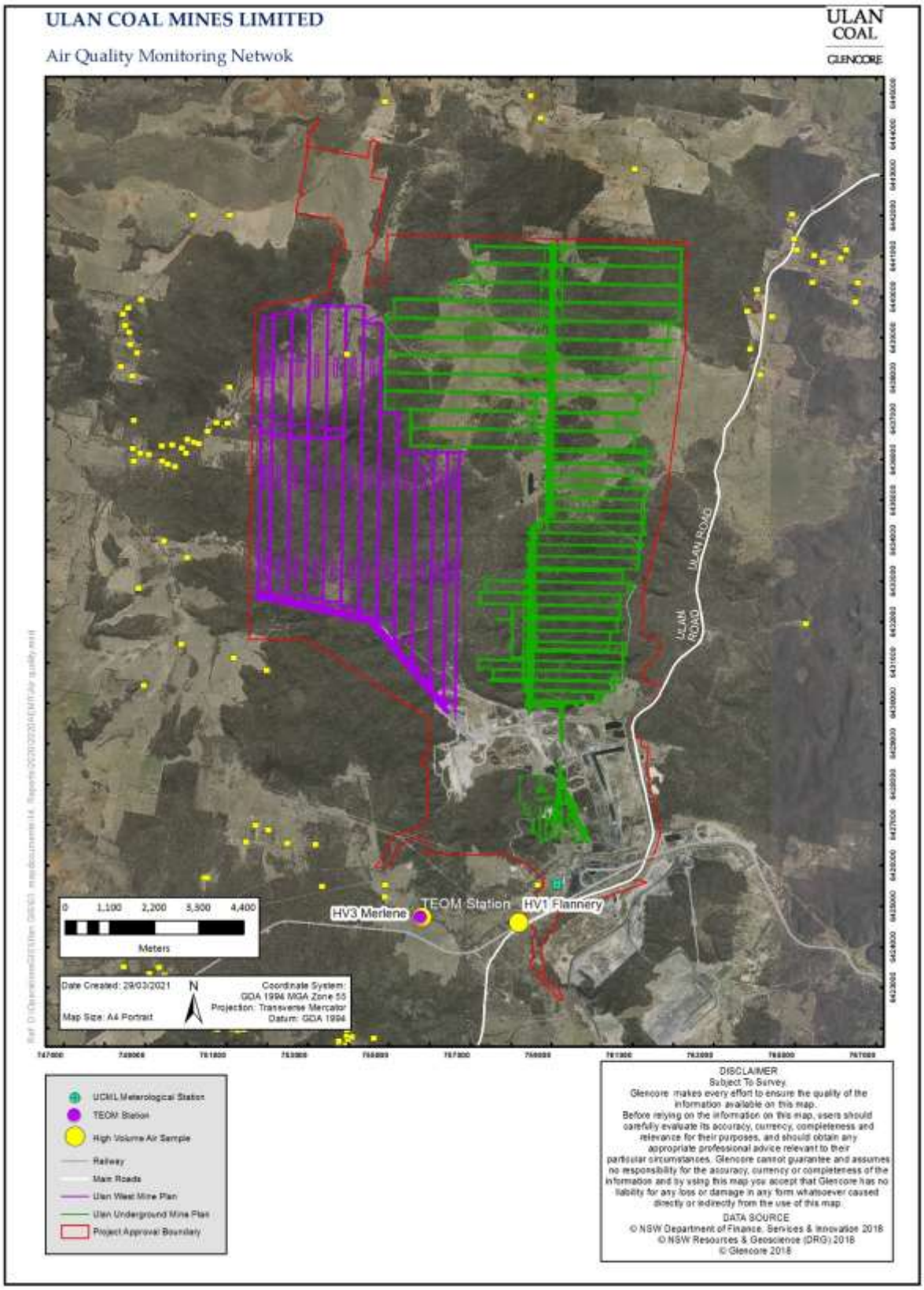


Figure 6-6 Air Quality Monitoring Network

6.5 Heritage

6.5.1 Aboriginal Heritage

Aboriginal heritage activities undertaken in accordance with the Heritage Management Plan (HMP) (ULNCX-111515275-95)[40] in 2020 included:

- Exploration activities as required;
- Inspections of Grinding Grooves at Bobadeen and Valley Way;
- Inspection Brokenback Conservation Area;
- Extension MOD heritage assessment
- Laser Scanning of 3 rock shelters pre and post subsidence (**Figure 6-7**) and
- Monitoring of aboriginal rock shelter sites in accordance with the Extraction Plans (results provided in Attachment J).

Figure 6-7 Site 1235 laser scan after subsidence

Aboriginal Heritage Meetings were held in July and December 2020. Items discussed included:

- Operational update;
- Bungaba updates;
- Mine Closure Workshop;
- Community Funding;
- Management Plan updates;
- The upcoming program of heritage works; and
- Change of Archaeologist.

6.5.1.1 Bobadeen and Valley Way Grinding Groove Conservation Areas

Inspections of the Bobadeen and Valley Way Grinding Groove Conservation Areas were undertaken on the 30 March and 16 December 2020. A small area of erosion was identified in a flow line above

[40] PA 08_0184, Schedule 3 condition 47

the Bobadeen Grinding Groove Conservation Area and does not impact upon the site. This was the only management issue that was identified.

6.5.2 European and Natural Heritage

Monthly inspection of the Bobadeen Homestead was undertaken, minor issues were observed and maintenance of fences and gardens was undertaken in accordance with the Bobadeen Homestead Management Plan.[41] Clean up around the homestead was undertaken in the spring/summer months to reduce the risk of a bushfire damaging the homestead.

Restoration works around the remaining chimneys at the Old Ulan Conservation Area commenced and will be completed in 2021.

6.6 Biodiversity

Flora, terrestrial and aquatic fauna/stream health monitoring was completed consistent with the Biodiversity Management Plan (BMP) (ULNCX-111515275-225), which includes the Offset Management Plan (OMP).Reports of monitoring prepared by Eco Logical Australia (ELA) are provided in **Attachment E**. Locations of monitoring sites are indicated in **Figure 6-8**. The 2020 monitoring consisted of:

- **Flora** – Assessment of 44 floristic sites, consisting of 14 within the Bobadeen VOA and a futher 30 within remnant vegetation of conservation agreement areas; 16 natural regeneration transects; 29 open cut rehabilitation sites; and 70 floristic based subsidence sites;
- **Fauna** (excluding microbats) – Feral animal monitoring was conducted using 10 infra-red motion cameras set up along two monitoring transects (Pleuger Road – Transect 1 and Bobadeen Corridor – Transect 2), capturing high resolution images of passing fauna over fourteen consecutive days Targeted *Tyto novaehollandiae* (Masked Owl) surveys were conducted at two sites. Nest Box monitoring of 103 pre-selected nest boxes was conducted to assess their condition and signs of use;
- **Microbats** –29 sites within past, current and future mine subsidence areas located over Ulan West LW3-LW7 and Ulan Underground LWW3-LWW5 were monitored. An additional eight control sites were sampled that have not been undermined by longwalls.
- **Aquatic fauna and riparian habitat** – within creek and river systems internal to, upstream and downstream of the project approval area.

6.6.1 Floristic Monitoring

The floristic performance of each Management Zone (MZ),[42] shown on **Figure 6-9**, is assessed in the Floristic Monitoring 2020 Annual Report (**Attachment E).** Conclusions of the assessment are summarised below.

[41] PA08_0184, Schedule 3, Condition 47 (d) and ULN SD EXT 0094 April 2011, revised scope of works ULN SD EXT 0135 January 2014
[42] Refer to BMP section 6 for MZ descriptions and objectives

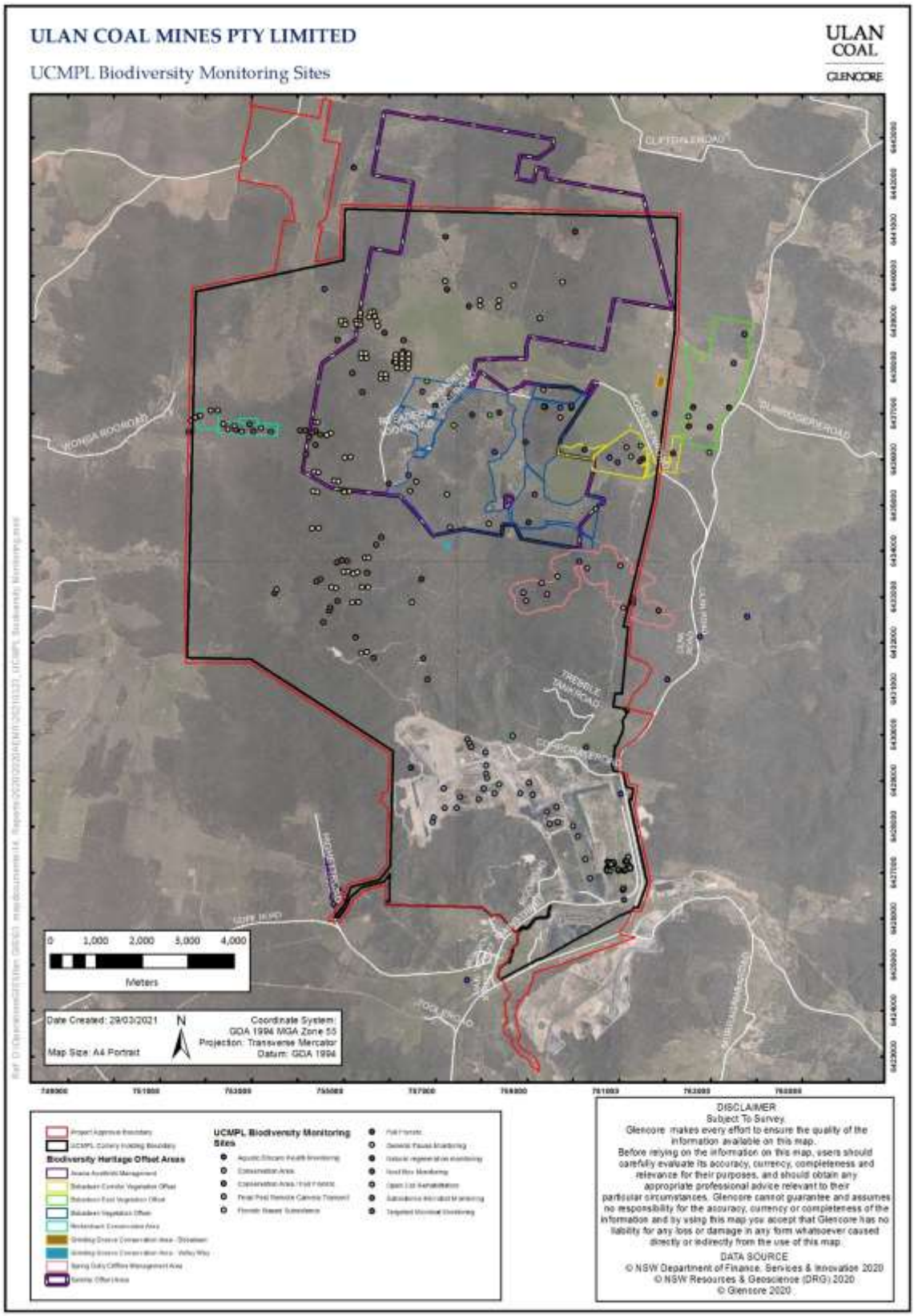


Figure 6-8 2020 Flora and Fauna Monitoring Sites

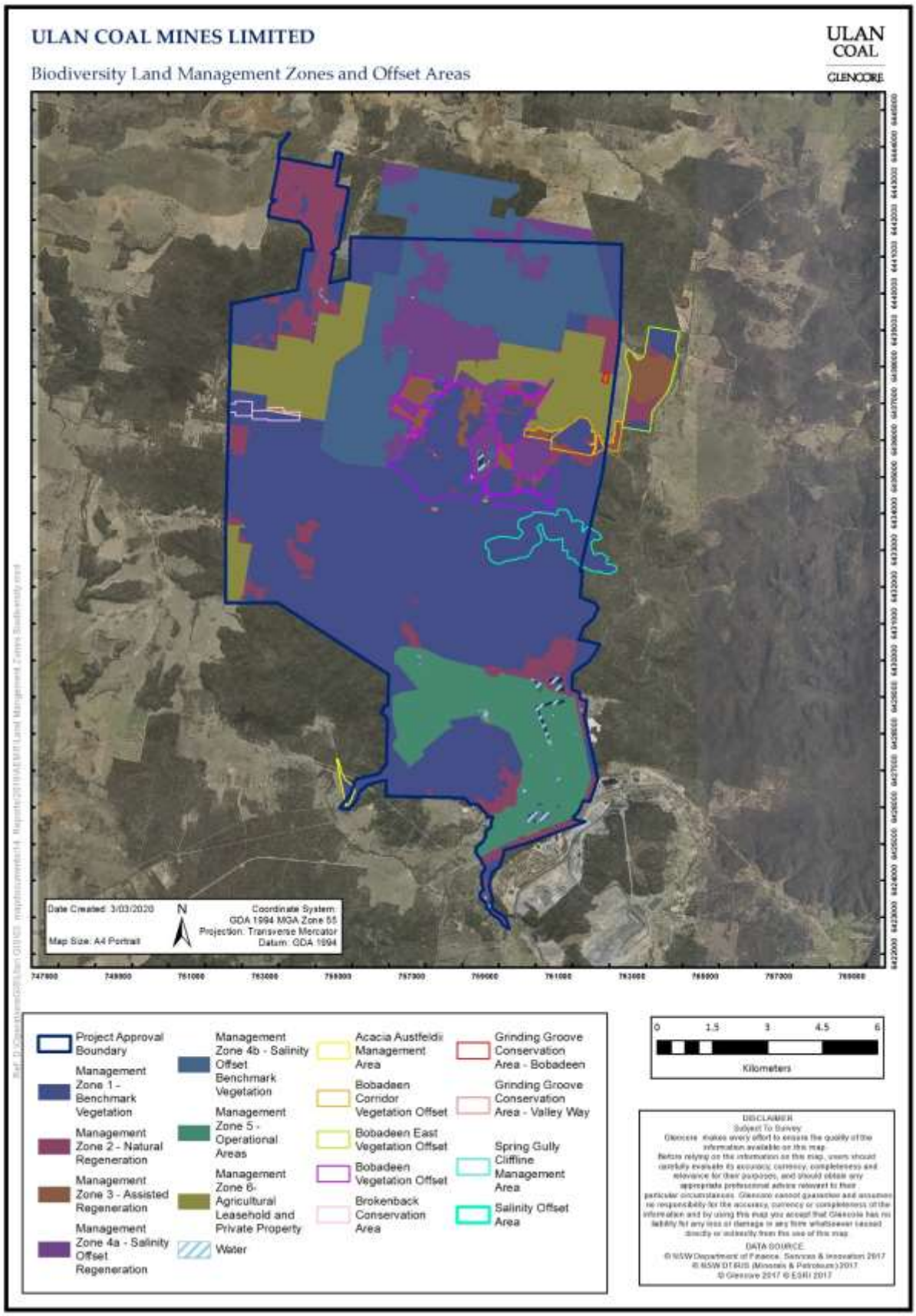


Figure 6-9 Management Zones

General Floristic Monitoring

General floristic monitoring was conducted across three management zones (MZ1, MZ2, and MZ3), of which there were six Dry Sclerophyll, and two Grassy woodland PCT's, with 34 and eight sites respectively. The performance measure was to:

- *Monitor native species diversity is approaching or consistent within MZ1 or other appropriate analogue sites*
- *Ensure priority weeds do not exceed 10% of plant cover*
- Assess stem density: >40 stems/ha for woodland; >60 stems/ha for open forest vegetation community.

Across the grassy woodland, sites native species richness ranged from 37 to 49 (median 40) at MZ1 and from 19 to 30 (median 27) at MZ3. No MZ2 grassy woodland sites were monitored during 2020. When MZ2 sites were monitored (between 2011 and 2019), the data indicated that MZ2 median richness is not changing, and therefore not approaching richness of MZ1. It is for this reason that MZ2 is not meeting the native species performance criteria currently, however will continue to be monitored in subsequent years. MZ3 in contrast, follows similar trends to MZ1 – likely due to climatic changes. The difference between the two zones has decreased, indicating that richness is approaching MZ1. Therefore, MZ3 is meeting the performance criteria.

Across dry sclerophyll, native species richness ranged from 6 to 43 at MZ1 sites (median 31) and from 34 to 39 at MZ2 sites (median 36.5). No MZ1 sites were monitored during 2018 and no MZ3 sites were monitored during 2020. A comparison of data between 2011 and 2020 indicates that MZ2 richness has exceeded that of MZ1, therefore the performance criteria is being met. Despite not being monitored in 2020, MZ3 sites indicate that richness has always been in line with that of MZ1, therefore assessing the data from 2019, the performance criteria is being met.

Section 6.6.6 outlines the weeds identified during floristic monitoring. Grassy woodlands recorded weeds throughout, however, as there was less than 10% coverage, the performance criteria is still being met across MZ1 and MZ3. Similarly, Dry sclerophyll sites recorded weeds throughout, however, as there was less than 10% coverage, the performance criteria is still being met across MZ1 and MZ2.

Assessment of canopy species across the grassy woodland sites indicates that for those area monitored during 2020, the averages of MZ1 (488 stems/ha) and MZ3 (305 stems/ha) were above 40 stems/ha, therefore the performance criteria is being met. Analysis of 2019 data also indicates that MZ2 is meeting the performance criteria, with an average of 142 stems/ha.

Assessment of canopy species across dry sclerophyll sites indicates that at both MZ1 (950 stems/ha) and MZ2 (1692 stems/ha), there are more than 60 stems/ha – excluding MZ2 sites BOB20 and RPA10. Stem density for the MZ3 site (BOB23) was last recorded at 22 stems/ha in 2019, which did not meet the performance criteria >60 stems/ha. This site will continued to be monitored in subsequent years. The performance criteria will also be reviewed as a greater than trigger does not account for areas where stems/ha are too many.

Natural Regeneration

Natural regeneration was assessed at 16 regeneration transects, across MZ2, MZ3 and MZ4a. The following completion criteria relating to the Biodiversity offset areas (MZ2 and MZ3) and the Salinity Offset area (MZ4a) have been addressed during 2020 monitoring.

