

2024 Annual Review

Attachment G: 2024 Annual Subsidence Report



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1. Introduction

Ulan Coal Mines Pty Limited (UCMPL) operate the Ulan West Underground Mine (UW) and the Ulan Underground Mine (UUG) in accordance with the approved *Ulan West Extraction Plan for Longwalls LW1 to LW8* (UW EP) and *Ulan Underground Extraction Plan for Longwalls LW30-LW32 & LWW6-LWW8* (UUG EP) respectively.

The UW EP and the UUG EP require UCMPL to prepare an Annual Report (AR) within 12 months of the date of the approval, annually thereafter by the 31 March and forms part of the Annual Review. The AR's reporting period is the 01 January 2023 to the 31 December 2024 (the 2024 review period).

UCMPL have prepared the *2024 Annual Report for Ulan West and Ulan Underground* (Annual Report) for both UCMPL's underground mining operations. The specific reporting requirements for UW EP and the UUG EP are in **Table 1-1**. The specific reporting requirements for the Annual Review are in **Table 1-2**.

UCMPL commissioned SCT Operations Pty Ltd (SCT) to undertake a review of the subsidence monitoring conducted for the 2024 review period, including a comparison of observed behaviour with subsidence forecasts and assessments of compliance with the subsidence performance measures (**Attachment G** of the 2024 Annual Review).

Table 1-1 Annual Report Requirements Specific to UW EP and UUG EP

UW EP and UUG EP Annual Report Requirements	Section Addressed in Annual Report and/or Annual Review
A summary of the subsidence and environmental monitoring results for the year	Sections 2, 3, 4, 5, 6, 7 and 8 in Annual Report
An analysis of these monitoring results against the relevant to impact assessment criteria, monitoring results from previous panels and predications made in the SMP (i.e. EP)	Sections 1 & 2 In Annual Report
A review of any trends in the monitoring results over the life of the activity	Appendix I of the Annual Review
A description of actions taken to ensure adequate management of any potential subsidence impacts due to longwall mining	Section 6.9 in the Annual Review

Table 1-2 Annual Review Reporting Requirements

Annual Review Requirements	Section Addressed in Annual Report and/or Annual Review
Describe the development (including any rehabilitation) that was carried out in the past year and proposed for the next year	Section 8 of the Annual Review and Section 6.1.2 in the Annual Report
Include a comprehensive review of the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the relevant statutory requirements, limits or performance measures/ criteria, the monitoring results of previous years, the relevant predictions in the EA	Section 2 of the Annual Report Section 6 and Section 9 of the Annual Review Sections 2 to 8 in the Annual Report
Identify any non-compliance over the past year, and describe what actions were (or are being) taken to ensure compliance	Section 11 of Annual Review
Identify any trends in the monitoring data over the life of the project	Appendix I of Annual Review
Identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies	Section 6 and 11 of Annual Review
Describe what measures will be implemented over the next year to improve the environmental performance of the project	Section 12 of the Annual Review

Figure 1-2 displays the extent of longwall mining activities for Ulan West and Ulan Underground in 2024.

Figure 1-1 Underground Longwall Retreat in 2024

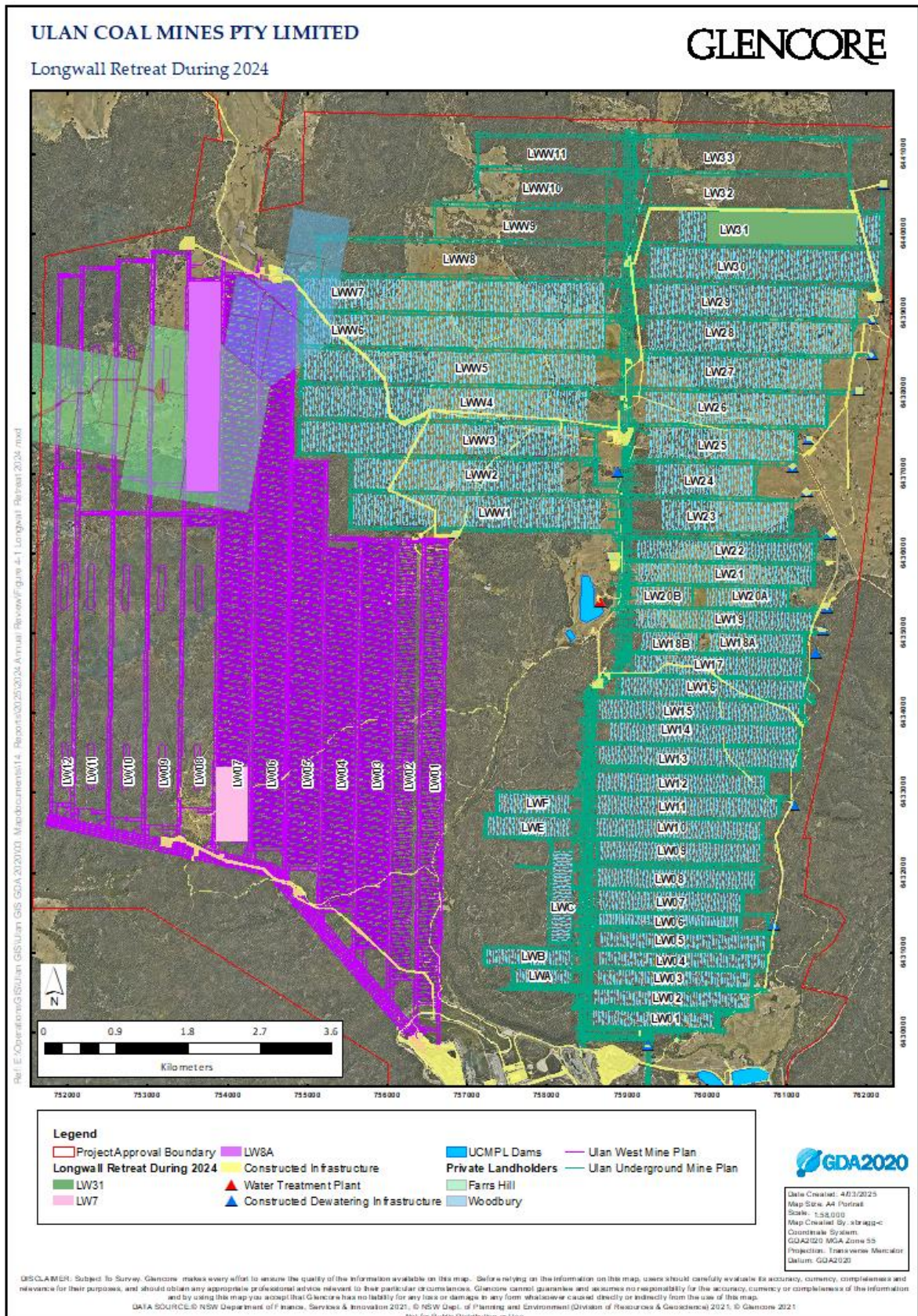
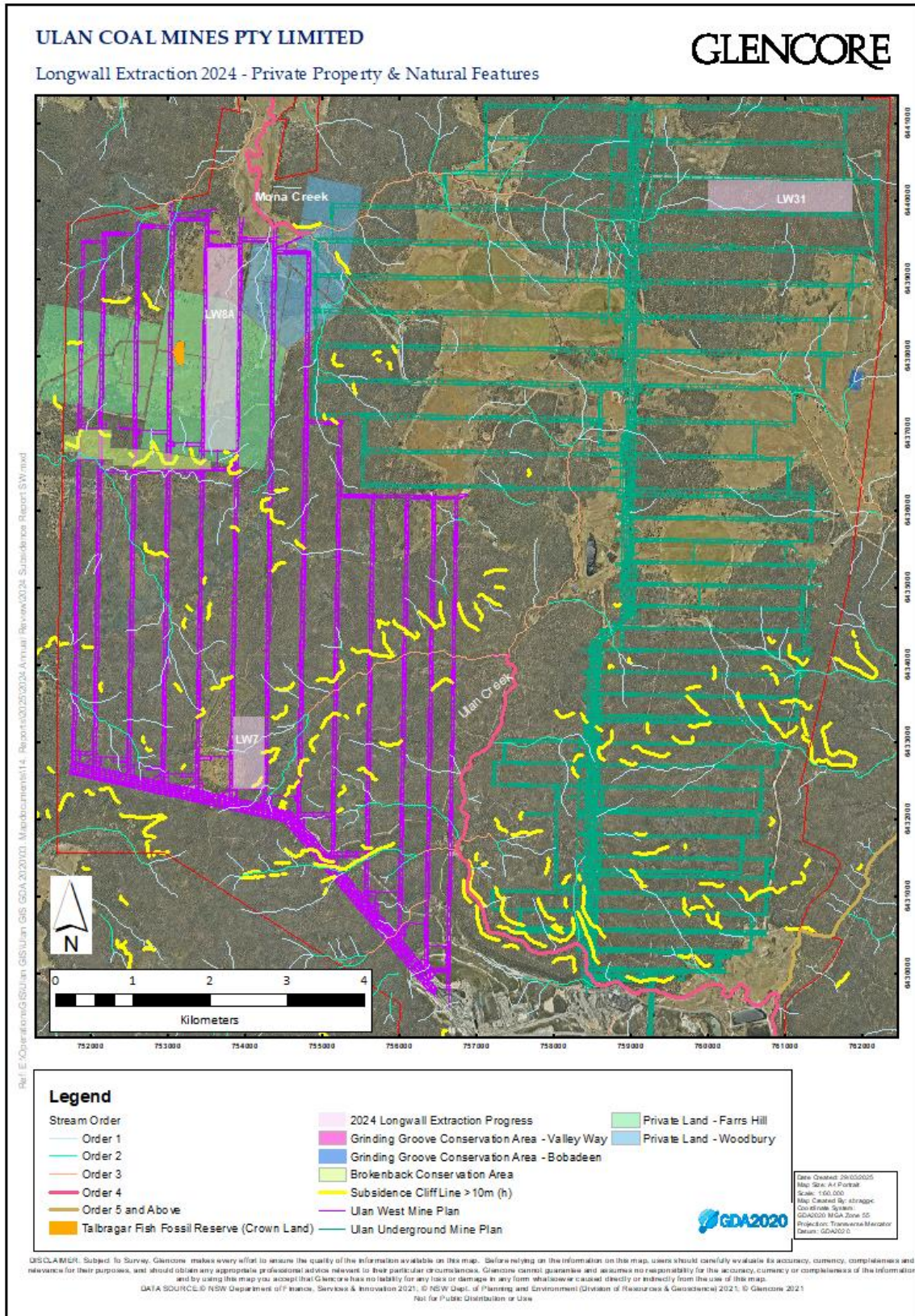


Figure 1-2 Underground Longwall Retreat & Natural Features



2. Subsidence Effects Monitoring

Subsidence effects monitoring was completed by UCMPL as required by UW EP and the UUG EP. The following assessment of subsidence effects monitoring during the 2024 review period summarised, is from the *2024 Annual Review of Subsidence Monitoring at Ulan West and Ulan Underground Mine* (SCT, March 2025).

Table 2-1 shows the measured maxima of primary subsidence parameters for conventional subsidence behaviour above each longwall shown (abbreviated M and shown in bold typeface) and the subsidence values forecast in the corresponding EP assessment for the longwall and depth on each subsidence monitoring line (abbreviated F and shown in normal typeface) (SCT, 2025) for the 2024 reporting period.

