SIMEC

MEMBER OF GFG ALLIANCE

Tahmoor Coal Pty Ltd

2021 ANNUAL REVIEW, AEMR AND REHABILITATION REPORT

March 2022

simecgfg.com

This page has been left blank intentionally.

Document Control

PUBLICATION DATE:	31/03/2022
REVIEW DATE:	31/03/2022
AUTHOR:	Natalie Brumby – Environmental Officer Amanda Bateman – Community Liason Specialist Tahmoor Coal – SIMEC Mining
REVIEW:	Zina Ainsworth – Environment and Community Manager April Hudson - Approval Specialist Thomas O'Brien – Environmental Specialist
VERSION NUMBER:	**Rev 1**
COMMENTS:	**Final**

simecgfg.com

This page has been left blank intentionally.

Table of Contents

Table of Contents v

List of Figures vii

List of Tables viii

1 Title Block 1

2 Statement of Compliance 2

3 Independent Audit 3

4 Introduction 11

4.1 Background 11

5 Approvals 14

6 Operations Summary 16

6.1 Mining Operations 16

6.2 Next Reporting Period 17

7 Actions Required from Previous Annual Review 20

8 Environmental Performance 21

9 Operational Noise 23

9.1 Environmental Management 23

9.2 Environmental Performance 23

9.3 Further Improvements 25

10 Air Quality 27

10.1 Environmental Management 27

10.2 Environmental Performance – Dust 27

10.2.1 Depositional Dust 27

10.2.2 Continuous and Hi Vol Dust Monitoring 28

10.2.3 Total Suspended Particulate 30

10.3 Environmental Performance – Greenhouse Gas Emissions 31

10.4 Further Improvements 32

11 Erosion and Sediment Control 33

11.1 Environmental Management 33

11.2 Environmental Performance 33

11.3 Further Improvements 33

12 Contaminated Land 34

12.1 Environmental Management 34

12.2 Environmental Performance 34

12.3 Further Improvements 35

13 Biodiversity 36

13.1 Environmental Management 36

13.2 Environmental Performance 36

13.3 Further Improvements 38

14 Aboriginal Cultural and Historical Heritage 39

14.1 Environmental Management 39

14.2 Environmental Performance 42

14.3 Further Improvements 44

15 Mine Subsidence 45
15.1 Environmental Management 45
15.2 Environmental Performance 45
15.3 Surface Water 45
15.4 Groundwater 46
15.4.1 Six Monthly Subsidence Impact Report results 46
15.5 Rail Infrastructure 47
15.6 Subsidence Event Notifications 48
15.7 Subsidence Monitoring 48
15.8 Further Improvements 49
16 Natural Heritage 50
16.1 Environmental Management 50
16.2 Environmental Performance 50
16.3 Further Improvements 50
17 Water Management 51
17.1 Groundwater 51
17.1.1 Environmental Management 51
17.1.2 Environmental Performance – Pit top and Reject Emplacement Area Piezometeres 51
17.1.3 Further Improvements 57
17.2 Surface Water 57
17.2.1 Environmental Management – Water Quality 57
17.2.2 Environmental Performance – Water Quality 58
17.2.3 Environmental Management – Water Discharge 65
17.2.4 Further Improvements 67
17.2.5 Potable Water Supply 68
17.2.6 Recycled Water Treatment Plant 68
17.2.7 Water Storage Volumes 68
18 Rehabilitation 70
Environmental Performance 71
18.1 71
18.2 Actions for the Next Reporting Period 73
18.3 Mine Closure 76
18.3.1 Post mining Land use 76
18.3.2 Rehabilitation Indicators 76
19 Weeds 79
19.1 Environmental Management 79
19.2 Environmental Performance 79
19.3 Further Improvements 80
20 Bushfire Management 81
20.1 Environmental Management 81
20.2 Environmental Performance 81
20.3 Further Improvements 81
21 Community 84
21.1 Community Engagement Activities 84
21.2 Community Contributions 84
21.3 Community Investment Program 85

21.4 Community Complaints 86
22 Incidents, Notifications and Non-Compliances 89
23 Activities to be Completed during the Next Reporting Period (1st January 2022 – 31st December 2022) 91
24 Related Documents 92
25 Abbreviations 93
26 Appendices 95

List of Figures

Figure 1 Mining Area and Tenure 13
Figure 2 Western Domain Longwalls West 1 - West 4 18
Figure 3 Tahmoor South Domain Longwalls 19
Figure 4 Locations of Noise Monitors 26
Figure 5 Depositional Dust Monitoring Annual Average Comparison 28
Figure 6 High Volume Air Quality Monitoring Results from PM10 dust monitors located at Olive Lane and Hodgson Grove. 29
Figure 7 Continuous PM10 annual average results from our Charlies Point Road dust monitor. 30
Figure 8 Aboriginal Sites within Study Area for LW W3-W4 40
Figure 9 Registered Historical heritage items within the Study Area for LW W3-W4. 41
Figure 10 Locations of Sandstone culvets at 88.400km and at 88.980km. 43
Figure 11 Locations of Piezometers at Pit top and the REA 52
Figure 12 Piezometer groundwater levels for Pit Top 53
Figure 13 Piezometer groundwater levels for REA 53
Figure 14 Groundwater Pit top Piezometers – pH 54
Figure 15 Groundwater REA Piezometers – pH 54
Figure 16 Groundwater Pit top Piezometers – EC 55
Figure 17 Groundwater REA Piezometers – EC 55
Figure 18 Calculated Groundwater Inflow Annual Volume (Calender Year). 57
Figure 19 Monthly Compliance Monitoring of pH at LDP1 from 2015-2021. 60
Figure 20 Monthly Compliance Monitoring of Electrical Conductivity at LDP1 from 2015-2021 60
Figure 21 Monthly Compliance Monitoring of Turbidity at LDP1 from 2015-2021. 61
Figure 22 Monthly Compliance Monitoring of Total Suspended Solids at LDP1 from 2015-2021. 61
Figure 23 Monthly Compliance Monitoring of Arsenic and Nickel at LDP1 from 2015-2021. 62
Figure 24 Monthly Compliance Monitoring of Zinc at LDP1 from 2015-2021. 62
Figure 25Monthly Compliance Monitoring of Aluminium at LDP1 from Dec 2020-Dec 2021. 63
Figure 26 Monthly Compliance Monitoring of Zinc at LDP1 from Dec 2020-Dec 2021. 63
Figure 27 Monthly Compliance Monitoring of Copper at LDP1 from Dec 2020-Dec 2021. 63
Figure 28 Monthly Compliance Monitoring of Barium at LDP1 from Dec 2020-Dec 2021. 64
Figure 29 Monthly Compliance Monitoring of Nitrogen at LDP1 from Dec 2020-Dec 2021. 64
Figure 30 Monthly Compliance Monitoring of Enterococci at LDP1 from Dec 2020-Dec 2021. 64
Figure 31 Daily Discharge (kL) via LDP1 67
Figure 32 Volume (ML) of Discharge from LDP1 for the past 5 years. 67
Figure 33 Rehabilitation stages and monitoring plots 73
Figure 34 Reject Emplacement Area 2021 progress and 2021 proposed works. 75
Figure 35 Final rehabilitation and post-mining land use 78

Figure 36 Annual Fire trail maintenance for Tahmoor Coal 82
Figure 37 Community Complaint Statistics 86

List of Tables

Table 1.1 Title Block 1
Table 2.1 Statement of Compliance (2021) 2
Table 2.2 Compliance Summary (2021) 2
Table 3.1 Actions from 2020 Independent Environmental Audit completed to date. 3
Table 4.1 Tahmoor Coal Contacts 12
Table 6.1 Operational Performance 16
Table 8.1 Environmental Performance 21
Table 10.1 Depositional Dust Gauge Data 27
Table 10.2 Total Suspended Particulates recorded for 2021. 30
Table 10.3 Annual Greehouse Gas Emissions for Financial Year 31
Table 12.1 Hazardous Building Material Audit Actions 34
Table 15.1 Subsidence Event Notifications 48
Table 17.1 Summary of Groundwater Outflow 56
Table 17.2 Licensed Discharge and Overflow Points Locations 57
Table 17.3 LDP1 Discharge Water Quality 59
Table 17.4 Daily Discharge (KL) via Licence Discharge Point 1 (LDP1). 66
Table 17.6 Recycled and Potable Water Use 68
Table 18.1 Rehabilitation Summary 70
Table 18.2 TARP Classification 71
Table 18.3 TARP Rehabilitation Performance 71
Table 18.4. Tahmoor Coal Closure Domains 77
Table 19.1 Weed Target Species 79
Table 21.1 Community Contributions in 2021 86
Table 21.2 Complaint Details 87
Table 22.1 2021 Incidents, notifications and non-compliances 89
Table 24.1 Related Documents 92
Table 24.2 Abbreviations 93
Table 26.1 Appendix Details 95

1 Title Block

Table 1.1 Title Block

Name of operation	Tahmoor Coal – SIMEC Mining
Name of operator	Tahmoor Coal Pty Ltd
Development consent / project approval #	DA 1975, DA 1979, DC 57/93, DC 67/98, DA 190/85, DA 162/76, SSD8445, EPBC 2017/8084
Name of holder of development consent / project approval	Tahmoor Coal Pty Ltd
Mining lease #	Tahmoor Coal Holdings - ML1376, ML1308, ML1539, ML1642 & CCL716 Bargo Coal Holdings - CCL747
Name of holder of mining lease	Tahmoor Coal Pty Ltd Bargo Collieries Pty Ltd
Water licence #	WAL36442, , WAL 25777, WAL43572
Name of holder of water licence	Tahmoor Coal Pty Ltd
MOP/RMP start date	1/10/2020
MOP/RMP end date	16/06/2024
Annual Review start date	01/01/2021
Annual Review end date	31/12/2021
I, Zina Ainsworth, certify that this audit report is a true and accurate record of the compliance status of Tahmoor Coal Mine for the period 1 January 2021 and 31 December 2021 and that I am authorised to make this statement on behalf of Tahmoor Coal Pty Ltd. *Note.* *a) The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.* *b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or $22,000, or both).*	
Name of authorised reporting officer	**Zina Ainsworth**
Title of authorised reporting officer	**Environment and Community Manager**
Signature of authorised reporting officer	
Date	*31/03/22*

2 Statement of Compliance

Table 2.1 outlines the statement of compliance with the relevant conditions for the reporting period.

Table 2.1 Statement of Compliance (2021)

Were all the conditions of the relevant approvals complied with?	Compliance
ML1376	Yes
ML1308	Yes
ML1539	Yes
ML1642	Yes
CCL716	Yes
CCL747	Yes
EPL 1389	One non-compliance – refer to Section 10.2 and Table 2.2
WAL36442	Yes
WAL43572	Yes
DA 1975	Yes
DA 1979	Yes
DA 190/85	Yes
DA 57/93	Yes
DA 67/98	One exceedance – refer to Section 15.6 and Table 2.2
SSD 8445	N/A - construction / works have not commenced in the Annual Review period, the conditions relating to the Annual Review are not yet relevant.
EPBC 2017/8084	N/A - construction / works have not commenced in the Annual Review period, the conditions relating to the Annual Review are not yet relevant.

Table 2.2 Compliance Summary (2021)

Relevant Approval	Condition #	Condition Description	Compliance statement	Section addressed in Annual Review
EPL 1389	M2.2	Air Monitoring Requirements	Non-compliance with monitoring frequency for Monitoring site PM10-1 due to power fault	Section 22 and Section 10.2.2
DA 67/98 Mod 5	13A	Exceedance of environmental performance indicators for 'aboriginal and heritage sites'.	Cracking and minor spalling on two culverts at 88.400km and 89.800km on the PMLL.	Section 22 and Section 14.2

3 Independent Audit

An Independent Environmental Audit was conducted by SLR in September 2020 during the last reporting period. The audit recommendations and actions undertaken are outlined and updated in **Table 3.1.** The next independent audit is due to be conducted in September 2023.

Table 3.2 provides a statement of compliance for Tahmoor Coal for 2021.

Table 3.1 Actions from 2020 Independent Environmental Audit completed to date.

Ref	Description	Risk	Tahmoor Coal Comment/Action	Timing
Non-Compliance Recommendations				
DA 67/98				
12	NC REC 1 - Groundwater Groundwater quality data need to be presented in the form of tables which list all monitored parameters and graphs to show the changes in water quality.	Administrative	All groundwater quality data will be presented in Annual Reviews and Six Monthly Subsidence Reports.	2020 Annual Review: **COMPLETED March 2021** 2021 Annual Review: **COMPLETED March 2022- see Appendix 13 and 14** Six Monthly Subsidence Report: **COMPLETED May 2021 and October 2021**
13H(c)	NC REC 2 - Groundwater It is recommended that: - groundwater quality data is reported fully ie all parameters that are sampled and analysed need to be reported along with trends in time. - any non-compliance and exceedance of triggers should be followed up and documented along with management measures reported as per TARP in WMP, 2015 and WMP, 2019 - while no auditing is required for groundwater resources in WMP (2019), the auditing in line with LW W1-W2 Extraction Plan should be undertaken to ensure that the water quality of the creeks does not further deteriorate.	Administrative	All groundwater quality data will be presented in Annual Reviews and Six Monthly Subsidence Impact Reports. The next Six Monthly Subsidence Impact Report will also document the progress of actions / management measures (if required) from previous or current non-compliance or triggers in accordance with the LW W1-W2 Water Management Plan TARP. Monitoring of water quality of creeks is reviewed and discussed by the Tahmoor Coal Environmental Response Group on a monthly basis in light of the the TARPs, and further investigations are complete where deemed necessary.	2020 Annual Review: **COMPLETED March 2021** 2021 Annual Review: **COMPLETED March 2022** Six Monthly Subsidence Impact Report: **COMPLETED May 2021 and October 2021**

40	NC REC 3 – Recommendations Provide notifications to relevant landowners of any monitored exceedances. If investigations have shown that it is not attributable to Tahmoor operations, provide evidence to the landowner.	Administrative	In the event of a monitoring value exceedance, Tahmoor Coal will log the exceedance via the Cority compliance software, investigate the cause for the exceedance, and provide evidence to relevant landholders where necessary.	Ongoing as required
44, 46	NC REC 4 – Management Plans Review the AQGHGMP and NMP required by this consent. The management plans should be updated to: - list all relevant statutory conditions (including consents and EPL) along with where they are addressed in the report, including this Management Plans condition 44. - a review of baseline data since the commencement of monitoring under this consent - include the real time monitoring TARPs within the management plans and not as separate procedures - include protocols for incident and complaints management and notifications	Administrative	Tahmoor Coal implemented these changes in the 2020 document review in accordance with Condition 46 of DA 67/98 following the 2020 Annual Review.	**Completed** in updated AQGHGMP (Version 9.0) and NMP (Version14.0) in **May 2021.**
48	NC REC 5 – Notifications Update PIRMP notification procedure to include DPIE and NRAR. Review any additional agencies which may require notification of incidents.	Administrative	Tahmoor Coal updated these changes in the Pollution Incident Response Management Plan (PIRMP) review.	**COMPLETED April 2021 – PIRMP version 16.0 (notification procedure section updated)**
DA 57/93				
41	NC REC 6 – REA Management Plan Include additional detail in Table 1 of the REA Management Plan to address where each specific requirement of the plan has been addressed,	Non – Compliant (Low Risk)	The REA Management Plan version 5.0 was updated to include how it addresses specific requirements.	**COMPLETED April 2021 -** in updated REA Management Plan version 5.0

	and if not provide justification.			
41	NC REC 7 – REA Management Plan Include detailed design drawings of the REA and stormwater management system within the management plan. The site water management plan for example does not show the water management at the eastern side of the REA.	Non – Compliant (Low Risk)	Design drawings of the REA were included in the REA Management Plan.	**COMPLETED April 2021 -** in updated REA Management Plan version 5.0
41	NC REC 8 – Topsoil/rehabilitation Complete cover crop seeding of topsoil stockpile areas.	Non – Compliant (Low Risk)	Tahmoor Coal has relocated a section of the topsoil stockpile. This section was noted during the audit as requiring reseeding due to lack of sufficient ground cover.	Topsoil relocated and applied to batters of current emplacement area September – finalised December 2021. Seeding delays due to unfavourable weather conditions. Soon to be completed (April 2022)
41	NC REC 9 – Topsoil/rehabilitation Reduce topsoil stockpile height to <3m and ensure stockpiles resulting from future disturbance be a maximum of be 3m high and be seeded with a temporary vegetation cover.	Non – Compliant (Low Risk)	Topsoil stockpiles were reduced to less than 3m between July and September 2021.	Reduction in stockpile height was completed in September 2021. Seeding works to be finalised in April 2022. Delays around unfavourable weather conditions and contractor scheduling.
41	NC REC 10 – Rehabilitation Ensure future contour drains and other water management structures at the Reject Emplacement Area are constructed in accordance with approved designs and complete erosion repairs/rock lining of existing contour drain.	Non – Compliant (Low Risk)	Tahmoor Coal will continue to implement rock drainage lines where needed throughout the REA, and repair as necessary.	Ongoing as required
EPL 1389				

A3	NC REC 11 – Water Treatment Plant Continue investigations to commission the water treatment plant in consultation with the EPA.	Non – Compliant (Low Risk)	Tahmoor Coal is required, under EPL1389 (2/12/2020) Special Condition E1, to install and test the Pilot Plant by 31/12/2021, and commission the Final Plant prior to commencement of secondary coal extraction in the Tahmoor South area (currently scheduled for September 2022).	Pilot plant: **COMPLETED December 2021** Final Plant: To be completed by September 2022.
L1	NC REC 12 – Water/incident management Ensure all follow up actions proposed in the incident report have been implemented and are documented in the Water Management Plan. Update the Water Management Plan to include details of the implemented measures and to document the TARP for water turbidity levels. Report the status of the follow up actions in the next annual review.	Non-compliant (Medium Risk)	Actions were completed and documented in the Soil and Water Management Plan, with results reported in the 2020 Annual Review.	Update of Soil and Water Management Plan: **COMPLETED April 2021** 2020 Annual Review: **COMPLETED March 2021**
Improvement Recommendations				
DA 57/93 C46	Improvement REC 1 – Reporting Include reference to the requirements of Condition 46 of DA 57/93 into future iterations of the MOP and include a table to show where these conditions have been addressed.	NA	Note that the MOP will be replaced by the new Rehabilitation reforms set to commence on the 2nd July 2022.	Note that the MOP will be replaced by the new Rehabilitation reforms set to commence on the 2nd July 2022.
DA 57/93 C46	Improvement REC 2- Rehabilitation Develop a formalised Rehabilitation Quality Assurance Process throughout the life of rehabilitation to include verification of activities and procedures and tracking of key data at each phase of rehabilitation (ie topsoil depth, amelioration, seed mix, weather conditions). It is recommended that GIS may be incorporated	NA	Future rehabilitation activities will incorporate these rehabilitation recommendations. A Rehabilitation Quality Assurance Process was detailed in an updated version of the Annual Rehablitation and Land Management Plan and results will be included in subsequent Annual Review.	**COMPLETED July 2021 – 2020 ALRMP version 1.0** Resources Regulator Rehabilitation Reforms will govern this improvement REC post 2nd July 2022.

	into the QA process to track phases of rehabilitation. This will assist in identifying differences in rehabilitation and determining factors for success and failure.			
DA 57/93 C46	Improvement REC 3 – Rehabilitation Prepare a topsoil inventory to understand volumes of material available for rehabilitation.	NA	Tahmoor Coal completed a topsoil stocktake and initiate a topsoil inventory.	**Completed July 2021** in the Annual Rehabilitation and Land Management Plan version 1.0 and will be updated **annually** following the Annual Review.
DA 57/93 C46	Improvement REC 4 – Rehabilitation Consider climatic conditions in rehabilitation timings and planning and utilise water carts or similar to assist in watering in of tubestock in dry conditions."	NA	Climatic conditions will be considered during future rehabilitation activities and will be tracked as per Improvement REC 2.	**Completed May 2021**– incorporated in REA Management Plan version 5.0. Included in Tahmoor South AQGMP version 2.0
EPL 1389 L1	Improvement REC 5 – Erosion/Water management Install temporary erosion and sediment controls at the drain between M4 and LDP1 until vegetation establishment is complete.	NA	Tahmoor Coal implemented erosion and water management controls to prevent degradation and erosion.	**Completed April 2021**
EPL 1389 L1	Improvement REC 6 – Erosion/Water management Complete repairs to erosion and sediment controls and eroded batter adjacent to LDP1.	NA	Tahmoor Coal implemented erosion and water management controls to prevent degradation and erosion.	**Completed April 2021**
ML1308 3(f); ML 1376 Variation (f); ML 1539 3(a)	Improvement REC 7 – Reporting Include comparison with completion criteria in the Annual Reviews and rehabilitation reports. Review and implement Resources Regulator rehabilitation reform reporting requirements as required.	NA	Tahmoor Coal will continue to include comparisons with completion criteria in the Annual Reviews and rehabilitation reports. The RR rehabilitation reforms will be implemented into Annual Reviews as required.	**COMPLETED March 2021 – refer to Section 18** Resources Regulator Rehabilitation Reforms will govern this improvement REC post 2nd July 2022.
DA 67/98 C40	Improvement REC 8 – Incident reporting All exceedances should be documented in the incidents/compliance register along with any investigations. The	NA	In the event of an exceedance Tahmoor Coal will log via the Cority compliance software and investigate as necessary. It will be noted whether the event is 'notifiable'	Ongoing as required

	incidents register should include note of whether or not the incident is "notifiable" and document notification if it has occurred.		and document notification if it has occurred.	
NA	Improvement REC 9 – Reporting Include reporting on GHG in the annual reviews.	NA	A summary of GHG performance will be included in Annual Reviews.	2020 Annual Review: **COMPLETED March 2021** 2021 Annual Review: **COMPLETED March 2022- see Section 10.3**
NA	Improvement REC 10 – ML 1376 Undertake further consultation with RR regarding status of mining lease application and obtain confirmation of expected date of approval.	NA	Tahmoor Coal will consult RR regarding status of mining lease.	Delays in relation to mining lease renewal and review into native title and the imposition regarding extraction plan SMP Ammendment condition
NA	Improvement REC 11 – Hydrocarbons Clean up hydrocarbon staining around diesel storage and associated workshops	NA	The area of concern underwent a thorough clean and relevant Tahmoor Coal personnel have been advised of house keeping standards.	**Completed April 2021**
NA	Improvement REC 12 – Reporting Include table showing actual daily results in discharge volumes against the approved volumes in Annual Review (as a table) as per the Annual Return (ie min, max and average). Reporting of volume should be in the same units as the limit (KL) rather than ML. Also recommended to update discharge figure in the Annual Reviews to show	NA	Tahmoor Coal will include comparison results and discharge figures in Annual Reviews.	2020 Annual Review: **COMPLETED March 2021** 2021 Annual Review: **COMPLETED March 2022- see Section 17.2**

	the discharge limit of 15500 KL/day.			
NA	Improvement REC 13 – Weed management Some evidence of weeds was noted around the Pit Top, ventilation shaft and in rehabilitation areas. Additional weed management recommended.	NA	Tahmoor Coal reviewed weed management practices and implemented changes at the site to prevent areas of weed growth as required.	**Completed April 2021** Weed Management incorporated into Monthly Environmental Inpections
NA	Improvement REC 14 – Safety Vegetation has been cleared to facilitate rehabilitation works at Myrtle Creek in accordance with the CMAP. It is recommended to install safety bunting at the top of the creek embankment until vegetation is re-established.	NA	Currently a farm fence has been installed at the top of Myrtle Creek where vegetation has been cleared. Native vegetation has been planted where vegetation was removed, and a hinge joint fence will be attached to the farm fence until vegetation has grown.	**Completed April 2021**
NA	Improvement REC 15 – Water take Review water take reported in 2017-2019 Annual Reviews. Provide justification for inconsistencies in the reported numbers.	NA	Tahmoor Coal reviewed the reported water take in previous Annual Reviews and justified miscalculation in the 2020 Annual Review.	2020 Annual Review: **COMPLETED March 2021 – refer to Table 18.1 in Section 17**
NA	Improvement REC 16 – Subsidence Due to the recent amendment to the 1961 Mine Subsidence Compensation Act in 2017, all claims and compensation for impacts after 1 January 2018 will be directed by SA NSW to the operating mine responsible. It would therefore be in the best interests of the mine to ensure all development	NA	Tahmoor Coal is given with an opportunity to provide advice on new developments by SA NSW, however the implementation of this advice is at the discretion of SA NSW and other regulators. Tahmoor Coal will continue to provide advice on new developments based on future mine planning and	Ongoing as required

	that is approved by SA NSW is compatible with the predicted subsidence effects at Tahmoor.		potential subsidence effects.	

4 Introduction

4.1 Background

Tahmoor Coal Mine (Tahmoor Mine) is an underground coal mine located approximately 80 kilometres (km) south-west of Sydney between the towns of Tahmoor and Bargo, New South Wales (NSW). Tahmoor Mine produces up to three million tonnes of Run of Mine (ROM) coal per annum from the Bulli Coal Seam. Tahmoor Mine produces a primary hard coking coal product and a secondary higher ash coking coal product that are used predominantly for coke manufacture for steel production. Product coal is transported via rail to Port Kembla and Newcastle for Australian domestic customers and export customers.

Tahmoor Mine has been operated by Tahmoor Coal Pty Ltd (Tahmoor Coal) since the mine commenced in 1979 using bord and pillar mining methods, and via longwall mining methods since 1987. Tahmoor Coal is a wholly owned entity within the SIMEC Mining Division of the GFG Alliance group.

Tahmoor Coal has previously mined 35 longwalls to the north and west of the Tahmoor Mine's current Pit Top location. Tahmoor Coal is currently mining Longwall West 3 (LW W3) in the Western Domain area located to the west of the Picton township. This mining is in accordance with Development Consents and Extraction Plan Approval.

An Environmental Impact Statement (EIS) was exhibited in early 2019 to gain approval for the Tahmoor South Coal Project, which involves use of the existing surface infrastructure and the expansion of underground longwall mining to the south of the existing workings (referred to as the Tahmoor South Domain). Tahmoor Coal subsequently revised the proposed mine design and submitted amended development applications on two occasions (in February and August 2020). In April 2021, Tahmoor Coal received Development Application Approval (SSD 8445) for the extraction of up to 4 Mtpa of ROM coal, with a total of up to around 33 Mt of ROM coal proposed to be extracted over a 10-year period. In addition to the SSD 8445 approval Tahmoor Coal also received conditions of approval (EPBC 2017/8084) under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) in October 2021.

The Tahmoor South Domain is located south of the Bargo River and east of Remembrance Driveway and the township of Bargo. Longwall mining would be used to extract coal from the Bulli coal seam within the bounds of Consolidated Coal Lease (CCL) 716 and CCL 747. Twelve longwalls are proposed in this domain which are divided into a series of six northern (A series) and six southern (B series) longwalls. An Extraction Plan for the A series, Longwalls South 1A to South 6A (LW S1A-S6A), is currently being prepared, and these longwalls will be extracted following the completion of the Western Domain.

The Department of Planning, Industry and Environment (DPIE) and the Department of Regional NSW – Resources Regulator (Resources Regulator) approved that the Annual Review prepared under Condition 45 of Development Consent DA 67/98 can also fulfil the requirement of the Annual Environmental Management Report (AEMR). This was to reduce duplication of reported information to both Government authorities. In addition this document fulfils the requirements of condition (f) of ML 1376 variation issued on 7th December 2020 which requires a Rehabilitation Report.

This Annual Review is for the reporting period of 1 January 2021 to 31 December 2021.

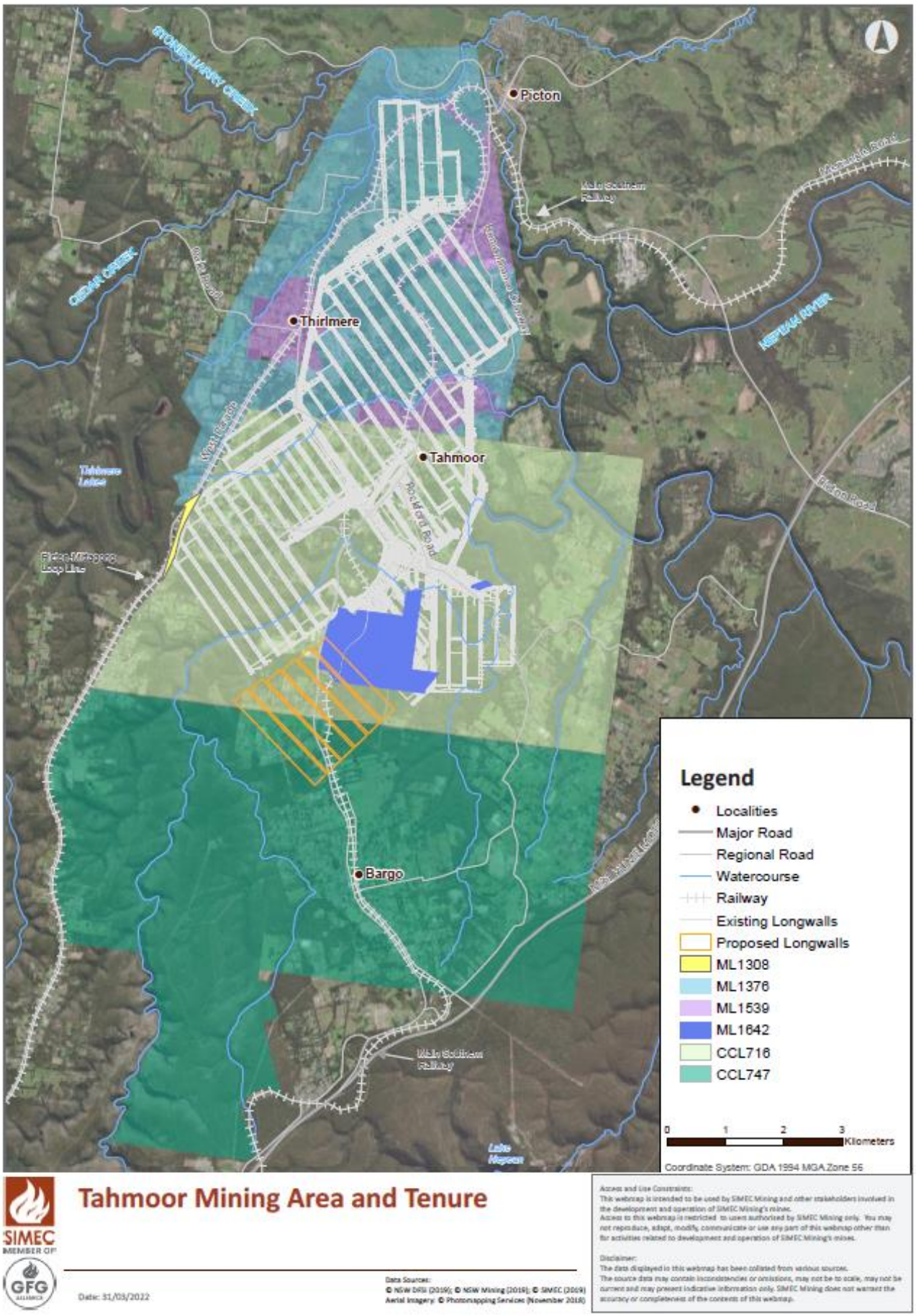
A plan of Tahmoor Coal showing the regional context, development consent boundary and mining lease boundaries is shown in **Figure 1**.

Contact information for Tahmoor Coal senior management and environment and community staff are listed in **Table 4.1**.

