1 January 2015 – 31 December 2015

Annual Review

TAHMOOR UNDERGROUND

GLENCORE

Document Number:	2015 Tahmoor Annual Review
Status:	Final
Version:	1.0
Effective:	28/02/2016
Review:	28/02/2017
Owner:	Environmental Coordinator

Uncontrolled unless viewed on the intranet

Title Block

Name of operation	Tahmoor Underground - Glencore
Name of operator	Tahmoor Coal Pty Ltd
Development consent / project approval #	DA 1975, DA 1979, DC57/93, DC67/98, DA190/85, DA 162/76
Name of holder of development consent / project approval	Tahmoor Coal Pty Ltd
Mining lease #	Tahmoor - ML1376, ML1308, ML1539, ML1642 & CCL716 Bargo - CCL747
Name of holder of mining lease	Tahmoor Coal Pty Ltd
Water licence #	WAL36442
Name of holder of water licence	Tahmoor Coal Pty Ltd
MOP/RMP start date	01/08/2012
MOP/RMP end date	01/08/2019
Annual Review start date	01/01/2015
Annual Review end date	31/12/2015

I, Peter Vale, certify that this audit report is a true and accurate record of the compliance status of Tahmoor Underground - Glencore for the period 1 January 2015 and 31 December 2015 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	**Peter Vale**
Title of authorised reporting officer	**Operations Manager**
Signature of authorised reporting officer	Peter Vale
Date	*29/02/2016*

Uncontrolled unless viewed on the intranet

Table of Contents

1 Statement of Compliance 5

2 Introduction 9

3 Approvals 11

4 Operations Summary 12

4.1 Mining Operations 12

4.2 Next Reporting Period 12

5 Actions Required from Previous Annual Review 13

6 Environmental Performance 14

6.1 Operational Noise 14

6.2 Air Quality 15

6.3 Biodiversity 18

6.4 Aboriginal Cultural and Historical Heritage 19

6.5 Erosion & Sediment Control 20

6.6 Contaminated Land 20

6.7 Bushfire Management 22

6.8 Mine Subsidence 22

6.9 Natural Heritage 23

7 Water Management 24

7.1 Surface Water 24

7.2 Groundwater 26

8 Rehabilitation 28

8.1 Weeds 31

8.2 Actions for the Next Reporting Period 32

9 Community 33

9.1 Community Engagement Activities 33

9.2 Community Contributions 33

9.3 Complaints 34

10 Independent Audit 35

11 Incidents and Non-Compliances during the Reporting Period 37

12 Activities to be completed in the Next Reporting Period 39

13 Appendix 40

List of Tables

Table 1 Statement of Compliance 5
Table 2 Non-Compliances 5
Table 3 Compliance Status Key for Table 2 8
Table 4 Mine Contacts 9
Table 5 Tahmoor Underground- Consents, Leases and Licences 11
Table 6 Production Summary 12
Table 7 Longwall Proposed Sequencing 12
Table 8 Actions from 2014 Annual Review 13
Table 9 Environmental Performance 14
Table 10 Depositional Dust Monitoring Results 16
Table 11 List of Reported Subsidence Related Impacts 23
Table 12 Water Take 24
Table 13 Licensed Discharge & Overflow Points 24
Table 14 100th Percentile Concentration Limits for Licensed Discharge Points 24
Table 15 Analysis for LDP1 for the EPL Annual Return Period 01/01/2015 – 31/12/2015 24
Table 16 Water Intensity 25
Table 17 Rehabilitation Summary 28
Table 18 Status of each Mine Closure Domain 30
Table 19 Weed Species Targeted During the Reporting Period 31
Table 20 2016 Rehabilitation Targets 32
Table 21 Maintenance Activities on Rehabilitated Land 32
Table 22 Community Contributions 2015 34
Table 23 2014 Independent Environmental Audit Recommendations 35
Table 24 Incidents during the Reporting Period 37

List of Figures

Figure 1 Tahmoor Underground Mine Layout 10
Figure 2 Comparison of Dust Data to Previous Years 17
Figure 3 PM10 Monitoring Data Completed as Per Development Consent 17
Figure 4 TEOM Monitoring Data at Charlies Point Road 18
Figure 5 Monitoring Results of Underground Storage Tank 21
Figure 6 WWTP as of December 2015 26
Figure 7 Rehabilitation (as of December 2015) 29
Figure 8 Number of Complaints Comparison 34

1 Statement of Compliance

Table 1 Statement of Compliance

Were all the conditions of the relevant approvals complied with?	Compliance
ML1376	Yes
ML1308	Yes
ML1539	Yes
ML1642	Yes
CCL716	Yes
CCL747	Yes
Auth206	Yes
Auth410	Yes
EPL 1389	Yes
WAL36442	Yes
DA 1975	Yes
DA 1979	Yes
DA 190/85	Yes
DA 57/93	No (minor non-compliance from 2014 Independent Environmental Audit)
DA 67/98	No (minor non-compliance from 2014 Independent Environmental Audit)

During the reporting period there were 8 non-compliances as identified in the independent environmental audit conducted in 2014, and provided to Tahmoor Colliery in 2015, the details of which are shown in Table 2.

Table 2 Non-Compliances

Relevant Approval	Condition #	Condition Description	Compliance Status		Comment	Where addressed in Annual Review
			at end 2014	at end 2015		
DA 67/98	Condition 7	Mining is not to occur so as to result in the subsidence of any habitable floors to below the 1:100 year flood level (1% flood level).	Non-compliant	Compliant	Evidence was not provided during the audit to demonstrate whether floor levels have actually remained above the 1:100 year flood level after subsidence. This has since been determined to be compliant following completion of a detailed flood study after completion of mining and consequent subsidence to the affected area.	Section 10

Relevant Approval	Condition #	Condition Description	Compliance Status at end 2014	Compliance Status at end 2015	Comment	Where addressed in Annual Review
DA 67/98	Condition 12	The Applicant shall undertake a detailed and ongoing monitoring program of subsidence resulting from mining to the satisfaction of the Director-General and in consultation with DPI (MR) and Council from the date of commencement (Condition 5) and for a period of at least three years after the completion of mining, or other such period as determined by the Director-General in consultation with DPI (MR) and Council.	Non-compliant	Non-compliant	The Subsidence Monitoring Program for LW28 was approved by the Principal Subsidence Engineer at DRE (Gang Li) on 05/06/2014. The Subsidence Monitoring Program for LW27 was submitted to the Director General (viewed letter dated 26 July 2013). Tahmoor Underground has not received any response from the Director General. Tahmoor Underground will continue to engage with DP&E to gain confirmation of satisfaction in writing.	Section 10
DA 67/98	Condition 38 (c)	The Applicant shall: implement best practice air quality management at the Tahmoor Mine, including all reasonable and feasible measures to minimise the off-site odour and dust emissions	Non-compliant	Compliant	There was currently no meteorological forecasting system at the time of the audit. It was recommended that this be progressed urgently and implemented in consultation with relevant regulators. A meteorological system has since been implemented with daily weather reports used for air quality management.	Section 10
DA 67/98	Condition 44 (a)	The Applicant shall ensure that the management plans required under conditions of consent for the Tahmoor Mine are prepared in accordance with any relevant guidelines, and include detailed baseline data	Non-compliant	Compliant	Baseline data is not included in the Noise Management Plan (NMP). Baseline data should be included in the NMP when the plan is next reviewed and updated. Baseline data is now included in NMP.	Section 10

Uncontrolled unless viewed on the intranet

Relevant Approval	Condition #	Condition Description	Compliance Status at end 2014	Compliance Status at end 2015	Comment	Where addressed in Annual Review
DA 57/93	Condition 42	Submission of a copy of approval granted by the Commission of Soil Conservation for the undertaking of works adjacent to a prescribed stream prior to the receival at the refuse emplacement of refuse from the Tahmoor North lease area.	Non-compliant	Compliant	Condition not included in previous audit. 2007 audit noted non-compliance and recommended seeking legal advice as to whether this section of Soil Conservation Act is valid. Tahmoor has received advice that the section of the Soil Conservation Act to which this condition relates has been repealed.	Section 10
DA 57/93	Condition 48	Completion of a written report to be submitted to council on a six monthly basis certifying compliance with the approved soil and water management plans for the duration of construction works at Bridge Street and for the duration of refuse emplacement	Non-compliant	Compliant	No examples of six monthly written reports were available to review at time of audit. It is recommended that upon the next modification to this consent, the 6-monthly requirement be removed and replaced with 'reported in the Annual Review'. Tahmoor Underground has begun submitting 6-monthly updates to Council to satisfy this condition, in addition to including required information annually in this Annual Review.	Section 10
DA 57/93	Condition 51 (b)	Prior to commencement of longwall mining, negotiate with the Mine Subsidence Board (MSB) and the council as to the most appropriate means to provide community information services.	Non-compliant	Compliant	At the time of audit, there was no evidence of consultation with the MSB regarding the provision of information to the community. Consultation has occurred with the MSB regarding community information services.	Section 10
DA 57/93	Condition 53	Mining is not to occur so as to result in subsidence of any habitable floors to below the 1:100 year flood level (1% flood level).	Non-compliant	Compliant	There is no evidence to demonstrate that floor levels have actually remained above the 1:100 year flood level after subsidence. This has since been determined to be compliant following completion of a detailed flood study after completion of mining and consequent subsidence to the affected area.	Section 10

Uncontrolled unless viewed on the intranet

Table 3 Compliance Status Key for Table 2

Risk Level	Colour Code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Moderate	Non-compliant	Non-compliance with: • Potential for serious environmental consequences, but is unlikely to occur; or • Potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: • Potential for moderate environmental consequences, but is unlikely to occur; or • Potential for low environmental consequences, but is likely to occur
Administrative Non-Compliance	Non-compliant	Only to be applied where the non-compliance does not results in any risk of environmental harm

Uncontrolled unless viewed on the intranet

2 Introduction

Tahmoor mine site is located between the townships of Tahmoor and Bargo, approximately 80 km south west of Sydney. Surface facilities are situated to the south of the Bargo River and adjacent to Remembrance Driveway (Old Hume Highway). The Refuse (Reject) Emplacement Area (REA) is located to the east of the main southern railway. Tahmoor North underground workings extend north under the township of Tahmoor, and towards Thirlmere and Picton.

Construction of the Tahmoor mine commenced in 1975 by Clutha Development. Mining commenced in 1980 and the Tahmoor Washery was commissioned in 1981. In the mid 1980's, BP Coal acquired the mine from Clutha Development. In 1987 the gas extraction facility was commissioned and longwall mining commenced. Conzinc Rio Tinto Australia (CRA) acquired BP Coal's interest in Tahmoor Coal in 1989, and operated the mine under the Kembla Coal & Coke (KCC) business division. In 1997, Austral Coal Limited acquired Tahmoor Coal from CRA. In 2005, Centennial Coal acquired a majority shareholding in Austral Coal Limited. In October 2007, Xstrata Coal Pty Ltd ("Xstrata Coal") successfully acquired 100% shareholding in Austral, and therefore ownership of Tahmoor Coal. In May 2013, Xstrata and Glencore merged to form one company. Tahmoor Coal is now referred to as Tahmoor Underground Glencore.

In addition to these changes, the Department of Planning & Infrastructure (DP&I) also approved the merging of the Annual Review (DP&I report required under Condition 45 of Development Consent DA67-98 - 2012 Modification), with the Annual Environmental Management Report (AEMR) to reduce duplication of reported information to both agencies. This included DP&I's approval of the current reporting period to 'bridge the gap' to the new calendar year report. Actions from the 2013 AEMR demonstrate Department of Resources and Energy, have agreed with this approach. This document has been prepared in accordance with the following:

a) ESG3: Mining Operations Plan (MOP) Guidelines, September 2013 (DRE, 2013)

b) Development Consent DA 67/98 (Mod 3)

A map of Tahmoor Underground showing the regional context, development consent boundary and mining lease boundaries is shown in Figure 1, and the current operational disturbance footprint and property boundaries can be seen in Appendix A.2.

Contact information for Tahmoor Underground mining and environmental management staff is provided in Table 4.

Table 4 Mine Contacts

Name	Position held	Contact details
Tahmoor Underground Glencore Management		
Jim Middleton	Director of Underground Operations, NSW	(02) 4640 0100
Peter Vale	Operations Manager	(02) 4640 0100
Tahmoor North Environmental Management Team		
Ian Sheppard	Environment & Community Manager	(02) 4640 0100
Fiona Robinson	Environmental Coordinator	(02) 4640 0048
Belinda Treverrow	Community & Approvals Coordinator	(02) 4640 0133
Samantha Beresford	Environment & Community Officer	(02) 4640 0079
Jessica Ainslie	Environment & Community Graduate	(02) 4640 0057

Uncontrolled unless viewed on the intranet

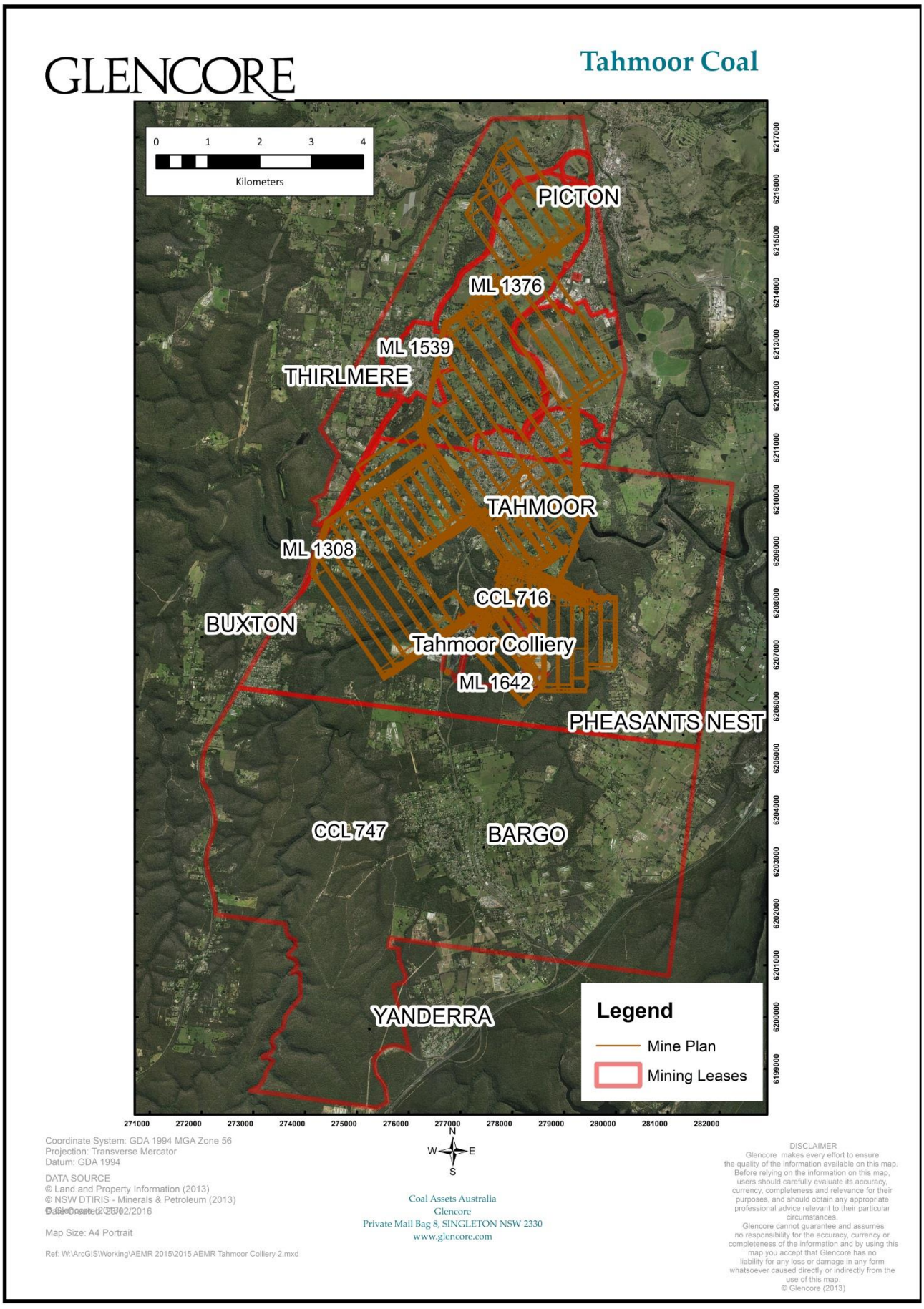


Figure 1 Tahmoor Underground Mine Layout

3 Approvals

Table 5 Tahmoor Underground- Consents, Leases and Licences

Consent Number	Consent Description	Date Granted	Expiry Date
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
Leases & Exploration Authorisations			
Consolidated Coal Lease 716	Original Tahmoor Leases	15/06/1990	13/03/2021
Mining Lease 1376	Tahmoor North Lease	28/08/1995	28/08/2016
Mining Lease 1308	Small Western lease to west of CCL716	02/03/1993	02/03/2014[1]
Mining Lease 1539	Tahmoor North Extension Lease	16/06/2003	16/06/2024
Mining Lease 1642	Surface Freehold Areas	27/08/2010	27/08/2031
Exploration Authorisation 206	Exploration Authorisation 206 - coincides with CCL 716 (renewal application pending with DRE)	05/8/2013	5/12/2015[1]
Exploration Authorisation 410	Exploration Authorisation 410 - coincides with ML 1376 and ML 1539 (renewal application pending with DRE)	5/8/2013	5/12/2015[1]
Consolidated Coal Lease 747	Original Tahmoor Leases	23/05/1990	06/11/2025
Licences			
EPL 1389	Environmental Protection Licence	17/10/2000	No expiry
WAL36442	Water Access Licence	06/12/2013	No expiry
XSTR200005	Dangerous Goods Licence	18/01/2012	2/02/2017

[1] Renewal Application Submitted

Uncontrolled unless viewed on the intranet

4 Operations Summary

4.1 Mining Operations

Mining activities during the reporting period have been in accordance with the approved Mining Operation Plan and Subsidence Management Plan approvals. Extraction of Longwall 28 was completed on 1 May 2015 and Longwall 29 extraction commenced 29 May 2015 and has not been completed during the current reporting period. Production tonnages during the reporting period and production tonnages forecast for the next reporting period are provided in Table 6.

