WPG Resources Ltd

TARCOOLA GOLD PTY LTD

# Tarcoola Gold Project

# Annual Compliance Report 2016/2017

ML 6455

## Preface

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## Disclaimer

Figures used in this document were developed by WPG Resources Ltd unless stated otherwise.

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## Abbreviations and definitions

| Abbreviation | Definition |
|---|---|
| Ag | silver |
| AMYAC | Antakirinja Matu-Yankunytjatjara Aboriginal Corporation |
| AMD | acid metalliferous drainage |
| ANZECC | Australian and New Zealand Environmental Conservation Council |
| ARTC | Australia Rail Track Corporation |
| Au | gold |
| BCM | bank cubic metre(s) |
| BOM | Bureau of Meteorology |
| DSD | Department of State Development (now DPC) |
| DPC | Department of the Premier and Cabinet |
| EPA | Environment Protection Authority |
| EPP | Environment Protection Policy |
| GAI | geochemical abundance index |
| g/t | grams per tonne |
| ML | Mineral Lease |
| NAF | non-acid forming |
| NGER | National Greenhouse Energy Reporting |
| NPI | National Pollutant Inventory |
| oz | ounces |
| PAF | potentially acid forming |
| PEPR | Program for Environmental Protection and Rehabilitation |
| ROM | run of mine |

| Abbreviation | Definition |
|---|---|
| SWL | standing water level |
| TDS | total dissolved solids |
| TRH | total recoverable hydrocarbons |
| tpa | tonnes per annum |
| WDE | water dependent ecosystem |
| WRF | waste rock storage facility |

# 1. Executive Summary

Upon approval of the PEPR on 4 November 2016, site works commenced to establish infrastructure for the Tarcoola Gold Mine on ML6455 later in November 2016, with actual mining commencing the following month in December. Ore haulage to the Challenger Mine commenced soon after in late January 2017.

This report is the first Annual Compliance Report (ACR) submitted for the Tarcoola Gold Project, and is applicable for the period 4 November 2016 to 3 November 2017. This ACR reports against the PEPR - Tarcoola Gold Project Program for Environmental Protection and Rehabilitation, dated 21 October 2016.

There is one notable variation where new groundwater monitoring and trigger bores were installed during the reporting period, to replace the bores specified in the approved PEPR. These bores were used to meet the ground water data requirements for the compilation of the ACR, and, given that the pit had not intersected groundwater during the reporting period, do not represent any lessening in the integrity of the associated results.

The environmental outcomes have been achieved, with no reported non-compliances with PEPR outcomes (operational or completion) for the Tarcoola Gold Mine during the reporting period. There were some areas where compliance could not be confirmed, and these typically relate to the absence of sufficient surface water for sample collection and/or completion criteria, whereby the actions to address the criteria cannot yet be undertaken. Native vegetation clearance for the approved mine design is complete, and is less than the approved clearance area. Further clearance for the current mine design is not anticipated.

Given the lack of surface water flows at Tarcoola, measurements and data collection associated with such have been problematic. Issues associated with surface water flow measurements are currently being addressed with a review of the approved PEPR, which is currently in the final stages of the review process.

# 2. Declaration of Accuracy

This document has been prepared to fulfil the requirements under Regulation 86 of the Mining Regulations 2011 for the tenements listed herein. The information contained in this report is to the best of my knowledge a true and accurate record of the mining activities and compliance status for the reporting period.

Jon Holden – General Manager, Challenger and Tarcoola Gold Mines

Date: 26 December 2017

# 3. Introduction

## 3.1 Background

Tarcoola Gold Pty Ltd (Tarcoola Gold) has developed the Tarcoola Gold Project approximately 600 km north-west of Adelaide, 360 km north-west of Port Augusta, and 3 km west of Tarcoola in South Australia.

Access to the project site is via the Stuart Highway to Glendambo, and then 120 km along the un-sealed Glendambo to Tarcoola road (see Figure 1).

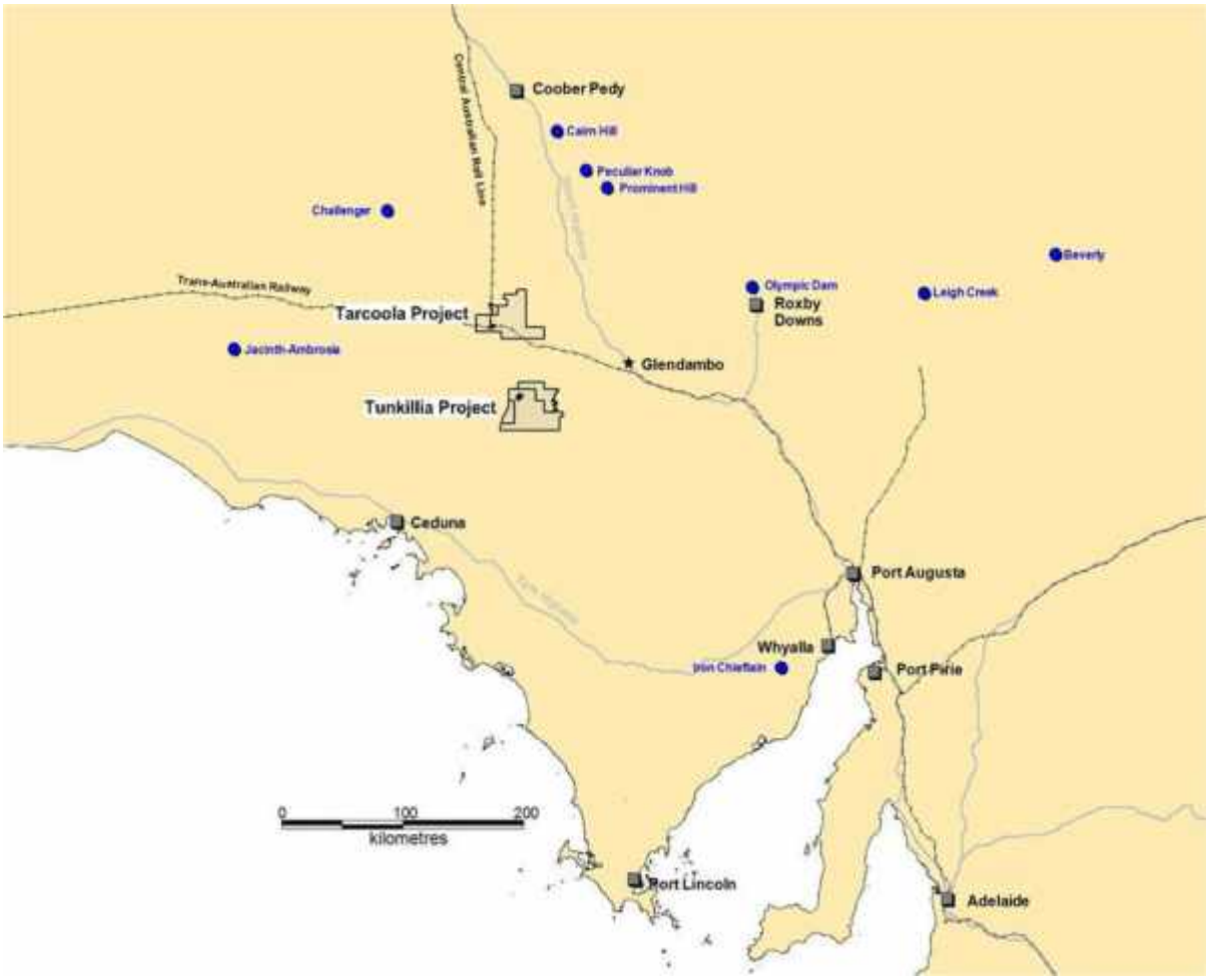


**Figure 1 Tarcoola Gold project location**

Tarcoola Gold was granted a mineral lease (ML) on 8 March 2016 for the mine and primary infrastructure. Project components within the ML include an open pit, waste rock storage and other minor infrastructure (Figure 2). The scope of the operations was revised following submission of a Mining Proposal document (August 2015) to include ore being trucked approximately 170 km north-west to the Challenger Gold (Challenger) mine for processing off-site.

The project involves an open pit mining operation producing a total of 720,000 tonnes of ore and trucking an average of 250,000 tonnes per annum (tpa) to Challenger for processing. It is expected that the pit will reach a maximum depth of approximately 110 m below surface.

Following initial approval of the operation's Program for Environmental Protection and Rehabilitation (PEPR) in November 2016, site works commenced in the fourth quarter (Q4) of 2016, followed by mining activity shortly thereafter. The project has an expected mine life of two to three years.

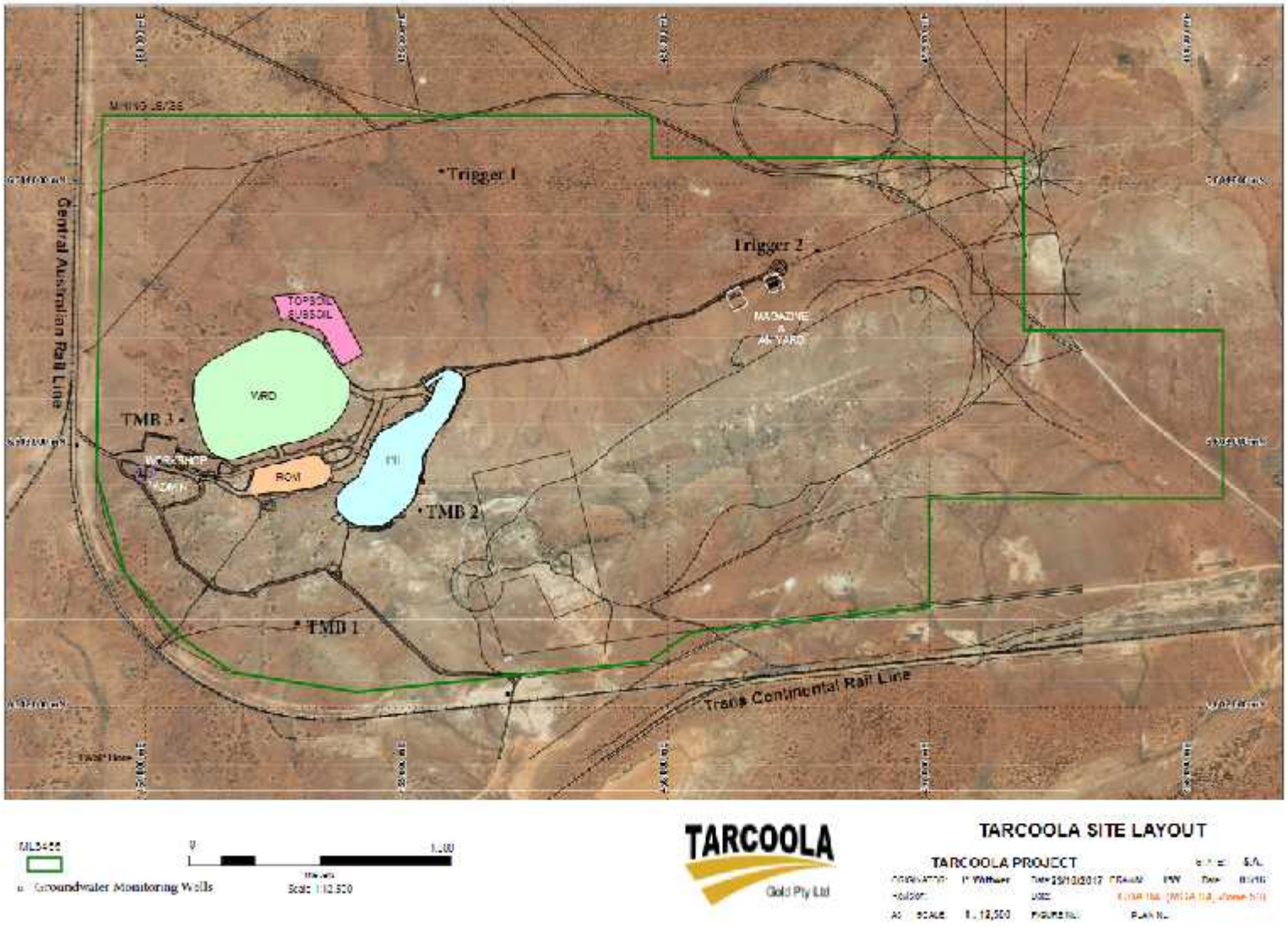


**Figure 2 Tarcoola Gold Project Layout**

## 3.2 Identification

Site details are provided in Table 1.

**Table 1 Project details**

| | | | |
|---|---|---|---|
| **Mine Name** | Tarcoola Gold | **PEPR#** | PEPR2016/044 |
| | | **Date Approved** | 4 November 2016 |
| **Tenement** | ML6455 | | |
| **Lease Holder** | Tarcoola Gold, a wholly owned subsidiary of WPG Resources Ltd | | |
| **Operator** | Tarcoola Gold Operations | | |
| **Mining Lease Approval Date** | 8 March 2016 | | |
| **Associated Tenements** | ML4650, ML4667, ML5179, ML5355 | | |
| **Approval Document** | Tarcoola Gold Project Program for Environmental Protection and Rehabilitation, dated 21 October 2016 | | |
| **Site Contact** | Henry Andryszczak<br>Mining Manager, Tarcoola Gold Operations<br>WPG Resources Ltd | | |
| **Email** | henryandryszczak@wpgresources.com.au | | |
| **Phone Number** | 08 8450 0199 | | |
| **Registered Mine Manager** | Henry Andryszczak<br>Mining Manager Tarcoola Gold Operations<br>WPG Resources Ltd | | |
| **Site Location Details** | Located approximately 600km north-west of Adelaide, 360 km north-west of Port Augusta, and 3 km west of Tarcoola in South Australia. Access to the project site is via the Stuart Highway to Glendambo, and then 120 m along the un-sealed Glendambo-Tarcoola road (see Figure 1). | | |
| **Reporting Period** | From 4 November 2016 | To 3 November 2017 | |
| **Date of Compliance Report Preparation** | December 2017 | | |

## 3.3 Tenements

Tenement details for the project are provided in Table 2. ML6455 encompasses the historic tenements ML4650, ML4667, ML5179 and ML5300 (see Figure 3).

**Table 2 Tarcoola tenement details**

| Tenement | Tenement Number | Approval Date | Expiry Date | Commodity | 2017 Activity |
|---|---|---|---|---|---|
| Tarcoola Gold Pty Ltd | ML6455 | 8 March 2016 | 7 March 2026 | Silver, Gold | Open cut mining |

| Tenement | Tenement Number | Approval Date | Expiry Date | Commodity | 2017 Activity |
|---|---|---|---|---|---|
| Tarcoola Gold Pty Ltd | ML5179 | 11 January 1984 | 10 January 2031 | Gold | Nil |
| Tarcoola Gold Pty Ltd | ML4650 | 30 October 1978 | 10 January 2031 | Silver, Gold | Nil |
| Tarcoola Gold Pty Ltd | ML4667 | 15 January 1979 | 10 January 2031 | Gold | Nil |
| Tarcoola Gold Pty Ltd | ML5300 | 3 September 1985 | 10 January 2031 | Gold | Nil |

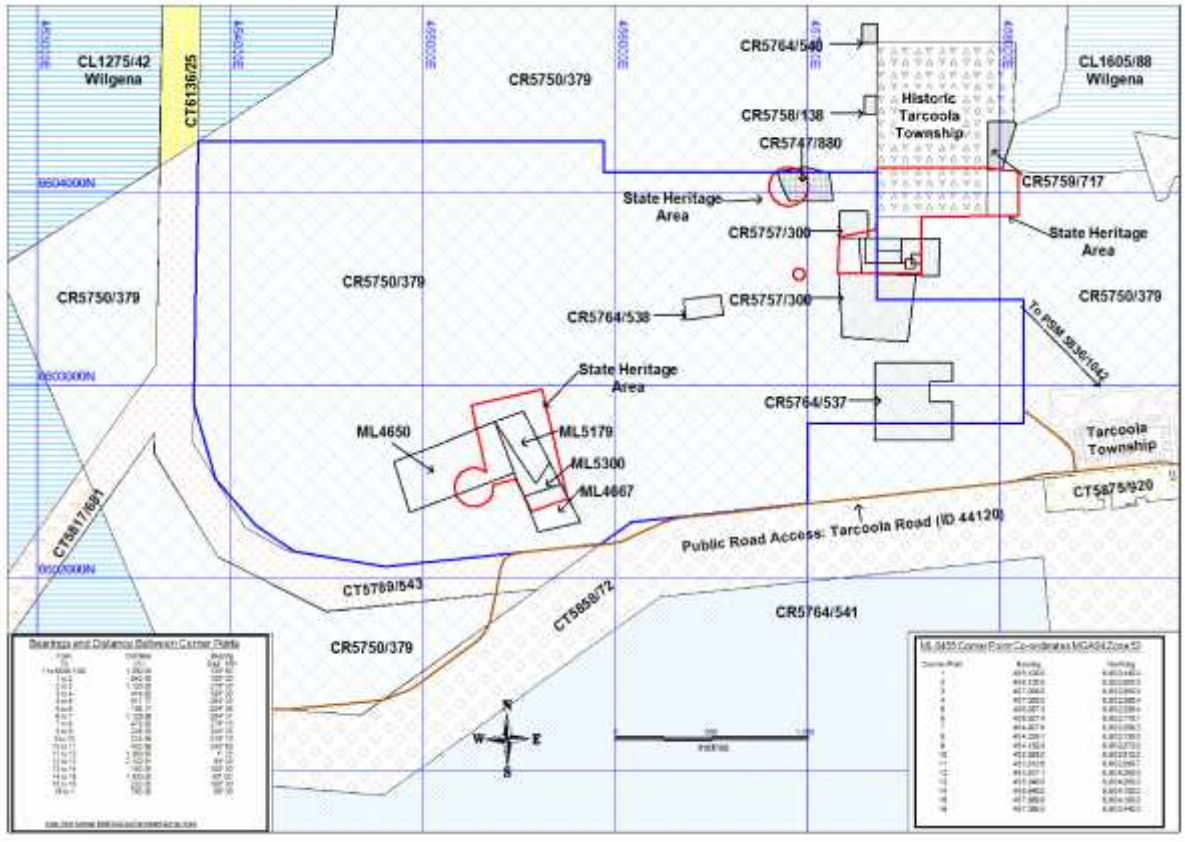


**Figure 3 Location of Mineral Leases**

## 3.4 Other Licences, Permits, Waivers, Native Title Agreements

Native title for the project area is held by the Antakirinja Matu-Yankunytjatjara people represented by the Antakirinja Matu-Yankunytjatjara Aboriginal Corporation (AMYAC). A Native Title Mining Agreement was negotiated and executed with AMYAC, and registered by the then mining Regulator, Department for State Development (DSD, and now Department of the Premier and Cabinet, DPC) before the mineral lease was granted.