Table 4.1 Tahmoor Coal Contacts

Name	Position held	Contact details
Tahmoor Coal Management		
Peter Vale	Executive General Manager Coal Operations	(02) 4640 0100
Clint Mason	Head of Tahmoor Coal Operations	(02) 46400150
Environment and Community Management Team		
Zina Ainsworth	Environment & Community Manager	(02) 4640 0100
Ross Barber	Projects Manager Subsidence	(02) 4640 0028
April Hudson	Approvals Specialist	(02) 4640 0022
Nick Le Baut	Environment Projects Coordinator	(02) 4640 0090
Thomas O'Brien	Environment Specialist	(02) 4640 0018
Natalie Brumby	Environmental Officer	(02) 4640 0048
Amanda Francis	Community Liason Specialist	(02) 4640 0025
Amanda Fitzgerald	Community Officer	(02) 4640 0079

Figure 1 Mining Area and Tenure



5 Approvals

The Tahmoor Mine development consents, mining tenure and environmental licences are outlined in **Table 5.1**.

Table 5.1 Consents and Licences

Consent Number	Consent Description	Date Granted	Expiry Date
Development Consents			
DA 1975	Underground Mine	26/03/1975	No expiry
DA 162/76	Bargo Consent	21/04/1976	No expiry
DA 1979	Coal Preparation Plant Stockpiles and Refuse Emplacement Area	23/08/1979	No expiry
DA 1979 (Mod 1)	Modification for road haulage of trial coal shipments	16/09/1985	No expiry
DA 190/85	Surface Works for Gas Extraction	16/12/1985	No expiry
DA 1979 (Mod 2)	Modification for Upgrades for Longwall Mining	05/11/1986	No expiry
DA 1979 (Mod 3)	Modification for Road haulage in Wollondilly Shire and when rail unavailable	1988	No expiry
DA 57/93	Tahmoor North Project	07/09/1994	No expiry
DA 1979 (Mod 4)	Modification for Road haulage to Corrimal and Coal Cliff Coke Works	13/12/1994	No expiry
DA 67/98	Tahmoor North Extension Project	25/02/1999	16/06/2024
DA 67/98 (Mod 1)	Modification for additional areas to be subsided	26/11/2006	16/06/2024
DA 57/93 (Mod 1)	Modification for heritage approval condition	07/06/2007	No expiry
DA 67/98 (Mod 2)	Modification for Redbank Tunnel Subsidence Management	08/04/2012	16/06/2024
DA 67/98 (Mod 3)	Modification for Redbank Tunnel Rail Deviation – Subdivision of Land	25/11/2012	16/06/2024
DA 67/98 (Mod 4)	Modification for subsidence are update	15/10/2018	16/06/2024
DA 67/98 (Mod 5)	Modification for subsidence are update	03/11/2020	16/06/2024
SSD 8445	Tahmoor South Project	23/04/2021	31/12/2033 (or 10years from commencement of second workings)
EPBC 2017/8084	Conditions of approval under the *Environment Protection and Biodiversity Conservation Act 1999*	01/10/2021	01/09/2061
Mining Tenure – Mining Leases & Exploration Authorisations			
Consolidated Coal Lease 716	Tahmoor Mining Lease – Renewal documentation submitted and being assessed	15/06/1990	13/03/2021 (approval pending)

Mining Lease 1376	Tahmoor North Mining Lease Renewal documentation submitted and being assessed – refer to comments in Table 3.1 (improvement REC 10)	28/08/1995	28/08/2016 (approval pending)
Mining Lease 1308	Mining Lease to west of CCL716	02/03/2014	02/03/2035
Mining Lease 1539	Tahmoor North Extension Mining Lease	16/06/2003	16/06/2024
Mining Lease 1642	Pit Top and REA surface Mining Lease	27/08/2010	27/08/2031
Consolidated Coal Lease 747	Bargo Mining Leases	23/05/1990	06/11/2025
Environmental Licences			
EPL 1389	Environmental Protection Licence– Licence variation 13th September 2021.	17/10/2000	No expiry
WAL36442	Water Access Licence	06/12/2013	No expiry
WAL43572	Water Access Licence	10/05/2021	No expiry

6 Operations Summary

6.1 Mining Operations

Mining activities during the reporting period have been conducted in accordance with the approved Mining Operation Plan (MOP) and Extraction Plan approvals. The MOP was updated in September 2020 and is next scheduled to be revised in September 2024. The new Resources Regulator Rehabilitation Reforms require the preparation of a Rehabilitation Management Plan and Strategy, which will replace the MOP from the 2nd of July 2022.

Extraction of Longwall West 2 (LW W2) was completed on 17th June 2021, and LW W3 extraction commenced on 13th September 2021 and was completed on the 21st March 2022. Extraction of Longwall West 4 (LW W4) is scheduled to commence on the 20th April 2022 (see **Figure 2** for longwall location). A modification for the start position of Longwall West 4 was approved by DPIE on 22 March 2022.

Current preparation of an Extraction Plan for Longwalls South 1A to South 6A is underway with commencement expected in September 2022 with the extraction of LW S1A (see **Figure 3** for longwall location). **Appendix 10** and **Appendix 11** show projected longwall timing for Western Domain and Tahmoor South respectively.

No seismic or exploration activity has occurred during the reporting period.

Table 6.1 outlines a summary of operational performance at Tahmoor Mine.

Table 6.1 Operational Performance

Material	Approved Limit (Specify Source)	Previous Reporting Period (2020) (Actual)	This Reporting Period (2021) (Actual)	Next Reporting Period (2022) (Forecast)
Waste Rock /Overburden	-	-	-	-
ROM Feed Tonnes	-	2,354,901	2,747,965	2,552,065
Reject Tonnes	-	1,025,137	903,622	840,118
Fine Reject (Tailings) Tonnes	-	-	117,470	-
Saleable Product Tonnes	3,500,000 (EPL 1389)	1,338,913	1 929,343	1,739,350

The Environmental Impact Statement for the Tahmoor South Project was submitted to DPIE in January 2019. Public exhibition was held and the project was subsequently amended and resubmitted in February 2020. A second amendment report was submitted in August 2020 which removed Longwalls 107B and 108B, kept current REA confines and amended Vent shaft layout. The Tahmoor South project was approved in April 2021 after a final stage of determination with the Independent Planning Commission (IPC).

In addition to the SSD 8445 approval Tahmoor Coal also received conditions of approval (EPBC 2017/8084) under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) in October 2021.

Secondary Workings in Tahmoor South (LW S1A) are scheduled to commence in September 2022 (date subject to change for operatonal reasons) following completion of Longwall West 4 in the Western Domain.

6.2 Next Reporting Period

Table 6.2 outlines the proposed longwall sequencing for the completion of mining within Tahmoor North Mining Domain in the Western Domain. LW W1, LW W2 and LW W3 have been completed, there is one (1) additional longwall proposed for the Western Domain region being LW W4.

Table 6.3 outlines the proposed longwall sequencing for the continuation of mining in the Tahmoor South Domain. First workings have commenced for these first two (2) longwalls in preparation for second workings to commence once Western Domain mining has been completed.

Appendix 10 and Appendix 11 outlines the planned longwall layout and planned longwall progress plot for the Western Domain and Tahmoor South longwalls.

Table 6.2 Western Domain Longwall Sequencing

Longwall Block	Proposed Start	Proposed Completion
Western Domain – Longwall West 1	15/11/2019 (Actual)	06/11/2020 (Actual)
Western Domain – Longwall West 2	05/12/2020 (Actual)	17/06/2021 (Actual)
Western Domain – Longwall West 3	14/08/2021 (Actual)	21/03/2022 (Actual)
Western Domain – Longwall West 4	20/04/2022	31/08/2022

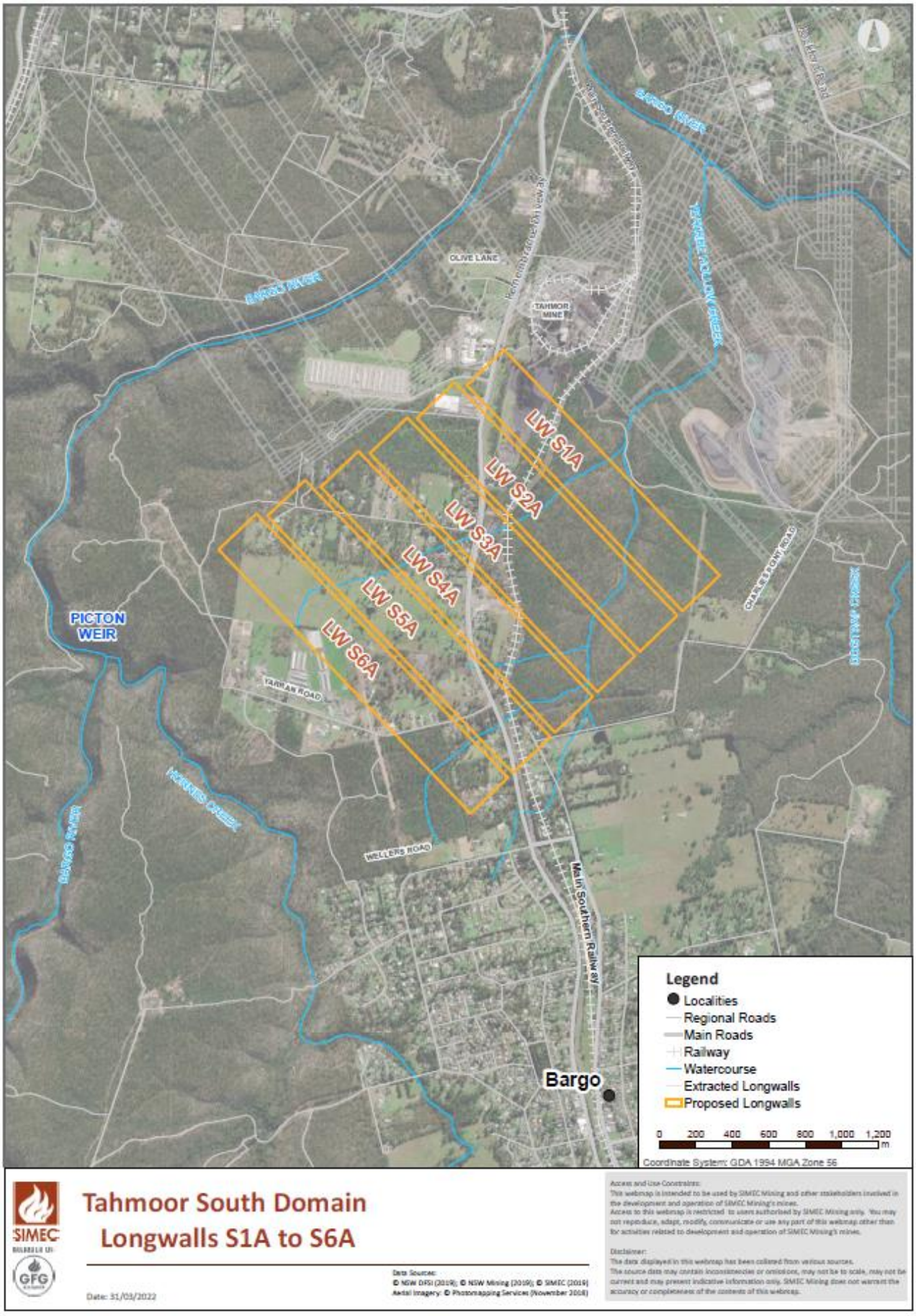
Table 6.3 Tahmoor South Longwall Sequencing

Longwall Block	Proposed Start	Proposed Completion
Tahmoor South – Longwall S1A	22/09/2022	30/04/2023
Tahmoor South – Longwall S2A	30/05/2023	09/01/2024
Tahmoor South – Longwall S3A	08/02/2024	19/09/2024
Tahmoor South – Longwall S4A	10/10/2024	04/06/2025

Figure 2 Western Domain Longwalls West 1 - West 4



Figure 3 Tahmoor South Domain Longwalls



7 Actions Required from Previous Annual Review

As required under Schedule 2, Condition 52 of Development Consent DA 67/98, a copy of the Annual Review is available on the Tahmoor Coal Website.

In accordance with Schedule 2, Condition 46 of the Development Consent DA 67/98, the related Management Plans were reviewed and updated, and submitted for approval. Comments received were addressed in the documents and sent for approval.

No further actions were required from DPIE or Resources Regulator for the 2020 Annual Review.

8 Environmental Performance

Environmental performance and implemented and/or proposed management activities at Tahmoor Mine is outlined in **Table 8.1**. Further details regarding environmental performance is given in **Sections 8 to 22**.

Table 8.1 Environmental Performance

Aspect	Approval Criteria/EIS Prediction	Performance during the Reporting Period	Trend/key management implications	Implemented / proposed management actions
Noise	Maximum L10 reading of 45 dBA within 3 m of a residence Maximum L10 reading of 37 dBA at the REA	Monitoring results all within approved criteria	Noise levels compliant	Continue regular monitoring of noise levels
Blasting	Tahmoor Coal does not conduct surface blasting activities			
Air quality	Maximum deposited dust annual average of 4 g/m^2/month (DA67-98 MOD3)	Monitoring results all within approved criteria	Air quality levels within approved criteria	Continue regular monitoring of air quality levels
	Maximum total suspended particulate (TSP) matter annual average of 90 $\mu g/m^3$ (DA67-98 MOD3)	Monitoring results all within approved criteria	Air quality levels within approved criteria	Continue regular monitoring of air quality levels
	Maximum particulate matter (PM10) annual average of 30 $\mu g/m^3$ (DA67-98 MOD3)	Monitoring results all within approved criteria	Air quality levels within approved criteria	Continue regular monitoring of air quality levels
	Maximum particulate matter (PM10) 24-hour average of 50 $\mu g/m^3$ (DA67-98 MOD3)	Short term exceedance on the 27th April 2021 from TEOM at Charlies Point Rd – 24-hour avg of 73.67 $\mu g/m^3$ -proximal cause-not attributed from mining activities	Levels returned to baseline within 24hours	Continue regular monitoring of air quality levels
	Maximum increase in deposited dust level over an annual period of 2 g/m^2/month (DA67-98 MOD3)	Monitoring results all within approved criteria	Air quality levels within approved criteria	Continue regular monitoring of air quality levels
Biodiversity	-	Monitoring results all within approved criteria	N/A	Continue current management and monitoring activities
Heritage	Aboriginal cultural heritage site at Redbank Creek	Monitoring results all within approved criteria	Heritage compliant	Continue current management and monitoring activities

Aspect	Approval Criteria/EIS Prediction	Performance during the Reporting Period	Trend/key management implications	Implemented / proposed management actions
Heritage	Stonequarry Rockbar	No loss of water or heritage value to the Rockbar. Minor fracturing in a location approx. 40m downstream of the closest heritage site across the highly disturbed access track. Fracturing is typical of previous naturally induced failures as a result of thinly bedded laminated sandstone		TARP implemented. Increased monitoring, Longwall stopped for investigation by Technical Committee and restarted with increased controls implemented. Refer to **Section 14**
Water Quality	EPL 1389 Conditions	Monitoring results all within approved criteria	Water quality compliant with EPL	WTP Pilot plant implemented. Construction of Water Treatment Plant to be completed. E3 Aquatic Health monitoring program commenced. E4 Investigation into Sediment Contamination in Teatree Hollow completed. Continue current management and monitoring activities.
Subsidence	Subsidence Management Plan and Extraction Plan approvals	Four (4) subsidence notifications: • Pool CR14 level decrease • Two culverts at 88.400km and 88.980km on the PMLL • Stonequarry Creek Rockbar dowstream of pool SR17 • Shallow VWP's TNC036 and WD01	Subsidence monitoring results generally within predictions	Continue current management and monitoring activities. For subsidence notifications refer to **Section 15.6** Complete remediation works for Redbank and Myrtle Creek.

9 Operational Noise

9.1 Environmental Management

Tahmoor Mine is approved to operate 365 days a year, 24 hours a day.

Tahmoor Mine and its associated facilities operate in accordance with noise criteria provided by the 1975 and 1994 Development Consents.

Noise conditions are listed in Conditions 73 and 74 (DA 57/93 Tahmoor North development consent) as follows:

> *Condition 73: The noise level emanating from Tahmoor Mine and any associated facilities, including the Washery, stock pile area and rail loading facility, shall not exceed an L10 level of 45 dBA when measured within 3 m of any residence.*
>
> *Condition 74: The noise emanating from operations at the refuse emplacement site shall not exceed an L10 of 37 dBA or background +5 dBA whichever is the greater when measured within 3 m of any residence.*

The DA 57-93 consent conditions reference a distance of three (3) metres (m) from any residence that was constructed or approved prior to 1994.

Tahmoor Coal operates a real-time noise monitoring system which includes a Trigger Action Response Plan (TARP) and alarm system, linked back to the mine's 24-hour control room.

Attended due diligence monitoring is conducted quarterly during the reporting period as part of ongoing noise compliance work.

9.2 Environmental Performance

Tahmoor Coal's real-time noise monitoring data and due diligence assessments continued to demonstrate compliance with the site's development consent noise criteria, with all monitoring results satisfying the noise assessment goals for the mine Pit Top, No.2 ventilation shaft and REA operational areas.

Appendix 1 outlines the locations of the noise monitoring locations and **Appendix 2** contains a summary of noise monitoring completed from 2014 to 2021.

Tahmoor Coal received five (5) noise complaints in 2021 as listed below.

- One (1) complaint received in relation to train noise during night time,
- One (1) complaint received in relation to train noise in general,
- One (1) complaint received from a past complainant in relation to departure and arrival of trains to the mine site during night-time.

- One (1) noise complaint received from another resident in relation to train arrival and departure during night-time and
- One (1) noise complaint received from a resident not attributed from mining related activities.

In relation to the noise compliants received during the last reporting period in relation to train noise on the MSRL, DPIE requested a noise monitoring plan to be submitted and approved prior to implementation. The plan was approved in December 2020. The plan included attended and unattended noise monitoring at a number of locations near the rail line leading to Tahmoor Mine. The program was completed in May 2021 with the noise assessment concluding Tahmoor Coal's compliance with Conditions 73 and 74 of Developement Consent 57/93.

9.3 Further Improvements

Tahmoor Coal will continue to operate and monitor the sites real-time noise monitoring network and alarm system, which includes a monitor at the mine's pit top facility (SX48) and one at a residence along Olive Lane (SX47) (refer to **Figure 4**) . This system has proved effective in managing compliance with development consent noise criteria.

As part of the Tahmoor South Project, significant noise mitigation works are being investigated as to the most effective avenues to mitigate noise emissions from site. Works being investigated include Coal Handling Prep Plant (CHPP) noise reduction progressing in two stages:

1. installation of noise dampening cladding (investigation completed, scope of works (SOW) being developed and issued for tender)

2. closure of openings on the external CHPP walls (contractors engaged, SOW developed and issued for tender)

Noise mitigation works will be implemented in a staged approach over the following 2 years in order to comply with Condition B2 (SSD 8445).

Tahmoor Coal will continue to operate and monitor the sites noise levels in accordance with the approved Noise Management Plan (TAH-HSEC-00150) which provides a framework for Tahmoor Coal personnel to ensure that compliance is achieved with relevant internal and external regulatory requirements related to noise management at Tahmoor Coal. The plan ensures that noise impacts on the community are minimised and managed efficiently and effectively within a structured framework.

Figure 4 Locations of Noise Monitors



10 Air Quality

10.1 Environmental Management

Tahmoor Coal manages air quality in accordance with the air quality management plan approved by the DPIE for version 9.2, update dated 13th July 2021 (*TAH-HSEC-00170– Air Quality & Greenhouse Gas Management Plan).*

A comprehensive system of controls is detailed for managing particulate matter on-site, including dust suppression sprays on the coal stockpiles (automatically triggered by pre-defined meteorological conditions), and visual triggers for operators and site personnel. Water carts are used at the REA and Pit top hardstand areas to reduce wheel generated dust from mobile equipment. Unsealed access ways are controlled through the daily and on-call deployment of water carts to control dust. An organic dust suppressant 'Dustloc' is mixed into the water carts for additional effectiveness.

The site also utilises a chemical dust suppressant 'PetroTac' on highly trafficked areas to prevent wheel generated dust from mobile equipment. This suppressant is applied monthly to hardstand areas by a third party contractor.

10.2 Environmental Performance – Dust

10.2.1 Depositional Dust

The annual average depositional dust monitoring results for the reporting period, expressed as insoluble solids (g/m^2/month), are compared against those from previous reporting periods and reviewed monthly. Monitoring results indicate that all recorded dust levels are within limits set by EPL 1389, with results below the annual average of 4 g/m^2/month as allowed by DA 67/98 Modification 3 (and future modifications). Depositional dust results during the reporting period are outlined in **Table 10.1** and **Figure 3** and have remained relatively low compared to results of the last reporting period. Air quality monitoring site locations are shown in **Appendix 3**.

Table 10.1 Depositional Dust Gauge Data

Month /Site	1	2	3	4	7	8	9	10	11	12
Jan-21	0.3	0.2	0.6	1.3	0.6	0.7	2.3	3.4	0.3	0.6
Feb-21	0.6	0.6	1	1.7	0.9	1.2	1.2	1.8	0.9	0.8
Mar-21	0.5	0.7	0.9	1.2	0.4	2.2	0.4	1.9	0.3	0.3
Apr-21	0.3	0.3	0.8	0.4	0.5	0.6	1.1	4.1*	0.3	0.3
May-21	0.9	1.3	0.9	0.7	0.8	3.0	1.2	2.6	0.3	0.4
Jun-21	0.6	0.4	0.4	0.7	0.1	0.8	0.6	1.1	0.5	0.3
Jul-21	0.2	0.9	0.2	0.4	0.2	0.4	1.2	1.8	0.2	0.2
Aug-21	0.4	0.2	0.3	0.3	<0.1	0.5	1.4	6.5*	0.3	0.2
Sep-21	0.5	0.3	0.5	0.8	0.3	0.9	1.4	1.1	0.1	1

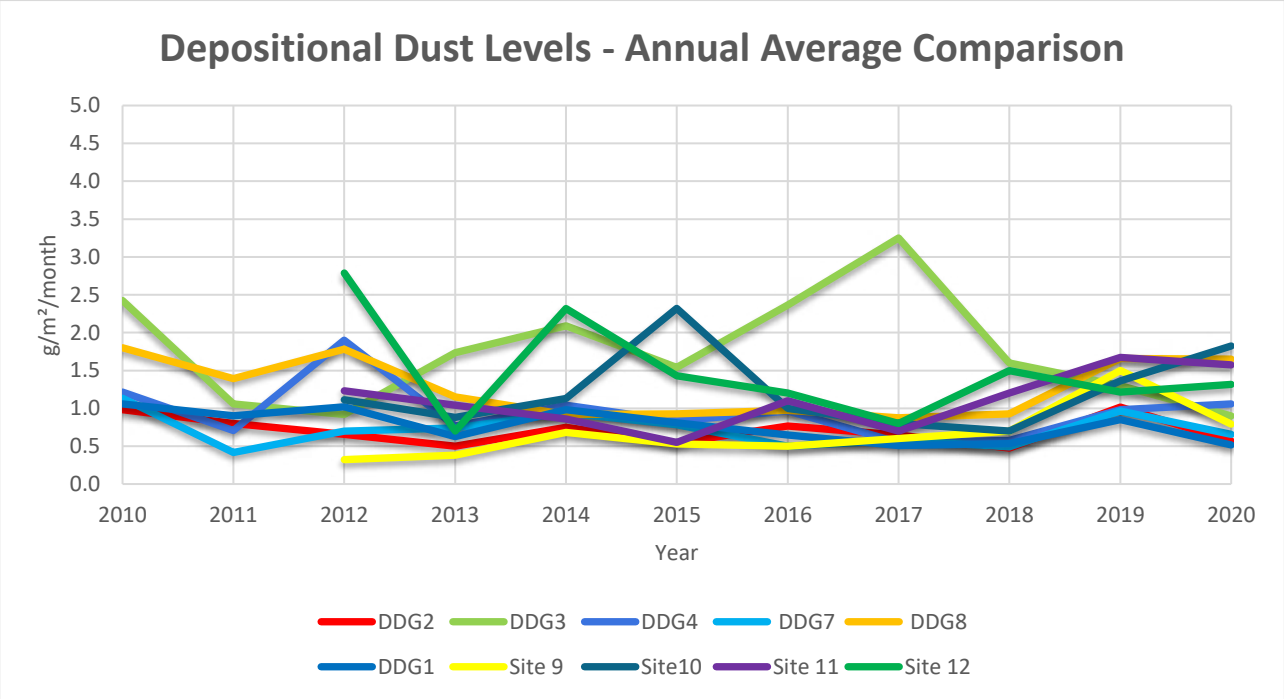
Oct-21	0.6	1.2	0.9	0.5	0.3	0.9	4.2*	2.7	1.7	0.9
Nov-21	1.3	1.1	1.8	1.3	1.2	1.3	1.3	2.3	0.9	2.7
Dec-21	0.6	3.1	5.3*	2.9	1.0	1.3	1.1	2.9	1.1	2.2
Average	**0.6**	**0.9**	**1.1**	**1.0**	**0.6**	**1.2**	**1.5**	**2.7**	**0.6**	**0.8**

Notes:

* Dust Gauge contaminated with Insects, Polysaccharide Slime and/or Vegetation.

Figure 2 illustrates all sites are below limits set by EPL 1389 and DA 67/98 Mod 3, with an increase of depositional dust at Site 10, (located just approximately 350m south of Site 4). It should be noted, there is no corresponding trend with the nearest sampling location Site 4, for the same reporting period. Composition results during the past 2 reporting periods have contained high amounts of polyssacharids slime, insects and vegetative matter during high sample result(s). In general with all other dust monitoring sites, levels fluctuated on average between 0.6 to 1.5g/m^2/month.

Figure 5 Depositional Dust Monitoring Annual Average Comparison



10.2.2 Continuous and Hi Vol Dust Monitoring

Figure 4 and **Figure 5** outline the results of the particulate matter (PM_{10}) monitoring at Charlies Point Road, Olive Lane and Hodgson Grove in Tahmoor. PM_{10} particles have a diameter of 10 micrometers or smaller and are found in dust and smoke as a common air pollutant. These monitoring sites have been established since August 2013, with a continuous TEOM dust monitor located at a Charlies Point Road residence and 2 Hi vol dust monitors located at residences in Olive Lane and Hodgson Grove.

In **Figure 4,** the historical high recorded in Q1 2019 was attributed to a localised dust event at Hodgson Grove (87.9 µg/m³) that is not thought to be related to mining operations. During 2021, Hi vol results have remained low and well below our 24 hour maximum average level of 50 µg/m³ and lower than last reporting period.

During a site visit to sample the HiVol reading for the second quarter of 2021 at Hodgson Grove, an electrical fault discontinued the power supply to the equipment. This could not be remediated until the next quarter sampling (Q3) which resumed as per normal.

In **Figure 5**, bushfires and hazard reduction burns impacted on the air quality significantly during November and December 2019 causing a steep increase in the PM_{10} annual average. However, during 2020 levels considerably declined and returned to baseline levels during 2021. During 2021, PM_{10} results from our continuous TEOM dust monitor at Charlies Point Road have remained below development conditions (DA 67/98) maximum annual average of 25 µg/m³.

Figure 6 High Volume Air Quality Monitoring Results from PM10 dust monitors located at Olive Lane and Hodgson Grove.

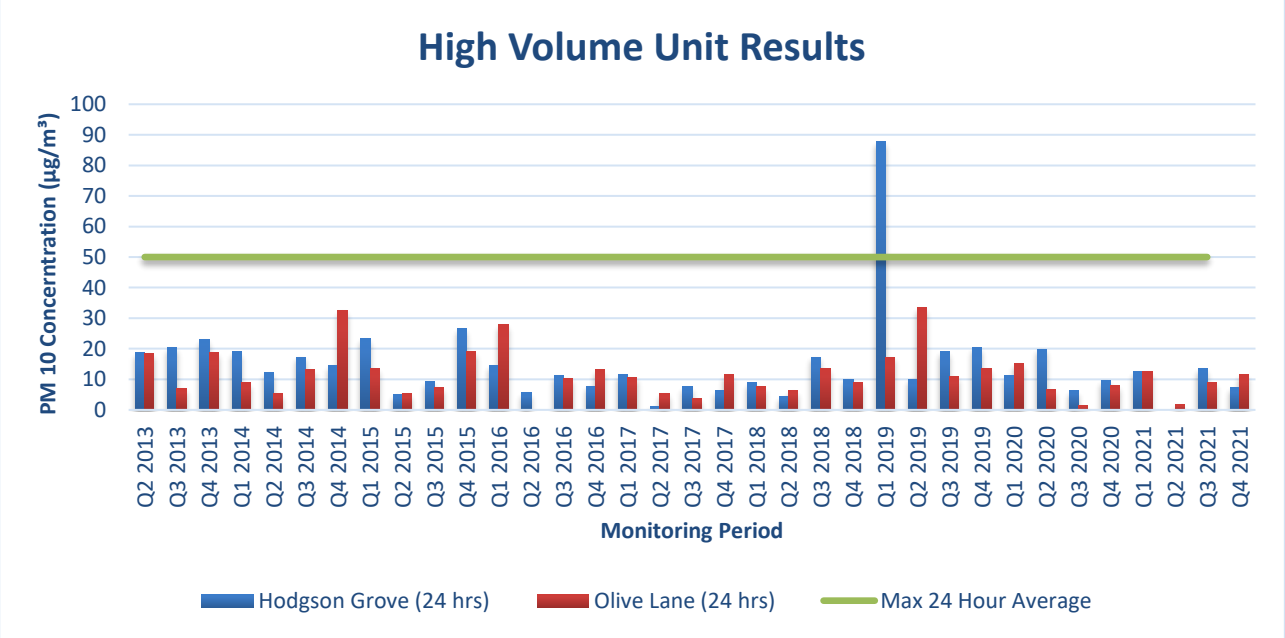
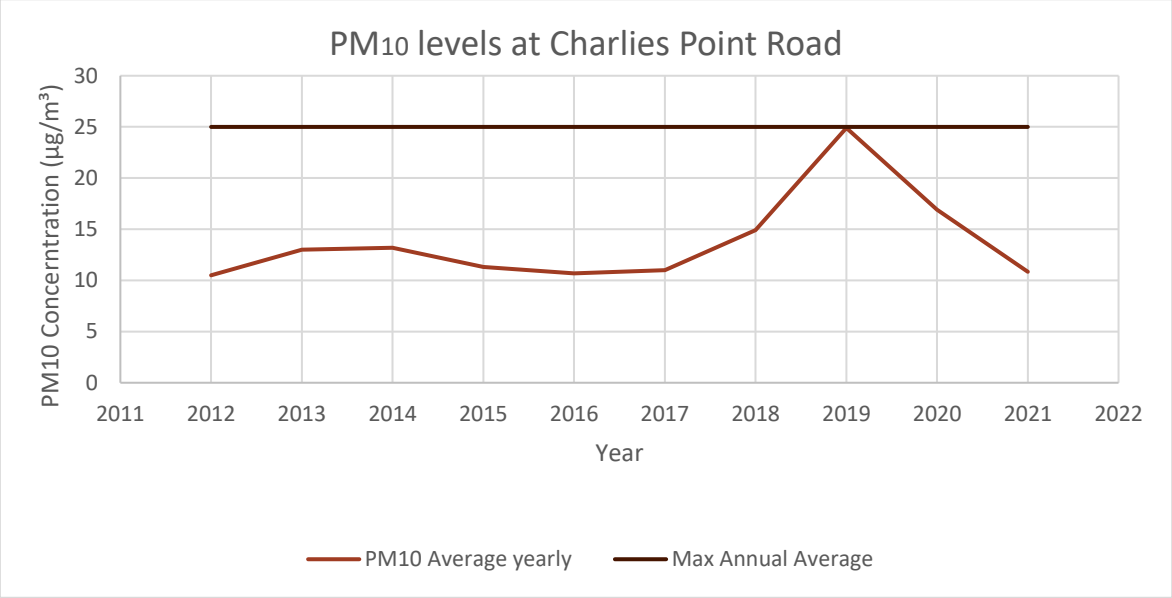


Figure 7 Continuous PM10 annual average results from our Charlies Point Road dust monitor.



