# Threatened Species and Communities Management Plan

| Issue No (version) | Status | Original prepared by | Issued to (description /section revised) | Date |
|---|---|---|---|---|
| V1 | Final | AngloGold Ashanti Australia | OEPA (Original Management Strategy with PER) | September 2009 |
| V2 | Draft for Review | AngloGold Ashanti Australia/360 Environmental | DPaW | March 2014 |
| V2 | Final | AngloGold Ashanti Australia/360 Environmental | OEPA | December 2014 |
| V3 | Draft for Review | AngloGold Ashanti Australia | DBCA | December 2017 |
| V3 | Revision including DBCA feedback | Tropicana Joint Venture | Internally | December 2019 |
| V4 | Draft for review focussed on EPA Management Plan template | Tropicana Joint Venture | DWER/EPA<br>DBCA | December 2021 |

## Endorsement

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Position: Manager Environment Operations

Date:21/12/2021

# 1 Summary

Conditions 6.1 and 6.2 of Ministerial Statement 839 and condition 4 of EPBC Act Approval No. 2008/4270 requires the Tropicana Joint Venture (Tropicana JV) to implement and review its Threatened Species and Communities Management Strategy (TSCMS) for the Tropicana Gold Project (TGP).

Following consultation *with the Department* of Biodiversity, Conservation and Attractions (DBCA) and Department of Water and Environmental Regulation (DWER); DWER has provided guidance to use its management plan template for the next revision of the strategy. With this in mind, the Tropicana JV has critically revised the TSCMS to fit the structure and outcomes of DWER's management plan template and have renamed the TSCMS to the Threatened Species and Communities Management Plan (TSCMP).

For the intent of satisfying condition 6.1 of Ministerial Statement 839, the TSCMP should be regarded as the TSCMS.

The table below presents the summary and purpose of the TSCMP for the purposes of satisfying condition 6 of the Ministerial Statement 839.

| Item | Description |
|---|---|
| Title of Proposal | Tropicana Gold Project |
| Proponent Name | Tropicana Joint Venture (AngloGold Ashanti Australia Limited and Independence Group NL) |
| Ministerial Statement Number | Ministerial Statement 839<br>EPBC Act approval 2008/4270 |
| Purpose of the EMP | Minimise adverse impacts to conservation significant species and communities. |
| Key Environmental Factors and Objectives | Relevant Ecological Factors include:<br>Flora and vegetation<br>Terrestrial fauna<br>Subterranean fauna |
| Condition Clauses | Ministerial Statement 839: Condition 6.1 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.<br>Ministerial Statement 839: Condition 6.2 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.<br>EPBC Act Approval 2008/4270: Condition 4 The proponent must implement the "Tropicana Gold Project Threatened Species and Communities Management Strategy Version 3.0, September 2009", or subsequent revisions approved by the WA EPA. The proponent must provide the Department with the revised strategy within 14 days of approval by the WA EPA. |

| Item | Description |
|---|---|
| Key Provisions in the Plan | No loss of Threatened flora attributable to mining activities<br>No new weed species shall establish in rehabilitation areas<br>Weed coverage in rehabilitation no greater than average of three reference sites<br>Disturbance not more than 3,540 ha<br>Demarcation of Threatened flora locations within 50 m of disturbance areas<br>Infrastructure designed to avoid known locations of conservation significant species, mapped habitat for Threatened fauna, and large Marble Gum trees with hollows where practicable<br>Conduct further subterranean fauna risk assessments for major new developments<br>Implement vehicle hygiene inspection programme<br>Installation of fencing around the landfill and isolated turkeys nests<br>Exploration drill holes to be capped immediately after completion<br>Conduct annual review and update of status of conservation significant species and communities |

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# 2 Context, Scope and Rationale

## 2.1 Proposal

The TGP comprises the Tropicana Gold Mine (TGM) and infrastructure to support the operation. Most infrastructure occurs within the project's Operational Area Development Envelope, with other infrastructure located in the Water Supply Area Development Envelope (hosting Process Water Supply Borefield in the Minigwal sub-basin) and the Infrastructure Development Envelope, which hosts the TGM access road, communications towers, and road maintenance infrastructure.

These activities are all approved under Ministerial Statement 839 and EPBC Act Approval 2008/4270.

Key features of the TGP include:

- Disturbance of not more than 3,540 ha (2,570 ha Operational Area; 300 ha Water Supply Area; 670 ha Infrastructure Area);
- Mining of up to four open pits, plus underground mining;
- Waste landforms occupying not more than 1,200 ha;
- A single cell tailings storage facility with possible in-pit tailings deposition.

In the time since original approvals for the TGP, the status of Threatened species and ecological communities has changed (and will continue to change) through improved information on species status (both upgrades and downgrades) and additional monitoring data. These have formed part of the latest update.


**Figure 1: TGP Development Envelopes**

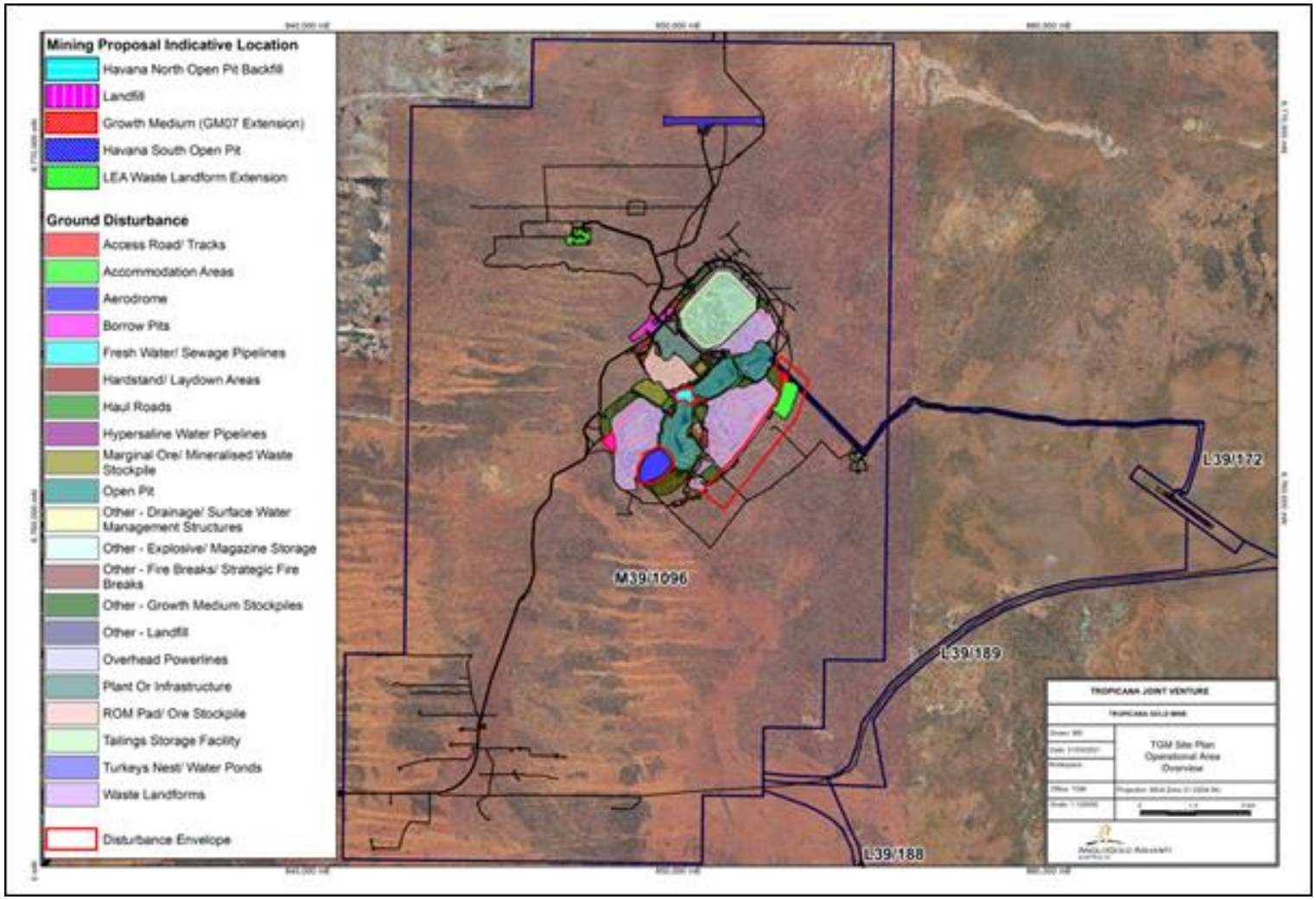


**Figure 2: Tropicana Gold Mine Site Layout**

## 2.2 Key Environmental Factors

The EPA determined there were five key environmental factors for the project which were subsequently assessed through the TGP Public Environmental Review (PER):

- Flora and vegetation;
- Terrestrial fauna;
- Subterranean fauna;
- Groundwater quality; and
- Rehabilitation and mine closure.

This TSCMP addresses the flora and vegetation, terrestrial fauna and subterranean fauna factors which are affected by the project activities described for each factor:

- Flora and vegetation – affected by disturbance for the mine and infrastructure;
- Terrestrial fauna - affected by disturbance for the mine and infrastructure and interaction with vehicles, development of trenches for pipelines, turkey nests and operation of a tailings storage facility (TSF).
- Subterranean fauna (troglofauna) – affected by direct habitat removal from mining and placing key infrastructure over the top of habitat such as waste landforms and TSF.

At the time of referral of the TGP (for 2008/4270) to the Commonwealth, the following Matters of National Environmental Significance were identified as present or likely to be present:

- Malleefowl – Vulnerable;
- Southern Marsupial Moles – Endangered;
- Sandhill Dunnart – Endangered (not recorded but suitable habitat present);
- Victoria Desert Smokebush (Conospermum toddii) – Endangered; and
- Rainbow Bee-eater – Migratory.

## 2.3 Condition Requirements

Specific conditions relating to Threatened and other conservation significant species and communities are described below. Those with outcome based provisions are summarised in **Table 1**

**Table 1: Condition Requirements for the TSCMP under Ministerial Statement 839 and EPBC Act Approval 2008/4270**

| Instrument and Condition | Requirement | Section Addressed |
|---|---|---|
| Ministerial Statement 839<br>Condition 5.1 | 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. | 4.1 and 4.2 |
| Ministerial Statement 839<br>Condition 6.1 | 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. | Entire document |
| Ministerial Statement 839<br>Condition 6.2 | 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. | 0 and 6 |

| Instrument and Condition | Requirement | Section Addressed |
|---|---|---|
| Ministerial Statement 839<br>Condition 6.3 | The proponent shall make the Tropicana Gold Project Threatened Species and Communities Management Strategy referred to in 6.1 publicly available in a manner approved by the Chief Executive Officer of the Office of the Environmental Protection Authority. | 4.4 |
| EPBC Act Approval 2008/4270<br>Condition 4 | The proponent must implement the "Tropicana Gold Project Threatened Species and Communities Management Strategy Version 3.0, September 2009", or subsequent revisions approved by the WA EPA. The proponent must provide the Department with the revised strategy within 14 days of approval by the WA EPA. | 0 and 6 |
| EPBC Act Approval 2008/4270<br>Condition 5 | If the Minister believes that it is necessary or desirable for the better protection of the Leipoa ocellata (Malleefowl), or other listed EPBC flora and fauna species to do so, the Minister may request that the proponent make specific revisions to the strategy referred to in condition 4, and submit the revised strategy for the Minister's approval. The proponent must comply with any such request. The revised approved strategy must be implemented. Unless the Minister has approved the revised strategy, the proponent must continue to implement the strategy referred to in condition 4. | Contingent only |

## 2.4 Rationale and Approach

In clarifying the rationale for this management plan, it is noted there is a difference between the title of the TSCMP, the scope of EPBC Act approval 2008/4280 (Matters of National Environmental Significance) and the objective contained in condition 6.1 of Ministerial Statement 839 of objective of this strategy is to "minimise adverse impacts to conservation significant species and communities". To reconcile these differences, the TSCMP is focussed on protecting the highest value flora and fauna values (Threatened flora, fauna, and ecological communities, listed Migratory and Other Specially Protected fauna) as defined by the Biodiversity Conservation Act and/or EPBC Act. For the purposes of the TSCMP these are collectively described as Threatened flora, fauna and/or ecological communities.

