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17 December 2014

Mr Kym Taylor
General Manager
Office of the Environmental Protection Authority
Locked Bag 10
EAST PERTH WA 6850

Attention: Kevin Da Silva

Dear Kym,

Re: Submission of Tropicana Gold Mine (Ministerial Statement No. 839) 2013-2014 Annual Compliance Assessment Report

In accordance with Condition 4-6 of Ministerial Statement No. 839, please find enclosed the 2014 Annual Compliance Assessment Report for the Tropicana Gold Mine. The report has been prepared in accordance with the Tropicana Gold Mine Compliance Assessment Plan and covers the period 24th September 2013 – 23rd September 2014.

This Compliance Assessment Report will be made publically available on the Tropicana JV website following acknowledgement from the Office of the Environmental Protection Authority that the report has been received and accepted.

We trust this report meets your requirements however should you have any queries regarding the information provided please contact me on (08) 9265 2213 or via TGMApprovals@anglogoldashanti.com.au

Yours sincerely

Emma Bamforth
Senior Environmental Coordinator – Approvals
TROPICANA GOLD MINE
ANGLOGOLD ASHANTI AUSTRALIA

Encl: *Tropicana Gold Mine, Ministerial Statement No. 839, 2014 Annual Compliance Assessment Report*

Tropicana Joint Venture

Tropicana Gold Project

Ministerial Statement No. 839

Annual Compliance Assessment Report

September 2013- September 2014

17th December 2014

Doc Ref: CAR20141217

Independence Group

ANGLOGOLD ASHANTI AUSTRALIA

Tropicana Gold Project, Annual Compliance Assessment Report

Ministerial Statement No. 839

CAR20141217

This report has been developed by AngloGold Ashanti Australia on behalf of the Tropicana Joint Venture.

Revision	Author	Reviewer	Date
Draft - for internal review	E. Bamforth	D. Gibbs	13th December 2014
Final – for review and release	E. Bamforth	D. Gibbs	17th December 2014

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1 INTRODUCTION

The Tropicana Gold Mine (TGM) is an open cut gold mine located approximately 330km east-north-east of Kalgoorlie on the western edge of the Great Victoria Desert (see Figure 1). The operation is a joint venture (Tropicana JV) between AngloGold Ashanti Australia (70% stakeholder and manager) and Independence Group (30% stakeholder).

The project was approved under the *Environmental Protection Act 1986* (EP Act) in September 2010 and issued with Ministerial Statement No. 839 (MS839). Condition M4.6 of MS839 requires the preparation and submission of an annual compliance assessment report for the preceding 12-months.

This report has been prepared to meet Condition M4.6 requirement and covers the period 24th September 2013 to 23rd September 2014. The TGM ministerial statement audit compliance table updated for the 2014 reporting period is provided in Appendix 1.

The TGM is comprised of:

- Operational area - containing the open pits, waste landforms, stockpiles, tailings storage facility, processing plant, mine village, aerodrome and other supporting infrastructure.
- Infrastructure corridor - including an access road and communications corridor linking the operational area to existing communications and road networks of the Goldfields regions. This corridor is referred to as the Pinjin Corridor.
- Process water supply area – containing the process water supply borefield (PWSB).

This is the fourth compliance assessment report (CAR) prepared by AngloGold Ashanti Australia on behalf of the Tropicana JV for the project and has been prepared in accordance with the approved Compliance Assessment Plan (CAP) dated 13 December 2010 prepared and submitted to the Office of the EPA in 2010.

2 CURRENT STATUS

During the reporting period commissioning activities of the processing plant and tailings storage facility were completed and production commenced in September 2013. The first gold bar was produced on 26th September 2013 and the mine was officially opened by the Minister for Mines on 6th March 2014.

The main process water supply borefield north of the operational area became fully operational during 2014 and two additional bores were installed at the Kamikaze borefield, located to the south of the operational area, to provide additional fresh water source. Further expansion of the process water supply borefield will be required to meet the sites water requirements and relevant approvals including a Section 45c amendment, mining proposal and 5C water abstraction licence are currently being sought to enable this expansion to occur.

Construction of the stage two wall raising of the tailings storage facility (TSF) was conducted during the reporting period following receipt of relevant approvals.

Access challenges were encountered throughout much of 2014 with heavy rainfall flooding the site access road between Kalgoorlie and Pinjin Station. An alternative route through Carosue Dam was established during this period.

Table 2.1 provides an overview of the Project's key characteristics and current status while the infrastructure footprint is shown on Figure 2 and in Plates 1 and 2.

Table 2.1: Tropicana Gold Project Key Characteristics – Status Report

Element	Description	Status / Comment
General		
Project Life	Approximately 15yr of mining; total project duration up to 25yr (including post closure monitoring)	Construction commenced in May 2011, mining commenced in July 2012, processing commenced in September 2013 and first gold bar poured September 2013
Mining and Processing		
Mining Rate	Up to 75 million tonnes per annum (ore and waste)	Mining commenced in July 2012. Mining rate unchanged
Stripping ratio	8:1	Unchanged
Number of pits	Up to 4	3 separate pits currently envisaged
Open pit void/s	Not more than 400 hectares	Unchanged. Current open pit area is 153.4ha
Max. length of pit/s	6km (if pits combine)	Unchanged
Max width of pit/s	1.5km	Unchanged. Current maximum width of Havana pit is approx. 700m
Overburden & waste	Not more than 800 million tonnes	Unchanged
Waste landform	Not more than 1,200ha, max height 375mRL, slope with max angle 15°	Unchanged
Infrastructure		
Mine access road	Pinjin option ~210km of new road	Road construction was completed during the 2012 reporting period.
Communications	Fibre Optic or Microwave via either Pinjin or Tropicana Transline Corridor	The microwave tower option was selected and was constructed along the Pinjin Corridor during 2012.
Aerodrome	All weather strip 2.4km long	Aerodrome completed and commissioned
Main power supply	Onsite power station with an installed capacity of up to 40 MW	Power station was constructed and commissioned during 2013.
Water pipeline	Approximately 50km in length from the borefield to the processing plant	Pipeline installation was completed in May 2013 and process water supply area become fully operational during the 2014 reporting period.
Tailings Storage Facility (TSF)	Up to 7 million tonnes per annum, two cell paddock tailings storage facility, maximum height 372mRL, approximately 1330m wide by 1850m	Approval to modify the TSF design to a single celled facility was obtained during 2012 via a Section 45C process.
Disturbance Areas		
Disturbance Area	Not more than 3,440ha comprising: • 2,570ha – operational area • 200ha* – water supply area • 670ha – infrastructure areas	Current disturbance footprint across project area is approximately 2,532ha well within the approved 3,440ha.

NOTE * - currently seeking approval through Section 45C process to increase footprint to 300ha

3 COMPLIANCE

The 2013-2104 reporting period represents the fourth reporting period for the TGM and the first full operating period for the TGM, with the processing plant commencing during September 2013. In April 2014, the OEPA conducted a desktop audit of the 2013 compliance assessment report and additional information from AGAA was requested to demonstrate compliance with conditions. The additional requested information included:

- The threatened species and communities management strategy – evidence of consultation with Department of Parks and Wildlife (DPaW)
- Threatened species and communities management strategy – evidence that the strategy is being implemented
- Water monitoring results analysed against the Australian Water Quality Guidelines for Fresh and Marine Waters
- Groundwater and surface water monitoring program – annually audited; and
- Monitoring activities commenced prior to ground disturbing activities

Following submission of the requested additional information, the 2013 report was accepted and TGM was deemed to be compliant with all MS839 conditions. A copy of the OEPA correspondence is provided in Appendix 2.

During the 2014 reporting period the Tropicana JV was compliant with all ministerial conditions and a completed audit table providing further detail on compliance with conditions is included in Appendix 1.

To enable compliance with condition No 8.2, associated with groundwater monitoring, an additional four groundwater monitoring bores were installed around the final waste landform footprints on the north and eastern sides of the operational area (See Figure 4) during the 2014 reporting period.

A section 45c seeking approval to expand the TGM process water supply borefield was developed during the reporting period and was submitted to the OEPA in October, just outside the reporting period. Key aspects of the expansion include installation of 25 production bores with pumping infrastructure, establishing up to 10 monitoring bores, internal access tracks and pipelines between the bores, overhead powerlines, borrow pits for track maintenance and controlled release areas. Figure 3 (a-c) shows the proposed expansion activities. Approval is also being sought to increase the annual abstraction rate from 7GL/annum to 9GL/annum and to increase the disturbance footprint within the process water supply area up to 300ha.

As construction activities within the operational area and process water supply borefields were only completed during 2013, opportunities for rehabilitation within these areas have been limited. Rehabilitation activities have however commenced along the Pinjin Corridor where a number of borrow pits, laydown areas, fly camps and turkey nests no longer required have been ripped and growth medium and cleared vegetation has been re-spread. Details of the Pinjin corridor rehabilitation was provided in the 2013 CAR. During 2014, rehabilitation activities within borrow pits and access tracks located in the operational area, that are surplus to requirements has recently commenced and will continue to be progressed during 2015. A copy of the rehabilitation plan for the operational area borrow pit rehabilitation activities is provided in Appendix 3.

The Kalgoorlie Boulder Urban Landcare Group was commissioned to grow a number of seedlings from seed collected within the Tropicana project area as a trial for rehabilitation activities during the reporting period (Plate 3). The seedlings will be available for transport to Tropicana early in 2015.

In accordance with the CAP, this CAR for the 2014 reporting period will be made publicly available once the Tropicana JV has received acknowledgement from the OEPA that the report has been accepted. A copy of the CAR 2014 will then be placed on the Tropicana JV website.

No changes have been made to the previously approved CAP during this reporting period (Condition 4.1 of MS839).

4 ENVIRONMENTAL MONITORING

During the 2014 reporting period dust, vegetation condition, fauna trench inspections and groundwater monitoring programs were continued to be implemented. Locations of four new groundwater monitoring bores on the northern and eastern side of the operational footprint around the final waste landform footprint were installed to ensure the requirements of condition M8.2 are met. Details of monitoring activities conducted through 2014 will be documented in the site Annual Environmental Report (AER) due in January 2015.

Groundwater monitoring from the eight ministerial monitoring bores installed around the TSF and waste landform footprints (See Figure 4) was undertaken throughout 2014. A summary of results from water samples taken are provided in Appendix 4. Results obtained from the ministerial monitoring bores are consistent with background groundwater quality results obtained from other monitoring bores within the operational area and those obtained during the 2013 reporting period. Further information on the sites water quality monitoring activities and results obtained will be included in the AER due for submission by the end of January 2015.

Surface water monitoring sites have been established around the TSF and waste landforms (Figure 5) as required by M8.2, however due to the absence of continuous standing surface water, samples from these locations have only been obtained following significant rainfall events. Results from surface water sampling locations are provided in Appendix 5.

The vegetation condition monitoring program conducted to meet Ministerial condition 5-2 was undertaken by Eco Logical Australian Pty Ltd in September/October 2014. The 2014 monitoring program followed the same methodology as the 2013 program and involved assessment of high resolution digital multi-spectral imagery and field survey verification at 112 quadrats 20m by 20m in size. Four additional vegetation monitoring locations were established within the process supply borefield during the 2014 survey in anticipation of the borefields expansion. The location of the vegetation monitoring sites utilised during the 2014 monitoring program are shown in Figure 6. Analysis of the data obtained during the 2014 survey is still being undertaken and results of the survey will be provided in the sites 2014 AER. To date, variations in vegetation condition due to environmental conditions, such as fire and rainfall, have been detected sporadically across the region, however no impacts associated with the mines operation have been identified.

Fauna monitoring conducted during the reporting period has included:

- Fauna survey of the Process Water Supply Borefield and an adjacent expansion area.
- Daily fauna inspections of the TSF
- Photographic monitoring of artificial water source (Plates 4-7)
- Photographic monitoring of a Malleefowl mound (Plates 8-9)
- Ad hoc fauna sightings recorded by staff via the fauna sighting report forms

A number of artificial water sources have been established around the TSF to provide an alternative water source for wildlife and these are monitored via motion sensing cameras.

Photographic monitoring has captured a number of fauna species utilising the artificial ponds including a variety of birds, mammals and reptiles.

During the reporting period a review of the TGM Threatened species and communities management strategy (TSCMS) was undertaken and the strategy was amended. The amended strategy was submitted to the Department of Parks and Wildlife for review and comments have recently been received. The strategy has now been updated to reflect DPaWs comments and the final updated version along with associated correspondence with DPaW is attached in Appendix 6. A copy of the amended TSCMS will be uploaded to the TGM website.

A review of the sites Environmental Monitoring Strategy and an internal audit of the sites groundwater monitoring methods and results against the Australian Water Quality Guidelines were also undertaken during the reporting period. Audit findings are provided in Appendix 7. Once the Environmental Monitoring Strategy has been updated, a copy will be provided to the relevant agencies.

As part of the Section 45c process for the process water supply borefields expansion, additional flora and fauna surveys were undertaken in the area. No additional threatened species were identified. Groundwater drawdown modelling was also updated for the borefield during the reporting period.

Trench inspections for trapped fauna were undertaken for minor pipeline installation projects conducted within the mining area, as part of dewatering infrastructure installation, and within the Kamikaze borefield, to connect additional bores to existing pipeline infrastructure. No fauna were observed or required relocation from within the trenches. A summary of the fauna trench inspection report is provided in Appendix 8.

During the reporting period, a mine closure plan was developed for the TGM in accordance with the DMP requirements and a copy was provided with the sites AER submitted in January 2014.

5 ENDORSEMENT

This Report has been endorsed by:

Mr Duncan Gibbs
General Manager
Tropicana Gold Mine
AngloGold Ashanti Australia

I have reviewed this document and accept that the information provided is an accurate account of the activities undertaken during the current reporting period (24th September 2013 to 23rd September 2014)

Date: 17th December, 2014

Duncan Gibbs
General Manager
Tropicana Gold Mine
AngloGold Ashanti Australia

FIGURES

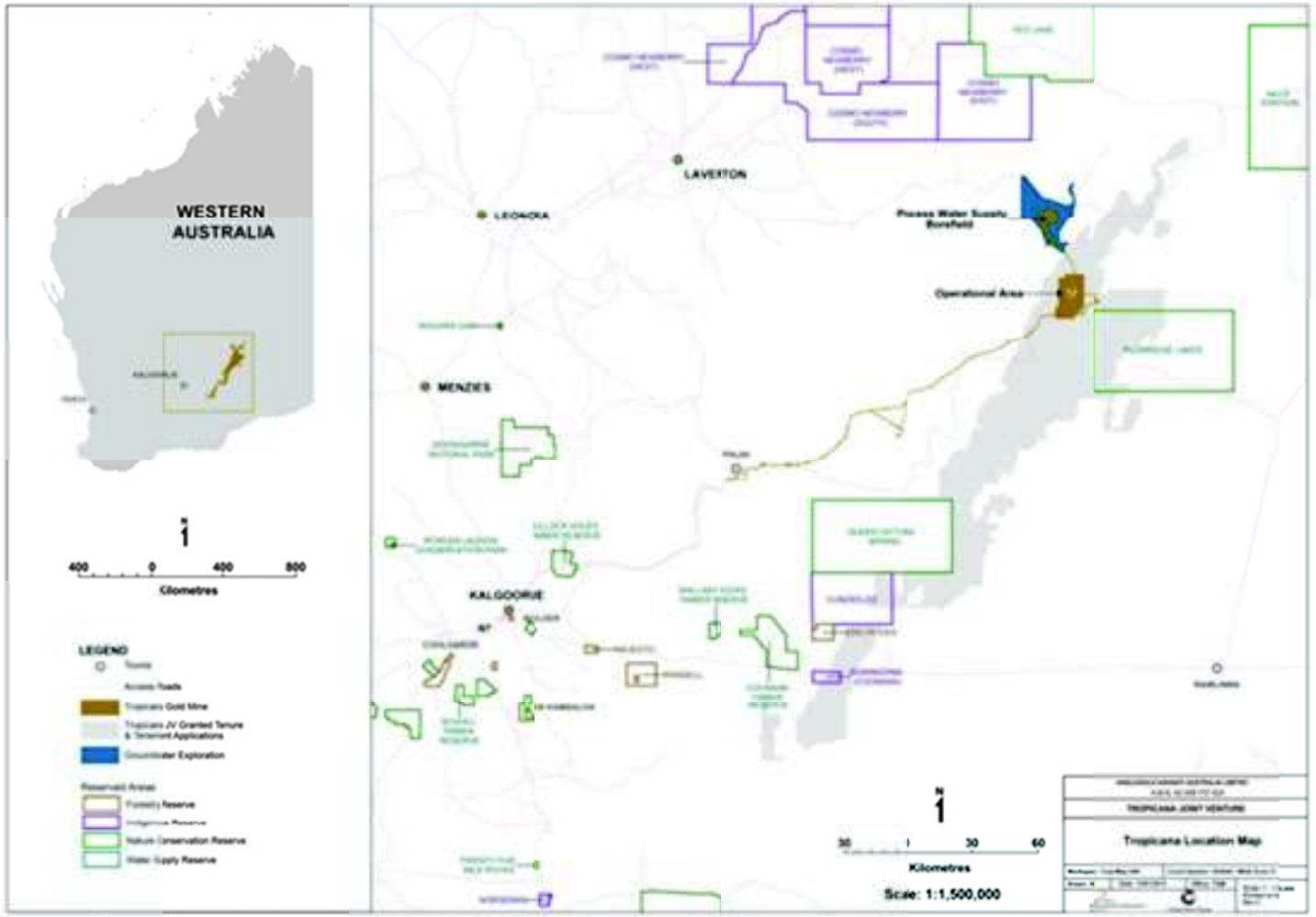

Figure 1: General location of the Tropicana Gold Project

Figure 2: Operational Area Infrastructure Layout (Aerial dated October 2014)

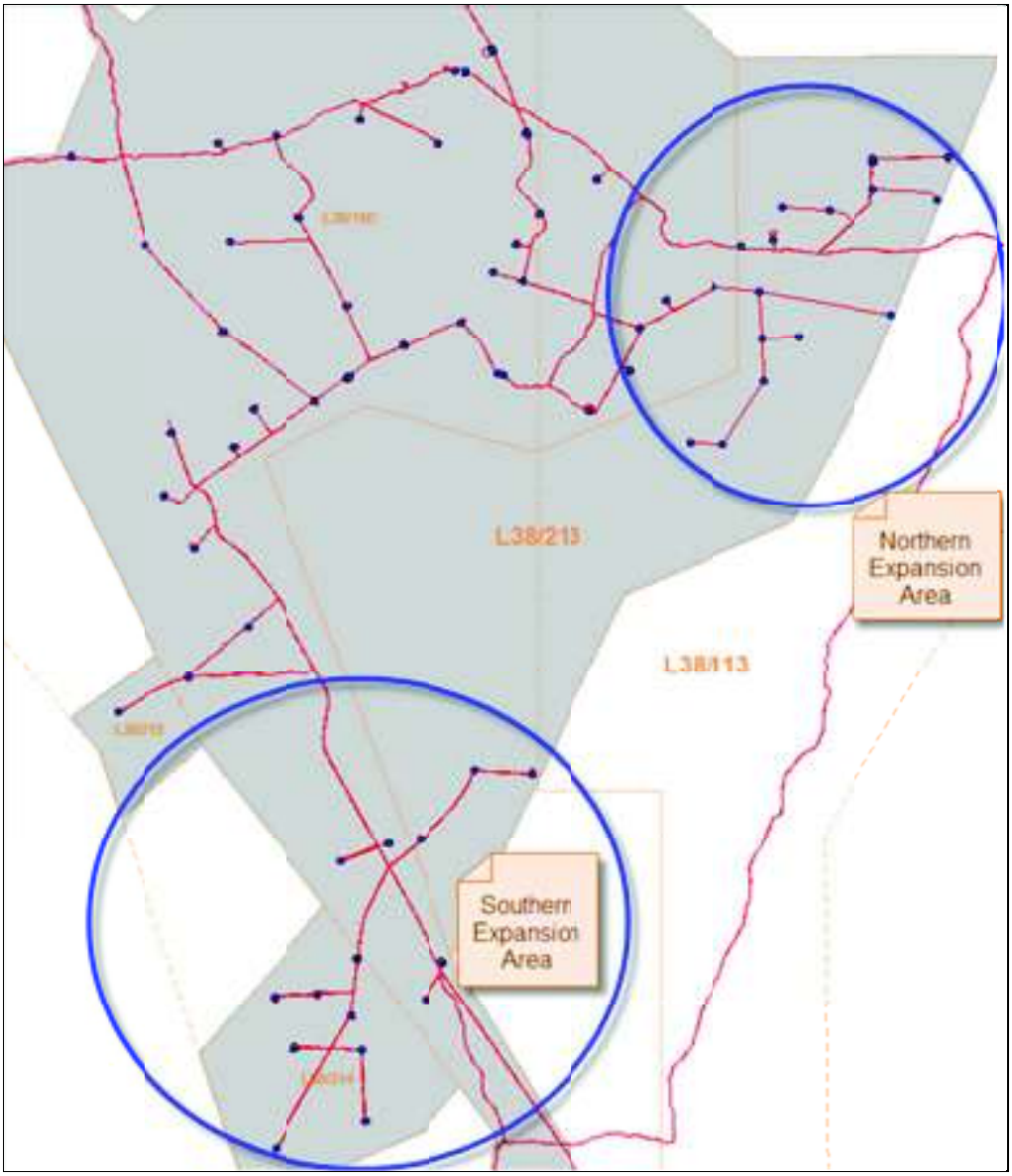

Figure 3: Proposed Process Water Supply Borefield Expansion Location

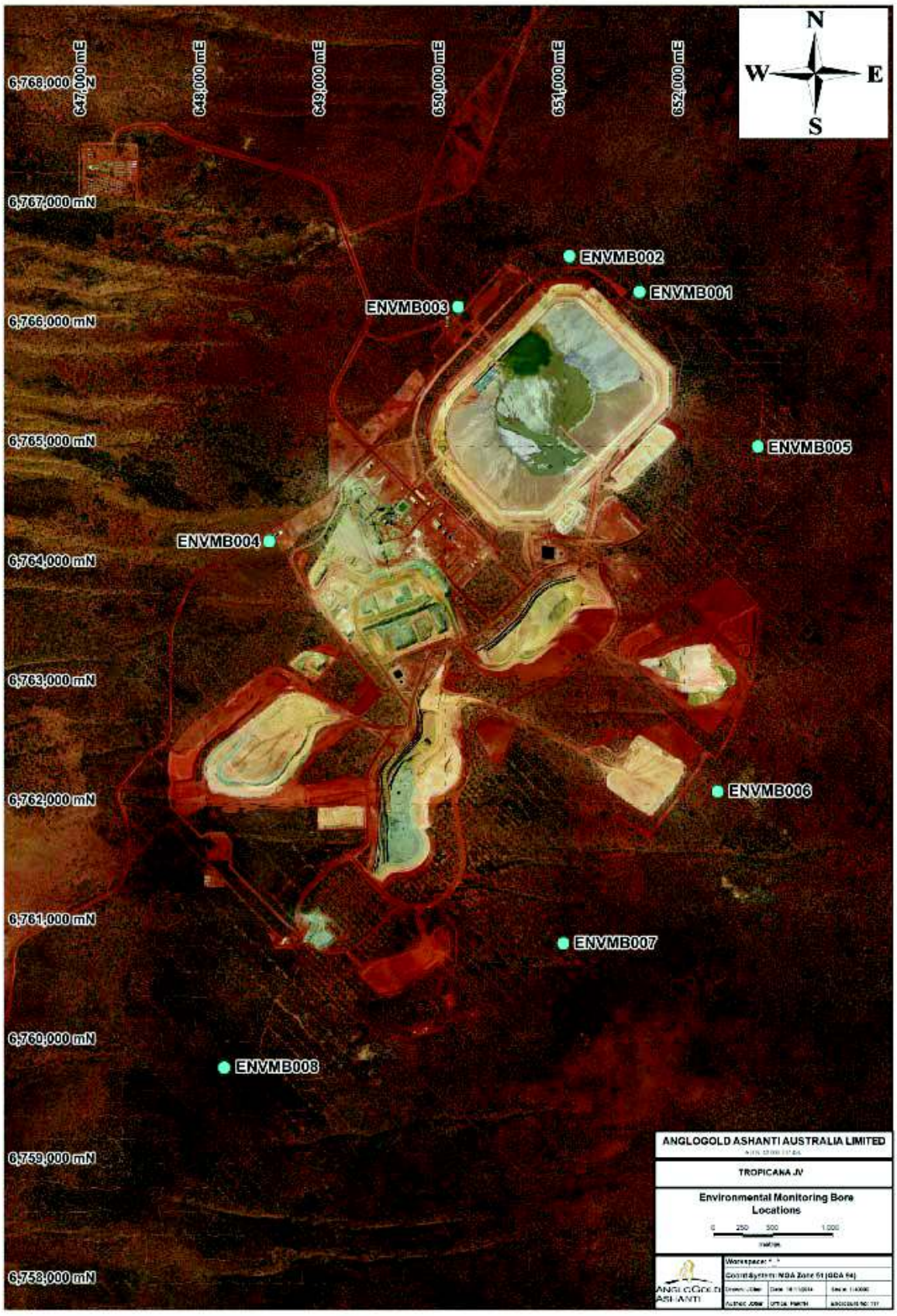

Figure 4: Ministerial Groundwater Monitoring Bore Locations

Figure 5: Ministerial Surface water monitoring locations

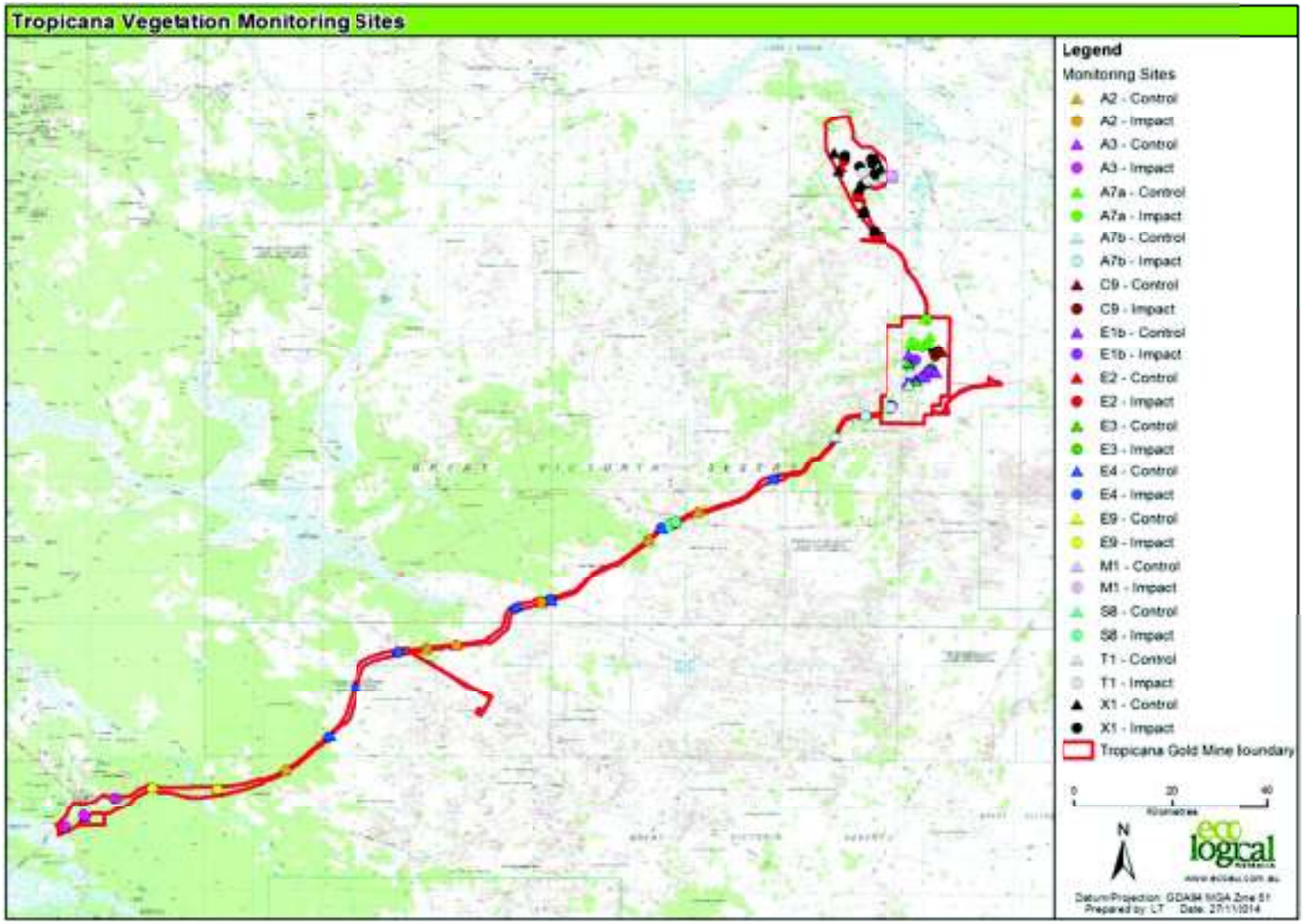

Figure 6: Vegetation Condition Monitoring quadrat locations 2014

SITE PHOTOGRAPHS

Plate 1: TGM Operational Area (October 2014 aerial) – Looking north

Plate 2: Processing Plant and power station September 2013

Plate 3: TGM Seedlings growing at the Kalgoorlie Urban Landcare Group for rehabilitation activities

Plate 4: Photographic monitoring TSF artificial water sources – Wedge-tailed Eagle

Plate 5: Photographic monitoring TSF artificial water sources — Emu drinking

Plate 6: Photographic monitoring TSF artificial water sources — Kangaroo andGalahs utilising the ponds

Plate 7: Photographic monitoring TSF artificial water sources — Goanna

Plate 8: Active Malleefowl Nest Photographic Monitoring

Plate 9: Active Malleefowl Nest Photographic Monitoring – Foxes scavenging within Malleefowl nest

APPENDICES

Appendix 1 – Tropicana Gold Project Ministerial Statement No. 839 Audit Table

GOVERNMENT OF WESTERN AUSTRALIA

Office of the Environmental Protection Authority

AUDIT TABLE

Proposal Implementation Monitoring Section
PROJECT: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder

Note:

- Phases that apply in this table = **Pre-Construction, Construction, Operation, Decommissioning, Overall (several phases)**
- This audit table is a summary and timetable of conditions and commitments applying to this project. Refer to the Minister's Statement for full detail/precise wording of individual elements.
- Code prefixes: M = Minister's condition; P = Proponent's commitment; A = Audit specification; N = Procedure.
- Any elements with status = "Audited by proponent only" are legally binding but are not required to be addressed specifically in compliance reports, if complied with.
- Acronyms list:- Minister for the Environment - Min for Env; Chief Executive Officer – CEO of the OEPA; Department of Environment – DoE (now DEC – Dept of Environment and Conservation); Evaluation Division - Part IV; Pollution Prevention Division - Part V; Waste Management Division - WMD; Department of Conservation and Land Management - CALM; Department of Minerals and Energy - DME; Environmental Protection Authority - EPA; Health Department of WA - HDWA; Water and Rivers Commission - WRC; Bush Fires Board - BFB.

Audit Code	Subject	Action	How	Evidence	Satisfy	Advice	Phase	When	Status 2014	Comment
839:M1.1	**Proposal Implementation**	The proponent shall implement the proposal as assessed by the Environmental Protection Authority and described in Schedule 1 of this statement subject to the condition and procedures of this statement.	As per Schedule 1, Statement 839	Compliance Report	Min for Env		Overall	Ongoing	Compliant	Activities undertaken during the reporting period were compliant with Schedule 1 of the Ministerial Statement. This CAR demonstrates that compliance.
839:M2.1	**Proponent Nomination and Contact Details**	The proponent for the time being nominated by the Minister for Environment under sections 38(6) or 38(7) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposal.	Notify in writing a letter that provides details of the name and address of the new proponent	Letter applying for a transfer of proponent and a copy of the Statement endorsed by the proposed replacement proponent	Min for Env		Overall	On going	Not required at this stage	The nominated proponents for the Project did not change during the reporting period.
839:M2.2	**Proponent Nomination and Contact Details**	The proponent shall notify the Chief Executive Officer of the Office of the Environmental Protection Authority of any change of the name and address of the proponent for the serving of notices or other correspondence within 30 days of such change	Notify in writing a letter that provides details of the name and address of the new proponent		CEO		Overall	Within 30 days of such change	Not required at this stage	There was no change to the contact name and or address of the nominated Proponent during the reporting period
839:M3.1	**Time Limit of Authorisation**	The authorisation to implement the proposal provided for in this statement shall lapse and be void five years after the date of this statement if the proposal to which this statement relates is not substantially commenced	Notify in Writing	Letter of notification	CEO		Overall	Before the 23 September 2015	Compliant	Since approval in 2010, the TGM project has progressed through construction and commissioning stages. Mining commenced in July 2012 and Gold production commenced in September 2013.
839:M3.2	**Time Limit of Authorisation**	The proponent shall provide the Chief Executive Officer of the Office of the Environmental Protection Authority with written evidence which demonstrates that the proposal has substantially commenced on or before the expiration of five years from the date of this statement	Notify in Writing	Letter of notification.	CEO		Overall	Before the 23 September 2015	Compliant	Written notification was submitted to the Office of the EPA 12th March 2011 advising of the proposed commencement of works
839:M4.1	**Compliance Reporting**	The proponent shall prepare and maintain a compliance assessment plan to the satisfaction of the Chief Executive Officer of the Office of the Environmental Protection Authority	Correspondence with the OEPA Preparation of a Compliance Assessment Plan and an audit table in compliance with the requirements of the OEPA.	Approved Compliance Assessment Plan (CAP). A completed and approved Audit Table (this document). Compliance Report	CEO		Overall	Ongoing	Compliant	Compliance Assessment Plan was prepared and submitted on 13 Dec 2010. No updates have been made during the reporting period. Correspondence from General Manager OEPA on 14 February 2011 indicates OEPA is satisfied that the CAP addresses Condition M4.1
839:M4.2	**Compliance Reporting**	The proponent shall submit to the Chief Executive Officer of the Office of the Environmental Protection Authority, the compliance assessment plan required by condition 4-1 at least 6 months prior to the first compliance report required by condition 4-6, or prior to ground disturbing activity, whichever is sooner. The compliance assessment plan shall indicate: 1. the frequency of compliance reporting; 2. the approach and timing of compliance assessments; 3. the retention of compliance assessments; 4. the method of reporting of potential non-compliances and corrective actions taken; 5. the table of contents of compliance reports; and 6. public availability of compliance reports.	The compliance assessment plan shall indicate: 1. the frequency of compliance reporting; 2. the approach and timing of compliance assessments; 3. the retention of compliance assessments; 4. reporting of potential non-compliances and corrective actions taken;	Approved Compliance Assessment Plan Correspondence with OEPA	CEO		Pre-construction	By 24 June 2011 or prior to ground disturbing activities, whichever is sooner.	Compliant	Compliance Assessment Plan was prepared and submitted on 13 Dec 2010. No updates have been made during the reporting period. Correspondence from General Manager OEPA on 14 February 2011 indicates OEPA is satisfied that the CAP addresses Condition M4.1

AUDIT TABLE

Proposal Implementation Monitoring Section
PROJECT: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder

Audit Code	Subject	Action	How	Evidence	Satisfy	Advice	Phase	When	Status 2014	Comment
			5. the table of contents of compliance reports; and 6. public availability of compliance reports.							
839:M4.3	**Compliance Reporting**	The proponent shall assess compliance with conditions in accordance with the compliance assessment plan required by condition 4-1.	As specified in CAP	Overview provided in Compliance Report	Min for Env		Overall	Compliance Report – Annually by 24 December	Compliant	Compliance assessment report prepared as per CAP and submitted prior to 24th December 2014 as required.
839:M4.4	**Compliance Reporting**	The proponent shall retain reports of all compliance assessments described in the compliance assessment plan required by condition 4-1 and shall make those reports available when requested by the Chief Executive Officer of the Office of the Environmental Protection Authority	Records and reports will be maintained in accordance with the Proponent's document management system requirements so that they can be retrieved if requested.	Availability at the request of the CEO	CEO		Overall	When requested by the CEO	Compliant	The CAP was submitted to the OEPA on 13th December 2010 and was approved by the OEPA on 14th February 2011. A CAR has been prepared annually since 2011. The 2014 CAR has been submitted prior to 24th December as required.
839:M4.5	**Compliance Reporting**	The proponent shall advise the Chief Executive Officer of the Office of the Environmental Protection Authority of any potential non-compliance within seven days of that non-compliance being known	Notify in writing	Correspondence to CEO of OEPA	CEO		Overall	Within 7 days of non-compliance being known	Compliant	No non-compliances, which were required to be reported to the OEPA in accordance with Condition 4.5 were observed during the reporting period.
839:M4.6	**Compliance Reporting**	The proponent shall submit to the Chief Executive Officer of the Office of the Environmental Protection Authority the first compliance assessment report fifteen months from the date of issue of this Statement addressing the twelve month period from the date of issue of this Statement and then annually from the date of submission of the first compliance assessment report. The compliance assessment report shall: 1. be endorsed by the proponent's Chief Executive Officer or a person delegated to sign on the Chief Executive Officer's behalf; 2. include a statement as to whether the proponent has complied with the conditions; 3. identify all potential non-compliances and describe corrective and preventative actions taken; 4. be made publicly available in accordance with the approved compliance assessment plan; and 5. indicate any proposed changes to the compliance assessment plan required by condition 4-1.	In accordance with CAP	1. Endorsement in Compliance Report. 2. Compliance Report. 3. Uploaded on to proponent's website and copies sent to DEC Library and PIMB (OEPA).	CEO		Overall	The First CAR submitted due by 24 December 2011. Then annually by 24 December	Compliant	The 2014 CAR will be the fourth annual compliance assessment report prepared in accordance with the CAP and has been submitted prior to 24th December as required.
839:M5.1	**Flora and Vegetation**	The proponent shall ensure that there is no loss of plants of Declared Rare Flora species due to construction or operational activities unless otherwise approved.	Implementation and internal audit of DRF management strategies in Section 13 of the Threatened Species and Community Management Strategy (TS&CMS). Implementation and internal audit of Environmental Monitoring Strategy Application for Licence to Take DRF (Regulation 17) where applicable	Species location records, design/location records and any incident reports/logs in monitoring report and summary in Compliance Report Approvals for license to take DRF	Min for Env		Overall	Ongoing	Compliant	The Threatened species and communities management strategy was updated during 2014. A number of species were removed to reflect changes in DRF and Priority Flora listings. Additional field surveys for flora and fauna have been undertaken when required, such as in the Process Water supply Borefield as part of the proposed expansion, to provide updated information particularly post recent fires. Pre clearing inspections are routinely conducted by the sites Environmental officers prior to any clearing activities and internal ground disturbance permits are issued for all ground disturbing activities. Records of significant flora and fauna identified in the field are uploaded into the sites GIS and are considered as "no go" areas. Data obtained is shared with DPaW annually. An internal audit of the TGM monitoring

AUDIT TABLE

Proposal Implementation Monitoring Section
PROJECT: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder

Audit Code	Subject	Action	How	Evidence	Satisfy	Advice	Phase	When	Status 2014	Comment
										strategy has commenced. Should amendments to the monitoring strategy be required, the strategy will be updated, a copy provided to the relevant agencies and uploaded to the TGM website. Scientific licenses have been obtained by key personnel to collect specimens for verification purposes as and when required.
839:M5.2	**Flora and Vegetation**	The proponent shall undertake monitoring of the condition and abundance of vegetation and flora at reference and potential impact sites in accordance with the "Tropicana Gold Project Environmental Monitoring Strategy, Version: 1.0, Author: B Bastow, Issue Date: 18 February 2010" or subsequent revisions approved by the Chief Executive Officer of the Office of the Environmental Protection Authority. This monitoring is to be carried out to the requirements of the Chief Executive Officer of the Office of the Environmental Protection Authority on advice of the Department of Environment and Conservation	Implementation and internal audit of Environmental Monitoring Strategy Correspondence with OEPA (revisions) and DEC	Monitoring report included in Project Annual Environmental Report (AER) and summary in Compliance Report. Monitoring Records Maps and Photos Correspondence with OEPA (revisions) and DEC	CEO	DEC	Overall	Ongoing	Compliant	The annual vegetation monitoring project was conducted during September/October 2014. The report will be submitted with the annual environmental report due for submission at the end of January 2015. The analysis of data obtained during the monitoring project is currently being finalised. A brief overview of the draft report's findings is however provided in the 2014 CAR as required.
839:M5.3	**Flora and Vegetation**	Should the potential impact sites show a 25 per cent (or greater) decline in cover or productivity as compared to the reference sites, the proponent shall provide a report to the Chief Executive Officer of the Office of the Environmental Protection Authority within 21 days of the decline being identified which 1). describes the decline; 2). provides information which allows determination of the likely root cause of the decline; and 3). if likely to be caused by activities undertaken in implementing the proposal, states the actions and associated timelines proposed to remediate the decline.	Internal audit of monitoring records and analysis of monitoring data Notify in writing	Monitoring Records Report outlining decline, potential causes and corrective actions taken Report to CEO of OEPA	CEO		Overall	Within 21 days of the decline being identified	Compliant	The annual vegetation monitoring was conducted during September/October 2014. No deterioration in vegetation condition associated with the project activities was noted during the field assessment. Computer analysis of all data collected is yet to be finalised. A number of locations were identified as being affected by fire and changes in condition due to annual rainfall fluctuation were noted. Additional monitoring sites were installed to accommodate the borefield expansion infrastructure. A brief overview of the draft report's findings is provided in the 2014 CAR.
839:M5.4	**Flora and Vegetation**	The proponent shall, on approval of the Chief Executive Officer of the Office of the Environmental Protection Authority, implement the actions identified in 5-3 (3) and continue to implement such actions until the Chief Executive Officer of the Office of the Environmental Protection Authority determines that the remedial actions may cease.	Implement the actions identified in 5-3 (3)	Correspondence with the OEPA	CEO		Overall	On approval of the CEO	Not required at this stage	No decline in vegetation condition associated with the TGM operational activities has been detected to date and no remedial actions have been required.
839:M5.5	**Flora and Vegetation**	The proponent shall make the Environmental Monitoring Strategy referred to in 5-2 publically available in a manner approved by the Chief Executive Officer of the Office of the Environmental Protection Authority	1. In accordance with Proposal Implementation Monitoring Section – Fact Sheet 1 – Draft - Making Documents Publicly Available, unless otherwise instructed by the CEO; 2. Adherence to a condition in a Statement requiring public availability of documents must occur within 14 days of submission of the	Document available on website (and letter to CEO to confirm) Copy of Document to DEC Library and PIMB (OEPA)	CEO		Overall	Ongoing and within 14 days of submission and approval of any revisions	Compliant	The Environmental Monitoring strategy is available on the Tropicana JV website (www.tropicanajv.com.au/sustainability/document library) An internal audit of the monitoring strategy has recently been conducted. Any recommended modifications will be implemented and an amended strategy, if required, will be provided to relevant agencies and uploaded to the TJV website.

AUDIT TABLE

Proposal Implementation Monitoring Section
PROJECT: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder

Audit Code	Subject	Action	How	Evidence	Satisfy	Advice	Phase	When	Status 2014	Comment
			documents to the CEO; and 3. 14 days from the date of making documents publicly available, proponents shall provide evidence to the CEO to confirm that advertising or lodgement on website has been completed.							
839:M6.1	**Threatened Species**	The proponent shall implement the "Tropicana Gold Project Threatened Species and Communities Management Strategy, Version 2.0, Author: B Bastow, Issue Date: July 2009", or subsequent revisions approved by the Chief Executive Officer of the Office of the Environmental Protection Authority. The objective of this strategy is to minimise adverse impacts to conservation significant species and communities.	Implementation and internal audit of DRF management strategies in Section 13 of the Threatened Species and Community Management Strategy (TS&CMS). Internal Audit Correspondence with OEPA (revisions)	Monitoring report included in Project Annual Environmental Report (AER) and summary in Compliance Report. Electronic Species location records Design/location records Site inductions Maps and Photos	CEO		Overall	Ongoing	Compliant	The threatened species and communities management strategy has been reviewed and conservation classifications have been updated. The updated strategy is included in the 2014 CAR. Pre-clearing inspections are undertaken via internal Environmental inspection notifications (EIN) and Ground Disturbance Permit (GDP) processes. No go and minimal impact areas are identified in the sites GIS and are avoided when planning future activities. Updating knowledge of threatened species in the area through additional surveys is ongoing as and when required. An example includes the recent borefields expansion flora and fauna surveys.
839:M6.2	**Threatened Species**	The proponent shall review and revise the Tropicana Gold Project Threatened Species and Communities Management Strategy referred to in 6-1, in consultation with the Department of Environment and Conservation, every three years to ensure that the mitigation and management techniques remain valid and incorporate any relevant new research.	Formal review by specialist advisers and DEC	Correspondence with DEC Revised Strategy Research records	Min for Env	DEC	Overall	Review and revise every 3 years with the first review due **24 September 2013.**	Compliant	The threatened species and communities strategy was updated and an amended version was provided to DPaW for comment. Feedback from DPaW has been recently provided and the strategy has been amended accordingly. The updated strategy has been provided in the 2014 CAR. An internal compliance audit against the updated strategy's requirements has been conducted and a copy of the audit findings are provided in the 2014 CAR.

