TNG LIMITED

GHD

# TNG Limited

## Mount Peake Project

## Supplement to the Draft Environmental Impact Statement

April 2017

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# 1. Introduction

TNG Limited (TNG) is proposing to develop the Mount Peake Project (the Project), 235 km north-northwest of Alice Springs in the Northern Territory. The Project comprises the mining of a polymetallic ore body, beneficiation of the ore to produce a magnetite concentrate and the export of the concentrate from site for further processing. Processing of the concentrate is the subject of a separate assessment.

A Draft Environmental Impact Statement (Draft EIS) was prepared for the Project and placed on public exhibition between 13 February 2016 and 25 March 2016.

Written submissions on the Draft EIS were provided to the Northern Territory Environment Protection Authority (NT EPA) by 13 organisations:

- Aboriginal Areas Protection Authority
- Department of Business
- Department of Health
- Department of Infrastructure
- Department of Lands, Planning and the Environment
- Department of Land Resource Management
- Department of Mines and Energy
- NT Police, Fire and Emergency Services
- Parks and Wildlife Commission
- Power and Water Corporation
- Department of Primary Industries and Fisheries
- Tourism NT
- Department of Transport
- Department of the Environment
- Arid Lands Environment Centre
- Central Land Council.

These submissions, together with a submission from the NT EPA, were provided to TNG in a summary table.

Pursuant with clause 12 of the Environmental Assessment Administrative Procedures (EAAP) the NT EPA requested TNG to prepare a Supplement to the Draft EIS (the Supplement) on 18 April 2016. Once completed, the Supplement and Draft EIS are collectively referred to as the EIS.

The Supplement addresses the issues raised by stakeholders in their submissions. It contains responses to individual issues, as well as providing additional information about Project impacts and management measures. The Supplement also documents proposed changes to the Project.

In accordance with clause 14 of the EAAP the NT EPA will consult with NT Government advisory bodies, suitably qualified persons or organisations, and commenters when examining the EIS, prior to completing its Assessment Report.

This Supplement is structured as follows:

- Chapter 2 documents changes to the Project
- Chapter 3 provides supporting technical information to support a detailed response to some of the submissions
- Chapter 4 provides summary tables of all submissions received together with either a direct response to the issue raised or a cross reference to where the Supplement of Draft EIS provides more detailed information
- Appendices provide additional supporting information.

# 2. Project Changes

A single Project change is currently proposed.

The draft EIS documented that power to each of the production and standby bores would be provided by a diesel generator located at each bore. A 4,670 L diesel tank would supply each generator. This would result in around 960,000 L of diesel being delivered, unloaded, stored and used within the borefield on an annual basis with a delivery typically occurring every 20 days.

TNG has now decided to provide a powerline to the borefield. This will consist of a 22 kV overhead line with 415 V pole-mounted transformers. The powerline will run adjacent to the water supply pipeline predominantly along existing tracks. Transformers will be mounted adjacent to each bore. Each submersible bore pump and its associated pole-mounted transformer will be fenced to exclude cattle.

The three main reasons for switching to a power line are:

- Storage and use of diesel in the floodplain of the Hanson River is not desirable due to the risk of spillage and contamination. Pads for storage of diesel will need to be engineered and raised above flood levels
- It becomes problematic to protect Stirling Station if the station decides to seek organic certification. The 40 km of access road and the diesel storage pads would need to be fenced and there is no guarantee that a spill in the floodplain can be contained with organic certification maintained
- Life cycle costs for the Project are reduced.

# 3. Supporting Technical Information

This chapter provides additional detailed information to support a response to some of the submissions received. Submissions in Chapter 4 are cross-referenced to this information where necessary.

## 3.1 Water Resources

### 3.1.1 Flood Assessment

Additional flood modelling was undertaken for Murray Creek and the Hanson River (Appendix E).

The modelling focussed on the stretch of Murray Creek adjacent to the proposed pit to more accurately determine whether the pit would be subject to flooding. Modelling determined that there is the potential for the pit to flood in a 72-hour 100-year ARI storm event and that a flood protection levee will be required.

Modelling was also completed where the access road crosses both Murray Creek and the Hanson River to determine maximum flow depths and the period of inundation. Based on the 72-hour 100-year ARI storm event:

- Approaches to the road crossings are likely to be inundated, which will need to be addressed in the road design
- Maximum depths of flow in the Hanson River and Murray Creek will be ~3.1 m and ~2.4 m respectively
- Duration of inundation of 0.5 m or greater in the Hanson River and Murray Creek are ~130 hours (i.e. ~5.5 days) and ~95 hours (i.e. ~4 days) respectively.

### 3.1.2 Hydrogeology

A supplementary groundwater assessment report was prepared to further define the project conceptual hydrogeological model following an additional drilling and testing program, and revise the numerical groundwater model to allow the assessment of the potential cumulative impacts of borefield operation and pit dewatering, and potential impacts following cessation of operations. The full report is provided in Appendix D of the Supplement

*Groundwater investigations*

An initial drilling and testing program for groundwater assessment was completed in 2015 along a 50 km length of the Hanson River. The program was aimed at identifying if the Hanson River palaeovalley aquifer could meet the supply demands of the project, namely delivering 1.6 GL/annum for Stage 1 (years 1 to 4), and 2.6 GL/annum for Stage 2 (years 5-17).

Drilling was completed at four locations with monitoring bores established at each and a production bore at the most prospective site. The production bore was pump tested and data interpreted from this test used to interpret aquifer properties. The program highlighted that the Hanson River palaeovalley has the potential to provide significant volumes of relatively brackish groundwater and the subsequent groundwater modelling supported this.

To provide further definition on the extent of the Hanson River palaeovalley and to determine if it had the potential to meet the water supply demands for the Project, further drilling and testing was completed in July and December 2016.

The 2016 drilling and testing program included the construction of an additional 10 monitoring bores (investigation sites) and 2 production bores. Drilling included locations to provide better definition of the lateral extents of the Hanson River palaeovalley. The drilling provided further data on the Hanson River palaeovalley aquifer, identifying a variable sequence of sands and gravels, offering good aquifer potential. The two production bores were pump tested, with the highest yielding bore (16MPWB017) pumped for 11 days at a rate of 18 L/s. The extended period pump test was completed to assess the long term viability of pumping at higher rate at this location as well as to provide higher confidence in interpreted aquifer parameters.

This drilling and testing programs have confirmed the presence of the Hanson River palaeovalley aquifer, highlighting its broad extent and relatively prospective groundwater yields. The programs have provided reliable data from which to develop an indicative design for the borefield and to develop a representative numerical groundwater model.

For Stage 1 water supply, the proposed borefield will require six production bores. Of these, three have already been installed. Bore 16MPWB017 will be operated at a recommended pump rate of 15 L/s, with the remaining five bores pumped at 7.1 L/s. For Stage 2, a further three bores are required (total of nine), with 16MPWB017 operated at a recommended pump rate of 15 L/s, with the remaining eight bores pumped at 8.4 L/s.

*Groundwater modelling*

Groundwater flow modelling was undertaken to assess the cumulative impact of the operation of the borefield and pit dewatering.

The project conceptual hydrogeological model was further developed based on the outcomes of the drilling and testing programs, and consideration of available data, maps and reports to provide a framework for numerical model development. A broad four layer system was adopted to describe the key modelling areas of the mine site and palaeovalley aquifer. The layers were:

- Layer 1 represents the extent of the weathered zone in the bedrock outside of the palaeovalley and sandy-silt layer in the palaeovalley;
- Layer 2 represents a transition zone between the weathered bedrock and fresh bedrock in the area outside of the palaeovalley and lower sand/gravel aquifer in the palaeovalley;
- Layer 3 represents fresh bedrock (igneous and metamorphic) in the area outside of the palaeovalley and sedimentary rock (claystone/sandstone) in the palaeovalley; and
- Layer 4 represents fresh bedrock throughout the model domain in order to account for the potential vertical flow into the proposed mine pit.

During flood events of the Hanson River, it is expected that surface water would infiltrate to groundwater, recharging the aquifer. However, due to the periodic nature of these events, and lack of monitoring within the Hanson River, these events are not included in the model recharge. As such the overall recharge used for the model is considered to be a conservative estimate.

The MODFLOW-2005 model configured in three-dimensional mode was used for simulations. Layer thicknesses and hydraulic properties were determined based on resource drilling within and around the mine site, groundwater drilling and testing in the palaeovalley and lithology data from historic drilling. Both steady state and transient modelling was undertaken.

The steady state model was calibrated to fit historical water level observations tests undertaken for model convergence, water balance and other qualitative and quantitative measures. Model parameters and boundary conditions were changed to match the measured head with the modelled head. Of note, depth to groundwater in the area of Mud Hut Swamp is modelled as being around 20 mbgl (i.e. conceptually the swamp is not connected to the regional groundwater system).

The model was applied in transient state mode to assess the maximum potential drawdown of the palaeochannel aquifer through borefield abstractions and from pit development. This allowed the simulation of both drawdown and recovery in annual increments over a period of 100 years (17 years of abstraction followed by 83 years of recovery). This also allowed the staging of the borefield operation to be assessed.

Modelling results indicate that:

- Maximum groundwater drawdown at the borefield at the end of borefield operation (year 17) is modelled as being up to 12 m at the location of the operating bores in the centre of the borefield (Figure 3-1). Drawdown is centred on each production bore, with drawdown decreasing significantly with distance away from the palaeovalley. The 1 m drawdown contour extends to a maximum distance from a pumping bore of around 6.5 km to the south of the borefield at the end of year 17;
- At the end of mining, drawdown under transient conditions reaches a maximum of around 80 m within the immediate area of the mine pit, and rapidly decreases with distance from the pit (Figure 3-2). The 1 m drawdown contour is modelled to occur to a maximum distance from the pit of around 1.3 km to the east and west of the pit. Drawdown of up to 10 m is expected on the western side of Murray Creek;
- Due to the relatively localised drawdown, no drawdown impacts at 17 years are expected within the area of Mud Hut Swamp. Drawdown extent in the area of the mine site at 100 years increases to 3.5 km from the mine pit for the 1 m drawdown contour. No drawdown impacts are expected at Mud Hut Swamp;
- Drawdown is predicted at several pastoral bores located close to the borefield, with groundwater levels expected to reduce by up to 3.0 m. Such a reduction in groundwater levels may lead to the existing stock bore infrastructure being inadequate to provide stock water supply;
- The model water balance for the end of mining and borefield operation (17 years) demonstrates that the majority of water abstracted from the bores is coming from storage within the aquifer (85%), and not from either throughflow or rainfall recharge. As such, the model predictions indicate that groundwater levels at the up-gradient model boundary, in the area adjacent to Stirling Swamp and outflow of the Ti Tree basin, are not impacted by abstraction from the borefield;
- The transient simulations indicate that groundwater level recovery is slow in the palaeovalley, largely related to the recharge characteristics of the model, which are conservative;
- The results of the sensitivity analysis (with no recharge for 12 years and lowering the head by 0.7 m to the south) show that there is insignificant additional impact/drawdown within the zone of influence of the borefield; and
- Following cessation of mining a shallow pit lake is predicted to form due to the minor ingress of groundwater (peaking at just over 100 $m^3/d$). The pit lake will become progressively more saline due to the accumulations of salts from groundwater, surface water and rainfall ingress. By around 7 years post-closure a salinity of around 35,000 mg/L is predicted.

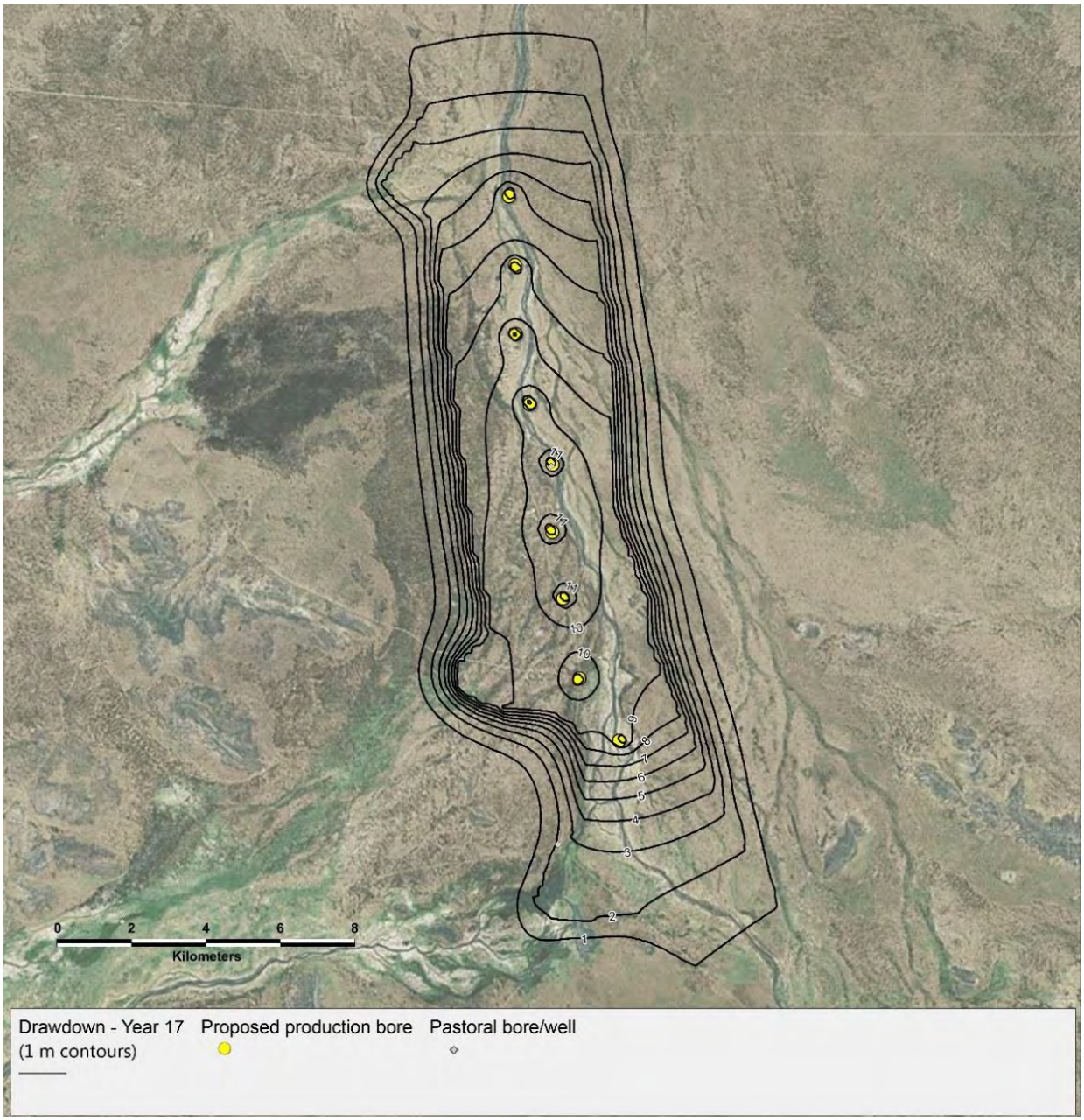


**Figure 3-1 Simulated transient groundwater drawdown – borefield at 17 years**

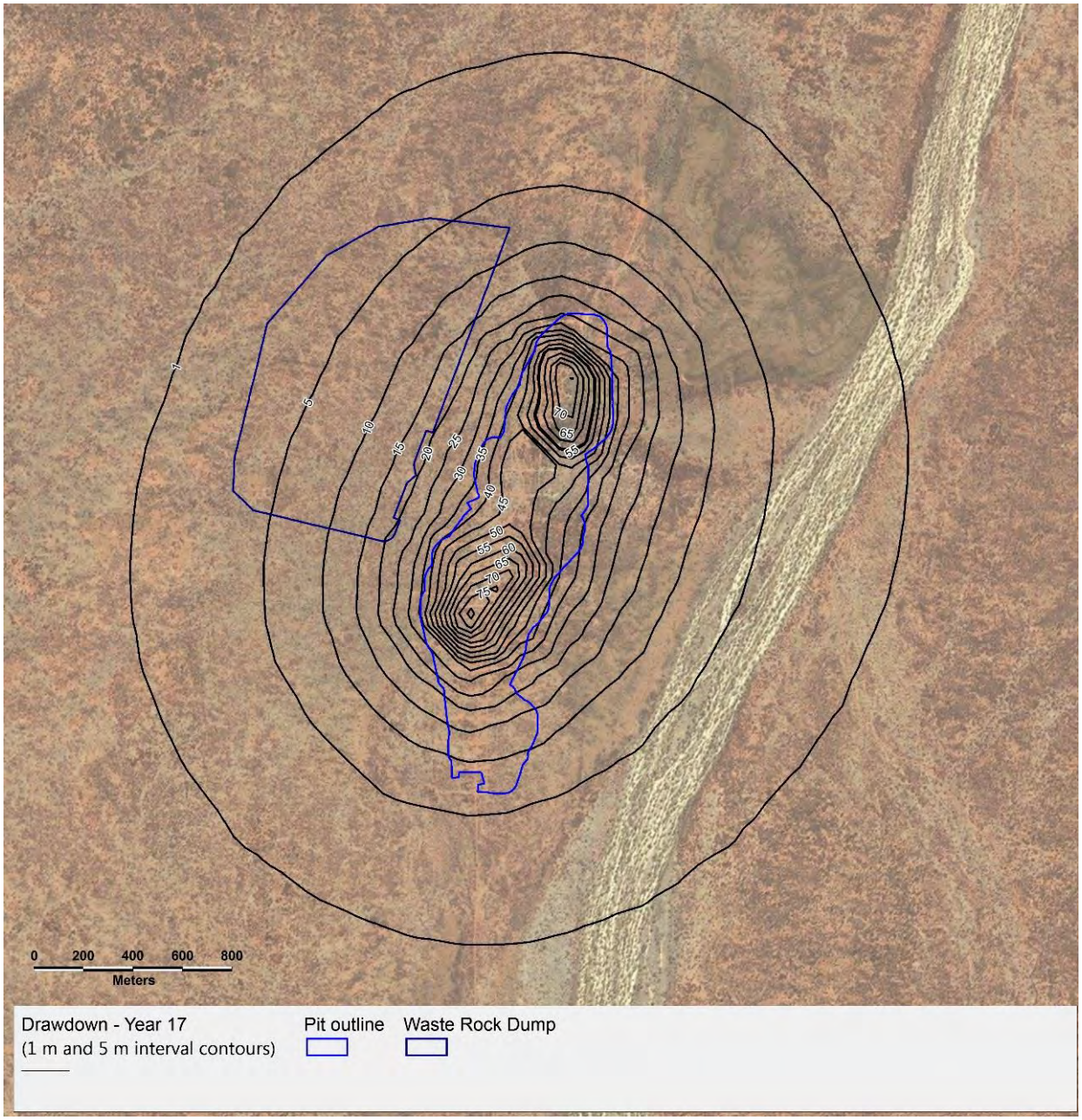


**Figure 3-2 Simulated transient groundwater drawdown – mine site at 17 years (contours 1 m and 5 m intervals)**

## 3.2 Biodiversity

### 3.2.1 Status of the Crest-tailed mulgara

*Changes to the EPBC threatened species lists*

During the course of the assessments for this project, the Commonwealth Department of the Environment made changes to the threatened species lists considered under the EPBC Act. Two of these changes concern species identified for this project, as discussed below.

### *Brush-tailed Mulgara (Dasycercus blythi) / Crest-tailed Mulgara (Dasycercus cristicauda)*

Up to December 2013, two species of mulgara were listed as threatened under the EPBC Act: the Brush-tailed Mulgara (*Dasycercus cristicauda*) and the Ampurta (*D. hillieri*). The distribution identified for *D. cristicauda* covered a large part of central and northern arid Australia, from western Qld, through northern SA and southern NT, across to the Pilbara region in WA. The distribution identified for *D. hillieri* covered a small area of central arid Australia, centred on the area where Qld, SA and NT meet. The distribution identified for *D. hillieri* did not include the Study area, while the distribution identified for *D. cristicauda* did. Because its distribution included the study area, the 'Brush-tailed Mulgara' (*D. cristicauda* or *D. blythi*) was included as a focal threatened species during the site assessments.

In December 2013, the EPBC species listings for mulgaras were revised to align with taxonomic work on the mulgara species by Woolley (2005). Woolley concluded that there were indeed two species of mulgara, but that those species did not align with the existing species identification.

Woolley concluded that *D. hillieri* is a synonym of *D. cristicauda* (i.e. that they are one and the same), and that species is now classified as the Crest-tailed Mulgara (*D. cristicauda*). The Crest-tailed Mulgara is listed as Vulnerable under the EPBC Act and Vulnerable under the TPWC Act. The Crest-tailed Mulgara is now reported to occupy an area of central arid Australia, centred on and extending west from the area where Qld, SA and NT meet. It occurs in sand dunes that have a sparse cover of Sandhill Canegrass (*Zygochloa paradoxa*). This habitat does not occur within the Study area. The Crest-tailed Mulgara was not identified by the PMST search for the Study area, and is considered unlikely to occur within the Study area.