Two waivers were required and obtained for an existing optic fibre cable. All waivers for exempt land are in place in accordance with the *Mining Act 1971*.

**Table 3 Waivers required under the *Mining Act 1971* (Extract of Table 4 from the PEPR)**

| Structure/feature | Distance from mining activity | Waiver required under the *Mining Act 1971* | Comments |
|---|---|---|---|
| Optic fibre cable | Installation of above ground water pipeline is <150 m from infrastructure | Yes | Waiver obtained from NextGen |
| Optic fibre cable | Upgrade to haul road is <150 m from infrastructure | Yes | Waiver obtained from ARTC |

# 4. Mining Operations

## 4.1 Ore Reserves and Mine Life

The 30 June 2017 Mineral Resource estimate, which is shown in Table 4, is a total of 1.6 million tonnes at an average grade of 1.7 g/t Au containing 87,600 ounces of gold.

**Table 4 Mineral Resource Estimate as at 30 June 2017**

| Category | Tonnes (000 t) | Gold (Au) (g/t) | Gold (000 oz) |
|---|---|---|---|
| Measured | 130 | 3.39 | 13.7 |
| Indicated | 930 | 1.82 | 54.4 |
| Inferred | 540 | 1.12 | 19.6 |
| **Total*** | **1600** | **1.70** | **87.6** |

Source: Tarcoola 30 June 2017 Mineral Resource and Ore Reserve estimates

*Totals may vary due to rounding

The 30 June 2017 Ore Reserves estimate is 567,200 tonnes at an average grade of 3 g/t Au containing 54,300 ounces of gold. The Proved and Probable Ore Reserves for Tarcoola are provided in Table 5.

**Table 5 Tarcoola Ore Reserve Estimate as at 30 June 2017**

| Reserve category | Tonnage (000) | Gold (g/t) | Gold (000 oz) |
|---|---|---|---|
| Proved | 151.6 | 3.4 | 16.6 |
| Probable | 415.6 | 2.8 | 37.7 |
| **Total** | **567.2** | **3.0** | **54.3** |

Source: Tarcoola 30 June 2017 Mineral Resource and Ore Reserve estimates

*The tonnes and grades are stated to a number of significant digits reflecting the confidence of the estimate. Since each number and total is rounded individually the columns and rows in Table 5 may not show exact sums or weighted averages of the reported tonnes and grades.

At this stage it is anticipated that mining of the open pit will be complete by early 2019. Ore haulage to Challenger of the mined ore will continue for at least another year after cessation of pit activities.

## 4.2 Ore Mining

Mining activity commenced in December 2016 at Tarcoola. Table 6 provides a summary of the ore mined, ore transported to Challenger, and the waste/overburden mined during the reporting period.

**Table 6 Summary of Ore Mined and Other Key Activities at Tarcoola**

| Item | Unit | Amount in reporting period | Amount to be mined/hauled during next reporting period | ROM Stockpile level at end of period |
|---|---|---|---|---|
| Ore Mined | tonnes | 191,771 | 506,918 | 71,231 |
| Ore Hauled to Challenger | tonnes | 120,540 | 230,017 | n/a |
| Waste Mined | bcm | 1,959,050 | 1,104,600 | n/a |

During the reporting period, a total of 191,771 tonnes of ore and 1,959,050 BCM of waste was mined, with 120,540 tonnes of ore being hauled to Challenger (see Table 6). Whilst waste mining will reduce significantly during the next reporting period (due to the removal of most of the overburden during the last period), ore mining and ore haulage will increase correspondingly until the end of the pit life. The projected physicals are also depicted in Table 6.

In addition to the above, 23,256 BCM of topsoil and 43,915 BCM of subsoil were collected and stockpiled for future rehabilitation activities.

Rehabilitation activities (such as the contouring of the waste rock facility), will be commencing during the next reporting period.

# 5. Voluntary Information

WPG Resources submitted a report under the *National Greenhouse and Energy Reporting (NGER) Act 2007* for 2016-2017. Tarcoola Gold operations were included in this report.

WPG Resources submitted a National Pollutant Inventory (NPI) report for 2016-2017 to the South Australian Environment Protection Authority (EPA). Tarcoola Gold operations were included in this report.

WPG Resources' relationship with neighbouring stakeholders continues to be a priority and regular communication is on-going. During the reporting period WPG Resources has engaged in regular dialogue with Commonwealth Hill Station regarding minimisation of dust generated by quad traffic on the Challenger access road. Some pro-active initiatives, over and above the existing road management activities, to arise from those communications include:

- Engaged water truck for active dust suppression
- Road surfacing trials (polymer)

Longer term initiatives involve upgrading the road immediately adjacent Commonwealth Hill station, and establishment of a nearby standpipe for water access

# 6. Project Variation Summary

There have been no project variations to report to DPC in the reporting period.

# 7. Complaints

One complaint was submitted to Tarcoola Gold by GWA on 3 February 2017, regarding the accumulation of sand in the sheep grids on the Rail Access Haul road due to the ore haulage truck traffic. The sand was removed from the grids within the week to the satisfaction of all relevant stakeholders.

No other complaints were received by Tarcoola Gold during the reporting period.

# 8. Compliance

## 8.1 Compliance with Operational Outcomes and Leading Indicator Criteria

Unless otherwise indicated, tables and appendices referenced within the Outcome Measurement and Leading Indicator Criteria columns in tables within Section 8.1, refer to the approved PEPR, dated 4 November 2016. Compliance with outcome measurement criteria has been assessed as well as leading indicator criteria to the extent of being relevant to the operation of any control strategy.

**Table 7 Native Vegetation**

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| T1 | No permanent loss of abundance or diversity of native vegetation on or off the ML through:<br>⟩ clearance<br>⟩ dust/contamination deposition<br>⟩ fire, or<br>⟩ other damage<br>unless prior approval under the relevant legislation is obtained | Annual vegetation survey at impact monitoring sites (Figure 47) demonstrates no significant difference in abundance and diversity of vegetation compared to baseline (Appendix K)<br>Results of weekly surveys of cleared areas on the mining tenement during construction, and annual surveys of the tenement during operations, demonstrates that the clearance areas of each native vegetation type does not exceed the associated total approved clearance areas (Figure 45) | Records demonstrate vegetation clearance approvals/inspection process is being implemented | Compliant | Annual flora survey determined no significant reduction in species abundance and diversity (Fyfe 2017), see Appendix C<br>Native vegetation clearance was undertaken in 2017 and surveyed. The area cleared was within the approved clearance area (82.84 ha), register and figure in Appendix B |
| T2 | No permanent loss of abundance or diversity of native vegetation on or off the ML through:<br>⟩ clearance<br>⟩ dust/contamination deposition<br>⟩ fire, or<br>⟩ other damage<br>unless prior approval under | Annual vegetation survey at impact monitoring sites (Figure 47) demonstrates no significant difference in abundance and diversity of vegetation compared to baseline (Appendix K)<br>Results of weekly surveys of cleared areas on the mining tenement during construction, and annual surveys of the tenement during operations, demonstrates that the clearance areas of each native vegetation type does not exceed the associated total approved clearance areas (Figure 45) | Records demonstrate vegetation clearance approvals/inspection process is being implemented | Compliant | Annual flora survey determined no significant reduction in species abundance and diversity (Fyfe 2017), see Appendix C<br>Native vegetation clearance was undertaken in 2017 and surveyed. The area cleared was within the |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | the relevant legislation is obtained | | | | approved clearance area (82.84 ha), register and figure in Appendix B |
| T3 | No permanent loss of abundance or diversity of native vegetation on or off the ML through:<br>⎫ clearance<br>⎫ dust/contamination deposition<br>⎫ fire, or<br>⎭ other damage<br>unless prior approval under the relevant legislation is obtained | Annual vegetation survey at impact monitoring sites (Figure 47) demonstrates no significant difference in abundance and diversity of vegetation compared to baseline (Appendix K)<br>Results of weekly surveys of cleared areas on the mining tenement during construction, and annual surveys of the tenement during operations, demonstrates that the clearance areas of each native vegetation type does not exceed the associated total approved clearance areas (Table 28)*<br>*Table 28 fails to show clearance for dust deposition as per SEB calculations in Table 29 | N/A | Compliant | Annual flora survey determined no significant reduction in species abundance and diversity (Fyfe 2017), see Appendix C<br>Native vegetation clearance was undertaken in 2017 and surveyed. The area cleared was within the approved clearance area (82.84 ha), register and figure in Appendix B |
| T4 | No permanent loss of abundance or diversity of native vegetation on or off the ML through:<br>⎫ clearance<br>⎫ dust/contamination deposition<br>⎫ fire, or<br>⎭ other damage<br>unless prior approval under the relevant legislation is obtained | Annual vegetation survey at impact monitoring sites (Figure 47) demonstrates no significant difference in abundance and diversity of vegetation compared to baseline (Appendix K)<br>Results of weekly surveys of cleared areas on the mining tenement during construction, and annual surveys of the tenement during operations, demonstrates that the clearance areas of each native vegetation type does not exceed the associated total approved clearance areas (Figure 45) | N/A | Compliant | Annual flora survey determined no significant reduction in species abundance and diversity (Fyfe 2017), see Appendix C<br>Native vegetation clearance was undertaken in 2017 and surveyed. The area cleared was within the approved clearance area (82.84 ha), register and |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | | | | | figure in Appendix B |
| T5 | No permanent loss of abundance or diversity of native vegetation on or off the ML through:<br>) clearance<br>) dust/contamination deposition<br>) fire, or<br>) other damage<br>unless prior approval under the relevant legislation is obtained | Annual vegetation survey at impact monitoring sites (Figure 47) demonstrates no significant difference in abundance and diversity of vegetation compared to baseline (Appendix K)<br>Results of weekly surveys of cleared areas on the mining tenement during construction, and annual surveys of the tenement during operations, demonstrates that the clearance areas of each native vegetation type does not exceed the associated total approved clearance areas (Figure 45) | N/A | Compliant | QHSE records indicate there were no incidents of reported fires during the reporting year.<br>Annual flora survey determined no significant reduction in species abundance and diversity (Fyfe 2017), see Appendix C<br>Native vegetation clearance was undertaken in 2017 and surveyed. The area cleared was within the approved clearance area (82.84 ha), register and figure in Appendix B |

**Table 8 Native Fauna**

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| T10 | No native fauna injuries or death caused by mining operations (including fire) that could have been | Results of annual audit reports of records (inspections, log entries) and investigations of all native fauna injuries or deaths on the ML demonstrate that the mine operator did not cause or could not have reasonably prevented | N/A | Compliant | A review of QHSE records indicates 5 vehicle strikes occurred during the reporting period, See Table 18. |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | reasonably prevented | the injury or death of native fauna from occurring | | | Measures in place to minimise strikes include minimisation of night driving<br>Vehicle strikes reported could not have reasonably been prevented<br>(QHSE is used for incident reporting) |
| T11 | No native fauna injuries or death caused by mining operations (including fire) that could have been reasonably prevented | Results of annual audit reports of records (inspections, log entries) and investigations of all native fauna injuries or deaths on the ML demonstrate that the mine operator did not cause or could not have reasonably prevented the injury or death of native fauna from occurring | N/A | Compliant | No incident of reported fires during the reporting year.<br>A review of QHSE records indicates 5 vehicle strikes occurred during the reporting period, See Table 18. Measures in place to minimise strikes include minimisation of night driving.<br>Vehicle strikes reported could not have reasonably been prevented.<br>(QHSE is used for incident reporting) |

**Table 9 Weeds, Pests and Pathogens**

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| T16,17 | No increased abundance or introduction of new or sustained increase in abundance of existing weed or pest and/or pathogen species on the ML | Annual survey of vegetation monitoring sites (Figure 47) indicate no new weed, pest and pathogen species incursions or increase in the density or distribution of weeds, pests and pathogens compared baseline (Appendix K), as a result of mining operations<br>Records of weeds, pests and pathogens identified within the site, and measures taken, are kept on site to demonstrate appropriate actions have been implemented | Inspection records for vehicles and machinery demonstrate that all vehicles and machinery have been certified as clean before operating on site | Compliant | Annual flora and fauna survey determined no significant increase in weed, pest or pathogen species abundance and diversity (Fyfe 2017), see Appendix C<br>Vehicle inspections records and audits, Waste tracking forms, Site inspections undertaken by Environment Officer, see Section 12 |
| T18 | No increased abundance or introduction of new or sustained increase in abundance of existing weed or pest and/or pathogen species on the ML | Annual survey of vegetation monitoring sites (Figure 47) indicate no new weed, pest and/or pathogen species incursions or increase in the density or distribution of weeds, pests and pathogens compared baseline (Appendix K), as a result of mining operations<br>Records of weeds, pests and pathogens identified within the site, and measures taken, are kept on site to demonstrate appropriate actions have been implemented | Inspection records for vehicles and machinery demonstrate that all vehicles and machinery have been certified as clean before operating on site | Compliant | Annual flora and fauna survey determined no significant increase in weed, pest or pathogen species abundance and diversity (Fyfe 2017), see Appendix C<br>Vehicle inspections records and audits, Waste tracking forms, Site inspections undertaken by Environment Officer, see Section 12 |
| T19 | No increased abundance or introduction of new or sustained increase in | Annual survey of cleared and operational areas (Figure 47) indicate no new weed, pest and pathogen species incursions or increase in the density or distribution of weeds, pests and | Inspection records for vehicles and machinery demonstrate that all vehicles | Compliant | Annual flora and fauna survey determined no significant increase in weed, pest or |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | abundance of existing weed or pest and/or pathogen species on the ML | pathogens compared baseline (Appendix K), as a result of mining operations<br>Records of weeds, pests and pathogens identified within the site and measures taken, are kept on site to demonstrate appropriate actions have been implemented | and machinery have been certified as clean before operating on site | | pathogen species abundance and diversity (Fyfe 2017), see Appendix C<br>Vehicle inspections records and audits, Waste tracking forms, Site inspections undertaken by Environment Officer, see Section 12 |

The groundwater monitoring wells proposed during the preparation of the PEPR, have since been found not suitable for ongoing monitoring purposes. Three new groundwater wells (TMB1, TMB2, TMB3) as well as two trigger wells were installed in 2017 (see Figure 2). The outcome measurement criteria in Table 10 have been updated to reflect the current well field.

A summary of groundwater data is provided in Appendix A.