Table 6 Production Summary

Material	Approved Limit (Specify Source)	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
Waste Rock /Overburden	-	-	-	-
ROM Coal/Ore	-	2,424,576	2,632,695	2,721,284
Coarse Reject	-	614,249	537,403	603,245
Fine Reject (Tailings)	-	0	0	0
Saleable Product	3,500,000 (EPL 1389)	1,812,588	2,125,532	2,208,695

No seismic or exploration occurred during the reporting period.

4.2 Next Reporting Period

In the next reporting period operations will remain unchanged other than in increase of development units from two (2) to three (3).

Table 7 shows the proposed longwall sequencing into the future and Appendix A.18 and Appendix A.19 show the planned longwall layout and planned longwall progress plot respectively.

No exploration is proposed for the next reporting period.

Table 7 Longwall Proposed Sequencing

Longwall Block	Proposed Start	Proposed Completion
Longwall 29	24/05/15	21/04/15
Longwall 30	19/05/16	30/03/17
Longwall 31	27/04/17	13/03/18
Longwall 32	10/04/18	22/02/19

Uncontrolled unless viewed on the intranet

5 Actions Required from Previous Annual Review

During the 2014 AEMR/Annual Review inspection Division of Resources and Energy (DRE) requested a number of actions be completed by the following Annual Rev submission date, these actions and related comments are provided in Table 8.

Table 8 Actions from 2014 Annual Review

Action required from previous Annual Review	Requested by	Action taken by the Operator	Where discussed in Annual Review
Please review the AEMR rehabilitation plan in context to the other rehabilitation phases. As a minimum the plan should show areas of landform establishment (this can also include the growth media development stage), Ecosystem Establishment (seeding), Ecosystem development (the majority of the Tahmoor REA is in this phase)	DRE	Complete – information provided to DRE	Section 8
DRE requests a 300mm topsoil layer as a minimum being recorded in all site documents.	DRE	Complete – information provided to DRE	Section 8
The AEMR needs to provide a summary of the works on underground storage tanks undertaken to date (including monitoring results) and details of any removal plans as detailed in the options report being developed.	DRE	Complete – information provided in this document	Section 6.6
Tahmoor is requested to provide a report to DRE outlining the reason for the apparent differences between the designed and constructed contour drains. DRE requests that a review be undertaken by a qualified engineer of the designed and constructed contour drains to determine the long-term stability of the emplacement under the existing water management arrangements. A Key outcome for this review is to provide DRE with a final contour plan including contour drains and drop structures. The plan is to be certified by a qualified engineer or mine surveyor. The contour drain design needs to take into account design parameters (e.g. channel width and grade, bank height, batter gradient) as described in TAH CHP PRO 0063	DRE	Complete – information provided to DRE	Section 8
Tahmoor need to reconcile the differences between these two documents[2] (DRE suggests that TAH CHP PRO 0063 incorporate the information provided in TAH SD PRO 009 and TAH SD PRO 009 to be archived) to ensure there is only one procedure that is being followed for REA construction and rehabilitation activities	DRE	Complete	Section 8

[2] TAH SD PRO 009 and TAH CHP PRO 0063

Uncontrolled unless viewed on the intranet

6 Environmental Performance

This sections outlines the environmental outcomes during the reporting period and identifies and management activities.

Table 9 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 45dBA within 3m of a residence Maximum L10 reading of 37dBA at the Refuse Emplacement Area (REA)	Monitoring results returned levels all within compliance	Noise levels continue to remain constant	Continue implemented, regular monitoring of noise levels
Blasting	Tahmoor Underground does not conduct surface blasting activities			
Air quality	Maximum deposited dust annual average of 4 g/m^2/month (DA67-98 MOD3)	Monitoring results returned levels all within compliance	Air quality levels continue to remain constant	Continue implemented, regular monitoring of air quality levels
	Maximum total suspended particulate (TSP) matter annual average of 90 $\mu g/m^3$ (DA67-98 MOD3)			
	Maximum particulate matter (PM10) annual average of 30 $\mu g/m^3$ (DA67-98 MOD3)			
	Maximum particulate matter (PM10) 24-hour average of 50 $\mu g/m^3$ (DA67-98 MOD3)			
	Maximum increase in deposited dust level over an annual period of 2 g/m^2/month (DA67-98 MOD3)			
Biodiversity	-	Nothing to report	Biodiversity continues to remain constant	Continue current management and monitoring activities
Heritage	Aboriginal cultural heritage site at Redbank Creek (AHIP received, see Section 6.4)	Nothing to report	Heritage continues to remain constant	Continue current management and monitoring activities

6.1 Operational Noise

Environmental Management

Tahmoor Underground is an approved 365 day, 24 hour operation. The mine and its associated facilities operate in accordance with noise criteria provided by the 1994 and 1975 Development Consent approvals.

Tahmoor Underground 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.

Periodic attended due diligence monitoring was also conducted during the reporting period as part of the site's ongoing noise assessment work aimed at identifying and implementing targeted reasonable and feasible noise reduction.

Uncontrolled unless viewed on the intranet

DA 57-93 Tahmoor North development consent noise conditions which are set out in Conditions 73 and 74 as follows:

a) 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 45dBA when measured within 3 m of any residence.

b) Condition 74. The noise emanating from operations at the refuse emplacement site shall not exceed an L10 of 37dBA or background +5dBA whichever is the greater when measured within 3m of any residence.

At the present time Tahmoor Underground has no noise limits or monitoring requirements included in its EPL.

The DA 57-93 Tahmoor North consent conditions are referenced at a distance of 3m from any residence (constructed or approved prior to '94). From experience it is generally not practical to measure environmental noise in close proximity to a residence without approval from the occupants of the residence. Accordingly, the *EPA, Industrial Noise Policy* recommends that environmental noise *(INP Section 2.2.1)* be measured or assessed at the most affected point on or within the residential property boundary or, if this is more than 30m from the residence, at the most affected point within 30m of the residence. In accordance with *INP* procedures, the noise levels reported were measured at residential boundaries and generally within 30m of the residence.

Environmental Performance

In reviewing noise performance with consent conditions, the EPA refer to procedures in the *INP (Section 11).* The *INP (Section 11.1.3)* recommends that noise from a development is considered to be in non-compliance with a consent or licence condition, if the measured/predicted noise contribution from a source is more than 2dB above the limit specified in the consent or licence. The EPA recognises that a development will be in breach of a noise consent or licence condition if sustained non-compliances are not addressed and rectified.

Tahmoor Undergrounds 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 A.3 shows the locations of the noise monitoring locations and Appendices A.4 & A.5 contain a summary of monitoring completed in 2014 and 2015.

Despite Tahmoor Underground's monitoring data demonstrating usual operation within the mining environment, there were several noise complaints during the reporting period. In total 11 noise complaints were made during the reporting period concerning night-time operations at the mine. All activities, operations and noise levels were conducted in accordance with Tahmoor Underground's development consents, and the complaints relate to perceived nuisance from particular sensitive receptors. Whilst these complaints are not related to an exceedance of the noise criteria on any approval, they are considered reportable to the EPA as part of the site's EPL Annual Return, and are therefore summarised in Section 0 and detailed in Appendix A.11.

Further Improvements

Tahmoor Underground will continue to operate and monitor the sites real-time noise monitoring network and alarm system, which includes a monitor at the mine and at Olive Lane, as this system has proved effective in managing compliance with development consent noise criteria.

6.2 Air Quality

Environmental Management

Tahmoor Underground manages air quality in accordance with *TAH SD PLN 003 – Air Quality & Greenhouse Gas Management Plan* approved by the Director General, Department of Planning and Infrastructure on 10 December 2012. A comprehensive system of controls are detailed for managing particulate matter on-site, including dust suppression sprays on the coal stockpiles (automatically triggered by predefined meteorological conditions), and visual triggers for operators and site personnel. Water carts are used at the Refuse Emplacement Area and Pit Top hardstand to reduce wheel generated dust from mobile equipment. Employees and contractors using temporary unsealed access ways are required to control dust utilising a water cart.

Uncontrolled unless viewed on the intranet

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.

Environmental Performance

The annual average depositional dust monitoring results for the reporting period, expressed as insoluble solids g/m2/month, are compared against those from previous reporting periods and reviewed on a monthly basis using Tahmoor Underground's Environmental Monitoring Database (EMD). Monitoring results indicate that all recorded dust levels are within limits set by the NSW EPA Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales (NSW DEC, 2005) impact assessment criterion of a maximum increase of 2 g/m2/month, as the overall results are below the annual average of 4 g/m2/month. **Table** 10 displays the dust results from the dust deposition monitors outlined in *TAH SD PLN 003 – Air Quality & Greenhouse Gas Management Plan* air quality monitoring site locations are shown in Appendix A.12.

Table 10 Depositional Dust Monitoring Results

Month/Site	1	2	3	4	7	8	9	10	11	12
January 2015	0.8	0.4	0.8	0.7	1.0	1.1	0.4	1.2	0.8	2.1
February 2015	0.4	0.7	1.9	0.6	1.6	0.7	1.8	4.4	1.5	0.7
March 2015	0.8	0.6	1.0	0.9	0.6	0.7	1.0	2.6	7.0[1]	3.1
April 2015	0.8	1.0	1.1	1.1	0.8	1.4	0.4	2.1	0.5	0.4
May 2015	0.3	0.3	1.3	0.3	0.4	0.6	0.4	2.2	0.2	0.6
June 2015	0.5	0.2	2.1	0.9	0.4	0.6	0.4	2.2	0.2	0.6
July 2015	0.8	0.3	2.6	0.8	0.7	1.5	0.2	5.0[2]	0.3	2.3
August 2015	0.8	0.5	1.7	1.6	0.6	0.7	0.2	3.3	0.5	1.1
September 2015	1.0	0.4	1.9	0.9	1.0	1.1	0.3	3.6	0.3	1.1
October 2015	0.2	0.4	1.3	0.4	0.6	0.4	0.2	0.7	0.2	1.9
November 2015	1.5	1.1	1.3	1.4	0.6	1.2	0.6	1.2	0.5	2.5
December 2015	1.8	0.6	2.7	0.7	1.1	1.1	0.4	2.0	1.1	0.8
Average	0.81	0.54	1.64	0.86	0.78	0.93	0.53	2.32	0.55	1.43

1. 60% dirt, 20% insects, 10% vegetation and 10% polysaccharide slime

2. 70% dirt, 10% coal, 10% insects and 10% vegetation

Note: Contaminated results from Depositional Dust sites 10 and 11 are not included in annual average calculation.

Uncontrolled unless viewed on the intranet

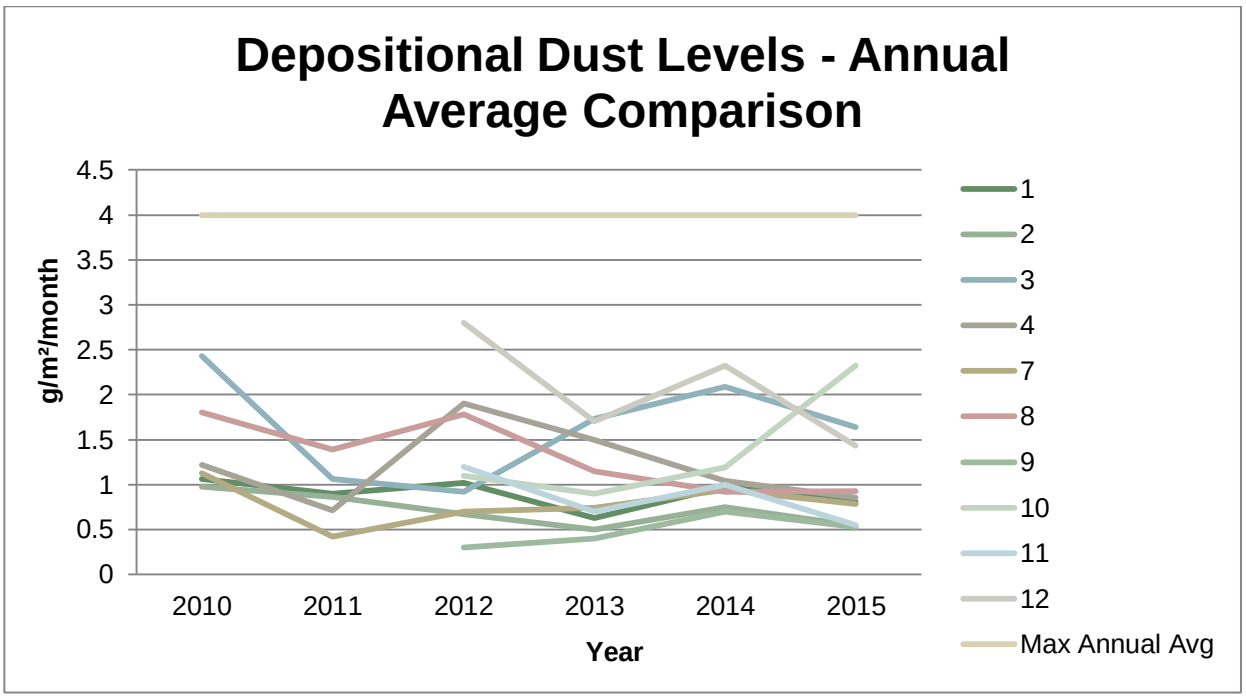


Figure 2 Comparison of Dust Data to Previous Years

Figure 2 indicates that there are no trends of concern are occurring with depositional dust sites 1-12. Levels continue to fluctuate between an average of 0.5 – 2.5g/m2/month. Due to no significant changes to the scale and location of the mining operation, it is predicted in 2016 levels will continue within this range.

Figure 3 outlines the performance of the particulate matter monitoring that occur onsite. These sites were added to the EPL in August 2013 and hence are reported from this point forward. The performance criteria for PM10 is 50ug/m2 over a 24 hours period and 30ug/m2 annually.

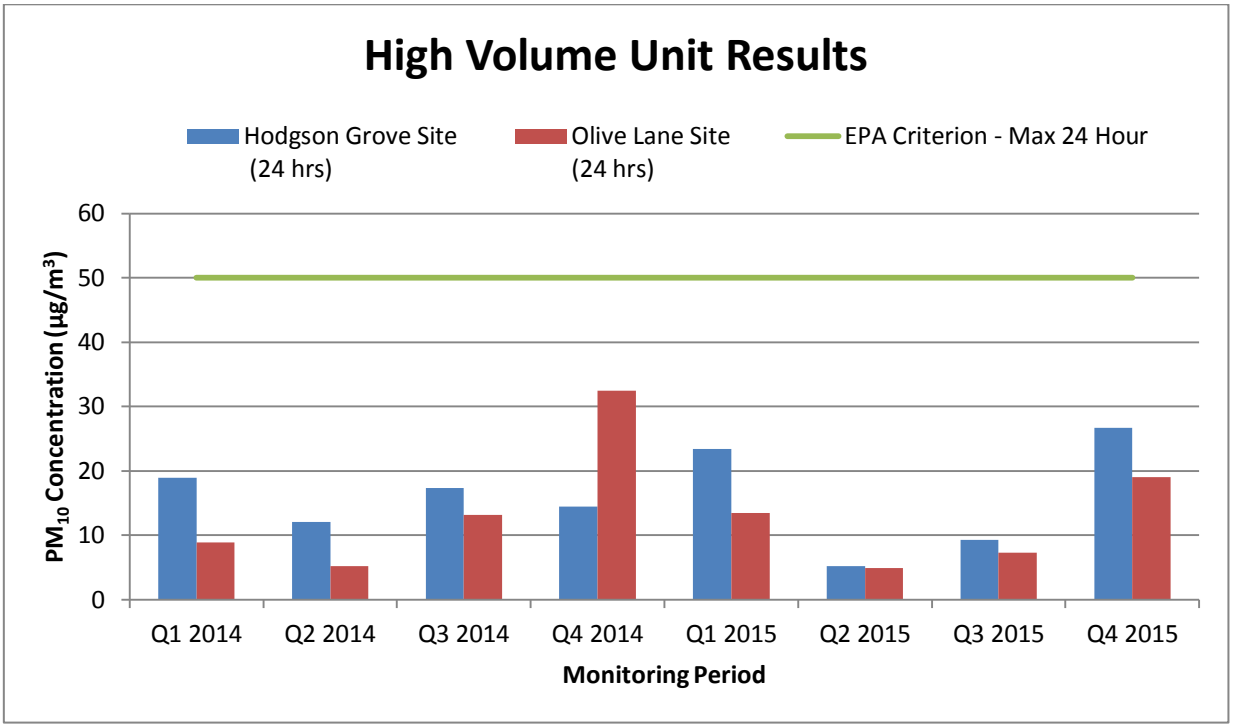


Figure 3 PM10 Monitoring Data Completed as Per Development Consent

The figure below compares the TEOM high volume air quality sampling results at Charlie's Point Road between 2012, 2013, 2014 and 2015. There was a slight increase in the dust levels up until 2014

however during the reporting period the levels began to decrease. Since monitoring began levels have continued well below the average performance criteria in Development Consent 67/98 of 50ug/m3 over a 24 hours period and 30ug/m3 annually. Due to no significant changes to the operation, these low levels are predicted to continue in 2016.

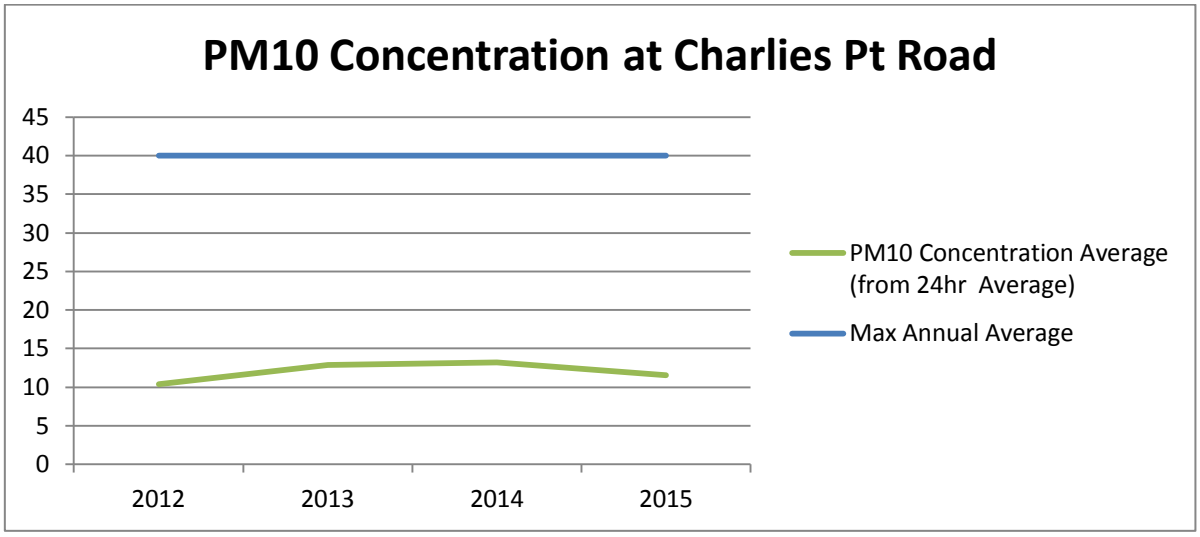


Figure 4 TEOM Monitoring Data at Charlies Point Road

In 2015, there were three (3) complaints related to odour from the No.2 Ventilation Shaft. Whilst these complaints are not related to an exceedance, they are considered reportable to the EPA as part of the site's EPL Annual Return, and are therefore summarised here.