Woolley concluded also that the mulgara species originally (i.e. pre-2013) referred to as Brush-tailed Mulgara (*D. cristicauda*) is really the Brush-tailed Mulgara (*D. blythi*). This species is not currently listed as threatened under the EPBC Act, but it is listed as Vulnerable under the TPWC Act. This species is reported to occupy sandplain habitats across a large part of central and northern arid Australia, from western Qld, through northern SA and southern NT, across to the Pilbara region in WA. This is the species that is likely to occur within the study area and the species that is likely to have excavated the mulgara burrow observed during the fauna survey.

The name *D. hillieri* has been removed from the EPBC Act threatened species list (December 2013). The name Ampurta was used by Aboriginal people (Woolley 2005), and Woolley notes that it is impossible to tell which species was known as Ampurta.

### 3.2.2 Statutory Plans

Following the identification of threatened species (or potential occurrence of threatened species) within the study area during the baseline surveys, concerted species-specific desktop investigations were conducted to compile appropriate information and strategies for determining species distributions (i.e. through subsequent targeted surveys) and likely threats and impacts resulting from the project, and therefore ultimately to devise appropriate ways to achieve species protection during construction and operation of the mine. The focal species for this were those listed under the EPBC Act (Greater Bilby, Black-footed Rock-wallaby and Great Desert Skink), and the Brush-tailed Mulgara, because of its history of species identification uncertainty and its close-relatedness to the EPBC listed Crest-tailed Mulgara.

As part of this process, numerous Commonwealth and NT government documents and websites were consulted that were considered to be directly or indirectly relevant to the project, including the Commonwealth Species Profile and Threats Database (SPRAT), NT government website (https://nt.gov.au/environment/animals/threatened-animals/), conservation advice statements, species fact-sheets, recovery plans, and threat abatement plans. Relevant information was incorporated into the risk assessment and impact assessment, to identify key threats and monitoring approaches, and into the Biodiversity Management Plan.

There is a published Recovery Plan for the Great Desert Skink that was consulted (McAlpin 2001). The Brush-tailed Mulgara is not listed as threatened under the EPBC Act and there is no adopted or made Recovery Plan for this species. There is also no recovery plan for the other mulgara species, which is listed as threatened under the EPBC Act (but which is not expected to occur within the study area): the Crest-tailed Mulgara, *D. cristicauda*. Given the historical uncertainty regarding the species identity of the mulgaras, conservation information pertaining to the Crest-tailed Mulgara was used also when evaluating potential impacts and mitigation for the Brush-tailed Mulgara. These species are likely to encounter similar threats and risks, and successful management of those factors for the two species is likely to follow similar approaches.

Threat Abatement Plans relevant to the Great Desert Skink and the Brush-tailed Mulgara (and many other fauna species that occur within the site) include Plans for feral cats, Red Foxes and European Rabbits. All of these were considered when developing the approach and methods for future monitoring and management of impacts on these threatened fauna species.

### 3.2.3 Targeted Fauna Survey

A full report is provided in Appendix C of the Supplement.

#### *Introduction, project description and objectives of this assessment*

Ecological assessments, including fauna surveys, were undertaken for the Project in April 2013 (fauna survey results are reported in the Draft EIS in Volume II, Appendix H). During these surveys a number of fauna species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were identified as being present, or potentially present, in the Study Area including:

- Black-footed Rock-wallaby (*Petrogale lateralis lateralis*) (MacDonnell Ranges Population)
- Greater Bilby (*Macrotis lagotis*)
- Great Desert Skink (*Liopholis kintorei*).

Based on the April 2013 survey results, fauna desktop assessment and the Terms of Reference (TOR) set by the Northern Territory Environment Protection Authority (NT EPA) for assessment of the Mount Peake Project, additional targeted threatened species survey work was required to obtain sufficient information on potential impacts of the project on the threatened species listed above. The TOR specify that the Project Environment Impact Statement (EIS) must provide a detailed assessment of Matters of National Environmental Significance (MNES), that being species and communities listed under the EPBC Act including:

- The likely presence of listed threatened species (focussing on the Greater Bilby, Black-footed Rock-wallaby and Great Desert Skink) and their habitat
- The quality and quantity of available habitat within the vicinity of the Study Area
- The potential impact of the project on these species and their populations.

This report presented in Appendix C of the Supplement describes the methods used and results obtained from a targeted survey for threatened fauna species (focussing on the Greater Bilby, Black-footed Rock-wallaby and Great Desert Skink and their habitats) completed in November 2016.

### *Methods used for this assessment*

Information presented is a synthesis of the following:

- A desktop search of government database information relating to fauna distributions, including the then DotE Protected Matters Search Tool (PMST) and the NT Department of Land Resource Management (DLRM) Fauna Atlas database, and subsequent six-day baseline fauna survey of the entire Study Area completed in April 2013. The survey used a range of trapping and non-trapping sampling techniques designed to gain as complete a description as possible of the relationships between fauna and the available habitats, and target the presence of fauna species listed as threatened/migratory under the *Territory Parks and Wildlife Conservation Act 2006* (TPWC Act) and/or the EPBC Act
- A four day targeted survey in November 2016 of the alignment of the access road, to assess fauna species listed as threatened/migratory under the TPWC Act and/or EPBC Act, with a particular focus on Greater Bilby, Great Desert Skink and Black-footed Rock-wallaby, including intensive walking transects over 25 km, and an area of 300-375 hectares
- Assessing the regional and national significance of the fauna and its populations of threatened species
- Determining ways in which the proposed mining operation might impact on the fauna and threatened species, proposing mitigation measures to reduce the risk of impacts, and determining residual risks to fauna including threatened species.

### *Results and discussion*

**Baseline fauna surveys**

Baseline fauna surveys completed in April 2013, along with analysis of desktop database searches, have identified 280 fauna species as occurring in the Study Area. Of those, 268 are native to the Northern Territory (40 mammals, 145 birds, 74 reptiles and nine amphibians).

**Threatened, near-threatened and migratory fauna species**

The DLRM Fauna Atlas and the PMST results identified 22 threatened vertebrate fauna species (15 mammals, 6 birds and one reptile) for the Study Area. Twenty of these are listed under the EPBC Act and all are listed under NT legislation (TPWC Act). Some of the species (all mammals) are considered extinct in the Northern Territory, and others are predicted to occur but have never before been recorded within the Burt Plains Bioregion.

Sixteen threatened or near-threatened species (six mammals, six birds, three reptiles and one frog) are considered likely to occur within the Study Area, either as residents or visitors. Many of these are expected to be rare or very rare. Seven of these species were detected during the baseline fauna survey in April 2013, and three were detected during the targeted survey in November 2016. These include:

- Bilby (*Macrotis lagotis*) – Potentially recorded April 2013
- Great Desert Skink (*Liopholis kintorei*) – Recorded November 2016
- Brush-tailed Mulgara (*Dasycercus blythi*) – Recorded April 2013
- Grey Falcon (*Falco hypoleucos*) – Recorded April 2013

- Emu (*Dromaius novaehollandiae*) – Recorded April 2013 and November 2016
- Australian Bustard (*Ardeotis australis*) – Recorded April 2013 and November 2016
- Woma Python (*Aspidites ramsayi*) – Recorded April 2013
- King Brown Snake (*Pseudechis australis*) – Recorded April 2013.

Bilby were not observed at any stage despite extensive targeted searches of all areas of potentially suitable habitat along the proposed access road alignment. However, potential Bilby diggings were found 11 km from the proposed impact areas in April 2013 and it was therefore considered possible for Greater Bilby to be present in the broader region. This determination is made on the basis of these possible diggings and areas of potentially suitable spinifex sandplain habitat containing witchetty bush (*Acacia kempeana*) particularly along the proposed alignment, apparent intent of the diggings (i.e. targeting a food source of termites and/or shallow roots), the appearance and characteristics of the scratchings (e.g. sharp edge to scrapes, two or three obvious claws marks), and proximity to historical Bilby records.

A single Great Desert Skink (*Liopholis kintorei*) was observed fleetingly during November 2016 surveys, on the edge of an access track in open sandplain within spinifex (*Triodia* spp.) understorey, approximately 7 km from the proposed access road. Subsequent searches of the area surrounding the sighting failed to detect any further signs of this species, such as communal burrow systems or latrines.

The Brush-tailed Mulgara was not observed, but was considered likely to be present on the basis of indirect signs (burrows, diggings and scratchings). Confidence in the identification of the mulgara burrow was high – the burrows were fresh and active, and showed the characteristic signs of a burrow of this species (as experienced by GHD zoologists in other surveys of the Burt Plain area of the NT, where live animals have been photographed using camera traps at potential burrows). Failure to detect a live animal at the burrow using a remote sensing camera may indicate relatively low abundance of the species at this site, but may also be explained by the species' known sensitivity to disturbance, and the likelihood that mulgaras have numerous burrow entrances that would be used preferentially in response to disturbance.

Based on the survey effort of the 2013 and 2016 assessments, observations of suitable habitat features, and advice and field assistance from local specialist ecologists from Desert Wildlife Services, the failure to detect a live Bilby or Mulgara, and observation of only a single Great Desert Skink and no burrows, suggests that none of these species is likely to be present in large numbers within the Study Area. However, arid fauna typically have breeding strategies that allow them to respond rapidly to improving conditions. Thus, future population sizes may differ greatly from current population sizes, and the value of potentially suitable habitat cannot be overstated.

All of the threatened and near-threatened species detected are species that have broad distributions across Australia. The narrowest distributions are those of the two mammal species (Bilby and Mulgara), whose distributional ranges have declined in recent decades, most likely in response to a combination of predation by feral cats, habitat disturbance and degradation due to grazing, weed invasion, and increased use of fire across the landscape.

Five of the seven threatened species detected are ground-dwelling species (reptiles, non-volant mammals, flightless birds) that have limited mobility across the landscape. These species are perhaps most at risk from localised habitat changes that may result from construction and operation of a mine in the Study Area.

### *Impact assessment, mitigation and monitoring*

The Study Area has the potential to support a range of threatened fauna species, including eight listed as vulnerable or endangered under the EPBC Act. Collectively, these species are likely to occupy the full range of available fauna habitats within the Project area, but the sandplain spinifex habitat has the potential to support more threatened species than other habitats. Following the initial impact assessment in 2013, the threatened fauna relevant to the Project and re-assessed following additional targeted surveys in November 2016 can be categorised as follows:

- Ground-dwelling sandplain fauna with limited mobility (Greater Bilby, *Macrotis lagotis*; Great Desert Skink, *Liopholis kintorei*; Brush-tailed Mulgara, *Dasycercus blythi*)
- Fauna in rocky habitat (Black-footed Rock-wallaby (MacDonnell Ranges race), *Petrogale lateralis*).

The Project poses a range of potential impacts on some of these threatened fauna species. Before mitigation, a small number of impacts have the potential to be medium or high risk. The main sources of impact on fauna are expected to be from:

- Clearing of vegetation, particularly for construction of the 100 km access road
- Unplanned wildfire, if inadvertently started by mine construction or operation
- Collisions between fauna and traffic during construction and operation, particularly in spinifex sandplain habitat and particularly at night
- Introduction and/or spread of weeds (particularly through inadequate site reinstatement)
- Increase in population size of native and non-native predators (particularly through inadequate management of garbage/waste, which could attract vermin, and subsequently their predators such as cats and foxes).

The extent and severity of impact that this Project has on fauna depends entirely on the level of management and mitigation effort given. There is potential for all impacts and risks to be reduced to an acceptable level (i.e. not significant) through the use of effective and appropriate management and mitigation. Inadequate management and mitigation has the potential to lead to irreversible long-term impacts on some threatened fauna species. Monitoring will be required to measure the effectiveness of mitigation and to identify where changes in effort may be required.

## 3.2.4 Potential Impacts to Groundwater Dependent Vegetation

An assessment of potential impacts to Groundwater Dependent Ecosystems (GDEs) from groundwater extraction activities associated with the project has been undertaken (Appendix K of the Supplement). The assessment uses existing groundwater assessments for the project, and specifically makes use of the groundwater drawdown models. The assessment covers the impacts of groundwater extraction from the mine pit and borefield during operation and following closure. The key conclusions from the assessment are:

- The project has the potential to reduce groundwater levels and modify the frequency/timing of water table level fluctuations. The project may also alter the natural groundwater chemistry and/or chemical gradients as a result of changes to water levels
- A groundwater model developed for the project predicts a maximum groundwater drawdown at the borefield of less than 5 m at Stage 1 (year 4), peaking at approximately 12 m at the end of mining (Stage 2: year 17). Predictions at 100 years shows groundwater levels rebounding with maximum drawdown less than 5 m

- Potential impacts of predicted groundwater drawdown as a result of the project include mortality of facultative phreatophytes such as River Red Gum, Ghost Gum, Bean Tree and Desert Bloodwood
- A conservative threshold of 20 meters below ground level (mbgl) was selected as the maximum depth at which facultative phreatophytes would access and rely upon groundwater resources to meet water requirements. Below 20 mbgl it was considered unlikely that River Red Gum, Ghost Gum, Bean Tree and Desert Bloodwood would be reliant on groundwater resources
- Along the Hanson River palaeochannel within the borefield, predicted groundwater drawdown of 10 m or more (resulting in an overall groundwater depth of 20+ mbgl) would trigger the threshold value and likely result in an impact to facultative phreatophytes (Figure 3-3). In this worst-case scenario it is estimated no individual trees at year 4 (as predicted drawdown is <5 m) and 2,209 individual trees at year 17 could be impacted
- Drilling completed to 35 and 36 m on the eastern bank of Murray Creek (near the mine pit) did not identify the presence of groundwater. This indicates that facultative phreatophytes within the area are unlikely to access and/or rely on groundwater resources. No impacts to GDEs in the Murray Creek area are anticipated through groundwater extraction activities associated with dewatering of the pit
- Opportunities to mitigate impacts to GDEs are limited, however, a monitoring program has been proposed to allow quantification of impacts over the duration of the project
- Modelling predicts that no groundwater drawdown for any scenario is expected at or near the three sites of conservation significance - Mud Hut Swamp, Anmatyerr North (including Stirling Swamp) and Wood Duck Swamp.

## 3.3 Acid and Metalliferous Drainage

Additional assessment for acid, metalliferous and saline drainage was undertaken (Appendix F). The assessment was undertaken to provide further information on the potential risk of AMD following an assessment undertaken as part of the Draft Environmental Impact Statement.

The previous assessment was based on extensive geochemical testing of ore and waste material using X-Ray Fluorescence analysis during various stages of drilling. The data found that in general the waste and ore was low in sulfur with 98.6% of the samples recording total sulfur less than 0.2%. Laboratory testing undertaken for the current assessment analysed ore and waste material for Static and Kinetic AMD parameters to test the validity of the previous assessment and further quantify the AMD risk.

The Stage 1 testing undertaken for this assessment analysed of 409 samples (196 from waste rocks, 209 from ore and 4 from tailings material). The number of samples analysed exceeded the industry recommended number of samples. Stage 1 analysis was undertaken on all samples for Net Acid Producing Potential (NAPP), Net Acid Generation (NAG), metals and sulfur.

Stage 1 results broadly supported the preliminary assessment undertaken in 2015, with both datasets showing consistently low sulfur concentrations for waste and ore, indicating the material is unlikely to generate acid. The laboratory analysis demonstrated that the majority of samples were low in sulfides, with 85% of the waste samples being less than 0.05% sulfides, and 97% of the ore samples being less than 0.05% sulfides. Total sulfur was below Limits of Reporting (0.01%) for almost half of the waste samples.

Maximum Potential Acidity (MPA) for the samples analysed recorded median, mean and 99% Upper Confidence Limit values of 0.5, 0.7 and 0.8 kg/t $H_2SO_4$ respectively, demonstrating a general lack of sulfide material and a very low acid potential for the waste and ore.


**Figure 3-3 17 year predicted maximum drawdown and GDEs**

Net Acid Producing Potential (NAPP) results demonstrated that all samples returned negative values, indicating that all the material can be classified as either acid-consuming material (ACM) or non-acid-forming (NAF).

Based on Stage 1 results, samples representing the highest sulfur and/or metal data were chosen for Stage 2 testing. Analysis included Kinetic NAG testing, acid buffering characteristic curve (ABCC) analyses and Australian standard leaching procedure (ASLP) testing.

The kinetic NAG and ABCC tests indicate that in the highest risk samples the ANC may be largely due to reactions of silicates such as micas and clays and hence overestimated. However, waste rock and ore material have adequate acid neutralising capacity and the risk of acid leachate generation is very low.

Leachate testing indicates that leachate from waste rock may be sodic and cause soil dispersion if irrigated on to local soils. This can be managed by capping waste rock dumps with non-dispersive soils on closure, diverting runoff to holding ponds via armoured drainage channels and by amending impacted soils or treating leachate with lime, if soil contact is likely.

It is concluded that the project does not pose a significant AMD risk to the environment.

In keeping with TNG's commitments to safeguarding the environment, further AMD monitoring will be undertaken pre-mining and during mining to provide feedback to confirm that concentrations of key AMD parameters are consistent with the existing testing. In the unlikely event that material with a greater AMD potential is identified, appropriate contingency measures will be taken.

## 3.4 Organic certification

Questions have been raised on the potential for chemicals transported and used at Mount Peake to impact on the organic certification of Anningie Station and the potential for Stirling Station to seek organic certification. Principal chemicals include:

- Diesel
- Sodium hypochlorite (or other chlorine based product) and a proprietary antiscalent for use in potable water treatment
- Ammonium nitrate
- Nalco
- Herbicides for weed control.

Anningie Station is certified as an organic beef producer by the United States Department of Agriculture (USDA) National Organic Program and the Australian National Standard for Organic and Bio-Dynamic Produce. Certification was undertaken by AUS-QUAL.

Certification of a property is risk based and there is a requirement for the owner to inform AUS-QUAL and update documentation when there is a change that may impact organic certification. Inspection and re-certification of the property may be required.

Certification requires the property to demonstrate compliance with USDA organic regulations (Code of Federal Regulations 7 (Agriculture), Part 205 (National Organic Program)) which describe the specific standards required to allow the selling, labelling or representation of a product as organic. The Australian Standard stipulates minimum requirements for products placed on the market with labelling which states or implies they have been produced under organic or bio-dynamic systems. The Standard provides a framework for the organic industry covering production, processing, transportation, labelling and importation. Of the two, the National Organic Program is the more stringent.

Under the National Organic Program organic livestock must, in part, be raised as per the National List of Allowed and Prohibited Substances (National List). Organic ruminant livestock - such as cattle, sheep, and goats - must also have free access to certified organic pasture for the entire grazing season.

The National List allows most natural substances in organic farming while prohibiting most synthetic substances. Under this list diesel, ANFO and non-organic herbicides are not listed as being specifically allowed. Sodium hypochlorite (and other synthetic chlorine compounds) is allowed providing residual levels of chlorine meet drinking water guidelines. Antiscalents are not specifically allowed although they are certified as being safe for human consumption.

The Australian Standard also lists permitted materials for use on organically certified properties. None of the chemicals listed above are specifically permitted.

Risks to organic certification from chemicals that are not specifically allowed include:

- Spills to land and water from the transport, handling and storage of chemicals
- Organically certified cattle coming into contact with chemicals
- Airborne release of chemicals from blasting.

The primary methods available for reducing risk to organic certification include:

- Providing a buffer between project activities and the certified property.

  The mine site and access road will be fenced. Fencing will also exclude organically certified cattle from the project area.

- Excluding any areas that pose a risk to the organic certification. Excluding areas so that they are not subject to certification is a common practice. For example, an area around the Anningie homestead including the home paddocks is excluded due to the storage of diesel.

  A short section of the access road will cross a corner of Anningie Station and may have to be excluded. The Mount Peake project area will also need to be excluded from any organic certification being pursued by Stirling Station.

- Transport, handling and storage of chemicals consistent with regulatory requirements.

  Diesel will be transported in licensed vehicles, stored in tanks manufactured to comply with AS1692 and with tanks installed in compliance with AS1940 for Storage of Combustible Fluids. Lubricating oil and waste hydrocarbons will be stored in bulk containers / tanks inside a bunded area. Other chemicals will be stored under cover in bunded areas. All vehicles transporting chemicals and all storage areas will have spill protection and recovery equipment.

  ANFO will be used in blasting. At detonation the very high temperatures generated volatilises the ANFO such that there are no residual nitrates or hydrocarbons.

  Spot control of weeds at the mine and along the access road is expected be necessary. No decision on the herbicide to be used has currently been made. There is the option of using organic control methods if there is an offsite risk posed to organic certification. This will be discussed with the pastoralists.

