TOMINGLEY
GOLD OPERATIONS PTY LTD
(A wholly owned subsidiary of Alkane Resources Ltd)
ABN 53 149 040 371

Tomingley Gold Operations
Annual Review
1 January – 31 December 2016

TOMINGLEY
GOLD OPERATIONS PTY LTD

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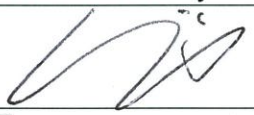
Definitions

Term	Definition
$CaCO_3$	Calcium carbonate
Council	Narromine Shire Council
CCC	Community Consultative Committee
DSC	Dam Safety Committee
EEC	Endangered ecological community
EC	Electrical Conductivity
EPA	Environment Protection Authority
EP&A	*Environment Planning and Assessment Act 1979*
EPL	Environment Protection Licence
DP&E	Department of Planning & Environment
DRE	Division of Resources and Energy (Department of Trade and Investment, Regional Infrastructure and Services)
ha	Hectares
HVAS	High volume air sampler
LDP	Licensed discharge point
LFA	Landscape function analysis
Mining Act	*Mining Act 1992*
MOP	Mining operations plan
ML	Mining Lease
NGERS	National Greenhouse and Energy Reporting Scheme
NMP	Noise Management Plan
NOW	NSW Office of Water
NSS	Noise and Sound Services
OEH	Office of Environment and Heritage
PM10	Particulate matter
RMS	Roads and Maritime Services
SEEC	Strategic Environmental and Engineering Consulting
TARP	Trigger action response plan
TEOM	Tapered Element Oscillating Microbalance
TGO	Tomingley Gold Operations
TGP	Tomingley Gold Project
TSP	Total suspended particulates
WAD	Weak acid dissociable cyanide
WAL	Water access licence
WHS	Workplace Health & Safety
TIM	Total Insoluble Matter
WRE	Waste rock emplacement
LOR	Limit of Reporting

Title Block

Table 1: Annual Review title block

Name of operation	Tomingley Gold Operations
Name of operator	Tomingley Gold Operations Pty Ltd
Development consent / project approval #	PA 09_0155 (MOD 3)
Name of holder of development consent / project approval	Alkane Resources Ltd
Mining lease #	ML 1684
Name of holder of mining lease	Tomingley Gold Operations Pty Ltd
Water licence #	WAL20270; WAL28643; WAL29266
Name of holder of water licence	Alkane Resources Ltd
MOP/RMP start date	14 April 2014
MOP/RMP end date	31 March 2021
Annual Review start date	01 January 2016
Annual Review end date	31 December 2016
I, Mark Williams, certify that this audit report is a true and accurate record of the compliance status of Tomingley Gold Operations for the period 01 January to 31 December 2016 and that I am authorised to make this statement on behalf of Alkane Resources 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	Mark Williams
Title of authorised reporting officer	Environment and Community Manager
Signature of authorised reporting officer	
Date	3 March 2017

1 Statement of Compliance

Table 2 provides a statement of compliance status for Tomingley Gold Operations Pty Ltd (TGO) with its project approval (PA) and mining lease (ML), as at the end of the reporting period.

Table 2: Statement of Compliance

Were all conditions of the following approvals complied with?	
PA 09_0155	NO
ML 1684	NO

Table 3 provides a summary of approval conditions not complied with as at the end of the reporting period.

Table 3: Non-compliances

Relevant approval	Condition #	Condition description (summary)	Compliance status	Comment	Relevent Section
PA 09_0155	Schedule 3, Condition 3	Exceedance of noise criteria	Non-compliant	Investigated and addressed	6.1
PA 09_0155	Schedule 3, Condition 7	Exceedance of airblast overpressure criteria	Non-compliant	Investigated and addressed	6.2
PA 09_0155	Schedule 3, Condition 17	Exceedance of 24 hour average PM_{10} and deposited dust criteria	Non-compliant	Investigated and addressed	6.3
PA 09_0155	Schedule 3, Condition 32	Water Management Plan still not approved	Non-compliant	Submitted to DP&E Nov 2016	7
ML 1648	Condition 3(a)	Non-compliance with 2014 MOP rehabilitation schedule	Non-compliant	Reported to DRE	8.1

Compliance status key for Table 3		
Risk level	**Colour Code**	**Description**
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: • potential for moderate environmental consequences, but is unlikely to occur; or • potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

2 Introduction

2.1 Tomingley Gold Mine

This Annual Review reports on operational and environmental management activities undertaken at Tomingley Gold Operations Pty Ltd (TGO) during the calendar year 2016, and provides details on activities proposed for 2017. The report has been produced in accordance with the *Post-approval requirements for State significant mining developments. Annual Review Guideline* (DP&E, October 2015) to meet the annual reporting requirements conditioned in the TGO Mining Lease (ML 1684) and Project Approval (PA09_0155).

TGO is a wholly owned subsidiary of Alkane Resources Ltd. TGO is a medium-sized gold project with approximately 612,000 ounces of gold in the current defined resource space. TGO aims to produce 50,000-70,000 ounces of gold per year, over the next 4.5 years, based on an annual ore throughput of approximately one million tonnes.

The Tomingley area has a long history of gold mining and exploration, with gold first discovered and mined from the Tomingley Goldfield in the 1880s. Numerous underground mining operations were subsequently located in the McPhail area, immediately south of the TGO minesite. The last economic 'mining' activities were completed in the late 1990s and involved the re-treatment of tailings from the McPhail Mine.

The current mining operations are focused on the area immediately north of the historic Myalls United Mine. Mining commenced in three open cut mines (Wyoming One, Wyoming Three and Caloma) in November 2013, with mining commencing in Caloma 2 in November 2016. The process plant, with associated residue facilities, was commissioned between December 2013 and February 2014.

2.2 Mine Contacts

The primary contacts for the TGO during the review period are detailed in Table 4.

Table 4: Tomingley Gold Operations Key Contacts

Key Contact	Position	Contact Details
Sean Buxton	Operations Manager	PO Box 59 Peak Hill, NSW, 2869 Phone: (02) 6867 9780
Mark Williams	Environment and Community Manager	PO Box 59 Peak Hill, NSW, 2869 Phone: (02) 6867 9780
Community Information Line		(02) 6865 6116

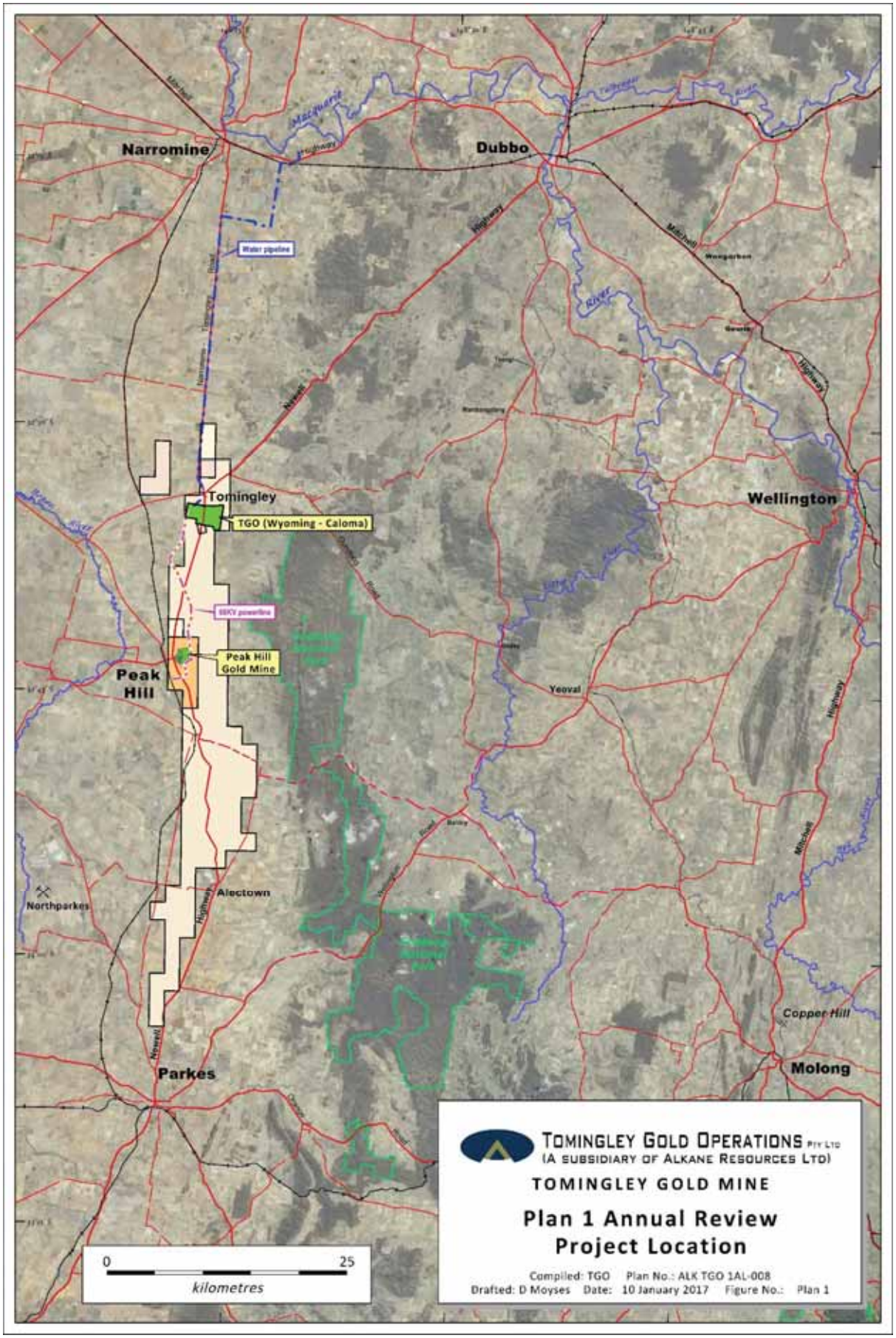


Figure 1: Tomingley Gold Operations – regional setting.

