2023 Annual Review

Northparkes Operations

Evolution MINING

Document Details	
Name of Operation	Evolution Mining Northparkes Operations
Name of Operator	Evolution Mining (Northparkes) Pty Ltd operating as Northparkes Mining Services Pty Ltd
Development Consent/Project Approval Number	11_0060, as modified
Name of holder of development consent/Project Approval	Evolution Mining (Northparkes) Pty Ltd
Mining Leases	ML1247, ML1367, ML1641, ML1743
Name of holder of mining lease	Evolution Mining (Northparkes) Pty Ltd
Water Licence #	Refer to Table 4 Summary of Licences
Name of holder of water licence	Evolution Mining (Northparkes) Pty Ltd
MOP/RMP Commencement Date	1st January
MOP/RMP Completion Date	31st December
Annual Review Commencement Date	1st January 2023
Annual Review Completion Date	31st December 2023
I, Rob Cunningham, certify that this audit report is a true and accurate record of the compliance status of Evolution Mining Northparkes Operations for the period 1st January 2023 to 31st December 2023 and that I am authorised to make this statement on behalf of Evolution Mining Pty Ltd.	
Name of authorised reporting officer	Rob Cunningham
Title of authorised reporting officer	General Manager
Signature of authorised reporting officer	
Date	28th March 2024

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1. STATEMENT OF COMPLIANCE

In accordance with the *Post-approval requirements for State significant mining developments – Annual Review Guideline* (NSW Government, 2015) a statement of compliance has been prepared to document the status of compliance with Development Consent 11_0060 (the Consent) (as modified), mining leases and other relevant approvals at the end of the 2023 reporting period. Table 1 shows each statutory approval and where a non-compliance was identified during the reporting period.

Table 1 Statement of Compliance

Were all conditions of the relevant approvals complied with?	
DC 11_0060	No
ML 1247	Yes
ML 1367	Yes
ML 1641	Yes
ML 1743	Yes
EPL 4784	Yes
EPBC 2013/6788	No
WAL9995, WAL8241, WAL7866, WAL34955, WAL32138, WAL32120, WAL32004, WAL31969, WAL31963, WAL31930, WAL31863, WAL31850, WAL21471, WAL21466, WAL1698, WAL13108, WAL10082	Yes

Table 2 Non-Compliance

Relevant Approval	Condition Number	Condition Description	Compliance Status	Comment	Where addressed in Annual Review
DC 11_0060	Schedule 3 Condition 7	Blasting Hours	Non-compliant	Blast conducted outside of licensed hours	Section 11.1.1
EPBC 2013/6788	Condition 12	Publicly Available Information	Non-compliant	Report not uploaded to website within specified timeframe	Section 11.1.2

2. INTRODUCTION

2.1 Mine Operation Introduction and History

2.1.1 Location, History and Process Overview

Evolution Mining Northparkes Operations (Northparkes) is a copper-gold mine located 27 kilometres north-west of the town of Parkes in central west New South Wales, Australia (Figure 1). The Northparkes business continues to run under a joint venture arrangement with 80% interest with Evolution Mining (Northparkes) Pty Ltd and the remaining 20 percent share owned by the Sumitomo Group.

The majority of Northparkes employees reside in the Parkes Shire, which has a population of approximately 15,000 residents. Parkes Shire is a diverse municipality centred in the town of Parkes. The largest industry is the retail industry, closely followed by the agricultural industry.

North Mining Limited originally received development consent for Northparkes operations in 1992, 15 years after the first onsite resource discovery. This approval was based on open cut mining of E22 and E27 and underground mining of E26 within the 'Mining Reserve' of 64.1 million tonnes (Mt).

Underground block cave mining commenced at Northparkes in October 1993 with the construction of the E26 underground block cave mine through the granting of development consent DA504/90. Northparkes commissioned its second block cave mine, E26 Lift 2 in 2004. In 2008, North Mining Limited commissioned an extension to the second block cave mine, E26 Lift 2 North (E26 Lift 2N). Mining operations at Northparkes focus on the extraction of a range of ore bodies based on a set of target mineral concentration limits.

Open cut mining commenced with the E27 pit in December 1993 and the E22 pit in January 1994. The gold-enriched oxide ore was processed through a separate carbon-in-pulp (CIP) gold circuit, including the use of cyanide for gold extraction, prior to the construction of the copper-gold sulphide processing circuits in 1995. Ore was then stockpiled for blending with E26 underground material. Open cut mining at Northparkes operated on a campaign basis determined by economic and environmental viability. Open cut mining ceased in October 2010 with the completion of the E22 open cut campaign. The CIP processing plant has been decommissioned from site, with cyanide no longer used in process circuits on site.

In February 2007, the NSW Minister for Planning granted PA06_0026 under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act). This approval provided for the ongoing operation of the previously approved mining operations and facilities and the extension of underground block cave mining into the E48 ore body. This project was known as the E48 Project. After approval in 2007, North Mining Limited commenced construction of E48 Lift 1, its third major block cave mine. Initial production of E48 Lift 1 began in 2010 and forms part of the approved underground mining operations in conjunction with E26 Lift 2 and E26 Lift 2N.

In October 2009, approval was granted for two modifications to PA06_0026 under Section 75W of the EP&A Act. Section 75W modification 1 (Mod 1) provided for the construction of the Estcourt Tailings Storage Facility (TSF), a mine and mill upgrade to increase processing up to 8.5Mtpa and extension of mine life until 2025. Section 75W modification two (Mod 2) provided for the development of a 1200m^2 warehouse within the approved mine infrastructure area.

In 2012 North Mining Limited was granted approval for development of a block cave knowledge centre under Part 4 of the EP&A Act (DA 11092) from Parkes Shire Council (PSC).

In 2013, CMOC Group Limited acquired Northparkes from Rio Tinto.

In July 2014, Development Consent 11_0060 was granted under section 75J of the EP&A Act for the Northparkes Extension Project (the Project). This Consent surrendered the Project Approval PA06_0026 and DA11092 in accordance with section 104A of the EP&A Act.

In 2019, the Consent was gazetted as a State Significant Development (SSD) under section 4 of the EP&A Act. Northparkes continues to undertake modifications to DC 11_0060 as operations develop (Section 3.2.1).

Evolution Mining acquired Northparkes in December 2023.

A copy of the 2023 Northparkes Value Chain is provided as Figure 2. The value chain is a high-level model used to describe the process by which Northparkes receive raw materials, add value to the raw materials through various processes to create a finished product, and then sell that end product to customers. Northparkes conducts annual value-chain analysis by looking at every production step required to create a product and identifying ways to increase the efficiency of the chain. The overall goal is to deliver maximum value for the least possible total cost and impact, while creating a competitive advantage. Surface infrastructure and operation layout is shown in Figure 3.

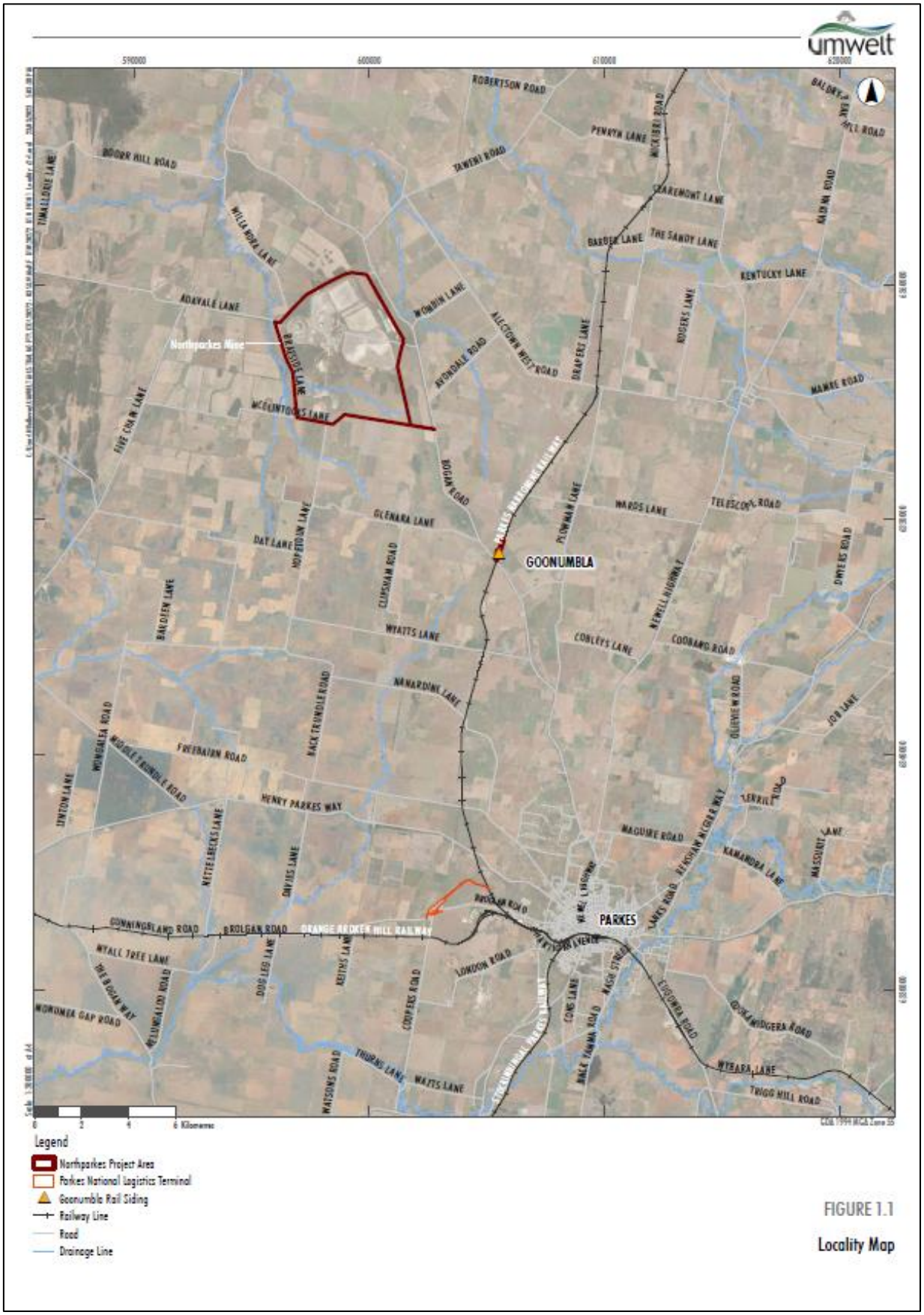


Figure 1 Project Locality Plan

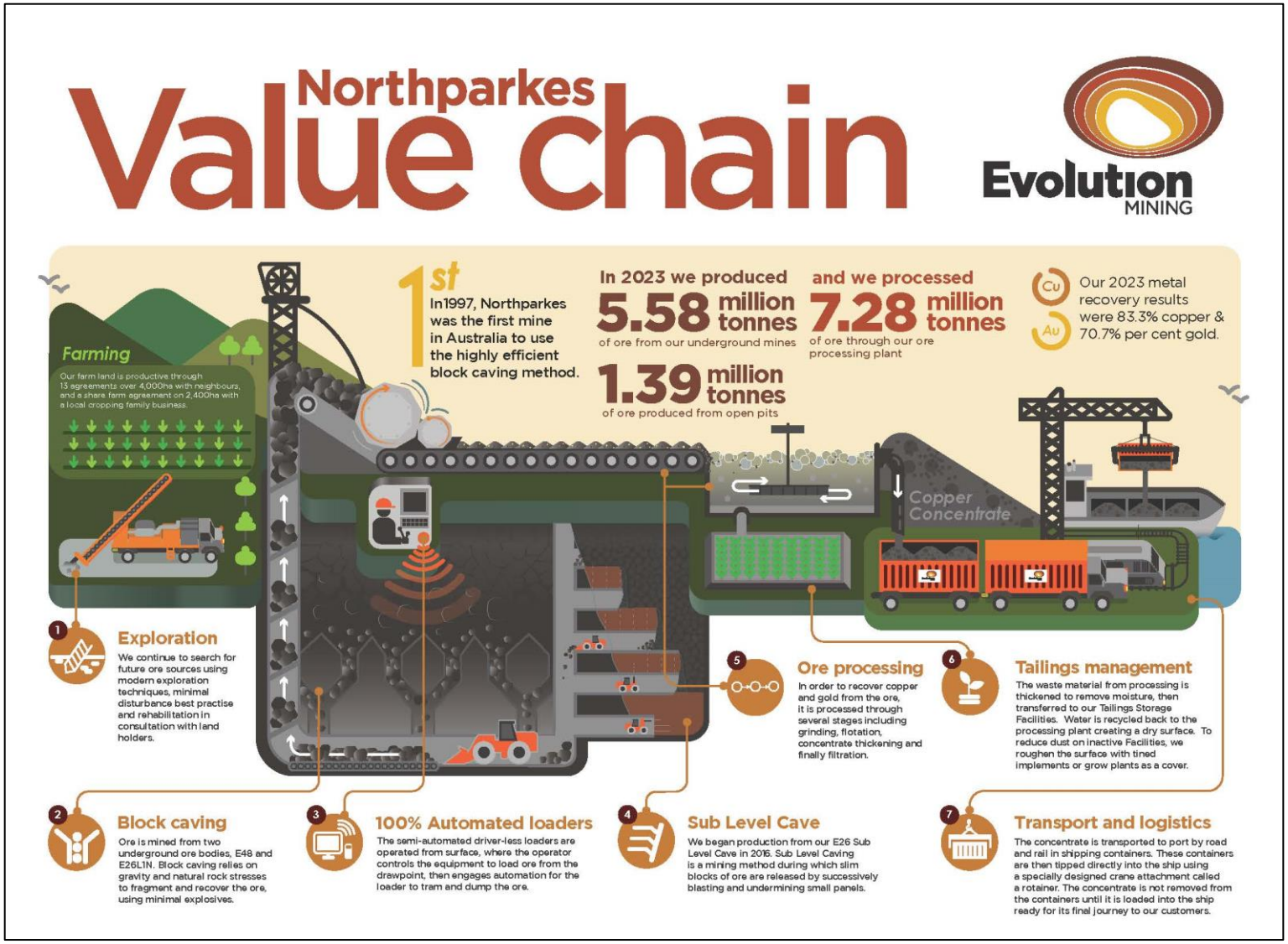


Figure 2 Northparkes Value Chain

2.1.2 Site Layout and Infrastructure

Figure 3 Surface Infrastructure and Operational Layout

The major components of the Northparkes onsite infrastructure and approved future operations includes:

- Continuation of approved underground block cave mining in the E48 and E26 ore bodies, and associated underground infrastructure
- Development of underground block caving in the E22 resource beneath the E22 open cut void
- Campaign open cut mining through development of four small open cut resources including E31, E31N, E28, E28NE
- Ongoing TSF disposal and raises including:
    - continuation of tailings disposal to TSF1, TSF2, Infill TSF and Estcourt TSF to an approved height of 28 metres
    - provision for additional raises on Rosedale TSF to provide for an increased height up to approximately 28 metres above ground surface
    - the extension of the Infill TSF west to adjoin the Estcourt TSF
- Development of new waste dumps (overburden emplacement areas) for the management of open cut waste rock. Waste rock from open cut mining areas to be utilised in the development of TSF raises, such as Rosedale TSF
- Continuation of approved ore processing infrastructure up to 8.5 Mtpa capacity, and road haulage of copper concentrate to local rail sidings
- Continued use of existing site infrastructure including administration buildings, workshops, internal access roads and service infrastructure
- Continued use of surface mining infrastructure including ventilation shafts, hoisting shaft and ore conveyors
- Continuation of existing approved water supply and management processes
- Continuation of approved mining operations until end of 2032, and
- Rehabilitation and closure of the mine site will be carried out after the end of the operational life of the Project in accordance with relevant approvals.

2.2 Scope

This Annual Review provides a summary of actual operational and environmental management activities undertaken at Northparkes during the reporting period and provides a review against planned works, as described in the Rehabilitation Management Plan (RMP), and predicted impacts documented in the Northparkes Mines Step Change Project Environmental Assessment (EA) (Umwelt, 2013). The Annual Review also covers community relations and addresses mine development and rehabilitation undertaken during the reporting period.

The report has been prepared to satisfy the conditions of the Consent (in particular Schedule 6, Condition 4) and Mining Leases (ML) 1247, 1367, 1641, 1743. Key requirements of these approvals are described in Table 3.

The report has been prepared generally in accordance with the NSW Governments "*Annual Review Guideline*" October 2015 where practicable, as well as the relevant Northparkes reporting framework.

Northparkes recognises and respects the importance of stakeholders and considers positive relationships that aid in continual improvement of its environmental management practice. This report is therefore provided to the following stakeholders:

- Department of Planning, Industry and Environment (DPE)
- Resource Regulator, Department of Regional NSW
- Forestry Corporation of NSW
- NSW Environment Protection Agency (EPA)
- Biodiversity Conservation Trust (BCT)
- Peak Hill Local Aboriginal Land Council (PHLALC)
- Wiradjuri Council of Elders (WCE)
- Parkes Shire Council (PSC)
- Forbes Shire Council (FSC)
- Northparkes Community Consultative Committee and,
- General public (available at **https://evolutionmining.com.au/northparkes/**).

2.3 Annual Review Requirements

Table 3 Annual Review Requirements

Licence Approval or Guideline	Section Reference	Requirement	Reference in this Report
Development Consent 11_0060	Schedule 6, Condition 4	By the end of March each year, or as otherwise agreed by the Secretary, the Proponent must review the Environmental performance of the project to the satisfaction of the Secretary. This review must: (a) describe the development that was carried out in the previous calendar year, and the development that is proposed to be carried out over the next year	Whole document
		(b) include a comprehensive review of the monitoring results and complaints records of the project over the previous calendar year, which includes a comparison of these results against the • the relevant statutory requirements, limits or performance measures/criteria • the monitoring results of previous years and • the relevant predictions in the EA	Section 4 Section 6 Section 7 Section 8
		(c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance	Section 1 Section 11
		(d) identify any trends in the monitoring data over the life of the project	Section 4 Section 6 Section 7 Section 8
		(e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies and	Section 4 Section 6 Section 7 Section 8
		(f) describe what measures will be implemented over the next year to improve the environmental performance of the project.	Section 12
	Schedule 3, Condition 38	The Proponent must: (a) implement all reasonable and feasible measures to minimise the waste (including waste rock) generated by the project) (b) ensure that the waste generated by the project is appropriately stored, handled and disposed of and (c) monitor and report on effectiveness of the waste minimisation and management measures in the Annual Review	Section 4
ML 1247 ML 1367	Condition 3 (f)	The lease holder must prepare a Rehabilitation Report to the satisfaction of the Minister. The report must:	Whole document

ML 1641 ML1742		i. provide a detailed review of the progress of rehabilitation against the performance measures and criteria established in the approved MOP ii. be submitted annually on the grant anniversary date (or at such times as agreed by the Minister) and iii. be prepared in accordance with any relevant annual reporting guidelines published on the Department's website.	

3. APPROVALS

3.1 Approvals, Leases and Licences

Table 4 summarises the key mining leases and approvals currently held by Northparkes which are relevant to the operations.

Table 4 Summary of Licences

Approval	Description	Issue Date
Project Approvals		
DC 11_0060	Project Approval – Step Change Project (Mine Extension)	16/07/2014
DC 11_0060 Mod 1	Modification to include Sub Level Cave Mining	16/05/2015
DC 11_0060 Mod 2	Correct error in project boundary	31/03/2016
DC 11_0060 Mod 3	Development and operation of E26 Lift 1 North	22/08/2017
DC 11_0060 Mod 4	Changes to Ore Processing Infrastructure	06/09/2018
DC 11_0060 Mod 5	Temporary road haulage route and new secondary crusher	30/09/2019
DC 11_0060 Mod 6	Amendments to Operational Activities	06/06/2022
DC 11_0060 Mod 7	Underground Portal and TSF buttressing	Withdrawn
DC 11_0060 Mod 8	Product haulage arrangements	22/12/2022
DC 11_0060 Mod 9	E22 Portal Geotechnical Drilling	20/04/2023
DC 11_0060 Mod 10	E31 Waste Rock Emplacements and Cyclone Tailings	09/11/2023
DC 11_0060 Mod 11	Open cut and infrastructure changes	In Progress
SSD	E44 Rocklands	In Progress
Commonwealth Approvals		
EPBC 2013/6788	EPBC Approval	13/02/2014
Current variation	s.143 Change to approval conditions	30/08/2017
Council Approvals		
	PSC Approval for Road Train Access on Bogan Road	19/11/1999
Mining Leases		
ML 1247	Mining Lease (1629.6 Ha)	27/11/1991
ML 1367	Mining Lease (826.2 Ha)	21/03/1995
ML 1641	Mining Lease (24.4 Ha)	25/03/2010
ML 1743	Mining Lease (193.3 Ha)	01/09/2016
Exploration Leases		
EL 5800	Exploration Lease (12,130Ha)	08/01/2001
EL 5801	Exploration Lease (49,550 Ha)	08/01/2001
EL 5323	Exploration Lease (21,840 Ha)	18/07/1997
EL 8377	Exploration Lease (25,950 Ha)	12/06/2015

Environmental Protection Licences		
EPL 4784	Environmental Protection Licence	30/05/2001
Current variation	s.58 Licence variation to amend P1.2 – replace groundwater monitoring points	01/09/2023
Dangerous Good and Explosives		
NDG029083	Acknowledgement of Notification of Hazardous Chemicals on Premises	19/08/2019
XSTR200036	Licence to Store Explosives	24/09/2019
XMNF200011	Licence to Manufacture Explosives	28/07/2019
5060895	Radiation Management Licence	13/10/2023
Heavy Vehicle Authorisation		
133827V6	Road Train Operation Permit	12/09/2020
Water Licences		
WAL43208	Water Access Licence - High Security	01/07/2020
WAL43207	Water Access Licence - General Security	01/07/2020
WAL34955	Water Access Entitlement	04/10/2012
WAL32138	Water Access Entitlement	14/09/2012
WAL32120	Water Access Entitlement	14/09/2012
WAL32004	Water Access Entitlement	14/09/2012
WAL31969	Water Access Entitlement	14/09/2012
WAL31963	Water Access Entitlement	14/09/2012
WAL31930	Water Access Entitlement	14/09/2012
WAL31863	Water Access Entitlement	14/09/2012
WAL31850	Water Access Entitlement	14/09/2012
Forestry Occupation Permits		
847	Limestone State Forest Occupation Permit	14/01/2022
Annual Rehabilitation Report		
	2022 ARR	31/03/2023

3.2 Amendments during the Reporting Period

3.2.1 Development Consent

Development Consent 11_0060 was granted on 16 July 2014, and has since undergone nine modifications.

During 2023, the modifications lodged for assessment under the Environmental Planning and Assessment Act 1979 (EP&A Act) were Modification 9 (MOD 9) and Modification 10 (MOD 10). Both applications were assessed and granted approval for operational changes.

Geotechnical drilling associated with MOD 9 permits Northparkes to undertake drilling activities within the E22 Stage 2 and Stage 3 disturbance areas without triggering the offsetting requirements for Stage 2 and 3. Site disturbance was augmented to only have superficial impacts to vegetation. Drilling associated with this activity has not yet been undertaken.

MOD 10 sought approval for varied operational changes and improvements, including the following:

- construction of an additional warehouse and laboratory within the approved operational area;
- changes to the size and layout of temporary E31 waste emplacement areas, including disturbance of an additional 13 hectares (ha) of land;
- use of cyclone sands tailings construction of upstream lifts at the Rosedale TSF;
- importation and testing and/or processing of up to 2,000 tonnes per annum (tpa) of bulk ore samples; and

- importation of up to 100 tonnes of biosolids, a by-product from treating sewage, for dust management and rehabilitation on TSF 2.

3.2.2 Environmental Protection Licence

An Annual Return for the reporting period was submitted to the EPA on 27 July 2023 in accordance with requirements under Environment Protection Licence (EPL) 4784 Condition R1.5. No non compliances were noted for the period.

On 21 June 2023, Northparkes requested that Environment Protection Licence 4784 conditions of approval be varied to permit the relocation of two monitoring points. With the planned Infill TSF Extension works, groundwater monitoring points W14 and W23 will be inundated within the facility. Northparkes requested that two newly constructed bores be approved as suitable replacements. Following a detailed review, the update to the EPL was subsequently approved on 1 August 2023.

4. OPERATIONS SUMMARY

4.1 Production Statistics

A summary of production figures for 2023 calendar year is provided in Table 5 below. Also shown are the previous and predicted production figures for the 2022 and 2024 reporting period, respectively.

Table 5 Production and waste rock summary

Material	Approved Limit	Previous Reporting Period	Current Reporting Period	Next Reporting Period (forecast)
Underground Ore Mined to ROM (Mt)	>5.0	5.96	5.563	4.672
Open Pit Ore Mined to ROM (Mt)		-	0.277	2.744
Open Pit Ore Mined and Stockpiled (Mt)	N/A	0.02	1.110	-
Existing Stockpiled Ore to ROM (Mt)	N/A	1.64	1.421	0.010
Ore Processed (Mt)	8.5	7.60	7.275	7.364
Waste Rock/Overburden (t)	N/A	894,872*	3,108,956*	2,340,800
Fine Reject (tailings) (Mt)	N/A	7.49	7.139	7.209
Saleable Product (t)	N/A	117,830	136,169	155,053

*a significant portion of the waste rock generated during the period was consumed as part of Rosedale Stage 3 construction.

Mining operations within the 2023 reporting period remained below the limits specified in the Consent. Other conditions relevant to operating conditions are addressed throughout the report.

4.2 Mining and Processing

4.2.1 Open cut

In the first half of 2023, the E31 Project continued providing waste for the construction of the adjacent Rosedale TSF until the facility was completed.

In July 2023, the approved mining contractor commenced production, with the two pits being mined concurrently to obtain greater operational flexibility. The estimated open pit mine life was approximately 18 months at a mining rate of approximately 400,000 bank cubic metres (BCM) per month.

During the open pit lifespan, approximately 3.9Mt of higher-grade sulphide ore will be added to the Northparkes production plan, as well as an additional 1.7Mt lower-grade sulphide and 1.9Mt of transitional ore, which will be stockpiled for future processing.

Over the life of the open cuts, a combined total of approximately 13.5 million tonnes of material is to be mined as either waste or ore, of which approximately 3.6 million tonnes were mined in 2023. This comprised of roughly 400,000 tonnes of sulphide ore, 935,000 tonnes of oxide ore, and 3.1 million tonnes of waste material.

Approximately three 10m benches were mined in each pit in 2023; E31N progressing from 290mRL to the 270mRL bench, while E31S was mined from 275mRL to the 255mRL bench.

As part of the surface mining operation, drill and blast activities were undertaken during the period. Blasting typically took place once a week, with a target volume of approximately 80,000 BCM. Northparkes monitors aspects of blasting such as overpressure and vibration to ensure impacts on our neighbours are minimised. All measurements for blasting during the period were below the criteria detailed in the Consent.

Geotechnical monitoring of pit walls was active in 2023, with slope monitoring prisms also installed as benches were progressively mined.

Pit dewatering has continued in both pits at E31 Project to manage water inflows. With significant summer rainfall in the November and December, all water pumped out of the voids has been contributed to rainwater, rather than groundwater in origin.

4.2.2 Underground Operations

Operations in 2023 included the mining of the E26 L1N block cave, E48 block cave, development of the E26 SLC level 5 and level 6, and the initial production from the E26 SLC level 5.

Table 6 Underground Operations Summary

2023 Summary	E26 L1N	E26 SLC	E48
Mining Method	Block Cave	Sublevel Cave	Block Cave
Ore Mined (tonnes)	4,324,637	239,942	998,533
Waste Mined (tonnes)	548	0	0
Centreline Development (meters)	0	2,350	0
Blast Frequency	Secondary breaking only – multiple firings daily	Development and Production firings twice per day	Ad-hoc secondary firings.

Underground mining activities are currently undertaken in the E26 ore body. The E26 L1N mine is operated as a block cave as the primary method of resource extraction. Block caving is an underground hard rock mining method that involves undermining an ore body, allowing it to progressively collapse under its own weight (see Figure 4 Block Cave Mining Method). The E26 SLC mine is a sublevel caving operation involving construction of the sub level horizon followed by retreat drill and blast of that horizon, with the material above allowed to freely cave to fill the opened voids.

The E26 SLC project commenced construction in April 2015 and went into production in 2016. The mine design aimed to extract a remnant wedge of high-grade material adjacent to the E26 Lift 2 block cave. The operations at E26 SLC had ceased in 2021, having completed production from the first four levels at approximately 20m vertical spacing. The remaining two levels were deferred due to less favourable economics. The development of the remaining levels commenced in 2023 with 25m vertical spacings. Production has commenced from level 5, with level 6 coming online early in 2024. Production in the SLC is expected to continue until early 2026.

Mining development is planned for 2024 for the purpose of accessing the E22 ore body, however, pending approval of proposed Modification, other development may occur under other orebodies.