Table 2-1 - Summary of Primary Subsidence Parameters Measured for the 2024 Reporting Period

	Subsidence (m)		Tilt (mm/m)		Strain (mm/m)			
	M	F	M	F	Compressive		Tensile	
					M	F	M	F
UW LW7 D Line	1.46	1.7	29	45	7	25	9	20
UW LW7 C Line	1.4	1.7	35	45	4	25	8	20
UW LW8A I Line	1.2	1.7	25	45	8	25	7	20

Analyses and interpretation of the subsidence monitoring conducted for the areas mined during the 2024 calendar year indicate that the observed subsidence behaviour is consistent with expectation. Measured subsidence effects are less than forecasts presented in SCT reports to inform the 2009 Environmental Assessment (EA) for the UCCO Project, the EP for Longwalls 7-8 at UW and the EP for Longwalls 30-32 and LWW6-LWW8 at UUG (SCT, 2025).

Primary subsidence parameters measured during 2024 are all less than the maximum forecast in the EP for Longwalls 1 to 8 at UW and the EP for Longwalls 30-32 and LWW6-LWW8 at UUG (SCT, 2025).

Subsidence impacts and environmental consequences to natural and built features observed on private property and land owned or leased by UCM are consistent with expectations and less than the maxima forecast (SCT, 2025).

SCT's review is based on analysis of the survey data from subsidence monitoring, site inspections, and reports by UCM personnel and other specialists. A surface inspection was conducted by SCT over areas the longwalls mined below during 2024 on 2 January 2025 in the company of UCM environmental staff (SCT, 2025).

For further details, refer to the *2024 Annual Review of Subsidence Monitoring at Ulan West and Ulan Underground Mines* (SCT, March 2025).

2.1 Subsidence Effects Monitoring (Previous Years)

Table 2-2 - Summary of Primary Subsidence Parameters Measured for the 2019-2023 Reporting Period

Subsidence Monitoring Lines:		D Line (UW)		C Line (UW)		F Line (UUG)		I Line (UW)	
2023: LW7 at UW& LW30 at UUG									
Subsidence (m)	1.34	1.7	NA	NA	1.54	1.7	NA	NA	
Tilt (mm/m)	18	45	NA	NA	13	30-35	NA	NA	
Tensile Strain (mm/m)	9	20	NA	NA	8	10-15	NA	NA	
Compressive Strain (mm/m)	7	25	NA	NA	6	15-20	NA	NA	
		D Line (UW)		C Line (UW)		H Line (UUG)		I Line (UW)	
2022: LW6 & LW7 at UW and LWW7 and LW30 at UUG									
Subsidence (m)	1.33	1.6	1.37	1.6-1.7	1.35	1.7	1.47	1.7	
Tilt (mm/m)	22	40-55	15	40-55	15	50	28	45	
Tensile Strain (mm/m)	8	15-20	5	15-20	5	15	9	20	
Compressive Strain (mm/m)	4	20-25	8	20-25	4	20	17	25	
2021: LW6 at UW and LWW6 and LWW7 at UUG									
Subsidence (m)	1.29	1.6	^	1.6-1.7	1.30	1.7	NA	NA	
Tilt (mm/m)	21	40-55	^	40-55	11	50	NA	NA	
Tensile Strain (mm/m)	9	15-20	^	15-20	4	15	NA	NA	
Compressive Strain (mm/m)	4	20-25	^	20-25	3	20	NA	NA	
2020: LW5 and LW6 at UW and LWW5* at UUG									
Subsidence (m)	1.37	1.6-1.7	1.44	1.6-1.7	1.27	1.6	NA	NA	
Tilt (mm/m)	20	40-55	19	40-55	20	10-20	NA	NA	
Tensile Strain (mm/m)	6	15-20	6	15-20	4	5-15	NA	NA	
Compressive Strain (mm/m)	5	20-25	5	20-25	8	5-15	NA	NA	
2019: LW5 at UW and LWW4* at UUG									
Subsidence (m)	1.37	1.6-1.7	1.44	1.6-1.7	1.47	1.6	NA	NA	
Tilt (mm/m)	20	40-55	19	40-55	20	10-20	NA	NA	
Tensile Strain (mm/m)	9	15-20	6	15-20	6	5-15	NA	NA	
Compressive Strain (mm/m)	3	20-25	3	20-25	7	5-15	NA	NA	

Notes: *End of Panel Measure Values. ^C Line not undermined during 2021. New I Line installed in 2022 prior to LW7 at Ulan West as required by Extraction Plan. **Bold type** represents Forecast Values

2.2 Assessment of Subsidence Performance Measures

In accordance with Condition 24 of Schedule 3 of the PA08_0184, UCMPL must ensure that there is no exceedance of the subsidence impact performance measures listed in Table 14. The performance measures specified in Table 14 of Condition 24 of Schedule 3 of the PA08_0184 are listed and assessed in Section 6.9.2 and Table 6-10 of the 2024 Annual Review.

There were no exceedances of the subsidence performance measures in 2024. A summary of the subsidence performance indicators utilised in each Extraction Plan to assess the subsidence performance measures are provided in **Section 2** to **Section 8**.

3. Consolidated Subsidence Monitoring Program

3.1.1 Surface Water

Surface water monitoring, creek stability monitoring, flow line monitoring and stream health monitoring were undertaken in accordance with the UW EP and UUG EP during the 2024 reporting period.

The following from each Extraction Plan provides a summary of the subsidence performance indicators to inform UCMPL if the subsidence performance measures for surface water are likely to be exceeded during the secondary extraction.

For Ulan West:

- Performance indicators will be considered to have been triggered if analysis of surface water monitoring data for surface water monitoring sites SW04, SW10 and SW11, against the applicable water trigger values and approved impacts indicates an exceedance of trigger values for pH, EC and TSS for three consecutive months as a result of mining impacts.

For Ulan Underground:

- Performance indicators will be considered to have been triggered if analysis of surface water monitoring data for surface water monitoring sites SW07, SW8 and SW10, against the applicable water trigger values and approved impacts indicates an exceedance of trigger values for pH, EC and TSS for three consecutive months as a result of mining impacts.

3.1.1.1 Surface Water Monitoring

An assessment of the 2024 surface water monitoring results for SW04, SW10 and SW11 against the applicable water trigger values and approved impacts indicates an exceedance of trigger values for pH, EC and TSS concluded:

- SW04 (No water triggers during the 2024 reporting period);
- SW10 (No water triggers during the 2024 reporting period); and
- SW11 (No water triggers during the 2024 reporting period).

An assessment of the 2024 surface water monitoring results for SW07, SW08 and SW10 against the applicable water trigger values and approved impacts indicates an exceedance of trigger values for pH, EC and TSS concluded:

- SW07 (No water triggers during the 2024 reporting period);
- SW08 (No water triggers during the 2024 reporting period); and
- SW10 (No water triggers during the 2024 reporting period).

For further details regarding surface water quality monitoring for 2024, refer to Section 7.8 and **Attachment C** of the 2024 Annual Review.

3.1.2 Creek Stability & Tributary Monitoring

The following from each Extraction Plan provides a summary of the subsidence performance indicators to inform UCMPL if the subsidence performance measures for surface water are likely to be exceeded during the secondary extraction.

For Ulan West:

Performance indicators will be considered to have been triggered if monitoring results from the channel stability monitoring within representative tributaries of Ulan Creek, Mona Creek and Cockabutta Creek identify greater impacts than predicted and/or a deteriorating trend in channel stability compared to pre-mining condition.

For Ulan Underground:

Performance indicators will be considered to have been triggered if monitoring results from the channel stability monitoring within:

- Representative tributaries of Mona Creek, Curra Creek and Bobadeen Creek identify greater impacts than predicted and/or a deteriorating trend in channel stability when compared to pre-mining condition as a potential result of mining impacts.
- Main channel of Mona Creek identifies greater impacts than predicted and/or a deteriorating trend in channel stability when compared to pre-mining condition as a potential result of mining impacts

3.1.2.1 Monitoring of Tributaries

Channel stability monitoring of tributaries scheduled to be undermined in 2024 was completed. UCMPL completed the pre and post mining monitoring (for a period of 2 years) of selected creeks and ephemeral tributaries in 2024, including:

- A section of Ulan Creek Flowline 4 (UCFL4) above Ulan West;
- A section of Brokenback Creek (BBC) above Ulan West; and
- Sections of lower order flowlines of BBC above Ulan West.

The purpose of the post mining monitoring of ephemeral tributaries and creeks above Ulan West and Ulan Underground mine is to identify the presence of surface cracking and erosion, surface ponding or out of channel flows and distinguish between natural erosion and erosion induced from mine subsidence, as required by both Extraction Plans, for a monitoring period of two years. The results of this flow line monitoring will be interpreted by UCMPL's subsidence engineer to validate subsidence predictions made in the respective Extraction Plan and Project EA.

UCMPL engaged Pacific Environmental Pty Ltd (PE) in 2024 to complete the annual monitoring of selected ephemeral creeks and tributaries (also referred to as flow lines). The monitoring results are from site inspections completed by PE on 27 November 2024. The following summary is from *2024 Monitoring of Creek and Tributaries* (PE, March 2025).

Identified impacts at number of sites to date have included cracking of bedrock material within the channel bed, surface cracking across the channel, ponding and erosion. Generally, in the absence of significant flow events, these observed impacts do not perceptibly change during re-inspections over their respective two-year monitoring period.

As observed in 2021, 2022 and 2023 there was less visual evidence (e.g. flood debris/sediment accumulation) of significant flow events in 2024 from high intensity rainfall events, when compared to observations made in 2020. The coincidence of such significant flow events with post mining impacts in some places has initiated erosion as identified in BBC-Site 1 and BBC-Site 2 and exacerbated existing erosion and changes of channel stability within the flowline as identified along some sections of UCFL4 (Section 1.3).

Water was observed flowing in 2022 along UCFL4 at post mining sites Site 3A, Site 5A Site 9, Site 11, Site 12, Site 13, Site 14, Site 15A, Site 15, Site 16 and Site 17. Water was observed flowing in 2022 along BBC at post mining sites Site 3, Site 4 and Site 5. No water was observed flowing within UCFL2 at post mining sites inspected in 2022. No water was observed flowing in the flow lines and creeks inspected in 2023. No water was observed flowing in the flow lines and creeks inspected in 2024.

It is recommended that UCMPL continue to record and monitor areas where subsidence impacts have likely occurred in flow lines and creeks above Ulan West and Ulan Underground as required by the relevant Extraction Plan and develop appropriate remediation measures, as required, for example sites BBC-Site 7 and BBC-Site 9. Both sites display only minor cracking but would benefit from further compaction and infilling intervention to reduce the risk of potential erosion during a high flow event as occurred at BBC-Site 1 and BBC-Site 2.

It is also recommended to inspect recently post mined flow lines after high intensity rainfall events No significant impacts were observed along drainage lines over areas mined by Longwall 7 and LW8A at UW and Longwalls 31 at UUG during 2024. No significant impacts were observed to the drainage lines on the Farris Hill property above Longwall 8A at UW.

For the complete *2024 Monitoring of Creek and Tributaries* report refer to **Attachment G**.