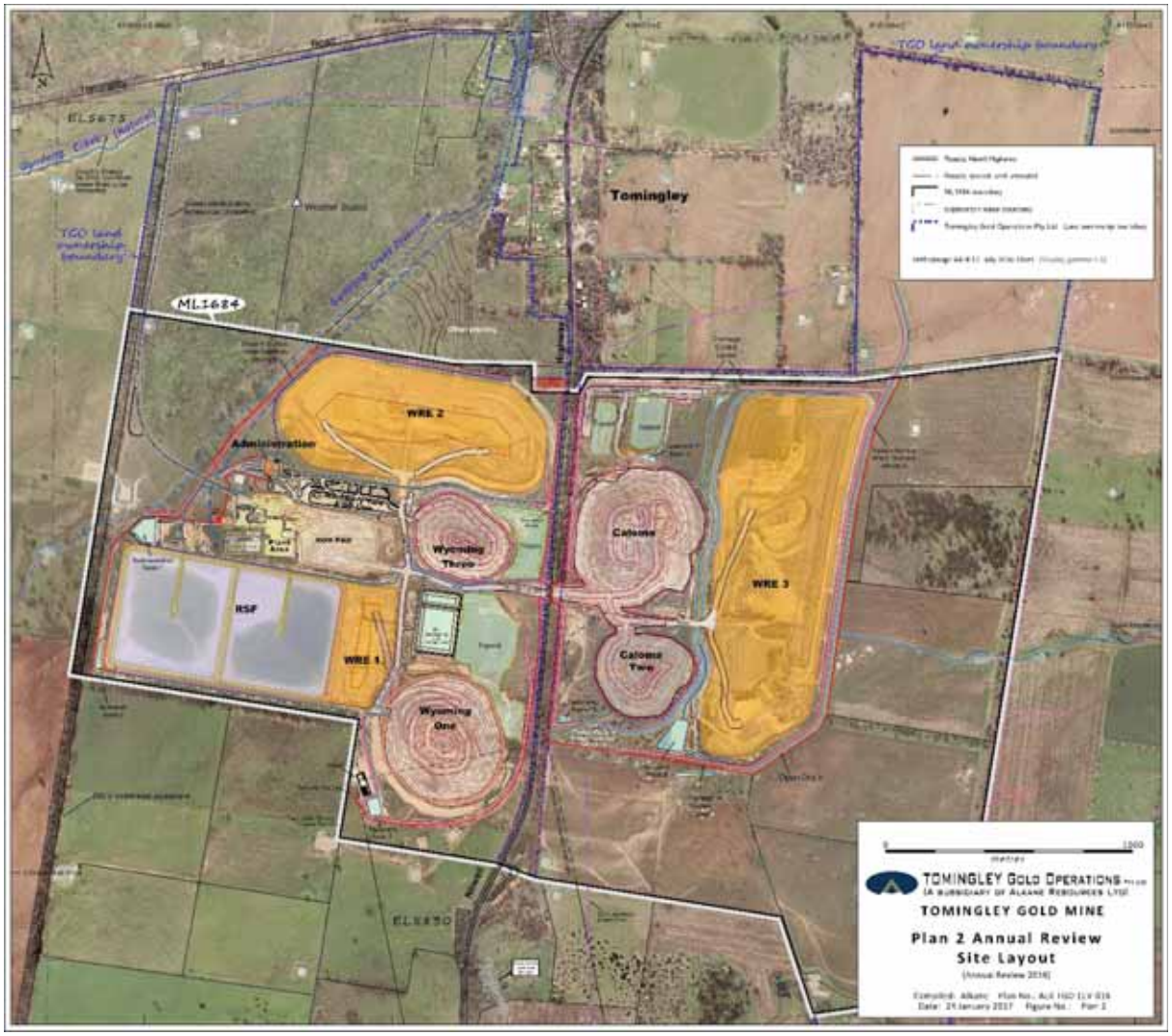


Figure 2: Tomingley Gold Operations – site layout

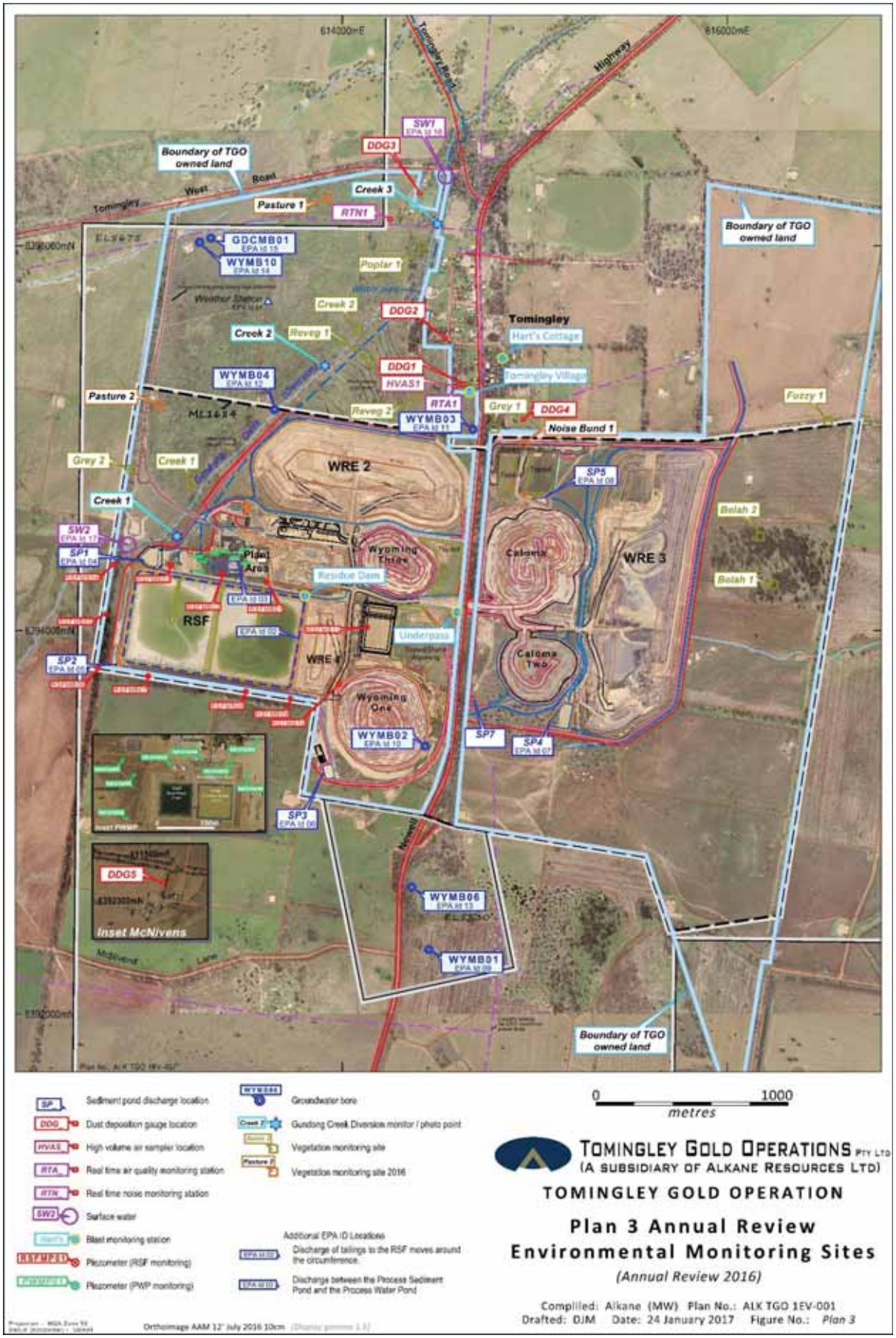


Figure 3: Tomingley Gold Operations – environmental monitoring locations.

3 Approvals

TGO operates under the environmental consents, leases and licenses specified in Table 5.

Table 5: Consents, leases and licenses

Title	Legislation	Regulatory Authority	Approval Duration/ Expiry
Project approval 09_0155 (MOD 1 – 24 July 2012) (MOD 2 – 13 May 2015) (MOD 3 – 5 July 2016)	Environmental Planning & Assessment (EP&A) Act 1979	NSW Department of Planning and Infrastructure (DP&I)	31 December 2022
Mining Lease 1684	Mining Act 1992	NSW Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS)	11 February 2034
Environment Protection License (EPL) 20169	Protection of the Environment Operations (POEO) Act 1997	NSW Environment Protection Authority (EPA)	Ongoing until surrendered (Next review 23 October 2018)
Flood Works Approval 80FW723901 (Gundong CK levy)	Water Management Act 2000	NSW Office of Water (NOW)	02 January 2018
Groundwater licences WAL20270, WAL28643 and WAL29266	Water Management Act 2000	NSW Office of Water (NOW)	N/A
Notification of Dangerous Goods NDG200150	Work Health & Safety Act (WHS) 2011	WorkCover NSW	NA

4 Operations Summary

4.1 Mining

Open cut mining operations continued in Caloma 1 and Wyoming 1 pits throughout the reporting period. Mining ceased in Wyoming 3 in late 2015 and, following approval of MOD3 to PA 09_0155, mining commenced in Caloma 2 in November 2016. Waste rock was hauled to Waste Rock Emplacement (WRE) 1, 2 and 3. Ore was hauled to the Run-of-mine (ROM) stockpile pad for processing at the site processing plant. Process residue was emplaced in the onsite residue storage facility (RSF).