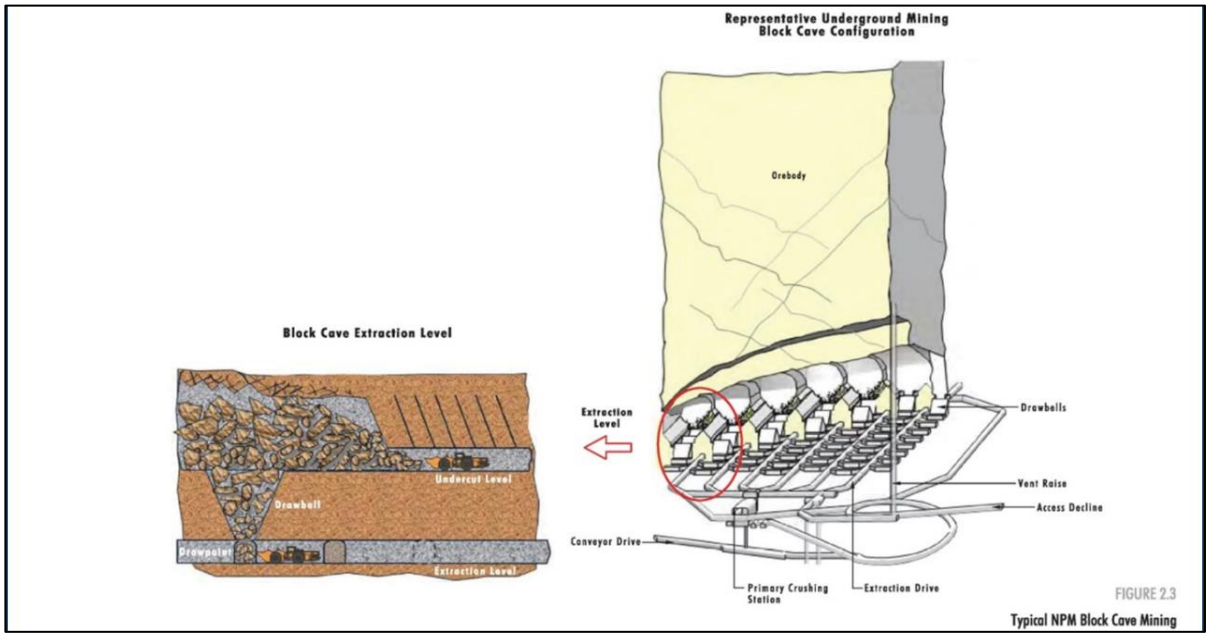


Figure 4 Block Cave Mining Method

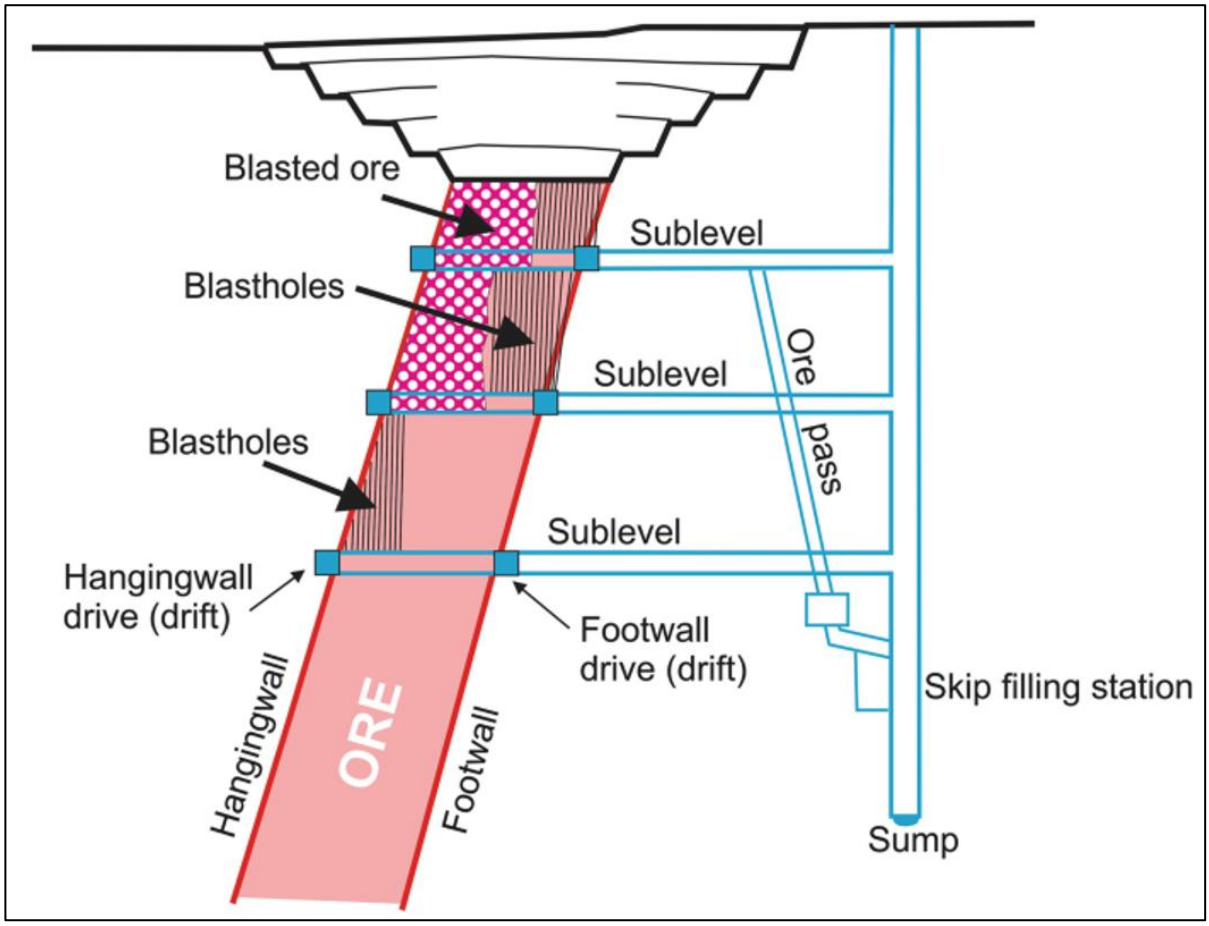


Figure 5 Sublevel Cave Mining Method

4.2.3 Waste Rock

A total of 548 tonnes of waste rock from underground development was placed on E26 waste rock emplacement during the reporting period. The underground waste was from the E26 L1N Block Cave Development Project and consisted mostly of rock contaminated by ground support (steel mesh and shotcrete) and concrete that could not be effectively separated out. All this waste material was trucked to the surface and separated to extract contaminating material.

During the development of the E31 open pits, suitable construction material was used directly for the construction of the Rosedale Stage 3 TSF. During the period, approximately 525,000 tonnes of material from the two pits was used for this purpose, with the Rosedale Stage 3 project concluding in August. As the pits transitioned into full production, waste material was placed within either of two temporary dumps; the West Waste Dump (WWD) and the Borrow Pit Stockpile (BPSP). The material within each of these dumps is to be removed prior to conclusion of life of mine. A small amount of waste deemed unsuitable for future TSF construction was deposited on the Eastern Waste Dump (EWD). In total, 2,583,956 tonnes of material was placed on the WWD, BPSP or EWD.

4.3 Exploration and Resource Utilisation

Exploration and evaluation programs continued across ML1247 and ML1367 during the reporting period as shown in Figure 6 Exploration and Evaluation Drilling Activities on Mining Leases.

No exploration activities were undertaken on ML1641 or ML1743 during the year. No non-compliances have been noted within the mining leases related to exploration or evaluation activities.

A total of 75 drill holes for 9,334.95m were completed for exploration and evaluation purposes during the reporting period. The drilling programs comprised 36 sonic holes targeting historic tailings for a total of 796.95m, and 39 surface diamond and RC drill holes totalling 8,538m of drilling. Northparkes is committed to identifying and evaluating new ore bodies with the intention of extending the life of operations.

Mining lease evaluation in 2023 involved the following works:

- A targeted surface diamond drill programs to test conceptual targets at the Major Tom prospect.
- Infill resource drilling for the E28 deposit.
- Infill drilling for the E51 prospect area.
- Completion of the remaining sterilisation RC drill holes for the proposed Rocklands TSF area.
- Follow-up sonic drilling of historic tailings located at TSF1.
- Infill testing of the E28 resource area to improve confidence of the existing resource estimate.
- Drilling of additional monitoring holes to support extraction of the E26Lift1 North Block Cave.
- Geotechnical drilling in support of the E22 feasibility study.

In addition to new drilling, assay results were returned for the following areas drilled in the previous reporting period:

- TSF2, Bodkin, E48 SHG Zone, GD540 follow-up, GRP314 East and E26 CLJ.

Non-drilling activities during 2023 included:

- The creation of two revised Block Models which were completed for the E22 and E28 deposit areas.
- Results and interpretations were received for auger sampling of the older TSFs (TSF1 and TSF2) as part of the MEG Critical Minerals and Mine Wastes program.
- Studies and assessments for potential future development and mining of mineralisation were undertaken for E28NE Project (open pit mining) and E22 project (block cave mining).
- Ongoing support for two research projects.

Exploration and evaluation activities will continue in the next reporting period with the major focus of these activities being completion of an underground infill drill program targeting the Lift 2 position of the E48 orebody, along with further diamond and/or RC drill testing of surface prospects.

The proposed exploration comprises 10,950m of drilling (3,250m of surface drilling and 7,700m of underground drilling) and will be focussed in six programs testing known and postulated mineralisation, being:

- Infill underground drilling in the E48 Lift2 Resource volume.
- Follow-up underground infill drilling for the E48 Bodkin Zone.
- Follow-up drilling for the E28 resource area south of the E48 subsidence zone with a program of RC +/- diamond drillholes.
- Follow-up drilling into the E51 deposit on ML1367.
- Follow-up drilling into the Major Tom prospect on ML1367.
- Geotechnical drilling to support the E22 Feasibility Studies and engineering design works.

In addition, trials of geophysical techniques to aid target selection for potential porphyry deposits including Induced Polarisation, Magneto-Telluric and active Seismic Reflection are in planning.

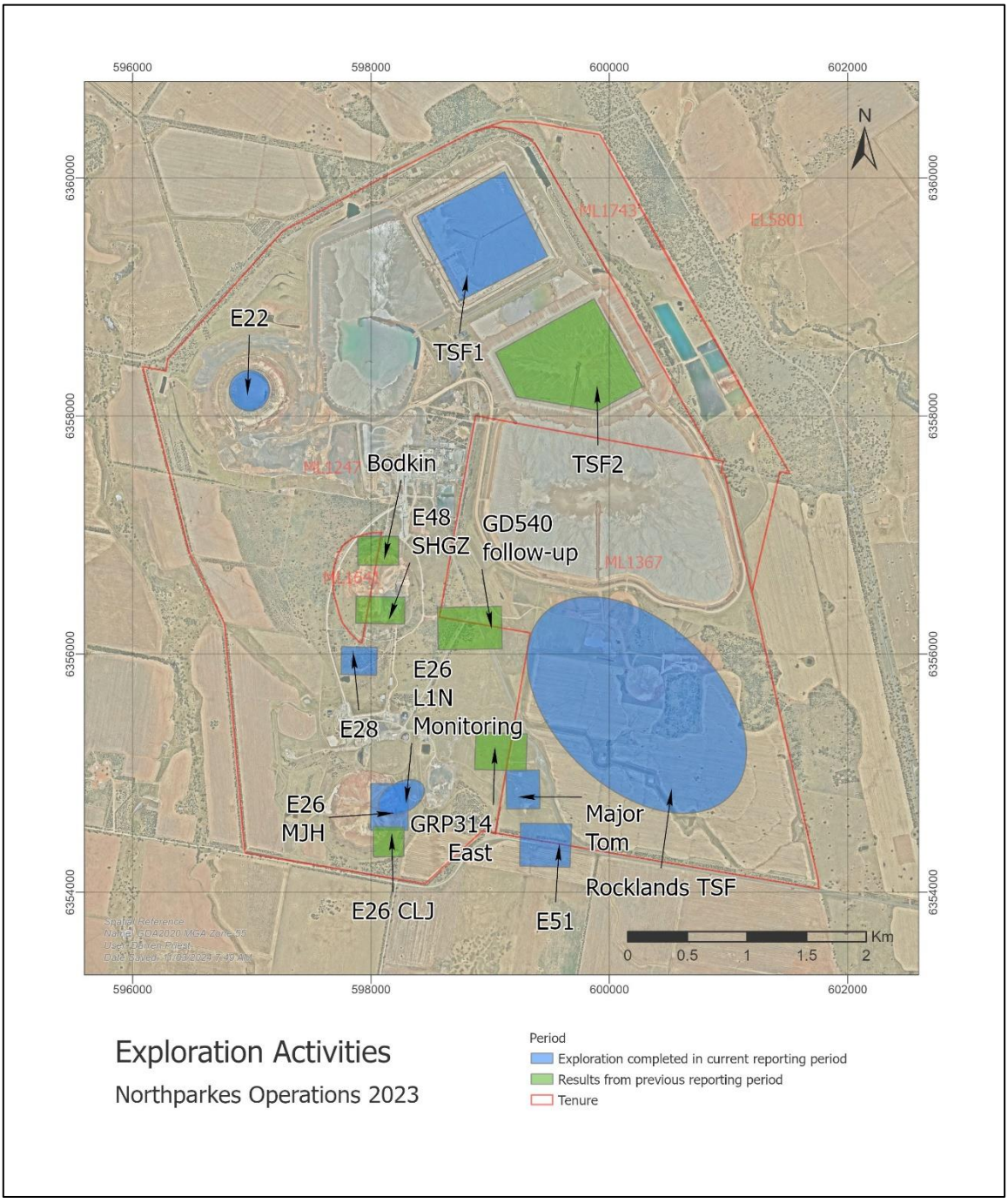


Figure 6 Exploration and Evaluation Drilling Activities on Mining Leases

4.4 Ore processing

In 2023, a total of 7.27 Mt of sulphide ore was processed from the underground ore bodies and existing surface stockpiles (5.56 Mt underground, 1.42 Mt stockpiled ore and 277kt of E31 open pit ore). Copper-gold concentrate production totalled 136,169 tonnes (dry) and was predominantly sold to customers in Japan. Production for the past five years is presented in Table 7 below.

Ore processing includes several defined stages that include crushing, grinding, flotation and dewatering. Ore is sourced from either underground mines, surface stockpiles or open pits, where it is first primary crushed, followed by passing through a secondary and tertiary crushing circuit before being stockpiled into two separate stockpiles. From the stockpiles, material is fed to the grinding circuit, compromising of two parallel modules (Mod 1 and Mod 2), each incorporating a Semi Autogenous Grinding (SAG) mill, oversize pebble crushing, two stages of ball milling, flotation (rougher-scavenger with cleaning stage) and thickeners for concentrate and tails streams.

Air and agitation to produce bubbles in combination with a suite of reagents, to enable attachment of particles (minerals) are captured and recovered in the flotation process to produce a sulphide-rich concentrate containing copper and gold bearing minerals. After flotation, the concentrate is first thickened through thickeners and filtered through ceramic disc filters to produce a low moisture concentrate ready for loading and transportation to the port.

The tailings component is pumped from the final flotation stage to a tails thickener for dewatering followed by additional pumping to the TSF.

Table 7 Ore Processing Production

Year	Ore Milled (Mt)	Production Copper Concentrate (t)
2019	6.42	120,832
2020	6.49	107,541
2021	6.84	107,798
2022	7.60	117,830
2023	7.27	136,169

4.5 Tailings

In the reporting period, 7.13 million tonnes of tailings were deposited into Estcourt Stage 3 TSF and Rosedale Stage 3. A summary of the tailings distribution and TSF capacity consumed during the reporting period is provided in Table 8 below.

Table 8 Distribution and Capacity Consumed of Tailings Storage Facilities

Tailings Storage Facility	Distribution (%)	Capacity Consumed (Mt)
TSF1	0	0
TSF2	0	0
TSF Infill	0	0
Estcourt Stage 3	87	6.19
Rosedale Stage 2	13	0.94

A total of 141 Mt of tailings has been deposited at Northparkes operations to date. All tailings have been deposited within TSF1, TSF2, Estcourt, Rosedale TSF and the Infill TSF located approximately 2km from the processing plant. The tailings are sub-aerially deposited into the active TSF from the external embankments (excluding TSF1 central discharge) and tailings and supernatant water runoff are contained and directed to the internal central decant towers.

All TSFs at Northparkes have been designed by a qualified engineering company and approved by the Engineer of Record to provide:

- Safe and permanent containment of all tailings solids
- The recovery of free water for reuse within the processing plant
- Containment of all water under extreme rainfall conditions
- Maximised structural strength through the deposited tailings and
- Containment of all chemical residues.

Northparkes control measures for the management of tailings during construction and operation are implemented as per the Dam Safety Management system plan, Maintenance and Surveillance (OMS) Manuals and the Emergency Management Tailings Storage Facility Procedure.

The site tailings strategy is regularly reviewed, with the most optimal disposal strategy determined for safe operation and future Life of Mine TSFs designs. The current tailings deposition strategy involves alternating deposition between the Estcourt TSF and Rosedale TSF. Further deposition into Infill extension and TSF1 is planned for 2024.

Construction of Rosedale Stage 3 Upstream Lift was completed in June 2023 and deposition commenced shortly after that.

Northparkes Tailings Team has been actively seeking methods other than track packing to improve the properties of tailings in the structural zone for the remaining lifts on Rosedale TSF. A project to trial Cyclone tailings to create a coarser, free draining base for future lifts commenced in Q4 with initial results looking positive.

Remediation of TSF2 with the unloading of the embankments was completed in June. Stability in TSF2 was achieved in 2023 with the Factor of Safety reaching the ANCOLD 2019 guidelines for the East and South Embankments. The Infill Extension Project will make the North and West TSF2 Embankments compliant. This work is scheduled in 2024.

Dust mitigation strategies will continue to be investigated and implemented across the business, with possibilities such as vegetation covers on non-operational facilities and ripping any dust susceptible areas of TSFs to be considered. Ripping the surface of TSF1 and Rosedale proved successful in limiting dust lift off towards year end.

5. ACTIONS REQUIRED FROM 2021 ANNUAL REVIEW

No actions were raised from the submission of the 2022 Annual Review to the agencies listed in Section 2.2.

6. ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

6.1 Environmental Management System

Northparkes has developed and implemented a Health, Safety and Environment Management System (HSEMS). The environmental related system components are compliant with ISO14001.

The Environment Management System (EMS) at Northparkes provides the strategic framework for environmental management. The EMS:

- Outlines all relevant statutory leases, licences and approvals that apply to the Northparkes operations
- Details key plans, procedures, management plans and other documents that will be implemented to ensure compliance with all relevant leases, licences and approvals
- Describes the key processes that will be implemented to:
  - Communicate with community and government stakeholders
  - Manage community complaints
  - Resolve disputes and
  - Respond to non-compliance incidents and emergencies.
- Outlines Northparkes monitoring, reporting and auditing requirements
- Outlines relevant roles, responsibilities and accountabilities relevant to environment management for all Northparkes employees and contractors.

During the reporting period, Northparkes maintained the EMS to the ISO14001:2015 standard. Northparkes also maintained its Level 1 risk rating under the EPA's risk based licencing scheme, the highest possible standard.

Northparkes has developed a suite of environmental management plans to guide environmental management at Northparkes. The plans have been developed in accordance with the EMS, the Consent and other statutory requirements. The revision status of approved key environmental management plans, as required by Schedule 6, Condition 3 of the Consent, is summarised in Table 9.

Table 9 Key Environmental Management Plans

Management Plan	Status
Biodiversity Offset Management Plan	Revision 7.03 - Revised December 2023
Water Management Plan Surface Water Management Plan Groundwater Management Plan	Revision 13.01 – Revised February 2023 Revision 7.01 – Revised May 2023 Revision 7.01 – Revised August 2023
Pollution Incident Response Management Plan (PIRMP)	Revision 11.04 – Revised December 2023
Air Quality Management Plan	Revision 21.02 – Revised March 2024
Noise Management Plan	Revision 18.01 - Revised May 2023
Environmental Management Strategy	Revision 16.01 - Revised December 2023
Blast Management Plan	Revision 9.01 - Revised January 2024
Heritage Management Plan	Revision 9.04 - Revised September 2022
Rehabilitation Management Plan	Revision 15.01 – Revised December 2023
Traffic Management Plan	Revision 3.0– Revised April 2023

The PIRMP listed in Table 9 applies to all activities that have the potential to generate pollution incidents. These include, but are not limited to, water discharge events, and hazardous spills resulting in land or water contamination and fire hazards.

The PIRMP was not implemented throughout the reporting period, however it was desktop scenario tested in November 2023, and revised accordingly.

6.2 Meteorology

The Consent (Schedule 3, Condition 18) requires a permanent meteorological station to be installed and maintained for the life of the Project. As such, a meteorological monitoring station (MET) has been established to continuously measure and record wind speed, wind direction, temperature, solar radiation and rainfall at Northparkes.

The MET station provides real-time data to Northparkes employees and contractors. Meteorological data is used for assessing compliance, dust and noise management, and for investigative and reporting requirements. The parameters recorded by the MET monitoring station and the method are outlined in Table 10.

Table 10 MET Monitoring Parameters

Parameter	Units	Frequency	Averaging period
Temperature at 2m	ºC	Continuous	15 minute
Temperature at 10m	ºC	Continuous	15 minute
Wind direction at 10m	º	Continuous	15 minute
Relative Humidity	%	Continuous	15 minute
Rainfall	mm/hr.	Continuous	1 hour
Solar radiation	W/m2	Continuous	15 minute

6.2.1 Temperature

Maximum, minimum and average temperatures are calculated daily, averaged in 15 minute interval recordings.

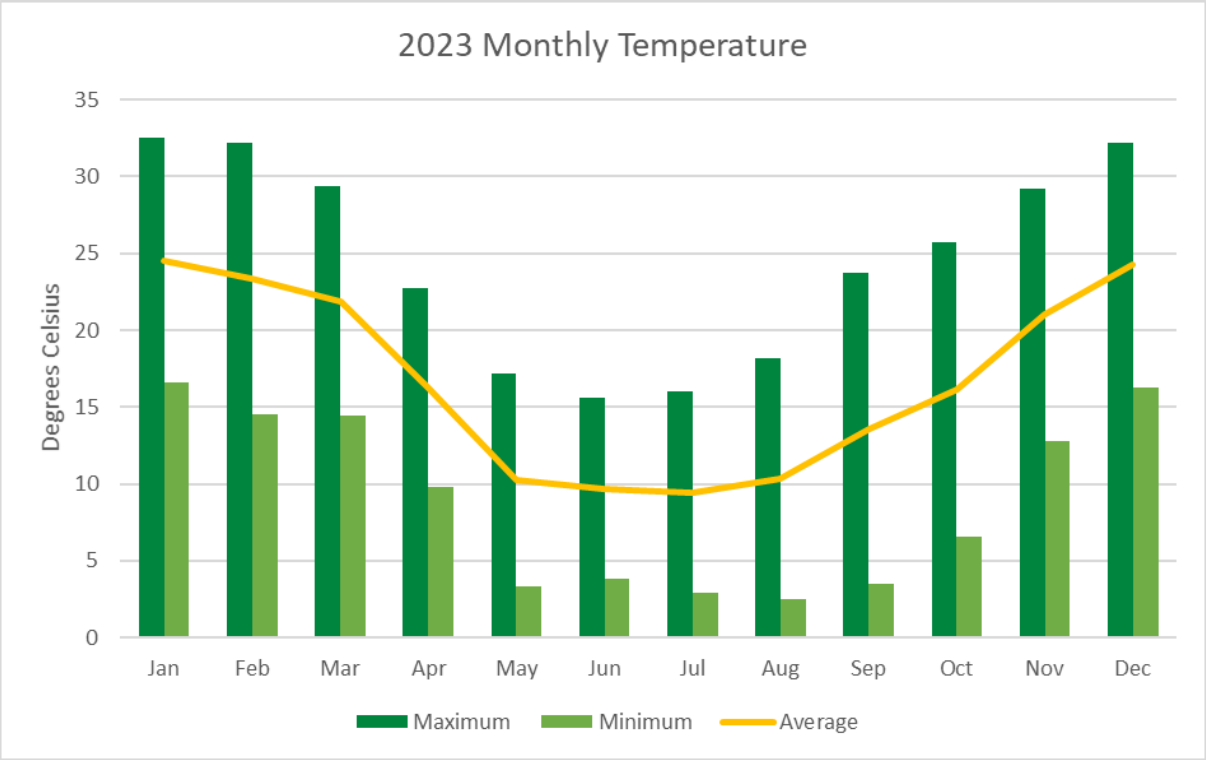


Figure 7 Average monthly temperature records (10m MET recordings)

Compared to the long-term historical data, average maximum temperatures were largely higher during the period, averaging 1.2°C across all months. The average maximum for September was significantly higher than the long-term average, recording +4.2°C. Average minimum temperatures were largely lower during the period, averaging -1.6°C across all months, noting a significant difference of -3.8°C in May.

Table 11 Temperature averages

2023	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Maximum Temp	32.5	32.2	29.4	22.7	17.2	15.6	16	18.2	23.7	25.7	29.2	32.2
Variance from long-term data	0.1	0.6	0.9	-0.9	-1.4	0.7	2.0	2.4	4.2	2.0	1.6	1.5
Average Minimum Temp	16.6	14.5	14.4	9.8	3.3	3.8	2.9	2.5	3.5	6.6	12.8	16.3
Variance from long-term data	-1.1	-3.0	-0.4	-0.8	-3.8	-1.0	-0.8	-1.9	-3.2	-3.2	-0.2	0.5

6.2.2 Rainfall

The total onsite rainfall recorded at the MET monitoring station for the period was 398.4mm. The rainfall received during the reporting period was 192.1mm below the long-term average for the region (590.2mm). Dry conditions aided the generation of airborne particulates during high wind events, requiring diligent management of onsite point sources that have the potential to generate significant dust. A comparison of the 2023 recorded rainfall to long-term average for Parkes is shown in Figure 8 below.