10.2.3 Total Suspended Particulate

Total suspended particulate (TSP) refers to the totality of small solid matter released, documented and/or otherwise observed in the atmosphere. TSP is sampled every 6 days by a third party contractor and sent to a laboratory for analysis. The below data was captured for the reporting period and recorded an average annual concentration of 16.5 µg/m^3 (within the 90 µg/m^3 average as stated in Condition 37, DA 67/98).

Table 10.2 Total Suspended Particulates recorded for 2021.

2021	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Jan	7.4	6.9	38.2	34	6.1	
Feb	34.2	17.8	15	12.3	26.6	
Mar	24.2	26.2	8.8	6.1	10.4	
Apr	14.6	21.1	31.3	15.6	88.9	
May	36.8	16.7	6.8	17	4.2	
June	21.1	13.9	7.2	5.8	3	
July	8.8	22.5	17.7	1.1	0.3	
Aug	16.4	4.7	7.9	21.6	3.9	19.1
Sept	10.3	22.1	19	16.5	10.1	
Oct	13.5	6.6	11.2	<0.1	25.4	
Nov	6.8	14.8	20.6	10.8	30.1	
Dec	18.2	5.7	24.6	13.8	9.2	

10.3 Environmental Performance – Greenhouse Gas Emissions

Greenhouse gas emissions (GHG) are reported every six (6) months in the National Greenhouse and Energy Reporting (NGERS) scheme as a requirement under the National Greenhouse and Energy Reporting Act 2007 (NGER Act). NGER provides information about GHG emissions, energy production and energy consumption.

Carbon Dioxide Emmisions (CO2-e) for the Financial Year 2021 and previous years are shown in **Table 10.2** below, as well as further explanation of the data.

Table 10.3 Annual Greehouse Gas Emissions for Financial Year

Year	Scope 1 (Mt CO2-e)	Scope 2 (Mt CO2-e)	Total Scope 1+2 (Mt CO2-e)	Explanation for results
FY16	1.643	0.085	1.727	Finished Longwall LW29 and commenced LW 30. A 78 day changeout between longwalls occurred versus a budget of 28 days. The cause of delays included 12 days lost due to surface dam subsidence risk management.
FY17	1.625	0.085	1.710	-
FY18	1.396	0.082	1.478	Decrease in emissions with use of more accurate gas composition (SICK Analyser) on Shaft 2 (VAM) emissions. In Dec 17 there was a Pit bottom roof fall which delayed mining for 12 days.
FY19	1.260	0.083	1.343	Decrease in Greenhouse emissions driven by plant outage for 10 weeks at Tahmoor due to Number 3 shaft safety incident (shaft winder), however 4 weeks of this period was a Longwall changeover, so the additional impact was 6 weeks. The Net Energy Consumed increased in main due to a higher ratio of CH4 to CO2 in mine gas flaring at Tahmoor due to longwall gas geology.
FY20	1.239	0.088	1.326	In H1 FY20 – Reduction in normal VAM emissions Sept-Nov 19 due to a longwall non-production period, due to extended LW changeout (discontinuity). Ramp up of longwall production within the new, more highly CH4 rich Domain has been significantly slower than forecast. Dec19- Bushfire site power outage.
FY21	1.124	0.079	1.222	Approx. 110,000 t CO2-e Scope 1 reduction due to decreases in VAM emissions primarily driven by • Increase in gas drainage plant capacity and post-drainage capture efficiency (PDCE) with waste gas sent to EDL and flares. • 2 x LW non-production periods in Nov 20 and Jun 21 relating to LW changeout. • Partial extraction in a virgin LW environment (ie. 1st LW in new domain i.e. Western Domain)

10.4 Further Improvements

Tahmoor Coal will continue to operate and monitor the sites dust and air quality levels in accordance with the approved Air Quality and Greenhouse Gas Management Plan (TAH-HSEC-00170) version 9.2 as approved by the DPIE for version 9.2, update dated 13th July 2021 .

Further improvements to be completed next reporting period include upgrading the existing TEOM (Tapered Element Oscillating Microbalance) to telemetry giving access 24/7 for PM10 (particulate matter 10µm) data readings and additional SMS alarm level alerts. Two (2) additional photometer dust monitors are to be installed prior to the commencement of Tahmoor South secondary extraction. These photometers will be equiped with telemetry and SMS alarm alerts for PM10 AND PM2.5.

11 Erosion and Sediment Control

11.1 Environmental Management

Tahmoor Coal has a Soil & Water Management Plan and project specific Erosion & Sediment Control Plans, prepared generally in accordance with the requirements of *Managing Urban Stormwater* (OEH, 2008), including *Volume 2E Mines and Quarries* (2008) (also known as 'the Blue Book').

A number of drive-in sumps are positioned around Pit top to capture and hold sediment laden water. Settling dams are also utilised to capture and settle sediments prior to discharge via Tahmoor Coal's Licence Discharge Point 1 (LDP1).

The unsealed equipment storage area between dams M1, M2, M3 and M4 is treated regularly with a dust suppressant to seal the roadways and reduce wind blown dust activity. The sealing agent is also useful in reducing sediment mobilisation during stormwater runoff.

Continued use of flocculent in surface water dams enables a reduction in turbidity and an increased settling of mobilised particles during rain events.

11.2 Environmental Performance

Dust sampling, water and continuous gauge downloads are carried out monthly by third party licenced contractors. Results obtained for the reporting period reflect Tahmoor Coal has operated within maximum levels as required by Environmental Protection Licence 1389 (EPL 1389).

During the reporting period, an additional drainage line was installed along side M4 Dam to capture run off from the yard and the rear of the flaring plant and direct it towards M4 entry point allowing additional time for mobilised sediment to settle out prior to discharge.

Additional sediment control work was completed as actioned from the *Independent Environmental Audit 2020* , which noted areas of concern to be remediated. These areas have not experienced any further erosion during the reporting period.

11.3 Further Improvements

Further drainage improvements are currently being planned for a section of drainage north of the Water Treatment Plant which feeds into the channel that flows down to LDP1.

Tahmoor Coal will continue to implement control strategies identified in Tahmoor Coal's Soil and Water Management Plan which incorporate site-wide erosion and sediment controls.

12 Contaminated Land

12.1 Environmental Management

A Stage 1 Preliminary Contamination Investigation was completed by GHD in 2017 and actions from the findings have been closed out, including removal of former underground storage tanks (USTs) and remediation works around the waste oil tanks and diesel above ground storage tanks (ASTs).

Groundwater monitoring around the UST area is ongoing as part of the quarterly water quality sampling and monitoring program for pit top groundwater.

12.2 Environmental Performance

A Hazardous Building Material audit and inspection was undertaken by GHD in 2018.

This audit focused on:

Asbestos containing materials (ACM);
Lead based paint systems;
Lead Dust;
Synthetic Mineral Fibre (SMF);
Polychlorinated Biphenyls (PCBs) in light fittings; and
Ozone depleting substances (ODS).

The Hazardous Materials Audit identified several actions that were completed during 2019 and one outstanding action as outlined in **Table 14.1** below.

Table 12.1 Hazardous Building Material Audit Actions

Action	Proposed Completion Date
Remove vinyl floor tiles from 5 offices and replace with new tiles	Complete
Labelling of all asbestos	Complete
Seal or encapsulate the eaves of BU001 which were found to contain asbestos	Works delayed – to be completed in 2022
Remove dust on upper surface of ceiling panels in muster area	Complete
Remove dust in Washery HV switch room SR 105 and SR106- low level lead contamination	Complete
Remove dust from No3 Switch room SR103 – high lead on top of st169	Complete

There were no reportable incidents related to contaminated land during the reporting period.

12.3 Further Improvements

Tahmoor Coal will continue to monitor potential areas of contaminated lands across the site and have one (1) action to complete from the 2018 Hazardous Building Materials Audit (refer to **Table 14-1**).

13 Biodiversity

13.1 Environmental Management

Tahmoor Coal undertakes ecological assessments and due diligence vegetation assessments prior to undertaking activities likely to require vegetation clearing. Several threatened plant species have previously been identified on the surface mining lease areas, including *Grevillea parviflora* and *Persoonia bargoensis,* which have been identified at the REA, near the No.2 Shaft area, and along Charlies Point Road.

Grevillea parviflora is listed as vulnerable on both the *Biodiversity Conservation Act 2016* (BC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). *Persoonia bargoensis* is listed as endangered under the BC Act and vulnerable under the EPBC Act.

Terrestrial ecology (amphibians and riparian vegetation) and aquatic ecology (macroinvertebrates) studies have also been conducted along Myrtle Creek and Redbank Creek to monitor impacts to stream health from subsidence and in response to post-mining creek remediation works currently being conducted.

Baseline terrestrial and aquatic ecology studies have previously been conducted within waterway catchments in the Western Domain in Stonequarry Creek, Matthews Creek and Cedar Creek before extraction of Longwall West 1 (LW W1). Visual inspections are conducted monthly during periods of active subsidence of these creek systems for any impacts to pool level, drainage behaviour and flow. Terrestrial and aquatic monitoring of these waterway catchments will continue to be monitored and assessed through-out the mining of the Western Domain longwalls.

Terrestrial and aquatic monitoring is currently conducted in various sites in Teatree Hollow Creek and Hornes Creek. For terrestrial ecology monitoring, the results of the first-year and a half baseline monitoring program for Tahmoor South Longwalls LW S1A, LW S2A and LW S3A, focuses on riparian vegetation, watercourses, and amphibian monitoring, as these areas were determined to be more susceptible to impacts from subsidence.

13.2 Environmental Performance

Terrestrial ecology (amphibians and riparian vegetation) and aquatic ecology (macroinvertebrates) studies have been conducted along Myrtle Creek and Redbank Creek to monitor impacts to stream health from subsidence and in response to post-mining creek remediation works currently being conducted. Monitoring was conducted using standard Australian River Assessment System (AUSRIVAS) methods and quantitative macroinvertebrate surveys in autumn and spring 2019 before remediation commenced, autumn and spring 2020, autumn and spring 2021 after remediation was complete in Pool 23 of Myrtle Creek. Pools 30 and 33 were monitoried as reference sites as the were unaffected by subsidence.

Aquatic ecology before and after remediation was investigated through temporal and spatial observations of aquatic habitat, water quality and macroinvertebrate communities, and compared to AUSRIVAS modelled, references sites. This process informs remediation and adaptive management of the waterway. The report outlined that, in general, the aquatic habitat was similar at most sites when compared to previous surveys; with Pool 23 scoring in band B in Autumn 2021. Pool 23 has provided aquatic habitat on three biannual sampling occasions including Autumn

2021. In Redbank Creek, Water Quality results were mostly similar to previous sampling occasions and remediated locations (pools RR11, RR 19 and Pool 26/Weir) were holding water and were able to be sampled. Pool 26/weir and RR 19 scored in Band C, indicating moderate levels of recovery and RB11 in Band D, indicating limited recovery. These studies have offered promising results to date from Tahmoor Coal's Creek Remediation Works and the re-establishment of aquatic life in remediated pools.

Baseline terrestrial and aquatic ecology monitoring in Stonequarry Creek, Matthews Creek and Cedar Creek were completed in early 2020, with further monitoring in relation to mining activities commenced in Autumn 2020 and is conducted biannually. For the reporting period, assessments were conducted in Autumn 2021 and Spring 2021 for terrestrial and aquatic monitoring.

For aquatic monitoring results, water quality and habitat availability was similar in condition to previous pre-mining monitoring and supported by generally similar AUSRIVAS OE50 scores compared to pre-mining stream surveys. A Level 2 TARP triggered for Aquatic Ecology regarding a reduction in family richness of macroinvertebrates and OE50 score at Site MC8 (Matthews Creek). As these changes are most likely attributed to natural variation, no further actions are required.

For riparian monitoring results, impact sites had a slightly higher mean flora species richness than control sites. However, control sites had higher percentage vegetation cover than impact sites. This is likely due to persistent rainfall patterns, human disturbance and altered flow regimes increasing weed dominance at the control sites. Some sites had higher soil fertility and organic matter loads, which lead to higher species diversity and generally more exotic species. These sites appeared to be more influenced by seasonal changes and flooding events than sites further up the catchment which tended to be protected in deeper gully sections.

For amphibian monitoring results, there was no significant difference in species diversity between control sites and impact sites, with the amphibian community present containing at least six species which are likely still viable indicators of impending or current environmental change. Amphibian detection rates fluctuated between monitoring events for most sites, likely due to the highly variable weather and climatic conditions experienced across all monitoring events.

Creek visual inspections conducted over the reporting period have reported no observed impacts to pool level, drainage behaviour or overland connected flow. Terrestrial and aquatic monitoring of these waterway catchments will continue to be monitored and assessed through-out the mining of the Western Domain longwalls.

Baseline aquatic and terrestrial monitoring is conducted in various sites in Teatree Hollow Creek and Hornes Creek. Additional baseline aquatic ecology studies commenced in spring 2019 and have been conducted biannual since this time for the waterway catchments in the Tahmoor South area to supplement baseline data captured in 2014. Macroinvertibrate results have recorded OE50 scores ranging in bands B and C. While there has been a reduction in modelled stream health at most sites during spring 2021 monitoring this could be the result of seasonal/climatic variability.

Terrestrial ecology baseline monitoring for Tahmoor South Longwalls (LW S1A, LW S2A and LW S3A) data was collected from six riparian vegetation and amphibian sites, including three impact and three control sites. Overall, the riparian monitoring showed some difference in the numbers of species recorded during Spring and Autumn monitoring (increased exotics and native regenerating species in Autumn, increased frog activity in Spring). However, none of these trends can be tested statistically due to insufficient sample size (three monitoring events).

There were no ecological surveys required for ground disturbance activities throughout the reporting period for the REA or associated operational areas.

There were no reportable incidents related to ecological impacts during the reporting period.

13.3 Further Improvements

Ecological surveys will continue to be undertaken as required to manage compliance and impact assessment across all Tahmoor Coal's mining domains.

14 Aboriginal Cultural and Historical Heritage

14.1 Environmental Management

Prior to the extraction of each longwall, a search is completed to confirm if new Aboriginal cultural or historical heritage sites have been identified.

An Extraction Plan was approved by DPIE for the extraction of LW W1 and LW W2 in 2020. The Heritage Management Plan recorded 25 Aboriginal sites in the Study Area, comprising 17 rock shelters (including those with multiple features), one grinding groove site, six open artefact sites and one modified tree.

A further Extraction Plan for LW W3 to W4 was approved in 2021 with the accompanying Heritage Management Plan identifying 8 Aboriginal sites in the study area, comprising one axe grinding groove site, six open artefact sites and one modified tree(shown in **Figure 6**). Six registered heritage items of local heritage significance that are registered on the WLEP (2011), the ARTC S170 Register, and the Department of Health S170 register were identified in the study area. These items include Mushroom Tunnel, Picton Tunnel, Weatherboard Cottage, Antill Street Underbridge, Rural Landscape (Thirlmere Way), and Redbank Uniting Church. None of these registered heritage items are located directly above the footprint of the longwalls (shown in **Figure 7**).

Monitoring and management measures are detailed within the Extraction Plan and assessment of monitoring results reviewed in the following two (2) Six Monthly Reports: Six Monthly Report 3 and Report 4 (**Appendix 13** and **Appendix 14** respectively).

Figure 8 Aboriginal Sites within Study Area for LW W3-W4



Aboriginal sites within the study area

Tahmoor Mine Extraction Plan:
Longwalls W3 - W4
Aboriginal Heritage Technical Report
Figure 3.1

EMM
creating opportunities

SIMEC

Figure 9 Registered Historical heritage items within the Study Area for LW W3-W4.



SIMEC

14.2 Environmental Performance

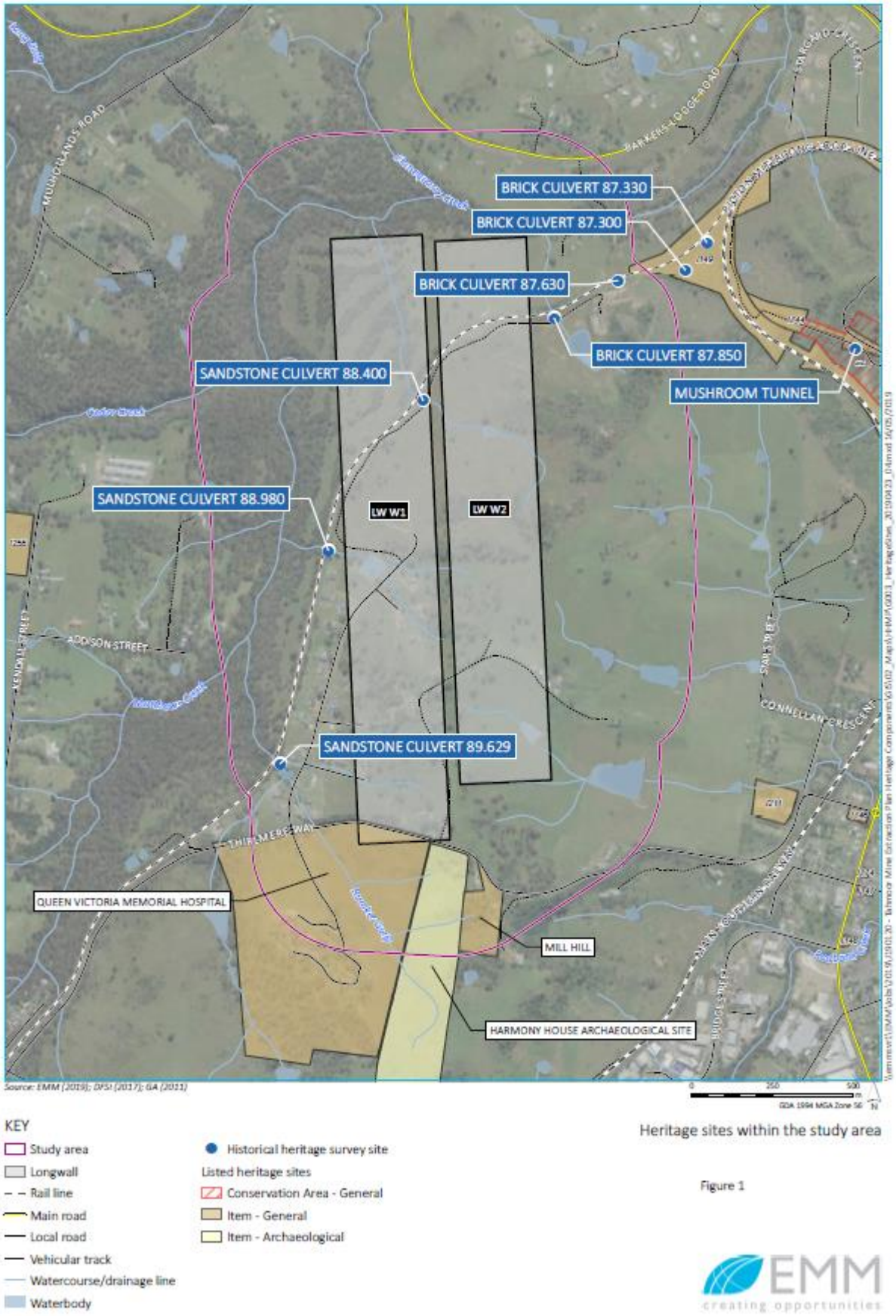
All Aboriginal and historical heritage items were managed in accordance with the relevant approvals during the reporting period.

During the reporting period for the Six Monthly Subsidence Impact Reports (13th October 2020 – 20th October 2021), there were no reportable incidents related to Aboriginal Cultural items during the reporting period. However, two (2) level 3 TARP triggers occurred to sandstone culverts in the Picton-Mittagong Loop line during regular monitoring at 88.400km and at 88.980km (refer to **Figure 8**).

Level 3 TARP Triggers for impacts to sandstone culverts at 88.400 km and 88.980 km occured during the reporting period. These impacts included cracking of mortar joints and blockwork and minor spalling progressively developing as mining continued. The timing of the observed changes correlate well with the observed developed of compressive strain across the culvert. No impacts have been observed within the culvert barrel when viewed from each end of the culvert and no impacts occured to the structural integrity of the culvert. Considering the size of the cracks, the impacts to heritage values were negligible. The relevant government agencies were notified in accordance with the Historical Heritage TARP.

The Rail Management Group (RMG) assessed the results of ground surveys and visual inspections on a weekly basis whilst the culvert experienced active subsidence during the mining of LW W1, W2 and W3. The RMG concluded that the impacts did not adversely affect the safety and serviceability of the culvert. The impacts developed gradually as mining occurred and have remained stable after the period of active subsidence. Tahmoor Coal is currently seeking expert advice from a heritage stonemason regarding remediation of the sandstone blocks, and remediation will be undertaken after the full effects of subsidence have been completed.

Figure 10 Locations of Sandstone culvets at 88.400km and at 88.980km.



SIMEC

14.3 Further Improvements

Aboriginal cultural and historical heritage due diligence assessments will continue to be undertaken by qualified Aboriginal cultural and historic heritage consultants.

Aboriginal cultural and historical heritage assessment process will identify items of significance and propose mitigation measures to ensure compliance with statutory requirements. Additionally, Tahmoor Coal aims to maintain valued working relationships with local Registered Aboriginal Parties (RAPS).

15 Mine Subsidence

15.1 Environmental Management

Tahmoor Coal completed extraction of LW W2 on 17th June 2021, LW W3 commenced on 13th September 2021. All subsidence related impacts are managed in accordance with the LW W1-W2 Extraction Plan approval and LW W3-W4 Extraction Plan approval.

15.2 Environmental Performance

A detailed review of subsidence monitoring data and impacts is provided in the Tahmoor Coal Six Monthly Subsidence Impact Reports. These reports fulfil the reporting requirement of the Extraction Plan approved for LW W1-W2 and LW W3-W4, and cover the period from 13th October 2020 to 20th October 2021. These requirements are outlined in Section 6.1.4 of the LW W1-W2 Extraction Plan and Section 6.1.3 of the LW W3-W4 Extraction Plan, which are derived from Section 6 of the DPIE *Draft Guidelines for the Preparation of Extraction Plans V5* (DPE, 2015). These reports provide the Secretary of DPIE with a summary of subsidence and environment monitoring results, subsidence impacts and management actions undertaken during the reporting period. The following Reports are found in the Appendix:

Appendix 13 – Six Monthly Subsidence Impact Report – Report 3; and
Appendix 14 – Six Monthly Subsidence Impact Report – Report 4.

15.3 Surface Water

During the reporting period for the Six Monthly Subsidence Impact Reports (13th October 2020 – 20th October 2021), no observable stream bed craking has been observed in Matthews Creek, Cedar Creek or Stonequarry Creek as a result of subsidence impacts. However, water level TARP triggers have been met and further details are explained below and in the Six Monthly Subsidence Impact Report 3 and 4 (**Appendix 13** and **Appendix 14** respectfully).

The following are the TARP levels triggered during the reporting period (13th October 2020 - 21st April 2021):

- Pool Water Level TARP – Level 2, 3 and 4 triggered due to Pool water level reduction and atypical surface water behaviour in Cedar Creek. Various pools were triggered including Site CA, CB, CD, CF and CG. Fortnightly monitoring and analysis of surface water level data will continue for sites CA, CB, CC1A, MR45 and MR46 until confirmed otherwise and further investigation into the feasibility of implementing additional surface water monitoring is being conducted, and
- Natural Drainage Behaviour TARP trigger due to gas emissions at Pool MR45. Minor gas emissions occurred in December 2020. Previous gas samples indicated that the gas originated from the shallow Hawkesbury Sandstone stratas and/or shallow anoxic muds. No further action required – continuation of existing monitoring program.

The following are the TARP levels triggered during the reporting period (1st April 2021 – 20th October 2021):

- Pool Water Level TARP – Levels 2 and 3 triggered due to pool water level reduction in Cedar Creek (pool CR14) and Stonequarry Creek (pool SG2). As the changes are relatively small and likely to be related to the prevailing below average rainfall conditions in combination with a slight increase in losing conditions, no further actions were undertaken. Tahmoor Coal is reporting on pool water level on a 3-monthly basis to DPIE.

Monitoring of flow and visual inspection of pools will continue under the existing monitoring program.

During the reporting period, there were no exceedances of environmental performance measures or indicators for surface water, as adopted from DA 67/98 Modification 4 or the LW W1-W2 and LW W3-W4 Extraction Plan Approval conditions.

15.4 Groundwater

15.4.1 Six Monthly Subsidence Impact Report results

During the reporting period for the Six Monthly Subsidence Impact Reports (13th October 2020 – 20th October 2021), Groundwater Bore level TARP triggers, Shallow Groundwater Pressures TARP trigger and Deep Groundwater Pressures TARP triggers occured. Further details are explained in the Six Monthly Subsidence Impact Reports 3, Report 4 excerpt from the 6-monthly Groundwater review (**Appendix 13**, **Appendix 14** and **Appendix 16** respectfully). Locations of boreholes monitored are shown in **Appendix 7**.

The following are the TARP levels triggered during the reporting period (13th October 2020 - 21st April 2021):

- Groundwater Bore Level TARP trigger due to reduced water level elevation below the baseline range for a number of open standpipe piezometers (P12, P13 and P16). Monitoring frequency increased from monthly to fortnightly for P12C as requested by DPIE. As the results are within predictions and are not connected with any surface water impacts, no actions are required other than the continuation of the existing monitoring program;
- Shallow Groundwater Pressures TARP triggered due to depressurisation below the baseline range for shallow vibrating wire piezometer TNC036 and WD01. Monitoring frequency increased from monthly to fortnightly for TNC036 as requested by DPIE. As the results are within predictions and are not connected with any surface water impacts, no actions are required other than the continuation of the existing monitoring program;
- Deep Groundwater Pressures TARP trigger due to a trend of depressurisation below baseline range for TNC036 in April 2021. Monitoring frequency increased from monthly to fortnightly for TNC036 as requested by DPIE. Groundwater monitoring will continue under the existing monitoring program.

The following are the TARP levels triggered during the reporting period (1st April 2021 – 20th October 2021):

- Groundwater Quality TARP – Levels 2, 3 and 4 triggered due to water quality results exceeding trigger levels, including lithium at P13C, Strontium at GW105228 and Barium at GW115860. The Lithium trigger level at P13C was questioned due to its conservation and very sensitive nature to any increase in Lithium concentration, and the trigger level was revised in August 2021. No further actions were undertaken;
- Groundwater Bore Level TARP – Levels 2, 3 and 4 triggered during the reporting period, however a trend in groundwater recovery was evident. This Level 4 TARP trigger is a continuation of the TARP notification to DPIE on 30 December 2020. Groundwater bore level will continue to be monitored in accordance with the LW W3-W4 Water Management Plan, and Tahmoor Coal will continue to provide 3-monthly reports to DPIE for surface water and groundwater;
- Shallow Groundwater Pressures TARP – Levels 2 and 4 triggered during the reporting period, however a trend in groundwater recovery was evident. This Level 4 TARP trigger is a continuation of the TARP notification to DPIE on 30 December 2020. Groundwater bore level will continue to be monitored in accordance with the LW W3-W4 Water Management Plan, and Tahmoor Coal will continue to provide 3-monthly reports to DPIE for surface water and groundwater, and
- Deep Groundwater Pressures TARP – Levels 2 and 3 triggered during the reporting period. Groundwater monitoring will continue under the existing monitoring program.

Further details of impacts to Groundwater from LW W2 and LW W3 are found in **Appendix 13** and **Appendix 14**.

15.5 Rail Infrastructure

During the reporting period for the Six Monthly Subsidence Impact Reports (13th October 2020 – 20th October 2021), there have been three (3) 'Blue Triggers' according to the Picton-Mittagong Loop Line TARP and the Main Southern Railway TARP.

- Blue Trigger at Ballast Top Subway (86.838 km) according to Main Southern Railway TARP. Minor closure across the abutments of the structure related to a continuation of pre-existing conditions and were unlikely to be mining induced, as discussed in Six Monthly Subsidence Impact Report 3 (**Appendix 13**). Trigger resolved following track adjustments in March 2021;

- Blue Trigger for Joint Closure (87.9 – 88.5 km) according to Picton-Mittagong Loop-line TARP. Adjustments of the track were completed in April 2021, resolving the TARP trigger. Discussed further in Six Monthly Subsidence Impact Report 3 (**Appendix 13**), and

- Blue Trigger at Ballast Top Subway (86.838 km) according to the Main Southern Railway TARP, due to minor closure across the abutments of the structure related to a continuation of pre-existing conditions. As these impacts were unlikely to be mining induced, the trigger level was increased. Visual inspections of the structure will continue under the existing monitoring program.

Further details of impacts to Rail Infrastructure from LW W2 and LW W3 are found in **Appendix 13** and **Appendix 14**.

15.6 Subsidence Event Notifications

There were three (3) subsidence incidents and ongoing management reporting notifications for LW W2 and LW W3 during 2021.

Notifications to Government agencies is required according to the LW W1-W2 and LW W3-W4 Extraction Plan, in particular the TARPs under the relevant Infrastructure and Environmental Management Plans. Notifications provided during the reporting period are summarised in **Table 16-1**.

It is noted that the Level 4 TARP trigger for piezometers P12C, P13C, P16 (intakes B and C) and TNC036 (intakes at 65, 97 and 169 meters below ground level) that was originally notified on 30th December 2020, were still exceedinging during this current reporting period.

Table 15.1 Subsidence Event Notifications

Date	Location	Longwall	Subsidence Incident Reported
23rd February 2021	Cedar Creek – Pool CR14	LW W2	Level 4 TARP Triggered for surface water level due to pool level dropping below previously recorded minimum.
21st September 2021	Two culverts at 88.400km and 88.980km on the PMLL	LW W2	Level 3 Historical Heritage TARP triggered – Cracking occured in the culvert at 88.400km and the culvert at 88.980km.
28th October 2021	Stonequarry Creek Rockbar dowstream of pool SR17	LW W3	Level 3 Stonequarry Creek Rockbar TARP triggered - No loss of water or heritage value to the Rockbar. Minor fracturing in a location approx. 40m downstream of the closest heritage site across the highly disturbed access track. Fracturing is typical of previous naturally induced failures as a result of thinly bedded laminated sandstone.

15.7 Subsidence Monitoring

Subsidence monitoring has been completed during the reporting period in accordance with the approved Tahmoor Coal LW W1-W2 and LW W3-W4 Extraction plan, specifically as summarised in the LW W1-W2 and LW W3-W4 Subsidence Monitoring Program.

On completion of a Longwall, the active subsidence zone is resurveyed, and comparative analysis of predicted and actual subsidence forecasts are reported in the 6 monthly Subsidence Report. LW W1-W4 Six Monthly Subsidence Report 3 **(Appendix 13)** and Report 4 **(Appendix 14)** demonstrates observed subsidence has been less than predicted subsidence, tilt and curvature during the reporting period.

Notable environmental monitoring observations during the reporting period are discussed in **Section 16.3** (Surface water), **Section 16.4** (Groundwater) and **Section 12.2** (Aboriginal Cultural and Historical Heritage).

15.8 Further Improvements

Tahmoor Coal have commited to the installation of a pre-mining and post-mining height of fracture hole is to be installed over LW W2 and associated headings as stated in accordance with the LW W1–W2 and LW W3-W4 Water Management Plan. The pre-mining borehole has been installed and the post-mining borehole will be installed once subsidence impacts from LW W3-W4 are finalised.

16 Natural Heritage

16.1 Environmental Management

No natural heritage sites have been identified.

16.2 Environmental Performance

There were no reportable incidents related to natural heritage during the reporting period.

16.3 Further Improvements

Natural heritage surveys will continue to be undertaken as per operational needs and approval requirements to manage compliance and impacts.

17 Water Management

17.1 Groundwater

17.1.1 Environmental Management

Longwalls are extracted within Tahmoor North and Western Domain at a depth of approximately 450 m in the Bulli Seam. Water from sedimentary layers above the mine workings seep into the mine at a rate of approximately 4.4 ML/day during the reporting period. This water is pumped to the surface and directed to a series of mine pit-top treatment dams before being discharged through LDP1. Water quality and flow is monitored under the conditions of Tahmoor Coal's Environmental Protection Licence (EPL) 1389 and Water Licence 36442.