Allowing for replacement plant and temporary introduction of additional plant for short projects, the TGO open cut mobile plant fleet remained generally consistent with the indicative mining fleet presented in the MOD 3 Environmental Assessment (R.W. Corkery, November 2015) during the reporting period.

Table 6: Production Summary

Material	Approved limit (specify source)	Previous reporting period (actual)	This reporting period (actual)	Next reporting period (forecast)
Waste rock (m^3)	-	5,800,000	6,405,394	8,200,000
Ore (kt)	1,500 (PA 09_0155)	1,400	1,114	968.5
Process Residue (tailings) (t)	-	1,073,700	1,077,262	1,091,126
Saleable Product (Oz)	-	63,211	54,868	69,132
Note: No course process waste produced at TGO				

4.2 Other Operations

In accordance with Schedule 3, Condition 4 of PA 05_0155, vegetation clearing and topsoil stripping was confined to the hours of 6am-6pm and rehabilitation was undertaken between 7am and 10pm.

TGO scheduled open cut operations to comply with Schedule 3, Condition 4. A which was included in PA 09_0155 during reporting period. Condition 4A requires that:

"The Proponent shall only undertake construction works on the modified amenity bund between 7am and 6pm Monday to Friday and 8am and 1pm Saturday."

TGO also employed 180 people onsite, meeting Condition 9 of ML 1648, which requires that:

"The lease holder must: (a) ensure that at least 30 competent people are efficiently employed in relation to the mining process or mining operations on the lease area OR (b) expend on operations carried out in the course of prospecting or mining the lease area, an amount of not less than $525,000.00 per annum whilst the lease is in force."

4.3 Next reporting period

During the next reporting period, open cut mining and processing operations will continue as described in the MOD 3 EA and 2014 MOP (amended in July 2016).

5 Actions required from previous Annual Review

No formal review of the 2015 TGO Annual Review was held during the reporting period. However, a summary of actions resulting from verbal comments or email responses from government agencies are presented in Table 7.

Table 7: Actions from review of 2015 Annual Review

Actions Required from review of previous Annual Review	Requested by	Action taken by Operator	Section where discussed
WAL28643 and WAL29266 expired 5/4/15 and not currently linked to any works on the mine site that would be related to GW inflows.	DPI (water)	WALs transferred to link with TGO site to licence open cut g/w inflow.	7.1
Non-approval of TGO Water Management Plan	DPI (water)	Water Management Plan finalised and submitted to DP&E for approval	7

6 Environmental performance

6.1 Noise management

Statutory attended noise monitoring (to meet the requirements of EPL 20169 Condition M4.1) was completed over a three evening and night periods (8-11 November 2016). The monitoring indicated noise generated by TGO complies with DA noise limits at all six monitored locations, as shown in Table 8. This is an improvement from previous attended noise monitoring, with 2015 monitoring indicating exceedances at four locations (R2, R3, R29 & 7 Burrill St), and 2014 monitoring indicating exceedance at one location (R3).

To address PA 09_0155, Schedule 3, Condition 6, the 2016 attended noise monitoring also identified an average 1.8dBA difference between attended monitoring and the continuous unattended real time noise monitors (at R4 and R23), indicating the unattended noise monitoring to be an appropriate tool for managing TGO noise emissions.

As required by PA 09_0155 Appendix 7, supplementary attended monitoring is undertaken for the 11 months each year that statutory EPL attended monitoring does not occur. Two exceedances of PA noise criteria were measured during this supplementary monitoring:

- 28 June 2016 (evening) - 1dB exceedance of statutory noise limits at R23 during worst case noise enhancing conditions. Investigation into potential noise source determined that elevated noise contribution came from mobile plant that had been fitted with the wrong attenuated reverse alarm (or squawker), which were subsequently replaced.
- 11 - 13 October 2016 (evening/night) – maximum 6 dB to11 dB exceedance at R3/29 and R23 over three nights of measurement. Investigation determined a significant contributor to be the use of a hydraulic rock breaker combined with a significant reduction in background noise levels caused by flood closure of the Newell Highway. The rock breaker had been used on the ROM pad since 8th August 2016 with no recorded exceedances. Use of the rock breaker on night shift was suspended. No complaints were received in relation to this incident. The incident was reported to DP&E on 15 November 2016.

TGO received ten noise related complaints for the reporting period (5 from same person). This is down from 11 noise complaints received in 2015, and 35 complaints in 2014.

In August 2016, TGO received a Penalty Infringement Notice from DP&E for non-compliance with Condition 3, Schedule 3 of PA 09_0155, resulting from noise exceedances recorded in 2014.

A copy of the Annual Noise Compliance Report is included as Appendix A.

Table 8: Attended Noise Monitoring Summary

Night time noise at Residence	Approval criteria[1] LAeq 15 min (dBA)	2016 Noise levels (dBA)	2015 Noise levels (dBA)	Key management implications	Implemented/ proposed management actions
R2	36	23-33	32-42	Compliance with PA 09_0155/ EPL 1684 noise limits	Ongoing monitoring, noise reduction investigation and mitigation measure implementation
R3/ 29	40	37-40	39-46		
R4	36	28-34	- [2]		
R5	37	23-28	35		
R6	36	30-34	30		
R23	39	34-39	42-46		

Notes:

1. Approval Criteria from PA 09_0155, Schedule 3, Condition 3, based on 2012 Project EIS Noise Assessment Criteria
2. Location R4 not measured in 2015

6.1.1 Management Measures

TGO engaged a noise consultant to complete a technical review of the Noise Management Plan and develop new site specific procedures for monitoring. The review recommended the introduction of quarterly attended noise monitoring (to supplement the statutory annual attended monitoring). TGO have incorporated this measure into the revised Noise Monitoring Plan, however the attended monitoring is carried out monthly.

A program to acoustically assess and treat 18 residential dwellings in, or near, Tomingley village was completed early in the reporting period. Treatment of the dwellings included: improved glazing to windows and doors including removal of existing elements,

- installation of awning style aluminium windows fitted with 6.38mm laminated glass;
- full asbestos assessments for any house assumed constructed prior to 1986;
- installation of Mitsubishi industrial air-conditioning including maintenance for life of
- open pit mining;
- painting, plastering, patching, recladding and removal of old air conditioner (where
- required); and
- contribution to electricity for life of open pit mining.

Evening and night time mining and waste rock emplacement practices were modified during the reporting period to reduce offsite noise impact, including:

- preferential operation of noise-generating plant in the deepest open cuts or as close behind acoustic bunds; and
- short-tipping of waste rock, with dozer pushing of short-tipped waste rock during day time.

6.1.2 Proposed Improvements

Where triggered by noise monitoring results or community compliants where exceedances are recorded, further opportunities for modification of night time mining practices would be investigated and trialled during the next reporting period.

6.2 Blasting

Blasting at TGO is managed in accordance with the Blast Management Plan (BMP), which was prepared to meet Schedule 3, Condition 14 of PA 09_0155 and relevant conditions of EPL 20169.

During the reporting period 148 blasts were shot at TGO. Of these blasts, two (1.35%) exceeded DA criteria for airblast overpressure, as indicated in Table 9.

This is an improvement from the previous reporting period, which had three airblast overpressure exceedances from 163 blasts (1.84%).

Table 9: Blasting Management

Aspect	Approval criteria* (dB (Lin Peak))	Airblast overpessure exceedances during reporting period	Key management implications	Implemented/ proposed management actions
	120	121.2 (21/3/16)		

Airblast Over-pressure		120.6 (5/5/16)	Exceedance of DA airblast overpressure criteria	Exceedance investigation and report to EPA. Review of presplit blasting procedure.

*Approval Criteria from PA 09_0155, Schedule 3, Condition 7

No blasting complaints were received during the reporting period, which is an improvement from three complaints in 2015 and two complaints in 2014.

With regards to blast timing, TGO complied with:

- Schedule 3, Condition 8 of the DA, which restricts TGO to blasting between 9am and 5pm, Monday to Saturday (excluding public holidays); and
- Schedule 3, Condition 9 of the DA, which restricts TGO to three blasts per day.

6.2.1 Management Measures

Blasts are designed and scheduled to ensure airblast overpressure and ground vibration levels remain within DA blast criteria. Weather conditions are also monitored to avoid blasting in conditions that will enhance offsite impacts, such as south westerly winds and low cloud cover.

Both 2016 exceedences occurred during presplit blasts. Following the 5th May 2016 exceedance, presplit blasting was suspended and a review of presplit blasting techniques was completed by an independent consultant. The review identified superimposition of airblast overpressure wave in the direction of the blast monitors as the most likely cause of the exceedances and recommended remedial measures (discussed in Section 6.2.2).

6.2.2 Proposed Improvements

Recommended modifications to TGO blast design and preparation procedures, resulting from the into presplit blast investigation, were implemented during the reporting period, including:

- Improved assessment of atmospheric conditions (such as wind direction/speed and atmospheric stratification) that may influence overpressure wave reflection and attenuation;
- Initiating blasts from the bank of holes clost to sensitive receptors, directing waves away from those receptors;
- Decreasing the number of holes in each bank and increasing the delay between banks to 25ms;
- More effective covering of surface detonating cord and hole collars;
- Improving stemming/buffering of blast holes, and backfilling of RC grade holes, to reduce potential for blast venting.

No exceedance of blast limits was recorded following implementation of these procedural modifications.

6.3 Air Quality

The TGO Noise Management Plan (NMP) was prepared to describe dust control measures at TGO and meet Schedule 3, Condition 19 of PA 09_0155.

All five depositional dust gauges were below the long term assessment limit of 4g/m^2/month (annual average). DDG 4 showed an improvement from previous reporting periods with an annual average of 1.4 g/m^2/month, compared with 8.2 g/m^2/month in 2015 and 8.5 g/m^2/month in 2014.