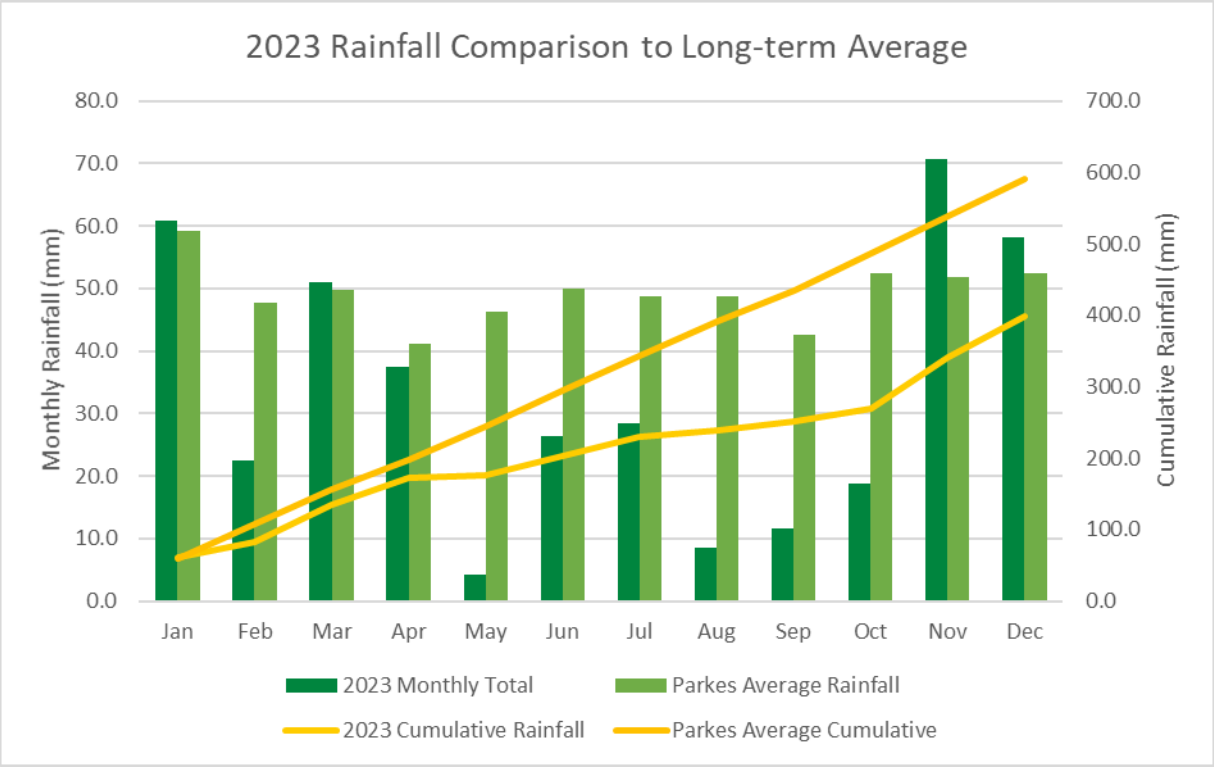
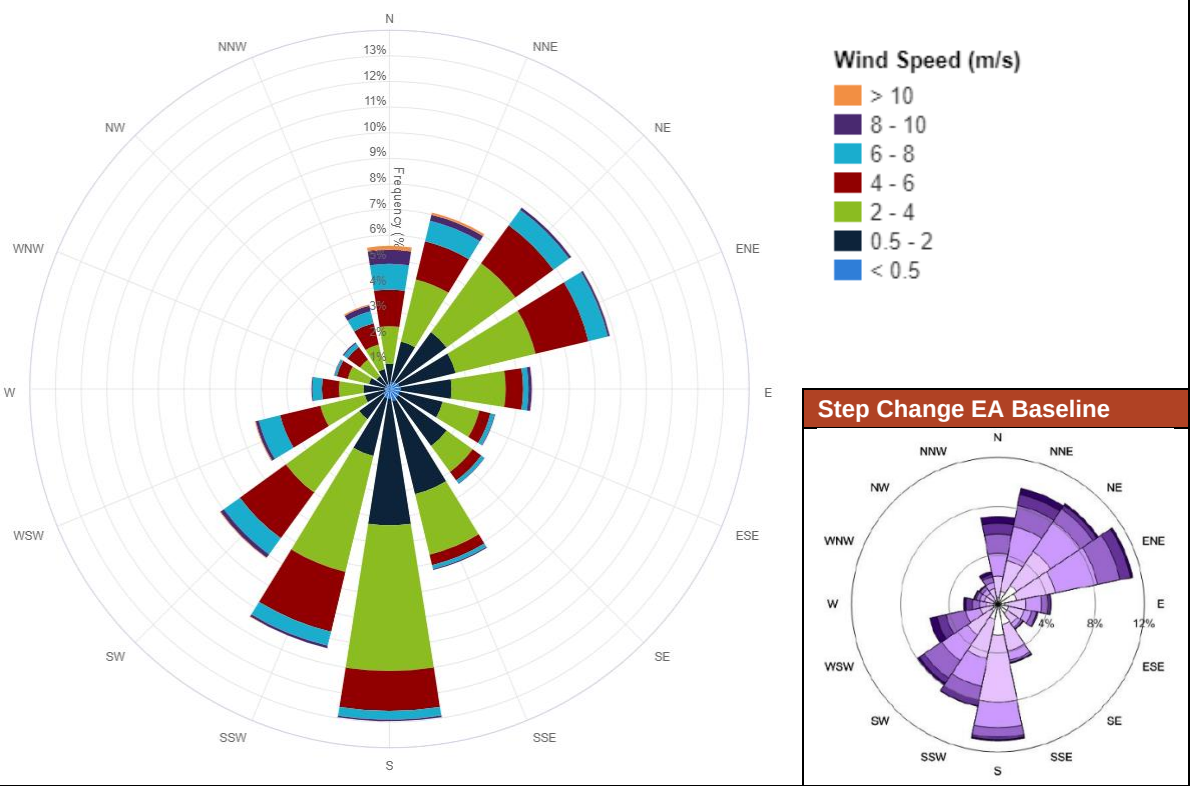


Figure 8 Rainfall comparison to long term average for Parkes

6.2.3 Wind

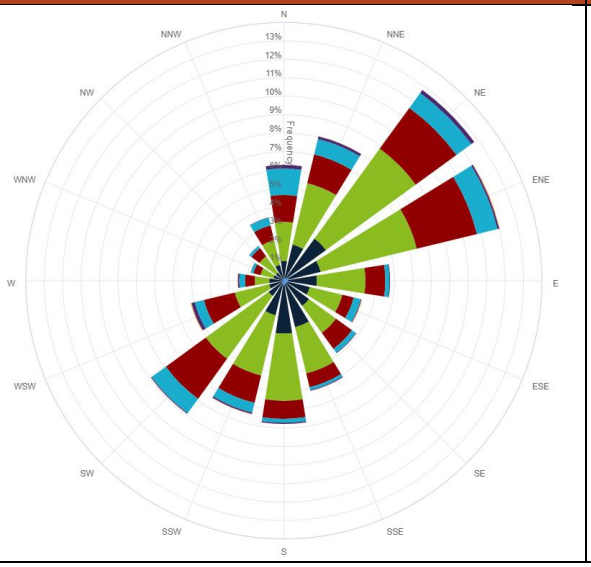
Analysis of data reveals that prevailing winds during the 2023 reporting period were largely in line with that recorded for the Step Change Environmental Assessment (EA), Umwelt 2013. Prevailing winds for the period were typically received from the south, south south-west or north-east. Average wind speeds were generally consistent the Q1, Q2 and Q3, recording 3.29m/s, 2.76m/s, and 2.68m/s, respectively. Wind speeds in Q4 we notably higher than the other periods, averaging 3.75m/s. Wind data for the 2023 reporting period is presented by the wind roses in Figure 9. Wind speed values are all displayed as metres per second.

Annual - 2023

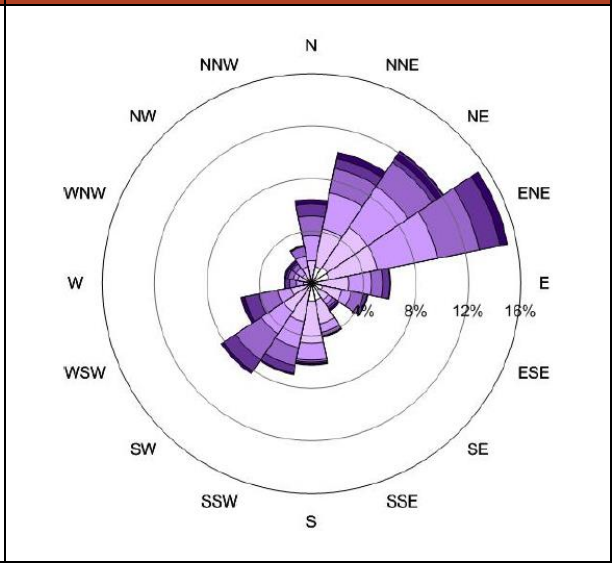


Step Change EA Baseline

Summer - 2023



Summer - Step Change EA Baseline



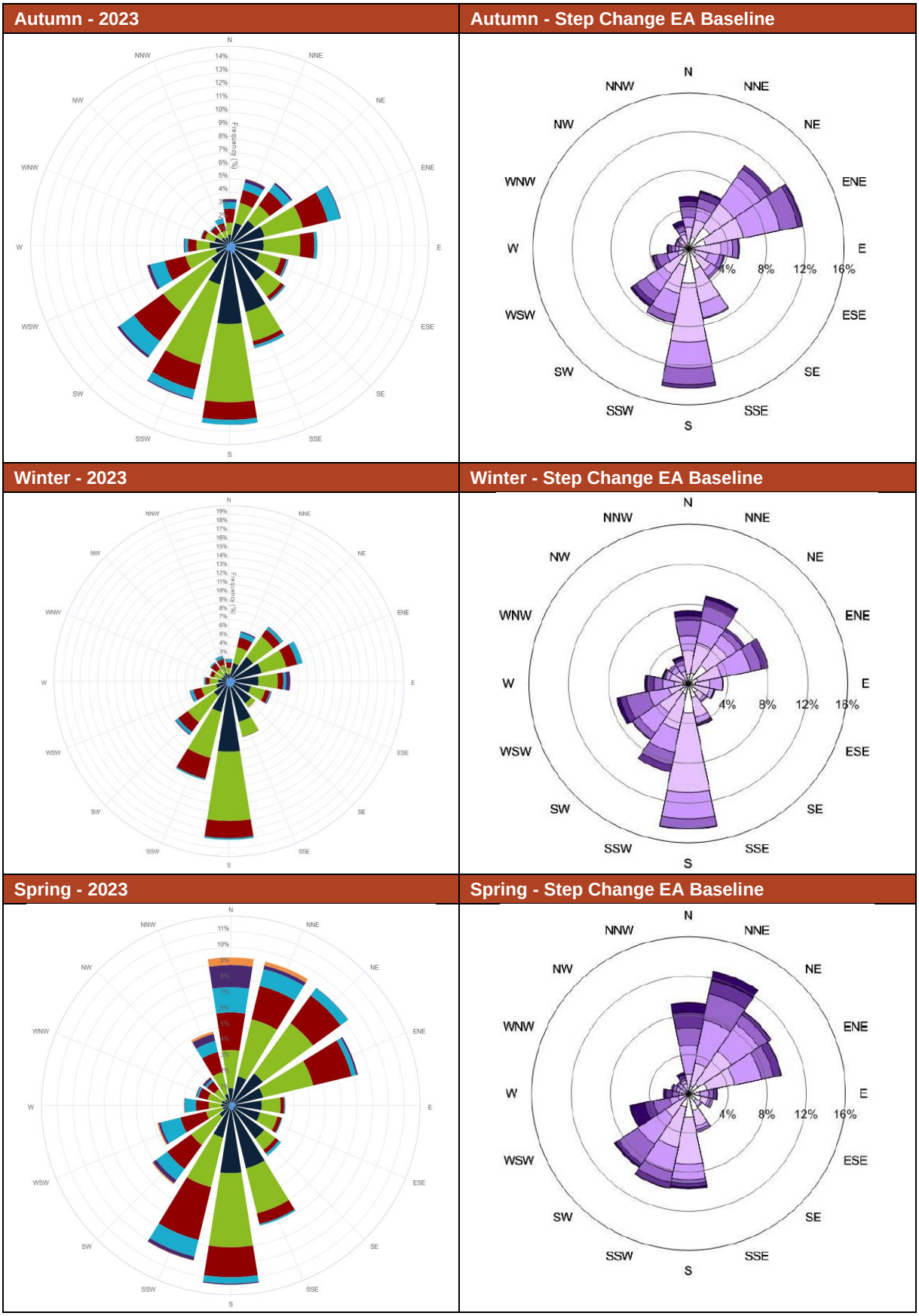


Figure 9 Seasonal wind rose comparison against Step Change EA baseline

6.2.4 Meteorology Improvements and Initiatives

Building on the work completed during the 2019 reporting period, Northparkes continues to implement and refine the environmental database at Northparkes. This included ongoing utilisation of real-time meteorological data and weather forecasting to guide the implementation of reactive and proactive mitigation measures. A weekly weather assessment is undertaken to evaluate the potential risk for fugitive dust generation, with mitigative measures implemented where required.

6.3 Air Quality

6.3.1 Air Quality Management

Air quality management is undertaken in accordance with the approved Air Quality Management Plan (AQMP). The AQMP outlines mitigation measures, required monitoring and provides clear definitions of the roles and responsibilities related to air quality and greenhouse gas management.

Through implementation of the AQMP, Northparkes executes a range of mitigation measures for air quality that have proven to be effective at managing dust impacts, demonstrated by maintaining compliance. These mitigation measures will continue to be implemented throughout 2024. During the 2023 reporting period, mitigation measures included, but were not limited to, the following:

- Major works scheduled to undergo a risk assessment prior to commencing work
- Environmental inductions and training to ensure workforce awareness
- Purchase of equipment that meets relevant air emission standards
- Maintaining plant and machinery in good working order
- Maintaining haul roads in good condition
- Regular contact with local residents to notify of extraordinary weather events
- Weekly internal weather assessment and forecast predicting risk and controls
- Sealing high traffic roads, where possible
- Ripping of exposed areas, including TSFs
- Targeted tailings deposition
- Use of water carts on construction haul roads
- Scheduling of work with attention paid to adverse weather conditions and modifications made to the work program where necessary
- Implementation of best management practice to minimise the construction, operational and road air quality impacts of the operations
- A program of permanent air quality monitoring, including real-time, of site operations to determine whether the operations are complying with the criteria set out in the Consent
- Continual upgrade and replacement of air quality monitoring equipment to ensure best practice.

Northparkes implements a comprehensive dust monitoring program to measure concentrations of particulate matter in the vicinity of the operations. PM10 monitors measure the concentration of particulate matter less than 10 microns in diameter, utilising real-time Beta-Attenuation Monitoring (BAM). As required by the consent, PM2.5 data will be derived via a calculation based on recorded PM_{10} data. The calculation shall use the ratio of PM10 to PM2.5 as recorded at the NSW DPE's Merriwa monitoring station (considered to be the most similar climatic conditions to Northparkes). The ratio is 1 (PM10) : 0.35 (PM2.5). Results from monitoring are discussed in Section 6.3.2.

Table 12 Air Quality Monitoring Sites

Site ID	Type	Units	Frequency
Milpose	PM10 (BAM) and PM2.5 (calculated)	µg/m3	Continuously
Hubberstone	PM10 (BAM) and PM2.5 (calculated)	µg/m3	Continuously
Hillview	PM10 (BAM) and PM2.5 (calculated)	µg/m3	Continuously

6.3.2 Air Quality Performance

All dust samples are collected by trained staff and analysed by NATA certified laboratories. This work is carried out in accordance with relevant statutory and industry code standards. Monitoring equipment is maintained in accordance with manufacturer's specifications.

During the reporting period dust lift-off from the TSFs was managed through the implementation of a variety of different strategies. These strategies included the:

- Weekly weather assessment to identify trending environmental conditions that have the potential to exacerbate dusty conditions
- deposition of wet tailings on active TSFs, and
- strategic ripping of tailings surfaces

Native groundcover species have continued to colonise across the TSF2 beach. These species are from planted tubestock, broadcasted seeds and natural germination, with succession occurring over the past few years, now providing generous ground cover to prevent the occurrence of tailings dust generation. Opportunities to vegetate TSFs that may be inactive for a period of time will be investigated during the 2024 reporting period.

Below average rainfall conditions for the majority of the reporting period resulted in poor regional air quality during high wind events. Several high wind events in Q4 resulted in dust being emitted from the inactive facilities of Rosedale and TSF1, none resulting in contributions above the approved impact criteria. Targeted deposition and ripping of the tailings surface was instigated and provided immediate mitigation that managed dust generation. Ripping is scheduled on a regular basis to ensure that facilities have minimal surface area that is likely to incur dust lift off. Figure 10 below shows ripping undertaken on the Rosedale TSF.

PM10

PM10 monitoring results for the 'Hubberstone' (Figure 11 and Figure 12), 'Milpose' (Figure 13 and Figure 14) and 'Hillview' (Figure 15 and Figure 16) monitoring locations, for the reporting period are displayed below. The criteria for exceedances (as nominated in the Consent) is >25 µg/m^3 for the annual average and >50 µg/m^3 for a 24-hour monitoring period.

Monitoring results for the three locations were under the air quality criteria stated in the Consent, with all outliers removed. During the reporting period, there were five elevated readings recorded, comprising of two at Hubberstone and three at Milpose monitoring locations. These readings were internally investigated and found to be non-mine related. Due to the rural setting off the project area, monitoring results are regularly impacted by agricultural activities, requiring detailed investigations to determine the source of the particulates.

Missing data as a result of power supply and instrumentation issues continue to be rectified and managed accordingly.

The annual average PM10 levels recorded at all monitoring locations are well below the predicted concentrations of the Step Change EA (~20 µg/m3) and the Consent criteria, shown in Table 13 below.

Table 13 Annual average PM10 and PM2.5 results compared to predicted concentrations and the Consent criteria

Site ID	Annual Average PM_{10} (Outliers Omitted)	Predicted Air Quality (Step Change EA)	Development Consent 11_0060 Criteria
Milpose	11.7 µg/m3	23 µg/m3	25 µg/m3
Hubberstone	11.1 µg/m3	21 µg/m3	25 µg/m3
Hillview	10.5 µg/m3	Not modelled	25 µg/m3
Site ID	**Annual Average $PM_{2.5}$ (Outliers Omitted)**	**Predicted Air Quality (Step Change EA)**	**Development Consent 11_0060 Criteria**
Milpose	4.2 µg/m3	Not modelled	8 µg/m3
Hubberstone	3.8 µg/m3	Not modelled	8 µg/m3
Hillview	3.7 µg/m3	Not modelled	8 µg/m3