Further Improvements

Following completion of an extensive investigation and odour modelling program, a number of potential improvements to reduce the level of odour experienced in the area around the No2 shaft site were identified and included increasing the height and/or discharge velocity of the No 2 shaft fan exhaust ducts. This is aimed at improving dispersion and dilution of the odour emanating from the exhaust ducts, and reducing or eliminating the odour being experienced by nearby local residences..

Tahmoor has completed preliminary design work to assess any potential impacts on fan performance that increasing the exhaust duct discharge velocity will have on ventilation performance and discharge noise. This has shown to be acceptable for both issues and detailed design work can now commence on the Exhaust duct modifications.

Tahmoor will continue to liaise closely with affected residents to communicate progress on these improvements.

6.3 Biodiversity

Environmental Management

Tahmoor Underground undertakes flora and fauna assessments before undertaking activities likely to require vegetation clearing. Several threatened plant species have previously been identified on the Tahmoor Surface lease area, including *Grevillea parviflora* and *Persoonia bargoensis* which have been identified throughout the REA and near the No.2 Shaft area. *Grevillea parviflora* is listed as vulnerable on both the Threatened Species Conservation Act 1995. (TSC Act) and the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). *Persoonia bargoensis* is listed as endangered on the TSC Act and vulnerable on the EPBC Act.

Terrestrial flora and fauna studies have also been conducted along the Myrtle Creek, Redbank Creek and the Bargo River for areas potentially affected by Longwalls 27-30, and forms part of the SMP application under assessment for these panels. Aquatic ecology assessments of the Bargo River, Redbank Creek and Myrtle Creek have been completed. These studies have indicated that the creeks are in poor condition after 150 years of rural/urban development. The reports indicate that the Bargo River is in a good condition supporting a reasonably healthy ecology. The reports will be used as a

comparative baseline as mining continues and will enable the Tahmoor Underground to determine if there have been any impacts on the ecology of the systems as a result of subsidence. Impacts to flora and fauna will continue to be managed under the approved SMPs for LW27-30.

Environmental Performance

Throughout the reporting period various due diligence flora and fauna surveys were completed at the REA and other operational areas associated where ground disturbance was planned to occur. This process of due diligence assessment is outlined in Tahmoor Underground's, internal management plans and managed effectively on-site through the implementation of Tahmoor Underground's Ground Disturbance Permit.

A plan showing the known location of threatened flora species is provided in **Appendix A.6**.

A plan showing the known location of threatened fauna species if provided in **Appendix A.7**.

There were no reportable incidents related to flora or fauna impacts during the reporting period.

Further Improvements

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

6.4 Aboriginal Cultural and Historical Heritage

Environmental Management

An Aboriginal Heritage Impact Permit (AHIP) search is completed prior to the extraction of each longwall to confirm if new Aboriginal cultural or historical heritage sites have been identified. This process is outlined in Tahmoor Underground's, internal management plans and managed effectively on-site through the implementation of Tahmoor' Underground's Ground Disturbance Permit.

A sandstone rock shelter that contains Aboriginal Art was identified in Redbank Creek as an Aboriginal object. The rock shelter is referred to as Redbank Creek 1. It is in the active subsidence zone of Longwalls 28, 29 and 30. Longwall mining will subside the shelter and potentially cause harm. An Aboriginal Cultural Heritage Assessment Report and Archaeological Report were prepared and submitted to the Office of Environment & Heritage (OEH) and AHIP approval was received on 19 December 2014. During the reporting period Redbank Creek 1 was not impacted by mining.

During the reporting period no new Aboriginal cultural or historical heritage items were identified in the active subsidence zone.

Tahmoor Underground submitted a Subsidence Management Plan (SMP) application to DRE in December 2014 for the approval to extract Longwalls 31 to 37. A Tahmoor North Longwalls 31 to 37 Aboriginal and European Heritage Assessment (Niche, 2014) was submitted with the application and developed for items identified in the study area of Longwalls 31 to 37. Approval of the application is still pending.

Environmental Performance

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

There were no reportable incidents related to Aboriginal or historical heritage items during the reporting period.

Further Improvements

Aboriginal and historical heritage due diligence assessments will continue to be undertaken by qualified consultants as per operational needs and approval requirements. This process will identify items of significance and propose appropriate mitigation measures to ensure compliance with statutory requirements and to maintain valued working relationships with local Registered Aboriginal Parties (RAPS).The site will continue to work with Glencore and the NSW Minerals Council to continually improve engagement techniques with local RAPs.

6.5 Erosion & Sediment Control

Environmental Management

Tahmoor Underground continues to see positive results from ongoing implementation internal management plans, and project specific Erosion & Sediment Control Plans, prepared generally in accordance with the requirements of *Managing Urban Stormwater* (Landcom, 2004), including *Volume 2E Mines and Quarries* (2008) (also known as 'the Blue Book').

Disturbed areas at the REA are controlled using a system of contour drains and cross ripping to reduce erosion and capture any runoff and sediment from rehabilitated areas. The erosion and sediment controls in these areas have been audited by GSS Environmental (GSSE), and auditing and maintenance of erosion and sediment controls is completed regularly.

Various drive-in sump arrangements and settling dams are utilised to capture sediments prior to discharge to LDP1. As previously reported, the unsealed equipment storage area between dams M1, M2, M3 and M4 is regularly treated with a dust suppressant to seal the area. The sealing agent is also useful in reducing sediment mobilisation in stormwater runoff. The storm water consolidation project has allowed for better operational control of the site, and has allowed for flocculent to be dosed into surface water runoff prior to discharge. This has resulted in better water quality results at LDP1 as indicated in monthly sampling results in 2015.

Environmental Performance

Water sampling is carried out monthly as required by EPL 1389 at LDP1 which is the final stage in the mine water and stormwater management system for the mine.

There were no reportable incidents related to erosion and sediment control during the reporting period.

Further Improvements

Tahmoor Underground will continue to implement control strategies identified in Tahmoor Underground's Soil & Water Management Plan. In addition, in 2016 the Waste Water Treatment Plant will be finalised. The aim of the plant is to reduce the concentrations of Total Suspended Solids (TSS) and heavy metals being discharged from the site.

6.6 Contaminated Land

Environmental Management

Following on from the completion of Pollution Reduction Program 19 (2011), Tahmoor continued to monitor Underground Storage Tanks on site. A soil and groundwater contamination report was prepared providing Tahmoor with recommendations based on the six monthly monitoring results.

Environmental Performance

As per the previous reporting period there is still some residual contamination around the now unused reagent Underground Storage Tanks (UST). This contamination was reported to the EPA. Monitoring of this site was continued during the reporting period. Contamination levels have decreased since 2014 however Tahmoor Underground will continue to monitor and remediate as required. A summary of the Total Recoverable Hydrocarbons (C10 to C36) is displayed in Figure 5 and the location of the monitoring wells in Figure 6.

Uncontrolled unless viewed on the intranet

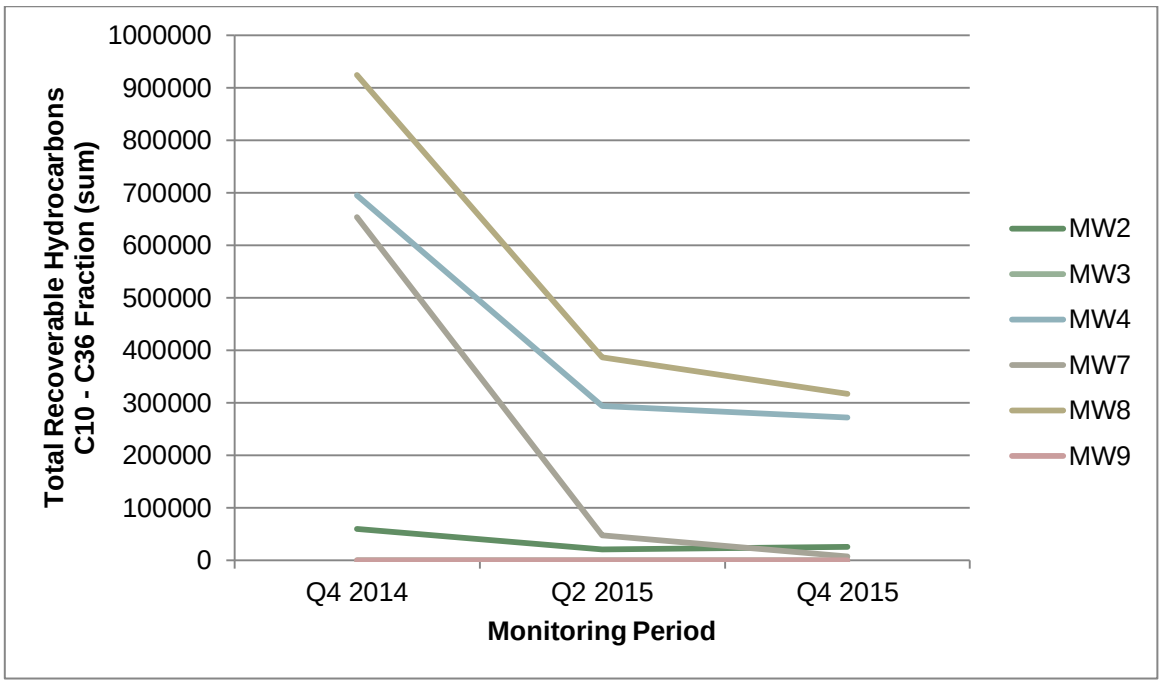


Figure 5 Monitoring Results of Underground Storage Tank

Figure 6 Monitoring Bore Locations

In late 2014 Tahmoor Underground completed a decommissioning report for the two underground storage tanks. The options discussed in this report were the leaving of the tanks in situ, filling the tanks with an inert material and also the removal of the tanks. In this report it was determined the most effective way of managing these tanks is to remove them. Due to the location of these tanks adjacent to the Washery Coal Thickeners, Tahmoor Underground is now determining of this is possible from a geotechnical perspective.

Further Improvements

Monitoring and an outcome for decommissioning will occur 2016.

6.7 Bushfire Management

Environmental Management

During 2015, Tahmoor Underground completed a review of the Bushfire Management Plan (BMP) in consultation with staff from the Wollondilly Rural Fire Service (RFS). This review occurred to review the timing of the hazard reduction burns and the inclusion of a new property purchase on Rockford Road, Tahmoor. The BMP provided significant detail on the location of all Tahmoor Underground land holdings, 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.

Environmental Performance

In 2015. Tahmoor Underground completed two (2) hazard reduction burns. These burns took place in separate locations as described below and were carried out by the Rural Fire Service (RFS).

The burns occurred at the following locations, which are also shown in Appendix A.8.

a) Number 2 Shaft, Rockford Road, Tahmoor.

b) Refuse Emplacement Area, Charlie's Point Road, Bargo.

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

Further Improvements

Continued implementation of Tahmoor Underground's BMP in consultation with the RFS and the Wollondilly Bushfire Management Committee (BFMC).

6.8 Mine Subsidence

Environmental Management

During the reporting period Tahmoor completed extraction of Longwall 28 in May 2015, and commenced extraction of Longwall 29 in June 2016. All subsidence related impacts are managed in accordance with the Tahmoor Colliery Longwalls 27-30 Subsidence Management Plans, including infrastructure and environmental management plans.

Environmental Performance

A detailed review of subsidence monitoring data and impacts is provided in the *Tahmoor Colliery Longwall 28 End of Panel Report* (submitted to DRE 17/09/2015). A brief summary of information relevant to natural features during the reporting period is provided below:

Surface waters

During the reporting period stream bed cracking and loss of pool holding capacity has been observed in numerous pools and stream reaches in Myrtle and Redbank Creek over longwalls 28 and 29. Cracking was observed in both creeks and pools were observed to drain at times of low flow, with sub-surface flow diversion observed to re-emerge downstream of longwall 28.

Groundwater

During the reporting period no open standpipe piezometer water level reduction in response to Longwall 28 or 29 was observed. Partial depressurisation of groundwater was observed at one piezometer, located above future longwall 30. No indication of any adverse interconnection between aquifers and aquitards within 20m of the surface. One (1) privately owned bore experienced depressurisation and loss of serviceability during the reporting period. The bore is located directly above Longwall 26, however the landholder notified the Tahmoor Underground in December 2015. Consultation has occurred with the landholder with Tahmoor Underground providing town water to the landholder.

Land

During the reporting period minor surface cracking and near surface unconformities occurred in isolated locations during the extraction of Longwalls 28 and 29. These resulted in some local

Uncontrolled unless viewed on the intranet

irregularities to the ground surface around semi-rural and urban properties. Restoration and rehabilitation of the land to the satisfaction of the property owner/s was undertaken.

There were a number of incidents reported to DRE regarding mine subsidence in accordance with approvals during the reporting period. These are summarised in the following table.

Table 11 List of Reported Subsidence Related Impacts

Date	Location	Subsidence Incidents Reported
06/03/2015	Redbank Creek	Minor crack and loss of water in two rock pools.
18/03/2015	Bridge Street Thirlmere	Dip and ripples in pavement on Bridge Street Thirlmere over the culvert crossing.
19/03/2015	Redbank Creek	Redirection of surface water flows and pool level decline in three rock pools.
17/07/2015	Main Southern Rail Line	Single tension crack extending across cutting bench to lower cutting batter.
17/07/2015	Main Southern Rail Line	Localised changes to track geometry, primarily track superelevation (cant).
11/12/2015	Redbank Creek	Minor cracking of colluvial soil sandstone and in bedrock downstream of Redbank Creek Culvert.
22/12/2015	Redbank Creek	Significant crack in rock bar observed.

Further Improvements

During the next 12 months, Tahmoor Underground will continue extraction of Longwall 29 and 30 under Thirlmere and Picton where minor impacts to road, kerbs, Sydney Water Potable service pipes and sewer lines and the Main Southern Rail line are expected to occur. These will be managed under the existing Subsidence Management Plan (SMP) approvals.

6.9 Natural Heritage

Environmental Management

No natural heritage sites have been identified. The Bargo River and the associated gorge are considered to hold recreational and aesthetic values in the local area. The Bargo River gorge is well outside the Longwall 28 and 29 subsidence zone, and is not impacted by future longwall extraction in Tahmoor North.

Environmental Performance

As the gorge is not impacted by future longwall extraction in Tahmoor North there is no monitoring data for the current reporting period.

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

Further Improvements

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

Uncontrolled unless viewed on the intranet

7 Water Management

Table 12 Water Take

Water Licence #	Water Sharing plan/source and management zone (as applicable)	Entitlement (ML)	Passive take/inflow (ML)	Active Pumping (ML)	TOTAL (ML)
36442	Greater Metropolitan Region Groundwater Sources / Sydney Basin Nepean Groundwater Source	1642	0	1161.89	1161.89

Note: Total pump does not include 552ML of recycled and potable water pumped into the pit

The water management schematic for Tahmoor Underground is shown in **Appendix A.13** and the water quality infrastructure is in **Appendix A.14.**

7.1 Surface Water

Environmental Management

Tahmoor Underground is licensed to discharge water from one (1) licenced discharge location and overflow from three (3) licenced overflow points. The location of the licensed discharge and overflow points is shown in **Table 13**.

Table 13 Licensed Discharge & Overflow Points

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.

Environmental Performance

Water discharging from the licensed discharge point is monitored monthly (minimum period between sampling – 4 weeks). The current Environmental Protection Licence maximum limits for LDP 1 is provided in Table **14**.

Table 14 100th Percentile Concentration Limits for Licensed Discharge Points

Point	pH	Electrical Conductivity (µS/cm)	As (µg/L)	Ni (µg/L)	Zn (µg/L)	Turbidity (NTUs)	TSS (mg/L)	Oil & Grease (mg/L)
1	6.5 - 9.0	2600	200	200	300	150	30	10

Table 15 Analysis for LDP1 for the EPL Annual Return Period 01/01/2015 – 31/12/2015

Pollutant	Unit of measure	No. of samples required by licence	No. of samples collected and analysed	Lowest sample value	Mean of samples	Highest sample value
Arsenic	µg/L	12	12	30	77	146
Conductivity	µS/cm	12	12	1910	2133	2340
Nickel	µg/L	12	12	49	64	83
Oil and grease	mg/L	12	12	<5	<5	<5

Uncontrolled unless viewed on the intranet

Pollutant	Unit of measure	No. of samples required by licence	No. of samples collected and analysed	Lowest sample value	Mean of samples	Highest sample value
pH	pH	12	12	8.4	8.6	8.7
Total suspended solids	mg/L	12	12	<5	7	15
Turbidity	NTU	12	12	1.8	9.1	23.8
Zinc	µg/L	12	12	36	76	150

There were no non-compliances related to surface water during the reporting period.

Further Improvements

Tahmoor Underground has demonstrated a significant reduction in historical non-compliances with EPL water conditions, with the performance improvement attributed to the implementation of water management PRPs at Tahmoor Underground from 2011 to present, including the successful completion of the Stormwater Consolidation Project at the REA.

Potable Water Supply

During the reporting period, surface and underground makeup potable water supply was from the Sydney Water main. The average monthly potable water usage during the reporting period ranged from 19.35 – 56.61 ML/month, with average consumption of 36.45 ML/month.

Recycled Water Treatment Plant (RWTP)

Tahmoor Underground has continues to recycle mine water from the sealed longwall goafs to the south of the No.3 Shaft for reuse in the mine operation underground and various surface facilities.