AUDIT TABLE

Proposal Implementation Monitoring Section
PROJECT: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder

Audit Code	Subject	Action	How	Evidence	Satisfy	Advice	Phase	When	Status 2014	Comment
839:M6.3	**Threatened Species**	The proponent shall make the Tropicana Gold Project Threatened Species and Communities Management Strategy referred to in 6-1 publically available in a manner approved by the Chief Executive Officer of the Office of the Environmental Protection Authority.	1. In accordance with Proposal Implementation Monitoring Section – Fact Sheet 1 – Draft - Making Documents Publicly Available, unless otherwise instructed by the CEO; 2. Adherence to a condition in a Statement requiring public availability of documents must occur within 14 days of submission of the documents to the CEO; and 3. 14 days from the date of making documents publicly available, proponents shall provide evidence to the CEO to confirm that advertising or lodgement on website has been completed.	Document available on website (and letter to CEO to confirm) Copy of Document to DEC Library and PIMB (OEPA)	CEO		Overall	Ongoing and within 14 days of submission and approval of revision	Compliant	The Threatened Species and Communities Management Strategy is available on the Tropicana JV website (www.tropicanajv.com.au/sustainability) and released with the Tropicana Gold Project EIA document. The strategy was updated during 2014 and issued to the DPaW for comment. . Feedback from DPaW has been recently provided and the strategy has been amended accordingly. The updated strategy has been provided in the 2014 CAR
839:M7.1	**Trapped Fauna**	The proponent shall ensure that open trenches associated with construction of the water pipeline and the communications link are cleared of trapped fauna by fauna-rescue personnel at least twice daily. Details of all fauna recovered shall be recorded. The first daily clearing shall take place no later than three hours after sunrise and shall be repeated between the hours of 3:00 pm and 6:00 pm. The open trenches shall also be cleared, and fauna details recorded, by fauna-rescue personnel no more than one hour prior to backfilling of trenches. Note: "fauna-rescue personnel" means an employee of the proponent whose responsibility it is to walk the open trench to recover and record fauna found within the trench.	Internal audit of trench inspection records and procedures	Trench Inspection Fauna Report Trench inspection records Backfilling records Fauna removal and relocation records Fauna injury/mortality records Correspondence with the DEC	Min for Env		Construction	Duration of pipeline construction Trench inspection fauna report will be submitted no later than 21 day from the cessation of construction	Compliant	During the reporting period, only minor internal pipelines have been installed within the mining area and the Kamikaze borefield. A summary of the trench inspections undertaken is provided in the 2014 CAR
839:M7.2	**Trapped Fauna**	The fauna-rescue personnel shall be trained in the following, through a program that meets the requirements of the Chief Executive Officer of the Office of the Environmental Protection Authority: 1. fauna identification, capture and handling (including venomous snakes); 2. identification of tracks, scats, burrows and nests of conservation-significant species; 3. fauna vouchering (of deceased animals); 4. assessing injured fauna for suitability for release, rehabilitation or euthanasia; 5. familiarity with the ecology of the species which may be encountered in order to be able to appropriately translocate fauna encountered; and 6. performing euthanasia.	Training program approved by CEO of OEPA Internal audit of training records	Training Program records Correspondence with the OEPA	CEO		Construction	Program approved prior to the commencement of pipeline construction	Compliant	A training program was developed in conjunction with Polytech West and was submitted to the OEPA on 6th February 2012. The training program has been rolled out to 27 people to date involved in the trench inspections along the Pinjin corridor, borefield pipeline and pipeline trenches within the mining area. Snake handlers have been trained through dedicated snake handling training courses. Register of certified snake handlers kept on site. TGM has an arrangement with qualified wildlife carers based in Kalgoorlie who rehabilitate fauna injured on site.
839:M7.3	**Trapped Fauna**	Open trench lengths shall not exceed a length capable of being inspected and cleared by the fauna-clearing	Internal audit of inspection records	Trench Inspection Fauna Report	Min for Env		Construction	During pipeline construction	Compliant	During the reporting period, only minor internal pipelines have been installed within the mining

AUDIT TABLE

Proposal Implementation Monitoring Section
PROJECT: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder

Audit Code	Subject	Action	How	Evidence	Satisfy	Advice	Phase	When	Status 2014	Comment
		personnel within the required times as set out in condition 7-1.	Appropriate planning of pipeline construction	Trench inspection records						area and the Kamikaze borefield. A trench inspection report for the Kamikaze pipeline installation is provided in the 2014 CAR
839:M7.4	**Trapped Fauna**	Ramps providing egress points and/or fauna refuges providing suitable shelter from the sun and predators for trapped fauna are to be placed in the trench at intervals not exceeding 50 meters.	Internal audit of inspection records and design drawings	Trench Inspection Fauna Report Trench inspection records Backfilling records Photographs	Min for Env		Construction	During pipeline construction	Compliant	The requirement to install fauna egress ramps at approximately 50m intervals along pipeline trenches has been included into the threatened species management strategy. Compliance is checked during the fauna trench inspections.
839:M7.5	**Trapped Fauna**	The proponent shall produce a report on fauna management within the water pipeline lateral easement and communication corridor at the completion of pipeline and communication link construction. The report shall include the following: 1. details of all fauna inspections; 2. the number of fauna cleared from trenches; 3. fauna mortalities; and 4. all actions taken. The report shall be provided to the Chief Executive Officer of the Office of the Environmental Protection Authority no later than 21 days after the completion of pipeline installation, and shall be made publicly available in a manner approved by the Chief Executive Officer of the Office of the Environmental Protection Authority	1. As per PIMB fact sheet 1 Making documents publicly available. Preparation of report as per criteria following finalisation of pipeline installation and submit to OEPA within 21 days. Report published in a manner approved by CEO of OEPA	Trench Inspection Fauna Report Document available on website (and letter to CEO to confirm) Copy of Document to DEC Library and PIMB (OEPA)	CEO		Overall	Trench inspection fauna report will be submitted no later than 21 days after the completion of pipeline installation	Compliant	Construction of the 50km borefield pipeline was completed during the previous (2013) reporting period and a fauna inspection report was developed and submitted as required by Condition M7.1. As part of the borefield expansion, an additional 30km of pipeline will be installed. During the pipelines installation, qualified personnel will undertake the required trench inspections and a fauna inspection report will be developed.
839:M8.1	**Groundwater and Surface Water Quality**	The proponent shall ensure that run-off and/or seepage from the tailings storage facility and waste material landforms does not impact the quality of surface water or groundwater within or adjacent to the proposal area to exceed the trigger values for a slightly to moderately disturbed ecosystem provided for in Table 3.4.2 of Chapter 3 of the Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand 2000, *Australian Water Quality Guidelines for Fresh and Marine Waters* and its updates, taking into consideration natural background water quality	Internal audit of water monitoring results against table 3.4.2 of Chapter 3 of *Australian Water Quality Guidelines for Fresh and Marine Waters (2000)* as updated	Monitoring Report included in Project AER and summary included as part of the Compliance Report	Min for Env		Overall	Ongoing	Compliant	Internal audit of water monitoring results against the Australia Guidelines has been conducted and findings are provided in the 2014 CAR. Groundwater monitoring bores around the TSF and waste landforms have been sampled throughout 2014. A summary of results is provided in the 2014 CAR and a monitoring report will be provided in the AER as required.
839:M8.2	**Groundwater and Surface Water Quality**	The proponent shall monitor the quality of surface water and groundwater upstream and downstream of the tailings storage facility and waste material landforms to ensure that the requirements of condition 8-1 are met. This monitoring is to be carried out using methods consistent with Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand 2000, *Australian Guidelines for Water Quality Monitoring and Reporting* (and its updates) and to the satisfaction of the Chief Executive Officer of the Office of the Environmental Protection Authority.	Implementation of Environmental Monitoring Strategy Internal audit of water monitoring methodology against *Australian Guidelines for Water Quality Monitoring and Reporting* (2000) and its updates	Monitoring report included in Project AER and Summary included in Compliance Report	CEO		Overall	Ongoing	Compliant	Groundwater monitoring bores around the TSF and waste land-forms have been sampled throughout 2014. Opportunistic surface water monitoring has been conducted following rainfall events A summary of results is provided in the 2014 CAR and a monitoring report will be provided in the AER as required. An internal audit of the monitoring methodology against the Australian Guidelines was undertaken as required and findings are provided in the 2014 CAR.
839:M8.3	**Groundwater and Surface Water Quality**	The proponent shall commence the water quality monitoring required by 8-2 before ground disturbing activities in order to collect baseline data	Implementation of Environmental Monitoring Strategy Internal audit of groundwater and surface water monitoring program	Monitoring report included in Project AER and Summary included in Compliance Report	CEO		Pre-construction	Before ground disturbing activities.	Compliant	Groundwater monitoring bores around the TSF and waste land-forms have been sampled through-out 2014 providing baseline data. Opportunistic surface water monitoring has been conducted following rainfall events

AUDIT TABLE

Proposal Implementation Monitoring Section
PROJECT: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder

Audit Code	Subject	Action	How	Evidence	Satisfy	Advice	Phase	When	Status 2014	Comment
839:M8.4	**Groundwater and Surface Water Quality**	The proponent shall submit annually the results of monitoring required by condition 8-2 to the Chief Executive Officer of the Office of the Environmental Protection Authority	Written submission of results within the annual compliance reports	Correspondence with OEPA Monitoring report included in Project AER and Summary included in Compliance Report	CEO		Overall	Compliance Report – Annually by 24 December	Compliant	Results of the water quality monitoring activities were provided in the sites 2013 AER, submitted in January 2014. Results from the 2014 monitoring activities will be provided in the 2014 AER due for submission in January 2015.
839:M8.5	**Groundwater and Surface Water Quality**	In the event that monitoring required by condition 8-2 indicates that the requirements of condition 8-1 are not being met, the proponent shall: 1. report such findings to the Chief Executive Officer of the Office of the Environmental Protection Authority within 21 days of the decline in water quality being identified; 2. provide evidence which allows determination of the root cause of the decline in water quality; and 3. if determined to be a result of activities undertaken in implementing the proposal, state the actions and associated timelines proposed to be taken to remediate the water quality.	Preparation of report as per criteria and submit to OEPA within 21 days. Internal review of monitoring results against criteria outlined in condition 8.1	Report outlining the water quality change, potential causes and corrective actions taken	CEO		Overall	No later than 21 days of the decline in water quality being identified.	Compliant	Baseline data compiled from water bores located within the resource area and sampled since 2008 was compared with the baseline data obtained from the TSF and waste landform monitoring bores. This baseline data is being used to establish response trigger levels. Results obtained to date do not indicate any decline in water quality.
839:M8.6	**Groundwater and Surface Water Quality**	The proponent shall, on approval of the Chief Executive Officer of the Office of the Environmental Protection Authority, implement the actions identified in 8-5 (3) and continue to implement such actions until the Chief Executive Officer of the Office of the Environmental Protection Authority determines that the remedial actions may cease.	Implement the actions identified in 8-5 (3)	Correspondence with OEPA	CEO		Overall	On approval of the CEO	Compliant	Baseline data compiled from water bores located within the resource area and sampled since 2008 was compared with the baseline data obtained from the TSF and waste landform monitoring bores. This baseline data is being used to establish response trigger levels. Results obtained to date do not indicate any decline in water quality.
839:M8.7	**Groundwater and Surface Water Quality**	The proponent shall make the monitoring reports required by condition 8-2 publicly available in a manner approved by the Chief Executive Officer of the Office of the Environmental Protection Authority	1. In accordance with Proposal Implementation Monitoring Section – Fact Sheet 1 – Draft - Making Documents Publicly Available, unless otherwise instructed by the CEO; 2. Adherence to a condition in a Statement requiring public availability of documents must occur within 14 days of submission of the documents to the CEO; and 3. 14 days from the date of making documents publicly available, proponents shall provide evidence to the CEO to confirm that advertising or lodgement on website has been completed. In accordance with CAP	Document available on website (and letter to CEO to confirm) Copy of Document to DEC Library and PIMB (OEPA)	CEO		Overall	Within 14 days of submission	Compliant	Results from water monitoring conducted throughout the year will be included in the sites AER due for submission at the end of January 2015. The annual report is submitted to the DMP electronically via their online submission process. Once submitted this information is publically available via the TJV website.
839:M9.1	**Rehabilitation**	The proponent shall undertake progressive rehabilitation over the life of the proposal to achieve the following outcomes: 1. The waste material landforms and tailings storage facility shall be non-polluting and shall be constructed so that their stability, surface drainage, resistance to erosion and ability to support local native vegetation are similar to undisturbed natural analogue landforms as demonstrated by Ecosystem	Implementation of Operational Management Strategy, Tailings Environmental Management Strategy and Conceptual Closure and Rehabilitation Management Strategy	Rehabilitation Records Annual Mine Plan Map and photos of rehabilitation	CEO	DEC	Overall	Ongoing	Compliant	A mine closure plan was prepared in accordance with DMP requirements and was submitted with the 2013 AER. TGM is in early stage of operations and final landforms are not yet available for rehabilitation to commence. A rehabilitation plan will be developed in due course.

Audit Code	Subject	Action	How	Evidence	Satisfy	Advice	Phase	When	Status 2014	Comment
		Function Analysis or other methodology acceptable to the Chief Executive Officer of the Office of the Environmental Protection Authority. 2. Waste material landforms, tailings storage facility and other areas disturbed through implementation of the proposal (excluding mine pits), shall be progressively rehabilitated with vegetation composed of native plant species of local provenance (defined as seed or plant material collected within the Great Victoria Desert Bioregions 1 and 2). 3. The percentage cover and species diversity of living self-sustaining native vegetation in all rehabilitation areas shall be comparable to that of undisturbed natural analogue sites as demonstrated by Ecosystem Function Analysis or other methodology acceptable to the Chief Executive Officer of the Office of the Environmental Protection Authority. 4. No new species of weeds (including both declared weeds and environmental weeds) shall establish in the area as a result of the implementation of the proposal. 5. The coverage of weeds (including both declared weeds and environmental weeds) within rehabilitated areas shall be no greater than the average of three reference sites on nearby land, with the reference sites to be chosen in consultation with the Department of Environment and Conservation. Note: The methodology for Ecosystem Function Analysis is set out in Tongway DJ and Hindley 2004 *Landscape Function Analysis – Procedures for Monitoring and Assessing Landscapes*, Commonwealth Scientific and Industrial Research Organisation Sustainable Ecosystems, Canberra.	(and approved future revisions) Internal audit of rehabilitation and closure activities and records Correspondence with OEPA and DEC on Monitoring Strategy Analysis of monitoring data	Rehabilitation Monitoring Records						Rehabilitation activities commenced within a disused borrow pit during the reporting period and will continue to progress during 2015.
839:M9.2	**Rehabilitation**	Rehabilitation activities shall continue until such time as the requirements of condition 9-1 are met, and are demonstrated by inspections and reports to be met, for a minimum of five years following mine completion to the satisfaction of the Chief Executive Officer of the Office of the Environmental Protection Authority, on advice of the Department of Mines and Petroleum	Activities will continue until the M9.1 requirements are met for a minimum of 5 years Seek advice from DMP following mine completion.	Rehabilitation records Rehabilitation Monitoring Records Correspondence with OEPA and DMP	CEO	DMP	Overall	Ongoing until the requirements of M9-1 are met for a minimum of 5 years	Compliant	TGM is in early stage of operations and final landforms are not yet available for rehabilitation to commence. Rehabilitation activities will be conducted progressively as and when areas become available.
839:M10.1	**Final Closure and Decommissioning Plan**	At least five years prior to mine completion, the proponent shall prepare and submit a Final Closure and Decommissioning Plan to the requirements of the Chief Executive Officer of the Office of the Environmental Protection Authority, on advice of the Department of Mines and Petroleum	Preparation of a Final Closure and Decommissioning Plan in accordance with criteria.	Correspondence with OEPA approving the Plan	CEO	DMP	Overall	At least five years prior to mine completion	Not required at this stage	A mine closure plan was prepared in accordance with DMP requirements and was submitted with the 2013 AER. TGM is in early stage of operations and has an expected mine life of 10-15 years. A final mine closure plan will be developed 5 years prior to mine completion as required.
839:M10.2	**Final Closure and Decommissioning Plan**	The Final Closure and Decommissioning Plan shall be prepared consistent with: 1. ANZMEC/MCA 2000, *Strategic Framework for Mine Closure Planning*; and 2. Department of Industry Tourism and Resources 2006 *Mine Closure and Completion* (Leading Practice Sustainable Development Program for the Mining Industry), Commonwealth Government, Canberra;	Preparation of a Final Closure and Decommissioning Plan in accordance with criteria.	Submit plan to CEO of OEPA and DMP Approval of Plan by OEPA.	CEO	DMP	Overall	At least five years prior to mine completion	Not required at this stage	A mine closure plan was prepared in accordance with DMP requirements and was submitted with the 2013 AER. TGM is in early stage of operations and has an expected mine life of 10-15 years. A final mine closure plan will be developed 5 years prior to mine completion as required.

AUDIT TABLE

Proposal Implementation Monitoring Section
PROJECT: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder

Audit Code	Subject	Action	How	Evidence	Satisfy	Advice	Phase	When	Status 2014	Comment
839:M10.3	**Final Closure and Decommissioning Plan**	The Final Closure and Decommissioning Plan shall provide detailed technical information on the following: 1. final closure of all areas disturbed through implementation of the proposal so that they are safe, stable and non-polluting; 2. decommissioning of all plant and equipment; 3. disposal of waste materials; 4. final rehabilitation of waste dumps; tailings storage facilities and other areas (outside the mine pit(s)); 5. Management and monitoring following mine completion; and 6.inventory of all contaminated sites and proposed management.	Preparation of a Final Closure and Decommissioning Plan in accordance with criteria.	Submit plan to CEO of OEPA and DMP. Approval of the plan by OEPA.	CEO	DMP	Overall	At least five years prior to mine completion	Not required at this stage	A mine closure plan was prepared in accordance with DMP requirements and was submitted with the 2014 AER. TGM is in early stage of operations and has an expected mine life of 10-15 years. A final mine closure plan will be developed 5 years prior to mine completion as required.
839:M10.4	**Final Closure and Decommissioning Plan**	The proponent shall close, decommission and rehabilitate the proposal in accordance with the approved Final Closure and Decommissioning Plan	Implementation of the Final Closure and Decommissioning Plan Internal and external audits (as required) of the Final Closure and Decommissioning Plan	Closure, rehabilitation and Decommissioning activities detailed in the Project AER and summary included in Compliance Report	Min for Env		Overall	Ongoing	Not required at this stage	TGM is in early stage of operations and has an expected mine life of 10-15 years.
839:M10.5	**Final Closure and Decommissioning Plan**	The proponent shall make the Final Closure and Decommissioning Plan required by conditions 10-1 and 10-2 publicly available in a manner approved by the Chief Executive Officer of the Office of the Environmental Protection Authority	1. In accordance with Proposal Implementation Monitoring Section – Fact Sheet 1 – Draft - Making Documents Publicly Available, unless otherwise instructed by the CEO; 2. Adherence to a condition in a Statement requiring public availability of documents must occur within 14 days of submission of the documents to the CEO; and 3. 14 days from the date of making documents publicly available, proponents shall provide evidence to the CEO to confirm that advertising or lodgement on website has been completed.	Document available on website (and letter to CEO to confirm) Copy of Document to DEC Library and PIMB (OEPA)	CEO		Overall	Within 14 days of submission	Not required at this stage.	TGM is in early stage of operations and has an expected mine life of 10-15 years.

Appendix 2: OEPA Audit 2013 CAR and associated Correspondence

Government of **Western Australia**
Office of the **Environmental Protection Authority**

Ms Belinda Bastow
Manager – Environment / Approvals
AngloGold Ashanti Australia Limited
PO Box Z5046
PERTH WA 6831

Your Ref: *Statement 839*
Our Ref: *CA03-2013-0078*
Enquiries: *Kevin Da Silva, 6145 0857*
Email: *kevin.dasilva@epa.wa.gov.au*

Dear Ms Bastow

TROPICANA GOLD PROJECT – STATEMENT 839 – RESULT OF DESKTOP VERIFICATION AUDIT

The Office of the Environmental Protection Authority (OEPA) has completed a Verification Desktop Audit (VDA) to verify AngloGold Ashanti Australia Limited's (AG) compliance with the implementation conditions of the above.

The VDA identified that the evidence provided on 1 April 2014 by AG was insufficient to determine compliance. Accordingly the OEPA requests that AG provide additional evidence to verify compliance. The VDA Report details the compliance status of the implementation conditions, and is enclosed for your information.

Accurate records and evidence of implementation to demonstrate compliance with the conditions are required for those marked as 'VR' in the enclosed Verification Desktop Audit and listed below:

839:M6.1 Threatened Species
839:M6.2 Threatened Species
839:M8.1 Groundwater and Surface Water Quality
839:M8.2 Groundwater and Surface Water Quality
839:M8.3 Groundwater and Surface Water Quality

The OEPA requests that AG submit this information by **28 May 2014.** If you have any queries regarding this matter, please contact Hugh Lance on 6145 0846.

Yours sincerely

p/p

Ian Munro
MANAGER, COMPLIANCE BRANCH

May 2014

Encl: Verification Desktop Audit – Ministerial Statement 839

Statement Compliance Section
Compliance Branch
Assessment and Compliance Division

GOVERNMENT OF WESTERN AUSTRALIA

Office of the Environmental Protection Authority

Verification Audit Report

Proponent	AngloGold Ashanti Australia Ltd and Independence Group NL	**Statement**	839
Proposal	Tropicana Gold Project, Shire of Menzies, Shire of Laverton and the City of Kalgoorlie – Boulder		
Proponent Contact	Belinda Bastow Manager Approvals/Compliance 94254621		
Auditor (Desktop)	Kevin Da Silva		
Date of Audit	20 January 2014		
File Number	CA03-2013-0078 and OEPA2010/000644-1		
Objectives	Assess the proponent's compliance with Statement 839		
Scope	Implementation conditions of Statement 839		
Documents Reviewed	Statement 839 Bulletin 1361 DER licence L8676/2012/1 Tropicana Gold Mine 2012-2013 Annual Compliance Assessment Report (2013-00000493653) Notice of commencement of construction letter 12 March 2012 (A379318) Letter from OEPA indicates Compliance Assessment Plan meets requirements 14 February 2011 (A368262) OEPA letter Fauna Handling Training Manual satisfies requirements of condition 7-2 (A480291) Fauna Trench Inspection Report (2013-0000246605) Proponent response to Desktop Audit and Compliance Information dated 1 April 2014 (2014-0000760001)		

Introduction

This Verification Audit Report covers the status of compliance with Ministerial Statement 839 which was issued 24 September 2010 to Tropicana Joint Venture (AngloGold Ashanti Australia Ltd and Independence Group NL) for the Tropicana Gold Project, Shire of Menzies, Shire of Laverton and the City of Kalgoorlie – Boulder. The proposal is for the construction and operation of an open cut gold mine and associated infrastructure, approximately 330 km east northeast of Kalgoorlie and 200km east of Laverton with production commencing in September 2013. A change to the proposal under Section 45C of the *Environmental Protection Act 1986* was approved 19 November 2012 to alter the proposed Tailings Storage Facility (TSF) from a two cell paddock to single celled facility.

Audit Findings

The following Audit Table presents the overall assessment of compliance, and details any non-compliances identified through completing a Verification Audit Report. The criteria used to assess compliance are taken from the implementation conditions of the Statement.

AUDIT TABLE

PROPOSAL: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder
STATEMENT: 839

Note:

- Phases that apply in this table = **Pre-Construction, Construction, Operation, Decommissioning, Overall (several phases)**
- This audit table is a summary and timetable of conditions and commitments applying to this project. Refer to the Minister's Statement for full detail/precise wording of individual elements.
- Code prefixes: M = Minister's condition; P = Proponent's commitment;
- Abbreviations: CAR = Compliance Assessment Report; CEO = Chief Executive Officer of OEPA; DER = Department of Environment Regulation; DIA = Department of Indigenous Affairs; DMP = Department of Mining and Petroleum; DoH = Department of Health; DoW = Department of Water, EPA = Environmental Protection Authority, Minister for Env = Minister for the Environment; OEPA = Office of the Environmental Protection Authority.
- Compliance Status: C = Compliant, CLD = Completed, NC = Non – compliant, NR = Not Required at this stage. Please note the terms NA = Not Audited and VR = Verification Required are only for OEPA use.

Number	Issue	Phase	Action	Plan Requirements	Notes	Status
839:M1.1	**Proposal Implementation**	Overall	The proponent shall implement the proposal as assessed by the Environmental Protection Authority and described in Schedule 1 of this statement subject to the condition and procedures of this statement.		Tropicana Gold Mine 2012-2013 Annual Compliance Assessment Report (2013-00000493653) (2013 CAR) indicates compliance with this condition. A s45c amendment was approved on 19 November 2012 which modified the TSF design to a single celled facility.	C
839:M2.1	**Proponent Nomination and Contact Details**	Overall	The proponent for the time being nominated by the Minister for Environment under sections 38(6) or 38(7) of the Environmental Protection Act 1986 is responsible for the implementation of the proposal.		2013 CAR (2013-00000493653) indicates compliance with this condition. The nominated proponent did not change during the reporting period.	C
839:M2.2	**Proponent Nomination and Contact Details**	Overall	The proponent shall notify the Chief Executive Officer of the Office of the Environmental Protection Authority of any change of the name and address of the proponent for the serving of notices or other correspondence within 30 days of such change.		2013 CAR (2013-00000493653) indicates compliance with this condition. There was no change to the contact name or address of the nominated proponent during the reporting period.	C

AUDIT TABLE

PROPOSAL: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder
STATEMENT: 839

Number	Issue	Phase	Action	Plan Requirements	Notes	Status
839:M3. 1	Time Limit of Authorisation	Overall	The authorisation to implement the proposal provided for in this statement shall lapse and be void five years after the date of this statement if the proposal to which this statement relates is not substantially commenced.		Written notification was submitted to the OEPA advising of the commencement of construction in a letter dated 12 March 2012 (A379318).	CLD
839:M3. 2	Time Limit of Authorisation	Overall	The proponent shall provide the Chief Executive Officer of the Office of the Environmental Protection Authority with written evidence which demonstrates that the proposal has substantially commenced on or before the expiration of five years from the date of this statement.		Written notification was submitted to the OEPA advising of the commencement of construction in a letter dated 12 March 2012 (A379318).	CLD
839:M4. 1	Compliance Reporting	Overall	The proponent shall prepare and maintain a compliance assessment plan to the satisfaction of the Chief Executive Officer of the Office of the Environmental Protection Authority.		OEPA confirmed the Compliance Assessment Plan submitted on 13 December 2010 (A366869) meets requirements in a letter dated 14 February 2011 (A368262).	C
839:M4. 2	Compliance Reporting	Pre-construction	The proponent shall submit to the Chief Executive Officer of the Office of the Environmental Protection Authority, the compliance assessment plan required by condition 4-1 at least 6 months prior to the first compliance report required by condition 4-6, or prior to ground disturbing activity, whichever is sooner. The compliance assessment plan shall indicate: 1. the frequency of compliance reporting; 2. the approach and timing of compliance assessments; 3. the retention of compliance assessments; 4. the method of reporting of potential non-compliances and corrective actions taken; 5. the table of contents of compliance reports; and 6. public availability of compliance reports.		OEPA confirmed the Compliance Assessment Plan submitted on 13 December 2010 (A366869) meets requirements in a letter dated 14 February 2011 (A368262).	CLD

AUDIT TABLE

PROPOSAL: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder
STATEMENT: 839

Number	Issue	Phase	Action	Plan Requirements	Notes	Status
839:M4.3	Compliance Reporting	Overall	The proponent shall assess compliance with conditions in accordance with the compliance assessment plan required by condition 4-1.		The 2013 CAR (2013-00000493653) indicates compliance with this condition.	C
839:M4.4	Compliance Reporting	Overall	The proponent shall retain reports of all compliance assessments described in the compliance assessment plan required by condition 4-1 and shall make those reports available when requested by the Chief Executive Officer of the Office of the Environmental Protection Authority.		The proponent has provided all documents relating to compliance assessment requested by the CEO to date.	C
839:M4.5	Compliance Reporting	Overall	The proponent shall advise the Chief Executive Officer of the Office of the Environmental Protection Authority of any potential non-compliance within seven days of that non-compliance being known.		The 2013 CAR (2013-00000493653) indicates compliance with this condition.	C
839:M4.6	Compliance Reporting	Overall	The proponent shall submit to the Chief Executive Officer of the Office of the Environmental Protection Authority the first compliance assessment report fifteen months from the date of issue of this Statement addressing the twelve month period from the date of issue of this Statement and then annually from the date of submission of the first compliance assessment report. The compliance assessment report shall: 1. be endorsed by the proponent's Chief Executive Officer or a person delegated to sign on the Chief Executive Officer's behalf; 2. include a statement as to whether the proponent has complied with the conditions; 3. identify all potential non-compliances and describe corrective and preventative actions taken; 4. be made publicly available in accordance with the approved compliance assessment plan; and 5. indicate any proposed changes to the compliance assessment plan required by condition 4-1.		2013 CAR (2013-00000493653) was submitted prior to 24 December 2013.	C
839:M5.1	Flora and Vegetation	Overall	The proponent shall ensure that there is no loss of plants of Declared Rare Flora species due to construction or operational activities unless otherwise		The 2013 CAR (2013-00000493653) indicates clearing permits are only	C

AUDIT TABLE

PROPOSAL: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder
STATEMENT: 839

Number	Issue	Phase	Action	Plan Requirements	Notes	Status
			approved.		signed off once a review has been completed against known Declared Rare Flora (DRF) locations.	
839:M5.2	Flora and Vegetation	Overall	The proponent shall undertake monitoring of the condition and abundance of vegetation and flora at reference and potential impact sites in accordance with the 'Tropicana Gold Project Environmental Monitoring Strategy, Version: 1.0, Author: B Bastow, Issue Date: 18 February 2010' or subsequent revisions approved by the Chief Executive Officer of the Office of the Environmental Protection Authority. This monitoring is to be carried out to the requirements of the Chief Executive Officer of the Office of the Environmental Protection Authority on advice of the Department of Environment and Conservation.		The Compliance Information provided by the proponent on 1 April 2014 (2014-0000760001) indicates compliance with this condition.	C
839:M5.3	Flora and Vegetation	Overall	Should the potential impact sites show a 25 per cent (or greater) decline in cover or productivity as compared to the reference sites, the proponent shall provide a report to the Chief Executive Officer of the Office of the Environmental Protection Authority within 21 days of the decline being identified which 1). describes the decline; 2). provides information which allows determination of the likely root cause of the decline; and 3). If likely to be caused by activities undertaken in implementing the proposal, states the actions and associated timelines proposed to remediate the decline.		The Compliance Information provided by the proponent on 1 April 2014 (2014-0000760001) indicates compliance with this condition.	C
839:M5.4	Flora and Vegetation	Overall	The proponent shall, on approval of the Chief Executive Officer of the Office of the Environmental Protection Authority, implement the actions identified in 5-3 (3) and continue to implement such actions until the Chief Executive Officer of the Office of the Environmental Protection Authority determines that the remedial actions may cease.		No decline in flora or vegetation condition has been noted during the reporting period.	NR

AUDIT TABLE

PROPOSAL: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder
STATEMENT: 839

Number	Issue	Phase	Action	Plan Requirements	Notes	Status
839:M5.5	**Flora and Vegetation**	Overall	The proponent shall make the Environmental Monitoring Strategy referred to in 5-2 publically available in a manner approved by the Chief Executive Officer of the Office of the Environmental Protection Authority.		The management strategy referred to in 5-2 is publically available on the Tropicana website. (http://www.tropicanajv.com.au/irm/content/dl_management.html).	C
839:M6.1	**Threatened Species**	Overall	The proponent shall implement the "Tropicana Gold Project Threatened Species and Communities Management Strategy, Version 2.0, Author: B Bastow, Issue Date: July 2009", or subsequent revisions approved by the Chief Executive Officer of the Office of the Environmental Protection Authority. The objective of this strategy is to minimise adverse impacts to conservation significant species and communities.		The Compliance Information provided by the proponent on 1 April 2014 (2014-0000760001) was not sufficient to assess compliance with all implementation requirements of the strategy. **Verification Priority: Medium** The OEPA may co-ordinate a site inspection to determine the compliance status of this condition during the next compliance program. Compliance of the following potential impacts managed by the strategy would be focussed on in the site inspection: • Clearing/Earthwork • Environmentally hazardous substances • General waste • Water	VR

AUDIT TABLE

PROPOSAL: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder
STATEMENT: 839

Number	Issue	Phase	Action	Plan Requirements	Notes	Status
					sources/Storage • Invasive flora	
839:M6.2	**Threatened Species**	Overall	The proponent shall review and revise the Tropicana Gold Project Threatened Species and Communities Management Strategy referred to in 6-1, in consultation with the Department of Environment and Conservation, every three years to ensure that the mitigation and management techniques remain valid and incorporate any relevant new research.	First review due 24 September 2013.	The Compliance Information provided by the proponent on 1 April 2014 (2014-0000760001) included a review of the Tropicana Gold Project Threatened Species and Communities Management Strategy however, evidence of consultation with the Department of Parks and Wildlife (DPAW) was not provided. **Verification Priority: Medium** The proponent is required to provide to the OEPA **by 28 May 2014:** Evidence that DPAW has been consulted on the strategy review.	VR
839:M6.3	**Threatened Species**	Overall	The proponent shall make the Tropicana Gold Project Threatened Species and Communities Management Strategy referred to in 6-1 publically available in a manner approved by the Chief Executive Officer of the Office of the Environmental Protection Authority.		The Tropicana Gold Project Threatened Species and Communities Management Strategy referred to in 6-1 is publically available (http://www.tropicanajv.com.au/irm/content/dl_management.html).	C
839:M7.1	**Trapped Fauna**	Construction	The proponent shall ensure that open trenches associated with construction of the water pipeline and the communications link are cleared of trapped fauna by		Proponent submitted the Fauna Trench Inspection Report at the completion of	CLD

AUDIT TABLE

PROPOSAL: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder
STATEMENT: 839

Number	Issue	Phase	Action	Plan Requirements	Notes	Status
			fauna-rescue personnel at least twice daily. Details of all fauna recovered shall be recorded. The first daily clearing shall take place no later than three hours after sunrise and shall be repeated between the hours of 3:00 pm and 6:00 pm. The open trenches shall also be cleared, and fauna details recorded, by fauna-rescue personnel no more than one hour prior to backfilling of trenches. Note: "fauna-rescue personnel" means employees of the proponent whose responsibility it is to walk the open trench to recover and record fauna found within the trench.		construction (2013-0000246605) indicating compliance with and completion of the condition. The construction period and inspections were conducted between May 2011 and June 2013.	
839:M7.2	**Trapped Fauna**	Construction	The fauna-rescue personnel shall be trained in the following, through a program that meets the requirements of the Chief Executive Officer of the Office of the Environmental Protection Authority: 1. fauna identification, capture and handling (including venomous snakes); 2. identification of tracks, scats, burrows and nests of conservation-significant species; 3. fauna vouchering (of deceased animals); 4. assessing injured fauna for suitability for release, rehabilitation or euthanasia; 5. familiarity with the ecology of the species which may be encountered in order to be able to appropriately translocate fauna encountered; and 6. performing euthanasia.		The construction period and inspections were conducted between May 2011 and June 2013. An OEPA letter dated 1 March 2012 indicated the Fauna Handling Training Manual satisfies requirements of Condition 7-2 (A480291). Proponent submitted the Fauna Trench Inspection Report (2013-0000246605) indicating compliance with and completion of the condition.	CLD
839:M7.3	**Trapped Fauna**	Construction	Open trench lengths shall not exceed a length capable of being inspected and cleared by the fauna-clearing personnel within the required times as set out in condition 7-1.		The construction period and inspections were conducted between May 2011 and June 2013. Proponent submitted the Fauna Trench Inspection Report (2013-0000246605) indicating compliance with	CLD

AUDIT TABLE

PROPOSAL: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder
STATEMENT: 839

Number	Issue	Phase	Action	Plan Requirements	Notes	Status
					and completion of the condition.	
839:M7.4	Trapped Fauna	Construction	Ramps providing egress points and/or fauna refuges providing suitable shelter from the sun and predators for trapped fauna are to be placed in the trench at intervals not exceeding 50 metres.		The construction period and inspections were conducted between May 2011 and June 2013. Proponent submitted the Fauna Trench Inspection Report (2013-0000246605) indicating compliance with and completion of the condition.	CLD
839:M7.5	Trapped Fauna	Overall	The proponent shall produce a report on fauna management within the water pipeline lateral easement and communication corridor at the completion of pipeline and communication link construction. The report shall include the following: 1. details of all fauna inspections; 2. the number of fauna cleared from trenches; 3. fauna mortalities; and 4. all actions taken. The report shall be provided to the Chief Executive Officer of the Office of the Environmental Protection Authority no later than 21 days after the completion of pipeline installation, and shall be made publicly available in a manner approved by the Chief Executive Officer of the Office of the Environmental Protection Authority.		The construction period and inspections were conducted between May 2011 and June 2013. Proponent submitted the Fauna Trench Inspection Report (2013-0000246605) indicating compliance with and completion of the condition.	CLD
839:M8.1	Groundwater and Surface Water Quality	Overall	The proponent shall ensure that run-off and/or seepage from the tailings storage facility and waste material landforms does not impact the quality of surface water or groundwater within or adjacent to the proposal area to exceed the trigger values for a slightly to moderately disturbed ecosystem provided for in Table 3.4.2 of Chapter 3 of the Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and		The 2013 CAR (2013-00000493653) did not provide sufficient information to determine compliance with this condition. **Verification Priority: Medium** The proponent is required	VR

AUDIT TABLE

PROPOSAL: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder
STATEMENT: 839

Number	Issue	Phase	Action	Plan Requirements	Notes	Status
			New Zealand 2000, Australian Water Quality Guidelines for Fresh and Marine Waters and its updates, taking into consideration natural background water quality.		to provide to the OEPA **by 28 May 2014:** Information to confirm that the 4 items listed in table 1 of the Tropicana Gold Compliance Assessment Plan (A366869) for Conditions 8-1 to 8-4 being: 1. Water Monitoring results against table 3.4.2 of Chapter 3 Australian Water Quality Guidelines for Fresh and Marine Waters (2000) (as updated). 2. Internal Audit of Water Monitoring results Australian Guidelines for Water Quality Monitoring and Reporting (as updated). 3. Groundwater and Surface Water Monitoring Program 4. Groundwater and Surface Water Monitoring Reports; have been audited annually by the proponent.	
839:M8.2	**Groundwater and Surface Water Quality**	Overall	The proponent shall monitor the quality of surface water and groundwater upstream and downstream of the tailings storage facility and waste material landforms to ensure that the requirements of condition 8-1 are met. This monitoring is to be carried out using methods consistent with Australian and New Zealand		The 2013 CAR (2013-00000493653) did not provide sufficient information to determine that the requirements of condition 8-1 are being	VR

AUDIT TABLE

PROPOSAL: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder
STATEMENT: 839

Number	Issue	Phase	Action	Plan Requirements	Notes	Status
			Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand 2000, Australian Guidelines for Water Quality Monitoring and Reporting (and its updates) and to the satisfaction of the Chief Executive Officer of the Office of the Environmental Protection Authority.		met. **Verification Priority: Medium** Information to confirm that the 4 items listed in table 1 of the Tropicana Gold Compliance Assessment Plan (A366869) for Conditions 8-1 to 8-4 being: 1. Water Monitoring results against table 3.4.2 of Chapter 3 Australian Water Quality Guidelines for Fresh and Marine Waters (2000) (as updated) 2. Internal Audit of Water Monitoring results Australian Guidelines for Water Quality Monitoring and Reporting (as updated) 3. Groundwater and Surface Water Monitoring Program 4. Groundwater and Surface Water Monitoring Reports; Have been audited annually by the proponent.	
839:M8.3	**Groundwater and Surface Water Quality**	Pre-construction	The proponent shall commence the water quality monitoring required by 8-2 before ground disturbing activities in order to collect baseline data.		The 2013 CAR (2013-00000493653) did not provide sufficient information to determine that monitoring was undertaken before ground disturbing activities had occured as required by Condition 8-2.	VR

AUDIT TABLE

PROPOSAL: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder
STATEMENT: 839

Number	Issue	Phase	Action	Plan Requirements	Notes	Status
					Verification Priority: Medium The proponent is required to provide to the OEPA **by 28 May 2014:** Information to confirm that the monitoring of the quality of surface water and groundwater upstream and downstream of the tailings storage facility and waste material landforms to ensure that the requirements of condition 8-1 are met.	
839:M8.4	**Groundwater and Surface Water Quality**	Overall	The proponent shall submit annually the results of monitoring required by condition 8-2 to the Chief Executive Officer of the Office of the Environmental Protection Authority.		The 2013 CAR (2013-00000493653) indicates compliance with this condition.	C
839:M8.5	**Groundwater and Surface Water Quality**	Overall	In the event that monitoring required by condition 8-2 indicates that the requirements of condition 8-1 are not being met, the proponent shall: 1. report such findings to the Chief Executive Officer of the Office of the Environmental Protection Authority within 21 days of the decline in water quality being identified; 2. provide evidence which allows determination of the root cause of the decline in water quality; and 3. if determined to be a result of activities undertaken in implementing the proposal, state the actions and associated timelines proposed to be taken to remediate the water quality.		The 2013 CAR (2013-00000493653) indicates compliance with this condition.	C
839:M8.6	**Groundwater and Surface Water Quality**	Overall	The proponent shall, on approval of the Chief Executive Officer of the Office of the Environmental Protection Authority, implement the actions identified in 8-5 (3) and		The 2013 CAR (2013-00000493653) indicates compliance with this	C

AUDIT TABLE

PROPOSAL: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder
STATEMENT: 839

Number	Issue	Phase	Action	Plan Requirements	Notes	Status
			continue to implement such actions until the Chief Executive Officer of the Office of the Environmental Protection Authority determines that the remedial actions may cease.		condition.	
839:M8.7	Groundwater and Surface Water Quality	Overall	The proponent shall make the monitoring reports required by condition 8-2 publicly available in a manner approved by the Chief Executive Officer of the Office of the Environmental Protection Authority.		The 2013 CAR (2013-00000493653) indicates compliance with this condition. There has not been a request for the documents to be made publically available.	C
839:M9.1	Rehabilitation	Overall	The proponent shall undertake progressive rehabilitation over the life of the proposal to achieve the following outcomes: 1. The waste material landforms and tailings storage facility shall be non-polluting and shall be constructed so that their stability, surface drainage, resistance to erosion and ability to support local native vegetation are similar to undisturbed natural analogue landforms as demonstrated by Ecosystem Function Analysis or other methodology acceptable to the Chief Executive Officer of the Office of the Environmental Protection Authority. 2. Waste material landforms, tailings storage facility and other areas disturbed through implementation of the proposal (excluding mine pits), shall be progressively rehabilitated with vegetation composed of native plant species of local provenance (defined as seed or plant material collected within the Great Victoria Desert Bioregions 1 and 2). 3. The percentage cover and species diversity of living self-sustaining native vegetation in all rehabilitation areas shall be comparable to that of undisturbed natural analogue sites as demonstrated by Ecosystem Function Analysis or other methodology acceptable to the Chief Executive Officer of the Office of the Environmental		The 2013 CAR (2013-00000493653) indicates that rehabilitation is being undertaken along the Pinjin corridor in borrow pits, turkey nests, laydown areas and flycamps.	C

AUDIT TABLE

PROPOSAL: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder
STATEMENT: 839

Number	Issue	Phase	Action	Plan Requirements	Notes	Status
			Protection Authority. 4. No new species of weeds (including both declared weeds and environmental weeds) shall establish in the area as a result of the implementation of the proposal. 5. The coverage of weeds (including both declared weeds and environmental weeds) within rehabilitated areas shall be no greater than the average of three reference sites on nearby land, with the reference sites to be chosen in consultation with the Department of Environment and Conservation. Note: The methodology for Ecosystem Function Analysis is set out in Tongway DJ and Hindley 2004 Landscape Function Analysis Procedures for Monitoring and Assessing Landscapes, Commonwealth Scientific and Industrial Research Organisation Sustainable Ecosystems, Canberra.			
839:M9.2	**Rehabilitation**	Overall	Rehabilitation activities shall continue until such time as the requirements of condition 9-1 are met, and are demonstrated by inspections and reports to be met, for a minimum of five years following mine completion to the satisfaction of the Chief Executive Officer of the Office of the Environmental Protection Authority, on advice of the Department of Mines and Petroleum.		The 2013 CAR (2013-00000493653) indicates that rehabilitation has commenced along the Pinjin corridor in borrow pits, turkey nests, laydown areas and flycamps.	C
839:M10.1	**Final Closure and Decommission-ing Plan**	Overall	At least five years prior to mine completion, the proponent shall prepare and submit a Final Closure and Decommissioning Plan to the requirements of the Chief Executive Officer of the Office of the Environmental Protection Authority, on advice of the Department of Mines and Petroleum		The project is in its third year of construction/ operation at the time of this audit.	NR
839:M10.2	**Final Closure and Decommission-ing Plan**	Overall	The Final Closure and Decommissioning Plan shall be prepared consistent with: 1. ANZMEC/MCA 2000, Strategic Framework for Mine Closure Planning; and 2. Department of Industry Tourism and Resources 2006 Mine Closure and Completion (Leading Practice Sustainable Development Program for the Mining		The project is in its third year of construction/ operation at the time of this audit.	NR

AUDIT TABLE

PROPOSAL: Tropicana Gold Project, Shire of Menzies, Shire of Laverton and The City of Kalgoorlie-Boulder
STATEMENT: 839

Number	Issue	Phase	Action	Plan Requirements	Notes	Status
			Industry), Commonwealth Government, Canberra.			
839:M10 .3	Final Closure and Decommission -ing Plan	Overall	The Final Closure and Decommissioning Plan shall provide detailed technical information on the following: 1. final closure of all areas disturbed through implementation of the proposal so that they are safe, stable and non-polluting; 2. decommissioning of all plant and equipment; 3. disposal of waste materials; 4. final rehabilitation of waste dumps; tailings storage facilities and other areas (outside the mine pit(s)); 5. Management and monitoring following mine completion; and 6.inventory of all contaminated sites and proposed management.		The project is in its third year of construction/ operation at the time of this audit.	NR
839:M10 .4	Final Closure and Decommission -ing Plan	Overall	The proponent shall close, decommission and rehabilitate the proposal in accordance with the approved Final Closure and Decommissioning Plan.		The project is in its third year of construction/ operation at the time of this audit.	NR
839:M10 .5	Final Closure and Decommission -ing Plan	Overall	The proponent shall make the Final Closure and Decommissioning Plan required by conditions 10-1 and 10-2 publicly available in a manner approved by the Chief Executive Officer of the Office of the Environmental Protection Authority.		The project is in its third year of construction/ operation at the time of this audit.	NR

Conclusions and Recommendations

In conclusion the Verification Audit Report was unable to determine compliance with a number of implementation conditions relating to Statement 839. These conditions have been given a compliance status of 'verification required' and are detailed in the previous report. Further information is required to verify the compliance status of the implementation conditions which are presented in the Desktop Audit Table and listed below:

839:M6.1 Threatened Species
839:M6.2 Threatened Species
839:M8.1 Groundwater and Surface Water Quality
839:M8.2 Groundwater and Surface Water Quality
839:M8.3 Groundwater and Surface Water Quality

Verification information for the above conditions is required to be submitted to the OEPA by **28 May 2014.** The OEPA may conduct a site inspection to confirm implementation of the above conditions at a date yet to be determined.

Report Prepared by: **Kevin Da Silva – Environmental Officer**	Date: 29 April 2014
Reviewed by: **Mark Rust – Snr Environmental Officer**	Date: 5 May 2014

TROPICANA JOINT VENTURE
AngloGold Ashanti Australia Limited \ A.B.N. 42 008 737 424
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28 May 2014

Dept. Ref: CA03-2013-0078
Our Ref: MS839

Kim Taylor
General Manager
Office of the Environmental Protection Authority
Locked Bag 33, Cloisters Square
Perth, WA 6850

Attn: Ian Munro
Manager Compliance Branch

Dear Ian

Re: Tropicana Gold Project – MS839 – Response to Desktop Audit and Request for Compliance Information

Further to your letter dated May 2014, AngloGold Ashanti Australia (AGAA) provides the following responses and additional information to assist the department in verifying Tropicana Gold Mine (TGM) compliance against the site's Ministerial Statement (MS839).

Condition 6.1 (number 839:M6.1)

AGAA acknowledges that the information supplied thus far has not provided the Department with adequate evidence that the site has implemented the Threatened Species and Community Management Strategy (TS&CMS). To address this, please find attached a number of additional documents as further evidence of how the TS&CMS has been implemented at TGM (Attachment 1):

- Construction Permit to Clear process and example permits;
- Site Environmental Hazardous Substance Management Plan; and
- TGM Water Storage Area Fence Specifications.

As suggested, should the Department require a site visit to further verify compliance, AGAA would be happy to facilitate such a visit.

Condition 6.2 (number 839:M6.2)

The revised version of the Threatened Species and Community management strategy as provided in April was updated taking into consideration information obtained from the following DPaW and related resources or plans such as but not limited to:

- September 2013 Specially Protected Fauna and Rare Flora list;
- Declared Rare and Poorly Known Flora in the Goldfield;
- National Malleefowl Recovery Plan;
- National Recovery plan for Marsupial Moles; and
- National Recovery Plan for the Sandhill Dunnart.

A complete list of reference material used is provided in Attachment 2. As a part of this update formal input has been requested from DPaW however this has not yet been

obtained. A meeting has been scheduled for the 30 May with Julie Futter (Environmental Impact Assessment Project Co-ordinator) and other members of the DPaW Environmental Management Branch to progress input (Attachment 3). Following this meeting and the provision of written feedback the strategy document could be revised further and will be provided to the OEPA with the 2014 CAR.