**Table 10 Groundwater**

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| T20 | No adverse impact to the quality and quantity of groundwater to existing users and groundwater environmental value caused by mining operations | Quantity to existing users<br>Quarterly monitoring of groundwater levels/drawdown in installed boundary (trigger) groundwater monitoring wells (TTW1 and TTW2) confirms standing water levels (SWL) are within 2 m of modelled (predicted) drawdown levels (based on Jacobs 2016), at that location, at the time of measurement, validating the modelled radius of drawdown and confirming that the pastoral bores and production wells are outside of the predicted radius of influence from pit dewatering (Figure 27) | Quarterly monitoring of groundwater levels in monitoring bores within the ML (A, B, C, TP004, TC006, PWR019 and GP054R) indicates SWLs are within 30% of modelled levels at those locations and times | Compliant | SWL measured during the reporting period (see Figure A2, Appendix A) indicates that groundwater drawdown is within modelled parameters (Jacobs 2016)<br>Pit has not intersected groundwater during the reporting period<br>TGO-PLN-005-Groundwater |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | | | | | Management Plan<br><br>See Appendix A for summary results<br><br>NB bores TMB1, TMB2, TMB3 assessed for LIC. |
| T21 | No adverse impact to the quality and quantity of groundwater to existing users and groundwater environmental value caused by mining operations | <u>Quality to existing users</u><br><br>Six monthly monitoring of water quality parameters (pH, EC, TDS, metals) at operational groundwater monitoring wells (A, B, C, TP004, TC006, PWR019 and GP054R) confirms that there is no reduction in water quality compared to that observed in boundary (trigger) groundwater monitoring wells (TTW1, TTW2) by comparing average concentrations for each data set (operational and trigger wells) for each sampling round to demonstrate that the rate of increase in average concentrations in the operational wells will not be more than 20% greater than the rate of change in average concentrations in trigger wells over the operational period for EC, TDS and metals and that pH in each operational well will not be reduced by more than 1 pH unit compared to average pH for the trigger wells | Quarterly field measurements of pH, EC and TDS in monitoring bores within the ML (A, B, C, TP004, TC006, PWR019 and GP054R) are within 20% of baseline levels (Figure 47) | Compliant | Groundwater was assessed on times during the reporting period (baseline and 2 subsequent monitoring rounds) and groundwater field results show levels are within 20% of baseline<br><br>(Baseline groundwater quality is defined as data from the trigger wells)<br><br>See Appendix A for summary results<br><br>TGO-PLN-005-Groundwater Management Plan<br><br>NB bores TMB1, TMB2, TMB3 assessed for LIC. |
| T22 | No adverse impact to the quality and quantity of groundwater to existing users and groundwater environmental value caused by | <u>Fuel storage</u><br><br>Six monthly monitoring of parameters (anthropogenic TRH) in operational groundwater monitoring wells (A, B, C, TP004, TC006, PWR019 and GP054R) (Figure 48) indicates TRH concentrations are less than the laboratory limit of detection or within 10% of | Results of soil validation sampling undertaken after soil removal from oil and fuel spill or leak sites demonstrates no residual TRH | Compliant | No spills requiring soil validation were reported during the reporting period.<br><br>Groundwater field results show pH, EC, TDS levels are |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | mining operations | baseline concentrations should TRH be detected in baseline samples<br><br><u>Protecting environmental values</u><br><br>Six monthly groundwater monitoring of water quality parameters (pH, EC, TDS) at operational groundwater monitoring wells (A, B, C, TP004, TC006, PWR019 and GP054R) (Figure 48) demonstrates that there is no reduction in groundwater environmental value and beneficial use based on TDS (EPP (WQ)) compared to the environmental value and beneficial use attributed to groundwater in the mining area prior to commencement of mining | concentrations in soil<br><br>Quarterly field measurements of pH, EC, TDS in monitoring bores within the ML are within 20% of baseline levels (Figure 48) | | within 20% of baseline and 10% of baseline TRH concentrations<br><br>TGO-PLN-005-Groundwater Management Plan<br><br>See Appendix A for summary results |

**Table 11 Surface Water**

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| T25 | No long term impact on local environmental values as a result of changes to flows or surface water quality characteristics | See Surface Water outcome measurement criteria for T27 | N/A | Unable to demonstrate compliance | There were insufficient surface water flows to allow safe collection of samples during the reporting period.<br><br>It is unlikely that mining operations have impacted the WDE and water quality to date, given the absence of surface water flows.<br><br>TGO-PLN-11-Surface Water Management Plan |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| T26 | Mining operations do not cause inundation of third party property and infrastructure by water (to a greater extent than would be expected to occur prior to mining operations commencing ) | Results of annual audits demonstrate that any inundation of third party property could not reasonably have been prevented and records will demonstrate that surface water control infrastructure is inspected, monitored and maintained and that corrective actions are implemented for all incidents and that mining operations are not adversely impacting ARTC"s rail infrastructure<br><br>Results of visual assessments of the extent of water pooling following intense rainfall events shows that water pooling extent at and beyond the lease boundary post rainfall event is within 20% of the predicted model (LBWep 2016, Appendix B) for a rainfall event of that depth and duration (recorded by local rain gauge and verified by BOM records) and that no off-site inundation of ARTC rail infrastructure occurs, unless for extreme ARI (100 yr and 1000 yr) events (as predicted by the model) | Any incident of stormwater control infrastructure not being maintained or having failed | Compliant | No surface water flows resulting in inundation of third party property during reporting period were recorded<br><br>TGO-PLN-11-Surface Water Management Plan covers on site compliance requirements<br><br>An audit has been conducted, reviewing Daily Shift Supervisor checklist which includes surface water control infrastructure inspections and these were found to be occurring-see section 12<br><br>Visual assessments have been conducted after intense rainfall events, confirming no water pooling at or beyond the lease boundary |
| T27 | No surface water contaminated as a result of mining operations leaves the mining lease area or results in increased sediment load off the lease area | Results of annual audits of inspection, monitoring and maintenance, incident and corrective action records, will demonstrate that sediment traps, toe drains, diversions and any other surface water and sediment control infrastructure is effectively managing surface water flows and containing sediment, particularly following | Any incident of stormwater control infrastructure not being maintained<br><br>Observations as part of operational inspection protocols identify potential issue with surface water quality (sediment load) | Compliant | No surface water flows allowing safe collection during reporting period were recorded<br><br>TGO-PLN-11-Surface Water Management Plan |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | | intense or prolonged rainfall events, from mining operations<br>Water quality monitoring (TSS, pH, metals) at surface water monitoring locations (Figure 49 ) when adequate water flows allow manual sampling, demonstrates that surface water quality of flows off-lease meet the following:<br>⁾ pH measured >6<br>⁾ metals concentrations below ANZECC fresh water criteria<br>⁾ TSS within 20% of that measured in a background location not affected by mining operations | | | |
| T28 | No surface water contaminated as a result of mining operations leaves the mining lease area or results in increased sediment load off the lease area | See outcome measurement criteria for soil (T43) | | Compliant | Movement records are collected and reviewed on a monthly basis, photo monitoring of stockpiles occurs to record changes in native vegetation and erosion<br>TGO-PLN-10-Soil Management Plan is implemented and addresses compliance criteria |
| T34 | No impacts to groundwater, surface water, soil and land use from PAF material | Monthly monitoring of saturation levels below the NAF base layer of the PAF cell measured by static pressure provided by two piezometers installed into or below the NAF | Field pH measurements of surface water collected in the WRF toe drain, following every rainfall event that produces a monitorable surface water flow, demonstrate that runoff pH from the WRF is | Unable to demonstrate compliance | Baseline dry pressure still to be established<br>Two sets of quarterly monitoring data have been |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | within the waste rock facility and open pit | base layer at locations near the centre and near the western edge, will demonstrate that no seepage is occurring if measured static pressure during operation is within 50% of baseline (dry pressure measured during construction) | > 6 Decreasing pH measurements during a monitoring period; or any event pH measurements of any water ponding in the WRF bund are <7<br><br>Monthly monitoring of saturation levels within the NAF base layer of the PAF cell measured by installed piezometers, will indicate that no seepage is occurring<br><br>Weekly operation reports completed by site personnel as part of operational controls for classification and placement QA/QC protocols for PAF/NAF demonstrates PAF is contained in accordance with design specifications (Appendix J)<br><br>Permeability tests (hydraulic conductivity) of the constructed NAF base prior to PAF placement indicate permeability is at a maximum of 10-2 m/day, demonstrating minimised possibility of seepage through the NAF base | | obtained to date (August 2017 and December 2017, which is outside of the reporting period). Data will continue to be collated to determine a suitable baseline<br><br>No surface water runoff from the WRF or in the toe drain has been observed during the reporting period<br><br>Tarcoola ARD Sample Register – records all PAF/NAF sampling undertaken at Tarcoola<br><br>Monthly reconciliations demonstrate NAF is being placed in appropriate locations<br><br>TGO-PLN-001-ARD Management Plan |

**Table 12 Acid Rock Drainage**

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| T36 | No impacts to groundwater, surface water, soil and land use from PAF material within the waste rock facility and open pit | See Surface Water T87, T88 Outcome measurement criteria, Measurement Criteria and Leading indicator criteria<br>See Groundwater T77, T78 Outcome measurement criteria, Measurement Criteria and Leading indicator criteria | Field pH measurements of surface water collected in the WRF toe drain, following every rainfall event that produces a monitorable surface water flow, demonstrate that runoff pH from the WRF is > 6 Decreasing pH measurements during a monitoring period; or any event pH measurements of any water ponding in the WRF bund are <7<br>Quarterly monitoring of saturation levels within the NAF base layer of the PAF cell measured by installed piezometers, will indicate that no seepage is occurring<br>Weekly reconciliations completed by site personnel as part of operational controls for classification and placement QA/QC protocols for PAF/NAF demonstrates PAF is contained in accordance with design specifications (Appendix J)<br>Permeability tests (hydraulic conductivity) of the constructed NAF base prior to PAF placement indicate permeability is at an maximum of $10^{-2}$ m/day, demonstrating minimised possibility of seepage through the NAF base<br>Implementation and compliance with ARD Management Plan (Appendix L) | Unable to demonstrate compliance | There was insufficient surface water flows to allow safe collection of surface waters samples during the reporting period.<br>QA/QC protocols for placement of PAF/NAF demonstrate PAF placement with in the PAF cell<br>TGO-PLN-001-ARD Management Plan has been implemented and addresses the compliance criteria<br>Falling Head permeability test (Golder Associates 2017) and Waste Rock Dump Compaction and Permeability testing (Connect Consulting Australia 2017) indicates that hydraulic conductivity is at an order of magnitude of $10^{-2}$ m/day<br>Piezometers are establishing a baseline dataset. Data will continue to be collected |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| Completion T77 | No compromise to the groundwater quantity and quality to other users and groundwater environmental value post mine completion | 6-monthly measurements of water quality parameters (pH, EC, TDS, metals) at operational groundwater monitoring wells (A, B, C, TP004, TC006, PWR019 and GP054R) (Figure 48) for three consecutive sampling events, indicate results are within an acceptable range of average values observed in boundary (trigger) groundwater monitoring wells (TTW1, TTW2) demonstrated by ) a comparison of plotting the average concentration determined for each data set (operational and trigger wells) for EC and metals for each sampling round and demonstrating that the rate of increase in average concentrations in the operational wells is not more than 20% greater than the rate of change in average concentrations in trigger wells over the monitoring period ) pH in each operational monitoring well not reduced by more than 1 pH unit compared to average pH for the trigger wells 6-monthly SWL gauging at the installed boundary (trigger) groundwater monitoring wells (TTW1 and TTW2) and existing monitoring bores (A, B, C, TP004, TC006, PWR019 and GP054R) confirms that the net hydraulic gradient in WRF area is towards the pit as per the groundwater model<br><br>A Groundwater Assessment Report for closure prepared by an independent, qualified and experienced professional verifies that groundwater | N/A | Unable to demonstrate compliance | Insufficient monitoring rounds completed to assess compliance.<br><br>TGO-PLN-005-Groundwater Management Plan has been implemented and addresses the compliance criteria<br><br>Groundwater sampling results (see Appendix A) |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | | levels, quality and pit hydraulic gradient demonstrates achievement of the outcome | | | |
| Completion T78 | No compromise to the groundwater quantity and quality to other users and groundwater environmental value post mine completion | 6-monthly measurements of water quality parameters (pH, EC, TDS, metals) at operational groundwater monitoring wells (A, B, C, TP004, TC006, PWR019 and GP054R) (Figure 48) for three consecutive sampling events, indicate results are within an acceptable range of average values observed in boundary (trigger) groundwater monitoring wells (TTW1, TTW2) demonstrated by ) a comparison of plotting the average concentration determined for each data set (operational and trigger wells) for EC and metals for each sampling round and demonstrating that the rate of increase in average concentrations in the operational wells is not more than 20% greater than the rate of change in average concentrations in trigger wells over the monitoring period ) pH in each operational monitoring well not reduced by more than 1 pH unit compared to average pH for the trigger wells 6-monthly SWL gauging at the installed boundary (trigger) groundwater monitoring wells (TTW1 and TTW2) and existing monitoring bores (A, B, C, TP004, TC006, PWR019 and GP054R) confirms that the net hydraulic gradient in WRF area is towards the pit as per the groundwater model | N/A | Unable to demonstrate compliance | Insufficient monitoring rounds completed to assess compliance.<br>Groundwater sampling results (see Appendix A)<br>Groundwater data is being collected during operations, however only two sampling events have been undertaken to date<br>TGO-PLN-005-Groundwater Management Plan has been implemented and addresses the compliance criteria |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| Completion T87 | No surface water contaminated prior to mine completion remains within the land after mine completion<br>No contamination of surface water occurs after mine completion as a result of mining operations | Sampling of surface waters at fixed sampling locations (Figure 48), for each rainfall event where adequate flows allow a sample/s to be collected and analysis of water quality (TSS, pH, metals, TRH), demonstrates no surface water contaminated from mining operations leaves the ML | N/A | Unable to demonstrate compliance | No adequate surface water flows to facilitate manual sampling |
| Completion T88 | No surface water contaminated prior to mine completion remains within the land after mine completion<br>No contamination of surface water occurs after mine completion as a result of mining operations | Prior to mine completion, results of an audit report independently prepared by a suitably qualified and experienced professional at closure demonstrates that the WRF structure is stable and that all infrastructure and waste has been removed from the ML (Figure 54) | N/A | Unable to demonstrate compliance-Operational Phase of mining activity | WRF is currently under construction<br>TGO-PLN-001-ARD Management Plan |

**Table 13 Air, Soil & Land Disturbance, Asbestiform Minerals**

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| T38 | No public health and/or public nuisance impacts to local residents from air emissions and/or dust generated by mining operations | Investigation of all dust related complaints were acknowledged within 48 hours and closed out with the complainant within 7 days to the satisfaction of the complainant or as agreed with the DSD and demonstrates that the mine operator did not cause or could not reasonably have prevented the incident from occurring. If a complaint is not resolved, the tenement holder will undertake monitoring of air emissions (using methodologies and instrumentation acceptable to DSD), to demonstrate that dust emissions are within applicable regulatory levels. | N/A | Compliant | No incidents/compl aints recorded during the reporting period |
| T43 | Existing (pre-mining) soil quantity and quality is maintained | Results of annual audits of survey, inspection, as construct reports, maintenance, incident and corrective action records demonstrate that all available topsoil is/was stripped, stockpiled, managed and reused, and that any losses of topsoil could not have reasonably been prevented<br><br>Prior to mine completion results of soil sampling results and analysis concludes that the quality of soils on the lease (as determined by pH, salinity and the presence of metals and TRH) is consistent with or within 10% of the baseline site assessment (to be completed) | Records maintained on site demonstrate that topsoil and subsoil have been stripped, stockpiled in delineated and labelled stockpile locations, in accordance with the Soil Management Plan<br><br>Sampling of surface water pooling in higher risk areas - WRF and ROM pad demonstrates that metals, pH and TRH are within baseline limits or EPP (Water Quality) 2015<br><br>Annual audit reports of bunding and fuel, oil and chemical storage management, and of inspection, maintenance, incident and | Compliant | Movement records are collected and reviewed on a monthly basis, photo monitoring of stockpiles occurs to record changes in native vegetation and erosion<br><br>TGO-PLN-10-Soil Management Plan is implemented and addresses compliance criteria |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | | | corrective action records, demonstrate that facilities are designed and constructed in accordance with relevant EPA Guidelines (EPA 080/07) and industry standards, and operated to best practice | | |
| T53 | No risk to human health from asbestiform minerals | Mine records demonstrate that upon discovery of asbestiform minerals the Fibrous Minerals Management Plan and procedures were complied with | Operational monitoring for fibrous minerals as part of WHS protocols | Compliant | Review of records and staff advice indicate no asbestiform materials have been identified through operation activities during the reporting period. |

**Table 14 Heritage**

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| T49 | No disturbance to Aboriginal heritage sites, objects or artefacts unless prior approval under the relevant legislation has been obtained | Mine records demonstrate that upon discoveries of suspected Aboriginal heritage sites, objects or artefacts, work ceased until appropriate authorisation under the relevant legislation was obtained | N/A | Compliant | A review of incident records and staff advice indicate no suspected heritage sites have been uncovered during the reporting period |
| T50 | No disturbance to non Aboriginal heritage sites | Results of annual audits of records and incident and corrective action reports, demonstrates compliance with | N/A | Compliant | A review of incident records and staff advice indicate no |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | and objects unless prior approval under the relevant legislation has been obtained | Heritage Places Act 1993, and approved Heritage Management Plan | | | disturbance incidents have been recorded during the reporting period<br>TGO-PLN-006-Heritage Management Plan addresses actions to be taken, should heritage sites be observed |