The following table shows the water intensity since 2012. As can be seen, potable water intensity has significantly decreased in 2015. During 2014, the RWTP plant was out of order for a number of months which explains the increase in potable water intensity.

Table 16 Water Intensity

Water Usage	2012	2013	2014	2015
Potable Water Usage (kL)	569,370	509,650	549,250	437,440
Recycled Water Usage (kL)	0	175,490	128,750	261,870
ROM tonnes	2,516,088	2,765,678	2,424,576	2,632,695
Potable Water Intensity (L/ROM tonne)	226	184	227	166

In addition to the RWTP, the majority of process water utilised at the Coal Preparation Plant and Stockpile Dust Suppression System is unprocessed recycled mine water. Water carts also utilise this water for dust suppression on haul roads at the Refuse Emplacement Area, to reduce dust generation by the haul trucks and other mobile equipment.

Water Storage Volumes

Volume data for stored water is provided in **Appendix A.9**. Note that Tahmoor 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 are discharged at the approved licence discharge or overflow point. Each discharge is sampled and tested monthly – minimum of every 4 weeks (depending upon flow) as per the site's EPL requirements. Mine water and storm water discharge into Tea Tree Hollow and eventually the Bargo River. Water samples from the Bargo River are also taken monthly, upstream and downstream of the confluence of Tea Tree Hollow. The layout of the site's water management system can be viewed in **Figure 6 and 7**.

Uncontrolled unless viewed on the intranet

Waste Water Treatment Plant (WWTP) Project

The WWTP project commenced in 2014 after a lengthy design and risk assessment phase. It involves the design and construction of a waste water treatment plant to reduce total suspended solids (TSS) and heavy metals within the mine discharge to complete PRP 23 in Tahmoor North EPL:

Figure 7 WWTP as of December 2015

Construction of the WWTP has been completed and the plant was commissioned by the design and construction contractor, Minetek, late in 2015. While initially indicating performance was to the specified design, a number of unexpected issues were identified with the plant. These have been progressively investigated through to the end of 2015 and early 2016, during which time plant operation has been maintained. Minetek and Tahmoor Colliery Underground are currently addressing the final outstanding issues and expect to have resolved in the near future.

7.2 Groundwater

Environmental Management

Water from porous sandstone layers above the mine workings seep into the mine at a rate of approximately 2,500 kL/day. This water is pumped to the surface and directed to the pit top treatment dams. Water quality is monitored under the conditions of the site's EPL as described above.

Near surface ground water levels may be affected by mine subsidence. Any property owner that has a registered borehole affected by mine subsidence is provided with water until the area stabilises and the bore is re-established. Each bore owner is contacted and 'Subsidence Management Plans' developed where there are identified risks. For further information relating to groundwater impacts due to subsidence refer to Section 6.8.

All groundwater impacts and monitoring were aligned to predictions and control strategies outlined in Tahmoor Underground's MOP and SMP.

Environmental Performance

A plan showing the location of all monitoring bores in the Tahmoor North mining area, as reported in the *Tahmoor Underground Annual Groundwater Report 2014-2015* is provided in Appendix A.10.

One (1) privately owned bore experienced depressurisation and loss of serviceability during the reporting period. The bore is located directly above Longwall 26, however the landholder notified Tahmoor Underground in December 2015. For further detail regarding groundwater level changes, refer to the *Tahmoor Underground LW28 End of Panel Report (17 September 2015)* and the *GeoTerra End of Longwall 28 Surface Water, Dams & Groundwater Monitoring Report (August, 2015).*

Historical records of the total groundwater withdrawn are displayed in Appendix A.15.

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

Uncontrolled unless viewed on the intranet

Further Improvements

In 2016 Tahmoor Underground will continue to implement the mines Groundwater Management Plan, and ongoing monitoring and reporting in-line with the conditions of Tahmoor Underground's Water Licences.

Uncontrolled unless viewed on the intranet

8 Rehabilitation

Table 17 Rehabilitation Summary

Mine Area Type	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
	2014 (ha)	2015 (ha)	2016 (ha)
A. Total mine footprint	127	127	130
B. Total active disturbance	65.5	59	62
C. Land being prepared for rehabilitation	0	6.5	0
D. Land under active rehabilitation	0	6.5	0
E. Completed Rehabilitation	0	6.5	0

Environmental Management

Annual rehabilitation monitoring of long-term transects was conducted during the reporting period. No significant changes in the vegetation quality, structure and diversity were observed during monitoring in 2015. Generally, additional characteristics and changes that were noted included:

a) Good growth in all canopy species including juveniles and seedlings;

b) Senescent Acacias becoming less common with many already fallen creating habitat for both fauna and regenerating native species;

c) Weed cover is low overall, however two areas have increasing weed populations;

d) Continued slow increase in colonisation by native groundcover species including grasses pre-2005 revegetation stages;

e) Growth rates overall are good in newly established revegetation with limited sloped areas not exhibiting such rates;

f) Target species recorded in all revegetation areas increased; and

g) Impact of rabbits on new seedlings has reduced minor gully erosion evident, however erosion control adequate with remediation on-going.

Rehabilitation monitoring was undertaken in 2015 and the following recommendations were made:

a) Continuation of the current weed control program and additional attention to weed control of *Andropogon virginicus* and *Eragrostis curvula;*

b) Monitoring of trials to introduce native grasses to increase cover within the older revegetated areas and implementation of successful strategies where revegetation has been unsuccessful and native cover is inadequate;

c) Monitoring of the Organic Growth Medium (OGM) trial to increase organic matter in the planting medium prior to direct seeding of new areas. If successful, the broad application of this method, and additionally this may be used with infill planting in older revegetation areas;

d) Infill planting with canopy species, other than Acacia species, in those areas lacking species representative of this storey; and

e) Monitoring of the rabbit population and control activities such as harbour destruction continued where practicable.

Uncontrolled unless viewed on the intranet

Environmental Performance

In 2015, 6.5ha of rehabilitation was completed. This area was mulched, a topsoil and organic matter mix layer of 400mm applied, then shallow ripped and seeded. Seed was mixed with a fertiliser named Croplifter 15 and spread at 100kg/hectare and gypsum was added at a rate of 10t/ha. Japanese Millet and a light pasture mix was added to additional long-term ground stabilisation. 20 bird boxes have also been placed across various ages of rehabilitation in the REA. The progress of the rehabilitation is shown in **Figure 8** and area rehabilitated is shown in **Appendix A.16** and planned disturbance for 2016 is displayed in **Appendix A.17**.

The seed mix was applied at a rate of 7.1kg/ha and included:

Acacia decurrens	***E. moluccana***	***Banksia spinulosa***
A. longifolia	***E. tereticornis***	***Dodonaea cuneata***
A. falcata	***Angophora floribunda***	***Leptospermum flavescens***
A. suaveolens	***Allocasuarina littoralis***	***Loptospermum juniperinum***
A. terminalis	***Kennedia rubicunda***	***Hakea dactyloides***
E. eugenoides	***Lomandra longifolia***	***Hakea sericea***
E. punctata	***Lomandra obliqua***	***Kunzea ambiqua***
E. scerophylla	***Dianella revoluta***	***Hardenbergia violaceae***
E. rossii	***Eucalyptus globoidea***	***Cassinia aculeate***

Figure 8 Rehabilitation (as of December 2015)

Mine Closure

There are a number of post mining land use options that may be applicable Tahmoor Underground including residential, light industrial or a return to native bushland. Currently, it is considered that the likely final land use option for most of the Tahmoor Underground closure domains will be a return to native bushland. However the final land use options will be confirmed in the detailed closure planning process, which involves undertaking a final land use analysis. The detailed closure plan, to be developed within five (5) years of mine closure and will be prepared using the selected final land use at that time.

Refuse Emplacement Area key rehabilitation indicators include the following:

i. Average depth of fill (height of refuse emplacement) will be 12m

ii. Maximum slope on final landform external batters will be 1:4 (generally will be 1:8)

Uncontrolled unless viewed on the intranet

iii. External batters should have gently sloping contour drains, reporting to water storage dams

iv. Topsoil placement depth >300mm

v. All final landform slopes to be contour ploughed prior to seeding or planting

vi. Target <10% weeds infestation within monitoring transects

vii. Target evidence of second generation flora germination in monitoring transects

viii. Rehabilitation monitoring transects contain flora species and structural characteristics similar to the desired vegetation communities at the analogue sites.

As detailed in Tahmoor Underground's MOP, soils occurring at Tahmoor and the REA 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.

As detailed in Tahmoor Underground's MOP, 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 Underground'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 (including active domains still in operational use) specific in Tahmoor Underground's *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.

A summary of the status of each closure domain is provided in Table 18.

Table 18 Status of each Mine Closure Domain

Domain	Description	Rehabilitation Status	
		Annual Review Commencement	Annual Review Completion
1	Tahmoor 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., & Ecosystem Dev.	Active Area, Ecosystem Est., & Ecosystem Dev.
4	No.1 Ventilation Shaft	Active Area	Active Area
5	No.2 Ventilation Shaft	Active Area	Active Area

Uncontrolled unless viewed on the intranet

Contour Drains

In 2015, a review was conducted of existing contour drains within Tahmoor Underground's REA. In addition to the review four (4) preliminary engineering layout plans were developed showing the REA and contour drains at various stages of completion.

The review and analysis showed that there were some minor inadequacies with the drains constructed onsite. There were several area of erosion and scouring identified and the hydraulic analysis revealed that the capacities of some of the contour drains within stages 7, 8 and 10-16 of the REA were undersized.

Following the analysis it was recommended that the contour drains be modified and regular spaced armoured drains outlets should be constructed connecting the contour drains to the toe drain. Regular maintenance and promotion of grass cover were also recommended.

The newly designed Cardno contours have been added to TAH CHP PRO 0063 and previous contours have been deleted from TAH SD PRO 009 to reconcile the differences between the two documents. This ensures that there is only one procedure that is being followed for REA construction and rehabilitation activities

8.1 Weeds

Environmental Management

A formal 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 19.

Table 19 Weed Species Targeted During the Reporting Period

Target Weed Species	Date of Control	Treatment Method
African Lovegrass (*Eragrostis curvula*)	All seasons	Herbicide (Glysophate)
Hedge Mustard (*Sisymbrium orientale*)	All seasons	Herbicide (Glysophate Dicamba)
Whiskey Grass (*Andropogon virginicus*)	All seasons	Herbicide (Glysophate)
Serrated Tussock (*Nassella trichotoma*)	All seasons	Herbicide (Glysophate)
Fireweed (*Senecio riensis madagasca*)	Winter or as detected	Hand Weeding & Herbicide (Glysophate)
Swan Plant (*Gomphocarpus fruticosus*)	All seasons	Hand Weeding
Western Australian Golden Wattle *(Acacia saligna)*	All seasons	Cut stump removal and herbicide application

Environmental Performance

Monthly weed management of all land owned or managed by the mine has continued through the reporting period, with positive results noted through inspections.

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 officinale*, *Acacia saligna,* and seedling *Leptospermum laevigatum* has been recommended.

Maintain monitoring for and weed control program of *Acacia saligna*

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

Further Improvements

Continue weed spraying activities on a monthly basis across Tahmoor leased and owned land, including throughout mine rehabilitation at the REA.

8.2 Actions for the Next Reporting Period

No rehabilitation is scheduled for the next reporting period. Disturbance targets and planned maintenance activities are outlined in **Table** 20 and Table 21 respectively.

Table 20 2016 Rehabilitation Targets

Category	Targets for 2016 (ha)				
	Q1	Q2	Q3	Q4	Total (Target)
Disturbed	3	0	0	0	3
Levelled/Re-contoured	0	0	0	0	0
Seeded	0	0	0	0	0
Established	0	0	0	0	0

A summary of maintenance activities completed and proposed for all rehabilitated land is also provided in Table 21.

Table 21 Maintenance Activities on Rehabilitated Land

Nature of Treatment	Area (ha)		Comments, Control Strategies, Treatment Detail
	Report period	Next period	
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)	6.5	0	Gypsum and 400mm topsoil spread No maintenance planned for 2016
Soil treatment (detail – fertiliser, lime, gypsum, etc)	6.5	0	Gypsum spread No maintenance planned for 2016
Treatment management (detail – grazing, cropping, slashing, etc)	0	0	N/A
Re-seeding/planting (detail – species density, season, etc)	6.5	0	No maintenance planned for 2016
Adversely affected by weeds (detail, type and treatment)	0	0	Note that the ongoing weed spraying program is conducted over approximately 80 ha of land at the REA. No areas are adversely affected by weed infestations.
Feral animal control (detail – additional fencing, trapping, baiting, etc)	0	0	Rabbit baiting in progress Feral Cats to be trapped across site as required

Actions are to be completed as per the recommendations from the 2015 rehabilitation monitoring, outlined in Section 8 – Environmental Management.

Uncontrolled unless viewed on the intranet

9 Community

9.1 Community Engagement Activities

Stakeholder engagement is an ongoing process which takes place throughout the life of the mining project. Tahmoor has previously established a good working relationship with its local community, and seeks to continue this as it establishes new projects, continues existing operations and moves towards mine closure. In particular, the site focuses on providing timely and accurate information regarding its Sustainable Development performance to its varied stakeholders as appropriate.

The method of consultation used may vary depending on the scale of project, or the stakeholder type and preferred method of communication. The following consultation methods are commonly used to identify and engage with stakeholders:

i. Distribution of Residents Monthly Newsletter – email, paper mail and printed posters displayed in various locations.

ii. Face to face consultation meetings – local landholders and community groups.

iii. 24 hour complaints line – phone number displayed on newsletter, Tahmoor Underground website and distributed at face to face consultation meetings.

iv. Tahmoor Colliery Community Consultative Meetings (TCCCC) – four (4) quarterly meetings held (5 March, 4 June, 3 September and 3 December).

v. Community Information Day – biannually or as required at the Tahmoor Community Centre (open to all members of the public).

vi. Longwall 28 End of Panel Report – distributed to TCCCC and available on Tahmoor Underground website.

vii. 2014 Annual Environment Management Report – distributed to TCCCC and available on Tahmoor Underground website (www.tahmoorcoal.com.au).

These processes and the mine's overall strategy for community engagement is detailed in Tahmoor Underground's Community Development Plan (formerly Social Involvement Plan). This Management Plan is regularly reviewed and updated based on changes or identified improvements.

Apprentice Community Engagement Program

Tahmoor has established an Apprentice Community Engagement program, encouraging apprentices to engage with local schools and community groups, highlighting the importance of communities surrounding our operation.

Tahmoor apprentices provide annual support to local primary schools by operating the BBQ stall at their annual school events, including the provision of all necessary food and equipment. All funds raised from the stall are donated back to the school.

In addition to this in 2015, the Tahmoor apprentices partnered with Tahmoor Uniting Men's Shed to commence constructing wheelchair accessible ramps, concrete pathways, retaining walls, a shed awning, flood lights and connecting rainwater tanks. This Project is set to be completed in early 2016.

9.2 Community Contributions

As a significant contributor to the local community, Tahmoor promotes community sustainability where possible. This is through consideration of support to charities and other non-for-profit organisations in the Tahmoor Community Investment Program.

In accordance with Glencore's Community Development and Investment Protocol all Community Investment activities, whether financial or in-kind support, should target the following group-wide focus areas:

a) Capacity Building, including education/training, enterprise development and economic diversification.

b) Health

c) Environment

An overview of Tahmoor community contributions are outlined in Table 22.

Category	2015 Spend
Capacity Building	$11, 750
Health	$16,098
Environment	$30,000
Other	$41,980
Total	$99,828

Table 22 Community Contributions 2015

9.3 Complaints

During the reporting period a total of 15 community complaints were received. Most of these were related to noise complaint forwarded from the EPA from a resident in Olive Lane. A significant portion (four (4)) were also related to noise and received by a resident in Banksia St, Couridjah, as a result noise monitoring was completed. Details of all community complaints made during the reporting period are shown in Appendix A.11.

Figure 9 details the number of community complaints in comparison to previous years. It is expected in 2016 Tahmoor will receive less than 20 complaints.

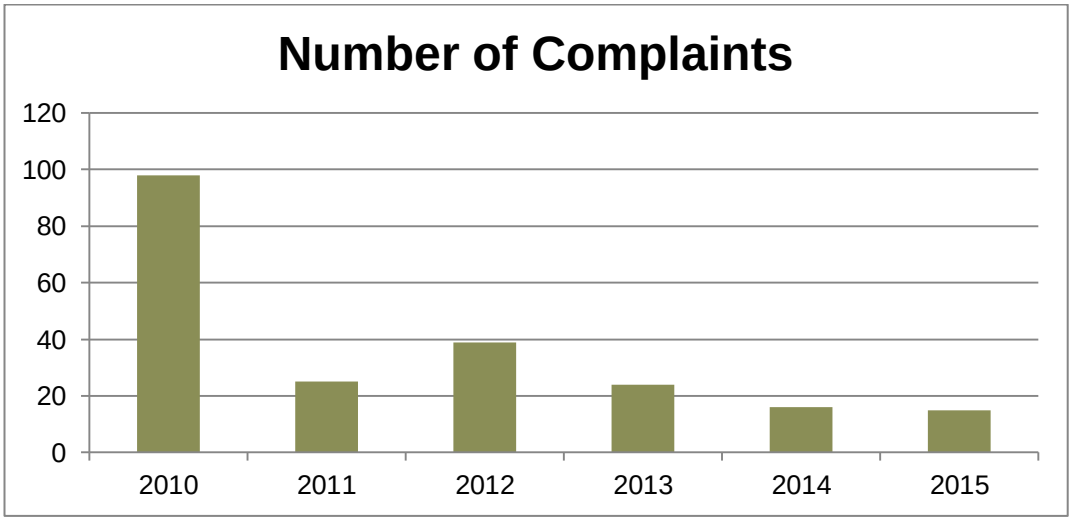


Figure 9 Number of Complaints Comparison

Uncontrolled unless viewed on the intranet

10 Independent Audit

No independent audits were conducted during the reporting period however the results from the audit conducted in 2014 were received in 2015, and are outlined in Table 23.