## 3.5 Human Health and Environmental Risks

The project will transport, store and use a number of potentially hazardous materials on site including:

- Diesel – used as a fuel source
- Nalco – used as a flocculant for settlement of tailings. The Material Safety Data Sheet (Appendix H of the Supplement) does no classify this as a hazardous substance and there are no known ecotoxicological effects
- Sodium hypochlorite – used in treatment of potable water. The MSDS (Appendix H of the Supplement) classifies this as a hazardous chemical and, although toxic to aquatic organisms, is biodegradable and does not bioaccumulate
- Antiscalent – used to maintain pipework associated with water treatment. A decision on the type of antiscalent to be used has not been made. However, given their use in water treatment, they are not generally classified as a hazardous substance or having significant ecotoxicological effects
- Ammonium nitrate – used in explosives. The MSDS (Appendix H of the Supplement) classifies this as a hazardous chemical with low toxicity to aquatic life. Ammonium nitrate is a plant nutrient and may kill vegetation and poison livestock if released in large quantities. It is biodegradable and does not bioaccumulate.

The management of human and environment risks are detailed in Volume III, sub Appendix F (Hazardous Substance Management Plan) of Appendix N (Environmental Management Plan) of the draft EIS. A risk assessment is provided (Table 3-1) including identification of sensitive receptors and management / mitigation measures proposed (Table 3-3). The MSDSs (Appendix H of the Supplement) also identify appropriate transport, storage and handling procedures.

# 4. Response to Submissions on the Draft EIS

This Chapter provides a consolidated summary table of submissions received on the Draft EIS.

Each submission is assigned a unique number. Responses are provided for each submission either directly in the table or, for the more complex responses, via a reference to the relevant section or technical appendix of the Supplement. Reference is also made where necessary to information previously provided in the Draft EIS.

Submissions were received from the following:

## 4.1 NT Environment Protection Authority

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
|---|---|---|---|---|---|
| **Transport safety** | | | | | |
| E1 | Rail Transport | ES p.1<br>Risk<br>TR01 | | The Draft EIS identifies Project scope as including concentrate transport to Darwin-Middle Arm, but has not discussed risks beyond stockpiling concentrate at Adnera.<br>Identify environmental risks associated with rail loading and transport components of the Project. Describe proposed management of identified risks. | Magnetite concentrate is not hazardous to human health or the environment (Appendix H of the Supplement).<br>Rail loadout of concentrate will be by front-end loader. Dust generation will be controlled by maintaining moisture levels in the concentrate and water application if required.<br>Rail wagons used to transport concentrate will be covered to prevent dust lift-off.<br>The primary risk during rail transport is train derailment leading to concentrate spillage. If this was to occur, machinery would be mobilised to recover the spilt material. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
|---|---|---|---|---|---|
| E2 | Haulage impacts to fauna | ES ii | *The Draft EIS describes the Project operating 24/7/365, with up to 50 concentrate loads hauled 100km by truck to the loadout facility, and returning empty.* | Does the Project include night road trips? If so, identify Project aspects / areas which increase risks to fauna, including listed threatened fauna and stray cattle, of being struck by vehicles at night. Identify sensitive receptors. Describe management to minimise such impacts. Consideration should include:<br>o *fauna aggregation points and transit pathways adjacent to, near or across proposed haul routes*<br>o *road route selection*<br>o *fence and verge design / maintenance*<br>o *width of the cleared roadside buffer, with regard to amount of warning a driver may get before a cow or kangaroo enters roadway ahead*<br>o *vehicle speed limits*<br>o *driver awareness / communication / reporting.*<br>o *signage* | Use of the access road will occur during both day and night time. A stock fence will be present along both sides of the access road to exclude cattle. No fauna aggregation points (e.g. for stock watering) will occur within the fenced corridor and no transit pathways cross the corridor.<br>The fence will be regularly visually inspected and any repairs made as necessary.<br>The access road will have a formed width (including shoulders and drains) of 13 m within an overall clearance of 25 m. This clearance will provide some warning to drivers on the presence of fauna.<br>Vehicle speeds will be limited to 80 km/h.<br>Driver awareness training will include inductions covering the dangers of fauna collision, presence of any threatened fauna in the area, communication between road users on the presence of any fauna observed in the corridor, and the reporting of any fauna strike / death to the Environmental Manager, station owner and agencies as appropriate.<br>Speed limits will be signposted and signs erected warning of the potential occurrence of fauna. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
|---|---|---|---|---|---|
| E3 | | App.H. Fauna / s.7.2.15, p.82 | *It is possible that several of the species that occur within the Project area could occasionally be struck and killed by vehicles moving in the area (e.g. Brush-tailed Mulgara, Greater Bilby, Common Brushtail Possum, Black-footed Rock-wallaby and Great Desert Skink). Some of the threatened species that do or may occur in the Project area are nocturnal and would only be affected by vehicles travelling at night. Mitigation options could involve the implementation of speed limits and a reduction in vehicle travel at night.* | Describe proposed operational management of fauna road-strikes, to minimise risks of road strikes, vehicle accidents and follow-on risks to scavenging birds and following vehicles. Reporting of strikes of listed threatened species (to DLRM) and livestock (to station owners) may be appropriate. | The road corridor will be fenced to exclude cattle.<br>Vehicles will be in radio communication to allow other road users to be warned of any fauna death.<br>If dead animals are found on/beside roads, the Environmental Officer will be notified to remove the carcass a minimum of 20 m into adjacent land to prevent subsequent collisions with scavenging animals.<br>Fauna strikes / deaths will be reported to agencies or the station owner as appropriate. |
| E4 | Vehicle accidents, spills | Risk TR01, TR03 | *Transportation of dangerous goods.*<br>*Spillage of dangerous goods and their release to the environment.*<br>*Vehicle collision resulting in injury or death*<br>*Transport of dangerous goods in accordance with relevant legislation with measures incorporated into the Transport Management Plan.* | Describe proposed prevention and management along the haul road, of:<br>o vehicle breakdowns<br>o road accidents / injuries<br>o major and minor spills, including spills of dangerous goods | **Vehicle breakdowns**<br>Vehicle maintenance schedule.<br>Posted speed limits.<br>All vehicles fitted with radio communications with the location of a breakdown communicated.<br>Vehicle to be parked on the shoulder of the road.<br>Recovery / repair crew sent to location of breakdown.<br>**Road accidents / injuries**<br>Actions consistent with the Emergency Response Plan (Volume III, Appendix N, sub Appendix J, s3.7 of the Draft EIS).<br>**Spills**<br>Dangerous goods transported in compliance with Dangerous Goods legislation.<br>Actions consistent with the Emergency Response Plan (Volume III, Appendix N, sub Appendix J, s3.6 of the Draft EIS). |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
|---|---|---|---|---|---|
| E5 | Road flooding / river crossings | App. F<br>p.38 | | Provide details of construction designs for the road-river crossings. Information gaps appear to exist for the proponent on river flow depths and velocities, required to inform appropriate road designs. What ARI are the road and river / creek crossings designed to withstand?<br>The assumption is made that an inundation depth of 0.2 m over roads is trafficable. NT EPA questions the safety of this practice, given the potential for minor flooding to hide increasing road damage, and related road safety risks. | The current concept for floodways across the Hanson River and Murray Creek is provided in Appendix G of the Supplement.<br>The concept of an ARI is not relevant when designing a floodway since flood immunity is not being provided. The floodway will be at, or close to, the creek / river bed (i.e. at grade) and will overtop during most flow events. This design removes the two key environmental risks associated with a river crossing – backup of floodwater and restriction of sediment movement.<br>Detailed design of the floodway and the approaches will be based on site specific geophysical assessments.<br>The design will consider the need for trafficability of floodways during inundation via a flow-duration frequency assessment. The trade-off of maintaining a stockpile of ore at the rail head versus the need for ongoing hauling of ore during flow events will be undertaken. Access across floodways will be assessed through a risk assessment and trafficability requirements and will be accounted for in the design. Access will not occur if conditions are unsafe. |
| **AMD / NMD / SD** | | | | | |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
|---|---|---|---|---|---|
| E6 | AMD / NMD / SD potential and need for further characterisation | App.O, s.5.5, p.36 | Potential exists for Acidic and/or Metalliferous Drainage (AMD), Neutral Mine Drainage (NMD) and/or Saline Drainage (SD)(AMD/NMD/SD) from the Tailings Storage Facility (TSF), Waste Rock Dump (WRD), Run of Mine (ROM) Pad, and other mine infrastructure constructed using mine waste rock, where construction materials have not yet been adequately characterised. Potential for environmental contamination from concentrate stockpiles may exist, depending on AMD / NMD / SD characteristics of the concentrate.<br>The Draft EIS presents interpreted results from X-ray fluorescence (XRF) testing of a large number of mine core samples (6324).<br>*Given the low sulfur content and low metals content, the primary (pre-management) risk level is currently medium. It is likely that with the proposed additional pre-production testing (Section 6.3.2), including additional kinetic AMD testing and sulfur speciation, the primary risk would be lowered. Taking in to consideration the proposed AMD management Plan (Section 6), the residual (managed) risk becomes low.*<br>*The high level AMD risk assessment presented in Table 17 shows that with appropriate design and operational control measures, the residual AMD risk on site is low.*<br>*Moderately elevated metal concentrations (are) present in some samples of the main lithological units.*<br>To improve confidence in these data sets, additional sampling and analysis would be | NT EPA agrees that implementation of the proposed pre-production testing could potentially demonstrate that AMD risks of the Project are low, however the further testing proposed may reveal that AMD/NMD/SD risks are not as low as TNG currently assumes them to be.<br>Designs of waste storage infrastructure are presented in the Draft EIS based on high-level (XRF) testing, and on the assumption that AMD/NMD/SD risks do not exist. The accuracy of this assumption has not yet been adequately demonstrated in the Draft EIS. Design aspects of the WRD and TSF that could reduce AMD/NMD/SD impacts on the environment are limited or absent: groundwater connectivity with tailings and WRD seepage is high / direct; no impermeable liner is proposed for the base of either facility; the potential PAF cell has no clay or impermeable lining; no cover design is provided for either facility, to demonstrate prevention of oxygen and water access to PAF contents.<br>Characterisation of tailings and TSF/Waste Rock Dump seepage has not been provided in the Draft EIS. The potential for Neutral Mine Drainage is identified but not clearly characterised nor quantified in the Draft EIS. The potential for Saline Drainage has not been adequately recognised, characterised nor managed in the Draft EIS. No management of Acidic and/or Metalliferous Drainage is firmly proposed.<br>Further characterisation is required of tailings, all waste rock types, and magnetite, for AMD, NMD and SD | Additional testing and assessment has been undertaken that demonstrates that the risk of acid, metalliferous or saline drainage is low. The results are summarised in s3.3 and a full report provided in Appendix F of the Supplement.<br>No change to infrastructure design is warranted with the results confirming the acceptability of an unlined TSF and WRD. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
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| | | | undertaken as detailed in the site procedure in the AMD Management Plan. The results would be used to validate AMD risk and management strategies in subsequent revisions of this document.<br>Additional testing to be done in the pre-production phase will include;<br>o *Identification of suitable cover/capping/encapsulation material and testing for dispersion, exchangeable cation, and general capping geotechnical parameters*<br>o *Laboratory static NAG and NAPP testing including sulfate (or chromium reducible) sulfur*<br>o *Kinetic NAG testing to confirm relative availability over time of acid-generating and neutralising capacity and to provide an indication of likely reaction times*<br>o *Column and or barrel leach tests to commence to provide long-term leachate generation information*<br>o *Additional metals (ICPMS scan) to be added to the leachate and groundwater suites to cover the full range of likely contaminants*<br>o *Additional metals to be added to laboratory and field XRF analyses to cover the range of potentially elevated or mobile metals* | potential. Prediction needs to be made of seepage quality from these facilities, such as through kinetic and column leach testing.<br>All the above characterisation information was requested by the Terms of Reference to be included in the Draft EIS. Delayed submission of key information until later stages reduces the effectiveness of the environmental assessment process in optimising Project environmental management / outcomes, transparency, accountability, public acceptability and support for the Project. The above studies should as a minimum be completed for inclusion into the Supplement, to inform whether existing infrastructure designs are appropriate to the level of AMD/NMD/SD risk, or require upgrading.<br>Designs should incorporate levels of protection against AMD/NMD/SD generation and discharge that are appropriate to the fully demonstrated seepage/runoff contamination potential of the material being stored, and in accordance with leading industry practice. | |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
|---|---|---|---|---|---|
| E7 | | s.5.2.1 | *The risk assessment recognises the limitations of the input data (i.e. no NAG, kinetic ABA testing or Australian Standard Leaching Procedure (ASLP) or column leaching tests).* | These are required for the Supplement. | Refer response to Question E6. |
| E8 | Use of NAF material in mine-site construction | s.2.3.3, p.2-10 | *It is proposed to use up to 5 Mt of non-acid forming waste from pre-production for Project construction requirements (ROM Pad, construction pads, site roads, sedimentation ponds etc).* | Material characterisation needs to be firmly established to inform the Project planning stage and material handling schedules, to ensure no net AMD/NMD/SD potential exists in material proposed to be used to construct Project infrastructure. While material may be 'non-acid forming', it may still be unsuitable for use in construction if likely to become a source of environmentally significant neutral mine drainage or saline drainage.<br>Information presented in the Draft EIS suggests the need for identification, location and quantification of the inferred pockets of PAF material, to allow incorporation of this knowledge into a block model / mine schedule, and preparation for appropriate containment of the material once exposed.<br>Prior XRF screening of waste material types to be used for construction needs to be backed up by kinetic and column leach testing to verify or revise XRF findings, and to evaluate risks of AMD / NMD / SD seepage. | Refer response to Question E6. |
| | | Risk SW10<br>*s.3.4.5* Waste Rock Dump | *Use of mine waste for construction purposes around the site.*<br>*Release of AMD causing contamination.*<br>*Approximately 70 Mt of waste will be generated over the life of the Project. Some of this waste will be used for construction purposes (building pads, ROM pad, road construction etc) during the two years of construction.*<br>*Due to the benign nature of the waste material it is not expected that specific handling of waste will be required. Geochemical testing identified that the waste does not contain significant quantities of AMD material. Two samples (out of 6000) were identified as having low acid forming potential. The Acid Neutralising Capacity of the orebody was found to be high and it is expected that any minor quantities of potentially acid forming material will be co-disposed with non-acid forming material to take advantage of this neutralising capacity.* | | |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
|---|---|---|---|---|---|
| E9 | Low sulfide content | s.7.5, p.7-27 | *Geochemical investigations by TNG have confirmed the orebody does not contain significant Acid Mine Drainage (AMD) materials, with geological logging rarely encountering visible sulphides and, when so, they were in the order of ~2% of the sample over a few metres.* | Given the large quantities of waste rock, sulphide occurrence at 1-2% could represent large total quantities of reactive materials within the WRD, with (AMD/NMD/SD) potential to cause environmental impacts and requiring management. Block modelling and mine scheduling should be based on prior knowledge of locations of pockets / strata of PAF material, to optimise management of this material, minimising its period of exposure to air and oxygen. | Refer response to Question E6. |
| | | *App.O, p.15, s.3.4.1* | *During logging of the resource drilling, there have only been rare occurrences of visible sulfides. Rarely do they comprise more than a few percent of the sample over a few metres. Generally, the sulfides seen are associated with structural zones and faults/fractures. The majority of fracture zones are less than one metre thick, irregularly developed, and not able to be correlated between holes.* | | |
| | | *App.O, p.29* | *Sulphide content is described as being low, but present in waste rock. A significant proportion of the rock types are classed as uncertain.* | | |
| E10 | Acid Based Accounting Total Sulfur | App. O, p.41, s.7.1.1 | *For those samples that did have >0.3% S, they tend to occur in the ore, gabbro, alluvials and fault zone in relatively thin bands and at a variety of depths but predominately in the upper 40 m. The elevated sulfur readings typically occur over less than 3 m intervals.* | Discussion and analysis of Total Sulfur should be based on a threshold of 0.2%S, not 0.3%S.<br>The DITR 2007 reference does not suggest use of a threshold of 0.3%S to categorise PAF material, as inferred in the Draft EIS. It provides two case studies, | Refer response to Question E6. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
|---|---|---|---|---|---|
| | | s.3.2.1, p.11 | *Total sulfur values of less than 0.3 % S or 10 kg H2SO4/t are considered uncertain (DITR2007)* | which use thresholds of 0.2%S (Tom Price Mine, WA), and 0.25%S (Sari Gunay, Iran). DITR 2007 defines PAF/NAF categorisation as:<br>o NAF: Non-Acid Forming<br>o PAF: Potentially Acid-Forming with acid-generating capacity less than or equal to 10 kg$H_2SO_4$/t<br>o High PAF: Potentially Acid-Forming with acid-generating capacity greater than 10 kg$H_2SO_4$/t.<br>An acid-generating capacity equivalent to greater than zero kg$H_2SO_4$/t should be classified as 'PAF', or PAF (LC), not 'Uncertain' as has been used in the Draft EIS. | |
| E11 | PAF management | *App.O, p.29* | *TNG recognises that planning for closure is a fundamental component of mine planning (INAP 2009, DITR 2007, EPA/DMP 2011). Therefore, identifying any AMD material within the context of the mine plan and schedules is essential such that its management may proceed successfully. To that end, TNG has developed comprehensive AMD design and operational controls to minimise forward* | How will the (~low amount of) sulphides present be managed? | Additional test work (s3.3 and Appendix F of the Supplement) demonstrates that all samples had negative Net Acid Producing Potential results indicating that the material is acid-consuming or non-acid-forming. Sulphides do not need to be managed. |
| E12 | | | | What specific commitments are made to manage any PAF material present? | Refer response to Question E11. There is no PAF material. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
|---|---|---|---|---|---|
| E13 | | | *closure risks.* | How will AMD/NMD/SD potential be identified in mined / stored material during mine operations? | Additional test work on waste and ore indicated that the material has a low risk of generating acidic, metalliferous or saline leachate (s3.3 and Appendix F of the Supplement).<br>During operations there will be continual testing of fresh material to confirm the absence of AMD with barrel leach testing of stockpiled ore and stored waste to confirm findings that there will be no AMD leachate generated. |
| E14 | | | | How will identified problematic material (with AMD/NMD/SD or toxic potential) be handled to avoid environmental impacts? | Problematic material has not been identified. |
| E15 | PAF cell design | s4.2, p.29 | *If any PAF is identified, a temporary PAF cell would be located within a designated area of the WRD. The cell would be constructed with side-walls and bases of crushed NAF materials up to 5 m thick. Following placement of the PAF materials, the cell will also be covered using crushed NAF materials to 5 m thick. The availability of AC material may also be sources from waste material and incorporated into the PAF cell to reduce potential impacts. Consideration of a PAF cell within the mined areas of the pit should also be considered.* | Demonstrate how this design will exclude air and water to prevent PAF material from oxidising and discharging AMD/NMD/SD? Under the current proposal PAF material will be effectively exposed to air oxygen and water for up to ~15 years, before being placed back into the pit, possibly under the 10m of available groundwater. Lag time for PAF material to form AMD/NMD/SD is likely to be much less than this. | There is no PAF material.<br>Refer response to Question E11. |
| E16 | | | | Lag time should be determined in this preliminary testing phase, prior to operation commencing, to inform appropriate handling of the material. | There is no PAF material.<br>Refer response to Question E11. |
| E17 | | | | Consideration and multi-element testing should be made of NMD/SD potential of material, not just of PAF aspects. | Refer response to Question E13. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
|---|---|---|---|---|---|
| E18 | | | | If a PAF cell is proposed, the Supplement should include as a minimum:<br>o PAF cell designs -conceptual design and engineering design<br>o construction materials<br>o material sources and quality (including clay permeability)<br>o predicted quantities of PAF waste to be stored<br>o proposed preventative and adaptive management of AMD/NMD/SD with triggers to action. | As a result of additional AMD testing (refer response to Question E6) a PAF cell is not currently proposed. |
| E19 | Water – AMD monitoring | App O, s.6.3.1, p.37 | *An outcomes-based approach would be used as informed by adaptive management to meet site-specific trigger values that would be developed over time as data is gathered. Currently, the 95% species survival trigger values (ANZECC & ARMCANZ 2000) have been nominated.*<br>*TNG will undertake periodic testing of the stockpiled ore to confirm the absence of potentially acid forming (PAF) material during mining operations.* | The Draft EIS provides inadequate detail of any reactive monitoring / management plan with regard to occurrence of AMD/NMD/SD. | Monitoring is reflective of the low AMD/NMD/SD risk (s3.3 and Appendix F of the Supplement). Barrel testing has commenced and will continue for the life of the project to confirm the low AMD risk. |
| E20 | | | | Justification is required as to why 99% species survival trigger values should not be used as reactive management thresholds. | Refer response to Question 92. |
| E21 | | | | A reactive monitoring / management plan should be designed and presented around risk identification, prevention, detection and management of AMD / NMD / SD, with description of how site specific trigger values would be applied to the framework. | Refer response to Question E19. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
|---|---|---|---|---|---|
| E22 | Returning PAF waste to pit? | App.O, s.4.2, p.29; App.O, s.7.3, p.42) | *... PAF material, or material with potential to leach metals or salinity, should be encapsulated within the WRD, and potentially returned to the pit progressively if mining schedules allow or on completion of mining.* | Details are not provided of this closure contingency action. The pit is predicted in the Draft EIS to end up with a long term pit lake depth of ~10m.<br>Based on updated waste rock and tailings characterisation, what volume of PAF waste is predicted?<br>When PAF material is returned to the pit, would it be submerged or above water level?<br>Would an impermeable PAF cell be created in the pit floor?<br>Does the pit-lake depth estimate change if PAF material is added to the pit? | PAF material has not been identified (s3.3 and Appendix F of the Supplement). There is no plan to return any waste material to the pit and no PAF cell is currently proposed. |
| E23 | | s.3.5, p.3-9 Pit Void | *... The pit will remain as a void at the end of mining.*<br>*The option of partially filling the pit with waste rock was considered but rejected for the following reasons:*<br>o *the cost of double handling the waste is cost prohibitive;*<br>o *the placement of waste material back into the pit would sterilise any remaining ore.* | How would the contingency of returning PAF waste to the pit account for the action's potential to sterilise the resource? | Refer response to Question E22. |
| E24 | Closure and rehabilitation - AMD management | *s.2.8, p.2-35* Closure and Rehabilitation | *A conceptual Mine Closure Plan has been prepared for the Project (Appendix M) consistent with Western Australian Department of Mines and Petroleum and Environmental Protection Authority Guidelines for Preparing Mine Closure Plans (2015).* | If tailings and/or waste rock are found by further characterisation studies to have potential to produce AMD/ NMD / SD, what post closure management, and reactive management contingencies are proposed to avoid post-closure environmental impacts from the WRD, TSF, ROM, pit walls and other Project infrastructure? | Refer response to Question E6. Additional test work demonstrates that all samples had negative Net Acid Producing Potential results indicating that the material is acid-consuming material or non-acid-forming. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
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| E25 | Salt cycling | s.2.7.5<br>p.2-34<br>Brine | *The brine reject from the Water Treatment Plant will be discharged to the Process Water Dam for reuse.* | Provide a conceptual site model tracking salt cycle and management within the Project. Include consideration of long-term fate, predicted concentrations and environmental consequences of salt accumulation. | Water supplied from the borefield will typically contain salt at around 4000 mg/L. Water requirements during Stage 2 are estimated at 2.63 GLpa. This gives a total salt load to the system of 10,520 tpa.<br>Around 17% of total water will be used for dust suppression around the mine site. This will contain around 1780 tpa of salt. The use of brackish water for dust suppression is common on mine sites and assists with dust suppression through formation of a surface crust.<br>The process water circuit will contain around 8740 tpa of salt. This incorporates brine reject from the desalination plant. Concentrate product will retain around 784 tpa of salt (10% moisture content) with the balance of 7956 tpa sent to the TSF.<br>Around 30% of water will be captured from the TSF for reuse in the process water circuit resulting in 2390 tpa of salt being recirculated. There will be a slow build-up of salt in the process water circuit until equilibrium is reached and consequently salt concentrations in the concentrate will also slightly increase.<br>The balance of the salt (around 5566 tpa) will be retained in the TSF, bound to tailings as they progressively dry.<br>Some leaching of salt to groundwater from the TSF will occur, however groundwater salinity at the mine site is currently 5000 – 9000 mg/L. |
| | | *App. F*<br>*s.8.4*<br>Saline Drainage<br>App.O<br>p.34<br>s.5.3<br>AMD Conceptual site model | *It is recommended that the various water storages be operated to ensure that they are well mixed and that any outflow to the environment considers the salinity of discharges.* | | |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
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| E26 | Health and environmental risks associated with reagents and consumables | s.2.8.4<br>p.2-21 | *The processing plant includes the plant site, water storage dams, power station, product stockpile storage and load-out area. The following objectives have been developed:*<br>- *hazardous material is remediated, encapsulated or contained to prevent off-site environmental impact;*<br>- *contaminated sites are appropriately remediated...* | What hazardous materials will be present and require management?<br>How is site contamination by these materials to be avoided, mitigated and/or remediated? | Refer to s3.5 of the Supplement for identification of hazardous materials and their appropriate transport, storage and handling. Management and mitigation measures are also identified. |
| E27 | | s.2.4.6 Reagents and Consumables | | For each reagent and consumable expected to be used at Mount Peake in quantities potentially significant to human or environmental health, describe:<br>o *mobility, bioavailability and toxicity of elements / substances*<br>o *levels of risk to human and environmental health*<br>o *sensitive receptors to identified toxicity / risks*<br>o *potential contamination / exposure pathways to sensitive receptors*<br>o *management of identified risks.*<br>o *Include consideration as a minimum of:*<br>▪ *Nalco 83372 (or similar) as a flocculant in the process plant – 300 tpa*<br>▪ *sodium hypochlorite (or similar) for disinfection in the water treatment plant – 5 tpa*<br>▪ *antiscalent for use in the water treatment plant – 1 tpa*<br>▪ *ammonium nitrate*<br>• include results in the conceptual site model for the Project (App.O p.34, s.5.3) | Refer to s3.5 of the Supplement. |