- *Monitor natural regeneration occurring within BOAs and update mapping with changes identified, and, Stem density >40 stems/ha for woodland, >60 stems/ha for Open Forest vegetation community*
- *Monitor natural regeneration is progressing throughout the RPA and SOA*

BOA natural regeneration is consistent with observations from previous years. There has been low recruitment of canopy species seedlings or saplings, most likely related to climatic changes. The presence of dominating perennial and annual native species may also be contributing to the success of suckering/germination of canopy species. All transects within the SOA recorded seedling or sapling individuals, however, numbers fluctuate between years.

Open Cut Rehabilitation

Twenty-nine (29) open cut rehabilitation sites were monitored across seven (7) polygons throughout: Domain B Polygon 2, Polygon 7, Polygon 8, Polygon 12, Polygon 13, Polygon 16 and Polygon 15; and one (1) polygon in Domain D, Polygon 5 during Spring 2020 rehabilitation monitoring.

Monitoring against the GCAA Rehabilitation Report Card (RRC) was undertaken in 2020. This involved assessing performance indicators, providing a score, than adding the score to acquire a total for each area. The following is a summary of Domain B rehabilitation areas as per RRC indicators:

- Ecosystem composition: proportion of native species endemic to the Kerrabee IBRA subregion ranged between 93%-100% (Polygon 13 the lowest). All polygons met the criteria of 75% species composition.
- Tree stem density: with a minimum stem density/ha of 70 stems/ha at Polygon 16, all polygons met the performance criteria of 60 stems/ha.
- Habitat features: length of large woody debris (LWD) is low across most polygons, there were no hollows present, litter and rock cover was generally good across all polygons, and vegetation structure was recorded throughout. In general, the polygons need more time to develop and/or site intervention for habitat features to be similar to that of remnant vegetation.
- Reproduction: seedlings/saplings were recorded at every polygon. Regenerating canopy species for each polygon ranged from 10% to 86%.

The following is a summary of Domain D rehabilitation area – Polygon 5, as per RRC indicators:

- Ecosystem composition: native species richness at Polygon 5 is lower compared to average native species richness for MZ1 sites. All were endemic to Kerrabee IBRA Subregion.
- Tree stem density: stem density was lower than MZ1 sites, at 100 stems/ha and 250 stems/ha. MZ1 sites were recording an average of 950 stems/ha.
- Habitat features: there was no LWD or hollows, surface rock was between 28% and 32% cover, vegetation structure is underdeveloped. The polygon need more time to develop and/or site intervention for habitat features to be similar to that of remnant vegetation.
- Reproduction: there was no evidence of canopy species, therefore no regeneration at this point.

Floristic based subsidence

Floristic based subsidence (FBS) monitoring was undertaken along six (6) longwall panels during autumn and seven (7) longwall panels during spring 2020. Each longwall had ten monitoring sites, total of 70 sites for 2020. Floristic based subsidence monitoring data indicates that percentage change in average canopy projected foliage coverage (PFC) since monitoring began is relatively consistent between longwall and transition sites for all longwalls. All longwalls recorded a decrease in PFC across longwall sites and / or transition sites since monitoring began. It was noted that the drought conditions of 2017 to early 2020 were a contributing factor for the canopy dieback. No longwalls recorded a greater than 10% decrease in average canopy PFC, therefore the performance measure has been met.

6.6.2 Nest Box Monitoring

Forty (40) out of the 103 nest boxes monitored during 2020 demonstrated signs of use; with 26 of these nest boxes containing nests or nesting material. Fourteen (14) nest boxes were determined to have been used recently, based upon the apparent freshness of nesting material (e.g. leaves) and scats present. Of the 103 nest boxes monitored, 93 were deemed fit for use and only eight (8) in need of repair or re-attachment. Two were unserviceable due to tree fall, they need to be reattached to a new tree.

Two fauna species were present amongst 5% of boxes, with Common Starling eggs and chicks present in four Treecreeper nest boxes located in adjacent trees in the East Pit East Rehabilitation Area, whilst one *Varanus varius* (Lace Monitor) was located in an Owlet Nightjar nest box also within the East Pit East Rehabilitation Area.

6.6.3 Fauna

A total of 87 species were recorded during diurnal bird surveys. There were no visible trends observed as the results showed varied changes across monitoring years. Of the seventeen (17) Regent Honeyeater/Swift Parrot sites located within FBS sites, there were no sightings. Call playback and spotlighting surveys at BE2 and RES2 did not record any Masked Owls at either monitoring site. The absence of Masked Owl during 2020 surveys does not indicate that the habitat contained within the UCMPL complex is unsuitable for this species. As the species is mobile and rare throughout its range, there is potential for it to utilise this area.

A total of six (6) threatened bird species were recorded during 2020 monitoring. *Grantiella picta* (Painted Honeyeater) which is listed as Vulnerable under the BC Act and EPBC Act, was the most abundant and found most commonly. *Chthonicola sagittata* (Speckled Warbler) which is listed as Vulnerable under the BC Act was also observed frequently during monitoring. *Callocephalon fimbriatum* (Gang-gang Cockatoo) and *Neophema pulchella* (Turquoise Parrot) were opportunistically sighted within the UCMPL project area during 2020. The presence of these species, demonstrates that the UCMPL project area continues to provide habitat for these two specialists feeding species.

6.6.4 Microbat Monitoring

Microbat monitoring was undertaken at eight control sites that have not been undermined by longwalls, twenty-four sites above Ulan West LW3 to LW7 and five sites above Ulan Underground LWW3 to LWW5. During 2020, the microbat survey methodology was revised. Key differences in the 2020 survey are:

- collection of additional acoustic call data at eight paired control and impact sites,
- analysis of call activity of threatened cave-roosting microbat species; and
- increased harp trapping survey effort at sites known or likely to be important to the local Large-eared Pied Bat (*Chalinolobus dwyeri*) population, in order to be more certain of population sizes and reproductive activity and to provide opportunities to locate females at other maternity roosts, should they move.

There were five control and two impacts sites where harp traps were established to determine the presence of threatened bat species. Two control sites that underwent harp trapping recorded microbats during 2020 monitoring. A total of 10 microbats from three individual species were captured at site BD6, whilst eight microbats from one species were captured at site UG1. Both impact sites recorded bats – 46 individuals from five species at UGLWW3, whilst one individual *Rhinolophus megaphyllus* (Eastern Horseshoe Bat) at ULGWW4a. *Chalinolobus dwyeri* (Large-eared Pied Bat) was captured at BD6, UG1 and UGLWW3. The continued presence of Large-eared Pied Bats at these sites,

including breeding and sub-adult individuals, indicates the UCC continues to provide suitable habitat for this threatened cave-roosting species.

A total of 19,023 call sequences were recorded across the eight control sites in which 11 microbat species were positively identified, and a further six species potentially identified. Both targeted and threatened cave-roosting microbat species were recorded at all control sites, with the exception of site BD9. A total of 19,838 call sequences were recorded across the 29 impact sites in which 12 microbat species were positively identified, with a further seven species potentially identified. Both targeted and threatened cave-roosting microbat species were recorded at impact sites, with the Large-eared Pied Bat recorded at 22 impact sites and the *Miniopterus orianae oceanensis* Large Bent-winged Bat was recorded at 23 impact sites.

The performance triggers for microbats, stipulated in management plans are as follows:

- threatened microbat species is maintained within Brokenback and Spring Gully Offset area; and
- relative microbat activity across the Ulan West Extraction Area (ref 4.3 ULW Extraction Plan LW1-6) and UCC mined areas (ref 7.21.5 BMP).

Large-eared Pied Bat and Large Bent-winged Bat were recorded within Brokenback and Spring Gully sites in 2020 and for two or more consecutive years, confirming habitat for threatened microbats is maintained in these areas.

Large Eared Pied Bat calls activity increased at both control and impact sites, whilst Large Bent-winged Bat increased at control and decreased at impact sites between 2019 and 2020 (**Figure 6-10** and **Figure 6-11**). With no decline in activity across the Application Area or Ulan Complex mined areas in 2020, the subsidence performance indicator for Large-eared Pied Bat was achieved. Large Bent-winged Bat call activity across the Application Area and complex mined areas, did decline >10% in 2020, however, this decline has not been recorded across two or more survey years. It is recommended that Large Bent-winged Bat activity is closely monitored again in the 2021 bat monitoring surveys.

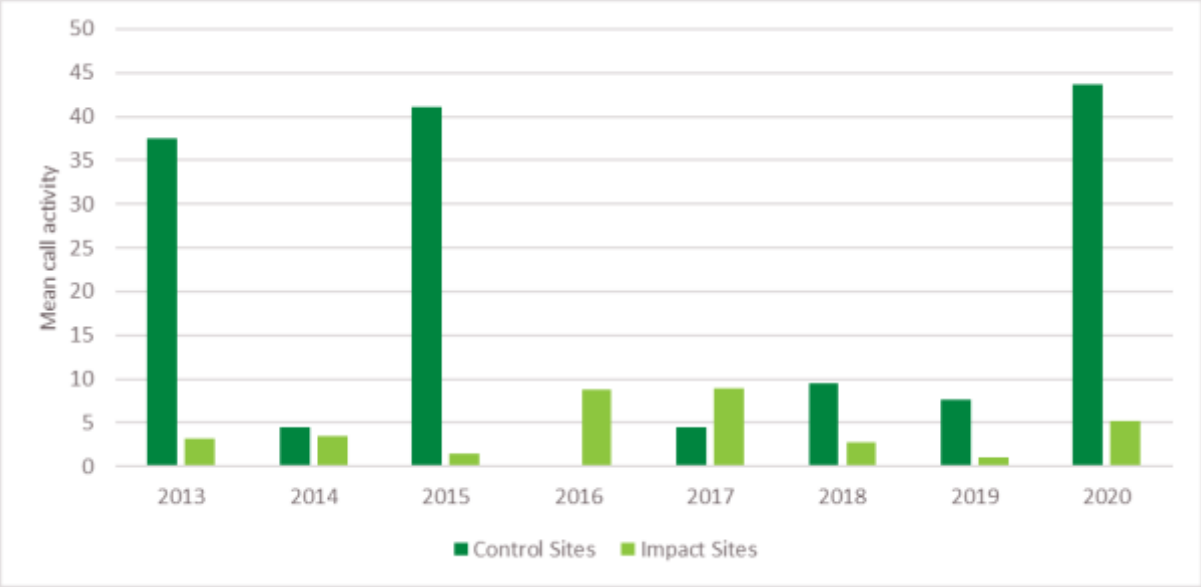


Figure 6-10 Mean Large-eared Pied Bat call activity across both control and impact sites, 2013 – 2020

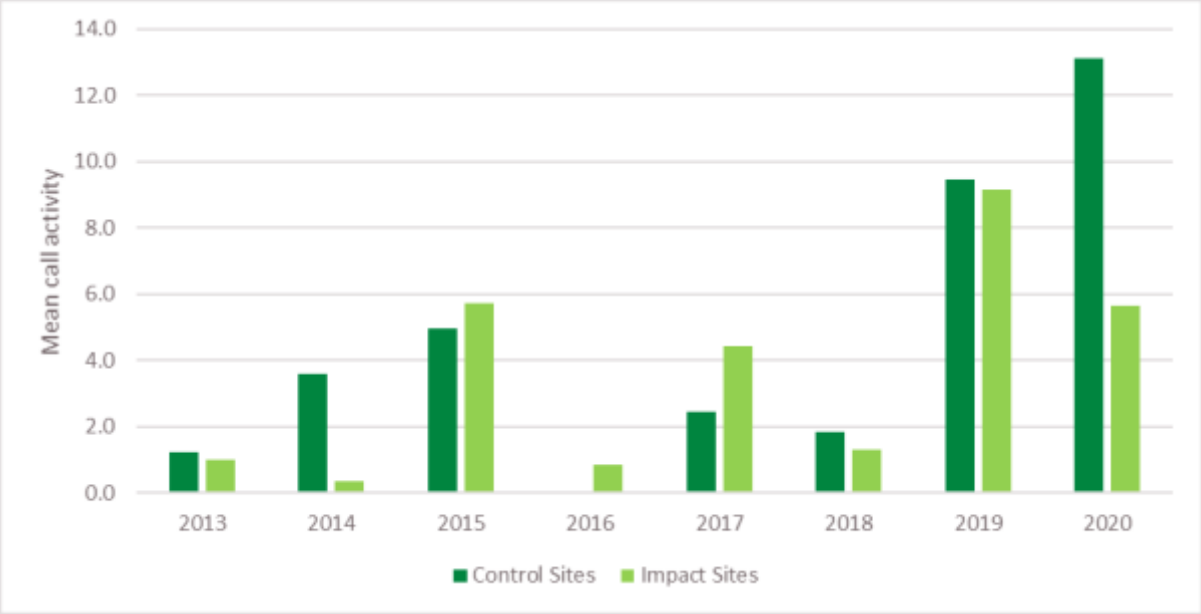


Figure 6-11 Mean Large Bent-winged Bat call activity across both control and impact sites, 2013 – 2020

6.6.5 Aquatic Monitoring

The 2020 aquatic monitoring event was undertaken following well-above average rainfall in the preceding two and twelve months, which followed on from a prolonged drought period extending back to 2017. Fourteen monitoring sites could be sampled for the first time since the commencement of the current monitoring program.

Macroinvertebrates

SIGNAL2 scores recorded in 2020 were variable compared to 2019, however, maintained scores reflective of moderate to severely disturbed systems. Average SIGNAL scores of each site from 2011 to 2020 are shown in **Figure 6-12.** 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.

Riparian Habitat

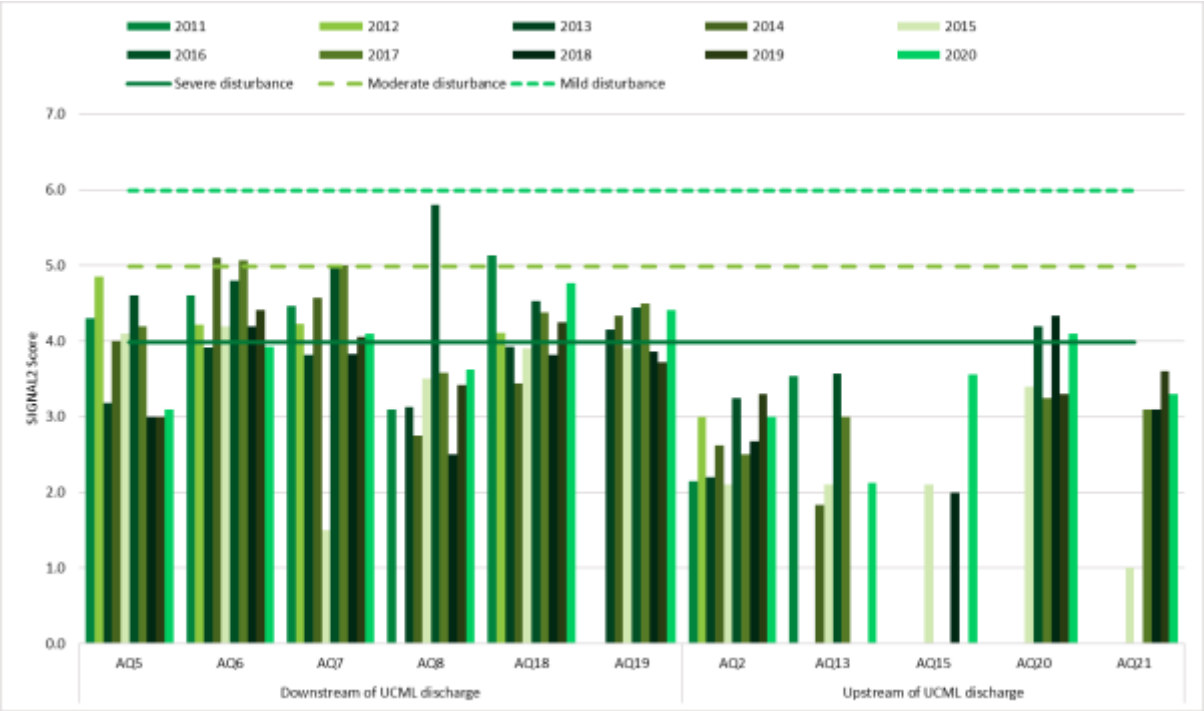
The 2020 Riparian Channel and Environmental (RCE) Inventory scores were consistent with previous years for each site. Five (5) sites scored RCE inventories of Good, five sites scored Very Good (and the remaining four (4) sites scored RCE inventories of Excellent. Sites located in the Goulburn River Diversion have increased RCE scores since 2016 when remediation works commenced. The only notable differences in RCE scores recorded in 2020 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. Results are outlined in **Figure 6-13** below.

Water Quality

Water quality sampling was undertaken at all 14 monitoring sites and the two Licenced Discharge Points (LDPs).The results provided that:

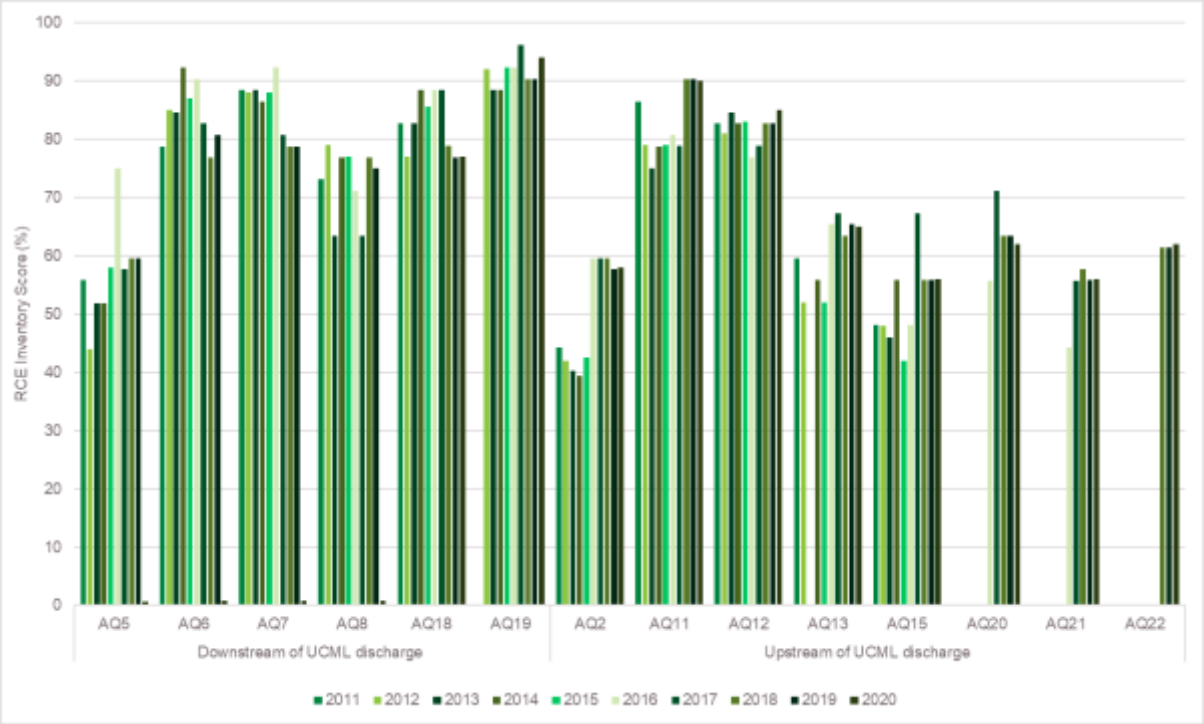
- Dissolved oxygen (DO) concentration (% saturation) was lower than ANZECC and ARMCANZ (2000) guidelines at all sites and overall, the lowest recorded across all monitoring years. Results from upstream and downstream sites and across multiple years indicate high variability in DO concentrations. This was further validated as DO loggers which UCMPL installed recorded variations of – 0-83% at SW01 and from 2-115% at SW02; and

- Alkalinity and pH results remain consistent across monitoring years. EC was high overall at sites both upstream and downstream of LDPs, indicating the contribution of naturally saline groundwater in the catchment.