Figure 10 Ripping undertaken on Rosedale TSF for dust control

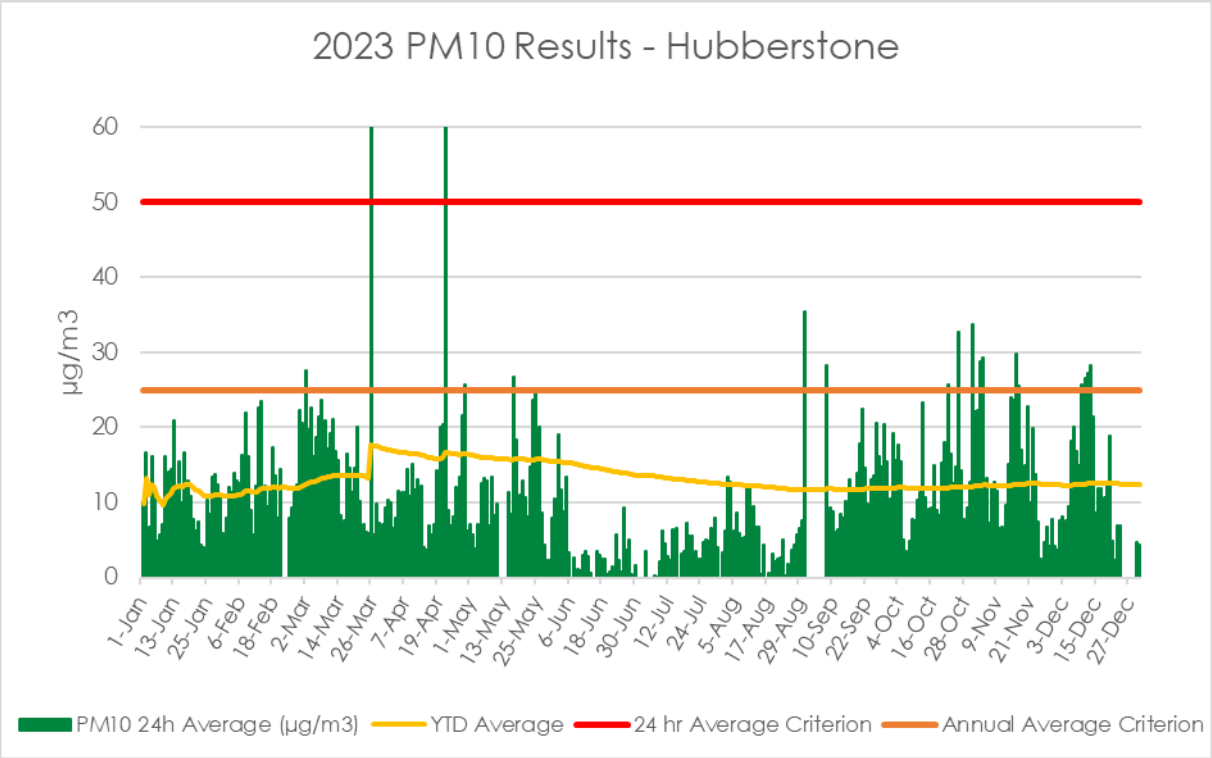


Figure 11 PM10 Monitoring results – Hubberstone

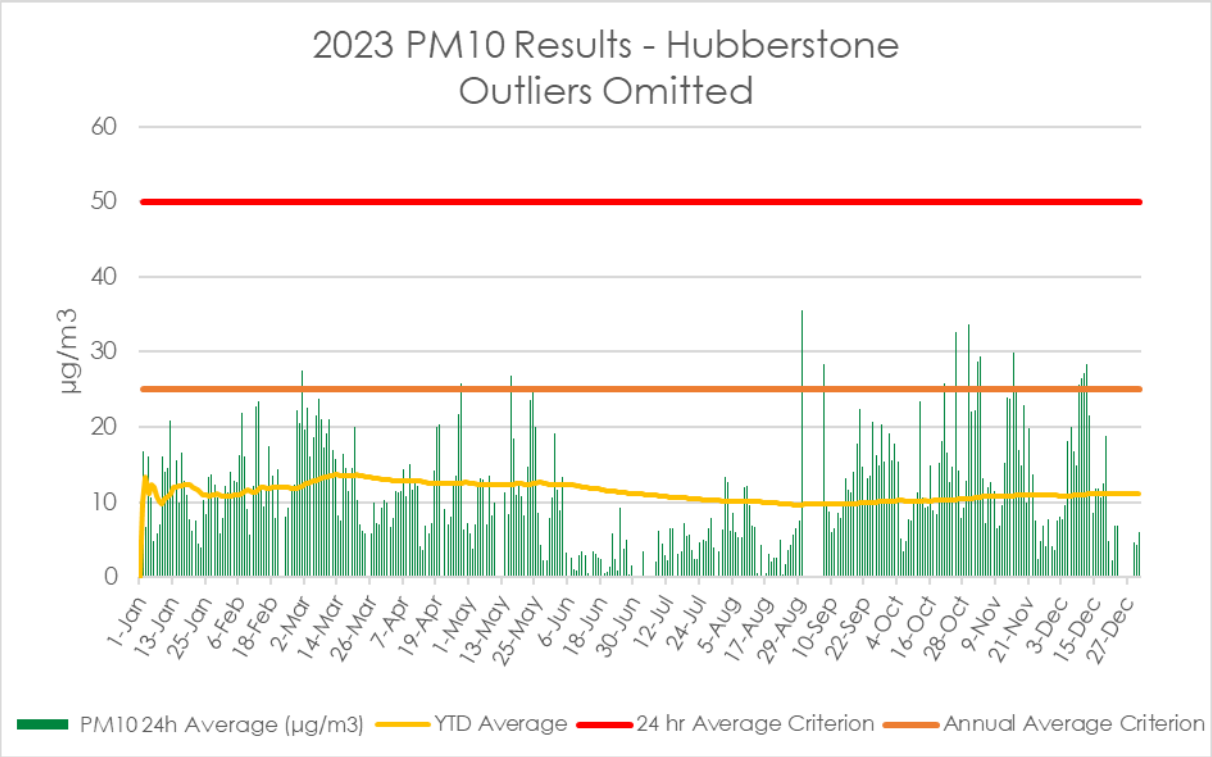


Figure 12 PM10 Monitoring results with outliers omitted - Hubberstone

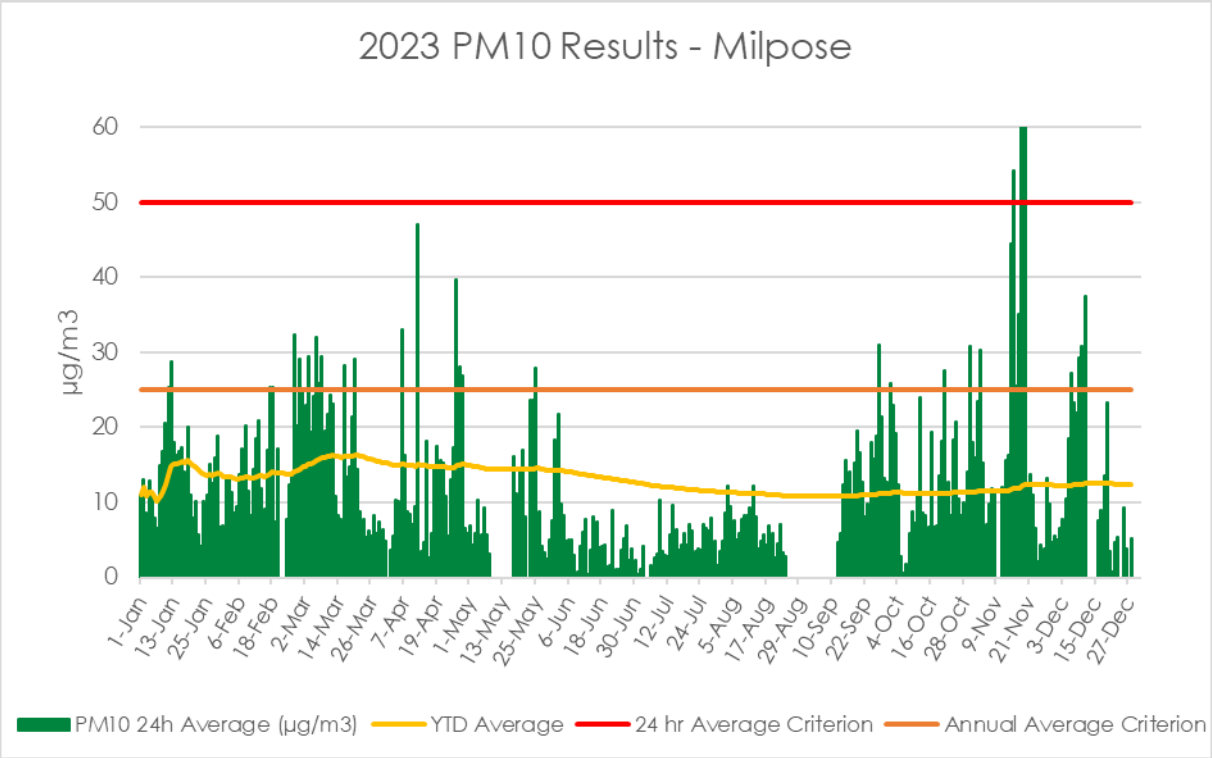


Figure 13 PM10 Monitoring Results – Milpose

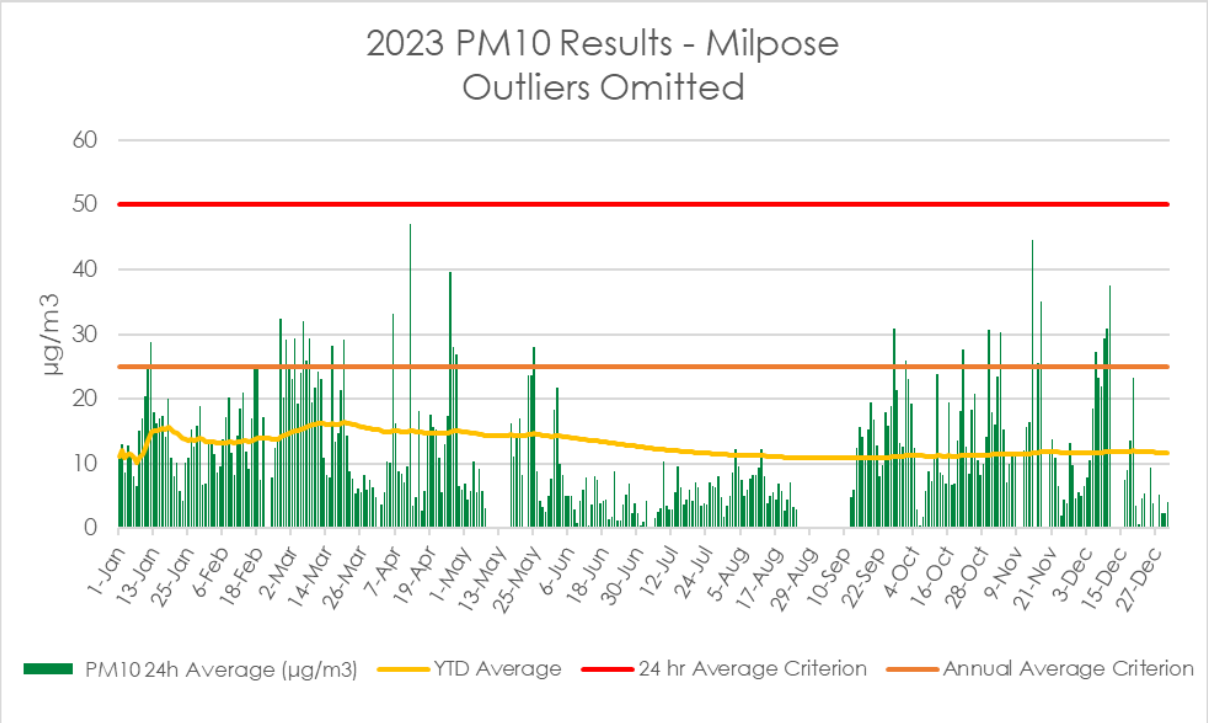


Figure 14 PM10 Monitoring results with outliers omitted – Milpose

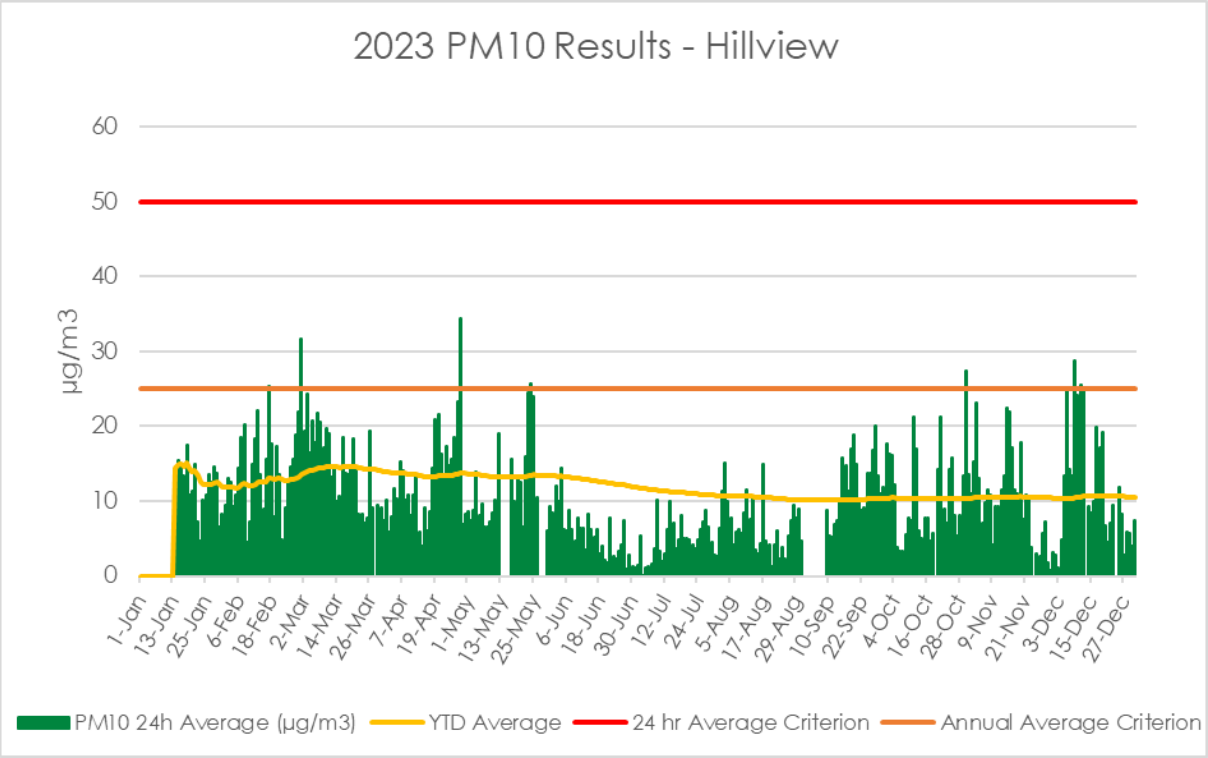


Figure 15 PM10 Monitoring Results – Hillview

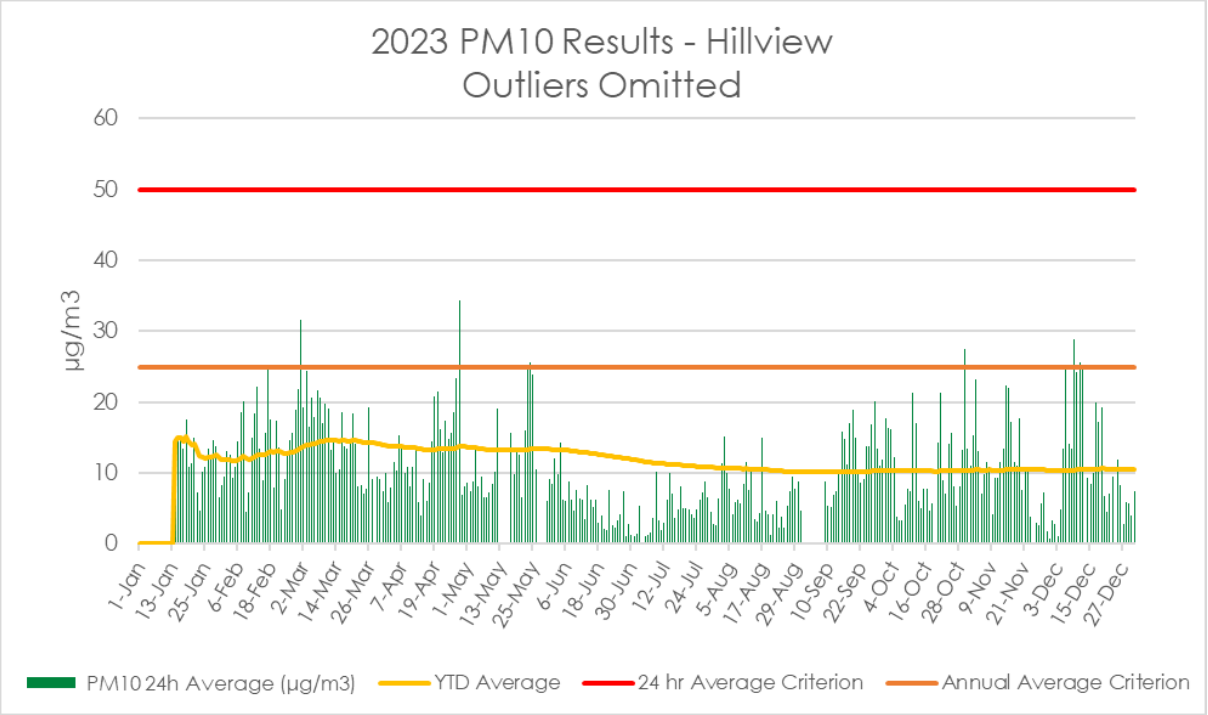


Figure 16 PM10 Monitoring results with outliers omitted – Hillview

PM2.5

Calculation based PM2.5 results for the 'Hubberstone' (Figure 17), 'Milpose' (Figure 18) and 'Hillview' (Figure 19) monitoring locations are detailed below. The PM2.5 criteria for exceedances (as nominated in the Consent) is >8 µg/m³ for the annual average and >25 µg/m³ for a 24-hour monitoring period. All results have had non-mine related outliers removed.

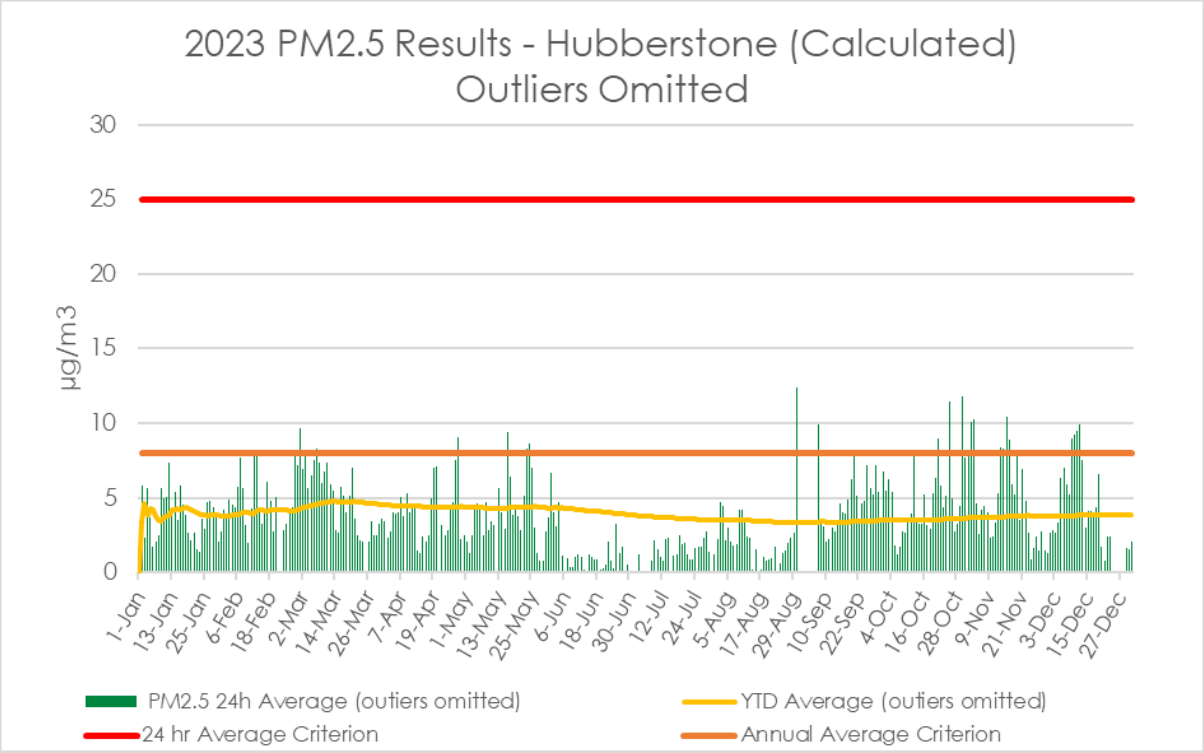


Figure 17 PM2.5 Monitoring results with outliers omitted – Hubberstone

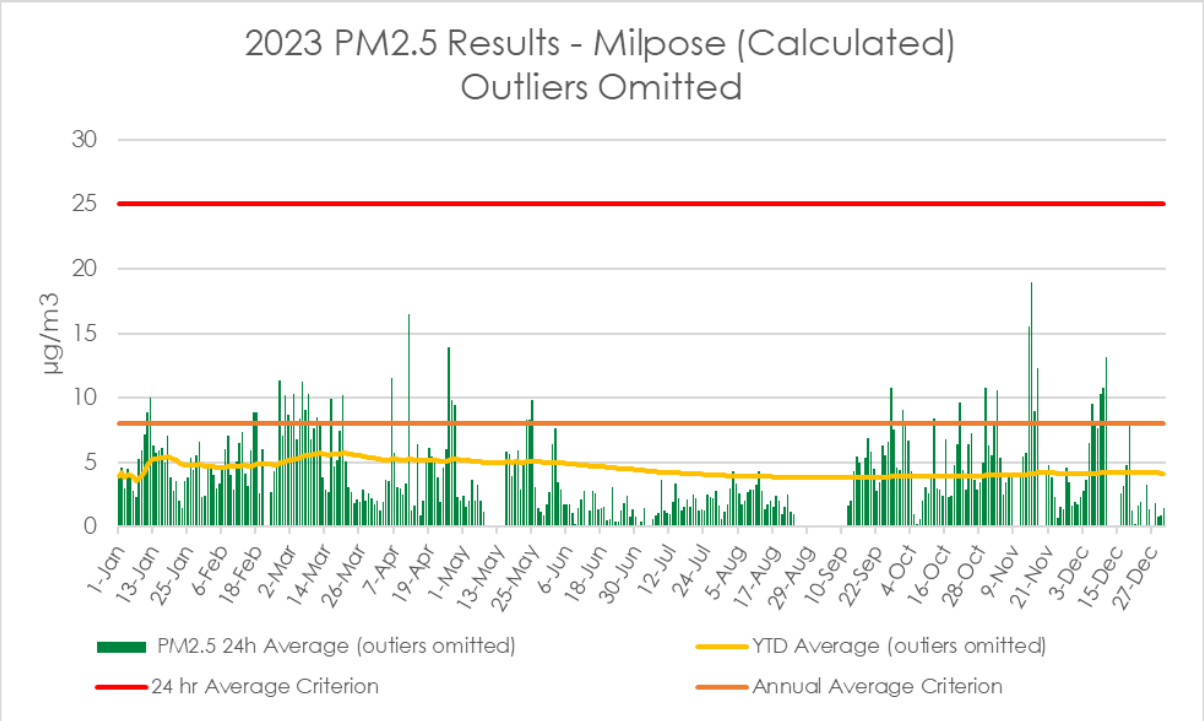


Figure 18 PM2.5 Monitoring results with outliers omitted – Milpose

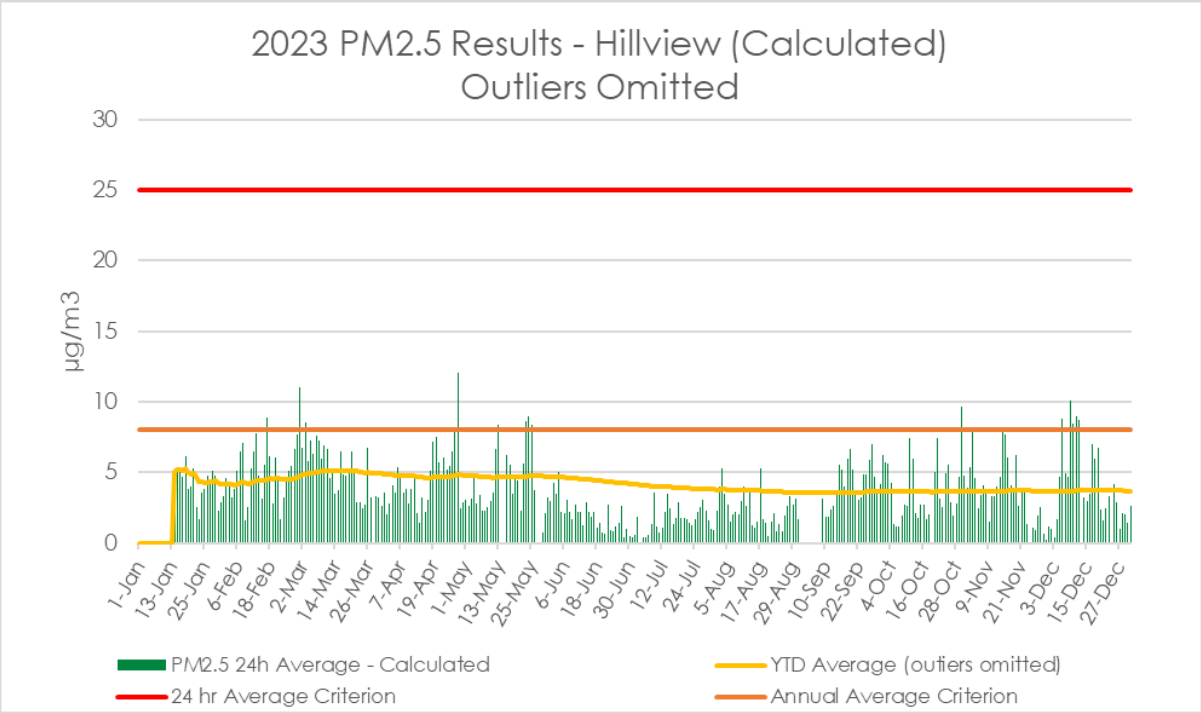


Figure 19 PM2.5 Monitoring results with outliers omitted – Hillview

6.3.3 Air Quality Improvements and Initiatives

Ongoing refinement of the real-time alert system enabled more efficient responses and investigations to elevated particulate matter. During the next reporting period, Northparkes will look to employ several additional strategies for air quality impacts, these include:

- Surfactant application on potential dust generating areas of inactive TSFs
- Intermediate vegetation of TSFs

6.4 Noise

6.4.1 Noise Management

Operational noise is managed in accordance with the approved Noise Management Plan (NMP). The NMP covers all operational activities with the potential to generate noise at Northparkes. It details specific noise management and mitigation measures, outlines monitoring and reporting requirements and provides clear definition of the roles and responsibilities for noise management.

Control measures for the management of noise during construction, operation and decommissioning are essential in minimising noise impacts. The three main strategies used to identify reasonable and feasible noise control/mitigation strategies are:

- Controlling noise at the source
- Controlling the transmission of noise and
- Controlling noise at the receiver.

Noise control measures at Northparkes are designed to comply with the Consent and the requirements of the *NSW Noise Policy for Industry (2017).*

Operational control measures include:

- Major scheduled works undergo a risk assessment prior to commencing work
- Environmental inductions and training to ensure workforce awareness
- Purchase of equipment that meets relevant noise emission standards

- Maintaining plant and machinery in good working order
- Maintaining haul roads in good condition
- Operating equipment in a manner that will minimise noise emissions
- Regular contact with local residents
- Modifications to surface ventilation fans
- Scheduling of work with attention paid to adverse weather conditions, particularly at night, and modifications made to the work program where necessary
- Implementation of best management practice to minimise the construction, operational and road noise of the operations
- A program of regular noise monitoring of site operations to determine whether the operations are complying with the criteria set out in the Consent. This monitoring will be undertaken as attended and real-time noise monitoring at surrounding receivers over the life of the mine
- Additional targeted noise monitoring during construction activities, and whilst open cut mining operations occur during winter night-time operations if required. This targeted monitoring program will include the use of real time monitoring and be undertaken to identify situations when meteorological conditions have the potential to exacerbate noise impact on neighbouring receivers. Appropriate noise mitigation measures will be implemented as required, and

6.4.2 Noise Performance

Northparkes undertakes a noise monitoring program at five locations on privately owned properties outside the mining leases. The program consists of operator-attended monitoring at five of the nearest occupied residences, 'Hubberstone', 'Milpose', 'Lone Pine', 'Hillview' and 'Adavale', and unattended real-time monitoring at four of these locations, excluding Lone Pine (see Appendix 1).

Noise measurements are undertaken in accordance with the requirements of the Consent, *AS 1055*, and the *NSW Noise Policy for Industry, 2017*. Northparkes engaged acoustic specialists to undertake attended noise monitoring on a quarterly basis at locations defined in the NMP to adequately assess the noise impacts related to Northparkes operations. All acoustic instrumentation is designed to comply with the requirements of *AS 1259.2* and carries current NATA or manufacturer calibration certificates.

Temperature inversions, when they occur, have the ability to increase noise levels by focusing sound waves. Temperature inversions occur predominantly at night during the winter months but can also occur as a result of low cloud cover. They are generally determined based on the occurrence of atmospheric stability classes, with moderate and strong inversions corresponding to atmospheric stability categories F and G respectively.

A total of 180 fifteen-minute LAeq attended noise surveys were undertaken during the reporting period. Of which, 135 (75%) were during favourable meteorological conditions, as stipulated in the Consent. The surveys undertaken during unfavourable meteorological conditions were excluded from assessment. The reason for this being that the assessment was undertaken during stability class of F or G. These are shown in Table 14 below.

Unattended noise monitoring was conducted continuously over the year at each monitoring location. This data was used to assess background ambient noise levels and do not have an applicable exceedance criterion.

Surface mining operations were confined to day shift only during the reporting period, significantly lowering the risk of impacts above the licence conditions.

A summary of the attended noise monitoring results is provided in Table 14. This includes all quarterly monitoring conducted in 2023.

Table 14 Summary of Attended Noise Monitoring Results

Location		Day	Evening	Night	
		L_{Aeq}(15min)	L_{Aeq}(15min)	L_{Aeq}(15min)	L_{A1}(1min)
	Criteria dB (A)	35	35	35	45
Hubberstone	21-22 February	^	*^	*^	<45
	23-24 May	^	**~<30**	**~<30**	<45
	15-16 August	^	**~<30**	<30	<45
	6-7 December	^	^	~<35	<45
Predicted Noise Impact (EA)		**19**	**32**		**n/a**
Lone Pine	21-22 February	^	^	^	<45
	23-24 May	^	^	**^**	<45
	15-16 August	^	**^**	~<30	<45
	6-7 December	^	^	^	<45
Predicted Noise Impact (EA)		**17**	**31**		**n/a**
Milpose	21-22 February	^	~27	~30	<45
	23-24 May	^	**~<30**	**~<30**	<45
	15-16 August	~<30	^	**^<30**	<45
	6-7 December	^	^	~<35	<45
Predicted Noise Impact (EA)		**19**	**19**		**n/a**
Hillview	21-22 February	^	^	^	<40
	23-24 May	^	^	**~<30**	<45
	15-16 August	^	**^**	**^**	<45
	6-7 December	^	^	**^**	<40
Predicted Noise Impact (EA)		**20**	**20**		**n/a**
Adavale	21-22 February	^	~<30	~<30	<40
	23-24 May	^	**~<30**	**~<30**	<45
	15-16 August	^	^	**^<30**	<45
	6-7 December	^	^	~<35	<45
Predicted Noise Impact (EA)		**21**	**34**		**n/a**

Note: Measurements represent total mine contribution by excluding impact noise from extraneous sources such as wind noise and fauna. As LA[1] results are not adjustable, this measurement is not representative of noise produced by the mine and should be disregarded. **Bolded** results have been recorded during a stability class of F or G and are not a true representation of the mine noise contribution. Predicted evening / night impact levels selected based on most significant impact of the two scenarios in the MOD 4 noise assessment.
^ Northparkes Inaudible.
~ Northparkes Slightly Audible
≠ Not measurable

Noise levels assessed as part of the monitoring program were within all operational noise criteria. They were also within the noise levels predicted in the Modification 4 Expansion Noise Assessment (Umwelt, 2018), and did not exceed the sleep disturbance limit at night despite the frequency and impact of temperature inversion conditions. During most attended monitoring surveys at all locations, operators noted that Northparkes operations were inaudible or only slightly audible.

Northparkes was successful in achieving the long-term intrusive noise goals during the 2023 reporting period.

All attended monitoring reports for the reporting period are available on the Northparkes webpage at: **https://evolutionmining.com.au/northparkes/**

6.4.3 Noise Improvements and Initiatives

Northparkes will continue to implement the operational controls in the approved NMP including its quarterly attended noise monitoring program to remain compliant with the approved limits.

Although night-time surface mining operations did not commence during the period, Northparkes undertook the double glazing of a neighbours' residence windows, in an effort to reduce nuisance noise. The project was carried out in anticipation of increased Autumn and Winter inversions that exacerbate open cut noise. Night-time surface mining will commence in 2024.

Northparkes have developed and begun implementing a trigger action response plan (TARP) to identify periods of adverse weather conditions (noise exacerbating) and control implementation to reduce the sites noise impact. As an input to the TARP, Northparkes is utilising inversion technology that predicts periods of adverse weather stability.

To further improve the real time noise monitoring network, a directional monitor is planned to be trialled at a nearby residence to evaluate the contribution of night-time surface mining, whilst excluding other potential noise contributing sources.

6.5 Blasting

6.5.1 Blasting Management

Blast management is undertaken in accordance with the approved Blast Management Plan (BMP) and outline the mitigation measures, required monitoring, and provides clear definitions of the roles and responsibilities related to managing impacts of surface blasting. The vibration monitors have also assisted to demonstrate that underground draw bell blasting is within the Consent criteria.

Implementation of the BMP executes a range of mitigative measures to minimise annoyance in accordance with the conditions of the Consent. Blast operations also have specific management requirements regarding:

- Blast hours
- Notification of the frequency of blasts
- Road closures
- Fly rock removal and road maintenance
- Property inspections
- Reporting of exceedances and complaints

6.5.2 Blasting Performance

During the reporting period, Northparkes completed 25 surface blasts at the E31 and E31N open pits. All events were successfully recorded at all monitoring locations and vibration impacts were well below the criteria detailed in the Consent. Overpressure results are also below the criteria in the Consent, though are heavily impacted by weather, most commonly wind and rain. Figure 20 and Figure 21 below detail the vibration and overpressure results from each of the blast events.

Northparkes is permitted to only carry out surface blasting on site between 9am and 5pm, Monday to Saturday inclusive. On 30 November 2023, Northparkes initiated a blast outside of the permitted time period (5:01pm) as a result of operational delays. Northparkes self-reported the event to DPE and provided a written investigation report within seven days of the incident. All other blasts were consistent with the approved periods defined in the Consent.

All underground blasting activities remain well within the impact limits detailed in the Consent.

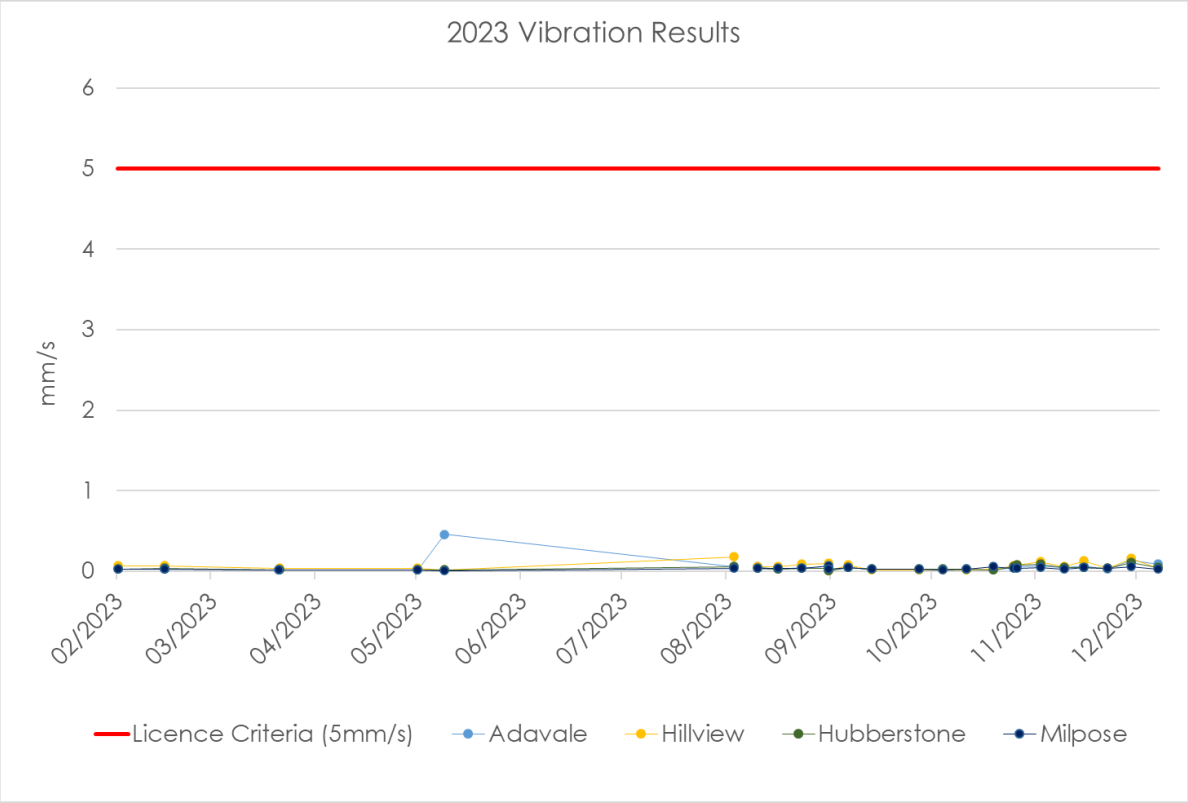


Figure 20 Vibration results for surface blasting

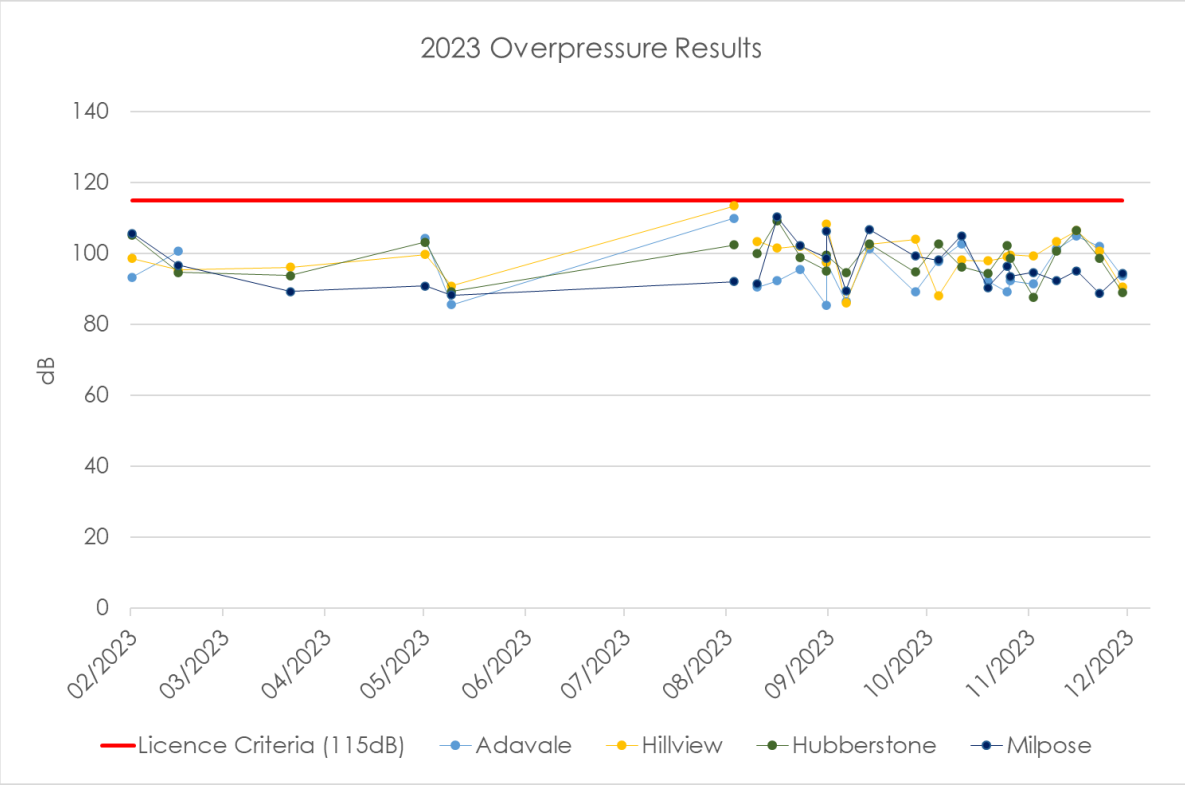


Figure 21 Overpressure results for surface blasting

6.5.3 Blasting Improvements and Initiatives

Northparkes will continue to review the blast management during 2024 and look for any possible opportunities to further minimise the potential impact to surrounding residences.