SCT's review of impacts to watercourses and drainage lines from the *2024 Annual Review of Subsidence Monitoring at Ulan West and Ulan Underground Mines (SCT, March 2025)* concluded:

- Subsidence impacts and environmental consequences to surface water courses were consistent with expectation and less than the maxima forecast.
- No significant impacts or consequences were reported or observed at drainage lines over areas mined by Longwall 7 and Longwall 8A at UW and Longwall 31 at UUG during 2024.
- No significant impacts or consequences were observed in the drainage line of Mona Creek above the central section of Longwall 31 at UUG.
- No significant impacts or consequences were reported to the drainage line of Ulan Creek on land owned by UCM above the southern section of Longwall 7 at UW.
- No significant impacts were reported to the drainage lines of Mona Creek and Brokenback Creek on land owned by UCM and the Farris Hill private property above Longwall 8A at UW.
- Minor impacts to the drainage lines of Mona Creek, Brokenback Creek, and Ulan Creek at UW in the form of cracks, primarily where the flow lines cross bedrock, and valley closure fracturing of rocky outcrops have been observed. A small ripple was also observed crossing the drainage line of Mona Creek on the Farris Hill property.

- No impacts were reported to the first order drainage line of Mona Creek above the central section of Longwall 31 at UUG.

3.1.2.2 Monitoring of Creeks (Main Channel)

There was no longwall mining under the main channel of Ulan Creek, Mona Creek or Cockabutta Creek in 2024 (**Figure 1-2**).

Ulan Creek is outside the immediate zone of subsidence from the first longwall panel (i.e. LW1) of the Ulan West underground mine, approximately 80m from the goaf edge of LW1. Longwall mining of LW1 was completed by Ulan West on the 01 May 2015. As with previous monitoring of Ulan Creek since 2015, there were no perceptible signs of subsidence related impacts from the Ulan West underground mine in 2024.

For further information refer to Section 7.9 of the 2024 Annual Review and for the complete *2024 Ulan Creek Stability Monitoring Report* refer to **Attachment G**.

3.1.3 Steam Health Monitoring

The following from each Extraction Plan provides a summary of the subsidence performance indicators to inform UCMPL if the subsidence performance measures for surface water are likely to be exceeded during the secondary extraction.

For Ulan West:

Performance indicators will be considered to have been triggered if analysis of stream health monitoring data and approved impacts at sites within Ulan Creek (AQ08), Mona Creek (AQ15) and Cockabutta Creek indicates a potential deterioration of stream health or data is outside of natural variability as per specialist advice as a result of mining impacts.

For Ulan Underground:

Performance indicators for water quality will be considered to have been triggered if analysis of data from the surface water monitoring program at sites within Mona Creek (AQ15) and Bobadeen Creek (AQ13) indicates a potential deterioration of stream health or data is outside of natural variability as a potential result of mining impacts.

3.1.3.1 Aquatic Monitoring

ELA was engaged by UCMPL to undertake aquatic monitoring in 2024 as required by the BMP. The following summary is from *UCMPL Aquatic Monitoring Report 2024* (ELA, Jan 2025).

This report outlines results from surveys conducted in spring 2024 and makes comparisons to data from previous monitoring events. Due to inherently low baseflow of creeks, despite above average rainfall in the preceding six months leading up to the 2024 monitoring period, only 13 of the 16 monitoring sites had enough water for the full suite of ecological surveys to be undertaken. Flow at most downstream sites was dominated by discharged mine water that had first been treated with reverse osmosis.

Aquatic macroinvertebrate taxonomic richness in 2024 ranged from seven to 24 taxa and was highest at downstream site AQ19. The Stream Invertebrate Grade Number Average Level (SIGNAL) 2 scores ranged from 2.7 to 4.7, with upstream site AQ15 recording the highest SIGNAL2 score. Three of the 13 sites sampled had SIGNAL2 scores equal to or above 4.0, with two of these sites located upstream of the

licensed discharge points (LDPs), and one downstream of mine operations. The mean SIGNAL2 score across all sites was 3.6, which is consistent with the long-term average across all previous monitoring years (3.6). Assessment of SIGNAL2 since the commencement of monitoring in 2011 demonstrates that downstream sites have a higher long-term mean SIGNAL2 score (4.0) compared to upstream sites (3.5) where water level is generally low to extremely low. Despite this trend, SIGNAL2 scores continue to be reflective of moderately to severely disturbed systems, and assemblages of macroinvertebrates were generally dominated by pollution-tolerant taxa. Across all years, macroinvertebrate results indicate that historical disturbances (e.g. clearing of riparian habitat) and regional land use practices, in conjunction with prevailing climatic conditions, remain the key factors influencing macroinvertebrate communities.

The 2024 Riparian Channel and Environmental (RCE) Inventory scores were largely consistent with previous years for each site. Five sites scored RCE inventories of 'Excellent', five sites scored 'Very Good' whilst the remaining six sites scoring RCE inventories of 'Good'. Sites AQ2 and AQ21 in the Goulburn River Diversion have maintained elevated RCE scores since 2016 when remediation works commenced. Overall, the RCE results indicate that the riparian environment is not subject to any ongoing adverse effects resulting from mining operations and is rather reflective of historical disturbances and regional land use practices in the catchment.

Six water quality parameters were measured at each site. High water temperatures reflected the high ambient temperatures of November, as well as a small volume of water in most streams. Electrical Conductivity (EC) was variable across monitoring sites both upstream and downstream of LDPs, however, measurements were still below the trigger values adopted for the UCC at downstream sites (UCMPL 2019).

DO (% saturation) was generally higher during 2024, and all downstream sites and two upstream sites met the ANZECC and ARMCANZ (2000) guidelines. Results from upstream and downstream sites and across multiple years indicate high variability in DO concentrations, which is also evident from year-round monitoring at UCMPL surface water sites in 2024.

Alkalinity results vary but remain consistent across both monitoring sites and years. Turbidity was higher than the upper limit recommended by the ANZECC and ARMCANZ (2000) guidelines at six sites, all of which were located upstream of the UCMPL LDPs, and lower at two sites located downstream.

There was no clear correlation evident between SIGNAL2 and DO results over time, whereas only a very weak positive correlation was identified between SIGNAL2 and RCE results.

In conclusion, the direct impacts of the coal mining operations at UCMPL on aquatic ecology are minimal and monitored streams retain the typical biodiversity values and water quality expected of similar streams in the area.

For the complete *UCML Aquatic Monitoring Report 2024* (ELA, Jan 2025) refer to **Attachment E**.

3.1.4 Groundwater

For Ulan West and Ulan Underground:

Groundwater monitoring was undertaken in accordance with the UW EP and UUG EP during the 2024 reporting period. Performance indicators have been developed in both the UW EP and UUG EP to assess if there is a potential or likely chance the performance measures are exceeded or are likely to be exceeded during longwall extraction. Analysis of monitoring data will be undertaken to assess the potential impacts

of mining within the Application Area against the relevant subsidence performance measures for groundwater.

To evaluate the impacts from subsidence on groundwater systems within the Extraction Plan area/s, each Extraction Plan has adopted the following key monitoring components from the GWMP to measure and evaluate the subsidence performance measure for groundwater, including:

- Groundwater levels (VWP Pore Pressuring Monitoring); and
- Private bore monitoring network (PBMN) (groundwater quality and water levels).

Section 7.11 of the 2024 Annual Review provides a summary and assessment of the 2024 groundwater monitoring results to determine if performance indicators for water have been triggered. Assessment of groundwater triggers are included in **Attachment D** of the 2024 Annual Review.

Australasian Groundwater and Environmental Consultants Pty Ltd (AGE) were commissioned by UCMPL to prepare the annual groundwater review for the 2024 monitoring period. The following summary below is provided from AGE (AGE 2025).

Groundwater monitoring was conducted in accordance with the WMP during 2024 and compared to the recent derivation of groundwater level and groundwater quality triggers for NMN bores, including groundwater level triggers based on predictions from the latest UCC numerical groundwater model (AOM2024) and triggers for metal concentrations based on historical values grouped by major lithologic units.

NMN bores intersecting Jurassic sediments recorded varied trends and most of the VWPs intersecting Jurassic sediment showed very little overall change in 2024. No drawdown exceedances were identified in Jurassic bores or VWP sensors intersecting Jurassic strata.

Some of the monitoring bores intersecting Triassic units recorded slight groundwater level declines over 2024 (similarly observed in 2023), which added to cumulative declines, but none of the NMN bores recorded drawdowns that exceeded the predicted groundwater level drawdowns. The AOM2024 predicts some drawdown at all Triassic bores and VWP sites and so the observed decline will be due to impacts from mining but may also be impacted by climate variability.

About half of the Permian bores reported groundwater level data in 2024 (several were dry) and drawdown was observed in all bores ranging from 0.2 m (PZ11A) to 26 m (PZ09B). Other bores were reported dry but many of these were predicted to experience large drawdowns (over 100 m). These drawdowns reflect long-term trends associated with mine-related dewatering and are predicted by the AOM2024. No Permian bores exceeded their groundwater trigger levels.

Porewater pressure data was reviewed from VWP sensor sites with a focus on trends and cumulative drawdown. Review found that several Triassic sensors are recording small but consistent declines over the period of record (often less than a few meters). Previous review of these declines attributed it to climate variability (which is not modelled) but improvements and recalibration in the AOM2024 lead to updated predictions of drawdown in Triassic sensors across the UCC and surrounds. The observed drawdown is therefore attributed (partly) to predicted impacts from depressurisation due to mining with discrepancies between observed and predicted drawdown attributed to a combination of uncertainty in hydraulic parameters and climate variability (which is not included in the AOM2024).

Many of the deeper sensors within or near the mine footprint recorded large depressurisation, which is predicted by the numerical model and expected due to mining. However, some shallow sensors in EX09,

TAL-1, and TAL-2 exceeded their predicted drawdowns. The exceedances in TAL-1 are minor and within the margin of uncertainty by the AMO2024 but a short period of steeper drawdown in late 2023 should be investigated. Only one sensor is active in TAL-2 and so may have been compromised as the deeper sensors have, and so data from this sensor may not be reliable. Porewater pressure behaviour in EX09 appears to be related to pumping regime of the nearby dewatering bores but this should be investigated further.

Six bores comprising the Mona Creek Monitoring Bore (MCMB) network were measured for groundwater levels in 2024 although two were recorded as dry throughout 2024. Three of the remaining bores recorded groundwater levels that showed generally small declines over 2024. Trigger levels were derived for these sites based on the predicted drawdown (plus 15% buffer) from the AOM2024. Drawdown is predicted at all of these bores and no bores exceeded the prescribed drawdowns.

Groundwater quality triggers for NMN bores were re-derived recently (AGE 2023) and 2024 EC and pH data were compared against these triggers. Two of the NMN bores exceeded Stage 2-Low pH triggers and two exceeded Stage 2 EC triggers. All these bores are predicted to experience drawdown due to mining and the exceedances are likely largely attributed to water quality changes due to dewatering of the intersected strata (all these bores are complete in Permian strata). Average EC and pH from all bores across all strata were in line with historic values indicating no major change to groundwater quality overall.