At a lower level, are "other conservation significant flora, fauna and ecological communities" which are not afforded the same legal protections as Threatened species/communities. These constitute priority flora, fauna and ecological communities listed by the Department of Biodiversity Conservation and Attractions (DBCA) and subterranean fauna (as a key environmental factor raised by the EPA during assessment of the TGP). In most respects, managing and minimising impacts on other conservation significant species and communities, adopts the same management strategies used for protection of Threatened species and communities.

### 2.4.1 Survey and Study Findings

Surveys conducted for the TGP PER identified several Threatened and other conservation significant species (Table 2 and Table 3). Since these studies, further work has been conducted at TGM as part of project modifications, monitoring commitments and site observations (due to the large number of studies, a complete list of TGP studies and key findings is presented in Appendix A). In the wider regional context, the Great Victoria Desert Biodiversity Trust has also been active in conducting biological surveys within the Great Victoria Desert increasing the knowledge base of species distribution.

The status of Threatened and other conservation significant species has also changed (promotions and relegations) at both the Commonwealth and State level. The confluence of these factors has led to changes to Threatened and priority species present or considered likely to be present at TGM. The change in status is recorded within Table 2 and Table 3.

### 2.4.2 Conservation Significant Flora

At the time of the PER, there was one recorded Threatened flora species (Victoria Desert Smokebush - *Conospermum toddii*). Another Threatened species was also potentially present along the Pinjin Infrastructure Corridor (Eucalyptus articulata - from the presence of mallees recovering after fire). Subsequent molecular assessment by Botanic Gardens and Parks Authority Service (2009) determined these mallees were not E. articulata.

Table 2 updates recorded Threatened and priority flora species across the TGP informed by a consolidation review undertaken by Mattiske Consulting Pty Ltd using baseline surveys and annual vegetation monitoring results. Changes to the species list since the previous TSCMS are illustrated in Appendix B.

Based on the current conservation status, there are no Threatened flora across the TGP, although there are 19 priority flora present as other conservation significant flora.

**Table 2: Conservation Significant Flora Recorded or Expected to Occur in and Around the Project's Development Envelopes**

| Species | Area Located or Expected | | | Conservation Status at the Time of the PER (2009) | | Current Conservation Status (2021) | | Preferred Substrate |
|---|---|---|---|---|---|---|---|---|
| | Operational Area | Pinjin Corridor | Water Supply Area | WA | Commonwealth | WA | Commonwealth | |
| *Acacia eremophila* numerous nerved variant | ✓ | - | - | P3 | - | P3 | - | Sandy soils and flats. |
| *Acacia eremophila* var. variabilis | ✓ | - | - | P3 | - | P3 | - | Sandy or sandy loam. |
| *Baeckea* sp. Sandstone | ✓ | - | - | P1 | - | P3 | - | Orange sand and flats. |
| *Caesia talingka* now *Caesia* sp. Great Victoria Desert | ✓ | - | - | Undescribed | - | P2 | - | Sand dunes. |
| *Comesperma viscidulum* | - | ✓ | - | P4 | - | P4 | - | Sandstone breakaway, red gritty sand, dune crest, swale, and rocky slopes. |
| *Conospermum toddii* | ✓ | ✓ | ✓ | T- DRF | EN | P4 | - | Crests of sand dunes and in interdunal swales between the sand dunes. |
| *Dampiera eriantha* | ✓ | - | - | P1 | - | P2 | - | Yellow sand dunes. |

| Species | Area Located or Expected | | | Conservation Status at the Time of the PER (2009) | | Current Conservation Status (2021) | | Preferred Substrate |
|---|---|---|---|---|---|---|---|---|
| | Operational Area | Pinjin Corridor | Water Supply Area | WA | Commonwealth | WA | Commonwealth | |
| *Dicrastylis cundeeleensis* | - | ✓ | ✓ | P3 | - | P4 | - | Yellow sand, red or reddish-yellow sand. Often found on sandplains. |
| *Eucalyptus pimpiniana* | - | ✓ | - | P3 | - | P3 | - | Red sand, sand dunes and plains. |
| *Grevillea secunda* | ✓ | ✓ | - | P2 | - | P4 | - | Yellow or red sand, sand dunes and sand plains. |
| *Labichea eremaea* | - | - | ✓ | P3 | | P3 | - | Red sands |
| *Malleostemon* sp. Officer Basin | ✓ | - | - | P2 | - | P2 | - | Yellow sand and dune slopes. |
| *Micromyrtus serrulata* | - | ✓ | - | P3 | - | P3 | - | Brownish sandy and clayey soils over granite. |
| *Olearia arida* | ✓ | ✓ | ✓ | P4 | - | P4 | - | Red or yellow sand and undulating low rises. |
| *Thryptomene eremaea* | - | ✓ | - | P2 | - | P2 | - | Red or yellow sand and sandplains. |

| Species | Area Located or Expected | | | Conservation Status at the Time of the PER (2009) | | Current Conservation Status (2021) | | Preferred Substrate |
|---|---|---|---|---|---|---|---|---|
| | Operational Area | Pinjin Corridor | Water Supply Area | WA | Commonwealth | WA | Commonwealth | |
| *Trachymene pyrophila* | - | - | - | | - | P2 | - | *Yellow or orange sand. T. pyrophila is often found on sandplains; germinating after fire or other disturbances.* |
| *Vittadinia pustulata* | ✓ | | | | | P3 | - | *Sandy red loam soils, in grasslands or disturbed sites* |
| *Lechenaultia aphylla* | | | | | | P1 | - | *Red sand on slopes and drainage areas.* |
| *Calytrix warburtonensis* | | | | | | P2 | | *Rocky hills and breakaways* |

*Species which are no longer recorded as Threatened or priority have been removed from the table.*

### 2.4.3 Conservation Significant Fauna

At the time of the PER, two Threatened fauna species had been recorded in surveys (Southern Marsupial Mole and Malleefowl). The Sandhill Dunnart had not been recorded although suitable habitat was located. In addition, the Rainbow Bee-eater was also listed as a Matter of National Environmental Significance (Migratory species). Long abandoned nests (in breakaways) of the locally extinct Stick-nest Rat (Leporillus sp.) were also recorded.

Table 3 contains an updated list of Threatened, and other conservation significant fauna which have been recorded (formally or informally) or the Tropicana JV considers to be likely to occur within at least one of the TGP development envelopes through the presence of suitable habitat, changes in habitat distribution from lightning initiated regional fires and recent third-party records in the Great Victoria Desert. Changes to the species list since the previous TSCMS are illustrated in Appendix C.

The breeding season for conservation significant fauna species, as understood in 2010, were identified and are in Appendix D. Monitoring and other activities will take into consideration the potential for species breeding seasons and if practicable will avoid the peak breeding season and key habitats.

Based on current knowledge, Threatened species present or believed to be present in at least one of the TGP's development envelopes are:

- Sandhill Dunnart (Endangered);
- Malleefowl (Vulnerable);
- Princess Parrot (Vulnerable);
- Great Desert Skink (Vulnerable);
- Grey Falcon (Vulnerable);
- Peregrine Falcon (Other Specially Protected);
- Common Greenshank (Migratory);
- Fork-tailed Swift (Migratory);
- Oriental Plover (Migratory); and
- Wood Sand-piper (Migratory).

Of these, the migratory species and falcons are expected to be vagrants only, either exploiting opportunistic conditions in the region (e.g., migratory species following passage of cyclones) or occupying very large ranges of aerial habitat (falcons). This leaves the key Threatened species from a management perspective being the Sandhill Dunnart, Malleefowl, Princess Parrot and Great Desert Skink.

**Table 3: Conservation Significant Fauna Recorded or Expected to Occur in and around the Project's Development Envelope**

| Species | Area Located or Expected | | | Conservation Status at the Time of the PER (2009) | | 2021 Status | | Habitat Notes |
|---|---|---|---|---|---|---|---|---|
| | Operational Area | Pinjin Corridor | Water Supply Area | WA | Commonwealth | WA | Commonwealth | |
| Central Long-eared Bat - *Nyctophilus major tor*. (previously *N. timoriensis*) | - | - | - | P4 | - | P3 | - | 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. |
| Mulgara - Brush-tailed *Dasycercus blythi* | - | - | ✓ | P4 | - | P4 | - | 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. |
| Sandhill Dunnart - *Sminthopsis psammophila* | - | - | - | S1 | EN | 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. |
| Southern Marsupial Mole | ✓ | - | ✓ | S1 | EN | P4 | - | 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 |

| Species | Area Located or Expected | | | Conservation Status at the Time of the PER (2009) | | 2021 Status | | Habitat Notes |
|---|---|---|---|---|---|---|---|---|
| | Operational Area | Pinjin Corridor | Water Supply Area | WA | Commonwealth | WA | Commonwealth | |
| - *Notoryctes typhlops* | | | | | | | | 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. |
| Grey Falcon - *Falco hypoleucos* | - | - | - | P4 | - | VU | 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. Likely to occur at times as a vagrant. |
| Malleefowl - *Leipoa ocellata* | ✓ | ✓ | ✓ | S1 | VU | 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* | - | - | - | S4 | - | P4 | - | 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. Its presence is expected to be as a vagrant. |

| Species | Area Located or Expected | | | Conservation Status at the Time of the PER (2009) | | 2021 Status | | Habitat Notes |
|---|---|---|---|---|---|---|---|---|
| | Operational Area | Pinjin Corridor | Water Supply Area | WA | Commonwealth | WA | Commonwealth | |
| *haematogaster narethae* | | | | | | | | |
| Peregrine Falcon - *Falco peregrinus* | ✓ | - | - | S4 | - | OS | - | The species prefers habitat with rocky ledges, cliffs, watercourses, open woodland or margins with cleared land. Whilst recorded its presence is expected to be as a vagrant. |
| Striated Grass wren - *Amytornis striatus* | - | - | - | P4 | - | 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* | - | - | - | P4 | - | 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. |
| Princess Parrot Alexandra's Parrot- *Polytelis alexandrae* | - | - | - | S1 | VU | P4 | VU | 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, |

| Species | Area Located or Expected | | | Conservation Status at the Time of the PER (2009) | | 2021 Status | | Habitat Notes |
|---|---|---|---|---|---|---|---|---|
| | Operational Area | Pinjin Corridor | Water Supply Area | WA | Commonwealth | WA | Commonwealth | |
| | | | | | | | | particularly River Red Gums *E. camaldulensis*, and also in Desert Oaks *Allocasuarina decaisneana.*<br>Whilst it has yet to be recorded, its presence is most likely to be near large Marble Gum trees with hollows. |
| Common Greenshank - *Tringa nebularia* | - | ✓ | - | IA | MI | MI | MI | The Common Greenshank is typical of well-watered regions; casual or vagrant on west-coast islands and in the arid east. Whilst recorded, its presence is expected to be as a vagrant during favourable conditions. |
| Fork-tailed Swift - *Apus pacificus* | ✓ | - | - | IA | MI | MI | MI | Aerial: over open country, from semi-deserts to coasts, islands; sometimes over forests, cities. Whilst recorded, its presence is expected to be as a vagrant during favourable conditions. |
| Oriental Plover, Oriental Dotterel - *Charadrius veredus* | - | - | - | - | MI | MI | MI | 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.<br>Its presence is expected to be as a vagrant during favourable conditions. |

| Species | Area Located or Expected | | | Conservation Status at the Time of the PER (2009) | | 2021 Status | | Habitat Notes |
|---|---|---|---|---|---|---|---|---|
| | Operational Area | Pinjin Corridor | Water Supply Area | WA | Commonwealth | WA | Commonwealth | |
| Wood Sandpiper - *Tringa glareola* | - | ✓ | - | | Mi | MI | MI | The Wood Sandpiper is typical of well-watered regions, particularly coastal plains and plains about lower courses of larger rivers. Whilst recorded, Its presence is expected to be as a vagrant during favourable conditions. |
| Great Desert Skink - *Liopholis kintorei (Egernia kintorei)* | - | - | - | S1 | VU | 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. |
| *Lerista puncticauda* | - | - | - | P2 | - | P2 | - | *Lerista puncticauda* prefers arid shrub-lands; sandridges vegetated with Marble Gums and *Triodia basedowii*. |
| Woma Python - *Aspidites ramsayi* | ✓ | - | ✓ | P1 | - | P1 | | 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. |

Species which are no longer recorded as Threatened or priority have been removed from the table.

### 2.4.4 Subterranean Fauna

Stygofauna and Troglofauna species in Western Australia exhibit high levels of endemism and many species have very restricted ranges, and as such were an important consideration in the Environmental Impact Assessment process (EPA 2003). Prior to surveys conducted for the TGP, there was no known data from the area surrounding TGM's Operational Area.