**Table 15 Waste, Public Safety and Third-Party Infrastructure**

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| T48 | No traffic accidents involving the public at mine access points or along the haul route that could have been reasonably prevented by the tenement holder | Independent investigations undertaken within 14 days (or other time period as agreed with the DSD) of all recorded traffic accidents at mine access points or along the haul route conclude that they could not have been reasonably prevented through implementation of precautionary measures or not due to traffic related to the mining operation | N/A | Compliant | A review of records indicates no incidents have been recorded during the reporting period |
| T62<br>T63 | No adverse impacts to:<br>⎩ public safety<br>⎩ adjacent public roads<br>⎩ adjacent railway infrastructure and operations<br>⎩ third party property (including stock)<br>⎩ aircraft and | Blast records kept on site (and provided to DSD on request) demonstrate that vibration and air-blast overpressure for each blast has been measured at locations specified in Appendix C, and that they are compliant with the current AS 2187.2, and that all exceedances have been investigated and the cause recorded and rectified, and that there has been no fly rock beyond mining lease or unplanned fly rock events | N/A | Compliant | Blast records have been reviewed and have been observed to be in compliance with AS 2187.2 for vibration and overpressure (noise)<br>No incidents have been recorded during |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | other receptors<br>from air blast, fly rock and vibrations caused by blasting | | | | the reporting period |
| T64 | Unauthorised entry to the ML does not result in public injuries and/or deaths that could have been reasonably prevented | The incident is investigated by an independent third party and completed within 14 days or as agreed with DSD and concludes that any injury and or death to the public through unauthorised entry could not have been reasonably prevented | Near Miss Reports | Compliant | No incidents have been recorded during the reporting period |
| T65 | No adverse impact to public as a result of transport of fuels to site (including explosives) | The incident is investigated by an independent third within and completed within 14 days or as agreed with DSD and concludes that no adverse impact to public health and safety has occurred or could not have been reasonably prevented | Near Miss Reports | Compliant | No incidents have been recorded during the reporting period |
| T132 | All industrial and commercial waste is disposed of in accordance with relevant legislation | Results of annual audits undertaken by an independent, qualified and experienced professional of waste management records, processes and procedures, demonstrate that all industrial and commercial waste is disposed of in accordance with relevant legislation | N/A | Compliant | Wastes have been managed in accordance with legislative requirements<br>Waste tracking forms are retained to demonstrate waste disposal |
| T133 | No adverse impact to public as a result of transport of ore from Tarcoola to Challenger that could have been reasonably prevented | A report by an independent third party is completed within 14 days or as agreed with DSD and concludes that any injury and or death to the public through an accident at the rail crossing could not have been reasonably prevented | Near Miss Reports | Compliant | No incidents have been recorded during the reporting period |
| T134 | Unauthorised entry to the haul road does not result in public injuries and/or | A report by an independent third party is completed within 14 days or as agreed with DSD and concludes that any injury and or death to the public through | Near Miss Reports | Compliant | No incidents have been recorded during |

| Impact ID | Outcome | Outcome measurement criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | deaths that could have been reasonably prevented | unauthorised entry could not have been reasonably prevented | | | the reporting period |
| T66<br>T70<br>T71 | No adverse impacts to third party land use and no unauthorised damage to adjacent public or private property and infrastructure as a result of mining operations (including uncontrolled fires and geotechnical failure),other than those agreed between the Tenement Holder and the affected user | Records of investigations carried out within 14 days or as agreed by DSD show that damage (including caused by uncontrolled fires) to adjacent public or private property and infrastructure was not attributable to mining operations | Near Miss Reports | Compliant | No incidents have been recorded during the reporting period |

Environmental incidents are reported internally for action and record keeping using the Quality Health Safety and Environment Management System tool (QHSE) . A summary of the environmental incidents recorded during the reporting period is presented in Table 16.

All hydrocarbon spills recorded during the reporting period occurred on operational areas of the ML, they were all cleaned up in line with the spill management guidelines outlined in TGO-PLN-004.

**Table 16 Internal Incident Reporting**

| Incident ID | Date | Details | Outcomes |
|---|---|---|---|
| 7245 | 22/12/2016 | Vehicle struck kangaroo and killed it when returning from Challenger to Tarcoola. | Following a number of similar events, driving outside of daylight hours except where absolutely necessary was restricted |

| Incident ID | Date | Details | Outcomes |
|---|---|---|---|
| 7118 | 15/02/2017 | Operator failed to turn on gate valve when starting a water bore pump, resulting in a discharge of saline water on the ground near the bore. Estimated water discharge was around 2kl. | Operator wasn't aware of correct process and was retrained |
| 7182 | 15/02/2017 | After the commissioning of the new fuel farm, the HiFlow attachment failed to cut out upon removal from a truck during refuelling, causing a fuel spill of approximately 100l. | Cardboard and cellophane were discovered within the nozzle (from commissioning). They were removed from the nozzle and attachment returned to operation. Fuel spill was cleaned up from pad |
| 7252 | 12/05/2017 | At approx 0600hrs when travelling to Glendambo in LV385, a small kangaroo was struck and killed. | Following a number of similar events, driving outside of daylight hours except where absolutely necessary was restricted |
| 7302 | 06/06/2017 | A tap from a hose connected to an oil pod was left slightly open by persons unknown, allowing oil into a hose which overhung the containment bund. Approximately 100l of oil escaped the containment bund onto the work pad in the workshop area. | Spill was cleaned up. Oil distribution system in containment bund simplified to minimise risk of reoccurrence |
| 7338 | 02/07/2017 | While undertaking refuelling of the quad road train using the quick fill, the quick fill did not cut off and approx 50L of diesel spilled to the pad. | Investigation revealed fault with breather tubes in fuel tanks which caused the incident. Breather tubes replaced on truck and all others inspected for similar issues |
| 7348 | 09/07/2017 | Whilst travelling back to site along the rail access road, a collision occurred between 2 emus and LV446. Both emus were killed. | Following a number of similar events, driving outside of daylight hours except where absolutely necessary was restricted |
| 7349 | 10/07/2017 | While moving a broken down dump truck to a more suitable position to undertake repairs, a hydraulic hose failed allowing between 20-40L of hydraulic fluid to escape to ground in the waste dump. | Hose was repaired and spill was cleaned up |
| 7386 | 31/07/2017 | A Hydraulic hose burst on drill rig whilst performing rod change out, spilling approximately 10l of oil. | Hose was repaired and spill was cleaned up |

| Incident ID | Date | Details | Outcomes |
|---|---|---|---|
| 7400 | 11/08/2017 | An outlet join in a potable water tank failed and approximately 6,000 litres of potable water was lost | Outlet join was repaired and tank returned to service |
| 9416 | 29/08/2017 | A kangaroo was struck and killed by light vehicle as vehicle was leaving the mine site | Following a number of similar events, driving outside of daylight hours except where absolutely necessary was restricted |
| 9430 | 09/09/2017 | A kangaroo was struck by a light vehicle whilst driving to site. Kangaroo was killed in the incident. | Following a number of similar events, driving outside of daylight hours except where absolutely necessary was restricted |

## 8.2 Compliance with Non-Outcome Based Mining Lease Conditions

**Table 17 Compliance with non-outcome based Mining Lease conditions**

| Lease Condition | Compliance Status | Summary and supporting evidence of compliance status determination |
|---|---|---|
| 21. The Tenement Holder must not carry out mining operations unless there is an approved program for environment protection and rehabilitation (an approved PEPR). | Compliant | PEPR was approved on 4 November 2016 (PEPR2016/044) |
| 25. In accordance with regulation 35 of the Regulations, unless otherwise determined or agreed by the Minister, the Tenement Holder must: 25.1. Commence mining operations in accordance with the APPROVED PEPR within twelve (12) months after its approval; and 25.2. Thereafter continue mining operations in accordance with the requirements of the program in the APPROVED PEPR. | Compliant | PEPR approved 4 November 2016, mining (removal of overburden/topsoil) began in December 2016 |
| **First Schedule: Additional Terms** | | |
| 1. The grant of the Mining Tenement authorises mining operations (only) for the recovery of: 1.1. Gold; and 1.2. Silver | Compliant | Ore material to be extracted for gold recovery and tracked through material movement records |
| 2. The grant of the Mining Tenement authorises mining operations (only) that are consistent with the mining operations described in the Mining Lease Proposal document dated 6 August 2015 | Compliant | Mining operations are consistent with the approved Mining Lease Proposal and Response Document |

| Lease Condition | Compliance Status | Summary and supporting evidence of compliance status determination |
|---|---|---|
| and subsequent Response Document dated 17 November 2015. | | |
| **Second Schedule: Additional Conditions** | | |
| 1. The Tenement Holder must ensure that no fly rock from the blasting activities undertaken on the land encroaches on the adjacent railways and the adjacent third party infrastructure unless the Tenement Holder obtains a registered Waiver of Exemption under the Act to undertake mining activities that would include such encroachment | Compliant | Blast records indicate no fly rock encroaching on adjacent third party infrastructure |
| 2. The Tenement Holder must develop and implement a blasting schedule in consultation with the owners and operators of the adjacent railways to ensure blasting does not coincide with trains passing the Mining Tenement. | Compliant | Blast management plan is in place and followed<br>Communication protocol has been followed for all blast events<br>Emails are sent to stakeholders to confirm blasting activity<br>Phone call notification is also made to specific stakeholders |
| 3. The Tenement Holder must notify the owners and operators of the adjacent railways of each blast within a timeframe determined in the communication protocol required by Second Schedule Condition 4. | Compliant | Blast management plan is in place and followed<br>Communication protocol has been followed for all blast events<br>Emails are sent to stakeholders to confirm blasting activity<br>Phone call notification is also made to specific stakeholders |
| 4. The Tenement Holder must develop (in consultation with the owners and operators of the adjacent railways and to the satisfaction of the Director of Mines or other authorised officer), a communication and operating protocol between the tenement holder and owners and operators of the adjacent railways prior to the commencement of mining operations that includes the following matters: 4.1. Notification of the owners and operators of the adjacent railways by the Tenement Holder of each proposed blast in advance of those blasts, within a timeframe determined between the Tenement Holder and the owners and operators of the adjacent railways; 4.2. A process to deal with an unanticipated change of blasting time and/or changes to the time that trains pass the Mining tenement; 4.3. Emergency procedures; and 4.4. Any matters identified by the Director of Mines or other authorised officer in writing. | Compliant | Blast management plan is in place and followed<br>Communication protocol is in place and has been followed for all blast events<br>Emails are sent to stakeholders to confirm blasting activity<br>Phone call notification is also made to specific stakeholders |

| Lease Condition | Compliance Status | Summary and supporting evidence of compliance status determination |
|---|---|---|
| 7. The Tenement Holder must comply with all State and Commonwealth legislation and regulations applicable to the activities undertaken pursuant the grant of the Mining Tenement including (but not limited to) the:<br>• *Aboriginal Heritage Act 1988*<br>• *Environment Protection Act 1993*<br>• *Environment Protection and Biodiversity Conservation Act 1999*<br>• *Development Act 1993*<br>• *Explosives Act 1936*<br>• *Dangerous Substances Act 1979*<br>• *Natural Resources Management Act 2004*<br>• *Public and Environmental Health Act 1987*<br>• *Heritage Places Act 1993*<br>• *Work Health and Safety Act 2012*<br>• *Native Vegetation Act 1991*<br>• *Mines and Works Inspection Act 1920*<br>• *Road Traffic Act 1961.* | Compliant | There have been no records of noncompliance with legislative requirements within the reporting period |

## 8.3 Compliance with Mine Closure Criteria

See Appendix D for compliance assessment against mine completion criteria not already included in Section 8.1, above.

## 8.4 Summary of Non-Compliances and Corrective Actions

There were no reported non-compliances with PEPR outcomes (operational or completion) during the 2017 reporting period.

Matters where compliance could not be confirmed typically relate to the absence of sufficient surface water for sample collection and completion criteria, whereby the actions to address the criteria cannot yet be undertaken, as TGO is still in the operational phase.

# 9. Reconciliation of Native Vegetation Clearance

Table 18 provides a summary of native vegetation clearance undertaken in the reporting period. The total area approved for clearance in the PEPR is 82.84 ha.

To support the existing mine plan, estimated clearance for the next reporting period is expected to be negligible.

**Table 18 Native vegetation clearance during the reporting period**

| Item | Clearance (ha) |
|---|---|
| Turkeys Nest | 0.55 |
| Workshop, Laydown and Fuel Bay | 3.07 |
| Roads + Office | 2.08 |
| Access Road | 2.66 |
| ROM and Haul Roads | 8.58 |
| WRD | 21.65 |
| Topsoil Subsoil Stockpiles | 3.85 |
| Pit | 12.25 |
| Magazine and Roads | 1.65 |
| Water Pipe Line | 0.00 |
| Exploration | 0.28 |
| **Total Cleared Area** | **56.62** |
| **Allowable Clearance (including dust deposition)** | **82.84** |
| **Total Remaining Allowance for Clearance** | **26.22** |

Note: figures in the table are subject to rounding

# 10. Technical Reports

Table 19 details the technical reports relevant to the Tarcoola PEPR outcome measurement criteria.

**Table 19 Technical reports received during the reporting period for Tarcoola operations**

| Report title | Report date | Author | Comments |
|---|---|---|---|
| Project Memo: Waste rock testing for Tarcoola Gold: Waste rock testing – Final results and conclusions | 15 February 2017 | SRK Consulting | Summary provided in Section 13.1<br>Full report to be provided to DPC separately |
| Assessment of the Proposed Slope Specifications for the Tarcoola Mine | March 2017 | Tony Meyers, Rocktest Consulting | A geotechnical review of the slope specifications of the Tarcoola Pit |
| Additional Geotechnical Advice Regarding the Proposed Slope Specifications for the Tarcoola Mine | April 2017 | Tony Meyers, Rocktest Consulting | Further geotechnical assessment of the slope specifications of the Tarcoola Pit |
| Seepage Infiltration Modelling Support | 29 May 2017 | Australian Water Environments | Summary provided in Section 13.3 |
| Technical Memorandum, Waste Rock Dump-Compaction Density and Permeability | 30 May 2017 | Connect Consulting Australia Pty Ltd | Summary provided in Section 13.2<br>Full report to be provided to DPC separately |
| Mineral Resource Estimate, Tarcoola South Australia 14th September 2017, CSA Global Report No. R313.2017 | September 2017 | Aaron Meakin, CSA Global Pty Ltd | Report used to populate tables in Section 4 |
| Tarcoola Opencut Gold Mine Ore Reserves Estimate as at 30th June 2017 | September 2017 | John Wyche, Australian Mine Design and Development Pty Ltd | Report used to populate tables in Section 4 |
| Tarcoola Gold Flora Fauna Monitoring Spring 2017 | November 2017 | Fyfe Pty Ltd | Summary provided in Appendix C<br>Full report to be provided to DPC separately |

# 11. Environmental Protection and Biodiversity Conservation Act Reporting

ML6455 is not subject to an approval under the *Environment Protection and Biodiversity Conservation Act 1999.*

# 12. Audits and Reviews

Audits were undertaken on the implementation of the Exact Mining daily shift supervisor checklist and the Exact Mining mechanical vehicle inspection forms. The audits were undertaken by the Tarcoola Environment Officer. See Table 20 and Table 21.

**Table 20 Shift supervisor daily checklist audit**

| Date audit undertaken | Date range audited | Audit component | Was the task completed? | Comments | Corrective Actions |
|---|---|---|---|---|---|
| 19 July 2017 | 13/7/17-17/7/17 | Are the surface water diversion ditches/drains free from debris and material (silt)? | Yes | | Nil |
| 19 July 2017 | 13/7/17-17/7/17 | Has the water bore line been checked for leaks and damage? | No | The boreline was not checked for the period | Environment Officer conducted an inspection of the boreline, finding no leaks/damage<br>Checklists for the week preceding and following the range of dates audited was reviewed as a corrective action. The bore line was inspected on the other dates reviewed.<br>Closed out 19 July 2017 |
| 11 October 2017 | 1/10/17-7/10/17 | Are the surface water diversion ditches/drains free from debris and material (silt)? | Yes | Item has been checked off every day | Nil |
| 11 October 2017 | 1/10/17-7/10/17 | Has the water bore line been checked for leaks and damage? | Yes | Item has been checked off every day | Nil |

Name of document audited - TARWHSFRM-008_Tarcoola Supervisors Shift Inspection (Ed. A Rev1)

**Table 21 Mechanical Vehicle Audit**

| Date audit undertaken | Vehicle check (yes) | Vehicle check (no) | Total vehicles audited | Comments | Corrective actions |
|---|---|---|---|---|---|
| 19 July 2017 | 2 | 1 | 3 | | |
| 11 October 2017 | 5 | 2 | 7 | Two vehicles did not have onsite mechanical check forms | Site communication issued requesting all mechanical checklists be provided to the Environment Officer for onsite storage |

Name of document audited - PLTFRM-003_Mobile Plant Mechanical Check Form (Ed. B Rev. 0)

# 13. Verification of Uncertainties

Environmental baseline data was collected during the reporting period to be used in subsequent reporting periods for validation and update of groundwater modelling and inform rehabilitation activities. (See Appendix A for groundwater data and Appendix C for summary of flora and fauna survey). See Section 14 for the forward work plans.

No environmental incidents recorded in the TGO QHSE system, required reporting to DPC during the reporting year.

There were no changes or failures to the mining operation or additional areas disturbed during the reporting year.

Additional studies were undertaken to evaluate potential for AMD, compaction density and permeability to provide additional data and interpretation to be used to develop a better understanding and reduce uncertainty around the seepage properties of the PAF cell within the WRF (See Section 13.1 and 13.2).