Groundwater quality exceedances were also evaluated in private bores (PBMN) with trigger values derived as part of this Report from the full historic record (up through 2023). Stage 2 EC exceedances were identified in three private bores and Stage 2 pH exceedances (high or low) were identified in 10 private bores. Neither pH nor EC values were substantially different from historic values and many of these bores also showed considerable variability in values. The exceedances were attributed to natural variability, influence from bore use (which is not recorded), or both.

This report also investigated trends in dissolved metals by comparing 2024 readings with statistical summary of historic data (through 2023). A comparison to the 95th percentile showed that only three bores (PZ01A, PZ06C, and PZ24B) exceeded the 95th percentile for Chromium, Barium, and Iron, respectively. The exceedances in PZ01A and PZ24B were minor and not indicative of any trends and PZ06C is predicted to experience substantial drawdown and so would also be expected to record considerable changes in water chemistry. Overall the exceedances were minor or in line with expected behaviour and no further investigations are recommended.

Water levels in Triassic and Permian units are monitored at key locations (PZ24, PZ29, TAL-1 and TAL-2) to inform ongoing assessment of baseflows to the Talbragar and Goulburn Rivers. Minor strata depressurisation was observed in the Triassic units in PZ24 and PZ29, which the Goulburn River flows over, as well as TAL-1 which is near the Talbragar River (TAL-2 only has one working sensor so the data may be unreliable). Drawdown has been predicted at these locations and the observations are generally in line with predictions with respect to impacts on baseflow, implying that the AOM2024 predictions of impacts to baseflow can also be considered accurate.

Water quality at The Drip continues to exhibit a major ion composition comparable to some Triassic bore samples, but more noticeably independent of the full range of Triassic bores and other NMN bores. This suggests a localised recharge source with perhaps some mixing with Triassic sediments or significantly different groundwater residence times for groundwater flow paths feeding The Drip. Impacts to Triassic

strata is predicted by the AOM2024 but the model does not predict any impacts to the Drip due to the representation of it as a local (rather than regional) discharge zones.

For further details regarding groundwater monitoring for 2024, refer to *The Ulan Mine - Annual Groundwater Review for the Period 2024*(AGE 2025) to Section 7.11 and **Attachment D** of the 2024 Annual Review

4. Land Management

The following provides a summary of the subsidence performance indicators to inform UCMPL if the subsidence performance measures for land are likely to be exceeded during the secondary extraction within the Extraction Area for Ulan West and Ulan Underground.

For Ulan West:

Performance indicators will be considered to have been triggered for cliff lines in the Brokenback Conservation Area (BBCA) if subsidence monitoring identifies an exceedance (or a trend to exceedance) of the predicted subsidence values surveyed along the D Line and by GNSS units.

Performance indicators will be considered to have been triggered if subsidence monitoring identifies a perceptible change as a result of subsidence induced impacts (e.g. rock fall or cracking) within the BBCA.

Performance indicators will be considered to have been triggered if subsidence monitoring of other cliffs undermined identifies an exceedance (or a trend to exceedance) of the predicted probability of $\leq 20\%$ of the total sum of rock falls in the Project Area.

Performance indicators will be considered to have been triggered if analysis of subsidence monitoring data indicates an exceedance of subsidence predictions for land (i.e. surface cracks are greater than 250mm wide).

For Ulan Underground:

Cliff lines in the BBCA are remote from this Extraction Plan and therefore are not considered in this Extraction Plan. Applicable subsidence performance indicators are provided in the Ulan West Extraction Plan (see above).

Performance indicators will be considered to have been triggered if subsidence monitoring of other cliff lines undermined in the Extraction Plan Area, identifies the total sum of rockfalls from other cliff lines $>10\text{m}$ in height undermined within the Project Area is $>18\%$ of the allowable $\leq 20\%$ maximum.

Performance indicators will be considered to have been triggered if analysis of subsidence monitoring data indicates an exceedance of subsidence predictions for land (i.e. surface cracks are greater than 250mm wide).

4.1.1 Cliff Lines $>10\text{m}$ above UUG & UW

Cliff line monitoring in the BBCA and other cliff lines were undertaken in accordance with the UW EP and UUG EP during the 2024 reporting period. During the post mining inspections in 2024, there were no known Aboriginal heritage rock shelter sites associated with the cliff lines for LW7 and LW31, as identified by their respective Extraction Plan.

The purpose of the *2024 Cliff Line Monitoring Report* was to record the combined lengths of subsidence induced rockfalls and record any observed signs of subsidence induced cracking (i.e. perceptible cracking or no perceptible cracking) along cliff lines $<10\text{m}$ in height, impacted by longwall mining activities in 2024.

During the post mining inspections in 2024, there were no known Aboriginal heritage rock shelter sites associated with the cliff lines for LW7 and LW31, as identified by their respective Extraction Plan.

The combined rockfalls observed as of the 31 December 2024 as a result of longwall mining at Ulan West:

- LW1 to LW8A remains at $\approx 670.2\text{m}$; and
- The sum of cliff lines undermined by LW1 to LW8A is $\approx 8623\text{m}$.

The combined rockfalls observed as of the 31 December 2024 as a result of longwall mining at Ulan Underground:

- LWW4 to LWW7 remains at $\approx 40\text{m}$; and
- The sum of cliff lines undermined by LWW4 to LWW7 is $\approx 933\text{m}$.

Approximately 7.0% of subsidence induced rockfalls has occurred to cliff lines undermined by LW1 to LW8A and LWW4 to LWW7, indicating the sum of rock falls as a result of subsidence at Ulan West and Ulan Underground remains within the 20% predicted in the 2009 EA.

As with historical observations of post mined cliff lines and rock features at Ulan West and Ulan Underground, there is the potential for further rock falls or instabilities to occur after post mining inspections.

For the complete *2024 Cliff Line Monitoring Report* (PE, March 2025) refer to **Attachment G**.

4.1.2 Cliff Lines in the BBCA

There were no perceptible changes i.e., no obvious evidence of subsidence related impacts observed, within the BBCA along cliff lines and at heritage sites during inspections in August and October 2024.

For the complete *2024 Cliff Line Monitoring Report* (PE, Mar 2025) refer to **Attachment G**.

4.1.3 SCT's Annual Subsidence Review

No perceptible subsidence impacts were observed in the BBCA at any of the sandstone cliff formations and Aboriginal heritage rock shelter sites during inspections by PE in August and October 2024 and by SCT in January 2025. Significant features within the BBCA are protected from subsidence impacts by a barrier of coal that excludes longwall mining. No perceptible impacts from longwall mining were expected to features within the BBCA during 2024 and none were observed.

For the complete *2024 Annual Review of Subsidence Monitoring at Ulan West and Ulan Underground Mine* (SCT 2025) refer to **Attachment G**.

5. Biodiversity Monitoring

The following provides a summary of the subsidence performance indicators (from the BMP) to inform UCMPL if the subsidence performance measures for biodiversity are likely to be exceeded during the secondary extraction within the Extraction Area for Ulan West and Ulan Underground.

For Ulan West and Ulan Underground:

Performance indicators will be considered to have been triggered if analysis of FBS data indicates a >10% (percentage points) decline in percentage foliage canopy cover of a site within the subsidence zone, inconsistent with percentage foliage canopy cover in the transition zone; and/or

Analysis of FBS data indicates a >10% (percentage points) decline in percentage foliage canopy cover in the selected vegetation community located above mining areas, not seen in non-mined areas of the vegetation community; and/or

A reduction in abundance and/or condition of hollow bearing trees (HBTs) at FBS monitoring sites suitable for Masked Owls; and/or

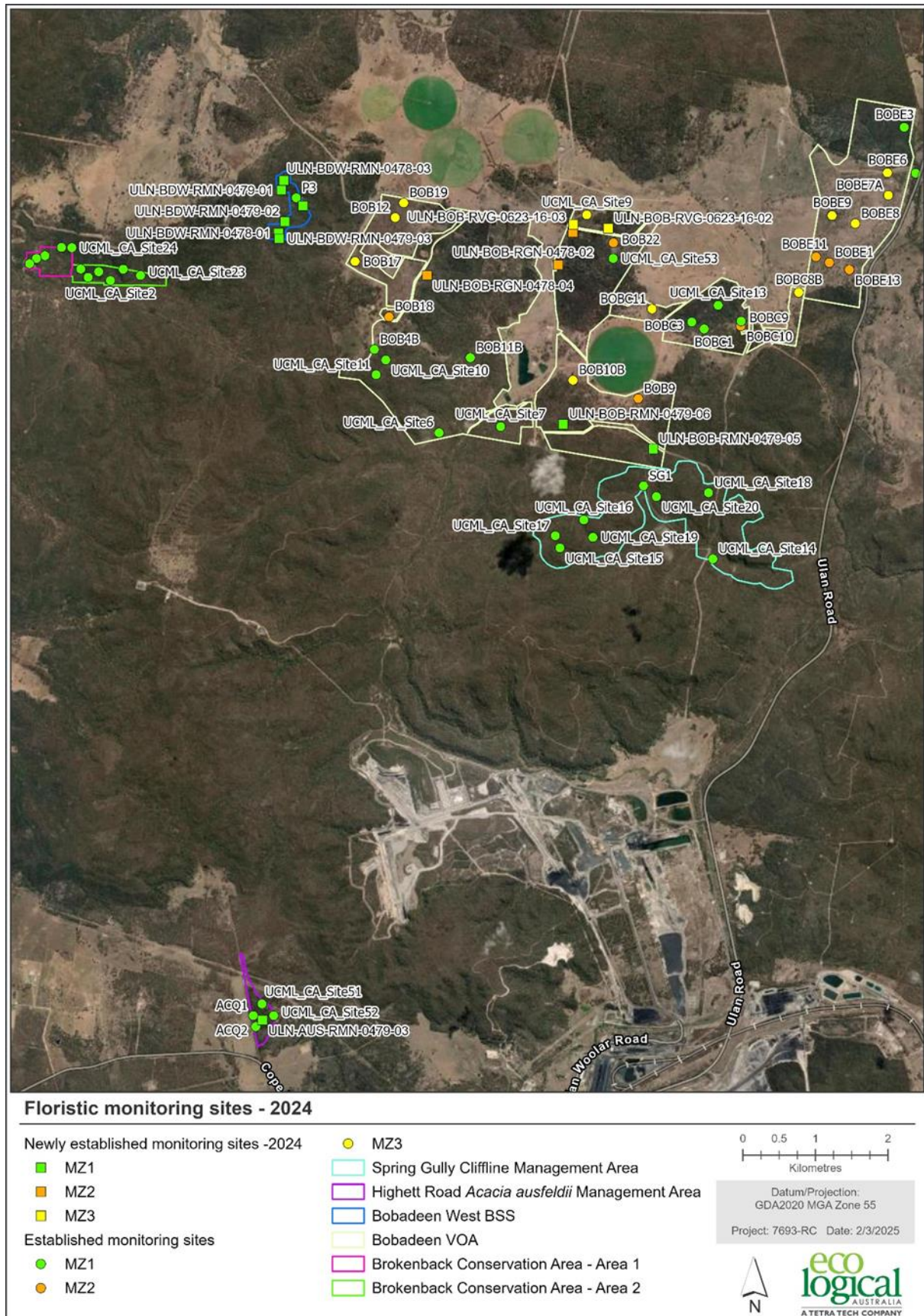
>10% decrease in canopy foliage cover of key feed species at FBS monitoring sites suitable for either the Regent Honeyeater and/or Swift Parrot.