During the reporting period, three results exceeded the 24 hour average limit for PM_{10}, as measured at the RTA1 TEOM. These PM_{10} results are shown in Table 10. All three exceedences were investigated and reported to NSW government regulators. This is an improvement from the ten exceedances recorded in 2015, and 20 excceedances recorded in the eight months of 2014 that the TEOM was operational.

The 26 February 2016 exceedance was partially due to non-conformance with the Dust SSP resulting in inadequate dust management within the TGO Processing area. This issue has now been rectified. The 6 April 2016 exceedance was mainly due to other sources as the RTA1 TEOM is located north of TGO and wind direction for 19 hours of that day was from the north to north-west. The 2 December 2016 exceedance was also largely due to non-mining sources, as wind direction for 10 hours of that day was from the north to north-west. Harvesting activities were generating visible dust plumes around the Tomingley district, including from properties to the south east TGO.

Total Suspended Patrticulates (TSP), as measured via high volume air sampler (HVAS) at monitoring location HVAS1, are compared with the long term assessment limit of 90 µg/m^3 (annual average). The annual average for TSP was 38.32 µg/m^3, which is below the long term assessment limit and a reduction from 50.01 µg/m^3 in the previous reporting period, and 59.4 µg/m^3 recorded in 2014.

Air quality monitoring results for the reporting year presented in Appendix B.

Table 10: Air Quality Management

Date	Approval criteria* PM_{10} (ug/m^3)	Performance during reporting period	Key management implications	Implemented management actions
PM_{10} as measured at RTA1				
26/02/2016	50 µg/m^3	52.89	Exceedance of criteria due to non-conformance with TGO procedures	Section 6.3.1 and regulator notification
6/04/2016		53.56	Wind from N-NW	N/A
2/12/2016		57.18	Non-mining sources (harvesting)	Continuing dialogue with adjacent landowners

*Approval Criteria from PA 09_0155, Schedule 3, Condition 17, based on 2012 Project EIS Assessment Criteria

During the reporting period, TGO received one dust complaint, which is a reduction from two complaints in 2015, and 11 complaints in 2014. The 2016 complaint was investigated and responded to, with monitoring data indicating no exceedence of PA 09_0155 air quality limits.

6.3.1 Management Measures

Shift supervisors, and the mining production team are provided with forecasts of high dust risk weather (such as hot, dry south westerly winds) in pre-shift meetings, sourced from the TGO Weatherzone portal. During these conditions, PM_{10} levels measured at RTA1 are monitored online and, where required, modifications are made to mining operations until conditions improve. Such modifications include the:

- reduction, cessation or relocation of dust generating activities;
- increased watering of the operational footprint.

The TGO Air Quality and Greenhouse Gas Management Plan and Dust SSP (incorporating the site dust Trigger Action Response Plan) were revised by an independent air quality consultant (Pacific Environment) during the reporting period to ensure consistency with industry leading practice.

Within the TGO processing area, the program of installing solenoid activators on conveyor irrigators to automate dust control spraying was continued.

6.3.2 Proposed Improvements

During the next reporting period further opportunities to optimise operational control of dust generation will be investigated.

Additional dust control training will be provided to TGO mining and processing staff to ensure awareness of, and propmote operational conformance with, TGO Dust SSP requirements.

6.4 Biodiversity

Biodiversity at TGO is managed under the Biodiversity Management Plan (BMP), completed in accordance with Schedule 3, Condition 37 of PA 09_0155. The BMP details the actions implemented at TGO to mitigate impacts on native fauna and vegetation from mining related activities such as storage of potentially hazardous process residue and the clearing of native vegetation.

Along with mitigation of mining impacts, the major biodiversity enhancement measure at TGO is the establishment, management and long-term protection of biodiversity offset areas in accordance with Schedule 3, Conditions 33 and 34 of PA 09_0155. To facilitate long-term security for the offset areas, a Property Vegetation Plan (PVP) was agreed to by TGO and approved by Local Land Services NSW in April 2015. The BMP incorporates measures and activities to manage and enhance TGO biodiversity offset areas, as required by the PVP.

6.4.1 Management Measures

Clearing Management

Under MOD 3 of PA 09_0155, approximately 0.8 ha of Belah/Black Oak Western Rosewood Wilga Woodland was approved for clearing ahead of excavation for the Caloma 2 open cut. The biodiversity assessment undertaken as part of the MOD 3 EIS considered the additonal clearing not to be a significant impact on the biodiversity value of the mine site and more than adequately compensated for by existing biodiversity offset areas. A pre-clearing survey of native vegetation was completed in accordance with PA 09_0155 Schedule 3, Condition 35 and the BMP. No roosting or nesting sites were identified.

Offset Management

In accordance with the authorised activities and management actions required by the PVP, tubestock planting within biodiversity offset areas continued in 2016 to supplement or extend remnant native vegetation communities. Native revegetation re-establishment activities will occur over a further 11 ha of offset area in autumn 2017 to complete supplentary and extension planting required in the first 24 months of the PVP. Figure 4 shows the location of 1,900 tubestock plants established in 2016, and the proposed 2017 area of native vegetation re-establishment. Plate 1 shows revegetation of offset areas from tubestock planting and Plate 2 shows revegetation of offset areas from volunteer natural native tree growth. Plate 3 shows an example of exclusion signage established on offset boundary fencing.

Other management measures within biodiversity offset area included the:

- establishment of exclusion/notification signs on boundary gates and fences;
- spraying of exotic weeds throughout offset areas;

- trapping of feral predators such as cats (9 caught) and foxes (1 caught);
- exclusion of agricultural activities (including cultivation and livstock grazing); and
- slashing of exotic pasture areas to reduce competition for replanted native tubestock and promote the voluntary estabishment of native plant species.

Biodiversity Monitoring

TGO biodiversity monitoring is completed annually to assess the condition and development of remnant and re-established native vegetation communities. Monitoring methodology is based on Landscape Function Analyses (LFA) and ecosystem diversity / habitat value measurements adapted from the Biometric methodology. Ten monitoring sites were established in August 2014, consisting of six remnant woodlands sites, two EEC woodland revegetation sites and two riparian woodland sites along Gundong Creek. These sites were re-monitored in August 2016. Two pasture reference sites and one rehabilitation monitoring site were also established in 2016. Key observations from the biodiversity monitoring program are summarised below.

- General Observations
    - No threatened species were identified within the monitoring sites; however, the threatened fauna species Grey-crowned Babblers were frequently observed within the woodland remnants and a small number of Superb Parrots flew over the site.
    - The noxious weed *Lycium ferocissimum* (boxthorn) was recorded in all remnant woodland areas despite a significant reduction from last year as a result of targeted weed control program, however further spraying will be required.
    - This year improved rainfall conditions during the autumn – winter growing period has promoted a flush of annual exotic species and as a result there has tended to be decline in endemic plant covers across all of the monitoring sites.
    - Many sites (except Reveg 2 and Creek 2) do not meet native shrub and juvenile tree density targets and may require planting intervention in the absence of natural recruitment. Species diversity was presently too low in Reveg 1, Creek 2, Belah 1, Belah 2 and Poplar 1.

- *Remnant Woodland Areas* (sites Fuzzy 1, Poplar 1, Grey 1 & Grey 2,)
    - Relatively high perennial plant components due to mature eucalypts and established perennial grasslands, with a well developed leaf litter layer and/or hard crusted soil patches stabilised by cryptogams.
    - Characterised by at least some mature canopy cover exceeding 6.0m in height and typically limited projected foliage 0.5 - 6.0m in height, which was provided by the scattered or occasional understorey shrubs.
    - Poplar 1 and Fuzzy 1 had a similar structure and composition with a well developed litter and humus layer and in combination with the sandy soils.
    - Typically situated on highly stable sandy clay loam with organic surface covers, but may have been slightly unstable when exposed.
    - Soil analyses indicated soils are typically low in phosphorous and nitrates with low levels of nutrient recycling as sites generally had a low Cation Exchange Capacity (CEC) and in organic matter. Electrical Conductivity was low and soils are moderately to slightly acidic, with elevated levels of magnesium, potassium, manganese, silicon and iron
    - This site has exceeded all aspects of ecological functional capacity.

- Woodland Revegetation Areas (Reveg 1 & Reveg 2)

  - Recovering native grasslands in old cropping paddocks that have had rows scalped and direct seeded with local woodland species.
  - Ground cover vegetation and cryptogams have since continued to colonise the exposed soils and have significantly increased the functional patch areas to 100%.
  - Low diversity of tree species in all sites. The remaining enhancement and revegetation areas did not yet contain vertical structure greater than 0.5m in height except for the occasional tall grass tussock.

- Creek Revegetation Sites (Creek 1 & Creek 2)
  - A tree corridor was developing along the riparian fringe but was not represented in the monitoring data.
  - Some bare and eroding areas due to a long disturbance history with compacted animal/vehicle tracks and some historic bank erosion.
  - Increase in patch area recorded, compared with a marginal decline in 2015.

- Belah Revegetation Sites (Belah 1 & Belah 2)
  - Heavy recent grazing history had left the Balah sitres with inter-gilgai ridges predominantly bare and eroding with low perennial plant cover.
  - Following livestock exclusion in past 12 months, ground cover in open areas had increased to provide 100% functional patch area, with litter and plant cover under the mature tree canopies increasing to provide 61% functional (but weak) patch area
  - In terms of mature canopy cover, Belah 2 had a mature overstorey; however, Belah 1 only contained the occasional mature Belah.
  - Belah 1 was the only site which was presently comprised of an adequate diversity of growth forms.

Fauna Monitoring

Field survey for the biannual fauna monitoring program was completed in December 2016. The survey report was in preparation at the time Annual Review and a summary of 2016 fauna monitoring observations will be included in the 2017 Annual Review.