6.6 Biodiversity and Ecology

6.6.1 Biodiversity and Ecology Management

Biodiversity impacts are managed in accordance with the approved Biodiversity Offset Management Plan (BOMP). The BOMP provides a framework for managing biodiversity values within the project boundary, Biodiversity Offset Areas (BOAs), and wider locality.

The BOMP guides the implementation of offsetting commitments and manages potential risks to biodiversity as a result of operations at Northparkes. Specifically, the BOMP aims to:

- Describe the measures (short, medium and long-term) to be implemented to manage remnant vegetation and habitat within the Project boundary and BOAs, including detailed performance and completion criteria
- Describes enhancement practices and procedures to be undertaken in accordance with commitments stipulated in the Voluntary Conservation Agreements (VCA) and BOMP
- Describe the practical management strategies to be implemented to:
  - manage impacts on flora and fauna
  - maximising salvage and beneficial use of resources in areas to be impacted for habitat enhancement
  - rehabilitate creeks, drainage lines and disturbed areas and
  - control weeds and pests.
- Ensure compliance with all legislative requirements, statutory approvals/licences and corporate responsibilities of Northparkes
- Describe biodiversity monitoring and reporting requirements and
- Provide details of the parties responsible for monitoring, reviewing, and implementing the BOMP.

No impacts outside those predicted in the EA have occurred during the reporting period indicating the management strategies specified by the BOMP implemented across the site are adequate to address potential impacts.

Northparkes has implemented a range of biodiversity monitoring activities since the commencement of operations, in addition to those studies completed for the EA.

6.6.2 Biodiversity and Ecology Performance Monitoring

During the reporting period Northparkes engaged external consultants to undertake ecological monitoring at Kokoda Biodiversity Offset. This program is guided by clearly defined, repeatable and consistent methodologies for monitoring changes in various aspects of ecosystem function, succession and long-term sustainability. The adopted monitoring methodology is a standard and simple procedure that can be easily replicated over any vegetation community or revegetation area. It includes a combination of Landscape Function Analysis (LFA) and flora diversity. For more details on rehabilitation monitoring undertaken in 2023, refer to the 2023 Kokoda Offset Monitoring Report, available via the Northparkes website at **https://evolutionmining.com.au/northparkes/**

Kokoda Ecological Monitoring

A range of ecological field surveys were undertaken across Kokoda in 2023. These included:

- Floristic data using plot-based surveys
- Landscape Function Analysis (LFA) monitoring
- Targeted bird surveys in winter and spring
- Monitoring of kangaroo numbers
- Qualitative biannual inspections for weeds, pests and maintenance.

Floristic Data Using Plot-Based Surveys

A total of seventeen 20 x 20 metre permanent flora sampling sites (plots) were assessed at Kokoda in 2023. The location of survey sites was selected to represent the different vegetation communities mapped by Umwelt in 2013 and were marked for ease of relocating for subsequent monitoring surveys (using a handheld global positioning system (GPS) and star pickets). Photographs were also taken at each site to help monitor changes over time.

During surveys, total floristic diversity was recorded in systematic increments within the monitoring plots, beginning at the start of the LFA vegetation transect in the 1 x 1 m sub-plot. Total shrub counts were made within the shaded 10 x 20 m subplots and mature tree counts and condition variables were made within the entire 20 x 20 m quadrat.

Floristic plot-based survey at Kokoda in 2023 recorded 164 plant species, comprised of 48 non-native (exotic) species and 116 native species (71%). No threatened flora species were detected in the flora plots during field surveys. Refer to the 2023 Kokoda Offset Monitoring Report for full information and data.

A range of Key Performance Indicators (KPI's) were quantified by data obtained from replicated reference sites which were representative of the Grey Box Woodland CEEC and Dwyer's Red Gum woodland. All ecological performance indicators are quantified by range values measured from these reference sites which form both *upper* and *lower* KPI targets. The same ecological performance indicators are also measured in the revegetation/rehabilitation sites and these should equal or exceed these values, or at least demonstrate an increasing trend.

Table 15 below indicates the performance of the woodland revegetation monitoring sites against the proposed Primary Completion Performance Indicators. The selection of criteria has been presented in order of rehabilitation phases according to the previous NSW ESG3 MOP guidelines. The range values of the ecological performance targets are amended annually. Revegetation sites meeting or exceeding the range values of their representative community type have been identified with a coloured box and have therefore been deemed to meet these primary completion performance targets this year. Hashed coloured boxes indicate they may be outside of the reference target ranges, but within acceptable agricultural limits.

The reference sites at Kokoda are typically degraded and of low quality which subsequently have provided low performance targets. In the Grey Box woodlands, there was limited abundance and diversity of the grassy understorey and there were limited shrubs. The revegetation activities included a range of species known to occur within these communities and not just restricted to those occurring within the existing reference sites.

Landscape Function Analysis Monitoring

Landscape Function Analysis (LFA) monitoring was also undertaken at the seventeen permanent plots. LFA is a methodology used to assess key indicators of ecosystem function including landscape organisation and soil surface condition as measure of how well the landscape retains and uses vital resources. The indicators used quantify the utilisation of the vital landscape resources of water, topsoil, organic matter and perennial vegetation in space and time. Soil sampling was also undertaken at the plots.

Table 15 Performance of the Grey Box, Ironbark and Dwyers Red Gum woodland revegetation sites against primary completion performance indicators

Rehabilitation Phase	Aspect or ecosystem component	Completion criteria	Performance Indicators	Unit of measurement (*desirable)	DReveg1	DReveg2	DReveg3	DWoodLQ	GBReveg 1	GBReveg 2	GBReveg 3	GBReveg 4	GBReveg 5	WBWood 1	IronWood 1
Performance indicators are quantified by the range of values obtained from replicated reference sites					2022	2022	2022	2022	2022	2022	2022	2022	2022	2022	2022
Phase 2: Landform establishment and stability	**Landform slope, gradient**	Landform suitable for final land use and generally compatible with surrounding topography	Slope	< Degrees (18°)	4	3	4	3	5	4	3	4	3	3	4
	Active erosion	Areas of active erosion are limited	No. Rills/Gullies	No.	0	0	0	0	0	0	0	0	0	0	0
Phase 3: Growth medium development	**Soil chemical, physical properties and amelioration**	Soil properties are suitable for the establishment and maintenance of selected vegetation species	pH	pH (*5.6 - 7.3)	5.7	5.4	6.0	5.5	6.4	5.5	6.2	5.7	6.0	6.5	5.2
			Organic Matter	% (*>4.5)	2.9	2.8	3.5	5.7	2.6	4.4	3.8	3.1	3.3	4.8	4.6
			Phosphorous	ppm (*50)	3.6	4.6	3.9	7.9	3.6	3.9	4.6	1.6	3.6	4.9	2.6
Phase 4: Ecosystem & Land use Establishment	**Landscape Function Analysis (LFA): Landform stability and organisation**	Landform is stable and performing as it was designed to do	LFA Stability	%	74.0	76.6	76.5	70.3	75.5	74.5	74.9	76.0	75.5	72.5	71.0
			LFA Landscape organisation	%	100	96	100	100	100	100	100	99	100	100	100
	Vegetation diversity		Diversity of shrubs and juvenile trees	species/area	2	7	1	3	1	0	6	6	1	9	9

Rehabilitation Phase	Aspect or ecosystem component	Completion criteria	Performance Indicators	Unit of measurement (*desirable)	DReveg1	DReveg2	DReveg3	DWoodLQ	GBReveg 1	GBReveg 2	GBReveg 3	GBReveg 4	GBReveg 5	WBWood 1	IronWood 1
		Vegetation contains a diversity of species comparable to that of the local remnant vegetation		% endemic	100	100	100	100	100	0	100	100	100	100	100
			Exotic species richness	<No./area	15	17	26	23	24	15	21	19	24	23	5
	Shrubs and juvenile tree (<5cm dbh) density	Vegetation contains a density of shrubs and juvenile trees (<5cm dbh) comparable to the local remnant vegetation	Total density of endemic shrubs and/or juvenile trees	No./area	6	11	1	23	1	0	12	7	4	23	112
	Ecosystem composition	The vegetation is comprised by a range of growth forms comparable to that of the local remnant vegetation	Trees	No./area	1	1	1	2	1	0	2	3	1	4	5
			Shrubs	No./area	1	8	0	2	0	0	4	3	0	6	5
			Herbs	No./area	19	34	33	39	32	27	27	28	32	49	25
Phase 5: Ecosystem & Land use Sustainability	**Landscape Function Analysis (LFA): Landform function and ecological performance**	Landform is ecologically functional and performing as it was designed to do	LFA Infiltration	%	45.6	34.5	51.5	56.1	48.2	42.9	47.9	44.8	47.1	53.2	49.6
			LFA Nutrient recycling	%	46.2	37.8	50.1	55.5	48.7	45.1	47.9	44.0	47.4	52	48.5

Rehabilitation Phase	Aspect or ecosystem component	Completion criteria	Performance Indicators	Unit of measurement (*desirable)	DReveg1	DReveg2	DReveg3	DWoodLQ	GBReveg 1	GBReveg 2	GBReveg 3	GBReveg 4	GBReveg 5	WBWood 1	IronWood 1
	Protective ground cover	Ground layer contains protective ground cover and habitat structure comparable with the local remnant vegetation	Perennial plant cover (< 0.5m)	%	20	26	7	9.5	32	6.5	18	17.5	22	38	13
			Total Ground Cover	%	91	91	100	99	100	98.5	98.5	98	100	99	98
	Native ground cover abundance	Native ground cover abundance is comparable to that of the local remnant vegetation	Percent ground cover provided by native vegetation <0.5m tall	%	50.5	57.6	47.4	47.8	27	41.9	49.1	35.4	53.7	68.7	87.2
	Ecosystem growth and natural recruitment	The vegetation is maturing and/or natural recruitment is occurring at rates similar to those of the local remnant vegetation	shrubs and juvenile trees 0 - 0.5m in height	No./area	4	5	0	11	0	0	2	1	2	12	50
			shrubs and juvenile trees 1.5 - 2m in height	No./area	0	0	0	0	0	0	1	1	0	0	5
	Ecosystem structure	The vegetation is developing in structure and complexity comparable to that of the local remnant vegetation	Foliage cover 0.5 - 2 m	% cover	2	0	0	0	0	0	0	0	0	0	0
			Foliage cover >6m	% cover	0	0	0	20	0	0	0	0	0	43	12.5

Rehabilitation Phase	Aspect or ecosystem component	Completion criteria	Performance Indicators	Unit of measurement (*desirable)	DReveg1	DReveg2	DReveg3	DWoodLQ	GBReveg 1	GBReveg 2	GBReveg 3	GBReveg 4	GBReveg 5	WBWood 1	IronWood 1
	Tree diversity	Vegetation contains a diversity of maturing tree and shrubs species comparable to that of the local remnant vegetation	Tree diversity	%	100	0	0	100	0	0	0	0	0	100	100
	Tree and mature shrub (>5cm dbh) density	Vegetation contains a density of maturing tree and shrubs (>5cm dbh) species comparable to the local remnant vegetation	Total tree and mature shrub density	No./area	9	0	0	9	0	0	0	0	0	7	27
	Ecosystem health	The vegetation is in a condition comparable to that of the local remnant vegetation.	Live trees	% population	100	0	0	100	0	0	0	0	0	87.5	73
			Healthy trees	% population	100	0	0	0	0	0	0	0	0	12.5	0
			Flowers/fruit: Trees	% population	11	0	0	78	0	0	0	0	0	12.5	11

Targeted Bird Surveys

Targeted bird surveys were carried out at Kokoda in winter and spring 2023. Bird surveys were conducted at six sites across two days in winter and eleven sites across two days in spring. Surveys consisted of a two-hectare area search for 20 minutes in suitable habitat within Kokoda on each day.

All bird surveys undertaken at Kokoda in 2023 were undertaken by a suitably qualified ecologist. Winter bird surveys targeted the Regent Honeyeater and Swift Parrot, and spring bird surveys targeted the Superb Parrot and eastern subspecies of the Grey-crowned Babbler. During targeted bird surveys, all birds seen (using binoculars) or heard (using diagnostic calls) were recorded. Targeted bird surveys were undertaken twice at each survey site each time in the early morning when birds are most active and vocal to maximise detectability. Any opportunistic bird species identified during surveys were also recorded.

During targeted bird surveys, a total of 54 bird species were recorded during winter and a total of 64 bird species during spring. Five of those species were identified as threatened and/or migratory under the *Biodiversity Conservation Act 2016* and *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). These include:

- Superb parrot (Polytelis swainsonii) (EPBC: V / BC: V)
- Grey-crowned babbler (eastern sub-species) (Pomatostomus temporalis) (BC:V)
- Brown Treecreeper (Climacteris picumnus victoriae) (EPBC: V / BC: V)
- Speckled Warbler (Chthonicola sagittata) (BC:V)
- Diamond Firetail (Stagonopleura guttata) (EPBC:V / BC:V)

Threatened species records appear consistent with previous years records. Overall, species diversity appears stable over the past few years. A slightly higher number of species are recorded during the spring survey periods compared with winter periods overall the previous five years. This is likely to be a function of the greater number of survey sites and microhabitats present in the spring than winter (11 in spring versus six in winter), rather than more species occurring in spring.

Figure 22 Superb Parrot, Grey-crowned babbler (eastern sub-species) & Speckled Warbler

Opportunistic Flora and Fauna Monitoring

Prior to the erection of the exclusion fence, a number of trial cameras were set up across Kokoda to opportunistically observe the range of potential feral animal species. The cameras were then again set up after the completion of the fencing to assess what species required ongoing management. Table 19 details the current presence of feral animal species from the trail cameras. Although the presence of cats has not been captured post fencing, it is possible they exist within offset area, but are yet to be photographed. A single deer was observed on the trail cameras, though has not been seen during onsite inspections. It is assumed to be an isolated occurrence.

Table 16 Presence of feral pest species

Feral Animal Species	Prior to Exclusion Fencing	2023
Rabbits	Yes	Yes
Cats	Yes	No
Dogs	No	No
Foxes	Yes	No
Pigs	Yes	Yes
Goats	Yes	No
Deer	No	Yes

Pests Animal Management

For the presence of pest animals noted in the table above, suitable pest management programs were developed in conjunction with the Local Land Service (LLS) and Northparkes. As part of a wider increase in feral pig populations, a rise in pig habitation was observed during the period at the Kokoda offset. Poison grain bait was administered out of a 'Hog Hopper', to specifically target the species and eliminate the potential for off-target deaths. There was positive uptake of the grain, with an immediate reduction in resident pigs evident. Concurrently, rabbit baiting was undertaken for an isolated site which resulted in a significant population decline. All uneaten grain was disposed of in accordance with the LLS recommendations.

Figure 23 Pigs accessing hog hopper bait station

Pine Donkey Orchid Population Monitoring

Field inspections of the two populations of the Pine Donkey Orchid (*Diuris tricolour*) (PDO) found within the Northparkes mining lease were carried out during October, which targeted emerging and effloresced plants to coincide with the species flowering period. The density of PDO individuals recorded at the two populations have varied significantly over the years, with the seasonal conditions, ground cover abundance, ease of identification and survey timing having a significant impact on the orchid populations. With below average rainfall again in 2023, lower numbers were observed than previous years during more favourable conditions.

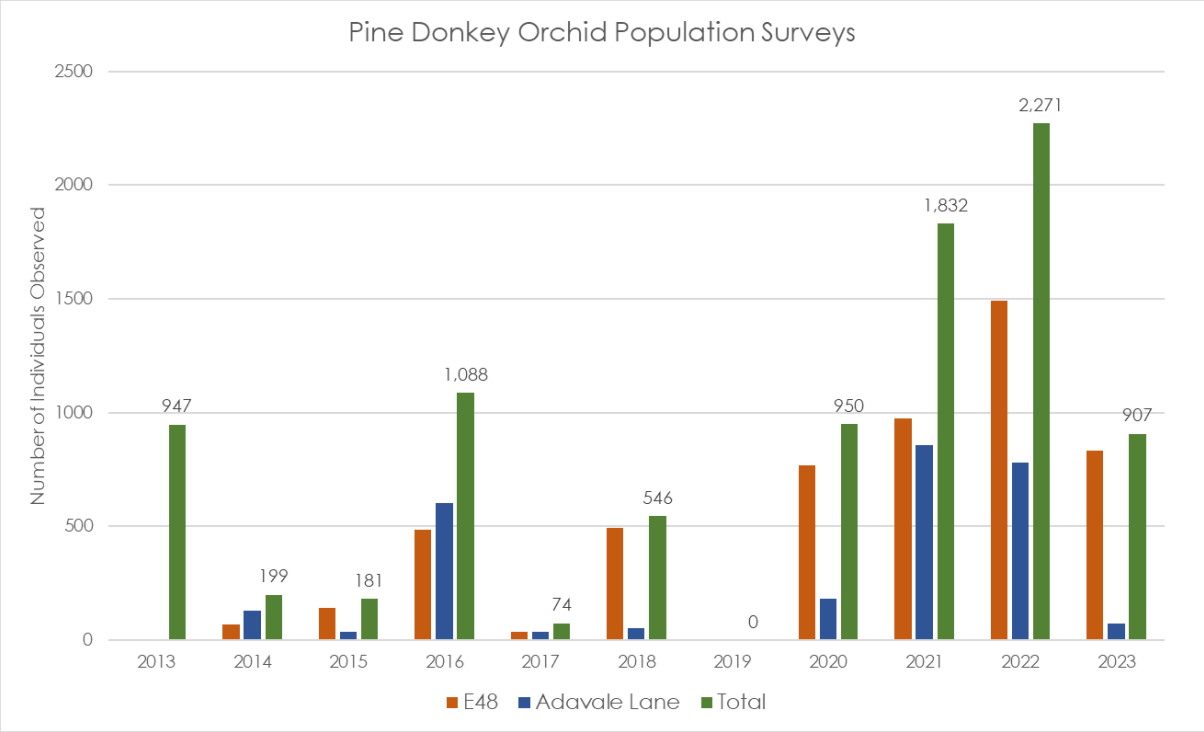


Figure 24 Number of Pine Donkey Orchids observed during surveys

Figure 25 Pine Donkey Orchid (*Diurus tricolour*)

6.7 Waste

6.7.1 Waste Management

The Consent, specifically Schedule 3 Condition 38, requires the following in regards to waste:

- Implement all reasonable and feasible measures to minimise waste generated by the Project
- Ensure waste generated by the Project is appropriately stored, handled and disposed of and
- Monitor and report on the effectiveness of waste minimisation and management measures in the Annual Review.

Northparkes Waste Management Plan covers aspects of waste management peripheral to mining activities, i.e. does not include production waste, such as coarse or fine reject. The Waste Management Plan was prepared in accordance with the objectives of the *Waste Avoidance and Resource Recovery Act 2007* and is based on the waste management hierarchy of avoid, reduce, reuse, recycle and dispose.

Waste management measures employed on site include:

- General waste from operations is disposed at an appropriate licensed waste management facility
- Recyclable wastes are collected for recycling at an appropriate facility
- Contaminated soil is collected and transported to the on-site bioremediation area for treatment and eventual on-site disposal
- Scrap metal materials are separated onsite and collected by a recycling contractor for off-site recycling
- All waste oils and greases are segregated and stored appropriately until collection by a licensed waste contractor for appropriate offsite recycling/disposal
- Waste chemicals (including solvents) are segregated, stored appropriately and transported offsite by a licensed waste contractor for appropriate disposal
- Contaminated areas are bunded and water is reused within the process water circuit and
- Clean water surface water/runoff is diverted around mine facilities (where feasible).

6.7.2 Waste Performance

Northparkes tracks operational waste disposal for all key waste streams. All waste streams are stored in appropriate containers prior to disposal at licenced facilities.

Operational waste collection statistics for the 2023 reporting period is summarised in Table 17.

Table 17 Summary of Waste Disposal

Waste Stream	Tonnes
Hazardous recycled: empty drums oil filters oily water waste grease waste oil dust suppressant/resin/glue and fluorescent tubes.	123.6
Hazardous disposal: hydraulic hose medical/sanitary waste oily rags and used absorbent	9.4
Non-Hazardous recycled: empty drums	61.8
Non-Hazardous disposal: mixed solid waste	381.3
Recycled metal	1,042.4
TOTAL	**1,618.5**

Northparkes and its contractors have continued to implement the waste management hierarchy. Wherever possible, waste materials are re-used on site in preference to direct disposal. Recycling of materials is also undertaken where possible to minimise waste. An example of reuse is the integration of an oil water separator at the wash bay, which minimises wastewater and returns water to the water management system for re-use.

Northparkes contracts a third-party waste service to manage its waste from the premises. This has been successful as specialised waste streams can be more thoroughly investigated for opportunities and improvements.

Site induction packages include waste awareness and Northparkes has included waste best practice in employee and contractor HSE sessions. Environmental inspections were undertaken by Northparkes throughout the reporting period with observations and non-conformances communicated as necessary to relevant contractors.

6.7.3 Bioremediation Area

The bioremediation area was maintained and monitored during the reporting period, as listed in Table 18. Successful management of this bioremediation area has allowed for onsite treatment of contaminated material and subsequently reduced the need to transfer contaminated waste material offsite. The bioremediation area was active during the 2023 reporting period (refer to Table 18).

Treated material was removed from the bioremediation bay and placed on the E26 waste emplacement. Material was then excavated from the western surge dam and placed in the remediation bay for microbial treatment.

Table 18 Summary of Bioremediation Activities

Initiated	Origin of Material	Description	Completion
2016	-	Construction of bioremediation area	2016
2016	Surge Dam 2	The treatment of approximately 15,000m^3 of material from the western surge dam with Micro-Blaze formulation	2017
2019	Surge Dam 1	The treatment of approximately 21,000m^3 of material from the eastern surge dam with Micro-Blaze formulation	2023
2023	Surge Dam 1	Removal of treated material to E26 waste emplacement	2023
2023	Surge Dam 2	Removal of approximately 20,000m3 of material from western surge dam to bioremediation bay.	2023

6.7.4 Waste Improvements and Initiatives

Consistent with the implementation of the waste management hierarchy, Northparkes and its waste contractor continue to look for ways to re-use waste materials onsite in preference to direct disposal.

Opportunities are being investigated to process the surge dam material through the ore handling circuit. This would eliminate the need to undertake microbial treatment as the material would be consumed through the process with no risk of environmental harm.

6.8 Cultural Heritage

6.8.1 Cultural Heritage Management

The management, including identification, assessment and monitoring, of cultural heritage at Northparkes is undertaken in accordance with the Cultural Heritage Management Plan (CHMP).

The CHMP prescribes:

- The policies and practices for the preservation of sites during construction and operations
- Other facets of cultural heritage practices and conservation measures including salvage of sites as required and the practice of due diligence inspections
- Management of unanticipated Aboriginal objects and
- Other relevant cultural heritage considerations including consultation with the Aboriginal community.

Northparkes utilises a Site Disturbance Permit (SDP) approval system to manage the protection of heritage sites on the mining lease. This approval process applies to activities planned in undisturbed areas or previously rehabilitated areas. The area to be disturbed is compared to the Aboriginal cultural heritage sensitivity zones to determine the need for additional survey work or salvage work prior to starting the project.

6.8.2 Cultural Heritage Initiatives and Programs

In accordance with the CHMP, the Wiradjuri Executive Committee (WEC) were in contact on a regular basis throughout the reporting period, with meetings held in March, and July. The WEC is a consultation forum to enable appropriate review of the aboriginal heritage management practices at Northparkes and identify potential improvement opportunities for the community.

In the reporting period, there was one due diligence survey undertaken across Northparkes holdings which was associate with Modification 11 works. Approximately 92 hectares was surveyed by the working group, comprised of external consultants, indigenous representatives and Northparkes employees. Three new sites and one existing were found within the study area, though only two are located within the proposed impact footprint. A determination is yet to be made whether the artefacts are to remain in situ or be salvaged. The two artefacts within the impact area are shown below.

Ground-edge axe fragment

Grinding dish fragment

Figure 26 Artefacts found during due diligence surveys

Works and initiatives undertaken by the WEC in the reporting period included:

- Feedback on selection of Northparkes Indigenous Scholarship recipients and encouragement of Indigenous employment
- Review of the planned modifications to the operations and therefore regulatory approvals
- Input into the rehabilitation planning process
- Planning to develop a cultural heritage training program for Northparkes' leaders
- Work plans relating to education, community engagement, business development and employment and training
- Improve community engagement through volunteer opportunities and
- Commenced a review of the working Agreement between Northparkes and the WEC.

7. WATER MANAGEMENT

Water management at Northparkes is undertaken in accordance with approved management plans, prepared generally in accordance with the Consent. The Water Management Plan (WMP) acts as the overarching document to govern water management at Northparkes. Approved subordinate plans supporting the WMP include:

- Surface Water Management Plan (SWMP)
- Groundwater Management Plan (GWMP) and
- Site Water Balance (SWB) report.

7.1 Surface Water

7.1.1 Surface Water Management

Surface water is managed in accordance with the SWMP and associated water management plans which conform to the Consent, licenses and other regulatory requirements of Northparkes.

The primary objectives of water management at Northparkes is to manage dirty and contaminated catchment runoff, divert clean water around operational areas of the mine and to collect and store water for use on site to minimise the dependence on external water supplies. A critical component of the water management system is to maintain zero discharge of contaminated water into the surrounding environment.

The water management strategy includes the separation of clean, dirty and contaminated water, categorised as follows:

- **Clean water** includes surface runoff from areas not affected by mining operations and includes runoff from undisturbed areas, rehabilitated areas and water supplied by external sources. The clean water system includes diversion drains and farm dams (FD) surrounding the active mining areas in order to capture and divert clean water away from areas disturbed by mining operations.
- **Dirty water** includes sediment-laden runoff from disturbed areas, including rehabilitated waste rock stockpile areas, TSF embankments and surface infrastructure areas that are not associated with mineralized ore. Runoff from these areas is collected in sediment ponds (SP) to allow sediment to fall out of suspension.
- **Contaminated water** includes water associated with mining, ore processing and TSFs. Any potentially contaminated water is managed within retention ponds (RP), the Caloola Dams, E22 pit, surge dams and the process water dam to avoid discharge into surrounding watercourses and to maximise water reuse.

In accordance with the Consent, Northparkes maintains a Surface Water Balance (SWB) for effective management of water resources. The SWB details water use, water demand and water management, as well as the sources and security of water supply, including contingency for future reporting periods.

The following subsections describe surface water monitoring and environmental performance.

Surface Water Monitoring Program

Water quality monitoring is undertaken at Northparkes specifically within the three defined water management systems mentioned above.

The table below lists each monitoring location and their corresponding water management system.

Table 19 Surface Water Quality Monitoring Location Catchments

Clean water management system	Dirty water management system	Contaminated water management system
Upstream WC4. WC6, WC7, WC13, W14 **Downstream** WC1, WC2, WC3, WC5, WC11 WC12, WC15, WC16 **Farm Dams** FD04, FD05, FD06, FD07, FD11, FD12, FD16, FD18, FD25, FD26, FD27	SP03, SP10, SP15, SP33	RP01, RP02, RP03, RP04, RP05, RP06, RP07, RP08, RP09, RP12 RP13, RP15, RP16, RP19, RP20, RP21, RP22, RP23, RP24, RP25, RP26, RP27, RP28, RP32, RP34 Process Water Dam, Surge Dam 1 and 2, Caloola Storages

The monitoring locations of watercourses and surface water storages are provided in Appendix 2. Table 20 identifies the specific analytical suites undertaken for each of the different water management systems.

The monitoring of watercourse stability is to identify potential changes on bank stability. Records are made, including comments regarding bed and bank condition. Photographs may also be taken to provide a record on the status of the watercourse.

Table 20 Surface water monitoring program

Monitoring Locations	Frequency	Analytical Suite
Watercourses (clean water systems)	Quarterly	pH, EC, TSS, TDS, Cu, Na, K, Ca, Mg, Cl, SO_4, HCO_3, CO_3
Farm Dams (clean water systems)	Quarterly	pH, EC, TSS, TDS, Cu, NA, K, Ca, Mg, Cl, SO_4, HCO_3, CO_3
Sediment Ponds (dirty water management system)	Quarterly	pH, EC, TSS, TDS, Cu, NA, K, Ca, Mg, Cl, SO_4, HCO_3, CO_3
Retention Ponds and Process water system (contaminated water management system)	Quarterly	pH, EC, Cu
	Annual	pH, EC, TSS, TDS, Na, K, Ca, Mg, Cl, SO_4, HCO_3, CO_3, Al, As, Ba, Be, Cd, Co, Cu, Cr, Mo, Mn, Ni, Pb, Se, Th, U, Zn

Table 21 Watercourse stability monitoring program

Location	Frequency	Assessment Requirements
WC01, WC02, WC03, WC04, WC05, WC06, WC07, WC11, WC12, WC13, WC14, WC15, WC16	Following significant rainfall events	Visual assessment of channel form, presence of instabilities in watercourse banks or in crossing structure (bridge/culvert).