Condition 8.1 – 8.2 (number 839:M8.1 and 839:M8.2)

Regarding the Auditing of compliance against:

- Australian Water Quality Guidelines for Fresh and Marine Waters (2000);
- Australian Guidelines for Water Quality Monitoring and Reporting (2000)
- The TGM groundwater and surface water monitoring program and report

Table 1 of the CAR does not specify the frequency of internal audits against the nominated documents and AGAA has scheduled its first internal audit for the 2014 reporting period. This is to coincide with the completion of construction and post commissioning.

AGAA acknowledges that regular internal audits are required, however, it had been determined that a suitable pre-operations baseline set of data was also needed. The data was to fully represent the natural variation in rainfall and variability in groundwater change. This has now been achieved through the monitoring of pre-2011 bores and the additional groundwater monitoring bores and surface water monitoring points established since 2011.

During 2014, TGM is embarking on the journey to ISO14001 certification, a significant part of which is the identification and implementation of an internal audit, inspection and monitoring schedule. Please be advised that as a part of this process, AGAA has scheduled an internal audit of the monitoring activities associated with condition 8 for the current reporting period and will provide the Department with a copy of this audit in the 2014 CAR.

Condition 8.3 (number 839:M8.3)

AGAA has made use of a combination of historic and newly established monitoring bores and surface water monitoring locations for compliance with Condition 8. Seven bores were established prior to the commencement of construction activities in 2011. Since then an additional 17 monitoring bore locations have been established during 2012 and 2013 to ensure adequate coverage. Attachment 4 provides a visual distribution of the groundwater monitoring locations, the year installed and the current surface water monitoring locations.

Surface water monitoring sites have been established, taking into consideration the current site layout, and will be expanded as activities change over the life of the mine. Attachment 5 provides evidence of the current surface water monitoring locations. During Q3 2014, and as a part of the ISO14001 implementation, a review will be undertaken of the current monitoring locations to ensure they provide a holistic assessment of upstream and downstream changes in water quality potentially linked to TGM's activities. It should be noted that the collection of surface water samples in a desert environment such as Tropicana, which lacks surface water drainage features and a high infiltration rate, is more challenging than was originally expected.

To complement the locations data provided, AGAA has attached example monitoring results associated with groundwater and surface water sampling complete since 2011 (Attachment 6).

Should you require further information or require a site inspection to close out these matter, please do not hesitate to contact us.

Yours sincerely

Belinda Bastow
Manager: Approvals/Compliance/Sustainability
Tropicana Gold Mine
ANGLOGOLD ASHANTI AUSTRALIA

Encl:

Attachment 1 – Additional Evidence of implementation of the Threatened Species and Community Management Strategy

Attachment 2 – Reference List associated with the revision of the Threatened Species and Community Management

Attachment 3 – Confirmation of the meeting between AGAA – DPaW on Friday 30 May, 2014

Attachment 4 – Groundwater monitoring locations adjacent to the operational area

Attachment 5 – Surface water monitoring locations adjacent to the operational area

Attachment 6 – Example results from groundwater and surface water monitoring.

Note: Appendices have not been reproduced here - please refer to data submitted to OEPA in May 2014.

Government of **Western Australia**
Office of the **Environmental Protection Authority**

Ms Belinda Bastow
Manager Approvals/Compliance/Sustainability
AngloGold Ashanti Australia Limited and
Independence Group NL
GPO Box B91
PERTH WA 6831

Our Ref: *CA01-2013-0078/2014-0000827594*
Enquiries: *Hugh Lance, 6145 0846*
Email: *hugh.lance@epa.wa.gov.au*

Dear Ms Bastow

RESPONSE TO DESKTOP AUDIT AND REQUEST FOR COMPLIANCE INFORMATION - MINISTERIAL STATEMENT 839: TROPICANA GOLD PROJECT

Thankyou for your letter dated 28 May 2014 regarding the above.

Following a review of the information provided in your correspondence, the Office of the Environmental Protection Authority (OEPA) considers that AngloGold Australia Limited is compliant with Ministerial Statement 839. As such, the status of the following conditions has been updated to reflect this determination:

839:M6.1	Threatened Species
839:M6.2	Threatened Species
839:M8.1	Groundwater and Surface Water Quality
839:M8.2	Groundwater and Surface Water Quality
839:M8.3	Groundwater and Surface Water Quality

If you have any questions regarding this correspondence, please contact Hugh Lance on 6145 0846.

Yours sincerely

Ian Munro
MANAGER, COMPLIANCE BRANCH

5 June 2014

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Appendix 3: Ground Zero borrow pit rehabilitation plan

REHABILITATION PROPOSAL & SPECIFICATION GROUND ZERO BORROW PITS

To: Earthworks Contractor/s
CC: Duncan Gibbs; Belinda Bastow
From: Paul McNeil
Date: 9th January 2014
Subject: DRAFT Rehabilitation Proposal for Ground Zero Borrow Pit Area

This proposal and specification has been prepared to assist quotation and the completion of rehabilitation work for the ground zero borrow pits located on M39/980.

Background

The ground zero borrow pits occur on either side of the road to the TGM village. Gravel resources have been substantially depleted other than a small pocket at its southern extent. For clarity, the area shown in Figure 1 has been divided into three zones:

A. Northern side of the road to the village (approx. 2.36 ha);
B. Southern side of the road to the village (approx. 8.18 ha); and
C. The area of insitu borrow material at the southern tip of the ground zero borrow pits which is not to be rehabilitated.

Timing

An opportunity exists to conduct rehabilitation in the near future using either equipment being floated to site for a borefield drilling program or as an independent project ahead of the official TGM opening in March 2014.

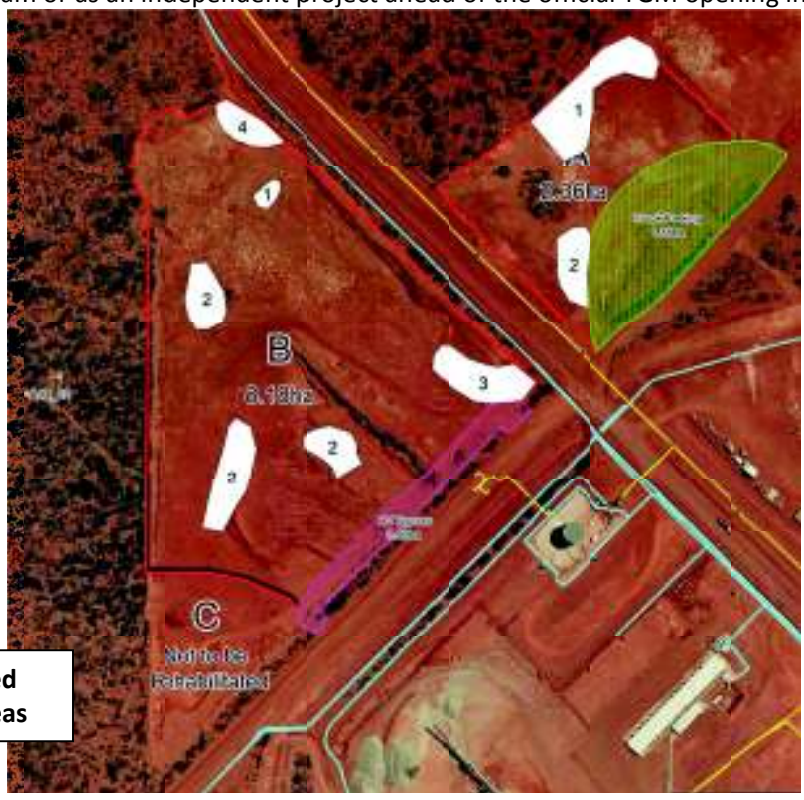

Figure 1. Proposed Rehabilitation Areas

Resources

The resources required to complete the rehabilitation described in this proposal are listed in Table 1.

Table 1: Resource Requirements for Ground Zero Borrow Pit Rehabilitation

Resource	Supplier
D6 or similar bulldozer	
D10 dozer or equivalent for ripping (assuming the D6 can't rip deep enough)	Macmahon
Loader	
Grader (or Loader) with a multi tyne	
Tipper	

Health and Safety Considerations

The area is not remote from site but does contain several hazards which will need to be managed to ensure the safety of personnel. Table 2 provides a list of potential hazards which may be encountered. Please note this list is not comprehensive and should be used in association with individual JHA forms completed prior to work.

JHA forms will need to be completed by all personnel involved in the work tasks described within this document prior to commencing the work.

Table 2. Hazards Associated with Rehabilitation of Ground Zero Borrow Pits

Hazard	Controls to be Implemented	Read & Understood Proposal
Contact with overhead power lines	Keep out of power line corridor	
	Adhere to electrical requirements for machinery crossing under the power line along the TSF road to access Area A	
	Use a spotter when required	
Buried power (potentially feeding boom gates) and water pipelines	Have buried services marked via dig permit	
	Pre Work inspection of area to show equipment operators where buried services are located even if not in work area	
Traffic (TGM Access Road, Road to Village and Road to TSF)	Establish traffic management around work area	
	Communicate traffic management via site notification	
Fire	Adherence to local government vehicle movement bans	
Uneven ground and trip hazards	Watch step when walking across work area and alighting from machinery	

NB: All personnel conducting works described in this proposal are to initial that the proposal & associated hazards & controls are understood.

Rehabilitation Planning Considerations

Rehabilitation of the ground zero borrow pits needs to be planned to avoid affecting or compromising existing infrastructure, or future activities as discussed below:

- An existing overhead powerline occurs on the northern side of the road to the TGM village. This will need to be avoided and its 20m wide exclusion corridor maintained.
- A major water pipeline occurs on the southern side of the road to the Village.
- Subsidiary water lines such as potable and sewerage lines are present along the both sides of the road to the Village.

- A dust monitoring gauge is present to the immediate west of Area B, which requires a 4 m track to maintain access.
- An approved borrow pit expansion on M39/979 occurs along the western side of Area B. Access needs to be maintained to develop a working face for future mining of gravel.
- Area C coincides contains in situ material. It is presumed this material is still useful for gravel extraction. By not rehabilitating Area C, the potential gravel resource is still maintained, whilst preserving access to a working face for the borrow expansion area.
- A loading ramp and hardstand area is proposed to be installed in Area A, north of the village road. An area has been left (Figure 1 – green hatch area) to allow for construction of a loading ramp and hardstand for semi trailers.
- The boom gates installed on the TGM access road are not wide enough to allow Macmahon's to float heavy machinery to or from site. A heavy vehicle bypass will need to be installed on the northern side of the TGM Site Access Road (allowance of a 20 m wide corridor; Figure 1).
- Areas A and B contain piles of calcrete which will need to be dozed down to allow coverage with growth medium.
- The eastern corner of Area B has been contaminated from a saline water spill in August 2013 which will need to be removed prior to rehabilitation (see Figure 1).

Area A - Rehabilitation Works

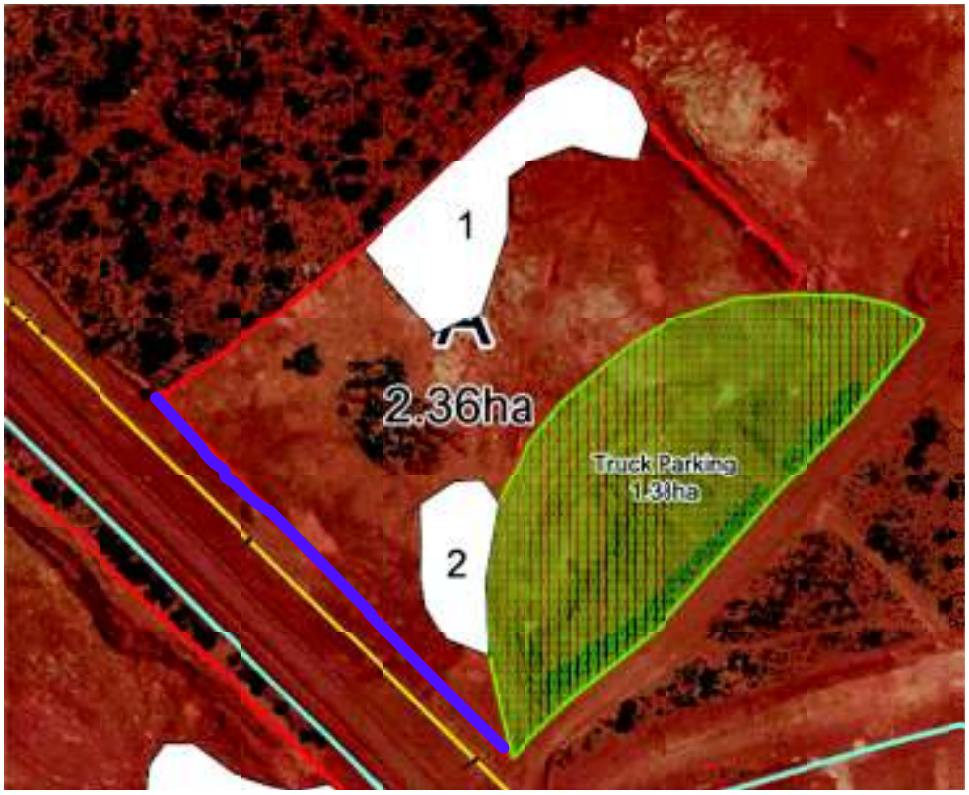

Figure 2. Area A North of the Road to the TGM Village

Preparation

- Any rubbish or waste materials need to be removed before rehabilitation commences.
- Whilst there is a small natural upstream catchment above the borrow pit, the catchment has a low gradient and short run which is unlikely to require active drainage measures.
- Establish a 0.5 m windrow on the borrow pit side of the 20 m powerline corridor (indicative location shown by purple line of Figure 2) and on the edge of the access road to the loading ramp and hardstand area (edge of the green area in figure 2)

Rehabilitation

- The entire area is to be deep ripped to at least 1 m, preferably 2m depth (pre-growth medium). Surface is shown in Figure 3.
- Ripping should be spaced 1.5 m apart.
- A low lying depression towards the southern end of the area needs to be filled to be free draining (labelled 2 in Figure 2 and shown in Figure 4). Piles of calcrete and mixed calcrete/growth medium can be used as fill (labelled 1 in Figure 2 and shown in Figures 5 and 6).
- The northern wall of the borrow pit needs re-working/filling to construct a 15 degree slope from crest to toe. Material stockpiled from within the truck laydown area can be used to create the 15 degree slope.
- Calcrete not used for filling needs to be re worked / pushed across the floor of the area so it can be covered with growth medium.
- All surfaces are to be covered with 0.3 m of growth medium.
- Stockpiled/windrowed vegetation shall be used to create fauna habitat mounds across the rehabilitation.
- The habitat mound should be partly covered with growth medium (ie dump several loader buckets of growth medium on the mound to create niches and seed traps). Input from Sustainability will be required at the time of construction of habitat mounds.
- Area A can then be scarified or lightly ripped to 0.3 m depth in a spiral shape of the borrow pit. Scarifying must not bring up calcrete to the surface.

Post Rehabilitation

- Create a 15 m wide access road into the proposed loading ramp and flatten the floor of the area to establish a hardstand area.
- Sustainability will arrange broadcasting of seed once the earthworks have been complete.

For earthworks quantification purposes, the activities for Area A are summarised in Table 3 below.

Table 3. Summary Table of Rehabilitation Activities at Ground Zero Area A

Activity	Quantity
Establish 0.5m bund on edge of Powerline corridor and loading ramp access road and hardstand area	Estimated 60 m^3
Ripping 1-2 m depth, 1.5 m spaced.	2.36 ha
Placement/Push material to achieve flat free draining surface.	Unknown (hourly hire)?
Re-work/fill northern wall of area to construct a 15 degree slope	Unknown (hourly hire)?
Dozing down piles of calcrete material	Unknown (hourly hire)?
Place and spread/Push 0.3 m growth medium	7,080 m^3
Push stockpiled vegetation to create habitat mound	Unknown (hourly hire)?
Place growth medium on habitat mound	Unknown (loader hourly hire)?
Scarify area to 0.3 m depth on contour/spiralled	2.36 ha
Create a 15 m wide access road into the proposed loading ramp and flatten of the floor to establish a hardstand area	1.4 ha

Figure 3. Example of Area Requiring Ripping

Figure 4. Depression Requiring Fill

Figure 5. Pile of Calcrete to be used as Fill, for creating the 15^{o} slope or spread across the floor of the borrow pit

Figure 6. Mixed Calcrete/Gravel to be used as Fill, for creating the 15^{o} slope or spread across the floor of the borrow pit

Area B - Rehabilitation Works

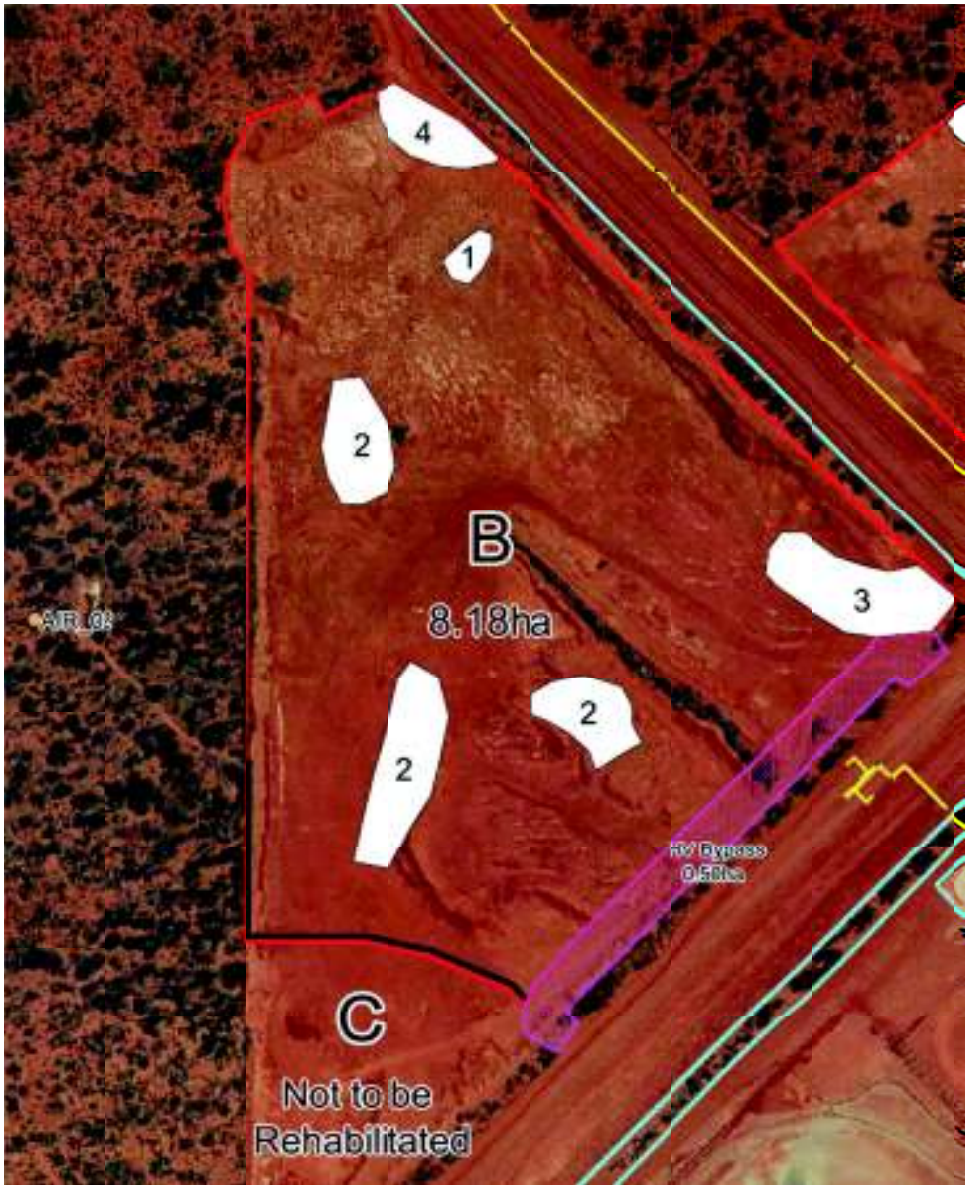

Figure 7. Area B South of the Road to the TGM Village

Preparation

- Any rubbish or waste materials need to be removed before rehabilitation commences.
- The northern end of the borrow pit receives substantial runoff from the infrastructure corridor, causing substantial erosion and sedimentation in the northern tip of Area B (Labelled 4 in Figure 7 and shown in Figure 8). Dedicated drainage is required to either disperse water on the upstream side of a sand dune north of Area B, guide water down the infrastructure corridor to bypass Area B, or use the northern tip of

the borrow pit as a compensating basin (although the latter option would involve inundating rehabilitation for periods of high rainfall input, affecting the vegetation which could develop, this option must be discussed with the Sustainability department if to be used to ensure the best outcome is achieved).

- Salt contaminated material at the eastern corner of Area B (0.3 ha up to 0.1 m deep; labelled 3 in Figure 7 and shown in Figure 9) needs to be excavated and removed to either the TSF or used in road works.
- To enable a heavy vehicle bypass of the boom gate, a 20 m wide corridor, 50 m north and up to 200 m south of the boom gate shall be left open (pink area in Figure 7 and shown in Figure 10).
- A 1 m bund/drain needs to be installed along the northern face of Area B, to guide natural runoff to the west and away from the borrow pit.

Rehabilitation

- The floor and recontoured slopes area is to be ripped to at least 1 m, preferably 2m depth (Figure 11).
- Ripping should be spaced 1.5 m apart.
- Area B requires selective fill in several locations to achieve a flat surface which is free draining (labelled 2 in Figure 7 and shown in Figures 12 to 14).
- The side walls of the borrow pit shall be re-worked or may require filling to construct a 15 degree slope from crest to toe. These occur on the eastern, northern and western sides of Area B (Figures 15 and 16).
- A small pile of calcrete needs to dozed down to allow for it to be covered (labelled 1 in Figure 7 and shown in Figure 17).
- All surfaces are to be covered with at least 0.3 m of growth medium.
- Stockpiled/windrowed vegetation shall be used to create eight habitat mounds across area B.
- The habitat mounds should be partly covered with growth medium (ie dump several loader buckets of growth medium on the mound to create niches and seed traps). Input from Sustainability will be required at the time of construction of habitat mounds.
- Area B can then be scarified or lightly ripped to 0.3 m depth on contour (eg the batter walls) or in a spiral shape for the flat areas of the borrow pit. Scarifying must not bring up calcrete to the surface.

Post Rehabilitation

- A 4 m track needs to be installed to access the dust gauge to the west of Area B (Black line in Figure 7). This can be achieved by linking with an existing exploration track, but will require part of the 15 degree battered slope to have the track crossing it. This access track is to be established from the heavy vehicle bypass, and allow access to the remaining insitu material in Area C. All vegetation remaining around the edge of the borrow pit and between the borrow pit and the access road is to be retain. Penalties will be imposed for any remnant trees removed.
- Sustainability will arrange broadcasting of seed once the earthworks have been complete.
- A 0.5 m bund adjacent to the heavy vehicle bypass and the edge of Area C.

For earthworks quantification purposes, the activities for Area B are summarised in Table 4 below.

Table 4. Summary Table of Rehabilitation Activities at Ground Zero Area B

Activity	Quantity
Excavate, load and haul salt contaminated material. Estimated 0.3 ha, 0.1 m deep, allow 2.5 km haul).	~300 m^3
Placement material to achieve flat free draining surface.	Unknown (hourly hire)
Undertake drainage modifications in northwest corner of Area B to manage runoff from infrastructure corridor	Unknown
Install 1 m drainage bund along northern edge of area	Estimated 125 m^3
Ripping 1-2 m depth, 1.5 m spaced (8.18 ha)	8.18 ha
Re-work/fill northern, western and eastern walls to construct a 15 degree slope	Unknown (hourly hire)?
Dozing down pile of calcrete material	Unknown (hourly hire)?
Place and spread/Push 0.3 m growth medium	~25,000 m^3
Push stockpiled vegetation to create 8 habitat mounds	Unknown (hourly hire)?
Place growth medium on habitat mound	Unknown (loader hourly hire)?
Scarify area to 0.3 m depth on contour/spiralled	8.18 ha
Install 4 m track to access dust gauge and Area C (approx 250m long)	250 m x 4 m = 1000 m^2
Install 0.5 m bund adjacent to the edge of the heavy vehicle bypass and Area C	Estimated 125 m^3

Figure 8. Sedimentation at the Northern Corner of Area B

Figure 9. Salt Contaminated Area

Figure 10. Area of Heavy Vehicle Bypass of TGM Boom Gates

Figure 11. Example of Area Which Requires Ripping

Figure 12. Depression Requiring Fill

Figure 13. Depression Requiring Fill

Figure 14. Depression Requiring Fill

Figure 15. Northern End of Borrow Pit Requires Reworking/Filling to Achieve 15 Degree Slope

Figure 16. Western End of Borrow Pit Requires Reworking/Filling to Achieve 15 Degree Slope

Figure 17. Calcrete which Requires Dozing Flat

Growth Medium Balance Check

Whilst growth medium can be sourced for Area A from stockpiles to the Northeast and a large stockpile within the proposed hardstand/loading ramp area, Area B is more isolated from major growth medium resources. TGM Survey has picked up growth medium stockpiles within Area B (Figure 18, Table 5). The volume present is 26,812m^3 which indicates a small surplus, with the following qualifications:

- there is no survey data for the base of the stockpiles (so the base level has been assumed);
- the windrows around the edge of the borrow pit do not appear to have been picked up, providing additional upside to the materials balance;
- assumed that all stockpiles present are/can be used as growth medium.

Table 5. Surveyed Growth Medium Stockpiles at Ground Zero Area B

Stockpile Volume LCM
6,649
111
271
10,488
93
8,880
320
26,812

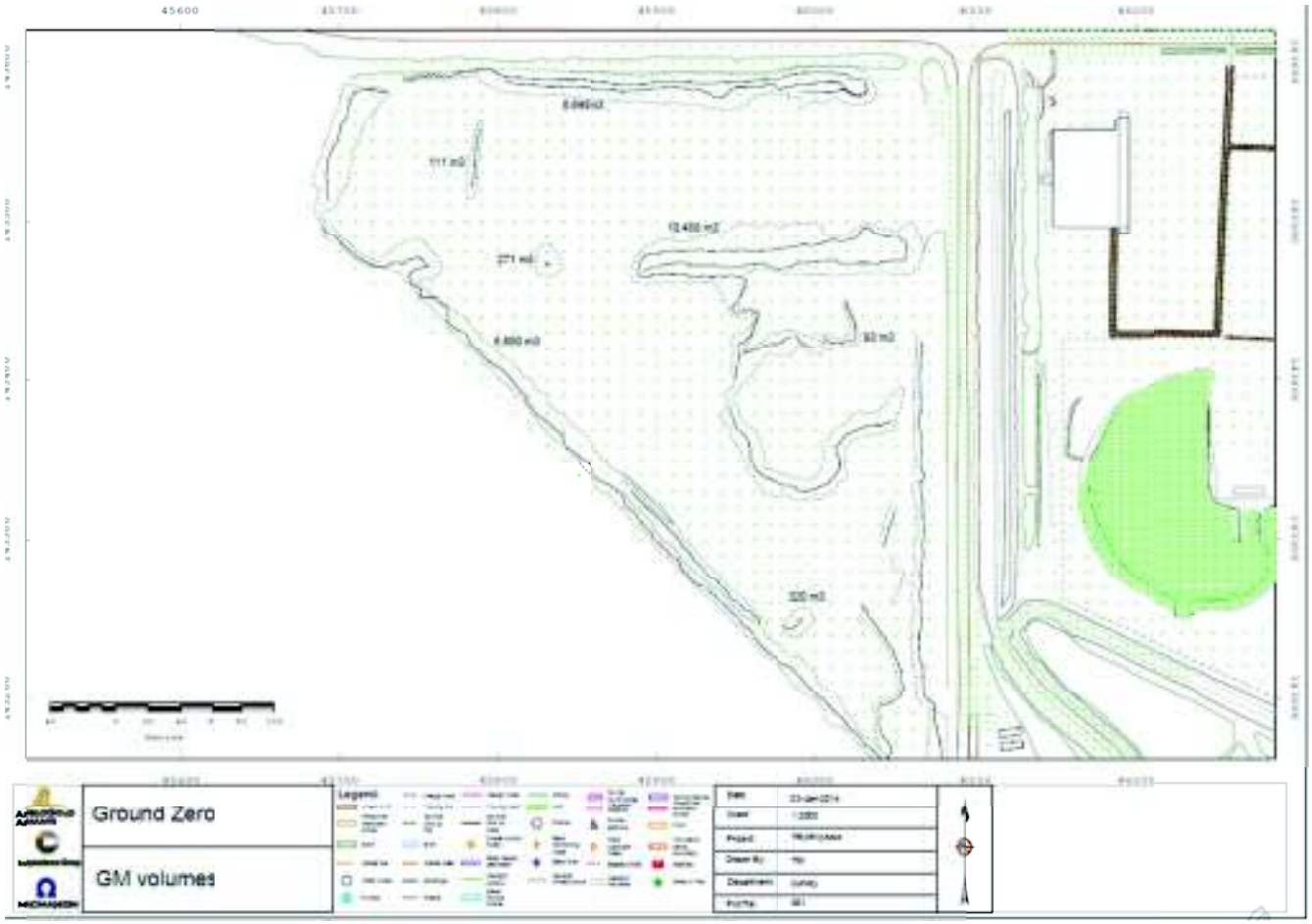

Figure 18. Growth Medium Stockpiles Picked Up By TGM Survey 3 January 2014

Appendix 4: Groundwater monitoring results

MEMORANDUM

Date: **28th November 2014**

To: Sustainability Department

From: Melissa Bolton

Subject: Groundwater Monitoring Results and Internal Audit against Australian Water Quality Guidelines

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Australian Water Quality Guidelines

An internal review/audit of the *Australian and New Zealand Environment Guidelines for Fresh and Marine Water Quality* (the Guidelines), specifically Tables 3.4.1 and Table 3.4.2, against results obtained from the Tropicana Gold Mine (TGM) environmental groundwater monitoring bores was undertaken. The review included the compilation of baseline monitoring data collected since the Environmental Monitoring Bores (ENVMB001 to ENVMB008) were installed. Monitoring data has been collected monthly since October 2013 until present (November 2014), with two exceptions during the reporting period (December and August). Current licence conditions require these bores to be monitored quarterly; however monthly monitoring has been implemented to provide a reasonable baseline dataset.

A review of the baseline data against the Guidelines trigger values for a slightly to moderately disturbed ecosystem (95% protection level) found that the Tropicana baseline data naturally exceeds a number of the Guidelines trigger values and/or the Guidelines trigger values are too low to be detected by the NATA accredited laboratory TGM uses for water analysis. For example Aluminium has been consistently recorded across the environmental monitoring bores by the laboratory as <0.1 milligrams per litre (mg/L), while the guideline value is 0.055 mg/L. Additionally the trigger value for zinc is 0.14 mg/L, however the baseline value for zinc within the monitoring bores has been recorded at 0.14 mg/L. Furthermore, the Guidelines were developed specifically for fresh and marine waters. The groundwater surrounding the TGM does not align with either fresh or marine waters, with Tropicana water quality ranging from saline to hypersaline (TDS ranging from 9,000 mg/L to 42,000 mg/L).

The intent of the Guidelines is to specify biological, water and sediment quality guidelines for protecting a range of aquatic ecosystems from fresh water to marine. The Guidelines state that they are not sufficient in themselves to protect ecosystem integrity; and that they must be used in the context of the local environmental condition and other important environmental factors. The guidelines should be applied to maintain ecosystems and protect from degradation. In accordance with the Guidelines, site specific baselines values are being established for Tropicana from the

ground water monitoring undertaken to date, and site specific triggers will be developed to enable water quality changes to be identified. Triggers will be developed for each parameter to allow a 10% variation in baseline ground water quality monitoring, as per the TGM Environmental Monitoring Strategy and the Guidelines. Therefore, although the triggers presented in the Guidelines are not considered relevant for TGM, the intent of the Guidelines has been adopted and implemented on site.

To date, baseline data has been collected from the environmental monitoring bores in order to establish appropriate triggers, so a comparison against the triggers has not yet been undertaken. However following the establishment of baseline and trigger values for each parameter, an analysis against trigger values will be undertaken. It is anticipated the data presented within the 2015 CAR, will include an analysis against trigger values.

Audit of groundwater monitoring results

Although the Environmental Monitoring Bores have been operational for a short period of time, there is historical groundwater quality data collected prior to the commencement of operations from bores in the region (underlying the deposit and tailings storage facility) between 2007 and 2013. A comparison has been undertaken against the historical ranges of these bores in the region against the current ranges observed within the environmental monitoring bores. This information is presented in **Table 1** below. The ranges recorded for the within the Environmental Monitoring Bores during the reporting period is within the historical ranges for nearby production bores for the following parameters:

- pH
- carbonate
- hydroxide
- chloride
- sulphate
- sodium
- calcium
- cadmium
- copper
- manganese
- iron
- lead
- nickel
- boron
- cobalt
- chromium

- zinc
- arsenic

A lower minimum was recorded within the environmental monitoring bores during the reporting period (compared with the historical ranges) for the following parameters:

- EC
- Total Dissolved Solids
- Potassium
- Magnesium

There were two cases of ranges recorded within the environmental monitoring bores during the reporting period which were above the historical ranges recorded within the nearby production bores for bicarbonate and nitrate. This data is not considered an exceedances at this point in time. Baseline values to be developed for the Project will take into consideration the nearby production bore historical groundwater quality results, and also the groundwater quality data collected within the Environmental Monitoring Bores within the first year of operation to ensure a sound baseline data set.

Table 1: Comparison of groundwater quality data between historical pre-operational bores and current environmental monitoring bores

Parameter	Unit	Historical Range (Pre-Operational Groundwater Data 2007 to 2013)	Current Range (Enviro Bores 2013 to 2014)	Comment
EC	(µS/cm)	8,700 to 100,000	5,600 to 49,700	Current range does not exceed historical range, however there is a lower minimum in the current range.
pH	pH units	4.55 to 8.8	6.5 to 8	Current range within historical range
Total Dissolved Solids	mg/L	6,000 to 71,000	3,270 to 41,100	Current range does not exceed historical range, however there is a lower minimum in the current range.
Carbonate (CO_3)	mg/L	2 to 12	<5	Current range within historical range
Bicarbonate (HCO_3)	mg/L	2 to 590	150 to 620	Current range of bicarbonate exceeds historical range
Hydroxide (OH)	mg/L	<1 to <5	2.5*	Current range within historical range

Parameter	Unit	Historical Range (Pre-Operational Groundwater Data 2007 to 2013)	Current Range (Enviro Bores 2013 to 2014)	Comment
Chloride (Cl)	mg/L	1,900 to 34,000	2,500 to 17,000	Current range within historical range
Sulphate (SO_4)	mg/L	590 to 17,000	120 to 4,700	Current range within historical range
Nitrate (NO_3)	mg/L	0.013 to 47	2.5* to 160	Current range of nitrate exceeds historical range
Sodium (Na)	mg/L	0.7 to 85,000	549 to 9,700	Current range within historical range
Potassium (K)	mg/L	100 to 14,000	57 to 840	Current range does not exceed historical range, however there is a lower minimum in the current range.
Calcium (Ca)	mg/L	0.1 to 1500	63 to 640	Current range within historical range
Magnesium (Mg)	mg/L	160 to 4,200	130 to 1900	Current range does not exceed historical range, however there is a lower minimum in the current range.
Cadmium (Cd)	mg/L	0.0001 to 0.036	0.0001 to 0.005	Current range within historical range
Copper (Cu)	mg/L	0.001 to 0.11	0.001 to 0.1	Current range within historical range
Manganese (Mn)	mg/L	0.001 to 1900	0.02 to 3.7	Current range within historical range
Iron (Fe)	mg/L	0.01 to 18	0.02 to 1.8	Current range within historical range
Lead (Pb)	mg/L	0.001 to 3.5	0.001 to 0.3	Current range within historical range
Nickel (Ni)	mg/L	0.003 to 0.38	0.009 to 0.02	Current range within historical range
Boron (B)	mg/L	2.9 to 14	3.9 to 11	Current range within historical range
Barium (Ba)	mg/L	0.007 to 0.046	ID	Insufficient data collected for current range
Cobalt (Co)	mg/L	0.001 to 0.13	0.001 to 0.012	Current range within historical range
Chromium (Cr)	mg/L	0.001 to 0.015	0.01 to 0.1	Current range within historical range
Zinc (Zn)	mg/L	0.005 to 240	0.02 to 0.14	Current range

Parameter	Unit	Historical Range (Pre-Operational Groundwater Data 2007 to 2013)	Current Range (Enviro Bores 2013 to 2014)	Comment
				within historical range
Arsenic (As)	mg/L	0.001 to 0.06	0.001 to 0.025*	Current range within historical range

*below detection limits – adjusted to 50%
ID – Insufficient data

Groundwater Monitoring Bores

During the reporting period (1 October 2013 to 30 September 2014), the eight Environmental Monitoring Bores were monitoring monthly. Environmental Monitoring Bores (ENVMB) 1 to 4 were monitored monthly with the exception of December 2013 (Total Dissolved Solids was analysed only) and August 2014. Monitoring of ENVMB5 to ENVMB8 commenced in December 2013 following installation, with data collected monthly throughout the monitoring period. A map of the monitoring locations is provided in Figure 1.

Figure 1: **Environmental Groundwater Monitoring Bores Location**

Water Quality results

An analysis of water quality data indicates no significant change to water quality throughout the reporting period, with steady pH, TDS and EC results recorded. Total cyanide levels have remained static throughout the reporting period with only one outlier (ENVMB002).

pH ranged between 6.6 (ENVMB004) and 8 (ENVMB004) for the reporting period (1 October 2013 to 30 September 2014) (**Figure 2**). Salinity ranged between 3270 mg/L TDS (ENVMB004) recorded in July 2014 and 41,100 mg/L TDS (ENVMB001) recorded in December 2013 (**Figure 3**). Electrical Conductivity (EC) ranged from 5600 (ENVMB004) recorded in May 2014 to 49,700 (ENVMB002) recorded in September 2014 (**Figure 4**). Total cyanide ranged from <0.004 mg/L (recorded in all bores) throughout the year to 0.023 mg/L recorded in ENVMB002 in February 2014 (**Figure 5**). This result is an outlier in the dataset, with the remaining results consistently <0.004 mg/L. The Total Cyanide levels recorded across the ENVMBs are largely less than the trigger value (0.007 mg/L) within the Guidelines for Fresh and Marine Water Quality, with the exception of the outliers recorded in ENVMB002). The total cyanide levels recorded are less than the Weak Acid Dissociable (WAD) levels permitted under the Prescribed Premises License of 0.5 mg/L.

Water Levels

The groundwater levels within environmental monitoring bores ENVMB04 to ENVMB08 recorded no significant change (<0.3 m change) during the reporting period. All bores recorded a slight increase in groundwater levels except for ENVMB08 (which recorded a 0.33 m decrease in water level).

Environmental Monitoring Bores (ENVMB 01 to ENVMB 03) recorded an increase in water levels. ENVMB01 recorded the greatest increase in water level (4.27 m). ENVMB02 and ENBMB03 recorded an increase in water levels of 0.95 m and 1.08 m respectively (**Figure 6**).

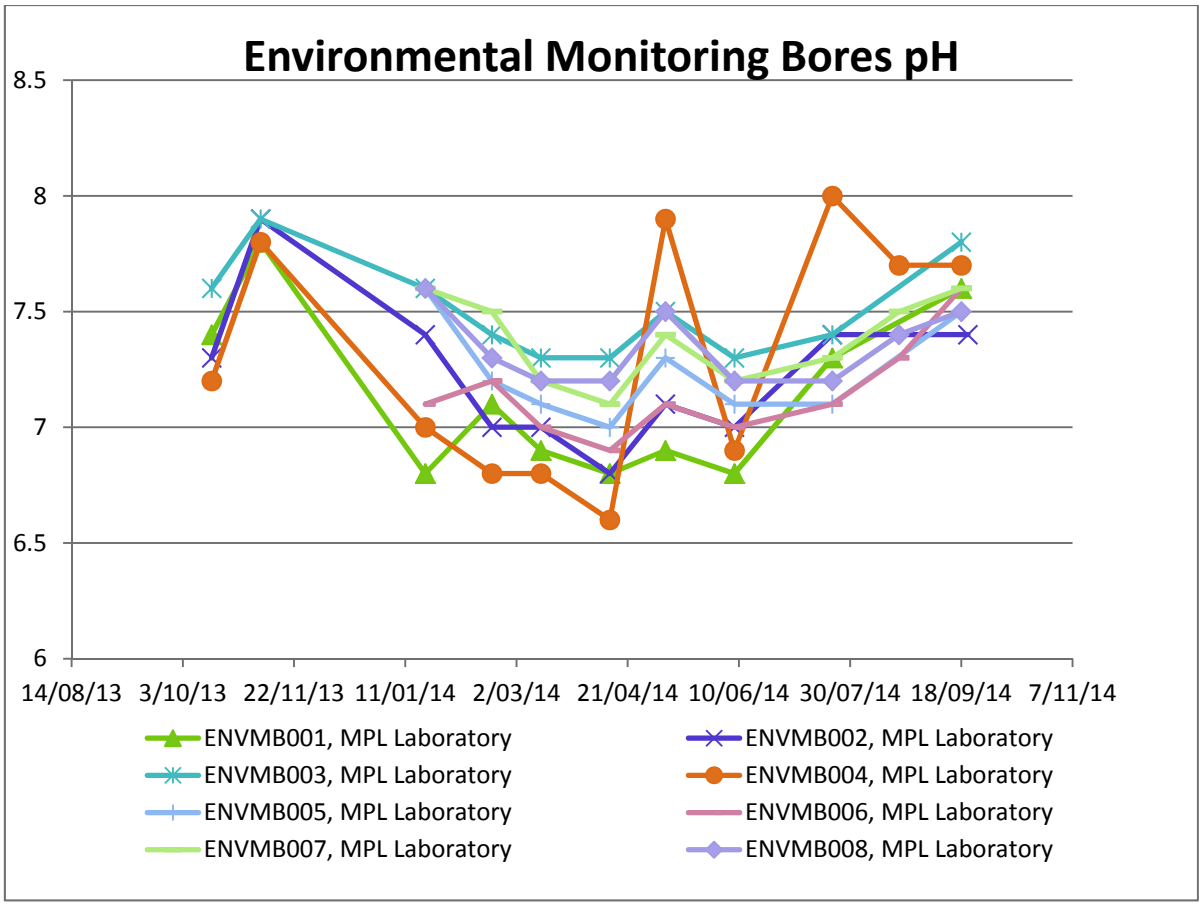

Figure 2: pH recorded in the Environmental Monitoring Bores (Oct 2013 to Sept 2014)

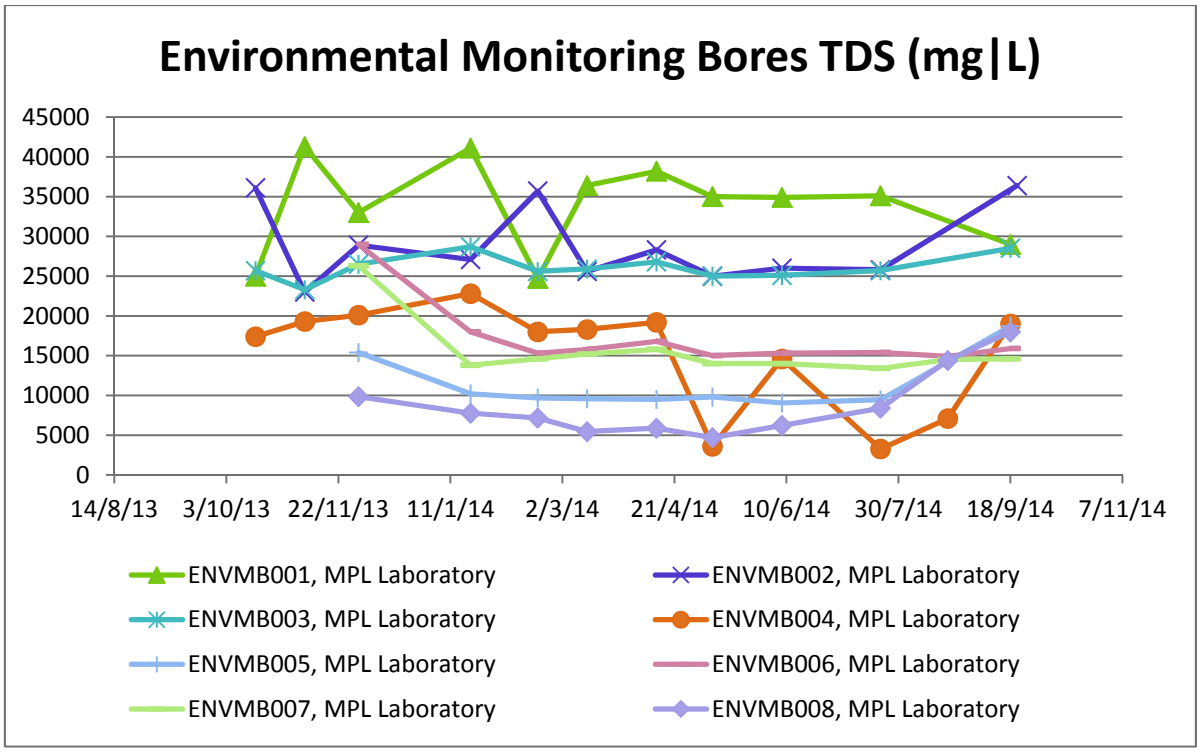

Figure 3: Total Dissolved Solids (mg/L) recorded in the Environmental Monitoring Bores (Oct 2013 to Sept 2014)

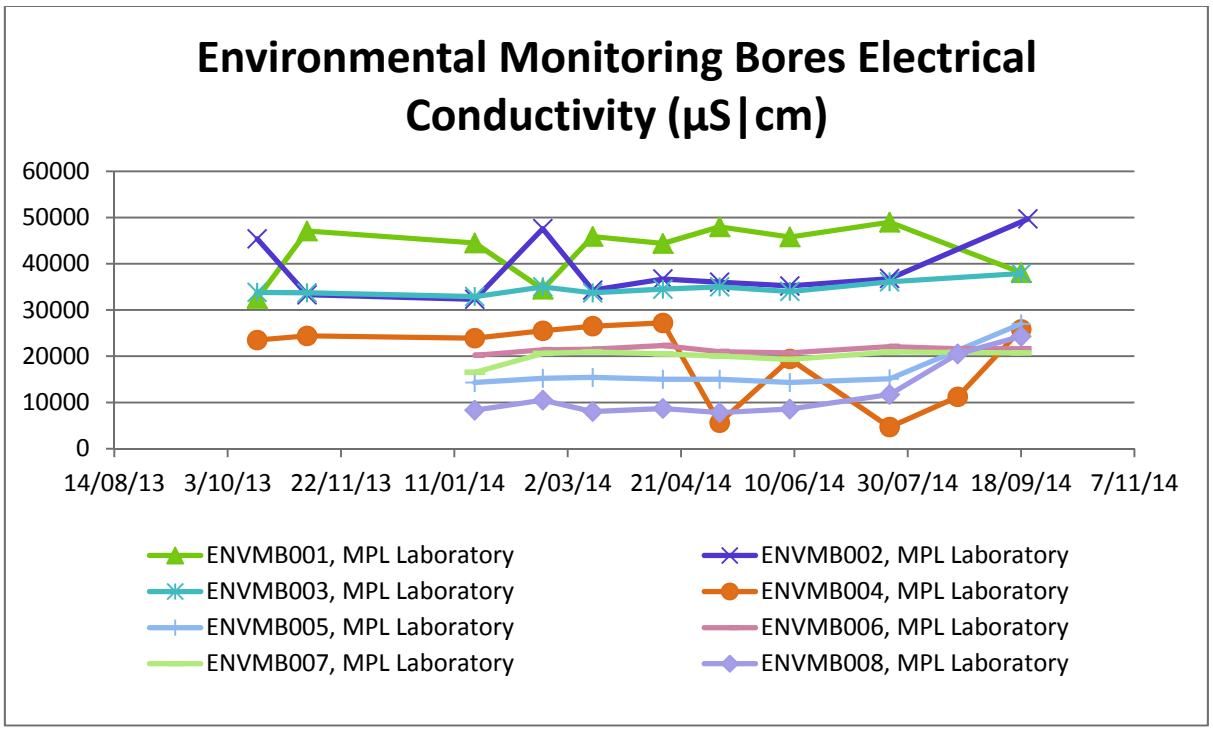

Figure 4: EC recorded in the Environmental Monitoring Bores (Oct 2013 to September 2014)