During the baseline surveys, no Stygofauna were recorded, with four Troglobitic species recorded in the Operational Area:

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

The slater was located within and outside of the disturbance footprint, whilst the dipluran, centipede have been located inside the disturbance footprint. The cockroach was located outside of the disturbance footprint.

In late 2019, a stygofauna survey was recently conducted at the Kamikaze borefield in the southwestern corner of the Operational Area. The survey did not record any stygofauna.

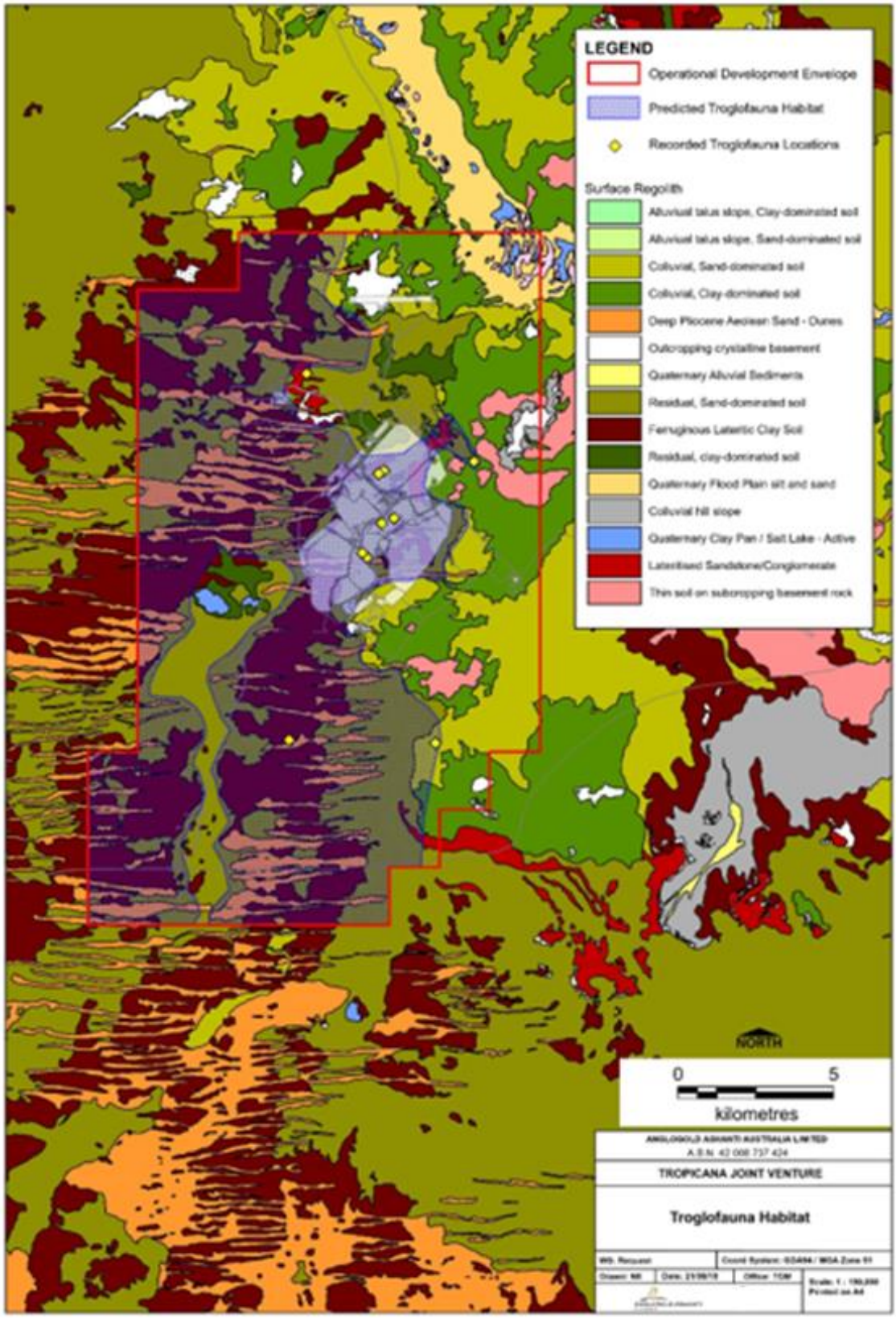


**Figure 3: Subterranean Fauna Records and Habitat Across the Operational Area Development Envelope**

### 2.4.5 Ecological Communities

Flora and vegetation surveys conducted for the PER did not identify the presence of Threatened Ecological Communities (TECs) within any of the development envelopes. However, areas of vegetation in the Operational Area and Pinjin Infrastructure Corridor were noted as having possible similarities to the Priority 3 (ii) ecological community (PEC) 'Yellow sandplain communities of the Great Victoria Desert'. At the time, detailed descriptions and complete regional boundaries of the PEC were not available. Thus, it was concluded the Operational Area was likely outside the PEC, but peripheral areas of the PEC may be intersected by the Pinjin Infrastructure Corridor.

In 2016, the EPA published a full boundary of the PEC in the Mulga Rocks Uranium Project Report and Recommendations of the Environmental Protection Authority (EPA 2016). The PEC was defined to occur over 1,692,000 ha. Whilst the PEC does not overlap the Operational Area development envelope, it does intersect substantial parts of the Pinjin Infrastructure Corridor. More recently, the PEC has been renamed as "Yellow sandplain vegetation of the Great Victoria Desert with diverse vertebrate fauna."

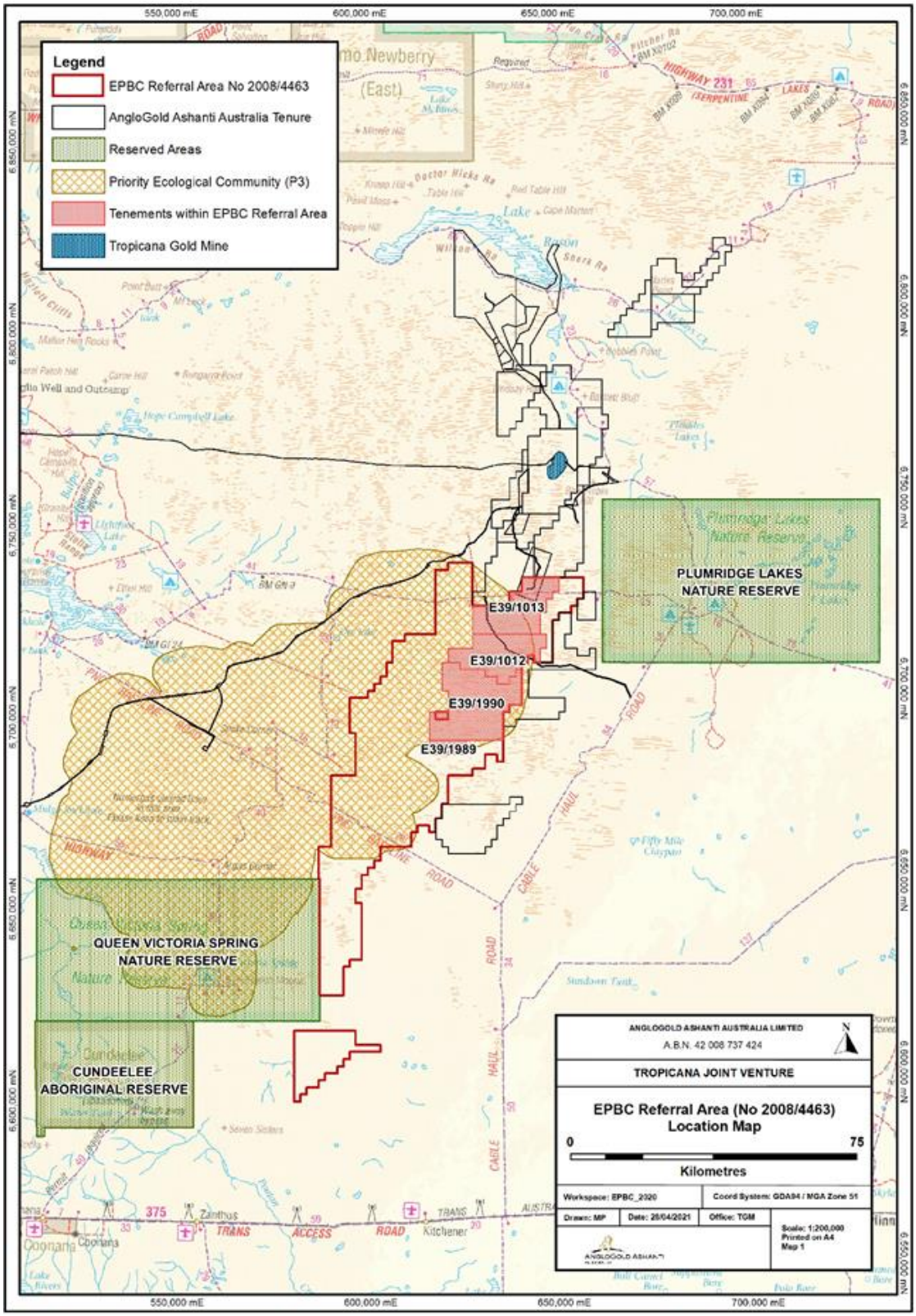


**Figure 4: Boundary of the Yellow sandplain vegetation of the Great Victoria Desert with diverse vertebrate fauna Priority Ecological Community**

# 3 Key Assumptions and Uncertainties

## 3.1 Assumptions

It is assumed measures to avoid direct disturbance to areas of known presence or mapped habitat for Threatened species and minimising overall disturbance footprints will have the greatest effect on minimising impacts to Threatened and conservation significant species.

Surveys conducted to date provide sufficient coverage of the ranges of vegetation associations and habitats to identify most Threatened and conservation significant species. Achieving 100% coverage of the biological inventory is unrealistic but the scope for new identifying new Threatened or conservation significant species considered unlikely to occur in the area is diminished.

Survey methods and techniques used for baseline and subsequent studies were effective and considered leading practise at the time.

In this update several fauna species have been included as likely to be present (as opposed to records of presence only). This decision has been informed from other work outside of the TGP development envelopes where records have been made, the presence of suitable unburnt habitat. As a result, there is no impediment for such species being within a TGP development envelope as part of their wider distribution. This assumption is also an uncertainty.

The Tropicana JV's prioritisation of minimising impacts to mapped habitat and remnant unburnt vegetation will have higher conservation outcomes than vegetation which has not been identified with particular values of conservation significance or has been recently burnt by lightning initiated fires.

Measures taken to protect Threatened fauna are also effective to protecting/minimising impacts to other conservation significant species. The exception to this are species dependent on or have life strategies which exploit fire.

## 3.2 Uncertainties

The passage of lightning initiated regional fires is a key uncertainty affecting the existence and distribution of flora and fauna species at any one time.

The intensity of survey effort closer to the main impact areas of the TGP, and in particular the Operational Area, does not mean the threatened and conservation significant species are concentrated around the TGP. Rather, reduced data density and low activity levels by TGM personnel in the regional areas mean a lower recording/observation of threatened and conservation significant species.

### 3.2.1 Management Approach

Management measures are required to ensure the project will not have a significant impact on Threatened species and communities at the TGP.
In adopting the TSCMS to the EPA management plan template, several management strategies were obscure in how they could be implemented or measured. This has required critical revision of strategies to more clearly reconcile with the objective they are trying to achieve.
Whilst the TSCMP is a standalone plan for the purposes of Ministerial Statement 839 and EPBC Act approvals, it is supported in the background by TGM's Integrated Management System and in particular Biodiversity Management Plan, which not only captures the Tropicana JV's commitments to Threatened species and communities but also addresses the Tropicana JV's corporate biodiversity commitments.
Potential impacts to Threatened and other conservation significant species and communities include:

- Direct loss of conservation significant species and communities from disturbance activities;
- Direct loss of habitat for conservations significant species; and
- Indirect loss from weed infestation/competition.
- Indirect loss from feral animal predation.

- Indirect loss from use of saline groundwater
- Indirect loss by entrapment of conservation significant fauna in trenches, turkeys nests or the TSF.
- Indirect loss from decline in vegetation and habitat due to dust generation.
  - Indirect loss from artificial changes to fire regimes.
  - Direct loss from interactions between conservation significant fauna vehicles travelling along roads.
  - Indirect loss to habitat from hydrocarbons and chemicals.
  - Indirect loss to vegetation and habitat from contact with saline water.

Management of Threatened and other conservation significant species and communities at the TGP is based on the hierarchy of:

- Avoidance;
- Impact minimisation; and
- Remediation/rehabilitation.