A schematic of the Tahmoor Mine water management system and water quality infrastructure is outlined within **Appendix 6**. This schematic details main water sources and their particular flow paths across the mine site and the eventual discharge via Tahmoor Coal's LDP1.

Groundwater bores at Tahmoor Coal Pit top and REA are monitored quarterly for water quality and water levels by a third party contractor. EC and pH results are recording a slight increase over the reporting period however still within baseline levels, for further information refer to **Appendix 15** for groundwater data from boreholes located at Pit top and the REA area. The below **Figures 11 to 16** illustrate changes in level data, pH and EC results during the reporting period. It is noted that PT4 (pit top piezometer 4) is greatly influenced by storm water and has been underwater during Q3 and Q4 site visits.

17.1.2 Environmental Performance – Pit top and Reject Emplacement Area Piezometeres

A plan showing the location of all monitoring bores in the Tahmoor North, Tahmoor South and Western Domain mining areas are shown in **Appendix 7** and reported in the Tahmoor Coal Six Monthly Subsidence Impact Report 3 & 4 (**Appendix 13** and **Appendix 14**, respectively). Piezometers located accross Tahmoor Coal's Pit top and REA are monitored quarterly for water quality and a quarterly download is conducted for the continual level loggers (for locations refer to **Figure 10 below**). For further information refer to **Appendix 15.**

Table 18.1 provides a summary of groundwater outflow from 2015 to 2021 and is illustrated in **Figure 17**.

There were no reportable incidents related to groundwater pollution during the reporting period.

Figure 11 Locations of Piezometers at Pit top and the REA



Figure 12 Piezometer groundwater levels for Pit Top

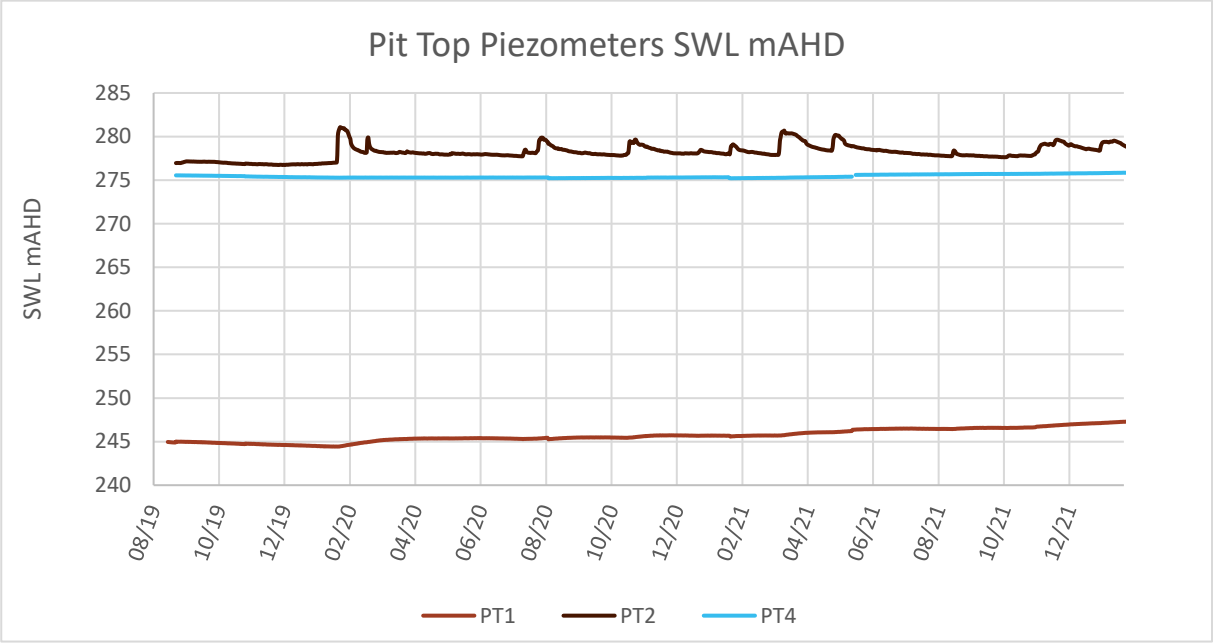


Figure 13 Piezometer groundwater levels for REA

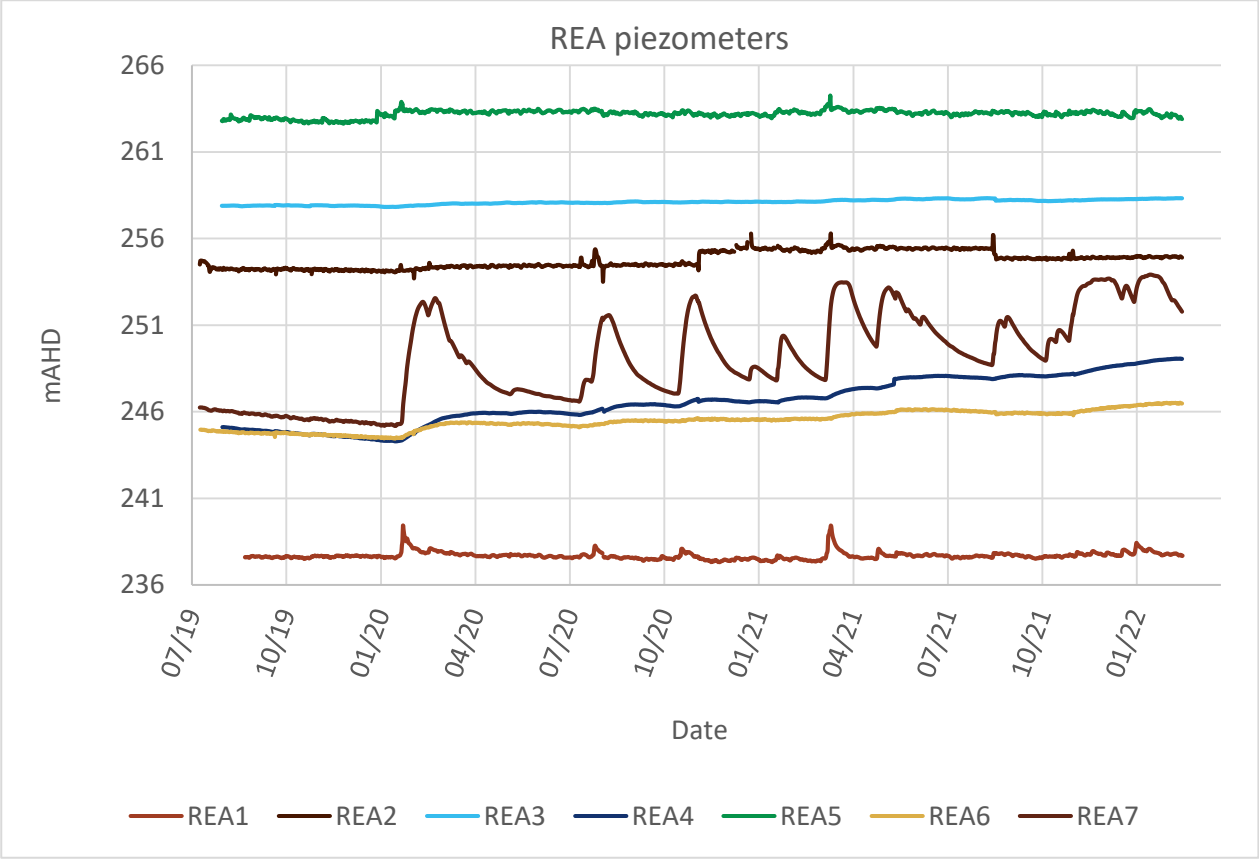


Figure 14 Groundwater Pit top Piezometers – pH

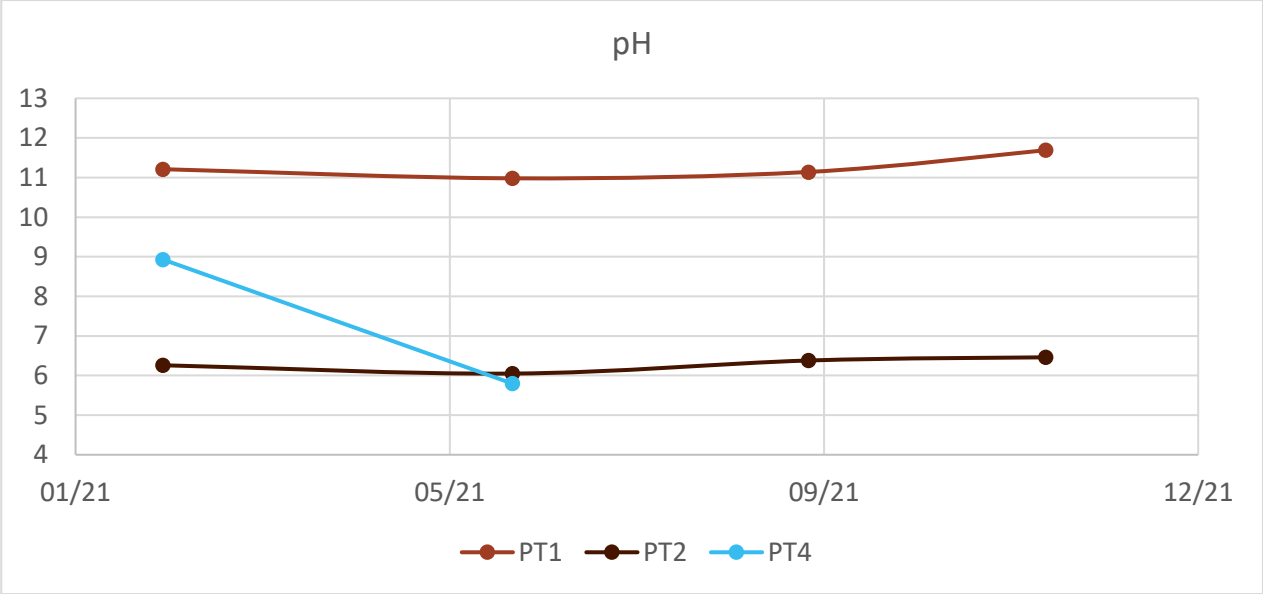


Figure 15 Groundwater REA Piezometers – pH

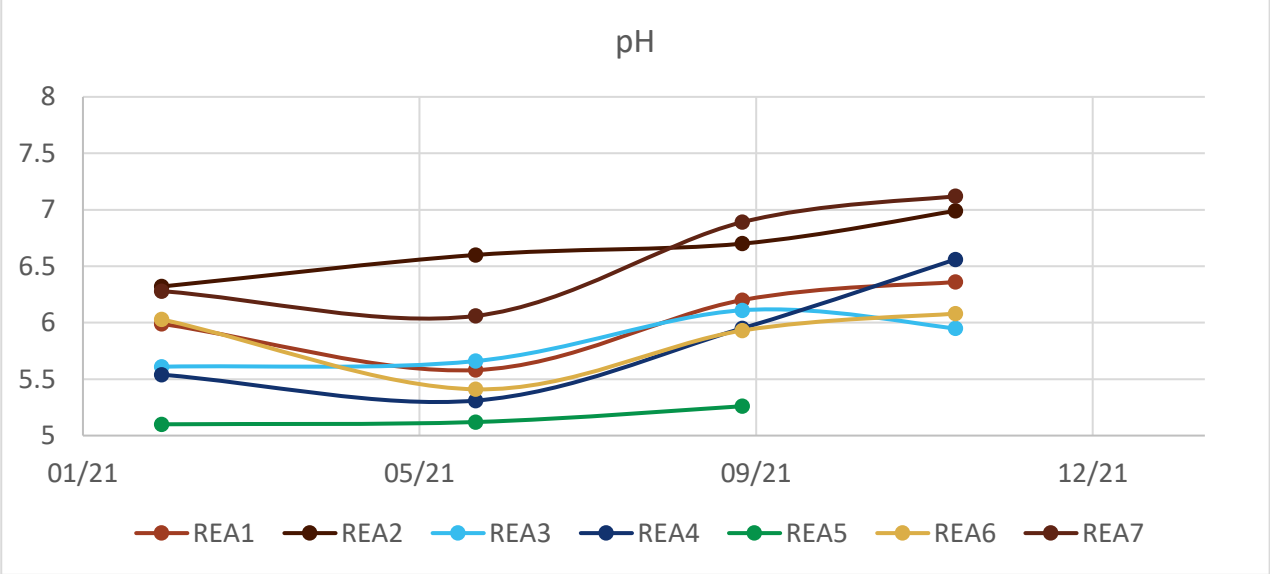


Figure 16 Groundwater Pit top Piezometers – EC

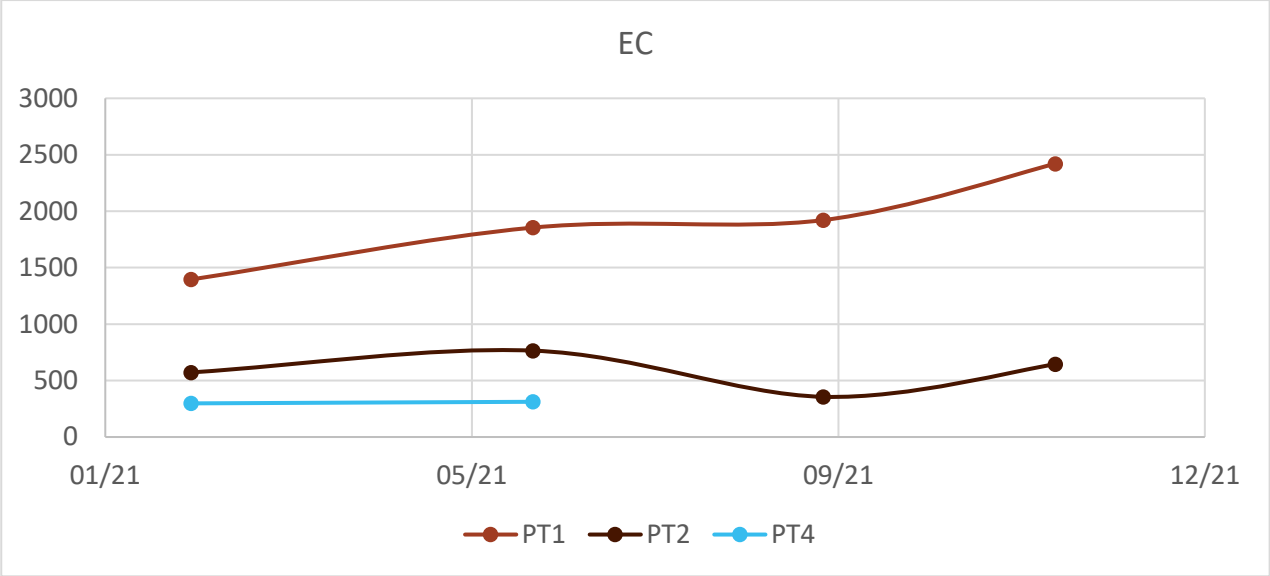


Figure 17 Groundwater REA Piezometers – EC

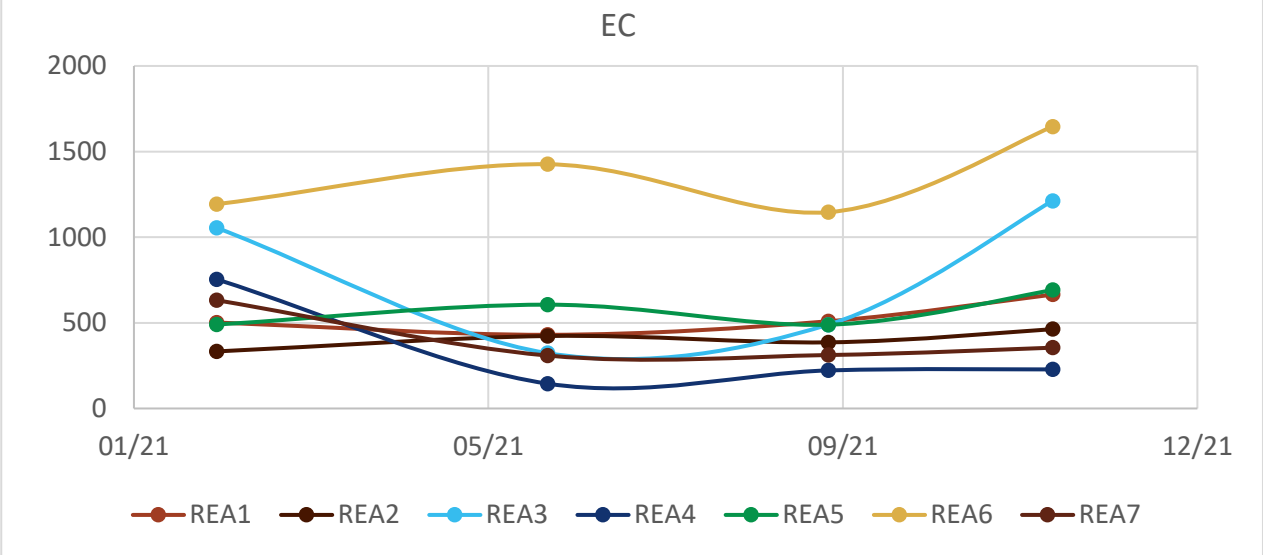
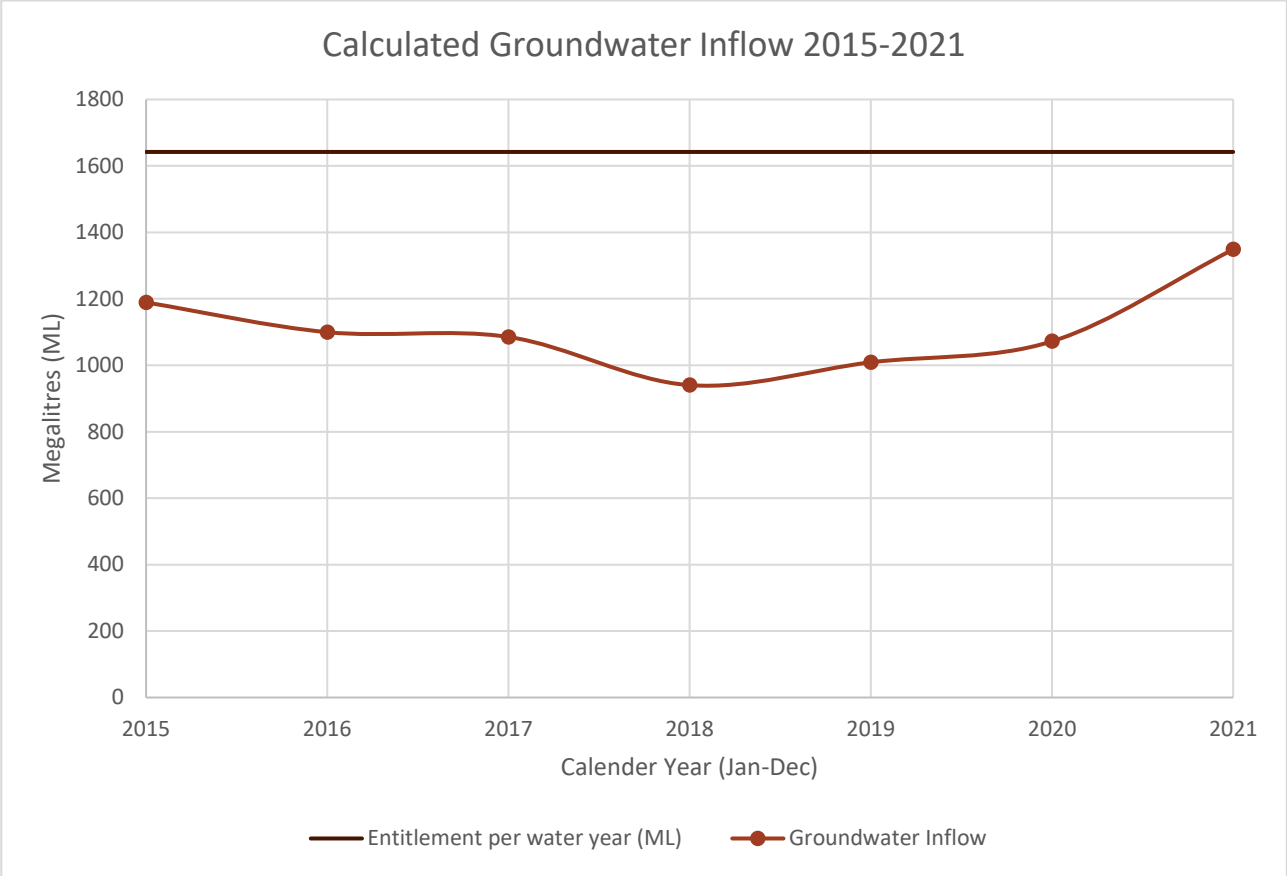


Table 17.1 Summary of Groundwater Outflow

Date	Water Licence #	Water Sharing plan/source and management zone (as applicable)	Entitlement per water year (ML)	Total Water loss from Underground (ML) *includes vent air and entrained ROM	Total from Underground (ML)	Total Water to Underground (ML)	Calculated Groundwater Inflow/Take (ML)
Jan-Dec 2015	36442	Greater Metropolitan Region Groundwater Sources / Sydney Basin Nepean Groundwater Source	1642	1189	1600.93	411.87	1189.06
Jan-Dec 2016	36442	Greater Metropolitan Region Groundwater Sources / Sydney Basin Nepean Groundwater Source	1642	1099	1524.50	424.92	1099.58
Jan-Dec 2017	36442	Greater Metropolitan Region Groundwater Sources / Sydney Basin Nepean Groundwater Source	1642	1085	1514.02	428.85	1085.17
Jan-Dec 2018	36442	Greater Metropolitan Region Groundwater Sources / Sydney Basin Nepean Groundwater Source	1642	940	1360.67	420.59	940.08
Jan-Dec 2019	36442	Greater Metropolitan Region Groundwater Sources / Sydney Basin Nepean Groundwater Source	1642	1009	1469.50	460.64	1008.86
Jan-Dec 2020	36442	Greater Metropolitan Region Groundwater Sources / Sydney Basin Nepean Groundwater Source	1642	1072	1619.49	547.52	1071.97
Jan-Dec 2021	36442	Greater Metropolitan Region Groundwater Sources / Sydney Basin Nepean Groundwater Source	1642	1348	1873.87	525.38	1348.49

Please note the following: 'Total Water to Underground' (Water sent from Tahmoor Coal's Recycle Water Treatment Plant and Sydney Water to underground workings), 'Calculated Groundwater inflow' ('Calculated inflow' equals 'Total from' less 'Total to' the mine workings) and 'Total water loss from Underground' (includes vented moisture and water entrained in ROM material extracted).

Figure 18 Calculated Groundwater Inflow Annual Volume (Calender Year).



Please note Tahmoor Coal have remained within groundwater extraction limits for the water year as per the licence WAL36442 for 2021 (as shown in **Table 18.1** above) and the FY21.

17.1.3 Further Improvements

Tahmoor Coal will continue to implement the Groundwater Management Plan, and ongoing monitoring and reporting will occur in accordance with the conditions in the water licence.

17.2 Surface Water

17.2.1 Environmental Management – Water Quality

Tahmoor Coal is licensed to discharge water from one (1) licenced discharge location and overflow from three (3) Licenced Overflow Points (LOPs) during periods of wet weather (as per EPL 1389) which refers to more than 10 mm of rainfall within a 24 hour period at the premisis. The location of the Licensed Discharge Point 1 and LOPs are described in **Table 18.2** and shown in **Appendix 4**

.

Table 17.2 Licensed Discharge and Overflow Points Locations

Point	Location
LDP 1	Discharge from Dam M4

LOP 3	Overflow from the REA Dam S9
LOP 4	Overflow from REA Dam S4
LOP 5	Overflow from REA Dam S8

17.2.2 Environmental Performance – Water Quality

Water discharged from LDP1 is monitored monthly via a grab sample and is conducted and analysed by an independent laboratory.

Tahmoor Coal's EPL 1389 states maximum discharge limits for analytes discharged via LDP1. These results are provided in **Table 18.3** for the reporting period. The water quality trend for LDP1 is outlined in **Figures 18** to **Figure 29** and shows relatively consistent results from monthly data in the last 7 years of monitoring since January 2015. There have been no non-compliances or exceedances of limits set by Tahmoor Coals EPL during the reporting period.

During the last reporting period, the installation of a real-time turbidity monitor was completed and has continued to form an integral part of the water management system on site. The additional use of flocculent mixed into the discharge dam series (M1-M4) via a dosing pump allows controlled dosing depending on the turbidity readings received from the real-time monitor.

Tahmoor Coal was issued with an updated EPL in September 2021 which adjusted the date of installation and testing completion for the pilot water treatment plant. These works were completed in December 2021. Commissioning of the main Water Treatment Plant will improve water quality for mine discharge waters.

Table 17.3 LDP1 Discharge Water Quality

	pH	Electrical Conductivity	Total Suspended Solids (TSS)	Turbidity	Enterococci	Total Nitrogen	Aluminium	Arsenic	Barium	Copper	Nickel	Zinc
	pH Unit	µS/cm	mg/L	NTU	CFU/100ml	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
100th Percentile Concentration Limits	6.5-9	2,600	30	150	1700	8	110	200	6440	5	200	300
Jan-2021	8.6	1960	<5	6.9	78	3.9	<10	75	2680	2	67	44
Feb-2021	8.7	2350	13	18	50	3.9	10	58	601	<1	63	96
Mar-2021	8.5	1910	9	7.1	100	3.4	30	91	2120	1	46	87
Apr-2021	8.5	2130	11	4.4	7	2.6	20	77	2400	<1	39	83
May-2021	8.6	1930	8	8.5	100	2.8	30	58	2530	1	43	82
Jun-2021	8.5	1830	16	19.1	12	2.7	20	32	3490	1	47	90
Jul-2021	8.4	2050	<5	2.3	4	2.9	<10	30	4000	<1	48	107
Aug-2021	8.5	2140	6	1.5	12	2.6	10	77	3210	<1	44	66
Sep-2021	8.5	1930	10	12.4	16	2.3	30	56	1590	1	30	71
Oct-2021	8.4	1920	24	12.4	33	2.4	40	72	1940	2	40	78
Nov-2021	8.5	1170	22	38.7	800	1.4	10	37	1280	2	17	84
Dec-2021	8.6	1840	<5	6.2	9	3.1	20	24	2290	1	36	40

Figure 19 Monthly Compliance Monitoring of pH at LDP1 from 2015-2021.

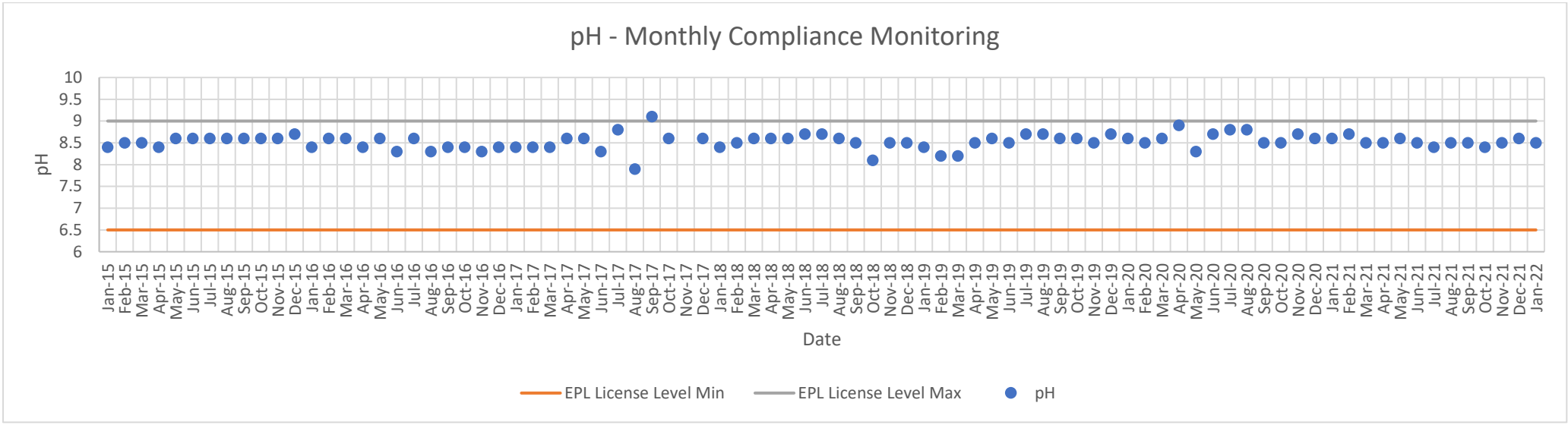


Figure 20 Monthly Compliance Monitoring of Electrical Conductivity at LDP1 from 2015-2021

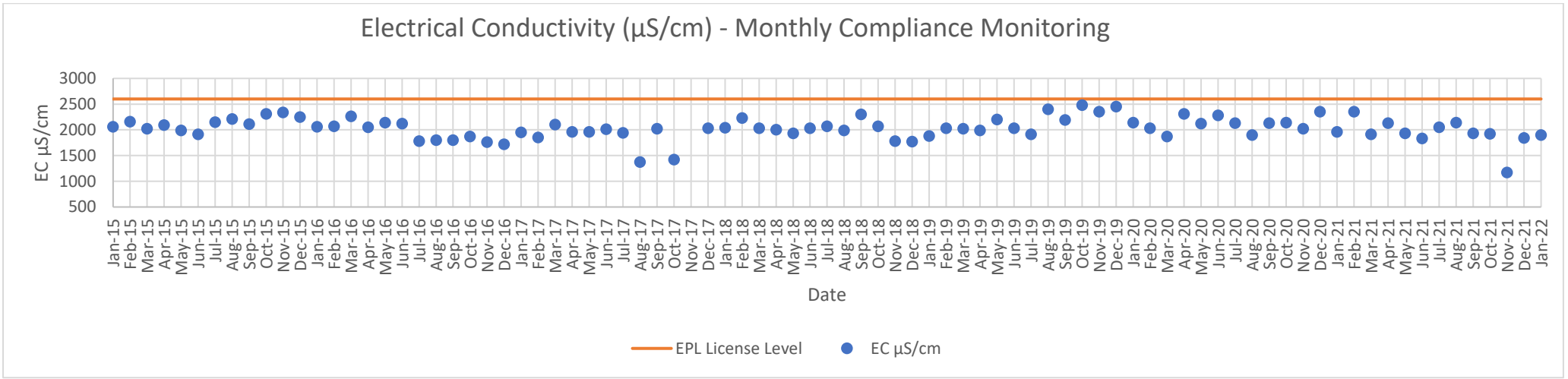


Figure 21 Monthly Compliance Monitoring of Turbidity at LDP1 from 2015-2021.

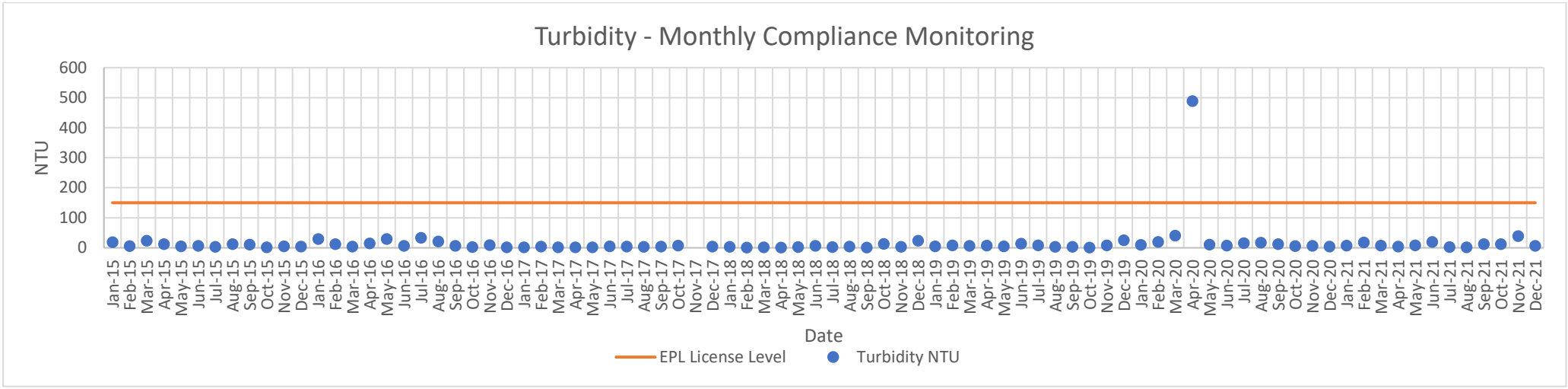


Figure 22 Monthly Compliance Monitoring of Total Suspended Solids at LDP1 from 2015-2021.