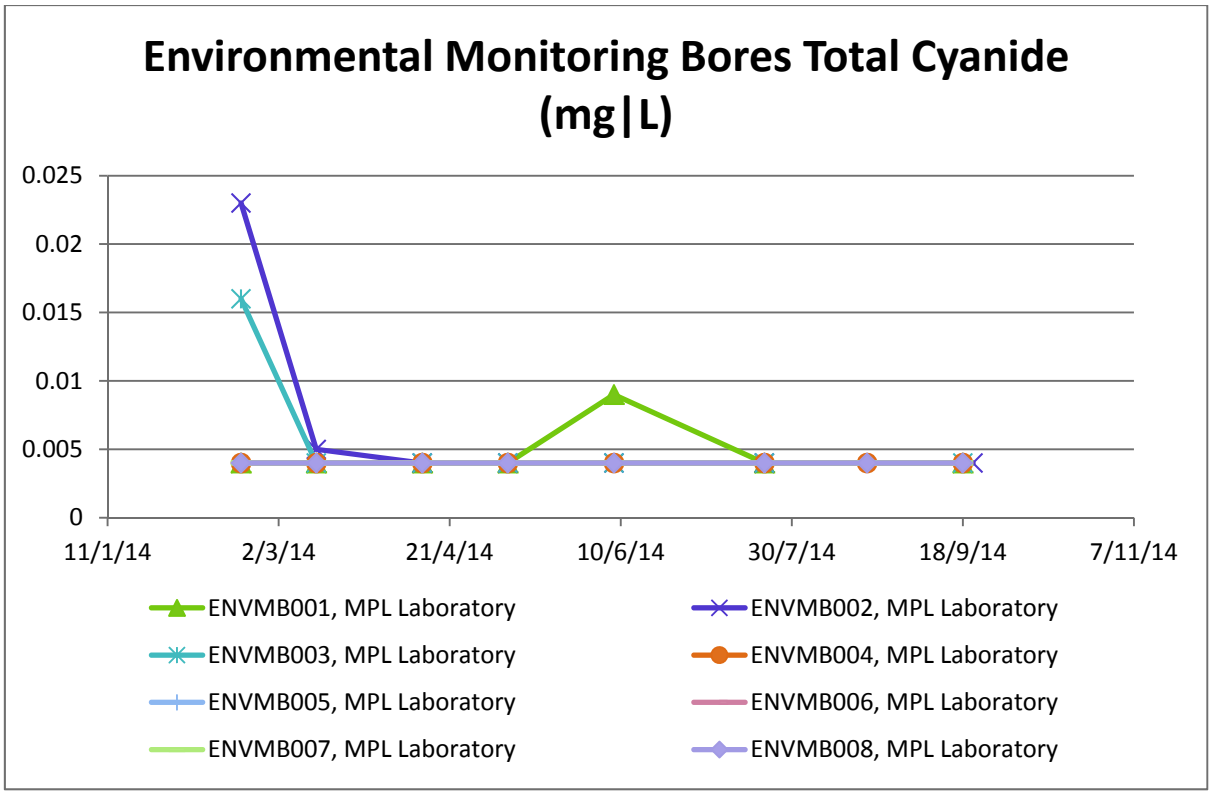

Figure 5: Total Cyanide recorded in the Environmental Monitoring Bores

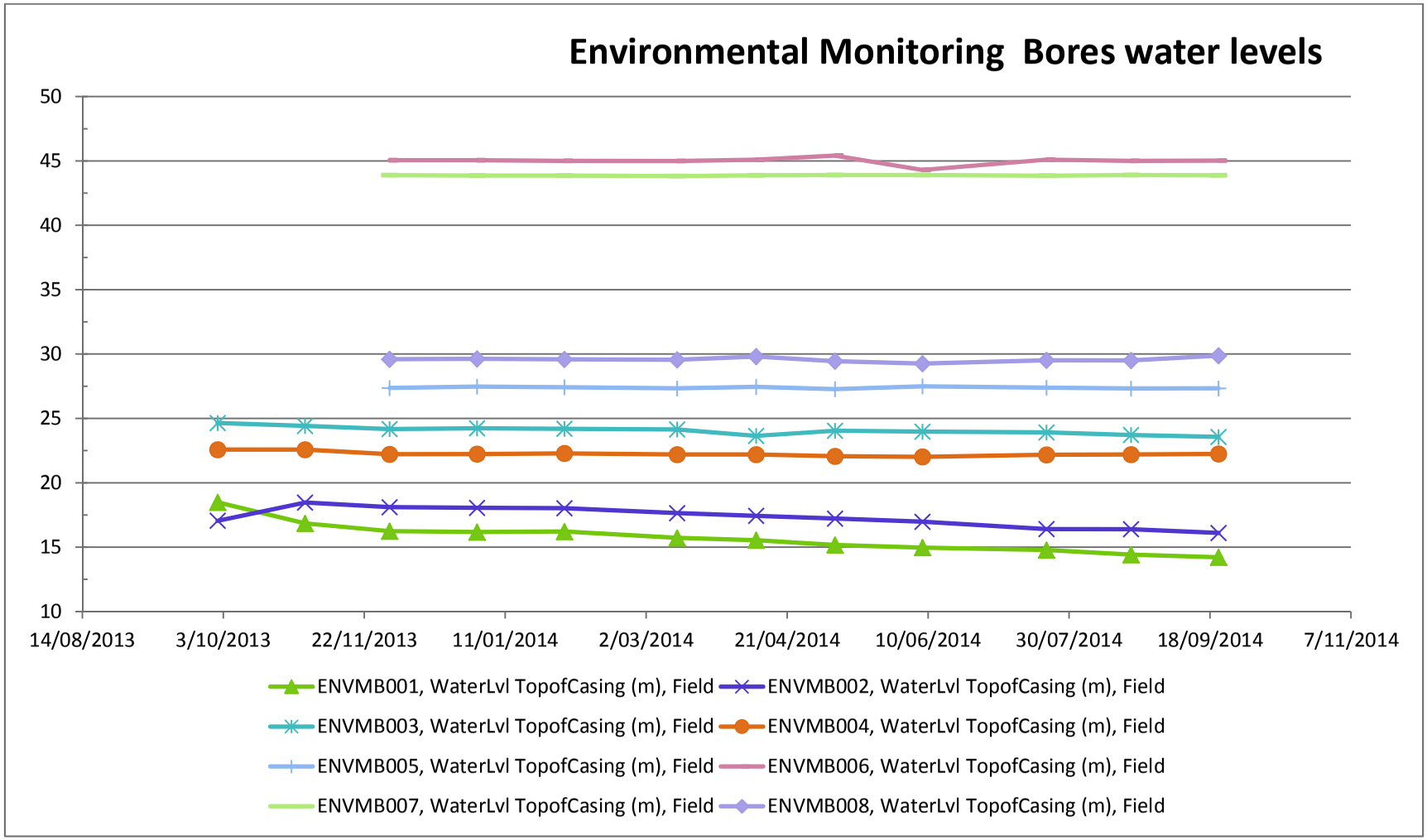

Figure 6: Groundwater levels recorded in the Environmental Monitoring Bores

Appendix 1: Groundwater Results

Table 1: Groundwater Monitoring Results – ENVMB001

	ENVMB001											
	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
Al (mg/L)	<0.1	<0.01*		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1
As (mg/L)	<0.05	0.001*		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05
Beryllium (mg/L)	-	-		-	-	-	-	-	-	-		<0.01
Bo (mg/L)	-	-		-	-	-	-	-	-	-		8.4
Ca (mg/L)	240	620		620	480	550	550	590	640	580		530
Cd (mg/L)	<0.01	<0.0001*		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
Cl (mg/L)	9400	17000		16000	-	-	-	-	17000	-		-
Co (mg/L)	<0.01	0.012*		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
CO^3 (mg/L)	<5	<5		<5	<5	<5	<5	<5	<5	<5		<5
Colour (True) (HZU)	-	<3		-	<3	<3	<3	<3	<3	<3		<3
Cr (mg/L)	-	-		-	-	-	-	-	-	-		<0.01
Cu (mg/L)	<0.01	0.001*		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
Dissolved CrIII (mg/L)	-	-		-	-	-	-	-	-	-		<0.005
Dissolved CrVI (mg/L)	-	-		-	-	-	-	-	-	-		<0.005
EC (µS/cm)	32500	47100		44500	34500	45900	44400	48000	45800	49000		38100
Fe (mg/L)	0.25	1.3*		<0.02	0.14	<0.02	0.04	0.12	<0.02	<0.02		0.04
Fluoride in water (mg/L)	-	-		-	-	-	-	-	-	-		<10
Hardness (mg/L)	3900	9100		7900	5800	8300	8200	8800	7400	8600		6700
HCO^3 (mg/L)	-	330		-	280	260	220	260	-	210		-
Hg (mg/L)	-	-		-	-	-	-	-	-	-		<0.00005
Ionic Balance (%)	-	0.79		-	-	-	-	-	-	-		-
K (mg/L)	310	800		730	520	780	810	840	780	730		510
Mg (mg/L)	680	1800		1800	1200	1700	1700	1800	1800	1700		1500
Mn (mg/L)	0.55	0.61*		0.32	0.83	0.09	0.02	0.11	0.04	<0.01		0.65
Na (mg/L)	3800	9100		9300	6700	9000	8800	9200	9200	9600		7800
Ni (mg/L)	<0.02	0.013*		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02
NO2 (mg/L)	-	<10		-	<10	<10	<25	<10	<12.5	<25		<10
NO3 (mg/L)	-	<10		-	<10	26	<25	12	20	<25		<10
OH (mg/L)	-	<5		-	<5	<5	<5	<5	-	<5		-
Pb (mg/L)	<0.03	<0.001*		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03		<0.03
pH (pH units)	7.4	7.8		6.8	7.1	6.9	6.8	6.9	6.8	7.3		7.6
Sb (mg/L)	-	-		-	-	-	-	-	-	-		<0.15
Se (mg/L)	-	-		-	-	-	-	-	-	-		<0.12
Sulphate by HPLC (mg/L)	2300	4600		4400	2900	4700	4700	4600	4600	4100		2300
TDS (mg/L)	25000	41300	33000	41100	24700	36400	38200	35000	34900	35100		29000
Total Alkalinity (mg/L)	270	330		320	280	260	220	260	240	210		270
Total Cyanide (mg/L)	-	-		-	<0.004	<0.004	<0.004	<0.004	0.009	<0.004		<0.004
TSS (mg/L)	-	5		-	5	15	5	5	10	5		10
Turbidity (NTU)	-	2.6		-	2.8	1.6	0.4	6.3	0.9	0.2		28
WAD Cyanide (mg/L)	-	-		<0.004	<0.004	<0.004	0.007	<0.004	0.007	<0.004		<0.004
Zn (mg/L)	<0.02	0.023*		<0.02	0.04	0.04	0.07	<0.02	0.05	0.08		<0.02

Table 2: Groundwater Monitoring Results – ENVMB002

	ENVMB002											
	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
Al (mg/L)	<0.1	0.01*		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<1
As (mg/L)	<0.05	0.001*		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.5
Beryllium (mg/L)	-	-		-	-	-	-	-	-	-		<0.1
Bo (mg/L)	-	-		-	-	-	-	-	-	-		11
Ca (mg/L)	630	440		430	600	440	500	470	470	450		570
Cd (mg/L)	<0.01	<0.0001*		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.1
Cl (mg/L)	17000	12000		11000	-	-	-	-	13000	-		-
Co (mg/L)	<0.01	0.005*		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.1
CO^3 (mg/L)	<5	<5		<5	<5	<5	<5	<5	<5	<5		<5
Colour (True) (HZU)	-	<3		-	<3	<3	5	4	<3	<3		<3
Cr (mg/L)	-	-		-	-	-	-	-	-	-		<0.1
Cu (mg/L)	<0.01	<0.001*		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.1
Dissolved CrIII (mg/L)	-	-		-	-	-	-	-	-	-		<0.005
Dissolved CrVI (mg/L)	-	-		-	-	-	-	-	-	-		<0.005
EC (µS/cm)	45400	33300		32300	47600	34300	36700	36000	35200	36800		49700
Fe (mg/L)	<0.02	1.8*		<0.02	<0.02	0.05	<0.02	0.27	0.42	<0.02		<0.2
Fluoride in water (mg/L)	-	-		-	-	-	-	-	-	-		<25
Hardness (mg/L)	8400	5700		5300	8500	5700	6200	6200	5500	5900		9200
HCO^3 (mg/L)	-	280		-	290	280	270	280	-	280		270
Hg (mg/L)	-	-		-	-	-	-	-	-	-		<0.00005
Ionic Balance (%)	-	1.4		-	-	-	-	-	-	-		-
K (mg/L)	760	480		540	830	460	510	490	450	430		750
Mg (mg/L)	1900	1100		1100	1800	1100	1200	1200	1200	1200		1900
Mn (mg/L)	0.4	0.8*		0.94	0.24	0.85	0.64	0.85	0.8	0.72		<0.1
Na (mg/L)	9400	6500		6600	9100	6300	6600	6600	6300	7000		9700
Ni (mg/L)	<0.02	0.009*		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.2
NO2 (mg/L)	-	<5		-	<10	<5	<10	<10	<5	<10		<25
NO3 (mg/L)	-	<5		-	15	<5	<10	<10	<5	<10		<25
OH (mg/L)	-	<5		-	<5	<5	<5	<5	-	<5		<5
Pb (mg/L)	<0.03	0.002*		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03		<0.3
pH (pH units)	7.3	7.9		7.4	7	7	6.8	7.1	7	7.4		7.4
Sb (mg/L)	-	-		-	-	-	-	-	-	-		<1.5
Se (mg/L)	-	-		-	-	-	-	-	-	-		<1.2
Sulphate by HPLC (mg/L)	4700	2800		2700	4500	3000	3300	2900	3000	2600		5000
TDS (mg/L)	36100	23000	28900	27100	35700	25600	28300	25000	26000	25800		36400
Total Alkalinity (mg/L)	320	280		290	290	280	270	280	280	280		270
Total Cyanide (mg/L)	-	-		-	0.023	0.005	<0.004	<0.004	<0.004	<0.004		<0.004
TSS (mg/L)	-	13		-	31	<5	20	<5	<5	<5		120
Turbidity (NTU)	-	20		-	6.5	4.1	26	3.1	7.1	0.9		19
WAD Cyanide (mg/L)	-	-		0.014	0.023	0.006	<0.004	<0.004	<0.004	<0.004		<0.004
Zn (mg/L)	<0.02	0.025*		<0.02	<0.02	0.03	<0.02	0.04	0.04	0.091		<0.2

Table 3: Groundwater Monitoring Results – ENVMB003

	ENVMB003											
	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
Al (mg/L)	<0.1	0.36*		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1
As (mg/L)	<0.05	0.001*		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05
Beryllium (mg/L)	-	-		-	-	-	-	-	-	-		<0.01
Bo (mg/L)	-	-		-	-	-	-	-	-	-		8.3
Ca (mg/L)	280	470		440	480	430	510	460	480	460		560
Cd (mg/L)	<0.01	0.001*		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
Cl (mg/L)	8300	12000		11000	-	-	-	-	12000	-		-
Co (mg/L)	<0.01	0.003*		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
CO^3 (mg/L)	<5	<5		<5	<5	<5	<5	<5	<5	<5		<5
Colour (True) (HZU)	-	<3		-	<3	<3	6	<3	4	<3		<3
Cr (mg/L)	-	-		-	-	-	-	-	-	-		<0.01
Cu (mg/L)	<0.01	0.004*		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
Dissolved CrIII (mg/L)	-	-		-	-	-	-	-	-	-		<0.005
Dissolved CrVI (mg/L)	-	-		-	-	-	-	-	-	-		<0.005
EC (µS/cm)	33800	33700		32900	35000	33700	34500	35000	34000	36100		37900
Fe (mg/L)	<0.02	0.75*		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02
Fluoride in water (mg/L)	-	-		-	-	-	-	-	-	-		<10
Hardness (mg/L)	3800	5900		5300	5800	5400	6000	5800	5000	5700		7000
HCO^3 (mg/L)	-	210		-	200	200	190	200	-	190		-
Hg (mg/L)	-	-		-	-	-	-	-	-	-		<0.00005
Ionic Balance (%)	-	2.8		-	-	-	-	-	-	-		-
K (mg/L)	350	490		540	510	450	510	470	450	430		490
Mg (mg/L)	760	1200		1100	1200	1100	1100	1100	1200	1200		1500
Mn (mg/L)	0.46	0.69*		<0.01	0.02	0.03	0.04	0.14	<0.01	<0.01		0.41
Na (mg/L)	4400	6900		6900	6800	6200	6700	6500	6400	7100		7500
Ni (mg/L)	<0.02	0.032*		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02
NO2 (mg/L)	-	<10		-	<10	<5	<10	<10	<5	<10		<10
NO3 (mg/L)	-	22		-	34	37	32	33	39	32		<10
OH (mg/L)	-	<5		-	<5	<5	<5	<5	-	<5		-
Pb (mg/L)	<0.03	0.002*		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03		<0.03
pH (pH units)	7.6	7.9		7.6	7.4	7.3	7.3	7.5	7.3	7.4		7.8
Sb (mg/L)	-	-		-	-	-	-	-	-	-		<0.15
Se (mg/L)	-	-		-	-	-	-	-	-	-		<0.12
Sulphate by HPLC (mg/L)	2300	3200		3000	3300	3300	3300	3200	3100	2800		2900
TDS (mg/L)	25700	23300	26500	28700	25600	25900	26800	25000	25100	25700		28500
Total Alkalinity (mg/L)	210	210		200	200	200	190	200	200	190		250
Total Cyanide (mg/L)	-	-		-	0.016	<0.004	<0.004	<0.004	<0.004	<0.004		<0.004
TSS (mg/L)	-	47		-	<5	<5	<5	<5	<5	<5		80
Turbidity (NTU)	-	4.1		-	0.2	0.3	0.3	<0.1	<0.1	0.8		19
WAD Cyanide (mg/L)	-	-		0.009	0.012	<0.004	<0.004	<0.004	<0.004	<0.004		<0.004
Zn (mg/L)	0.07	0.13*		0.09	0.099	0.095	0.093	0.1	0.09	0.093		0.02

Table 4: Groundwater Monitoring Results – ENVMB004

	ENVMB004											
	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
Al (mg/L)	<0.1	0.45*		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
As (mg/L)	<0.05	0.001*		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Beryllium (mg/L)	-	-		-	-	-	-	-	-	-	-	<0.01
Bo (mg/L)	-	-		-	-	-	-	-	-	-	-	3.9
Ca (mg/L)	430	460		450	490	420	510	180	340	190	280	500
Cd (mg/L)	<0.01	0.0035*		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cl (mg/L)	9200	8900		8000	-	-	-	-	6800	-	-	-
Co (mg/L)	<0.01	0.001*		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CO^3 (mg/L)	<5	<5		<5	<5	<5	<5	<5	<5	<5	<5	<5
Colour (True) (HZU)	-	<3		-	<3	<3	<3	6	<3	5	<3	<3
Cr (mg/L)	-	-		-	-	-	-	-	-	-	-	<0.01
Cu (mg/L)	<0.01	0.002*		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
Dissolved CrIII (mg/L)	-	-		-	-	-	-	-	-	-	-	<0.005
Dissolved CrVI (mg/L)	-	-		-	-	-	-	-	-	-	-	<0.005
EC (µS/cm)	23500	24400		23900	25500	26500	27200	5600	19400	4670	11200	25800
Fe (mg/L)	<0.02	0.71*		<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02
Fluoride in water (mg/L)	-	-		-	-	-	-	-	-	-	-	<10
Hardness (mg/L)	5900	5900		5600	6200	5400	6100	1000	4100	1000	-	6600
HCO^3 (mg/L)	-	150		-	150	150	150	220	-	260	260	-
Hg (mg/L)	-	-		-	-	-	-	-	-	-	-	<0.00005
Ionic Balance (%)	-	-0.19		-	-	-	-	-	-	-	-	-
K (mg/L)	370	320		360	340	310	340	94	200	57	130	310
Mg (mg/L)	1200	1200		1200	1200	1000	1200	140	790	130	460	1300
Mn (mg/L)	0.1	0.11*		0.09	0.08	0.04	0.06	0.02	0.04	<0.01	0.02	0.05
Na (mg/L)	3800	3800		4000	3900	3400	3800	630	2600	540	1500	4100
Ni (mg/L)	<0.02	0.012*		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
NO2 (mg/L)	-	<5		-	<5	<5	<10	<1	<5	<2.5	<5	<10
NO3 (mg/L)	-	<5		-	9.9	17	<10	94	29	94	69	<10
OH (mg/L)	-	<5		-	<5	<5	<5	<5	-	<5	<5	-
Pb (mg/L)	<0.03	0.002		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
pH (pH units)	7.2	7.8		7	6.8	6.8	6.6	7.9	6.9	8	7.7	7.7
Sb (mg/L)	-	-		-	-	-	-	-	-	-	-	<0.15
Se (mg/L)	-	-		-	-	-	-	-	-	-	-	<0.12
Sulphate by HPLC (mg/L)	2100	2000		1800	2000	2000	2100	130	1500	120	620	1600
TDS (mg/L)	17400	19300	20100	22800	18000	18300	19200	3600	14600	3270	7090	19000
Total Alkalinity (mg/L)	150	150		150	150	150	150	220	160	260	260	150
Total Cyanide (mg/L)	-	-		-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
TSS (mg/L)	-	31		-	17	34	<5	10	18	71	80	140
Turbidity (NTU)	-	22		-	2.7	4.9	0.7	3.2	0.4	11	13	35
WAD Cyanide (mg/L)	-	-		<0.004	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Zn (mg/L)	0.02	0.036*		0.02	<0.02	0.02	0.02	<0.02	0.04	<0.02	0.03	0.09

Table 5: Groundwater Monitoring Results – ENVMB005

	ENVMB005											
	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
Al (mg/L)	N/A	N/A		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1
As (mg/L)	N/A	N/A		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05
Beryllium (mg/L)	N/A	N/A		-	-	-	-	-	-	-		<0.01
Bo (mg/L)	N/A	N/A		-	-	-	-	-	-	-		9.3
Ca (mg/L)	N/A	N/A		88	88	73	86	81	63	77		230
Cd (mg/L)	N/A	N/A		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
Cl (mg/L)	N/A	N/A		3900	-	-	-	-	4200	-		
Co (mg/L)	N/A	N/A		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
CO^3 (mg/L)	N/A	N/A		<5	<5	<5	<5	<5	<5	<5		<5
Colour (True) (HZU)	N/A	N/A		-	3	<3	<3	5	<3	<3		<3
Cr (mg/L)	N/A	N/A		-	-	-	-	-	-	-		<0.01
Cu (mg/L)	N/A	N/A		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05
Dissolved CrIII (mg/L)	N/A	N/A		-	-	-	-	-	-	-		<0.005
Dissolved CrVI (mg/L)	N/A	N/A		-	-	-	-	-	-	-		<0.005
EC (µS/cm)	N/A	N/A		14300	15200	15400	15000	15000	14300	15100		27000
Fe (mg/L)	N/A	N/A		<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02		<0.02
Fluoride in water (mg/L)	N/A	N/A		-	-	-	-	-	-	-		<10
Hardness (mg/L)	N/A	N/A		1100	1200	1100	1200	1100	920	1100		3200
HCO^3 (mg/L)	N/A	N/A		-	620	620	570	620	-	600		
Hg (mg/L)	N/A	N/A		-	-	-	-	-	-	-		<0.00005
K (mg/L)	N/A	N/A		200	190	170	190	170	150	150		310
Mg (mg/L)	N/A	N/A		230	250	210	240	220	180	220		650
Mn (mg/L)	N/A	N/A		0.1	0.08	0.06	0.05	0.1	0.04	0.05		0.14
Na (mg/L)	N/A	N/A		3200	3100	2700	3100	3000	2600	3000		6000
Ni (mg/L)	N/A	N/A		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02
NO2 (mg/L)	N/A	N/A		-	<5	<5	<5	<5	<5	<5		<10
NO3 (mg/L)	N/A	N/A		-	130	150	160	140	140	150		<10
OH (mg/L)	N/A	N/A		-	<5	<5	<5	<5	-	<5		
Pb (mg/L)	N/A	N/A		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03		<0.03
pH (pH units)	N/A	N/A		7.6	7.2	7.1	7	7.3	7.1	7.1		7.5
Sb (mg/L)	N/A	N/A		-	-	-	-	-	-	-		<0.15
Se (mg/L)	N/A	N/A		-	-	-	-	-	-	-		<0.12
Sulphate by HPLC (mg/L)	N/A	N/A		1200	1300	1300	1400	1400	1200	1200		2300
TDS (mg/L)	N/A	N/A	15400	10200	9680	9580	9500	9800	9060	9450		18700
Total Alkalinity (mg/L)	N/A	N/A		630	620	620	570	620	620	600		530
Total Cyanide (mg/L)	N/A	N/A		-	0.004	0.004	0.004	0.004	0.004	0.004		0.004
TSS (mg/L)	N/A	N/A		-	10	<5	<5	6	<5	<5		<5
Turbidity (NTU)	N/A	N/A		-	0.5	0.8	1.3	1.2	<0.1	0.3		1.2
WAD Cyanide (mg/L)	N/A	N/A		<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004		<0.004
Zn (mg/L)	N/A	N/A		0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02		0.07

Table 6: Groundwater Monitoring Results – ENVMB006

	ENVMB006											
	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
Al (mg/L)	N/A	N/A		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
As (mg/L)	N/A	N/A		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Beryllium (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.01
Bo (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	4.7
Ca (mg/L)	N/A	N/A		420	460	410	470	380	370	400	450	460
Cd (mg/L)	N/A	N/A		<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01
Cl (mg/L)	N/A	N/A		6400	-	-	-	-	6800	-	-	-
Co (mg/L)	N/A	N/A		0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.01	<0.01
CO^3 (mg/L)	N/A	N/A		<5	<5	<5	<5	<5	<5	<5	<5	<5
Colour (True) (HZU)	N/A	N/A		-	4	<3	5	<3	<3	<3	<3	<3
Cr (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.01
Cu (mg/L)	N/A	N/A		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.02
Dissolved CrIII (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.005
Dissolved CrVI (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.005
EC (µS/cm)	N/A	N/A		20200	21400	21500	22300	21000	20700	22100	21600	21600
Fe (mg/L)	N/A	N/A		0.07	0.1	0.04	0.04	0.07	<0.02	<0.02	0.02	0.1
Fluoride in water (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<10
Hardness (mg/L)	N/A	N/A		4300	4600	4200	4400	3900	3800	4400	-	4600
HCO^3 (mg/L)	N/A	N/A		-	430	430	420	430	-	420	450	-
Hg (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.00005
K (mg/L)	N/A	N/A		200	200	180	200	170	160	160	190	170
Mg (mg/L)	N/A	N/A		810	830	780	790	720	710	780	860	870
Mn (mg/L)	N/A	N/A		2.2	1	0.66	0.39	0.82	0.33	1.1	1.2	3.1
Na (mg/L)	N/A	N/A		3600	3500	3100	3500	3200	3000	3400	1700	3700
Ni (mg/L)	N/A	N/A		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
NO2 (mg/L)	N/A	N/A		-	<5	<5	<10	<5	<5	<10	<10	<10
NO3 (mg/L)	N/A	N/A		-	8	13	<10	6	6.4	<10	<10	<10
OH (mg/L)	N/A	N/A		-	<5	<5	<5	<5	-	<5	<5	-
Pb (mg/L)	N/A	N/A		<0.03	<0.03	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03
pH (pH units)	N/A	N/A		7.1	7.2	7	6.9	7.1	7	7.1	7.3	7.6
Sb (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.15
Se (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.12
Sulphate by HPLC (mg/L)	N/A	N/A		2100	2200	2200	2300	2100	2100	2000	2000	1900
TDS (mg/L)	N/A	N/A	29000	18000	15300	15800	16800	15000	15300	15400	14900	15900
Total Alkalinity (mg/L)	N/A	N/A		430	430	430	420	430	430	420	450	460
Total Cyanide (mg/L)	N/A	N/A		-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
TSS (mg/L)	N/A	N/A		-	15	38	35	160	<5	460	260	210
Turbidity (NTU)	N/A	N/A		-	2.5	4.8	3.2	16	0.2	55	58	46
WAD Cyanide (mg/L)	N/A	N/A		<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004

Table 7: Groundwater Monitoring Results – ENVMB007

	ENVMB007											
	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
Al (mg/L)	N/A	N/A		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
As (mg/L)	N/A	N/A		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Beryllium (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.01
Bo (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	4.8
Ca (mg/L)	N/A	N/A		370	460	420	470	400	370	420	460	460
Cd (mg/L)	N/A	N/A		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cl (mg/L)	N/A	N/A		5000	-	-	-	-	6000	-	-	-
Co (mg/L)	N/A	N/A		0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01
CO^3 (mg/L)	N/A	N/A		<5	<5	<5	<5	<5	<5	<5	<5	<5
Colour (True) (HZU)	N/A	N/A		-	4	<3	5	<3	<3	<3	<3	<3
Cr (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.01
Cu (mg/L)	N/A	N/A		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06
Dissolved CrIII (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.005
Dissolved CrVI (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.005
EC (µS/cm)	N/A	N/A		16500	20600	20900	20500	20000	19300	20900	20800	20700
Fe (mg/L)	N/A	N/A		<0.02	0.03	<0.02	0.07	0.07	<0.02	<0.02	<0.02	<0.02
Fluoride in water (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<10
Hardness (mg/L)	N/A	N/A		3000	4100	3800	3800	3700	3300	3900	-	4100
HCO^3 (mg/L)	N/A	N/A		-	460	460	440	470	-	460	500	-
Hg (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.00005
K (mg/L)	N/A	N/A		150	170	170	170	160	130	140	160	160
Mg (mg/L)	N/A	N/A		500	710	670	650	640	580	660	740	740
Mn (mg/L)	N/A	N/A		2.9	2	1.9	2.1	2.3	3	3.7	2.2	1.3
Na (mg/L)	N/A	N/A		2700	3400	3100	3400	3400	2900	3400	1700	3800
Ni (mg/L)	N/A	N/A		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
NO2 (mg/L)	N/A	N/A		-	<5	<5	<10	<5	<5	<10	<10	<10
NO3 (mg/L)	N/A	N/A		-	<5	<5	<10	<5	<5	<10	<10	<10
OH (mg/L)	N/A	N/A		-	<5	<5	<5	<5	-	<5	<5	-
Pb (mg/L)	N/A	N/A		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
pH (pH units)	N/A	N/A		7.6	7.5	7.2	7.1	7.4	7.2	7.3	7.5	7.6
Sb (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.15
Se (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.12
Sulphate by HPLC (mg/L)	N/A	N/A		1600	2100	2100	2200	2100	1800	1800	2000	1800
TDS (mg/L)	N/A	N/A	26300	13800	14600	15200	15800	14000	14000	13400	14500	14600
Total Alkalinity (mg/L)	N/A	N/A		450	460	460	440	470	470	460	500	480
Total Cyanide (mg/L)	N/A	N/A		-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
TSS (mg/L)	N/A	N/A		-	7	36	83	7	220	580	240	240
Turbidity (NTU)	N/A	N/A		-	3.1	6	10	3.5	11	110	48	98
WAD Cyanide (mg/L)	N/A	N/A		<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Zn (mg/L)	N/A	N/A		0.06	0.03	0.03	0.03	0.03	0.03	0.06	0.14	0.093

Table 8: Groundwater Monitoring Results – ENVMB008

	ENVMB008											
	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
Al (mg/L)	N/A	N/A		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
As (mg/L)	N/A	N/A		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Beryllium (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.01
Bo (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	3.7
Ca (mg/L)	N/A	N/A		240	350	230	270	240	260	350	550	650
Cd (mg/L)	N/A	N/A		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cl (mg/L)	N/A	N/A		2500	-	-	-	-	2600	-	-	-
Co (mg/L)	N/A	N/A		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CO^3 (mg/L)	N/A	N/A		<5	<5	<5	<5	<5	<5	<5	<5	<5
Colour (True) (HZU)	N/A	N/A		-	<3	<3	<3	<3	<3	<3	<3	<3
Cr (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.01
Cu (mg/L)	N/A	N/A		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05
Dissolved CrIII (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.005
Dissolved CrVI (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.005
EC (µS/cm)	N/A	N/A		8310	10500	8020	8670	7800	8560	11700	20500	24300
Fe (mg/L)	N/A	N/A		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
Fluoride in water (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<10
Hardness (mg/L)	N/A	N/A		1800	2500	1600	1800	1700	1800	2600	-	6100
HCO^3 (mg/L)	N/A	N/A		-	190	170	170	170	-	190	250	-
Hg (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.00005
K (mg/L)	N/A	N/A		79	78	66	61	68	58	73	130	150
Mg (mg/L)	N/A	N/A		290	400	240	280	250	270	400	910	1200
Mn (mg/L)	N/A	N/A		0.02	0.07	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.02
Na (mg/L)	N/A	N/A		1200	1400	1000	1100	1000	1100	1600	1500	3800
Ni (mg/L)	N/A	N/A		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
NO2 (mg/L)	N/A	N/A		-	<2.5	<2.5	<2.5	<2.5	<2.5	<5	<10	<10
NO3 (mg/L)	N/A	N/A		-	48	70	72	66	56	44	26	<10
OH (mg/L)	N/A	N/A		-	<5	<5	<5	<5	-	<5	<5	-
Pb (mg/L)	N/A	N/A		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
pH (pH units)	N/A	N/A		7.6	7.3	7.2	7.2	7.5	7.2	7.2	7.4	7.5
Sb (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.15
Se (mg/L)	N/A	N/A		-	-	-	-	-	-	-	-	<0.12
Sulphate by HPLC (mg/L)	N/A	N/A		700	940	630	730	680	790	1100	1900	1900
TDS (mg/L)	N/A	N/A	9850	7760	7160	5450	5870	4700	6230	8400	14400	18000
Total Alkalinity (mg/L)	N/A	N/A		180	190	170	170	170	180	190	250	250
Total Cyanide (mg/L)	N/A	N/A		-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
TSS (mg/L)	N/A	N/A		-	5	5	5	5	5	5	5	6
Turbidity (NTU)	N/A	N/A		-	0.3	0.4	1.3	0.6	0.1	0.6	1.8	1
WAD Cyanide (mg/L)	N/A	N/A		<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004

Appendix 5: Surface Water monitoring results

MEMORANDUM

Date: **28th November 2014**

To: Sustainability Department

From: Melissa Bolton

Subject: Surface Water Monitoring Results

Surface water sampling locations have been established in and around the operational area, however no permanent surface water sites occur in or around the operational area and therefore samples are only able to be collected following rainfall events. All sample locations are visited after each rainfall event, however surface water is not always present and therefore no samples are able to be taken. Also, additional surface water sample locations have been established progressively as the project has transitioned from construction to operational phases and some sample points discussed in this memo were only established and monitoring commenced during early 2014.

Surface water quality monitoring is undertaken in accordance with the Tropicana Gold Mine Environmental Monitoring Strategy, with samples collected following rain events of over 20 millimetres (mm) in 24 hours or when surface water is observed in collection ponds. Event sampling was undertaken during the reporting period following rainfall events in November 2013, December 2013, January 2014, February 2014 and April 2014. The following sampling locations have been established:

- Downstream drain;
- Downstream LWE1;
- ROM drain;
- ROM sump;
- TSF North east;
- TSF North west;
- TSF South west;
- TSF South East: and
- Upstream Drain.

The location of these sampling sites is shown on Figure 1.

Figure 1: Surface Water Sample Locations

Results

Results obtained from surface water sampling conducted during the reporting period are provided in Appendix 1 and discussed briefly below. Please note that no results indicate no sample was able to be taken due to absence of surface water being present.

pH of samples collected across the surface water sampling locations ranged between 6.1 and 9 pH units with levels typically falling within the 7-8 range (**Figure 2**) .

Total Dissolved Solids (TDS) recorded across the surface water sampling locations typically ranged from 70 to 1100 mg/L and EC values typically ranges from 240 to 1860 µS/cm (**Figure 3** and **Figure 4**). One exception where higher EC and TDS was recorded is the drain downstream of LWE1 with TDS ranging between 3920 and 5850 mg/L and EC ranging from 6310 and 8250 µS/cm. This is likely to be due to the use of hypersaline water on the haul roads in the area. The surface water sampling is expected to have picked up salts contained in the LWE 1 drain resulting in these higher readings. This drain was constructed specifically to contain water running off the landform. These results indicate the importance of the toe drains at the base of landforms and that the drain is working effectively to contain sediment laden water.

Total cyanide (mg/L) recorded in the surface water sampling locations was largely below the detectable limits (<0.04) and/or below the trigger value (0.07 mg/L) within the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* One outlier was recorded at the TSF Southeast sampling location of 0.02 mg/L (**Figure 5**). This result is not unexpected from this location. This surface water is contained in the Project area, and does not flow off site. All cyanide values recorded were below the trigger value identified within the Sites Prescribed Premises Licence of 0.5 mg/L.

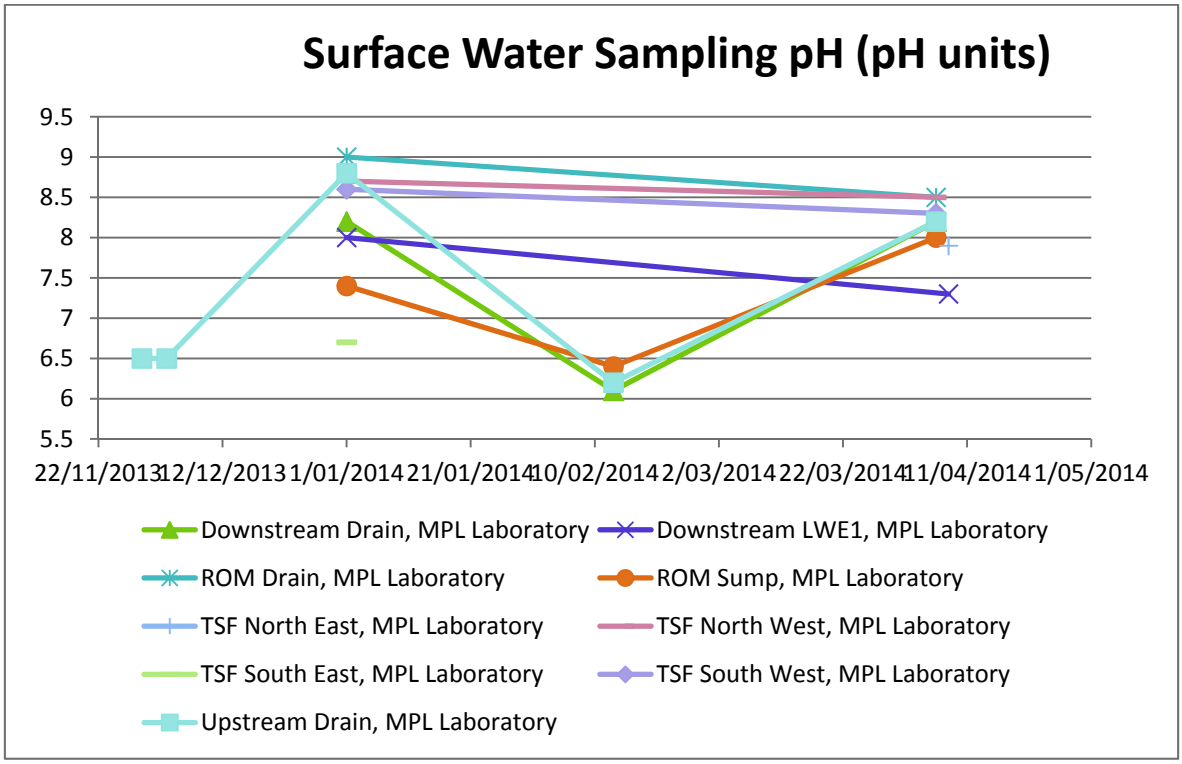

Figure 2: Surface water monitoring pH

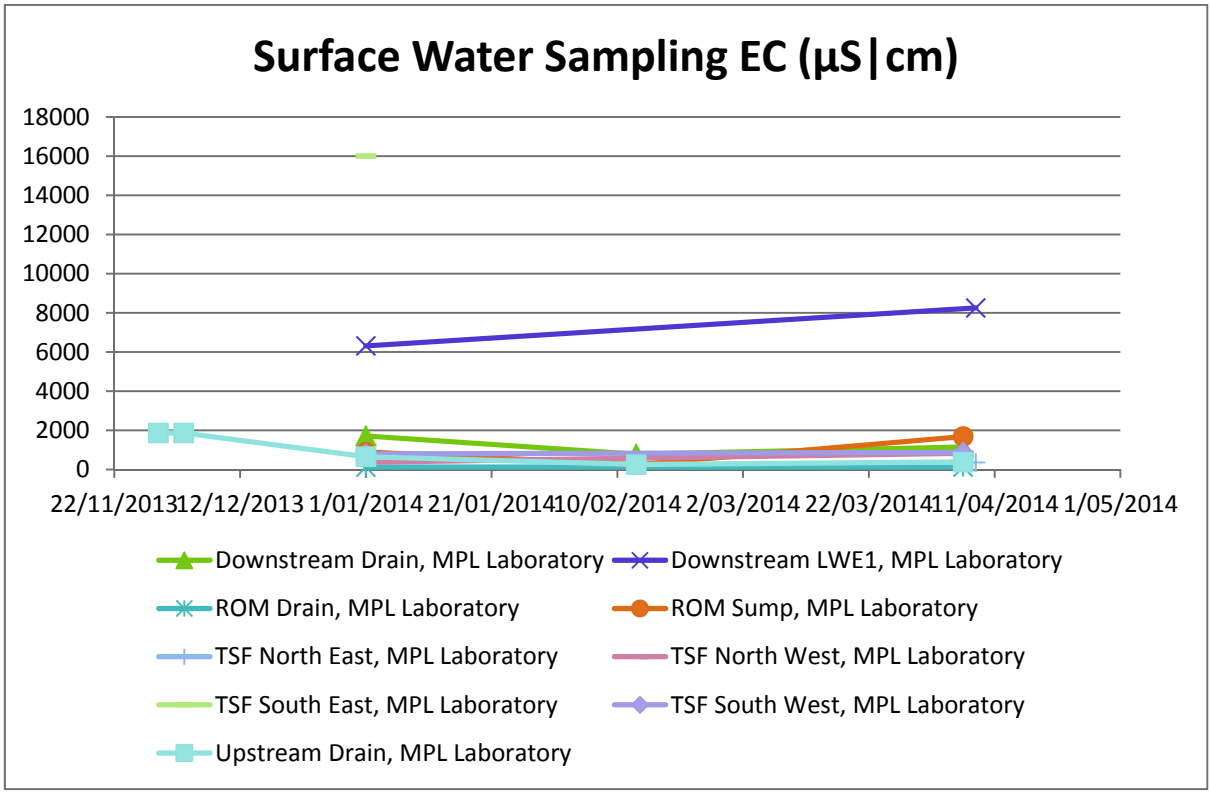

Figure 3: Surface water monitoring Electrical conductivity

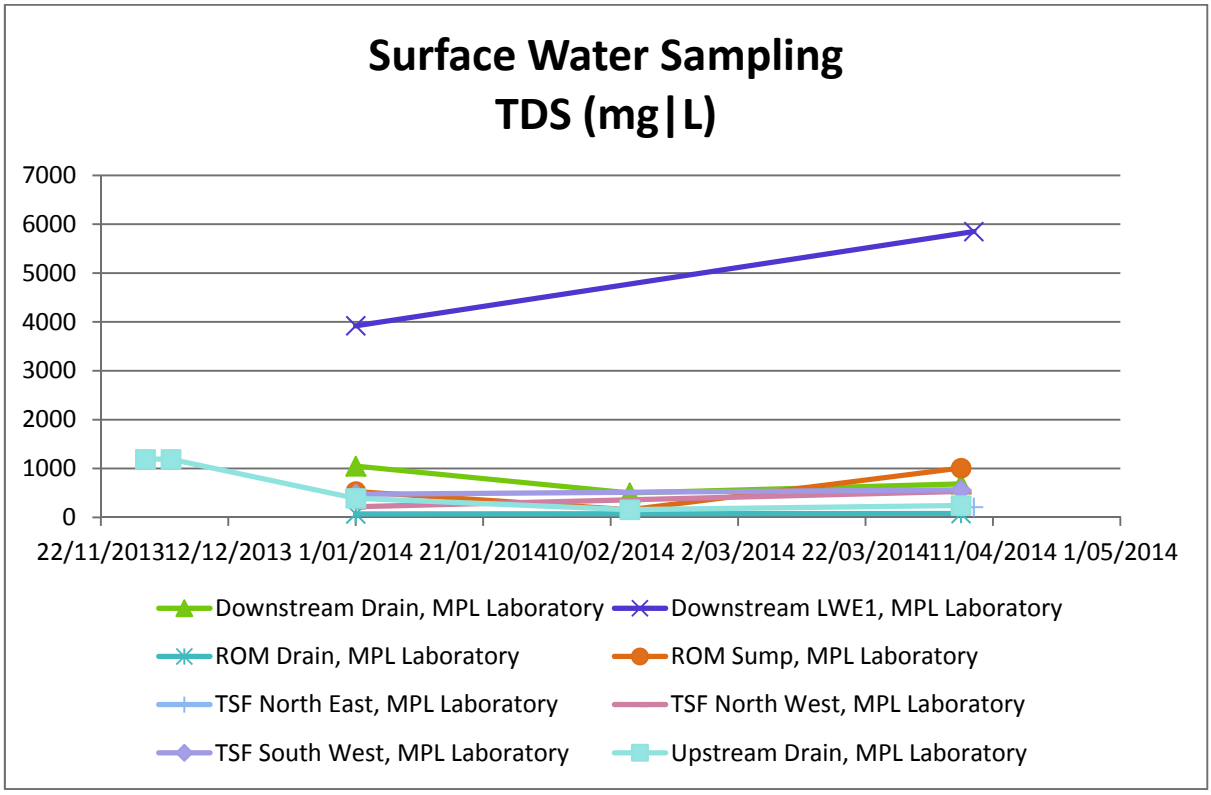

Figure 4: Surface water monitoring Total Dissolved Solids

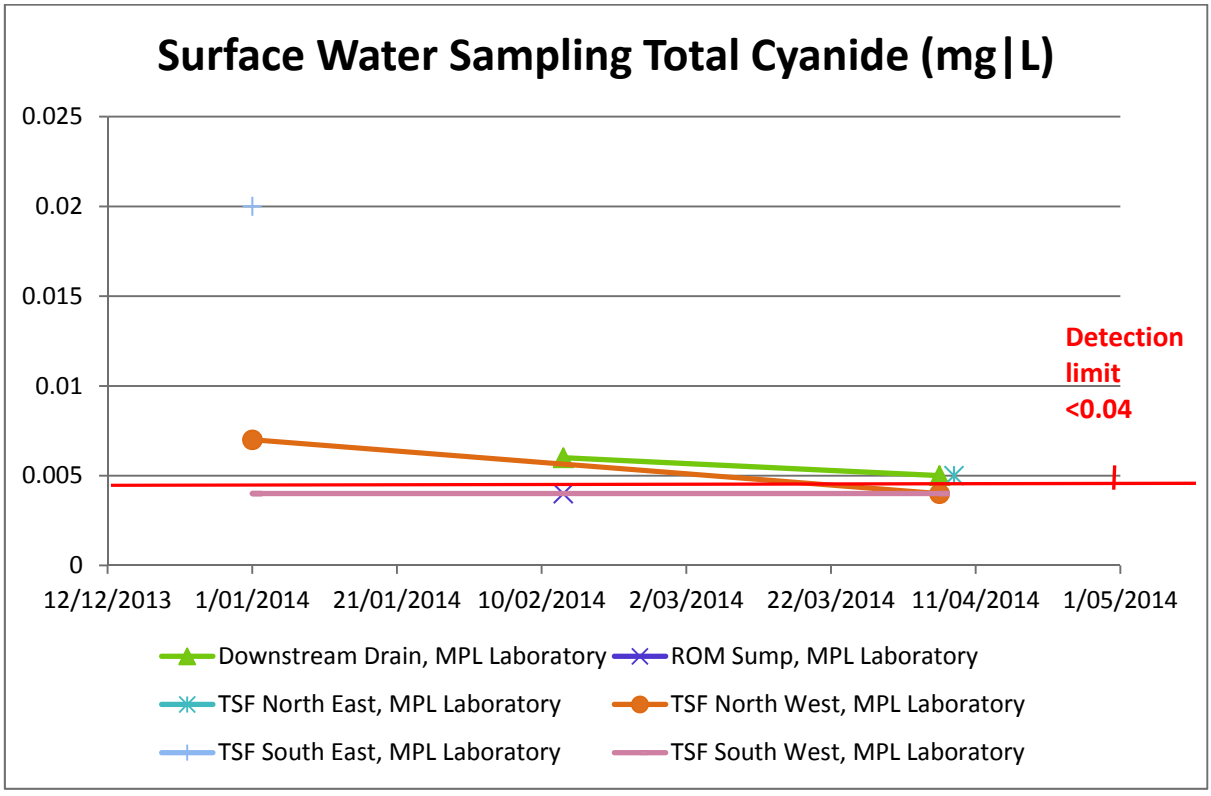

Figure 5: Surface water monitoring total cyanide results

Appendix 1: Surface Water Results

Table 1: Surface water results – Downstream Drain sample point

	Downstream Drain				
	Nov	Dec	Jan	Feb	Apr
Miscellaneous Inorganics					
pH (pH units)	-	-	8.2	6.1	8.2
EC (µS/cm)	-	-	1710	780	1140
TDS (mg/L)	-	-	1050	501	684
Total Cyanide (mg/L)	-	-	-	0.006	0.005
NO3 (mg/L)	-	-	2.7	1.4	1.4
Turbidity (NTU)	-	-	54	35	11
Colour (True) (HZU)	-	-	<3	<3	<3
Ionic Balance					
Ca (mg/L)	-	-	43	29	41
K (mg/L)	-	-	19	11	11
Mg (mg/L)	-	-	21	13	14
Na (mg/L)	-	-	270	150	170
HCO^3 (mg/L)	-	-	23	25	21
CO^3 (mg/L)	-	-	<5	<5	<5
OH (mg/L)	-	-	<5	<5	<5
Total Alkalinity (mg/L)	-	-	23	25	21
Cl (mg/L)	-	-	460	260	290
Sulphate by HPLC (mg/L)	-	-	110	75	100
Ionic Balance (%)	-	-	2.1	-0.83	-0.15
Hardness (mg/L)	-	-	200	130	160
Dissolved Metals					
Cd (mg/L)	-	-	<0.01	<0.01	<0.0001*
Cu (mg/L)	-	-	<0.01	<0.01	0.002*
Fe (mg/L)	-	-	<0.02	<0.02	0.52*
Mn (mg/L)	-	-	0.01	<0.01	0.016*
Pb (mg/L)	-	-	<0.03	<0.03	<0.001*
Ni (mg/L)	-	-	<0.02	<0.02	0.002*
Al (mg/L)	-	-	<0.1	<0.1	0.34*
Cyanides in Water					
WAD Cyanide (mg/L)	-	-	-	0.005	<0.004
vTRH(C6-C10)/MBTEXN in water					
TRH C6 - C9 (µg/l)	-	-	<10	<10	<10
TRH C6 - C10 (µg/l)	-	-	<10	<10	<10
TRH C6-C10 less BTEX (µg/l)	-	-	<10	<10	<10
MTBE (µg/l)	-	-	<1	<1	<1
Benzene (µg/l)	-	-	<1	<1	<1
Toluene (µg/l)	-	-	<1	<1	<1
Ethylbenzene (µg/l)	-	-	<1	<1	<1
m+p-xylene (µg/l)	-	-	<2	<2	<2
o-xylene (µg/l)	-	-	<1	<1	<1
Naphthalene (µg/l)	-	-	<1	<1	<1
Dibromofluoromethane (%)	-	-	107	104	101
Surrogate toluene-d8 (%)	-	-	112	102	100
Surrogate 4-BFB (%)	-	-	100	98	96
svTRH(C10-C40) in water					
TRH C10 - C14 (µg/l)	-	-	<50	50	53
TRH C15 - C28 (µg/l)	-	-	<100	<100	<100
TRH C29 - C36 (µg/l)	-	-	<100	<100	<100
TRH >C10 - C16 (µg/l)	-	-	<50	<50	61
TRH >C10-C16 less N (µg/l)	-	-	<50	<50	61
TRH >C16 - C34 (µg/l)	-	-	<100	<100	<100
TRH >C34 - C40 (µg/l)	-	-	<100	<100	<100