## 3.3 Avoidance

The primary management approach to avoid impacts to Threatened species and communities or their habitat and other conservation significant species and communities is to avoid direct disturbance through the Tropicana JV's Ground Disturbance Permit process. By following this process, the only impacts to Threatened species and communities are those which have been assessed under Part IV of the Environmental Protection Act and EPBC Act.

## 3.4 Minimising Impact

When planning for development of the TGP during the approvals phase, some impacts were unavoidable which included disturbance to sand dunes (habitat for the Southern Marsupial Mole and a number of priority flora species), habitat for Malleefowl and Sandhill Dunnarts and potential habitat for troglofauna. However, with the benefit of baseline data and planning of activities, direct impacts were minimised to those required to develop the project.

Indirect impacts may not be entirely preventable and so provisions are applied to reduce or minimise the likelihood of their occurrence. In some cases, effective management controls can prevent occurrence, whilst in others management controls may reduce the extent of an indirect impact.

Remediation or Rehabilitation of Residual Impacts

The primary impact to the Threatened and conservation significant species and communities and their habitat is direct disturbance. Whilst impacts can be minimised, conducting remediation or rehabilitation can diminish the extent of impact or at least re-establish the environment to a point where it encourages return of species.

### 3.4.1 Rationale for Choice of Provisions

The mitigation hierarchy described above recognises avoidance of an impact is always preferable over minimising an impact. However, where impacts can't be avoided, or occur, remediation or rehabilitation provides the best opportunity for minimising the duration of and mitigating the extent of the impact.

Over the 3,540 ha identified for impact, most is expected to be of high intensity with an operational life of 15 years extending to 25 years when including the closure and rehabilitation phase. However, the magnitude of the project's impact in the context of the Great Victoria Desert is small. For example, the total Southern Marsupial Mole habitat impact was assessed to be approximately 15 km of dune out of an estimated 14,000 km of dune north of the Operational Area (representing less than 0.15% of this habitat and less than 0.01% of the available habitat for Southern Marsupial Mole in the Great Victoria Desert).

Similarly, surveys found evidence of 14 inactive Malleefowl mounds in the Operational Area. Modifications to the project avoided all Malleefowl mounds with the exception of one inactive mound in the Operational Area (coinciding with location of open pits). Disturbance to some mapped habitat for conservation significant fauna, including Malleefowl and Sandhill Dunnart was approved for development of the project.

Fire is the principal influence on conservation significant species (mostly negative, but for some species like Trachymene pyrophila fire is a positive influence). Remnant unburnt vegetation following the passage of several lightning initiated regional fires have increased the value as refuge habitat.

Therefore, key management provisions in the TSCMP are focussed on avoiding or minimising direct disturbance to habitat for conservation significant species and remnant unburnt vegetation.

# 4 Management Plan Provisions

The primary objective of the TSCMP "is to minimise adverse impacts to conservation significant species and communities". Whilst the term "minimise adverse impacts" and much of the language in previous versions of the TSCMS is geared towards management based provisions, there are several outcome based provisions which are applicable to the TSCMP.

## 4.1 Outcome Based Provisions

Using the EPA's guidance, outcome based provisions are clear unambiguous (shall/must/maintain) criteria used for determining an outcome. Whilst these were not previously part of the TSCMS, they are explicitly stated in Ministerial Statement 839.

**Table 4: Outcomes Based Provisions**

| Environmental Objective/Condition | Environmental Criteria | Response Actions | Monitoring | Reporting |
|---|---|---|---|---|
| 5.1 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 | Trigger Criteria – No trigger<br><br>Threshold Criteria - Loss of 1 or more plant of a Threatened flora species without prior approval | Stop the incident/activity from continuing to have impact.<br><br>Notify DWER, DBCA and DAWE.<br><br>Determine if any individuals within population affected can be saved and mark off to prevent further disturbance.<br><br>In consultation with DBCA determine if there is any salvageable material for future propagation (including authorisation to take if salvage is practicable).<br><br>Review other populations to determine if any are suitable for collection of propagules<br><br>Obtain authorisation to take prior to harvesting propagules<br><br>Conduct propagation/seeding in other suitable areas to achieve no nett loss of individuals<br><br>Investigate the incident and report to DWER, DBCA and DAWE<br><br>Review which management strategy/ies failed and make changes | Pre-disturbance Ground Disturbance Permit (GDP) and Environmental and Heritage Inspection (EIN)<br><br>Post clearing reconciliation survey<br><br>Post impact population monitoring<br><br>Monitoring of propagules | External:<br><br>CAR report<br><br>Regulatory notification – if excursion occurred<br><br>Internal:<br><br>Incident report<br><br>GDPs and EINs |

| Environmental Objective/Condition | Environmental Criteria | Response Actions | Monitoring | Reporting |
|---|---|---|---|---|
| Minimise loss of habitat for Threatened fauna<br>Disturbance not more than 3,540 ha comprising:<br>2,570 ha within Operational Area Development Envelope<br>300 ha within Water Supply Area Development Envelope<br>670 ha within Infrastructure Development Envelope | Trigger Criteria:<br>No trigger<br>Threshold Criteria:<br>Non-exploration disturbance of:<br>2,570 ha Operational Area<br>300 ha Water Supply Area<br>670 ha Infrastructure Corridor | Notify DWER<br>Obtain further approval if footprint exceeds or is planned to exceed disturbance limits | Annual flyover reconciliation | External:<br>CAR report<br>Regulatory Notification– if excursion occurred<br>Internal:<br>Incident report<br>GDPs and EINs |

## 4.2 Management Based Provisions

Previous versions of the TSCMS have been derived from management based provisions. To reconstruct the strategies within the TSCMS into the format of the EPA's management plan template the following general approach has been taken:

- Threats and/or Potential Impacts have been used to derive Management Objectives;
- Management Strategies have been used to derive Management Actions (often with substantial revision to make them more measurable);
- Targets have been used to derive Management Targets; and
- Monitoring and Reporting columns have been newly populated as there was no direct equivalent in the TSCMS (other than auditing the TSCMS).

**Table 5: Management Based Provisions**

| Management Objective | Management Action | Management Targets | Monitoring | Reporting |
|---|---|---|---|---|
| Minimise direct loss of conservation significant species and communities or their habitat from disturbance activities | Known locations of Threatened flora within 50 m of the disturbance area will be visibly demarcated.<br><br>Infrastructure areas will be designed and located to avoid known locations of Threatened flora<br><br>Infrastructure areas will be designed and located to avoid known locations of conservation significant species and ecological communities, mapped habitat for Threatened fauna and large Marble Gum trees with hollows, where practicable. When disturbance is unavoidable, design infrastructure to minimise impacts.<br><br>Areas of habitat for conservation significant species identified with the TGM GIS database and used for planning and design.<br><br>Recently defined boundary of the "Sandplain Vegetation of the Great Victoria Desert with Diverse Vertebrate Fauna PEC" imported to the TGM GIS database for use when planning activities along the Pinjin Infrastructure Corridor and in exploration areas.<br><br>Collection of seed from conservation significant flora in accordance with the Biodiversity Conservation Act and DBCA requirements. | No Threatened flora will be disturbed by the project<br><br>No adverse impacts to conservation significant species or communities outside approved areas/activities | Annual review of conservation significant species and ecological communities status.<br><br>Mapped habitat and GIS records of conservation significant species and communities used to assess GDPs and inform field EINs<br><br>Post clearing survey reconciliation | External:<br><br>Regulatory notification should mortality of Threatened species occur or disturbance to Malleefowl mound to DBCA, DAWE and DWER.<br><br>Regulatory notification should mortality of other conservation significant species to DBCA.<br><br>Collection of conservation significant flora reported/submitted to WA Herbarium (DBCA).<br><br>Internal:<br><br>Incident report<br><br>GDPs and EINs |

| Management Objective | Management Action | Management Targets | Monitoring | Reporting |
|---|---|---|---|---|
| | Where seed from conservation significant flora species has been collected for use in rehabilitation, samples will be contributed to the Threatened Flora Seed Centre (at the WA Herbarium) | | | |
| Minimise direct loss of conservation significant species and communities or their habitat from disturbance activities | Conduct risk assessments forsubterranean fauna for major new developments<br>Where risk assessments identify suitable habitat and uncertainty of impact, conduct supporting subterranean fauna surveys | Risk to subterranean fauna assessed or study undertaken to inform risk for major new developments | Subterranean fauna risk assessment/monitoring | External:<br>Approval submission e.g., S45C for new developments |
| Minimise weed infestations competing with Threatened and conservation significant flora and Threatened fauna habitat | Implement a vehicle hygiene inspection programme for equipment mobilising to site<br>Record the location of weed populations<br>Inspect areas of known past weed infestations at high risk times i.e., after rainfall<br>Following rehabilitation, areas will be monitored and treated for weeds, if necessary<br>Where equipment conducting road maintenance activities at Pinjin Station is likely to interact with weed species then it will be cleaned down at the Pinjin Station boundary | Introduction and spread of weed species as a result of TGM activities minimised | Vehicle hygiene inspection records<br>Weed layer in TGM's GIS system<br>Inspections of past weed infestation areas<br>Weed monitoring within rehabilitation areas | External:<br>CAR report<br>Internal:<br>Incident report<br>Hygiene inspection and area inspection records |

| Management Objective | Management Action | Management Targets | Monitoring | Reporting |
|---|---|---|---|---|
| Minimise feral animal predation of conservation significant species | Site landfill will be fenced to exclude access by scavenging fauna<br>Installation of fencing/barriers around isolated turkeys nests<br>No pets will be permitted in TGM areas<br>All bins to be fitted with secure lids | Feral animals cannot access landfills or isolated turkeys nests<br>In areas of known feral animal activity bins will be modified to prevent access by feral animals | Inspections of isolated turkeys nests for fence integrity<br>Conduct routine feral animal abatement programs in areas of higher potential (Village, Admin Offices, Crib rooms)<br>Workforce reports of feral animals | External:<br>CAR report<br>Internal:<br>Inspection records<br>Summary of abatement programmes |
| Minimise potential for entrapment of conservation significant species in trenches and turkeys nests | Trenches will be designed, constructed and inspected to minimise potential entrapment of fauna<br>Installation of fencing/barriers around isolated turkeys nests<br>Installation of egress matting/ramps in turkeys nests<br>Exploration drill holes to be capped immediately after completion | No habitation of turkeys nests (excluding decoy wetlands and avifauna)<br>No conservation significant fauna mortalities trapped/ caught in fences, or in turkeys nests | Inspections of turkeys nests for fence integrity, evidence of fauna mortalities and condition of egress mats<br>Drill hole completion audits | External:<br>CAR report<br>Regulatory notification should mortality of Threatened fauna species occur to DBCA, DAWE and DWER.<br>Regulatory notification should mortality of other conservation significant species to DBCA.<br>Internal:<br>Incident report<br>Inspection records |
| Minimise interaction of conservation significant fauna with TSFs | Weak Acid Dissociable Cyanide levels on the TSF will be managed in accordance with the TGM International Cyanide Management Code Certification.<br>TSF freeboard design intended to contain a probable maximum precipitation (PMP) event | Maintain compliance with International Cyanide Management Code.<br>No loss of conservation significant fauna when WAD CN exceeds 50 | Daily TSF inspections<br>Decant water monitoring<br>Cyanide Code surveillance auditing<br>Geotechnical auditing | External:<br>CAR report<br>Regulatory notification should mortality of Threatened fauna species occur to DBCA, DAWE and DWER. |

| Management Objective | Management Action | Management Targets | Monitoring | Reporting |
|---|---|---|---|---|
| | Installation and maintenance of decoy ponds to deter fauna use of the TSF decant pond | mg/L at the decant pond.<br>No uncontrolled releases of tailings outside the containment areas.<br>Fauna trapped in tailings are rescued where safe to do so or recorded as mortalities | | Regulatory notification should mortality of other conservation significant species to DBCA.<br>Internal:<br>Incident report<br>Inspection records |
| Minimise dust generation where practicable | Implement dust suppression on active haul roads and internal roads with high traffic (e.g., Village Access Road)<br>Implement dust control in the process plant<br>Minimise new disturbance areas and vegetation clearing | Minimise decline of health of conservation significant species or communities outside approved areas | Annual vegetation monitoring | External:<br>Annual vegetation monitoring reported as part of the CAR report<br>Internal:<br>Incident reporting of excessive dust |
| Minimise interaction between vehicles and conservation significant fauna | Planning and design of infrastructure corridors and resources supply (borrow/gravel pits) will be such to avoid mapped habitat for Threatened and other conservation significant fauna where practicable<br>To minimise vehicle movements, establish a charter flight for Kalgoorlie based employees and contractors to access site.<br>Speed limits to be implemented and enforced along all roads. | Risk of mortalities to conservation significant fauna species reduced | Mapped habitat and GIS records of conservation significant species and communities used to assess GDPs and inform field EINs<br>Post clearing survey reconciliation<br>Periodic speed checks | External:<br>Regulatory notification should mortality of Threatened fauna species occur to DBCA, DAWE and DWER.<br>Regulatory notification should mortality of other conservation significant species to DBCA.<br>Internal: |