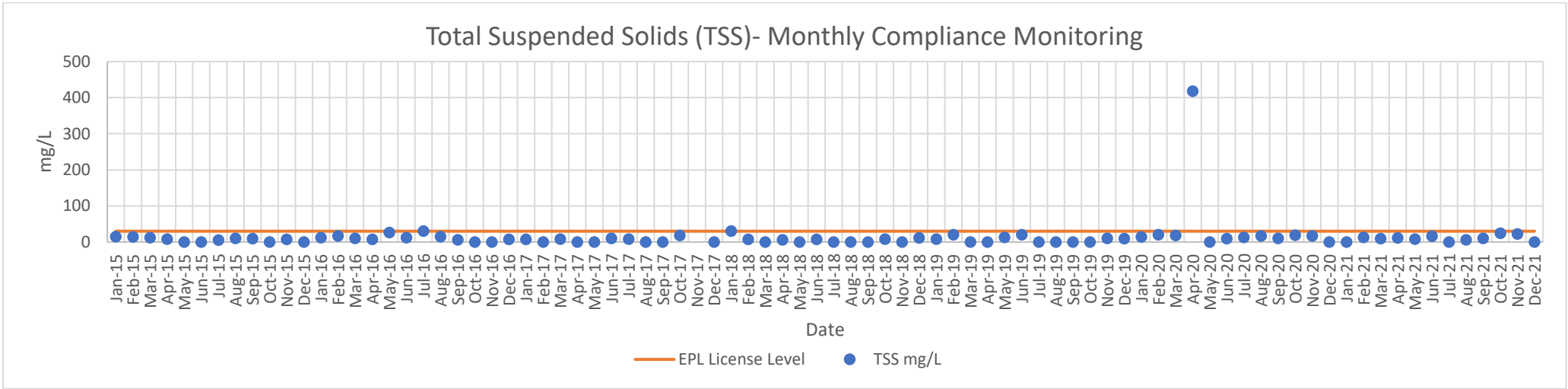


Figure 23 Monthly Compliance Monitoring of Arsenic and Nickel at LDP1 from 2015-2021.

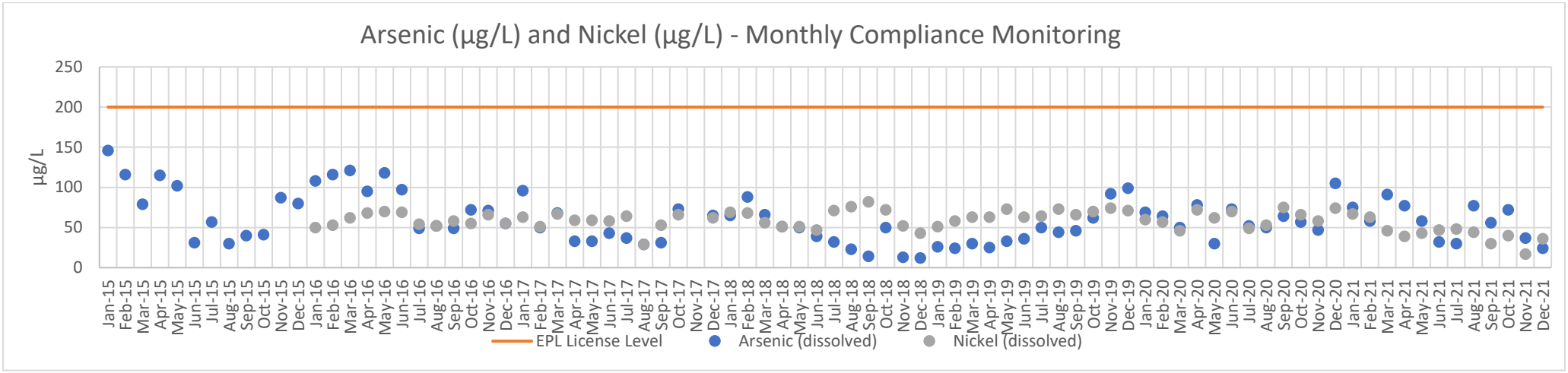


Figure 24 Monthly Compliance Monitoring of Zinc at LDP1 from 2015-2021.

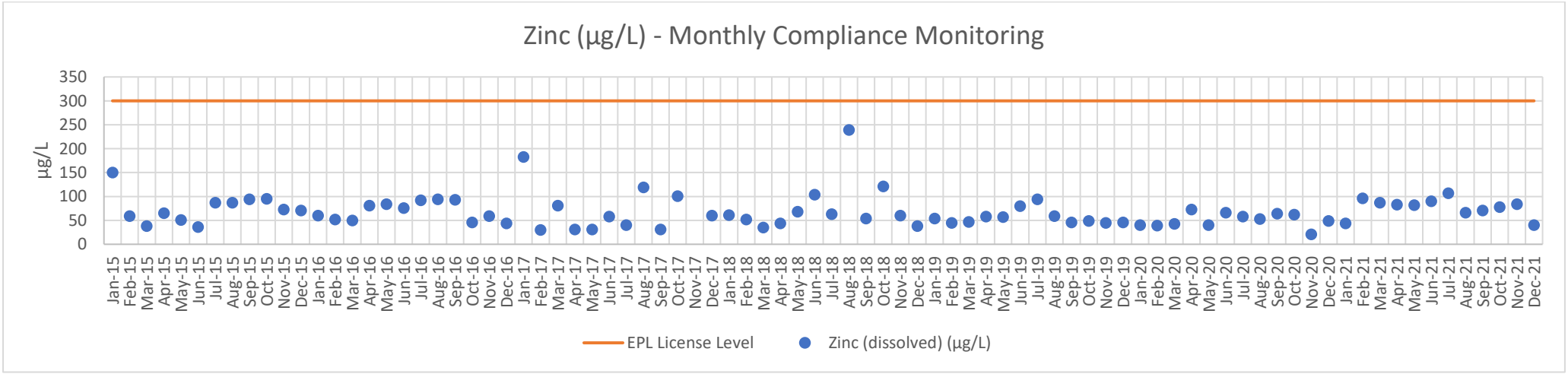


Figure 25Monthly Compliance Monitoring of Aluminium at LDP1 from Dec 2020-Dec 2021.

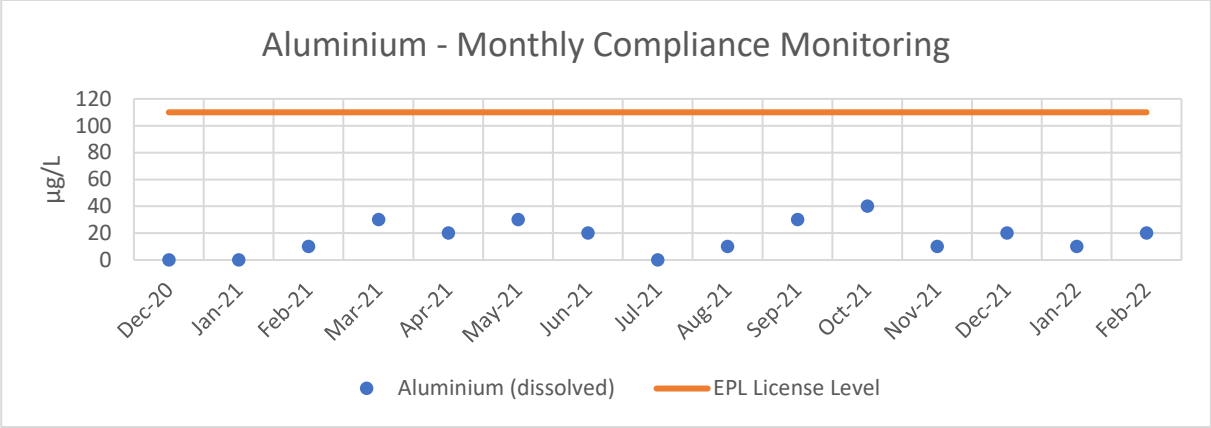


Figure 26 Monthly Compliance Monitoring of Zinc at LDP1 from Dec 2020-Dec 2021.

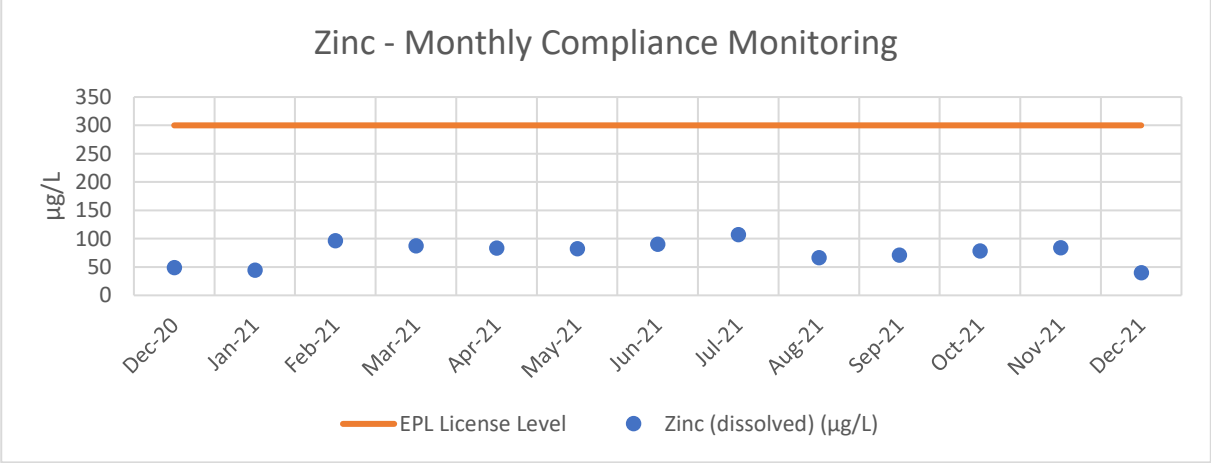


Figure 27 Monthly Compliance Monitoring of Copper at LDP1 from Dec 2020-Dec 2021.

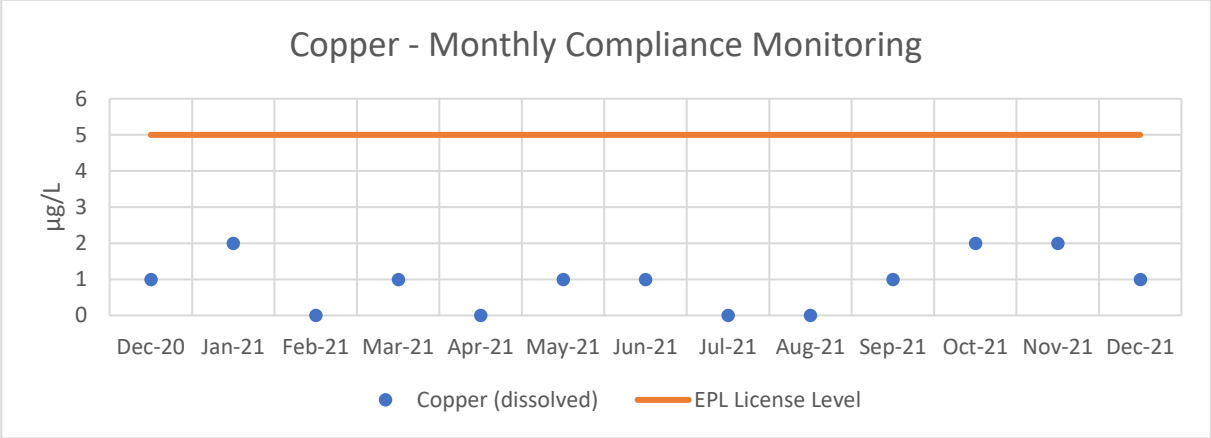


Figure 28 Monthly Compliance Monitoring of Barium at LDP1 from Dec 2020-Dec 2021.

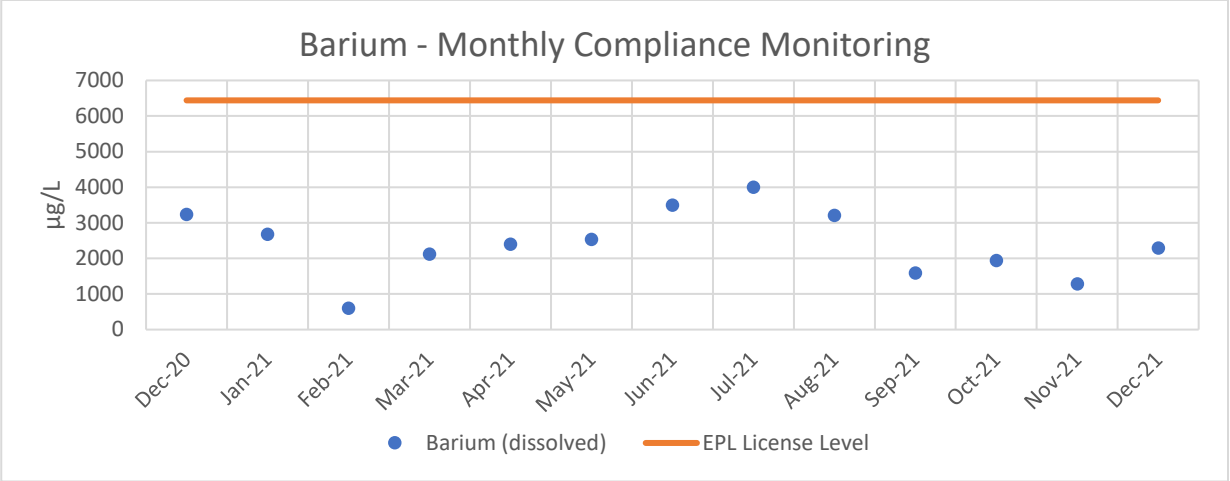


Figure 29 Monthly Compliance Monitoring of Nitrogen at LDP1 from Dec 2020-Dec 2021.

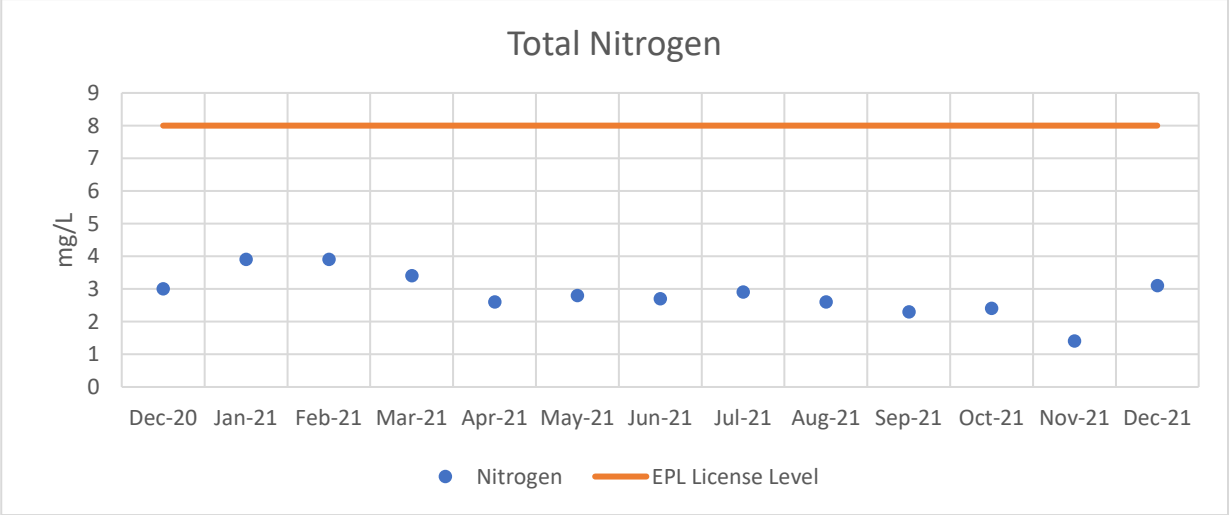
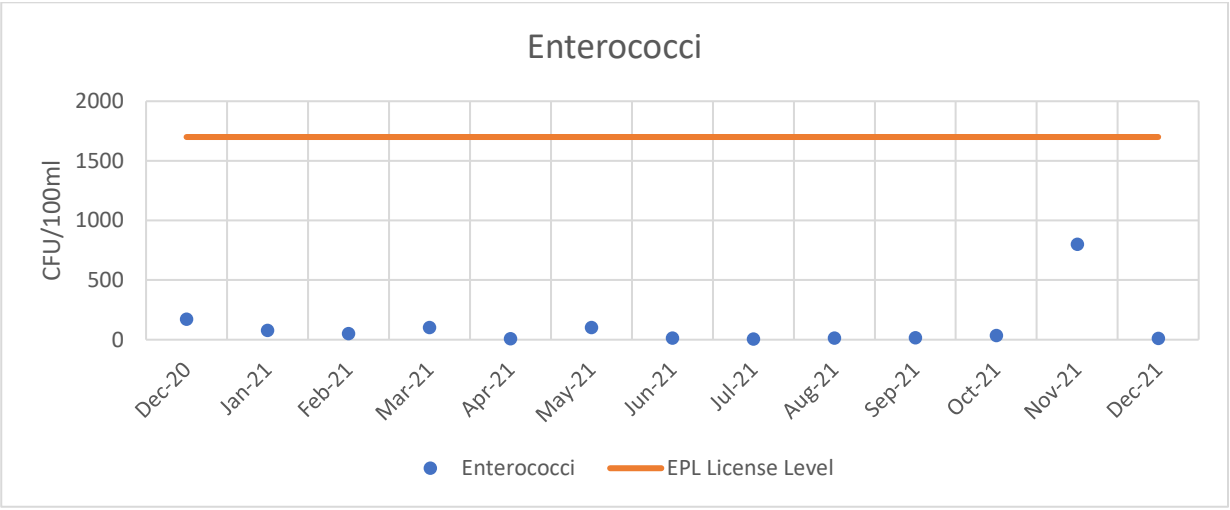


Figure 30 Monthly Compliance Monitoring of Enterococci at LDP1 from Dec 2020-Dec 2021.



17.2.3 **Environmental Management – Water Discharge**

Tahmoor Coal is licensed to discharge water from one (1) licenced discharge location and overflow from three (3) LOPs during periods of wet weather (as per EPL 1389) which refers to more than 10 mm of rainfall within a 24 hour period at the premisis. The location of the LDP1 and LOPs are described in **Table 18.2** and shown in **Appendix 4.**

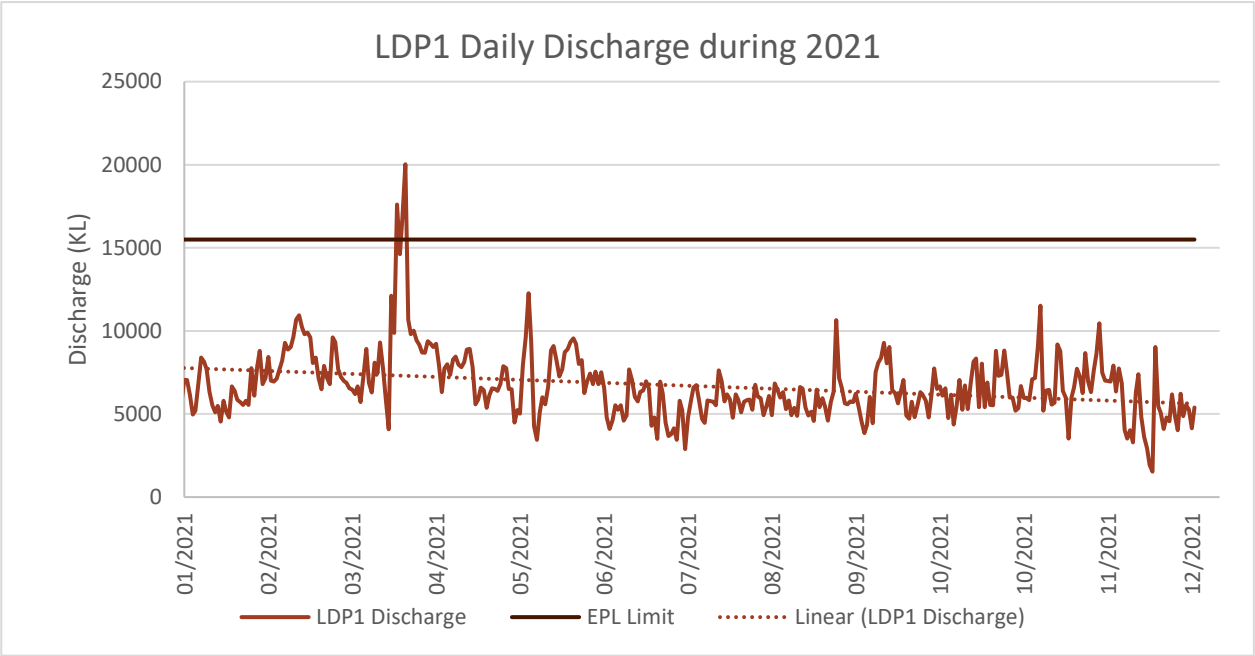
On average Tahmoor Mine discharged 6706 kL/day with a total of 2 461 522 kL or approximately 2462 ML discharged during the reporting period. This is shown in **Table 18-4, Figure 30** and **Figure 31.** The peak in **Figure 30** in March 2021 was as a result of high rainfall events between the 21st of March and the 24th of March 2021. This is in accordance as per Tahmoor Coal's EPL 1389 (more than 10 mm rainfall in 24 hrs, recorded from Tahmoor Coal's Pit Top weather station).

Table 17.4 Daily Discharge (KL) via Licence Discharge Point 1 (LDP1).

Day	Jan (kL)	Feb (kL)	Mar (kL)	Apr (kL)	May (kL)	Jun (kL)	Jul (kL)	Aug (kL)	Sep (kL)	Oct (kL)	Nov (kL)	Dec (kL)	EPL Daily Discharge Limit (kL)
1	6535	6795	7227	9370	6481	6794	5212	6093	6229	6665	5945	6953	15500
2	5384	7161	6986	9222	4481	7514	2893	4933	5430	6108	5828	7906	15500
3	5757	8427	6874	9028	5242	6561	4785	6831	4558	6547	7084	6349	15500
4	7041	7010	6548	9217	5023	4793	5776	6438	3850	4765	7171	7743	15500
5	7055	6956	6475	7927	7909	4094	6593	5988	4339	6164	9059	6850	15500
6	6133	7122	6199	6308	9602	4600	6739	6324	6026	4368	11510	4052	15500
7	4961	7697	6660	7749	12262	5524	5762	5296	4442	5469	5196	3526	15500
8	5196	8213	5719	7984	9385	5254	4699	5809	7506	7044	6420	4022	15500
9	6783	9280	7286	7350	4279	5530	4463	4938	8063	5259	6449	3286	15500
10	8406	8878	8914	8290	3445	4610	5808	5380	8368	6721	5570	6277	15500
11	8154	9028	6886	8452	5123	4915	5781	4891	9279	5287	5676	7402	15500
12	7708	9629	6291	7973	6014	7683	5730	6629	8050	6845	9186	4830	15500
13	6328	10680	8082	7811	5585	7044	5532	6537	9035	8141	8790	3617	15500
14	5532	10946	7461	8127	6617	6029	7635	5399	6429	8335	6402	2940	15500
15	5112	10220	9300	8888	8817	5762	6983	4918	6253	5420	5983	1940	15500
16	5493	9798	7774	8915	9094	6333	5760	5135	5641	8029	3516	1532	15500
17	4547	9897	5871	7837	8235	6419	6187	4591	6278	5419	5991	9037	15500
18	5790	9604	4082	5582	7256	6980	5875	6462	7044	6885	6610	5465	15500
19	5161	8074	12116	5852	7682	6529	4772	5405	4903	5554	7720	5070	15500
20	4801	8389	9878	6587	8733	4296	6179	5942	4710	5519	7256	4104	15500
21	6657	7144	17608	6422	8892	4799	5856	5444	5740	8810	6255	4788	15500
22	6364	6490	14621	5370	9334	3509	5100	4598	4812	7299	8669	4564	15500
23	5844	7903	16900	6101	9558	6957	5745	5709	5517	7364	6952	6177	15500
24	5712	7180	20028	6556	9220	6246	5828	6354	6309	8829	6314	4916	15500
25	5539	6801	10671	6516	8005	4458	5870	10645	6123	7411	7659	4027	15500
26	5789	9619	9810	6389	8247	3680	5250	7166	5800	5985	8635	6218	15500
27	5553	9320	10017	6810	6262	3769	6750	6533	4785	5995	10464	4880	15500
28	7752	7694	9433	7872	6976	4135	6052	5650	6221	5206	7482	5554	15500
29	6100		9142	7760	7440	3440	5958	5583	7750	5346	7005	5261	15500
30	7844		8705	6513	6802	5787	4929	5755	6505	6679	6989	4142	15500
31	8801		8687		7542		5475	5727		5976	6953	5387	15500
MIN	4547	6490	4082	5370	3445	3440	2893	4591	3850	4368	3516	1532	1532
MAX	8801	10946	20028	9370	12262	7683	7635	10645	9279	8829	11510	9037	20028
AVERAGE	6253	8427	9105	7493	7405	5468	5677	5907	6200	6434	7121	5123	6706

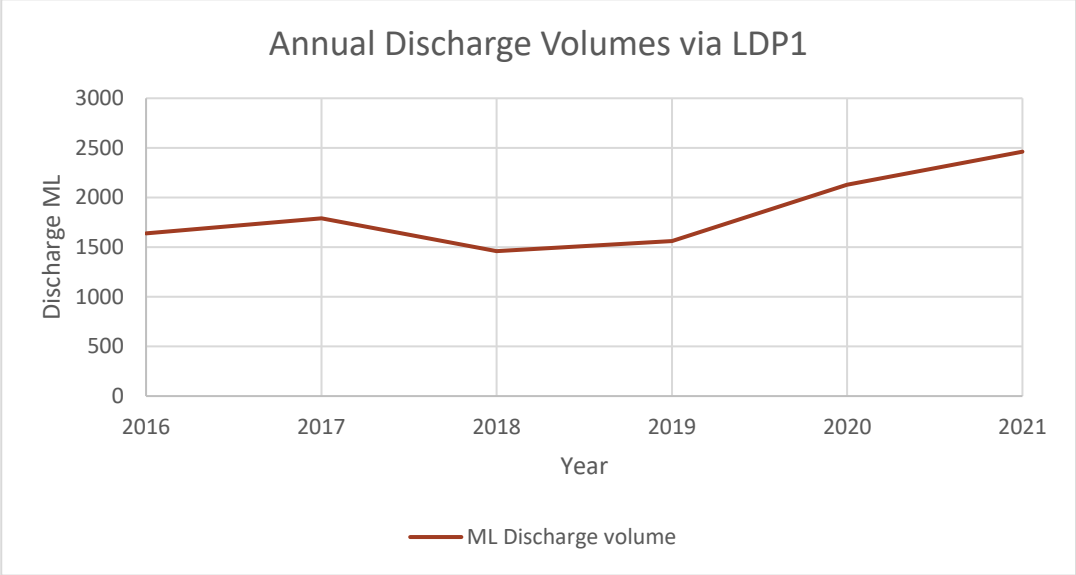
Highlighted cells indicate exceedance due to high rainfall events with more than 10mm of rainfall received from our stockpile weather station on site. This is in accordance with Tahmoor Coal's EPL 1389 which allows daily discharge over the prescribed limit when more than 10mm of rainfall is recorded in 24hours

Figure 31 Daily Discharge (kL) via LDP1



*The spike in March 2021 is attributed to high rainfall events between the 21st and 24th of March 2021 (refer to Table 18.4 for further details). This is in accordance with Tahmoor Coal's EPL 1389 which allows daily discharge over the prescribed limit when more than 10mm of rainfall is recorded in 24hours.

Figure 32 Volume (ML) of Discharge from LDP1 for the past 5 years.



17.2.4 Further Improvements

Tahmoor Coal has demonstrated a significant reduction in historical non-compliances with EPL water conditions, with the performance improvement attributed to the implementation of water management Pollution Reduction Program (PRPs) at Tahmoor Coal from 2011 to present.

Tahmoor Coal will further improve Water Quality of its discharge waters through the construction and implementation of a new Water Treatment Plant in the near future. The implementation of a pilot plant trial operated for 8 weeks and was successfully completed in December 2021, ensuring

that Reverse Osmosis technology is fit for purpose. Output water achieved compliance with ANZECC Guidelines for all specified analytes within the Environment Protection Licence (EPL).

17.2.5 Potable Water Supply

Sydney potable water is utilised across Tahmoor Coal with applications in amendities across Pit top facilities and sent underground for Longwall applications. Emphasis is placed on utilising recycled water and seeking to reduce Sydney Water potable water use on site where possible. The average monthly potable water usage was 43 ML/month for the reporting period.

17.2.6 Recycled Water Treatment Plant

Tahmoor Coal recycles mine water from the sealed longwall goafs to the south of the No.3 Shaft for reuse in the mine operations underground and various surface facilities. **Table 18-5** demonstrates an increase in the use of Sydney potable water for site due to issues with the operation of the Recycled Water Treatment Plant (RWTP), causing a decrease in the amount of water recycled for site during this reporting period.

Table 17.5 Recycled and Potable Water Use

Water usage	2015	2016	2017	2018	2019	2020	2021
Potable Water usage (kL)	437 440	402 840	259 668	133 389	414 115	396 435	525 301
Recycled Water usage (kL)	261 870	308 290	200 755	388 449	291 372	186 584	65 259*
ROM tonnes	2 632 695	2 721 284	2 107 326	2 110 328	2 388 854	2 354 901	2 747 965
Potable Water Intensity (L/ROM tonne)	166	156	123	63	173	151	168

*Reduction in Recycled water usage for the reporting period is attributed to issues with the operation of the Recycled Water Treatment Plant.

17.2.7 Water Storage Volumes

Data regarding stored water volume in site dams is provided within **Appendix 5.**

Tahmoor Coal does not participate in any salinity trading scheme, and therefore does not report controlled discharge water in this section.

Water used or contaminated by mining activities is discharged at the approved licence discharge or overflow point. Each discharge is sampled and tested monthly by a third party contractor in accordance with the EPL 1389 conditions and EPA *Approved methods for sampling and analysis of water pollutants in NSW*.

Mine water and storm water is discharged into Teatree Hollow Creek which flows into the Bargo River. Water samples from the Bargo River are also taken monthly; upstream, downstream and at the confluence of Teatree Hollow Creek.

The layout of Tahmoor Mine site's water management system is outlined within **Appendix 4** and **Appendix 6**.

18 Rehabilitation

The Tahmoor South Project was approved in the reporting period, extending mining activities until December 2033 or 10years from the commencement of second workings (whichever is sooner). The area for future reject emplacement will occupy the current approval extent, increasing the allowable height of the REA to 320RL. This will involve the stripping of top rehabilitated sections to emplace reject material higher, which will then be capped with topsoil and re-rehabilitated as per site rehabilitation procedures.

A summary of the Tahmoor Mine rehabilitation is provided within **Table 19-1**. Approximately three (3) hectares of land in the western section of the REA will be prepared for rehabilitation during the next reporting period and active rehabilitation will be commenced shortly thereafter. Rehabilitation for the eastern batter has been postponed given further emplacement to commence in the next reporting period, this section will then be re-capped with topsoil and rehabilitation will commence shortly after.