RSF Cyanide Monitoring

The BMP requires inspection and monitoring of the RSF to reduce potential for interaction between native fauna and potentially cyanide-contaminated water in the RSF. Such measures were continued through the reporting period, and include:

- daily sampling and monitoring of WAD cyanide levels in RSF residue;
- management of RSF decant water to minimise appeal to native avifauna; and
- regular inspection of the RSF for fauna deaths.

No deaths were recorded during the reporting period, compared to one bird death in 2015, and two bird deaths in 2014. It should be noted that no previous deaths were caused by cyanide following veterinary examination.

6.4.2 Proposed Improvements

During the next reporting period, TGO will continue to implement the biodiversity conservation and enhancement measures outlined in the BMP. The biodiveristy monitoring program is scheduled for spring 2017.

Management actions, such as livestock exclusion and feral animal/weed control, will be expanded in scope to cover the newly established offset areas. Supplementary revegetation

of woodland tree species within 11 ha of offset area between Gundong Ck and the TGO site access road (PVP map unit 1b) is planned for autumn 2017.

6.5 Heritage

A Cultural Heritage Management Plan (CHMP), which outlines measures to manage Aboriginal and Non-Aboriginal heritage sites at TGO, was prepared during the 2013 reporting year, and reviewed during the 2016 reporting year, with no changes made. The CHMP was developed from a previous assessment, which identified 60 Aboriginal sites and eight Non-Aboriginal heritage features.

With all existing or relocated sites adequately maintained, no active cultural heritage management occurred during the reporting period.

6.5.1 Management Measures

As recorded heritage sites are located away from site operational areas, and no new sites or items were identified during the reporting year, management of the existing sites mainly consisted of periodic inspection and local site maintenance.

6.5.2 Proposed Improvements

No improvements to the management of cultural heritage sites and items is proposed in the next reporting period.

Plate 1: Vegetation establishment in offset areas from tubestock planting

Plate 2: Voluntary growth of native vegetation in offset areas

Plate 3: Signage established on offset area boundary fencing

6.6 Contaminated Land

As TGO is a relatively new site, having completed construction and commenced operations in early 2014, the risk of site contamination is relatively low. The contamination assessment

completed as part of the project environmental assessment, also determined risk of land contamination onsite to be very low.

No contaminated sites were identified at TGO during the reporting period.

During the reporting period four minor hydrocarbon spills and two chemical spills were reported at TGO, including:

- 9/1/16 – processing leach tanks overflowed, but contained in bunds
- 12/1/16 – small diesel spill on concrete apron at fuel bay
- 14/1/16 – 5-100L hydraulic oil spilled in Caloma 1 pit
- 14/1/16 – oil & grese noticed in dirty water drain adjacent to washdown bay
- 19/1/16 – fuel spill at heavy vehicle fuel bay
- 19/3/16 – slurry overflow from processing mill

This compares to four minor hydrocarbon spills reported in 2015. No major spill incidents were reported.

6.6.1 Management Measures

At this early stage of the operation, the safe and responsible storage and handling of hazardous materials is the key strategy to preventing, and therefore managing, land contamination.

All chemical and hydrocarbon storage at TGO has been designed and constructed in accordance with the relevant Australian Standard, including:

- AS/NZS 4452: The Storage and Handling of Toxic Substances; and
- AS 1940-2004: The storage and handling of flammable and combustible liquids

Vehicle washdown and re-fuelling facilities were upgraded during reporting period, which will assist in the prevention of land contamination.

6.6.2 Proposed Improvements

No improvements to the management of contaminated sites is proposed in the next reporting period.

7 Water Management

Following a substantial consultation and revision period, the TGO Water Management Plan (WMP) was finalised and submitted to DP&E for review and approval in 2016. The WMP details how TGO will manage site water to comply with the *Water Performance Measures* contained in Schedule 3, Condition 27 of PA 09_0155. Table 11 presents these measures and where each measure is addressed in this Water Management section.

Table 11: Water Performance Measures (PA 09_0155, Schedule 3, Condition 27)

Feature	Performance Measure	Relevant Section
Water management - General	Minimise the use of clean water on site Minimise the need for make-up water from external potable water supplies	7.1
Construction and operation of infrastructure	Design, install and maintain erosion and sediment controls generally in accordance with the series Managing Urban Stormwater: Soils and Construction including Volume 1, Volume 2A – Installation of Services and Volume 2C – Unsealed Roads Design, install and maintain the infrastructure within 40 m of watercourses generally in accordance with the: • *Guidelines for Controlled Activities on Waterfront Land (DPI 2007)*, or its latest version • *Guidelines for fish habitat conservation and management – Chapter 4 (DPI 2013*), or its latest version.	7.5
Clean water diversion & storage infrastructure	Design, install and maintain the clean water system to capture and convey the 100 year ARI flood Maximise as far as reasonable and feasible the diversion of clean water around disturbed areas on site	7.3
Sediment dams	Design, install and maintain the dams generally in accordance with the series *Managing Urban Stormwater: Soils and Construction – Volume 1 and Volume 2E Mines and Quarries*. Ensure the capacity of all sediment dams is sufficient to contain rainfall up to a 10 day 90 percentile rain event	7.5
Mine water management system, including residue storage facility and associated collection pond	• No unlicensed or uncontrolled discharge of mine water off-site (except in accordance with condition 23) • Ensure that the capacity of the residue storage facility and associated collection pond is designed to meet the requirements of the Environmental Guidelines – Management of Tailing Storage Facilities (Vic DPI, 2004), or its latest version, and that the floor and walls are lined to achieve a permeability standard of at least 1 x 10-9 m/s, unless otherwise agreed by the EPA and the Secretary • Maintain adequate freeboard (i.e. minimum 500 mm) in the residue storage facility at all times • All water storages on site that receive chemical or salt laden water, including the dewatering ponds, raw water dams and process water dams are lined to achieve a permeability standard of at least 1 x 10-9 m/s, unless otherwise agreed by the EPA and the Secretary • Maintain adequate freeboard (i.e. minimum 200 mm) in the process water and raw water dams at all times	7.4
Chemical and hydrocarbon storage	Chemical and hydrocarbon products to be stored in bunded areas in accordance with the relevant Australian Standards	6.6.1
Gundong Creek	Maintain or improve baseline channel stability	7.3

	Develop site-specific water quality trigger levels in accordance with ANZECC 2000 and Using the ANZECC Guidelines and Water Quality Objectives in NSW procedures (DECC 2006), or its latest version	

7.1 Water Supply

The principal source of water for TGO is a licensed production bore located approximately 7km east of Narromine, with water transported to the TGO site Raw Water Dam via the Narromine water pipeline. During extensive dry periods, emergency water haulage from Peak Hill Mine may also be used; however, this option was not utilised during the reporting period.

Maximum Harvestable Rights Dams Capacity (MHRDC) is the volume of water landholders are entitled to capture and use without need for licencing. Landholders are permitted to intercept and store a proportion of runoff from their property without a licence under the *Water Management Act 2000*. In addition, no licence is required for water stored within dams that:

- Control or prevention of soil erosion.
- Capture, contain and recirculate drainage.
- Have no catchment (i.e. “turkey’s nests”).

The existing surface water storages that are part of TGO all fall into one of the above categories and therefore do not require licensing.

During the reporting period Alkane transferred two water access licences (WAL28643 and WAL29266) to be linked with the miscellaneous water supply works raised by DPI-Water for the TGO mine site (80MW724171). Although these water access licences allow TGO open cut pits to intercept up to 290ML aquifer water per year, negligible groundwater has been intercepted to date. Water pumped from the open cuts consists almost entirely of captured rainfall.

Processing water (including RSF decant) is recovered and pumped to the Process Water Dam for re-use in processing. During the year, it is estimated that 483 ML was recycled process/decant water, significantly reducing the volume of water needing to be imported.

An onsite water treatment plant is used to produce potable water onsite, eliminating the requirement to import potable water.

Table 12: Water Supply

Water Licence	Water sharing plan, source and management zone (as applicable)	Entitlement (ML)	Passive take / inflows	Active pumping	TOTAL
WAL20270 (Narromine Pipeline)	Lower Macquarie Zone 6 Groundwater Source	1000	nil	611.6	611.6
WAL28643 & WAL29266 (open cut)	NSW Murray Darling Basin Fractured Rock Aquifer	220	Negligible (not measurable)	nil	negligible
N/A	Direct rainfall and catchment runoff captured under harvestable rights	N/A	403*	nil	403
WAL 34968 (Peak Hill Gold Mine)	Upper Bogan River Water Source/ Macquarie Bogan Unregulated and Alluvial Water Sources 2012	300	nil	nil	nil

* Direct rainfall and catchment runoff volume based on modelled

7.2 Water Balance

As part of the WMP finalisation, the site water balance was reviewed during the reporting period. The water balance indicates that TGO is dependent on raw water imported via Narromine pipeline which is expected to account for approximately 50% of TGO's water supply over the four years to 2020. The modelling also predicts minimal risk of offsite discharge.

During the next reporting period, TGO will investigate options for reducing the volume of water currently stored in TGO open cut pits, including reverse osmosis, evaporation and recycling of mine water through the processing plant.

7.3 Clean Water Management (Surface)

For reporting purposes, clean water management is divided into:

- Site Water;
- Gundong Creek; and
- offsite discharge.

7.3.1 Site Water

Clean water consists of through-flow from offsite and water from onsite non-mine disturbed catchments. This water is diverted away from contamination sources (mine disturbance and infrastructure) and directed offsite. Management includes the construction of drains and bunds to collect and divert surface water flow past, or away from, mining disturbed catchments. Site drains and sediment basins were remediated as discussed in Section 7.5.