| Management Objective | Management Action | Management Targets | Monitoring | Reporting |
|---|---|---|---|---|
| | Any fauna killed on roads encouraged to be reported to environmental personnel for recording. | | | Summary of speed check results<br>Incident reports of fauna mortalities |
| Avoid artificial changes to fire regimes | Operational practice is to not intervene with naturally occurring lightning initiated fires unless there is a risk to people or property.<br>Develop and implement a Prevention of Bushfire Procedure<br>Establish fire breaks adjacent to high fire risk areas.<br>Consult with DBCA on fire /emergency planning at TGM<br>Communicate notice of Vehicle Movement Bans and Catastrophic fire conditions to work groups.<br>Conduct activities in accordance with Total Fire Ban exemption permit requirements (current to 2021) | No adverse impacts to mapped habitat for conservation significant species and communities as a result of fires generated by TGM activities | Continued monitoring and communication of Vehicle Movement Bans, Catastrophic fire conditions, total fire bans and path/spread of lightning initiated regional fires in the general TGM area | External:<br>Regulatory notification should TGM initiated fire spread to vegetation (excluding back burns which would be in any event conducted in consultation with local authorities)<br>Regulatory notification should TGM initiated fire occur in mapped habitat for Threatened fauna. |
| Prevent impacts from hydrocarbons and chemicals on Threatened fauna habitat | Where practicable, chemical and hydrocarbon storage facilities are to be located away from mapped habitat for Threatened fauna species.<br>Manage environmentally hazardous substances in accordance with the site's Dangerous Goods licences, applicable Australian Standards and TGM's IMS. | No major spills from fixed chemical or hydrocarbon storage facilities impacting mapped habitat for Threatened Fauna species | Storage facility inspections<br>Observation of exception | External:<br>Regulatory notification should excursion occur<br>CAR report<br>Internal:<br>Incident report |

| Management Objective | Management Action | Management Targets | Monitoring | Reporting |
|---|---|---|---|---|
| Minimise impacts from saline water on Threatened fauna habitat | Where practicable, saline water pipelines and roads located away from mapped habitat for Threatened fauna species.<br><br>Process Water Supply Borefield to TGM pipeline will be buried or bunded with leak detection | Saline water pipeline leaks/ruptures are promptly shut down | Citect records | External:<br><br>Regulatory notification should excursion occur<br><br>CAR report<br><br>Internal: Incident report |
| Minimise impacts from saline water on Threatened fauna habitat | Smaller water carts used to apply dust suppression along roads adjacent to vegetation | No mapped habitat for Threatened species is affected by dust suppression overspray killing vegetation | Observation – sudden browning of vegetation | External: Regulatory notification should excursion occur<br><br>CAR report<br><br>Internal: Incident report |
| Update the status of conservation significant flora, fauna and communities | Conduct an annual review and update the status of the TGP's Threatened and Priority species and communities annually against Western Australian and Commonwealth listings.<br><br>Update TGM's general induction to provide current status of Threatened species.<br><br>Update workforce education packages to provide current status of conservation significant species | Awareness of conservation status of species and communities is maintained. | Review of lists on DBCA website and EPBC Act website | External:<br><br>Triennial update and review of TSCMP<br><br>Internal:<br><br>Annual update of listed species tables in TSCMP<br><br>Updated general induction and workforce education packages |

| Management Objective | Management Action | Management Targets | Monitoring | Reporting |
|---|---|---|---|---|
| Rehabilitate open areas once permanently available | Rehabilitate available areas in accordance with the Mine Closure Plan prescriptions and subject to appropriate monitoring.<br><br>Following rehabilitation, areas will be monitored and treated for weed invasion, if necessary. | Open areas are rehabilitated within two years of becoming available | Management signoff of open areas for rehabilitation | External:<br><br>Records of areas rehabilitated included in CAR report<br><br>Internal:<br><br>Records of rehabilitation activities conducted |

## 4.3 Monitoring

The monitoring programmes to assess the effectiveness of management actions and satisfy reporting requirements are summarised below.

**Table 6: Monitoring Undertaken as Part of the TSCMP**

| Monitoring Event/Type | Monitoring Action | Frequency |
|---|---|---|
| Disturbance monitoring | Mapped habitat and species locations from predisturbance biological surveys | Project even triggered – i.e., new development requires baseline studies |
| | Ground disturbance permit (GDP) and Environmental and Heritage Inspection (EIN) | As required |
| | Post clearing reconciliation survey | As required (typically monthly) |
| | Post disturbance monitoring of Threatened flora populations (should a Threatened flora incident occur) | Contingent – conducted only if an unauthorised clearing incident occurs near Threatened flora |
| | Annual flyover aerial photography | Annually (usually September/October) |
| | Monitoring of propagules of Threatened flora | Contingent – conducted as a remedial measure in response to unauthorised clearing incident impacting Threatened flora or if seed has been collected for use in rehabilitation |
| Weed monitoring | Inspection of past weed infestations areas | Episodic - based on rainfall & seasonality |
| | Vehicle hygiene inspections | As required |
| | Weed layer in TGM GIS system | Updated as new populations are encountered |
| | Rehabilitation monitoring (including weed monitoring) | Dependent on age and scale of rehabilitation |
| Species/Ecological Community Status | Review DBCA and EPBC Act lists to update status of conservation significant species and communities | Annually (usually December/January) |
| Subterranean fauna | Undertake subterranean fauna risk assessment/monitoring | Project event triggered – new development where risk assessment identifies suitable habitat affected by major development with uncertain impact to subterranean fauna |
| Feral animals | Inspections of isolated turkeys' nests and water pond fences for fence integrity | Quarterly |
| | Workforce reports of feral animals | Event based |
| | Feral animal abatement programme of feral animals in higher risk areas | Episodic |

| Monitoring Event/Type | Monitoring Action | Frequency |
|---|---|---|
| Fauna mortality/mortality risk monitoring | Inspections of turkeys' nests for fence integrity, evidence of fauna mortalities and condition of egress mats | Quarterly |
| | Observation of fauna mortalities by workforce (incident report) | Event based |
| | Daily TSF monitoring | Daily |
| | Cyanide code auditing | Biennially |
| | Geotechnical auditing | Annually |
| | Decant water monitoring | Monthly (NATA)<br>Continuous (non-NATA) |
| | Drill hole completion audit | Episodic – related to timing of drilling programme |
| | Vehicle speed checks | Random |
| Decline in habitat monitoring | Annual vegetation monitoring | Annually |
| | Monitoring and communication of Vehicle Movement Ban, Catastrophic fire conditions, total fire bans, and the path/spread of lightning initiated regional fires in the general TGM area | Continuous |
| | Hydrocarbon and chemical storage facility inspections | Quarterly |
| | Citect records of leak detection | Continuous |
| Rehabilitation | Rehabilitation monitoring (including weed monitoring) | Dependent on age and scale of rehabilitation |
| | Management signoff of open areas for rehabilitation | As required |

## 4.4 Reporting

Incidents are recorded through use of InControl as TGM's incident management database. This represents the primary reporting tool used at TGM for events regardless of whether they become externally reportable or remain internal incidents.

In its review of the 2017 draft of the TSCMS, the DBCA requested inclusion of a commitment to report incidents involving Threatened and priority flora and fauna to DBCA. Incidents involving Threatened flora and fauna species will be reported to DWER, DAWE and DBCA, whereas incidents involving other conservation significant species (i.e., priority species) will be reported to DBCA.

**Table 7: External Reporting and Notification Requirements under the TSCMP**

| Notification/Reporting Event | Action | Responsibility | Timing |
|---|---|---|---|
| Incident involving Threatened species | Report to DBCA, DWER and DAWE. | Manager: Environment Operations | As soon as practicable but no later than 5 pm of the next usual working day of first becoming aware of the event |
| Incident involving other conservation significant species | Report to DBCA (as per comments from DBCA review) | Manager: Environment Operations | As soon as practicable but no later than 5 pm of the next usual working day of first becoming aware of the event |
| Threshold exceedance | Report to DWER<br>and DAWE (and DBCA if threshold exceedance involves mortality of Threatened species) | Manager: Environment Operations | As soon as practicable but no later than 5 pm of the next usual working day of first becoming aware of the event |
| Compliance Assessment Report | Annual audit of TSCMP included in CAR report | Manager: Environment Operations | Annually by 23 December. |
| Subterranean risk assessment/monitoring | Submission of approval document if risk of detrimental effect of change is anticipated | Manager: Environment Operations | At the time of seeking approval for a new development |
| Annual Vegetation Monitoring Report | Report to DWER via CAR report (as an Appendix) | Manager: Environment Operations | Annually by 23 December. |
| Review of TSCMP | Conduct triennial review | Manager: Environment Operations | Triennially |
| Public accessibility of the TSCMP | Make the TSCMP publicly available on the Tropicana JV website | Manager: Environment Operations | Each triennial review |

# 5 Adaptive Management and Review of the Plan

## 5.1 Adaptive Management

Adaptive management involves:

- Implementing mitigation or remedial measures to either stop degradation of a value occurring or to repair the impact being experienced.
- Monitoring and evaluation against environmental criteria for outcome based provisions and management targets for management based provisions
- Adapting management and mitigation measures and monitoring, including work by third parties in the Great Victoria Desert, to achieve management objectives.

Management targets will require ongoing review and consideration of their appropriateness in terms of if management objectives are being achieved. Where targets are not meeting objectives, adjustments will need to be made.

When an event occurs or monitoring data recorded suggests a control provided by management action has failed, the cause of the event will need to be identified to determine if the action itself has been the failure or its implementation in which case changes will need to be made to reduce the likelihood of re-occurrence.

Technological improvements can also be a cause for adaptive management, which case adopting new technologies will improve either measurement of the effectiveness of outcomes or result in a change to management actions to one which is seen to be superior.

## 5.2 Review of the TSCMP

The TSCMP will be audited annually as specified in the TGM Compliance and Assessment Plan (CAP) for implementation, effectiveness and compliance to commitments. The annual audit findings will be provided to DWER as an appendix to the annual TGM Compliance Assessment Report required under Ministerial Statement 839. Feedback from DCBA has also requested the results of auditing the TSCMS/TSCMP. This review will be targeted at checking compliance against the TSCMP.

To maintain currency of the conservation status of species of Threatened and other conservation significant species and communities and annual review of EPBC Act, Biodiversity Act and DBCA priority lists will be undertaken (updating Appendices B and C).

A triennial review of the Threatened Species and Community Management Strategy will be completed to adjust the plan to fit with adaptive management changes implemented over the previous three years and ensuring the plan is appropriately focussed to achieving the stated objective of the TSCMP as required by Condition 6.2 of Ministerial Statement 839. A summary of changes made between the 2014 TSCMS and TSCMP is provided in Appendix E.

# 6 Stakeholder Consultation

Consultation has been undertaken with the DBCA and DWER in reviewing the TSCMS to the TSCMP. Key feedback received from these agencies is provided below:

## 6.1 DBCA Feedback January 2018 (of Version 3)

“That the 2017 Threatened Species and Communities management Strategy (TSCMS) includes a map(s) that clearly illustrates the area(s) that the strategy applies.”

Response: The Tropicana JV has incorporated two maps into the TSCMP outlining the development envelopes. Exploration activities whilst minor in impact, will occur outside of these areas.

1. “That further clarification is provided on the ongoing use/retention of Management Strategies and/or Consolidated Management Strategies” and

2. “That the Management Strategies are retained, alternatively further specific information is provided in the TSCMS regarding the Consolidated Management Strategies including more specific details around proposed management measures/actions.”

Response: At the time of the 2017 TSCMS, the Tropicana JV noted TSCMS was largely comprised of strategies from within the Construction and Operational Management Strategies. However, these have been superseded by development of, and subsequent ISO certification of, TGM’s Integrated Management System, with greater system documentation. Thus, DBCA were seeking to see implementation actions in the strategy rather than references to management system documentation (e.g., procedures etc). In preparing to present these changes to DBCA in late November/early December 2019, further comment and guidance was received in that DBCA’s interest is more technical in nature rather than how a strategy is presented, which was more the hegemony of DWER. Subsequent discussion with DWER’s provided advice to revise the TSCMS into the EPA’s management plan template.