Source: *2020 Aquatic Monitoring Report (ELA, 2020)*

Figure 6-12 Average SIGNAL2 Scores per site 2011 to 2020



Source: *2020 Aquatic Monitoring Report (ELA, 2020)*

Figure 6-13 Comparison of RCE Inventory Percentage Scores across sites over time

6.6.6 Pest and Weed Monitoring

Six (6) feral animal species were recorded across both remote camera monitoring transects, five (5) of which are listed as priority pest species under Section 5 of the Central Tablelands Regional Strategic Pest Management Plan 2018-2023 (Local Land Services, 2018). *Dama dama* (Fallow Deer) was the most commonly recorded feral pest species and was recorded at both transect locations – total of 63 detections. All feral pest species identified through this monitoring have been previously recorded within the UCC.

The Local Land Authority conducted an aerial dog baiting program in across the site and surrounding properties during June and October. Pigs were difficult to manage due to the availability of food for them. Baiting commenced in December 2020, and was completed in 2021. The Bobadeen farm manager conducted opportunistic shooting of feral animals year round.

Weed species and coverage increased in 2020 due to favourable growing conditions. Seven listed weeds[43] were identified within offset and rehabilitation areas as follows:

- *Hypericum perforatum* (St. John's Wort);
- *Rubus fruiticosa spp aggregate* (Blackberry);
- *Xanthium spinosum* (Bathurst Burr);
- *Heliotropium amplexicaule* (Blue Heliotrope);
- *Xanthium occidentale* (Noogoora Burr);
- *Opuntia stricta* (Common Prickly Pear); and
- *Rosa rubiginosa* (Sweet Briar).

These weed species were targeted during annual weed control spraying. Management of these species and those that pose a risk to ecological communities or are present rear infrastructure will continue to be managed in 2021.

6.7 Energy and Greenhouse Gas

Greenhouse Gas (GHG) and energy consumption is reported[44] for Ulan Coal Mine which triggers the individual facility threshold.[45] GHG emissions and energy consumption are reported under the parent company, AZSA Holding Pty Ltd. The total energy consumed for Scope 1 and Scope 2 can be found in **Table 6-7** below. Importantly, energy and GHG intensity remain lower than predicted[46] in the EA.

[43] Central Tablelands Regional Strategic Weed Management Plan (CTRSWMP)
[44] PA 08_0184 Schedule 3, Condition 22, Air Quality and Greenhouse Gas (GHG) Management Plan (ULNCX-111515275-1653) and *National Greenhouse and Energy Reporting Act (NGER) 2007* (Cth)
[45] > 25,000 tonnes of carbon dioxide equivalent (t CO2-e) generated and/or > 100 terajoules (TJ) of energy consumed *NGER 2007* (Cth)
[46] Energy intensity of 0.051 GJ/ tonne of ROM coal produced, predicted 0.081 GJ/tonne. GHG intensity 0.017 tCO2e/ tonne of ROM coal produced, compared with predicted rate 0.029 tCO2e /tonne.

Table 6-7 - Summary Scope 1 and 2 emissions Statistics for 2020

	2020	EA prediction for year 8 to 11 of the project
Fossil Fuels tCO2-e	13,624	
Fugitive Emissions tCO2-e	22,523	
Scope 1 Total	**36,147**	
Electricity From Grid tCO2-e	147,057	
Scope 2 Total tCO2-e	**147,057**	
Total Scope 1 and Scope 2 tCO2-e	**183,205**	**230,934**
Total Scope 1 and Scope 2 GJ	**653589**	**799,814**

6.8 Mine Subsidence

Underground Mining activities undertaken during the reporting period are outlined in **Section 4.3.**

Subsidence monitoring compares survey of monitoring lines and the monitoring of heritage sites, infrastructure, cliff lines, flora, fauna, groundwater, drainage lines and surface waters to subsidence predictions.[47] In 2020 subsidence monitoring focussed on;

- Ulan Underground LWW5 (SMP/EP), which requires the submission of 4 monthly subsidence status reports and end of panel reports; [48]
- Ulan Underground LWW6 which requires submission of an Annual Report (incorporated into this Annual Review, **Attachment J**) by 31 March; and
- Ulan West Operations LW5 and LW6 (EP) which requires submission of an Annual Report (incorporated into this Annual Review, **Attachment J**) by 31 March.

Subsidence effects as follows, were within predictions:

- Cracking of land including internal roads and private land;
- Rock falls and perceptible cracking in clifflines, including a number of identified rockshelters;
- Minor cracking ephemeral tributary flow lines;
- No obvious signs of subsidence impact to major creek lines;
- No evidence of subsidence impact upon flora or fauna including endangered species and communities; and
- No public safety concerns raised.

One subsidence incident occurred during the 2020 monitoring period, with the development of an erosion hole after significant rainfall received between 17 February and 4 April 2020, resulting in collapse of the erosion hole. The erosion hole was reported to the Resources Regulator on 17 April 2020 and was repaired immediately. Inspection of the area by the Subsidence Engineer, confirmed that the impact was erosion related and not greater than predicted subsidence.
An assessment of subsidence performance during the reporting period against the performance measures[49] are provided in **Table 6-8**.

[47] PA08_0184 Schedule 3, Condition 24
[48] Status reports submitted to RR, DPI-Water and OEH (15 August 2018 and 2 January 2019). End of Panel report for LWW4 due 10 April 2019.
[49] PA08_0184 Schedule 3 Condition 24

Table 6-8 - PA08_0184 Subsidence Performance Measures

Subsidence Performance Measures		Assessment of Performance[50] 2020 (Ulan Underground LWW5, LWW6, Ulan West LW05 and LW06)
Water		
Ulan, Mona & Cockabutta Creeks	No greater environmental consequences than predicted in the EA *EA 2009 predictions:* *Ulan Creek is considered unlikely to be significantly impacted by the proposed mining. Some small horizontal movements may occur toward the goaf, but the character and capacity of the creek to maintain flow is unlikely to be affected by these movements.* *Mining below ephemeral creeks is considered to have the potential to reduce surface flows and the duration that pools retain water following a rainfall event*.	Longwall mining in 2020 did not occur in the Mona or Cockabutta Creeks. No impacts have occurred in these areas as a result of subsidence. No evidence of surface cracking or subsidence related instabilities were observed in Ulan Creek. (Pacific Environmental 2020 Attachment G). Minor impacts in tributaries to Mona and Ulan Creeks were identified, however impacts were consistent with EA Predictions. Where the erosion hole did develop in LWW5 (Mona Creek Tributary), impacts were reported to the Regulator and have since been repaired. Minor drainage works on private property to redirect flow will be completed in 2021.
Biodiversity		
Threatened species, populations, habitat or ecological communities	Negligible impact No change to endangered micro-bat activity levels pre and post mining	Floristic-based subsidence (FBS) monitoring shows no trends of decline across years that would indicate adverse subsidence-related impacts on plant biodiversity (Eco Logical 2021 Flora report **Attachment E**). The microbat monitoring indicated that the Trigger Response Action Plan (TARP) had not been triggered (Eco Logical Microbat Monitoring 2021 **Attachment E**).
Land		
Cliffs in the Brokenback Conservation Area	Nil environmental consequences	Longwall mining in 2020 did not occur near the Brokenback Conservation Area. No subsidence impacts to sandstone cliff formations in the Brokenback Conservation Area were observed (Pacific Environmental 2020 Cliff line Monitoring Attachment J).
Other cliffs	Minor environmental consequences *EA 2009 predictions:* *Mining subsidence is expected to cause rock falls on 10-20% of the sandstone cliff formations directly above the mining area.*	Surface inspections over Ulan West LW5 and LW6 and Ulan Underground LWW5 and LWW6 indicate observed subsidence impacts to cliff lines is generally consistent with predictions. (Attachment J)).
Heritage		
Aboriginal sites	Nil impact in the Brokenback Conservation Area, Grinding Groove Conservation Areas; and on Mona Creek Rock Shelter Sites	Aboriginal sites listed in this performance measure were not located within the potential subsidence zone for mining in 2020. There have been no recordable changes to these sites as a result of mining.
Talbragar Fish Fossil Reserve	Negligible impact	Longwall mining in 2020 did not occur near the Talbragar Fish Fossil Reserve.
Other Heritage Sites	No greater impact than predicted in the EA	Old Ulan Village is located adjacent to UWO LW1. Inspections of the area found no visible impacts of subsidence.

[50] Assessment made through performance indicators detailed in the component management plans of the SMP/EP Approvals.

Subsidence Performance Measures		Assessment of Performance[50] 2020 (Ulan Underground LWW5, LWW6, Ulan West LW05 and LW06)
	EA 2009 predictions: Subsidence movements are not expected to have any practical effect on artefact scatters and isolated finds in open terrain Mine subsidence is not expected to cause any acceleration or change in the degradation that is occurring naturally over time at Old Ulan Village Mine subsidence is not expected to significantly impact any of the European Heritage sites within the Project Area.	Cracking and rock falls observed at Aboriginal heritage rock shelter sites Ulan ID 1235, 1258, 1261, 1263, 1148, 1149, 1151, 1153, 1154, 1155,1157 and 1158 were within the range predicted in SCT (2007) for the EP (SCT, 2021).
Built Features		
All built features	Safe, serviceable and repairable unless the owner agrees otherwise in writing	One Private property was undermined in 2020 including a dam (Spring Dam 4) access tracks and fence lines. The Dam was reported as impacted in December 2019 by the adjacent longwall, LWW5. No significant impacts to tracks and fence lines occurred, however cracks to farmland were repaired. Minor cracking of an access tracks located over the longwall panels being mined were observed on UCMPL owned land for Ulan Underground and Ulan West. These observations were consistent with predictions and access tracks were repaired. Road repairs were undertaken to address cracking that posed a potential safety risk to mine employees and contractors. There were no perceptible impact to stock fences located over LWW6.
Public Safety		
Public Safety	No additional risk due to mining	The areas mined in 2020 are not accessible to the public, consistent with each relevant Public Safety Management Plan, and there is not considered to have been any increase in risk to public safety as a result of longwall mining. No incidents of public safety in relation to mining were recorded in the reporting period. On private property was undermined during 2020 by LW6 and LWW6. A Private Property SMP is in place to manage the safety aspects. Subsidence cracking did occur on private land, which has either been repaired or is in the process of being repaired. Cracking was within prediction and no incidents occurred.

6.9 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) (ULNCX-111515275-98).[51] A licensed waste contractor provides off-site waste disposal and recycling. A summary of waste performance is provided in **Table 6-9**.[52] Approximately 62% 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 103 tonnes of Concrete (in accordance with Condition L4.1 which specifies a limit of 400 tonnes per year).

Table 6-9 - Summary of Monthly Waste Statistics for 2020

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
USO	**Total Offsite Waste (T)**	24.52	23.37	35.81	37.02	21.84	49.70	31.66	50.56	59.20	18.67	55.11	40.64	448.09
	Recycled Waste (T)	20.64	16.29	26.97	24.26	12.71	44.28	26.61	44.25	41.69	16.04	34.98	35.55	24.26
	Recycling %	**84.20**	**69.70**	**75.32**	**65.53**	**58.19**	**89.09**	**84.03**	**90.20**	**70.42**	**85.92**	**63.47**	**87.49**	**77.09**
UUG	**Total Offsite Waste (T)**	62.25	101.35	92.06	79.73	47.11	103.32	72.88	155.01	82.27	45.46	58.28	70.31	970.02
	Recycled Waste (T)	41.58	74.75	68.01	49.17	14.91	75.65	49.29	133.57	54.58	23.40	27.99	39.00	651.89
	Recycling %	**66.80**	**73.76**	**73.88**	**61.68**	**31.66**	**73.21**	**67.63**	**86.16**	**66.34**	**51.48**	**48.03**	**55.47**	**67.20**
UWO	**Total Offsite Waste (T)**	104.58	123.62	89.48	125.44	79.63	137.71	104.00	97.44	78.90	57.91	87.89	69.83	1,156.42
	Recycled Waste (T)	42.63	44.77	33.23	68.34	26.43	77.45	51.35	45.03	38.52	29.78	25.53	28.77	511.83
	Recycling %	**40.76**	**36.22**	**37.14**	**54.48**	**33.19**	**56.25**	**49.37**	**46.21**	**48.81**	**51.42**	**29.05**	**41.20**	**44.26**

7. Water Management

The Water Management Plan (WMP ULNCA-111515275-99)[53] includes a number of sub plans and systems including:

- Site Water Balance;
- Erosion and Sediment Control Plan (ESCP) (ULNCX-111515275-224
- Surface Water Monitoring Program (SWMP) (ULNCX-111515275-1642);
- Groundwater Monitoring Program (GWMP) (ULNCX-111515275-1643); and
- Surface Water and Groundwater Response Plan (SWGWRP) (ULNCX-111515275-1644);
- Goulburn River Diversion Remediation Plan (GRDRP) (ULN SD PLN 0054);

[51] PA 08_0184 Schedule 3, Condition 54, and SoC 6.15.1 and EPL 394.
[52] PA 08_0184 Schedule 5, Condition 3.
[53] PA08_0184 Schedule 3, condition 34, EA 2009, EPL394.

- Goulburn River Diversion Erosion & Sediment Control Plan (ULN SD PLN 0104).

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 balance[54] 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 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 2020 calendar year inflow to the Ulan Underground workings averaged 17.49 ML/day, whilst inflow to the Ulan West Underground workings averaged 4.74ML/day.

15.68ML of potable water was supplied to site through an external party in 2020. Additional potable water—approximately 32ML—was sourced from the PB1C bore and treated at the Millers Water Treatment Facility, reducing the need for third party imports. It is planned to decommission the Millers WTF during 2021 and replace with a potable water treatment system using the permeate from the NSWD WTF, further reducing the need for third party imports.

Table 7-1 - Water Balance Calculation 2020 Water Year

Water Balance Period[55]	Total Inputs[56]	Total Outputs[57]	Net Water Balance[58]
2020	11276 ML (30.9ML/day)	9318 ML (25.5ML/day)	-1328ML (3.64 ML/day)

[54] In accordance with Condition 34, Schedule 3 of the PA08_0184
[55] 1 January 2018 to 31 December 2018.
[56] Includes rainfall, seepage from groundwater, coal and spoil, groundwater and water from dewatering bores and runoff/drainage from tailings.
[57] Includes water used in the CHPP, dust suppression, irrigation, licensed discharge, evaporation, moisture bound to coal, rejects and tailings, onsite potable water use and seepage to spoil.
[58] Total inputs less total outputs.

7.3 Salt Balance

The GoldSIM water model estimates a Net Salt loss of 487 tonnes for the 2020 reporting year.

Table 7-2 - Salt Balance Calculations for 2020

Site	Salt tonnes (1 Jan 2020)	Salt tonnes (31 Dec 2020)	Net Salt Balance 2020 tonnes
Water Management System	11051	10564	-487

7.4 Baseflow Offsets

Baseflow loss to the Goulburn River catchment is estimated by groundwater modelling at 0.05 ML/day, equivalent to 18.25 ML per year.[59] Baseflow loss is offset from Water Access Licence (WAL) 19047[60] for (**Section 5.4**). An average 16.35 ML/day of treated water was discharged to the Goulburn River in 2020. Flow at the downstream gauging station (SW02) ranged between 1.2 ML/day and 2002.6 ML/day.[61] From mid-February 2020 onwards there was a period of higher rainfall and higher flow and therefore any streamflow losses would be less evident in such a period.

A review of baseflow losses was undertaken by HEC (see **Attachment** G) during 2020 which concluded there was no clear evidence consistent loss of flow which could be attributed to the effects of mining. It was recommended to undertake period gauging at SW02 and adjust the ratings curve if required, continue to collect data and re-assess in the next 12 months.