Performance indicators will be considered to have been triggered if analysis of micro-bat monitoring data identifies decreasing activity levels (>10% decline) of endangered micro bat species during cliff line monitoring within the mined areas over two or more monitoring periods, outside of seasonal variations.

5.1.1 Floristic Monitoring

Eco Logical Australia (ELA) were engaged by UCMPL to undertake floristic monitoring during autumn and spring 2024 at the Ulan Mine Complex (UMC). Monitoring was undertaken in accordance with the requirements of the BMP. Refer to **Attachment E** for the complete report by ELA. The following summary is from *UCMPL Flora Monitoring Report 2024* (ELA, March 2025).

Figure 5-1 BOA Floristic Monitoring Sites 2024



Summary of Assessment Against Floristic Based Subsidence Performance Indicators

The 2024 floristic monitoring by ELA also comprised of floristic based subsidence (FBS) monitoring undertaken above nine longwall panels (**Figure 5-2**) during autumn and spring with the results assessed against the relevant Extraction Plan subsidence performance measures and indicators from the BMP (**Attachment E**). Baseline data was collected at two longwall panels during 2024, namely UW LW9 and UUG LWW8. An assessment of the BMP performance indicator relating to FBS monitoring, specific to the Extraction Plans include:

- Analysis of FBS data indicates a >10% (percentage points) decrease in canopy foliage cover of a site within the subsidence zone inconsistent with canopy foliage cover in the transition zone; and
- Analysis of FBS data indicates >10% (percentage points) decrease in canopy foliage cover in the selected vegetation community located above mining areas, not seen in non-mined reference sites.

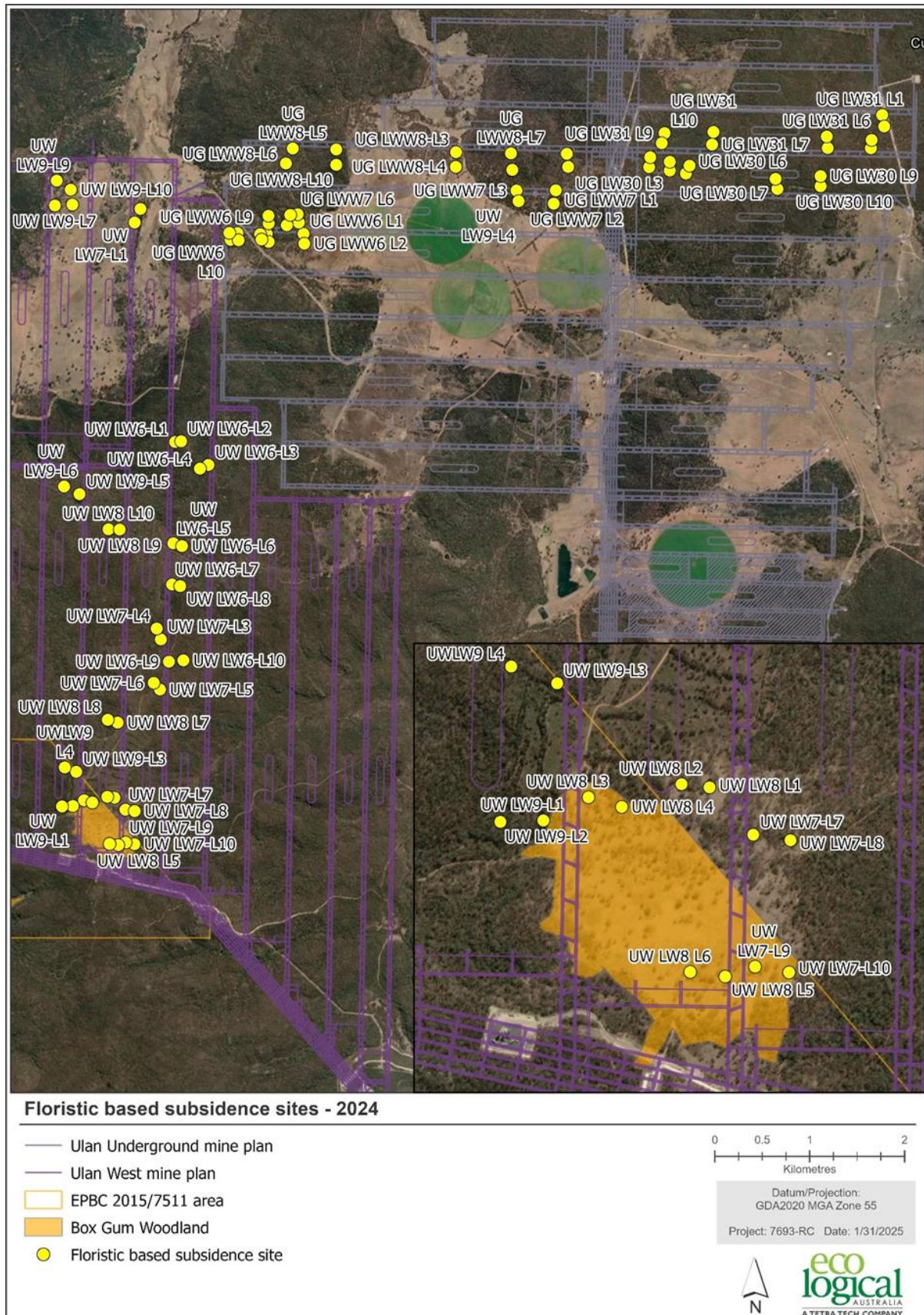
Change in project foliage cover (PFC) at all longwalls remains less than the subsidence Performance Indicator of a >10% decrease in canopy foliage cover (ELA, 2025).

For sites with three or more years of data (UG LW30, UG LWW6, UG LWW7, UW LW6 and UW LW7), trends over time between maximum subsidence and transition sites have been compared. Fluctuations in PFC were recorded at each longwall for the duration of monitoring, with maximum subsidence and transition sites following similar trajectories (ELA, 2025).

The greatest decrease in average PFC for both maximum subsidence and transition sites occurred at UG LWW6, however, this is only attributed to 4% decreases in PFC at only two transition sites (L1 and L3) and one maximum subsidence site (L8) out of 10 sites at UG LWW6 (Autumn 2019 compared to Spring 2023). All other sites recorded either no change or an increase in PFC. Slight fluctuations in PFC are expected for remnant vegetation (ELA, 2025).

Despite the presence of subsidence cracks at recently undermined locations, monitoring results demonstrate that tree health has not been affected by the mining activities across UCMPL over the monitoring periods (ELA, 2025).

Figure 5-2 Floristic Based Subsidence Sites 2024



Summary of Assessment Against Ulan West EPBC 2015/7511 Performance Indicators

Development of a monitoring program for, and subsequent baseline monitoring of Box Gum Woodland condition and extent throughout the Ulan West Underground EPBC Referral Area was undertaken during 2022 (ELA 2023) as required by Condition 3 of EPBC Referral 2015/7511. The monitoring program and baseline monitoring also seeks to track progress against Condition 2 of EPBC Referral 2015/7511 (ELA, 2025).

The EPBC 2015/7411 referral area contains ten FBS monitoring sites (**Table 5-3 & Figure 5-2**). Six of these sites are located within the area mapped as Box Gum Woodland during baseline assessments (ELA 2023). Areas of UW LW10, UW LW11 and UW LW12 are also within the EPBC 2015/7411 referral area. Sites will be established on these longwalls once mining progresses (ELA, 2025).

Table 5-1 EPBC 2015/7511 Referral Area Monitoring Sites and Corresponding Vegetation

Longwall	Site	Vegetation
UW LW7	L9	Box Gum Woodland
	L10	Box Gum Woodland
UW LW8	L3	Box Gum Woodland
	L4	Box Gum Woodland
	L5	Box Gum Woodland
	L6	Box Gum Woodland
UW LW9	L1	Dry Sclerophyll Forest
	L2	Dry Sclerophyll Forest
	L3	Dry Sclerophyll Forest
	L4	Dry Sclerophyll Forest

Assessment against the Ulan West EPBC 2015/7511 Area performance measures from the 2024 monitoring results is provided in **Table 5-4**.

Table 5-2 Assessment Against Ulan West EPBC 2015/7511 Area Performance Indicators

Performance Measure	Performance Indicator	Assessment of performance indicator/measure	Assessment
Negligible impact on Box Gum Woodland.	Box Gum Woodland located above longwall panels in the subsidence zone are not expected to experience changes in condition different to changes in the corresponding sites located in the transition zone.	An indicator will be considered to have been triggered if: - Analysis of FBS data indicates a >10% (percentage points) decrease in canopy foliage cover of a site within the subsidence zone inconsistent with canopy foliage cover in the transition zone; and - Analysis of FBS data indicates >10% (percentage points) decrease in canopy foliage cover in the selected vegetation community located above mining areas, not seen in non-mined reference sites. The performance measure is exceeded if investigation shows subsidence has resulted in greater than negligible impacts to the Box Gum Woodland within mined areas.	Ongoing – No sites have recorded a >10% decrease in canopy cover between pre mining data and spring 2024 data, noting that autumn monitoring is yet to be undertaken for completion of the monitoring program.
	At the completion of undermining, Box Gum Woodland patches continue to meet the condition thresholds described in the Policy Statement (DEH 2006).	An indicator will be considered to have been triggered if assessment against the condition thresholds within the Policy Statement (DEH 2006) are no longer met, with no negative impacts and/or decline in condition also recorded in Box Gum Woodland reference.	Ongoing – Ongoing This will be assessed upon completion of autumn monitoring.

5.1.2 Fauna Monitoring

ELA was engaged by UCMPL to undertake fauna monitoring in accordance with the requirements of the BMP. The 2024 Fauna Monitoring Report details the results of autumn and spring feral pest monitoring, spring targeted threatened bird monitoring, and spring nest box monitoring (**Attachment E**). The following summary is from *UCMPL Fauna Monitoring Report 2024* (ELA, March 2025).

A large quantity of data was collected during formal surveys as well as opportunistic observations throughout 2024. General woodland bird surveys recorded 78 different bird species across 20 monitoring locations, including four threatened bird species listed under the NSW *Biodiversity Conservation Act 2016* and/or the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*. Furthermore, three additional threatened bird species were identified through opportunistic sightings in the UCMPL Complex in 2024.

General woodland bird surveys and opportunistic observations in 2024 resulted in the absence of three threatened woodland bird species that were previously identified within the Bobadeen BOAs for two or more consecutive monitoring periods. Meeting Condition Amber requires to investigate whether threatened species habitat has reduced within the Bobadeen BOAs and undertake additional monitoring to confirm absence of threatened species from within the BOAs. Despite the absence of records during 2024, it is considered unlikely that habitat availability for Brown Treecreeper (eastern subspecies), Speckled Warbler and Varied Sittella has decreased within the Bobadeen BOAs

The target threatened bird species *Tyto novaehollandiae* (Masked Owl) was not recorded during the 2024 surveys, and this species has yet to be recorded within the UCMPL complex. Since Ulan West Longwall 6 (UWLW6) L6 contains suitable hollow-bearing trees for the Masked Owl, an assessment of hollow conditions and abundance was required. During the monitoring period between pre-mining and post-mining, the number of large hollows increased from zero to one, and therefore the subsidence impact on Masked Owl is considered negligible.