Table 2 Surface water results – Downstream LWE1 sample point

	Downstream LWE1				
	Nov	Dec	Jan	Feb	Apr
Miscellaneous Inorganics					
pH (pH units)	-	-	8	-	7.3
EC (µS/cm)	-	-	6310	-	8250
TDS (mg/L)	-	-	3920	-	5850
NO3 (mg/L)	-	-	<1	-	<2.5
Turbidity (NTU)	-	-	120	-	11
Colour (True) (HZU)	-	-	<3	-	10
Ionic Balance					
Ca (mg/L)	-	-	210	-	200
K (mg/L)	-	-	53	-	48
Mg (mg/L)	-	-	120	-	140
Na (mg/L)	-	-	1100	-	1400
HCO^3 (mg/L)	-	-	24	-	21
CO^3 (mg/L)	-	-	<5	-	<5
OH (mg/L)	-	-	<5	-	<5
Total Alkalinity (mg/L)	-	-	24	-	21
Cl (mg/L)	-	-	1800	-	2700
Sulphate by HPLC (mg/L)	-	-	550	-	600
Ionic Balance (%)	-	-	4.7	-	-2.5
Hardness (mg/L)	-	-	1000	-	1100
Dissolved Metals					
Cd (mg/L)	-	-	<0.01	-	<0.0001*
Cu (mg/L)	-	-	<0.01	-	0.001*
Fe (mg/L)	-	-	<0.02	-	0.27*
Mn (mg/L)	-	-	0.07	-	0.092*
Pb (mg/L)	-	-	<0.03	-	<0.001*
Ni (mg/L)	-	-	<0.02	-	0.001*
Al (mg/L)	-	-	<0.1	-	0.15*

Table 3 Surface water results – ROM drain sample point

	ROM Drain				
	Nov	Dec	Jan	Feb	Apr
Miscellaneous Inorganics					
pH (pH units)	-	-	9	-	8.5
EC (µS/cm)	-	-	115	-	122
TDS (mg/L)	-	-	70	-	78
NO3 (mg/L)	-	-	<0.5	-	0.6
Turbidity (NTU)	-	-	2000	-	3100
Colour (True) (HZU)	-	-	36	-	840
Ionic Balance					
Ca (mg/L)	-	-	8.7	-	7.9
K (mg/L)	-	-	3.1	-	2.6
Mg (mg/L)	-	-	1.8	-	1.5
Na (mg/L)	-	-	9.8	-	15
HCO^3 (mg/L)	-	-	51	-	41
CO^3 (mg/L)	-	-	11	-	<5
OH (mg/L)	-	-	<5	-	5
Total Alkalinity (mg/L)	-	-	62	-	45
Cl (mg/L)	-	-	12	-	11
Sulphate by HPLC (mg/L)	-	-	6	-	6
Ionic Balance (%)	-	-	-22	-	-4.3
Hardness (mg/L)	-	-	29	-	26
Dissolved Metals					
Cd (mg/L)	-	-	<0.01	-	0.0001*
Cu (mg/L)	-	-	<0.01	-	0.033*
Fe (mg/L)	-	-	0.31	-	35*
Mn (mg/L)	-	-	<0.01	-	0.39*
Pb (mg/L)	-	-	<0.03	-	0.028*
Ni (mg/L)	-	-	<0.02	-	0.032*
Al (mg/L)	-	-	0.6	-	29*

Table 4 Surface water results – ROM Sump sample point

	ROM Sump				
	Nov	Dec	Jan	Feb	Apr
Miscellaneous Inorganics					
pH (pH units)	-	-	7.4	6.4	8
EC (µS/cm)	-	-	884	243	1680
TDS (mg/L)	-	-	530	157	1010
NO3 (mg/L)	-	-	0.5	0.8	1.3
Turbidity (NTU)	-	-	120	260	26
Colour (True) (HZU)	-	-	<3	5	<3
Ionic Balance					
Ca (mg/L)	-	-	41	12	26
K (mg/L)	-	-	11	4.9	11
Mg (mg/L)	-	-	17	2.3	22
Na (mg/L)	-	-	120	29	220
HCO^3 (mg/L)	-	-	11	61	18
CO^3 (mg/L)	-	-	<5	<5	<5
OH (mg/L)	-	-	<5	<5	<5
Total Alkalinity (mg/L)	-	-	11	61	18
Cl (mg/L)	-	-	200	35	370
Sulphate by HPLC (mg/L)	-	-	100	18	110
Ionic Balance (%)	-	-	5.4	-8.2	-1.2
Hardness (mg/L)	-	-	170	40	150
Dissolved Metals					
Cd (mg/L)	-	-	<0.01	<0.01	0.0004*
Cu (mg/L)	-	-	<0.01	<0.01	0.25*
Fe (mg/L)	-	-	<0.02	0.04	240*
Mn (mg/L)	-	-	0.03	<0.01	5.8*
Pb (mg/L)	-	-	<0.03	<0.03	0.14*
Ni (mg/L)	-	-	<0.02	<0.02	0.29*
Al (mg/L)	-	-	<0.1	<0.1	190*
Cyanides in Water					
WAD Cyanide (mg/L)	-	-	-	<0.004	-
Total Cyanide (mg/L)	-	-	-	<0.004	-

Table 5 Surface water results – TSF North-east sample point

	TSF North East				
	Nov	Dec	Jan	Feb	Apr
Miscellaneous Inorganics					
pH (pH units)	-	-	-		7.9
EC (µS/cm)	-	-	-		354
TDS (mg/L)	-	-	-		212
NO3 (mg/L)	-	-	-		1.9
Turbidity (NTU)	-	-	-		740
Colour (True) (HZU)	-	-	-		23
Ionic Balance					
Ca (mg/L)	-	-	-		15
K (mg/L)	-	-	-		5.6
Mg (mg/L)	-	-	-		3.5
Na (mg/L)	-	-	-		39
HCO^3 (mg/L)	-	-	-		40
CO^3 (mg/L)	-	-	-		<5
OH (mg/L)	-	-	-		<5
Total Alkalinity (mg/L)	-	-	-		40
Cl (mg/L)	-	-	-		72
Sulphate by HPLC (mg/L)	-	-	-		21
Ionic Balance (%)	-	-	-		-6.1
Hardness (mg/L)	-	-	-		52
Dissolved Metals					
Cd (mg/L)	-	-	-		<0.0001
Cu (mg/L)	-	-	-		0.009
Fe (mg/L)	-	-	-		10
Mn (mg/L)	-	-	-		0.18
Pb (mg/L)	-	-	-		0.007
Ni (mg/L)	-	-	-		0.007
Al (mg/L)	-	-	-		6.5
Cyanides in Water					
WAD Cyanide (mg/L)	-	-	-		<0.004
Total Cyanide (mg/L)	-	-	-		0.005
vTRH(C6-C10)/MBTEXN in water					
TRH C6 - C9 (µg/l)	-	-			<10
TRH C6 - C10 (µg/l)	-	-			<10
TRH C6-C10 less BTEX (µg/l)	-	-			<10
MTBE (µg/l)	-	-			<1
Benzene (µg/l)	-	-			<1
Toluene (µg/l)	-	-			<1
Ethylbenzene (µg/l)	-	-			<1
m+p-xylene (µg/l)	-	-			<2
o-xylene (µg/l)	-	-			<1
Naphthalene (µg/l)	-	-			<1
Dibromofluoromethane (%)	-	-			104
Surrogate toluene-d8 (%)	-	-			97
Surrogate 4-BFB (%)	-	-			95
svTRH(C10-C40) in water					
TRH C10 - C14 (µg/l)	-	-			<50
TRH C15 - C28 (µg/l)	-	-			<100
TRH C29 - C36 (µg/l)	-	-			<100
TRH >C10 - C16 (µg/l)	-	-			<50
TRH >C10-C16 less N (µg/l)	-	-			<50
TRH >C16 - C34 (µg/l)	-	-			<100
TRH >C34 - C40 (µg/l)	-	-			<100

Table 6 Surface water results – TSF North-west sample point

	TSF North West				
	Nov	Dec	Jan	Feb	Apr
Miscellaneous Inorganics					
pH (pH units)	-	-	8.7	-	8.5
EC (µS/cm)	-	-	361	-	823
TDS (mg/L)	-	-	217	-	529
NO3 (mg/L)	-	-	1	-	10
Turbidity (NTU)	-	-	1300	-	1100
Colour (True) (HZU)	-	-	10	-	15
Ionic Balance					
Ca (mg/L)	-	-	17	-	13
K (mg/L)	-	-	6.6	-	16
Mg (mg/L)	-	-	4	-	6.6
Na (mg/L)	-	-	49	-	150
HCO^3 (mg/L)	-	-	40	-	46
CO^3 (mg/L)	-	-	<5	-	6
OH (mg/L)	-	-	5	-	5
Total Alkalinity (mg/L)	-	-	44	-	52
Cl (mg/L)	-	-	76	-	180
Sulphate by HPLC (mg/L)	-	-	23	-	100
Ionic Balance (%)	-	-	-0.49	-	0.47
Hardness (mg/L)	-	-	58	-	60
Dissolved Metals					
Cd (mg/L)	-	-	<0.01	-	<0.0001*
Cu (mg/L)	-	-	<0.01	-	0.012*
Fe (mg/L)	-	-	0.05	-	13*
Mn (mg/L)	-	-	0.01	-	0.15*
Pb (mg/L)	-	-	<0.03	-	0.012*
Ni (mg/L)	-	-	<0.02	-	0.008*
Al (mg/L)	-	-	<0.1	-	11*
Cyanides in Water					
WAD Cyanide (mg/L)	-	-	0.005	-	<0.004
Total Cyanide (mg/L)	-	-	0.007	-	<0.004

Table 7 Surface water results – TSF south-east sample point

	TSF South East				
	Nov	Dec	Jan	Feb	Apr
Miscellaneous Inorganics					
pH (pH units)	-	-	6.7		
EC (µS/cm)	-	-	16000		
TDS (mg/L)	-	-	10300		
NO3 (mg/L)	-	-	<5		
Turbidity (NTU)	-	-	170		
Colour (True) (HZU)	-	-	<3		
Ionic Balance					
Ca (mg/L)	-	-	340		
K (mg/L)	-	-	110		
Mg (mg/L)	-	-	330		
Na (mg/L)	-	-	2900		
HCO^3 (mg/L)	-	-	36		
CO^3 (mg/L)	-	-	<5		
OH (mg/L)	-	-	<5		
Total Alkalinity (mg/L)	-	-	36		
Cl (mg/L)	-	-	4200		
Sulphate by HPLC (mg/L)	-	-	750		
Ionic Balance (%)	-	-	13		
Hardness (mg/L)	-	-	2200		
Dissolved Metals					
Cd (mg/L)	-	-	<0.01		
Cu (mg/L)	-	-	<0.01		
Fe (mg/L)	-	-	<0.02		
Mn (mg/L)	-	-	2.6		
Pb (mg/L)	-	-	<0.03		
Ni (mg/L)	-	-	<0.02		
Al (mg/L)	-	-	<0.1		
Cyanides in Water					
WAD Cyanide (mg/L)	-	-	0.03		
Total Cyanide (mg/L)	-	-	0.02		

Table 8 Surface water results – TSF South-west sample point

	TSF South West				
	Nov	Dec	Jan	Feb	Apr
Miscellaneous Inorganics					
pH (pH units)	-	-	8.6	-	8.3
EC (µS/cm)	-	-	785	-	873
TDS (mg/L)	-	-	471	-	562
NO3 (mg/L)	-	-	<0.5	-	0.8
Turbidity (NTU)	-	-	-		19
Colour (True) (HZU)	-	-	<3	-	4
Ionic Balance					
Ca (mg/L)	-	-	36	-	32
K (mg/L)	-	-	7.8	-	7.6
Mg (mg/L)	-	-	10	-	10
Na (mg/L)	-	-	97	-	120
HCO^3 (mg/L)	-	-	25	-	20
CO^3 (mg/L)	-	-	<5	-	<5
OH (mg/L)	-	-	<5	-	<5
Total Alkalinity (mg/L)	-	-	28	-	20
Cl (mg/L)	-	-	180	-	210
Sulphate by HPLC (mg/L)	-	-	85	-	75
Ionic Balance (%)	-	-	-1.6	-	0.44
Hardness (mg/L)	-	-	130	-	120
Dissolved Metals					
Cd (mg/L)	-	-	<0.01	-	<0.0001*
Cu (mg/L)	-	-	<0.01	-	0.002*
Fe (mg/L)	-	-	<0.02	-	1.6*
Mn (mg/L)	-	-	<0.01	-	0.024*
Pb (mg/L)	-	-	<0.03	-	<0.001*
Ni (mg/L)	-	-	<0.02	-	0.001*
Al (mg/L)	-	-	<0.1	-	0.96*
Cyanides in Water					
WAD Cyanide (mg/L)	-	-	-		<0.004
Total Cyanide (mg/L)	-	-	-		<0.004
vTRH(C6-C10)/MBTEXN in water					
TRH C6 - C9 (µg/l)	-	-			<10
TRH C6 - C10 (µg/l)	-	-			<10
TRH C6-C10 less BTEX (µg/l)	-	-			<10
MTBE (µg/l)	-	-			<1
Benzene (µg/l)	-	-			<1
Toluene (µg/l)	-	-			<1
Ethylbenzene (µg/l)	-	-	-	-	<1
m+p-xylene (µg/l)	-	-	-	-	<2
o-xylene (µg/l)	-	-			<1
Naphthalene (µg/l)	-	-			<1
Dibromofluoromethane (%)	-	-	-	-	102
Surrogate toluene-d8 (%)	-	-			100
Surrogate 4-BFB (%)	-	-			97
svTRH(C10-C40) in water					
TRH C10 - C14 (µg/l)	-	-			92
TRH C15 - C28 (µg/l)	-	-			<100
TRH C29 - C36 (µg/l)	-	-			<100
TRH >C10 - C16 (µg/l)	-	-			55
TRH >C10-C16 less N (µg/l)	-	-			55
TRH >C16 - C34 (µg/l)	-	-			100
TRH >C34 - C40 (µg/l)	-	-			<100

Table 9 Surface water results – Upstream Drain sample point

	Upstream Drain				
	Nov	Dec	Jan	Feb	Apr
Miscellaneous Inorganics					
pH (pH units)	6.5	6.5	8.8	6.2	8.2
EC (µS/cm)	1860	1860	650	246	378
TDS (mg/L)	1190	1190	390	158	243
NO3 (mg/L)	1.4	1.4	<0.5	0.9	1
Turbidity (NTU)	14	14	180	320	170
Colour (True) (HZU)	<3	<3	<3	4	6
Ionic Balance					
Ca (mg/L)	63	63	28	9	16
K (mg/L)	17	17	8.7	2.8	4.3
Mg (mg/L)	29	29	8.9	2.9	4.3
Na (mg/L)	250	250	81	30	48
HCO^3 (mg/L)	24	24	70	23	24
CO^3 (mg/L)	<5	<5	<5	<5	<5
OH (mg/L)	<5	<5	<5	<5	<5
Total Alkalinity (mg/L)	24	24	74	23	24
Cl (mg/L)	520	520	140	53	78
Sulphate by HPLC (mg/L)	160		65	17	37
Ionic Balance (%)	-5.2	-5.2	-8.1	-5.4	-1.6
Hardness (mg/L)	270	270	110	34	56
Dissolved Metals					
Cd (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.0001*
Cu (mg/L)	<0.01	<0.01	<0.01	<0.01	0.01*
Fe (mg/L)	<0.02	<0.02	<0.02	0.23	8.3*
Mn (mg/L)	0.02	0.02	<0.01	<0.01	0.17*
Pb (mg/L)	<0.03	<0.03	<0.03	<0.03	0.008*
Ni (mg/L)	<0.02	<0.02	<0.02	<0.02	0.01*
Al (mg/L)	<0.1	<0.1	<0.1	0.5	6*
Cyanides in Water					
WAD Cyanide (mg/L)	-	-	-		-
Total Cyanide (mg/L)	-	-	-		-
vTRH(C6-C10)/MBTEXN in water					
TRH C6 - C9 (µg/l)	-	-	<10		<10
TRH C6 - C10 (µg/l)	-	-	<10		<10
TRH C6-C10 less BTEX (µg/l)	-	-	<10		<10
MTBE (µg/l)	-	-	<1		<1
Benzene (µg/l)	-	-	<1		<1
Toluene (µg/l)	-	-	<1		<1
Ethylbenzene (µg/l)	-	-	<1		<1
m+p-xylene (µg/l)	-	-	<2		<2
o-xylene (µg/l)	-	-	<1		<1
Naphthalene (µg/l)	-	-	<1		<1
Dibromofluoromethane (%)	-	-	100		102
Surrogate toluene-d8 (%)	-	-	113		101
Surrogate 4-BFB (%)	-	-	98		96
svTRH(C10-C40) in water					
TRH C10 - C14 (µg/l)	-	-	56		<50
TRH C15 - C28 (µg/l)	-	-	410		<100
TRH C29 - C36 (µg/l)	-	-	<100		<100
TRH >C10 - C16 (µg/l)	-	-	99		<50
TRH >C10-C16 less N (µg/l)	-	-	99		<50
TRH >C16 - C34 (µg/l)	-	-	370		<100
TRH >C34 - C40 (µg/l)	-	-	<100		<100

Appendix 6: Amended Threatened Species Management Strategy and associated DPaW Correspondence

Tropicana Gold Project
Threatened Species and Communities Management Strategy

1 OVERVIEW

The Threatened Species and Communities Management Strategy (TS&CMS) contained within this document provides the framework for managing threatened species and communities located within the Tropicana Gold Project (the Project) disturbance area. The TS&CMS forms part of the Project's Integrated Management System (referred to as ONE MS) that ensures the effective management of all health, safety, environment, community and operational issues associated with the Project.

ONE MS (including the TS&CMS) establishes the framework and standards that must be achieved for all activities associated with the Project. It includes the development and management of policies, management strategies, procedures and reporting requirements (Figure 1). The ONE MS is designed to align with the principle of ISO14001 – Plan, Do, Check, Act.

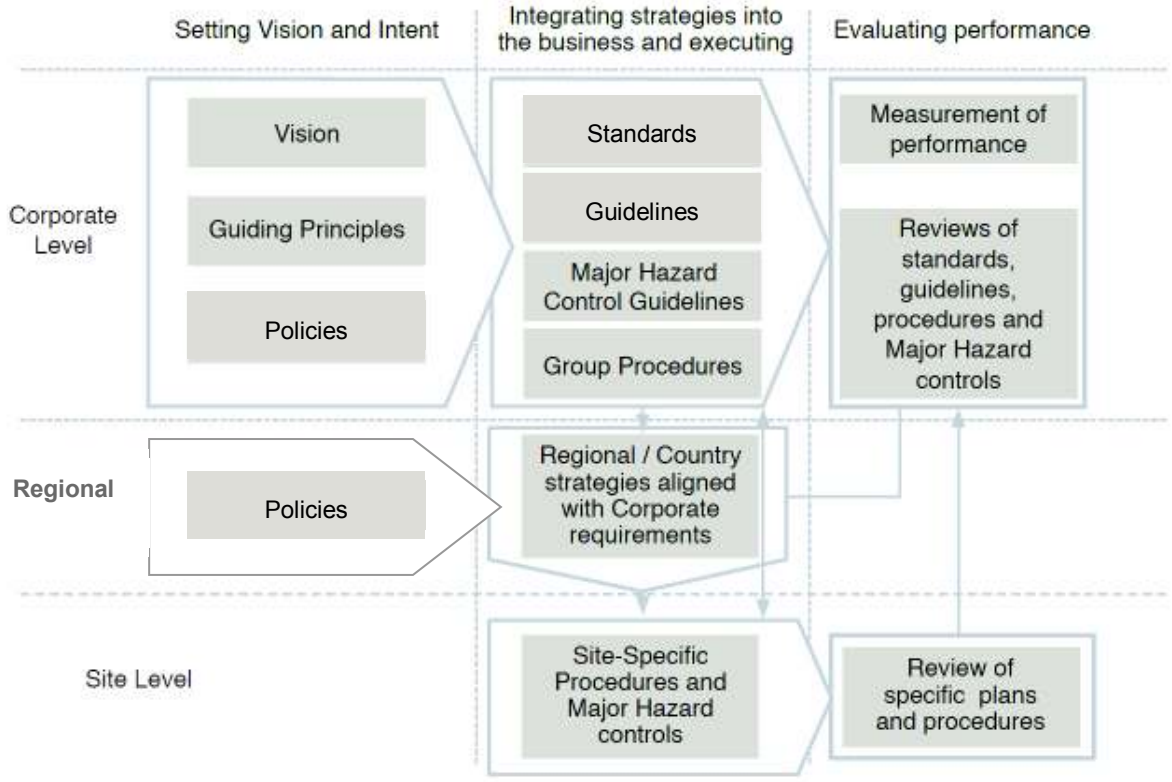

Figure 1 Tropicana Gold Project Management System Framework 'ONE'

As part of the development of the ONE MS, Tropicana Gold Mine (TGM) has established two key registers, the site legal and other obligation register (managed via CMO Compliance Database) and aspects / impacts register that documents the environmental potential impacts associated with operation. To ensure compliance and a consolidated approach to aspect/impact/hazard/risk management the site has identified 25 key environmental factors. These form the basis around which the environmental component of the ONE MS has been developed, including documentation, training and audits and inspections. The TGM environmental management strategies, of which the TS&CMS is one, identify how these environmental factors will be managed

This document has been compiled (September 2009) and revised (March 2014) with the assistance of 360 Environmental.

2 PURPOSE

The purpose of this document is to identify the threatened species and communities that may be impacted by the Project and to establish mitigation and management measures to minimise potential impacts. Many of the potential threats posed to threatened species and communities by the Project are relevant to the design, construction, commissioning and operational phases of the Project (e.g. vehicle movement [road kill and off-ride driving]), therefore this strategy has not been divided into these phases but rather, presents life of mine management for threatened species and communities. In this document 'threatened' refers to:

- species or communities that are specifically protected under State or Federal legislation (the State *Wildlife Conservation Act 1950* or the Federal *Environment Protection and Biodiversity Conservation Act 1999* respectively);
- species or communities recognised under the Department of Parks and Wildlife (DPaW, previously the Department of Environment and Conservation) Priority Ranking; and,
- other species that are new to science, previously undescribed, at the periphery of their known distribution, have limited distribution within the Project's disturbance area or have been identified as a range extension during surveys commissioned for the Project.

Specifically, this strategy:

- identifies and describes threatened flora and fauna species that have been confirmed to occur within the Project footprint or surrounding area;
- identifies and describes threatened fauna species that have suitable habitat in the Project footprint or its surrounds, but have not been confirmed as present to date;
- identifies threatened vegetation communities that occur within the Project footprint or in its surrounds;
- identifies the risks associated with the construction and operation of the Project to the threatened species and communities; and
- proposes mitigation and management techniques to minimise the impact of the Project on threatened species and communities.

This strategy aligns with the following standards contained in the AngloGold Ashanti Australia Integrated Management System:

- Biodiversity Standard; and
- Land Management Standard.

3 SCOPE AND REVIEW PROTOCOLS

This TS&CMS is applicable to all activities (current and future changes) associated with the Project and associated activities that occur on the tenements under the management of the Tropicana General Manager such as Exploration activities occurring within the Mining Lease.

It is the intension that all future proposal or significant changes to the Project are implemented in accordance with the requirements of this strategy.

This strategy does not however cover regional exploration activities (occurring outside TGM managed land) which are managed via the ISO14001 certified AngloGold Ashanti Australia Exploration Integrated Management System.

This document will be audited annually as required by the Compliance Assessment Plan (CAP) and will undergo a management review tri-annually.

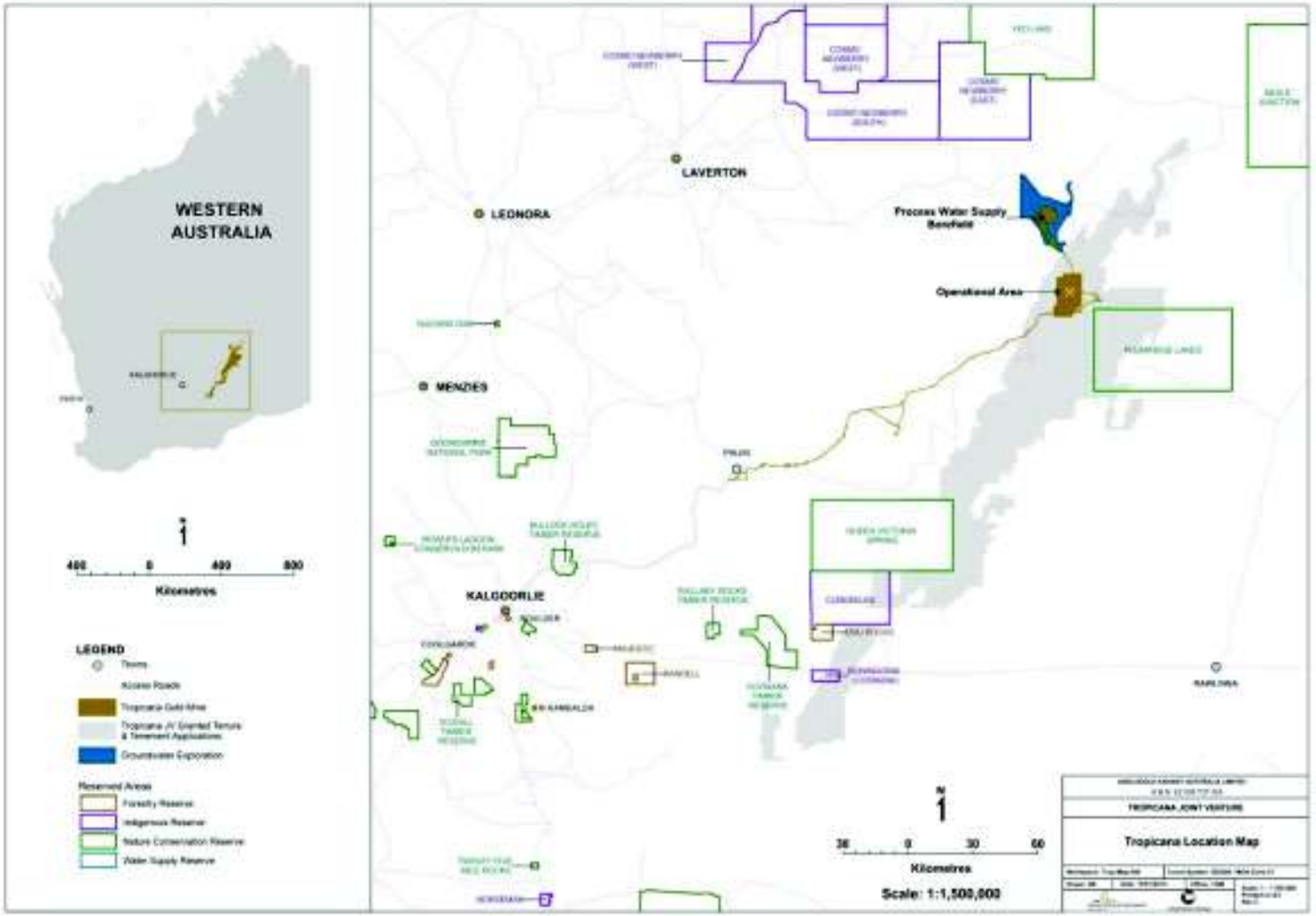

Figure 2 Tropicana Gold Project - General Locations

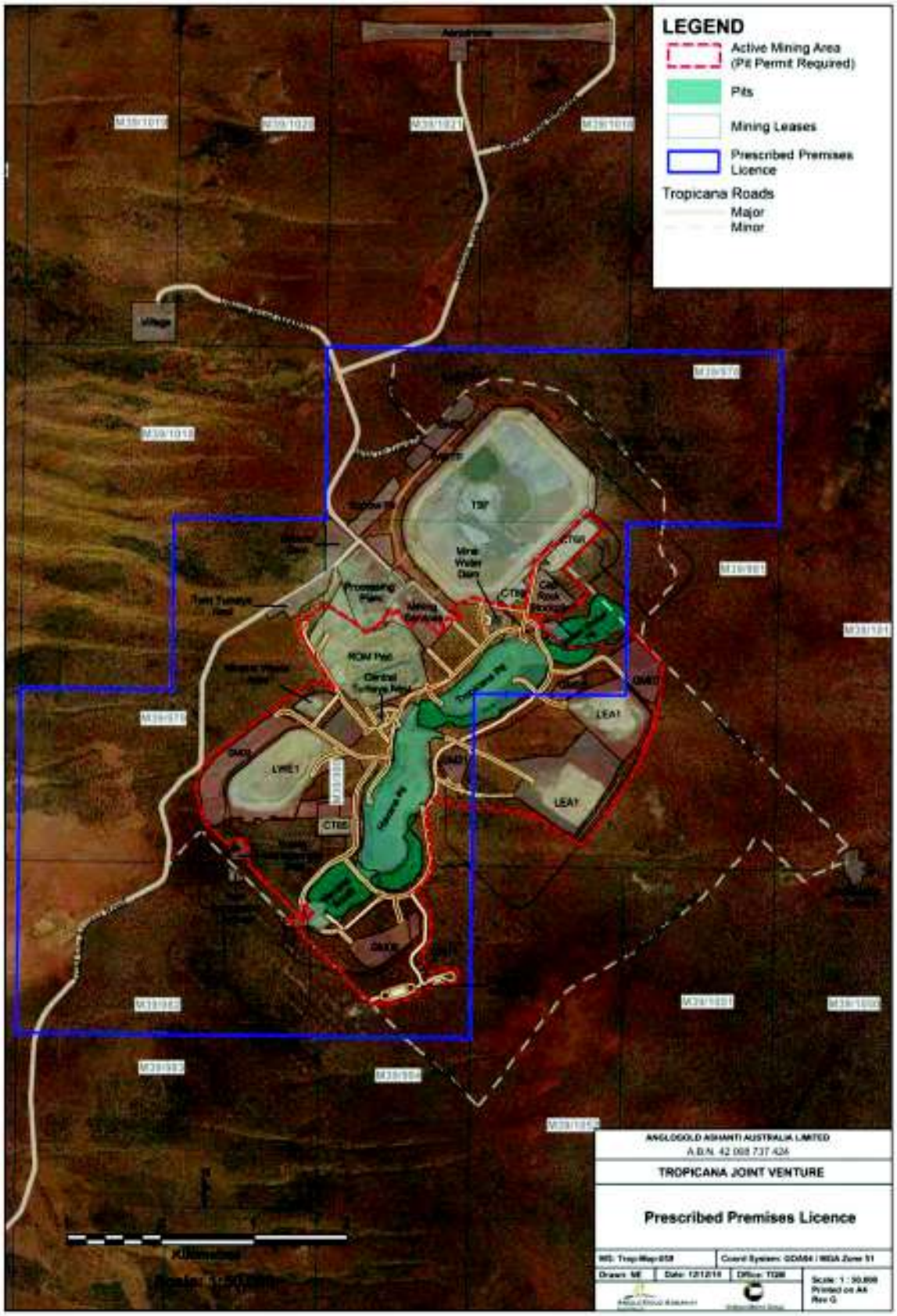

Figure 3 Tropicana Resource Footprint – Operational Area (Oct, 2014)

4 BACKGROUND

The Joint Venture (TJV) has commissioned flora, vegetation, fauna and fauna habitat surveys and desktop assessments covering all proposed disturbance areas of the Project in order to establish the presence and distribution of threatened species and communities, and likely impacts. A list of the surveys completed to date is provided in Table 1.

In addition, consultation has been undertaken with members of the DPaW Science Division, the Western Australia Museum and other relevant experts and institutions to confirm the adequacy of the investigations. All threatened species and communities (as defined broadly above) deemed to potentially occur in the Project footprint, are discussed within this management strategy.

Table 1 Biological Surveys for Conservation Significant Flora, Vegetation, Fauna and Fauna Habitat

Title of the Report	Consultant	Date of Report	Survey Target
Threatened Species			
Threatened Species Assessment for the Tropicana Gold Project Area	MBS Environmental	September 2009	Consolidation of survey data from multiple surveys and consultants, and analysis of potential impacts.
Flora and Vegetation			
Minigwal Borefields (PWS) Level 1 Flora & Vegetation Survey	Botanica Consulting.	November 2014	Vegetation and flora of the Minigwal Borefield update.
Minigwal Trough and Pipeline Corridor Flora and Vegetation Survey	Botanica Consulting.	September 2009	Vegetation and flora of the Minigwal borefield.
A Molecular Assessment of the Identity of regenerating Mallees on the Tropicana Mine Access road, in relation to DRF *Eucalyptus articulata*	BGPA Science	November 2009	*Eucalyptus articulata* assessment of the Tropicana mine access road.
Tropicana Project - Proposed Operational Area Threatened Flora Survey	*ecologia* Environment	July 2009	Flora survey of the Project Area.
Flora and Vegetation Survey of Proposed Pinjin Infrastructure Corridor	Mattiske Consulting	July 2009	Flora survey of the Pinjin Infrastructure Corridor.
Assessment of the Flora and Vegetation of the Proposed Tropicana Project.	*ecologia* Environment	July 2009	Baseline flora and vegetation survey of Tropicana study area.
Tropicana-Transline Infrastructure Corridor: Flora and Vegetation Survey.	*ecologia* Environment	July2009	Level 1 flora and vegetation survey of the Cable Haul Road.
Terrestrial Vertebrate Fauna			
Minigwal Trough Borefield (PWS) and Pipeline Fauna SUrvye	Kingfisher Environmental Consulting	November 2014	Level 1 Fauna survey PWS borefeild.
Second round Sandhill Dunnart surveys of the proposed operational area and infrastructure corridor	GHD	February 2010	Supplementary Sandhill Dunnart Survey.
Assessment of habitat availability for the Sandhill Dunnart. *Sminthopsis psammophila* in Western Australia.	Churchill	December 2009	Assessment of habitat availability for the Sandhill Dunnart.
A Level One Survey of Vertebrate Fauna for the proposed Tropicana - Pinjin Infrastructure Corridor.	Ninox Wildlife Consulting	June 2009	Fauna Survey of the Infrastructure Corridor (level 1).
Tropicana-Transline Infrastructure Corridor Level 1 Fauna Survey.	*ecologia* Environment	July 2009	Fauna Survey of the Cable Infrastructure Corridor

Title of the Report	Consultant	Date of Report	Survey Target
Malleefowl and Mulgara Survey TGP Operational Area	URS	June 2009	Fauna Survey of the Operational Area
Sandhill Dunnart Survey of the Proposed Operational Area, Access Road and Public Bypass.	Gaikhorst and Lambert	July 2009	Sandhill Dunnart assessment of the Project Area, Pinjin Infrastructure Corridor and Public Bypass.
Marsupial Mole Survey: Proposed Pinjin Infrastructure Corridor, TGP	URS	July 2009	Fauna Survey of the Pinjin Access Road.
Tropicana Gold Project Operational Area Vertebrate Fauna Assessment.	*ecologia* Environment	July 2009	Vertebrate fauna of the Operational Area (level 2 survey).
Tropicana Gold Project Minigwal Trough Water Supply Area and Pipeline Corridor.	*ecologia* Environment	July 2009	Fauna Survey of the Water Supply Area.
Survey of the underground signs of marsupial mole in the WA Great Victoria Desert.	Benshemesh and Schulz	July 2008	Marsupial mole activity within the Great Victoria Desert.
Terrestrial Invertebrates			
TGP Short Range Endemic Invertebrate Survey	*ecologia* Environment	July 2009	Short Range Endemic survey of the Operational Area
TGP Operational Area SRE - Targeted Mygalomorph Survey and Genetics Addenda	*ecologia* Environment	July 2009	Targeted Mygalomorph Survey and Genetics
Subterranean Fauna			
TGP Troglofauna Survey Phases 6 and 7	*ecologia* Environment	March 2010	Troglofauna of the Project Footprint
TGP Stygofauna Survey Operational Area	*ecologia* Environment	July 2009	Stygofauna of the Operational Area
Minigwal Trough Water supply area pipeline corridor	*Subterranean Ecology*	June 2009	Stygofauna desktop and pilot study of the water supply area
TGP Operational Area Troglofauna	*ecologia* Environment	July 2009	Troglofauna of the Project Footprint

5 LEGAL REQUIREMENTS AND OTHER CONSIDERATIONS

There are several acts, regulations and other requirements that should be considered in the protection of environmental assets such as threatened fauna, flora and communities. The most significant documents are summarised below.

5.1 LEGISLATION

Wildlife Conservation Act 1950 (WA)

The *Wildlife Conservation Act 1950* (WC Act) was developed to provide for the conservation and protection of wildlife in Western Australia. Under Section 14 of the Act, all native fauna and flora within Western Australia are protected. However, the Minister may, via a notice published in the Government Gazette, declare a list of taxa that are in need of special protection. The current listing was gazetted on 5 August 2008 (Government of Western Australia 2008).

Under the WC Act flora listed as Declared Rare Flora (DRF) are afforded specific protection as threatened species. The WC Act allows for the special protection of rare and threatened native fauna species. Currently in Western Australia, rare or threatened fauna species are defined under the WC Act according to the following schedules:

- Schedule 1: A native species that is rare or likely to become extinct, is declared to be fauna that is in need of special protection;
- Schedule 2: A native species that is presumed to be extinct, is declared to be fauna that is in need of special protection;
- Schedule 3: Birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is in need of special protection; and,
- Schedule 4: A native species that is in need of special protection, otherwise than for the reasons specified in Schedules 1, 2 and 3.

Ecological communities in Western Australia are also ranked by DPaW and can be listed as 'Threatened Ecological Communities' once they have been defined by the Western Australian Threatened Ecological Communities Scientific Advisory Committee and are then endorsed by the Minister for Environment. Threatened Ecological Communities are listed under four categories; Presumed Totally Destroyed, Critically Endangered, Endangered or Vulnerable (Department of Environment and Conservation 2008d).Environmental Protection and Biodiversity Conservation Act 1950 (Commonwealth).

At the Federal level, the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is relevant to the Project because the Act:

- protects the environment, particularly matters of 'national environmental significance' (NES) which include threatened species, such as the Southern Marsupial Mole and Crested-tailed Mulgara, and Threatened ecological communities; and,
- ensures Australia's environmental compliance with international treaties that Australia is party to e.g. Japan and Australia Migratory Bird Agreement, China and Australia Migratory Bird Agreement and Republic of Korea and Australia Migratory Bird Agreement.

5.2 Other Requirements and Considerations

Department of Parks and Wildlife Priority List

If a species does not meet the criteria for listing as Threatened Fauna or Declared Rare Flora under the WC Act (e.g. due to lack of information) and is poorly known and/or conservation dependent, it may be classified as a Priority Species at the discretion of the DPaW. Priority Fauna are placed into one of five categories and Priority Flora are placed into one of four categories (see Appendices 1 and 2). The DPaW also recognises Priority Ecological Communities (PECs) for which there is insufficient knowledge to warrant Threatened Ecological Community status, but for which there is some conservation concern. Priority species are not provided any extra legislative protection over other native species in Western Australia. The listing of a species or a community as a Priority indicates that activities that may impact them are in need of special consideration.

International Union for Conservation of Nature – Red List of Threatened Species

The International Union for Conservation of Nature Red List of Threatened Species provides taxonomic, conservation status and distributional information for taxa that have been globally evaluated using the Red List Categories and Criteria (http://www.iucnredlist.org/ Accessed 21/03/2014). This system is designed to determine the relative risk of extinction. The main purpose of the Red List is to catalogue and highlight those taxa that are facing a higher risk of global extinction (i.e. those listed as Critically Endangered, Endangered and Vulnerable). The Red List also includes information on taxa that are categorised as Extinct or Extinct in the Wild; on taxa that cannot be evaluated because of insufficient information (i.e. are Data Deficient); and on taxa that are either close to meeting the threatened

thresholds or that would be threatened were it not for an ongoing taxon-specific conservation programme (i.e. are Near Threatened).

EPA Position Statement 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection

The Environmental Protection Authority (EPA) regards biological diversity as a key environmental factor and has an objective to ensure that biodiversity is protected. Position Statement 3 discusses the principles which the EPA will use when assessing proposals which may impact on biodiversity values.

International Council on Mining and Metals Sustainable Development Principle

The International Council on Mining & Metals (ICMM) is an industry group that addresses key priorities and emerging issues within the sector. The ICMM has implemented 10 principles to measure their performance relating to sustainable development in the mining and minerals. Of importance:

Principle 7: Contribute to conservation of biodiversity and integrated approaches to land use planning:

- respect legally designated protected areas;
- disseminate scientific data on and promote practices and experiences in biodiversity assessment and management; and,
- support the development and implementation of scientifically sound, inclusive and transparent procedures for integrated approaches to land use planning, biodiversity, conservation and mining.

Other Considerations

Other species that are new to science, or previously undescribed, or at the periphery of their known distribution, or have been identified as a range extension during the Joint Venture's surveys have been taken into consideration.

Consultation with the DPaW Science Division, the Western Australian Museum and other experts was also undertaken to confirm that all relevant species were considered in the surveys and in this TS&CMP.

6 REGIONAL SETTLING

The main disturbance area of the Project is the Operational Area, located within the Great Victoria Desert, as defined by the Interim Biogeographic Regionalisation of Australia (IBRA version 7). IBRA divides the Australian continent into 89 bioregions and 419 sub-regions for assessing the status of native ecosystems, their protection in the national reserve system and for use in the monitoring and evaluation framework in the Australian Government's current Natural Resource Management initiatives (Department of the Environment 2014).

The regional setting of the Project is:

- the Operational Area and the Minigwal Trough Water Supply Area are located in the southwest corner of the Great Victoria Desert (GVD) IBRA bioregion;
- the Pinjin Infrastructure Corridor spans the Murchison and GVD bioregions; and,
- the Cable Haul Infrastructure Corridor spans the Nullarbor and GVD bioregions.