Baseflow losses from the Talbragar River catchment have not occurred based on observed levels in VWPs, TAL1 and TAL2, which were installed for the purpose of assessing baseflow impacts in that area. The groundwater model estimates baseflow losses in the Talbragar catchment will commence at 0.135 ML/day, rising to 0.2 ML/day. UCMPL has secured WALs to offset the Talbragar Baseflow losses as follows:

- WAL 41817 provides 50 units in the Upper Talbragar River Water Source[62]*;* and
- WAL 34921 provides 30 units in the Talbragar Alluvium Water Source.[63]

7.5 Water Extraction Licence Compliance

Water Balance indicates total groundwater extraction of 5530 ML (**Table 7-3**) for the 2020 water year (1 July 2019 to 30 June 2020), of which;

- 3099.6 ML of groundwater was extracted from the Oxley Basin Coast Groundwater Sources[64] (WAL41492 provides 7060 units of allocation). This was withdrawn under work approval 20AL214787 including various dewatering locations (**Figure 7-1**) throughout the Ulan Complex, none of which are in alluvial sediments;
- 2401.8 ML of groundwater was extracted from the Sydney Basin of the Murray Darling Basin (MDB) Groundwater Source[65] (WAL37192 704 units, WAL41906 2215 units and WAL42900 4031 units of allocation respectively).
- 0.72 ML was extracted from Moolarben Creek Dam/Pump and 18.25 ML of entitlement used to offset the maximum expected base flow losses[66] to the Upper Goulburn River Water Source

[59] PA08_0184, Schedule 3, condition 29, note
[60] WAL19047 for Upper Goulburn River Water Source within *Water Sharing Plan for the Hunter Unregulated & Alluvial Water Sources 2009*.
[61] Flow at SW02 augmented by licenced water discharge.
[62] *Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012*
[63] *Water Sharing Plan for the Macquarie Bogan Unregulated and Alluvial Water Sources 2012*
[64] *Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016*
[65] *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011*
[66] *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011*

during the reporting period. 120.81 ML of water was released as flow through the dam wall for riparian right (as per the conditions of the licence) and seepage, and 42.02 ML was evaporated during the reporting period. A total of 181.80 ML of entitlement under water access licence WAL19047 was used during the reporting period (extraction limit 400ML).

Table 7-3 - Water Extraction

Water Licence	Water sharing plan, source and management zone (as applicable)	Entitlement (Unit Shares)	Shares in ML for 2020 Water Year	Passive take / outflows	Active pumping	TOTAL
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	3099.562	3099.562
WAL 41900	Sydney Basin Groundwater Source *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011*	2215	2215ML	0	2215	2215
WAL37192	Sydney Basin Groundwater Source *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011*	704	704ML	0	186.801	186.801
WAL19047 (20WA209953, Moolarben Creek Dam / Pump / Water Supply)[67]	Upper Goulburn River Water Source *Water Sharing Plan for the Hunter Unregulated & Alluvial Water Sources 2009*.	400	400ML	120.81	0.72	181.80*

Notes: *Includes 0.72 ML water extraction via small pump, 18.25 ML offset baseflows to Goulburn River, 42.02 ML annual evaporation from Moolarben Dam, 120.81 ML to maintain riparian flow/seepage from Dam Wall..

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)[68;]
- The Bobadeen Water Treatment Facility (LDP6) [69;] and
- The North West Sediment Dam Water Treatment Facility (LDP19). [70]

[67] Works approval 20WA209953 requires riparian flow of 7 L/second. 144.92 ML was released to Moolarben Creek in 2018.
[68] The BIS (operating since 2004) utilises five central irrigating pivots to irrigate approximately 242ha of pasture.
[69] The BWTF (commissioned 2006) uses microfiltration and reverse osmosis water treatment and discharges to EPL 394 LDP 6.
[70] 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.

Approximately 905ML of water with an average EC of 1088µS/cm was applied to the BIS in 2020, with 52% of the modelled offset capacity used during 2020 and 79% 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 7.11.6**.

Discharge of blended product water from the Bobadeen Water Treatment Facility to Ulan Creek at Bobadeen (LDP6) occurred on 365 days with an average daily discharge volume of 7,280 KL/day. Measured pH, EC and TSS concentrations were within EPL394 limits (**Table 7-7**). The maximum discharge volume on any day was 14,095 KL (EPL394 volume limit 15,000 KL/day) (**Table 7-4**).

Discharge of blended product water from the Northwest Sediment Dam Water Treatment Facility to Ulan Creek near the Goulburn River (LDP19) occurred on 355 days with an average daily discharge volume of 9,376 KL/day and a maximum discharge on any day of 16,587 KL (**Table 7-4**) (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 27,661 KL, on 31 December 2020, was below the 30,000 KL limit. Monitoring summaries are provided in **Table 7-4.** 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. 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 per an Alternative Water Supply Agreement[71] entered into with a landholder in 2019 a new bore was sunk to a greater depth in response to dry conditions and poor performance of their existing bore, which was potentially impacted by drawdown.

An Alternative Water Supply Agreement is in place for a spring fed dam, however, as the dam has been refilled from regular rain events in 2020, no compensatory water was needed.

[71] As required by Condition 30, Schedule 3 of the Project Approval PA08_0184

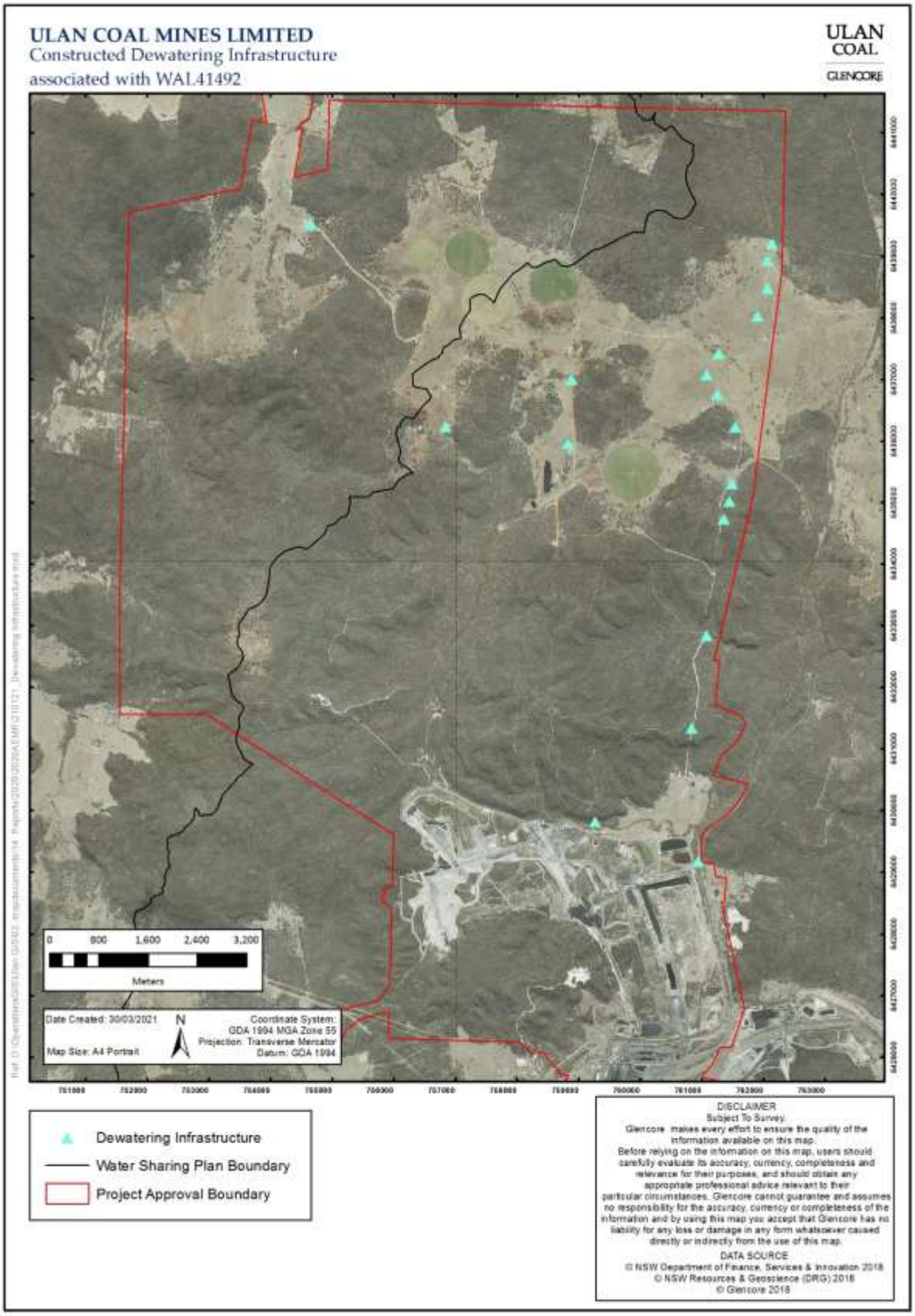


Figure 7-1 Dewatering Infrastructure

Table 7-4 - 2020 Calendar Year Discharge Volumes

Location	Licence Limit (ML/year)	Discharged Volume (ML/year)	2020 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	2657.7	Yes
Discharge to Ulan Creek (LDP 19)	10,950	3328.5	Yes
Discharge to Ulan Creek (LDP3, LDP6, and LDP19)	10,950	5986.2	Yes
Discharge through irrigation scheme (BIS)	No applicable volume limit[72]	904	Yes

7.8 Surface Water Monitoring Results

The Surface Water Monitoring Program (ULNCX-111515275-1642) (SWMP)[73] 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 **Figure 7-2**. 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 (µS/cm) via a continuous monitor and TSS collected via monthly grab sample. **Figure 7-3** - **Figure 7.8** show the daily average real time water quality results for SW01 and SW02 for 2020 and historical results since 2012. **Figure 7-9** shows flow at 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. Automatic sampling stations are installed at SW06, SW07, SW10 and SW11. Samples are collected and sent to the laboratory for analysis of pH, EC (µS/cm), TSS (mg/L), TDS (mg/L) and Turbidity (NTU). **Figure 7-10 to 7.12** provide water quality results for SW03 to SW11 within the reporting period compared with the historical average (2011-2020). The 2020 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 a summary of investigations undertaken where results exceeded trigger values in 2020. Results of monitoring for EPL 394 licence discharge points are reported in the annual return.

[72] 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.

[73] 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).

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

Water Quality Variable	Goulburn River Upstream (SW01)	Goulburn River Downstream (SW02)	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[4]	Watercourses flowing to Talbragar River[6]
pH	6.5 – 8.01	6.4 – 8.13	6.5 – 7.98	6.5 – 8.58	6.5 – 8.58	6.5 – 8.55	6.5 – 8.06	6.5 – 8.05
EC (µS/cm)	680[2]	854[2]	1126[8]	900[8]	900[8]	125 – 2200[5]	30 – 350[6]	30 – 350[5]
TSS (mg/L)	50[2]	50[2]	64[9]	83.2[10]	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 UCMPL 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)

Table 7-6 - Surface Water Monitoring Result TARP Activation

Site	Date of sample	Trigger	Action	Result
SW01	Numerous times by continuous monitoring.	pH result below trigger of 6.5	Inspection of site undertaken. Probe within calibration. Review of water quality parameters from grab samples.	This site is upstream of UCC operations and discharge. Discharge pH was within limits. Significant rainfall has occurred throughout the year which may have reduced pH. pH is gradually recovering. Monthly grab samples have generally compliant, with no triggering of the TARP. No non-compliance with EPL.
SW02	Intermittently between January and March	Elevated pH and EC.	Inspection of site and review of potential attributing factors including review of discharge water quality parameters and grab samples.	Discharges within EPL limits. Significant rainfall throughout the period resulted in the probe being covered with sediment due to increased flows. No exceedance of EPL criteria. Grab samples general compliant, with no triggering of the TARP.
SW03	3 Consecutive Months (April – June)	Elevated EC.	Inspection of Site and review of flow data and LDP data.	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.
SW06	3 Consecutive readings (February)	Elevated EC.	Inspection of Site and review of data	There was one trigger of the SWGWRP for EC following prolonged rain with a maximum EC recorded of 510 µS/cm following heavy rainfall on the 18 February. EC levels have been below the level for the remainder of the year and Site Specific Trigger levels will be developed during 2021.

Site	Date of sample	Trigger	Action	Result
SW08	3 consecutive readings (February to April)	Low pH	Inspection of Site and review of data	There was one trigger of the SWGWRP for pH (three consecutive exceedances) where pH was below the adapted trigger value, with a range of 5.60-6.4 recorded during the rainfall events from February to April 2020. pH increased during subsequent sampling and is likely to be associated with the breakdown of accumulated organic material in that location. When 24 samples from this location exist, site specific values will be calculated.
SW11	3 consecutive readings	Low pH	Inspection of Site and review of data	The SWGWRP for pH was triggered throughout the reporting period with a range of pH recorded between 4.9 – 6.3 indicating that the water is acidic in this area. This is likely to be associated with the breakdown of organic matter. pH is comparable with previous sampling events. When 24 samples from this location exist, site specific values will be calculated.

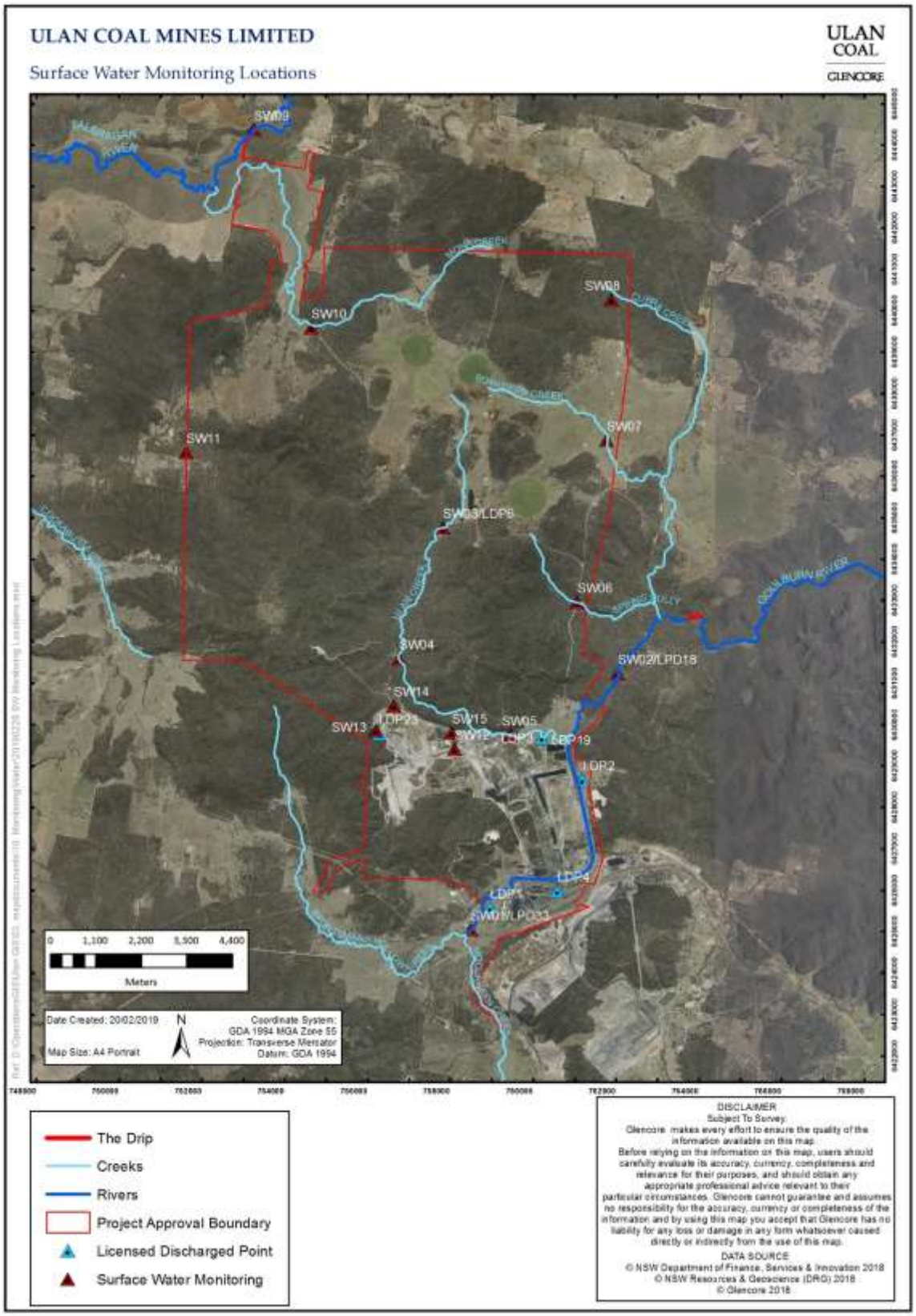


Figure 7-2 Surface Water Monitoring Network

Table 7-7 - EPL 394 Concentration Limits for Licensed Discharge Points

Location	(LDP)	Discharge Limits								2020 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
Goulburn River Gauging Station Upstream	33	-	-	-	-	-	-	-	-	Compliant
Ulan Creek Cumulative Discharge Limit^	3+6+19	-	-	-	-	-	-	-	30,000	Compliant

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

Table 7-8 - 2020 Sampling Result Summary

SW Sites	pH			EC (µS/cm)			TSS (mg/L)		
	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave
SW01	**2.6**	7.7	6.27	70	**3472**	438.18	2	**862**	79.45
SW02	**4.7**	**8.5**	7.33	52	**5605**	630.44	1	**330**	40.95
SW03	7.1	**8.1**	7.7	86	**2130**	886	<1	**268**	42.12
SW04	6.9	8.5	7.93	97	**980**	606.61	<1	**2160**	252.00
SW05	6.6	7.9	7.48	157	**1120**	667.76	<1	**246**	35.00
SW06	6.8	8.0	7.45	129	**510**	296.57	4	**225**	48.64
SW07	6.3	7.7	7.2	53	182	130.8	6	**150**	62.27
SW08	5.6	7.1	6.53	155	257	187.91	<1	30	8.70
SW09	7.3	**9.3**	8.19	172	**727**	456.63	2	**12700**	1410.19
SW10	**6.2**	7.5	6.96	30	235	145.93	<1	**108**	35.00
SW11	4.9	6.6	5.85	90	192	146.27	3	16	7.27