Table 23 2014 Independent Environmental Audit Recommendations

Ref	Description	Risk	Progress
Recommendations from Previous Audit			
	Implement management actions from Annual Rehabilitation Monitoring reports and document the outcomes of these measures in the AEMR Section 5.2.5 of the 2014 Annual Review, which was published after the audit period, includes a discussion of rehabilitation monitoring.	Low	Complete
DA 67/98			
	Consider the recommendations outlined in Table 3 of Appendix E to address non-compliances with the Statement of Commitments for the Redbank Tunnel Deviation. Consider improved documentation of management measures in the future to assist in demonstrating compliance with regulatory requirements.	Low	N/A
	Confirm whether subsidence has caused any floor levels to be lowered to beneath the 1:100 year flood level (Condition 7);	Moderate	Complete
	Consult with DP&E to determine whether the Director-General is satisfied with the Subsidence Monitoring Program (Condition 12);	Administrative	In progress
	At next modification, request removal of Condition 14 from the consent as this is no longer relevant (Condition 14).	Administrative	In progress
	Finalise compensatory measures for residents that have experienced severe, very severe or unrepairable damage to property (Condition 18)	Administrative	Complete
	A detailed review of each quarterly noise report should be undertaken by relevantly qualified personnel to ensure values are appropriate. It is further suggested that it be confirmed that the automatic inclusion of a 2 dBA buffer is acceptable to DP&E (Condition 33).	Administrative	In progress
	Where results are not applicable due to 'adverse weather conditions', leading practice 'make up' monitoring should be undertaken to ensure compliance (Condition 33).	Moderate	Complete
	Report progress of Tahmoor Coal's implementation of best practice air quality controls (including odour controls) in the AEMR (Condition 38(a)).	Administrative	In progress
	Establish required meteorological forecasting component of the air quality monitoring network as soon as possible in 2015 (Condition 38(c)).	Moderate	Complete
	Include a summary of baseline noise datasets in next review of the relevant management plans (Condition 44(a)).	Administrative	Complete
	Include contingency measures for the management of unanticipated impacts in the next review of the AQGHG and Noise Management Plans (Condition 44(e)).	Administrative	N/A
	Include actions taken in response to reportable incidents in future AEMRs. It is also recommended that future AEMRs should include incidents that are recorded internally (Condition 45(c)).	Low	Complete
	Consult with DP&E to confirm the scope of the requirement to review management plans under Condition 46.	Administrative	In progress

Uncontrolled unless viewed on the intranet

Ref	Description	Risk	Progress
DA 57/93			
	Confirm if the *Soil Conservation Act 1938* requirements are relevant to Tahmoor Coal's approvals platform (Condition 42).	Administrative	In progress
	Review existing REA Plan and revise (if necessary) to reflect contemporary standards (Conditions 44 to 47)	Administrative	In progress
	Review conditions requiring delineation, WSC notification and approval of completed stages of the Refuse Emplacement Area to ensure that measures are in place for future works required in the next auditing period (Conditions 44 to 47).	Administrative	In progress
	Seek to vary requirement for reporting of six-monthly reporting to WSC to be replaced by reporting in the Annual Review (Condition 48).	Administrative	Complete
	Consult with MSB prior to next issuance of 'Resident Information Pack' on mine subsidence impacts, management and rights (Condition 51(b)).	Administrative	Complete
	Liaise with relevant regulatory agencies to confirm if the required annual meeting on subsidence monitoring is required (Condition 51(c)).	Administrative	In progress
	Confirm whether subsidence has caused any floor levels to be lowered to beneath the 1:100 year flood level (Condition 7);	Moderate	Complete
	Implement noise recommendations outlined above under recommendations 7 & 8, above (Condition 73).	Moderate	In progress
EPL 1389			
	Implement measures to ensure that coal extraction does not exceed approved limits (Condition A1.1).	Low	Complete
	Prepare and implement a Work Plan for pit top housekeeping to demonstrate plant and equipment is maintained in a proper and efficient manner (Condition O.1).	Low	Complete
	Seek confirmation from EPA in relation to the objectives of the aquatic health monitoring investigation in Tea Tree Hollow and Bargo River, as required under PRP23 (Condition U2 of EPL 1389). This is suggested as the aquatic health monitoring investigation may have consequences for the design of the mine water treatment plant (required and proposed to be installed in 2015 under PRP22).	Low	In progress
	Install telemetry link for water discharge monitoring point as soon as possible in 2015 (Condition M6.1).	Low	In progress
	Complete the required aquatic health monitoring investigation in Tea Tree Hollow and the Bargo River as soon as possible to meet submission date of 30 April 2016 (Condition U2, PRP23).	Moderate	In progress

The next independent audit of Tahmoor is due to be conducted in 2017.

Uncontrolled unless viewed on the intranet

11 Incidents and Non-Compliances during the Reporting Period

A summary of all environmental incidents which occurred during the reporting period is shown in Table 24. In total there were 14 incidents, four (4) related to subsidence, three (3) related to water, one (1) related to noise and the remainder hydrocarbon related incidents.

Table 24 Incidents during the Reporting Period

Time and Date	Classification	Type	Location	Details	Action/s Taken
06/02/15 at 09:00	Nil Category	Water	Surface	Suspected exceedance of EPL1389 Total Suspended Solids (TSS) at Licence Discharge Point 1 (LDP1)	Floc system was checked to ensure working correctly.
09/02/15 at 13:20	Category 1	Hydrocarbon	Workshop	60L hydrocarbon (Quintolubric) spill in the workshop	Site was cleaned, review of fitting of underground tank. A procedure was developed for carting the tank. A crew brief was communicated to workforce about filling and carting of Quintolubric.
06/03/15 at 10:12	Nil Category	Subsidence	Offsite	Minor crack in Redbank Creek and lowered pool level at one site.	Subsidence event notification to all infrastructure owners/operators, DRE Principal Subsidence Engineer, Director Environmental Sustainability and Land Use and Tahmoor Community Consultative Committee.
18/03/15 at 12:23	Nil Category	Subsidence	Offsite	Dip and ripples in pavement due to subsidence impacts from Longwall 28.	Weekly inspection during mining and notification to Wollondilly Shire Council and Mine Subsidence Board.
19/03/15 at 01:09	Nil Category	Subsidence	Offsite	Redirection of Redbank Creek surface water flows and pool level decline during mining at sites RC37, RC2 and R6.	Subsidence event notification to all infrastructure owners/operators, DRE Principal Subsidence Engineer, Director Environmental Sustainability and Land Use and Tahmoor Colliery Community Consultative Committee.
21/04/15 at 12:00	Category 1	Hydrocarbon	Coal stockpiles	Blown hydraulic hose on bulldozer caused oil spill of approximately 45L.	Area isolated. Leak contained in bunded area until excavator sourced to recover the dozer.

Uncontrolled unless viewed on the intranet

Time and Date	Classification	Type	Location	Details	Action/s Taken
28/05/15 at 08:30	Nil Category	Hydrocarbon	Yard	Gate valve on diesel tank leaking when filling	Repair or replace leaking spindle seals on gate valves located on diesel fill pipes. Remove non-essential material from bund area of diesel tanks.
28/05/15 at 09:00	Nil Category	Water	Sediment Dams	Water being pumped from underground via main drift was excessively discoloured containing high volumes of fine clay sediment, causing M1, M2 and M3 to become discoloured.	Advised Underground Engineer who arranged to stop pumping. Temporarily increased flocculent dosing into M3 dam to remove increased sediment load.
08/06/15 at 22:00	Nil Category	Noise	Surface	Noise alarm triggered to Environmental Coordinator but alarm not received at control room. Noise was found to have originated from a stationary train beside monitor.	Correct function of alarm system after repair was checked. Control room operators were trained on Noise TARP.
17/06/15 at 16:00	Nil Category	Hydrocarbon	Yard	Oil residue noted in area of yard that discharges off site without passing through dams.	The area was cleaned up. A more appropriate location was created to park underground equipment on Surface so oil does not discharge from site.
12/10/15 at 15:00	Nil Category	Hydrocarbon	Yard	Small (<10L) oil and diesel spill within the pit top yard area.	The area was cleaned and follow up inspections were completed. A shift brief was distributed to reinforce expected standards.

Uncontrolled unless viewed on the intranet

12 Activities to be completed in the Next Reporting Period

During the next reporting period, the following activities are expected to be completed:

a) Conduct an Aquatic Monitoring Program for aquatic health monitoring investigation in Tea Tree Hollow and the Bargo River. The main objective of the investigation will be to define site specific trigger values for electrical conductivity in the Bargo River, recommend suitable discharge concentration limits for electrical conductivity at Licensed Discharge Point 1 and submit a copy of the investigation report to the EPA by the due date.

b) Complete design, installation and monitoring of discharge modifications to No 2 shaft fans to confirm reduction or elimination of odour impacts being experienced by nearby resdients.

c) Completion of any outstanding issues regarding the operation and maintenance of the Waste Water Treatment Plant

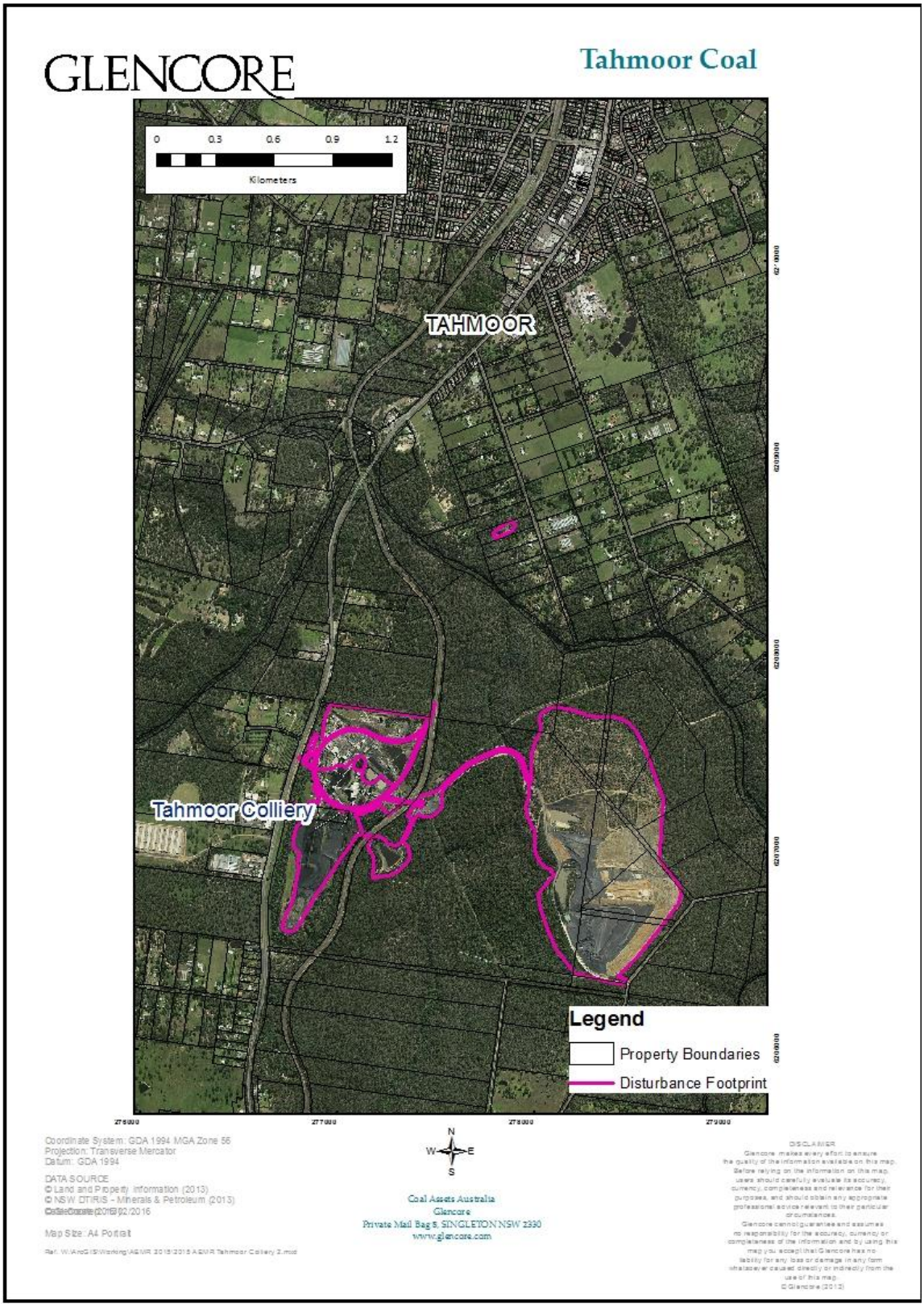
d) Review and update LW 31-37 Subsidence Management Plan Application, respond to community comments, and gain approval for Longwalls 31 and 32 initially, while further reviewing details for longwall 33 to 37.

e) Complete the final extension ogf the Refuse Emplacement Area within the current approved extents, commissioning revised drainage and roadworks and amending management plans and procedures to accommodate the change.