The Tropicana JV has had to critically review the strategies in the TSCMS to fit into the management plan template, including making them more actionable and measurable whilst avoiding use of references to management system documentation where possible. This resultant TSCMP has attempted to address the collective feedback from both agencies insofar as it is now structurally aligned with the EPA’s template, has retained strategies but refined them to implementation actions (or more specifically management actions) but has also seen removal of strategies which were not readily actionable or measurable such as the noise strategies.

3. “That the commitment to report incidents involving threatened and priority flora or threatened fauna species to DBCA is included in the latest version of the TSCMS.”

Response: This has been incorporated as part of the reporting against outcome based and management provisions and within the reporting section.

4. “That the audit and performance reporting requirements in the 2014 TSCMS are included in the latest version of the TSCMS.”

Response: The 2014 TSCMS included both biannual and annual auditing in different sections of the document. Annual auditing is conducted and included as an Appendix of the CAR report. The additional reference to biannual auditing is spurious and may have been intended to be biennial. Given established annual vegetation monitoring as part of the CAR, annual internal update of the status of conservation significant species and communities and formal triennial update of the strategy as required by condition 6.2 of Ministerial Statement 839, auditing has been aligned to an annual frequency to be reported at the time of the CAR report. The reporting section of the TSCMP has been updated to provide a copy of the annual TSCMP audit to DBCA.

5. “That AGAA provides a summary sheet /table of all changes to the TSCMS.”

Response: The Tropicana JV agrees with this proposition, although given the extensive changes made in transitioning the TSCMS to the TSCMP, a summary table of changes is provided in Appendix E to reconcile how the document has changed. As the entire document has changed, it is impractical to summarise all changes.

6. “That all references to the Department of Parks and Wildlife should be revised to the Department of Biodiversity, Conservation and Attractions.”

Response: All references have been updated to the Department of Biodiversity Conservation and Attractions or DBCA, with the exception of department names enshrined in the conditions of Ministerial Statement 839. Condition 6.2 notes the department is named Department of Environment and Conservation which DBCA was a part of at the time Ministerial Statement 839 was issued.

## 6.2 DBCA – Phone Discussion - M Baker 3 December 2019

The context of discussion was to arrange a meeting with DBCA to run through changes to the TSCMS and in particular structural changes to the document and feedback on comments from previously

supplied feedback (discussed above). DBCA clarified their input should be at a technical level only, not format/structure, which was the role of DWER.

### 6.3 DWER – Phone Discussion - L Zheng 4 December 2019

Following on from consultation with DBCA, the Tropicana JV sought engagement with DWER to meet on the TSCMS. Summary of feedback provided:

1. "It is preferred that TGM use the latest, contemporary templates for Management Plans (i.e., the EPA Management Plan Template)"

Response: The Tropicana JV supports use of the EPA's template resulting in this version of the TSCMP.

2. "TGM to include all engagement correspondence from DBCA with the submission"

Response: This section provides a narrative of consultation with DBCA and DWER in chronological order.

3. "Submit via registrar@dwer.wa.gov.au email address and it will be assigned an assessing officer"

Response: Acknowledged and will be conducted once ready to be submitted.

4. "If DWER require a discussion meeting, TGM will be advised of that"

Response: Acknowledged.

5. "Timing of the review is not urgent"

Response: Acknowledged.

## 7 Bibliography

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Ninox Wildlife Consulting (2009) A Level One Survey of the Vertebrate Fauna Infrastructure Corridor Pinjin Option

Ninox Wildlife Consulting (2010). A Level 1 Survey of the Vertebrate Fauna of the Proposed Minigwal South Pipeline

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URS (2009). Malleefowl and Mulgara Survey TGP Operational Area

URS (2009). Marsupial Mole Survey: Proposed Infrastructure Corridor – Pinjin Option

# 8 Appendice 1: Surveys for Conservation Significant Flora, Fauna & Habitat

| Study | Summary/Key Findings Related to Conservation Significant Fauna |
|---|---|
| Flora and Vegetation | |
| Ecologia (July 2009) Assessment of the Flora and Vegetation of Operational Area and its Surrounding | Level 2 flora and vegetation survey of Operational Area development envelope and beyond. Conducted in November 2006, June-July 2007 across 1356 km$^2$.<br>Survey recorded:<br>• *Conospermum toddii* (Declared Rare Flora at the time)<br>• *Dampiera eriantha* (Priority 1 at the time)<br>• *Baeckea* sp. Sandstone (Priority 1 at the time)<br>• *Baeckea* sp. Great Victoria Desert Priority 2 at the time)<br>• *Dicrastylis nicholasii* (Priority 2 at the time)<br>• *Malleostemon* sp. Officer Basin Priority 2 at the time)<br>• *Olearia arida* (Priority 2 at the time)<br>• *Grevillea secunda* (Priority 2 at the time)<br>• *Acacia eremophila* numerous -nerved variant (Priority 3 at the time)<br>• *Acacia eremophila* var. *variabilis* (Priority 3 at the time)<br>• *Dicrastylis cundeeleensis* (Priority 3 at the time)<br>• *Microcorys macredieana* (Priority 3 at the time)<br>• *Micromyrtus stenocalyx* (Priority 3 at the time)<br>• *Daviesia purpurascens* (Priority 4 at the time)<br>• *Lepidobolus deserti* (Priority 4 at the time)<br>• *Caesia talingka* (undescribed species at the time)<br>• *Tricoryne* sp. Great Victoria Desert (undescribed species at the time)<br>• *Lechenaultia divaricata* (new record of this species in WA at the time)<br>Three naturalised weed species were also recorded: Sonchus oleraceus, Spergularia rubra, Erodium aureum |

| Study | Summary/Key Findings Related to Conservation Significant Fauna |
|---|---|
| Ecologia (July 2009). Operational Area Threatened Flora Assessment | Threatened flora survey targeting DRF and Priority species conducted in three field trips in October 2007, July 2008 and November 2008.<br>18 populations of the DRF *Conospermum toddii* were located.<br>The following 12 priority taxa were also recorded<br>• *Dampiera eriantha* (Priority 1 at the time)<br>• *Baeckea* sp. Sandstone (Priority 1 at the time)<br>• *Baeckea* sp. Great Victoria Desert (Priority 2 at the time)<br>• *Dicrastylis nicholasii* (Priority 2 at the time)<br>• *Malleostemon* sp. Officer Basin (Priority 2 at the time)<br>• *Olearia arida* (Priority 2 at the time)<br>• *Acacia eremophila* numerous-nerved variant (Priority 3 at the time)<br>• *Dicrastylis cundeeleensis* (Priority 3 at the time)<br>• *Microcorys macredieana* (Priority 3 at the time)<br>• *Micromyrtus stenocalyx* (Priority 3 at the time)<br>• *Daviesia purpurascens* (Priority 4 at the time)<br>• *Lepidobolus deserti* (Priority 4 at the time)<br>The undescribed species *Caesia talingka* was also located |

| Study | Summary/Key Findings Related to Conservation Significant Fauna |
|---|---|
| Tropicana JV (July 2009). Regional Threatened Flora Survey | Consolidation of three flora and vegetation surveys which included an area 50 km south of the Operational Area (Survey 1), the Queen Victoria Spring Nature Reserve (Survey 2) and Plumridge Lakes Nature Reserve (Survey 3) to determine the extent of conservation species outside of the TGP disturbance areas.<br><br>These surveys have recorded<br>• *Conospermum toddii* (Declared Rare Flora at the time) – located in surveys 2 and 3<br>• *Baeckea* sp. Great Victoria Desert Priority 2 at the time) – located in surveys 1 to 3<br>• *Dicrastylis nicholasii* (Priority 2 at the time) – located in surveys 1 & 3<br>• *Olearia arida* (Priority 2 at the time) – located in surveys 1 and 3<br>• *Grevillea secunda* (Priority 2 at the time) – located in surveys 1 to 3<br>• *Dicrastylis cundeeleensis* (Priority 3 at the time) located in surveys 1 & 3<br>• *Microcorys macredieana* (Priority 3 at the time) located in surveys 1 to 3<br>• *Micromyrtus stenocalyx* (Priority 3 at the time) located in surveys 1 to 3<br>• *Lepidobolus deserti* (Priority 4 at the time) located in surveys 1 & 2<br>• *Caesia talingka* (new species at the time) – located in surveys 2 & 3.<br>• *Comesperma viscidulum* (Priority 4 at the time) – located in survey 1. |

| Study | Summary/Key Findings Related to Conservation Significant Fauna |
|---|---|
| Ecologia (July 2009) Tropicana-Transline Infrastructure Corridor: Vegetation and Flora Survey | Level 1 flora and vegetation survey of the Cable Haul Road conducted in July and August 2007.<br>Survey recorded:<br>• *Dampiera eriantha* (Priority 1 at the time)<br>• *Baeckea* sp. Great Victoria Desert (Priority 2 at the time)<br>• *Dicrastylis nicholasii* (Priority 2 at the time)<br>• *Isotropis canescens* (Priority 2 at the time)<br>• *Malleostemon* sp. Officer Basin (Priority 2 at the time)<br>• *Olearia arida* (Priority 2 at the time)<br>• *Physopsis chrysotricha* (Priority 2 at the time)<br>• *Grevillea secunda* (Priority 2 at the time)<br>• *Dicrastylis cundeeleensis* (Priority 3 at the time)<br>• *Microcorys macredieana* (Priority 3 at the time)<br>• *Micromyrtus stenocalyx* (Priority 3 at the time)<br>• *Daviesia purpurascens* (Priority 4 at the time)<br>• *Lepidobolus deserti* (Priority 4 at the time)<br>• *Comesperma viscidulum* (Priority 4 at the time)<br>• *Eremophila ?undulata* (insufficient material to formally identify but was Priority 2 at the time)<br>• *Caesia talingka* (undescribed species at the time).<br>The survey also located one weed species *Carrichtera annua.*<br>To the limits of the known boundary of the Yellow sandplain communities of the Great Victoria Desert Priority 3 Ecological Community, it was extrapolated the proposed corridor would intersect 15 km of the PEC in two areas (a 12 km and 3 km section) |

| Study | Summary/Key Findings Related to Conservation Significant Fauna |
|---|---|
| Mattiske Consulting Pty Ltd (July 2009) Flora and Vegetation Survey of Proposed Pinjin Access Road and Infrastructure Corridor L31/57, L39/185, Tropicana Mine - Pinjin Station. | Level 1 flora and vegetation survey of the Pinjin Access road conducted in December 2007, March 2008 and May 2008. Follow-up targeted searches for Eucalyptus articulata (DRF) was conducted in March and May 2008, Threatened Species Assessment was in May and June 2009 which were appended to the survey report.<br>Survey recorded<br>• *Conospermum toddii* (Declared Rare Flora at the time)<br>• *Baeckea* sp. Great Victoria Desert Priority 2 at the time)<br>• *Dicrastylis nicholasii* (Priority 2 at the time)<br>• *Malleostemon* sp. Officer Basin (Priority 2 at the time)<br>• *Olearia arida* (Priority 2 at the time)<br>• *Grevillea secunda* (Priority 2 at the time)<br>• *Acacia* eremophila numerous -nerved variant (Priority 3 at the time)<br>• *Acacia eremophila* var. *variabilis* (Priority 3 at the time)<br>• *Thryptomene eremaea* (Priority 2 at the time)<br>• *Dicrastylis cundeeleensis* (Priority 3 at the time)<br>• *Eucalyptus pimpiniana* (Priority 3 at the time)<br>• *Microcorys macredieana* (Priority 3 at the time)<br>• *Micromyrtus serrulata* (Priority 3 at the time)<br>• *Micromyrtus stenocalyx* (Priority 3 at the time)<br>• *Daviesia purpurascens* (Priority 4 at the time)<br>• *Lepidobolus deserti* (Priority 4 at the time)<br>• *Hibbertia* sp. (nov.) a potential new species.<br>The *Eucalyptus articulata* search did not locate the species at any location.<br>One weed species *Salvia verbenaca* was recorded at five locations during the survey on Pinjin Station.<br>Whilst at the time there was no definitive boundary for the Yellow Sandplain communities of the Great Victoria Desert, it was considered that six sections of the proposed corridor potentially intersect the PEC. |