## 13.1 Waste rock testing

SRK Consulting undertook characterisation of two waste rock samples to provide preliminary information to evaluate the likely long-term erodibility (durability) of the waste rock samples tested, as well as their potential to generate acid and metalliferous drainage (AMD). The results were included in a letter report, *Waste rock testing for Tarcoola Gold: Waste rock testing – Final results and conclusions*, 15 February 2017.

The results from the tests suggest that both samples tested are of Good to Excellent quality in terms of durability, with the Quartzite is slightly better than Monzonite in terms of the strength (refer to Table 5-1), although it is likely that both could be classified as Good in terms of strength.

Geochemical characterisation has indicated that the Monzonite sample tested was NAF, with an excess of neutralisation capacity over acid generation potential. The Quartzite was classified as PAF; however, due to the low sulphide-S content (0.1 %), the quantities of acidity likely to be produced would be considered low. Based on geochemical abundance index (GAI) results, neither sample contains concentrations of elements considered to be significantly enriched. Short-term leach testing resulted in neutral to mildly alkaline leachates with relatively low solute concentrations.

**Table 5-1: Guide durability criteria summary for both Quartzite and Monzonite materials**

| Material Property | Excellent | Good | Marginal | Poor |
|---|---|---|---|---|
| Density (t/m³) | | | | |
| Porosity (%) | | | | |
| Lithology | | | | |
| Compressive strength (MPa) | | | | |
| Soundness (%) | | | | |
| Slake durability (%) | | | | |
| Slaking dispersion potential | | | | |

**Rock type:**
Quartzite
Monzonite

## 13.2 Waste Rock Dump-Compaction Density and Permeability

Connect Consulting were engaged to undertake field density testing on the waste rock at Tarcoola mine and issued a technical memorandum *Waste Rock Dump – Compaction Density and Permeability, Connect Consulting*, 30 May 2017.

Each of the materials tested are classified as Silty Gravelly CLAY.

All tests were compacted with a Standard compaction effort as per AS1289.

Figure 1 is a plot of the test results in relation to density and permeability. Figure 1 identifies through extrapolation of the previous permeability results that the three tests conducted on the Silty Gravelly CLAY material are likely to have significantly less permeability based on the density ratio. The estimated permeability approximately ranges from 0.028 m/day to 0.032 m/day.

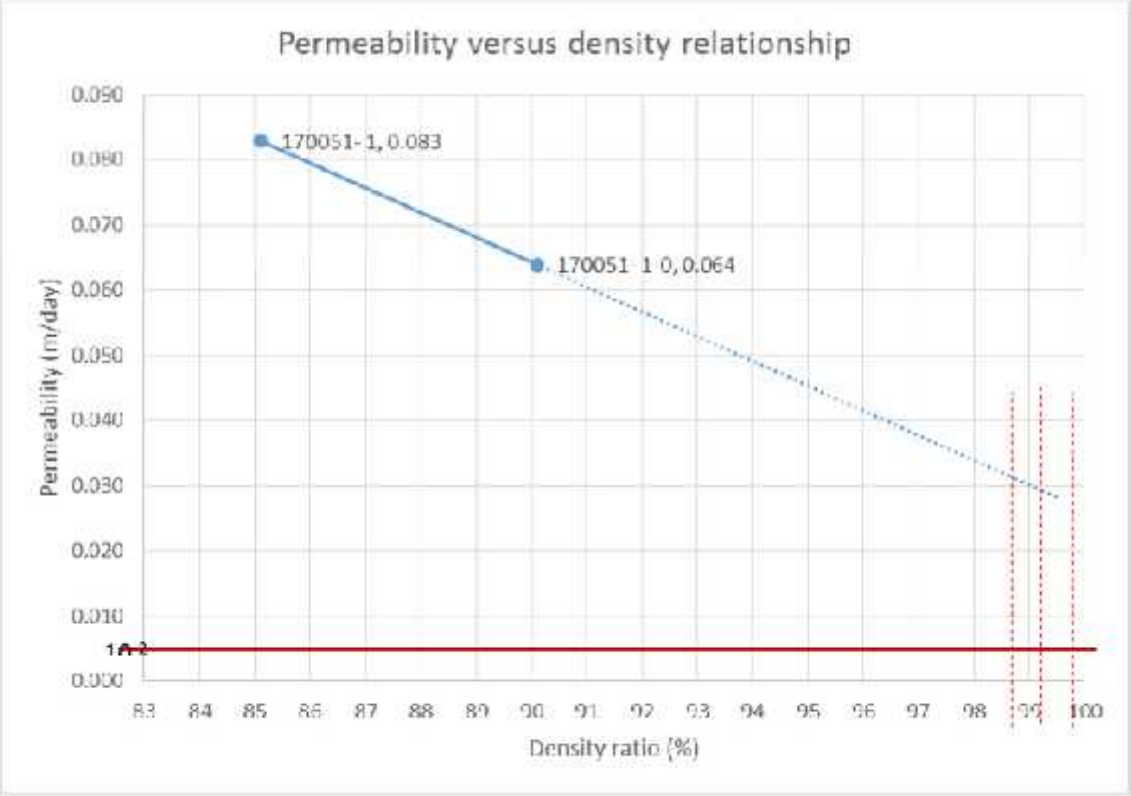


**Figure 1.** Permeability versus Relative Density for all test results.

Based on the previous test work, the field density tests and the extrapolated permeability relationship illustrated in Figure 1, the Silty Gravelly CLAY material being emplaced in the waste rock dump is within the order of magnitude required by the Tarcoola Gold PEPR for permeability. Permeability and particle size has an approximate direct relationship, such that the smaller the particles the less permeable the material; suitably compacted clay material has a lower permeability than a compacted sands and gravels. This relationship confirms that relative to the permeability tested Silty GRAVEL material, the Silty Gravelly CLAY would have less permeability.

## 13.3 Seepage Infiltration Modelling

Australian Water Environments were engaged to conduct seepage modelling to assess potential infiltration rates on the WRF.

The conservatively assumed compaction rate on the WRF, from dump and traffic compaction, was used to estimate an infiltration rate of 10-2 m/day.

Seepage modelling of the worst case scenario indicated an infiltration rate through the NAF material is in the order of 10-2 m/day for a 1 in 100 year ARI (72 hour) rainfall event, with a maximum ponding depth of 140 mm. Given the worst case rainfall event causes saturation of only 30% of the WRF NAF cap at the design achievable compaction, unforeseen reduction in the achieved compaction would need to be significant for moisture to penetrate the 7 m buffer the modelling demonstrates. Hence the risk of PAF exposure is very low, even if the 10-2 m/day permeability were not to be achieved.

The results of seepage modelling confirm a maximum expected infiltration of 3.14m after 40 days following a 1 in 100 year ARI storm duration of 72 hours (152.6mm). As the cover is placed over a minimum of 10m of compacted waste rock surface, it acts in concert with the low permeability material to enhance the surficial moisture retention whilst significantly reducing the water load to be managed by infiltration.

Seepage modelling indicates that there is no likelihood of stored surface water to infiltrate the WRF sufficient to and interact with the PAF. The effectiveness of the store-and-release cover is a function of its design and construction, and provides an extra level of protection over and above what is already in place. The top surface has been designed with an undulating form to maximise the surface area. This increased surface area maximises evaporation. The material in the surface cover also enhances the moisture retaining characteristics and encourages the growth of vegetation which will over time enhance overall water-loss rates by stimulating both evaporation and transpiration.

On the basis of seepage modelling, the level and degree of compaction achieved by standard dump compactions is considered adequate.

# 14. Forward Work Plans

Table 22**Error! Not a valid bookmark self-reference.** provides the forward work plan from the PEPR. An update on the status of the forward work plan items is included.

**Table 22 Tarcoola forward work plan**

| Activity | Start Date | Completion Date | Planned Date for Submission | Justification of Timing for Works | Responsibility | Current Status |
|---|---|---|---|---|---|---|
| Desktop hydrological assessment and surface water model to be validated by operational observations, monitoring as operations, in particular the WRF, is progressed | 2017 | 2020 | Compliance report | Ongoing review and validation to inform operational and closure management and monitoring | Tarcoola Gold Mining Manager, Environment Officer and hydrological consultants, as required | Operational data collected during the reporting period |
| Trials of alternative methods of soil application for rehabilitation activities (to facilitate optimum revegetation) | 2018 | 2019 | Compliance report | Results obtained can be collated in readiness for final rehabilitation specific for localised areas to achieve best results for revegetation | Tarcoola Gold Mining Manager, Environment Officer and external ecological consultants, as required | No action taken during reporting year |
| Conduct ecosystem function analysis (EFA), or similar to determine success of rehabilitated sites (as recommended by ecological advice) and adjust rehabilitation activities as appropriate based on the results | 2018 | 2020 | Compliance report | Aligned with progressive rehabilitation schedule | Tarcoola Gold Mining Manager, Environment Officer and external specialist ecological consultants, as required | Operational data was obtained during the 2017 flora survey (Fyfe 2017) |
| Groundwater model validation with operational monitoring data | 2018 | 2018 | To be submitted to DPC in 2018<br>PEPR update | Requires operational data from ongoing groundwater monitoring program | Tarcoola Gold Mining Manager, Environment Officer and hydrological consultants, as required | Operational monitoring data collated for 2017 |

| Activity | Start Date | Completion Date | Planned Date for Submission | Justification of Timing for Works | Responsibility | Current Status |
|---|---|---|---|---|---|---|
| Detailed land-use and infrastructure plan to be established in collaboration with DEWNR during operations in preparation for closure | 2018 | 2019 | To be submitted to DPC upon establishment of agreement with DEWNR | Ongoing consultation with DEWNR will include a “close out" with an agreed Final Land Use and Infrastructure Plan for the site DPC will be periodically informed of progress during the consultation process | Tarcoola Gold Mining Manager | No action taken during reporting year |
| PEPR review | 2018 | 2018 | To be submitted to DPC in late 2018 | Review of PEPR leading up to closure to consider operational environmental monitoring; updated environmental assessments, modelling and other works; ongoing community and stakeholder consultation; and as the Land Use Plan is finalised with DEWNR | Tarcoola Gold Mining Manager, Environment Officer and external specialist consultants, as required | No action taken during reporting year |

# 15. Ministerial Determination Checklist

**Table 23 Ministerial Determination Checklist**

| Section | ACR Reference |
|---|---|
| **Executive summary** | |
| **1. Introduction** | Section 3 |
| Tenement number(s) | |
| Name of the mine operation | |
| General location details | |
| Name(s) of the mine owner and mine operator(s) | |
| Site Contact | |
| Registered Mine Manager, *Mines Works Inspection Act, 1920* | |
| Reference and approved date of relevant PEPR being reported against | |
| Person accepting responsibility for the report | |
| Dates of the reporting period for the report | |
| Date of preparation of the report. | |
| **2. Executive Declaration** | Section 2 |
| **3. Tenements** | Section 3.3 |
| Summary table of all tenements including ML, MPL, EML etc. | |
| **4. Other Licences, Permits, Waivers, Native Title and Agreements** | Section 3.4 |
| Summary table of all licences, permits, waivers, native title and other agreements relevant to the PEPR. | |
| Where applicable, provide a statement that all waivers for exempt land required for the current operation are in place in accordance with the Mining Act | Section 3.4 |
| **5. Mining operations** | |
| ***Ore reserves and mine life***<br>New delineation or exploration drilling activities on or off the lease (if required)<br>Review of reserves (if required)<br>Other potential sources of ore (e.g. from nearby mines) (if required) | Section 4.1 |

| Section | ACR Reference |
|---|---|
| ***Overburden, Ore and Concentrate***<br>Overburden<br>Ore<br>Concentrate | Section 4 |
| **6. Voluntary information** | Section 5 |
| **7. Project Variation Summary** | Section 6 |
| Summary table of any changes/project variations submitted to DPC | |
| **8. Complaints** | Section 7 |
| Summary table of complaints made by members of the public during the reporting period | |
| Indicate how concerns or complaints by third parties were addressed. | |
| **9. Compliance Summary** | Section 8.4 |
| Summary table of non-compliances (if relevant) | |
| **10. Compliance Tables** | Section 8 |
| For **each** outcome in PEPR state if "complied", "not complied", or "unable to demonstrate compliance" | |
| For **each** outcome in the PEPR provide summary criteria data that supports the conclusion above | |
| For **each** lease or licence condition (other than environmental outcomes) state if "complied", "not complied", or "unable to demonstrate compliance" | |
| For each leading indicator criterion state if any were triggered in the reporting period | |
| If triggered, **(if required)** | |
| ) What actions were taken | |
| ) An assessment of the effectiveness of the current control strategies or criteria | |
| **10.1 Closure** | Section 8.3 & Appendix D |
| Where native vegetation has been cleared in the reporting period, the following must be included: (if required):<br>) a reconciliation between the approved maximum clearance in hectares,<br>) the amount cleared in the reporting period,<br>) the total amount cleared to date,<br>) an estimated amount to be cleared in the next reporting period. | |

| Section | ACR Reference |
|---|---|
| **11. Non-Outcome Based Lease Conditions** | Section 8.2 |
| If you have any lease conditions which do not have an outcome measurement criteria relating to it please list the compliance status and evidence against **each** condition in a summary table | |
| **12. Rectification of Non-Compliances** | Section 8.4 |
| If a "not complied" is recorded, the following must be included: (if required) | |
| ) date of the incident | |
| ) state if the incident was a Reportable Incident under Regulation 87. If so the report must also state the date the incident was initially reported to the Minister and the date the written report was provided to the Minister. | |
| ) what environmental outcome or lease condition was breached | |
| ) if and how the noncompliance was, or is planned to be, rectified | |
| ) what measures, if any, will be taken to prevent recurrence. | |
| Progress update on previous non-compliances not fully rectified at time of last report | |
| **13. Disturbance and Rehabilitation Activities**<br>Information on areas disturbed and current rehabilitation status<br>The amount of land disturbed<br>Vegetation cleared<br>New measures implemented to avoid or control environmental impact<br>Revegetation or rehabilitation earthworks conducted.<br>Evidence (by using closure and rehabilitation criteria in the current approved PEPR) of the effectiveness of rehabilitation being progressively undertaken.<br>Any problems or potential improvements learned from previous rehabilitation<br>An assessment of risks that rehabilitation may or may not be achieved as planned<br>New strategies to be undertaken to achieve rehabilitation outcomes (if required) | Section 9<br>Appendix B |
| **14. Environment Protection and Biodiversity Conservation Act reporting** | Section 11 |
| Demonstration of compliance with EPBC conditions (if required) | |
| **15. Audits and Reviews**<br>If an audit or review of any part of the operation management system was conducted during the reporting period, the following information on the audit or review must be included: (if required)<br>) when the audit or review was undertaken<br>) who undertook the audit or review<br>) what aspect(s) of the management system was/were audited/reviewed<br>) what issues, or recommendations for improvement, were noted<br>) an assessment of the potential for any issues identified in the audit/review to lead to a noncompliance with approved environmental outcomes | Section 12 |

| Section | ACR Reference |
|---|---|
| ) what corrective action that has or will be taken to address any issues. | |
| **16. Verification of Uncertainties**<br>Changes or failures of mining operations<br>Increases to areas disturbed<br>New baseline environmental data<br>Reported to DPC<br>Uncertainties table | Section 13 |
| **17. Technical Reports** | |
| Summary of technical data studies and reports generated in reporting period | Section 10 & Section 13 |
| **18. Forward Work Plan** | Section 14 |
| Action description | |
| Responsibility | |
| Proposed Completion Date | |

# 16. References


Australian Mine Design and Development Pty Ltd 2017, *Tarcoola Opencut Gold Mine Ore Reserves Estimate as at 30th June 2017,* report dated September 2017

Australian Water Environments 2017, Seepage Infiltration Modelling Support, 29 May 2017, unpublished report

Connect Consulting Australia Pty Ltd 2016, *Tarcoola WRF Independent Review,* 28 July 2016, Document No. CCA160012-1

Connect Consulting Australia Pty Ltd 2017, *Technical Memorandum, Waste Rock Dump-Compaction Density and Permeability, dated 30 May 2017*

CSA Global Pty Ltd 2017, *Mineral Resource Estimate, Tarcoola South Australia 14th September 2017,* CSA Global Report No. R313.2017

Department of Premier and Cabinet (DPC) 2009, *Mineral Regulatory Guidelines MG3, Guidelines for Miners: preparation of a mining and rehabilitation compliance report (MARCR) in South Australia, Version 1.4 March 2009, Government of South Australia*, viewed 4 December 2017, available at:

<https://sarigbasis.pir.sa.gov.au/WebtopEw/ws/samref/sarig1/image/DDD/MRGMG3.pdf>.

EBS Ecology 2013, *Tarcoola Baseline Flora and Fauna Assessment 2013*, unpublished report.

EBS Ecology 2014, *Tarcoola Flora and Fauna Survey Spring 2014*, unpublished report.