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| E28 | Health and environmental risks - contaminated seepage and runoff | App. O,<br>s. 3.4.1<br>p.27 | The Draft EIS states that arsenic, lead, selenium and vanadium exceeded a Geochemical Abundance Index (GAI) rating of 3 for over 1% of samples, considered to indicate significant elevation above "background" crustal abundance. | Based on results of column leach tests characterising expected seepage composition from storage facilities, identify risks to human health and any downstream environments associated with elements and substances likely to be present in seepage / runoff from storage facilities. | Additional test work on waste and ore indicated that the material has a low risk of generating acidic, metalliferous or saline leachate (s3.3 and Appendix F of the Supplement).<br>There is no risk to human health. |
| E29 | | | | For each seepage component likely to be at elevated concentrations above background groundwater concentrations, describe:<br>o mobility, bioavailability and toxicity of elements / substances<br>o levels of risk to human and environmental health<br>o discharge/seepage concentrations and quantities likely to enter underlying aquifers or stormwater runoff<br>o connectivity of underlying aquifers, and/or plume fate<br>o sensitive receptors to identified toxicity / risks<br>o potential contamination / exposure pathways to sensitive receptors<br>o management of identified risks<br>o Include consideration (if not already provided) of arsenic, lead, selenium, vanadium products, Fe, $SiO_2$, MgO, $Al_2O_3$ and $TiO_2$ | Refer response to Question E28.<br>The site will not handle vanadium products. |
| E30 | | | | Include results in the conceptual site model for the Project (App. O, p.34, s.5.3 AMD Conceptual site model). | Refer response to Question E28. |

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| E31 | | | | Please provide the Material Safety Data Sheet (MSDS) for the:<br>o flocculant - Nalco Optimer 83372 powder flocculant,<br>o magnetite product - Magnetite (Fe3O4) Material Safety Data Sheet, prepared for TNG Limited, December 2014. | MSDSs are provided in Appendix H of the Supplement. |
| E32 | | | | Vanadium pentoxide dust inhalation has been associated with a variety of human health risks, such as identified in reports at:<br><http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3168171/><br><http://apps.who.int/iris/bitstream/10665/42365/1/9241530294.pdf>. | Vanadium pentoxide will not be produced at the mine site. It will be a product of the proposed Darwin Processing Facility. |
| E33 | | | | A comprehensive human health and environmental impact assessment of all products, processing reagents and consumables that workers and / or the public could reasonably, potentially be exposed to risk from, should be provided in the Supplement. Preventative and reactive management measures should be provided for each identified risk to sensitive receptors, including workers. | Refer to s3.5 of the Supplement. |
| E34 | | App. F<br>s.8.2.4<br>Tailings | *The tailings stream will consist of non-magnetic silts and sands. Geochemical testing of the tailings has been completed by Outotec Laboratory (2015) and identifies that the non-magnetic tailings are composed of silicate wastes. The chemical composition includes 13% Fe, 44% $SiO_2$, 12% MgO, 12% $Al_2O_3$ and1% $TiO_2$.* | Identified risks should be included in the conceptual site model for the Project. (App. O p.34, s.5.3). | There are no identified risks in these elements. |

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| E35 | Magnetite | *s.7.5*<br>*p.2-28* | *The Project will produce magnetite concentrate which will be stored in stockpiles at the processing plant and at the Adnera Loadout Facility. Material Safety Data Sheet (Midas METS 2014) identifies that the magnetite ($Fe_3O_4$) product exhibits low risk with regards to health, flammability, reactivity and contact. Although the concentrate is considered inert and non-toxic and does not constitute a threat to identified receptors and endpoints, a key hazard relates to high level prolonged exposure to dust which may cause lung or airway irritation.*<br>*The magnetite concentrate is non-toxic to flora and fauna, insoluble, chemically stable and not regulated for transport (Midas METS 2014).* | (The MSDS for magnetite, processing chemicals and flocculant is requested above)<br>Validation of MSDS findings with respect to environmental risks should be presented in the Supplement, including results of kinetic and column leach testing. | Refer response to Question E31.<br>Test results on ore are provided in s3.3 and Appendix F of the Supplement. |
| E36 | Other Potential Sources of Water Contamination | | | Describe other risks to water quality associated with other Project elements that have a potential to adversely impact water quality, including consideration of explosives, chemicals and hydrocarbons - use and storage. | Contamination risks to water quality are discussed in Volume II, Appendix F, s8 of the Draft EIS. The assessment identifies potential contaminants of concern, likely release mechanisms and locations, contamination pathways and sensitive receptors and endpoints.<br>The assessment of the fate and transport of contaminants of concern will be updated once project design is finalised with results incorporated in the final Water Management Plan. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
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| E37 | | | | Identify areas of the Project presenting risks of spills, or need for discharge of environmentally hazardous substances. | Spill risk is discussed in Volume II, Appendix F, s8 of the Draft EIS.<br>The primary risk area is associated with hydrocarbon storage and procedures and practices are identified to manage this risk.<br>There is no plan to discharge environmentally hazardous substances. |
| E38 | Organic certification | ES iv<br>s.12.3.4<br>p.12-8 | *Anningie and Stirling Stations both have or are seeking (respectively) organic certification, so risks of transport spills could impact on these uses, particularly of any toxic loads.* | Describe and discuss the relevant criteria to achieve organic certification of a livestock property, with reference to potential impacts on adjacent properties from the Project. Describe how such impacts will be avoided.<br>Identify which transported materials present risks to the properties' certification, and how, and demonstrate that appropriate management will protect organic status of the properties.<br>Identify any further Project risks to the stations' organic certification, and TNG's proposed management of identified risks.<br>Include consideration of:<br>o potential for spills (of hazardous substances) on the haul road<br>o wind / dust / water vectors<br>o blast residue plume within prevailing winds<br>o stray cattle onto the Project site. | Refer to s3.4 of the Supplement. |

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| E39 | Groundwater Contamination | App. N-H –Water Management Plan<br>s.5.3,<br>p.29<br>Table | | Where affected bores in potentially impacted aquifers are currently accessed as potable water supplies, the drinking water Guidelines should dictate monitoring and reactive management thresholds, not ANZECC 2000 Stock Water thresholds. | Noted. No bores in the areas potentially impacted by the Project are accessed for potable water. |
| E40 | Groundwater drawdown | | *Pit modelling indicates that groundwater drawdown will not impact any groundwater dependent ecosystems or wetlands.* | Given the close proximity of Murray Creek, very little information, risk identification or management is provided regarding the creek. This should be provided in the Supplement.<br>Describe the quality of the riparian habitats in areas of potential Project impact in Bloodwood Ck, Murray Ck and the Hanson River, including seasonal variation of the habitats. Describe expected Project impacts on the habitats.<br>To what extent will pit dewatering (water-table drawdown) impact on riparian vegetation in Murray Creek? How will this be managed to minimise impacts? | Appendix B of the Supplement describes the riparian habitats of Murray Creek and the Hanson River.<br>Potential impacts to groundwater dependent vegetation are discussed in s3.2.4 and Appendix K of the Supplement.<br>Bloodwood Creek is outside of the zone of influence of any groundwater drawdown. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
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| E41 | | s.8.1.4<br>p.8-13 | *Groundwater extraction from the borefield will lower existing water table levels by approximately 12 m.*<br>*Measures to minimise risks associated with lowering of the water table during groundwater extraction from the borefield will include:*<br>o *further predictive modelling to confirm the extent of groundwater drawdown*<br>o *establishing a groundwater monitoring program to quantify drawdown during abstraction*<br>o *monitoring vegetation potentially at risk of impact from a lowering of the water table*<br>o *if significant impacts are identified consider mitigation options. This could include modification of the pumping regime to manage groundwater levels.* | The borefield's water table drawdown (cone of depression) along the Hanson River paleochannel presents a high residual risk to large expanses of phreatophytic vegetation, with particular risks identified to mature, deep rooted groundwater dependent River Red Gums and Ghost Gums. The area predicted to encounter ecologically significant drawdown may extend over 40-50km along the Hanson river paleochannel. The affected mature trees may have particular (cultural) importance to local aboriginal people.<br>Deep rooted groundwater dependent trees are likely to provide important dry-period capillary connections to aquifers for species assemblages within the living canopies of the trees. Potential exists for presence of listed threatened species being present within the assemblages, with dependence on their canopy-dependent foodwebs. The Draft EIS has not presented flora/fauna surveys of the areas of drawdown, although they are planned (and required) for submission in the Supplement. | Additional flora, vegetation and fauna surveys have been undertaken of areas that were not specifically surveyed for the Draft EIS (Appendix B of the Supplement).<br>The occurrence of groundwater dependent vegetation has been mapped in the project area (Appendix K of the Supplement) and an assessment of potential impacts is provided in s3.2.4 and Appendix K of the Supplement.<br>No fauna of conservation significance are predicted to rely on groundwater dependent vegetation for their survival. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
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| E42 | | | | Proposed controls are inadequate to prevent permanent loss of phreatophytic plants, and fauna dependent on them, potentially including listed threatened species. Proposed controls to 'consider' a response after impacts (i.e. vegetation dieback) are detected would be too late to prevent impact.<br>Identify and discuss feasible options to reduce identified potential impacts to phreatophytic vegetation. | s3.2.4 and Appendix K of the Supplement identify the potential for phreatophytic vegetation to be impacted where groundwater drawdown exceeds 20 metres below ground level. However this is not a definitive level and there is the potential for impacts to occur at shallower depths or for no impacts to occur until greater drawdown depths are reached.<br>Modifying extraction rates or the distribution of bores would not necessary provide protection to phreatophytic vegetation. If monitoring identifies an impact, a short term recovery in groundwater level is unlikely and vegetation will still be lost. |
| E43 | | | | Ecological impacts of potential / expected loss of large River Red Gums and Ghost Gums and other riparian habitats should be described in detail, including impacts on any listed threatened species utilising the trees, such as for feeding, roosting or nesting habitat. | Refer response to Question E41. |
| E44 | | | | Design and present a management plan to protect significant phreatophytic vegetation from borefield -related impacts, including groundwater drawdown. | Refer response to Question E42. |

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| E45 | | | | Options for further reducing water demand for the Project could be considered, such as by lining the tailings dam to increase the recycling of tailings waters. Tailings water losses amount to ~1/2 the Project's water demand, according to figures provided in the Draft EIS. | Options to line the TSF with clay or a synthetic liner have been considered but rejected due to cost. There are no substantial quantities of clay in the area and this would need to be imported.<br>Dry stacking of tailings has also been considered but the cost is significantly more than the current proposed method of tailings disposal. |
| E46 | Pit water quality | s.8.2.4<br>p.8-29 | *After decommissioning, the mine void will act as a sink with a shallow lake forming.*<br>Post mining, water quality on the pit will steadily decline and become more saline. | Will mine-site contaminated stormwater runoff be directed to the pit? | No. |
| E47 | | | | Does modelling indicate that TSF / WRD seepage will report to the pit, post mining? | Post-mining, local groundwater flow will be towards the pit void. However, as demonstrated by current AMD work, seepage is largely benign, and will not pose a risk to water quality in the pit (pit water quality will already be saline). |
| E48 | | | | How will pit wall exposure of material with AMD/NMD/SD potential be factored in to calculation of post-closure water quality over time? | Additional test work has demonstrated the low risk of AMD/NMD/SD of waste material (s3.3 and Appendix F of the Supplement). No specific management is required. |
| E49 | | | | Would post mining flood events >100 ARI flood overflow the pit? | Additional flood modelling was undertaken for Murray Creek (s3.1.1 and Appendix E of the Supplement) which has determined that the pit may be susceptible to flooding. A flood protection levee will be required adjacent to the eastern edge of the pit. |

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| E50 | | | | In an arid climate, a flooded pit will attract wildlife. How will post-mining impacts on wildlife be minimised, where risk exists of their drinking contaminated pit water? | Pit water will be brackish to saline reflecting the natural groundwater quality (TDS >5000 mg/L). As such, it is unlikely to be considered as a drinking water source for wildlife.<br>There will be no contamination of pit water. |
| E51 | Surface Water runoff | s.8.2.3<br>p.8-21<br>Sites of Conservation Significance | *Any interruption to surface water supply has potential to adversely affect Mud Hut Swamp* | A reactive management plan that incorporates monitoring of water quality in sediment basins will need to be in place to determine suitability of planned water release points or uses around the Project site, such as for dust-control. | A floodway is proposed across Murray Creek so that streamflow is not impeded. Catchment areas for runoff retention and treatment across the mine site are anticipated to be small compared to the contributing catchments of the Murray and Bloodwood Creeks. Accordingly, changes in streamflow arriving at Mud Hut Swamp are anticipated to be negligible.<br>Water quality in basins will be regularly monitored as a condition of the Waste Discharge Licence. Receiving water quality will also be monitored. |
| E52 | | s.8.1.4<br>p.8.14 | *There are a number of sensitive riparian habitats close to the development footprint, including drainage lines, Bloodwood Creek (and onto Mud Hut Swamp), Murray Creek and the Hanson River. These areas are all sensitive receptors for any adverse impacts on water quality potentially arising from the Project. Vegetation and flora reliant on surface flows and groundwater uptake may also be impacted by surface water and groundwater contamination* | | Floodways are proposed across all waterways so there will be no impact on ambient sediment loads. Water quality impacts could result from vehicles crossing the waterways and may include sediment, hydrocarbons or spills from transported loads. Appropriate containment and treatment measures (such as sedimentation ponds and gross pollutant traps) will be incorporated into the designs of these crossings. The monitoring and management of such measures will be included in the adaptive site water monitoring and management plan. Management measures will also include response to spills and removal and rehabilitation of hydrocarbon impacted soils. |

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| E53 | | s.7.5<br>p.7-27 | *Runoff from the ore stockpiles will be contained and directed to appropriately sized sedimentation ponds for managed release to the environment.* | | Sedimentation ponds will be sized following detailed design of the Project, and will be designed in accordance with appropriate standards. Monitoring and management measures will be included in the adaptive site water monitoring and management plan. Management measures will include routine inspections and inspections following significant rainfall events. Removal of sediment build up will be undertaken when necessary. |
| E54 | | s.2.7.1<br>p.2-30 | *Stormwater collected on (waste rock) dump benches will be conveyed to a sedimentation basin on the toe of the WRD through engineered channels located on the benches. After settling of any sediment load, water will be either used around the site, for example in dust suppression, or allowed to discharge to natural drainage lines.* | | Refer response to Question E53. |
| E55 | | DLRM factsheet | *'Mud Hut Swamp remains inundated for relatively long time after flooding, and may hold water for several months….and is likely to support a range of wetland birds, fish and plants'* | Aquatic surveys have not been undertaken. If any potential exists for the mine impacts to affect Mud Hut Swamp, then a monitoring program of keystone indicator species in Mud Hut Swamp may be relevant, and baseline conditions should be described. | Aquatic surveys were not undertaken as Mud Hut Swamp was dry at the time of the baseline surveys. The Project is not predicted to impact the swamp. |

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| E56 | TSF drainage | s.2.7.2<br>p.2-32 | *A seepage recovery trench will be constructed along the upstream toe of the perimeter embankment to recover seepage that would otherwise pass under the embankment.*<br>*To monitor behaviour of the TSF and its influence on the environment, a seepage monitoring system will be installed. The proposed monitoring system comprises 14 monitoring bores designed primary to monitor groundwater level and allow for sampling to carry out water quality checks.* | The Draft EIS predicts (App. A of App.F) TSF seepage drains will capture 30% or 86 m3/hr, of the 287 m3/hr tailings waters sent to the TSF. 201 m3/hr of tailings waters are predicted to be lost to the environment as seepage and evaporation. Rates of loss of tailings waters as seepage + evaporation equate to:<br>o ~56 L/sec<br>o the output of 6 of the borefield's 12 production bores (each est. at 8.5 L/sec) planned for stage 2<br>o nearly the volume of two (1.92) olympic swimming pools per day.<br>The proportion of TSF water losses to the environment due to evaporation rather than seepage is not provided in the Draft EIS. Tailings are described as silty sands, so infiltration and seepage levels are likely to be high, compared to evaporation.<br>Increased efficiency of the TSF in recovering seepage thus could result in significant efficiencies for the Project by reducing water demand, and reducing the borefield's groundwater drawdown footprint, and ecological impact. | These comments are noted.<br>It is agreed that infiltration and seepage will be high compared to evaporation.<br>Options to line the TSF with clay or a synthetic liner have been considered but rejected due to cost. There are no substantial quantities of clay in the area and this would need to be imported.<br>Dry stacking of tailings has also been considered but the cost is significantly more than the current proposed method of tailings disposal. |