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,*

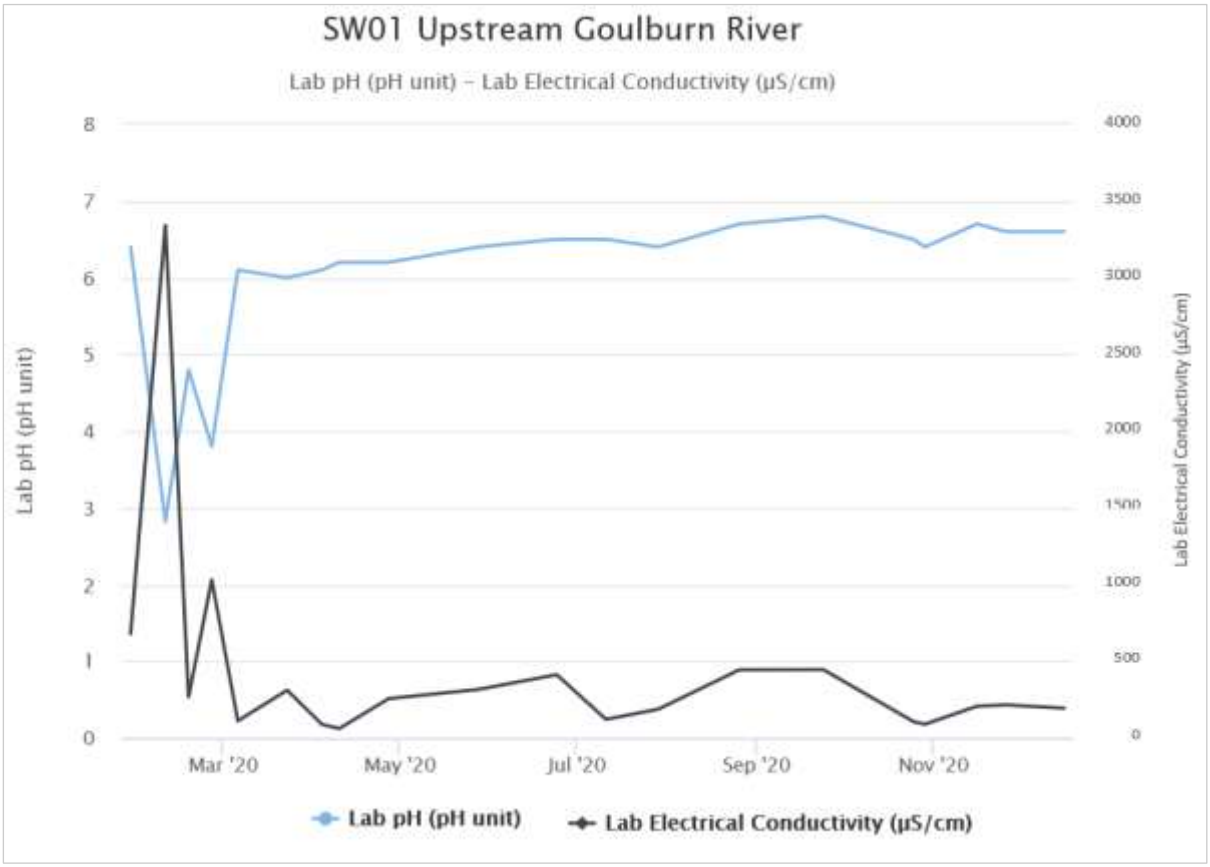


Figure 7-3 SW01 Upstream Goulburn River Monitoring Results 2020

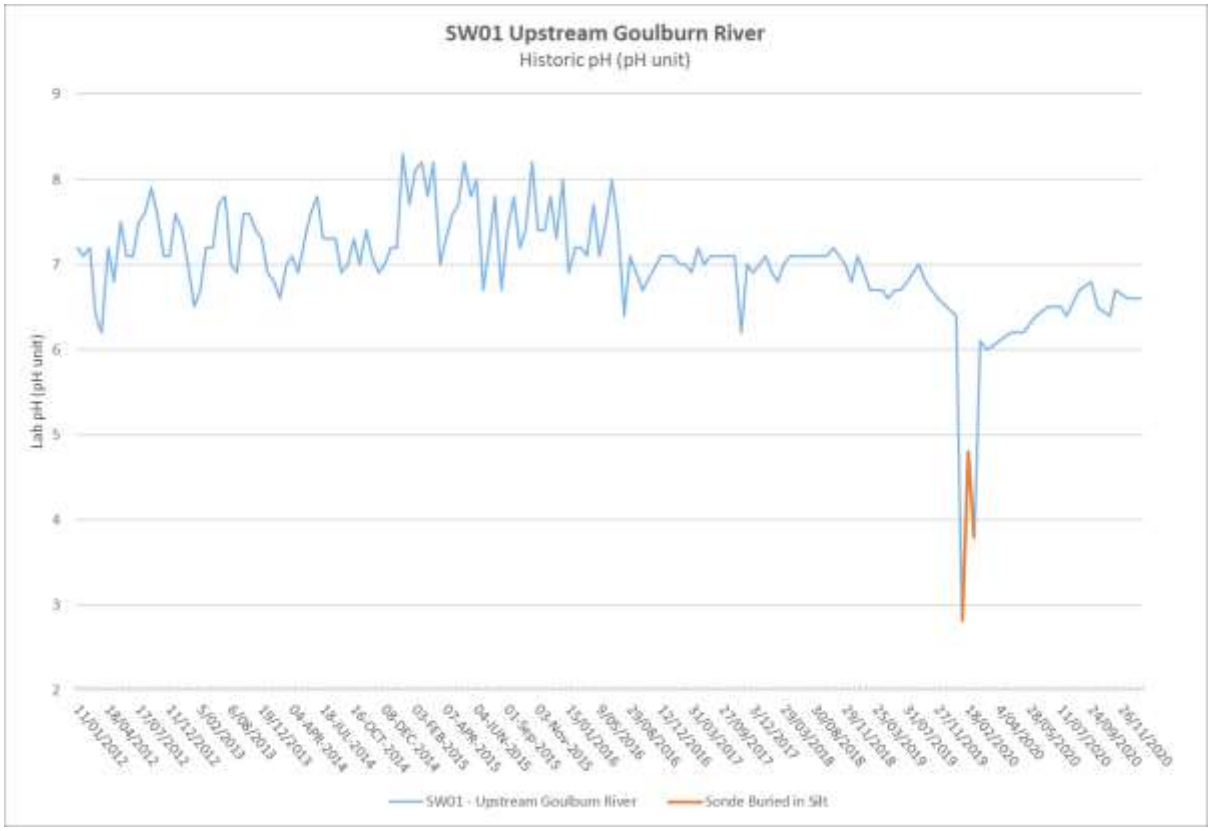


Figure 7-4 SW01 Upstream Goulburn River Historical pH (2012 - 2020)

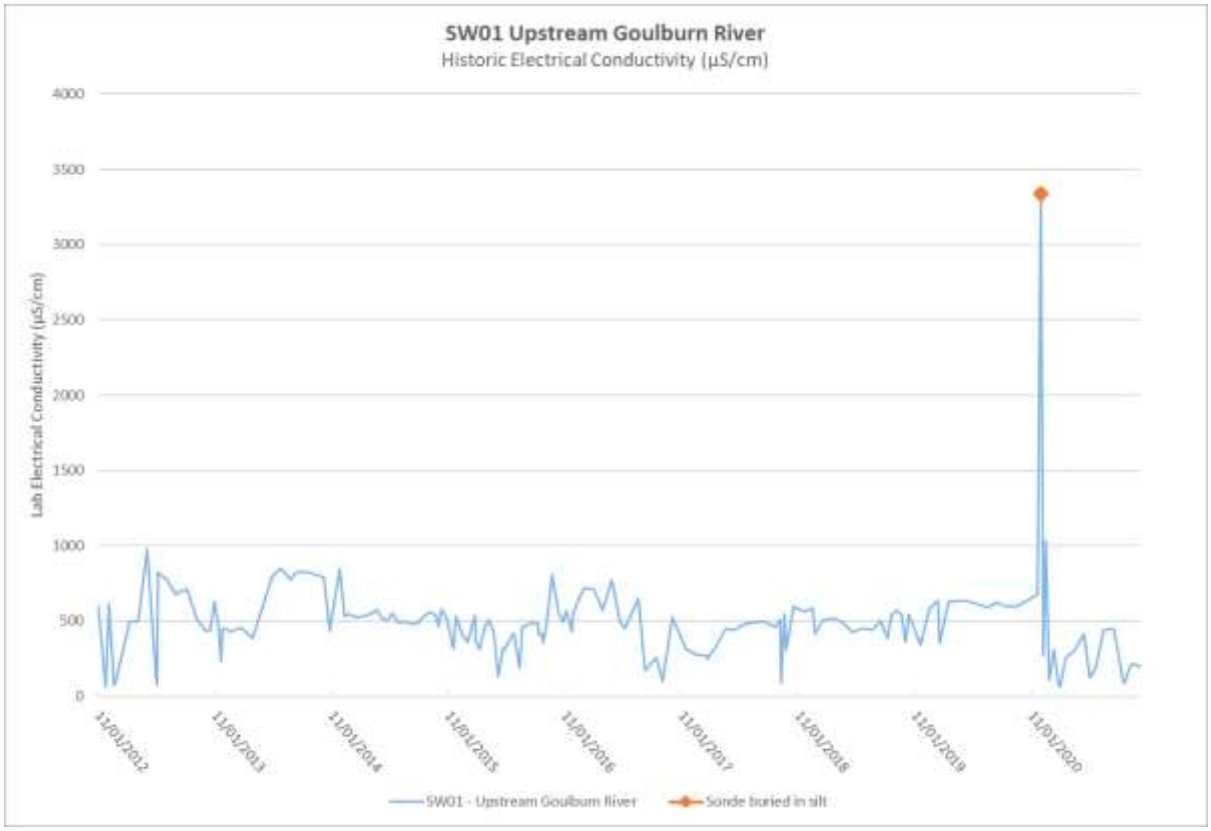


Figure 7-5 SW01 Upstream Goulburn River Historical EC (2012 - 2020)

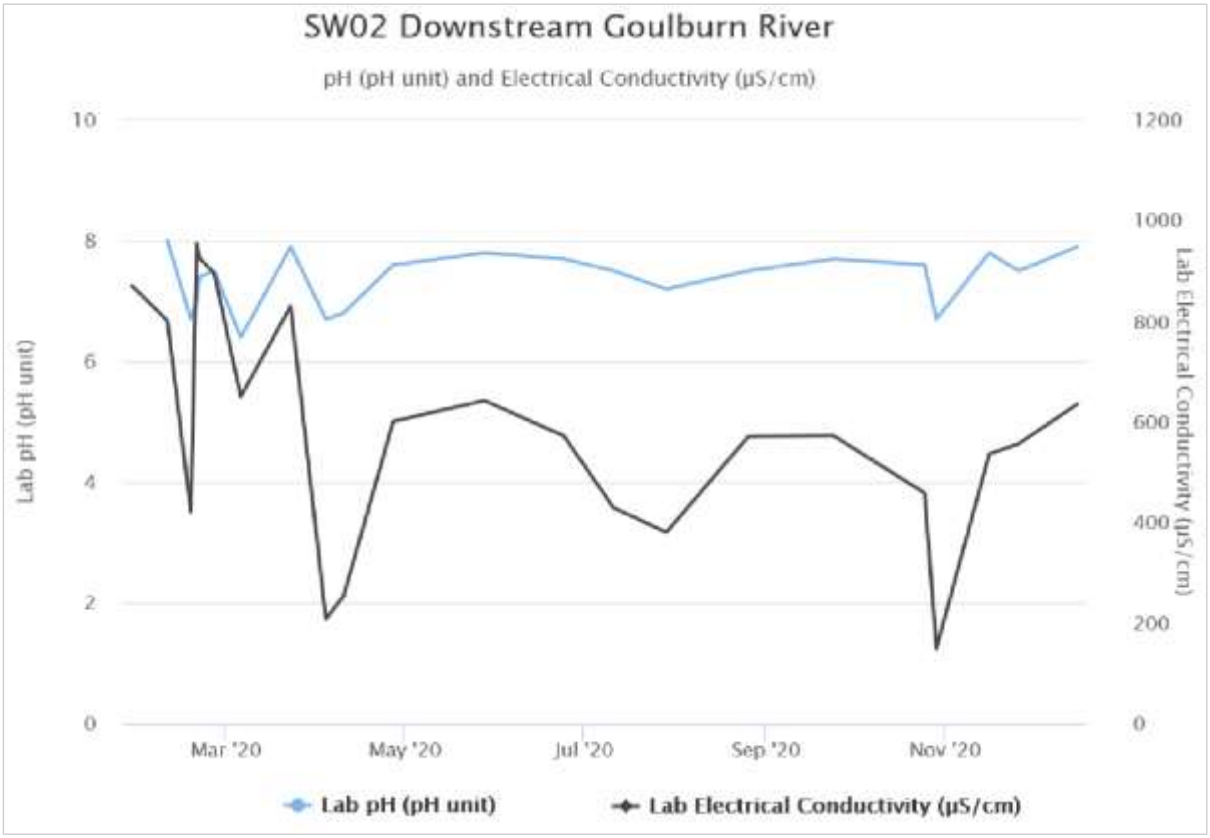


Figure 7-6 SW02 Goulburn River Downstream Monitoring Results 2020

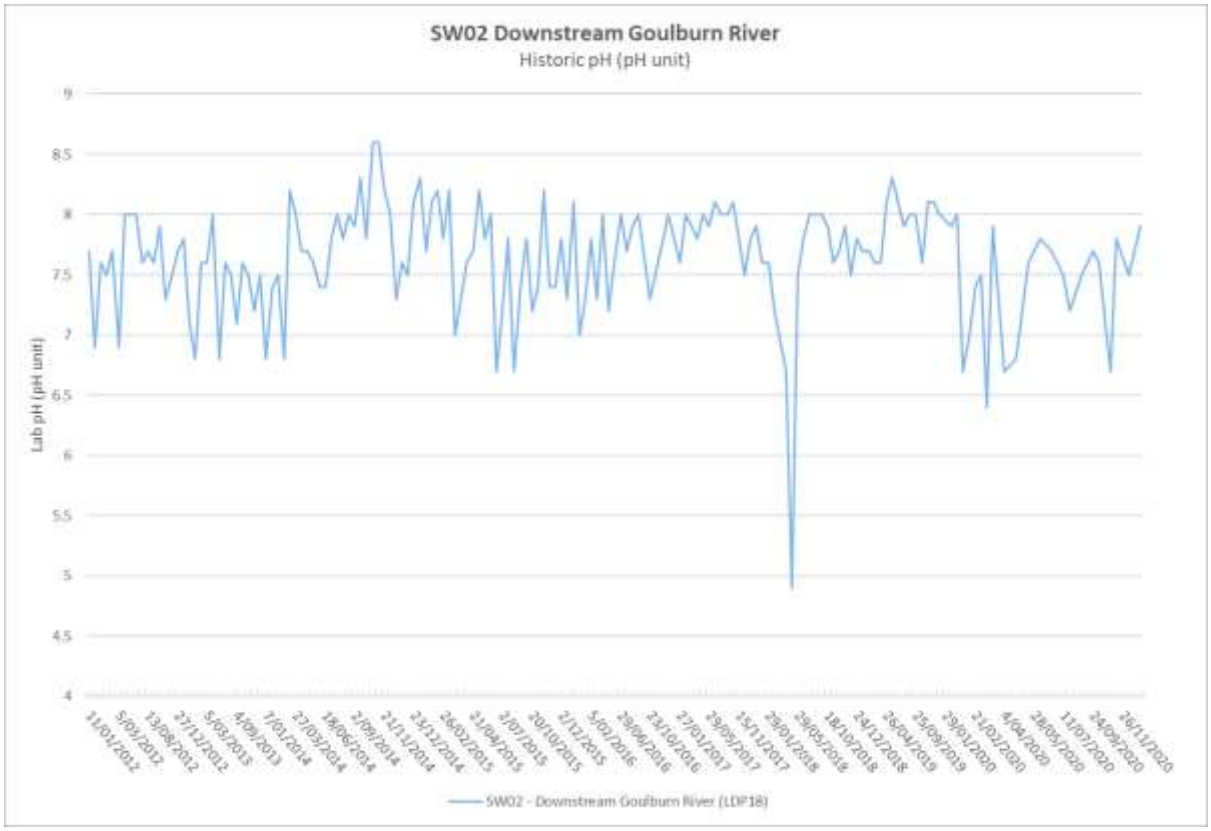


Figure 7-7 SW02 Goulburn River Downstream Historical pH (2012 - 2020)

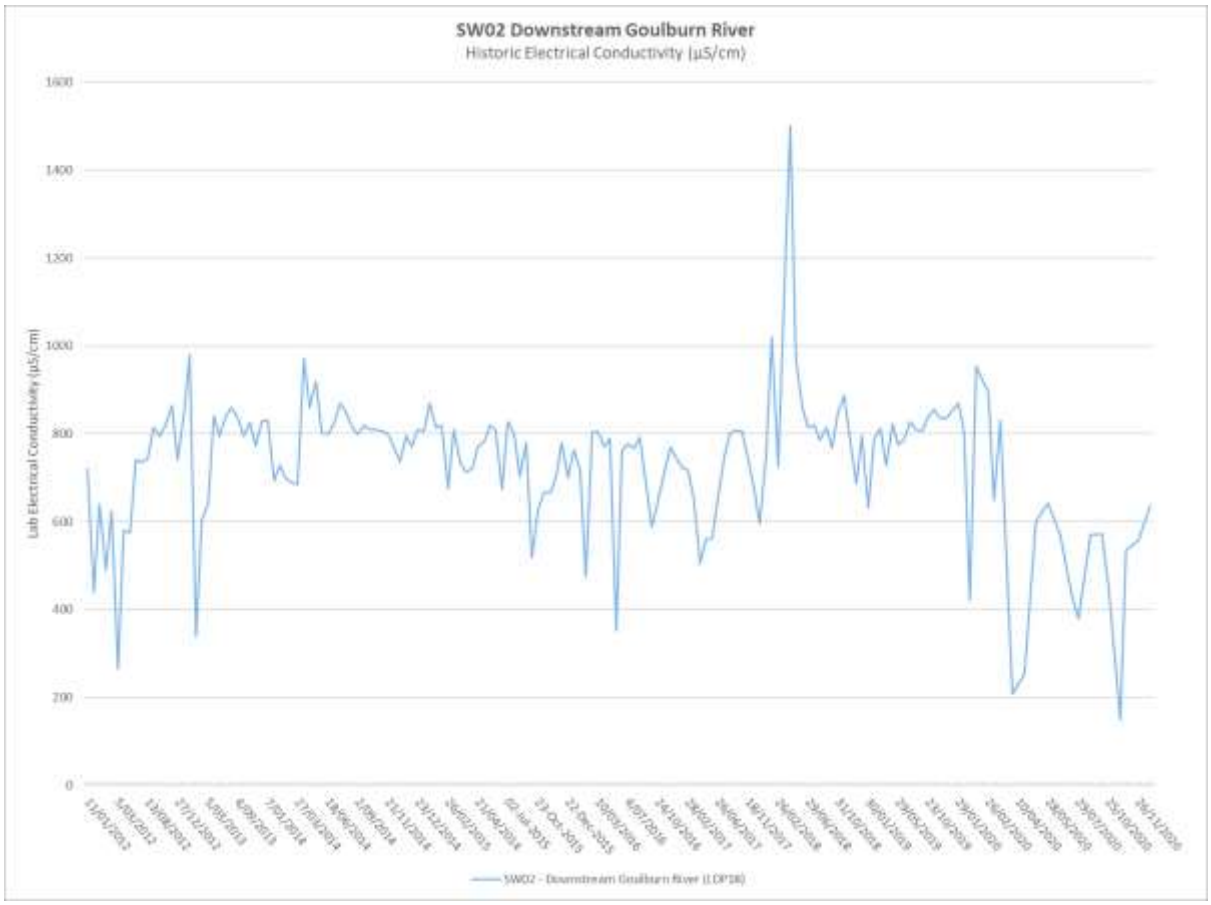


Figure 7-8 SW02 Goulburn River Downstream Historical EC (2012 - 2020)