Uncontrolled unless viewed on the intranet

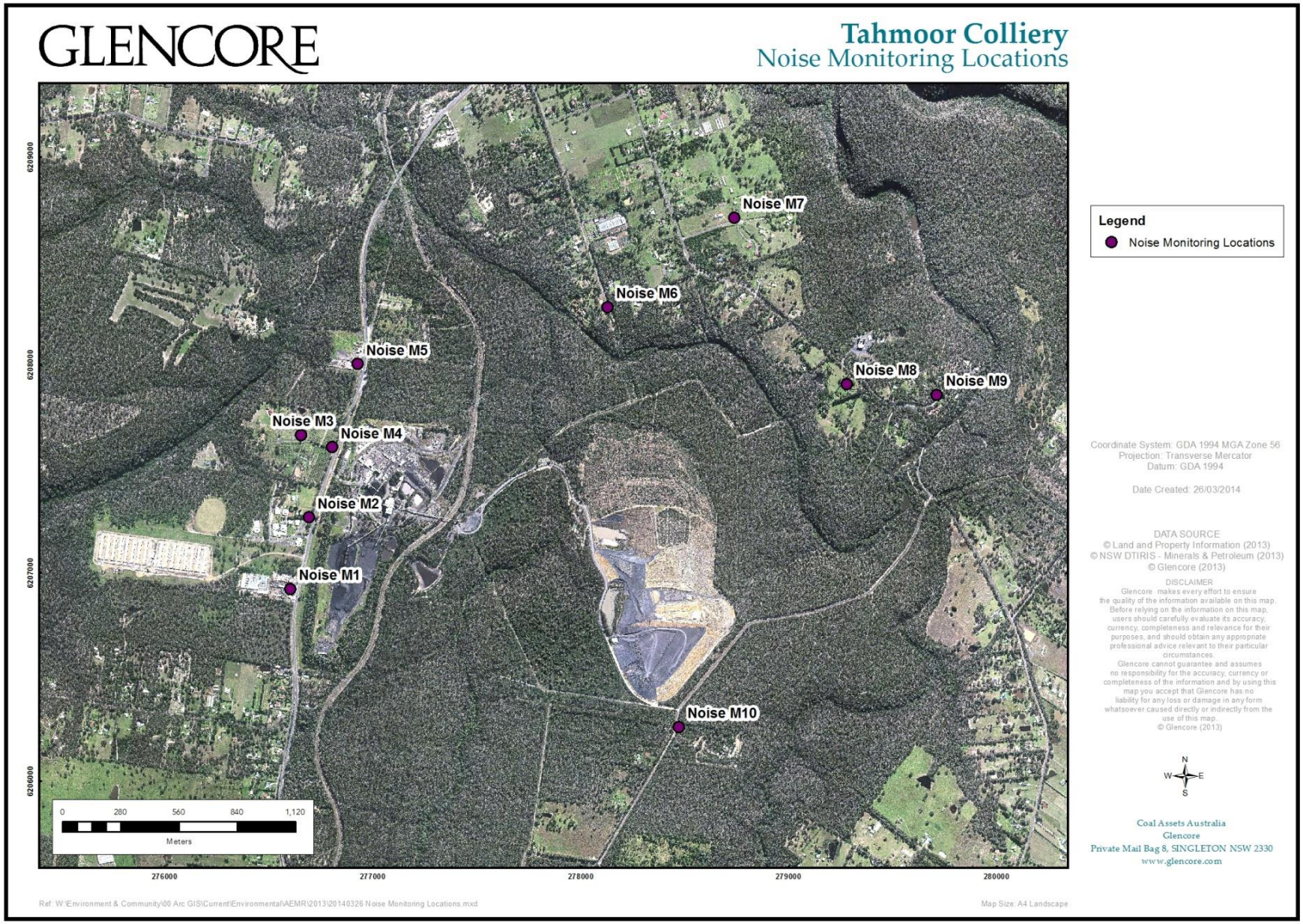
13 Appendix

A.2 Disturbance Footprint and Property Boundaries



Uncontrolled unless viewed on the intranet

A.3 Noise Monitoring Locations



A.4 Due Diligence Noise Assessment 2014

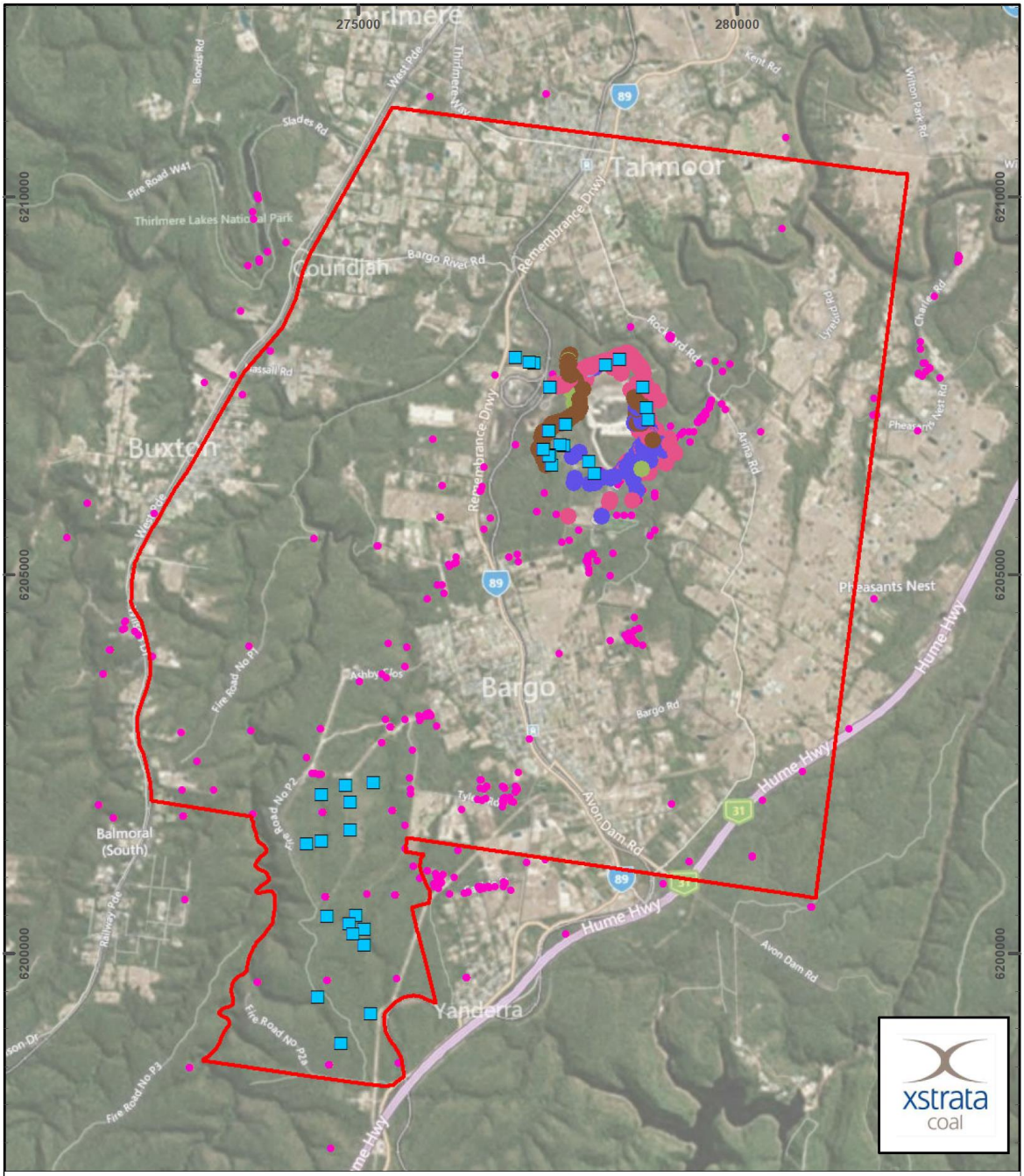
Location	Assessment Goals* LA10	Estimated Contribution Quarter 1 LA10	Estimated Contribution Quarter 2 LA10	Estimated Contribution Quarter 3 LA10	Estimated Contribution Quarter 4 LA10	Description	Residential Property?
M1	47	<45/6	<48	<48	<48	Remembrance Drive (Service Station)	No
M2	47	46/7	47	<60	47	Remembrance Drive (School entrance road)	No
M3	47	<44	<47	<45	<42	Olive Lane (End of cul-de-sac)	Yes
M4	47	<45	<49	<47	<45	Olive Lane/Remembrance Drive Intersection	No
M5	47	<40	<40	<47	<40	Remembrance Drive (Service Station)	Yes
M6	47 (39)	<35 (<35)	<43 (<35)	<38 (<35)	<30	Stratford Road	Yes
M7	47	<35	<35	<35	<30	Hodgson Grove (End of cul-de-sac)	Yes
M8	47	<35	<35	<35	<32	Rockford Road	Yes
M9	47	<35	<35	<35	<30	Kammer Place (End of cul-de-sac)	Yes
M10	47/(35)	<35 (<35)	<36 (<35)	<32 (<35)	<30	Charlies Point Road	No

A.5 Due Diligence Noise Assessment 2015

Location	Assessment Goals* LA10	Estimated Contribution Quarter 1 LA10	Estimated Contribution Quarter 2 LA10	Estimated Contribution Quarter 3 LA10	Estimated Contribution Quarter 4 LA10	Description	Residential Property?
M1	47	<52	<50	<46	54/5	Remembrance Drive (Service Station)	No
M2	47	<53	<54	<47	55/6	Remembrance Drive (School entrance road)	No
M3	47	<48	<47	<42	44/5	Olive Lane (End of cul-de-sac)	Yes
M4	47	<48	<53	<47	47/8	Olive Lane/Remembrance Drive Intersection	No
M5	47	<40	<46	<42	<42	Remembrance Drive (Service Station)	Yes
M6	47 (39)	<30	40/1 (-)	40/1 (-)	39/40 (-)	Stratford Road	Yes
M7	47 (39)	<30	35/6 (-)	<35	<30 (-)	Hodgson Grove (End of cul-de-sac)	Yes
M8	47 (39)	<33	32/3 (-)	<34	<35 (-)	Rockford Road	Yes
M9	47 (39)	<30	<30 (-)	<30 (-)	<30 (-)	Kammer Place (End of cul-de-sac)	Yes
M10	47/(35)	<30	<30	<6	<35	Charlies Point Road	No

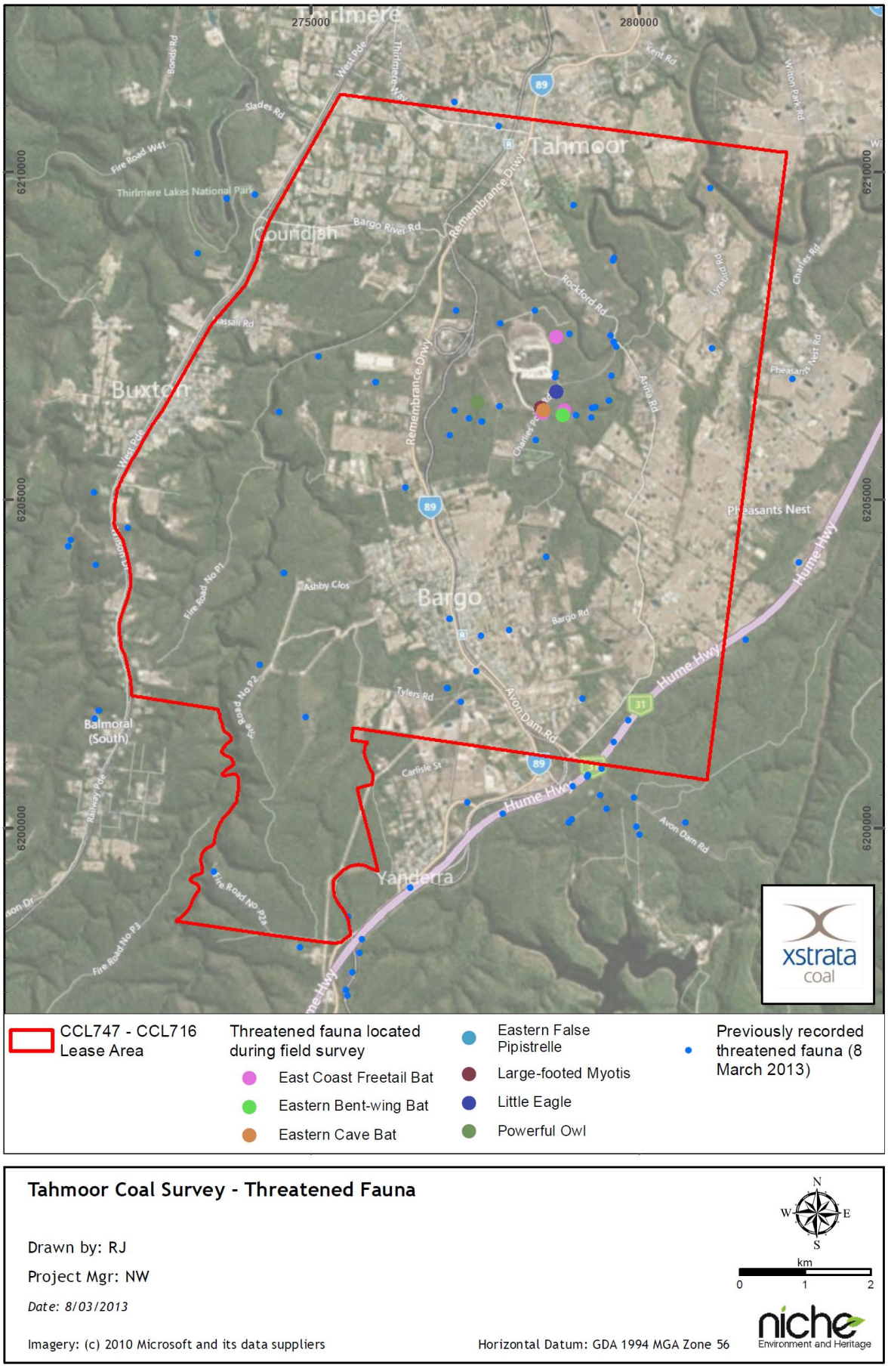
Uncontrolled unless viewed on the intranet

A.6 Threatened Flora



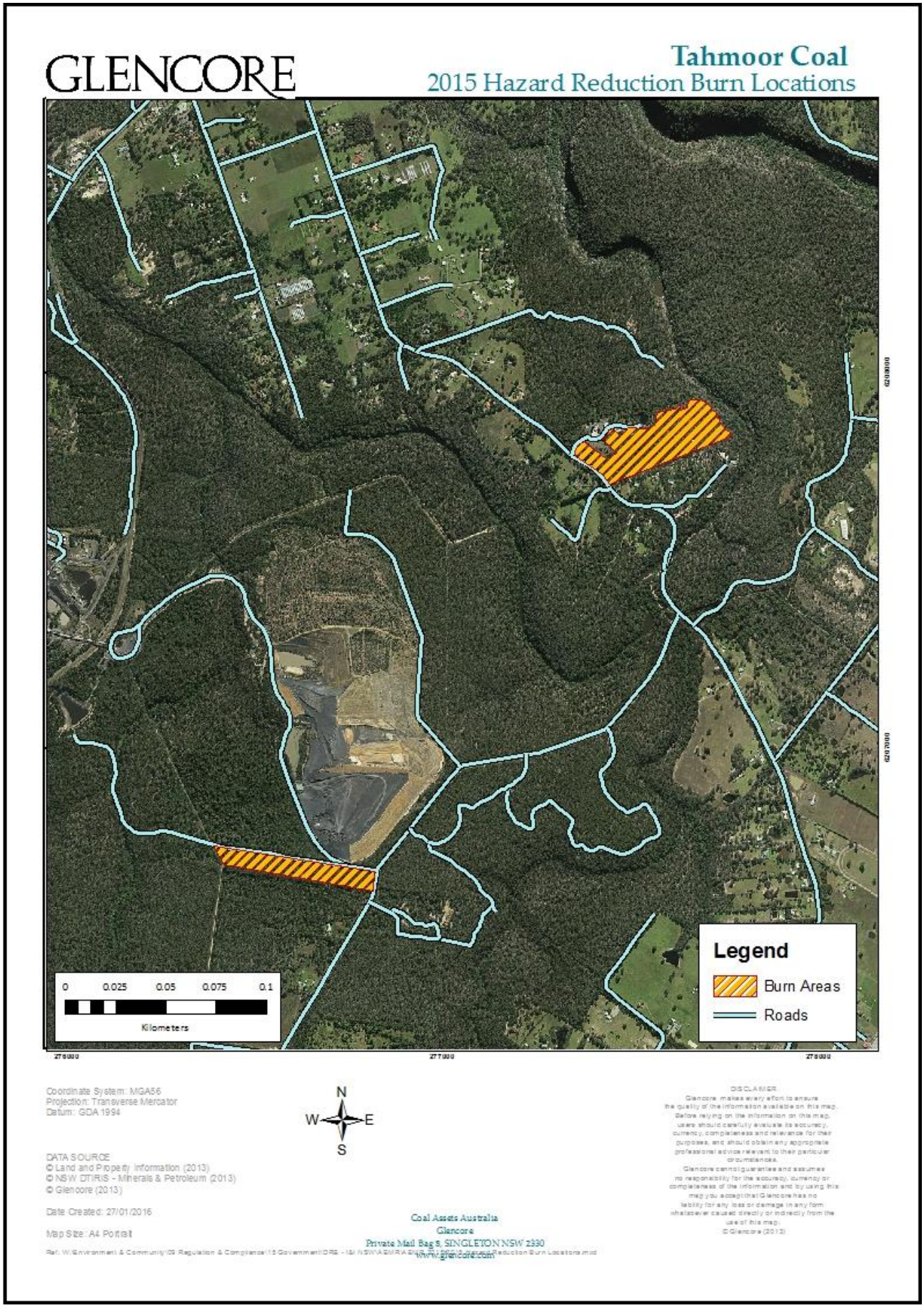
Uncontrolled unless viewed on the intranet

A.7 Threatened Fauna



Uncontrolled unless viewed on the intranet

A.8 Hazard Reduction Burn Locations 2015



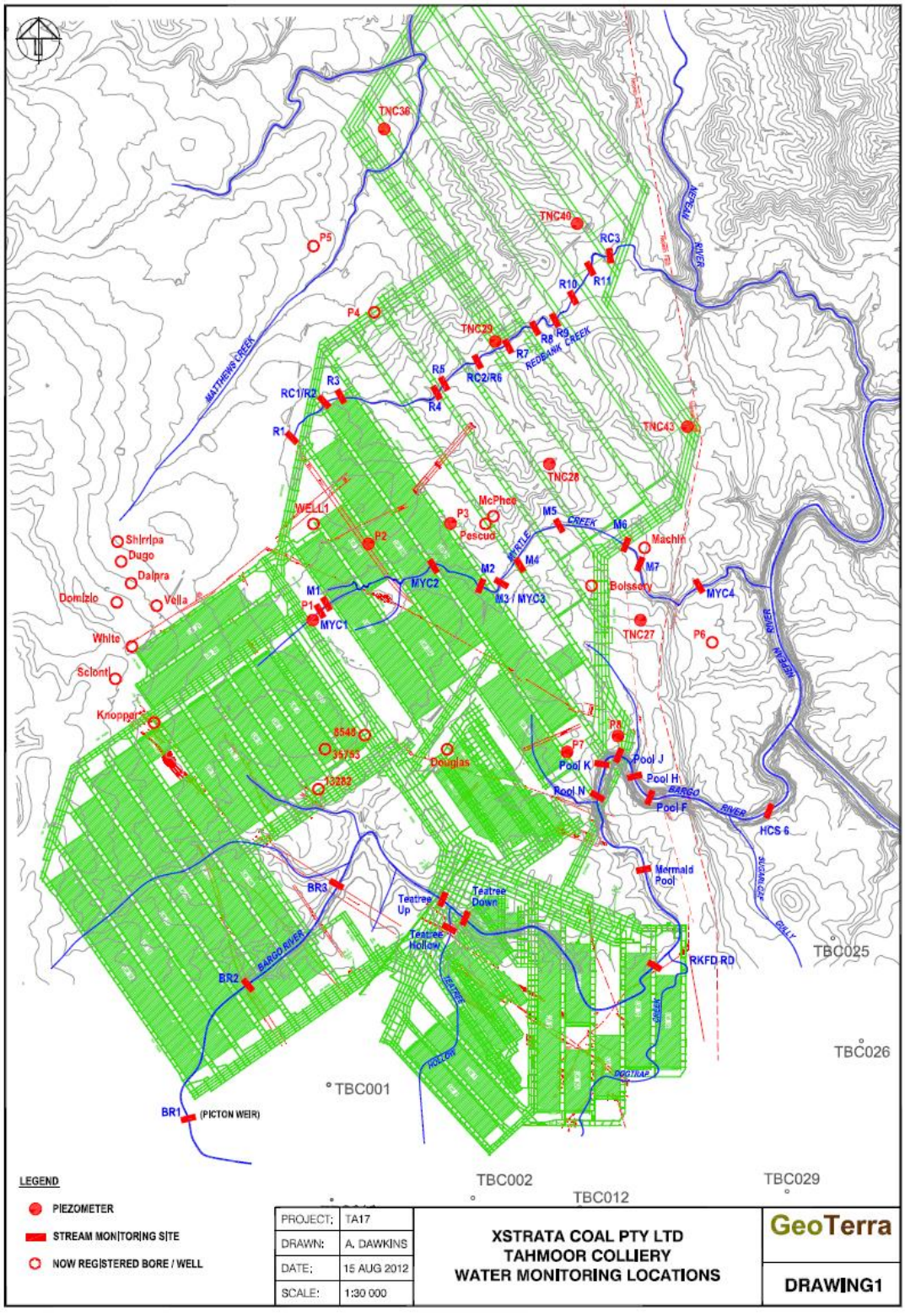
Uncontrolled unless viewed on the intranet

A.9 Stored Water

Water Storage Name	Estimated Water Volume		Capacity	Comments
	Beginning 2015	End 2015		
M5	1.0ML	1.0ML	3.0ML	First settling dam for No.2 Shaft site area. (stormwater)
M6	0.5ML	0.5ML	4.5ML	Second settling dam for No.2 Shaft site area. (stormwater)
S4	5.0ML	25.0ML	36.9ML	This dam is designed to act as a retention basin with a controlled outlet. Discharges via Overflow Point 4.
S8	0.2ML	0.2ML	0.45ML	Dam in reject area. Pumps to S9 dam. Discharges via Overflow Point 5.
S9	0.2ML	0.2ML	0.4ML	Silt trap only for sealed haul road. Wet well pumps to S4 dam. Discharges via Overflow Point 3.
Tank No.1	250kL	250kL	250kL	Underground potable water supply.
Tank No.2	250kL	250kL	250kL	Underground potable water supply.
M1	1.8ML	1.8ML	1.8 ML	M series dams act together to treat mine water pumped from underground and stormwater, discharge via LDP1
M2	0.5ML	0.5ML	0.5ML	
M3	9.0ML	9.0ML	9.0ML	
M4	8.0ML	8.0ML	8.0ML	
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	8.3 ML	
S5	0.01 ML	0.01 ML	0.5 ML	Silt trap only, discharges to dam S6.
S6	1.3ML	1.3ML	1.5 ML	This dam is designed to act as a retention basin with a controlled outlet.
S7a	10.0ML	11ML	12.0ML	These dams are designed to act as retention basins with a controlled outlet to S7 Dam.
S7b	0.5ML	0.5ML	1.0ML	
S7	8.0ML	8.0ML	41.5ML	This is the main catchment for runoff from the REA. The dam is a retention basin during peak rainfall. All water is pumped to Dam S4.
Sewage Maturation Pond 1	590kL	590kL	590kL	Treated effluent overflows to M1 dam.
Sewage Maturation Pond 2	590kL	590kL	590kL	

Uncontrolled unless viewed on the intranet

A.10 Groundwater Monitoring Boreholes in Tahmoor North Mining Area



Uncontrolled unless viewed on the intranet

A.11 Community Complaints

Date	ID	Type	Details	Actions Taken
13/01/2015	237.0	Odour	Complaint regarding strata oil odour. The complainant stated that there had been no issues over the past 12 months however the last few days he had detected the odour and it had been particularly strong over the previous 24 hours.	E&C Manager reported that the Tahmoor longwall had not reported any occurrence of strata oil underground for over 12 months and it was thought that the longwall may have mined beyond the area which contained the oil. E&C Manager indicated that he would immediately go to the shaft to confirm the extent of the odour. Production Manager confirmed that the longwall had experienced strata oil on the face since mid-December 2014 but levels had increased significantly in the previous few days
30/01/2015	238.0	Noise	EPA contacted E&C Coordinator to advise of a resident from Olive Lane, Tahmoor complaining of intermittent noise emanating from the mine on most nights and there was a 'humming and droning' sound. The complainant also made mention of vibration to their property and to their neighbours' house.	E&C Coordinator reviewed noise data and responded to the EPA. Detail was provided to the EPA in the form of Sentinex data and a description of the mines current operations. CHPP supervisor was also contacted to establish if any change had been made to the operation – there had been none.
11/02/2015	275.0	Noise	EPA received a complaint from resident on Olive Lane, Tahmoor with regards to "humming and droning all night with the noise from the washery and conveyor belt" starting up at 9pm	E&C Coordinator contacted the CHPP supervisor to establish if any change had been made to the operation. It was noted that the CHPP had been operating continuously from 5.15pm to 5am. The quarterly noise assessment was being conducted at the time and there was no indication of noise being an issue at the time of sampling. E&C Coordinator reviewed noise data and responded to the EPA.