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| E57 | | App.F<br>s.2.6<br>p.13 | *Implementation of a drainage system is important to maximise functionality for the TSF and to maximise water recovery from the tailings.* | Will a clay or low-flow base be included in TSF design? Water recovery would be maximised by inclusion of an impermeable base into the TSF design. Depending on effectiveness of the seepage cut-off trench inside the perimeter wall, a recovery bore network could represent a further operational contingency measure to capture a greater proportion of TSF seepage. Monitoring bores around the TSF are commended, however are not stated as having any recovery-bore function if plume water is found to be contaminated.<br>An impermeable TSF base, and a recovery bore network, while increasing water recovery and reducing water demand, would reduce potential for offsite environmental impacts from contaminated seepage during the operational phase. | The option of lining the TSF base with clay has been considered but rejected due to cost.<br>It is agreed that a recovery bore network could represent an opportunity to increase recovery of TSF seepage, however trials would need to be undertaken to determine yield from the largely unsaturated alluvial sediments underlying the TSF. This opportunity will be investigated during Stage 1 of the project once operation of the TSF is further confirmed. If viable this could reduce draw from the Hanson River palaeovalley.<br>The perimeter cut-off trench also has the potential to progressively capture more water as the base of the TSF becomes less permeable due to tailings deposition. |

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| E58 | Groundwater modelling | Ch.7<br>App. F<br>s.7.4.1<br>p.7-14<br>Figure 7-10<br>Regionally mapped aquifer systems | | Mine-site groundwater modelling, as required by section 5.2 of the Terms of Reference, should have predicted seepage quality, flow directions and quantities, destinations / expression points across the mine site, and predicted impacts on sensitive receptors, such as riparian ecosystems in Murray Creek. This analysis has not been provided in the Draft EIS, and is now necessarily required in the Supplement.<br>o Modelling should predict fate of soluble contaminant loads associated with tailings and waste rock streams.<br>o Describe local and regional aquifer connectivity with aquifers underlying the Project components, including the mine-site and borefield.<br>o Relationship between site groundwater and surface water flows has not been presented in the Draft EIS, and should be provided in the Supplement.<br>o Site groundwater modelling should consider potential / proportion of TSF seepage reporting to the pit off-site (and if so, to where). The Draft EIS (App. A of App. F - Water Balance) doesn't identify pit dewatering quantities.<br>TeamNT[1] (2004, pge.82) stated that, as a rule of thumb: 'one year of groundwater contamination can translate to ten years of pump and treat to recover and treat the plume'. Recovery to baseline groundwater | Additional test work has demonstrated the benign nature of the waste streams (s3.3 and Appendix F of the Supplement). Significant contamination is unlikely.<br>s2.2 (Appendix D of the Supplement) discusses the regional and local aquifers. As discussed, existing information on these, including their extent, depth and connectivity is largely unknown. The main aquifer considered for the Project is the Hanson River palaeovalley aquifer. Drilling in this aquifer has shown it overlies basement material that offers little to no aquifer potential. Drilling in the pit area has largely shown a lack of a defined aquifer, with minor flows of groundwater noted in the alluvial cover of the ore body.<br>The relationship between site groundwater and surface water flows is not expected to be significant given the relatively large separation depth of groundwater from surface water. Groundwater levels at the mine site and within the Hanson River palaeochannel are around 20 mbgl and 10 mbgl respectively (s2.5.2 of Appendix D of the Supplement).<br>Some TSF seepage is expected to report to the pit however as transmissivity values are low expected volumes will be small.<br>Pit dewatering volumes will be low with airlift volumes less than 12 L per minute in bore holes that contained water (s3.2 of Appendix D of the Supplement).<br>Additional testwork has demonstrated that seepage will not be contaminated (s3.3 and |

[1] TEAM NT (2004) Northern Territory Minerals Council (Inc.) and the Mines and Petroleum Management Division of the Northern Territory Government. *TEAM NT: Technologies for Environmental Advancement of Mining in the Northern Territory*: *Toolkit.* D.R. Jones & M. Fawcett principal authors.

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| | | | | conditions on-site would likely be very costly and require a long period of active management.<br>If further characterisation predicts seepage to be contaminated, proposed methods of containment / management should be described in the Supplement. | Appendix F of the Supplement). |
| E59 | Groundwater allocation plan knowledge gaps | s.7.4.1<br>p.7-17 | *The allocation plan and associated technical documentation also note that further scientific work needs to be undertaken to improve the knowledge about the areas water resources and estimation of their characteristics. In particular, more evenly spread and deeper groundwater drilling investigations are recommended to determine bore yields and consequential sustainable yields of aquifers. Identification and measurement of recharge mechanisms is also recommended.* | How will Project data collection and reporting contribute to improving public and Government knowledge of local water resources and their characteristics, to improve management and sustainable use of the available water resources? | Drilling undertaken in the Hanson River palaeochannel has already improved knowledge of this resource, as no previous groundwater exploration had been undertaken in this area. The drilling data has already been provided to the NT Government.<br>The groundwater monitoring proposed for the project will provide substantial data on groundwater level and quality trends, something not previously available in this area. |

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| E60 | Water quality testing - Sediment quality | s.7.3.1<br>p.7-9 | *Sediment sampling was undertaken to characterise sediment quality as a proxy for water quality given the infrequent nature of flow events within the region'* | This approach needs to be justified / demonstrated as a valid approach. Given the goal is to describe surface water quality, explain how sediment quality equates to / indicates water quality?<br>Where / when possible, ground-truthing should be provided to validate assumed relationship between sediment quality and surface water quality. For example, The Ti-Tree region received rainfall (~108 mm) in December 2015, and ~45 mm so far in January 2016. Opportunistic supplementary surveys should be undertaken to obtain actual surface water data, for inclusion in the Supplement to the Draft EIS. | Sediment sampling was used for the preliminary assessment of ambient conditions as surface water sampling is only possible during streamflow events. These are rare in the ephemeral systems on the site. There was no opportunity for water quality sampling during the investigations associated with the Draft EIS. Surface water samples have now been collected from sites within and adjacent to the Hanson River due to a flood event in January 2017 (Appendix J of the Supplement). Creeks near the mine site were not be sampled due to lack of access.<br>A water sample may not be representative of the streamflow quality. Water quality can vary depending on the nature, timing and location of the runoff. Grab samples during an event may miss the progression / change in water quality.<br>Potentially contaminating material is normally associated with sediments following subsidence of flow. This is released from natural sediment traps and trapped again further downstream following successive streamflow events.<br>This approach is consistent with that adopted by the NT EPA for Waste Discharge Licences for mining activities where ongoing monitoring comprises a combination of sediment and surface water sampling.<br>Water quality (subject to their being a flow) and further sediment sampling will occur prior to operations commencing to establish background conditions and triggers. Water quality sampling will be incorporated into the adaptive site water monitoring and management plan. |

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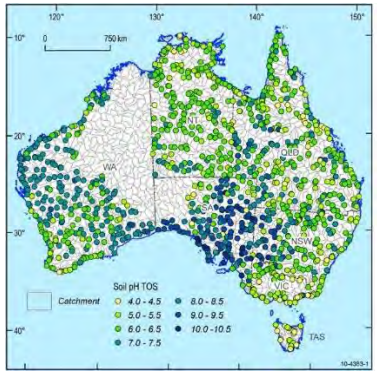
| E61 | | App. F<br>p.42. | *The sediment pH of the majority of sediment baseline samples were strongly acid to very strongly acid pH.* | Discuss the relevance of this statement to the Draft EIS assumptions that the ore and waste rock for the Project will be inert? What is the source of this acidity? | This reference applies to interpretation of soil chemical analyses for cropping purposes, which is important to understand ambient conditions in which natural vegetation has evolved.<br>o Very strongly acid: pH 4.5-5.0.<br>o Strongly acid: pH 5.1-5.5.<br>The results are in line with Geoscience Australia mapping (see below). The relevance is that the near-surface environment of the Project area is naturally acidic.<br>  <br>Further assessment of AMD potential (s3.3 and Appendix F of the Supplement) demonstrates that the ore and waste is non-acid forming. |

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| **Biodiversity** | | | | | |
| E62 | Biodiversity monitoring | | | The Biodiversity Management Plan proposes a basic monitoring program which is unlikely to detect biodiversity declines. Further to this, the monitoring program does not identify specific thresholds or contingency measures if monitoring activities detect some change in biodiversity associated with mining activities. It is recommended that a revised Biodiversity Management Plan be provided based on the level of risk. Where the risk assessment indicates the potential for significant impacts to biodiversity, the monitoring program should (at a minimum), include the following:<br>o measures for monitoring the effectiveness of avoidance/mitigation measures<br>o clear thresholds for identifying when avoidance/mitigation measures are ineffective<br>o identify contingency measures for implementing additional avoidance/mitigation measures propose reporting requirements | An updated Biodiversity Management Plan is provided in Appendix I of the Supplement. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
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| E63 | Project infrastructure vicinity to sites of conservation significance | | | Wood Duck Swamp (a site of conservation Significance ~10 km south of the access road, and near the rail siding) doesn't appear on maps in the Draft EIS.<br>Please show proximity of Project infrastructure, and Project environmental footprints to Wood Duck Swamp, Stirling Swamp, Mud Hut Swamp, Ti Tree and other aquifers, waterways, water control district boundaries, and water flow directions. | Figure 8-1 (Volume I of the Draft EIS) shows the northern end of Wood Duck Swamp (bottom right hand corner). It also shows the proximity of Project infrastructure to the three swamps.<br>Figure 7-5 (Volume I of the Draft EIS) shows the Wiso Surface Water Management Area and the Ti Tree and Western Davenport Water Control Districts.<br>Figure 7-7 (Volume I of the Draft EIS) shows the Murray Creek, Hanson River and Wood Duck Creek catchment boundaries.<br>Figure 7-10 (Volume I of the Draft EIS) shows the location of regionally mapped aquifer systems. The unconsolidated sediments of the Ti Tree aquifer occur 15 km to the south of the access road. |

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| **Consultation with Indigenous stakeholders** | | | | | |
| E64 | | | | *ToR section 5.4 Risks to Historic or Cultural Heritage states:*<br>*'The Draft EIS must outline consultations with Indigenous stakeholders and Traditional Owners for all areas potentially affected by the Project. Determination and details should be provided of current Traditional Owner utilisation of Project areas, and spiritual/cultural significance of potentially affected areas.'* | The CLC is the representative body for the TO's and TNG by legislation is required to deal with them. TNG has consulted regularly with the CLC over a number of years from when exploration works commenced. This has resulted in a number of agreements being put in place or progressing including Exploration Agreements, Mining Agreement, Native Title determination and CLC Clearance Certificates.<br>A full Sacred Sites Survey of the Project area was undertaken by the CLC in the presence of TO's. The survey highlights the historical and current Indigenous uses and values of the area with the CLC issued Clearance Certificate identifying Exclusion Zones and Restricted Works Areas that protect these uses and values.<br>None of these agreements could have been put in place without consultation and involvement with TO's.<br>The CLC has not identified that there has been insufficient consultation and TNG is satisfied that it has met its statutory requirements in this regard.<br>Consultation with the CLC on behalf of TO's will continue as the Project progresses.<br>There is no formal CLC Indigenous consultation report to hand over.<br>Current TO utilisation of the Project area, including spiritual/cultural significance, is confidential and cannot be released. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
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| E65 | | *Appendix K - 1.3.1* - Aboriginal Community Consultation | *A report detailing the consultation process, a cultural heritage assessment, and the methodology for obtaining Sacred Sites Clearance and approval from the Aboriginal Areas Protection Authority, has been prepared separately by the CLC. The cultural heritage report has not been provided for consideration as part of this assessment, and is not addressed in this report.*<br>*AM Consulting contacted the CLC to facilitate engagement with the local Aboriginal community for this archaeological assessment, and to organise the participation of community representatives in the archaeological survey. Unfortunately, due to an unexpected death in the community immediately prior to the scheduled survey, the CLC was unable to contact the appropriate community members, and AM Consulting was forced to proceed without community involvement in fieldwork.* | Due to the limitations stated above, the Draft EIS does not demonstrate that an appropriate level of consultation has occurred with Indigenous stakeholders and Traditional Owners for all areas potentially affected by the Project. Inadequate levels of consultation with Indigenous stakeholders are apparent in the Draft EIS in the:<br>o stakeholder consultation report (Ch.12)<br>o Aboriginal and historic Heritage Assessment (App..K, p.7, s.1.3.1),<br>o non-submission of the CLC Indigenous consultation report (at least) to the NT EPA, if not to the public. | Refer response to Question E64.<br>The archaeological survey was not conducted with TO's present due to their unavailability, however it is not mandatory to include TO's in survey work. The area surveyed was the same as the Sacred Sites Survey which identified sites/areas of significance. The results of the archaeological survey have been provided Draft EIS (Volume I, s11.4). |
| E66 | | | | Assessment of the consultation process, and TNGs level of compliance with CLC's consultation report recommendations, is not possible without provision of the consultation report. If it is necessary to make use of material that is considered to be of a confidential nature, TNG should consult with the NT EPA on the preferred presentation of that material, to facilitate its submission to the NT EPA for consideration.<br>In the absence of local Aboriginal community participation in the field survey, and in the absence of the CLC report, an indication of continuation of traditional uses of the Project areas into the present by Traditional Owners cannot be ascertained, nor impacts of the Project on such uses. | Refer to response to Questions E64 and E65. |

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| E67 | | | | The Draft EIS (App. K) cited that Stuart (~1860) '*posited that Aboriginal people congregated around the Hanson and other permanent soaks and rock holes in times of water shortage, and could extract potable water by means of sinking wells into the sandy banks'*.<br>The EIS should as a minimum be able to establish current Indigenous uses and values of the Project areas, and potential Project impacts upon any identified uses or values. | A CLC Clearance Certificate was issued following survey work undertaken in the presence of TO's. The certificate recognises traditional uses of the area and identifies Exclusion Zones and Restricted Works Areas that protect Indigenous uses and values. This heritage work is now being submitted to AAPA so that TNG can be issued with an Authority Certificate. |
| E68 | | | | Inclusion of a map showing sites of Aboriginal Heritage, with respect to Project components would improve communication of the findings of the report at Appendix K. | The locations of heritage sites in relation to key project components are shown in Volume I, Figure 11-1 of the Draft EIS. |
| E69 | Native Title Applicants | s.4.2,<br>p.4-2<br>Commonwealth Legislation / Native Title Act | *The Mount Peake Project tenements are covered by a native title application – DC11/12 Stirling and Neutral Junction, registered 17 August 2011. ...The Native Title Claimant Group comprises members of the Akalpere, Amakweng, Alapanp, Alhalker Anangker, Arlwekarr, Arnerre, Arnmanapwenty, Errene/Warlukurlangu, Jarra Jarra, Kwerrkepentye, Twerrpe, Wake and Wurrulju landholding groups.*<br>*TNG and the Native Title Claimant Group are discussing development of an ILUA.* | Tables 6-2 and 6-3 in s.6.6 provide no indication of Traditional Owner feedback on the Project.<br>Describe consultation that has occurred and feedback provided from the Traditional Owner groups applying for Native Title on the Mt Peake site.<br>Have Traditional Owner concerns been presented in the Draft EIS or in the confidential report? If not presented in the Draft EIS then these need to be provided to the NT EPA / AAPA for consideration as part of the environmental assessment.<br>How would the Project impact on Traditional Owner interests in the area? | Refer to response to Questions E64 and E65. |

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| E70 | Groundwater drawdown effects on riparian vegetation - cultural impacts | *s.6.6*<br>*p.6-8*<br>*Table 6-2*<br><br>s.2.5.3<br>p.2-23;<br><br>s.5.3.2, p.5-7;<br><br>s.8.1.4<br>8-13 | *The Sacred Sites Clearance included the mining lease and the transport corridor and provides the opportunity to protect sites and the areas' wider cultural integrity* | (see also 'Groundwater drawdown' section of comments above)<br>Comments submitted by CLC on the Draft EIS highlighted the high cultural significance for Traditional Owners of riparian vegetation, including River Red Gums along the Hanson River and Murray Creek.<br>TNG has rated the likelihood as 'high' or 'almost certain' that groundwater drawdown from the borefield would lead the death of groundwater dependent River Red Gums and Ghost Gums, extending over an area of approximately 40-50 km of the Hanson River channel<br>Was the large area of riparian vegetation affected by groundwater drawdown on the Hanson River (and Murray Ck) accounted for in discussions with Traditional Owners, and considered in the scope of the CLC Sacred Site Clearance Certificate? If not, further consultation may be required with CLC to include or account for the new (previously undefined) areas. | TNG recognises the cultural significance of riparian vegetation along the water courses in the Project area.<br>Specific discussions have not been held to-date with TO's on the likely impact to vegetation from groundwater drawdown.<br>Additional assessment of drawdown impacts has been undertaken and the likely area of impact quantified (s3.2.4 and Appendix K of the Supplement).<br>TNG commits to further discussion with TO's on the implications of this impact. This will be a feature of TNG's engagement going forward during development and operation of the Project. |
| E71 | | | | Has consultation occurred and AAPA clearance been gained with respect to the borefield and drawdown impact cone, the road and pipeline corridors? Traditional Owner occupation is more likely to have existed along river courses. | Consultation has occurred and a Clearance Certificate has been obtained for the borefield, road and pipeline corridors. Additional consultation is required to cover the area potentially affected by the drawdown cone.<br>AAPA Certificates are currently being sought. |

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| E72 | | | | NT EPA recommends TNG consult further with Indigenous stakeholders with respect to proposed impacts on groundwater dependent, riparian vegetation, and investigate means to mitigate risks to cultural values of the habitats. Outcomes of consultation should be reported in detail in the Supplement. | TNG has committed to further discussions with Indigenous stakeholders on potential impacts to groundwater dependent vegetation. These discussions have not yet occurred and the results of the discussions will be subjected to the same confidentially arrangements as discussion previously undertaken on other Project elements. |
| E73 | | | | Expected residual impacts of the Project of any loss of groundwater dependent trees on associated cultural values for Traditional Owners should be detailed. | Refer response to Question E72. |
| E74 | | App.K | | Aboriginal input was not gained into the report on aboriginal and archaeological heritage of the Project areas. The Supplement should provide a supplementary report to the aboriginal heritage report, providing critique and input from an appropriate Traditional Owner perspective. | The archaeological survey was not conducted with TO's present due to their unavailability, however it is not mandatory to include TO's in survey work. The area surveyed was the same as the Sacred Sites Survey which identified sites/areas of cultural significance. The results of the archaeological survey have been provided in the Draft EIS (Volume I, s11.4).<br>No formal comments were provided on the report. |

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| E75 | Indigenous employment | App.E<br>p.18<br>Table 5-2 | *It is anticipated that the workforce will primarily comprise personnel on a fly-in / fly-out basis from Darwin, Alice Springs and potentially further afield, depending on where the necessary skills reside, with some employment from local communities.*<br>*TNG's target is to employ 15% of the workforce from local Aboriginal communities* | What is the local Indigenous community population and their employment status / potential?<br>How many positions does 15% equate to?<br>How will employment opportunities and training to be offered to local workers and aboriginal communities, meet a 15% quota? | The ESIA (Volume 3, Appendix L of the Draft EIS) identifies that the Indigenous populations of Ti Tree, Wilora and the wider Central Desert LGA are 61, 111 and 2975 people respectively (Table 2-2) with unemployment of 0, 10 and 163 people respectively (Table 2-5).<br>An Indigenous employment target of 15% equates to around 34 construction and 25 operational personnel.<br>As a component of the Native Title process TNG will continue to work with traditional owners to further develop and agree on Indigenous business and employment opportunities. |
| E76 | Water supply continuity | Table 6-3<br>p.6-10 | *Current water supplies to the stations need to be maintained during and post mining.*<br>TNG has committed to the provision of alternative water supply if the Project impacts any existing supplies. | Who will oversee this commitment?<br>Identification and consideration is required of potential existing Indigenous uses of groundwater from the Hanson River palaeochannel. | TNG will oversee the commitment in consultation with the pastoralist.<br>There are no indigenous uses of groundwater in the palaeochannel potentially impacted by groundwater extraction. |