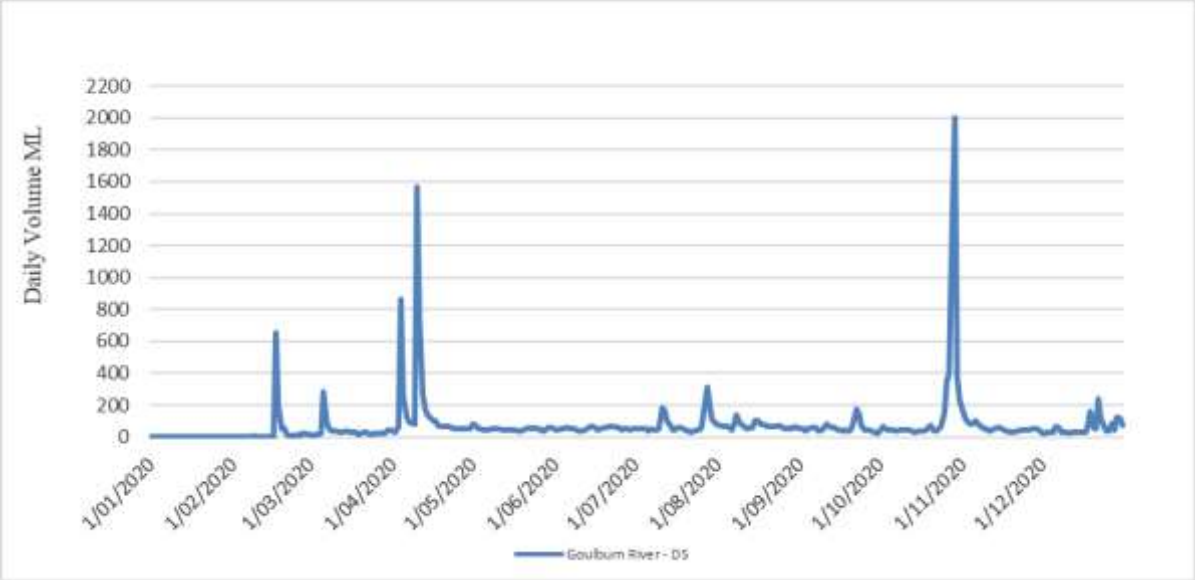


Figure 7-9 SW02 Goulburn River Downstream Flow 2020

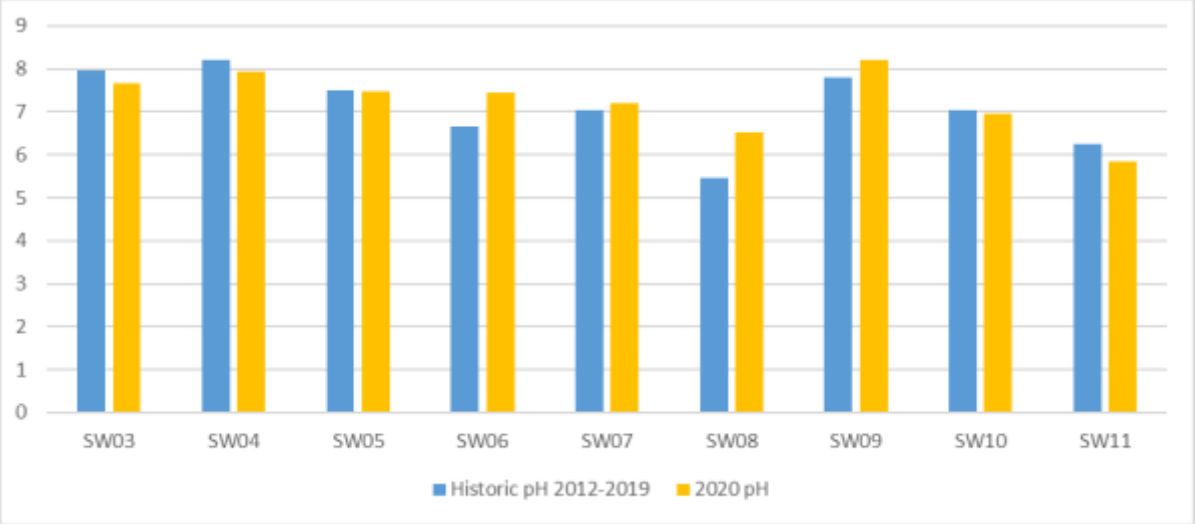


Figure 7-10: Comparison 2020 to Historic Average pH Monitoring Results

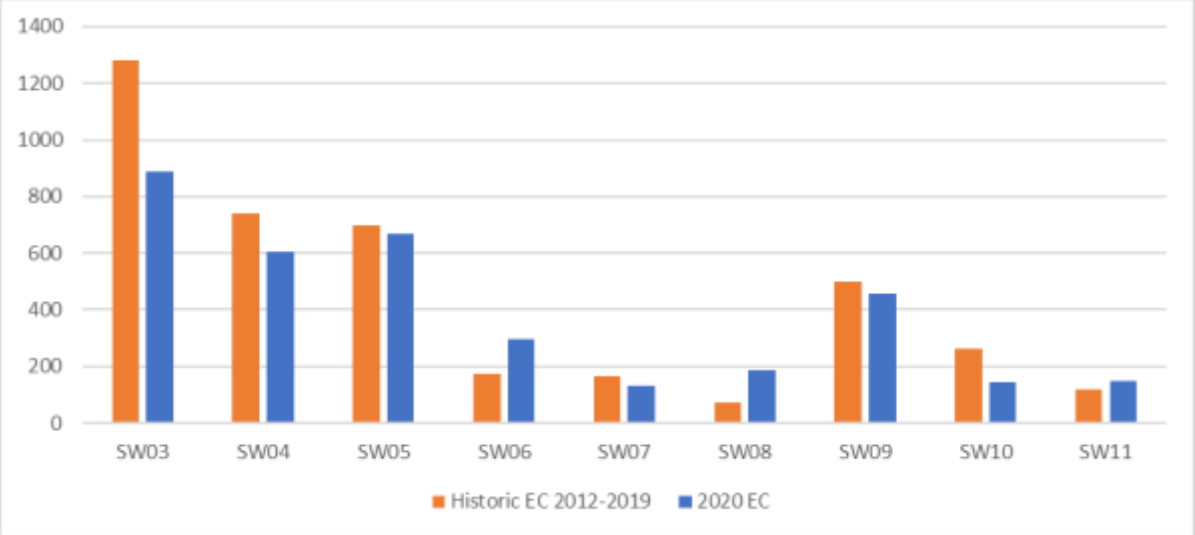


Figure 7-11 Comparison 2020 to Historic Average EC Monitoring Results

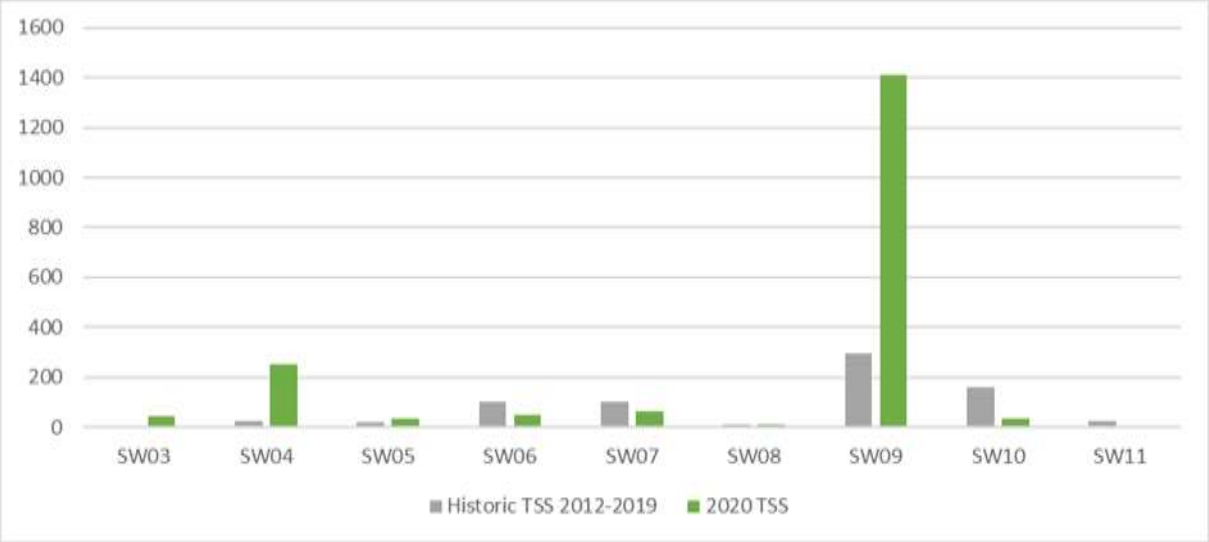


Figure 7-12 Comparison 2020 to Historic Average TSS Monitoring Results

7.9 Ulan Creek Stability Monitoring

Channel stability monitoring as required by the SWMP, subsidence monitoring programs and PA08_0184, is completed annually. Channel stability monitoring along the Ulan Creek, downstream of LDP6 was completed in November 2020 (**Attachment G**). The monitoring involves an observational survey which provides a description of locations and dimensions of significant erosive or depositional features and photographs recorded at monitoring points in representative locations.

Targeted monitoring of creek lines above the longwall panels proposed to be undermined in the next 12 months and those undermined in the previous 24 months is also conducted pre, during and post mining. This monitoring is summarised in the subsidence section (**Section 6.8**) of this report.

The results from the Ulan Creek stability monitoring in 2020 concluded:

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. As with previous monitoring of Ulan Creek completed since 2015, there were no obvious signs of subsidence related impacts from the Ulan West underground mine. There was no clear evidence of surface cracking or subsidence related instabilities that could be identified in the Ulan Creek channel at the time of the 2020 creek stability assessment.

The decreasing stability scores can be attributed to almost no well-established vegetation noted on the channel floor and creek banks observed in 2020. In contrast, the ground cover had notably increased above the banks of Ulan Creek when compared to previous years. Also noted above the banks were numerous eucalyptus saplings having recently germinated in the past twelve months.

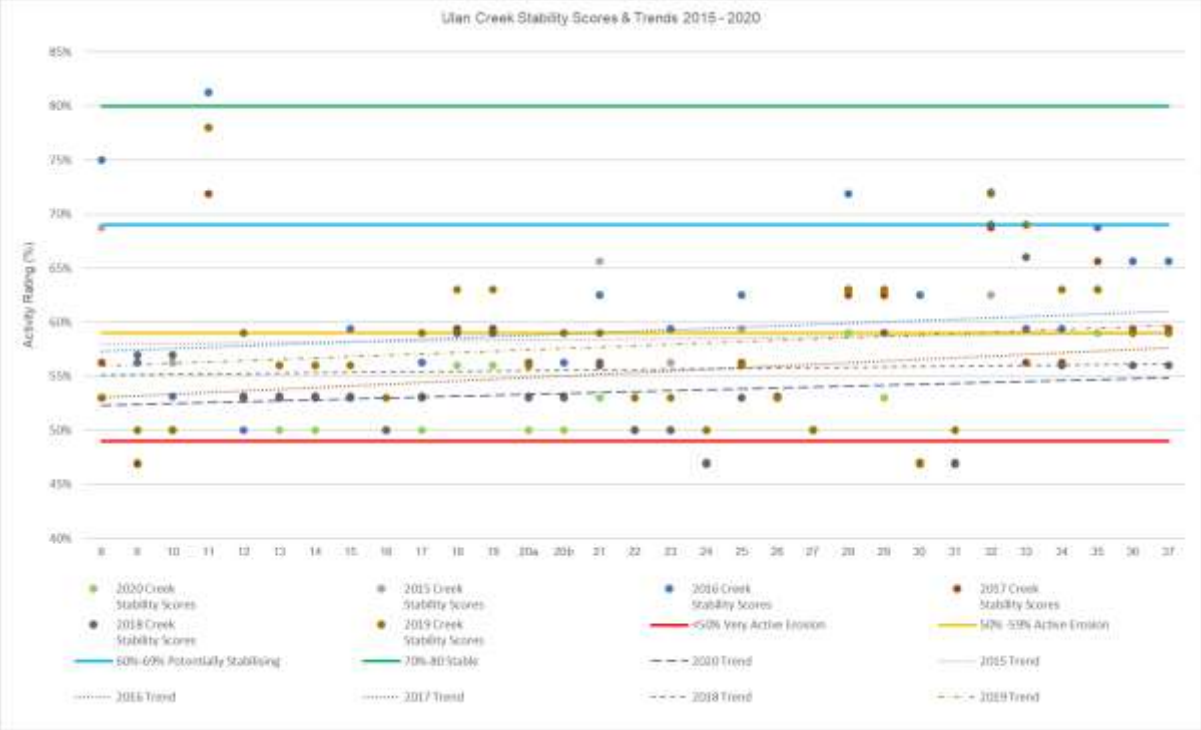
Contributing to the lower scores in 2020 was a change in the shape and aspect ratio of the drainage line as many sites were reassigned lower scores from 'active erosion' in previous years to 'very active erosion' in 2020.

Also observed in 2020 were many examples of flood debris and sediment deposits transported above the banks of Ulan Creek during one or more high flow events that occurred in 2020.

Several trees had also fallen into Ulan Creek since 2019. A high flow event also washed away sections of the Old Ulan Road across Ulan Creek, transported large trees and other flood debris, removed and deposited sediment and gravel material down the creek and destroyed SW03 and SW04 gauging stations.

The 2020 Ulan Creek stability assessment results indicate a deteriorating trend in the overall creek stability from Site UC08 to UC37 when compared to historical monitoring from 2015. Although a slight improving trend in 2019

was observed, one or more high flow events in 2020 has caused significant instabilities and further exacerbated the existing erosion along the creek inspected.



Source: *2020 Channel Stability Monitoring Report (Pacific Environmental 2020)*

Figure 7-13 Ulan Creek Stability Monitoring Assessment Scores

7.10 Stream Health/Aquatic Monitoring

Results of stream health/aquatic monitoring for the Goulburn River, Talbragar River, Ulan Creek, Bobadeen Creek, Mona Creek and Cockabutta Creek (i.e. aquatic surveys) are summarised in **Section 6.6.5**.

7.11 Groundwater Monitoring results

The Groundwater Monitoring Program (GWMP) (ULNCX-111515275-1643)[74] 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;

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

- 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 as the mine advances to the North and West.

Three sets of two monitoring bores were installed to assess the potential for alluvium at Mona Creek. No additional VWPs were installed in 2020. Maintenance and download of VWPs is undertaken quarterly.

7.11.3 Groundwater Monitoring Results

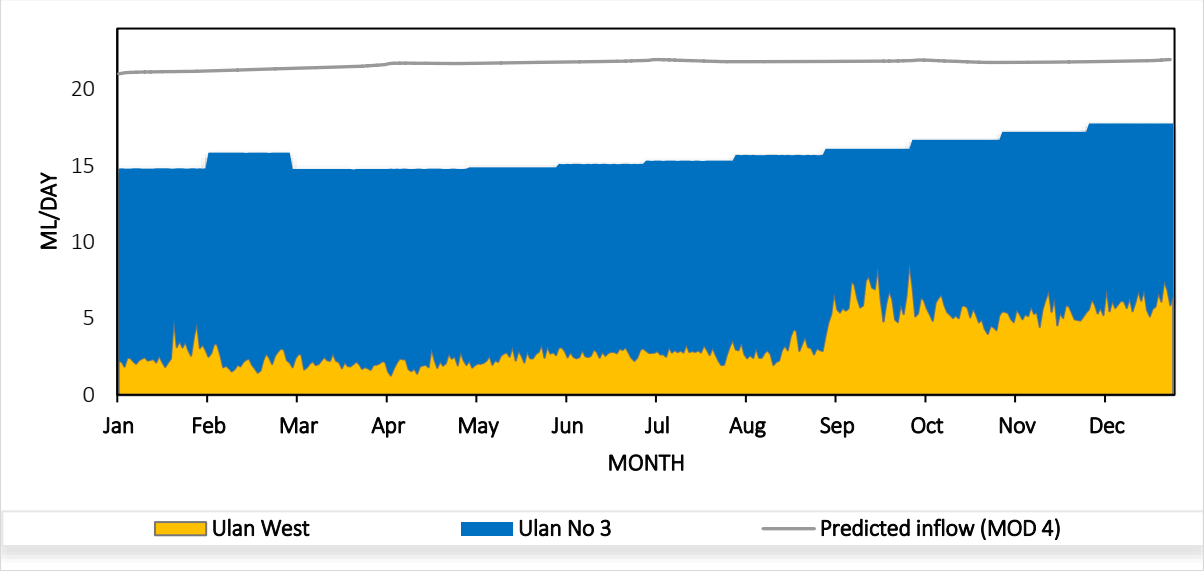
Relatively stable groundwater levels were recorded in bores targeting Jurassic sediments indicating no mine related impacts. Monitoring bores and VWPs intersecting Triassic units over 2 km from the mine recorded relatively stable groundwater levels. Monitoring bores intersecting the Triassic units within 1 km of the mine area recorded less than a 1 m decline in groundwater levels. Observed changes are generally consistent with model predictions. Groundwater levels within the Permian coal measures generally declined over the monitoring period, consistent with model predictions. Groundwater levels observed in the Private bore network have remained stable with no marked decline during 2020 monitoring period.