Uncontrolled unless viewed on the intranet

Date	ID	Type	Details	Actions Taken
27/02/2015	276.0	Odour	Tahmoor was contacted regarding recent strata oil odour from No. 2 shaft fans being experienced at his property in Rockford Road opposite the shaft. The resident stated that this had been occurring for hours on end and he was sometimes awakened at night by the odour. The complainant wanted to know what the mine proposed to do about the issue	E&C Manager phoned the complainant 02/03/2015 where the frustrations and concerns regarding the continuing odour from No. 2 shaft. He requested a response as to what actions Tahmoor will undertake to resolve this issue.
17/04/2015	247.0	Noise	E&C Officer received a complaint from a resident at Banksia St, Couridjah regarding noise from the mine. He complained about his perception of increasing levels of droning from the pit-top. The complainant came to the front gate of the mine last week to confirm it was the same sound and believes it is getting worse and he will be forced to move if it is not addressed	The control room was contacted to determine if there had been any issues that would have caused an increase in noise over the past 3 months – no issues were raised
15/06/2015	248.0	Noise	EPA received a complaint from residents in Olive Lane, Tahmoor regarding "mine noise starting Saturday 13 June at midnight and went through all night until Sunday morning. It was loud constant washer noise going full blast. The noise was loud and annoying and vibrating the whole house"	E&C Coordinator responded to the EPA providing details in the form of Sentinex data and a description of the mines operations
03/08/2015	233.3	Noise	Complaint to E&C Coordinator by a resident at Banksia St, Couridjah regarding noise which he believes is emanating from Tahmoor mine. The complainant believes the noise is occurring 24 hours a day and 7 days a week and feels that Tahmoor should put double glazed windows onto his property as a gesture of goodwill.	2 rounds of noise monitoring have been conducted at the residence previously. E&C Coordinator will include the property in the next round of attended noise monitoring and will discuss with Graham Atkins further actions that may be undertaken with regards to noise levels impacting the house.

Uncontrolled unless viewed on the intranet

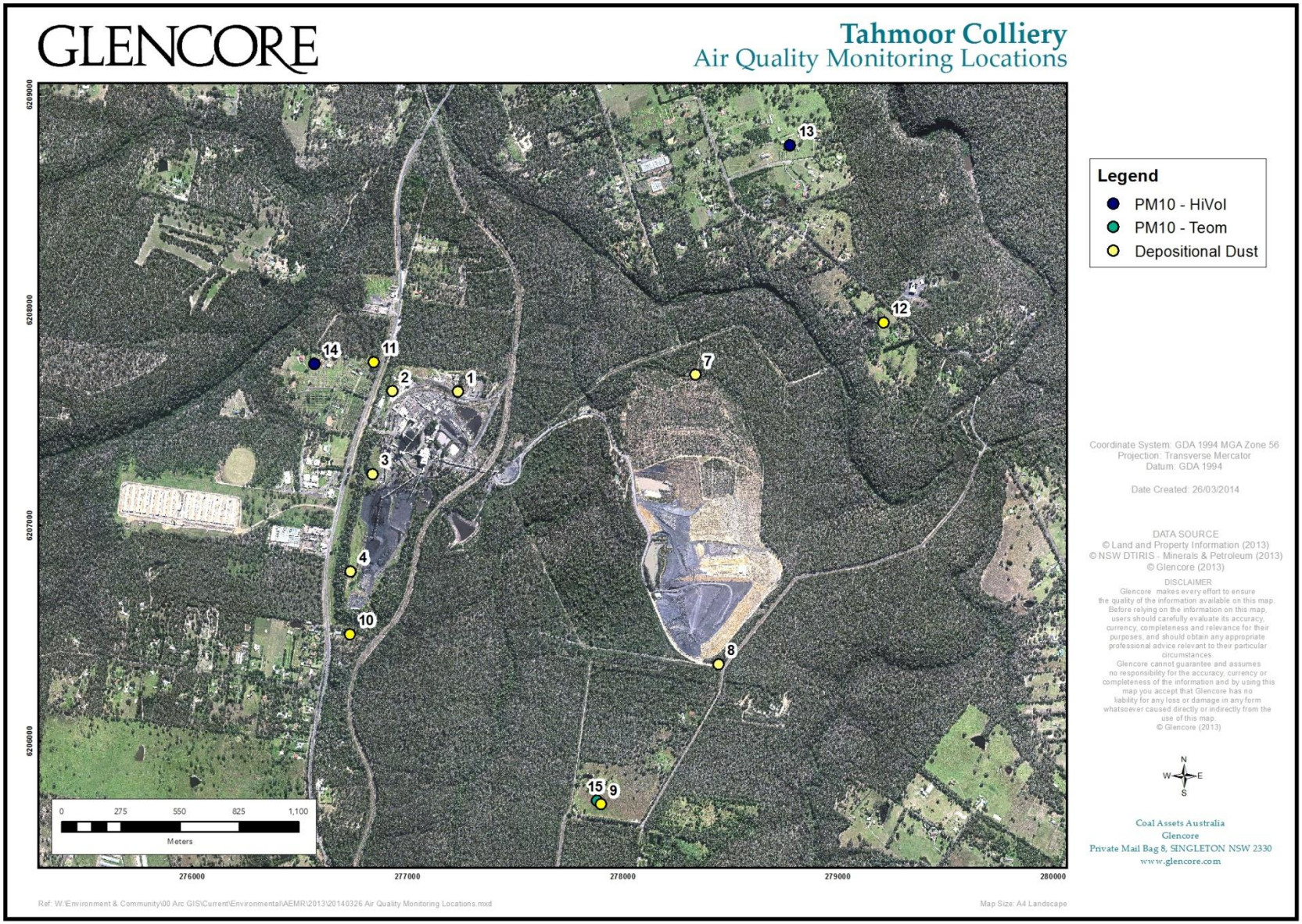
Date	ID	Type	Details	Actions Taken
21/08/2015	296.1	Noise	The Department of Planning contacted the Environment Coordinator to notify them of a noise complaint from a resident from Banksia St, Couridjah	E&C Coordinator emailed Department or Planning a copy of the previous attended noise monitoring results
30/09/2015	250.1	Other	Complainant phoned control at 8.30pm regarding an ongoing issue of the resident's driveway access from the new Bridge Street Bridge. The complainant was not satisfied with how the issue was being handled and wanted to obtain contact details for a senior position	Control emailed the E&C Manager and Community Coordinator with details of the exchange. E&C Manager telephoned the resident at 9.30am 1 October and discussed the situation, explained that Glencore was taking the issue seriously and said that she would respond to him within a week.
20/10/2015	277.1	Noise	EPA notified Tahmoor Underground about a complaint from Olive Lane, Bargo regarding humming and droning noises from Washery all night, every night. The complainant also said "there was a cluttering noise at 3am from the mine."	Real time noise data was reviewed and it was found there was no increase in noise levels.
28/10/2015	325.0	Noise	EPA emailed a complaint which had been made the previous day. The complaint detailed the humming and droning noise from the mine as well as trucks entering and exiting the mine during the night.	E&C Coordinator reviewed real-time monitoring and found there was no increase in noise levels. The camera/video footage was also reviewed and no trucks were seen entering the mine site
28/10/2015	318.0	Noise	EPA contacted the E&C Coordinator with details of a complaint received from residents at Olive Lane by the EPA on 20 October 2015. The complaint detailed the "ongoing noise problems from the mine; humming and droning all night every night". The complainant also noted "several trucks clearly heard entering and leaving the site"	E&C Coordinator reviewed real-time noise monitors and found no increase in noise levels. The camera/video footage was also reviewed for the date and trucks were not seen entering the mine site during the period in question.

Uncontrolled unless viewed on the intranet

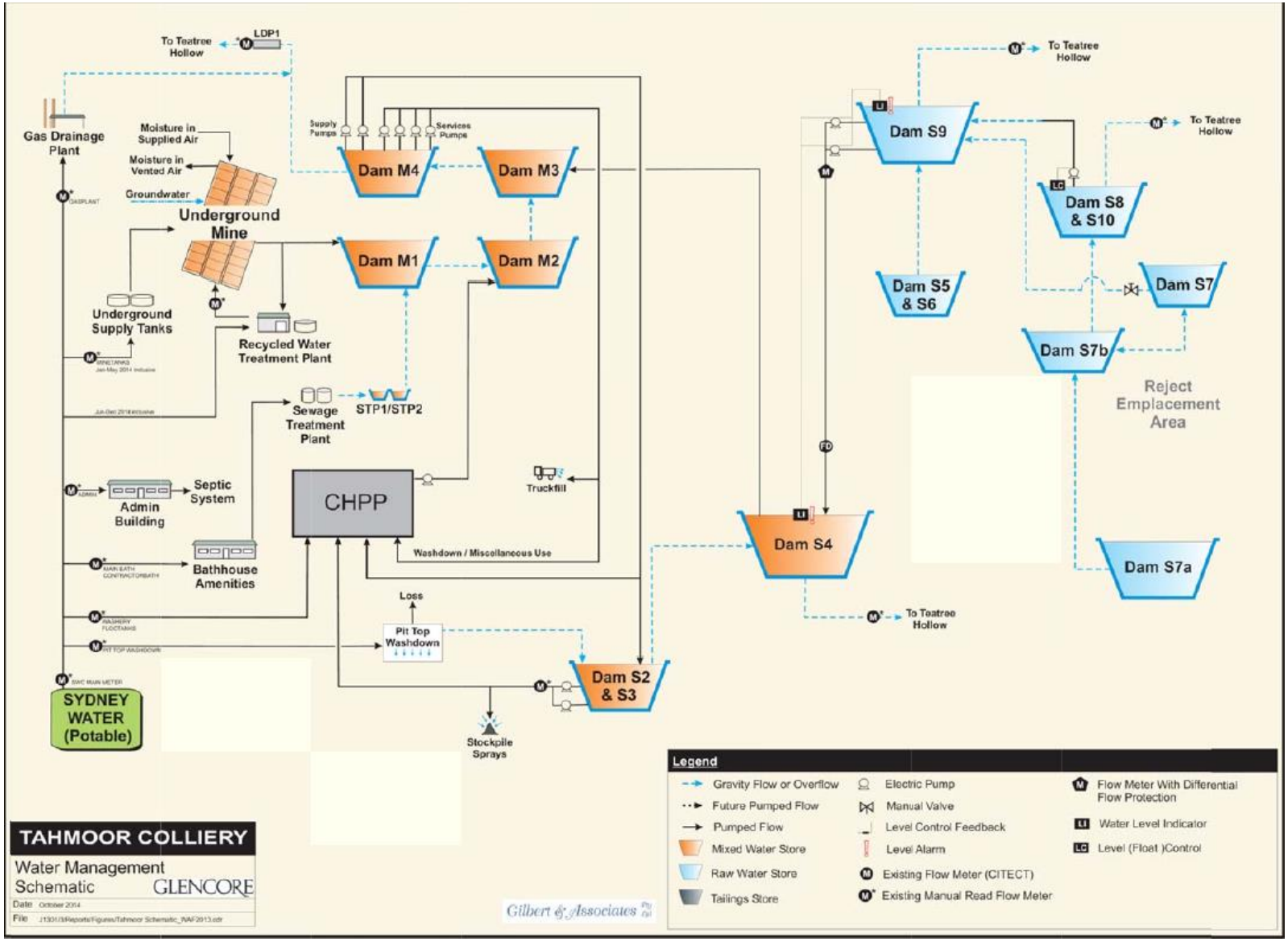
Date	ID	Type	Details	Actions Taken
15/12/2015	358.2	Noise	EPA received a complaint from a resident at Olive Lane regarding "loud machinery noise – humming and droning all night every night and whooshing and back loading sounds"	Real time noise data was reviewed and it was found there was no unusual data recorded.
22/12/2015	309.0	Noise	Phone call from a resident at Banksia St, Couridjah to Tahmoor to complain about the noise from the mine that occurs every night. The complainant stated that he believed the mind did not case and did not intend to do anything about the issue.	Tahmoor Underground has completed both attended and continuous noise monitoring at the complainants house which is located approximately 2.5km from the mine. The monitoring shows compliance with both the Development Consent and Industrial Noise Policy. E&C Coordinator reviewed real time noise monitors and found that there was no increase in noise levels.
22/12/2015	304.0	Odour	EPA notified Tahmoor of a complaint regarding odour from Number 2 shaft. Very minimal information was disclosed by the EPA.	E&C Coordinator provided an update regarding the latest study regarding odour and produced an email regarding odour mitigation.

Uncontrolled unless viewed on the intranet

A.12 Air Quality Monitoring Sites

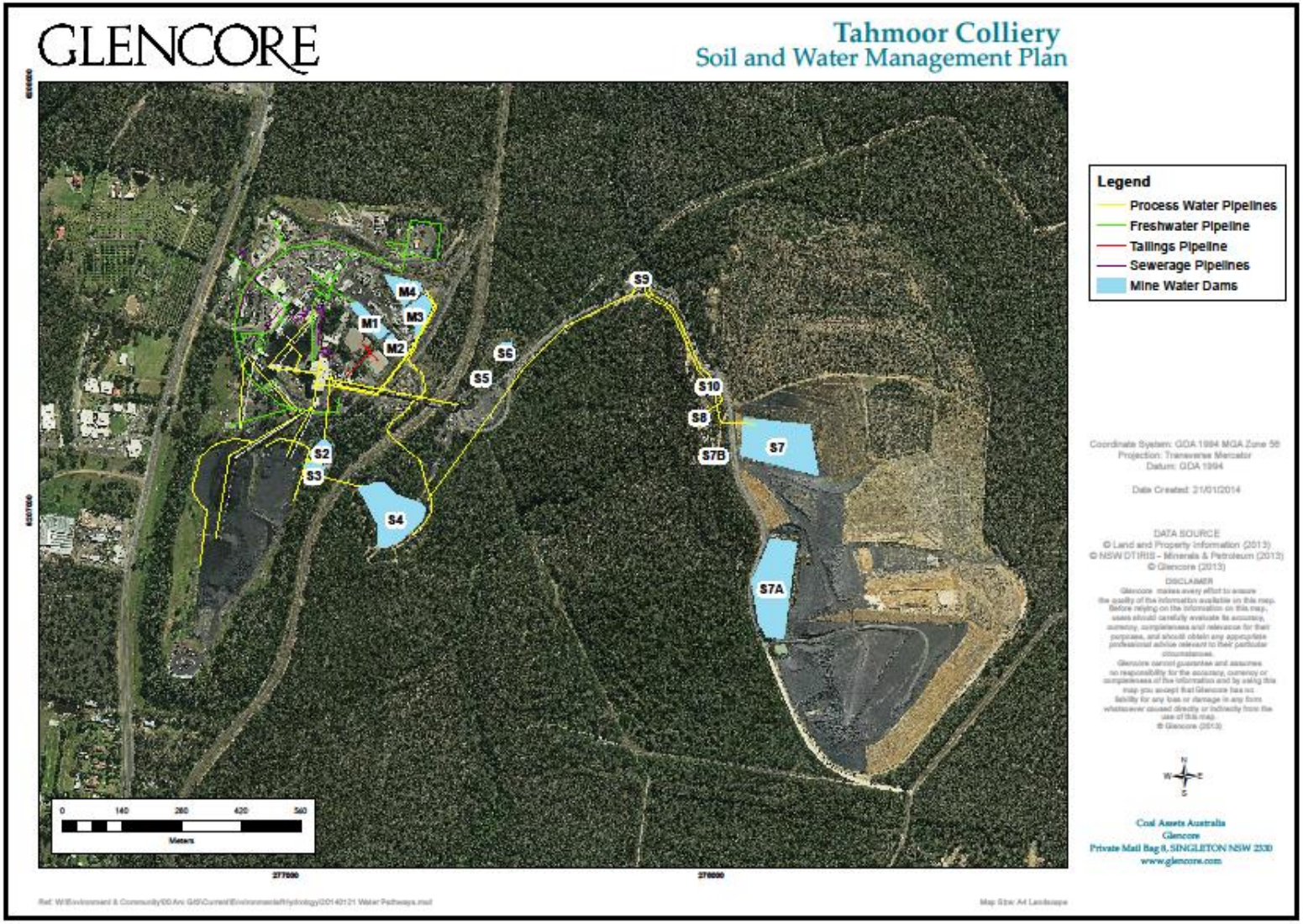


A.13 Water Management Schematic (Gilberts and Associates)