| Study | Summary/Key Findings Related to Conservation Significant Fauna |
|---|---|
| Mattiske Consulting Pty Ltd (January 2010) Threatened Flora Collections Tropicana Gold Project L31/56, L31/57, L39/185 Operational Area – Pinjin Station | Completion of a spring (October 2009) flora and vegetation survey to supplement the three surveys conducted along the Pinjin Infrastructure Corridor from 2007/2008.<br>Survey recorded:<br>• *Conospermum toddii* (Declared Rare Flora at the time)<br>• *Dampiera eriantha* (Priority 1 at the time),<br>• *Baeckea* sp. Great Victoria Desert Priority 2 at the time)<br>• *Dicrastylis nicholasii* (Priority 2 at the time)<br>• *Olearia arida* (Priority 2 at the time<br>• *Grevillea secunda* (Priority 2 at the time)<br>• *Malleostemon* sp. Officer Basin (Priority 2 at the time)<br>• *Thryptomene eremaea* (Priority 2 at the time)<br>• *Dicrastylis cundeeleensis* (Priority 3 at the time)<br>• *Eucalyptus pimpiniana* (Priority 3 at the time)<br>• *Microcorys macredieana* (Priority 3 at the time)<br>• *Micromyrtus serrulata* (Priority 3 at the time)<br>• *Micromyrtus stenocalyx* (Priority 3 at the time)<br>• *Daviesia purpurascens* (Priority 4 at the time)<br>• *Lepidobolus deserti* (Priority 4 at the time)<br>• *Comesperma viscidulum* (Priority 4 at the time)<br>A potentially new species of *Hibbertia* (?*nov*) (undescribed at the time). Subsequent review at the WA Herbarium found this to be the same as *Hibbertia* aff i*nclusa* which had previously been collected in the Officer Basin.<br>In addition to these species, *Physopsis chrysotricha* (Priority 2 at the time was opportunistically located outside of the survey area) |
| Mattiske Consulting Pty Ltd (October 2010). Flora and Vegetation Survey of the Minigwal South Pipeline Corridors and Water Supply Area | Level 1 Flora and Vegetation Survey of the Minigwal South Borefield Area conducted in May 2010.<br>Survey recorded:<br>*Comesperma viscidulum* (Priority 4 at the time)<br>*Discrstylis cundeeleensis* (Priority 4 at the time)<br>*Olearia arida* (Priority 4)<br>Vegetation association S11 was consistent with Yellow sandplain communities of the Great Victoria Desert Priority 3 Ecological Community |

| Study | Summary/Key Findings Related to Conservation Significant Fauna |
|---|---|
| Botanic Gardens and Parks Authority (November 2009). A Molecular Assessment of the Identity of Regenerating Mallees on the Tropicana Mine Access Rd, in relation to DRF Eucalyptus articulata (Myrtaceae) | DNA testing of potential regenerating mallees sampled by Mattiske Consulting Pty Ltd to check field assessment the mallees were not E. articulata. Four independent molecular DNA tests concluded the samples were not E. articulata. |
| Botanica Consulting (July 2009). Minigwal Trough Water Supply Area and Pipeline Corridor Vegetation and Flora Survey | Flora and vegetation survey for the Process Water Supply Borefield conducted in November and December 2008.<br>Survey recorded:<br>• *Baeckea* sp. Great Victoria Desert (Priority 2 at the time)<br>• *Dicrastylis nicholasii* (Priority 2 at the time)<br>• *Olearia arida* (Priority 2 at the time)<br>• *Dicrastylis cundeeleensis* (Priority 3 at the time)<br>• *Microcorys macredieana* (Priority 3 at the time)<br>• *Daviesia purpurascens* (Priority 4 at the time)<br>• *Lepidobolus deserti* (Priority 4 at the time) |
| Botanica Consulting (May 2015). Minigwal Borefields (PWS) Level 1 Flora & Vegetation Survey | Flora and vegetation survey of the expansion area for the Process Water Supply Borefield in September 2014.<br>Survey recorded:<br>• *Conospermum toddii* (Priority 4 at the time)<br>• *Olearia arida* (Priority 4 at the time) |
| *Terrestrial Fauna* | |
| Ecologia (July 2009). Tropicana Gold Project Operational Area Vertebrate Fauna Assessment. | Level 2 fauna survey of the Operational Area conducted in three sampling events, November 2006, March 2007 and March 2008 plus an additional Southern Marsupial Mole survey in August 2007.<br>Survey recorded or found secondary evidence of:<br>• Australian Bustard (Priority 4 at the time)<br>• Peregrine Falcon (Schedule 4 at the time)<br>• Rainbow Bee-eater (Migratory at the time)<br>• Evidence of Southern Marsupial Mole (Endangered/Schedule 1 at the time)<br>• Eight inactive mounds of Malleefowl (Vulnerable/Schedule 1 at the time) |

| Study | Summary/Key Findings Related to Conservation Significant Fauna |
|---|---|
| Benshemesh and Schulz (September 2008). Survey of the underground signs of marsupial mole in the WA Great Victoria Desert. | Survey for Southern Marsupial Moles across the Great Victoria Desert predominantly within Western Australia but also into South Australia.<br><br>Results found 170 backfilled tunnels from 89 trenches at 325 sites, confirming the Southern Marsupial Mole has a widespread distribution and is probably more common than previous records suggest.<br><br>Activity suggests more than 30 km of mole holes per ha. With 10% of mole holes appearing to be fresh, tunnelling appears to be at a rate of 3 km/ha since the last soaking rains occurred. |
| URS (June 2009). Malleefowl and Mulgara Survey TGP Operational Area | Targeted fauna survey for Malleefowl and Mulgara of the Operational Area and surrounds conducted in April and August 2008.<br><br>Potentially suitable habitat occurs in the Operational Area development envelope and its surrounds.<br><br>Survey located 13 Malleefowl inactive mounds (Vulnerable/Schedule 1 at the time) with no signs of recent use (at least five years since last use).<br><br>No direct recent or historical evidence of Mulgara was located during the surveys and no historic evidence present in the survey area. However, some suitable Mulgara habitat was located.<br><br>Evidence of Australian Bustard (Priority 4 at the time) was also recorded opportunistically. |
| Gaikhorst and Lambert (September 2009). Sandhill Dunnart Survey of the Proposed Operational Area and Infrastructure Corridors (Pinjin and Bypass) | An initial desktop assessment of suitable habitat for the Sandhill Dunnart, followed by ground truthing habitat, then conducting targeted surveys. Surveys conducted in March and May 2008.<br><br>No Sandhill Dunnarts were recorded however, some of the habitat areas had experienced fire or had poor spinifex quality.<br><br>Amongst the fauna recorded or opportunistically observed were two old disused Malleefowl mounds (Vulnerable/Schedule 1 at the time). |
| Churchill (December 2009) Assessment of habitat availability for the Sandhill Dunnart. Sminthopsis psammophila in Western Australia. | Assessment of habitat availability for the Sandhill Dunnart. Found whilst there is some habitat within the Operational Area, most lies to the west of the Operational Area development envelope. The bulk of the proposed footprint occurs in vegetation that is marginal habitat for the Sandhill Dunnart.<br><br>In the Pinjin Infrastructure Corridor survey area , 1170.7 ha was assessed as being prime habitat of which 63 ha is impacted by the corridor, although most of this area had been burnt by fire making it unsuitable for at least the next decade. |

| Study | Summary/Key Findings Related to Conservation Significant Fauna |
|---|---|
| GHD (February 2010) Second Round Sandhill Dunnart surveys of the Proposed operational area and infrastructure corridor | Follow-up targeted survey for Sandhill Dunnart in the Operational Area and Pinjin Infrastructure Corridor conducted in November 2009).<br>The survey did not record any Sandhill Dunnarts. However, the study did record:<br>• Australian Bustard (Priority 4 at the time)<br>• Crested Bellbird (Priority 4 at the time)<br>• Rainbow Bee-eater (Migratory at the time)<br>Despite not recording any Sandhill Dunnarts the area west of the Operational Area and in the southwest of the Operational Area could be considered prime habitat for Sandhill Dunnart. It was concluded Sandhill Dunnarts are either present in low numbers or locally extinct. |
| Adaptive NRM (November 2018) Potential Impacts on Night Parrots of Habitat Disturbance Relating to Powerline Construction for Tropicana Gold Mine | Review of potential habitat for Night Parrots associated with a powerline at TGM.<br>Roosting and breeding habitats for Night Parrots are *Triodia* species with ring forming growth habits.<br>*Triodia basedowii* present at TGM can form suitable roosting and breeding habitat) However for the area investigated (near the TSF) the *T. basedowii* has not developed the large complex structure required by Night Parrots.<br>The presence of trees and shrubs in the area make the habitat unsuitable for breeding habitat based on current understanding of preferred habitat.<br>Vegetation at TGM does not support feeding habitat requirements either.<br>The study concluded it was extremely unlikely that Night Parrots would be affected in the area. |
| Ecologia (July 2009) Tropicana-Transline Infrastructure Corridor Level 1 Fauna Assessment. | Level 1 fauna survey of the Transline Infrastructure Corridor (option did not proceed) conducted in July and August 2007.<br>Survey recorded or found secondary evidence of:<br>• Evidence of Southern Marsupial Mole (Endangered/Schedule 1 at the time)<br>• Fresh tracks and eight Malleefowl mounds (Vulnerable/Schedule 1 at the time) |
| Ninox Wildlife Consulting (January 2009) A Level One Survey of the Vertebrate Fauna Infrastructure Corridor Pinjin Option | Level 1 fauna survey over the Pinjin Infrastructure Corridor conducted in December 2007 and March 2008.<br>Survey recorded or found evidence of:<br>• Malleefowl (sighted plus tracks and mounds) (Vulnerable/Schedule 1 at the time)<br>• Rainbow Bee-eater (Migratory at the time)<br>• Australian Bustard (Priority 4 at the time) |

| Study | Summary/Key Findings Related to Conservation Significant Fauna |
|---|---|
| Ninox Wildlife Consulting (August 2010). A Level 1 Survey of the Vertebrate Fauna of the Proposed Minigwal South Pipeline | Level 1 survey conducted in June 2010 at Minigwal South.<br>Survey recorded the Australian Bustard (Priority 4 at the time) |
| URS (February 2009). Marsupial Mole Survey: Proposed Infrastructure Corridor – Pinjin Option | Targeted survey for Southern Marsupial Moles with secondary aims of recording evidence of Sandhill Dunnarts, Malleefowl and Mulgara conducted in November 2007, March 2008 and April 2008.<br>73 trenches from 25 sites were excavated with ten Mole holes identified.<br>No direct evidence of Mulgara, Sandhill Dunnarts or Malleefowl was identified but an inactive Malleefowl mound was located.<br>Suitable habitat for Mulgara was however located.<br>Other conservation significant species recorded were:<br>• Rainbow Bee-eater (Migratory at the time) and<br>• Australian Bustard (Priority 4 at the time) |
| Ecologia (July 2009). Tropicana Gold Project Minigwal Trough Water Supply Area and Pipeline Corridor Level 1 Fauna Survey | Level 1 fauna survey of the Process Water Supply Borefield area and pipeline corridor conducted in March 2008.<br>Survey recorded:<br>• Australian Bustard (Priority 4 at the time)<br>• One inactive Malleefowl mound (Vulnerable/Schedule 1 at the time) |
| Kingfisher Environmental Consulting (2014) Minigwal Trough Borefield (PWS) and Pipeline Fauna Survey | Level 1 Fauna survey of the Process Water Supply Borefield conducted in 2014.<br>Survey recorded:<br>• Evidence of Malleefowl including 12 mounds (of which two were active or recently active) and tracks (Schedule 1/vulnerable at the time)<br>• Southern Marsupial Mole tunnels (Schedule 1/Endangered at the time)<br>• Brush-tailed Mulgara burrow and scat (Priority 4 at the time)<br>• Australian Bustard (Priority 4 at the time) |
| Subterranean Fauna | |
| Ecologia (July 2009) Tropicana Gold Project Stygofauna Survey Operational Area | Stygofauna survey across the Operational Area and several regional bores conducted in September 2007, November 2007 and April/May 2008. No stygobitic species were recorded, although several non-stygobitic species were collected including two troglofauna.<br>Risk of impacts to stygofauna in the Operational Area considered to be low.<br>Lack of stygofauna hypothesised to be due to a historical geological event, specifically a marine incursion followed by sediment deposition decreasing available habitat for stygofauna – similar to that which has occurred in the Nullarbor. |