7.3.2 Gundong Creek

Gundong Creek is an ephemeral watercourse which flows along the northern and western boundaries of the TGO site. In a departure from normal ephemeral flow patterns, Gundong Creek started flowing in mid June 2016, following 64 mm of rain over a week, and continued flowing for the remainder of the year due to consistent rain. Twenty-three samples were collected from monitoring sites SW01 (Gundong Creek upstream) and SW02 (Gundong Creek downstream) during flow events between 2016 for laboratory analysis. No TGO discharges to Gundong Creek occurred during the reporting period.

Laboratory analysis of water samples from Gundong Creek indicate levels of copper, lead, phosphorous and zinc exceeding EPL 20169 limits upstream (SW1) and downstream (SW2) of the TGO mine site, suggesting that background levels of these pollutants may be naturally higher than the concentration limits included in EPL 20169 (based on the 95% species protection trigger values for freshwater aquatic ecosystems (ANZECC, 2000)). Total Suspended Solids (TSS) results exceeded EPL 20169 concentration limits at SW1 and SW2, which is indicative of the storm/flood flows that were observed in Gundong Ck during the reporting period. A summary of analytical results for Gundong Creek samples are presented in Table 13, with full monitoring data presented in Appendix C.

The 2016 results are consistent with sampling from 2014 and 2015, which generally indicated levels copper, lead and zinc at both SW01 and SW02 above the adopted EPL 20169 concentration limits.

Table 13: Gundong Creek water quality samples at SW1 (upstream) and SW2 (downstream)

Parameter	Unit	EPL 20169 Limit	Gundong Ck Upstream (SW1)				Gundong Ck Downstream (SW2)			
			No. samples	Average	Max	Min	No. samples	Average	Max	Min
Arsenic	mg/L	0.024	22	0.00118	0.002	0	22	0.0018	0.003	0.001
Cadmium	mg/L	0.0002	22	0.000027	0.0005	0	22	0	0	0
Copper	mg/L	0.0014	22	0.00354	0.008	0.002	22	0.0039	0.009	0.002
Electrical conductivity	µS/cm	350	23	162.43	316	49	23	163.39	326	56
Lead	mg/L	0.0034	22	0.0095	0.05	0.001	22	0.053	1.04	0.001
Nickel	mg/L	0.011	22	0.0029	0.006	0	22	0.0035	0.007	0.002
Total Nitrogen	mg/L	250	23	1.369	3.2	0.8	23	1.339	2.3	0.8
Total Phosphorus	mg/L	20	23	73.04	330	20	23	71.74	280	10
pH	pH units	6.5-8.5	23	7.38	8.2	6.75	23	7.37	8.3	6.18
Total Suspended Solids	mg/L	50	23	59.91	464	0	23	71.61	403	0
Zinc	mg/L	0.008	22	0.0138	0.129	0	22	0.0106	0.038	0

7.3.3 Discharge

No discharges from site occurred during the reporting period.

7.4 Mine Water Management

Water which has been impacted by mining operations, is not considered not suitable for offsite discharge and requires onsite managmeent or treatment is known as mine water. This includes:

- ***Sediment Laden Water*** **-** retained in sediment basins. If required, flocculated to promote the settlement of sediment load and/or pumped to Wyoming Central Dam (WyCD) large cell.
- ***Open cut pit water*** – retained onsite in the WyCD - large cell and re-used for site operations.
- ***Process water*** – recycled for re-use via decant from the RSF, the raw water dam and process water dam.
- ***Oily water*** – treated at onsite oily water separator, with clean discharge to Sediment Basin 1.
- ***Onsite sewerage*** - treated at an onsite treatment plant and used to irrigate site revegetation areas.

Table 14: Stored Water

Description and structure name	Storage Capacity m^3	Start of Reporting Period m^3	At end of Reporting Period m^3
Raw Water Dam[1]	10,700	10,700	10,700
WyCD – small cell	14,000	14,060	13,420
WyCD – large cell	59,400	588	9,500
Residue Storage Facility	423,870 [2]	30,000	60,000
Process Water Dam[1]	9,200	9,200	7,500

[1] Operational water storage - volumes fluctuate frequently based on operational demand.
[2] Water storage capacity as at January 2016.

Decant water from the RSF is sampled twice daily during the reporting period for Weak Acid Dissociable (WAD) Cyanide. A total of 1,254 residue samples were collected from decant cells 1 and 2 during the reporting period, with no WAD Cyanide concentrations above the 90th percentile limit of 20 mg/L. This is an improvement from two WAD Cyanide samples in 2015 and one sample in 2014 above 20mg/L (but still below the maximum limit of 30mg/L).

7.5 Erosion and Sediment Control

The erosion and sediment control plan (as part of the TGO Surface Water Management Plan) was revised during the reporting period, following approval of the Caloma 2 open cut (under MOD 3) and construction of the RSF lift. In accordance with the he revised plan, civil works were completed during the reporting year to:

- desilt and marginally enlarge existing sediment basin SP1;
- enlarge existing sediment basin SP2 capacity to 5.2 ML;
- enlarge existing sediment basin SP4 capacity to 34.2 ML;
- enlarge existing sediment basin SP5 capacity to 9.7 ML;
- construct sediment basin SP7 to the southwest of Caloma 2 open cut; and
- re-align drains reporting to SP4, SP5 and SP7; and

Works also commenced on the realignment of approximately 500m of the Caloma Central Drain, which carries clean water through the site, around the Caloma 2 open cut. Realignment works include:

- excavation and grading to establish a suitable cross-sectional profile;
- integration of gypsum into the re-graded surface;
- placement of topsoil and initial spray seeding;
- placement of turf reinforced mesh;
- rock-armouring of inflow drains; and
- final spray-seeding of pasture grass seedmix.

Plates 4 and 5 show the civil works in progress.

Inspections of drains and sediment basins were conducted throughout the reporting period, with all sediment basins being inspected once per quarter. Following heavy rain and/or dewatering, sediment basins were inspected and, when water levels allowed, sampled. No offsite discharges from sediment basins occurred during the reporting period.

The stabilisation and/or revegetation treatment of earthworks batters and site drains will continue in the next reporting period. Priorities for treatment in 2017 will include the enlargement of Sediment Basin SP3.

An application to modify EPL 20169 will also be submitted to the EPA to allow Wyoming Central Dam large cell to be used for emergency storage of RSF decant water in event of extreme rain events.

Plate 4: Revegetation following re-alignment of Caloma Central Drain.

Plate 5: Works to re-align Caloma Central Drain, enlarge Sediment Basin SP4 and construct Sediment Basin SP7.

7.6 Groundwater

Sampling and inspection of local district groundwater bores and RSF monitoring piezometers continued during the reporting period.

As shown in Table 15, three of the seven bores (WYMB03, WYMB04 and WYMB10) recorded relatively steady groundwater levels during the reporting period. These groundwater levels are of similar depth range to the previous year's results. Bores WYMB01, WYMB02 and WYMB06 saw significant rises in water level coinciding with high winter rainfall. GDCMB01 recorded a 0.97m water level rise in September, and subsequent fall of 1.34m in December.

Field and laboratory water quality measurements for the reporting period were also comparable to the previous reporting period. Water quality trigger values based on the 95% species protection recommended by ANZECC and ARMCANZ (2000a) have been adopted only for bore GDCMB01 due to its location within the alluvium. Due to the high electrical conductivity of water within the deep aquifers, and no registered production bores within 8km of TGO, trigger values for the deep water bores (WYMB01 – 04, WYMB06 and WYMB10) are based on community groundwater complaints. No groundwater complaints were received during the reporting period. GDCMB01 exceeded the adopted water quality trigger values for Copper in three of the four monitoring rounds for 2016. Copper exceedances were also recorded in the 2015 reporting period. Single round exceedances were also recorded for Nickel (March) and Iron (June). The December 2016 round of monitoring was below the adopted trigger levels for all analytes. Analytical results are shown in Appendix D.

Table 15: Groundwater bore water levels during reporting period.

	Groundwater level (metres below Top of Casing)						
2016	WYMB 01 (EPA09)	WYMB 02 (EPA10)	WYMB 03 (EPA11)	WYMB 04 (EPA12)	WYMB 06 (EPA13)	WYMB 10 (EPA14)	GDCMB 01 (EPA15)
March	-39.06m	-59.22m	-54.21m	-62.54m	-37.63m	-72.05m	-2.01m
June	-39.17m	-53.39m	-54.01m	-62.52m	-37.78m	-72.03m	-1.92m
September	-29.14m	-59.66m	-54.27m	-62.46m	-24.73m	-72.05m	-0.95m
December	-27.11m	-59.99m	-53.75m	-62.4m	-26.38m	-71.97m	-2.29m
Range (within period)	12.06	6.6	0.52	0.14	13.05	0.08	1.34

RSF Piezometers

Monitoring piezometers RSFMP01, RSFMP02 and RSFMP04, and RSFMP09 were largely dry and saw little variation in water depth during the reporting period. Water levels in RSFMP03, RSFMP05, RSFMP06, RSFMP07, RSFMP08, RSFMP10 and RSFMP11 recorded a rise of between 0.46m (RSFMP11) and 6.2m (RSFMP05) following high winter rainfall. Most of these piezometers recorded a subsequent fall in water levels towards the end of the reporting period. These RSFMP results show a greater influence from surface water/rainfall compared to the 2015 reporting period, which saw all piezometers (except RSFMP03 and RSFMP06) largely dry (or drying) over the year.

During the reporting period, four samples were collected from RSFMP06, two samples were collected from RSFMP03 and single samples were collected from RSFMP02, RSFMP05 and RSFMP07. One sample from RSFMP03 recorded 0.014 mg/L Total Cyanide in October 2016. Athough an independent consultant's report indicated that water levels in RSFMP03 were independent of the RSF and result is likley to be a false positive. Following discussions with ALS Laboratory and the CSIRO sampling techniques were reviewed and no results for cyanide have since been recorded. Piezometers will continue to be monitored in the next reporting period in accordance with the TGO Water Management Plan.