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| E77 | | | | Section 3.1 of the Terms of Reference states:<br>*'The EIS should provide a brief background and context to the Project, including: how the Project relates to any other proposals or actions (of which the Proponent should reasonably be aware that have been or are being taken, or that have been approved in the region.'*<br>Public comments on the Draft EIS mentioned 'a large nearby agricultural project has applied for a very large amount of water from the same aquifer'. Please provide details of the agricultural Project, and other groundwater users of the same aquifer in the vicinity of the borefield. | The closest agricultural project is in the area of Ti Tree, over 70 km from the borefield with groundwater extracted from the Ti Tree aquifer within the Ti Tree Water Control District.<br>The Project will extract water from the Hanson River palaeochannel. This aquifer is currently only used for limited stock watering for Stirling Station (Draft EIS, Volume I, pp7-17).<br>The proposed borefield falls within the Western Davenport Water Control District but outside of the main Western Davenport Plains aquifer. It occurs around 100 km down gradient of the Ti Tree aquifer (i.e. borefield extraction will not affect the Ti Tree aquifer). |
| E78 | Health services | *s.12.3.3*<br>*p.12-7* | *The Project will maintain an on-site medical facility and ambulance to service the workforce. Local medical and health services are not expected to be accessed by the Project workforce. In the event that personnel need to be medically evacuated they will be conveyed to Ti Tree for airlift by the RFDS.* | To what extent will onsite health services be available to non-workers in the 'local' area? | Onsite health services will only be available to the workforce. |

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| E79 | Rehabilitation and Mine Closure | | | The Terms of Reference (s.5.6 Rehabilitation and Mine Closure) for the Project required the Draft EIS to present details of how rehabilitation and closure plans incorporate recognition and consideration of traditional knowledge, cultural values, land management systems and significance of particular species and places, based upon consultation with Traditional Owners.<br>This requirement appears not to have occurred for the Project. | The conceptual Mine Closure Plan (Volume III, Appendix M of the Draft EIS) outlines closure and rehabilitation objectives for various project elements.<br>The DME draft Closure Guidelines also require that relevant stakeholders are consulted on post-operational final landuse.<br>The Closure Plan will be refined as a component of the Mine Management Plan and will document the results of discussions on the recognition of cultural values and on inclusion of particular species in the final rehabilitation plan. This will occur via the CLC as the body representing Traditional Owners. |
| E80 | Statutory Context - Sacred Site Clearance certificate | s.4.3<br>p.4-5<br>Legislative Framework / Northern Territory Legislation / Northern Territory Aboriginal Sacred Sites Act | *Consultation with the CLC has been undertaken by TNG as part of Project development activities.*<br>*A number of sacred sites are present in proximity to the mining area and access road. CLC has provided TNG with Sacred Site Clearance Certificate for the Project.* | Under s23(1)(ba) of *Aboriginal Land Rights (Northern Territory) Act 1976* (ALRA), land councils have the function to assist Aboriginal people in the protection of sacred sites. However the AAPA is the only body that can issue an Authority Certificate under the NT Aboriginal Sacred Sites Act (NTASSA). An Authority Certificate issued by the APAA is the only | An AAPA Authority Certificate for the Project is currently being sought.<br>TNG has held a number of meetings with AAPA keeping them informed of ongoing developments associated with the Project. From the beginning the heritage plan, as discussed and agreed at meetings, confirmed the appointment of the CLC to carry out the Heritage work and, on completion, to submit |

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| | | s.11.1<br>p.11-2 - Statutory Context / Aboriginal Land Rights (Northern Territory) Act 1976 | *The Central Land Council (CLC) can issue a Sacred Site Clearance Certificate (SSCC) to prevent damage to, and interference with, Aboriginal sacred sites. .... A SSCC not only protects the applicant against prosecution for entering, damaging, or interfering with sacred sites under the ALR (NT) Act, but also the Northern Territory Aboriginal Sacred Sites Act 1989. It achieves this by providing the applicant with documentary evidence that the custodians and Traditional Owners of the subject land have been consulted and consent to the applicant's proposed works.* | recognised guarantee of indemnity from prosecution for damage to a sacred site.<br>AAPA has provided the following clarification:<br>*'Under certain circumstances in accordance with s22(1)(b) of the NTASSA, the AAPA can issue an Authority Certificate based on an agreement between the custodian and the applicant. AAPA do this to ensure projects can be moved forward quickly and to ensure that proponents are not disadvantaged by any disagreements between the CLC and AAPA over who has the proper jurisdiction to issue sacred site clearances.*<br>*AAPA have been liaising with representatives of the Mount Peake project for a number of months. The company has engaged the CLC to carry out consultations for the project. The AAPA hope to be able to issue an Authority Certificate based on an agreement the CLC has facilitated between custodians and the company in the near future.'* | this work for assessment and use by AAPA in issuing TNG with an Authority Certificate. |
| | | s.11.1<br>p.11-3 - Statutory Context / Northern Territory Aboriginal Sacred Sites Act 1989 | *'Aboriginal sacred sites are declared by the Aboriginal Areas Protection Authority (AAPA). It is an offence for a person to enter or remain on, carry out work on or use, or desecrate a Sacred Site without the prior issue of an Authority Certificate. ... A search of the Register of Sacred Sites by TNG identified Sacred Sites that required an Authority Certificate to be issued.'* | | |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
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| E81 | | | | Concern is raised by CLC with the threat of collapse of a pit wall impacting an adjacent sacred site.<br>Any damage caused by TNG to this (or any) sacred site, beyond actions approved under an Authority Certificate issued by AAPA, could leave TNG vulnerable to prosecution under NTASSA. | The potential for a pit wall collapse impacting the sacred site was identified in the Project risk assessment and assigned a consequence rating of "Major" but with a likelihood rating of "Rare".<br>The current design for the pit has the crest of the wall located approximately 150 m from the boundary of the sacred site which should prove adequate protection to the site in the highly unlikely event of a pit wall collapse. There is flexibility in the design of the wall to provide additional protection through "laying" the wall back (i.e. reducing its steepness) with this modification still providing a separation between the pit and the site of at least 100m. |
| E82 | Air - Greenhouse gas emissions | (ES-xiii) | *Greenhouse gas emissions will be managed and minimised through:*<br>o *maintenance of fuel-powered plant and equipment to the manufacturers specifications;*<br>o *considering the potential use of biodiesel blends;*<br>o *considering the potential use of solar* | If the calculation in the Draft EIS is correct, then the Project's contribution to Northern Territory and Australian greenhouse gas levels is relatively substantial, at 1% of NT emissions. | The calculations are indicative of the level of greenhouse gas emissions expected to be produced by the project. |

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| E83 | | | *power and storage battery systems;*<br>o *energy auditing and review;*<br>o *monitoring of emissions.* | None of the above measures actually demonstrate reduction in $CO_2$ outputs.<br>Please detail how greenhouse gas emissions are proposed to be minimised by the Project, and further feasible alternatives available to reduce such emissions, over the life of the Project.<br>Solar power could make a significant contribution to power needs of the accommodation village.<br>'Consideration' of a more effective management measure has little value on its own in practical terms unless firmly committed to. | The primary reduction in greenhouse gas emissions arises through the use of gas rather than diesel for power generation.<br>TNG is still evaluating options to provide solar power with battery storage at the accommodation village and borefield and, potentially, for power supply to other project elements. Ultimately consideration of solar power will come down to an assessment of economics and reliability of supply. |
| **Other Risks** | | | | | |
| E84 | Radiation | s.2.7.1<br>p.2-30 | *No sources of radiation have been identified from the ore body or waste material.* | The Draft EIS statement is ambiguous as to whether any testing for radioactivity or analysis has occurred. Vanadium itself is weakly radioactive. Further discussion and analysis is required to describe levels of radiation associated with Project components, and demonstrate whether or not radiation risks are present to/from the Project. | Refer to Appendix A of the Supplement.<br>The titanomagnetite concentrate is not considered to be radioactive. |

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| E85 | Waste Management | s. 14.1<br><br>s.14.5.1 | *Green waste, topsoil, packaging waste (including cardboard, timber, plastics and polystyrene foam) scrap metal and general maintenance wastes will be appropriately managed to prevent degradation of amenity, blocking of drainage lines, and avoiding impediments to revegetation efforts.*<br>*These wastes represent resources that, if not recovered through reuse or recycling, are lost once placed. TNG will seek to maximise the use of existing recycling services wherever possible through contractual arrangements.*<br>*To maximise the re-use of onsite material over imported material for reclamation, a site wide inventory will be prepared for reclamation materials.* | A similar inventory should be prepared for all recyclables that could not be dealt with by contractual arrangements and which the company was forced to bury. | Noted. This will be included in the Waste Management Plan. |

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| E86 | Dust - Adnera stockpiles | *2.4.5*<br>Adnera Loadout Facility<br>p.5-47<br>Table 5-5<br>Risk AQ01 | *The stockpile will have a capacity of up to 150,000 tonnes, sufficient for four weeks.*<br>*Standard dust minimisation measures will be applied including:*<br>o *maintenance of moisture levels in ore and concentrate*<br>o *application of water to unsealed roads*<br>o *application of water to WRD and ore stockpiles as required.* | Stockpiles at this location would dry out quickly in the arid climate and often be subject to wind mobilisation.<br>Is irrigation of stockpiles proposed? If so, using what water source?<br>The above measures don't appear practical or efficient for controlling dust from the stockpiles. A local bore supply for dust control & irrigation may be more appropriate and energy efficient than transporting required water supplies 120 km from the borefield by tanker.<br>Is the magnetite magnetic (i.e. does the material when stockpiled resist wind mobilisation?) If the material is magnetic, how will this aspect be managed during handling?<br>The use of water at the Adnera stockpile site appears to have not been included in the Project water balance diagram at (App F (App A)). Please provide a water budget for the Adnera site. | In addition to maintenance of moisture levels in the concentrate, a single bore will be established at Adnera to provide water for stockpile dust suppression.<br>Dust suppression will be required when wind shear results in particle lift-off from the stockpile. Moisture levels in the surface layer of concentrate will be maintained to minimise dust lift-off.<br>A water demand has not been developed for Adnera but the volume of water required is expected to be low.<br>The concentrate is magnetic (which is how it was separated out in the process plant) and will have no bearing on dust mobilisation.<br>TNG is also considering the option of containerising concentrate which would remove the need for stockpile dust suppression. |

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| **Infrastructure** | | | | | |
| E87 | Infrastructure designs | | | Design concepts / details have not been not provided in the Draft EIS for:<br>o leach and salt residue storage cells<br>o Process Water Dam<br>o explosives and detonator magazines;<br>o product and other stockpiles and other significant mine infrastructure<br>o processing infrastructure<br>o water treatment & brine disposal infrastructure, including process water dam<br>o estimates of construction material volumes required for infrastructure | The pit is fixed in position due to the location of the ore reserve. The remaining infrastructure is located to demonstrate that there is sufficient space available to accommodate all project elements. Detailed design for most of this infrastructure has not been developed and will be provided to support the Mining Management Plan once a final site layout is confirmed.<br>There is no salt residue pond proposed.<br>Footprints / areas of the Process Water Dam are provided in Volume I, s2.5.3 of the Draft EIS.<br>The location of the explosives and detonator magazine has not been determined.<br>Disturbance areas for infrastructure are provided in Volume I, Table 2-2 of the Draft EIS.<br>Volume I, Figure 2-19 of the Draft EIS shows a concept layout for the TSF and associated infrastructure.<br>Construction material volumes are not available at this time. |

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| E88 | Construction materials | s.2.3.3<br>p.2-10 | *It is not expected that clay will be required at site.* | Is clay present on-site and/or accessible to the Project? If so, what quantities and permeability characteristics would be available, with a view to its potential required use to construct PAF cells, TSF / WRD covers and other water/air impermeable barriers?<br>Calculate Project clay requirements that would be required to manage the maximum quantities of PAF material that could be present in a worst case scenario, based on current understanding and materials characterisation.<br>How is NAF/SD drainage accounted for? | Clay will not be required. Additional test work has demonstrated that waste materials are NAF and that no PAF material has been identified (s3.3 and Appendix F of the Supplement). |
| E89 | Dispersive soils | s.8.7<br>p.76 | Dispersive soils have been identified as potentially being present onsite, and potentially presenting erosion risks to linear infrastructure. GHD recommended that the design and construction of linear infrastructure corridors (access corridor, water pipeline) for the Project … minimise the risk of exposure of dispersive soils. | NT EPA recommends mapping of dispersive soils across the Project site, where soil disturbance is planned, and incorporation of appropriate management measures (as outlined in section 8.7) where dispersive soils are identified. | Although potentially present, dispersive soils have not been observed in areas that will be impacted by the project. The presence of any dispersive soils identified will be taken into account in the design and final alignment of infrastructure with management measures (Volume II, Appendix F, s8.6 of the Draft EIS) applied as necessary. |

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| E90 | Tailings Storage Facility | s.2.7.2<br>p.2-31<br>Tailings deposition | *The ramp embankment connects the perimeter wall with the central deposition area and will be constructed in stages. The first section of the ramp will be horizontal and it will change to a 3% slope to reach the Stage 1 deposition platform, 14 m above natural ground level. In later stages, the sloping section of the access ramp will be progressively raised by centreline construction according to the staged development schedule (Table 2-6).*<br>*Tailings deposition will be via outlet spigots placed around the perimeter of the central discharge area. The spigots will open and close progressively to form an even beach that will allow effective draining and drying of the tailings. Discharged tailings will form a cone shape tailings beach creating a roughly circular storage area.*<br>*In addition to the main delivery pipeline, an emergency pipeline will be installed with a single discharge point. This pipeline will run from the thickener to a discharge point close to the perimeter embankment.* | Is tailings spread intended to be due only to passive (gravitational) flow, or will tailings be manually spread across the TSF base by machinery? It seems counter-intuitive that tailings with 65% sandy/silty solids on a porous base can be expected to flow via gravity up to 1km down a 3% slope, once discharged at the centre of the TSF? What is the collapse angle of wet tailings? More likely behaviour might be the creation of relatively steep cones of tailings underneath the discharge points, soon reaching spigot height.<br>Please provide details and evidence from an existing equivalent operation to demonstrate that this method is feasible. | Tailings spread will be due solely to passive flow.<br>The Paste books provide many different articles on beach slopes (e.g. http://www.paste2013.com/wp-content/uploads/2013/07/Jeronimo-Covacevich-Comparison-of-predictions-of-beach-slopes-using-alternative-models.pdf).<br>Beach slope can vary significantly between 1% and 6% depending on many factors including solid content, fines content, particle texture etc. For this study 3% has been adopted as it is close to the average value.<br>The final shape, size and capacity of the TSF will depend on the beach slope. The 2 m high perimeter embankment is sufficient for a beach angle of 3% and this will be confirmed during the initial years of tailings deposition. |

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| E91 | | | | Please provide more details of the emergency discharge point conceptual design, and how this will not become buried in its own discharge solids, or mound to the point of overflow over the 2m embankment. | A design for the spillway has not been completed and will be provided as part of the Mining Management Plan.<br>The emergency spillway will be constructed at the lowest part of the perimeter area.<br>The spillway will be around 14 m wide to safely convey the 100 year storm event. This will provide protection to the TSF. It is expected that discharge will occur rarely, if at all, during the life of the project.<br>No solids are expected to be discharged. Solid material will reside on the base of the TSF. The discharge is only expected to be clean stormwater. |
| E92 | | s.2.7.2<br>p.2-32 - Drainage management | *A seepage recovery trench will be constructed along the upstream toe of the perimeter embankment to recover seepage that would otherwise pass under the embankment.* | Please provide more details of the proposed seepage recovery trench. The trench is not marked on Figure 2-19. What is the depth of the trench with respect to underlying strata types? | A detailed design for this trench has not been developed but will be provided with the Mining Management Plan.<br>The trench will be located inside, and at the base of, the perimeter bund. |
| E93 | | | | Please map the proposed TSF footprint in terms of rock types, hydrologeological strata, aquifers, faults, paleochannels, neutralising capacity, permeabilities of geological strata and aquifer connectivity to creeks, to demonstrate that a cut-off trench will capture seepage effectively. | No geological mapping of the TSF footprint has been undertaken.<br>Seepage from the TSF has been shown to be benign (s3.3 and Appendix F of the Supplement). Seepage will migrate vertically to groundwater located at a depth of over 20 m below ground level.<br>The cut-off trench is not being proposed to capture all seepage from the TSF. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
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| E94 | Pipeline impacts | s.8.1.4, p.8-12 | *Vegetation in riparian zones and floodplain areas are likely to be at least partially dependent on surface water flows. The construction of linear infrastructure such as access roads and pipelines has the potential to interfere with natural surface water flows by blocking or disrupting the movement of water across the landscape. These potential impacts are likely to be most significant where the access road crosses the Hanson River and in areas within the borefield area adjacent to the Hanson River.* | Provide design details for the water pipeline. Will any sections of the pipeline be buried, raised or anchored? How will the pipeline be protected against damage from fire and floodwaters?<br>Identify and discuss risks associated with the pipeline obstructing surface water flows, and obstructing native fauna movements.<br>Describe proposed management of identified risks. | The HDPE pipeline will be surface laid within a cleared corridor adjacent to an existing access track. Appropriate soil erosion protections measures will be constructed along the length of the pipeline. The pipeline will be buried across waterways (with appropriate anchoring to prevent floating of an empty pipeline) so as not to interfere with surface flows. The pipeline will also be buried where necessary to provide vehicular access and raised on sleepers at regular intervals to allow movement of small animals. The pipeline corridor will be maintained free of vegetation and routine inspections will be undertaken to ensure adequacy of erosion protection measures and animal movement areas. |
| E95 | Flood immunity | Appendix K of Appendix *3.4.1* - Site Selection for Mine Site Project Components | *'the mine site lies between Murray Creek and Bloodwood Creek and there is a need to ensure that infrastructure is located above the flood extent of these creeks.* | Where do Project Flood vulnerabilities exist for the Project? How are these being protected?<br>What are the flow and flooding regimes and characteristics for Murray Creek? | Volume II, Appendix F, Figure 5-9 of the Draft EIS depicts the areas of the site that may be vulnerable to flooding from Murray Creek and Table 5-10 provides details of the flow characteristics of the main waterways.<br>Additional flood modelling was undertaken for Murray Creek (s3.1.1 and Appendix E of the Supplement) which has determined that the pit may be susceptible to flooding. A flood protection levee will be required adjacent to the eastern edge of the pit.<br>The modelling also identifies maximum flow depths and the period of inundation for Murray Creek and the Hanson River. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
|---|---|---|---|---|---|
| E96 | | *s.3.4.4*<br>*p.2-6* | *Option 2 – mine access road under the Stuart Highway (Figure 3 3).*<br>*A diversion road will be required while the existing road is demolished and excavation is completed for the construction of the Super-Cor arch* | Will the proposed Stuart Highway underpass be subject to flooding risk? How will this be avoided / mitigated? | The underpass will be designed so that it will not be subject to flooding from either the Hanson River or runoff from the Stuart Highway. This will entail appropriate vertical and horizontal alignments and road drainage. |
| E97 | | | | What period of time (weeks / months) would be necessary for Stuart highway traffic to be diverted or subject to roadwork delays, while installation of the haul road underpass of Stuart Highway occurs? | Based on the proposed top deck down construction, a diversion road for the works associated with the grade separation would be approx. 4-5 weeks. |
| **EIS document gaps** | | | | | |
| E98 | References | | The *Terms of Reference*, at section 2.1 states:<br>*'The EIS should be a stand-alone document. It should contain sufficient information to avoid the need to search out previous or additional, unattached reports.'* | Certain cited references are not included in relevant section's reference lists, or the Draft EIS and/or are not publicly accessible documents on the www. Please provide the following documents in the Supplement.<br>o Outotec Laboratory (2015) – not listed in references (App. F, s.8.2.4, p.73)<br>o Midas METS (2014). Magnetite (Fe3O4) Material Safety Data Sheet, prepared for TNG Limited, December 2014. – can't find document in the Draft EIS or on the www<br>o MSDS for flocculant - Nalco Optimer 83372 powder flocculant - not available on www and not provided in the Draft EIS | The Outotec report is confidential and cannot be released.<br>MSDSs are provided in Appendix H of the Supplement. |

| | Topic | Draft EIS section | Draft EIS quote | NT EPA Comment | Response |
|---|---|---|---|---|---|
| E99 | Social Impact Management Plan (SIMP) | | | The Terms of Reference (s.5.5) for the Project required that a Social Impact Management Plan (SIMP) be prepared and included in the Draft EIS. This did not occur. Some of the required information is included in Chapter 12 and Appendix L, however, no outcome or threshold criteria are presented to provide early warning that management and mitigation measures are failing.<br>A SIMP for the Project should be provided in the Draft EIS, as specified in the Terms of Reference. | A SIMP is not required as there is no potential for the project to have a significant social impact. |