Northparkes uses a handheld multi-parameter water quality probe (pH, electrical conductivity (EC), temperature). All water quality samples requiring lab analysis are collected by a suitably qualified employee and sent to a NATA accredited laboratory for processing.

The existing monitoring program is subject to periodic review and as such will evolve with the continual development of Northparkes water management system.

Surface Water Quality Criteria

Surface water quality criteria use a two-stage water quality trigger system based on the statistical analysis of the existing available water quality data. The current WMP Stage 1 and Stage 2 trigger values, as well as livestock water quality guidelines were taken into consideration when developing and updating the site water quality trigger levels. The current trigger levels for surface water quality sites are detailed in Appendix C of the approved WMP.

7.1.2 Surface Water Performance

There were no non-compliances related to surface water management recorded during the reporting period. All storages show trends that are generally within historical ranges of all parameters. All quarterly monitoring events were carried out successfully and within the scheduled period.

Surface Water Quality

Samples were able to be taken at all locations, excluding watercourses, during the period. Due to the nature of the ephemeral streams, the majority of water courses were not flowing or had insufficient water at time of sampling throughout the monitoring period, with the exception of WC12. WC12 is located along the Bogan River and seldom goes dry unless in severe drought. FD12 was also dry for most of the period.

Watercourses

Only WC12 was able to be sampled during the period, with all other locations dry. pH slightly increased though all results were below internal trigger values. Northparkes will continue to monitor and assess local water courses to ensure there are no detrimental mine related impacts to the local environment.

Farm Dams

Farm dam results for all parameters remained in line with historical data, with the exception of FD18 which recorded elevated electrical conductivity. Since the commencement of monitoring FD18, EC values have averaged 2,295 µS/cm, higher than the Stage 1 trigger value of 2,133µS/cm. Trigger levels will be reviewed in the next reporting period.

Retention Ponds

Process water monitoring locations (retention ponds) fluctuated throughout the year although still remain within long-term historical data across pH, electrical conductivity and dissolved copper. RP09, RP16, RP28 and SD1 had elevated EC results above the Stage 1 internal trigger level during the Q4 monitoring program. These results are consistent with that of the contaminated water system.

Sediment Ponds

Sediment pond locations recorded pH, electrical conductivity and dissolved copper results in line with long-term historical data. There was however an increase in electrical conductivity at SP03 during the period, exceeding the Stage 1 trigger level in Q4. The results will be monitored during the next reporting period.

The monitoring results were predominantly in line with or below historical data and representative of the regional freshwater quality characteristics. The monitoring results are available in Appendix 2.

7.1.3 Surface Water Improvements and Initiatives

Catchment reduction investigations were undertaken for multiple areas across the site to reduce capacity requirements of ponds and relieve pressure of existing systems. This will be further explored during the next reporting period.

Within the next reporting period, Northparkes will continue to work to streamline monitoring requirements and refine the site water model to reflect current and future operations.

7.2 Groundwater

7.2.1 Groundwater Management

Groundwater is managed in accordance with the approved GWMP. The GWMP provides a framework defining how Northparkes will assess, manage and mitigate impacts to the groundwater system. This particularly focuses on impacts to the shallow alluvial aquifer as a result of mining activities such as dewatering the open pit void and underground operations. The GWMP specifies impact assessment criteria and trigger levels to identify groundwater level and quality changes, and outlines Northparkes monitoring and reporting requirements for groundwater management.

Groundwater Monitoring Program

Northparkes groundwater monitoring program aims to identify any changes to the natural groundwater system as a result of mining operations and ensure compliance with the Consent. It focuses on potential impacts to environmental assets and groundwater users in the area surrounding Northparkes.

The monitoring program undertaken during the reporting period included:

- Quarterly monitoring of groundwater levels and
- Quarterly laboratory groundwater quality analysis.

During the reporting period the active groundwater monitoring network comprised 42 monitoring bores located across different geographical areas, including 12 surrounding the tailing storage facilities, 14 surrounding the open cut voids, 11 associated with the underground operations and five regional bores on neighbouring properties. Monitoring details for these bores are listed in Table 22 and Table 23 and their respective locations are shown in Appendix 2.

Table 22 Groundwater Monitoring networks

TSF Bores	Opencut Bores	Underground Bores	Regional
MB01, MB02, MB03, MB05, MB06B, W26, W27, W28, W29, W30, W31, W32	MB10, MB11, MB12, MB13, MB14, MB16, W14, W19, W20, W21, W22, W23, W24, W25, W33, W34 (W33 and W34 installed in Q4 to replace W14 and W23)	MB17, MB18, MB19, MB20, P101, P102, P103, P104, P139, P145, P149	Far Hilliers, Moss, Wright, Long Paddock, South Hilliers

Table 23 Groundwater monitoring program

Monitoring Locations	Frequency	Analytical Suite
TSF Bores, Open cut Bores, Underground Bores, Regional Bores	Quarterly	Water level, pH, EC, total dissolved solids, hydroxide alkalinity, carbonate alkalinity, bicarbonate alkalinity, total alkalinity, sulphate, chloride, calcium, magnesium, sodium, potassium, aluminium, antimony, arsenic, beryllium, barium, cadmium, chromium, cobalt, copper, lead, manganese, molybdenum, nickel, selenium, zinc, nitrate, strontium, thallium, thorium, uranium, iron and mercury.

Groundwater Quality Criteria

Northparkes engaged an independent consultant to conduct a review of trigger levels for groundwater levels and quality. The review was conducted to assist in providing more relevant trigger levels for the groundwater monitoring network. The trigger levels were developed to assist in identifying and appropriately managing potential groundwater impacts based on historical monitoring data available from the groundwater monitoring network. Northparkes has developed groundwater levels and quality criteria for each bore where there is sufficient data available.

7.2.2 Groundwater Performance

There were no non-compliances related to groundwater management recorded during the reporting period. All bores show trends that are generally within historical ranges of all parameters. Quarterly monitoring events were carried out successfully and within the scheduled period.

Groundwater Quality

TSF Bores

The groundwater monitoring results were predominantly in-line with historical long-term data. The electrical conductivity, pH and dissolved copper levels of all bores remained in line with the previous reporting period and long-term averages.

Open Cut Bores

Open cut monitoring bore MB11 was not sampled during the reporting period and hasn't been sampled since Q2 2016 due to it being dry. Likewise, foreign material at water level is preventing MB12 from being sampled (last sampled Q1 2018).

Electrical conductivity was recorded above the internal trigger value at MB03 during the reporting period, though still consistent with long term data. W21 EC has stabilised from the previous reporting period, and will continue to be closely monitored. All other readings are largely in line with historic data. There were no significant changes to copper or pH levels.

Underground Bores

All bores monitoring the underground areas are generally in line with historical data and below internal trigger values. The electrical conductivity of MB18 has lowered below the internal trigger level, and in line long term averages. There were no significant changes to copper or pH levels.

Regional Bores

Regional ground water quality remained similar to the previous reporting period and in-line with the long-term averages. Groundwater pH, copper concentration and electrical conductivity at each regional bore were generally consistent with previous monitoring periods. pH results at Wright are trending slightly upward, and will be closely monitored during the next period. Copper levels at Moss during the previous reporting period have reduced back to levels consistent withy long-term data.

The groundwater monitoring results were predominantly in-line with historical long-term average data, and consistent with the EA predictions. The monitoring results are presented in Appendix 2.

Groundwater Levels

Quarterly monitoring of groundwater levels is undertaken by suitably qualified Northparkes personnel in accordance with the approved GWMP. Throughout 2023, and over the last 10 years, groundwater levels have displayed a consistent upward trend at all monitoring bores. Changes in rainfall over the past decade may have effects on local water quality variability. Groundwater levels remained below internal trigger values set in the WMP.

7.2.3 Improvements and Initiatives

During the next reporting periods, Northparkes will be carrying out an update to the Groundwater model as part of future approvals Environmental Assessment. As part of this update, all groundwater data will be reviewed for trends.

7.3 Water Balance

Northparkes has implemented a water model to capture water inputs, outputs and throughputs. The GoldSim model is used to incorporate the latest production data and future demands.

Results of the model are incorporated in internal management decisions and are communicated internally to the leadership team on an annual basis.

In reviewing the mine water balance for the reporting period, the following is of note:

- A total rainfall of 398mm was recorded at the onsite weather station during the reporting period. The rainfall received during the reporting period was 192mm above the long-term average for the region (590 mm),
- The volume of freshwater imported to site was less than the previous reporting period (2,827ML in 2022) as a result of the utilisation of onsite water stocks. All water imported to site was from groundwater and surface water licence allocations owned by Northparkes or through a commercial arrangement with Parkes Shire Council, as shown in Table 24
- Total water usage was more than the previous reporting period (6,688 ML in 2022)
- Recycled water use remained at approximately 70% of all water use during the period.

Details of Northparkes water balance for the reporting period are outlined in the table below.

Table 24 Reporting period water balance

Water Balance	Total (ML)
Total Water Input from external sources	1,821
Recycled onsite water	4,967
Water Use	**6,788**

7.3.1 Surface Water Storage

Water is essential in the processing of ore through the concentrator to produce copper concentrate. Effective water management is therefore crucial to the long-term success of Northparkes. A summary of the major water storage volumes at the beginning of the five most recent reporting periods are provided in Table 25.

Table 25 Major Water Storages

Major Storage Volumes (ML)	01/01/2020	01/01/2021	01/01/2022	01/01/2023	01/01/2024
Caloola North	0	326	425	500	353
Caloola South	0	427	504	570	256
E22 Void	533	575	917	2,858	3,089
Process Water Dam (PWD)	132	180	190	166	132
RP09	10	60	60	50	60
Other Infrastructure	-	-	200	440	340
TOTAL	675	1,538	2,296	4,584	4,230

Water storage levels of all active sediment ponds, retention ponds and process water dams are monitored and recorded periodically. This allows for effective management of stored supplies in terms of consumption, avoidance of potential discharges and infrastructure planning.

Onsite water storages are heavily dictated by surface water inflows. Fluctuating rainfall adds further emphasis on the need to conserve, protect and recycle water resources. Northparkes continually look to optimise water use and investigate opportunities to operate more efficiently to manage water impact responsibly.

7.4 Water Supply

Northparkes sources water from numerous locations including imported water from various licences (see Table 4 Summary of Licences).

Water recycled from the on-site ore processing facility and TSF reclamation system is collected through existing on-site infrastructure.

Effective water management is crucial to the long-term success of Northparkes operations as it is essential in the processing of ore through the concentrator to produce copper concentrate. The water management system aims to efficiently and economically collect, store and re-use water onsite to minimise external water supply inputs and supplement supply during periods of high consumption.

In accordance with its licences and the Consent, Northparkes:

- accesses groundwater from the Lachlan Alluvial Water Sources
- holds water entitlements for surface water extraction from the Lachlan River.
- can trade additional water to make up shortfalls or sell any excess water in a reporting period
- uses existing water entitlements to supplement demand.

The water supplied by Northparkes licenses for mining activities during the 2023 water reporting period is detailed in Table 26.

Table 26 Mine Water Entitlements and Use

Water Licence	Water sharing plan, source and management zone	Licenced Volume (ML)	Passive take/ inflows	Active Pumping	Total
WAL43208	Lachlan River Water Sharing Plan Lachlan River Regulated River Water Source (High Security)	1305	0	No	1227
WAL43207	Lachlan River Water Sharing Plan Lachlan River Regulated River Water Source (General Security)	3463	0	No	0
WAL34955	Lachlan River, Water Sharing Plan NSW Murray Darling Basin Fractured Rock Groundwater Sources	232	<10	No	<10
WAL32138	Lachlan River, Water Sharing Plan Lachlan Unregulated and Alluvial Water Sources	1110	0	No	0
WAL32120		1050	0	Yes	260
WAL32004		1600	0	Yes	500
WAL31969		1728	0	No	0
WAL31963		700	0	No	0
WAL31930		600	0	No	0
WAL31863		534	0	No	0
WAL31850		500	0	No	0

Core water demand during the 2023 reporting period was for ore processing. Small quantities of water were also required for dust suppression, vehicle wash down and potable water uses. Table 27 outlines future estimated water volumes as described in the EA (Umwelt, 2013). Water demand predictions were initially provided in the EA and have remained unchanged through subsequent project modifications.

Table 27 Predicted Water Demand

Water Source	Current Approved Operations (ML)
External	4,350
Recycled	2,091
Surface Water Runoff	523
Groundwater	290
Total	7,254

8. REHABILITATION

Northparkes owns and manages approximately 10,500 ha of land within and surrounding the mine leases. This area supports a range of land uses including mining, exploration, crop production, grazing and habitat re-establishment.

Rehabilitation activities incorporate the entire landholding in order to enhance the regional landscape and native habitat values. The Rehabilitation Strategy is described in Sections 2.0 and 3.0 of Appendix 4 of the EA. The State and Commonwealth approvals require rehabilitation to be generally consistent with the Rehabilitation Strategy (i.e. Schedule 3, Condition 39 of DC 11_0060).

The Rehabilitation Management Plan (RMP) was prepared to guide the ongoing management of the sites progressive rehabilitation, to ensure integration with the surrounding Northparkes owned land, and is managed with the view of enhancing the regional landscape and native habitats.

8.1 Post Mining Land Use

Northparkes is committed to developing a stable landform that is capable of supporting sustainable ecosystems and enables sustainable land use after the completion of mining operations at Northparkes.

The agreed final land use as stated in the MOD6 Consent includes the following:

- Agricultural land use
- Native vegetation and
- Restricted land use.

8.2 Landform Establishment

8.2.1 TSF1 Final Landform

During 2019, discharge of tailings using the central discharge method was undertaken to assist the final formation of TSF1. This method creates a self-draining final landform that assists with closure of the facility. The central discharge requires the deposition of tailings in thin layers to enable drying. As such, the tailings discharge will continue to occur over several years.

Deposition of tailings on TSF1 has ceased whilst investigation studies into increased height (Section 8.2.3) or consolidated landforms (Section 8.2.4) of TSFs is completed.

8.2.2 TSF2 East Embankment Buttress

The Eastern embankment of TSF2 is the only embankment that won't be covered by deposition from adjacent TSFs. Within 2021 and 2022 all of the TSF2 embankments were reshaped to improve the safety factor to current guidelines. The embankments were reshaped by pushing material from the upper section down to the lower section.

The East embankment of TSF2 was primarily reshaped in 2022, with some further landform work carried out in 2023. The growth medium and seed was applied in 2023. The TSF2 East Embankment will be monitored for vegetation establishment success over 2024.

8.2.3 Increased TSF Height Investigations

Investigations to increase the heights of the current TSFs began in 2023 with a range of design options being considered. Increasing the height of TSFs will reduce the need for new facilities potentially reducing environmental impacts. If the TSFs are increased in height, the final landforms will be modified.

8.2.4 Consolidated Northern TSF Investigations

With the construction of Infill TSF extension planned to start in 2024, an integrated tailings footprint will existing from TSF1, TSF2, Estcourt, Infill and Rosedale. With the potential for increasing throughput rates later in the life of mine, larger TSFs may be required. Instead of creating new TSFs in the future, the consolidation of some or all of these TSFs is being investigated. A range of design options are being considered. To deposit into a consolidated TSF, the final approved height will need be raised and the final landform altered.

8.2.5 Mining Void Tailings Investigations

Studies investigating the filling of E31 and E31N open cut voids with tailings started in 2023. The primary focus is groundwater modelling. The E31 and E31N in-pit tailings is essential for the future Rocklands TSF. Filling voids with tailings is desired for the final landform as it reduces ongoing safety risks and provides tailings storage capacity.

8.2.6 Tailings Construction Materials

To reduce ongoing final landform and material balance risks, in 2022 and 2023 Northparkes trialled the use cyclones to separate course and fine tailings particles as tailings is deposited into the TSF. In 2023 the trial moved into implementation with cyclone deposition occurring in the Rosedale TSF. The course tailings particles are being used as the construction material for the upstream, on beach, portion of the future lifts. As the outcomes from the use of cycloned tailings become known, it is planned to assess if the use waste rock for TSF construction will be reduced, providing an increased volume for rehabilitation.

8.3 Growth Medium Development

Growth medium was placed on the eastern embankment of TSF2 during the reporting period. This material was sourced from the cover that was on the east embankment prior to it being reshaped. Additional volume was also sourced from the E31 mining area as part of the overburden stripping process.

8.4 Ecosystem Development and Establishment

8.4.1 E22 Waste Rock Batter

A small area on the western batter of the rehabilitated E22 waste rock emplacement had erosion repairs carried out in 2021. The area was reshaped, with erosion gutters and benches removed to create a consistent gradient Figure 27. Growth medium was sourced immediately below the area from a rehabilitation stockpile that was against the Sediment Pond 3 embankment.

During 2022 a range of vegetation species established creating the early succession of ecosystem development. As expected, the percentage of common introduced vegetation species were higher than the adjacent undisturbed areas. The species composition will continue to be monitored by Northparkes staff.

Figure 27 E22 waste rock batter rehabilitation repairs from 2020 to 2023

8.5 Research and Rehabilitation Trials

8.5.1 TSF1 Trial Plots

Four trial plots of 20m x 20m have been within the southwest corner of TSF1, separated from active deposition, since 2008. Each plot has different levels and layers of cover over the tailings.

Table 28 TSF1 capping trial design specifications

Design	Plot A	Plot B	Plot C	Plot D
	No specific cover	Shallow cover	Shallow cover with capillary break	Standard cover
Topsoil [m]	0.1	0.1	0.1	0.1
Waste rock [m]	--	0.4	0.4	0.9
Capillary break [m]	--	--	0.3	--
Total trial depth [m]	0.1	0.5	0.8	1

Modelling of the water balance for various cover design scenarios showed that for the climatic conditions of Northparkes, the contribution of vegetation to extract moisture from the cover could greatly improve the performance. The maximum depth from which upward water flow, caused by evaporation, has been derived from modelling is approximately 1.8 to 2m. This depth would ensure avoidance of surface salt accumulation. In case of shortcomings of topsoil or other fine textured material, upward flow from a saline subsurface layer can be interrupted by a capillary break layer, consisting of coarse competent rock, which would allow a reduction of the cover thickness.

Drone photos have been taken of the trial plots from 2019 onwards to assist in monitoring the differences between groundcover percentage and indicate species diversity between each plot across the reporting years (Figure 28). Plot A continued to maintain the highest percentage of groundcover and higher contribution to cover from perennial grasses.

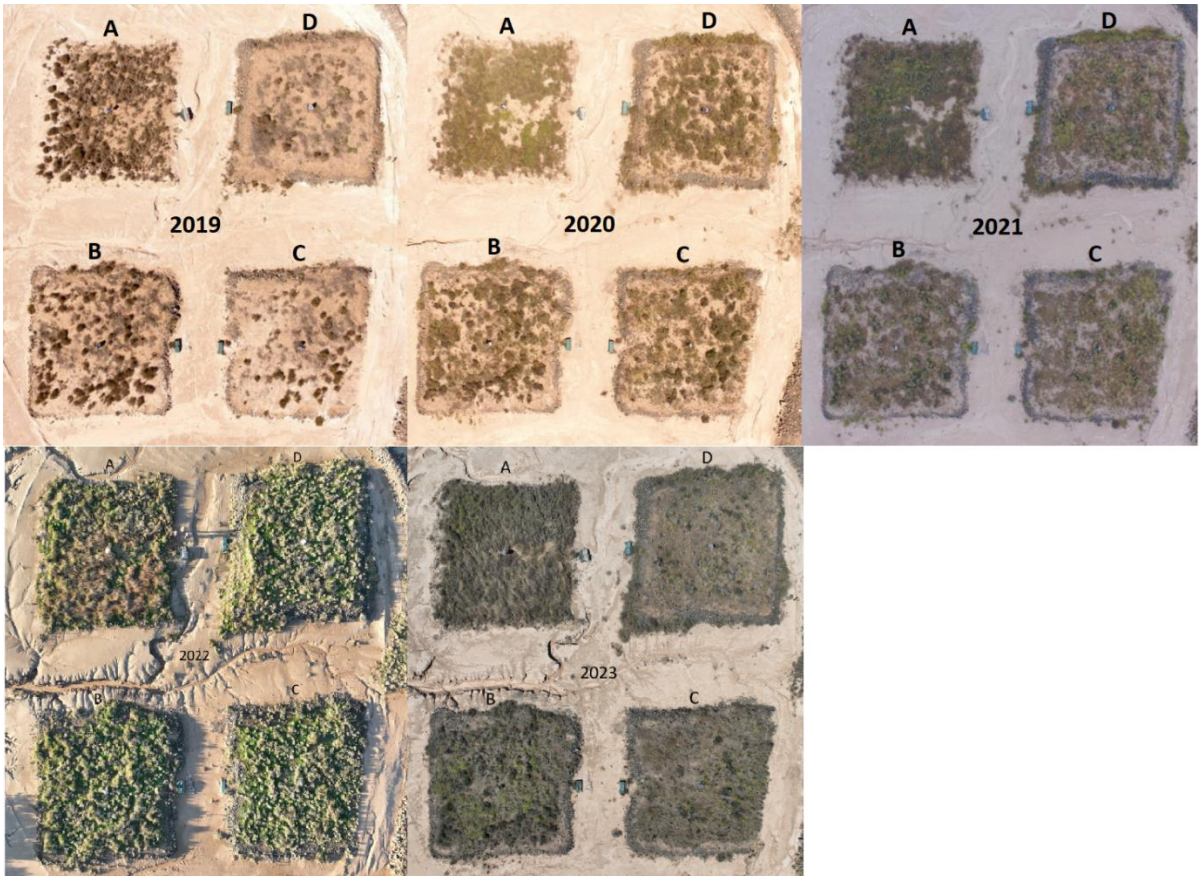


Figure 28 TSF1 trial plot groundcover comparison from 2019 to 2023

An external ecologist assessed the vegetation cover across the four TSF1 trial plots in October 2023 and compared the results to their August 2019 assessment. Figure 28 shows the changes in ground cover provided by living plants across each of the plots. The percentage of living groundcover was maintained with Plot A (0.1m topsoil) over the four years, however the percentage of living groundcover is less as the plot thickness increases.

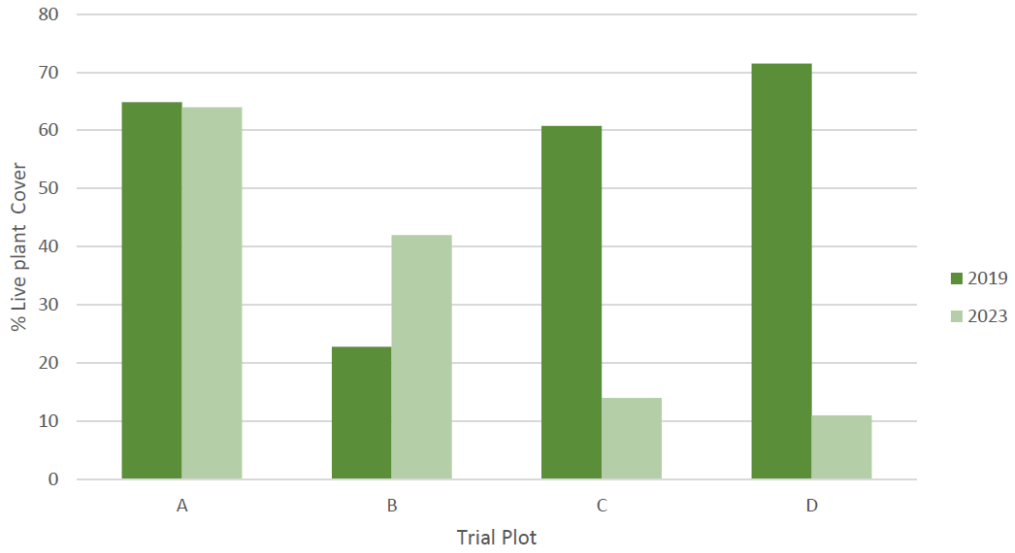


Figure 29 Percentage live plant cover recorded for TSF1 trial plots (2019 to 2023)

The percentage of groundcover provided by native plants was compared across three different assessment years (Figure 30). Plot A (0.1m topsoil) has maintained the highest percentage of native groundcover across the assessment period. It is understood that all plots had the same seeding treatment, indicating that the variability in native groundcover is likely to be influenced by the depth of the cover.

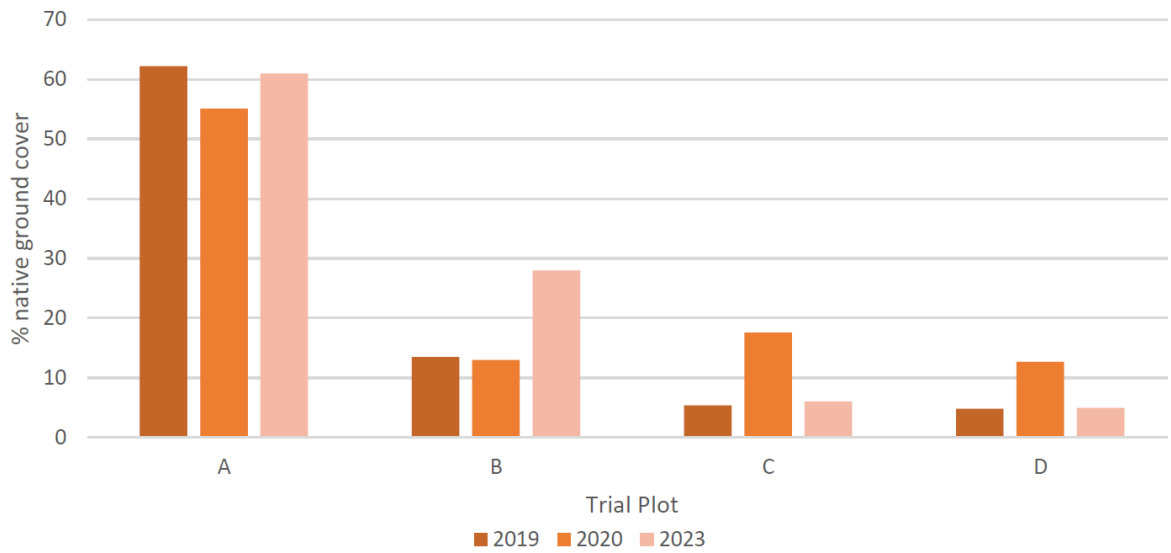


Figure 30 Percentage groundcover provided by Native Plants for TSF1 trial plots

8.5.2 TSF2 Direct Revegetation

Since 2015, a range of projects have been carried out on the existing TSFs to reduce potential dust lift off. The establishment of vegetation directly onto tailings has not only proven to be an effective dust control strategy but has demonstrated vegetation establishment directly within the saline tailings surface is possible.

Local native salt bush and blue bush species have colonised TSF2 and continue to provide ongoing dust management. The ongoing success of native vegetation species to establish directly in the TSF2 tailings has initiated a multi-year study into the potential for the tailings material to be used as a growth medium for long term rehabilitation.

During 2023 the microbial results from the 2022 sampling program were assessed. The results from vegetated and bare areas at varying depths or fertilizer applications were compared. Figure 31 shows the range of microbes across four different tailings treatments on TSF2. As expected, the tailings with the application of chicken manure or nitro humus have increased microbial activity.

In November 2023, as part of Modification 10, Northparkes was approved to use biosolids on the surface of TSF2 to enhance the established vegetation. Biosolids is expected to provide both a nutrient improvement, but equally important, a boost in microbes to the tailings profile.

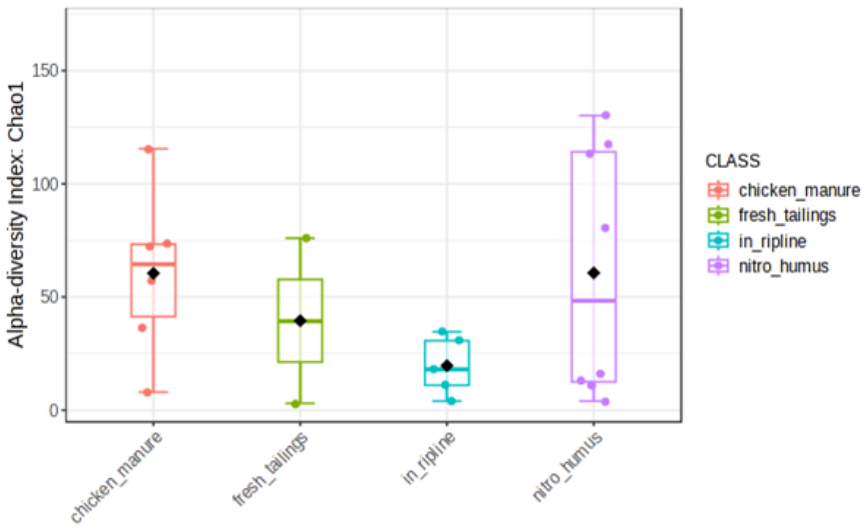


Figure 31 Range of microbe diversity across different TSF2 tailings treatments

8.5.3 Rehabilitation Notice Directions

In December 2023 Northparkes received a draft notice from the NSW Resources Regulator containing three directives. The formal notice was received in January 2024, stating the responses to the directions is to be completed by 31 October 2024. The three directions can be summarised as:

1. Modelled assessment of longer-term erosional stability of TSF landforms
2. Progression of the TSF capping planned for closure
3. Update the rehabilitation risk assessment including the outcomes from directions 1 & 2.