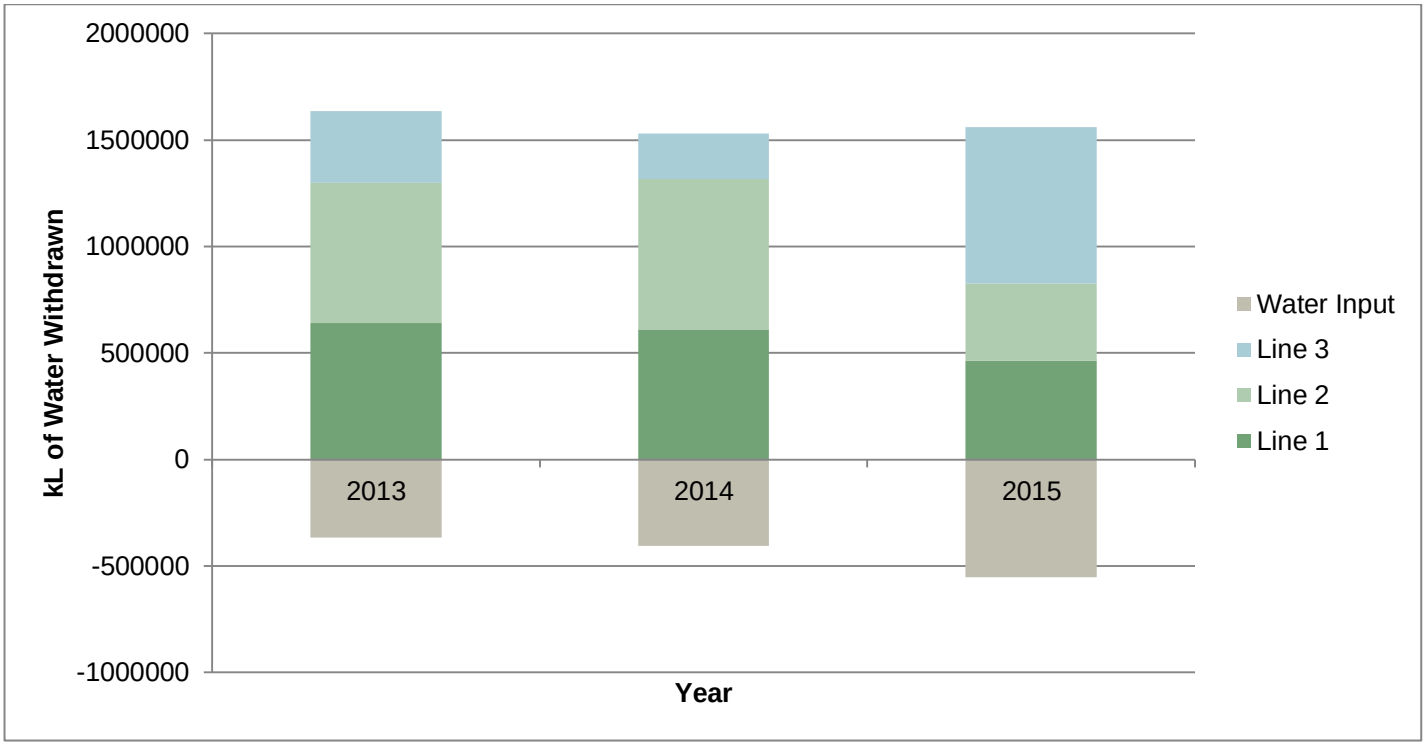


Uncontrolled unless viewed on the intranet

A.14 Tahmoor Water Quality Infrastructure

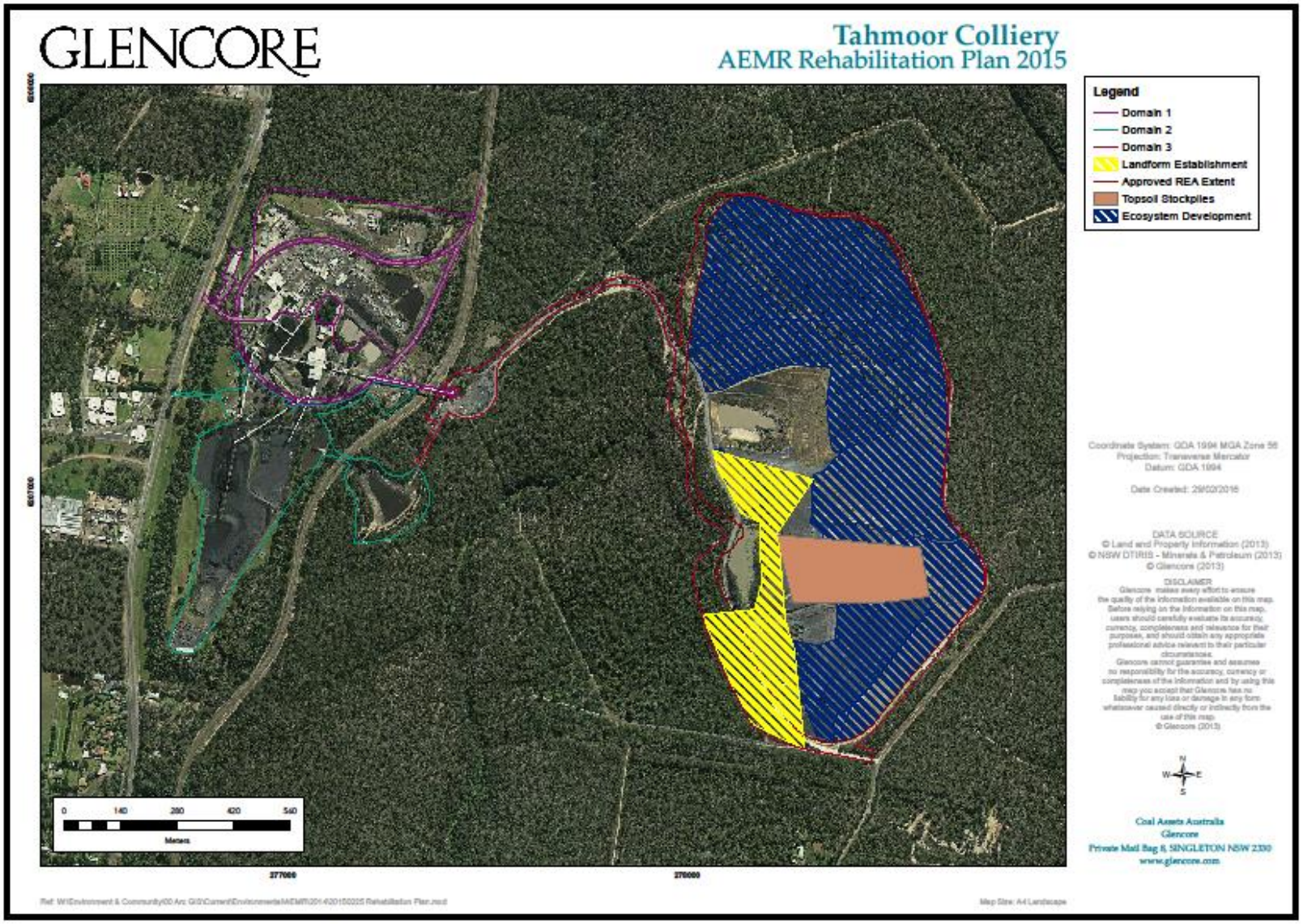


A.15 Historical records of Total Groundwater Withdrawn

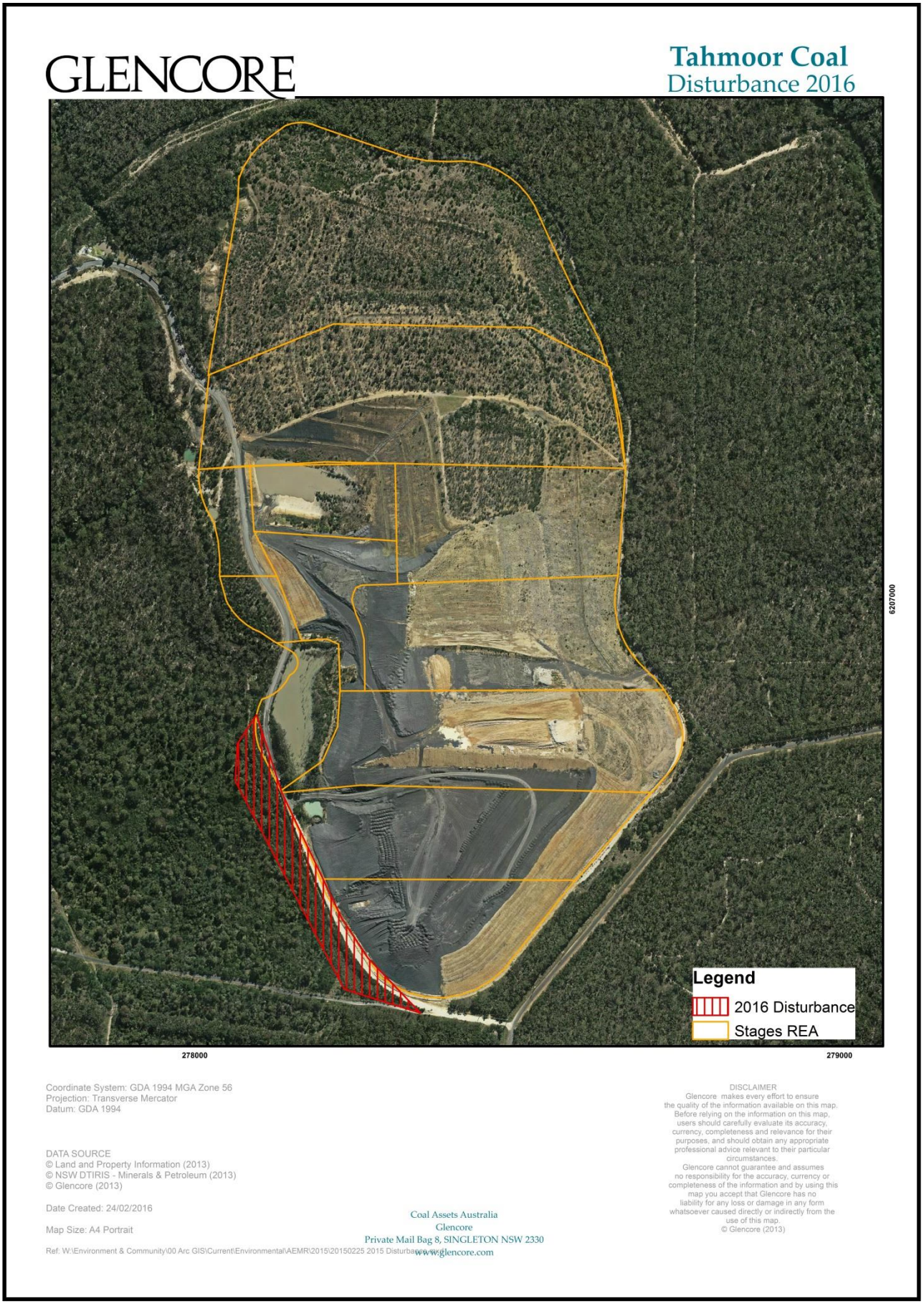


Uncontrolled unless viewed on the intranet

A.16 Rehabilitation Area 2015

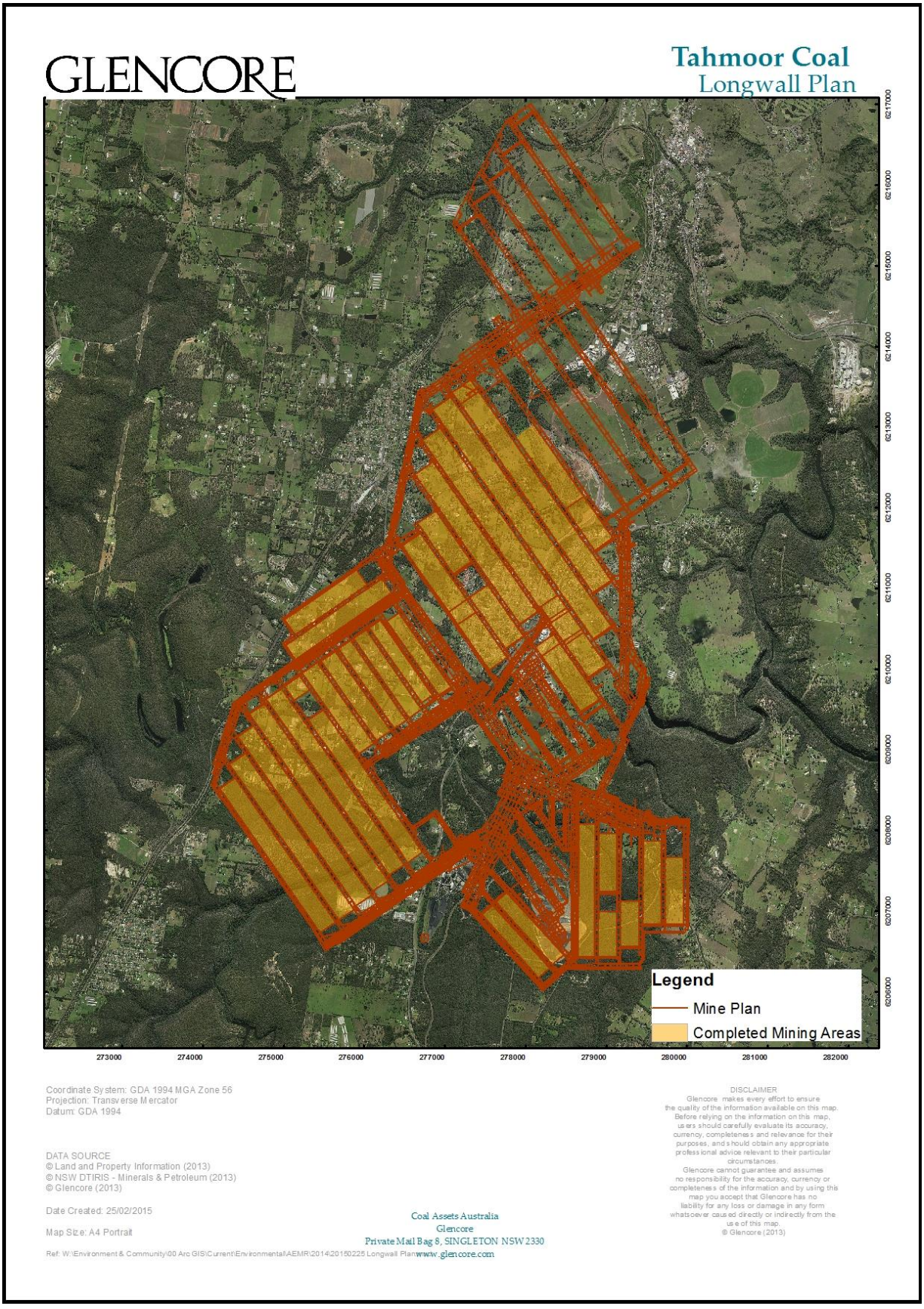


A.17 Disturbance Planned for 2016



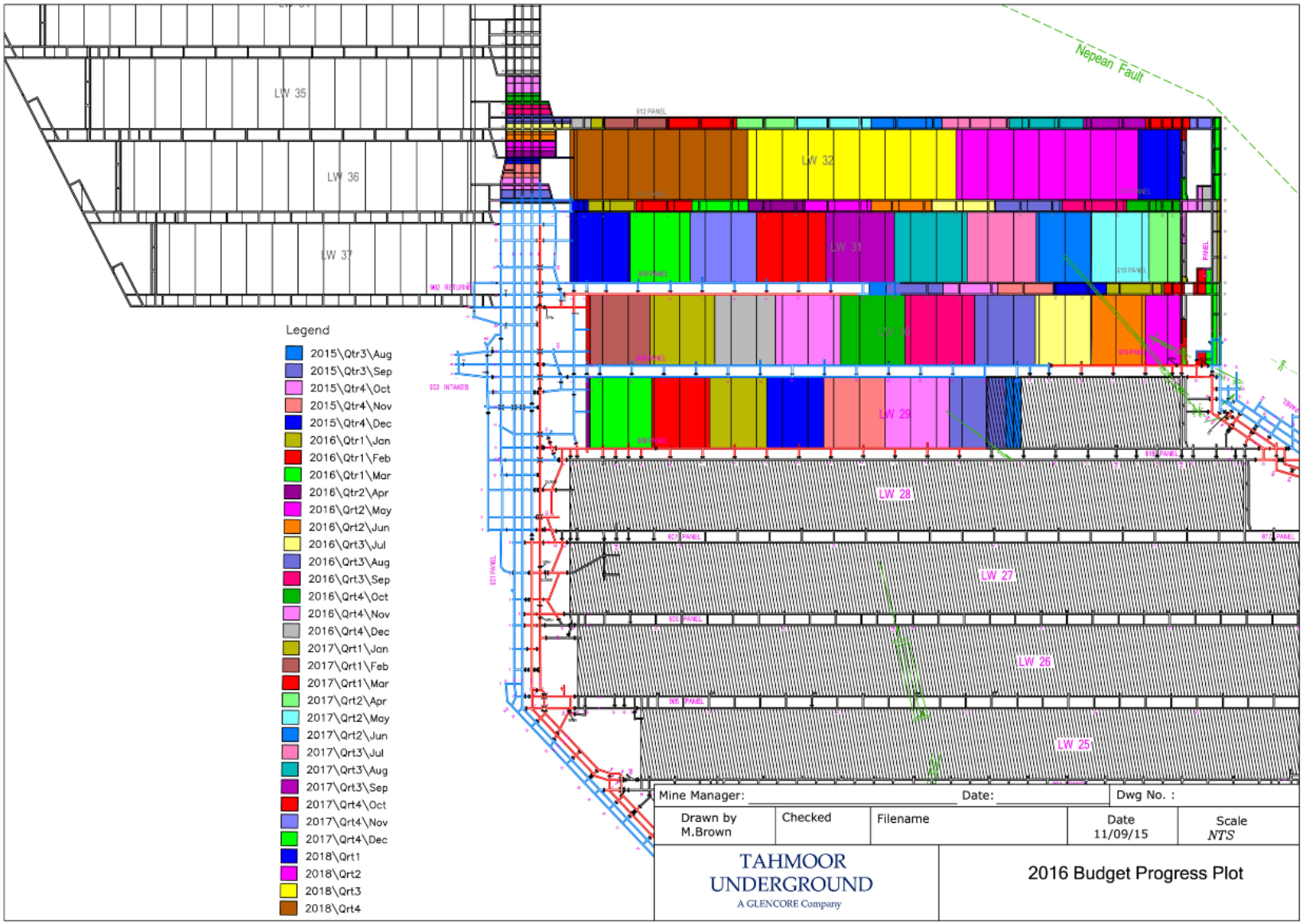
Uncontrolled unless viewed on the intranet

A.18 Planned Longwall Layout



Uncontrolled unless viewed on the intranet

A.19 Planned Longwall Progress Plot



Uncontrolled unless viewed on the intranet