Any minor deviations to the groundwater model are summarised in the Groundwater TARP Activation on **Attachment D.**

Groundwater monitoring results are summarised in Sections **7.12.4** to **7.12.9** and detailed in the 'Annual Groundwater Monitoring Review – 2020' by AGE in **Attachment D**.

7.11.4 Observed and Predicted Groundwater Inflows and Levels

Extracted water from pit inflows ranged between 14.8 ML/day and 17.8 ML/day in 2020 with a combined average of 15.78 ML/day. Abstracted volumes from each operation comprised Ulan West (23%) and Ulan No. 3 (77%) during 2020. **Figure 7-14** shows the modelled inflow combined for the two mine areas and indicates that actual inflows are less than the modelled inflows throughout the year.



Source: *2020 Groundwater Monitoring Report (AGE 2020)*

Figure 7-14 Comparison of Modelled and Calculated Groundwater Inflows to the Underground

7.11.5 North Monitoring Network

North Monitoring Network (NMN) is the largest network of environmental monitoring bores and consists of 35 monitoring standpipes (SPs) at 14 locations, and 9 VWPs with a total of 38 sensors (**Figure 7-15**). Groundwater levels in SPs are monitored quarterly (March, June, September, and December), R755A, PZ07C, and PZ08C are equipped with loggers and water samples are collected from a subset of the SPs for groundwater analysis annually.

Tertiary Basalt

Monitoring bore R752 intersects Tertiary basalt. This monitoring bore has been dry since mid-2018. It is expected that the absence of groundwater levels at R752 is the result of insufficient rainfall recharge.

Jurassic Sediments

Figure 7-16 shows the interpolated groundwater contours from monitoring bores and VWP in the Jurassic sediments. The contours show groundwater flow mirrors topography, flowing towards adjacent watercourses. Groundwater levels during 2020 in:

- PZ09D were relatively stable;
- PZ10B was dry between Q1 to Q3, recharging in Q4;
- PZ14C declined from late 2019 to Q2 2020, before increasing;
- PZ26D were not measured due to inaccessibility; and
- PZ28B were relatively steady.

Triassic Sediments

Groundwater levels for PZ12, PZ01A, PZ06C, PZ09C, PZ24B, PZ28A and R755A were generally stable. Groundwater levels at PZ07C and PZ10A (located directly above the underground mine, respectively) continued to decline, with these monitoring bores becoming dry in Q3 2020. Groundwater levels at PZ04A, PZ08C and PZ14B, east of the mine footprint, continued to decline during 2020. No exceedance of trigger values were recorded at PZ04A and PZ14B. Long-term groundwater level decline in PZ08C has gradually reduced the water elevation below the trigger value at this bore. **Figure 7-17** shows the interpolated groundwater contours from monitoring bores in the Triassic sediments. The contours show depressed groundwater levels nearby to the mine (PZ08C), with groundwater also flowing south-east towards the Goulburn River.

Permian Coal Measures

Groundwater levels in this stratigraphic unit are predicted to decline as the process of underground mining reduces groundwater pressures within the target coal seam (Ulan Seam) and hydraulically connected aquifers. Depressurisation may occur at a different rate as modelled due to changes in the mine pattern or rate of extraction. **Figure 7-18** shows the interpolated groundwater contours from monitoring bores in the Permian Coal Measures, indicating that groundwater is flowing towards the underground mine and drawdown is occurring within the Ulan Seam towards the active mine area, as predicted within the EA.

Groundwater triggers of the SWGWRP are included in **Attachment G**.

7.11.6 Bobadeen Monitoring Network

Land above Ulan Underground is irrigated with recycled 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.

Five samples were collected from two monitoring bores (IMW05 and IMW06), other monitoring bores were dry. The 2020 averages fall within standard deviation range of historical EC and pH values. The lower mean EC in 2020 may be attributed to lower salinity associated with surface water infiltration during recharge events.

7.11.7 Mona Creek Alluvials

Three sets of two monitoring bores were installed within the Mona Creek Paleo Channel in December 2020. Data collection from these bores will commence in 2021.

7.11.8 Private Bore Monitoring

Monitoring of the private bores is conducted annually, where owners have requested it and the bore is accessible. Water quality and level results, where available, were collected from 20 bores during 2020. Of the 36 bores visited, groundwater levels at 12 bores were not measured due to them being equipped with a pump and/or headworks. All bores were within the groundwater level range previous recorded, including those predicted to be impacted. Three bores are being investigated for elevated EC. No complaints related to private bores were received in 2020.

7.11.9 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). Groundwater levels were relatively stable or increased throughout 2020.

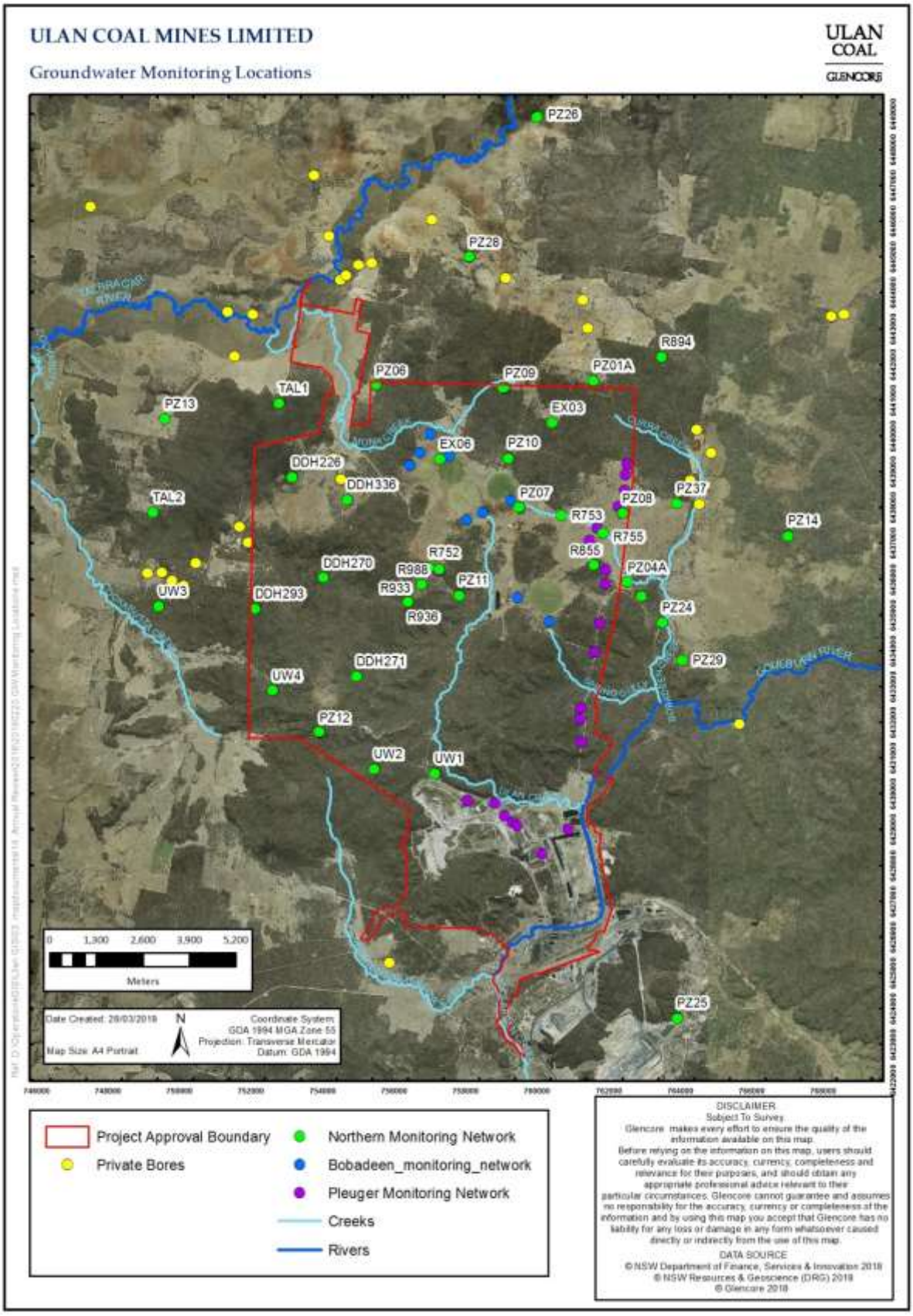
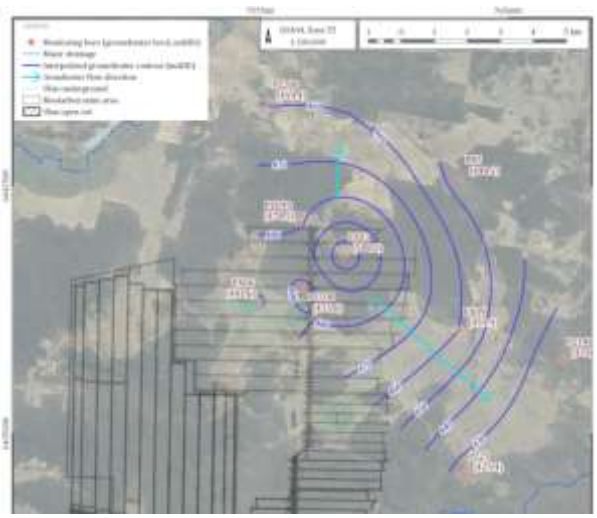
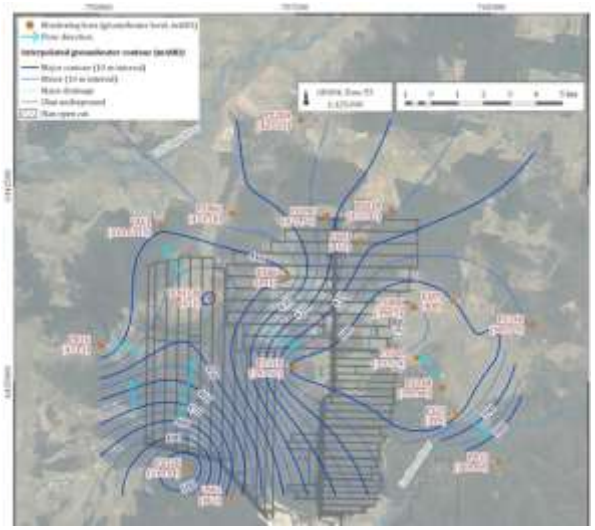


Figure 7-15 Groundwater Monitoring Network



Source: *2020 Groundwater Monitoring Report (AGE 2020)*

Figure 7-16 Interpolated Groundwater Contours - Jurassic Sediments December 2020



Source: *2020 Groundwater Monitoring Report (AGE 2020)*

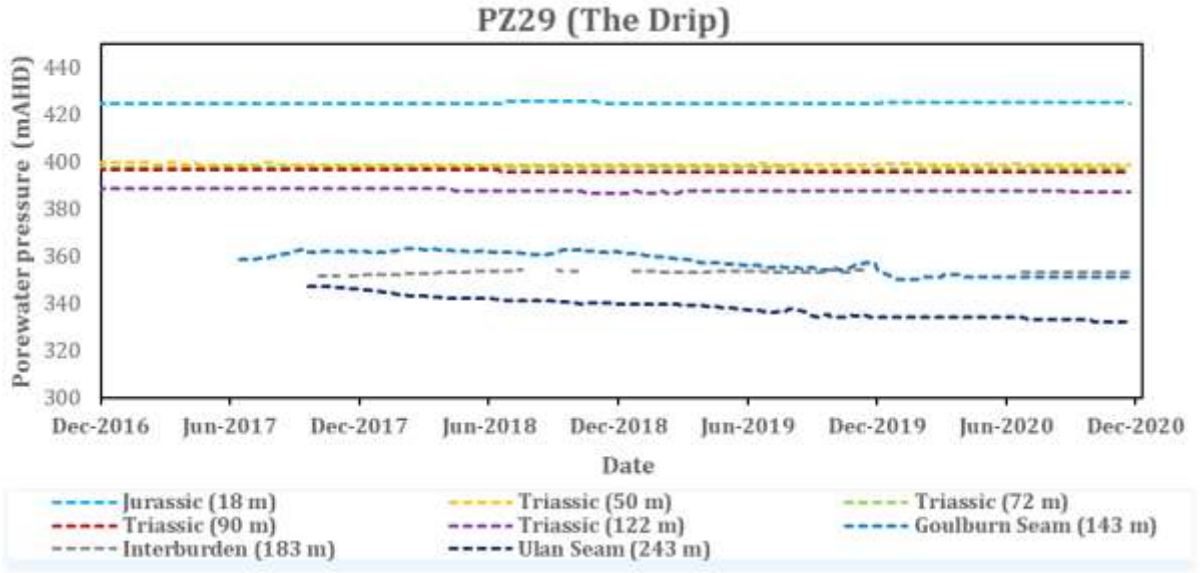
Figure 7-17 Interpolated Groundwater Contours - Triassic Sediments December 2020

Source: *2020 Groundwater Monitoring Report (AGE 2020)*

Figure 7-18 Interpolated Groundwater Contours – Ulan Seam for December 2020

7.11.10 The Drip Monitoring Program

Analysis of water samples collected from the drip for Anions, Cations, pH, EC and TSS indicate the water source is distinct from Triassic ground water in the region. The differences in major ion proportions between Triassic bores and The Drip suggests the influence of differing recharge sources and varying water-rock interactions / residence times between the two groundwater systems. The porewater pressure trends (**Figure 7-19**) have been stable for 3 years, are consistent with natural variation and indicate that there is no mining related drawdown in the Triassic sediments. Consistent with groundwater model predictions, there is minor drawdown in the Ulan seam (PCM 243) due to active mining and dewatering of that seam.



Source: *2020 Groundwater Monitoring Report (AGE 2020)*

Figure 7-19 PZ29 Porewater Pressure

8. Rehabilitation

8.1 Status of Rehabilitation

The Ulan Coal Mining Operations Plan 2017 to 2024 (MOP)[75] details the proposed mining, processing and rehabilitation of disturbed areas. Section 7 of the MOP provides the rehabilitation plan[76] for the MOP period. 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. **Table 8-1** presents a summary of current rehabilitation and disturbance areas. The Open Cut remained in care and maintenance in 2020 and no further areas are currently available for rehabilitation.

[75] Required by mining lease conditions under the *Mining Act 1992*
[76] PA08_0184, Schedule 3, Condition 57 - Rehabilitation Management Plan (RMP)

Table 8-1 - Rehabilitation and Disturbance Summary

	2019 (ha)	2020 (ha)	2021 Forecast (ha)
A. Total mine footprint[77]	1296	1299	1312
B. Total Active disturbance[78]	690	698	711
C. Land being prepared for rehabilitation[79]	0	0	0
D. Land under active rehabilitation[80]	601	551	551
E. completed rehabilitation[81]	0	50	100

Notes: Figures from MOP 2018-2024 Table 7-1

The site is divided into a number of conceptual units or 'rehabilitation domains' that focus on the treatment of like areas. Domains are assigned based on location, type of land disturbance and remedial aspects. The status of mining and rehabilitation at the end of the reporting period are shown on the plans in **Attachment H**. Rehabilitation Areas 1 to 18 were created to facilitate tracking of rehabilitation performance. The areas were formed by grouping rehabilitation areas with a similar age, structure and species composition.

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** with proposed management actions. Based on the results of the annual inspection and long term rehabilitation monitoring rehabilitation area performance is classified into one of the following categories[82];

- 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 establish which rehabilitation phase each of the rehabilitation areas are in and highlight any areas where further remediation/improvement works may be required to progress rehabilitation areas to meet completion/relinquishment criteria (**Table 8-2**).