An assessment of potential foraging habitat for *Anthochaera phrygia* (Regent Honeyeater) and *Lathamus discolor* (Swift Parrot) was also undertaken at floristic-based subsidence monitoring sites UWLW6 and Ulan Underground Longwall West 6 that located above undermined longwalls which contain key and supplementary feed trees for these species. The assessment found that percent foliage canopy cover of feed trees at monitoring sites had not declined by >10% post-mining and as such, the relevant subsidence performance measure for these two threatened bird species has been met.

A total of 118 nest boxes were monitored in 2024, of which 86% remained fit for use, with 22% of all nest boxes monitored demonstrating signs of use. A total of two *Trichosurus vulpecula* (Common Brushtail Possum), three eggs and a nestling were observed in five nest boxes. Sixteen nest boxes require either repair or total replacement due to damage to the box or misalignment.

Given the successful implementation of the UCMPL fauna monitoring program in 2024 and the results detailed in this report, UCMPL is considered to be compliant with their relevant Project Approval conditions.

5.1.3 Microbat Monitoring

ELA was engaged by UCMPL to undertake microbat monitoring in accordance with the requirements of the BMP and the Extraction Plans. The following summary is from *UCMPL Microbat Monitoring Report 2024* (ELA, March 2025).

Microbat monitoring in 2024 was undertaken in accordance with the approved management plans for the management of threatened species habitat across the UCC. This annual report details the results of microbat monitoring of eight control sites, 15 impact sites and four microbat monitoring sites within the Bobadeen West Biodiversity Stewardship Site (BSS), during December 2024.

Targeted cliffline monitoring was undertaken at non-mined control and both mined and non-mined impact sites above Ulan West longwall panels, to record the presence and activity of threatened cave-roosting microbat species *Chalinolobus dwyeri* (Large-eared Pied Bat) and *Miniopterus orianae oceanensis* (Large Bent-winged Bat). Monitoring at Bobadeen West BSS sites was undertaken to confirm the ongoing presence of the Large-eared Pied Bat within the BSS.

The Large-eared Pied Bat was definitely or potentially recorded via acoustic call detection at all eight previously established targeted cliffline - control sites, whilst the Large Bent-winged Bat was potentially recorded at all eight sites. The consistent recording of both target threatened cave-roosting species in relatively high quantities, including the capture of Large-eared Pied Bat across multiple control sites, confirms their suitability for use as control sites for monitoring the population of both target species.

Monitoring was also completed at 15 targeted cliffline - impact sites, of which four sites, located above the UWLW9 longwall panel, were established and monitored for the first time. Acoustic call detection surveys recorded a diversity of species richness, with at least 12 individual microbat species recorded across all impact sites, inclusive of at least two and up to seven threatened microbat species listed under the NSW Biodiversity Conservation Act 2016 and/or Commonwealth Environment Protection and Biodiversity Conservation Act 1999. Mean species richness was highest in 2024 at previously mined sites above both UWLW7 and UWLW8 longwall panels, in comparison to non-mined (UWLW8 and UWLW9) impact sites. This result indicates the maintenance of habitat in the post-mining UCC landscape, which continues to provide habitat for a diverse range of microbat species. The capture of 20 microbat individuals from six different species at site UWLW7a, including the target threatened cave roosting Large-eared Pied Bat, provides a further positive indication as to the continued provision of suitable quality microbat habitat post-mining.

Large-eared Pied Bat call activity across all previously undermined sites increased substantially in 2024, compared to the previous year, and as such the relevant performance indicators for the management of habitat for the species (being a decline in call activity >10%) have not been exceeded. This increased call activity was also recorded at UWLW7 sites in isolation, and with 2024 being the final year of the sites' post-mining monitoring period, the conclusion of targeted monitoring at these sites is recommended.

In contrast, Large Bent-winged Bat call activity across previously mined sites, as well as non-mined control sites, decreased substantially in 2024, in comparison to the abnormally high call activity recorded for the species during 2023. The high call activity of 2023 monitoring was also recorded at UWLW7 sites during what was the first year of their post-mining monitoring period and as such,

combined with the consistent declines in both control and impact site call activity during 2024, the performance indicator has not been exceeded for the species, across the two-year post-mining monitoring period.

Given the successful implementation of the UCMPL microbat monitoring program in 2024 and the results detailed in this report, UCMPL is considered to be compliant with their relevant project approval conditions.

6. Heritage Monitoring

The following provides a summary of the subsidence performance indicators to inform UCMPL if the subsidence performance measures for heritage are likely to be exceeded during the secondary extraction within the Extraction Plan Area for Ulan West and Ulan Underground.

For Ulan West:

Grinding Groove Conservation Area is considered remoted from the current mining area at UW.

Performance indicators in the current Extraction Plan for LW1-LW8 will be considered to have been triggered for the BBCA if subsidence monitoring identifies an exceedance (or a trend to exceedance) of the predicted subsidence values surveyed along the D Line and GNSS units.

Performance indicators will be considered to have been triggered if subsidence monitoring identifies a greater than nil impact within the BBCA.

The performance indicators will be considered to be triggered if subsidence monitoring identifies other Aboriginal sites displaying greater than predicted impacts.

The performance indicators will be considered to be triggered if subsidence monitoring identifies other European heritage sites displaying greater than predicted impacts.

The performance indicators will be considered to be triggered if subsidence monitoring identifies greater than negligible impacts to the Talbragar Fish Fossil Reserve.

For Ulan Underground:

Grinding Groove Conservation Area is considered remoted from the current mining area at UUG.

The Talbragar Fish Fossil Reserve and the BBCA are remote from this Extraction Plan and therefore are not considered in this Extraction Plan. Applicable subsidence performance indicators are provided in the Ulan West Extraction Plan (see above).

Performance indicators for the MCRSS will be considered to have been triggered if analysis of data from the heritage monitoring program indicates:

- A trigger alarm from the LWW8 GNSS units has been received; and/or
- A perceptible change to the pre-mining condition of the MCRSS (e.g. recent rock fall or cracking).

The performance indicators will be considered to be triggered if subsidence monitoring identifies other Aboriginal sites displaying greater than predicted impacts.

The performance indicators will be considered to be triggered if subsidence monitoring identifies other European heritage sites displaying greater than predicted impacts.

6.1.1 BBCA Monitoring

In addition to the visual monitoring program and subsidence effects monitoring program, SCT were engaged by UCMPL to design and develop a specific ground movement monitoring system (i.e BBCA Subsidence Monitoring Program) with appropriate management measures to ensure the subsidence performance measures of 'nil environmental impact' for cliffs and 'nil impact for Aboriginal sites' within the BBCA is maintained. Baseline monitoring at the BBCA commenced in August 2022 with the

installation of two GNSS¹ units located on the cliff line formation associated with LW8. Since then, UCMPL have installed potentiometer units (monitoring displacement change) commissioned 4 January 2024, a stress cell monitor installed April 2024 and six additional GNSS units within the BBCA. GNSS monitoring systems indicate there has been less than 10 mm vertical subsidence observed on any of the GNSS units. These instruments show less than 100 mm of general horizontal movement of the ground. GNSS monitoring indicate strains from BBCA01 to BBCA03 are less than 0.03 mm/m in a direction along the length of the sandstone outcrop. These levels of subsidence effects are within expectation for the mining geometry and subsidence management systems and strategies for impacts and consequences (SCT, 2025).

6.1.2 MCRSS Monitoring

Secondary extraction of LW8 is not scheduled until late 2025. Visual and subsidence effects monitoring of the MCRSS will be undertaken as required by the UUG Extraction Plan in 2025.

A pre-mining inspection of Mona Creek Rockshelters Sites (MCRS) Ulan ID#184 to 187 was completed by UCMPL on 29 January 2020 prior to the commencement of LW6. Inspections by UCMPL of the MCRS have occurred on the 22 February 2022 after mining of LW7 and again on the 24 August 2023 with the landowner in attendance. No perceptible impacts as a result of mining have been noted during the inspections in February 2022 and August 2023.

In addition to the visual monitoring program and subsidence effects monitoring program, SCT were engaged by UCMPL to design a specific ground movement monitoring system and develop a TARP with appropriate management measures for the MCRSS. The MCRSS and associated cliff line by design are protected from impacts by mining setback, a barrier greater than half depth from the nearest GOAF edge (UUG LW8). Baseline monitoring at the MCRSS commenced in January 2024 with the initial monitoring system finalised in April 2024.

6.1.3 SCT's Annual Subsidence Review

No perceptible subsidence impacts were observed in the BBCA at any of the sandstone cliff formations and Aboriginal heritage rock shelter sites during inspections by PE in August and October 2024 and by SCT in January 2025. Significant features within the BBCA are protected from subsidence impacts by a barrier of coal that excludes longwall mining. No perceptible impacts from longwall mining were expected to features within the BBCA during 2024 and none were observed (SCT, 2025).

Overall, perceptible cracking and rock falls on sandstone outcrop formations and at Aboriginal heritage rock shelter sites observed from the longwall mining during 2024 are consistent with expectation and less than the forecasts in SCT (2009) for the UCCO Project EA, in SCT (2021) for the Longwalls 1-8 EP at UW and in SCT (2016, 2019 and 2022) for the Longwalls 30-32 and W6-W8 EP at UUG (SCT, 2025).

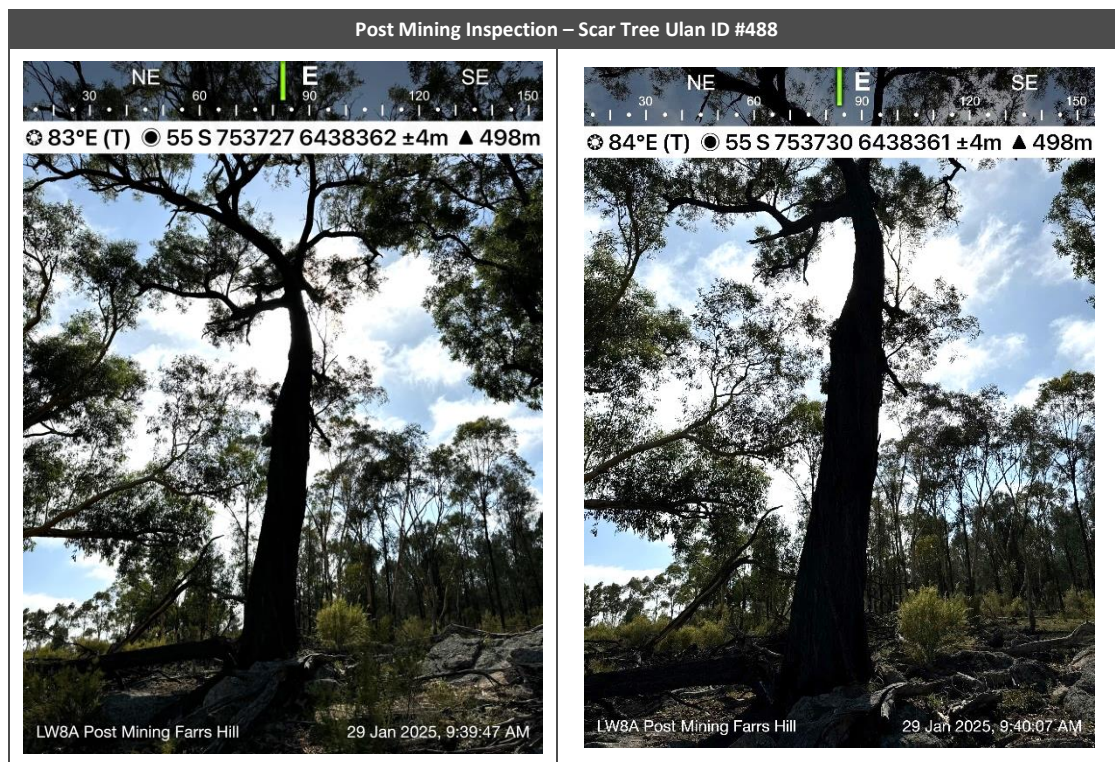
No impacts were observed to the Aboriginal heritage scar tree (SCT, 2025).