7 FLORA OF CONSERVATION CONCERN

A number of threatened flora species protected under State and Federal legislation, or otherwise of conservation concern to the Joint Venture have the potential to occur in and around the disturbance areas of the Project. Searches of the DPaW Declared Rare and Priority Flora Database, the Western Australia Herbarium database, the EPBC Protected Matters database, various reference books and consultation with experts were undertaken to identify species of conservation concern potentially occurring in and around the Project footprint. A number of taxa identified in the original PER have changed status or are no longer listed. A summary of these changes is provided in Table 2

Several field surveys were carried out across the Project footprint; these surveys ranged from Level 1 and Level 2 surveys (EPA 2004a) to targeted surveys for threatened species (Table 1). A summary of the current flora species of conservation concern to the Project including the results of surveys undertaken by specialist consultants is provided in Table 3.This list is accurate at the time of writing, however further survey and taxonomic work may alter the list in the future.

Table 2 Changes in conservation status

Species	Previous Status	Current Status
Conospermum toddii	DRF/EN	P4
Calandrinia porifera	P3	Delisted
Baeckea sp. Great Victoria Desert (A.S. Weston 14813)	P2	Delisted
Dicrastylis nicholasii	P2	Delisted
Diocirea ternata	P3	Delisted
Micromyrtus stenocalyx	P3	Delisted
Daviesia purpurascens	P4	Delisted
Lepidobolus deserti	P4	Delisted
Microcorys macredieana	P3	Delisted
Baeckea sp. Sandstone	P1	P3
Dicrastylis cundeeleensis	P3	P4
Grevillea secunda	P2	P4
Lechenaultia divaricata	Unlisted	P1
Olearia arida	P2	P4
Hibbertia crispula	Unlisted	P2, VU
Caesia talingka (*Caesia talinyka* ms)	Unlisted	P2

(DRF = Declared Rare Flora, EN = Endangered, VU = Vulnerable, P=Priority) (Conservation definitions Appendix 1, Detailed Species Definitions Appendix 3).

Table 3 Threatened Flora Potentially Occurring In and Around the Project Footprint

(DRF = Declared Rare Flora, EN = Endangered, VU = Vulnerable, P=Priority) (Conservation definitions Appendix 1, Detailed Species Definitions Appendix 3).

Species	Recorded:				Listed Under:			Preferred Substrate
	Operational Area	Pinjin Corridor	Cable Haul Corridor	Water Supply Area	WA Status	Federal Status	IUCN Status	
Acacia eremophila numerous nerved variant	✓	-	-	-	P3	-	-	Sandy soils and flats.
Acacia eremophila var. *variabilis*	✓	-	-	-	P3	-	-	Sandy or sandy loam.
Baeckea sp. Sandstone	✓	-	-	-	P3	-	-	Orange sand and flats.
Caesia talingka	✓	-	✓	-	P2	-	-	Unknown.
Comesperma viscidulum	-	✓	✓	-	P4	-	-	Sandstone breakaway, red gritty sand, dune crest, swale, and rocky slopes.
Conospermum toddii	✓	✓	-	-	P4	-	-	Crests of sand dunes and in interdunal swales between the sand dunes.
Dampiera eriantha	✓	-	✓	-	P1	-	-	Unknown.
Dicrastylis cundeeleensis	-	✓	✓	✓	P4	-	-	Yellow sand, red or reddish-yellow sand. *D. cundeeleensis* is often found on sandplains.
Eremophila perglandulosa	-	-	-	-	P1	-	-	Sandy soils and flats.
Eucalyptus articulata	-	-	-	-	DRF	VU	-	Red sand, sandy loam, arkose rubble. *E. articulata* is likely to be found on sand dunes.
Eucalyptus pimpiniana	-	✓	✓	-	P3	-	-	Red sand, sand dunes and plains.
Grevillea secunda	✓	✓	✓	-	P4	-	-	Yellow or red sand, sand dunes and sand plains.

Species	Recorded: Operational Area	Pinjin Corridor	Cable Haul Corridor	Water Supply Area	Listed Under: WA Status	Federal Status	IUCN Status	Preferred Substrate
Hibbertia crispula	-	✓	-	-	P2	VU	-	Unknown.
Isotropis canescens	-	-	✓	-	P2	-	-	Yellow clayey sand and sandplains.
Labichea deserticola	-	-	-	-	P1	-	-	Sandstone ridges.
Lechenaultia divaricata					P1	-	-	Dry red sand on flats.
Malleostemon sp. Officer Basin	✓	-	✓	-	P2	-	-	Yellow sand and dune slopes.
Melaleuca nanophylla	-	-	-	-	P3	-	-	Often found on ridges.
Micromyrtus serrulata	-	✓	-	-	P3	-	-	Brownish sandy and clayey soils over granite.
Minuria ?tridens	✓+	-	-	-	P1	-	-	Unknown, during surveys it was observed on roadsides.
Olearia arida	✓	✓	✓	✓	P4	-	-	Red or yellow sand and undulating low rises.
Physopsis chrysotricha	-	-	✓	-	P2	-	-	Red sand over calcrete.
Thryptomene eremaea	-	✓	-	-	P2	-	-	Red or yellow sand and sandplains.
Thryptomene wittweri	-	-	-	-	DRF	VU	-	Skeletal red stony soils. *T. wittweri* occurs on breakaways and stony creek beds.
Thysanotus baueri	-	-	-	-	P1	-	-	Calcareous loam, sand, and clay.
Trachymene pyrophila	-	-	-	-	P2	-	-	Yellow or orange sand. *T. pyrophila* is often found on sandplains; germinating after fire or other disturbances.

+ - requires flowering specimens to confirm identification.

8 FAUNA OF CONSERVATION CONCERN

Desktop searches of available literature, the DPaW Threatened and Priority Species Database, the EPBC Protected Matters Database and consultation with various experts identified 28 current conservation significant fauna species potentially present in and around the Project disturbance area (including some species presumed to be extinct in the local area). Table 1 summarises the desktop searches and the field surveys undertaken to date with regards to vertebrate fauna protected under State or Federal legislation, or otherwise considered to be of conservation interest to the Joint Venture. Field surveys recorded evidence of six of these species in the Project footprint (Table 5). This total does not include a species of Stick-nest Rat (*Leporillus* sp. – presumed locally extinct) which formerly occurred in the area, based on the presence of old, abandoned nests in breakaways.

This list is accurate at the time of writing, however, further survey and taxonomic work may alter the list in the future (e.g. the taxonomy and range of *Dasycercus* sp. is currently uncertain). A number of species identified in the original PER have changed status or are no longer listed. A summary of these changes is provided in Table 4

The breeding season for the conservation significant fauna species has been identified to assist in minimising the potential disruption and disturbance to these species from the construction and operation of the Project (Table 6). Where possible, activities that are potentially detrimental to a species breeding should be scheduled to avoid critical breeding periods and/or preferred habitat.

Table 4 Changes in conservation status

Species	Previous Status	Current Status
Grey Falcon - *Falco hypoleucos*	P4	S1
Night Parrot - *Pezoporus occidentalis*	VU	EN
Slender-billed Thornbill (western) - *Acanthiza iredalei iredalei*	S1/VU	Delisted
Woma Python - *Aspidites ramsayi*	P1	S4
*South-Western Carpet Python – *Morelia spilota imbricata*	S4	S4

*only recently identified as potentially occurring

Table 5 Threatened Fauna Potentially Occurring In and Around the Project Footprint

Species	Recorded: Operational Area	Pinjin Corridor	Cable Haul Corridor	Water Supply Area	Listed Under: WA Status	Federal Status	IUCN Status	Habitat Notes:
Mammals								
Bilby - *Macrotis lagotis*	-	-	-	-	S1	VU	VU	Extant populations occupy three major vegetation types; open tussock grassland on uplands and hills, Mulga woodland/shrubland growing on ridges and rises, and hummock grassland in plains and alluvial areas.
Central Long-eared Bat - *Nyctophilus* sp. (previously *N. timoriensis)*	-	-	-	-	P4	-	-	Often found in heavy Eucalypt woodlands and tall woodlands of the Coolgardie IBRA region with a tall shrub understorey of *Melaleuca lanceolata*, *M. pauperiflora*, *M. quadrifaria*, and *Eremophila* sp., *N. timoriensis* is less common in open woodlands.
*Chuditch - *Dasyurus geoffroyii*	-	-	-	-	S1	VU	NT	Inhabit most kinds of wooded habitat within its current range including Eucalypt forest (especially Jarrah, *Eucalyptus marginata*), dry woodland and Mallee shrublands.
Greater Stick-nest Rat - *Leporillus conditor* (locally extinct)	✓	-	-	-	S1	VU	VU	Inhabits perennial shrublands, especially of succulent and semi-succulent plant species.
Mulgara - Crested-tailed *Dasycercus cristicauda*	-	-	-	-	S1	VU	LC	The main vegetation in inhabited areas, specifically *Triodia basedowii*, provides refuge from the heat and cover for the entrance to their burrows. Mulgara live in burrows which they dig on the flats between low sand-dunes or on the lower edges of dunes. *D. cristicauda* is assumed extinct in WA.
Mulgara - Brush-tailed *Dasycercus blythi*	-	-	-	-	P4	-	LC	As above. This is the more likely Mulgara to be present in the Project footprint – *D. cristicauda* is assumed extinct in WA.
*Numbat - Walpurti *Myrmecobius fasciatus*	-	-	-	-	S1	VU	EN	The remaining populations of the Numbat are found in Eucalypt forests and woodlands dominated by *E. marginata, E. calophylla* and *E. wandoo.* Numbats nest in hollow logs or in burrows.

Species	Recorded: Operational Area	Pinjin Corridor	Cable Haul Corridor	Water Supply Area	Listed Under: WA Status	Federal Status	IUCN Status	Habitat Notes:
Sandhill Dunnart - *Sminthopsis psammophila*	-	-	-	-	S1	EN	EN	Sandhill Dunnarts prefer sandy soils, typically low parallel sand dune habitat with a diverse understorey and a ground cover of Spinifex (*Triodia*). Spinifex size is variable in preferred habitat; dunnarts show a preference for large hummocks approximately 40 cm high and 70 - 100 cm diameter as nest sites. Other vegetation in preferred habitats varies but is most commonly Mallee or Marble Gum (*Eucalyptus gongylocarpa*), often with *Callitris verrucosa* and a complex shrub understorey.
[1]Southern Marsupial Mole - *Notoryctes typhlops*	✓	-	✓	✓	S1	EN	DD	SMM inhabits Spinifex dominated sand dune and sand plain country. The sand in these regions tends to be loose and free of gravels. The SMM appears to have a preference for substrate with compactness at the level of <10 drops per 150 mm to a depth of at least 450 mm when measured using a penetrometer.
Birds								
[2]Australian Bustard -*Ardeotis australis*	✓	✓	✓	✓	P4	-	LC	Australian Bustards are found in tussock grassland, *Triodia* hummock grassland, grassy woodland, low shrublands. They will also use denser vegetation when recent burning has temporarily opened up these areas.
Crested Bellbird - *Oreoica gutturalis*	-	✓	-	-	P4	-	LC	The species occurs from semi-arid coastlines to the arid Australia interior.
Grey Falcon - *Falco hypoleucos*	-	-	-	-	S1	-	VU	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. They also occur near wetlands where the surface water attracts the prey.
Major Mitchell's Cockatoo - *Cacatua leadbeateri*	-	-	-	-	S4	-	LC	Inhabits a wide variety of semi-arid and arid inland habitats, provided there is fresh surface water and large hollow trees for nesting. It has been recorded in forest, woodland and shrubland, including Mulga, Mallee, *Acacia*, and *Callitris* associations.

Species	Recorded: Operational Area	Pinjin Corridor	Cable Haul Corridor	Water Supply Area	Listed Under: WA Status	Federal Status	IUCN Status	Habitat Notes:
[3]Malleefowl - *Leipoa ocellata*	✓	✓	✓	✓	S1	VU	VU	Found principally in semi- arid to arid shrublands, low woodlands dominated by mallee and associated habitats such as Broombush (*Melaleuca uncinata*). In the GVD, Malleefowl appear to prefer the smaller desert-mulga *Acacia minyura*. Studies have shown that the birds use vegetation adjacent sand plain areas for foraging where food resources are more common. The birds also occur in denser Mallee (*E. socialis, E. oxymitra*, and *E. gammophylla*). Typically, these Mallee areas have an understorey of *Triodia basedowii* or other *Triodia* species, and shrub thickets on the ridges where *Acacia ligulata* and other seed bearing shrubs are often common.
Naretha Blue Bonnet - *Northiella haematogaster narethae*	-	-	-	-	S4	-	LC	Usually found in or within sight of Casuarina and Acacia woodland, and usually near shrubland. They are often found far from water. The Naretha Blue Bonnet moves seasonally with the rains.
Night Parrot - *Pezoporus occidentalis*	-	-	-	-	S1	EN	EN	Most records for this species come from hummock grasslands with Spinifex (*Triodia spp*.) or from areas dominated by samphire. They have also been reported in low chenopod shrub lands with Saltbush and Bluebush, and from areas of Mitchell Grass (*Astrebla* spp.) with scattered Chenopods. Many records have come from waterholes, and interestingly, almost all reports from areas of *Triodia* have noted the presence of water nearby.
Peregrine Falcon - *Falco peregrinus*	✓	-	-	-	S4	-	LC	The species prefers habitat with rocky ledges, cliffs, watercourses, open woodland or margins with cleared land.
Striated Grass wren - *Amytornis striatus striatus*	-	-	-	-	P4	-	-	This subspecies of Striated Grasswren inhabits Spinifex on sandhills and rocky hillslopes and may occur in the survey area. The species' presence is strongly correlated with vegetation communities that support hummock grassland (*Triodia* sp.).
Thick-billed Grass-wren (western sp) - *Amytornis textilis textilis*	-	-	-	-	P4	-	-	The Thick-billed Grasswren was found in areas of 'thick bush' or 'thickets', dense Saltbush, in 'marlock' or low Mallee scrub and in 'large clumps of bushes which had extremely dense masses of foliage.

Species	Recorded: Operational Area	Pinjin Corridor	Cable Haul Corridor	Water Supply Area	Listed Under: WA Status	Federal Status	IUCN Status	Habitat Notes:
Princess Parrot Alexandra's Parrot- *Polytelis alexandrae*	-	-	-	-	S1	VU	NT	The Princess Parrot usually occupies swales between sand dunes and is occasionally seen on slopes and crests of dunes. This habitat consists mostly of shrubs such as *Eremophila, Grevillea*, and *Hakea* and scattered trees. Some records are from riverine forest, woodland and shrubland. Breeding takes place in hollows in large Eucalypts, particularly River Red Gums *E. camaldulensis*, and also in Desert Oaks *Allocasuarina decaisneana*.
Cattle Egret *Ardea ibis*	-	-	-	-	-	MI	LC	Stock paddocks, pastures, croplands, garbage tips, wetlands, tidal mudflats and drains.
Common Greenshank - *Tringa nebularia*	-	✓	-	-	-	MI	LC	The Common Greenshank is typical of well-watered regions; casual or vagrant on west-coast islands and in the arid east.
Fork-tailed Swift - *Apus pacificus*	✓	-	-	-	-	MI	LC	Aerial: over open country, from semi-deserts to coasts, islands; sometimes over forests, cities.
Great Egret, White Egret - *Ardea alba*	-	-	-	-	-	MI	-	Shallows of rivers, estuaries, tidal mudflats, freshwater wetlands, sewage ponds, irrigation areas, larger dams etc.
Oriental Plover, Oriental Dotterel - *Charadrius veredus*	-	-	-	-	-	MI	LC	Open plains, bare, rolling country, often far from water, ploughed land; muddy or sandy wastes near inland swamps or tidal mudflats; bare claypans; margins of coastal marshes; grassy airfields, sportsfields, lawns.
Rainbow Bee-eater - *Merops ornatus*	✓	✓	-	-	-	MI	LC	Open woodlands with sandy, loamy soils; sandridges, sandpits, riverbanks, road-cuttings, beaches, dunes, cliffs, mangroves, rainforest, woodlands.
Wood Sandpiper - *Tringa*	-	✓	-	-	-	MI	LC	The Wood Sandpiper is typical of well-watered regions, particularly coastal

Species	Recorded: Operational Area	Pinjin Corridor	Cable Haul Corridor	Water Supply Area	Listed Under: WA Status	Federal Status	IUCN Status	Habitat Notes:
glareola								plains and plains about lower courses of larger rivers.
Reptiles								
South-Western Carpet Python – *Morelia spilota imbricata*	-	-	-	-	S4	-	-	Habitat is varied and includes dense forests, sparse woodlands, and in vegetated rocky areas.
Great Desert Skink - *Liopholis kintorei* (*Egernia kintorei*)	-	-	-	-	S1	VU	VU	The species generally occurs on red sand plains and sand ridges and they generally prefer spinifex (*Triodia* species and *Plectrachne* species), grassland sand plains and some adjacent dune field swales. Regenerating vegetation appears to be a critical habitat requirement. Skinks appear to prefer a mosaic landscape of different aged vegetation and inhabit sites that have been burnt in the previous 3-15 years. Preferred habitat has at least 50% bare ground.
Southern Desert *Lerista* - *Lerista puncticauda*	-	-	-	-	P2	-	-	The Southern Desert Lerista prefers arid shrub-lands; sandridges vegetated with Marble Gums and *Triodia basedowii*.
Woma Python - *Aspidites ramsayi*	✓	-	-	-	S4	-	EN	The Woma Python is generally found in sandy arid habitats including desert sand hills and dunes as well in a variety of other subtropical, temperate, arid and semi-arid regions. Generally Woma Pythons are strongly associated with red desert and Spinifex.

*Due to specific habitat requirements it is unlikely these species occur in the Project footprint.

1 Some evidence of mole activity was also found in the flat red plains that occur across much of the Minigwal Water Supply Area and the Cable Haul Infrastructure Corridor Survey Area.

2 Tracks were found in an area of long unburnt Eucalypt woodland with a Spinifex understorey.

3 Inactive nesting mounds were located in dense Mulga woodland in the Minigwal Water Supply Area and along the proposed Cable Haul Infrastructure Corridor Road.

Table 6 Calendar of the Breeding/Nesting Season of Fauna Species Potentially Occurring in the Project Footprint

Species	Species Name	Jan Feb Mar Apr May June July Aug Sept Oct Nov Dec
Bilby	*Macrotis lagotis*	Throughout the year – rain dependent
Central Long-eared Bat	*Nyctophilus* sp.	Unknown
Chuditch	*Dasyurus geoffroyii*	
Greater Stick-nest Rat	*Leporillus conditor*	Peak Breeding time
Mulgara – Crested-tailed	*Dasycercus cristicauda*	Winter months
Mulgara - Brush-tailed	*Dasycercus blythi*	Winter months
Numbat, Walpurti	*Myrmecobius fasciatus*	
Sandhill Dunnart	*Sminthopsis psammophila*	Spring and early summer
Southern Marsupial Mole	*Notoryctes typhlops*	Unknown
Australian Bustard	*Ardeotis australis*	
Common Greenshank	*Tringa nebularia*	Breeds abroad
Crested Bellbird	*Oreoica gutturalis*	
Grey Falcon	*Falco hypoleucos*	
Major Mitchell's Cockatoo	*Cacatua leadbeateri*	
Malleefowl	*Leipoa ocellata*	
Naretha Blue Bonnet	*Northiella haematogaster narethae*	And after rain

Species	Species Name	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Night Parrot	*Pezoporus occidentalis*							And after rain					
Peregrine Falcon	*Falco peregrinus*												
Striated Grass wren	*Amytornis striatus striatus*												
Princess Parrot, Alexandra's Parrot	*Polytelis alexandrae*									And after rain			
Cattle Egret	*Ardea ibis*												
Fork-tailed Swift	*Apus pacificus*	Breeds abroad											
Great Egret, White Egret	*Ardea pacificus*	Unknown											
Oriental Plover, Oriental Dotterel	*Charadrius veredus*	Breeds abroad											
Wood Sandpiper	*Tringa glareola*	Breeds abroad											
Rainbow Bee-eater	*Merops ornatus*												
Great Desert Skink	*Liopholis kintorei*												
Southern Desert Lerista	*Lerista puncticauda*	Unknown											
Woma Python	*Aspidites ramsayi*												
South-Western Carpet Python	*Morelia spilota imbricata*												
	Normal Breeding times												
	Peak times outside of normal												
	Breeds abroad												
	Unknown												
	No breeding activity expected												

9 PUTATIVE SHORT RANGE ENDEMICS

Some invertebrates, known broadly as Short Range Endemic species, are particularly sensitive to habitat alteration and are an increasingly important consideration as part of the Environmental Impact Assessment process. Short Range Endemics have been broadly defined as species with a natural range of less than 10,000 km^2 (Harvey 2002), and many species have a natural range that is considerably less, sometimes from a single locality (New and Sands 2002).

Surveys conducted in the Operational Area revealed 17 morphologically defined species considered to be putative Short Range Endemic species. Of the 17 species of conservation interest, one (*Kwonkan* sp. 2) has only been located within the proposed operational footprint. Up until recently, the operational footprint of the waste material landform was also expected to disturb the only known sampling location of *Aganippe* sp. 4. The Joint Venture has re-designed the footprint of one of the waste landforms and the sampling location of *Aganippe* sp. 4 is now approximately 800 m from the waste landform footprint. None of the species are currently listed (under State or Federal legislation, or under the DPaW Priority scheme) as protected species and their conservation significance results from the fact that all are new to science and/ or belong to genera composed predominantly of Short Range Endemic species.

10 SUBTERRANEAN FAUNA

Western Australian Stygofauna and Troglofauna exhibit high levels of endemism and many of these species appear to have restricted ranges, making them particularly important in the Environmental Impact Assessment process (EPA 2003). There is a significant lack of information on Stygofauna and Troglofauna within the GVD, and prior to the Joint Venture's activities there were no known data for the area surrounding the project.

No Stygofauna have been recorded in the surveys during any of the survey undertaken during the Project baseline survey process.

The survey conducted both inside and outside the proposed Operational Area recorded three Troglobitic species:

- Isopod (slater);
- Diplura (dipluran); and,
- Chilopoda (centipede).

The Isopod has been located both within and outside of the footprint. Currently, the dipluran and centipede have only been located inside the disturbance footprint. Further work has been undertaken to demonstrate that the presumed habitat of the dipluran and centipede occur more widely.

11 ECOLOGICAL COMMUNITIES

Extensive surveys have been undertaken (Table 1) to determine the presence of Threatened Ecological Communities (TECs) and Priority Ecological Communities (PECs) in the Project footprint. Despite extensive and detailed survey and vegetation mapping, no TECs have been identified.

The importance of a community referred to as the 'Yellow sandplain communities of the Great Victorian Desert' has been noted since 1994 (Pearson 1994). The community contains a diverse array of flora and fauna including the Sandhill Dunnart. The community is characterised by highly diverse mammalian and reptile fauna and distinctive plant communities (Barton and Cowan 2001). The DPaW has nominated the 'Yellow sandplain communities of the Great Victorian Desert' as a Priority 3 (ii) ecological community. At the present time, no definitive description of the boundary of this community has been

determined by DPaW. The Operational Area is clearly outside the PEC, however the Joint Venture considers that the peripheral areas of the PEC may be intersected by the both Infrastructure Corridors, thus management of the proposed corridors to minimise impacts on flora, vegetation and fauna values will be important in maintaining biodiversity values of the PEC.

12 RISK ASSESSMENT

A risk assessment process has been undertaken for the proposed Project, prior to commencing the formal environmental assessment process. The risk assessment process will be ongoing through the life of the Project, and has been based on principles and methodology outlined in HB 203:2006 – Environmental Risk Management – Principles and Processes and AS/NZS 4360:2004 – Risk Management. The primary aim has been to identify potential environmental consequences (specific to the item being considered, in this case threatened flora and fauna; Table 7) to all activities, the likelihood of occurrence (Table 8) and to assign an appropriate response to reduce environmental risk.

Table 7 Consequence Table for Assessing Impacts on Threatened Species or Communities

Consequence	Example
Insignificant	• The Joint Venture considers that there is no 'insignificant' impact to a threatened species precisely because they are threatened.
Minor	• Temporary alteration to behavior of individuals of a conservation significant species e.g. short term avoidance of a component of pre-disturbance range.
	• Temporary alteration to population dynamics (resolved within one breeding cycle) e.g. reduction in recruitment for one breeding season.
	• Temporary reduction of connectivity or habitat values for threatened species e.g. connectivity is restored (with or without human intervention) within one breeding cycle of the species of interest.
Moderate	• Short term loss of a small number (<5%) of individuals of a threatened species.
	• Alteration to population dynamics of a threatened species that is resolved during the operational phase of the Project (with or without human intervention).
	• Permanent loss of <5% of suitable habitat (relative to the area of suitable habitat pre-disturbance).
Major	• Loss of <25% of individuals of a threatened species in the area.
	• Long term alteration to population dynamics e.g. population dynamics do not return to pre-disturbance levels until the closure phase of the Project.
	• Long term loss of habitat e.g. habitat remains unviable until the closure phase of the Project.
	• Permanent loss of <25% of suitable habitat (relative to the area of suitable habitat pre-disturbance).
Catastrophic	• Loss of a local population of a threatened species from the region.
	• Extinction of a threatened species.
	• Permanent loss of >25% of suitable habitat (relative to the area of suitable habitat pre-disturbance).

Table 8 Risk Assessment Table

			Likelihood				
			A	B	C	D	E
			Almost certain (occurs in all circumstances/ planned event)	Likely (50 % chance of occurrence)	Possible (25 % chance of occurrence)	Unlikely (5 % chance of occurrence)	Rare (only occurs in exceptional circumstances)
Consequence	5	Catastrophic	E	E	E	E	H
	4	Major	E	E	E	H	M
	3	Moderate	E	H	H	M	M
	2	Minor	H	H	M	L	L
	1	Insignificant	H	M	L	L	L

E: Extreme risk – immediate action and formal documentation required

H: High risk – management attention and formal documentation required

M: Medium risk – environmental management documents will specify responsibility and actions

L: Low risk – manage by routine procedures/instructions

The following section addresses the risks to threatened species and communities identified by the risk assessment process.

13 THREATS AND MITIGATIONS

CLEARING/EARTHWORKS	
Background	The construction and operation of the Project will require the clearing of up to 3,940 ha. The most significant threat this poses is the loss of critical habitat as many of the species of conservation significance have specific habitat requirements.
Potential Impacts	
Potential impacts resulting from the clearing of native vegetation and development of infrastructure for the Project are:	• The loss of individual conservation significant flora and fauna species.
	• The loss of Short Range Endemic species i.e. *Kwonkan* sp. 2
	• The loss of conservation significant vegetation communities.
	• The loss and degradation of habitats essential to the survival of conservation significant fauna species.
	• The direct removal of habitat of dependent subterranean species from the ore extraction process.
	• Fragmentation of populations of conservation significant flora and fauna species.
	• Access roads may alter local surface water flows.
	• Changed fire regimes.
	• Introduction of Invasive flora.
	• Generation of dust.
	• Salinisation of soil or vegetation death from saline water use.
	• Fauna entrapment in open trenches.
Management Strategy	
The following management measures will be implemented by the Joint Venture to prevent or mitigate impacts of land and habitat disturbance on conservation significant species and communities:	• Disturbance to native vegetation will be minimised where possible and all areas requiring clearing will be clearly delineated.
	• Known locations of DRF within 50 m of the disturbance area will be visibly demarcated.
	• All infrastructure (including the access roads) has/will be designed and located to avoid impacts on all known populations of Declared Rare Flora.

CLEARING/EARTHWORKS	
	• Infrastructure areas have/will be designed and located to avoid known locations of Priority flora where reasonably practical.
	• Surface water dispersion systems will be incorporated into road corridors to prevent interference with surface flow critical for vegetation survival.
	• The overall layout of the Operational Area has been designed to minimise impacts to surface water flow.
	• Surface water dispersion systems will be incorporated into the design of the Operational Area to minimise impacts to surface water flow.
	• The location of infrastructure (e.g. alignment of Mine Access Road) will minimise the fragmentation of habitat (e.g. by avoiding bisecting areas of continuous habitat of threatened species)
	• Develop and implement appropriate fire protocols to reduce the risk of fire and to ensure fire is effectively managed.
	• Establish appropriate fire breaks adjacent to high fire risk areas.
	• Confining clearing impacts strictly to the minimum area practical for the establishment of the mine and associated infrastructure.
	• Conducting further surveys for troglobitic fauna prior to any pit extensions or amendments.
	• Disturbance to critical habitats will be avoided where practicable in sand dune systems suitable for Marsupial Moles, Sandhill Dunnarts, Mulgara.
	• Disturbance to possible Malleefowl and Sandhill Dunnart habitats will be minimised where practicable such as Areas of Spinifex which have been unburnt for between eight and 38 years, and have the potential to provide habitat for Sandhill Dunnarts and Mulgara.
	• Known locations of critical threatened fauna habitat such as Malleefowl mounds, Bustard nests and dune systems with evidence of Marsupial Mole activity will be avoided where practicable.
	• Known locations of Priority Ecological Communities (PEC) will be avoided where practicable.
	• The removal of large mature “habitat” trees, particularly Marble Gum (*Eucalyptus gongylocarpa*), with hollows providing nesting sites for rare parrots will be avoided where reasonably practicable.
	• Areas no longer required will be rehabilitated as soon as is practicable. Rehabilitation will include placing cleared vegetation and logs within the area to provide fauna refuge.
	• Following rehabilitation, areas will be monitored and treated for invasive flora invasion, if necessary.
	• Information on current listings (State or Federal legislation, or DPaW Priority ranking) will be kept up to date.

CLEARING/EARTHWORKS	
	• Site inductions will include information about conservation significant flora, vegetation, fauna and habitat to ensure personnel are aware of the potential impacts associated with activities on these species.
	• Trapped fauna within open trenches should be cleared and recorded by a suitably trained fauna-clearing person no later than three hours after sunrise. The clearing and recording shall be repeated before sunset.
	• Open trench lengths shall not exceed a length capable of being inspected and cleared by the fauna-clearing person.
	• Fauna refuges and/or egress ramps should be placed in the trench at intervals not exceeding 50 m
	• A report on fauna management should be produced including; details of all fauna inspections; the number of fauna cleared from trenches; fauna interactions; fauna mortalities and all actions taken.

	Performance Indicator	**Target**
Performance Indicators	• State, Federal or Priority listed fauna species or communities.	• No adverse impacts to State, Federal or Priority listed fauna species or communities outside the approved area.
	• Declared Rare Flora and Priority plant taxa.	• No DRF will be removed by the Project. • Development of ex situ seed banking for DRF and Priority plant taxa. • DRF and Priority plant taxa to be reintroduced with DPaW approval in the event of a decline in population.
	• Species	• No species extinctions directly attributable to the Project.

EMISSIONS TO AIR/LAND/WATER	
Background	The construction and operation of the Project will require activities such as the use and production of materials that may generate or release potentially hazardous emissions to the environment which may, in turn, impact upon a threatened species. These include: • Putrescible waste (e.g. vegetable scraps) and associated disposal facility. • Inert waste (e.g. solid waste that will not break down) and associated disposal facility. • Accidental release of saline water. • Workshops, hydrocarbon storage areas and other dangerous goods (e.g. - cyanide). • Tailings and associated tailings storage facility. • Waste landforms. • Dust.
Potential Impacts – Environmentally Hazardous Substances	
The inappropriate disposal or accidental spill/release of waste hydrocarbons and other environmentally hazardous substances can cause contamination of substrate, groundwater or surface water potentially leading to:	• Implementation of the Construction and Environmental Management Strategy (CEMS) and the Operational Environmental Management Strategy (OEMS).
	• Loss of critical fauna habitat.
	• Loss of threatened flora substrate.
	• Poisoning of threatened fauna.
	• Contamination of surface water and groundwater.
Management Strategy	
Disturbance to the habitat of threatened species by the disposal or accidental spill of waste hydrocarbons and other environmentally hazardous substances can be prevented by:	• Avoiding critical habitat in the placement of storage, re-fuelling, handling and disposal facilities.
	• In accordance with CEMS and OEMS, all pipelines with will either be buried or bunded, have leak detection systems and automatic cut-off systems
	• The pipeline corridor to the Minigwal Borefield will be designed to avoid areas where threatened or conservation significant species and habitats have been recorded.
	• Preventing contamination of troglobitic habitats by hydrocarbon / chemical spills as per site procedures.
	• Appropriate licenses for the transport, handling, storage and disposal of hazardous materials including any Dangerous Goods Licensing.
	• Ensuring appropriate containment, bunding and storage facilities are present and meet the specifications of Australian Standard 1940.
	• Establishing and implementing hydrocarbon storage, handling and use procedures and process.

EMISSIONS TO AIR/LAND/WATER	
	• Ensure all re-fuelling bays at bulk storage facilities have appropriate spill containment.
	• Establishing and implementing Emergency Response Procedures (ERP) for hydrocarbon spills, including strategies for environmentally sensitive areas.
	• Relevant staff to be trained in the use of spill kits and emergency response.
Potential Impacts – General Waste	
The generation of waste poses potential impacts to conservation significant species such as:	• Habitat modification.
	• Contamination of surface water and groundwater.
	• Localised pollution.
	• Smothering of threatened flora.
	• Spread and/or proliferation of invasive flora.
	• Alien substances providing a poison or ingestion risk to native species.
	• Attraction of fauna species to food scraps provides an increased risk of native animals becoming pests, and an increased road kill risk as native fauna travels to and from domestic waste dump.
	• Fire.
Management Strategy	
The risks posed by domestic waste will be minimised through:	• Implementation of strict domestic waste management practices, including disposal of domestic waste in a licensed facility.
	• All domestic waste skips and bins shall have lids and be closed at all times to reduce the likelihood of fauna being attracted to the area.
	• Waste stations will be labelled for the appropriate segregation of waste.
	• All putrescible and inert wastes shall be disposed of in a licensed landfill facility and covered.

EMISSIONS TO AIR/LAND/WATER	
Potential Impacts – Tailings	
The use of cyanide in gold extraction may result in the presence of this pollutant in the tailings and water. Inappropriately managed tailings storage facilities (i.e. wall breach) may result in the release of cyanide to surface and groundwater potentially:	• Seepage of processing water through the base of the facility resulting in contaminating land and groundwater. This presents a significant risk to subterranean fauna.
	• Fauna death as a result of drinking water containing cyanide.
	• Entrapment in the tailings.
Management Strategy	
The risk of impacts associated with the tailings and tailings storage facility can be managed by:	• Design infrastructure such as the tailings storage facility to ensure containment of any potentially contaminated runoff, to prevent uncontrolled discharge of tailings into the environment.
	• Limit Weak Acid Dissociable Cyanide to less than 50mg/L in water sitting on the tailings storage facility.
	• Compliance with the International Cyanide Management Code.
	• Restricting animal access to the facility (netting / fencing).
	• Implementation of the Tailings Storage Facility Management Strategy.
	• Tailings storage facility will be designed and constructed to limit the potential release of seepage water through the installation of a basin liner, seepage recovery system and by recovering water at the plant prior to the releasing of the tailings into the tailings storage facility
	• By recovering water off the top of the tailings storage facility as quickly as possible and reusing it.
Potential Impacts – Dust	
There is the potential for increased dust creation from earthworks for the road and mine, general mining operations and erosion of exposed surfaces. Potential impacts of dust on conservation significant species include:	• Coverage of foliage reducing photosynthesis and transpiration, resulting in reduced productivity and increased plant death, particularly relevant in areas adjacent to tracks.
	• Alteration of habitat negatively impacting on conservation significant flora and fauna species.
	• Salinisation for dust suppression measures.

EMISSIONS TO AIR/LAND/WATER	
Management Strategy	
The increased vehicle movements and construction and mining operations have the potential to increase dust in Project areas. Dust mitigation will include:	• Implementing CEMS and OEMS.
	• Minimising disturbance area to what is absolutely necessary by limiting clearing and progressively rehabilitating to limit windblown dust generation.
	•
	• Limiting road speeds near dust sensitive vegetation and ensure road speeds are manage to on other road to reduce dust generation and safety issues
	• Implementing dust suppression techniques.
	• Internal roads in the Operational Area shall be watered at a rate that reduces dust generation to acceptable levels as required. This rate will be dependent upon climatic conditions at the time.
	• Minimise total surface disturbance at any one time to reduce areas potentially producing windblown dust.
	• Land clearing and topsoil stripping will not be undertaken during weather conditions likely to generate excessive dust.
Potential Impacts – Noise / Vibration	
Excessive noise emissions and vibration associated with the construction and operation of the Project can potentially lead to:	• Interference with fauna behaviour and movement.
Management Strategy	
	• All activities to be conducted in compliance with the *Environmental Protection (Noise) Regulations 1997*.
	• Implementation of the CEMS and OEMS.
	• Activities shall be managed according to weather conditions and proximity to noise and blasting sensitive areas.

EMISSIONS TO AIR/LAND/WATER		
	Performance Indicator	**Target**
Performance Indicator	**Environmentally Hazardous Substances**	
	• Environmentally hazardous substances.	• No unauthorised discharge.
	• Prescribed premises and Controlled waste.	• Compliance with all statutory requirements.
	• Spills and releases.	• Minor spills/releases reported via Project reporting system within 48 hr and cleaned up.
		• Major spills/releases or externally reportable incident reported via Project reporting system and authorities within 24 hrs.
		• No spills/releases that require emergency response.
	General Waste	
	• Prescribed premises and Controlled waste.	• Compliance with all statutory requirements.
	Tailings	
	• Tailings.	• No uncontrolled releases of tailings outside the containment areas.
	• Cyanide.	• Compliance with International Cyanide Management Code.
	• State, Federal or Priority listed fauna.	• No State, Federal or Priority listed species lost due to tailing issues.
	Dust	
	• State, Federal or Priority listed species and communities	• No adverse impacts to State, Federal or Priority listed species or communities outside the approved areas.
	• State, Federal or Priority listed species habitats.	• No adverse impacts to State, Federal or Priority listed species habitats outside the approved areas.

WATER SOURCES / STORAGE		
Background	Access to water can increase the size of invasive and native fauna populations and increase the risk of animal vehicle interaction in water storage areas.	
Potential Impacts		
Water stored in the form of dams, borrow pits or the tailings storage facility during the operation of the mine provides an additional and atypical water source to the region potentially leading to:	• Drowning of threatened fauna.	
	• Attraction and habituation of threatened and invasive fauna.	
	• Alteration of fauna behaviour.	
	• Attraction of predators and herbivores increasing predation and herbivory on threatened flora and fauna.	
	• Borrow pits used for access road creation can become areas of water storage if not well managed. The Project may use borrow pits for water storage, in this event the borrow pits will be fenced appropriately.	
Management Strategy		
	• Restrict access to water storage areas either by fencing or installing some other suitable barrier where required.	
	• Fauna egress ramps and/ or nets will be incorporated into permanent water storage sites, where appropriate (e.g. lined dams).	
	• Fauna deterrent methods will be utilised.	
	Performance Indicator	**Target**
Performance Indicators	• Fauna	• No animal habituation of artificial water sources. • No animals trapped/caught in fence, water storage facility or tailings.

EROSION / SEDIMENTATION		
Background	Poorly managed surface water flows can result in the release of sediment, loss of topsoil / growth medium and the erosion of the natural environment. All of these activities have the potential to adversely affect threatened species and communities.	
Potential Impacts		
Activities associated with the construction and operation of the Project may lead to the modification of sediment transport, erosion and deposition patterns. Potential impacts associated include:	• Detrimental changes to downstream water quality.	
	• Loss of threatened flora, fauna or fauna habitat.	
Management Strategy		
	• Implementation of the Construction and Environmental Management Strategy (CEMS) and the Operational Environmental Management Strategy (OEMS).	
	• Disturbance area to be minimised.	
	• Erosion and sediment control structures to be installed and routinely inspected.	
	• Stormwater diversion drains will be installed within the Operational Area.	
	• Diversion system installed across the Operational Area will separate clean and potentially dirty stormwater	
	• Dust control measures will be adopted.	
	• Vehicle movement will be restricted to operational area except where undertaking exploration activities.	
	Performance Indicator	**Target**
Performance Indicators	• State, Federal or Priority listed species or communities.	• No adverse impacts to State, Federal or Priority listed species or communities outside the approved area.
	• Water quality.	• No adverse impacts of State, Federal or Priority listed species' habitats outside the approved area. • No detrimental changes to downstream surface water quality.

ALTERATION TO TERRESTRIAL ECOSYSTEMS	
Background	Improved access to the region has the potential to increase the number of people using the area for recreational purpose which in turn can increase the risk of anthropogenic fires, litter, off-track driving, invasive flora spread or introduction and the increase occurrence of invasive fauna. There is also the potential that Joint Venture activities could increase the risk of fire in the region
Potential Impacts – Changed Fire Regimes	
Potential impacts on conservation significant species resulting from accidental fire comprise:	• Immediate deaths of conservation significant flora and fauna individuals and populations.
	• Loss of critical habitat such as Spinifex for fauna species reliant on long unburnt vegetation, or mosaic/patch style burning for example: o Mulgara maintain a semi-permanent home within Spinifex, the burning of the Spinifex, whether by natural or man-made fire, poses a threat to Mulgara. o The Sandhill Dunnart is Spinifex dependent; fire potentially reduces the variability of Spinifex age at a local scale, thus the availability and suitability of habitat for the Sandhill Dunnart. o The Great Desert Skink is dependent on regeneration vegetation therefore changed fire regimes is the species' most significant threat.
	• Loss of breeding habitat.
	• Increased proliferation of invasive flora.
	• Altered vegetation structure.
	• Altered habitat unable to provide conditions for conservation significant flora species to recolonise.
Management Strategy	
	• Develop and implement appropriate fire protocols to reduce the risk of fire and to ensure fire is effectively managed.
	• Ensure the Project has an appropriate emergency response plan and equipment.
	• Ensure that the Project compile with *Bush Fire Act* requirements and fire bans.
	• Provide ongoing education and training regarding appropriate management and behaviour.
	• Correct storage and isolation of flammable liquids.
	• Establish appropriate fire breaks adjacent to high fire risk areas.

ALTERATION TO TERRESTRIAL ECOSYSTEMS	
	• Implementation of safe smoking practices and appropriate disposal of cigarette butts.
	• Work with DPaW to reduce the risk of fires in the region.
Potential Impacts – Invasive Flora	
The introduction of machinery, earthworks and disturbance in the area, increased traffic flows, water availability and increased population has the potential to introduce invasive flora into the area. The introduction of invasive flora to an area has the potential to impact threatened species by:	• Interfering with natural function.
	• Displacing threatened flora species.
	• Out-competing threatened species for resources.
	• Degradation of critical habitats for conservation significant flora and fauna species.
	• Inhibiting regeneration of threatened flora.
	• Changing fire characteristics resulting in altered habitats for conservation significant flora and fauna species.
	• Reduced success of rehabilitation.
Management Strategy	
Mitigation measures are required to control and prevent the spread of invasive flora previously recorded within the Project footprint and to minimise the potential for the introduction of any additional invasive flora. The risk of introducing invasive flora will be minimised through the implementation of the following management measures:	• Invasive flora management procedures to be developed and implemented to identify areas of risk, permitted access and inspections to be undertaken.
	• Implementation of the Construction and Environmental Management Strategy (CEMS) and the Operational Environmental Management Strategy (OEMS).
	• Strict vehicle hygiene practice will be adopted by staff and contractors, with all machinery, vehicles and plant to be free of soil and vegetative matter upon arrival to Joint Venture controlled areas.
	• Strict vehicle hygiene practice will be adopted by staff and contractors, with all machinery, vehicles and plant to be free of soil and vegetative matter when moving between weed infested and un-infested areas (most relevant on the Infrastructure Corridors as there is little weed presence at the Operational Area).
	• Work in known invasive flora infested areas will be undertaken separately to work in pristine areas. This relates mainly to work in the Pinjin area. Any vehicles moving between the Pinjin area and other areas during clearing and construction will be thoroughly cleaned of soil and vegetation matter.
	• Develop a process to limit the risk of soil/ invasive flora transfer by clearing equipment.
	• Induction programs to promote awareness of invasive flora management measures that are to be used at the Joint Venture.
	• Provide specific training in invasive flora identification and eradication measures to relevant Joint Venture personnel and contractors.

ALTERATION TO TERRESTRIAL ECOSYSTEMS	
	• Undertake regular Project footprint inspections to record new observations of invasive flora infestations or changes in invasive flora distribution especially near known populations of DRF. An invasive flora tracking system will be implemented for recording invasive flora populations or high risk areas.
	• Any soil / fill brought to site will be certified free of propagules of invasive flora.
	• Gravel and borrow material will be sourced locally, therefore free of phytophora and invasive flora.
	• Domestic waste to be disposed of in the correct manner to prevent seed invasion from food waste products.
	• Specific control measures and treatment programs for invasive flora that have been recorded on the Joint Venture tenements will be developed in consultation with DPaW, where appropriate.
	• Invasive flora control to be implemented in rehabilitation works.
	• Clean seeds will be used to rehabilitation.
	• Seed will be harvested locally to reduce the risk of new invasive flora introduction.
Potential Impacts – Invasive Fauna	
Invasive fauna such as the European Fox (*Vulpes vulpes*), Wild Dog (*Canis lupus*) and Feral Cat (*Felis catus*) potentially pose a threat to all threatened species in the Project footprint. The construction and operation of the Project may provide additional resources (food or water) for invasive species if inappropriately managed. The attraction of invasive fauna to the area may impact conservation significant fauna and flora by:	• Competing with threatened species.
	• Direct predation on threatened species. The Sandhill Dunnart, Mulgara, Malleefowl, the SMM and the Woma Python are highly susceptible to predation. Remains of the SMM have been recorded in the scats of Feral Cats, Wild Dogs and European Foxes.
	• Habitat degradation including compression of dunes and trampling and habitat alteration from Camels (*Camelus dromedarius*) or Goats (*Capra hircus*). This may adversely affect the habitat of threatened fauna or their local movement and dispersal. Compaction of substrate from Camels may adversely affect the availability of invertebrate prey. As the majority of the species of interest are insectivorous this may impact on food availability.
	• Herbivorous grazing or trampling of conservation significant flora species.
	• Grazing of rehabilitated areas thus degrading habitat.

ALTERATION TO TERRESTRIAL ECOSYSTEMS	
Management Strategy	
The risk of introducing animal species to Project Areas will be mitigated in the following ways:	• No pets will be allowed in Project areas.
	• Putrescible wastes will be disposed of in accordance with legal obligations.
	• Access to water by animal will be managed.
	• Project stormwater management to minimise the unplanned ponding of water.
	• Maintenance of taps and other water infrastructure to prevent leaks.
	• All personnel will be discouraged from feeding fauna.
	• Support and implement Pest Management Strategies informed by a risk management approach.
	• Pest Management Strategies that aim to reduce impacts rather than reduce numbers of individuals will be developed (in consultation with appropriate organisations such as DPaW).
	• Support regional studies into invasive fauna populations across the Joint Venture with the aim of improving pest management.
Potential Impacts - Traffic	
The construction and operation of the Project and access road will increase traffic flows in the areas. Increased vehicle movements along the access road, especially of large vehicles may result in the following impacts on conservation significant species:	• Mortality of individual fauna through direct collisions with vehicles.
	• Injury of individual fauna through direct collisions with vehicles.
	• Erosion and compaction of substrate from unauthorised off-road driving potentially altering the ability of animals and pollinators to move through the landscape.
	• Hazardous spills resulting in land contamination (e.g. following an accident).
	• Fire.
	• Generation of dust.
Management Strategy	
Strategies to reduce the risk of vehicles on threatened species include:	• Implement and enforce an appropriate speed limit on all roads taking into account risks associated with threatened fauna.
	• Infrastructure Corridors (including access roads) will be designed to avoid bisecting critical habitats.