[77] Mine footprint comprises areas that are subject to active disturbance, decommissioning, landform establishment, growth medium development, ecosystem establishment, ecosystem development and relinquished lands (as defined in RR MOP/RMP Guidelines) and excludes subsidence remediation areas.
[78] Active disturbance is areas not already rehabilitated including exploration, active mining areas, infrastructure areas, water and sewage infrastructure, topsoil stockpiles, access tracks and haul roads, waste emplacements (active/unshaped/in or out-of-pit), and tailings dams (active/unshaped/uncapped).
[79] Rehabilitation preparation – describes land where decommissioning, landform establishment and growth medium development (as defined in RR MOP/RMP Guidelines) are in progress.
[80] Active rehabilitation includes "ecosystem and land use establishment" (area seeded or surface developed in accordance with final land use) and "ecosystem and land use sustainability" (revegetation assessed as showing signs of trending towards relinquishment or infrastructure development)
[81] Completed rehabilitation has successfully met the rehabilitation land use objectives and completion criteria and is signed off by RR.
[82] Categories taken from the Glencore Coal Assets Australia Guideline 11.6 Completion Criteria and Rehabilitation Monitoring

Figure 8-1 Rehabilitation Aerial Image May 2019

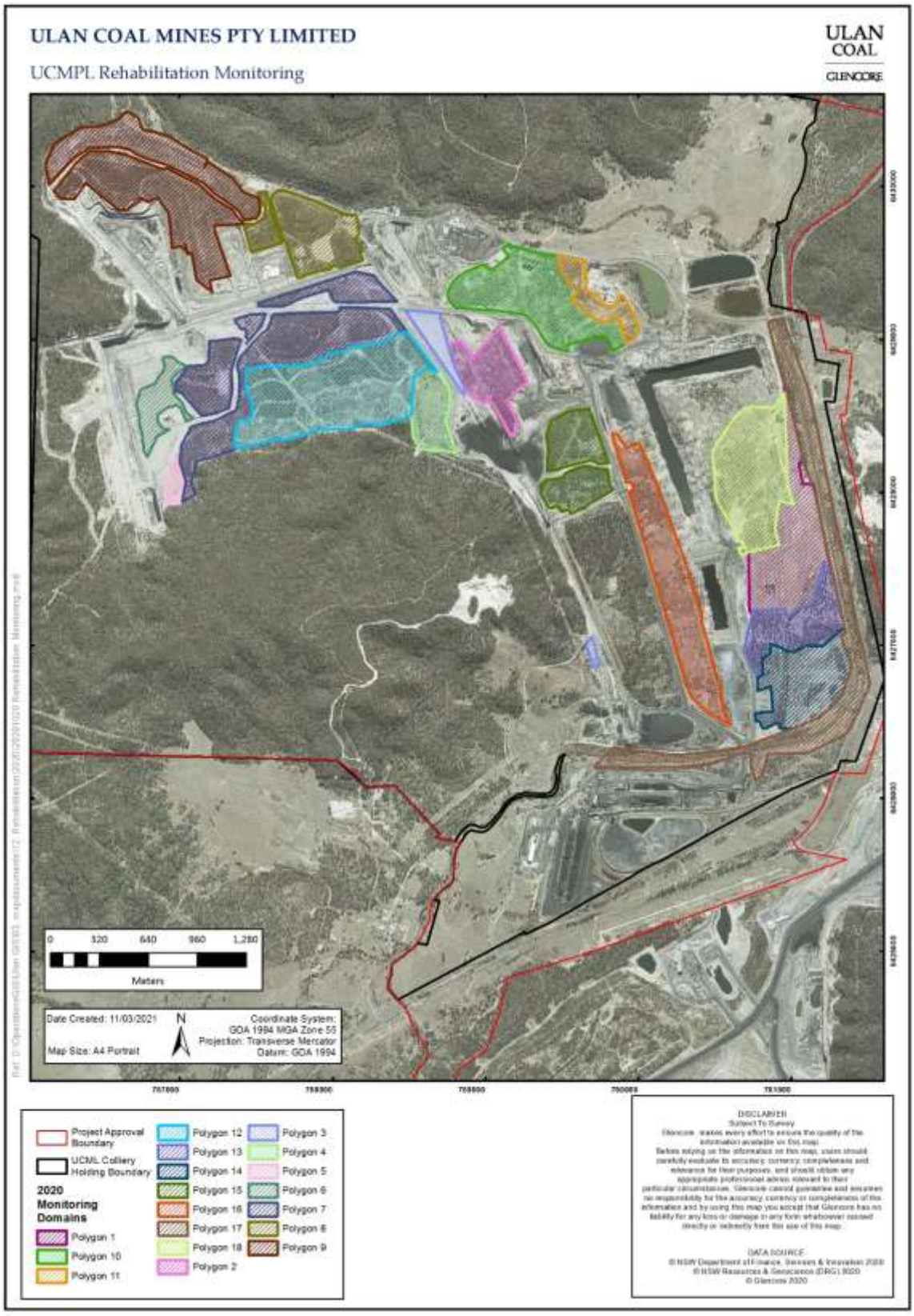


Figure 8-2 Mine Rehabilitated Areas

Table 8-2 - Rehabilitation Area Performance Category and Management Issues

Rehabilitation Polygon	Performance Category[83]	Anticipated Rehabilitation Phase [84]	Management Issues	Management Action Required[85]	Management Action Undertaken in the Reporting Period[86]
1	Monitor	4	Weed colonising monitor spices diversity	Walk through spot spray slashing monitor for species other than trees	Spot spraying walk over inspection
2	Monitor	5	Weed colonising canopy species Minor erosion and the ingress of dirty water in one location. Poor species diversity predominately acacia species with little tree establishment - low presence of eucalypts in large areas in the northern region.	Walk through spot spray planting of tube stock in areas without canopy spices Repairs of minor erosion and correction to the drainage to Minor rework Minor rework is required to increase the presence of eucalyptus tree species within the northern area	Spot spraying of Prickly Pear
3	Rework	3-4	Poor germination rate due to drought conditions	Ground amelioration and selective seeding/planting harrow ground	Ground amelioration and selective seeding/planting harrow ground
4	Monitor	4-5	Density of trees in some areas	Planting of tub stock collection of soil samples	Tube stock planted soil sampling completed
5	Maintenance	3-4	Poor germination rate due to drought conditions	Ground amelioration and selective seeding/planting harrow ground	Ground amelioration and selective seeding/planting harrow ground
6	Monitor	3-4	Poor germination rate due to drought conditions	Minor erosion to continue to be monitored, access to repair area would require re-disturbance to rehabilitation area.	Tube stock planted and hand seeding soil sampling completed walk over inspection
7	Monitor	5	Sink hole in the Sed dam	Repair sink hole	nil
8	Monitor	5	Sink hole and the removal of the dam wall insufficient water data to release water	Minor erosion to be repaired in one location and selective seeding/planting required in the bare area is proposed to occur in 2018-2019. Works to be completed within the peanut dam to repair sinkholes and remove the temporary dam wall will be undertaken in 2021.	Water sampling completed to verify water quality reporting to the peanut dam is good enough to release, so Dam wall can be removed soil sampling, walk over inspection Look for relinquishment of this area in 2021
9	Monitor	4-5	Minor erosion noted at 3 locations.	Minor erosion to continue to be monitored, access to repair area would require re-disturbance to rehabilitation area.	Walk over inspection
10-11	Monitor	4	Minor erosion and the ingress of dirty water in one location. Poor species diversity predominately acacia species with little tree establishment - low presence of eucalypts in large areas in the northern	Repairs of minor erosion and correction to the drainage to Minor rework is required to increase the presence of eucalyptus tree species within the northern area. A trial of methods for eucalyptus tree species establishment is proposed.	Walk over inspection

[83] Categories taken from the Glencore Coal Assets Australia Guideline 11.6 Completion Criteria and Rehabilitation Monitoring
[84] As per Table 5-3 of the Ulan Coal Mining Operations Plan 2017-2024.
[85] The management of weeds and feral/pest animals is ongoing throughout the rehabilitation areas and only noted in management actions if there is a particular issue to be addressed.
[86] Weed and feral animal control is conducted throughout the rehabilitation areas.

Rehabilitation Polygon	Performance Category[83]	Anticipated Rehabilitation Phase [84]	Management Issues	Management Action Required[85]	Management Action Undertaken in the Reporting Period[86]
			region. (this area proposed for final void material)		
12	Monitor	5	Sink Holes in drain and possible tree thinning. Look for relinquishment 2021	Repair sink holes and complete tree thinning if required complete monitoring and assess completion criteria for relinquishment maintenance as required	Walk over inspection Soil sampling and extra monitoring Look for relinquishment 2021
13	Monitor	5	General Maintenance Look for relinquishment 2021	Complete monitoring and assess completion criteria for relinquishment maintenance as required	Walk over inspection Soil sampling and extra monitoring look for relinquishment 2021
14	Monitor	3-4	Weeds monitor areas for regrow of trees area may need some replanting	Weed spraying possible replanting of some of the area	Walk over inspection
15	Monitor	4-5	Poor species diversity predominately acacia species with little tree establishment - low presence of eucalypts in large areas	Monitor and planting of eucalypts trees may be required	Walk over inspection weed spraying
16	Monitor	4-5	Poor diversity (This area is proposed for capping and potential tailings facility Weed spraying	Continue with weed spraying No other work proposed	Weed control Area will be used for tailings capping
17	Monitor	4	Weeds small areas of erosion	Continue monitoring for bank and revetment stability and repair erosion issues weed spraying	GRD stable weed spraying Walk over inspection Lidar survey of revetment completed after flood event
18	Rework	3	Failed rehab area from 1990-2000 (Final Land form in this area is subject to change)	Area to be replanted within the current MOP period once final landform is confirmed.	

Figure 8-3 2020 Rehabilitation Inspection - Issues Identified

8.2 Rehabilitation Activities during the Reporting Period

8.2.1 Open Cut Rehabilitation

No areas were available and no rehabilitation was undertaken within the Open Cut.

8.2.2 Maintenance Activities Rehabilitation areas

Rehabilitation maintenance identified in the annual walk over inspection consisted of:

- Planting and seeding of failed rehabilitation areas;
- Soil sampling
- Removal of rubbish; and
- Weed spraying conducted early in 2020.

Figure 8-4 Rehabilitation Repairs/maintenance activities

8.2.3 Relinquishment of Rehabilitated areas

A 50 ha 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 8-6**). Monitoring results within the area recorded;

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

As such a rehabilitation completion form was submitted to the Resources Regulator and approved in June 2020. Photos of the area are provided below

Figure 8-5 Rehabilitation Certification Areas under investigation.

UCMPL is currently investigated the potential certification of three rehabilitation polygons (see **Figure 8-6**), totalling an area of 103.2 Ha. Flora, fauna and soil investigations have all commenced for potential rehabilitation certification areas (**Figure 8-5**). The areas of certification include:

- 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 linearfolia* (+/- 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 8-6 Rehabilitation Relinquishment Areas

8.2.4 Offset Management Program

Walk-over assessments of revegetation areas deemed 91% of the revegetation area (approximately 248.5 ha) to have successfully established. Trees are continuing to grow in autumn 2020, and direct seeding undertaken in late-summer of 2020 will be assessed in autumn 2021. There was little sign of success during the survey period in April-May 2020. The area will be closely monitored in future surveys.

Extensive natural regeneration is occurring across the Bodadeen Offset Areas, with approximately 421 ha of successfully natural regenerated into woodland since the 1960s. This indicates that natural regeneration is a viable option for restoration of woodland/forest cover.

Five species listed as vulnerable under the BC Act were also recorded within the BVOA during 2020 surveys and walkovers.

Assisted revegetation and natural regeneration areas within the Biodiversity Offset Areas[87] are referred to as MZ3 and MZ2 respectively in **Section 6.6.1** of this report. Offset area performance indicators for rehabilitation phases 3 to 4 are outlined in Section 6 of the MOP.

Figure 8-7 2020 Bobadeen Offset Area

8.2.5 Rehabilitation Report Card

GCCA aims to standardise monitoring and completion criteria based on Resource Regulator feedback, using the RRC monitoring and assessment process described in section 6.6.1.

[87] Offset Management Program (OMP) for the MZ2 and MZ3, Appendix B of the BMP, completed 2016.

8.2.6 Infrastructure Decommissioning/Building Removal

ULW LW2 End of block ventilation fan infrastructure was relocated to the ULW LW6 End of Block. This is used to ventilate the single entry roadway inbye the longwall face. The ULW transformer was also relocated from LW2 to LW7

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

8.2.7 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.

9. Community

9.1 Ulan Coal CCC Meetings

Four meetings of the Ulan Coal CCC were held in 2020. Operational progress, community complaints, monitoring results and environmental performance were presented at each meeting. The 2020 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 approval, results of the Annual Review, additional community consultation and the community investment program.

9.2 Exploration Consultation

The exploration program for EL8687 and EL7542 in 2020 was announced in the local newspaper. 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. Land access agreements were negotiated with landholders where drilling was undertaken on private property.

9.3 Community Sponsorship

Glencore 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 local projects:

- 200 Bales – Drought Relief program
- Can Assist Mudgee Branch ;
- Charitable Workers Project;
- Covid Projects – Donation of disposable overalls and Nitrile/latex gloves;
- Cudgegong Valley Antique Machinery Club – National Historic Machinery Association National Rally;
- GCAA Junior Sports Development Program – Gulgong Bowling Club, Mudgee Little Athletics and Mudgee District Junior Cricket Association;
- Mudgee Day VIEW Club;
- Mudgee Hospital and Gulgong MPS - Blood spinner, transfer device for non-weight bearing patients and 2 x Pro-ex vision flex cameras
- Mudgee Indoor Swimming Club Carnival;

- Mudgee-Kandos-Gulgong Max Potential;
- Mudgee Lions and Ulan Underground Firewood Project;
- Mudgee Pistol Club Defibrillator purchase;
- Mudgee Region Tourism Covid Impact Support;
- Mudgee Show Society;
- Plumbing works at Bungaba Community Hall;
- Rylstone RFS electrolyte sachets;
- Ulan Coal Education Grant Program – Gulgong, Kandos and Lue Public Schools;
- UWO Apprentice fencing project; and
- Wenonah Lodge vegetable gardens

Figure 9-1 Community Activities

9.4 Community Complaints

Of the eight (8) complaints received during the 2020 reporting period, 5 were due to noise, one traffic, one access and one disturbance from attended noise monitoring. Complaints per year are presented in **Figure 9-2**. A community complaint summary is available from the Ulan Coal Website *https://www.glencore.com.au/operations-and-projects/coal/current-operations/ulan-coal/community-documents*.

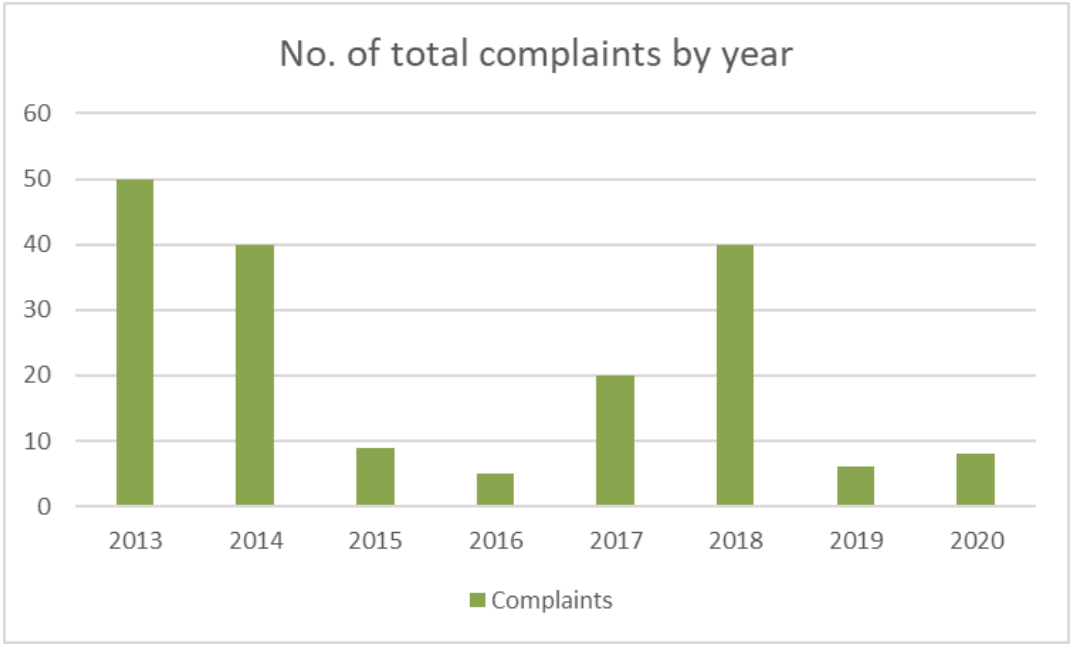


Figure 9-2 Complaints by Year

9.5 Ulan Road Noise Mitigation Strategy

Eighteen (18) residences were identified within the noise mitigation strategy for the Ulan Road Upgrade. The mitigation strategy has been agreed and implemented at 14 residences. One (1) owner has an agreement in place and works have commenced and 3 residence owners will not have any works conducted because either, they do not want to, or the buildings within the noise mitigation zone are not residences.

9.6 Ulan Road Traffic Management

Employees, including contractors, are trained and reminded (through site inductions, environmental management systems training, training day presentations and tool box 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 Compliance Audit is conducted every three years by a suitably quality, experience and independent team, who has been endorsed by the Director- General. The previous audit was conducted in 2019 and the next audit is scheduled for 2022. A copy of previous audit reports and responses to audit recommendations can be found on the Ulan Coal website at *www.ulancoal.com.au*

11. Incidents & Non-compliances

Incidents are notified to the EPA, DPIE and other relevant agencies immediately on becoming aware of a notifiable incident.[88]

11.1 Reportable Incidents

There was one reportable incident recorded during 2020 which resulted in the activation of the PIRMP. On the 17 February 2020, a significant rainfall event occurred resulting in sediment laden water overcoming the erosion and sediment controls at two construction site. The PIRMP was instigated, inspections conducted, samples collected and repairs undertaken. No environmental harm occurred.

11.2 Non-Compliances

There were a total of three non-compliances, as identified in **Compliance Table 2** for the 2020 reporting period. Non-compliances were recorded against EPL 394 Clause M2.2 and M4.1. 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.

[88] 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 24/7/2019 and subsequently updated on 26/7/2019).

Table 11-1 - Details of Non-Compliances

Relevant Approval	Date	Details of Non-Compliance	Cause of Non-Compliance	Action to Address Non-Compliance
EPL 394 M2.2	3 January 2020	EPA identification numbers 15 (HV1 at Flannerys) and 29 (HV3 at 331 Cope Road), failed to collect valid samples.	The canisters were secured into the monitoring equipment incorrectly, personnel will be re-trained if they have not undertaken the task for greater than 6 months.	Reported to DPIE and EPA
EPL 394 M2.2	6 August 2020	EPA identification number 15 (HV1 at Flannery's), failed to collect a valid sample.	The filter paper was found damaged at the time of collection, the cause of damage could not be determined	Reported to DPIE and EPA
EPL 394 M4.1	1 December to 31 December 2020	The metrological monitoring station Sentinex 71 (WS2) did not accurately record rainfall data	The gauge was cleaned and a cleaning maintenance regime implemented to avoid the issue in future	Reported to EPA on 13 January when the issue was discovered.

12. Activities Planned for 2021

Operational activities planned for 2021

- The Ulan Underground will continue to develop roadways for LWW8 and LW30 in 2021 as well as advancing the Main Headings. Longwall mining will continue in LWW6 until late April when, following a Longwall relocation, mining will commence and continue in LWW7 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 throughout 2021. The Ulan West Operations will commence 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 2021. 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 80 holes to be drilled in 2021

Groundwater Management Plan

- Response to recommendations from the 2020 Groundwater monitoring report;
- Installation of VWPs to the West of Ulan West;
- Finalisation of the groundwater model recalibration.

Surface Water Management Plan

- Review of the surface water triggers

Rehabilitation/Remediation/Offset Areas/Goulburn River

- Management actions as for identified issued within the rehabilitation/remediation and offset areas
- Prepare to plant within revised Bobadeen East Offset area
- Progress RR Rehabilitation relinquishment and identify other areas that meet completion criteria.
- Implement report card recommendations.

The following heritage works are planned for 2021:

- 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 2021 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

- Development of Extraction Plan for UWO LW7 and LW8;
- Review of Subsidence Monitoring Program and Survey Practices for UWO.

Approval Modifications

- Two new modification applications are anticipated to be submitted in 2021
  - Proposed Modification 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.
  - Alternative Offset for 10 ha portion of Brokenback Conservation Area that could not be secured (accounting for approximately 0.6% of the total agreed offset package).

Community

- Consultation for the 2021 Exploration Program within EL8687 and EL7542 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 and EL7542.
- Provide support to the local community through Community Investment Program via sponsorship support, community projects and in-kind donations.

GLENCORE