8.6 Rehabilitation Status

The areas rehabilitated to date include the E26 Oxide Dump, E26 Lift 1 Mullock Dump and waste rock dumps surrounding the E22 pit. None of these rehabilitated areas have been signed-off as final by regulators.

In 2009, DnA Environmental established monitoring sites which included mixed woodland and native grassland reference sites. These monitoring sites are assessed on a three-year basis, with the latest monitoring being carried out in the 2023 reporting period across 16 rehabilitation sites and seven reference sites.

All reference sites have been subjected to some prior form of disturbance, in particular clearing, logging and grazing and some sites were likely to be older regrowth. Exotic annual grasses and a range of other agricultural weeds such were also common.

The rehabilitation monitoring sites occur on various waste emplacements and on the TSF embankments. Some sites were also established in revegetation areas located around the farming properties as well in the Limestone Forest area. As discussed above, separate monitoring reports are prepared to record ecological changes occurring in the Estcourt and Kokoda Offset Areas. The monitoring sites were chosen based on their final land use/vegetation community type and year of establishment and were considered to be representative of the rehabilitation area as a whole.

Due to the disturbance on the TSF2 East Embankment (Section 8.2.2) and the E22 batter (Section 8.4.1), the two associated monitoring sites were restarted with new monitoring locations with low levels of functional patch areas currently. Older monitoring sites, such as E26 and E27 have developed well with patch areas remaining relatively high.

Many sites were dominated by naturalised exotic annuals that although they are weeds, they are an important part of the successional development of the rehabilitated area. The drier season leading up to the survey did results in few exotic annuals compared to other years. Macropod grazing impact was less in 2023 compared to the 2020 survey, primarily due to the improved seasonal conditions across the region.

There are no current or foreseeable issues that may affect the ability to successfully rehabilitate the site. Table 29 Rehabilitation Status and Figure 30 Percentage groundcover provided by Native Plants for TSF1 trial plots provides the status of disturbance and rehabilitation as per '*Table 8*' of the guidelines.

Table 29 Rehabilitation Status

Mine Area Type	2022 Reporting Period (Previous)	2023 Reporting Period (Actual)	2024 Reporting Period (Forecast)
Total Mine Footprint	1,303	1,386	1,418
Total active disturbance	1,224	1,177	1,209
Land being prepared for rehabilitation	137	158	158
Land under active rehabilitation	179	52	52
Completed Rehabilitation	0	0	0

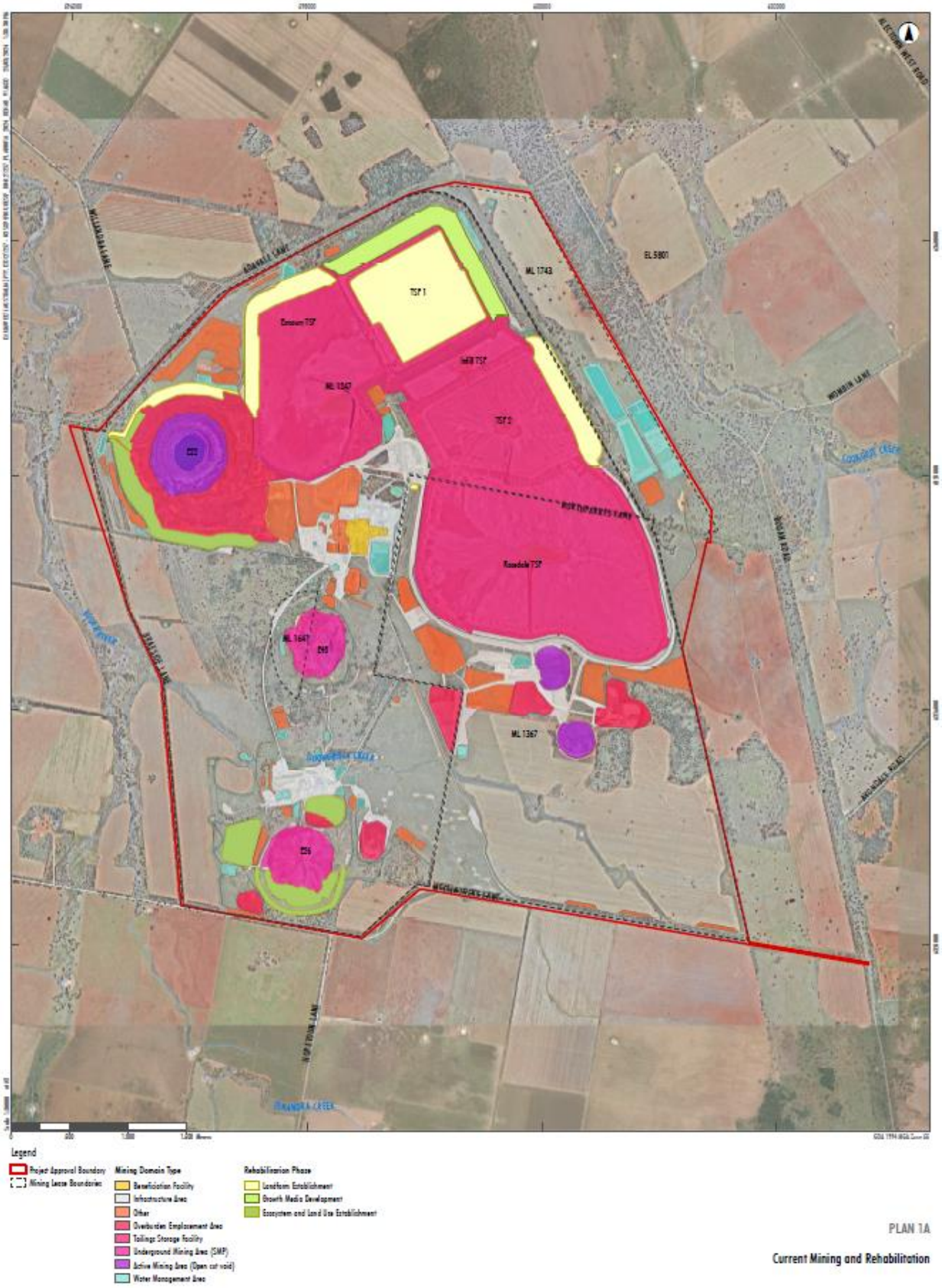


Figure 32 Rehabilitation status

8.7 Rehabilitation Actions for the next Reporting Period

As per the commitments within the current Forward Program, the following rehabilitation activities will be carried out:

- The ongoing monitoring of the established tailings cover trial plots on TSF1 will continue, which is detailed within Section 8.5.1
- Continued research into the vegetation established directly into the tailings, which is detailed within Section 8.5.2
- Research into various opportunities to modify the final tailings landforms will continue
- Respond to the Resources Regulator Directions (Section 8.5.3).

9. COMMUNITY RELATIONS

9.1 Reporting Period Summary

The Stakeholder Communications Management Plan (the Plan) guides Northparkes relationship with the community in which it is licensed to operate. The Plan aims to address the various and, at times, diverse needs of Northparkes stakeholders, employees, community and government. During 2023 Northparkes:

- Expanded stakeholder relationships
- Worked closely with the community and proactively participated in community initiatives
- Invested in the future of the community through community contributions, strategic partnerships, and scholarship programs and
- Recognises the importance of positive relations with its community and takes this into account in the operation of its business and the decisions made.

9.2 Community Engagement

Northparkes engages directly and regularly with the local community to both understand community issues and to keep the community updated about activities relating to the operations.

The Northparkes Community Consultative Committee (CCC) was established in 2006. The CCC provides an open forum to discuss any issues relating to Northparkes and its impact on the local community. The CCC comprises an independent chairperson, several local council and community members and Northparkes personnel. Two meetings were held in the reporting period in March, and July 2023. The primary topics covered within the period related to the Modification 10 and 11, and proposed State Significant Development (SSD): E44 Rocklands. A range of considerations were discussed, however no significant issues were raised during the meetings held with the CCC during the reporting period.

Northparkes hosts formal meetings open to neighbours twice a year and meets with many neighbours individually throughout the year. During 2023, formal meetings were held in March and October at Adavale Hall.

The Northparkes Facebook and LinkedIn page were used actively as a two-way communication channel by both Northparkes and the community in 2023. The Northparkes Facebook Page has over 5,000 followers and LinkedIn has over 10,000 followers.

Additional engagement and communication with neighbours were undertaken on a scheduled and as required basis, with the commencement of surface blasting in the E31 zone. Neighbours received scheduled text messages 24 hours prior to the blast, and any updates if the schedule changed. The Northparkes website was also used to communicate blasting times and additional information to our community.

The Northparkes Environment Team distributes a weekly weather report, internally. If there is a high-risk dust day, the Community and Engagement Team contact any neighbour who may be potentially impacted. The messaging includes information about the expected high-risk day and any mitigating actions Northparkes plans to take, as well as the invitation to call the Community and Engagament Specialist if people have concerns or questions.

9.3 Contributions and Achievements

In line with its commitment to support a sustainable community, Northparkes has an investment program to manage financial support for local community events, committees and schools. This program encompasses a small number of carefully considered donations, the Northparkes Community Investment Program and the partnership programs. An independent sub-committee helps Northparkes make decisions regarding sponsorship requests from the local community, as part of the Northparkes Community Investment Program.

In 2023, Northparkes continued to provide financial assistance to local organisations that deliver benefits to the community investing in various sporting, educational, cultural, industry, environmental and agricultural programs.

The major initiatives in the reporting period included:

- Funding a Grants Officer Program in conjunction with Parkes Shire Council
- Funding for an Aboriginal Project Officer in conjunction with Parkes Shire Council
- A Sports Grant Program with the Parkes Shire Council
- Supporting education through the Parkes Life Education Program
- Supporting children's developmental health through the Sprouts Program and the Parkes Early Intervention
- Funding for the Frontline Services Ball in support of the Central West Ronald McDonald House Orange

Figure 33 Northparkes employees and committee members for the Northparkes Frontline Ball

9.4 Complaints

9.4.1 Management of Complaints

Northparkes has a process for receiving, investigating, responding and reporting complaints received from community members. 24-hour external telephone lines are in place to allow the public to raise community concerns. These contact numbers are advertised on the Northparkes website.

Registered neighbours received an updated magnetised contact list including all relevant contact numbers of Northparkes personnel.

The website provides information about all aspects operations and has the capacity for the community to submit enquiries, concerns or complaints via e-mail direct to the Community and External Relations Advisor.

All complaints received across site are referred to the Community and Engagement Team, and are then responded to in a professional and timely manner. All complaints are recorded, with the outcomes of investigation findings and corrective actions communicated to the relevant personnel and reported in the Annual Review and the annual Northparkes Report.

9.4.2 Registered Community Complaints

During the reporting period, two community complaints were received in relation to separate dust events coming from the site. Both events were the result of a combination of adverse weather conditions and operational circumstance preventing mitigation measures being implemented on the TSFs. Neither of the events exceeded the impact criteria defined in the Consent. The complainants were notified of the results of the internal investigation and the implemented controls to reduce extent of future dust events.

Monthly summaries of complaints are made publicly available on the website at: **https://evolutionmining.com.au/northparkes/**

A number of concerns were raised by Northparkes neighbours to employees which were addressed adequately, preventing the neighbours making formal complaints.

9.5 Workforce Profile

Wherever possible, local personnel are employed by Northparkes and its contractors. The team consists of 407 staff, with majority locally based. Modified employee working arrangements increased the personnel residing in 'Other' localities from 15% to 16%. A breakdown of the local government areas where employees reside is presented in Table 30.

Table 30 Residential Locality of Employees

Locality	Employee Residency (%)
Parkes	65%
Forbes	13%
Dubbo	2%
Orange	2%
Peak Hill	2%
Other	16%

10. INDEPENDENT ENVIRONMENTAL AUDIT

As required by Schedule 6, Condition 9 and 10 of DC 11_0060, Northparkes are required to undertake an independent environmental audit every three years. The last independent audit was carried out within the 2021 reporting period with all actions complete. The next independent audit is scheduled for May 2024.

11. INCIDENTS AND NON-COMPLIANCES

11.1 Non-compliances during the reporting period

As stated within Section 1, there were two non-compliances recorded for the 2023 reporting period. The non-compliances are considered administrative and no risk for environmental harm. Details of the non-compliances are provided within the following sections.

11.1.1 Blasting Hours

Blast occurring on Thursday, 30 November, in the E31 open cut area and was recorded by the blast monitor to have occurred at 5:01:19, one minute and 19 seconds after the 5pm limit stated in the Consent. The event was identified as a breach of Schedule 3, Condition 7, stating that surface blasting is to be carried out between 9am and 5pm. Northparkes self-reported the event to DPE. An internal investigation was undertaken and found reasons for the non-compliance were due to decisions to ensure the safety of employees and contractors. Loaded holes were not permitted to be left overnight as risk of rockfall had the potential to cause premature initiation or misfire. Northparkes has proposed and implemented actions to prevent the non-compliance from reoccurring.

11.1.2 Publicly Available Report

As per Condition 12 of EBPC Approval 2013/6788, stating that "*Within three months of every 12 month anniversary of the commencement of the action (12 June), the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval*,…". Due to issues with the company website, the annual compliance report was not uploaded within the specified timeframe. Northparkes notified the Department of Climate Change, Energy, the Environment and Water (DCCEEW) on 15 January after becoming aware of the issue. These issues have since been rectified and the compliance report is now publicly available.

11.2 Summary Environmental Incidents

During 2023 there were 23 internally reported events, with an environmental component, reported across different event types and event outcomes. The majority of events related to hydrocarbon management and spillage from damaged equipment. The details of events, likely causes, actions to date and additional proposed measures were uploaded into the risk management system (known as RMSS) in accordance with reporting procedures. The separation between near misses and incidents is detailed within Table 31.

Table 31 Environmental Hazards and Incidents

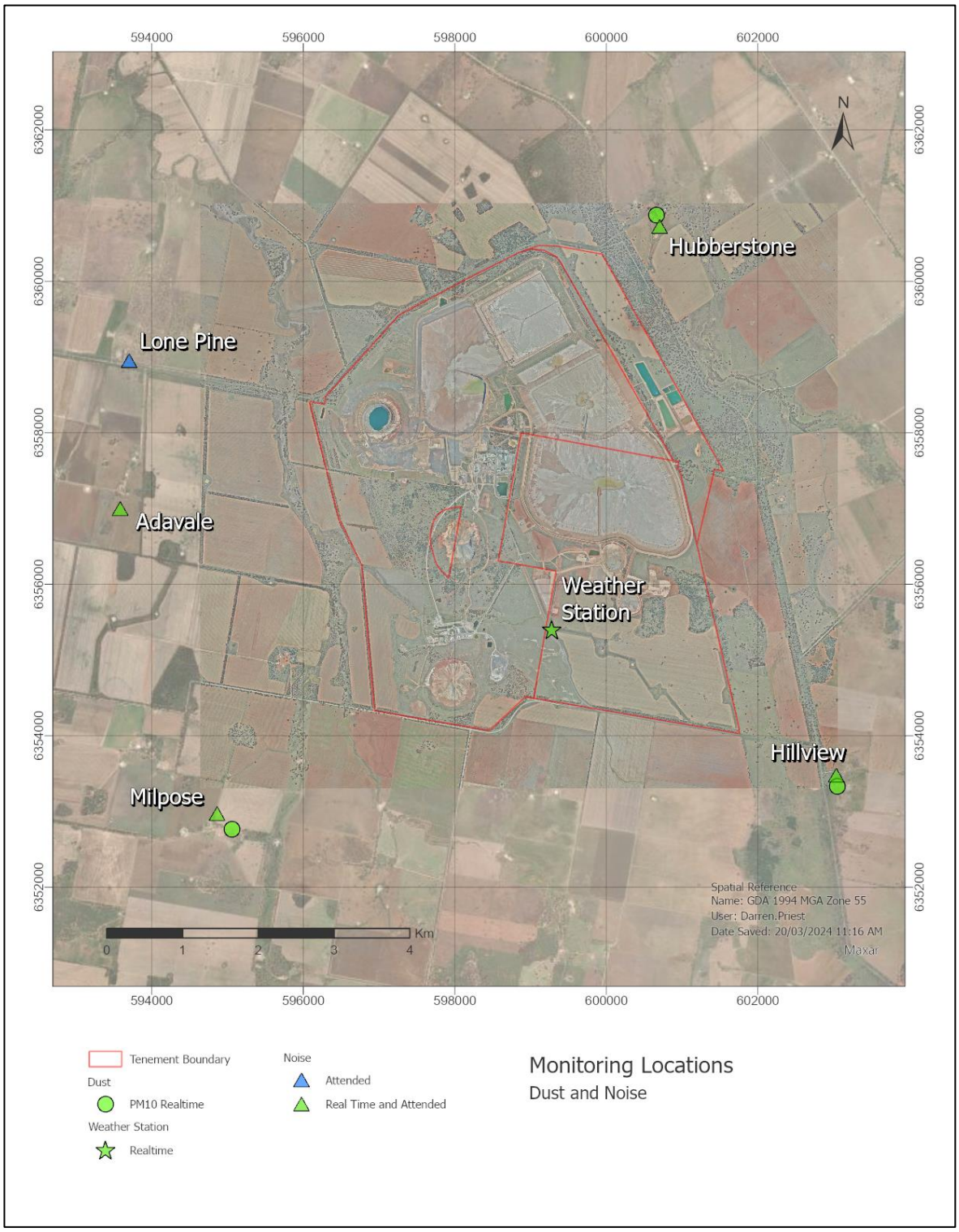
Event Type	Number
Hazards	12
Incident Near Miss	0
Incident Actual	10
Total	**22**

12. ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

Activities proposed for the next reporting period include:

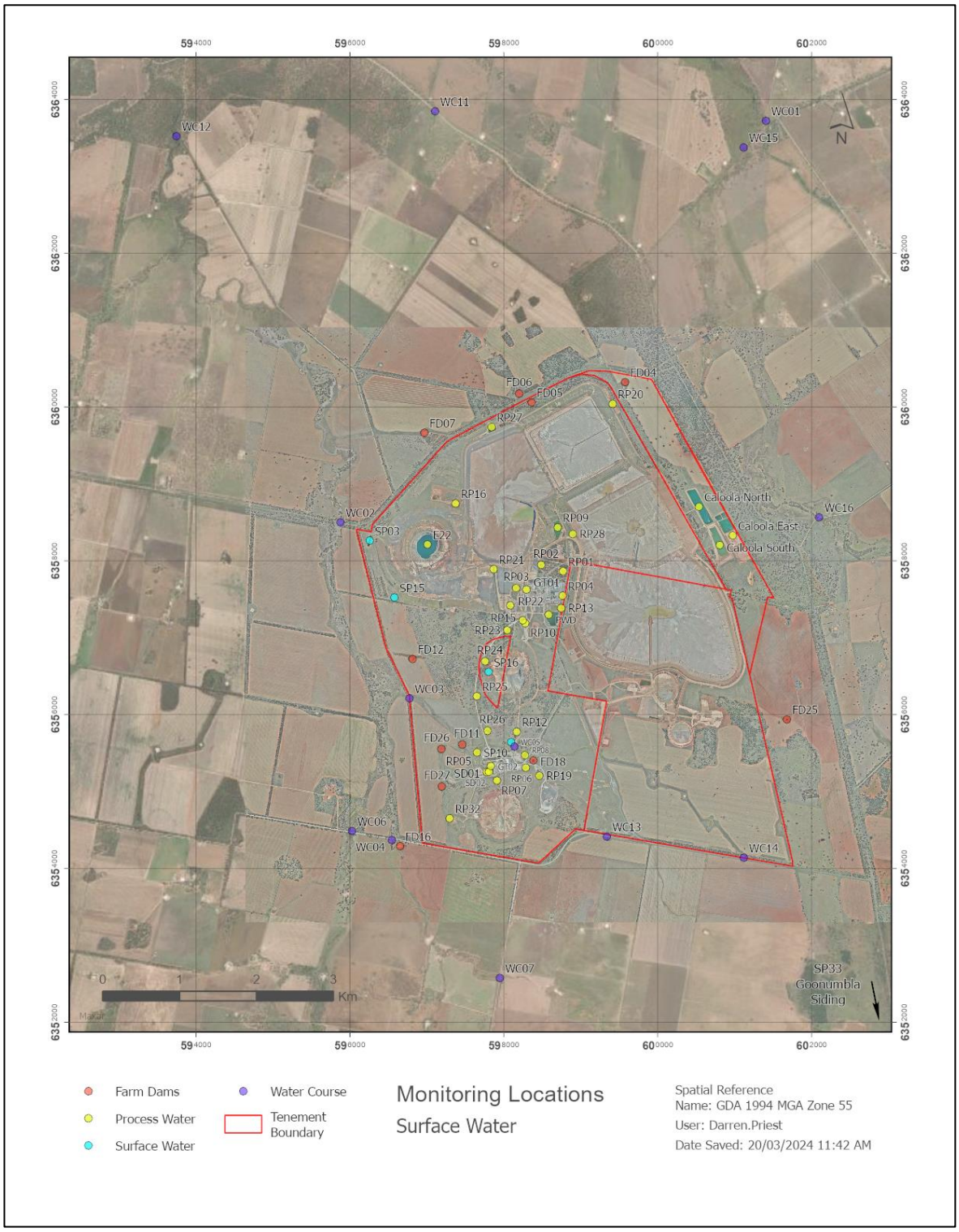
- Complete Post Approval Independent Environmental Audit in accordance with Schedule 6, Condition 9 of the Consent
- Progress various modifications works and implement conditions post approval
- Investigate and implement noise mitigative techniques for surface mining activities
- Continue research aimed at improved long-term effectiveness of tailings closure covers and embankment designs

APPENDIX 1 DUST AND NOISE MONITORING LOCATIONS

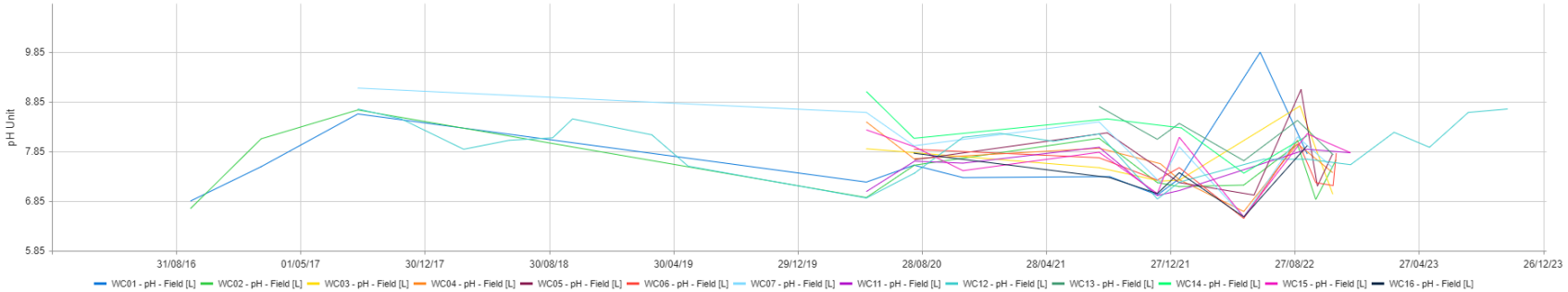


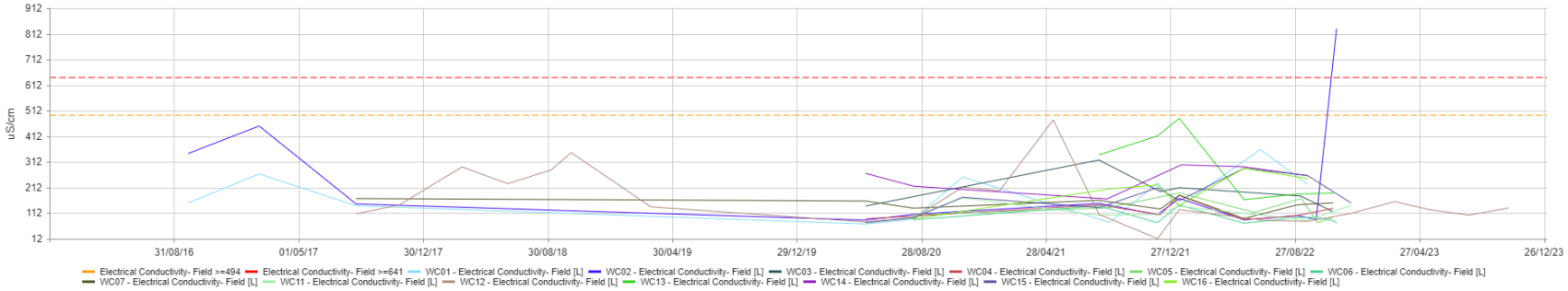
APPENDIX 2 WATER MONITORING

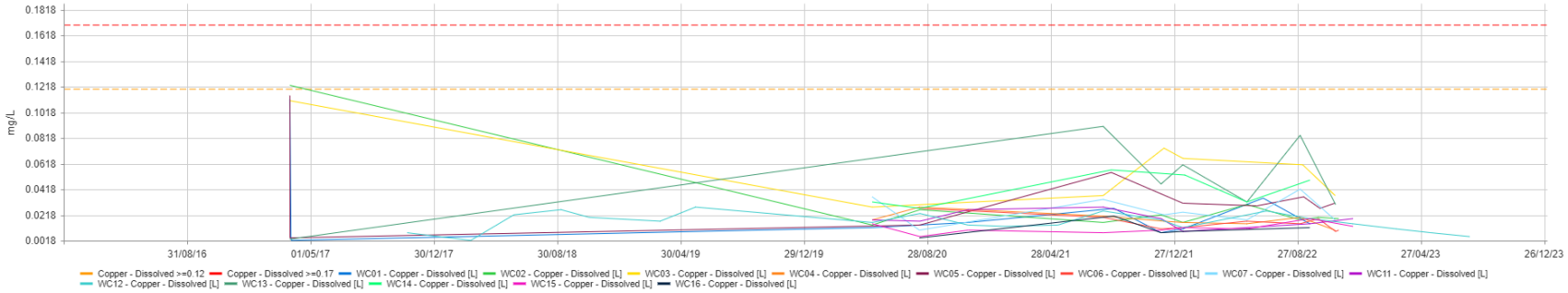
Surface water monitoring locations



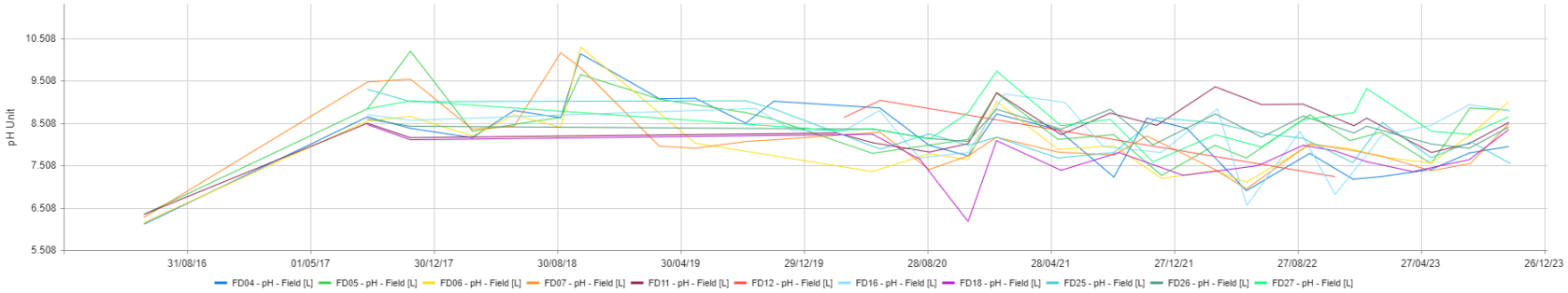
Surface water monitoring results – Water Course pH, electrical conductivity and copper