ALTERATION TO TERRESTRIAL ECOSYSTEMS		
	• Signs indicating the likely presence of threatened fauna in areas of preferred habitat will be erected along roadsides to increase driver awareness of the risk to fauna.	
	• Borrow pits will be located a suitable distance from the road to limit potential interaction between animals and vehicles.	
	• Any fauna killed on roads encouraged to be reported to environmental personnel for recording.	
	• Implement and enforce a no off-road driving policy for operational staff and contractors (Exploration activities and Emergency response personnel will be exempt).	
Potential Impacts – Increase Use of Region Nature Reserves		
Less than 10 % of the WA GVD is protected in formal reserves. The existing reserve system includes the Queen Victoria Spring Nature Reserve, the Plumridge Lakes Nature Reserve and the Neale Junction Nature Reserve. The increased use of these nature reserves poses the following risks to conservation significant species and communities:	• Degradation of environmental values.	
	• Increased erosion from off- track driving.	
	• Increased incidence of fire.	
	• Introduction/spread of invasive flora and fauna.	
	• Inappropriate disposal of waste.	
Management Strategy		
	• Discourage unauthorised use of the private Mine Access Road.	
	• Restrict vehicle movement by staff with private vehicles on site to minimise impact to nearby Nature Reserves and wider region.	
	• Consider providing an alternate transport arrangement for local (i.e. Kalgoorlie and surrounds) staff/contractors to access the site, rather than driving private vehicles.	
	• Consider educational initiatives throughout the region to promote environmentally friendly behaviour by visitors (e.g. signage).	
	• Undertake specific environmental surveys to describe region and identify high value environmental assets (e.g. conservation significant species) that may be at risk or require mitigation/offset.	
	Performance Indicator	**Target**

ALTERATION TO TERRESTRIAL ECOSYSTEMS		
Performance Indicators	**Fire**	
	• State, Federal or Priority listed species or communities.	• No adverse impacts of State, Federal or Priority listed species or communities. • No adverse impacts of State, Federal or Priority listed species habitats. • No regional impacts.
	Invasive Flora	
	• Invasive flora.	• No invasive flora introduced as a result of the Project. • No spread of invasive flora from an existing location.
	Invasive Fauna	
	• Invasive fauna.	• No invasive fauna introduced to the area as a result of the Project. • No spread of invasive fauna.
	• State, Federal or Priority listed species or communities.	• No adverse impacts on State, Federal or Priority listed species or communities.

14 TRAINING AND AWARENESS

To ensure the effective implementation of this and other strategies associated with the Project, a site specific induction has been developed and includes general information on the threatened and priority flora, fauna and communities known to occur within the Project area. All employees and contractors permanently based onsite are required to complete the sites general induction.

To complement the site induction, the Project incorporates Threatened Species and Community awareness topics will be periodically roll-out across the operation, the topics will comprised of toolbox information and posters that are distributed across site to ensure ongoing awareness of the management measures associated with this strategy.

15 REHABILITATION AND SEED BANKING

Over the life of the Project the TJV will work with regional seed collectors to obtain viable seed for known priority and DRF species within and adjacent to the Project area. These resources will be shared with DPaW and used to return these species to the post mining landscape.

Priority and DRF seed collections will be undertaken with in accordance with the WA Wildlife Conservation Act and regulations and DPaW requirements. Seed collected will be lodged with DPaW through the Threatened Flora Seed Centre (housed at the WA herbarium). Where practical plant material, photographs and location data will be lodged with the seeds to enable confirmation of ID and expand the States knowledge of the collected species.

16 DATA MANAGEMENT AND INCIDENT REPORTING

The TJV will at least annually provided DPaW with threatened systems and community data in the form of location information, photographs (where appropriate), herbarium samples and survey reports. This information will be provided to both the Regional Office and directly with the Threatened Species and Community Branch.

Should the TJV (or its contractors) encounter threatened fauna species efforts will be made to collect DNA samples from live specimens and to preserve and lodge specimens of deceased animal encountered. This material will be provided to the WA Museum as soon as practical after collection.

In accordance with the sites Incident reporting procedure, non-compliance with this strategy will be treated as an incident and will be reported via the site incident reporting system (InControl). Incidents that directly involve priority or threatened fauna species will be reported to DPaW within 24hrs of reporting to the sites Environmental team, these reports will be lodged via fauna@dpaw.wa.gov.au as required.

17 MEASUREMENTS AND MONITORING

The implementation and effectiveness of this strategy will be audited as specified in the TGM Audits and Inspection schedule. A copy of the audit findings will be provided to DMP, DPaW and the OEPA following completion.

Established performance indicators and targets set out in Section 13 (above) will be assessed bi-annually and reported to DPAW and DMP via a TS&CMS Performance Report.

18 REFERENCES

The following documents were used in the production of this TS&CMS:

- Barton, B & Cowan, M 2001. 'Great Victoria Desert 2 (GVD2 – Great Victoria Desert Central subregion)' In A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002, Department of Conservation and Land Management, Perth, pp. 351-357
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- Bureau of Meteorology 2008. http://www.bom.gov.au/ Accessed November 2008.
- Churchill 2009. Assessment of habitat availability for the Sandhill Dunnart. *Sminthopsis psammophila* in Western Australia
- Commonwealth Government 2008a. Australian Natural Resources Atlas – Great Victoria Desert. http://www.anra.gov.au/topics/rangelands/overview/wa/ibra-gvd.html. Accessed November 2008.
- Commonwealth Government 2008b. Australian Natural Resources Atlas – Murchison Region. http://www.anra.gov.au/topics/rangelands/overview/wa/ibra-mur.html. Accessed November 2008
- Commonwealth Government 2008c. Australian Natural Resources Atlas – Nullarbor Region. http://www.anra.gov.au/topics/rangelands/overview/sa/ibra-nll.html. Accessed November 2008.
- Department of the Environment and Heritage 2005. Fire management, Managing for biodiversity in the rangelands. Commonwealth of Australia.
- *ecologia* Environment 2009. Tropicana Project - Proposed Operational Area Threatened Flora Survey. Unpublished report.
- *ecologia* Environment 2009. Assessment of the Flora and Vegetation of the Proposed Tropicana Project.
- *ecologia* Environment 2009. Tropicana Joint venture Cable Haul Road Access Road: Flora and Vegetation Survey.
- *ecologia* Environment 2009. Tropicana Gold Project Cable Haul Road Fauna Survey.
- *ecologia* Environment 2009. Tropicana Gold Project Southern Marsupial Mole Survey.
- *ecologia* Environment 2009. Tropicana Gold Project Vertebrate Fauna Assessment
- *ecologia* Environment 2009. Group 2 Southern Marsupial Mole Survey. Unpublished report prepared for AngloGold Ashanti Australia, December 2007.
- *ecologia* Environment 2009. Tropicana Project Proposed Operational Area –- Threatened Species Survey. Unpublished report prepared for AngloGold Ashanti Australia, January 2008.
- *ecologia* Environment 2010. Tropicana Gold Project Troglofauna Survey Phases 6 and 7.
- Environmental Protection Authority 2004a. Guidance Statement No. 51 Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia.
- Environmental Protection Authority 2004b. Guidance Statement No. 56 Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia.
- GHD 2010. Second round Sandhill Dunnart surveys of the proposed operational area and infrastructure corridor
- Government of Western Australia 2008. Western Australian Government Gazette No. 134 pp 3471-3485.
- Harvey, MS 2002. 'Short-range Endemism Among the Australian Fauna: Some Examples from Non-marine Environments' Invertebrate Systematics 16:555-570.
- Mattiske Consulting 2009. Flora and Vegetation Survey of Proposed Pinjin Access Road and Infrastructure Corridor L31/57, L39/185, Tropicana Mine - Pinjin Station. Unpublished report.

- Ninox Wildlife Consulting 2009. A Level One Survey of Vertebrate Fauna for the proposed Tropicana - Pinjin Access Track.
- URS 2009. Malleefowl and Mulgara Survey Tropicana Gold Project.
- URS 2009. Marsupial Mole Survey: Proposed Access Road Route Tropicana Gold Project.

19 APPENDICES

Appendix 1: Flora Conservation Codes

Appendix 2: Fauna Conservation Codes

Appendix 1: Flora Conservation Codes

Protected Under:	Category	Description
EPBC Act	Extinct	There is no reasonable doubt that the last member of the species has died.
	Extinct in the Wild	A native species: • is known only to survive in cultivation or as a naturalised population well outside its past range; and, • has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
	Critically Endangered	A native species facing an extremely high risk of extinction in the wild in the immediate future.
	Endangered	A native species: • is not critically endangered; and • is facing a very high risk of extinction in the wild in the near future.
	Vulnerable	A native species: • is not critically endangered or endangered; and • is facing a high risk of extinction in the wild in the medium-term future.
	Conservation Dependent	The species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered.
Wildlife Conservation Act	Declared Rare Flora	A native species which has been adequately searched for, and is deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and has been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
DPaW Priority	Priority 1	A native species which is known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g., road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g., from disease, grazing by invasive fauna, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
	Priority 2	A native species which is known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
	Priority 3	A native species which is known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
	Priority 4	A native species which is considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.

Appendix 2: Fauna Conservation Codes

Protected/ Recognised Under:	Category	Description
EPBC Act	Extinct	There is no reasonable doubt that the last member of the species has died.
	Extinct in the Wild	A native species: • is known only to survive in captivity or as a naturalised population well outside its past range; and, • has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
	Critically Endangered	A native species facing an extremely high risk of extinction in the wild in the immediate future.
	Endangered	A native species: • is not critically endangered; and • is facing a very high risk of extinction in the wild in the near future.
	Vulnerable	A native species: • is not critically endangered or endangered; and • is facing a high risk of extinction in the wild in the medium-term future.
	Conservation Dependent	The species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered.
	Marine	Marine species including some birds.
	Migratory	The entire population, or any geographically separate part of the population of any species or lower taxon of wild animal, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries.
WC Act	Schedule 1	A native species that is rare or likely to become extinct, is declared to be fauna that is in need of special protection.
	Schedule 2	A native species that is presumed to be extinct, is declared to be fauna that is in need of special protection.
	Schedule 3	Birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is in need of special protection.
	Schedule 4	A native species that is in need of special protection, otherwise than for the reasons specified in Schedules 1, 2 and 3.

Protected/ Recognised Under:	Category	Description
DPaW Priority	Priority 1	A native species that is known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
	Priority 2	A native species that is known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g., national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
	Priority 3	A native species that is known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
	Priority 4	A native species that is considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
	Priority 5	A native species that is not considered threatened but is subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Bamforth, Emma

From: Bamforth, Emma
Sent: Wednesday, 17 December 2014 7:04 AM
To: 'Futter, Julie'
Cc: (G) AGA TGM Sustainability Environment Compliance
Subject: RE: Tropicana Gold Mine - Threatened Species and Community Management Strategy
Attachments: TGM TSCMS_December 2014.pdf; DPaw comments on TSCMS and AGAA response.pdf

Hi Julie,
Thank you for your comments on the TGM Threatened Species and Communities Management Strategy. Your comments have been incorporated into the amended version of the strategy (December 2014) and a copy is attached for your information. I have also attached a table which summarises how we have addressed your comments and maps our response to the section of the strategy that has been updated.

Should you require any additional information please feel free to contact me on 9265 2213.
Kind regards
Emma

Emma Bamforth
Senior Environmental Coordinator - Approvals
Sustainability
ANGLOGOLDASHANTI
AUSTRALIA
Tel: +61 (08) 9265 2213
Cell: 0419919196
Email: ebamforth@anglogoldashanti.com

From: Futter, Julie [mailto:Julie.Futter@DPaW.wa.gov.au]
Sent: Monday, 1 December 2014 10:36 AM
To: Bastow, Belinda
Subject: RE: Tropicana Gold Mine - Threatened Species and Community Management Strategy

Hi Belinda,

Thank you for your time to talk through my comments last week it was most helpful. Please find attached the Department's comment sheet in relation to the updated Tropicana Gold Mine - Threatened Species and Community Management Strategy. If you have any queries please do not hesitate to contact me – I am out in the field over night but will be back in the office from Wednesday.

I hope the Trust Launch went great.

Kind regards,

Julie

Julie Futter

Department of Parks and Wildlife

Document Review Comments Sheet

Document Title:	Tropicana Gold Project Threatened Species and Communities Management Strategy
Document Revision:	March 2014
Date of Review:	October 2014
Date comments provided	December 2014

Item No.	Section No./Title	Reviewer Comment / Advice	AGAA response to DPaW comments and changes made to TSCMS (16th December 2014)
1	Monitoring	The document does not provide clarification on how the success of Threatened Species and Communities Management Strategy's environmental procedures will be assessed and reviewed in relation to the identified performance indicators. Parks and Wildlife recommends measurable indicators are set and that a reporting requirement is included in the management strategy. For example - how are no adverse impacts or no detrimental changes within the performance indicator targets being measured? If performance indicators are not being met, it is recommend Anglo seeks consultation with Parks and Wildlife to discuss management strategy options.	A new section (Section 17- Measurements and Monitoring) has been included in the amended version of the TS&CMS to address reporting requirements. A TS&CMS Performance Report will be developed bi-annually to assess performance against indicators and targets outlined in Section 13 of the strategy. The first report will map out the tools used to measure compliance.
2	Future Proposals	Parks and Wildlife recommends that the management strategy addresses what considerations Threatened species and communities will be given during the development of any future proposals for infrastructure etc for the Tropicana Gold Project. These could include but not be limited to ensuring recommend survey protocols and timing are followed and options analyses are conducted to reduce potential impacts to Threatened species.	Section 3 (Scope and review protocols) of the TS&CMS has been updated to clearly state that the Strategy applies to all activities (current and future) associated with the Project as well as extending to exploration activities undertaken within the operational area mining leases. Baseline flora and fauna surveys are conducted in accordance with the EPA Guidance statements including Guidance statement 51, 54 and 56.
3	Reporting	If not included elsewhere in Anglo's environmental management procedures Parks and Wildlife would appreciate that Threatened and Priority flora and fauna encountered and / or incidents (i.e. injuries or	A new section (Section 16 – Data management and incident reporting) has been included in the amended version of the TS&CMS to address data collection,

		deaths) relating to fauna are reported to the Department (fauna@dpaw.wa.gov.au) . Furthermore, if conservation significant fauna species are encountered during field surveys Parks and Wildlife recommends DNA samples (e.g. ear clips) are taken and provided to the WA Museum for their collections.	submission and incident reporting requirements.
4	Seed Bank	To help safe guard Declared Rare and Priority flora species Parks and Wildlife asks that samples from Anglo's collection for the *ex situ* seed banking are contributed to the Threatened Flora Seed Centre (Housed in the WA Herbarium) for permanent collection.	A new section (Section 15 –Rehabilitation and seed banking) has been included in the amended version of the TS&CMS to address requirements associated with seed collection and lodgment to DPaW.
6	Document Review	It is recommend any future approved footprint areas associated with the Tropicana Gold Project are included in the future document revisions and the management strategy is included in mine site inductions for proposed works by Anglo's employees and contractors.	A new section (Section 14 – training and awareness) has been included in the amended TS&CMS to highlight existing measures to improve awareness of site personnel of the significant flora and fauna of the region and management requirement to protect them.

End of Document Review Sheet

Environmental Impact Assessment Project Co-ordinator
Department of Parks and Wildlife - Goldfields Region

32 Brookman St Kalgoorlie - PO Box 10173 Kalgoorlie WA 6433
Phone: (08) 9080 5555 Fax: (08) 9021 7831
Email: julie.futter@dpaw.wa.gov.au

From: Bastow, Belinda [mailto:BBastow@AngloGoldAshanti.com]
Sent: Wednesday, 2 July 2014 5:07 AM
To: Futter, Julie
Subject: RE: Tropicana Gold Mine - Threatened Species and Community Management Strategy

Hi Julie,

Any feedback on our threatened species and community management strategy post our meeting?

Regards,

Belinda Bastow
Manager: Approvals/Compliance/Sustainability
Sustainability

Dept Assistant: +61 8 9265 2201 Direct Line: +61 8 9265 2200
Mobile: +61 (0) 418 950 678 Email: bbastow@anglogoldashanti.com.au

"Please consider the environment before printing this email"

From: Futter, Julie [mailto:Julie.Futter@DPaW.wa.gov.au]
Sent: Friday, 16 May 2014 5:45 PM
To: Bastow, Belinda
Subject: RE: Tropicana Gold Mine - Threatened Species and Community Management Strategy

Hi Belinda,

Sorry I have not been able to reach you on the phone.

Thank you for referring through the management strategy, the department will have a response within 20 working days.

It would be great to discuss Anglo's findings during the review process.

Speak to you soon.

Julie

Julie Futter
Environmental Impact Assessment Project Co-ordinator
Department of Parks and Wildlife - Goldfields Region

32 Brookman St Kalgoorlie - PO Box 10173 Kalgoorlie WA 6433
Phone: (08) 9080 5555 Fax: (08) 9021 7831

Email: julie.futter@dpaw.wa.gov.au

From: Bastow, Belinda [mailto:BBastow@AngloGoldAshanti.com.au]
Sent: Thursday, 15 May 2014 10:36 AM
To: Futter, Julie; Jackson, Jennifer
Cc: (G) AGA TGM Approvals; Kalgoorlie DER
Subject: Tropicana Gold Mine - Threatened Species and Community Management Strategy

Hi Julie and Jennifer,

In accordance with the Tropicana Gold Mine Ministerial Statement Condition 6.2, the Tropicana Gold Project Threatened Species and Community Management Strategy shall be reviewed every three year in consultation with the Dept of Environment and Conservation (or equivalent authority) to ensure the mitigation and management techniques remain valid and incorporates any relevant new research.

Please find attached an update version of the strategy for you review.

AGA needs to provide an update version of this strategy to the OEPA in the near future, please advise when the department is able to provide feedback.

Thanks in advance.

Regards,

Belinda Bastow
Manager: Approvals/Compliance/Sustainability
Sustainability
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Perth Office: +61 8 9425 4600 Dept Assistant: +61 8 9265 2201
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Bamforth, Emma

From: Bastow, Belinda
Sent: Monday, 1 December 2014 10:40 AM
To: Bamforth, Emma
Subject: FW: Tropicana Gold Mine - Threatened Species and Community Management Strategy
Attachments: Anglo Gold Threatened Species and Communities Management Strategy - Parks and Wildlife Comments.docx

FYI.

I will integrate in to the version in Controlled Document tomorrow so we can review together on Wed.

Regards,

Belinda Bastow
Consulting Advisor to
AngloGold Ashanti Australia
Direct Line: +61 8 9265 2200
Mobile: +61 418 950 678
Email: bbastow@anglogoldashanti.com.au

"Please consider the environment before printing this email"

From: Futter, Julie [mailto:Julie.Futter@DPaW.wa.gov.au]
Sent: Monday, 1 December 2014 10:36 AM
To: Bastow, Belinda
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I hope the Trust Launch went great.

Kind regards,

Julie

Julie Futter
Environmental Impact Assessment Project Co-ordinator
Department of Parks and Wildlife - Goldfields Region

32 Brookman St Kalgoorlie - PO Box 10173 Kalgoorlie WA 6433
Phone: (08) 9080 5555 Fax: (08) 9021 7831
Email: julie.futter@dpaw.wa.gov.au

From: Bastow, Belinda [mailto:BBastow@AngloGoldAshanti.com]
Sent: Wednesday, 2 July 2014 5:07 AM
To: Futter, Julie
Subject: RE: Tropicana Gold Mine - Threatened Species and Community Management Strategy

Hi Julie,

Any feedback on our threatened species and community management strategy post our meeting?

Regards,

Belinda Bastow
Manager: Approvals/Compliance/Sustainability
Sustainability

Dept Assistant: +61 8 9265 2201 Direct Line: +61 8 9265 2200
Mobile: +61 (0) 418 950 678 Email: bbastow@anglogoldashanti.com.au

From: Futter, Julie [mailto:Julie.Futter@DPaW.wa.gov.au]
Sent: Friday, 16 May 2014 5:45 PM
To: Bastow, Belinda
Subject: RE: Tropicana Gold Mine - Threatened Species and Community Management Strategy

Hi Belinda,

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Thank you for referring through the management strategy, the department will have a response within 20 working days.

It would be great to discuss Anglo's findings during the review process.

Speak to you soon.

Julie

Julie Futter
Environmental Impact Assessment Project Co-ordinator
Department of Parks and Wildlife - Goldfields Region

32 Brookman St Kalgoorlie - PO Box 10173 Kalgoorlie WA 6433
Phone: (08) 9080 5555 Fax: (08) 9021 7831
Email: julie.futter@dpaw.wa.gov.au

From: Bastow, Belinda [mailto:BBastow@AngloGoldAshanti.com.au]
Sent: Thursday, 15 May 2014 10:36 AM
To: Futter, Julie; Jackson, Jennifer
Cc: (G) AGA TGM Approvals; Kalgoorlie DER
Subject: Tropicana Gold Mine - Threatened Species and Community Management Strategy

Hi Julie and Jennifer,

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Please find attached an update version of the strategy for you review.

AGA needs to provide an update version of this strategy to the OEPA in the near future, please advise when the department is able to provide feedback.

Thanks in advance.

Regards,

Belinda Bastow
Manager: Approvals/Compliance/Sustainability
Sustainability

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http://www.anglogoldashanti.co.za/additional/generalinfo/emaildisclaimer.htm

Bamforth, Emma

From: Thomas, Sandra <Sandra.Thomas@DPaW.wa.gov.au>
Sent: Thursday, 29 May 2014 11:28 AM
To: Bastow, Belinda; Futter, Julie; Bamforth, Emma
Subject: RE: Meeting with EMB re Threatened Species and Community Management Strategy

Hi Belinda

Yes, Julie and I received the meeting request and we look forward to seeing you tomorrow morning.

Sandra

Sandra Thomas
Acting Area Manager North
Science and Conservation
Department of Parks and Wildlife
Locked Bag 104 Bentley Delivery Centre WA 6983

Phone: 08 9334 0246
Email: sandra.thomas@dpaw.wa.gov.au

From: Bastow, Belinda [mailto:BBastow@AngloGoldAshanti.com.au]
Sent: Thursday, 29 May 2014 3:53 AM
To: Futter, Julie; Bamforth, Emma
Cc: Thomas, Sandra
Subject: RE: Meeting with EMB re Threatened Species and Community Management Strategy

Hi Guy's,

Did we all get this meeting request for Friday?

Belinda Bastow
Manager: Approvals/Compliance/Sustainability
Sustainability

Dept Assistant: +61 8 9265 2201 Direct Line: +61 8 9265 2200
Mobile: +61 (0) 418 950 678 Email: bbastow@anglogoldashanti.com.au

-----Original Appointment-----
From: Bastow, Belinda
Sent: Saturday, 24 May 2014 10:42 AM
To: Bastow, Belinda; julie.futter@dpaw.wa.gov.au; Bamforth, Emma
Cc: Thomas, Sandra
Subject: Meeting with EMB re Threatened Species and Community Management Strategy
When: Friday, 30 May 2014 8:00 AM-9:00 AM (UTC+08:00) Perth.
Where: DPAW Kensington

Hi Julie,

As discuss during the GEMG, it would be great to catch up while you are in Perth on the Threatened Species and Community Management Strategy.

I hope this time is suitable, if not please advise.

Regards,

Belinda Bastow
Manager: Approvals/Compliance/Sustainability
Sustainability
<< OLE Object: Picture (Device Independent Bitmap) >>
Perth Office: +61 8 9425 4600 Dept Assistant: +61 8 9265 2201
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Mail: GPO Box B91, Perth, WA 6838
Perth Office Address: L13 St Martins Tower, 44 St Georges Tce, Perth WA 6000

Bamforth, Emma

From: Bastow, Belinda
Sent: Tuesday, 25 November 2014 6:51 AM
To: Futter, Julie
Cc: Thomas, Sandra (Sandra.Thomas@DPaW.wa.gov.au); Bamforth, Emma
Subject: RE: Tropicana Gold Mine - Threatened Species and Community Management Strategy

Hi Julie,

It was great to catch up with you at the Sandhill Dunnart workshop on 11/11 and it certainly sounds as if you have been busy.

During the workshop you indicated that you should have time in the coming week to provide feedback to TGM on the Threatened Species and Community Management Strategy. We are just wondering how you are progressing as we must include a copy of the updated strategy in our annual report to the OEPA this year. The report is due in December.

We look forward to and await your feedback.

Regards,

Belinda Bastow
Consulting Advisor to
AngloGold Ashanti Australia
Direct Line: +61 8 9265 2200
Mobile: +61 418 950 678
Email: bbastow@anglogoldashanti.com.au

From: Bastow, Belinda
Sent: Thursday, 14 August 2014 11:59 AM
To: 'Futter, Julie'
Cc: Thomas, Sandra (Sandra.Thomas@DPaW.wa.gov.au)
Subject: RE: Tropicana Gold Mine - Threatened Species and Community Management Strategy

Hi Just wondering when we might receive your comments on the Threatened Species and Community Management Strategy?

Regards,

Belinda Bastow
Manager: Approvals/Compliance/Sustainability
Sustainability

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AUSTRALIA
Perth Office: +61 8 9425 4600 Dept Assistant: +61 8 9265 2201
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Mail: GPO Box B91, Perth, WA 6838
Perth Office Address: L13 St Martins Tower, 44 St Georges Tce, Perth WA 6000

From: Bastow, Belinda
Sent: Wednesday, 2 July 2014 5:07 AM
To: Futter, Julie
Subject: RE: Tropicana Gold Mine - Threatened Species and Community Management Strategy

Hi Julie,

Any feedback on our threatened species and community management strategy post our meeting?

Regards,

Belinda Bastow
Manager: Approvals/Compliance/Sustainability
Sustainability

Dept Assistant: +61 8 9265 2201 Direct Line: +61 8 9265 2200
Mobile: +61 (0) 418 950 678 Email: bbastow@anglogoldashanti.com.au

From: Futter, Julie [mailto:Julie.Futter@DPaW.wa.gov.au]
Sent: Friday, 16 May 2014 5:45 PM
To: Bastow, Belinda
Subject: RE: Tropicana Gold Mine - Threatened Species and Community Management Strategy

Hi Belinda,

Sorry I have not been able to reach you on the phone.

Thank you for referring through the management strategy, the department will have a response within 20 working days.

It would be great to discuss Anglo's findings during the review process.

Speak to you soon.

Julie

Julie Futter
Environmental Impact Assessment Project Co-ordinator
Department of Parks and Wildlife - Goldfields Region

32 Brookman St Kalgoorlie - PO Box 10173 Kalgoorlie WA 6433
Phone: (08) 9080 5555 Fax: (08) 9021 7831
Email: julie.futter@dpaw.wa.gov.au

From: Bastow, Belinda [mailto:BBastow@AngloGoldAshanti.com.au]
Sent: Thursday, 15 May 2014 10:36 AM
To: Futter, Julie; Jackson, Jennifer
Cc: (G) AGA TGM Approvals; Kalgoorlie DER
Subject: Tropicana Gold Mine - Threatened Species and Community Management Strategy

Hi Julie and Jennifer,

In accordance with the Tropicana Gold Mine Ministerial Statement Condition 6.2, the Tropicana Gold Project Threatened Species and Community Management Strategy shall be reviewed every three year in consultation with the Dept of Environment and Conservation (or equivalent authority) to ensure the mitigation and management techniques remain valid and incorporates any relevant new research.

Please find attached an update version of the strategy for you review.

AGA needs to provide an update version of this strategy to the OEPA in the near future, please advise when the department is able to provide feedback.

Thanks in advance.

Regards,

Belinda Bastow
Manager: Approvals/Compliance/Sustainability
Sustainability

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MEMORANDUM

Date: **28th November 2014**

To: Sustainability Department

From: Melissa Bolton

Subject: Threatened Species Management Strategy Internal Audit

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An internal audit of the Threatened Species and Communities Management Strategy was undertaken between the 14th and the 18th of November 2014. The audit template covered all aspects detailed in Section 13 Threats and Mitigation of the Threatened Species and Communities Management Strategy. The audit was developed around 13 key aspects including:

1. Clearing/ earthworks;
2. Environmentally hazardous substances;
3. General waste;
4. Tailings;
5. Dust;
6. Noise/ vibration;
7. Water sources/ storages;
8. Erosion/ sedimentation;
9. Terrestrial ecosystems – fire regimes;
10. Terrestrial ecosystems – invasive flora;
11. Terrestrial ecosystems – invasive fauna;
12. Terrestrial ecosystems – traffic; and
13. Terrestrial ecosystems – increase use of region nature reserves.

This audit determined a high level of compliance with the Threatened Species and Communities Management Strategy, with an overall score of 93%. **Table 1** below outlines the scores for each of the aspects and **Table 2** summarises the actions required to be undertaken. The completed audit table is provided in Appendix 1.

Table 1: Audit scores of key aspects

Aspect	Score
Clearing/ earthworks	100%
Environmentally hazardous substances	86%
General waste	100%
Tailings	71%
Dust	100%
Noise/ vibration	100%

Aspect	Score
Water sources/ storages	75%
Erosion/ sedimentation	75%
Terrestrial ecosystems – fire regimes	100%
Terrestrial ecosystems – invasive flora	100%
Terrestrial ecosystems – invasive fauna	100%
Terrestrial ecosystems – traffic	75%
Terrestrial ecosystems – increase use of region nature reserves	100%
Total	**93%**

Table 2: Actions assigned following audit

Actions
Ensure leak detection systems are installed on all pipelines
Develop and roll out spill kit awareness training
Undertake ongoing and additional workforce awareness training on waste management and recycling protocols
Install toe drains on the outside of the TSF
Continue to work towards Cyanide Code Certification
Ensure all fauna egress points are fastened to the bottom of water storage facilities to ensure they are effective.
Install additional storm water drains around site (pending approval of Mining Proposal)
Surface hydrologist to be engaged to review the requirements of site stormwater management

Appendix 1: Completed Audit Table

TGM Threatened Species and Commmunities Management Strategy
Internal Audit - Environmental Compliance

Audit undertaken by:	Mel Bolton	**Date of Audit:**	14th November 2014 to 18th November 2014
Supervisor:	Craig Maxwell	**Communicated:**	

1	Clearing/ Earthworks	Compliance (place x in applicable box)			Observations/Findings/Comments
		Yes	No	N/A	
1.1	Disturbance to native vegetation is minimised with clearing confined to the minimum area practicable.	X			All clearing undertaken is approved through GDP boundaries to minimise disturbance to native vegetation.
1.2	All areas requiring clearing are clearing delineated.	X			All clearing is clearly delineated within GDP application form.
1.3	Declared Rare Flora (DRF) within 50 m of disturbance areas are visibly demarcated.			X	During construction, DRF were demarcated, since this time, the DRF were delisted. No current DRF in the Operational Area.
1.4	Infrastructure and access roads has been designed and located to avoid impacts on all known populations of DRF and priority flora.	X			Prior to clearing being undertaken, a GDP is required. The GDP requires specific details of the proposed disturbance. During the GDP assessment process, a desktop assessment is undertaken to determine if there will be any impacts to DRF or priority flora and whether the proposed disturbance can be relocated to avoid the DRF or priority flora. A site inspection (pre clearing inspection) may also be undertaken in areas outside the PER boundary to ensure disturbance to DRF and Priority Flora is avoided.
1.5	No evidence of vegetation disturbances outside authorised areas (Inc. significant species)	X			Following approved ground disturbance activities, the area disturbed is verified through survey. Additionally, annual aerial surveys assist in the identification of any unauthorised disturbance. Induction includes material on unauthorised clearing.
1.6	No evidence of vegetation death in adjacent uncleared vegetation	X			Photographic dust vegetation monitoring is undertaken to monitor impacts from the Project to surrounding vegetation. Monitoring has not identified any loss of vegetation in uncleared areas.
1.7	Surface water diversion systems have been incorporated into road corridors to prevent interference with sheet flow	X			Roads located on high points, culverts installed on site access roads to allow water to flow underneath the road to prevent interference with sheet flow. Re-evaluate current design of the borefield access road to determine whether culverts or additional surface water management measures are required.
1.8	The operational area layout has been designed to minimise impacts to surface water flow	X			Surface water diversions in place around site to intercept surface water and prevent offsite impacts. Waste Rock Landforms have been designed with a toe drain and collection point to prevent sedimentation down stream.
1.9	Infrastructure has been located to minimise fragmentation of important habitat	X			Environmental values were taken into consideration during project footprint design. Minimising impacts to avoidance areas. TSF was re-evaluated, original TSF design comprised of valley fill utilising the nearby sand dunes as containment walls. The sand dunes however were subsequently recognised as significant habitat, and the TSF design was re-evaluated to prevent impact to the sand dunes.
1.10	Fire protocols have been implemented to reduce the risk of fire	X			Tropicana works activity with and regularly collaborates with the Department of Fire and Emergency Services (DFES) to determine suitable fire regimes.
1.11	Fire breaks have been established adjacent to high risk areas	X			Fire breaks located in the following locations: Village, explosives magazine and exploration camp. Considering installing additional firebreaks - determining where these may be required. Firebreaks will be installed if there is an imminent risk of fire.
1.12	No extensions to the pit or amendments have been undertaken without further troglobiotic surveys			X	No extensions or amendments to the pit has been undertaken beyond the current approval.
1.13	Disturbance to critical habitat has been avoided (sand dune systems suitable for Marsupial Moles, Sandhill Dunnarts and the Mulgara).	X			Key habitats have been avoided. One Priority Ecological Community (PEC) could not be avoided - positioned to be minimised. The Environmental and Heritage Inspection (EIN) and ground disturbance permitting (GDP) processes aim to minimise impacts to environmentally sensitive areas.

1.14	Disturbance to possible Mallee fowl and Sandhill Dunnart habitats has been minimised where practicable (including areas of spinifex unburnt between eight and 38 years.	X			Infrastructure locations and project footprint has been placed to avoid and minimise disturbance to significant habitats including sand dunes and areas of unburnt spinifex).
1.15	Locations of critical threatened fauna habitat have been avoided (including Mallee fowl mounds, Bustard nests and sand dunes).	X			Infrastructure locations and project footprint has been placed to avoid and minimise disturbance to significant habitats including sand dunes and areas of unburnt spinifex).
1.16	Locations of Priority Ecological Communities (PEC) have been avoided.	X			One Priority Ecological Community (PEC) could not be avoided - positioned to be minimised. The Environmental and Heritage Inspection (EIN) and ground disturbance permitting (GDP) processes aim to minimise impacts to environmentally sensitive areas through the identification of PEC locations in relation to proposed disturbances.
1.17	Removal of large mature habitat trees has been avoided (particularly Marble Gum).	X			The project footprint was placed to avoid the removal of mature habitat trees. During clearing, areas marked in the field further minimised the impact to large trees.
1.18	Rehabilitation is undertaken as soon as is practicable.	X			Borrow pits along the access road have been rehabilitated. Ground Zero area has been rehabilitated. A rehabilitation plan will be developed for the mining area to enable and plan progressive rehabilitation of landforms.
1.19	Rehabilitation areas are monitored for presence of weeds			X	Currently limited rehabilitation areas in place. Following the commencement of progressive rehabilitation, a rehabilitation plan including monitoring for weeds will be implemented.
1.20	Information on current flora and fauna conservation status is maintained	X			The Threatened Species and Community Management Plan was updated to reflect changes in listings in 2014.
1.21	Site induction includes information on conservation significant flora, vegetation, fauna and habitat.	X			Site induction covers content on flora and fauna in the region. All employees are provided with a handbook which outlines provides information on threatened species (flora and fauna).
1.22	Open trenches are cleared and inspected for fauna at sunrise and sunset.	X			Suitably qualified fauna clearing personnel (360 Environmental) inspecting borefield trenches from pipeline activities.
1.23	Trenches do not exceed a length capable of being inspected by fauna clearing person.	X			Trenches to be inspected are to be of a length appropriate that the fauna clearing perso can get to the trenches within the required timeframes (three hours after sunrise and three hours after sunset). Additional fauna clearing personnel to be placed on the proje or trenching to reduce to enable this to occur
1.24	Fauna refuges and/or egress ramps are placed in the trench at 50 m intervals	X			Currently borefield expansion and pipeline laying trenches have adequate fauna egress.
1.25	Report on fauna management following trenching activities has been produced.	X			Upon completion of the borefield expansion trenching activities, a report will be produce by the fauna clearing personnel (360 Environmental).
		22	0	3	
		22	/	22	100%

2	Environmentally Hazardous Substances	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
2.1	The placement of storage, re-fuelling, handling and disposal facilities avoids critical habitat	X			The project footprint was placed to avoid critical habitat
2.2	All pipelines are buried or bunded, have leak detection systems and automatic cut off systems	X			Pipelines are buried. Not all pipelines have leak detection systems in place. Leak detection systems will be installed on all pipelines (currently in progress).
2.3	The pipeline corridor to the Minigwal borefield avoids threatened or conservation significant species	X			Designed to avoid critical habitat - minimise impact zones.
2.4	Hydrocarbons and chemicals are stored as per site procedures and Australian Standard 1940	X			Facility inspections and audits are undertaken regularly to ensure hydrocarbons and chemicals are stored appropriately. Refer to the Audit Schedule.
2.5	Dangerous Goods licensing covers all hazardous materials on site	X			Chemical request process ensure that the Dangerous Goods Licence is considered prior to the chemical being approved for use on site.
2.6	Evidence of appropriate spill containment at refuelling bays and bulk storage facilities	X			Spill kits are located at refuelling bays and at bulk storage facilities
2.7	Evidence of implementation of Emergency Response Procedures for hydrocarbon spills	X			Emergency response team have attended significant hydrocarbon spill incidents as required.
2.8	Evidence of spill kit training records for relevant staff.		X		This has been identified as a requirement. A spill kit awareness coarse will be developed and roll out across site.
		7	1	0	
		7	/	8	88%

3	General Waste	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
3.1	Housekeeping and strict waste management practices	X			Waste management practices are in place, although further education of the workforce may be required.
3.2	All domestic waste is disposed within the licensed waste management facility	X			Yes - prescribed premises license includes this facility
3.3	All domestic rubbish bins have lids	X			Yes - wheelie bins with lids are utilised for domestic waste.
3.4	Waste stations are labelled for the appropriate segregation of waste (e.g. recyclables, general waste, hydrocarbon waste)	X			Yes - however there is some need for improvement with respect to workforce training to ensure employees are aware of appropriate disposal.
3.5	Putrescible and inert waste is disposed of and covered within the licensed waste management facility.	X			Yes - the landfill is regularly maintained and contains putrescible and inert waste only.
		5	0	0	
		5	/	5	100%

4	Tailings	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
4.1	The TSF design contains any potentially contaminated runoff, preventing uncontrolled discharge		X		The TSF design does not currently contain contaminated runoff, however no tailings have been released during an event where sediment laden water run off the northern side. No toe drain in place. Tailings discharge pipelines designed to capture spills. Leak detection systems in place. Toe drain to be installed on the outside of the TSF.
4.2	WAD CN levels in free water on the TSF do not exceed 50 mg/L	X			Monthly decant pond water sampling undertaken since March 2014, the monthly data indicates that the WAD CN level has not exceeded 50 mg/L. The WAD CN levels are also measured daily from the TSF Decant pond. These results indicate that there has been two spikes in WAD CN levels, one recorded on the 9th of July recording 90 mg/L and 58.10 mg/L on the 19th of August 2014.
4.3	Compliance with the International Cyanide Management Code		X		Currently working toward achieving Cyanide Code Certification.
4.4	Animal access is restricted	X			The TSF is fenced. Freshwater fauna ponds have been placed in locations outside of the TSF to attract fauna to these ponds over the TSF.
4.5	The TSF Management Strategy has been implemented,	X			Tailings Storage Facility Monitoring and Maintenance Manual.
4.6	TSF design limits seepage through the installation of a basin liner, seepage recovery system and water recovery.	X			Seepage Recovery System installed. Compacted clay liner and HDPE liner underlying the decant. (300 mm liner).
4.7	Operation of TSF limits volume of water stored on the TSF at any one time (through re-use)	X			Water recycled on site. Second line installed to increase water recovery.
		5	2	0	
		5	/	7	71%

5	Dust	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
5.1	Evidence of implementation of the CEMS and OEMS	X			Dust suppression - including water carts and dust monitoring program in place
5.2	Pollution control devices (e.g. dust suppressants) operational and maintained in accordance with manufacturer's instructions	X			Dust suppression - including water carts
5.3	No excessive water pooling from dust suppression	X			Occasional salt crust build up on sides of roads as a result of dust suppression, but no evidence of ponding.
5.4	Disturbance is minimised and progressive rehabilitation undertaken to reduce the potential for dust generation from cleared areas.	X			Disturbance is undertaken progressively to minimise dust generation. Progressive rehabilitation will be undertaken.
5.5	Growth medium stripping and clearing activities are undertaken in appropriate weather conditions	X			Yes growth medium is stripped in dry conditions only.
5.6	Road speeds are limited to reduce dust generation.	X			The road speeds on site do not exceed 60 km/hr., the access road permits speed up to 80 km/ hr. All employees are required to drive to the conditions.
		6	0	0	
		6	/	6	100%

6	Noise/ Vibration	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
6.1	Noise levels acceptable	X			Noise surveys are undertaken every 5 years. Impacts of noise are very localised.
6.2	Vibration is being controlled	X			Modifications have been undertaken on the processing plant to reduce the impact of vibration.
		2	0	0	
		2	/	2	100%

7	Water Sources/ Storage	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
7.1	Water storage areas are fenced	X			Twin turkeys, Kamikaze Turkeys nest, WWTP ponds and Process Water Ponds are fenced with lockable gates
7.2	Fauna egress and/or nets have been incorporated into permanent water storage sites	X			Nets are located in ponds, however some nets are not fastened to the base of the pond - which may compromise the integrity and accessibility to fauna to utilise.
7.3	Evidence of fauna deterrent methods	X			Fencing in place, egress and artificial water ponds in place to attract fauna to these ponds in lieu of the TSF. There is also a gas cannon to deter birds from the TSF.
7.4	No animals trapped/ caught in fence, water storage facility or tailings.		X		Although water storages are fenced, there has been two kangaroos caught in the TSF, one resulted in a fatality, and the other was a successful release, two dogs caught in the wash down bay turkeys nest, one resulted in a fatality and the other a successful release and one emu was caught in one of the waste water treatment plant ponds, which was successfully released. Continue to inspect facilities to ensure fencing is adequate and there is suitable fauna egress.
		3	1	0	
		3	/	4	75%

8	Erosion/ Sedimentation	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
8.1	Evidence of routine inspections of erosion and sediment control structures		X		Facility audits and inspections are undertaken which include aspects of erosion and sediment control. A separate inspection of site diversions and drains and sediment traps on landforms to be undertaken.
8.2	Evidence of stormwater drains within the operational area.	X			Large diversion drain around site. Mining Proposal submitted included requirement for additional storm water drains
8.3	Installation of an effective diversion system to separate clean and dirty water	X			Large diversion drain around site. Mining Proposal submitted included requirement for additional storm water drains
8.4	Evidence of dust control measures	X			Dust suppression measures in place - water carts, sprinklers on stockpiles
		3	1	0	
		3	/	4	75%

9	Terrestrial Ecosystems - Fire Regimes	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
9.1	Flammable liquids are stored appropriately	X			Flammable Liquids are stored as per Dangerous Goods License requirements.
9.2	Fire protocols have been implemented to reduce the risk of fire	X			Tropicana works activity with and regularly collaborates with the Department of Fire and Emergency Services (DFES). Fire activity is monitored by the Emergency Response Team.
9.3	Fire breaks have been established adjacent to high risk areas	X			Fire breaks located in the following locations: Village, explosives magazine and exploration camp. Considering installing additional firebreaks - determining where these may be required. Firebreaks will be installed if there is an imminent risk of fire.
9.4	Designated smoking areas and provision of appropriate cigarette disposal.	X			Designated smoking areas established on site. Cigarette Butt disposal pockets available to all employees on site.
9.5	Collaboration with regulators to reduce the risk of fires	X			Data collation undertaken by Department of Fire and Emergency Services to gather fuel load information.
		5	0	0	
		5	/	5	100%

10	Terrestrial Ecosystems - Invasive Flora	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
10.1	Invasive flora management procedures have been implemented	X			Weed Hygiene Certificate process has been successfully implemented. Additional procedures to be implemented, to increase workforce awareness, and cover other foreign objects brought to site with the risk of contamination such as timbers.
10.2	Strict Vehicle hygiene practices implemented	X			All new vehicles/ equipment mobilised to site, require a notification form which provides details of the last service, location utilised and last clean. Upon arrival to site, the Environment team will inspect all equipment in order to grant approval for use.
10.3	Inductions and training promote awareness of weeds	X			Induction includes content on weeds and the strict vehicle mobilisation protocols. Following the recent infestation of the prickly lettuce weed, site wide posters and tool box training was implemented around site.
10.4	Inspections are undertaken to record invasive flora infestation or changes in invasive flora.	X			Following the recent prickly lettuce infestation and removal, a monitoring programme was established to prevent regeneration of the species.
10.5	All soil brought to site is certified weed free.	X			Only certified weed free soil can be brought to site.
10.6	Control and treatment measures for weeds are developed in consultation with DPaW where appropriate			X	Although one weed species has been brought to site, the management of this weed could be determined internally (manual removal of plants). In the case a significant weed was introduced on site, DPaW would be consulted regarding management, control measures and treatment programs
10.7	Clean seed and local seed only to be harvested for use in rehabilitation			X	Seed harvesting has not yet commenced. The local Tjuntunrtjarra community have recently had training in seed collection and will be utilised for seed collection for the purposes of rehabilitation.
		5	0	2	
		5	/	5	100%

11	Terrestrial Ecosystems - Invasive Fauna	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
11.1	No pets on site	X			There is no evidence of pets on site.
11.2	Putrescible waste is disposed of in the licensed waste management facility	X			Waste landfill is managed and utilised in accordance with the PPL conditions and requirements.
11.3	Water storage facilities are Fenced	X			Except for the freshwater fauna ponds outside the TSF (designed and strategically placed to attract fauna to the ponds over the TSF).
11.4	Stormwater management around site minimises ponding	X			Surface hydrologist to be engaged to review the requirements - improvement plan in progress.
11.5	Taps are maintained to prevent leaks	X			360 Maintain ace tool established on site, any maintenance items including fixing leaking taps on site is undertaken through this process.
		5	0	0	
		5	/	5	100%

12	Terrestrial Ecosystems - Traffic	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
12.1	Speed limits consider interaction with and impacts to threatened fauna	X			Site awareness on driving to conditions, dawn and dusk.
12.2	Infrastructure corridors have avoided bisecting critical habitats	X			The project footprint placement considered the locations of critical habitats, and aimed to minimise the impact of disturbance to these habitats and bisecting of these habitats.
12.3	Evidence of signs present in areas of threatened fauna habitat along roadsides		X		No signs have physically been installed.
12.4	No evidence of unauthorised off road driving	X			Aerial survey, survey and reconciliation against approved ground disturbance activities is undertaken to verify there is no unauthorised off road driving.
		3	1	0	
		3	/	4	75%

13	Terrestrial Ecosystems - Increase Use of Region Nature Reserves	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
13.1	Restrict vehicle movement and unauthorised use of the mine access road.	X			DIDO forms required to drive to site - requiring GM approval.
		1	0	0	
		1	/	1	100%

Audit Score	72	/	77
		94%	

Actions to be added to In Control			
Ref	**Action**	**Accountability**	**Due Date**
2.2	Ensure leak detection systems are installed on all pipelines		
2.8	Develop and roll out spill kit awareness training		
3.1 and 3.4	Undertake ongoing and additional workforce awareness training on waste management and recycling protocols		
4.1	Install toe drains on the outside of the TSF		
4.3	Continue to work towards Cyanide Code Certification		
7.4	Ensure all fauna egress points are fastened to the bottom of water storage facilities to ensure they are effective.		
8.2 and 8.3	Install additional storm water drains around site (pending approval of Mining Proposal)		
11.4	Surface hydrologist to be engaged to review the requirements of site stormwater management		
12.3	Identify locations along roadsides where threatened fauna habitat occurs and identify requirements for signs.		