Fyfe Pty Ltd 2017, *Tarcoola Gold Flora Fauna Monitoring Spring 2017*, Unpublished report dated November 2017

Golder Associates 2017, *Falling Head Permeability Test Report,* unpublished report dated February 2017

Jacobs Group (Australia) Pty Limited 2016, *Tarcoola Gold Mine – Tarcoola Groundwater Assessment, July 2016,* unpublished report, report no. IW131000-NGW-001|1

LBW Environmental Projects 2017, *Tarcoola Gold Mine, Baseline Shallow Soil Assessment*, 3 February 2017, unpublished report

Rocktest Consulting 2017a, *Additional Geotechnical Advice Regarding the Proposed Slope Specifications for the Tarcoola Mine,* unpublished report dated April 2017

Rocktest Consulting 2017b, *Assessment of the Proposed Slope Specifications for the Tarcoola Mine*, unpublished report dated March 2017

Tarcoola Gold Pty Ltd 2015, *Tarcoola Gold Project, Mining Proposal for Mineral Lease Application, August 2015,* unpublished document

Tarcoola Gold Pty Ltd 2016, *Tarcoola Gold Project, Program for Environmental Protection and Rehabilitation* (PEPR) PEPR2016/044, November 2016

# Appendix A

## Groundwater Data Summary

Three groundwater monitoring events were undertaken during the reporting period (May, August and November). The May event serves as the baseline data. The August sampling event was undertaken using a bailer for the field measurements. The May and November events were undertaken using a low-flow pump. Results have not yet been obtained for a full year of operation.

Groundwater well locations are shown in Figure, section 3.1. Figure A1 shows the predicted area of influence from pit dewatering (Jacobs, 2016). Field results for groundwater sampling in August are shown in Table A1. Groundwater laboratory analysis results for May and November are provided in Table A2. Graphs are provided in Figures A3-A7.

**Outcome**

No adverse impact to the quality and quantity of groundwater to existing users and groundwater environmental value caused by mining operations *(impact ID T20)*

**Outcome Measurement Criteria**

Quarterly monitoring of groundwater levels/drawdown in installed boundary (trigger) groundwater monitoring wells (TTW1 and TTW2) confirms standing water levels (SWL) are within 2 m of modelled (predicted) drawdown levels (based on Jacobs 2016), at that location, at the time of measurement, validating the modelled radius of drawdown and confirming that the pastoral bores and production wells are outside of the predicted radius of influence from pit dewatering (Figure 27)

**Summary of Evidence**

There is no reduction in groundwater availability as a result of bore development and mine dewatering (the mine is yet to intersect water). See Figure A3 for a graphical representation of the standing water levels (SWL) in monitored wells. August measurements were taken with a bailer which could account for the variation in SWL. Data will continue to be collected over the mine life and analysed for long term trends

**Outcome**

No adverse impact to the quality and quantity of groundwater to existing users and groundwater environmental value caused by mining operations *(impact ID T21)*

**Outcome Measurement Criteria**

Six monthly monitoring of water quality parameters (pH, EC, TDS, metals) at operational groundwater monitoring wells (TMB1, TMB2, TMB3) confirms that there is no reduction in water quality compared to that observed in boundary (trigger) groundwater monitoring wells (TTW1, TTW2) by comparing average concentrations for each data set (operational and trigger wells) for each sampling round to demonstrate that the rate of increase in average concentrations in the operational wells will not be more than 20% greater than the rate of change in average concentrations in trigger wells over the operational period for EC, TDS and metals and that pH in each operational well will not be reduced by more than 1 pH unit compared to average pH for the trigger wells

**Summary of Evidence**

See Table A2 for groundwater results.

Minor pH increases were observed in operational wells and trigger wells (as opposed to a reduction in pH). Similar increases were observed in operational wells and trigger wells in the November results.

EC values showed minor increases from the May to November sampling rounds. The rate of change in the operational wells was not more than 20% greater than the rate of change in the trigger wells.

The rate of increase in metal concentrations in the operational wells when compared to the trigger wells was not greater than 20% of the rate of change in average concentrations of the trigger wells.

Only two sampling events have been undertaken to date. Additional data is required to establish data trends and account for seasonal variation.

**Outcome**

No adverse impact to the quality and quantity of groundwater to existing users and groundwater environmental value caused by mining operations *(impact ID T22)*

**Outcome Measurement Criteria**

Fuel storage Six monthly monitoring of parameters (anthropogenic TRH) in operational groundwater monitoring wells (TMB1, TMB2, TMB3) indicates TRH concentrations are less than the laboratory limit of detection or within 10% of baseline concentrations should TRH be detected in baseline samples

Protecting environmental values Six monthly groundwater monitoring of water quality parameters (pH, EC, TDS) at operational groundwater monitoring wells (TMB1, TMB2, TMB3) demonstrates that there is no reduction in groundwater environmental value and beneficial use based on TDS (EPP (WQ)) compared to the environmental value and beneficial use attributed to groundwater in the mining area prior to commencement of mining

**Summary of Evidence**

TRH results from the May sampling event (see Table A2) can be considered as the baseline dataset. Results do not show any increase in TRH concentrations in the November sampling round. TRH levels decreased from the May 2017 sampling event to the November sampling event.

Monitoring well TMB1 exceeded ANZECC 2000, Livestock Drinking Water Quality for cadmium (see Table A2). Cadmium above ANZECC Livestock Drinking Water Quality was also detected in samples from QR186, QR022, QR117 during previous baseline sampling events (Jacobs 2016).

TMB1 is likely located in a different aquifer to TMB2 and TMB3 due to the differences observed in salinity.

There has been no material change in cadmium levels from baseline (prior to the mine starting) to monitoring results obtained in 2017 therefore it is likely that the cadmium levels detected are background.

It is considered that there is no loss of environmental value due to contamination or spills. However ongoing monitoring will continue to establish a statistically significant data set and identify any trends in the analytes.


**Figure A1 - Predicted area of influence from pit dewatering (not yet commenced) (assuming groundwater system homogeneity)**

**Table A1 – August groundwater data summary (using bailer)**

| Well ID | Easting | Northing | SWL | Date | Electrical Conductivity | Approximated TDS (mg/L)^ | pH | Temperature | Visual or Olfactory Observation | Volume Purged |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | (mBTOC) | | (mS/cm) | | | (°C) | | (L) |
| Trigger 1 | 455134 | 6604047 | 12.68 | 8/08/2017 | 74.4 | 48,279 | 7.63 | 22.95 | None | Bailer Used |
| Trigger 2 | 456569 | 6605745.8 | 29.1 | 8/08/2017 | 26.1 | 17,148 | 7.86 | 22.64 | None | Bailer Used |
| TMB1 | 455605 | 6602494 | 23.125 | 9/08/2017 | 84.3 | 55,316 | 8.21 | 18.91 | Slight odour-Plastic or PVC | Bailer Used |
| TMB2 | 45505 | 6602756 | 50.73 | 9/08/2017 | 37.7 | 24,575 | 7.98 | 19.35 | None | Bailer Used |
| TMB3 | 454139.8 | 6603099.1 | 23.52 | 9/08/2017 | 72.3 | 46,939 | 7.67 | 22.39 | None | Bailer Used |

**Table A2 – May and November groundwater results summary**

| May | Easting | Northing | Date | SWL (mBTOC) | Electrical Conductivity (mS/cm) | Approximated TDS (mg/L)^ | pH | Temperature ($^0$C) | Visual or Olfactory Observation | Volume Purged (L) |
|---|---|---|---|---|---|---|---|---|---|---|
| Trigger 1 | 455134 | 6604047 | 20/05/2017 | 18.92 | 71.7 | 48,039 | 6.73 | 20.3 | Slight odour, PVC glue | 10 |
| Trigger 2 | 456569 | 6605745.8 | 19/05/2017 | 29.05 | 29.1 | 19,788 | 6.77 | 21.5 | None | 4 |
| TMB1 | 455605 | 6602494 | 20/05/2017 | 23.34 | 128.5 | 86,296 | 6.16 | 21.5 | Slight odour, PVC glue | 5 |
| TMB2 | 45505 | 6602756 | 20/05/2017 | | 36.2 | 24,254 | 6.84 | 17.3 | Slight odour, PVC glue | 1 |
| TMB3 | 454139.8 | 6603099.1 | 21/05/2017 | 23.57 | 68.3 | 45,761 | 6.77 | 23 | None | 8 |
| **November** | | | | | | | | | | |
| Trigger 1 | 455134 | 6604047 | 1/11/2017 | 19.15 | 51.1 | 49,300 | 6.46 | 24.6 | No odour, cloudy, mildly silty | 10 |
| Trigger 2 | 456569 | 6605745.8 | 1/11/2017 | 29.084 | 19.8 | 17,700 | 6.45 | 24.8 | No odour, clear, no turbidity | 8 |
| TMB1 | 455605 | 6602494 | 1/11/2017 | 23.3 | 64.8 | 97,700 | 5.97 | 25.4 | No odour, cloudy, high turbidity | 10 |
| TMB2 | 45505 | 6602756 | 2/11/2017 | 50.88 | 33.2 | 25,100 | 6.37 | 19.6 | Light odour, clear colour, no turbidity | 300 ml bailed |
| TMB3 | 454139.8 | 6603099.1 | 1/11/2017 | 23.454 | 48.2 | 46,200 | 6.26 | 24 | No odour, very cloudy, high turbidity | 10 |