For the complete *2024 Annual Review of Subsidence Monitoring at Ulan West and Ulan Underground Mine* (SCT 2025) refer to **Attachment G**.

¹ Continuous global navigation satellite system (GNSS) provides continuous 3D ground movement data with alarm triggers.

6.1.4 Scar Tree (Farrs Hill)

Table 6-1 Post Mining Scar Tree Farrs Hill 2024



6.1.5 Old Ulan

No subsidence related impacts to the heritage structures at Old Ulan have been observed as a result of underground longwall mining at Ulan West.



Photo 1 Old Ulan April 2021 & October 2022

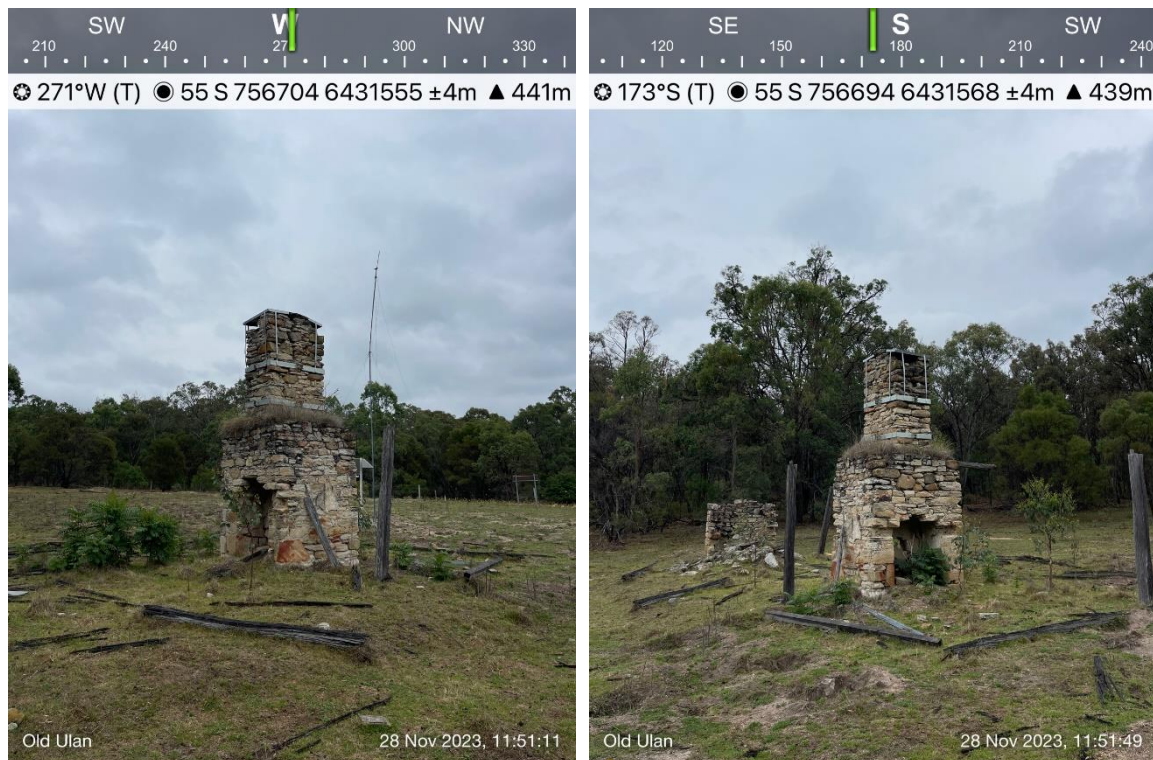


Photo 2 Old Ulan November 2023

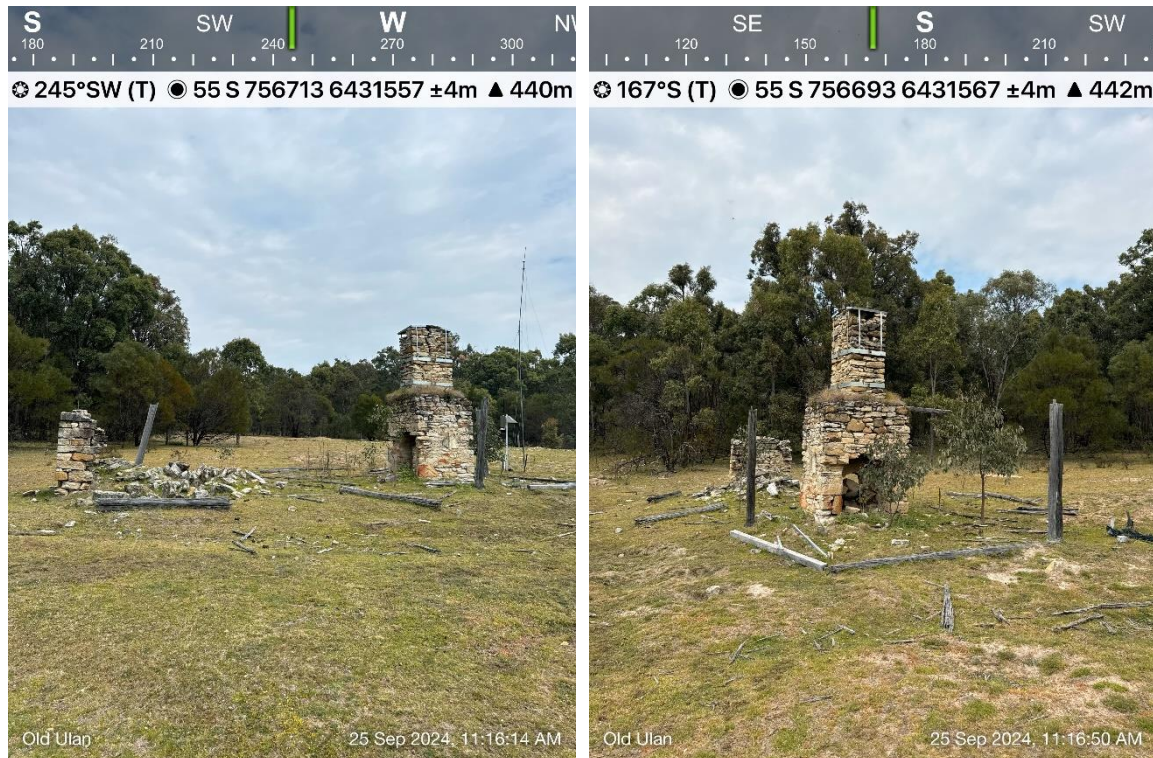


Photo 3 Old Ulan September2024

7. Built Features

The following provides a summary of the subsidence performance indicators to inform UCMPL if the subsidence performance measures for built features are likely to be exceeded during the secondary extraction within the Extraction Plan Area for Ulan West and Ulan Underground.

For Ulan West:

Performance indicators will be considered to have been triggered regarding public utilities (i.e. Telstra Cable, Essential Energy Powerline and State Survey Marks) if a greater impact than predicted to the integrity and functionality of public utilities within the Extraction Plan Area has occurred.

Performance indicators will be considered to have been triggered if a greater impact than predicted to the integrity and functionality of a privately-owned built feature within the Application Area; and/or

If UCMPL receive a complaint from a landowner regarding a built feature or a subsidence related impact within the Application Area.

For Ulan Underground:

Performance indicators will be considered to have been triggered if analysis of data from the built features monitoring program indicates a greater impact than predicted to the integrity and functionality of applicable public utility has occurred within the Extraction Plan Area (e.g. loss of electrical supply from the SWER line or 4WD access track in the DSCA not safe to use or impacts to water supply dam); and/or

A greater than predicted Impact to the integrity and functionality of a privately owned built features (e.g. significant impacts to farm dams i.e. non-repairable, extensive damage to stock fencing, tracks unsafe to use or complete structural failure of the small shelter) within the Extraction Plan Area; and/or

If UCMPL receive a complaint from a landowner regarding a built feature that may have been potentially impacted by subsidence.

7.1.1 Built Features Monitoring

To evaluate the impacts from subsidence on built features, both Extraction Plans have developed the following key monitoring components to measure and evaluate the subsidence performance measure for built features, including:

- Public utilities and amenities monitoring;
- Built features owned UCMPL property monitoring; and
- Built features on private property monitoring.

For private property UCMPL undertake pre-mining inspections, during mining inspections and post mining inspections (**Table 7-1** and **Table 7.2**) utilising photographic monitoring points and visual inspections to determine the baseline condition of the relevant surface features and record impacts to built features and landforms. Refer to **Table 7-1** for an examples of recorded impacts on the Farris

Hill property as a result of LW8A and the remediations and repairs completed by UCMPL during the 2024 Reporting Period.

7.1.2 SCT's Annual Subsidence Review

A detailed review of subsidence impacts to the Farris Hill property from the mining of Longwall 8A at UW has been prepared and is presented in SCT Letter Report ULA5878 (SCT 2025), to satisfy the post-mining requirements of the PPSMP for Farris Hill. A summary of the measured subsidence effects and observed subsidence impacts and environmental consequences reported in SCT (2025) is provided in this section. Our review of subsidence effects monitoring and recording of impacts indicates:

- Subsidence effects have been less than forecast.
- Impacts and consequences to agricultural landform, natural features including sandstone outcrop formations have been consistent with expectation and less than the maxima forecast.
- Impacts and consequences to drainage lines, surface dams are consistent with expectation and less than the maxima forecast.
- Impacts and consequences to built features including farm infrastructure are consistent with expectation and less than the maxima forecast.
- No public safety incidents from impacts and consequences to sandstone outcrop formations or access roads/four-wheel-drive tracks have been reported.

Subsidence impacts and environmental consequences to the Farris Hill property were monitored during the period of mining in Longwall 8A. This monitoring included pre-mining and monthly inspections and reporting by UCM environmental staff and other environmental specialists as well as site visits by SCT to inspect impacts and consequences (SCT, 2025).

Overall, impacts and consequences over Longwall 8A are similar in nature and magnitude to those observed over Longwall 7, although mapping indicates the frequency of subsidence cracks over Longwall 8A is less and there were no consequences to the farm dam. All impacts and consequences are consistent with expectation and less than the maxima forecast (SCT, 2025).