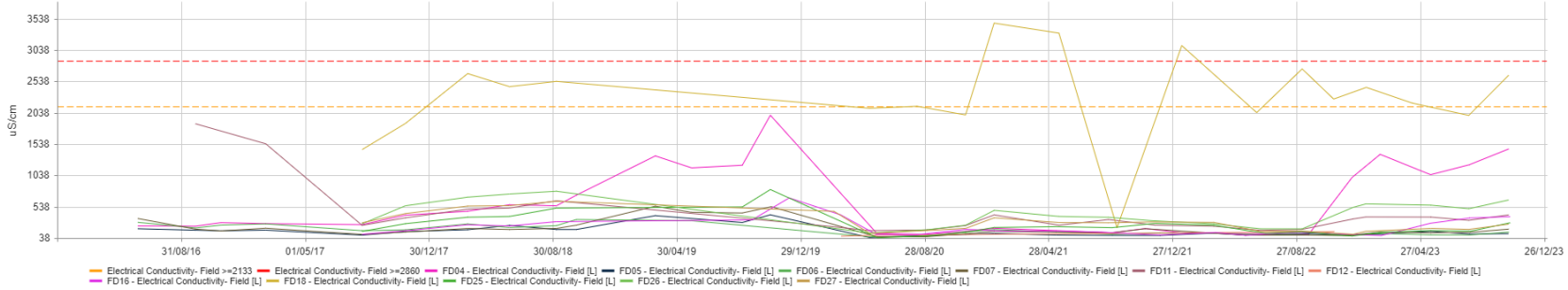


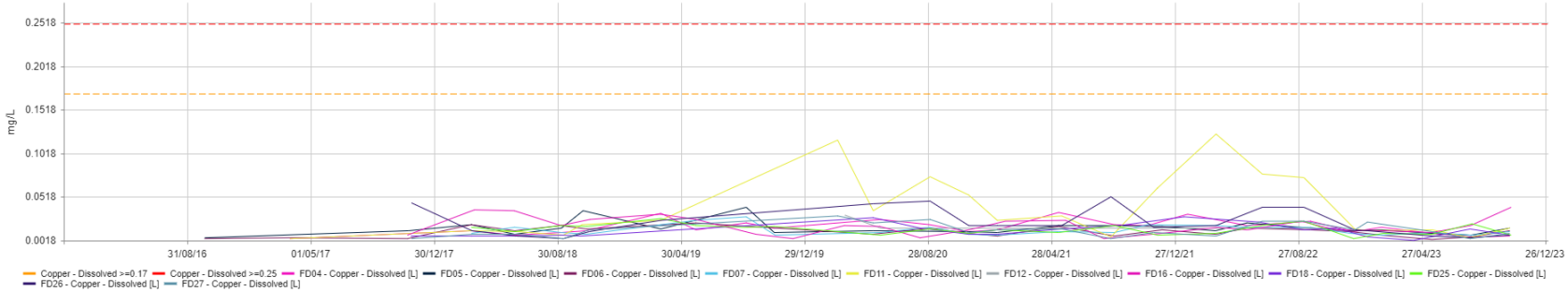




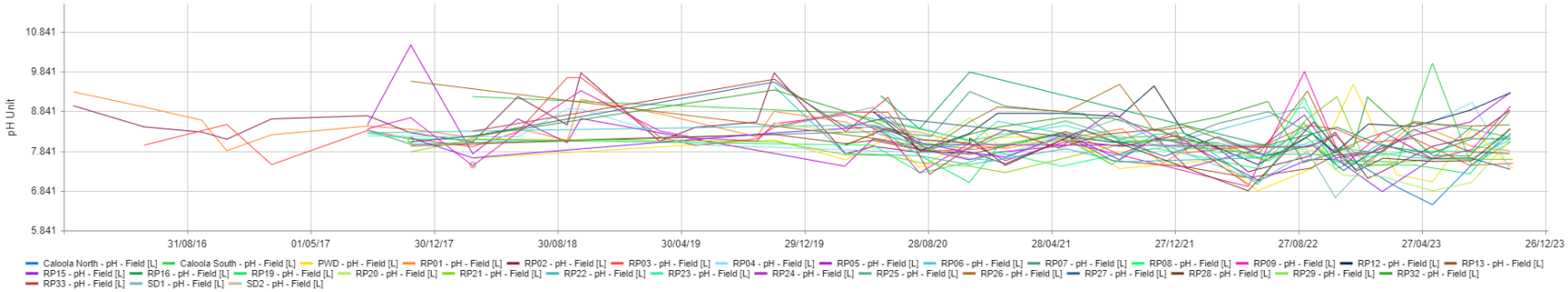
Surface water monitoring results – Farm dams pH, electrical conductivity and copper

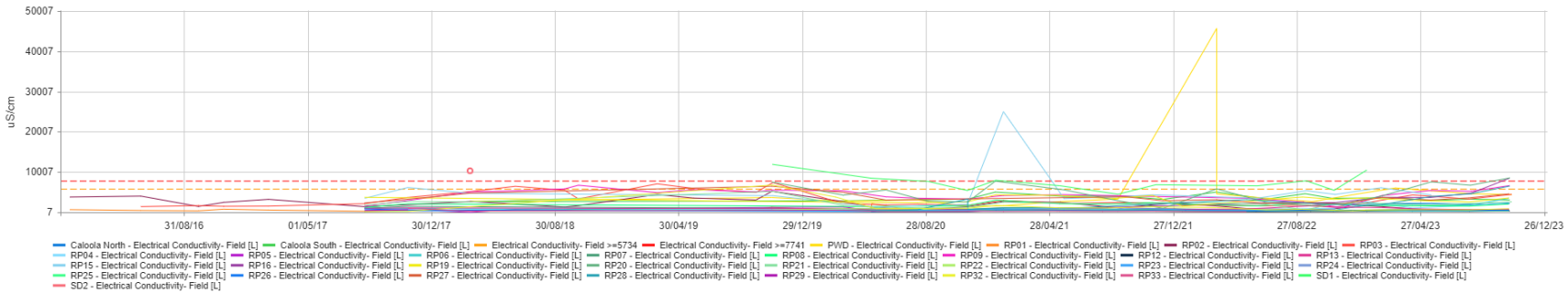


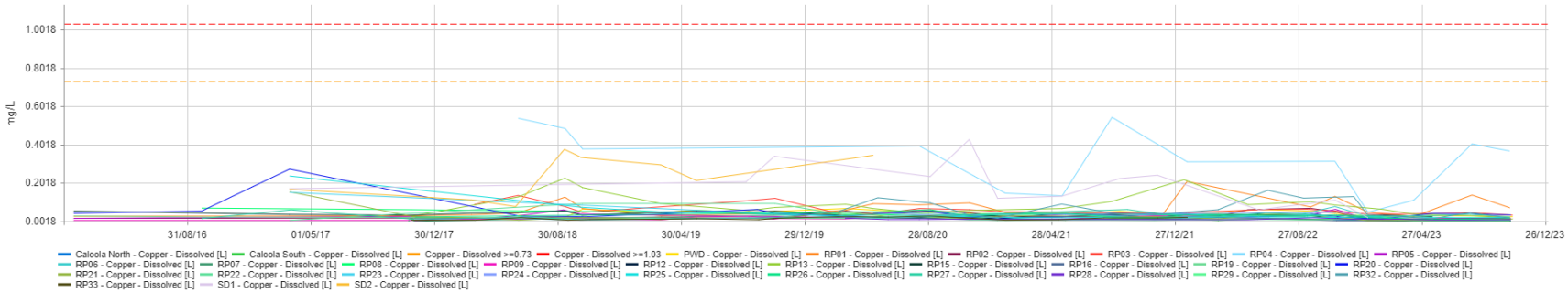




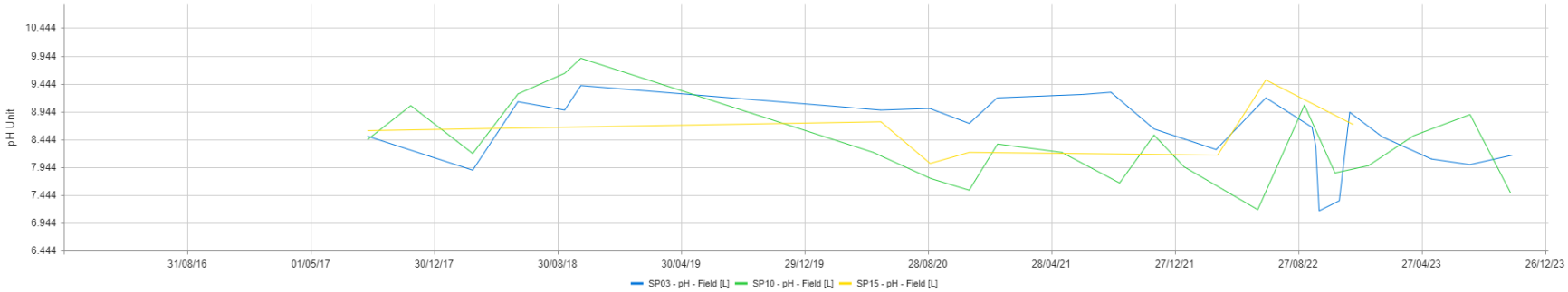
Surface water monitoring results – Retention ponds pH, electrical conductivity and copper

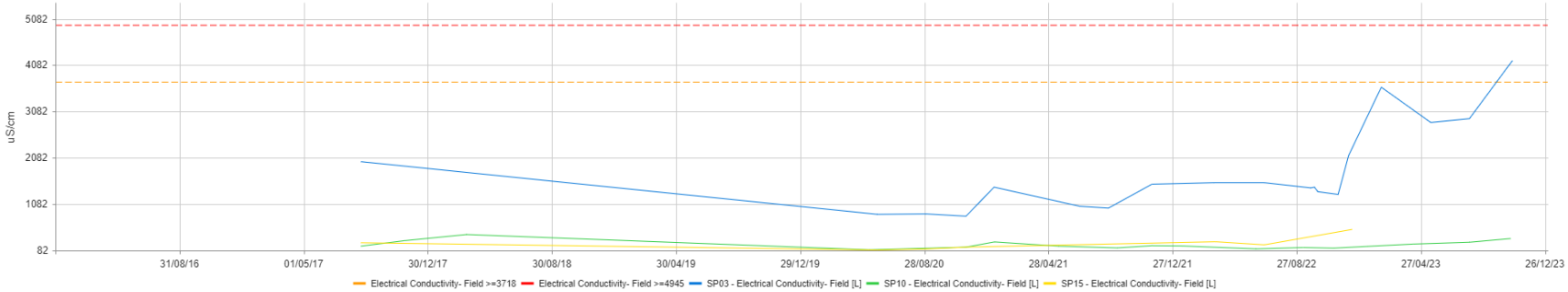


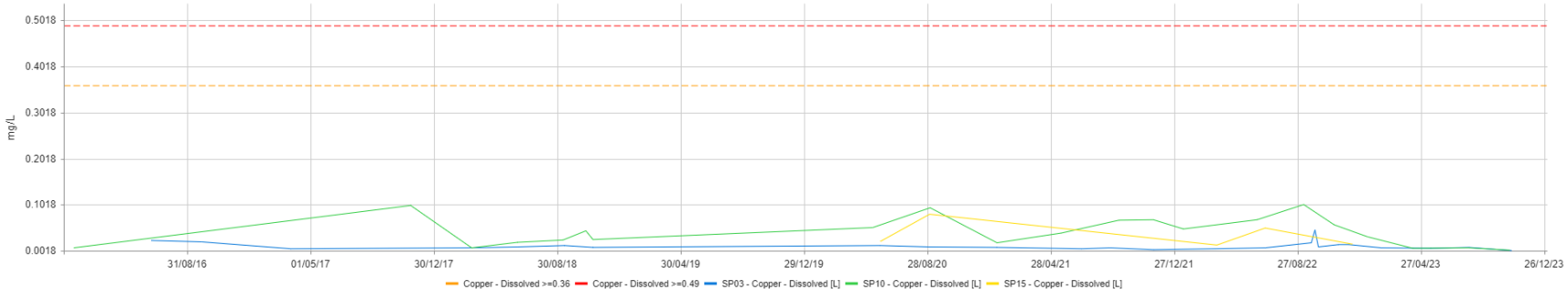




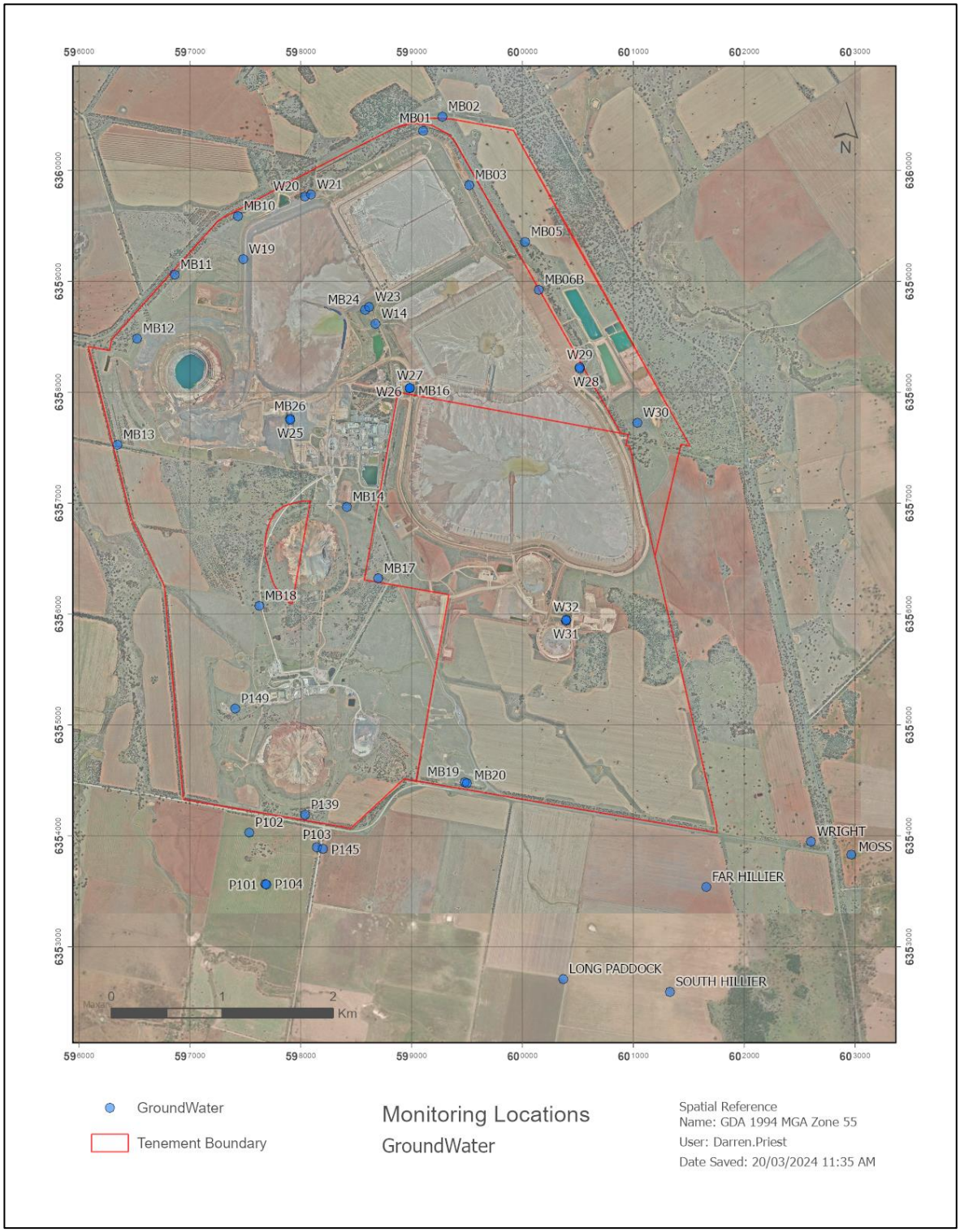
Surface water monitoring results – Sediment ponds pH, electrical conductivity and copper



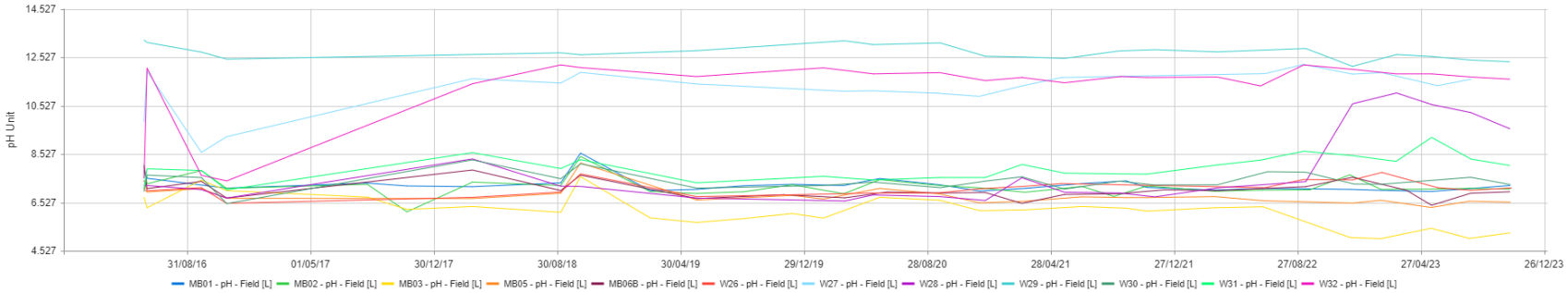


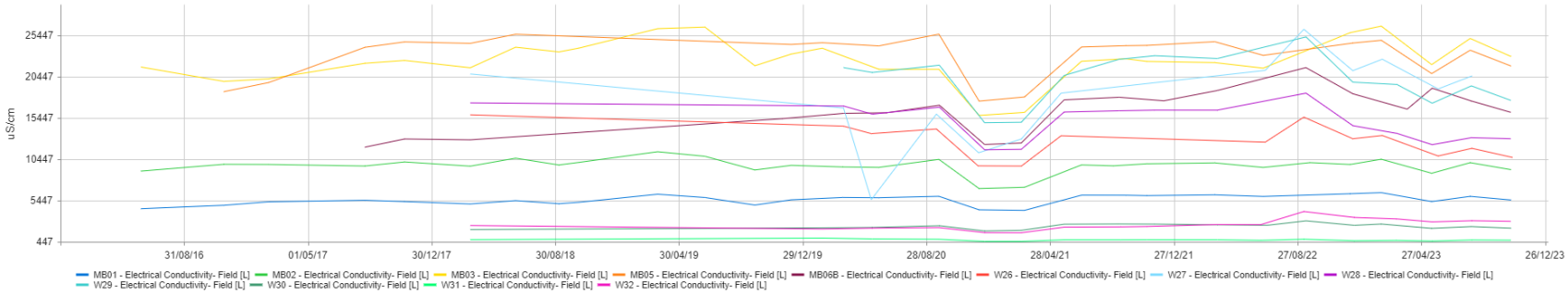


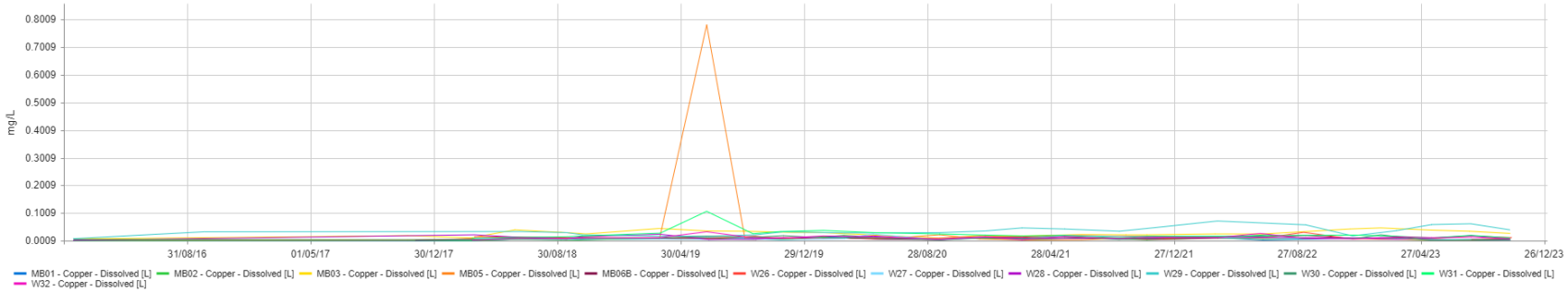
Ground water monitoring locations



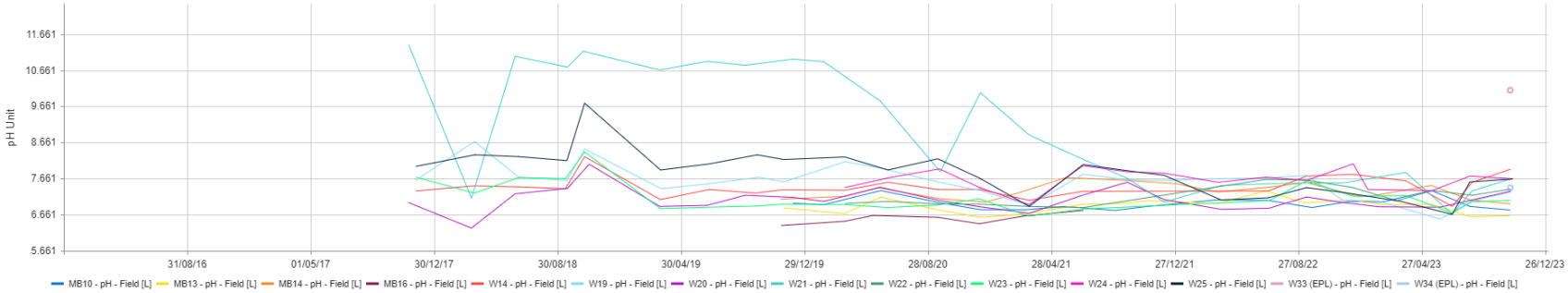
Ground water monitoring results – TSF bores pH, electrical conductivity and copper

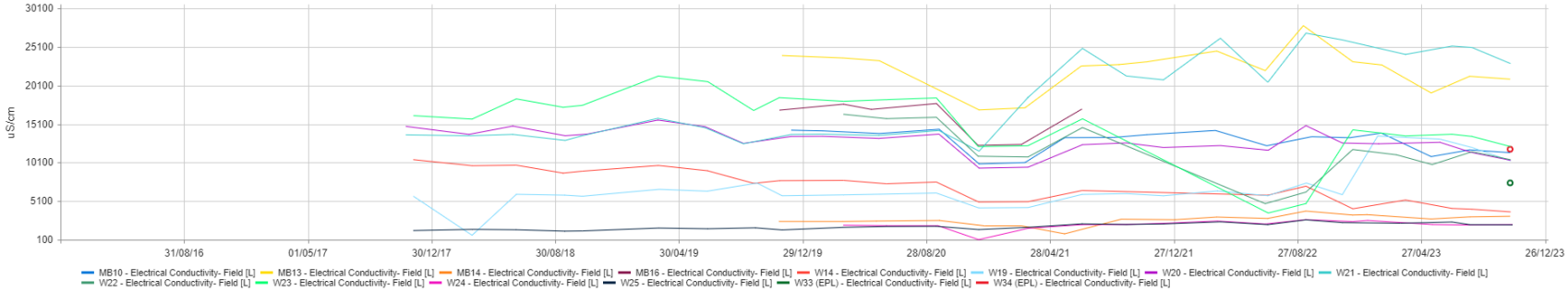


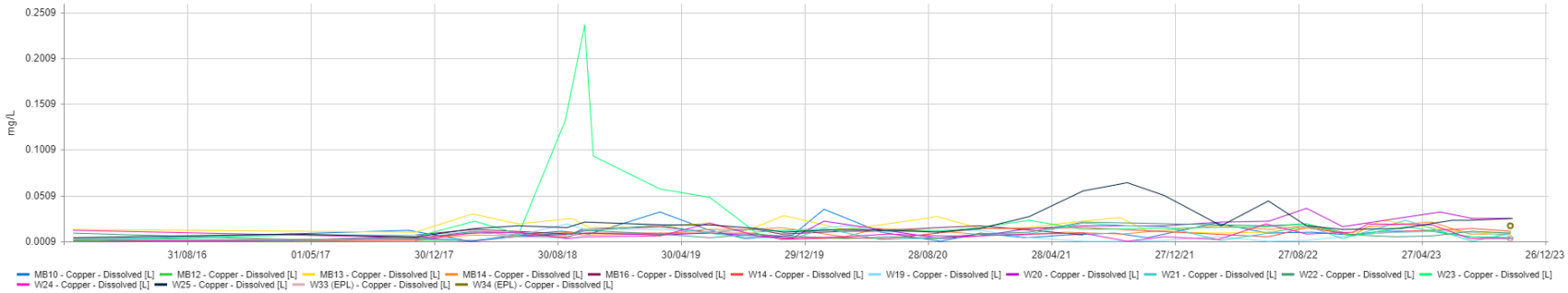




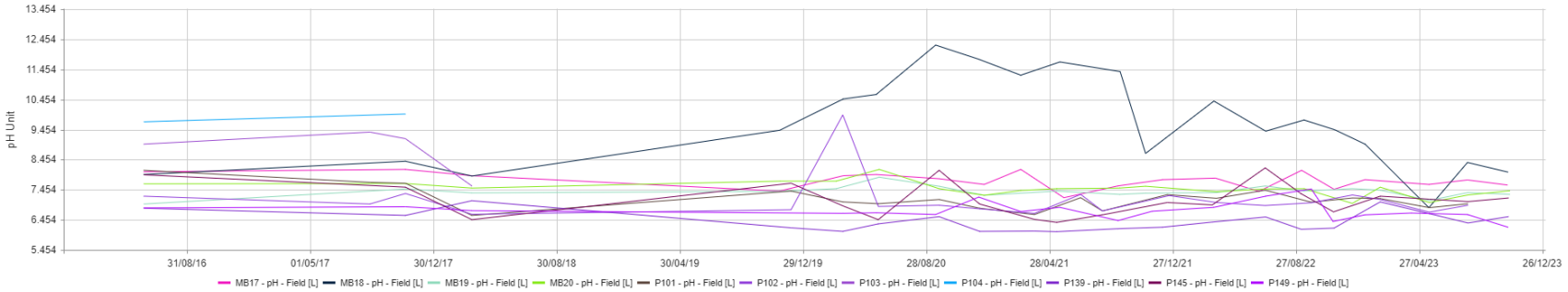
Ground water monitoring results – Opencut bores pH, electrical conductivity and copper

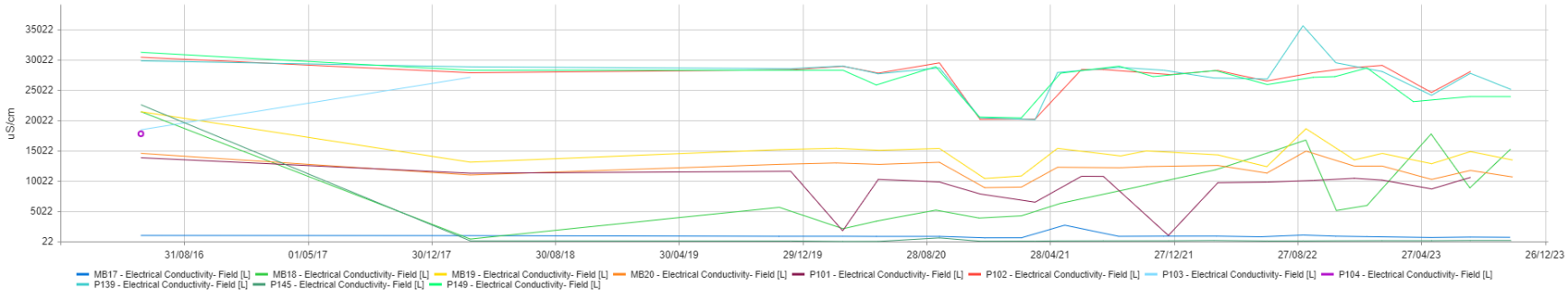


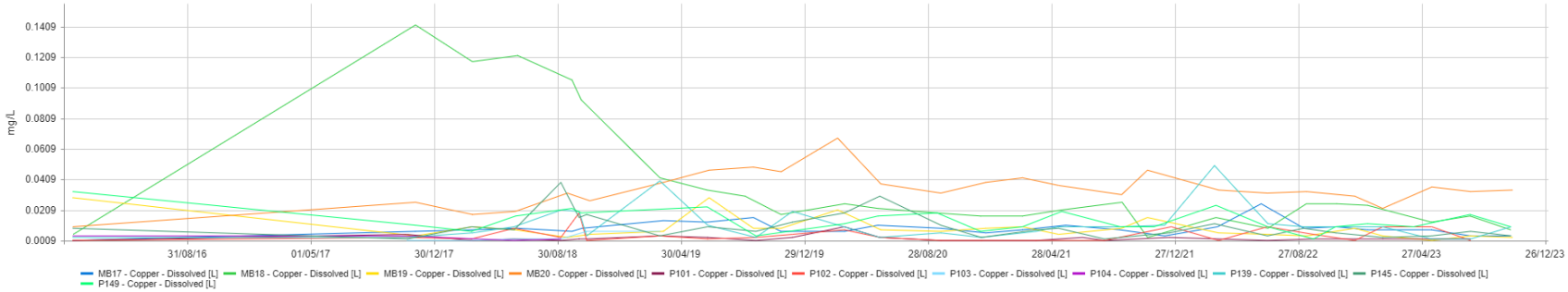




Ground water monitoring results – Underground bores pH, electrical conductivity and copper







Ground water monitoring results – Regional bores pH, electrical conductivity and copper