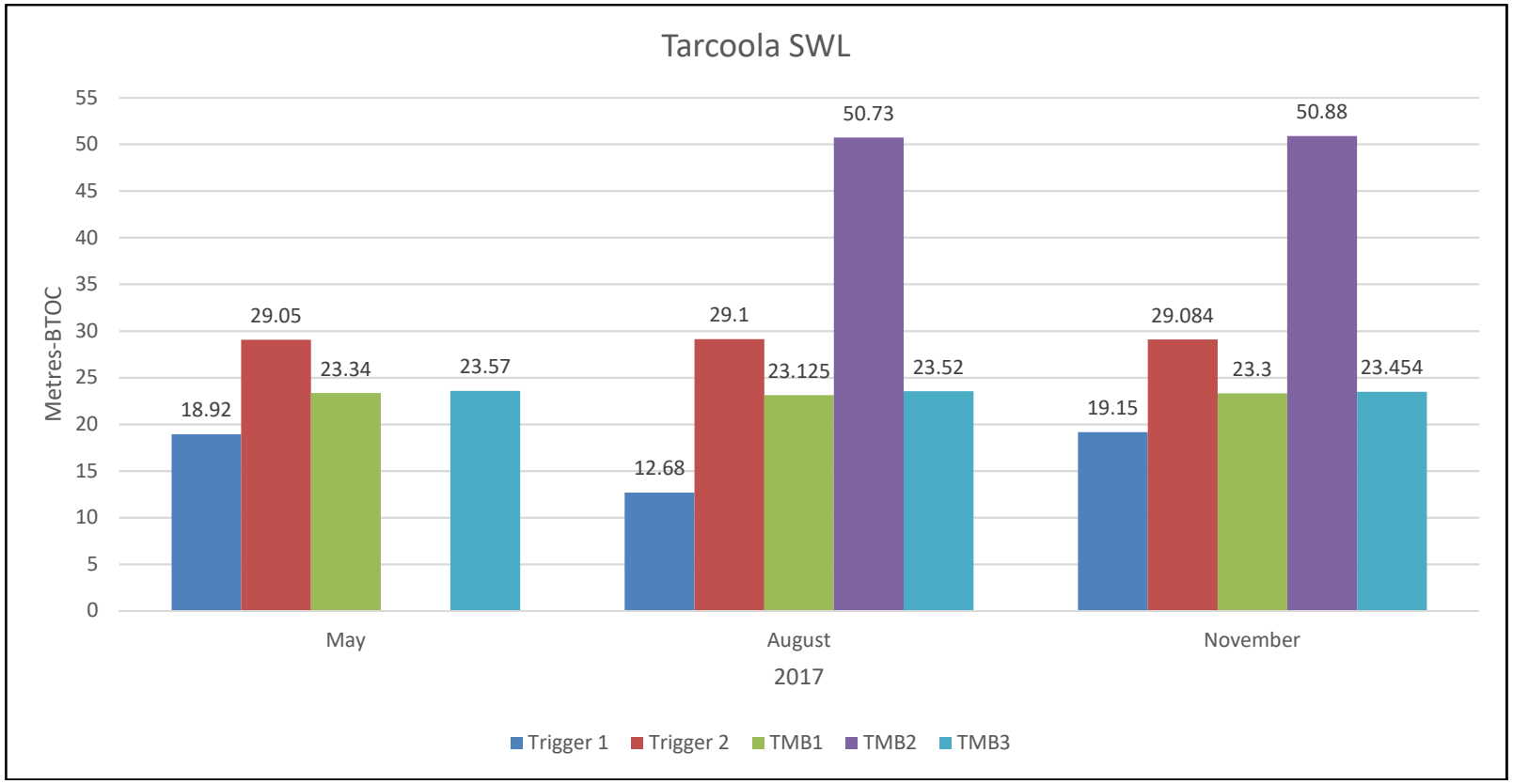


**Figure A2 – Tarcoola groundwater standing water level (SWL) results 2017**

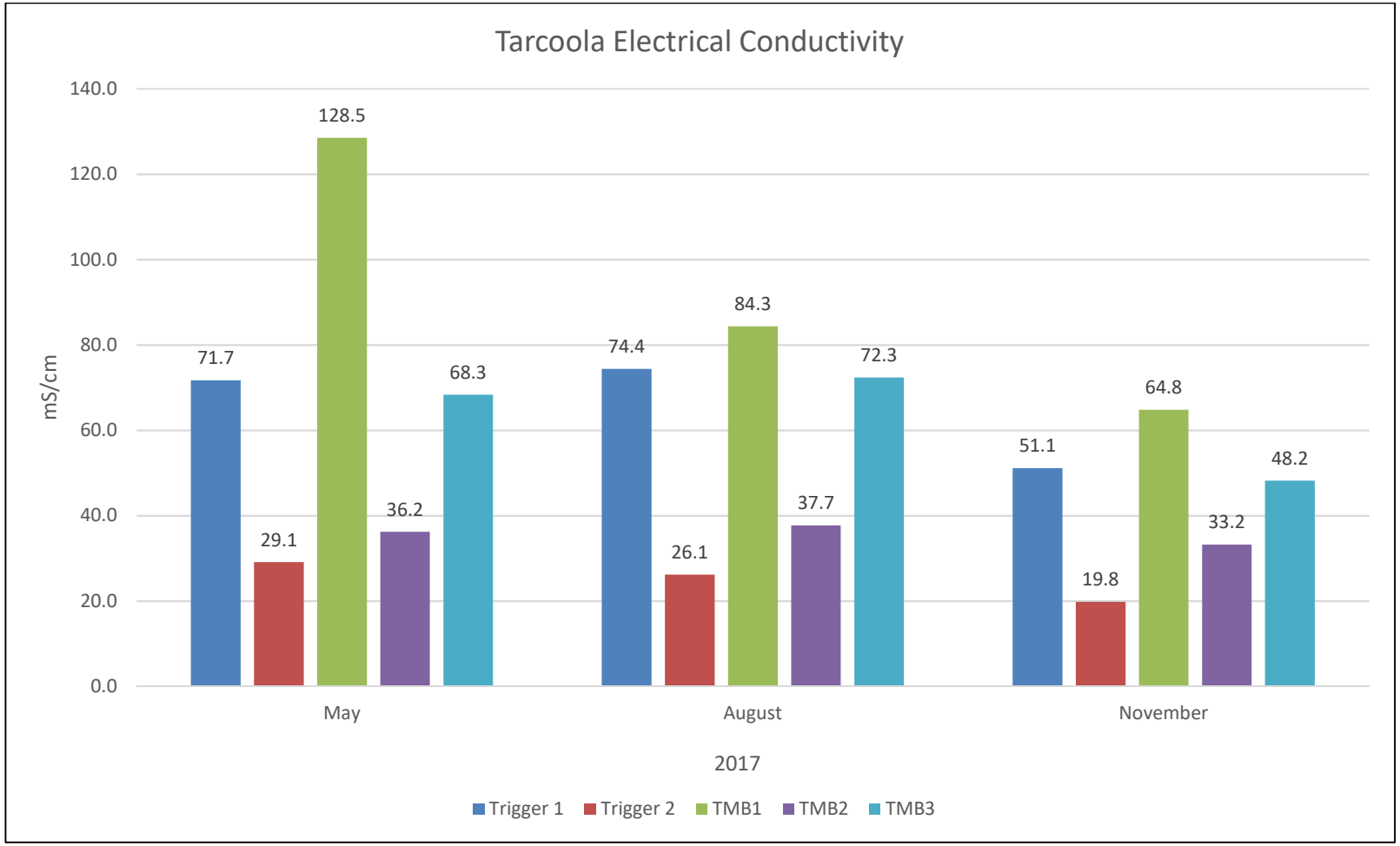


**Figure A3 – Tarcoola groundwater electrical conductivity (EC) results 2017**

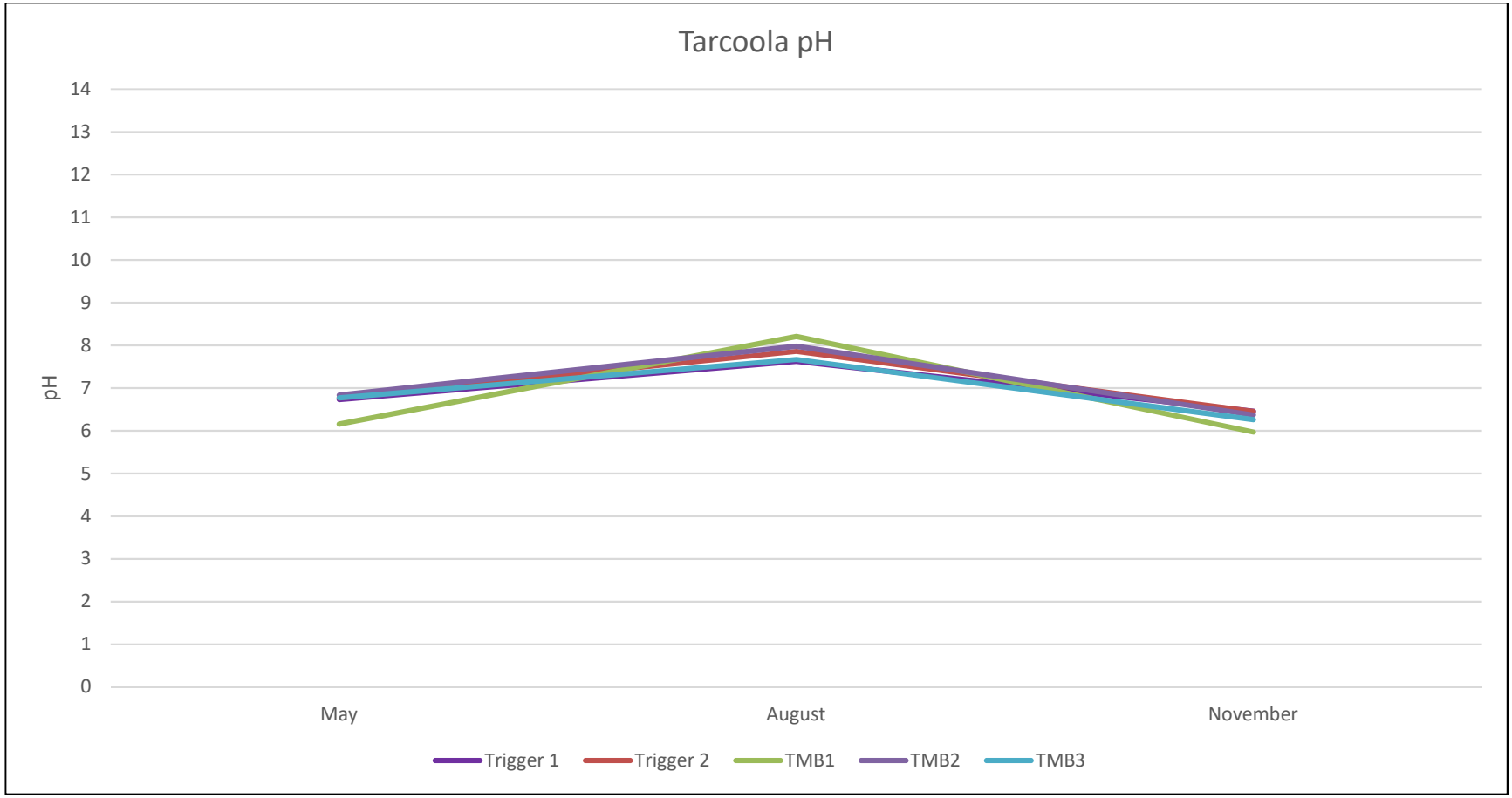


**Figure A4 – Tarcoola groundwater pH results 2017**

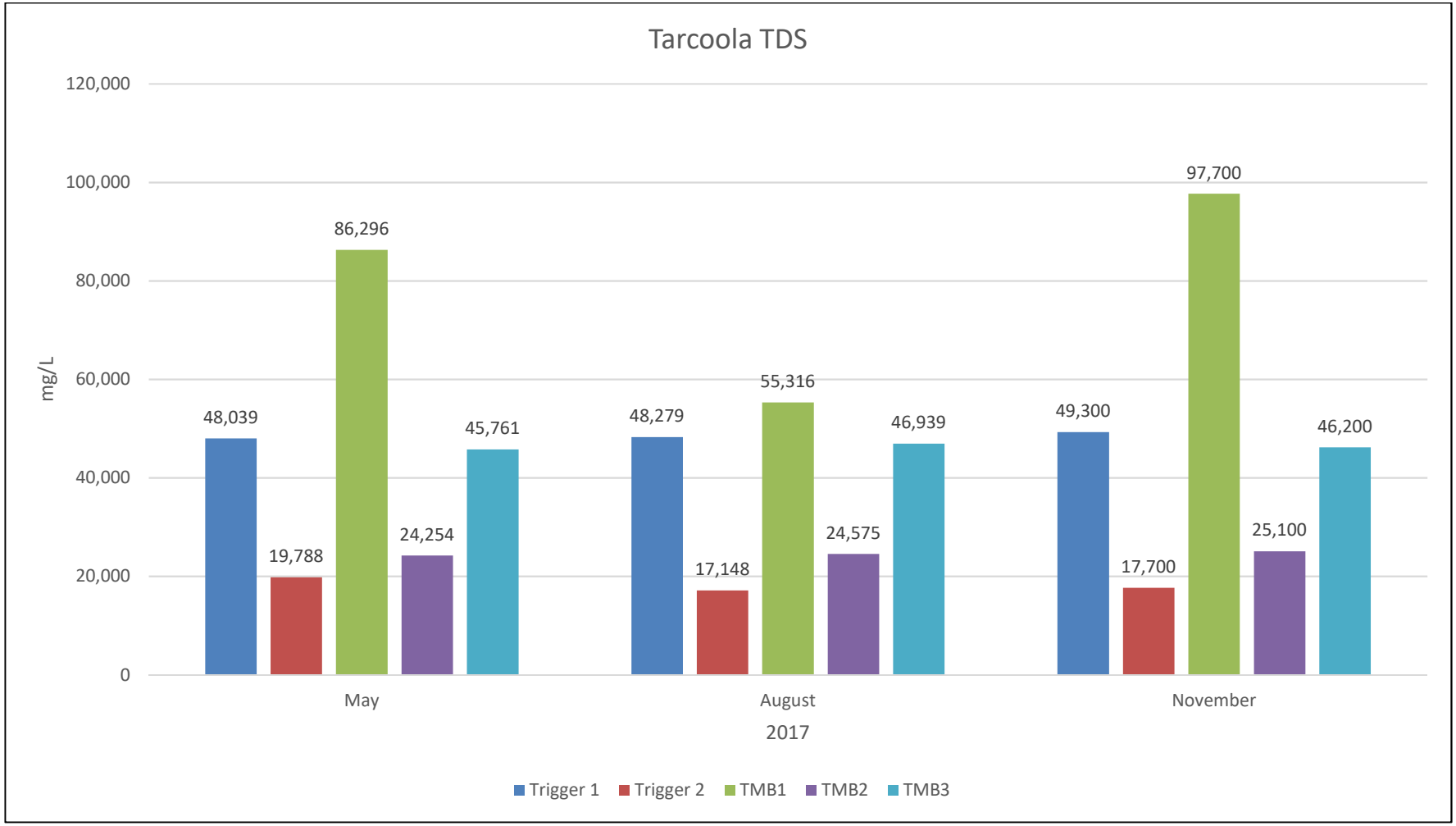


**Figure A5 – Tarcoola groundwater total dissolved solids (TDS) results 2017**

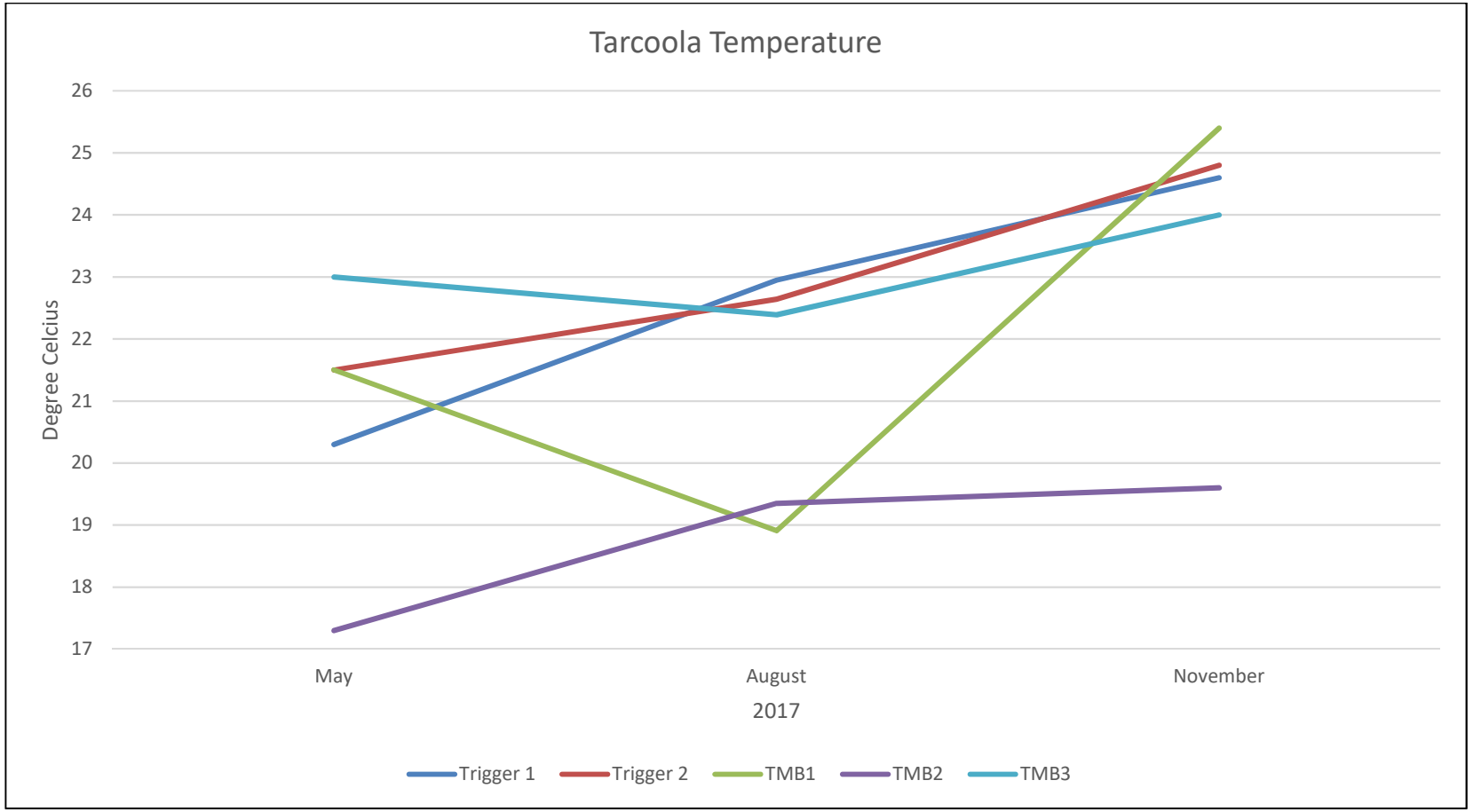


**Figure A6 – Tarcoola groundwater temperature results 2017**

# Appendix B

## Native Vegetation Clearance Map

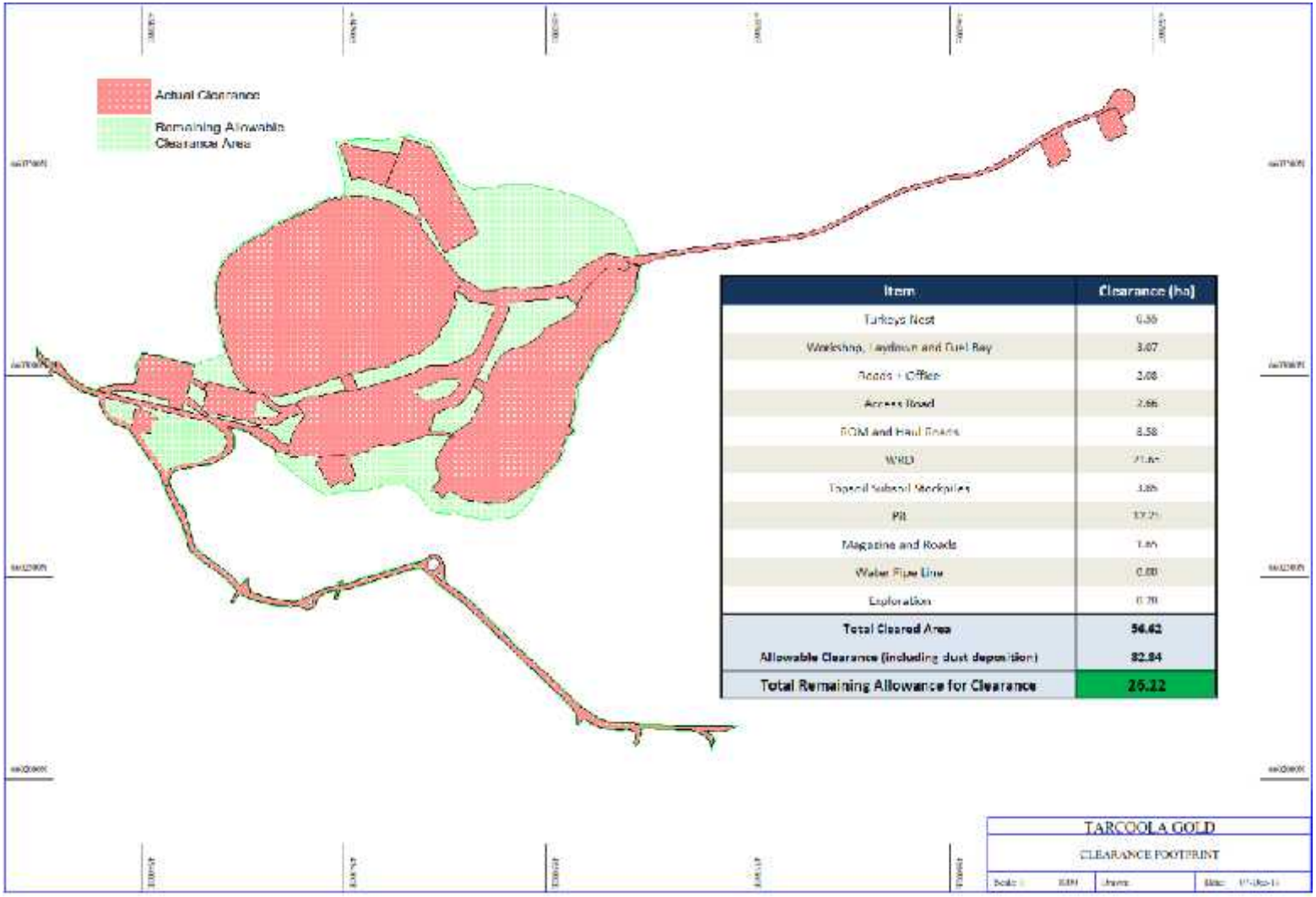


**Figure B1 – Native Vegetation Clearance Undertaken in Reporting Period**

# Appendix C

## Flora and Fauna Survey 2017

**Summary of results from the 2017 flora and fauna survey (Fyfe 2017)**

This repost presents the findings of the flora and fauna survey conducted by Fyfe Pty Ltd at Tarcoola Gold mine owned by WPG Resources Ltd. This survey follows on from work completed by EBS Ecology in 2013 and 2014 and is the second monitoring report for the site.

Each of the six flora, eight bird and four fauna monitoring sites established during EBS Ecology's baseline site survey in 2013 were surveyed using the same methodology. No flora or fauna of national or State conservation significance were recorded during the current survey.

A total of 93 (90 native and 3 exotic) flora species were recorded across the 6 flora monitoring sites. The species recorded were consistent with previous surveys completed in 2013 and 2014.

A total of 13 terrestrial mammal species from seven families were recorded across the Tarcoola project area, with a total of 29 animals captured. One of these species, Mitchell's hopping mouse (*Notomys mitchelli*) was not recorded in 2013 and 2014. Bat calls recorded across the fauna monitoring sites indicated an increase in species diversity based on previous survey efforts.

A total of 11 reptile species from 4 families were recorded within the Tarcoola Gold Mining Lease, with a total of 29 animals recorded. Three species of reptile Bynoe's Gecko (*Heteronotia binoei*), Common snake-eye (*Morethia boulengeri*) and Desert Wall Skink (*Cryptoblepharus australis*) were recorded during the current survey that were not detected in previous surveys. The majority of reptile species were recorded in average numbers, with less than 5 records each which is consistent with 2013 and 2014 data.

A total of 29 bird species from 23 families were recorded within the Tarcoola Mining Lease with 134 individuals recorded. The diversity and abundance recorded during the current survey was less than 2014 and is likely attributed to adverse weather conditions at the time of survey.

Based on data collected during the 2017 there was no evidence of the mines operations impacting the abundance and diversity of flora and fauna species. Of note was the decrease in exotic species present at the monitoring sites and across the lease. This reduction may be attributed to management of pest species within the mining lease or may be attributed to an unseasonably dry winter.