Table 18.1 Rehabilitation Summary

Mine Area Type	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
	2020 (ha)	2021 (ha)	2022 (ha)
A. Total mine footprint	142.5	142.5	142.5
B. Total active disturbance	74.5	78.5	78.5
C. Land being prepared for rehabilitation	0	0	3
D. Land under active rehabilitation	0	0	0
E. Completed Rehabilitation	0	0	0

Annual rehabilitation monitoring was conducted during the reporting period. Bushfires affected the area in late 2019 destroying reference sites and plots established in stages 6 and 9, however during the annual walkover 2020 evidence of epicormic growth across all sites have been noted and regrowth of grasses and forbs as groundcover have regenerated. This has continued in 2021, with further abundance of new and thickening of vegetation through out the rehabilitation areas.

The reference plots and permanent monitoring plots which were burnt by fire in 2019 showed good signs of recovery with epicormic growth evident of canopy species, high levels of seedings and saplings of canopy species noted, and a high level of species cover and diversity of grasses and forbs. There is also evident of nutrient recycling with termite mounds, ants and scats noted in those burnt plots. Litter cover had significantly improved in these plots with grass, leaf litter and twigs recorded in all plots.

Over the past 12 months there has been above average rainfall attributed to the current La Nina event. The non-burnt plots in the REA show that the above average rainfall had a positive impact on understorey species cover and across the REA. Most plots recorded an increased percentage of understorey cover, and native grass cover. Generally, most plots also recorded an increase in the

number of target species. Some plots also recorded a higher percentage cover of weed cover which is expected considering the high rainfall coverage over the past 12 months.

Generally, additional characteristics and changes that were noted include:

- Adequate growth of the diameter at breast height (DBH) in all canopy species including juveniles and seedlings;
- Consistent senescence of *Acacia* spp*;*
- Increase of weed cover over the last 12 months in stage 1 of the REA and increased weed management is required in this area;
- Signs of a rabbit population observed, and
- Herbivory of planted grasses in grass trials reducing reproductive potential of grass species.

18.1 Environmental Performance

A Rehabilitation Improvement Plan in association with a TARP included a classification status of each assessed area forming the basis for the TARP for each stage showed in **Table 19-2** and **Table 19-3**. This is used in the Annual Rehabilitation walkover to categorise the successfulness of the rehabilitation in **Appendix 12**. Over the reporting period, Stages 8, 6 and 9 have upgraded from NC1 to C (see **Figure 32** for location of stages).

Table 18.2 TARP Classification

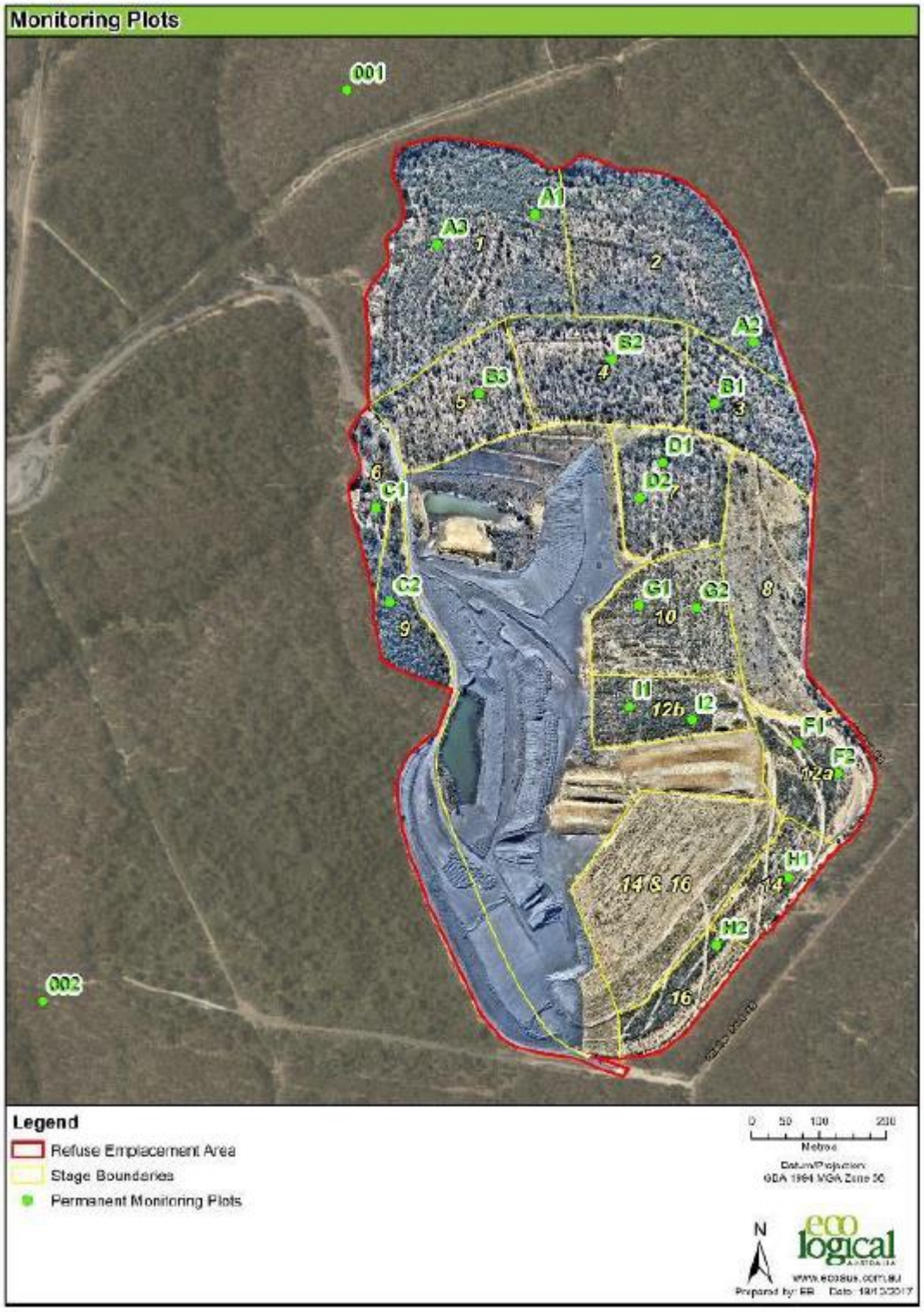
Annual Rehabilitation Status	Description	Action
VC	Generally, exceeds the good practice standards and regulatory requirements by a significant margin.	No further action. Continue to maintenance activities as scheduled.
C	Generally good practice standards and regulatory requirements subject to normal variance.	No further action. Continue to maintenance activities as scheduled.
NC1	Not complying with some regulatory requirements and improvement needed to meet required good practice standards. Required works minor in nature and generally within budgeted site program.	Undertake minor works to improve rehabilitation to minimum standard prior to next annual inspection.
NC2	Not complying with significant risk to this inspection item, urgent corrective action needed. Requirements generally substantial in nature and beyond a budgeted site program.	Undertake major works required to improve rehabilitation to minimum standard prior to next annual inspection.

Table 18.3 TARP Rehabilitation Performance

Area	Status Rating	Comments/Opportunity for improvement
Stage 1-2	C	Minor gully erosion to be improved, continued weed control.
Stage 3-5	C	Continued weed control. Opportunity for planting with understorey species in limited areas

Stage 7	NC1	Continued weed control for priority and environmental weeds
Stage 8	C	Continued weed control for priority and environmental weeds
Stage 6 & 9	C	Continued weed control for priority and environmental weeds
Stage 10	C	Continued weed control
Stage 12	C	Opportunity for brush mulching to increase species diversity in understorey species
Stages 14-16	C	Continued weed control for priority and environmental weeds

Figure 33 Rehabilitation stages and monitoring plots



18.2 Actions for the Next Reporting Period

Rehabilitation works on the eastern batter of the REA have been postponed to allow for further reject emplacement, this area will then be capped with topsoil and rehabilitated as per site procedures. On the western section batters, contour drainage works are proposed to be completed, batters contour plouded and rehabilitation seeding commenced. Rehabilitation targets for the next reporting period (1st January 2021 – 31st December 2021) are outlined in **Table 19.4**.

Table 19.4 Rehabilitation Targets

Category	Targets for 2022 (ha)				
	Q1	Q2	Q3	Q4	Total (Target)
Disturbed	0	0	0	0	0
Levelled/Re-contoured	0	0	0	0	0
Rehabilitation Seeding	0	0	3	0	3
Established	0	0	0	0	0

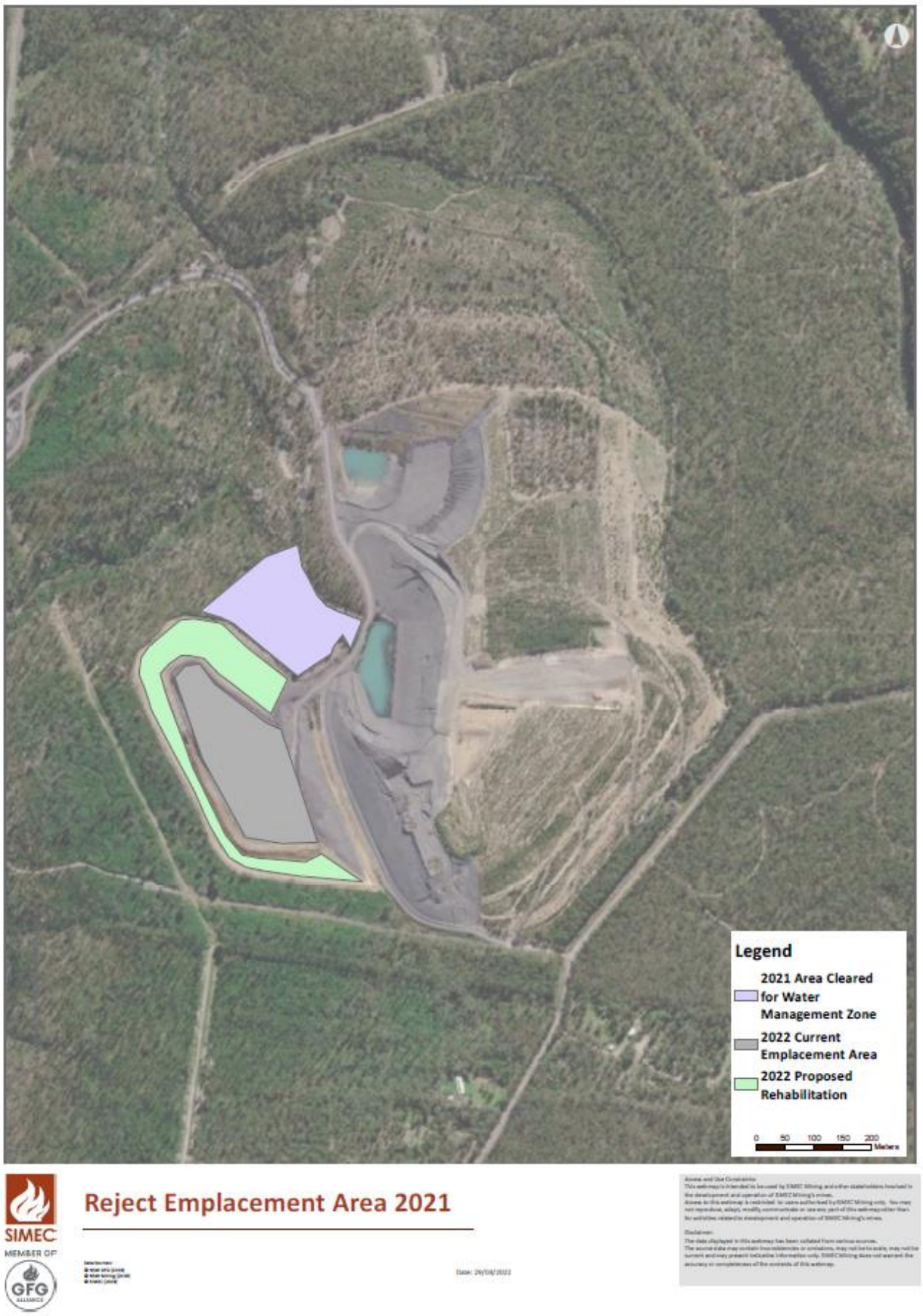
A summary of maintenance activities completed and proposed for all rehabilitated land is outlined within **Table 19.5**.

Table 19.5 Rehabilitation Maintenance Activities

Nature of Treatment	Area (Ha) this Reporting period	Area (Ha) next reporting period	Comments, Control Strategies, Treatment Detail
Additional erosion control (drains re-contouring, rock protection)	<1	<1	Routine improvements and maintenance to existing stormwater drainage system and erosion/sediment controls on disturbed areas.
Re-covering (detail – further topsoil, subsoil sealing, etc)	4	0	Exterior batters of western section covered in 2021 with top soil, topsoil to be seeded with a prescribed grass mix in 2022. Topsoil stock piles to be also seeded with a pasture mix in 2022.
Soil treatment (detail – fertiliser, lime, gypsum, etc)	0	4	No rehabilitation conducted in 2021 Gypsum to be applied to the exterior batters of the western section in 2022 and top soil stockpiles.
Treatment management (detail – grazing, cropping, slashing, etc)	0	0	-
Re-seeding/planting (detail – species density, season, etc)	0	0	No rehabilitation conducted in 2021
Adversely affected by weeds (detail, type and treatment)	0	0	No areas adversely affected by weeds for 2021
Feral animal control (detail – additional fencing, trapping, baiting, etc)	80	80	Feral Cats and foxes to be trapped across site as required. Continued baiting of rabbits next reporting period.

Figure 33 demonstrates future rehabilitation works proposed for the next reporting period during 2022. Current Emplacement is taking place within the dark section shown in **Figure 33** and clearance works were completed in 2021 in the purple section for the location of future water management zone (i.e. future dam).

Figure 34 Reject Emplacement Area 2021 progress and 2021 proposed works.



18.3 Mine Closure

18.3.1 Post mining Land use

There are several post mining land use options that may be applicable for the Tahmoor Mine site including residential, industrial or a return to native bushland.

The likely final land use option for most of the Tahmoor Mine closure domains will be a return to native bushland (refer to **Figure 34**). However, the final land use options will be confirmed in the detailed closure planning process, which involves undertaking a final land use analysis.

A detailed closure plan was developed as part of the Environmental Impact Statement for the Tahmoor South Project, as the Rehabilitation and Mine Closure Strategy (SLR,2020).

18.3.2 Rehabilitation Indicators

The REA key rehabilitation indicators include the following:

- Maximum height of RL320 (SSD 8445);
- Maximum slope on final landform external batters will be 1:4 (generally will be 1:8);
- External batters should have gently sloping contour drains, reporting to water storage dams;
- Topsoil placement depth >300 mm;
- All final landform slopes to be contour ploughed prior to seeding or planting;
- Target <10% weeds infestation within monitoring transects;
- Target evidence of second-generation flora germination in monitoring transects (monitored annually); and
- Rehabilitation monitoring transects contain flora species and structural characteristics like the desired vegetation communities at the analogue sites (monitored annually).

The MOP outlines that soils found at Tahmoor Mine have been identified as part of the Lucas Heights Soil Landscape and occurring adjacent to the Gymea Soil Landscape. Soil limitations of the landscape include stoniness, hard setting surfaces and low soil fertility. Erosion on the landscape is generally low. Where possible, deeper soil horizons are reserved for subsoil and capping material, while the top soil horizons with the highest organic content is reserved to rehabilitation and direct seeding/planting.

A combination of sterile cover crops and grass, shrub and tree seed mixes are used at the REA to achieve the rehabilitation objective of native bushland. A species list has been developed and refined based on Tahmoor Coal ’s development consents and the results of annual rehabilitation monitoring (identifying which species have proven more successful than others).

Hollow bearing trees and timber logs from clearing activities at the REA have been salvaged and stockpiled for use throughout rehabilitation areas. Logs and hollows are spread throughout rehabilitation areas where access permits, to provide structure and encourage colonisation by fauna.

All mine closure domains (refer to **Appendix 9**)(including active domains still in operational use) specific in Tahmoor Mine Conceptual Mine Closure Plan and MOP were assessed to establish an annual record of the status of each domain, including photographic monitoring to show progress and changes year to year included in the annual rehabilitation walkover (**Appendix 12**).

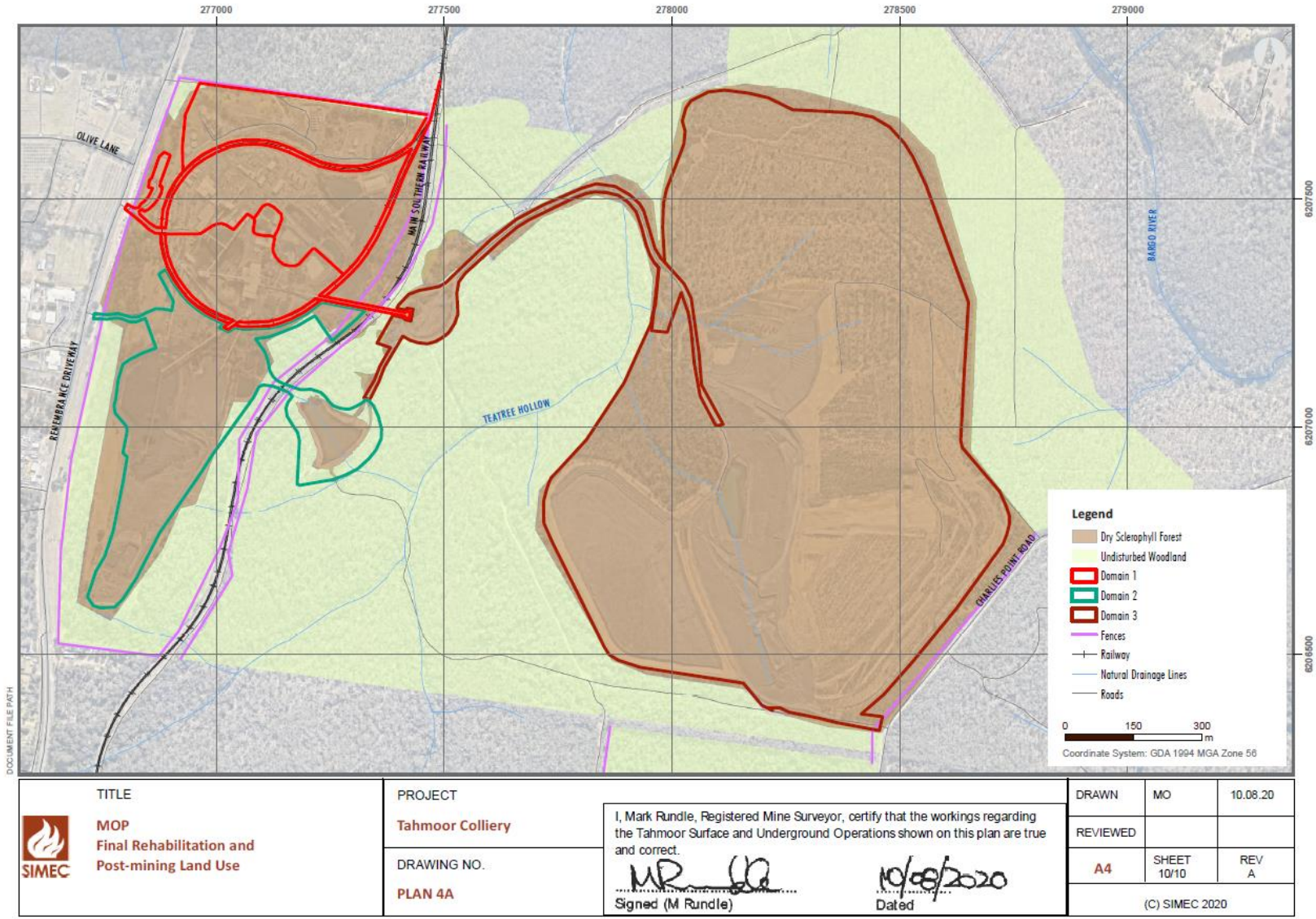
Monthly surveying is conducted in active landform areas to monitor maximum slope to conform to final landform designs.

Tahmoor Coal has five (5) identified primary closure domains based on operational function and geography. Most of these domains are connected or within close proximity of one another, and will therefore share similar final landforms and rehabilitation objectives. A schedule of these domains, with the rehabilitation status and the start and end of the MOP term, is provided in **Table 19-4** and shown in **Appendix 9.**

Table 18.4. Tahmoor Coal Closure Domains

Domain	Description	Rehabilitation Status	
		MOP Commencement	**MOP Completion**
1	Tahmoor Mine Main Pit Top Area	-	-
1A	CHPP	Active Area	Active Area
1B	Rail Loading Facility	Active Area	Active Area
1C	Main Workshop and Administration Area	Active Area	Active Area
1D	No.3 Shaft and Gas Drainage Plant	Active Area	Active Area
1E	Sewage/Water Treatment Plant	Active Area	Active Area
2	Product Stockpile Area	Active Area	Active Area
3	Refuse Emplacement Area	Active Area, Ecosystem Est., and Ecosystem Dev.	Active Area, Ecosystem Est., and Ecosystem Dev.
4	No.1 Ventilation Shaft	Active Area	Active Area
5	No.2 Ventilation Shaft	Active Area	Active Area
6	Off Title Subsidence Area	Active Area	Active Area

Figure 35 Final rehabilitation and post-mining land use.



19 Weeds

19.1 Environmental Management

A Weed Management Plan has been developed as part of the site Environmental Management System. The purpose of this plan is to outline management strategies and controls for noxious and environmental weeds, so that weed infestations are controlled and kept at an acceptable level on all lands owned or managed by the mine. A summary of weed species targeted during the reporting period, and control methods used, is provided in **Table 20-1.**

Table 19.1 Weed Target Species

Target Weed Species	Date of Control	Treatment Method
African Lovegrass (Eragrostis curvula)	All seasons	Herbicide (Glyphosate)
Hedge Mustard (Sisymbrium orientale)	All seasons	Herbicide (Glyphosate Dicamba)
Whiskey Grass (Andropogon virginicus)	All seasons	Herbicide (Glyphosate)
Serrated Tussock (Nassella trichotoma)	All seasons	Herbicide (Glyphosate)
Fireweed (Senecio riensis madagasca)	Winter or as detected	Hand Weeding & Herbicide (Glysophate) Late Autumn
Swan Plant (Gomphocarpus fruticosus)	All seasons	Hand Weeding
Western Australian Golden Wattle (Acacia saligna)	All seasons	Cut stump removal and herbicide application
Couch (Cynodon dactylon)	All seasons	Herbicide (Glyphosate)
Fountain Grass (Cenchrus setaceus)	All seasons	Herbicide (Glyphosate)
Catsear (Hypochaeris radicata)	All seasons	Herbicide (Glyphosate)
Narrow-leafed Cotton Bush (Gomphocarpus fruticosus)	All seasons	Herbicide (Glyphosate Dicamba)
Flaxleaf Fleabane (Conyza bonariensis)	All seasons	Herbicide (Glyphosate resistant)
Scarlet Pimpernel (Anagallis arvensis)	All seasons	Herbicide (Glyphosate Dicamba)
Veined Verbena (Verbena rigida)	All seasons	Herbicide (Glyphosate Dicamba)
Paspalum (Paspalum dilatatum)	All seasons	Herbicide (Glyphosate)
Red-flowered Mallow (Modiola caroliniana)	All seasons	Hand weeding & Herbicide (Glyphosate)
Plantain (Plantago)	All seasons	Herbicide (Glyphosate)

19.2 Environmental Performance

Weed management of all land owned or managed by Tahmoor Coal has continued through the reporting period. Monthly Environmental inspections across Pit Top, REA, Shaft site 1, Shaft site 2 and the Bargo shaft site continually monitor weed prevalence across these sites and target area's of concern to be controlled within the next month by Tahmoor Coal's Grounds maintenance contractors.

Continuation of the current weed control program and additional attention to weed incursion in newly vegetated areas and control of *Andropogon virginicus, Eragrostis curvula, Sisymbrium orientale , Acacia saligna*, and seedling *Leptospermum laevigatum* has been recommended and is monitored monthly.

During the reporting period there was an increased prevalence in the quantity of weed species germinating on site due to the wetter than average conditions. This was managed and maintained monthly by Tahmoor Coal's Grounds Maintenance Contractor.

There were no reportable incidents related to weed management during the reporting period.

19.3 Further Improvements

Tahmoor Coal will continue weed management monitoring and activities within associated leased and owned land, across pit top and continue monitoring of our rehabilitation areas at the REA.

20 Bushfire Management

20.1 Environmental Management

During 2020, Tahmoor Coal reviewed and updated the Bushfire Management Plan (BMP) in consultation with the Wollondilly Rural Fire Service (RFS) to include an updated hazard reduction burn schedule as a response to the Green Wattle Bushfire of November 2019 to January 2020 (see **Figure 10**). The BMP provides significant detail on the location of all Tahmoor Coal land holdings with detailed maps showing Asset Protection Zones (APZ), Land Management Zones (LMZ) and Strategic Fire Zones (SFZ), gate/track/road access for all locations, and a detailed schedule of hazard reduction activities required for each location.

20.2 Environmental Performance

During 2021, Annual Asset Protection Zone maintenance was undertaken successfully for the perimeters of pit top, REA fire trails, Shaft site 1, Shaft site 2 and Tahmoor Coal owned neighbouring properties on Charlies Point Road (refer to **Figure 9**). No hazard reduction burns were completed during the reporting period and no wild fires were reported in the region.

20.3Further Improvements

Additional boundary clearance works are currently being organised for a section along the Reject Emplacement Area southern boundary fenceline.

Tahmoor Coal will continue to implement hazard control strategies outlined in the current BMP.

Figure 36 Annual Fire trail maintenance for Tahmoor Coal

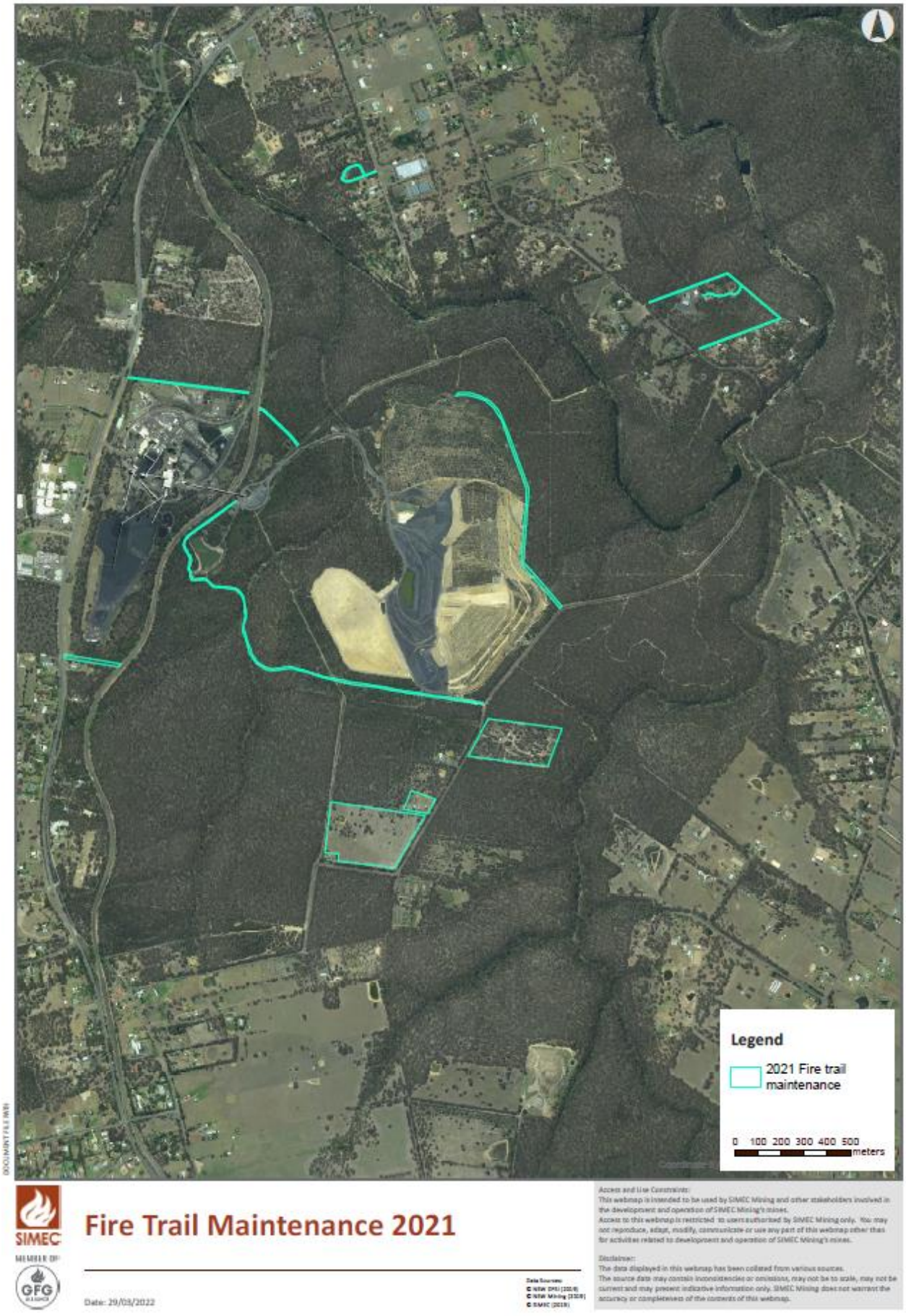
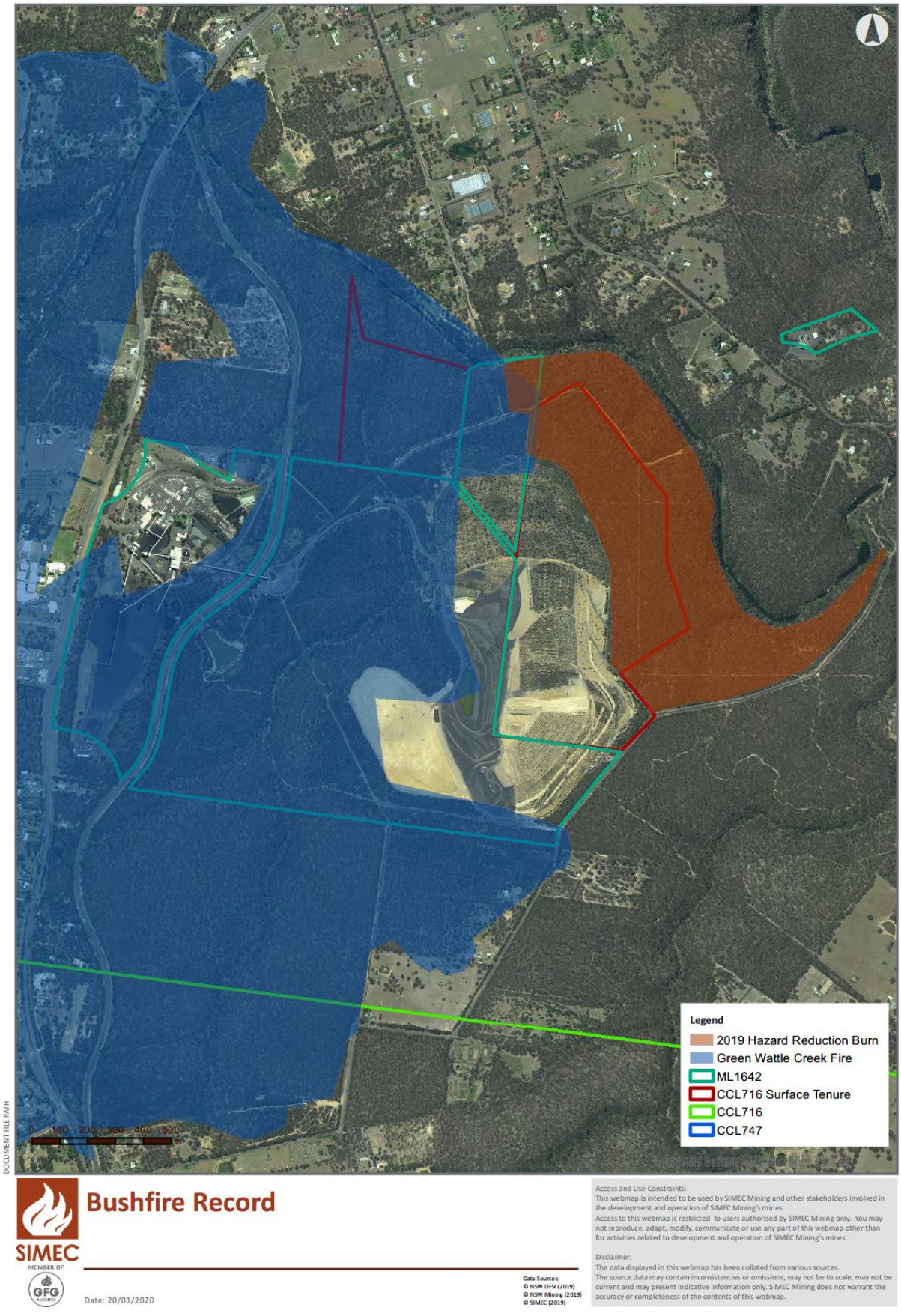


Figure 37 Bushfire Record from 2019 Green wattle Creek Fire and hazard reduction burn.