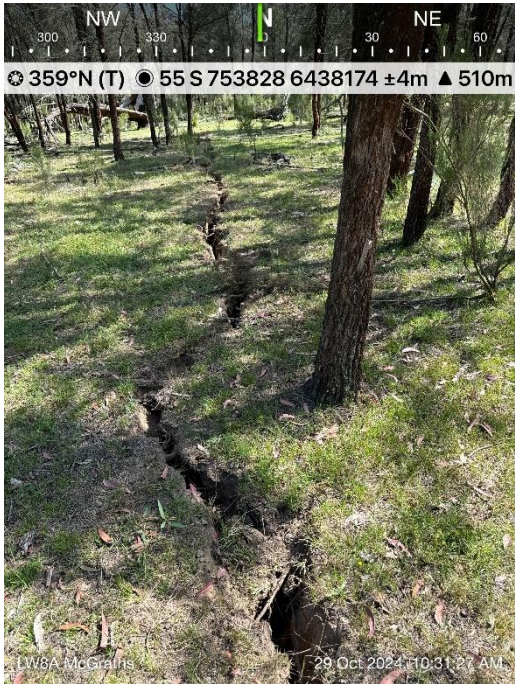
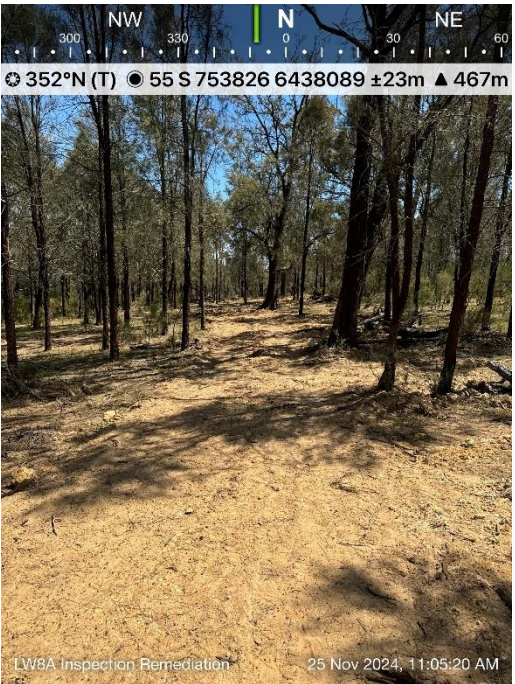
The main impacts include cracks in the ground around the panel edges and across the panel width. These cracks intersected the farm dam and are more prominent on hard surfaces such as access roads/four-wheel-drive tracks and rocky outcrops in drainage lines and at topographic high points. Impacts and consequences in the form of cracking and rock falls were observed on some sandstone outcrop formations that host Aboriginal heritage rock shelters. Minor impacts to fencing were also observed (SCT, 2025).

For the complete *2024 Annual Review of Subsidence Monitoring at Ulan West and Ulan Underground Mine* (SCT 2025) refer to **Attachment G**.

7.1.3 Subsidence Remediation

Subsidence remediation was ongoing during 2024 to address surface cracking associated with LW8A on the Farris Hill property as required by the PPSMP and to the satisfaction of the landowner (refer to **Table 7-1**).

Table 7-1 Subsidence Repairs and Fence Repairs Farrs Hill 2024

Surface Cracking October 2024	
	
Surface Cracking Repairs in November 2024	
	

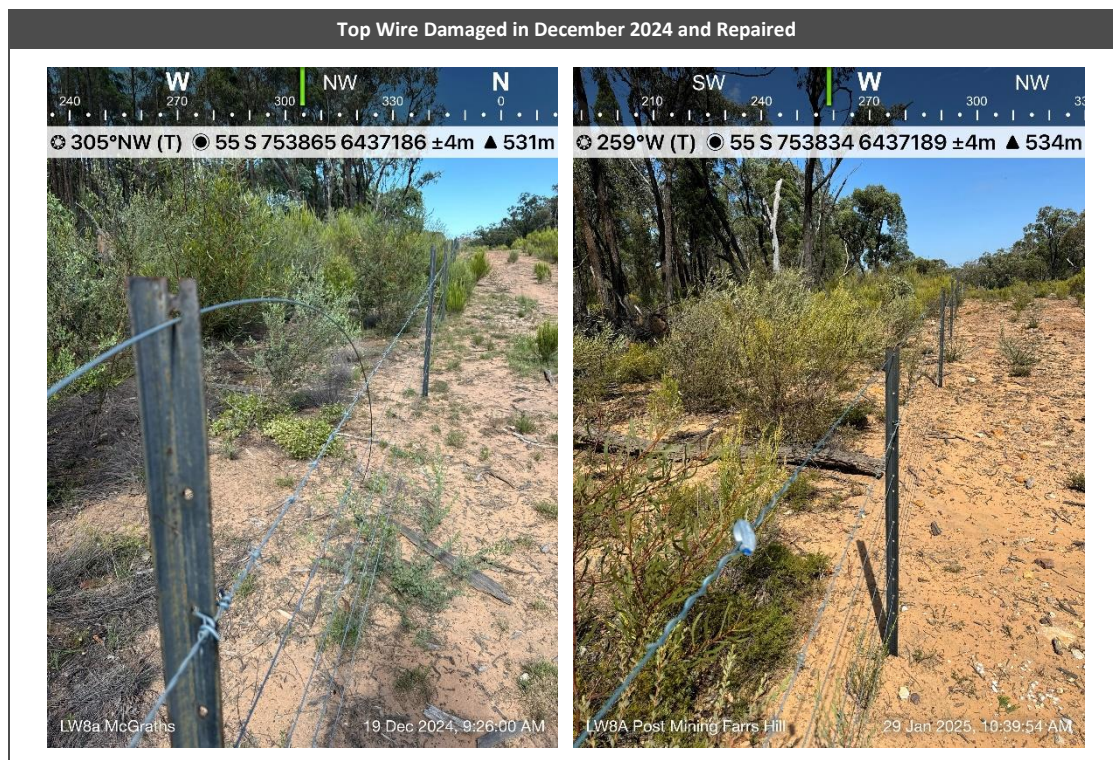
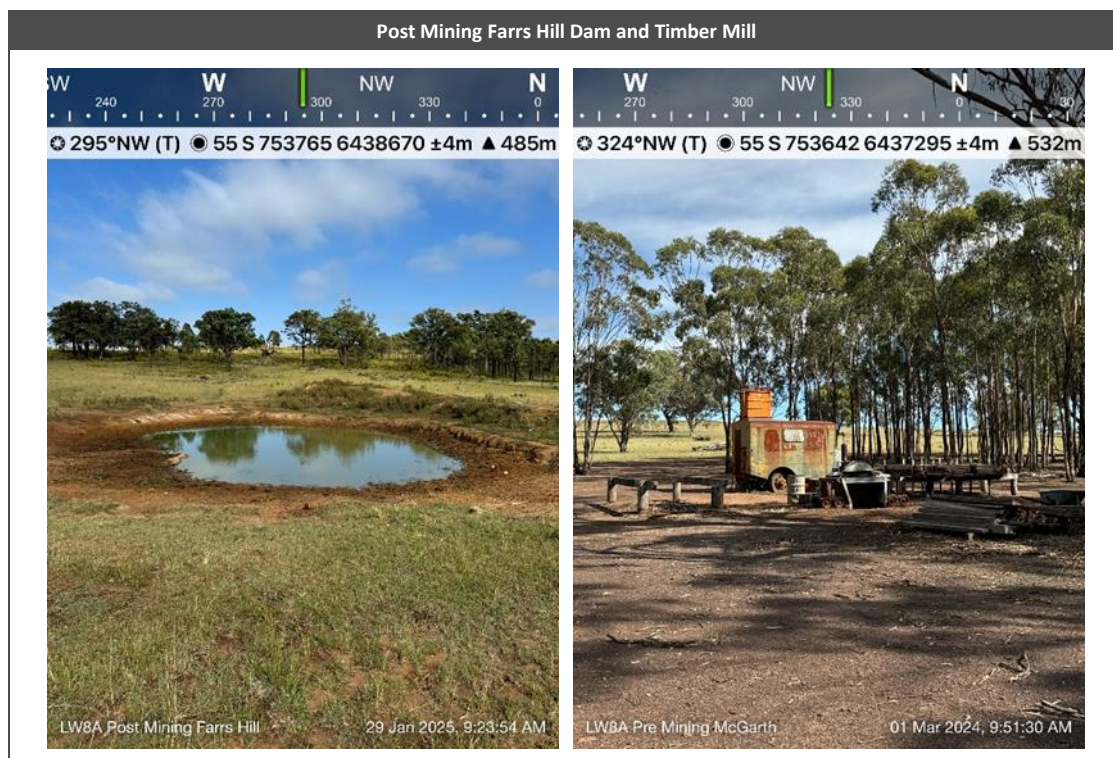


Table 7-2 Post Mining Condition Built Features Farris Hill 2024



8. Public Safety

The following provides a summary of the subsidence performance indicators to inform UCMPL if the subsidence performance measures for public safety are likely to be exceeded during the secondary extraction within the Extraction Plan Area for Ulan West and Ulan Underground.

For Ulan West and Ulan Underground:

Performance indicators will be considered to have been triggered if analysis of subsidence monitoring data indicates an exceedance of subsidence predictions for cliffs and land during mining within the Extraction Plan Area; and/or UCMPL become aware that a member of the general public may have entered the Extraction Plan Area without authorisation and a safety incident has potentially occurred.

8.1.1 Public Safety Monitoring

To evaluate the impacts from subsidence on public safety both Extraction Plans have developed the following key monitoring components to measure and evaluate the subsidence performance measure for public safety, including:

- Surface impacts on land features (including cracking, steps, overrides and erosion holes);
- Cliff line rock falls; and
- Site security and signage.

The frequency of pre-mining inspections, during mining inspections and post mining inspections on UCMPL land and non-UCMPL land will occur monthly as a minimum. Inspections during longwall mining and post longwall mining subsidence impacts which may include cracking, steps, overrides and erosion holes. This monitoring data will confirm if there has been a potential exceedance of subsidence predictions or subsidence performance measures for public safety or if the observed impacts are within prediction. The inspections will also identify potential subsidence hazards on both UCMPL owned land and non-UCMPL owned land. If subsidence monitoring identifies a potential or immediate safety risk, the area will be cordoned off and/or warning signage placed to either alert or to prevent access in consultation with the relevant land owner.

There were no triggers as they related to public safety as a result of longwall mining at UW and UUG during the 2024 Reporting Period.

8.1.2 SCT's Annual Subsidence Review

No significant impacts were observed within the Durridgere State Conservation Area (SCT, 2025)

Subsidence impacts and environmental consequences, including to water, biodiversity, land, heritage, built features and public safety risk, are likely to be compliant with the subsidence performance measures detailed in the UCCO Project Approval 08_0184 (as modified), notwithstanding the input of other specialists. Impacts and risks on private property are being mitigated and remediated by management plans and agreements between the landholder and UCM (SCT, 2025).

No incidents relating to public safety on land owned or leased by UCM, private property or in a public space have been reported (SCT, 2025).

Ongoing monitoring is recommended consistent with subsidence monitoring programs detailed in relevant Extraction Plans for both the UW and UUG mines (SCT, 2025).

For the complete *2024 Annual Review of Subsidence Monitoring at Ulan West and Ulan Underground Mine* (SCT 2025) refer to **Attachment G**

GLENCORE