The data collected from this survey have contributed to a long-term dataset for the Tarcoola Mining Lease.

The data provide an accurate and robust analysis of regional abundance, diversity and productivity of the local flora and fauna including pre- and post-mining. Continuing the monitoring program at least annually is recommended to coincide with optimal conditions for flora and fauna monitoring.

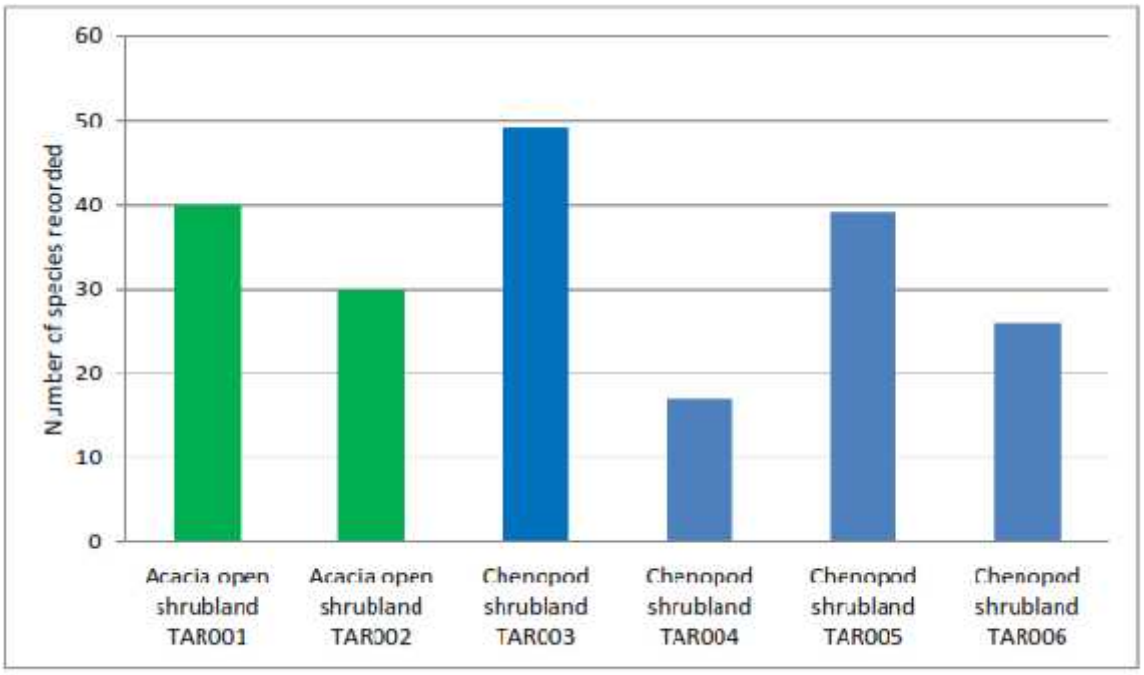


**Figure 4.1** **Native species richness per habitat type recorded during the 2017 survey.**

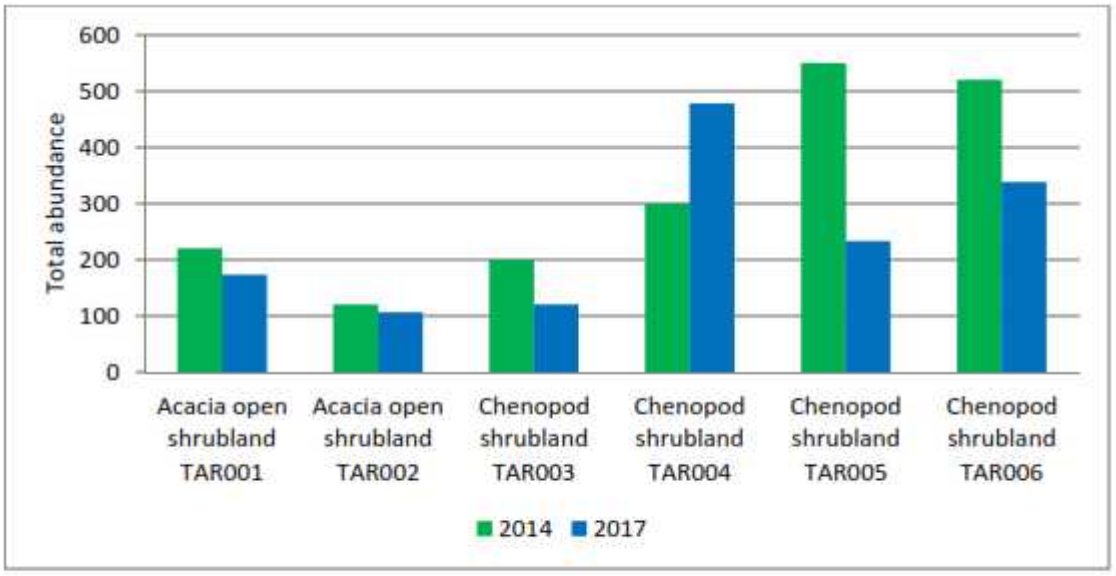


**Figure 4.3** **Total abundance per hectare recorded for each of the habitat types during the Spring 2014 and Spring 2017 survey**

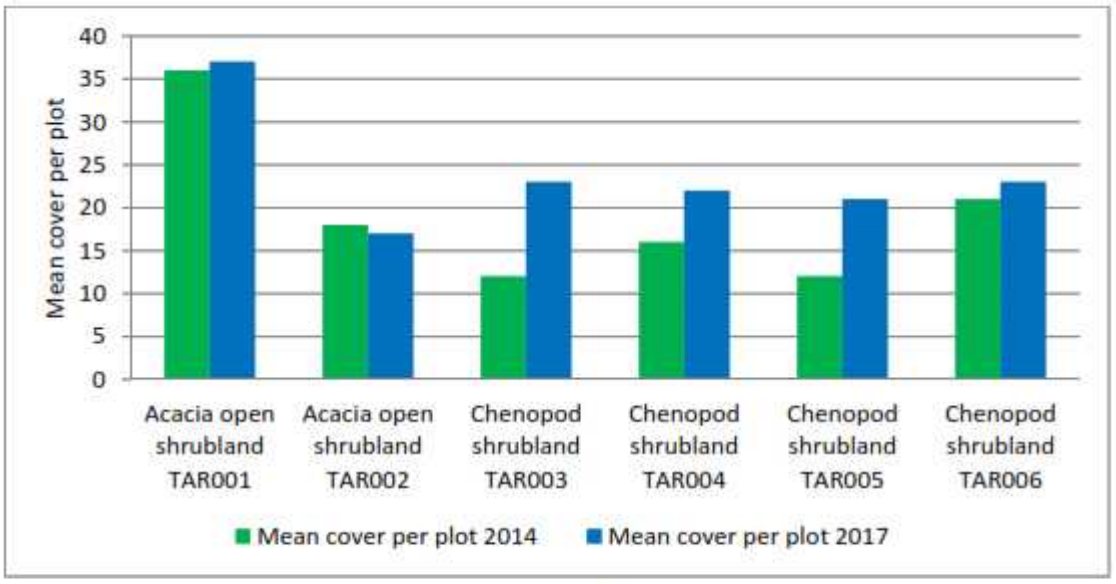


**Figure 4.4** **Mean cover per 5 x 2m quadrat for each of the habitat types during the spring 2014 and spring 2017 surveys**

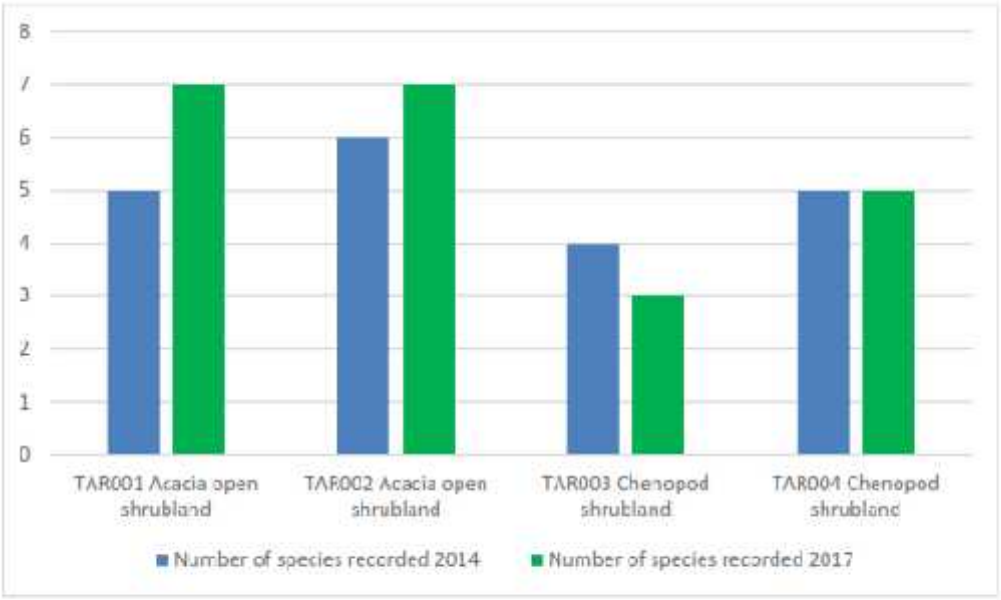


**Figure 5.1** **Terrestrial mammal species diversity (based on trap captures) recorded at each of the monitoring sites during the spring 2014 and spring 2017 monitoring events**


**Figure 5.2** **Number of individual terrestrial native mammals captured at each of the monitoring sites during the spring 2014 and spring 2017 survey**

# Appendix D

## Compliance against Mine Completion Outcomes

**Table D1 – Assessment against mine completion outcomes**

| Impact ID | Outcome | Outcome measurement Criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| T43 | Existing (pre-mining) soil quantity and quality is maintained | Results of annual audits of survey, inspection, asconstruct reports, maintenance, incident and corrective action records demonstrate that all available topsoil is/was stripped, stockpiled, managed and reused, and that any losses of topsoil could not have reasonably been prevented<br><br>Prior to mine completion results of soil sampling results and analysis concludes that the quality of soils on the lease (as determined by pH, salinity and the presence of metals and TRH) is consistent with or within 10% of the baseline site assessment (to be completed) | N/A | Compliant<br><br>Unable to demonstrate compliance | Soil surveys are undertaken regularly.<br><br>Baseline soil assessment was undertaken in 2017 (LBWep 2017)<br><br>All spills are cleaned up |
| T72<br>T73 | Integrate and harmonise final rehabilitated landforms with the surrounding landscape | Results of an independent audit undertaken prior to mine completion by a suitably qualified and experienced specialist demonstrates that the final rehabilitated landforms have been integrated and harmonised with the surrounding landscape in accordance with the closure strategies in the PEPR (Section 8.9) | N/A | Unable to demonstrate compliance | Mine is in the operational phase and final rehabilitated landforms are yet to be constructed |
| | | | | | |

| Impact ID | Outcome | Outcome measurement Criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| T86 | At completion of mining operations, surface water flows do not cause inundation of third party property and infrastructure (to a greater extent than would have been expected prior to mining operations) | Prior to mine completion results of an audit all operational criteria including reports of inspection, maintenance, incident and corrective action records, demonstrate no adverse impact is caused to ARTC"s rail infrastructure, by surface water flows or flooding caused by the mining operation Where there is a lack of rainfall to allow effective monitoring of third party property and infrastructure for mine completion, surface water modelling for pre-mining, predicted and at closure will demonstrate that flooding or inundation of third party property and infrastructure is not increased by post completion landforms resulting from mining activities | Operational observations and incidents involving surface water flows and third-party property and infrastructure | Compliant to date | Mine is in the operational phase<br>There have been no reports surface water flows causing inundation to third party property during the reporting period. |
| T97<br>T98 | Post mining landforms are physically stable and risks to the health and safety of the public and fauna are as low as reasonably practicable | Prior to mine completion, results of an audit report prepared by an independent, suitably qualified and experienced specialist during closure demonstrates that:<br>J open pit and WRF are geotechnically stable<br>J the pit safety (abandonment) bund has been constructed in accordance with the approved design<br>J warning signage installed | N/A | Unable to demonstrate compliance | Mine is in the operational phase |

| Impact ID | Outcome | Outcome measurement Criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | | ) and any other strategies from the PEPR have been appropriately implemented | | | |
| T100 | All infrastructure (unless otherwise agreed with the pastoralist or other third parties) removed from the site prior to mine completion | An audit undertaken, prior to mine completion, by a suitably qualified professional, demonstrates that all infrastructure, not remaining part of agreed Heritage areas or final landforms remaining on site, has been removed during closure<br>See Waste OMC T132 Measurement criteria and Leading indicator criteria | Incidents and corrective actions associated with operational waste management and monitoring | Unable to demonstrate compliance | Mine is in the operational phase |
| T101<br>T102<br>T103 | Re-establishment of pre-mining ecosystem and landscape function, where practical within the site | Prior to mine completion, an audit report prepared by an independent, suitably qualified and experienced specialist during closure (prior to mine completion) verifies that vegetation surveys at representative monitoring sites located on rehabilitated areas have achieved baseline ecosystem condition and landscape function and is appropriate for the agreed post-completion land use (Figure 54) | N/A | Unable to demonstrate compliance | Mine is in the operational phase<br>Annual vegetation monitoring was undertaken during the reporting period (Fyfe 2017) |
| T105 | No disturbance to non-Aboriginal heritage sites (from mining and rehabilitation activities | Prior to mine completion results of an audit of the mine records and the Lease by an independent qualified and experienced specialist undertaken prior to mine completion demonstrates that there is no | N/A | Unable to demonstrate compliance | Heritage Management Plan is currently implemented<br>There have been no incidents during the reporting period of disturbance to heritage sites |

| Impact ID | Outcome | Outcome measurement Criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | undertaken) on the ML | disturbance to aboriginal heritage and no disturbance to non-Aboriginal heritage sites within the ML other than in accordance with the approved Heritage Management Plan (developed in collaboration with, and endorsed by, State Heritage Unit, DEWNR pre-mining) | | | |
| T106<br>T107<br>T108<br>T121<br>T125 | No impacts to groundwater, surface water, soil and land use from PAF material within the waste rock facility and open pit<br>No adverse impacts to adjacent land uses including, but not limited to, growth of native vegetation, from seepage from the WRF | Prior to mine completion results of an audit conducted by a suitably qualified and experienced specialist verifies that AMD management is undertaken in accordance with design specifications (Appendix J) and that:<br>) permeability tests (hydraulic conductivity) of NAF base and WRF capping is at a maximum of 10- 2 m/day ) classification and placement QA/QC protocols for PAF/NAF adequately demonstrates that PAF is contained in accordance with design specifications ) as-construct and survey reports demonstrate WRF construction achieves design specifications (Appendix J) ) results of surface water and groundwater monitoring indicate no impacts from PAF ) no PAF outside of the pit remains exposed on site ) the rehabilitated landform is performing as per the design ) no seepage from | Field pH measurements of surface water collected in the WRF toe drain, following every rainfall event that produces a monitorable surface water flow, demonstrate that runoff pH from the WRF is > 6 demonstrating acidification has not occurred Monthly monitoring of pressure differentials within the NAF base layer of the PAF cell (once-capped) measured by two piezometers installed beneath or within the base of the NAF layer near | Unable to demonstrate compliance | Groundwater monitoring is being undertaken<br>Two piezometers have been installed in the WRF base layer Baseline dataset is being established<br>PAF/NAF classification is being undertaken<br>ARD Management Plan is being implemented |

| Impact ID | Outcome | Outcome measurement Criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| | | the PAF cell as measured by piezometers in the base of the WRF during operations and closure See Surface Water T87, T88 OMC, Measurement Criteria and Leading indicator criteria See Groundwater T77, T78 OMC, Measurement Criteria and Leading indicator criteria | the centre and western wall, will demonstrate that no seepage occurs, and therefore no impacts to groundwater, surface water, soil and land use from PAF within the WRF | | |
| T114 | No post mine completion adverse impacts to adjacent land use and third party infrastructure as a result of mining operations | See Surface Water OMC T86 Measurement criteria and Leading indicator criteria | | | |
| | | | | | |
| T131 | Where practicable, the pre-mining land use can be recommenced after mine completion | See outcome measurement criteria and measurement criteria for public safety (T97) and Aboriginal and non-Aboriginal heritage (T105) | N/A | Unable to demonstrate compliance | Mine is in operational phase |

| Impact ID | Outcome | Outcome measurement Criteria | Leading indicator criteria | Compliance status | Summary and supporting evidence of compliance status determination |
|---|---|---|---|---|---|
| T135 | Where practicable, the pre-mining land use can be recommenced after mine completion | Prior to mine completion an assessment of the status of site contamination by a suitably qualified consultant is conducted and concludes that the Lease is suitable for the future post-mining land use | N/A | Unable to demonstrate compliance | Baseline soil assessment was completed in 2017 (LBWep 2017)<br><br>Mine is currently operational. A Soil assessment will be undertaken prior to mine completion |