21 Community

21.1 Community Engagement Activities

Tahmoor Coal recognises that genuine partnerships with stakeholders and local communities are an essential part of community engagement.

Tahmoor Coal has established a good working relationship with the local community throughout its operations and seeks to continue this as new projects are established. There is a focus on providing timely and accurate information regarding its performance to its varied stakeholders.

The method of consultation used varies depending on the scale of project, stakeholder type and preferred method of communication.

The following consultation methods are commonly used to communicate and engage with stakeholders (subject to Covid-19 protocols):

- Newsletters – distributed by email, website, post and printed posters displayed in various locations;
- Resident Information Packs – Distributed to residents in current and future proposed mining areas and website;
- Face to face consultation meetings, eg. Local landholders, schools, businesses and community groups;
- Website (http://www.simec.com/mining/tahmoor-coal-pty-ltd/) containing a variety of information and reports;
- 24-hour complaints line – phone number displayed on newsletter, website and distributed as required, eg. Face to face meetings;
- Tahmoor Coal Community Consultative Committee (TCCCC) Meetings – four (4) quarterly meetings held in 2021 (4th March, 3rd June, 2nd September and 2nd December);
- Community Information Sessions –as required at various locations (open to all members of the public)
- Six Monthly Subsidence Impact Report – distributed to TCCCC and available on Tahmoor Coal website.

21.2 Community Contributions

Tahmoor Coal contributes to the social and economic development of sustainable communities associated with its operations and ensures the rights of communities in which it operates are respected and supported. This achieved by:

- Identifying the communities and stakeholders associated with our operations and actively engaging with them as early as possible and throughout the life cycle of the operations to establish relationships based on mutual benefit and active participation;
- Respecting the cultural, customs, interests and rights of communities, including indigenous peoples and vulnerable or disadvantaged groups;

- Working with governments, local authorities, community representatives, inter-governmental and non-governmental organisations and other interested parties to develop and support projects that benefit the communities associated with our operations; and
- Contributing an indicative amount of $100,000 each year to fund initiatives that benefit the communities associated with our operations, particularly those located in remote areas or in regions with a lower level of social and economic development and infrastructure.

21.3 Community Investment Program

In 2021 some of the major sponsorships and donations included support for:

- Australian Wildlife Sanctuary: Tahmoor Coal sponsored and provided a grant of $55,000 over 5 years for the Wild Rover project. The Wild Rover is a mobile education van used to attend schools, events and at times transport animal species. It also assists with wildlife rescue, partnering with local veterinarians and wildlife rehabilitation groups.
- Wollondilly Shire Council Beach Bus: The Beach Bus is a free service travelling to the Illawarra Beaches daily during the summer months. The program primarily targets the 8000 young people in the LGA. Wollondilly is significantly transport disadvantaged and has a lack of free or affordable entertainment options for young people. The service enables young people to meet with or develop new friendships while undertaking a recreational activity that promotes healthy lifestyle and fitness. Ultimately, it connects the community throughout summer, providing them with an opportunity to socialise, exercise and unwind. Tahmoor Coal provides the financial support to allow two buses to run at no cost to participants during January 2021 with over 165 people using the beach bus.
- Born to Ride Freestyle: Tahmoor DNA Dirt Park / Pump Track upgrade. Tahmoor Coal sponsored and provided a grant for the upgrade of the BMX pump track at Tahmoor Sports Ground coordinated by local volunteer group Born to Ride Freestyle.
- Our Community Pantry: OCP is a food-rescue service that diverts safe and edible food, household items, fruit, vegetables and bakery items heading to landfill. OCP provides food hampers at five outreach locations in the local area and surrounds. In 2021, Tahmoor Coal assisted with the purchase of a new freezer for the storage of frozen goods for the community food hampers.

In accordance with Tahmoor Coal Community Development Plan and Community Investment Program, all community investment activities, whether financial or in-kind support, should target the following group-wide focus areas:

- Community development;
- Education;
- Health; and
- Environment.

An overview of the Tahmoor Coal community contributions during 2021 are outlined in **Table 21-1**. Due to Covid-19 restrictions, several community events and activities were cancelled or postponed.

Table 21.1 Community Contributions in 2021

Category	Contributions in 2021
Community Received	$38,000
Health	$17,483
Environment	$0
Education	$49,720
Total	**$105,203**

21.4 Community Complaints

A total of seventeen (17) community complaints were received for the reporting period. As outlined in **Figure 24** and **Table 21-2**, there has been a significant reduction in community complaints since 2010, however during approval of the Tahmoor South Consent with the IPC, there was an increase in complaints received during the months leading up to the final determination. In comparison to 2020, with 9 community complaints received, 2021 received 17. The complaints received related to the following categories:

- Noise and Vibration (10)
- Water (2)
- Social Media (4)
- Miscellaneous (1)

Figure 37 Community Complaint Statistics

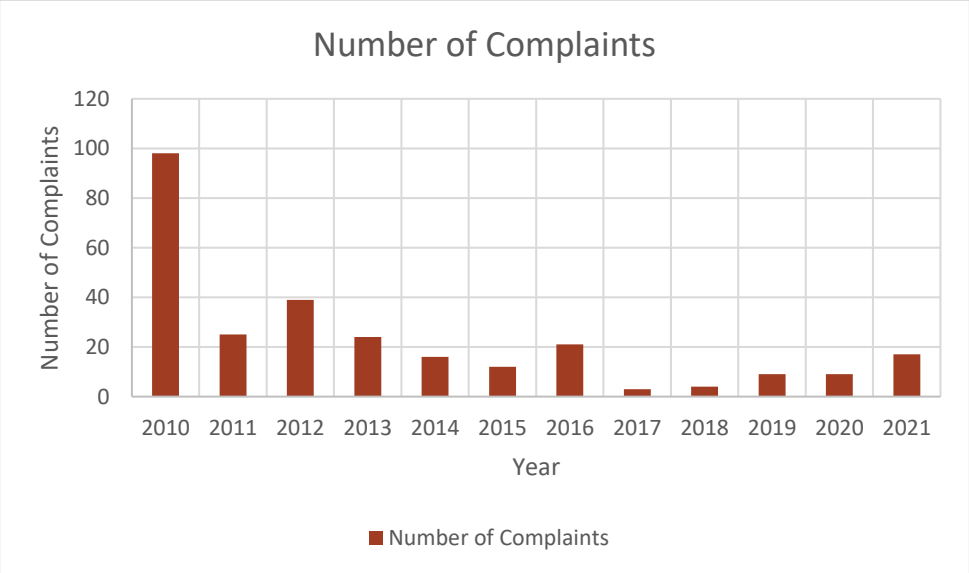


Table 21.2 Complaint Details

Date	Type	Complaint Details
7th January 2021	Noise	Repeat complaint involving train arrival/departure on the MSRL. Noise assessment undertaken. Noise levels within allowable limits for MSRL. Further actions included reducing train speed on MSRL, reducing high pitch, quick braking previously undertaken.
7th January 2021	Water	Complaint received about turbid waters in creek system. Immediate investigation found the issue was not related to mining activities.
14th February 2021	Water	Complaint received about turbid water and potential dam issue. Immediate investigation into dams and discharge points across site found no issues. Turbid waters not mining related.
17th February 2021	Social Media	Social media comment complaint involving potential mine employee. Shift Brief to all employees of Tahmoor Social Media code of conduct reminder.
9th March 2021	Off site/ Miscellaneous	Complaint received regarding 'No Mine at Bargo' signs being removed from a property fence. There was no evidence Tahmoor Coal employees were involved
18th March 2021	Social Media	Social media comment complaint involving potential mine employee. Shift Brief to all employees of Tahmoor Social Media code of conduct reminder.
20th April 2021	Noise	Complaint received regarding train activities and mine site. Investigation found no issues with machinery onsite or trains.
20th April 2021	Noise/Vibrations	Complaint received regarding vibrations in dwelling floor. Investigations found no correlation with CHPP or mining activities.
22nd April 2021	Noise	Complaint received regarding train movements and any changes of late. Investigation found no changes to train movements. Site noise monitors check and within compliance limits.
22nd April 2021	Noise	Complaint received regarding train noise and potential schedule changes. Investigation found no changes or issues. Quarterly noise assessment undertaken on same night with noise levels within consent conditions.
23rd April 2021	Social Media	Social media comment complaint involving potential mine employee. Shift Brief to all employees of Tahmoor Social Media code of conduct reminder.
26th April 2021	Noise	Complaint regarding a loud bang heard by a resident. Investigation from our on site noise monitors found no loud bang from site during that night.
1st May 2021	Noise/Vibrations	Resident asked to keep a noise/vibration log. Investigation closed out with no log received to date.
6th August 2021	Noise/Vibrations	Complaint received regarding vibrations on resident windows. Investigations found no correlation with CHPP or mining activities.
30th September 2021	Noise/Vibrations	Complaint received regarding vibrations on resident windows. Pre-liminary investigation found no issues on site and Noise monitor recording within consent limits. Resident asked to keep a noise/vibration log. Investigation closed out with no log received to date.
20th December 2021	Social Media	Social media comment complaint involving potential mine employee. Shift Brief to all employees of Tahmoor Social Media code of conduct reminder.

23rd December 2021	Noise/Vibrations	Complaint received regarding vibrations on dwelling. Pre-liminary investigation found no issues on site and Noise monitor recording within consent limits. Resident asked to keep a noise/vibration log. Investigation closed out with no log received to date.

22 Incidents, Notifications and Non-Compliances

Tahmoor Coal recieved one (1) non-compliance with condition M2.2 of the EPL1389 in relation to monitoring frequency for monitoring site PM10-1 due to a power fault.

A summary of all environmental incidents, notifications or non-compliances which occurred during the reporting period for 2021, is outlined within **Table 22-1** below.

In total there were seven (7) incidents, with three (3) related to subsidence, and two (2) related to water management, one (1) to Dust monitoring and one (1) to Noise management.

Table 22.1 2021 Incidents, notifications and non-compliances

Date	Classification (if required)	Type	Location	Details	Action/s taken
19/02/2021	Cat 1	Water Management Water	Pit top surface dams	Foam was detected in downstream section of dams due to issue with body wash dispenser in bath house	Anti-foam agent was added to the water system, immediately diminishing the bubbles, spill socks were utilised strategically to capture excess foam
23/02/2021		Subsidence event notification	Cedar Creek – Pool CR14	Pool level dropped below previously recorded minimum	Continued longterm monitoring being undertaken
05/05/2021		Dust Monitoring	Hodgson Grove, Tahmoor	Electrical fault occurred during Q2 sampling, delayed sampling till Q3 sampling.	Installation of new power outlet and cable with appropriate weather protection
17/06/2021	Cat 0	Water Management	Pit top surface dams	Foam was detected within on site dams due to a hose failure on a body wash IBC	Audit conducted on bodywash IBCs on site, bunds installed and correct spill procedure re-enforced
25/08/2021		Subsidence event notification	Two culverts at 88.400km and 88.980km on the PMLL	Craking and spalling of culverts in mortar and blockwork	Site inspection by a structural engineer and archaeologist was completed, discussion at ERG, report completed and remediation actions agreed after LW extraction completed in the area.
28th October 2021		Subsidence event notification	Stonequarry Rockbar	Level 3 Stonequarry Creek Rockbar TARP triggered - No loss of water or heritage value to the Rockbar. Minor fracturing in a location approx. 40m downstream of the	TARP implemented. Increased monitoring. Longwall stopped for investigation by Technical Committee and restrted with increased controls implemented.

				closest heritage site across the highly disturbed access track. Fracturing is typical of previous naturally induced failures as a result of thinly bedded laminated sandstone	
30/11/2021		Noise Management	Off site	Increased noise emission recorded at 2 offsite monitoring sites	Investigation into issue – meterological conditions influenced noise assessment

23 Activities to be Completed during the Next Reporting Period (1st January 2022 – 31st December 2022)

The following activities are aimed to improve the environment and/or community performance of Tahmoor Coal and are planned to be completed during the next reporting period:

- Progress Myrtle Creek and Redbank Creek CMAP;
- Complete installation and testing of Main Water Treatment Plant for processing discharge water;
- Continue Aquatic Health Monitoring Program for the Bargo River as directed in EPL 1389;
- Installation of 2 (two) new dust monitoring equipment positioned west and north-east of the pit top facility as required by the Tahmoor South consent SSD 8445, Condition B14;
- Upgrade of current TEOM dust monitor to real-time monitoring software with activated alarm level alerts;
- Upgrade of current stockpile Weather station as per Tahmoor South consent SSD 8445, Condition B22.
- Road upgrade to Remembrance driveway entrance to mine site.
- Continue community engagement for Tahmoor South Project;
- Noise mitigation investigation and staged implementation
- Undertake ongoing monitoring for LW W4 extraction; and
- Undertake studies required to support Extraction Plan for LW S1A-S6A, and ongoing monitoring

24 Related Documents

Related Documents directly related to or references from this document are provided below in **Table 24-1**.

Table 24.1 Related Documents

Document Title	Document Number
Air Quality and Greenhouse Gas Management Plan	TAH-HSEC-00170
Conceptual Closure Plan	TAH-HSEC-00121
Noise Management Plan	TAH-HSEC-00150
Soil and Water Managemnt Plan	TAH-HSEC-00016
Longwall West 1 and West 2 (LW W1-W2) Extraction Plan	TAH-HSEC-00248
Longwall West 3 and West 4 (LW W3-W4) Extraction Plan	TAH-HSEC-00326
Mining Operations Plan (MOP) 2020-2024	20079

25 Abbreviations

Abbreviations used in this document are provided below in **Table 25-1**.

Table 24.2 Abbreviations

Abbreviation	Definition
ACM	Asbestos containing materials
AEMR	Annual Environmental Management Report
APZ	Asset Protection Zones
ASTs	Above ground storage tanks
AUSRIVAS	Australian River Assessment System
BC Act	*Biodiversity Conservation Act 2016*
BMP	Bushfire Management Plan
CCL	Consolidated Coal Lease
CHPP	Coal Handling Preparation Plant
CMAP	Corrective Management Action Plan
DA	Development Application
DPIE	Department of Planning, Industry and Environment
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPL	Environmental Protection Licence
ERG	Tahmoor Coal Environmental Response Group
GHG	Greenhouse gas
GIS	Global Information System
IPC	Independent Planning Commission
km	Kilometre
KL	Kilolitres
LDP1	Licenced Discharge Point 1
LMZ	Land Management Zones
LOP	Licenced Overflow Point
LW	Longwall
LW W1	Longwall West 1
LW W1-W2	Longwall West 1 and Longwall West 2
LW W2	Longwall West 2
LW W3	Longwall West 3
LW W3-W4	Longwall West 3 and Longwall West 4
LW W4	Longwall West 4
m	Metres

Abbreviation	Definition
ML	Mining Lease
MOP	Mining Operation Plan
NGERS	National Greenhouse and Energy Reporting
NSW	New South Wales
ODS	Ozone depleting substances
OSP	Open Stand Pipe
PCBs	Polycholorinated Biphenyls
PIRMP	Pollution Incident Response Management Plan
PM10	Particulate Matter smaller than 10 micrometres
PRP	Pollution Reduction Program
QA	Quality assurance
RAPs	Registered Aboriginal Parties
REA	Reject Emplacement Area
RFS	Rural Fire Service
RWTP	Recycled Water Treatment Plant
Resources Regulator	Department of Regional NSW – Resources Regulator
ROM	Run of Mine
SFZ	Strategic Fire Zones
SLR	SLR Consulting Australia Pty Ltd
SMF	Syntheci Mineral Fibre
TSS	Total Suspended Solids
Tahmoor Coal	Tahmoor Coal Pty Ltd
Tahmoor Mine	Tahmoor Coal Mine
TARP	Trigger Action Response Plan
TCCCC	Tahmoor Coal Community Conultative Committee
USTs	Underground storage tanks
VWP	Vibrating Wire Piezometer
WMP	Water Management Plan
WWTP	Waste Water Treatment Plant

26 Appendices

Table 26.1 Appendix Details

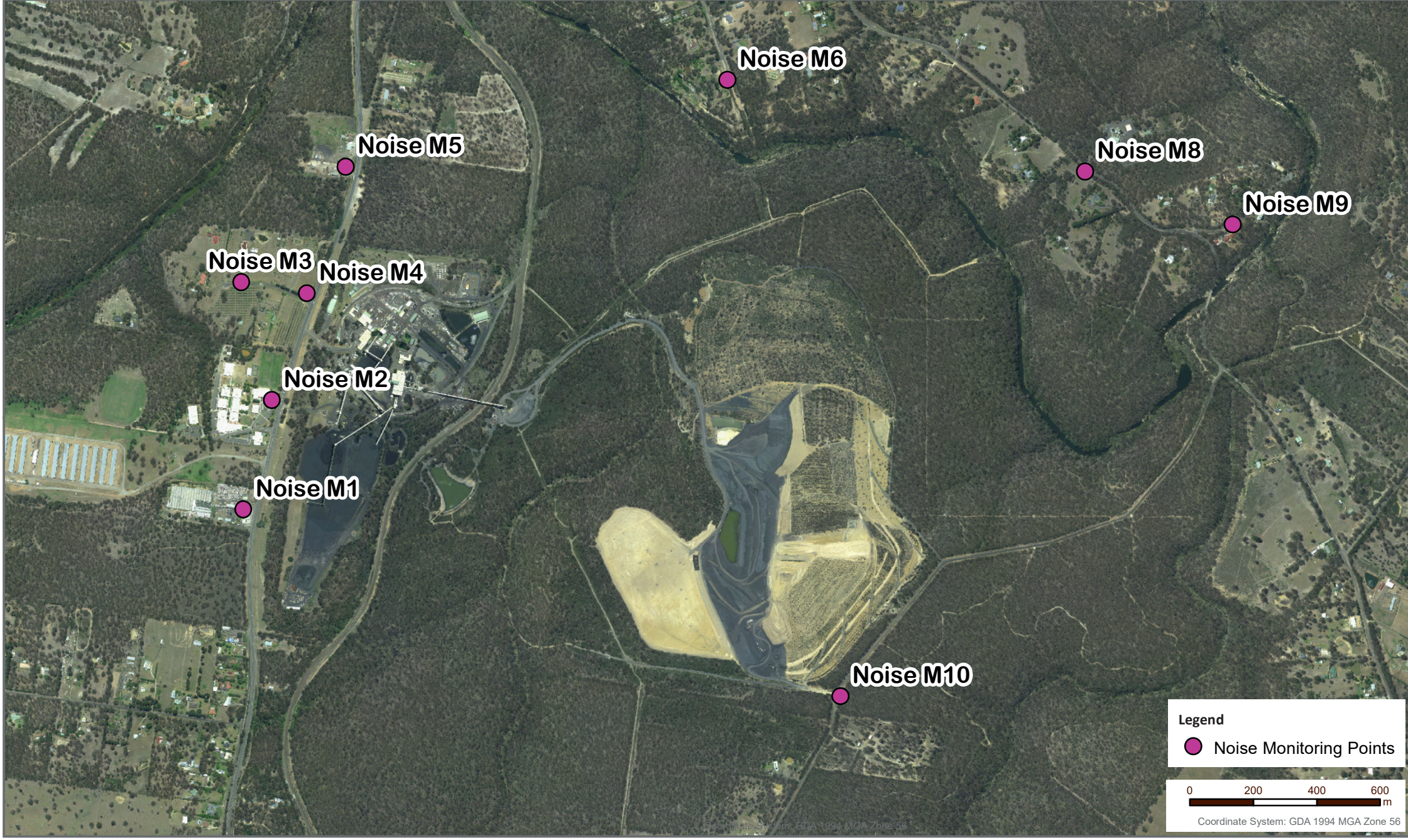
Appendix Number	Details
Appendix 1	Noise Monitoring Locations
Appendix 2	Quarterly Noise Monitoring Assessment Results
Appendix 3	Air Quality Monitoring Points
Appendix 4	Licence Discharge and Overflow Points
Appendix 5	Dam Water Volumes
Appendix 6	Surface Water Management Schematic
Appendix 7	Groundwater Monitoring Locations
Appendix 8	Monitored Groundwater Borehole locations
Appendix 9	Closure Domains
Appendix 10	Western Domain Longwall schedule
Appendix 11	Tahmoor South Longwall schedule
Appendix 12	Tahmoor Annual Rehabilitation monitoring 2021
Appendix 13	Six Monthly Subsidence Report 3
Appendix 14	Six Monthly Subsidence Report 4
Appendix 15	Groundwater Pit Top Borehole Data 2021
Appendix 16	Groundwater Monitoring results for May-Oct 2021 (excerpt from Groundwater 6-month review)

SIMEC

MEMBER OF GFG ALLIANCE

APPENDIX 1

simecgfg.com



Noise Monitoring Locations

SIMEC MEMBER OF GFG ALLIANCE

Noise Monitoring

Date: 30/03/2020

Data Sources:
© NSW DFSI (2019)
© NSW Mining (2019)
© SIMEC (2019)

Access and Use Constraints:
This webmap is intended to be used by SIMEC Mining and other stakeholders involved in the development and operation of SIMEC Mining's mines.
Access to this webmap is restricted to users authorised by SIMEC Mining only. You may not reproduce, adapt, modify, communicate or use any part of this webmap other than for activities related to development and operation of SIMEC Mining's mines.

Disclaimer:
The data displayed in this webmap has been collated from various sources.
The source data may contain inconsistencies or omissions, may not be to scale, may not be current and may present indicative information only. SIMEC Mining does not warrant the accuracy or completeness of the contents of this webmap.

SIMEC

MEMBER OF GFG ALLIANCE

APPENDIX 2

simecgfg.com

Year	Site	Assessment Goal L10	Estimated contribution Q1 (L10)	Estimated contribution Q2 (L10)	Estimated contribution Q3 (L10)	Estimated contribution Q4 (L10)	Description	Residential Property
2014	M1		<45/6	<48	<48	<48	Remembrance Driveway (Service Station)	No
2015			<52	<50	<46	54/5		
2016			<50	<50	<55	<45		
2017			53/4	50/1	54/5	53/4		
2018			48/9	50/1	<45	<45		
2019			<49	<52	<56	<45		
2020			<48	<46	<46	<44		
2021			<47	<56	<47	<58***		
2014	M2		46/7	47	<60	47	Remembrance Driveway (School Entrance Road)	No
2015			<53	<54	<47	55/6		
2016			<50	<50	<50	<46		
2017			53/4	55/7	56/7	53/3		
2018			48/9	50/1	<45	<46		
2019			<53	<56	<56	<48		
2020			<48	<46	<48	<45		
2021			<49	<56	<48	<60***		
2014	M3	45	<44	<47	<45	<42	Olive Lane (End of Cul-de-sac)	Yes
2015			<48**	<47	<42	44/5		
2016			44/5	<40	<45	<45*		
2017			<45**	<47**	<47	<45*		
2018			<47***	<47**	<44	<47***		
2019			<46***	<47***	<42**	<44		
2020			<46***	<44**	<46**	<45**		
2021			<45**	<45**	<45**	<51***		
2014	M4		<45	<49	<47	<45	Olive Lane/Remembrance Driveway Intersection	No
2015			<48	<53	<47	47/8		
2016			<45	<40	<45	<46		
2017			<48	<50	<50	<50		
2018			<45	<50	<50	<48		
2019			<50	<46	<46	<50		
2020			<48	<47	<47	<46		
2021			<50	<52	<50	<60***		
2014	M5	45	<40	<40	<47	<40	Remembrance Driveway (Service Station)	Yes
2015			<40	<46	<42	<42		
2016			<40	<40	<45	<45*		
2017			<45**	<45**	<45	<40		
2018			<35	<35	<45	<40		
2019			<43**	<45**	<40**	<40		
2020			<44**	<45**	<35	<40		
2021			<45**	<45**	<42**	<48***		
2014	M6	45 (37)	<35 (<35)	<43 (<35)	<38 (<35)	<30	Stratford Road	Yes
2015			<30	40/1 (-)	40/1 (-)	39/40 (-)		
2016			<35 (<35)	<50	<55	<45		
2017			<40** (<35)	<40** (<35)	<40 (<35)	<40 (<35)		
2018			<35	<37	<40	<40**		
2019			<35**	<37**	<39**	<39		
2020			<35	<39	<35	<40		
2021			<44**(<35)	<42(<35)	<40 (<35)	<42** (<35)		
2014	M7	45 (37)	<35	<35	<35	<30	Hodgson Grove (End of Cul-de-sac)	Yes
2015			<30	35/6(-)	<35	<30 (-)		
2016			<30 (-)	<30 (-)	<30 (-)	<35*(-)		
2017			<35**(<35)	<35**(<35)	<35**(<35)	<35**(<35)		
2018			<35	<35	<35	<35		
2019			<35	<35	<35	<35		
2020			<35	<35	<35	<35		
2021			<35(<35)	<35 (<35)	<35 (<35)	<42** (<35)		
2014	M8	45 (37)	<35	<35	<35	<32	Rockford Road	Yes
2015			<33	32/3(-)	<34	<35 (-)		
2016			<33 (-)	<30 (-)	<30 (-)	<40* (<35)		
2017			<35**(<35)	<35**(<35)	<37**(<35)	<37**(<35)		
2018			<35	<35	<35	<40		
2019			<35	<35	<35	<35		
2020			<35	<35	<35	<37**		
2021			<37 (<35)	<35 (<35)	<35 (<35)	<42 (<35)		
2014	M9	45 (37)	<35	<35	<35	<30	Kammer Place (End of Cul-de-sac)	Yes
2015			<30	<30 (-)	<30 (-)	<30 (-)		
2016			<30 (-)	<30 (-)	<30 (-)	<35* (<35)		
2017			<35* (<35)	<35* (<35)	<35* (<35)	<35* (<35)		
2018			<35	<35	<35	<35		
2019			<35	<35	<35	<35		
2020			<35	<35	<35	<35		
2021			<35 (<35)	<35 (<35)	<35 (<35)	<35 (<35)		
2014	M10		<35 (<35)	<36 (<35)	<32 (<35)	<30	Charlies Point Road	No
2015			<30	<30	<6	<35		
2016			<30	<35	<35	<35		
2017			<45	<45	<35	<35		
2018			<35	<35	<35	<35		
2019			<35	<35	<35	<35		
2020			<35	<35	<30	<30		
2021			<35	<35	<35	<35		

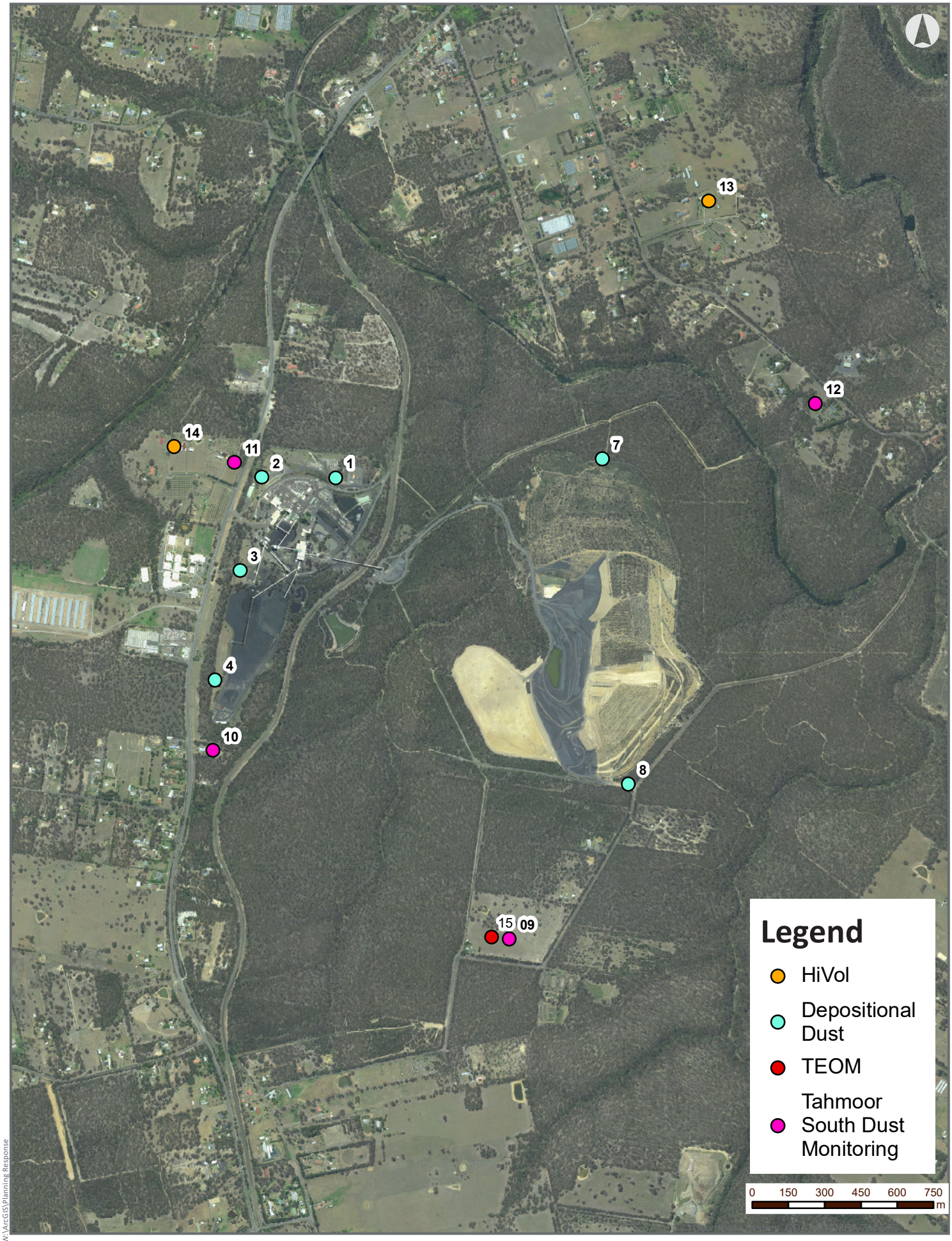
NOTES: # Ambient noise controlled by insects (2-5kHz)
* Includes DECC INP +2dB(A) allowance (INP Section 11.1.3)
** Includes +2dB correction for low frequency noise (NPfl Table C.1)
*** Includes +5dB correction for low frequency noise (NPfl Table C.1)
() Noise Assessment Goal for REA

SIMEC

MEMBER OF GFG ALLIANCE

APPENDIX 3

simecgfg.com



W:\ArcGIS\Planning Response

Tahmoor Mine

Dust Monitoring Points

SIMEC MEMBER OF GFG ALLIANCE

Date: 9/03/2021

Data Sources:
© NSW DFSI (2019)
© NSW Mining (2019)
© SIMEC (2019)

Access and Use Constraints:
This webmap is intended to be used by SIMEC Mining and other stakeholders involved in the development and operation of SIMEC Mining's mines.
Access to this webmap is restricted to users authorised by SIMEC Mining only. You may not reproduce, adapt, modify, communicate or use any part of this webmap other than for activities related to development and operation of SIMEC Mining's mines.