RSFMP monitoring analytical results for the reporting period are included in Appendix D.

RSFMP09 and RSFMP10 were removed in reporting year due to operational development, but will be reinstated in next reporting period. No other improvements are proposed to groundwater management at TGO in the next reporting period.

8 Rehabilitation

The 2016 Annual Review reporting period was the third year of mining operations at TGO and largely overlapped with Year 3 of the 2014 MOP, which runs from 1 April 2016 to 31 March 2017. According to the MOP progressive rehabilitation tables (MOP Tables 19 and 21 – 22), 73.2 ha of final rehabilitation was scheduled to have been seeded by the end of Year 3, including:

- 54.2 ha of Primary Domain 4 – *Waste Rock Emplacements* / Secondary Domain C *Woodlands*; and
- 19 ha of Primary Domain 6 – *Open Cut* / Secondary Domain I – *Final Void*

8.1 Rehabilitation during reporting period

During the reporting period, 3.2 ha of rehabilitation was seeded on the Caloma Amenity Bund (CAB) and 4.2 ha was seeded on WRE 3, with a total of 7.4 ha now under active rehabilitation. A further 13.9 ha was in preparation (reshaped or topsoiled) at the end of the reporting period. Figure 4 shows land management activities completed for the reporting period.

Due to issues with the rehabilitation of sodic subsoils, substantial re-design of WRE final landforms occurred over the 2015 reporting period. In 2016, much effort was spent fine-tuning the methodology required to achieve the revised WRE design. TGO also received substantial rainfall over winter 2016, which contributed to delays in preparation of Waste Rock Emplacement slopes for rehabilitation.

Due to the more involved rehabilitation processes required to achieve the revised WRE design, and above average rainfall over winter, rehabilitation scheduled for completion during the 2016 reporting period has been delayed. Substantial reshaping works and drop structure construction has been completed on WRE 2 and WRE 3 during the reporting period, with topsoil placement and seeding now scheduled for autumn 2017. Plates 6 and 7 show reshaping works progressing during the reporting period.

Progress against key rehabilitation performance indicators is shown in Table 16. Mine disturbance and rehabilitation activities activities are shown on Figure 4.

Plate 6: Reshaping works at WRE 2.

Plate 7: Reshaping and revegetation at WRE 3.

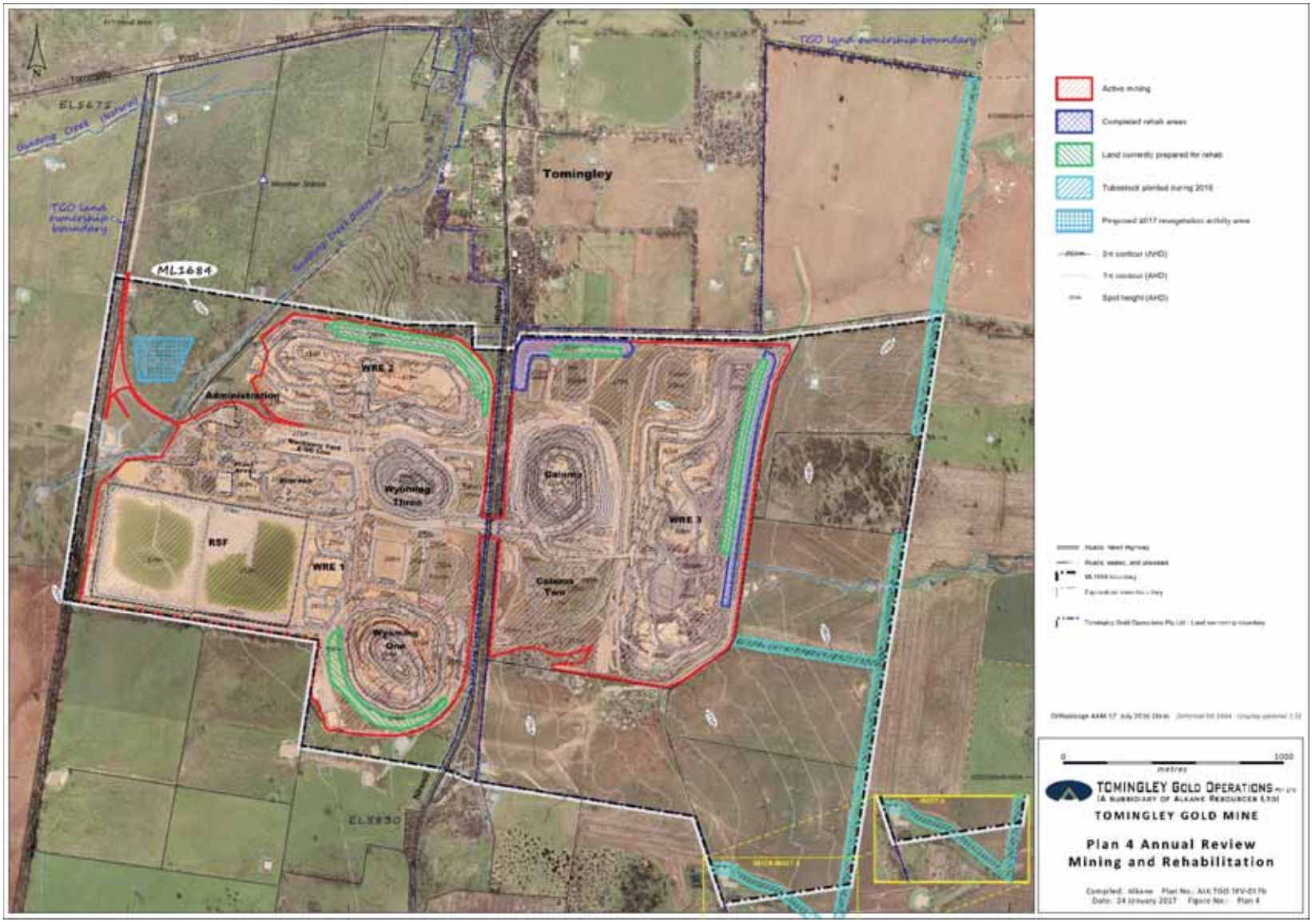


Figure 4: Rehabilitation and land management activities completed during the reporting period.

8.2 Post Rehabilitation Land use

According to the 2014 MOP, the TGO post rehabilitation area is proposed to consist of the following land uses.

- Infrastructure - entrance roads and void safety berms
- Water Management Areas - water bodies on floor of final voids
- Grasslands – rehabilitated WRE outside batters
- Woodlands - rehabilitated WRE outside batters
- Rural Land – existing open buffer land
- Final Void – residual open cut voids
- Conservation and Biodiversity Offset – registered offset areas under PVP.

These post-rehabilitation land uses are shown on MOP Plan 4, included as Figure 5.

8.3 Buildings, Infrastructure and other Rehabilitation

All buidings and infrastructure were still operational during the reporting period and no decommissioning, removal or demolition was undertaken.

During the reporting period, temporary stabilisation works (grass cover establishment) was completed on the northern end of WRE 3 and eastern end of WRE 2. RST polymer was also applied to disturbed topsoil dumps and the RSF surfaces to promote erosion stability and dust supression.

8.4 Completed Rehabilitation

No areas of final rehabilitation have received formal relinquishment sign-off from DRE. Nor are any areas anticipated to do so in the next reporting period.

Table 16: Rehabilitation Status

Mine Area Type	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
	MOP Year 2 (ha)	MOP Year 3 (ha)	MOP Year 4 (ha)
A. Total mine footprint	434.9	434.9	434.9
B. Total active disturbance	382.7	402.4	405
C. Land being prepared for rehabilitation	4	13.9	16
D. Land under active rehabilitation	0	7.4	32
E. Completed rehabilitation	0	0	0

Figure 5: MOP Plan 4 showing proposed final land uses at TGO

8.5 Trials, Monitoring and Research

Significant resources have been allocated over the reporting period to develop suitable rehabilitation treatment processes for the WRE, and this will continue in subsequent reporting periods. Within the confines of the revised rehabilitation specifications, variables such as soil depth, ameliorant (i.e. gypsum) application, slope stabilisation and revegetation will be trialled.

A formal inspection regime was implemented during the reporting period to assess the performance of rehabilitated slopes, identify potential problems and trigger remedial actions. As rehabilitation works progress, an inspection and evaluation regime will be established to closely monitor the performance of this design in shedding water whilst maintaining slope and landform stability.

As WRE landform areas are rehabilitated, monitoring plots will be established and incorporated into the biodiversity monitoring program (see Section 6.4.1 for details). During 2016 biodiversity monitoring, the first rehabilitation monitoring plot was established and monitored, along with two pasture reference sites. The key observations from the first year of monitoring were:

- Soils at the rehabilitation monitoring site were comparable to the local pasture or within agricultural guidelines. One large rill was recorded which will require remedial attention.
- Exotic pasture grasses had established satisfactorily; however, the stability, infiltration and nutrient capacity was lower than the reference sites due to the underdevelopment of the perennial plant cover, litter and humus layers.

- If more native perennial plants do not develop, this may be an impediment to achieving completion targets.
- Minor rilling had occurred, which may have been exacerbated by downward indentation of machinery tracks. While most rills have become stabilised withvegetation, consideration to how the earthworks are undertaken may need to be reviewed. Techniques that create a roughened sequence of troughs and banks along the contour of the batters by cross ripping will increase the engineered functional patch area of the slope in the short term and assist in reducing the extent of rilling while the vegetation becomes established.

8.6 Key rehabilitation risks

As discussed in Section 8.1, the main threats to successful rehabilitation stem from the highly sodic properites of the subsoil and near surface overburden that dominate the TGO project area. The revised WRE design, devised to address this threat, has undergone substantial evaluation and refinement during the reporting period and will be applied across the remaining WRE landforms awaiting rehabilitation.