Sign off

Role/Name	Name	Signature	Date
Sustainability Coordinator:	Melissa Bolton	Mbo	28.11.14
Sustainability Superintendent:			
Senior Sustainability Coordinator:			

Appendix 7: Internal audit of groundwater monitoring methodology and results against the Australian Water Quality Guidelines for Fresh and Marine Waters and Water Quality Monitoring and Reporting

MEMORANDUM

Date: **28th November 2014**

To: Sustainability Department

From: Melissa Bolton

Subject: Monitoring Strategy Internal Audit

Groundwater and Surface Water

An internal audit of the water quality monitoring methodology outlined in the TGM Monitoring Strategy was undertaken against the *Australian Guidelines for Water Quality Monitoring and Reporting* (2000) in November 2014. The audit covered seven key aspects including:

1. monitoring preparation;
2. contamination prevention;
3. sample collection;
4. quality control and quality assurance;
5. sample storage and transport;
6. record management; and
7. laboratory analysis.

Table 1 below provides the actions to be undertaken following the audit and a summary of the audit findings for each of the key aspects. The completed audit table is provided in Appendix 1.

Table 1: Audit actions to be undertaken

Action	Accountability	Due
Formalise current protocols in place in the form of written procedures and work instructions which detail field sampling, transport and storage	Mel Bolton	28-Feb-15
Formalise current protocols in place in the forms of detailed descriptions for collecting, labelling, transporting and storing samples and the necessary ancillary field data.	Mel Bolton	28-Feb-15
Develop specific procedures which specify the sample collection device, type of storage container, preservation procedures, type and numbers of quality control samples to be taken.	Mel Bolton	28-Feb-15
Procedures to be developed are to include exact locations of sampling sites and any sub sites	Mel Bolton	28-Feb-15
Formalise current protocols in place in the form of written procedures detailing handling, tracking and correcting data	Mel Bolton	28-Feb-15
Sampling staff are to use disposable plastic gloves during sampling for contamination prevention. New gloves are to be worn at each sampling location.	Jesse Ober	30-Nov-14
Ensure samples are collected in the appropriate bottles for the analyte being tested (to be formalised through the development of a procedure)	Jesse Ober/ Mel Bolton	30-Nov-14
Onsite analysis and field records to be provided with the CoC and	Jesse Ober/ Mel Bolton	31-Jan-15

Action	Accountability	Due
sent with the samples to the Lab		
Update field data sheet to include weather conditions (wind speed, cloud cover and temperature) and water sample (odour, colour, floating material)	Mel Bolton	31-Dec-14
Field data sheet or report to record the following: - method of sampling - time of sampling - general environmental and climatic conditions - nature of pre-treatment - preservation procedures (i.e. filtering) - data gathered in the field	Mel Bolton	31-Dec-14
QA/QC process to be implemented which includes sample blanks for contamination from the field, containers, equipment and transport as well as duplicate and replicate sampling.	Mel Bolton/ Jesse Ober	28-Feb-15
Develop a calibration log to be stored with all sampling equipment. Ensure regular calibration and that records are maintained.	Mel Bolton/ Jesse Ober	31-Jan-15

Monitoring Preparation

Monitoring preparation overall is undertaken well. Although sampling protocols are in place, these protocols have not yet been documented as work instructions or procedures. It is the intention that these protocols will be formalised into procedures in the near future. Monitoring Preparation scored 56% in the audit.

Contamination Prevention

Contamination prevention is currently a very high standard. The only area for improvement is for sampling staff to utilise plastic disposable gloves during sampling. Contamination prevention scored 86% in the audit.

Sample Collection

Sample collection is undertaken well, although it is recognised there is some room for improvement. The measurement of water levels and sampling of water which is representative of the aquifer is undertaken to a high standard. The field sampling sheets could be updated to document additional information in the field, and also provide the laboratory with additional information pertaining to the samples. Sample collection scored 62% in the audit.

Quality Control and Quality Assurance

Quality Control and Quality Assurance (QAQC) is the one aspect which is recognised as having the greatest opportunity for improvement. Currently there is no specific QAQC process implemented across the monitoring regime. It is anticipated a rigorous QAQC program will be implemented in the near future. Quality control and quality assurance scored 0% in the audit.

Sample Storage and Transport

Sample storage and transport is undertaken to a very high standard, and is the one aspect which is currently 100% compliant. Every effort is made to align sampling with available transport, to ensure samples meet holding times, and are received by the laboratory appropriately. Sample storage and transport scored 100% in the audit.

Record Management

Records are currently maintained well. There are some areas for improvement including, the maintenance of calibration records. Record management scored 80% in the audit.

Laboratory Analysis

Laboratory analysis covered aspects pertaining to the external laboratory. Some areas could be completed based on the laboratory's NATA accreditation, however more specific requirements were not incorporated into this audit, as they were outside the scope. Laboratory analysis scored 100% in the audit (not including audit components which were not applicable).

Appendix 1: Completed Audit Table

ANGLOGOLD ASHANTI AUSTRALIA

Independence Group

Internal Audit - Environmental Bores

Water Quality Monitoring against the *Australian Guidelines for Water Quality Monitoring and Reporting (2000).*

Audited by:	Mel Bolton and Jesse Ober	**Date of Audit:**	16/11/2014
Supervisor:	Craig Maxwell		

1	Monitoring Preparation	Compliance (place x in applicable box)			Observations/Findings/Comments
		Yes	No	N/A	
1.1	Is there a record of the sampling site locations	X			Map available of the environmental monitoring bores and the surface water collection points (sampling locations).
1.2	Sampling device is calibrated prior to each monitoring event	X			Water quality parameter meter is calibrated. Service history of the pump is maintained.
1.3	Water quality parameter meter is calibrated prior to each monitoring event	X			Water quality parameter meter is calibrated.
1.4	Field staff have had sufficient training and experience to undertake the sampling	X			Field staff were trained in the use of the Grundfos groundwater sampling unit (pump)
1.5	All equipment and field instruments are kept clean and in good working order	X			Stored within an air-conditioned sea container, in storage containers, away from exposed sunlight and dust.
1.6	Sampling protocols and procedures in place for field sampling, transport and storage		X		Protocols in place, however this is not currently documented in a procedure.
1.7	Procedures provide detailed descriptions for collecting, labelling, transporting and storing samples and the necessary ancillary field data.		X		Protocols in place, however this is not currently documented in a procedure.
1.8	Specific procedures and protocols have been developed and specify the sample collection device, type of storage container, preservation procedures, type and numbers of quality control samples to be taken.		X		Protocols in place, however this is not currently documented in a procedure.
1.9	Exact locations of sampling sites and any sub sites are recorded in the sampling protocol.			X	No documented procedure in place
1.10	Procedures are in place for handling, tracking and correcting data		X		Protocols in place, however this is not currently documented in a procedure.
		5	4	1	
		5	/	9	56%

2	Contamination Prevention	Compliance (place x in applicable box)			Observations/Findings/Comments
		Yes	No	N/A	
2.1	Field measurements are made on separate sub-samples of water (not in the laboratory samples)	X			Bypass valve enables in field sampling, and separate hose to take lab sample
2.2	Only sample containers supplied by the analytical laboratory are utilised	X			Containers supplied by MPL laboratory
2.3	The insides of containers do not come into contact with hands or objects	X			There is no direct contact with the insides of containers.
2.4	Sample containers are kept in a clear environment away from dust and dirt	X			Samples are stored in containers within a sea container.
2.5	Sampling staff use plastic disposable gloves when handling sample containers at every stage during sampling.		X		Disposable gloves are currently not utilised when handling sample containers.
2.6	Sampling equipment including containers, water quality parameter probes, pumps and bailers are rinsed with deionised water in between samples to prevent cross contamination.	X			Sampling jug is rinsed.
		5	1	0	
		5	/	6	83%

ANGLOGOLD ASHANTI AUSTRALIA

Internal Audit - Environmental Bores

Water Quality Monitoring against the *Australian Guidelines for Water Quality Monitoring and Reporting (2000).*

Independence Group

3	Sample Collection	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
3.1	Samples are collected in the appropriate bottles for the analyte being tested		X		Until recently - metals have been collected in the green sample bottles. This has been amended for all future sampling.
3.2	The depth below ground level at which the sample is taken is always recorded	X			Standing Water Level meter is utilised to record this information.
3.3	Water levels are measured before prior to pumping	X			Water levels are always recorded prior to pumping.
3.4	Sampling device ensures representative sample of the aquifer is obtained (sample is derived from the aquifer itself and not from stagnant water in the bore).	X			The sampling devices, pumps three times the bore volume, and then once the field measurements stability (pH, TDS and EC), a sample is taken.
3.5	Sampling containers are clearly marked in a durable manner, enabling clear identification of all samples in the laboratory	X			Investigating potential use of stickers for clearer labelling, although no problems encountered with current system.
3.6	Onsite analysis and field records are included in a report with the sample to the laboratory		X		CoC or field report to be provided to the lab with the samples
3.7	Are field notes recorded on the field data sheet including weather conditions (wind speed, cloud cover and temperature) and water sample (odour, colour, floating material etc.)		X		Comments box allows for any unusual items to be noted, however does not specifically require comments on the weather or water sample. Field sheet to be updated to incorporate this.
3.8	All field records are documented before leaving a sampling location	X			All field records are documented before leaving a sampling location.
3.9	Observations or information on the conditions at the time of sampling that may assist in interpretation of the data are noted on the field record sheet or field notebook.	X			Unusual observations are noted
3.10	Field Sampling: Field record sheet includes field register of sample number, site, time, date, type/technique, technician, field data sheet		X		Field data sheet captures some but not all of this information. Field data sheet to be updated to include time and technique.
3.11	Field data sheet describes the samples taken, the labels and details.	X			Field data sheet captures some information. Field data sheets to be updated to incorporate some additional information.
3.12	The volume of sample collected is sufficient for the required analyses, including any repeat analyses.	X			Only containers provided by the laboratory are utilised.
3.13	A sampling report is prepared with the following information: - location (and name) of sampling site, with coordinates and any other relevant locational information - details of sampling point - date of sampling - method of sampling - time of sampling - name of sampler - general environmental and climatic conditions - nature of pre-treatment - preservation procedure - data gathered in the field - any information which may affect the results of the analysis.		X		No specific report is compiled, however some of the items are included on the field data sheet. Field data sheet or report to record the following: - method of sampling - time of sampling - general environmental and climatic conditions - nature of pre-treatment - preservation procedures (i.e. filtering) - data gathered in the field
		8	5	0	
		8	/	13	62%

4	Quality Control and Quality Assurance	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
4.1	QAQC process has been implemented		X		No QA/QC is currently integrated into the sampling program
4.2	Sample blanks are prepared to test for contamination from the field, containers, equipment and transport.		X		No QA/QC is currently integrated into the sampling program
4.3	Duplicate and replicate samples are taken as part of the sampling QA/QC		X		No QA/QC is currently integrated into the sampling program
4.4	Protocols specify how sampling staff are to be trained to use sampling equipment		X		No QA/QC is currently integrated into the sampling program
		0	4	0	
		0	/	4	0%

5	Sample storage and transport	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
5.1	Samples are delivered to the laboratory to meet the holding times (within 24 hours)	X			Sampling is undertaken with the aim to provide to the lab within 24 hours.
5.2	Samples are stored in an esky in the field and then refrigerated to cool to 4 degrees Celsius	X			Samples are always stored in an esky with ice bricks in the field
5.3	Sample storage and transport Register of transport container number and sample numbers, date and time	X			Detailed within the Chain of Custody
		3	0	0	
		3	/	3	100%

6	Record Management	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
6.1	Calibrations and preventative maintenance are recorded carefully		X		Service records of the pump are maintained. Suggest a calibration log is kept within the storage case of the equipment.
6.2	All repairs to equipment and instruments are recorded as well as any incidents that could affect the reliability of the equipment.	X			Grundfos pump has service history log.
6.3	Laboratory results and data is backed up in case of system or file failure.	X			Sharepoint system backs up laboratory data.
6.4	Chain of custody documentation in place	X			Chain of custody forms in place for each sampling event.
6.5	Chain of custody records maintained	X			Chain of custody records are maintained in hard copy and electronic.
		4	1	0	
		4	/	5	80%

7	Laboratory Analysis	Compliance			Observations/Findings/Comments
		Yes	No	N/A	
7.1	Analytical lab is NATA accredited			X	Not Applicable - associated with an offsite laboratory, which is outside the scope of the audit undertaken.
7.2	Laboratory Receipt of Samples: Laboratory register or transport container number and sample numbers, date and time			X	Not Applicable - associated with an offsite laboratory, which is outside the scope of the audit undertaken.
7.3	Laboratory storage of samples: Laboratory register of storage location, type, temperature, time and date			X	Not Applicable - associated with an offsite laboratory, which is outside the scope of the audit undertaken.
7.4	Sample Preparation: Analysis register of sample (laboratory number), pre-treatment, date, technician			X	Not Applicable - associated with an offsite laboratory, which is outside the scope of the audit undertaken.
7.5	Sample Analysis: Analysis register of instrument, calibration, technician, standard method, date, result			X	Not Applicable - associated with an offsite laboratory, which is outside the scope of the audit undertaken.
7.6	Analytes are clearly stated	X			Not Applicable - associated with an offsite laboratory, which is outside the scope of the audit undertaken.

7.7	Appropriate analytical methods identified	X			The Analytes were recently reviewed and updated on all COCs going forward.
7.8	Analytical methods cover the range of concentrations expected	X			NATA accredited laboratory
7.9	Analytical methods detect the minimum concentration of interest	X			NATA accredited laboratory
7.10	Analytical methods have sufficient accuracy and precision	X			NATA accredited laboratory
7.11	Samples are processed within the samples storage life	X			NATA accredited laboratory
7.12	Laboratory has appropriate equipment to undertake the analytical method chosen	X			NATA accredited laboratory
7.13	Laboratory facilities are suitable for planned analyses	X			NATA accredited laboratory
7.14	Laboratory staff have the expertise, training and competence to undertake the planned analyses	X			NATA accredited laboratory
7.15	Laboratory has a data management system including: - track samples and data (chain of custody) - have written data entry protocols to ensure correct entry of data - enable associated data to be retrieved (e.g. nutrient concentration and flows to calculate nutrient loads) - have validation procedures to check accuracy of data - have appropriate storage and retrieval facilities to prevent loss of data and enable retrieval (for at least three years) based on current and expected information needs). - Procedures are in place to ensure information reaches the user			X	Not Applicable - associated with an offsite laboratory, which is outside the scope of the audit undertaken.
7.16	From documentation, the following information is available: - how the results were obtained? - samples unique identification - who the analyst was? - what test equipment was used? - the original observations and calculations? - how data transfers occur? - how standards were prepared? - the certified calibration solutions used, their stability and storage?			X	Not Applicable - associated with an offsite laboratory, which is outside the scope of the audit undertaken.
		9	0	7	
		9	/	9	100%

Audit Score	**34**	**/**	**49**	
	69%			

Actions to be added to In Control			
Ref	**Action**	**Accountability**	**Due Date**
1.6	Formalise current protocols in place in the form of written procedures and work instructions which detail field sampling, transport and storage	Mel Bolton	28-Feb-15
1.7	Formalise current protocols in place in the forms of detailed descriptions for collecting, labelling, transporting and storing samples and the necessary ancillary field data.	Mel Bolton	28-Feb-15
1.8	Develop specific procedures which specify the sample collection device, type of storage container, preservation procedures, type and numbers of quality control samples to be taken.	Mel Bolton	28/02/2015
1.9	Procedures to be developed are to include exact locations of sampling sites and any sub sites	Mel Bolton	28/02/2015
1.10	Formalise current protocols in place in the form of written procedures detailing handling, tracking and correcting data	Mel Bolton	28/02/2015
2.50	Sampling staff are to use disposable plastic gloves during sampling for contamination prevention. New gloves are to be worn at each sampling location.	Jesse Ober	30-Nov-14
3.10	Ensure samples are collected in the appropriate bottles for the analyte being tested (to be formalised through the development of a procedure)	Jesse Ober/ Mel Bolton	30-Nov-14
3.6	Onsite analysis and field records to be provided with the CoC and sent with the samples to the Lab	Jesse Ober/ Mel Bolton	31-Jan-15
3.7	Update field data sheet to include weather conditions (wind speed, cloud cover and temperature) and water sample (odour, colour, floating material)	Mel Bolton	31-Dec-14
3.10 and 3.13	Field data sheet or report to record the following: - method of sampling - time of sampling - general environmental and climatic conditions - nature of pre-treatment - preservation procedures (i.e. filtering) - data gathered in the field	Mel Bolton	31-Dec-14
4.1, 4.2, 4.3, 4.4	QA/QC process to be implemented which includes sample blanks for contamination from the field, containers, equipment and transport as well as duplicate and replicate sampling.	Mel Bolton/ Jesse Ober	28-Feb-15
6.1	Develop a calibration log to be stored with all sampling equipment. Ensure regular calibration and that records are maintained.	Mel Bolton/ Jesse Ober	31-Jan-15

Appendix 8: Fauna Trench Inspection – Kamikaze borefield

MEMORANDUM

Date: **28th November 2014**

To: Sustainability Department

From: Vanja Sekizovic

Subject: Fauna Trench Inspections – Ministerial Statement Report summary

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During the 2013/14 reporting year, a number of minor pipelines were installed, mainly at the Kamikaze and the Process Water Supply Borefields. Prior to the trenching and construction activities being undertaken, a Workplace Risk Assessment and Controls (WRACs) were completed. The WRACs include a number of environmental risks and their controls relevant to the scope of works, including fauna egress requirements and trapped fauna trench inspections. An example of the WRAC for Kamikaze Borefield is attached for information (Attachment 1).

All trenches had fauna egress ramps installed at 50m intervals as required, in form of an earthen ramp or similar. In addition, all pipe ends were capped with sample bags to prevent any inadvertent fauna entering the pipelines. Photos from trench inspections conducted are provided in Attachment 2.

The open trenches were inspected twice daily, and recorded on the TGM Trench Inspection Form. Examples of completed forms are provided as Attachment 3.

While no fauna were removed from these trenches, a number were sighted in the area.

Attachment 1: Example of a Workplace Risk Assessment and Controls

Workplace Risk Assessment and Control (WRAC)

WRAC Title: Kamikaze Borefield Expansion Risk Assessment		Date: 25/6/14
Operation Description: Work is progressing on the expansion of the Kamikaze borefield, and thus a risk assessment was conducted to ensure health, safety and environmental risks were understood and assessed prior to commencement	Relevant Documents: General Arrangement Drawings	Page:
Team Leader: Belinda Bastow (BB)	Team Members: Vanja Sekizovic (VS) Richard M. (RM) Mathew Matheson (MM) Robert McCourt (RMc) Steve Callaghan (SC)	Recorded by: Vanja Sekizovic
Relevant SOPs: No relevant Scopes of Work were reviewed. The scope of the works is the expansion of the Borefield, including the installation of pipelines, transfer tanks, pumps, borehead works and pumps, power supply, connection fo the transfer tanks to the existing lines and the set up for future expansion. Discussion was that there will be 3 people involved in the works, and it will take months to do.		

Completed by Task Team:

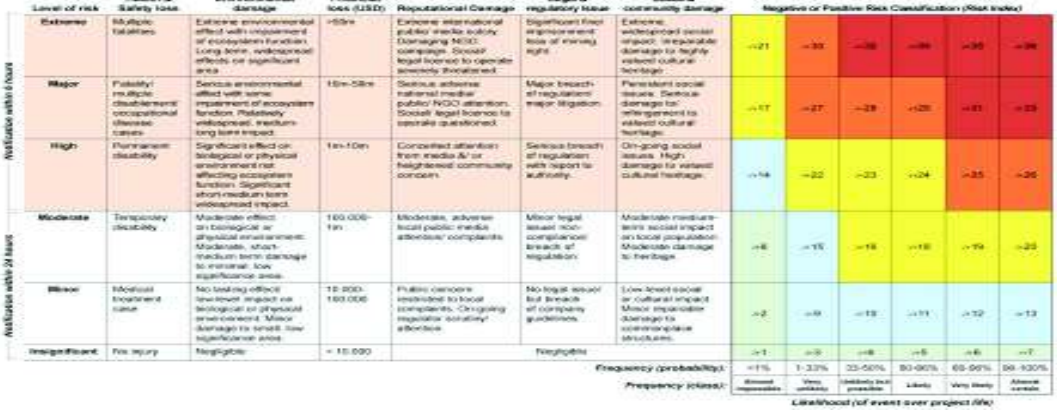
No.	Step in Operation (From Process Map)	Hazard	Unwanted Event	Current Preventative Controls	Current Recovery Controls	Likelihood	Consequence	Risk Rating	Recommended Improvements or New Controls	By Whom	When
1.1	Mobilisation of contractor	Uninformed contractor, incorrect mobilisation	Contractor not mobilised to site in accordance with procedures	Utilising existing contractors (Craig Harvey for clearing, and Osiris for installation)		Unlikely	Minor	Moderate	Ensure contractors have all the required permits (JHAs, GDPs, Dig Permits etc.) and know the requirements. Ensure contractors are provided with a Work Pack.	RMc	Prior to commencement of work
1.2		Equipment not compliant with TGM requirements	Hydrocarbon spills due to damaged equipment, injury to personnel due to machinery tagging out of date, mechanical failure	Utilising existing contractors (Craig Harvey for clearing, and Osiris for installation)		Unlikely	Minor	Moderate	Ensure contractors familiar with TGM requirements and report all spills.	RMc	Prior to commencement of work
1.3		Mobilisation of transport of goods and plant to site	Vehicle accident, fatality, damage, fauna interaction, personnel getting lost, loss of load etc	Utilising existing contractors (Craig Harvey for clearing, and Osiris for installation). All drivers to be inducted. Loading and unloading procedures to be followed (JHAs etc.). Ensure all transported material appropriately secured.		Unlikely	High	High	Ensure all mobilised personnel undertake the induction and have the appropriate driving permissions. Ensure all delivery drivers aware of TGM requirements and DIDO procedures.	RMc	Prior to commencement of work
1.4		Lack of communication	Other teams at TGM not aware of works			Very Likely	Minor	Moderate	Site notifications, TMP and other notices to be clearly communicated site wide and to all relevant teams (RSS, Processing etc.)	RMc	Saturaday 26 July
2.1	General hazards	Nightshift work - Not occurring	Interruption of fuel delivery trucks	Traffic Management Plan to be developed. Site notices to be sent out regarding any closures or interruptions. Minimise interruptions through planning and early consideration and communication with relevant parties.		Likely	High	High	Develop a TMP for the works. Ensure a 2 week look-ahead is produced to ensure sufficient time to prepare any site notices required.	RMc	Prior to interruption of road access
2.2			LV, Pedestrian or truck interaction	Traffic Management Plan to be developed. Site notices to be sent out regarding any closures or interruptions. Minimise interruptions through planning and early consideration and communication with relevant parties.		Unlikely	Major	Major	Develop TMP for the works.	RMc	Prior to commencement of work
2.3			Inadequate lighting	Ensure adequate lighting for nightshift as required.		Likely	High	High	RM to confirm the requirements, and these to be documented for the work through JHA/SOP or WI.	RM	Prior to commencement of night shift
2.4		Communications	Inability to call up an emergency	Team to have radio and phones. Satellite phones for areas where there is no phone communication.		Unlikely	High	High	Confirm the mobile phone coverage for the works, to ensure constant communication is available.	RMc	Prior to commencement of work
2.5		Inclement weather	Lightening strikes personnel	Inclement weather procedure.		Likely	High	High	Confirm understanding by all of the inclement weather procedure.	RMc	Prior to commencement of work
2.6		Waste disposal	Waste illegally disposed off at the new bores.	All waste to be returned to central laydown and the WMF.		Very Likely	Minor	Moderate	Ensure adequate bins available and a waste strategy understood by all parties, obtain mini skip from bundarra and tarp, collect all waste and return at end of job.	RMc	Prior to commencement of work
2.7		Loading and unloading of equipment and materials	Damage to equipment and injury to personnel, incorrect positioning of truck, lack of stable ground, unsecured loads, loads shifting	Competent and experienced operators, spotters as required, Supervision, load inspections, VOCs, designated laydown areas, Correct PPE, Permits to work		Likely	Moderate	High	Ensure all required documentation in place and requirements understood. Have obtain copies of tickets for Osiris personnel. C Harvey to be check as part of the Kamikaze job.	RMc	Prior to commencement of work
2.8		Interaction with other traffic	Vehicle collision	Driver VOC requirements, driving to conditions, PPE		Very unlikely	High	High	JHA to cover controls and traffic management for pipeline trench and installation	RMc	Prior to commencement of work
2.9		Vehicle / people interactions	Pedestrian hit by fuel truck	Traffic Management Plan to be developed. Site notices to be sent out regarding any closures or interruptions. Minimise interruptions through planning and early consideration and communication with relevant parties.		Very unlikely	High	High	No refueling required by either Osiris or C Harvey	RMc	Prior to commencement of work
2.10		Boom gates	Vehicles interacting with boom gates, delay in accessing site	Security/Reception on call (CH12) opening and closing gates.		Likely	Minor	Moderate	Call up Gate House.	RMc	Prior to commencement of work
2.11		Spilling of Hypersaline water	Machinery accidentally cutting the existing pipeline. During the connection of new pipeline to old pipeline, inexperienced people chainsaw the pipeline leading to a spill and potable water supply interruption.	Excavation Permit. Surveyor have marked pipeline in field and work will be leave 1 from existing clearing provide ~1-2m from existing buried lines		Likely	Major	Major	AGAA supervision of works. Forward planning. Identification of proposed tie in points early on.	RMc	Prior to commencement of work
2.12		Unearthing existing pipeline	Operators unearthing the pipeline while excavating for new pipeline.	Excavation Permit. Surveyor have marked pipeline in field and work will be leave 1 from existing clearing provide ~1-2m from existing buried lines		Likely	Major	Major	AGAA supervision of works. Forward planning. Identification of proposed tie in points early on.	RMc	Prior to commencement of work
2.13		Tight working area	Vehicle / pedestrian / asset interaction due to tight working area.	Competent and experienced operators to undertake works.		Likely	Major	Major	JHAs to cover works, appropriate TMP. Clear communications protocols	RMc	Prior to commencement of work
2.14		Lifting operations (slewing, non-slewing, fixed hoists, vehicle loading cranes, loading/unloading of pipelines)	Inadequate lifting equipment leading to dropped objects. Load striking plant/equipment/personnel	Competent and experienced operators, spotters as required, Supervision, load inspections, VOCs, designated laydown areas, Correct PPE, Permits to work		Unlikely	Major	Major	Ensure VOCs completed, identify laydown areas and flag as appropriate, obtain appropriate permits, lift studies, exclusion areas	RMc	Prior to commencement of work
2.15		System not able to be utilised until install	Delay in access to adequate water for the Plant.	Osiris not to cut into the pipe until approved by Processing		Likely	Moderate	High	Develop a schedule for the works with contingencies and aim for Aug shutdown. Processing to approve.	RMc	Prior to commencement of work
2.16		Inadequate survey control	Pipeline interfered with due to lack of accuracy of existing survey information. Delay to project due to survey unavailability.	Previous dxfs exist, to be reviewed for accuracy.		Almost certain	Moderate	High	Install mark pegs and survey to pick up when available.	RMc	Prior to commencement of work
2.17		Refuelling of machinery	Spills of hydrocarbon	Spill kits, only refuel in field what is necessary, all other equipment to be refuelled back on site.		Likely	Minor	Moderate	Supervision of refuelling	RMc	Prior to refuelling
2.18			Inadequate access to gensets for refuelling	Planning to consider turn around areas for vehicles		Likely	Moderate	High			
2.19		Incorrect machinery, operators used	Personal injury, spills, incidents	Lessons learnt from previous incidents (GFR, Bundarra)		Almost certain	Minor	Moderate	Osiris to be supervised by AGAA daily	RMc	Prior to construction
2.20		Chemicals	Chemical spill, personnel injury from chemicals	No chemicals (other than hydrocarbons and welding chemicals) proposed.		Very unlikely	Minor	Moderate	Any chemicals to be approved via ChemAlert and included in JHA	RMc	Prior to commencement of work
2.21		In-field servicing	Spills, personnel injury	No in field servicing allowed. All servicing to be completed at respective contractor's laydown areas.		Very unlikely	Moderate	Moderate			
2.22		Dust	Visibility reduced on road due to trenching	Not seen as a significant issue, no plan to water the roads		Almost impossible	Insignificant	Minor			
2.23		Other		No confined space, no isolation, no working at heights		Almost impossible	Insignificant	Minor			
3.1	Set-up of worksite / site establishment	Clearing for crib and other facilities - no onsite facilitie	Unauthorised clearing, damage to infrastructure	GDP process		Unlikely	High	High	General a arrangement drawings to be produced for the facilities and appropriately approved	MM/RMc	Prior to commencement of work
3.2		Installation of temporary facilities such as toilets/ablution facilities, crib room etc - no onsite facilities	Inappropriately located temporary facilities.	Planning of facilities, JHA		Unlikely	Moderate	High	General arrangement drawings to be produced for the facilities and appropriately approved.	RMc	Prior to commencement of work
3.3		Temporary toilets/ablution facilities - no onsite facilities	Sewerage spill	Appropriate type of facility, bunding		Likely	Moderate	High	BB to provide advice on temporary toilets allowed on site	BB	Prior to commencement of work
3.4			Inadequate facilities (hygiene/health issues)	Ensure adequate facilities on site		Unlikely	Moderate	High	Kerry Lind to provide advice on requirements. Bob to request	RMc	Prior to commencement of work
3.5			Costs associated with disposal off site	Ensure facilities on site do not need to be disposed off site, with either waste being incinerated or incorporated into TGM waste stream		Likely	Minor	Moderate	Bob to investigate Fiesta Caravans to hire a van with adequate facilities that do not need disposal off site	RMc	Prior to commencement of work
3.6		Pipe delivered to site	Inadequate laydown for pipe delivery	Designated laydown with adequate area delineated		Likely	Minor	Moderate	Bob to identify the laydown requirements and exact locations inc. transfer pump area.	RMc	Prior to commencement of work
3.7		HDPE pipeline exposed to sun (inappropriate storage)	Inadequate appropriate laydown for pipe with shading	Designated laydown and forward planning of works.		Likely	Minor	Moderate	Bob to identify the laydown requirements and exact locations inc. transfer pump area.	RMc	Prior to commencement of work
3.8		Trailor mounted Genset	Spill during refuelling	Trailor to be refilled onsite and mobilied each day		Likely	Moderate	High	Refueling to be undertaken at Bulk diesel tank	RMc	Prior to commencement of work
3.9			Additional turnaround for rigid truck - not planned	Planning of facilities		Likely	Moderate	High	General arrangement drawings to be produced for the facilities and appropriately approved.	RMc	Prior to commencement of work
3.10		Fencing of compound	Existing fencing inadequate and requires additional fencing	Planning of facilities, compliance with the Fencing Specification		Likely	Minor	Moderate	General arrangement drawings to be produced for the facilities and appropriately approved.	RMc	Prior to commencement of work
3.11		Need to plan the boundaries for fencing while considering the access.	Existing fencing inadequate and requires additional fencing	Planning of facilities, compliance with the Fencing Specification		Likely	Minor	Moderate	General arrangement drawings to be produced for the facilities and appropriately approved.	RMc	Prior to commencement of work
3.12		Vehicle tracks within the pipeline corridor	Unauthorised clearing, damage to infrastructure	JHAs		Likely	Moderate	High	Windrows to be planned and installed	RMc	During works
4.1	Clearing of vegetation	Unauthorised clearing	Vehicles undertaking clearing by driving off tracks, or creating additional disturbances for turn around areas	GDP process, JHA, work planning		Almost certain	Moderate	High	General arrangement drawings to be produced for the facilities and tracks and appropriately approved.	RMc	Prior to commencement of work
4.2		Interaction with existing pipeline	While clearing, existing pipeline cut into causing a water spill	Excavation Permit.		Likely	Moderate	High	Existing pipeline to be identified in the field	RMc	Prior to commencement of work
4.3		Clearing for bore and pipeline installation	Clearing outside approved areas	GDP process		Likely	Moderate	High	GDP to be read and understood by all in the field.	RMc	Prior to commencement of work
4.4		Clearing in excess of approval	Clearing outside approved areas	GDP process, flagging in the field		Likely	High	High	Conducted spot checks to confirm clearing width prior to trench establishment. Survey to pick up total clearing once ojb is finalised	BB	Prior to commencement of work
4.5		Underestimation of clearing	Clearing outside approved areas	GDP process, flagging in the field		Likely	Moderate	High	Bob to identify additional clearing that may be required	RMc	Prior to clearing
4.6		Weeds	Weeds introduced to area from clearing and unwashed / unhygienic equipment	Craig Harvey's team utilising existing procedures. Ensure machinery washed down if coming from Ponton Creek		Unlikely	Moderate	High	Only to use equipment based at Tropicana for this job.	JB	Prior to clearing
5.1	Bore headworks installation	Concreting of headworks for each bore	Concrete waste management	Concrete waste to be returned back to the batch plant washout pad		Likely	Minor	Moderate	Osiris to be aware of requirements	RMc	Prior to concreting
5.2			Concrete exposure to personnel	PPE, Experienced operators		Almost certain	Insignificant	Minor			

Workplace Risk Assessment and Control (WRAC)

WRAC Title: Kamikaze Borefield Expansion Risk Assessment													Date: 25/6/14
Operation Description: Work is progressing on the expansion of the Kamikaze borefield, and thus a risk assessment was conducted to ensure health, safety and environmental risks were understood and assessed prior to commencement				Relevant Documents: General Arrangement Drawings									Page:
5.3			Inadequate clearances for concrete headworks			Likely	Minor	Moderate	General arrangement drawings to be produced for the headworks at two bores and appropriately approved	RMc	Prior to concreting
5.4			Inadequate concreting of areas under gensets			Likely	Minor	Moderate	General arrangement drawings to be produced for the headworks at two bores and appropriately approved	RMc	Prior to concreting
5.5		Hypersaline water	Spill during headworks installation			Likely	Moderate	High	A test procedure to be developed prior to commissioning	RMc	Prior to testing
5.6		Future development	Headworks in the wrong location for future redevelopment and pipework tie in			Unlikely	Minor	Moderate	General arrangement drawings to be produced for the headworks at two bores and appropriately approved	RMc	Prior to installation and concreting
6.1	Trenching	Excavation of trench for pipeline installation	Lack of fauna egress, lack of inspections	No more than 1.5km to be excavated/open at one time. Twice daily documented trench inspections		Likely	Moderate	High	Daily morning and afternoon trenching inspections to be completed. To be handed over to Hydrogeology or another team when Osiris on R&R. Must be completed daily if trench open.	RMc	Prior to trenching
6.2		Trenching under roads	Compromising road condition, damage to pipeline	To be installed via sleeve or concrete, TMP, bollards		Unlikely	Moderate	High	TMP to be approved for the area. Adequate signage. Bollards installed to indicate pipeline buried underneath.Contact Supply to discuss requires and release site notification well in advance	RMc	Prior to encroaching on road.
6.3		Trench inadequate size	Trench size inadequate to capture all events as required by approvals			Likely	Moderate	High	Bob to ensure that the trench engineered in accordance with approval conditions on Sustainability Department's advice	RMc	Prior to trenching
6.4		Trenching	Impacting on existing infrastructure, concrete pits etc	Excavation Permit.		Unlikely	Moderate	High	Ensure all permits in place prior to construction	RMc	Prior to trenching
7.1	Cutting of pipe	Personal injury, damage to plant, damage to environment	While cutting pipe, person slips and cuts themselves leading to laceration/amputation	PPE, Experienced operators, JHAs, Appropriate tools		Unlikely	Moderate	High			
8.1	Welding	Inadequate welding controls	Welds fail, Hypersaline spills	Osiris to have Welding controls in place (stamps, registers, QA/QC)		Likely	Moderate	High	Bob to ensure Osiris has the requirements covered, Mini MDR to be developed and provided to AGAA Maintenance	RMc	Prior to welding
8.2		Testing of welds	Hypersaline spills, injury to personnel	Testing and commissioning of pipeline to be done during the day and with adequate personnel to inspect the whole line with adequate valves in place		Unlikely	Moderate	High		RMc	During testing
9.1	Pipeline burial and installation	Burying and installing of pipe	Hypersaline spills, injury to personnel	PPE		Likely	Moderate	High			
9.2		Installation under road	Pipeline damaged over long period of time due to lack of sleeving/protection under road	Pipeline to be sleeved under road and track crossings or anywhere where it may need to be buried under installation		Unlikely	Moderate	High			
9.3		Open/welded pipelines left insitu	Fauna entering the partially installed pipeline	Ensure all ends taped at end of each shift or during installation		Very likely	Moderate	High	Daily inspections	RMc	During works
9.4		Non-compliance with Environmental Design Basis	Legal non-compliances	Ensure familiarity with EDB and requirements. Engineering to comply with EDB and legal obligations. Ensure adequate number of valves to be installed.		Likely	Major	Major	Bob to become familiar with EDB requirements	RMc	Prior to construction
9.5		Inadequate breathers	Breathers to be installed as required	Engineering to be completed for the pipeline to identify requirements. Ensure breathers, if required, to be of the same design as existing, i.e. camel proof		Likely	Major	Major		RMc	Prior to construction
9.6		Commissioning of infrastructure	Tie in affects operation of Processing Plant due to stop in water supply	Ensure tie in day/point coincides with a shutdown.		Very Likely	Major	Extreme			
9.6		Appropriately certified and installed flow meters	Flow meters installed do not accurately reflect the water abstracted, leading to a noncompliance with licence			Likely	Moderate	High	Bob to ensure all flow meters installed are appropriately calibrated and copies of certificates provided to Sustainability	RMc	During installation
9.7		Adequate dip guides and piezos to be installed	Inadequate dip guides installed preventing adequate monitoring			Very Likely	Moderate	High	Bob to ensure adequate installation and design of the bore setup	RMc	During installation
10.1	Post installation	Buried pipe	Damage to infrastructure from vehicles crossings	Pipeline to be installed on the eastern side of the existing or so vehicles do not need to cross, with windrows		Very likely	Major	Extreme	Consider 2 windrows on either side of the pipeline as they do at KCGM. Bollards to be installed at all locations where the pipeline crosses under the road to indicate pipeline buried underneath. Signage to be installed	RMc	Post construction
10.2		Lack of timely survey for post installation survey prior to backfill	Inadequate survey of installed pipeline prior to backfill. Trenches left open for extended period of time	Fauna egress, twice daily inspections		Very likely	Moderate	High	Ensure a plan is developed for when survey would be required and clear communications with Survey team	RMc	Prior to backfilling
10.3		Infrastructure not meeting the AGAA standard	Diesel generator does not have requirements such as fire extinguisher, self bunded tank etc.	Ensure all equipment inspected prior to installation.		Very unlikely	Moderate	Moderate	Bob to ensure the installed infrastructure meets the intent of sustainability, safety and emergency response on site	RMc	Prior to works completing
10.4		Settling of road due to pipeline installed underneath	Road condition deteriorates due to installation of pipeline			Likely	Moderate	High	TMP to be approved for the area. Speed limits to be reduced until road settled. Roads to be inspected on regular basis post installation to verify adequacy.	RMc	Prior to works completing
11.1	Inspection points	Inspection points to have lids installed - requires a crane	Crane access impedes access, crane incidents			Very unlikely	Moderate	Moderate	Lids to be modified so they have inspection hatches	RMc	Prior to installing inspection pits
12.1	Rehabilitation	Existing sumps and turkeys nests filled in	Existing backfilling inadequate	Review prior to commencement of work to make area safe		Very unlikely	Minor	Moderate	Review area prior to commencement of work	RMc	Prior to commencement of work
12.2		Vegetation and Growth Medium Recovery from new clearing	Inadequate availability of material for rehabilitation	Site walkover prior to clearing, identification of stockpile locations		Likely	Moderate	High	Site walkover with Bob and Craig	VS	Prior to commencement of work
								0			
								0			

Supporting Information

AngloGold Ashanti Group Risk Evaluation and Reporting Matrix



Attachment 2: Photos from Trench inspections

Fauna trench inspection photos

Attachment 3: Examples of Fauna Trench Inspection record forms

ANGLOGOLD ASHANTI AUSTRALIA

Trench Inspection Form

Independence Group

Date	Time	Observer	Pipe Section Inspected	Animal sighted	Status – Alive / Dead	Action Taken - called Sustainability, animal exited trench themselves, recovered dead animal etc	Distance from Fauna egress ramp
17-6-14	6.30am	Josh		no animal	no animal	no action needed	
17-6-14	4.45pm	Josh		no animal	no animal	no action needed	
18-6-14	7am	Josh		no animal	no animal	no action needed	
18-6-14	5pm	Josh		no animal	no animal	no action needed	
19-6-14	6.30am	Josh		no animal	no animal	no action needed	
19-6-14	5pm	Josh		no animal	no animal	no action needed	
20-6-14	7:30am	Josh		no animal	no animal	no action needed	
20-6-14	4-30pm	Josh		no animal	no animal	no action needed	
21-6-14	6am	Josh		no animal	no animal	no action needed	
21-6-14	4:30pm	Josh		no animal	no animal	no action needed	
22-6-14	7.45am	Josh		no animal	no animal	no action needed	
22-6-14	5pm	Josh		no animal	no animal	no action needed	

Note: All open pipeline trenches must be inspected within three hours after sunrise and between 3:00pm and 6:00pm. Each animal must be recorded as a separate record on a separate line

Date	Time	Observer	Pipe Section Inspected	Animal sighted	Status – Alive / Dead	Action Taken – called Sustainability, animal exited trench themselves, recovered dead animal etc.	Distance from Fauna egress ramp
16.07.14	10:00	Joe Mendoza	Entire trench	no	N/A	N/A	N/A
16.07.14	16:00	Joe Mendoza	Entire trench	no	N/A	N/A	N/A
17/07/14	13:00	Dave Bayle	Entire Trench	No	N/A	N/A	N/A
18/07/14	10:00	Dave Bayle	Entire Trench	No	N/A	N/A	N/A
19/07/14	09:28	DBayle	Entire Trench	No	N/A	N/A	N/A
19/07/14	16:05	DBayle	Entire Trench	No	N/A	N/A	N/A
20/07/14	05:30	DBayle	Entire Trench	No	N/A	N/A	N/A
20/07/14	16:30	DBayle	Entire Trench	No	N/A	N/A	N/A
21/07/14	09:35	DBayle	Entire Trench	No	N/A	N/A	N/A
21/07/14	16:00	DBayle Trent	Entire Trench	No	N/A	N/A Mapped Filled in Trench.	N/A
22/07/14	09:15	DBayle T.Quesnel	open trench	NO	N/A	N/A	N/A

ANGLOGOLD ASHANTI AUSTRALIA

Trench Inspection Form

Independence Group

Date	Time	Observer	Pipe Section Inspected	Animal sighted	Status – Alive / Dead	Action Taken - called Sustainability, animal exited trench themselves, recovered dead animal etc.	Distance from Fauna egress ramp
9-7-14	6.00.	B.SCHAFER	00-VS/1	NIL	NIL	NIL	NIL
9-7-14.	4.00	B SCHAFER	VS-9	NIL	NIL	NIL	NIL
10-7-14.	6.00.	B SCHAFER	VS-3	N/A	N/A	N/A	N/A
10-7-14.	5.00.	B.SCHAFER	VS-8.	N/A	N/A	N/A	N/A
11-7-14	6.00.	B.SCHAFER	VS-2	DINGO	ALIVE	RAN OFF	ON ROAD.
11-7-14.	5.00	B SCHAFER	VS-8	N/A	N/A	N/A	N/A
12-7-14	6.00.	B.SCHAFER	VS-9	N/A	N/A	N/A	N/A
12-7-14	5.00	B.SCHAFER	VS-2	N/A	N/A	N/A	N/A.
13-7-14	6.00	T Morrison	VS-7	N/A.	N/A	N/A	N/A.
13-7-14	1700	T Morrison	VS-9	N/A	N/A	N/A	N/A.
14-7-14	600	T Morrison	VS-8	N/A	N/A	N/A	N/A
14-7-14	1700	T Morrison	VS-2	N/A	N/A	N/A	N/A.

ANGLOGOLD ASHANTI AUSTRALIA

Trench Inspection Form

Independence Group

Note: All open pipeline trenches must be inspected within three hours after sunrise and between 3:00pm and 6:00pm. Each animal must be recorded as a separate record on a separate line

Date	Time	Observer	Pipe Section Inspected	Animal sighted	Status – Alive / Dead	Action Taken – called Sustainability, animal exited trench themselves, recovered dead animal etc	Distance from Fauna egress ramp
22/8/14	4:30 Pm	MCO		None			
23/8/14	7:00 Am	MCO		None			
23/8/14	1700	MCO		None			
24/8/14	7:00 Am	MCO		None			
25/8/14	7:15	MCO		None.			

ANGLOGOLD ASHANTI AUSTRALIA

Trench Inspection Form

Independence Group

Date	Time	Observer	Pipe Section Inspected	Animal sighted	Status – Alive / Dead	Action Taken - called Sustainability, animal exited trench themselves, recovered dead animal etc.	Distance from Fauna egress ramp
28/7/14	6:30	T Quesnel	Open trench sections	No	N/A	N/A	N/A
28/7/14	17:30	T. Quesnel	Open trench sections	No	N/A	N/A	N/A
29/7/14	7:15	T. Quesnel	Open trench Sections	No	N/A	N/A	N/A
29/7/14	16:30	T. Quesnel	Open trench sections	No	N/A	N/A	N/A
30/7/14	6:20	T. Quesnel	Open trench sections	No	N/A	N/A	N/A
30/7/14	5:45	T. Quesnel	Open trench Sections	No	N/A	N/A	N/A

ANGLOGOLD ASHANTI AUSTRALIA

Trench Inspection Form

Independence Group

Note: All open pipeline trenches must be inspected within three hours after sunrise and between 3:00pm and 6:00pm. Each animal must be recorded as a separate record on a separate line

Date	Time	Observer	Pipe Section Inspected	Animal sighted	Status – Alive / Dead	Action Taken - called Sustainability, animal exited trench themselves, recovered dead animal etc.	Distance from Fauna egress ramp
22/07/14	1600	DBoyle	open Trench sections	No	N/A	N/A	N/A
23/07/14	0917	DBoyle	open trench sections	No	N/A	N/A	N/A
23/07/14	1646	T.Quesnel	Open trench Sections	No	N/A	N/A	N/A
24/07/14	0630	DBoyle	open Trench Section	No	N/A	N/A	N/A
24/07/14	16 20	T.Quesnel	Open trench sections	No	N/A	N/A	N/A
25/07/14	6 20	T.Quesnel	open trench Sections	No	N/A	N/A	N/A
25/07/14	16 30	T.Quesnel	Open trench Sections	No	N/A	N/A	N/A
26/07/14	8 40	T.Quesnel	Open trench Sections	No	N/A	N/A	N/A
26/07/14	16 10	T.Quesnel	Open trench Sections	No	N/A	N/A	N/A
27/07/14	715	T.Quesnel	open trench sections	No	N/A	N/A	N/A
27/07/14	1615	T.Quesnel	open trench Sections	No	N/A	N/A	N/A