## 4.2 Aboriginal Areas Protection Authority

| | Comment | Response |
|---|---|---|
| 1 | Please note under s23(1)(ba) of ALRA, land councils have the function to assist Aboriginal people in the protection of sacred sites. However the AAPA is the only body that can issue an Authority Certificate under the NT Aboriginal Sacred Sites Act (NTASSA). An Authority Certificate issued by the APAA is the only recognised guarantee of indemnity from prosecution for damage to a sacred site.<br>Under certain circumstances in accordance with s22(1)(b) of the NTASSA, the AAPA can issue an Authority Certificate based on an agreement between the custodian and the applicant. We regularly do this to ensure projects can be moved forward quickly and to ensure that proponents are not disadvantaged by any disagreements between the CLC and AAPA over who has the proper jurisdiction to issue sacred site clearances.<br>AAPA have been liaising with representatives of the Mount Peake project for a number of months. The company has engaged the CLC to carry out consultations for the project. The AAPA hope to be able to issue an Authority Certificate based on an agreement the CLC has facilitated between custodians and the company in the near future. | Noted. |

## 4.3 Department of Business

| | Comment | Response |
|---|---|---|
| 2 | The Department of Business (DOB) does not have any major issues in relation to the Draft EIS. This project would provide socio-economic benefits including employment and business opportunities to the region as well as the broader Territory economy.<br>DoB supports TNG's commitment to long term employment, skills training and mentoring of Aboriginal people for the proposed project.<br>DoB notes the Refinery part of the overall project (to be located in Darwin) is being assessed separately. | Noted. |

## 4.4 Department of Health

| | Comment | Response |
|---|---|---|
| 3 | (Medical) Entomology does not intend to comment on this Project.<br>DoH Environmental Health makes the following comments with respect to the Draft EIS - TNG Limited - Mount Peake Project: | Noted. |
| 4 | • It is noted from the Draft EIS that the project will include a workers camp with facilities for up to 225 persons. | Noted. |
| 5 | • The wastewater treatment and disposal system servicing camp and other facilities will require a wastewater works design approval (WWDA) from the Department of Health. The Draft EIS does not include sufficient information in relation to wastewater generation, treatment and disposal from camp facilities to enable assessment of wastewater treatment systems. It's also noted that a failure of the WWTP (p.5-23) (assumed to be waste water treatment plant – not defined in definitions table), may produce impacts such as limitation upon reuse options. Irrigation (referenced in section 2.5.5) and other reuse options for treated wastewater are subject to Department of Health approval also assessed and referred to in a WWDA. | A detailed design for the waste water treatment and disposal system will be provided to the Department for approval once the design is finalised. |
| 6 | • It's noted that workers camp facilities include a kitchen that may be considered as a commercial food preparation area (kitchen). The *Northern Territory Food Act 2004* defines a food business as 'any business or activity that handles food intended for sale or selling regardless whether the business is of a commercial, charitable or community nature, or whether it involves handling or selling on one occasion only'. Consequently the workers camp's commercial food preparation area is considered to be a food business and therefore likely to require registration with Environmental Health in accordance with the Food Act. | Noted. |
| 7 | • It's noted that a potential impact of bore water extraction from the project is that drawdown could affect other bores in the area supplying potable water. It is recommended that the Draft EIS be brought to the attention of Power Water Corporation to provide comment. | No bores supplying potable water will be affected. |

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| 8 | • It is noted from the Draft EIS that the project will include a water treatment plant comprising filtration using multi-media filters (MMF), desalination using brackish water reverse osmosis (BWRO) and disinfection using sodium hypochlorite or similar. Although not a recognised water utility, it is recommended that the proponent conform with the requirements of the Australian Drinking Water Guidelines (ADWG) including adopting a formalised plan of assessing microbiological, physical and chemical parameters and a system for ensuring ongoing compliance with ADWG drinking water guideline values. | This will be done. |
| 9 | • Section 4.3 of the Draft EIS (Northern Territory Legislation) makes reference to the Public and Environmental Health Act. Due to the considerable size of this project and the likelihood of requiring environmental health approvals it is recommended that the Public and Environmental Health Regulations be included within the project framework including general clauses related to prevention of public health nuisance and risk of these occurring. | Noted. |
| 10 | • It is recommended that the proponent contact the Environmental Health Unit located at Alice Springs (08 8955 6118) to discuss further to ensure compliance has been achieved. Link to the standard fact sheet which outlines the environmental health requirements for mining and construction projects is:<br>http://www.health.nt.gov.au/library/scripts/objectifyMedia.aspx?file=pdf/16/49.pdf&siteID=1&str_title=Requirements for Mining | This will be done. |

## 4.5 Department of Infrastructure

| | Comment | Response |
|---|---|---|
| 11 | The Department of Infrastructure (DoI), Engineering and Environment Services on behalf of the Department have reviewed the Draft EIS for comment - TNG Limited - Mount Peake Project and provide the following on the proposed development.<br>It is understood that the applicant has been liaising closely with the Department of Transport with regard to project specific requirements and is addressing the concerns raised by the Department.<br>It is understood the Department of Transport as the Asset owner of the Northern Territory Government roads will provide a detailed response in relation to impacts on road assets as a result of the proposed works. | Noted. |

## 4.6 Department of Lands, Planning and the Environment

| | Comment | Response |
|---|---|---|
| 12 | TNG engaged Australian Museum Consulting (AMC) to undertake a very comprehensive Aboriginal and Historic Heritage Assessment for the Mount Peake Project (provided as Appendix K in Draft EIS). This assessment concluded that there are no Aboriginal or historic heritage constraints on the proposed mine site, camps site and rail siding I load-out facility; however, that Aboriginal archaeological sites and areas of high archaeological sensitivity occur within the proposed alignments of the borefield pipeline and haul road. TNG subsequently re-aligned the proposed access road and pipeline to avoid impacts to identified archaeological sites; however, as noted in the AMC assessment report, sections of the revised alignments will still impact on areas of identified archaeological potential I sensitivity. The AMC report thus recommended that additional archaeological assessment, in consultation with the Aboriginal community, should be conducted in order to assess the impact of the revised road and pipeline alignments on the predicted archaeological resource. However, there is no acknowledgement of this recommendation in the body of the Draft EIS or the Cultural Heritage Management Plan (within the Environmental Management Plan, Appendix N), or any indication that a revised archaeological assessment has been undertaken for the new alignments.<br>It is noted that the Draft EIS does state that "Through the detailed design phase of the Project, TNG will look to avoid impacts to Aboriginal sites or areas of archaeological sensitivity." And "Where impacts are unavoidable, artefact recording and relocation will be undertaken " (Section 11 Aboriginal and Historic Heritage). However, it is not clear how TNG will identify the level of potential archaeological impact within the revised road and pipeline alignments, whether impacts are avoidable or not, and / or determine appropriate archaeological mitigation measures, without a revised archaeological assessment being undertaken.<br>The proponent should clarify this issue in the Draft EIS; and also be aware that it is generally beneficial to have archaeological constraints identified and dealt with early in the planning stages in order to avoid potential delays (especially if Works Permits are required under the *Heritage Act*) during the construction phase. | TNG commits to undertaking additional archaeological survey in areas where the Project has the potential to impact areas not covered by the previous survey.<br>The results of the survey will be used to inform detailed design for the Project and whether additional mitigation measures are required. |

## 4.7 Department of Land Resource Management

| | Comment | Response |
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| 13 | The *Assessment of Risk* for all fauna conducted by the proponent does not:<br>a. adequately or accurately assess and quantify the impacts to native fauna in relation to vegetation clearance, habitat fragmentation, creation of barriers to fauna movement, risks associated with transport and traffic, pest invasion, dust and noise impacts;<br>b. adequately identify and quantify the potential of operation activities, particularly of the haul road, to interact with threatened species, or quantify the severity of these risks;<br>c. provide an adequate assessment of the presence and potential impacts to listed threatened species. | A comprehensive assessment of impacts to fauna has been undertaken with details provided in the Draft EIS (Volume I, s5.3.2 (Ref. FA1 – FA38 and Volume II, Appendix H, Chapter 9). Following this work a targeted survey was undertaken focussing on species of conservation significance (S3.2.3 and Appendix C of the Supplement).<br>The targeted survey concluded that no species of |

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| | For the particular threatened fauna species listed in the Terms of Reference, there are numerous issues requiring resolution, including:<br>a. Mapping of the rocky habitats (figure 4-1 Appendix H) indicates that the haul road will create a barrier to dispersal for Black-footed rock-wallaby (if present) between these habitats and create risks associated with transport. This has not been adequately addressed.<br>b. The grouping of functionally dissimilar species (Greater Bilby, Brush-tailed Mulgara, Great Desert Skink, Southern Marsupial Mole) based on broad habitat types is inappropriate. These species have distinctly different mobility and habitat requirements that are masked by this grouping. Each species should be reassessed individually or in groups that better represent their ecology and thus their risk level.<br>*c.* For Greater Bilby, Brush-tailed Mulgara and Great Desert Skink, the risks presented in Chapter 5 Table 5-5 differ from the risks assessed in Appendix H Table 9-6 and referred to in Chapter 8. Targeted surveys are needed to quantify the density and distribution of these species and their risk level.<br>d. The likelihood of occurrence of Southern Marsupial Mole was identified as *Unknown* in the baseline fauna survey (Appendix H) and *Unlikely* in Chapter 8, without explanation. Targeted surveys are needed to quantify the density and distribution of this species and level of risk. | conservation significance occur in high numbers within the study area.<br>Potential habitat for Black-footed rock-wallaby occurs outside of the study area and no impact to this species is predicted to occur. The transport corridor, which will have stock fences installed to exclude cattle, would not form a barrier in the unlikely event that the species migrated from rocky habitat to sand plain country which is where the transport corridor is primarily located.<br>Species have been assessed individually in the targeted fauna survey.<br>The targeted fauna survey provides an updated risk assessment and concludes that risks to the species can be managed.<br>The Southern Marsupial Mole has been de-listed as a Matter of National Environmental Significance under the EPBC Act and does not require further assessment. |
| 14 | The draft EIS provides adequate assessment of the likelihood and severity of risks to vegetation at local and regional scales, with particular reference to clearing and disturbance (mainly Mulga and Triodia grassland), weed incursion (all habitats); alteration to surface water flows (riparian and floodplain vegetation); water table drawdown (riparian vegetation, Stirling and Mud Hut Swamps); contamination of surface and groundwater (principally riparian, floodplain and swamps), changes to fire regimes (all habitats), and dust and erosion impacts (all habitats). Based on available information, it is accurately reported that no high priority vegetation types will be affected by the mine operations.<br>Adequate consideration is given to all situations where construction and/or operation activities could potentially interact with the threatened plant species Dwarf Desert Spikerush (*Eleocharis papillosa* - Vulnerable, *Territory Parks and Wildlife Conservation Act* (TPWC Act) and *Environment Protection and Biodiversity Conservation Act* (EPBC Act)), given its highly localised occurrence. However, the risk to other threatened or high value plant species (including the culturally important and near threatened species, *Ipomoea polpha* subsp. *latzii,* cannot be accurately assessed because targeted surveys have not been undertaken. It is accurately reported that no EPBC Act-listed Ecological Communities occur in the project area. | Noted.<br>*Ipomoea polpha* subsp. *latzii* (Giant Sweet Potato) is endemic to the Burt Plain Region and known only from a small area near Ti Tree. The species grows in *Acacia* shrublands (particularly Mulga) on red earth soils and occasionally on adjacent sandplains with *Triodia basedowii*. All known population are within a few kilometres of low rocky ranges and experience some degree of rainfall 'runon' (Threatened Species Scientific Committee 2010). All populations occur well to the south of the access road. |
| 15 | **Mitigation**<br>A Biodiversity Management Plan (BMP) is included (Appendix C of Appendix N). Overall, this BMP does not comply with the Terms of Reference requirement for the inclusion of concise mitigation measures for the likely impacts of the project. Notably though, various mitigation measures are included in Chapter 5, Chapter 8, and Appendices G & H. Reference is made throughout the draft EIS to numerous plans (Construction Environmental Management Plan, Fire Management Plan, Weed Management Plan, Traffic Management Plan among many others) that have either not yet been developed or difficult to locate. A clear, concise set of mitigation measures should be included to form part of the main body of the document. | An updated Biodiversity Management Plan is provided in Appendix I of the Supplement.<br>The Biodiversity Management Plan identifies the need to monitor and respond to impacts to threatened fauna, and the need for preclearance surveys by qualified ecologists.<br>No threatened plants are expected to be impacted by |

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| | Some specific issues are:<br>1. For threatened fauna, the mitigation measures included mostly do not contain sufficient detail to evaluate their likely efficacy. Specifically, once the likelihood of threatened species presence is determined via targeted surveys, appropriate mitigation measures (e.g. the introduction of haulage road speed limits, the avoidance of known populations though mapping and advanced planning, feral predator management, road-side fencing, fire management etc.) could then be assessed.<br>2. For the proposed pre-clearance surveys, the recommendation that qualified ecologists would be on site to assist/translocate animals to safety is unlikely to be effective given that certain target species occur in sedentary colonies/burrows. For threatened plants, an explicit statement should be included regarding the course of action if a population is encountered. Currently, there are no mitigation measures developed for *Ipomoea polpha* should it occur in the path of the haulage road.<br>3. Overall, it would be useful if the proponent divided the project area into activity zones (mine site, haulage road, borefield, rail facility) and then developed a set of mitigation measures appropriate for each zone. | the Project.<br>It is not expected that *Ipomoea polpha* subsp. *latzii* will be encountered (refer response to Question 14). |
| 16 | **Monitoring**<br>The Biodiversity Management Plan includes insufficient detail of a Fauna and Flora Monitoring Program to enable an assessment of the effectiveness of the proposed mitigation measures. As per the Terms of Reference, clear thresholds and contingency measures need to be explicitly included as part of a monitoring methodology. | An updated Biodiversity Management Plan is provided in Appendix I of the Supplement. |
| 17 | **Recommendations**<br>Many of the identified limitations of the draft EIS arise from the project area not being subject to adequate flora and fauna survey, particularly targeted surveys for threatened species, which are noted in the Terms of Reference. It is recommended further field surveys are carried out and then the risk, mitigation and monitoring sections are re evaluated on the basis of more comprehensive data. | A targeted survey was undertaken in spring 2016. Results are summarised in s3.2.3 of the Supplement with a detailed report presented in Appendix C of the Supplement. Management of potential impacts are addressed in an updated Biodiversity Management Plan (Appendix I of the Supplement). |
| 18 | The Department recommends that a dedicated, stand alone, Erosion and Sediment Control Plan (ESCP) be included within the Mine Management Plan, to be cross referenced as required by related Environmental Management Plans (EMPs). The ESCP should consist of methods, strategies and standard drawings and should include details of permanent and temporary erosion and sediment control methods and treatments to be implemented during both construction and operation of the mine. The ESCP should address factors such as timing and duration of works including vegetation clearance; management of storm water; track formation and creek crossings; erosion control including channel and surface protection/stabilisation; and earthworks and revegetation required for rehabilitation. The Draft Environmental Impact Statement (EIS) refers to an 'ESCP' as well as a 'Drainage, Erosion and Sediment Control Plan' (DESCP). However, only a DESCP is included in the Environmental Management Plan in the EIS. As such, it is recommended that the single document be referred to by the same title in all documentation to avoid confusion.<br>The Department acknowledges that the DESCP has been developed to be consistent with The International Erosion Control Association (IECA) Best Practice Erosion and Sediment Control booklets (2008), Erosion and Sediment Control (Catchments and Creeks 2010), Erosion and Sediment Control Guidelines: Built Environment (DNREA 2007) and Erosion and Sediment Control Plans Fact Sheet (Land Management Unit, Natural Resources Division). It is acknowledged that as the DESCP is a preliminary document, many of the designs regarding erosion and sediment control (ESC) structures (e.g. | Future documentation will be revised to ensure consistency in naming between, and reference to, the ESCP and DESCP. The DESCP will be updated and refined following detailed Project design and submitted as part of the Mining Management Plan.<br>Standard drawings and typical schematics of all proposed drainage and ESC structures and techniques will be included.<br>Road drainage (including table drains, mitre drains, cut off drains etc.) will be trapezoidal and will comply with NT Government requirements.<br>Staked hay bales were mentioned for consideration only during construction as these would be temporary. Other measures (e.g. sediment ponds) |

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<td>surface runoff collector drains, bund drains, floodways, sediment basins etc.) have not been finalised. The final ESCP should include standard drawings of all proposed ESC structures and techniques to assist with correct implementation on ground.<br>Section 4.5 of The DESCP identifies design, construction/operation and closure information regarding the access road and haul roads. In this section, "V drains" are suggested to remove runoff from the edge of the road. It should be noted that DLRM do not recommend the use of "V drains" as they concentrate flow and scour out along the drain invert; as such trapezoidal drains are preferred. In addition, the DESCP identifies staked hay bales as potential temporary sediment traps during construction. DLRM do not recommend the use of hay bales as sediment control as they deteriorate quickly and tend to encourage scouring where hay bales join. Furthermore, there is no mention of bush tracks (e.g. to gain access to sampling sites etc.). Any bush tracks proposed to be established should be included in the ESCP document.<br>The DESCP only provides ESC information for the major infrastructure associated with the mining operations (e.g. mine pit, waste rock dump, tailings storage facility and dams, stockpiled material, access and haul roads, borefield etc.). All proposed infrastructure (e.g. concentrate loadout facility and rail siding, accommodation village, administrative buildings etc.) and their associated ESC measures should be included in the ESCP.</td>
<td>as suggested in the IECA Field Manual will be considered and details will be provided in both the updated DESCP and construction EMP.<br>Details of drainage, erosion and sediment control management of all proposed infrastructure (including bush tracks) will be included in the updated DESCP following detailed Project design.</td>
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<td>19</td>
<td>An assessment of the NT Weeds Database for NT Portion 655, surrounding areas and adjoining land tenures has revealed previous data records of the following:
<table>
<tr><th>Common name</th><th>Botanical name</th><th>Declared</th></tr>
<tr><td>Athel pine</td><td>Tamarix aphylla</td><td>Class A, C</td></tr>
<tr><td>Mesquite</td><td>Prosopis spp</td><td>Class A, C</td></tr>
<tr><td>Parkinsonia</td><td>Parkinsonia aculeate</td><td>Class B, C</td></tr>
<tr><td>Rubber bush</td><td>Calotropis procera</td><td>Class B, C</td></tr>
<tr><td>Hyptis</td><td>Hyptis suaveolens</td><td>Class B, C</td></tr>
</table>
The Weeds Management Act (the Act) enables the following weed declarations: Class A (to be eradicated); Class B (growth and spread to be controlled); Class C (not to be introduced into the NT). All Class A and B weeds are also Class C.<br>All land in the Northern Territory is subject to the Act. The Act states that the owner and occupier of land must - (a) take all reasonable measures to prevent the land being infested with a declared weed; (b) take all reasonable measures to prevent a declared weed or potential weed on the land spreading to other land.<br>Mesquite is subject to a Statutory Weed Management Plan and Management obligations outlined in this plan must be adhered to by all land holders. The proponent will need to ensure that any vehicles and machinery equipment is free of weeds, weed seeds, soil and vegetative material containing weeds and weed seeds prior to entering or exiting the sites. Under the Act it is an offence to move or spread declared weeds off or within the site.<br>The document 'Preventing Weed Spread is Everybody's Business' is a resource produced by the Department's Weed Management Branch. This document may assist the proponent in developing plans to reduce the spread or introduction of weeds to the mine tenure. This document is available at - http://www.lrm.nt.gov.au/weeds-news-andfeatures/preventing-</td>
<td>Database searches identified the presence of 16 exotic species for the locality with 5 species recorded during site surveys. One of these (Caltrop Tribulus terrestris) is listed as Class B and Class C under the Weeds Management Act. It occurs in low abundance and is likely spread by cattle.<br>TNG is aware of its obligations under the Act to control noxious weeds on land under its control and to prevent the spread of weeds through vehicle hygiene.</td>
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| | weed-spread-is-evervbodys-business.<br>The Department's Weed Management Branch may conduct random inspections of the area in the future to ascertain the weed status of this land and the surrounding land for the presence or absence of declared weeds as part of its regional weed surveys.<br>The Alice Springs Weed Management Branch can be contacted for advice on weed identification or weed management options for the control of declared weeds. Please contact the regional weed officer Chris Brown for further advice on (08) 8951 9210, or email chris.brown@nt.gov.au. | |
| 20 | The conclusions of the groundwater modelling are based on hypotheticals, such as monitoring and model recalibration during the operation of the mine, to assess the viability of the borefield to meet demand are mentioned in the groundwater consultant's report. This is a practical strategy, however details on the availability of the actual Modflow model and expertise of who is to re-calibrate it need to be clearly identified, along with a timeframe and reporting procedure (e.g. when will the Department of Mines and Energy be informed of these results etc). It is prudent to identify how this assessment of actual aquifer response will be undertaken (monitoring schedule, timeframe and personnel who will recalibrate model once data analysed etc). | Further modelling was undertaken by GHD to incorporate the results of the additional groundwater drilling. Updated groundwater model results are provided in s3.1.2 and Appendix D of the Supplement. |
| 21 | One of the fundamental assumptions used in developing the groundwater model is that the southern boundary of the aquifer behaves as a constant head. This simulates aquifer through flow as a constant for the life of the model simulation run. While this practice is often taken as a fair approximation in temperate or tropical regions where annual average recharge to an aquifer can be expected, it is not always appropriate in arid regions such as the Hanson River palaeovalley aquifer near Mt Peake. For instance a more realistic prediction of aquifer response for this borefield would be to have the southern constant head boundary decline by say 0. 7 metres for the 17 year life span of the mine. This would then mean the reasonable arid zone scenario of there being no recharge during the life of the borefield is also evaluated. | The Groundwater Supplementary Report models no recharge for 12 years and a reduced inflow head of 0.7 m to better understand model sensitivity (s6.3 of Appendix D of the Supplement). This analyses confirm that groundwater extraction rates are unaffected with extraction relying on aquifer storage rather than recharge mechanisms. |
| 22 | The project proposes a borefield (comprised of 10 bores) extracting up to 2.6 GL/year from the palaeovalley of the Hanson River, located within the Southern Ranges Management Zone of the Western Davenport Water Control District. As outlined in Rooke (2009), which underpins the available allocation specified in the water allocation plan, the estimated storage for the Southern Ranges management zone is 147GL. This estimated storage only refers to water sourced from the local-scale, fractured aquifers underlying the Osborne, Crawford, Watt, and Forster Ranges, and does not include the Hanson River paleochannel. The water available from the Hanson River paleochannel, is therefore in addition to the allocations outlined in the current Western Davenport Water Allocation Plan (6.8 GL/year is available for allocation, of which 0.036 GL/year is currently licensed). | Noted |
| 23 | It is important to note that the Western Davenport Water Allocation Plan is currently under review and there is a moratorium on assessment of all licence applications within the water control district. Although there is considerable interest in accessing water for horticultural development in the water control district, there is little interest, to date in accessing water for horticulture in the vicinity of the proposed borefield. It is considered that the relatively high salinity groundwater available in the Hanson River paleochannel is unlikely to support horticultural or other agricultural uses. The proponent has also proposed development of 'make good agreements' with the owners of affected neighbouring bores, prior to development of the borefield - this could include deepening of existing bores, construction of replacement bores, and offtake arrangements. As such, the Department has no concerns regarding the proposed extraction rates. | Noted |