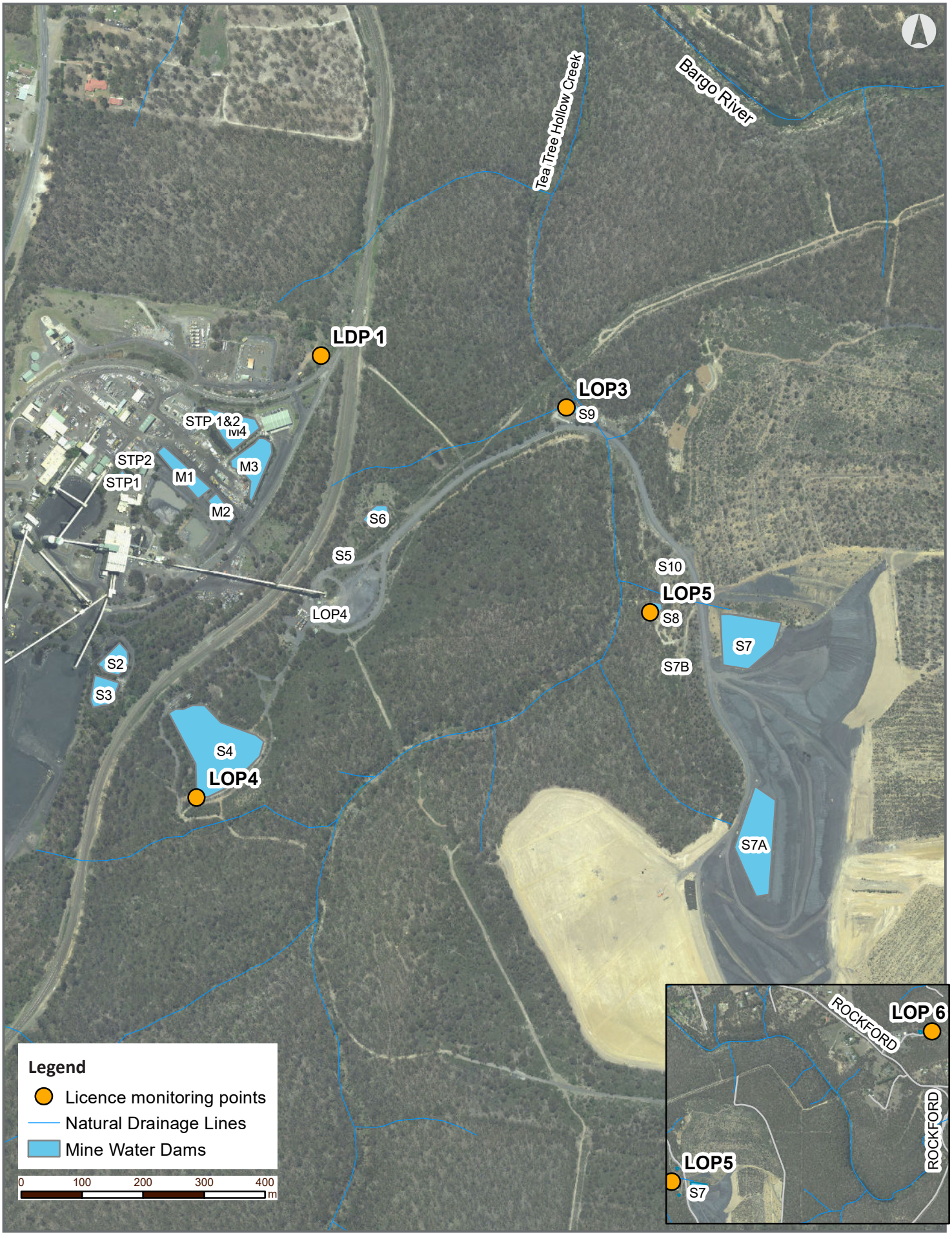
Disclaimer:
The data displayed in this webmap has been collated from various sources.
The source data may contain inconsistencies or omissions, may not be to scale, may not be current and may present indicative information only. SIMEC Mining does not warrant the accuracy or completeness of the contents of this webmap.

SIMEC

MEMBER OF GFG ALLIANCE

APPENDIX 4

simecgfg.com



DOCUMENT FILE PATH

SIMEC
MEMBER OF
GFG ALLIANCE

Tahmoor Coal EPL Discharge Point and Overflow points

Date: 30/03/2022

Data Sources:
© NSW DFSI (2019)
© NSW Mining (2019)
© SIMEC (2019)

Coordinate System: GDA 1994 MGA Zone 56

Access and Use Constraints:
This webmap is intended to be used by SIMEC Mining and other stakeholders involved in the development and operation of SIMEC Mining's mines.
Access to this webmap is restricted to users authorised by SIMEC Mining only. You may not reproduce, adapt, modify, communicate or use any part of this webmap other than for activities related to development and operation of SIMEC Mining's mines.

Disclaimer:
The data displayed in this webmap has been collated from various sources.
The source data may contain inconsistencies or omissions, may not be to scale, may not be current and may present indicative information only. SIMEC Mining does not warrant the accuracy or completeness of the contents of this webmap.

SIMEC

MEMBER OF GFG ALLIANCE

APPENDIX 5

simecgfg.com

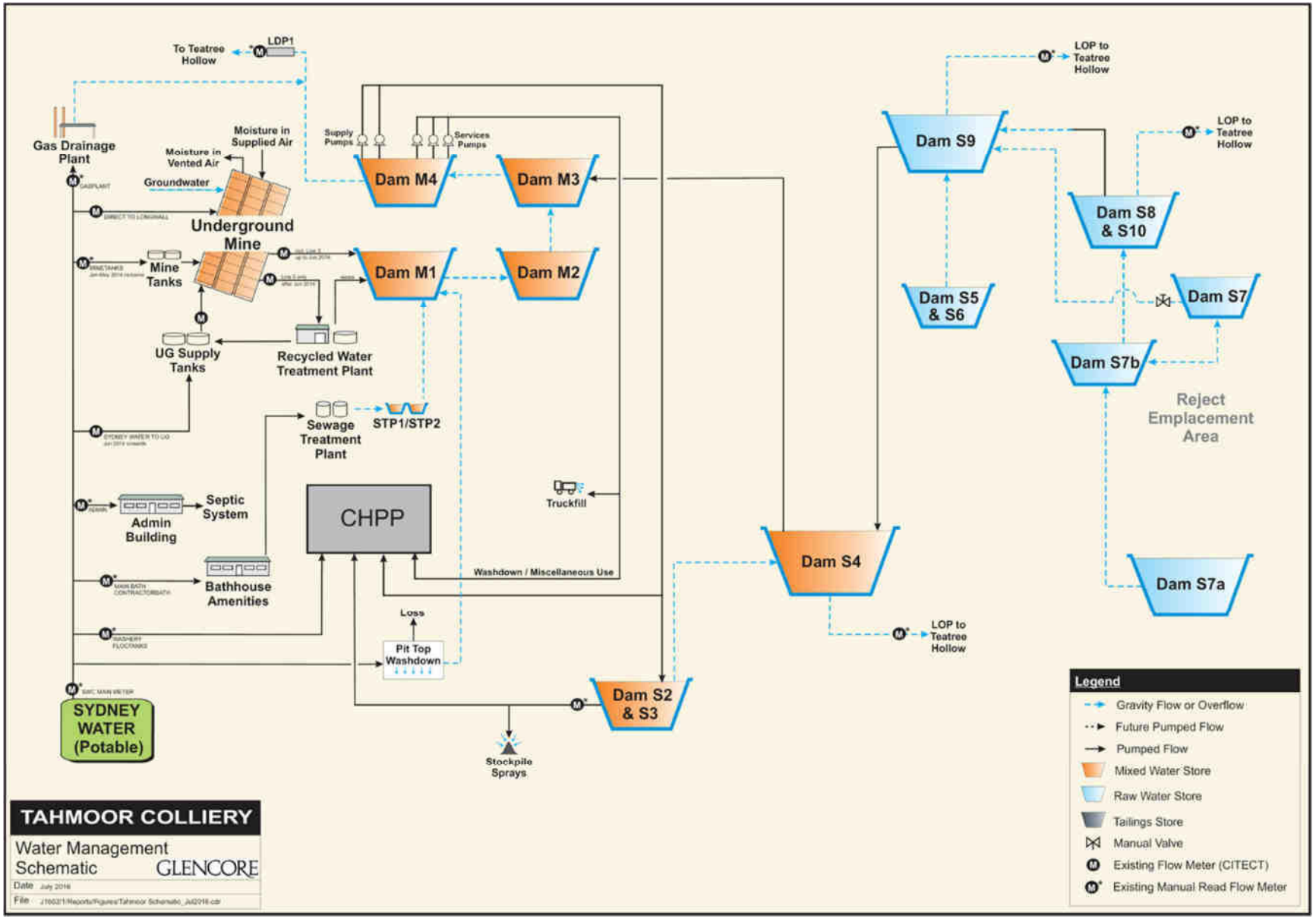
Estimated Water Volume				
Water Storage Name	**Beginning 2021**	**End 2021**	**Capacity**	**Comments**
M1	1.8ML	1.8ML	1.8ML	M series Dams act together to treat mine water pumped from Underground and stormwater, discharged via LDP1
M2	0.5ML	0.5ML	0.5ML	
M3	9.0ML	9.0ML	9.0ML	
M4	8.0ML	8.0ML	8.0ML	
M5	0.5ML	1.5ML	3.0ML	First settling Dam for No.2 Shaft Site area (stormwater)
M6	2ML	4ML	4.5ML	Second settling Dam for No.2 Shaft Site area (stormwater)
S1	0ML	0ML	14.5ML	The coking coal stockpile acts as a retention basin during major storms. Discharges to S2 Dam. Stockpile Dams are kept full and are used to supply water used for Dust suppression. Discharges to S4 Dam.
S2/S3	8.3ML	8.3ML	8.3ML	
S4	4ML	1.8ML	36.9ML	The Dam is designed to act as a retention basin with a controlled outlet. Discharges via overflow Point 4.
S5	0.1ML	0.3ML	0.5ML	Silt Trap only. Discharges to S6
S6	0.5ML	1ML	1.5ML	This Dam is designed to act as a retention basin with a controlled outlet.
S7	10ML	2ML	41.5ML	This is the main catchment for runoff from the REA. The dam is a retention basin during peak rainfall events. All water is pumped into Dam S4 via S9.
S7a	10ML	10ML	12.0ML	These Dams are designed to act as retention basins with a controlled outlet to S7 Dam.
S7b	0.5ML	0.8ML	1.0ML	
S8	0.3ML	2ML	4.5ML	Dam retains overflow from S7b. Pumps to Dam S9. Discharges via LOP5.
S9	0.15ML	0.2ML	0.4ML	Silt trap only for sealed Haul road. Wet werll pumps to Dam S4. Discharges via LOP3.
STP1	590KL	590KL	590KL	Treated effluent overflows to M1 Dam.
STP2	590KL	590KL	590KL	
Tank No.1	250KL	250KL	250KL	Underground potable water supply
Tank No.2	250KL	250KL	250KL	Underground potable water supply

SIMEC

MEMBER OF GFG ALLIANCE

APPENDIX 6

simecgfg.com

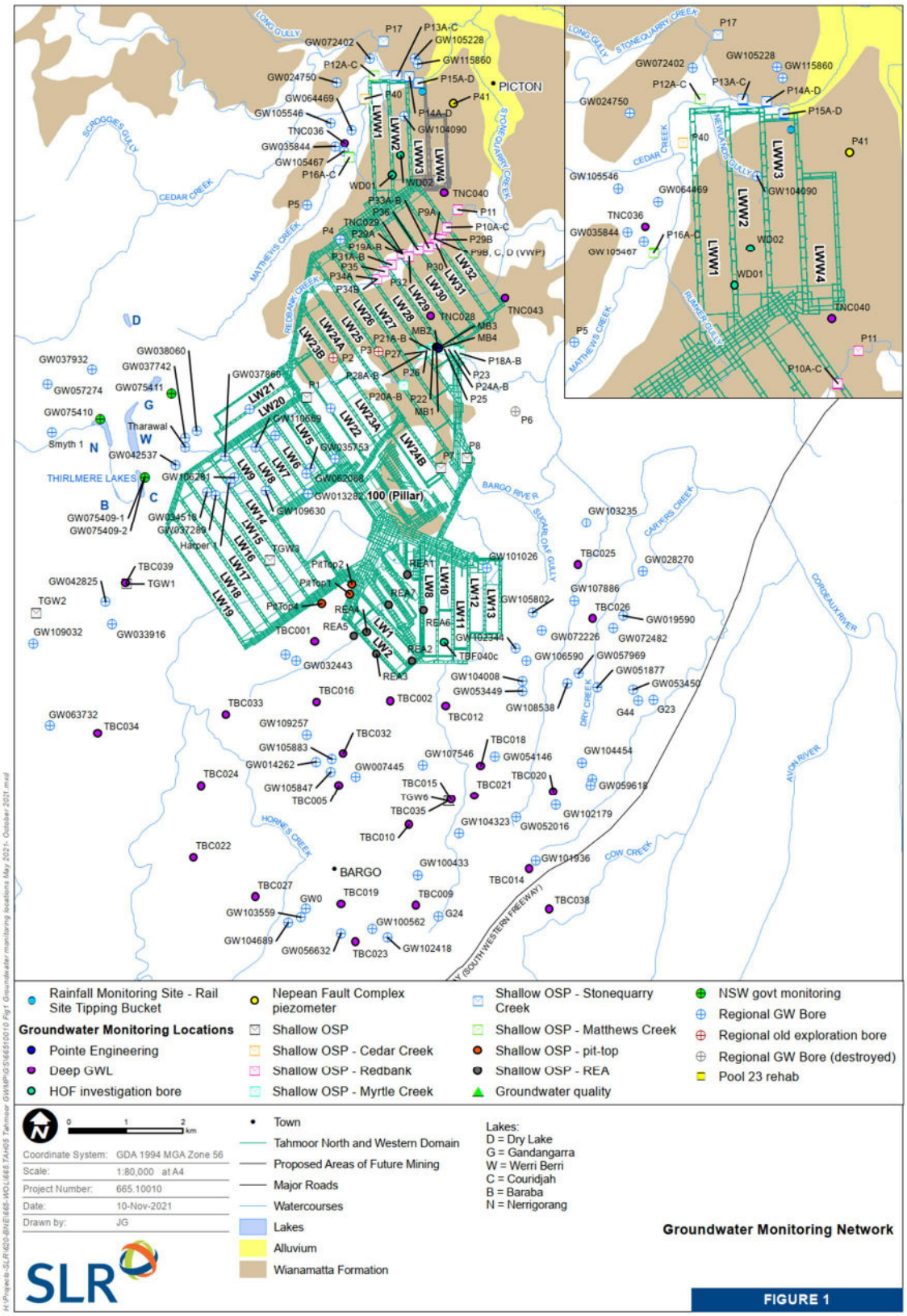

To Teatree Hollow
LDP1
Gas Drainage Plant
Moisture in Vented Air
Moisture in Supplied Air
Groundwater
Underground Mine
Supply Pumps
Services Pumps
Dam M4
Dam M3
Dam M1
Dam M2
Mine Tanks
UG Supply Tanks
Recycled Water Treatment Plant
Sewage Treatment Plant
STP1/STP2
CHPP
Truckfill
Admin Building
Septic System
Bathhouse Amenities
Washdown / Miscellaneous Use
Loss
Pit Top Washdown
SYDNEY WATER (Potable)
Stockpile Sprays
Dam S2 & S3
Dam S4
LOP to Teatree Hollow
Dam S9
Dam S8 & S10
Dam S5 & S6
Dam S7
Dam S7b
Dam S7a
Reject Emplacement Area
TAHMOOR COLLIERY
Water Management Schematic
GLENCORE
Date July 2016
File J:\6023\1\Reports\Figures\Tahmoor Schematic_Jul2016.cdr
Legend
Gravity Flow or Overflow
Future Pumped Flow
Pumped Flow
Mixed Water Store
Raw Water Store
Tailings Store
Manual Valve
Existing Flow Meter (CITECT)
Existing Manual Read Flow Meter

SIMEC

MEMBER OF GFG ALLIANCE

APPENDIX 7

simecgfg.com


PICTON
BARGO
THIRLMERE LAKES
100 (Pillar)
Tharawal
Smyth 1
Harper
LW1
LW2
LW3
LW4
LWW1
LWW2
LWW3
LWW4
Rainfall Monitoring Site - Rail Site Tipping Bucket
Groundwater Monitoring Locations
Pointe Engineering
Deep GWL
HOF investigation bore
Nepean Fault Complex piezometer
Shallow OSP
Shallow OSP - Cedar Creek
Shallow OSP - Redbank
Shallow OSP - Myrtle Creek
Shallow OSP - Stonequarry Creek
Shallow OSP - Matthews Creek
Shallow OSP - pit-top
Shallow OSP - REA
Groundwater quality
NSW govt monitoring
Regional GW Bore
Regional old exploration bore
Regional GW Bore (destroyed)
Pool 23 rehab
Coordinate System: GDA 1994 MGA Zone 56
Scale: 1:80,000 at A4
Project Number: 665.10010
Date: 10-Nov-2021
Drawn by: JG
Town
Tahmoor North and Western Domain
Proposed Areas of Future Mining
Major Roads
Watercourses
Lakes
Alluvium
Wianamatta Formation
Lakes:
D = Dry Lake
G = Gandangarra
W = Werri Berri
C = Couridjah
B = Baraba
N = Nerrigorang
Groundwater Monitoring Network
FIGURE 1

SIMEC

MEMBER OF GFG ALLIANCE

APPENDIX 8

simecgfg.com

Monitoring Plots



Legend

- Refuse Emplacement Area
- Stage Boundaries
- Permanent Monitoring Plots

0 50 100 200
Metres

Datum/Projection:
GDA 1994 MGA Zone 56

N

ecological AUSTRALIA
www.ecosus.com.au

Prepared by: EB Date: 18/12/2017

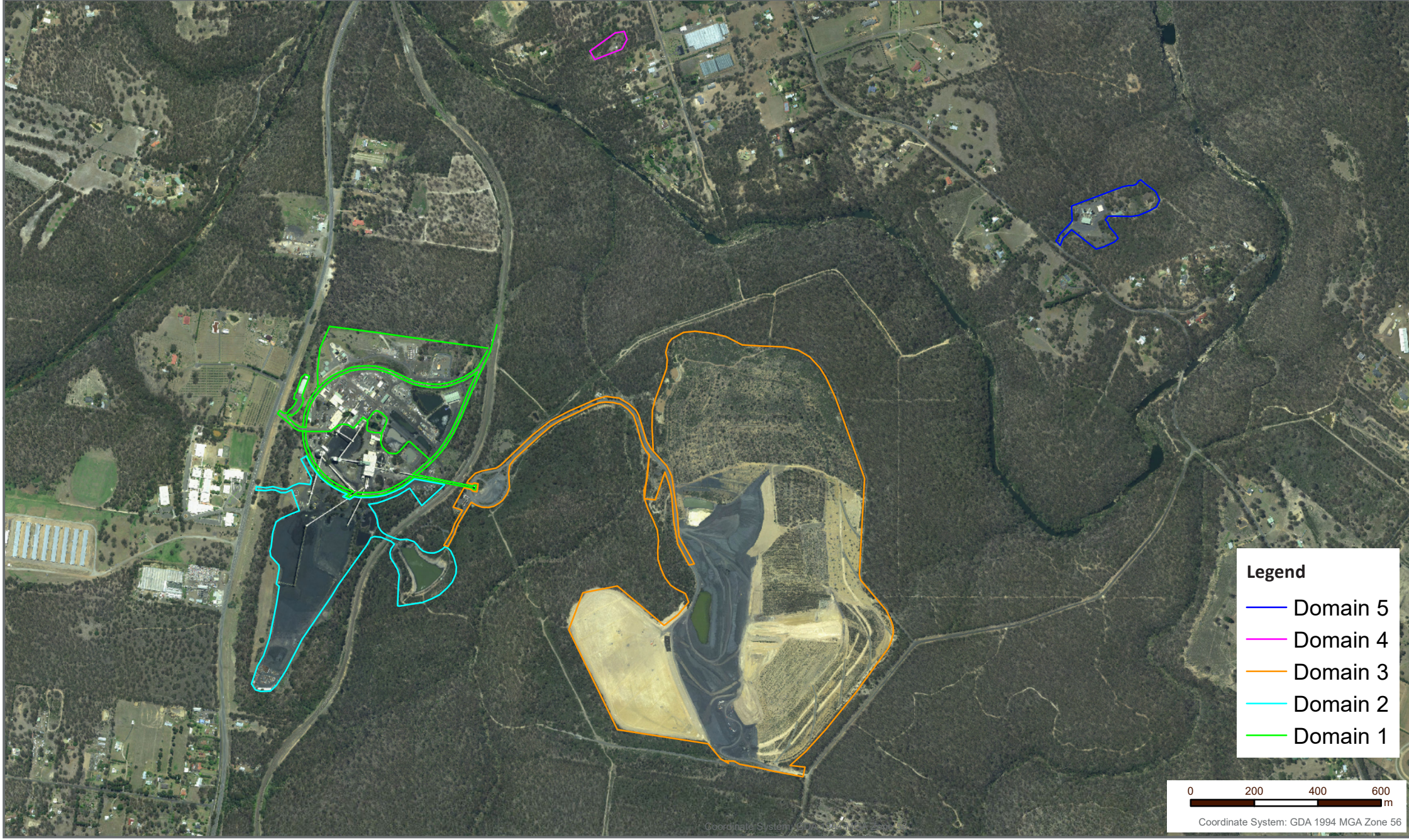

Features
CO1
A1
A3
1
2
A2
B2
4
B3
5
B1
3
6
D1
D2
7
G1
G2
9
G1
G2
8
10
I1
I2
12b
F1
F2
12a
14 & 16
14
H1
H2
16
CO2
Legend
Refuse Emplacement Area
Stage Boundaries
Monitoring Plots
Features
Acacia saligna
Nassella neesiana
Eragrostis curvula
Eragrostis curvula large patch
Minor gully erosion
Sisymbrium officinale
Sisymbrium officinale & Cenchrus setaceus
Waste
0 55 110 220
Metres
Datum/Projection
GDA 1994 MGA Zone 56
nearmap
Imagery: 05/09/2020
N
Prepared by: JK
Date: 8/12/2020

SIMEC

MEMBER OF GFG ALLIANCE

APPENDIX 9

simecgfg.com



Closure Domains

SIMEC
MEMBER OF GFG ALLIANCE

Closure Domains

Date: 30/03/2020

Data Sources:
© NSW DFSI (2019)
© NSW Mining (2019)
© SIMEC (2019)

Access and Use Constraints:
This webmap is intended to be used by SIMEC Mining and other stakeholders involved in the development and operation of SIMEC Mining's mines.
Access to this webmap is restricted to users authorised by SIMEC Mining only. You may not reproduce, adapt, modify, communicate or use any part of this webmap other than for activities related to development and operation of SIMEC Mining's mines.

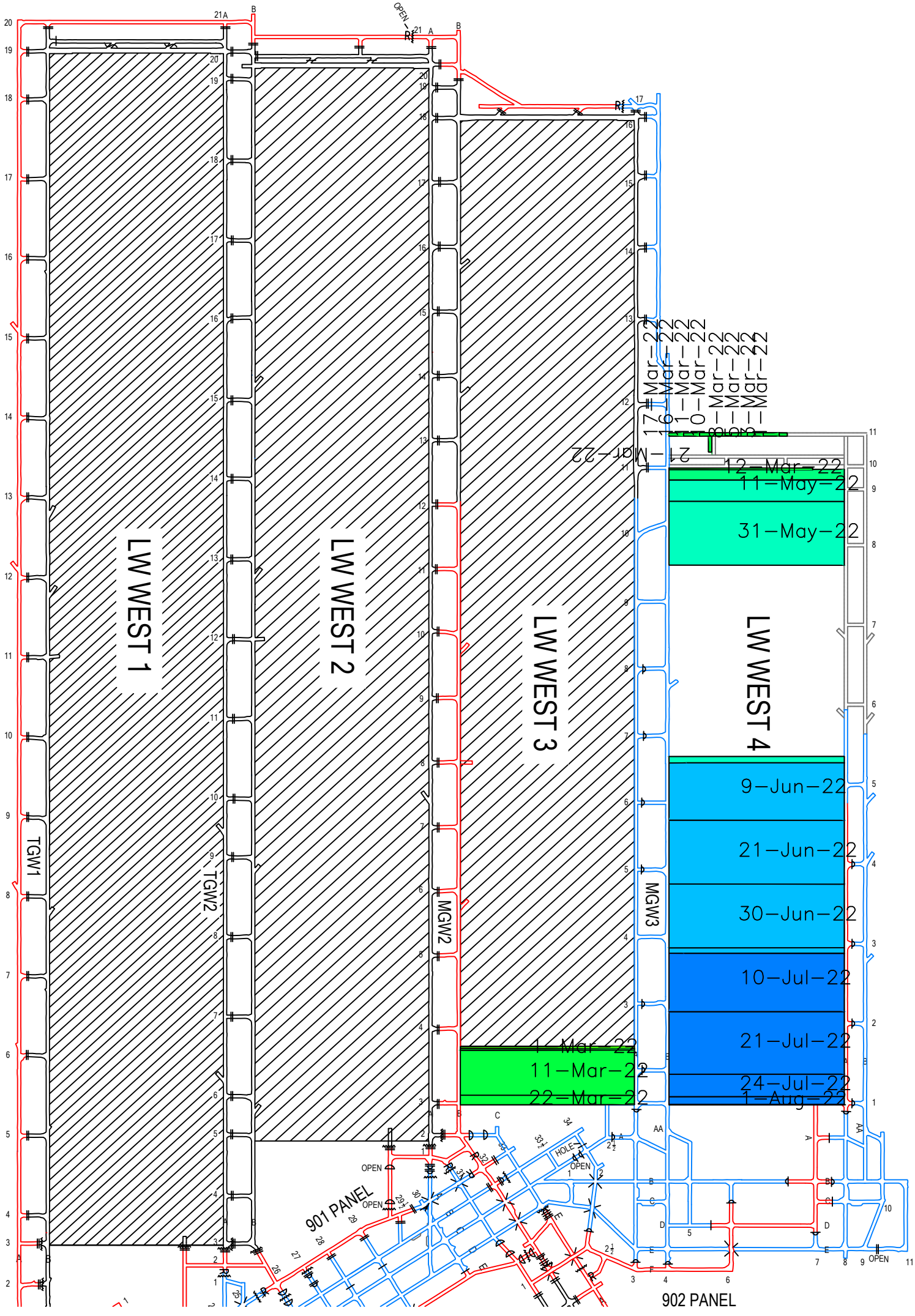
Disclaimer:
The data displayed in this webmap has been collated from various sources.
The source data may contain inconsistencies or omissions, may not be to scale, may not be current and may present indicative information only. SIMEC Mining does not warrant the accuracy or completeness of the contents of this webmap.

SIMEC

MEMBER OF GFG ALLIANCE

APPENDIX 10

simecgfg.com

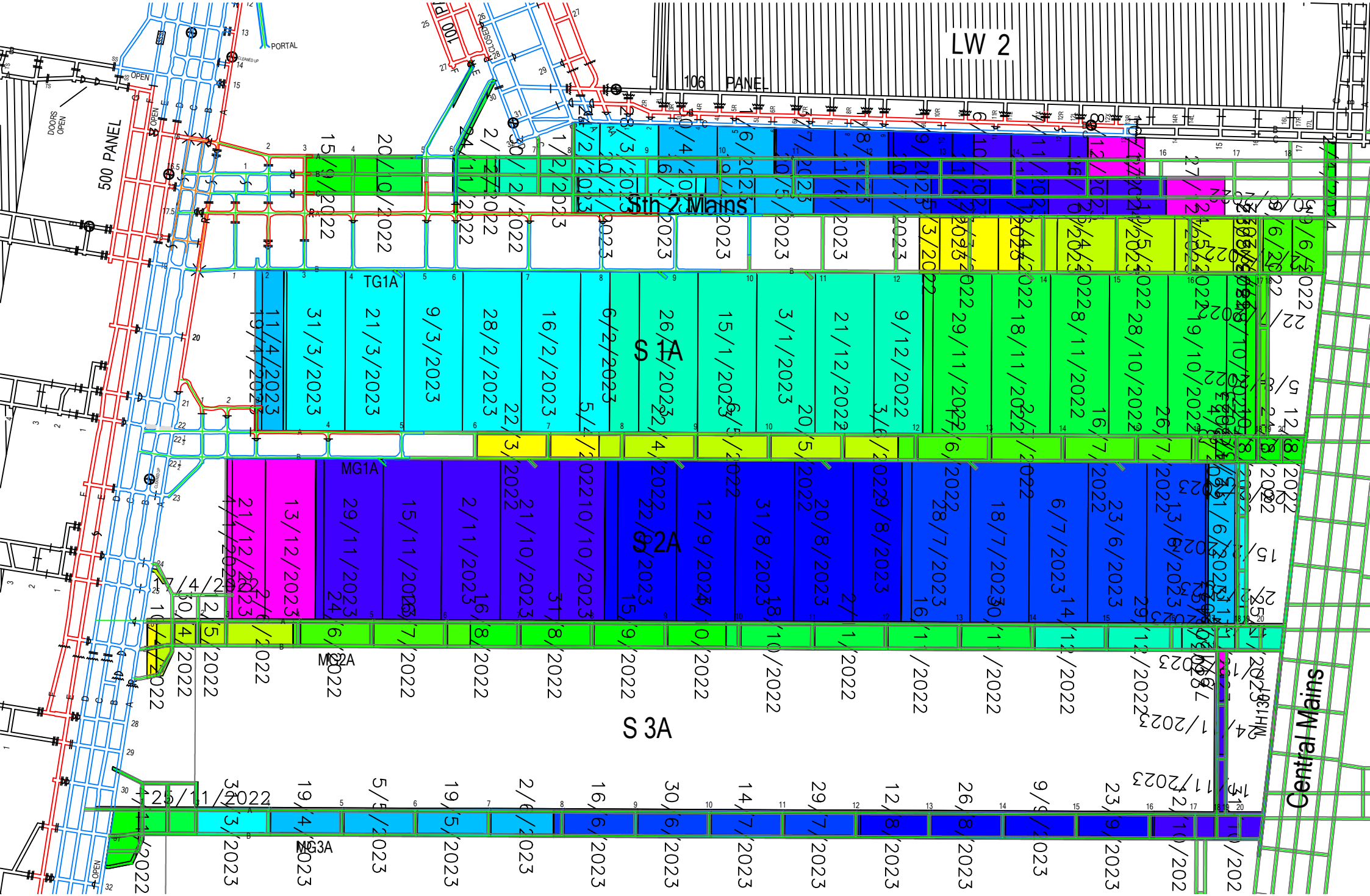

LW WEST 1
LW WEST 2
LW WEST 3
LW WEST 4
TGW1
TGW2
MGW2
MGW3
901 PANEL
902 PANEL
OPEN
HOLE
21-Mar-22
12-Mar-22
11-May-22
31-May-22
9-Jun-22
21-Jun-22
30-Jun-22
10-Jul-22
21-Jul-22
24-Jul-22
1-Aug-22
1-Mar-22
11-Mar-22
22-Mar-22

SIMEC

MEMBER OF GFG ALLIANCE

APPENDIX 11

simecgfg.com


LW 2
106 PANEL
500 PANEL
PORTAL
DOORS OPEN
OPEN
Sth 2 Mains
TG1A
S 1A
MG1A
S 2A
MG2A
S 3A
MG3A
Central Mains
MH130