The unusually wet winter of 2016 was only a temporary/ seasonal threat to rehabilitation progress; however, it does illustrate the wider difficulties of scheduling amd executing rehabilitation in the highly variable climate of Central-Western NSW.

8.7 Actions for next reporting period

During the next reporting period, priority rehabilitation actions will include:

- evaluation and finalisation of standard rehabilitation procedures for WRE slopes;
- reshaping and drainage structure construction on the northern face of WRE 3 and eastern face of WRE 2; and
- seeding of the 13.9 ha of WRE slopes currently in preparation for rehabilitation, along with the 13 ha proposed for preparation early in the next reporting period.

9 Community

9.1 Consultation

The key strategy to ensure an effective passage of information between TGO and the surrounding community is the Community Consultative Committee (CCC). The CCC is an independently chaired ten member committee representing TGO, the local community, the Aboriginal community. During the reporting period, the CCC met on the:

- 11 February;
- 12 May;
- 12 August; and
- 10 November.

At CCC meetings, members are updated by TGO personnel on the progress of current and proposed mining operations and projects. Community representatives are given the opportunity to raise concerns regarding the project and to offer advice regarding TGO's consultation with the community. CCC meeting minutes are available via the Alkane Resources website (www.alkane.com.au). Quarterly CCC meetings will continue in the next reporting period.

In addition to the CCC, TGO utilised a number of methods of communication/consultation with the community during the reporting period, including:

- Making relevant information regarding mine approvals, operations and environmental monitoring available to the public on the Alkane Resources website;
- Distributing a community newsletter, to provide the Tomingley community with information on TGO operations;
- Providing a 24 hour community information;
- Sending issue-specific letters to the residents of Tomingley regarding TGO's approach to sensitive issues such as residentail acoustic treatment.

These methods of community consultation will continue during the next reporting period.

9.2 Support

Over the life of the mine, TGO has committed to contribute (subject to annual CPI increases):

- $430 000 to the Tomingley Gold Project - Community Fund
- $360 000 for road maintenance and
- $160 000 for Narromine Shire Council environmental expertise.

The Tomingley Gold Project Community Fund has been established to support projects within the Narromine Shire that promote the long term economic growth, community connectivity, education and training, or community infrustructure.

Allocation of funds is decided by a fund panel, consisting of two TGO representatives and two from Narromine Shire Council, based on annual applications from community members, groups or organisations.

A variation to the Voluntary Planning Agreement with Narromine Shire Council (NSC) was agreed in March 2016, prior to approval of MOD 3. The varied agreement included commitments by TGO to:

- commission and fund a 'water supply options' report to investigate the practicalities of providing water to the township of Tomingley using the Narromine pipeline;

- transfer ownership of the Narromine pipeline water supply infrastructure to NSC upon mine closure;
- start providing water to the township of Tomingley until end of mine life; and
- notify NSC of environmental incidents (and provide investigation reports) required to be reported to state government authorities.

9.3 Complaints and enquiries

TGO manage complaints in accordance with the protocols and procedures contained in the EMS. During the reporting period, 18 complaints were received. The majority of these complaints were received through the community information line or other Alkane/TGO phone lines, with three received by email or text message and three in person. TGO complaint history is presented in Table 17, with complaint number and type for the current and previous reporting periods presented in Figure 7.

TGO staff responded to all complainants and conducted investigations into specific concerns. Investigation outcomes consisted of corrective action, where required, and follow-up communication with the complainant. All enquiries and complaints have been closed out for the reporting period, with recent noise complaints being incorporated into the ongoing acoustic investigation and treatment program.

A register of complaints and enquiries received from the commuinity is maintained by TGO. A modified version of this register (excluding personal details of complainants) is published on the Alkane Resources website. A copy of the TGO community complaints register for the reporting period is included as Appendix E.

Table 17: TGO complaint history

Year	Number of complaints	Complaint Type				
		Dust	Noise	Blasting	Traffic/ Road Safety	Other
2016	18	1	10	0	3	4 (lighting, TV reception)
2015	16	2	11	3	0	0
2014	53	11	35	2	4	1 (UHF radio misuse)
2013	9	4	0	0	3	2 (property damage)
2012	2	0	0	0	0	2 (property damage)

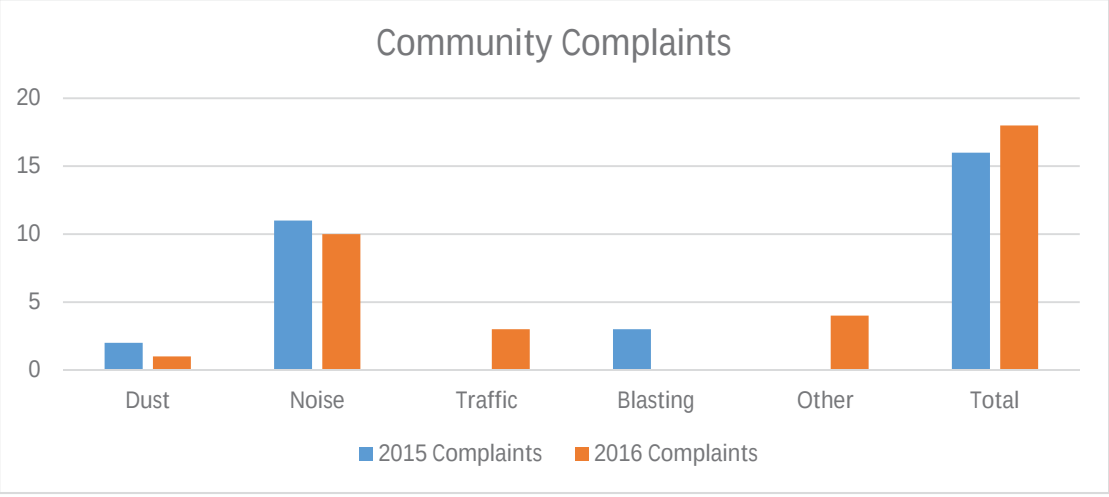


Figure 7: Summary of community complaints by type received in 2016 and the previous reporting period.

10 Independent Audit

An Independent Audit was conducted during the 2015 reporting period. All corrective actions from the audit report have been implemented, except an action requiring feral animal baiting. TGO offset areas are located too close to privately owned residences in Tomingley township to safely undertake a feral animal baiting program in accordance with Pesticide Control (1080 Liquid Concentrate and Bait Products) Order 2010. As an alternative control, feral animal trapping was implemented during the reporting period (see Section 6.4.1).

The next Independent Audit is scheduled for 2018.

11 Incidents and non-compliances during reporting period

This section provides further detail on the incidents and non-compliances reported in Section 1 as well as any other official regulatory interaction that occurred during the reporting period.

11.1 Incidents and Non-compliances

11.1.1 Exceedance of noise criteria

Supplementary attended monitoring, undertaken to meet PA 09_0155 Appendix 7, recorded two exceedances of PA noise criteria, including a 1dB exceedance at R23 on 28 June 2016 (evening) and a maximum 6 - 11 dB exceedance at R3/29 and R23 over the three nights of measurement, 11 - 13 October 2016 (evening/night). These exceedances, and the management measures implemented to address them, are described in Section 6.1.

11.1.2 Exceedance of airblast overpressure criteria

Monitoring of blasting at TGO recorded two airblast overpressure exceedences of blasting criteria inluded in Schedule 3, Condition 7 of PA 09_0155. The exceedences occurred on 21 March and 5 May. These exceedances, and the management measures implemented to address them, are described in Section 6.2.

11.1.3 Exceedance of 24 hour average PM10 and deposited dust criteria

Monitoring of particulate matter at the nearest residence to TGO identified three exceedences of the 24 average PM_{10} criteria as included in Schedule 3, Condition 17 of PA 09_0155. These exceedances were recorded on the 26 February, 6 April and 2 December. These exceedances, and the management measures implemented to address them, are described in Section 6.3.

11.1.4 Water Management Plan still not approved

Water management at TGO is generally undertaken in accordance with commitments and actions outlined in the draft Water Management Plan (WMP), which was revised following MOD 3 approval and submitted to DP&E for approval in November 2016.

11.1.5 Non-compliance with MOP rehabilitation schedule

Final rehabilitation of mining disturbed land at TGO is not in compliance with the rehabilitation schedule included in the 2014 TGO MOP. The reason for this delay in rehabilitation, and the actions being undertaken to address the non-compliance, are described in Section 8.1.

11.2 Official Regulatory Interaction

TGO received a $3000 PIN from DP&E for noise exeedances recorded in 2014 and reported in the 2014 Annual Environmental Management Report.

12 Activities to be completed in next reporting period

Environmental activities and initiatives to be implemented in the next reporting period will focus on reduction of offsite impacts such as noise and dust, management of biodiversity offset areas, refining WRE rehabilitation processes, and increasing the rate of rehabilitation. Details on these activities are shown in Table 18.

Table 18: Environmental management activities proposed for 2017

Proposed Activities	**Location**	**Proposed Completion Date**
Feral animal trapping program in offset areas	Offset areas	November 2017
Control of boxthorn and other noxious weeds	TGO site and offset areas	December 2017
Continue revegetation activities in accordance with the BMP and PVP	Offset areas	April 2017
Carry out LFA monitoring of biodiversity and rehabilitation areas.	Biodiversity and rehabilitation areas	October 2017
Increase capacity of sediment basin SP3	SP3	September 2017
Ongoing rehabilitation of WRE2 and WRE3	Waste rock emplacements	December 2017 (but ongoing)
Noise, air quality, blasting and water quality monitoring in accordance with EPL and PA.	TGO site and district	December 2017
Investigate water reduction options to reduce pit water inventory.	Open cut pits	December 2017