| Study | Summary/Key Findings Related to Conservation Significant Fauna |
|---|---|
| Ecologia (July 2009) Tropicana Gold Project Troglofauna Survey Report<br><br>Phases 1-4 | Troglofauna survey across the Operational Area conducted in four phases, September-November 2007, April-June 2008, August-October 2008 and October-December 2008.<br><br>Habitat assessment suggested Operational Area not very prospective for troglofauna due to no evidence of cavitates or voids in the 40-50 m layer of weathered material. Survey conducted as recent examples of troglofauna found in a range of geologies previous thought to be not suitable for troglofauna.<br><br>Two troglofauna were recorded during a contemporaneous stygofauna sampling (isopod and centipede). Whilst no species found in Phase 1, Phases 2-4 recorded further isopods and a single dipluran.<br><br>Most likely habitat hypothesised to be small voids left by decayed roots. |
| Ecologia (July 2009) Tropicana Gold Project Troglofauna Survey Report Addendum Phase 5 Additional Survey Results | Survey conducted outside of the proposed footprints of the project.<br><br>Despite extensive surveying no troglofauna species were recorded in this survey. |
| Louisa Lawrance and Associates (July 2009) Tropicana Gold Project Review of Local and Regional Regolith Types and Distribution as Potential Troglofauna Habitat | Investigation following recording of troglofauna species to determine geologies suitable for habitation.<br><br>The review found the only realistic habitat was in less indurated friable areas underneath duricrust exposures which host interconnected interstitial voids, root casts and solution pipes. |
| Ecologia (March 2010). Tropicana Gold Project Troglofauna Survey Phases 6 and 7 | Additional troglofauna survey conducted from outside the proposed disturbance footprint in August-September 2009 (Phase 6) and November 2009 - January 2010.<br><br>Phase 6 did not record any troglofauna<br><br>Phase 7 recorded one additional troglobitic species (cockroach) and one species previously recorded (Isopod)<br><br>Thus over 7 phases 14 individuals from 4 troglobitic species were recorded, suggesting the troglobitic community in the region is very sparse.<br><br>Building from the geological interpretation from Louisa Lawrance and Associates (2009), suitable habitat for troglofauna is expected to be 16,670 ha of the 27241 ha Operational Area development envelope. Favourable habitat for troglofauna is expected to extend beyond the Operational Area development envelope. |
| Subterranean Ecology (June 2009) Minigwal Trough Water Supply Area Pipeline Corridor | Stygofauna desktop and pilot study of the Process Water Supply Borefield area conducted in May 2008.<br><br>Study recorded no stygofauna which was consistent with the desktop review. Concluded the lower sandstone aquifer of the Minigwal trough is not highly prospective for stygofauna. |

# 9 Appendix 2: Changes in Conservation Status or Occurrence of Flora Across the TGP

| Species | 2014 TSCMS Conservation Status | | January 2021 Conservation Status | |
|---|---|---|---|---|
| | WA | Commonwealth | WA | Commonwealth |
| *Acacia eremophila* numerous nerved variant | P3 | | P3 | |
| Acacia eremophila var. variabilis | P3 | | P3 | |
| Baeckea sp. Sandstone | P3 | | P3 | |
| Caesia talingka | P2 | | P2 | |
| Calytrix warburtonensis | | | P2 | |
| Comesperma viscidulum | P4 | | P4 | |
| Conospermum toddii | P4 | | P4 | |
| Dampiera eriantha | P1 | | P2 | |
| Dicrastylis cundeeleensis | P4 | | P4 | |
| Eremophila perglandulosa | P1 | | Not recorded | |
| Eucalyptus articulata | DRF | VU | Not recorded | |
| Eucalyptus pimpiniana | P3 | | P3 | |
| Grevillea secunda | P4 | | P4 | |
| Hibbertia crispula | P2 | VU | Not recorded | |
| Isotropis canescens | P2 | | Not recorded | |
| Labichea deserticola | P1 | | Not recorded | |
| Labichea eremea | | | P3 | |
| Lechenaultia divaricata | P1 | | Excluded name | |
| Lechenaultia aphylla | | | P1 | |
| *Malleostemon* sp. Officer Basin | P2 | | P2 | |
| Melaleuca nanophylla | P3 | | Not recorded | |
| Micromyrtus serrulata | P3 | | P3 | |
| Minuria ?tridens | P1 | | Not recorded | |
| Olearia arida | P4 | | P4 | |
| Physopsis chrysotricha | P2 | | Recorded outside of survey area | |
| Thryptomene eremaea | P2 | | P2 | |

| Species | 2014 TSCMS Conservation Status | | January 2021 Conservation Status | |
|---|---|---|---|---|
| | WA | Commonwealth | WA | Commonwealth |
| Thryptomene wittweri | DRF | VU | Not recorded | |
| Thysanotus baueri | P1 | | Not recorded | |
| Trachymene pyrophila | P2 | | P2 | |
| Vittadinia pustulata | | | P3 | |

# 10 Appendix 3: Change in Conservation Status or Expected Occurrence of Fauna Across the TGP

| Species | 2014 TSCMS Conservation Status | | January 2021 Conservation Status | |
|---|---|---|---|---|
| | WA | Commonwealth | WA | Commonwealth |
| Bilby - Macrotis lagotis | S1 | VU | Not recorded or Expected | |
| Central Long-eared Bat - *Nyctophilus* sp. (previously *N. timoriensis)* | P4 | | P3 | |
| Chuditch - Dasyurus geoffroyii | S1 | VU | Not recorded or Expected | |
| Greater Stick-nest Rat - *Leporillus conditor* (locally extinct) | S1 | VU | Not recorded or Expected (long abandoned nests located) | |
| Mulgara - Crested-tailed *Dasycercus cristicauda* | S1 | VU | Not recorded or Expected | |
| Mulgara - Brush-tailed *Dasycercus blythi* | P4 | | P4 | |
| Numbat - Walpurti Myrmecobius fasciatus | S1 | VU | Not recorded or Expected | |
| Sandhill Dunnart - Sminthopsis psammophila | S1 | EN | EN | EN |
| Southern Marsupial Mole - *Notoryctes typhlops* | S1 | EN | P4 | Delisted |
| Australian Bustard -*Ardeotis australis* | P4 | | Delisted | |
| Crested Bellbird - *Oreoica gutturalis* | P4 | | Delisted | |
| Grey Falcon - Falco hypoleucos | S1 | | VU | |
| Major Mitchell's Cockatoo - *Cacatua leadbeateri* | S4 | | Delisted | |
| Malleefowl - Leipoa ocellata | S1 | VU | VU | VU |
| Naretha Blue Bonnet - Northiella haematogaster narethae | S4 | | P4 | |
| Night Parrot - Pezoporus occidentalis | S1 | EN | Not recorded or Expected | |
| Peregrine Falcon - *Falco peregrinus* | S4 | | OS | |
| Striated Grass wren - Amytornis striatus striatus | P4 | | P4 | |

| Species | 2014 TSCMS Conservation Status | | January 2021 Conservation Status | |
|---|---|---|---|---|
| | WA | Commonwealth | WA | Commonwealth |
| Thick-billed Grass-wren (western sp) - *Amytornis textilis textilis* | P4 | | P4 | |
| Princess Parrot Polytelis alexandrae | S1 | VU | P4 | VU |
| Cattle Egret *Ardea ibis* | MI | | Delisted | |
| Common Greenshank - *Tringa nebularia* | MI | | MI | |
| Fork-tailed Swift - *Apus pacificus* | MI | | MI | |
| Great Egret, White Egret - *Ardea alba* | MI | | Delisted | |
| Oriental Plover, Oriental Dotterel - *Charadrius veredus* | MI | | MI | |
| Rainbow Bee-eater - *Merops ornatus* | MI | | Delisted | |
| Wood Sandpiper - *Tringa glareola* | MI | | MI | |
| South-Western Carpet Python – *Morelia spilota imbricata* | S4 | | Delisted | |
| Great Desert Skink - Liopholis kintorei (Egernia kintorei) | S1 | VU | VU | VU |
| Southern Desert Lerista - Lerista puncticauda | P2 | | P2 | |
| Woma Python - Aspidites ramsayi | S4 | | P1 | |

## 11 Appendix 4: Breeding/Nesting Season of Fauna Species

| Species | Species Name | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Central Long-eared Bat | Nyctophilus sp. | Unknown | | | | | | | | | | | |
| Mulgara - Brush-tailed | Dasycercus blythi | | | | | Winter months | | | | | | | |
| Sandhill Dunnart | Sminthopsis psammophila | | | | | | | | | Spring and early summer | | | |
| Southern Marsupial Mole | Notoryctes typhlops | Unknown | | | | | | | | | | | |
| Common Greenshank | Tringa nebularia | Breeds abroad | | | | | | | | | | | |
| Grey Falcon | Falco hypoleucos | | | | | | | | | | | | |
| Malleefowl | Leipoa ocellata | | | | | | | | | | | | |
| Naretha Blue Bonnet | Northiella haematogaster narethae | | | | | | | And after rain | | | | | |
| Peregrine Falcon | Falco peregrinus | | | | | | | | | | | | |
| Striated Grass wren | Amytornis striatus striatus | | | | | | | | | | | | |

| Species | Species Name | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Princess Parrot, Alexandra's Parrot | Polytelis alexandrae | | | | | | | | | And after rain | | | |
| Fork-tailed Swift | Apus pacificus | Breeds abroad | | | | | | | | | | | |
| Oriental Plover, Oriental Dotterel | Charadrius veredus | Breeds abroad | | | | | | | | | | | |
| Wood Sandpiper | Tringa glareola | Breeds abroad | | | | | | | | | | | |
| Great Desert Skink | Liopholis kintorei | | | | | | | | | | | | |
| Southern Desert skink | Lerista puncticauda | Unknown | | | | | | | | | | | |
| Woma Python | Aspidites ramsayi | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | Normal Breeding times | | | | | | | | | | | | |
| | Breeds abroad | | | | | | | | | | | | |
| | Unknown | | | | | | | | | | | | |
| | No breeding activity expected | | | | | | | | | | | | |

## 12 Appendix 5: Summary of Changes Between the 2014 TSCMS and 2021 TSCMP

| 2014 Threatened Species and Communities Management Strategy Section | 2021 Threatened Species and Communities Management Plan Section | Comments |
|---|---|---|
| Overall document | Restructured to fit to the EPA Management Plan template | From consultation with DWER. |
| 1 Overview | 1 Context Scope and Rationale | Removed management system framework information |
| 2 Purpose | | Focuses the plan on the TGP proposal, relevant environmental factors, key conditions of approval and the most critical species (Threatened), whilst maintaining observance of priority species/ecological communities and subterranean fauna |
| 3 Scope and Review Protocols | Scope = 1 Context Scope and Rationale<br>Review = 3 Adaptative Management and Review and 4 Stakeholder Consultation | Review and stakeholder consultation in sections 3 and 4 respectively consistent with the EPA Management Plan template |
| 4 Background | 1.4 Rationale and Approach | Summary of studies has been provided in Appendix A as a consequence of the large number of studies |
| 5 Legal Requirements | 1.3 Condition Requirements | Sharper focus |
| 6 Regional Setting | | Deleted |
| 7 Flora of Conservation Concern | 1.4 Rationale and Approach | Flora tables combined to present conservation status, area located or expected and preferred substrate<br>Species status updated following review of data by Mattiske Consulting Pty Ltd |
| 8 Fauna of Conservation Concern | 1.4 Rationale and Approach | Fauna tables merged to see conservations status, area located or expected and preferred habitat<br>Species status updated |
| 9 Putative Short-Range Endemics | | Deleted to keep focus on values and key environmental factors |
| 10 Subterranean Fauna | 1.4 Rationale and Approach | Updated to include fourth troglofauna species found (Cockroach – found post EIA outside of disturbance footprints) |
| 11 Ecological Communities | 1.4 Rationale and Approach | Updated to reflect change in PEC name and publication of PEC |

| 2014 Threatened Species and Communities Management Strategy Section | 2021 Threatened Species and Communities Management Plan Section | Comments |
|---|---|---|
| | | boundary (previously the full boundary had not been defined) |
| 12 Risk Assessment | | Deleted as does not fit with the management plan template |
| 13 Threats and Mitigations | 2 Management Plan Provisions | Note strategies have required extensive review to fit into management provisions. Introduced outcome-based provisions |
| 14 Training and Awareness | 2 Management Plan Provisions | Incorporated into management provisions |
| 15 Rehabilitation and Seed Banking | 2 Management Plan Provisions | Incorporated into management provisions |
| 16 Data Management and Incident Reporting | 2.4 Reporting | Greater detail of reporting requirements |
| 17 Measurement and Monitoring | 2.3 Monitoring | Greater detail of monitoring |