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| 24 | The EIS states that further investigation is required to be carried out to determine the need for flood protection in this vicinity. Studies have revealed that sheetflow shadows will result from the access road and therefore regularly spaced culverts have been recommended to prevent this occurrence. The proponent will also need take into consideration flash flooding situations. | Studies have identified the potential for sheetflow shadows to occur if water ponding upstream of the road occurs. Appropriately spaced culverts will remove this risk.<br>The access road east of the Stuart Highway crosses flat terrain with no well-defined channels, so is unlikely to be subject to flash flooding. |

## 4.8 Department of Mines and Energy

| | Comment | Response |
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| 25 | **General**<br>Please provide more detailed design drawings of the waste rock dump (WRD) and open cut pit, including cross sections. | Clearance areas for the WRD and pit are provided in Volume I, Table 2-2 of the Draft EIS with the disturbance footprint provided in Figure 2-2.<br>Detailed design drawings of the WRD and pit will be provided in the Mining Management Plan. |
| 26 | **General, Waste rock and ore classification**<br>The waste rock characterisation method contains a multitude of assumptions that cast doubt on the reliability of the analysis methods undertaken.<br>The results of waste rock classification and ore (WRC), including tailings, are based only on XRF data which has not been backed up by laboratory experiments. There are a number of issues with the WRC.<br>The WRC does not account for neutral mine drainage (NMD).<br>The WRC assumes 100% acid neutralisation capacity (ANC) and doesn't account for the influence of aluminium – laboratory test need to be done during the project feasibility stage.<br>The sulfur content of 0.3% for an unclassified (UC) classification indicates more assessment is required.<br>The assumption that all waste rock is oxidised based on the occurrence of Fe3O4 requires more justification.<br>10 kg/t $H_2SO_4$ or less is still classified as PAF material without any reliable acid neutralisation capacity (ANC) lab results.<br>Depth profiles should be included for PAF analysis. From the available information there appears to be very few samples taken at >60m depth. A cut off of 0.3%S for PAF is unreasonable, no acid mine drainage documents support the use of 0.3% as a broad non PAF classification value.<br>Undertaking laboratory analysis for NMD and AMD on a representative number of waste rock and ore samples is a more appropriate approach and must be done before designing storage facilities which may house these materials (ie: TSF, WRD and long term stock piles). This should have already been done in the feasibility stage of the project. | Refer response to Question E6. |

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| | This has implication regarding the environmental management of the tailings storage facility (TSF), WRD, pit and the current proposed management of the overall site. The EIS should be reviewed after reassessing the waste rock. | |
| 27 | **General, The surface water balance**<br>The high EC value suggests that groundwater may require processing to prevent any potential detriment to plant equipment. After processing where will the excess salts from groundwater be stored? How will this area be remediated? How will the impact on surrounding surface water be minimised?<br>Many schematics and some remediation sections have omitted the raw water dam and other surface water features. Please include all proposed dams and other surface water features. | Processing is not sensitive to salinity and desalination of process water is not proposed.<br>Desalination of groundwater is required for potable and gland water use with the brine reject disposed to the process water dam.<br>The salt cycle is provided in the response to Question E25. Impacts of salt are discussed in the response to Question 34.<br>The location of the raw water and process water dams is shown in the schematic in Volume 1, Figure 2-12 of the Draft EIS.<br>Detailed design of all water storage features will be provided in the Mining Management Plan. |
| 28 | **General, The closure plan**<br>Given that the project is no longer in the feasibility phase the nature and size of the sedimentation ditch/pond at the WRD should have been already assessed.<br>Additionally a laboratory analysis on all rock should have also been conducted. | Details of drainage, erosion and sediment control management at the WRD will be included in the updated DESCP following detailed project design and submitted as part of the Mining Management Plan.<br>Further assessment of waste rock demonstrates that the rock is non-acid forming (refer s3.3 and Appendix F of the Supplement). |
| 29 | **General, TSF design**<br>The TSF material has not yet been shown to be benign and therefore seepage controls and surface water controls need to be improved. | Refer response to Question E6. |
| 30 | **General, Groundwater**<br>There is currently no groundwater quality data regarding metal concentrations. This needs to be provided with the EIS. Baseline conditions need to be presented to enable a complete understanding of the area.<br>A figure depicting groundwater movement in the region should be included and should be constructed using data collected in situ.<br>All the groundwater modelling is based on airlifting data only; sensitivity and uncertainty analysis is required to fully accurately understand groundwater recharge and drawdown impacts.<br>Groundwater recharge may only occur once every twelve years, using an average recharge rate is not reasonable. New models should be developed showing a 0 recharge rate for 12 years as a worst case scenario for groundwater drawdown.<br>The pit groundwater impacts were based on bore holes made to 20m, the pit will extend to 125m deep and there is no | Groundwater metal concentrations are provided in the Groundwater Supplementary Report (Appendix D, sub Appendix A, s5.3 of the Supplement).<br>Groundwater movement is shown in the Groundwater Supplementary Report (Appendix D, Figure 5-2 of the Supplement). This is modelled data and fits the data collected to date.<br>The modelling is not based on airlifting data only. Aquifer properties were calculated from pump test data undertaken in the Hanson River palaeovalley. |

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| | mention of how this discrepancy is justified. The impacts of bore and pit dewatering on the riparian vegetation and related fauna should also be discussed.<br>Finally the groundwater recovery rate of 8.5L/s is taken from the most productive bore, other bore holes only produce 4L/s. all calculations regarding the 8.5L/s recovery need to be reassessed. | Assessment of recovery data from airlifting within the mine pit was used to assist in determining hydraulic properties for basement rock layers.<br>The Groundwater Supplementary Report models no recharge for 12 years (Appendix D, s6.3.1 of the Supplement). Changes in water level were considered insignificant due to the majority of the abstracted water coming from storage within the aquifer rather than recharge.<br>Groundwater in the pit is at >20 mbgl and this was used as the basis for modelling.<br>The comment regarding bore yield is incorrect. The Groundwater Supplementary Report updates the modelling based on additional collected date (s3.1.2 and Appendix D, Chapter 6 of the Supplement). For Stage 1 water supply, the proposed borefield will require six production bores. Of these, three have already been installed. One bore will be operated at a pump rate of 15 L/s, with the remaining five bores pumped at 7.1 L/s. For Stage 2, a further three bores are required (total of nine), one bore operated at a pump rate of 15 L/s, and the remaining eight bores at 8.4 L/s. |
| 31 | **Executive Summary, Anningie station organic certification**<br>The use of herbicides to control weeds and other chemicals may impact on the organic certification of surrounding cattle stations. Please clarify the control methods in place for weed management and how stakeholders will be consulted regarding this. | Refer to s3.4 of the Supplement.<br>Spot control of weeds at the mine and along the access road is expected to be necessary. No decision on the herbicide to be used has currently been made. There is the option of using organic control methods if there is an offsite risk posed to organic certification. This will be discussed with the pastoralists. |
| 32 | **Executive Summary, Surface water, potential impacts**<br>"*Waste rock does not contain material with significant acid forming potential*".<br>Based on the 0.3%S values quoted there will be approximately 0.88Mt of PAF material contained within the WRD. Additionally, the analysis is not reliable as volumes of material have not been appropriately represented by the number of samples collected.<br>Laboratory analysis needs to be undertaken on a representative number of samples from each section of the pit. | Refer response to Question E6. |

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| 33 | Aquatic fauna surveys should be completed prior to commencing mining activity. Given the significant rain events in 2016 this has been possible. | Rainfall during 2016 did not result in any stream flow events. |
| 34 | **Executive Summary, Air Quality**<br>"*Standard dust minimisation measures will be applied including maintenance of moisture levels in ore and concentrate*".<br>Where will water for dust suppression be taken from? The groundwater in the region has significantly elevated EC and should not be allowed to enter local waterways. | Water for dust suppression will be obtained from the Hanson River borefield (refer response to Question E25).<br>Brackish water for dust suppression is common on mine sites and assists with dust suppression through formation of a surface crust. During periods of heavy rainfall some of the accumulated salt will be released from the application areas and has the potential to enter waterways. Rainfall sufficient to result in surface water runoff is rare at Mount Peake. When rainfall sufficient to cause the creeks to run does occur, any saline runoff will be significantly diluted. No environmental impacts are expected to occur. |
| 35 | **1.3 The Proponent**<br>"*Environmental conditions are set and monitored by the NT DME through the Mining Management Plan (MMP) authorisation process*".<br>Environmental monitoring is undertaken by TNG or an appropriate contractor and regulated by the NT DME, regulation may include sample collection by the NT DME. | Noted. |
| 36 | **1.4.2 Key Issues Identified by the NT EPA, "Ground and surface water resources**<br>*Potential for Acidic and/or Metalliferous Drainage (AMD/NMD) from the waste rock dump, tailings storage facility and other mine infrastructure, to contaminate shared water resources*".<br>This concern has not adequately been addressed. Laboratory analysis is required. | Refer response to Question E6. |
| 37 | **2.1.4 Timing**<br>The timing section should mention that monitoring and rehabilitation will be undertaken until TNG has demonstrated that no adverse environmental impacts are likely to occur as a result of mining activity. | Noted. |
| 38 | **2.3.3 Construction Materials**<br>"It is not expected that clay will be required at site".<br>What about covering the WRD and tailings? Given that the current results do not adequately assess the potential harm posed by the WRD and TSF all precautions should be taken to minimise the potential harm, including the use of clay liners in TSF and WRD design. | Refer response to Question E88. |
| 39 | **2.3.5 Access Road** | While generally dry the watercourses are prone to |

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| | "*Floodways will be constructed across the Hanson River, Murray Creek and some minor watercourses that bisect the access road. Crossing design incorporates a 300mm thick stabilised road boarded with rock filled gabion baskets to sit at grade*".<br>Why is erosion protection required in the beds of creeks and rivers, given that the crossing is designed to wash out during significant flow events?<br>There is a high risk that the wire gabion baskets could wash away during high flow events, or cause unnatural turbulence leading to unknown impacts on the creek's bed and banks.<br>Please justify this design, taking into consideration how the rock gabions would be retrieved after a high flow event.<br>Please provide information on where this design has been implemented successfully (if applicable), or what literature or guidelines were considered prior to choosing this option.<br>Figure 2.8 Floodway Detail, is illegible. Please provide a diagram that is legible. | infrequent flooding and crossings will require drainage allowance. Gabion baskets are steel wire mesh baskets which, when filled with rocks and locked together, can be placed as a drainage wall. They will provide a barrier to slow erosion adjacent to the floodway during sub-surface and low flow conditions.<br>Gabion walls resist breakage and separation due to the flexibility of their wire mesh construction and can last 100+ years. They can endure repeated water pounding and stream flow without disintegration. The double twisted wire mesh ensures they will not unravel if one or more of the wires breaks. Located at the level of the river bed they are not expected to wash out.<br>Gabions with this design application have been used throughout Australia on a vast range of projects associated with industry sectors including road and transport, marine / coastal, water and power, transport and Infrastructure, and commercial.<br>The current floodway concept is provided in Appendix G of the Supplement. |
| 40 | **2.4.2 Mine site layout**<br>"*Figure 2-11 shows the progression of mining over the Project life*".<br>Rehabilitation should be included here. | Volume I, Figure 2-11 of the Draft EIS shows the progression of mining. It was not developed to show rehabilitation. The pit and WRD will not be progressively rehabilitated as these will remain active until mining ceases. |
| 41 | **2.4.3 Processing**<br>"*Non-magnetic tailings streams will be pumped to a tailings thickener where the solids density is increased to approximately 65%. Overflow from the thickener will gravitate to the process water dam whilst underflow will be pumped to the TSF*".<br>Please list the expected volumes for each step. | 38.13 Mt of tailings will be discharged to the TSF over the life of the project. 2519 MLpa of water contained in the thickened tailings underflow will also be sent to the TSF with around 30% being recovered for reuse in processing. |
| 42 | "*Filter cake is then stockpiled in a concentrate storage area*".<br>Details regarding the concentrate storage area should be included. | Detailed design drawings of the storage area will be provided in the Mining Management Plan. |
| 43 | **2.4.6 Reagents and Consumables**<br>"Nalco 83372 (or similar) as a flocculant in the process plant – 300 tpa". | The MSDS (Appendix H of the Supplement) does no classify Nalco as a hazardous substance and there are no known ecotoxicological effects. |

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| | Human health influences should not be used as a proxy for environmental health issues. Please provide evidence that the product intended to be used as a flocculent has no known environmental impacts. | |
| 44 | **2.5.2 Power Supply**<br>Table 2-5 Power plant specifications.<br>What controls are there for reducing particulate emissions? | Particulate emissions from gas fired power stations are considered to be low and no specific controls are required. |
| 45 | **2.5.3 Water Supply and Storage**<br>"*Around 2,625 MLpa of make-up water will be required for mining, processing, dust suppression and potable use once the mine reaches full production. The brine reject will be discharged to the Process Water Dam where it will be recirculated*".<br>This equates to 85L/s and dewatering will likely influence the surrounding groundwater significantly. As a result groundwater modelling should be undertaken with both the Murray and Bloodwood streams.<br>Additionally brine reject volume calculations should be included and the process water dam size needs to be reassessed to have an adequate 2 day supply. | All of the water required for the project will be drawn from the Hanson River palaeovalley. Groundwater modelling demonstrates that this extraction will not influence Murray or Bloodwood Creeks (Appendix D, Figure 6-4 of the Supplement).<br>Brine reject volumes are minimal. The process water dam has been sized for a two day emergency supply. |
| 46 | **2.5.7 Chemical and Hydrocarbon Storage**<br>Will refuelling areas, in the vicinity of the 85,500L self-bunded diesel tanks, be lined to contain any hydrocarbon spills? Please provide details. | Yes. Storage and handling of all hydrocarbons will be consistent with AS/NZS 1940:2004 *Storage and handling of flammable and combustible liquids*. |
| 47 | Are any preventative measures/critical controls proposed for ensuring no loss of containment of the self-bunded diesel tanks?<br>Please conduct an assessment of the risks to ensure hydrocarbons are contained (i.e. vehicle/machinery collision with tanks, integrity of tanks and valves, inspection schedules, etc).<br>What risks have been identified and what critical controls will be implemented to reduce the likelihood of a loss of containment? | The diesel tanks have the following characteristics:<br>o Rugged double walled, self-bunded construction<br>o Overfill protection valve and overfill alarm<br>o Interstitial space venting and dip monitor for leakage<br>o Anti-syphon valves.<br>When installed in compliance with AS/NZS 1940:2004 *Storage and handling of flammable and combustible liquids* they easily meet regulatory requirements.<br>The tanks are designed to stand up to a vehicle collision. Maintenance and inspection schedules will be as per the manufacturers specifications. |
| 48 | *"Waste hydrocarbons will be stored in a tank within a bunded area to be held for collection by a contractor for reprocessing and recycling*."<br>Will this bunded area be lined and constructed in accordance with Australian Standard 1940-2004? Please provide details. | Yes. Storage and handling of all hydrocarbons will be consistent with AS/NZS 1940:2004 *Storage and handling of flammable and combustible liquids*. |
| 49 | **2.7.1 Waste Management** | Refer response to Question E6. |

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| | *"All of the intrusive is oxidised so there is no magmatic sulphide within this material*."<br>What evidence is there for the complete oxidation of the intrusion? | |
| 50 | "Other rock types that will contribute to the waste dump also have a low sulphide content."<br>This is based only on XRF data which has not been verified against laboratory experiments. The conclusion is therefore unreliable until non XRF laboratory data has been assessed and shown to agree with the XRF results. | Refer response to Question E6. |
| 51 | **2.7.1 Waste Management**<br>"*All of this material contains some magnetite indicating oxidising conditions for the intrusive magma and hence no significant sulphide is present*."<br>Pyrite may rim the magnetite and veinlets of pyrite may cut across the magnetite grains. The assumption that all rock material is oxidised ignores the fact that the iron in magnetite is only partially oxidised (with 1 FeII and two FeIII) suggesting a limited availability of oxygen. | Refer response to Question E6 in relation to the low risk posed by sulphides. |
| 52 | "*The Acid Neutralising Capacity (ANC) was found to be relatively high, indicating that any acid forming waste would likely to be neutralised*."<br>However this value was calculated assuming 100% solubility, which is unlikely. Laboratory kinetic and ANC analysis is required to obtain an accurate figure. Elements which may be present as a result of NMD may also reduce the ANC – for example aluminium.<br>Laboratory analysis needs to be undertaken on a representative number of samples prior to drawing any conclusion about the ANC of the waste rock. Without further analysis all waste rock should be treated as AMD/NMD producing. | Refer response to Question E6. |
| 53 | *"The key aspect of the management plan is early identification of Potentially Acid Forming (PAF) material through additional analyses and ongoing monitoring*."<br>A contingency plan should also be developed which will enable waste management of a significant proportion of PAF material. | No PAF material has been identified and contingency planning is not required (refer to s3.3 and Appendix F of the Supplement). |
| 54 | *"There are no specific strategies to manage waste placement in the dump as the waste rock is benign."*<br>Stormwater drainage, erosion and sediment controls will be designed and constructed to minimise erosion and channel scour. A concept is presented in the Drainage, Erosion and Sediment Control Plan (Appendix N). Stormwater collected on dump benches will be conveyed to a sedimentation basin on the toe of the WRD through engineered channels located on the benches. After settling of any sediment load, water will be either used around the site, for example in dust suppression, or allowed to discharge to natural drainage lines.<br>The waste rock has not been shown to be benign as roughly 0.9% of waste rock (by volume) is PAF. The ANC is based on calculations only with no laboratory data to support the results. Therefore the lack of management strategies for the WRD is not acceptable. The reuse of potentially contaminated water is unacceptable and the site water balance should be revised taking this into consideration. | Refer response to Question E6. No specific management strategies are required for the WRD other than the collection and management of stormwater. |
| 55 | **2.7.2 Tailings Storage Facility, Emergency Spillway** | Refer response to Question E91. |

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| | "*The emergency spillway will discharge into Bloodwood Creek*."<br>Please justify why you have chosen to construct an emergency spillway with an outlet that will discharge into Bloodwood Creek, which flows directly into Mud Hut Swamp?<br>Please provide a design drawing of the emergency spillway. | Under a 100 year storm event, the project area will be in flood. No contamination is expected. |
| 56 | *"Tailings will be produced following the magnetic separation of the crushed and screened ore and will consist of non-magnetic silts and sands. Geochemical characterisation of ore and waste samples show a very low percentage of sulfur within the ore body and AMD is not expected to be an issue."*<br>The 0.3%S should not be used as the primary line of evidence for an UC/NAF classification. Laboratory analysis is required to obtain reasonable results. | Refer response to Question E6. |
| 57 | *"Given that the tailings do not contain contaminants, the TSF will not be lined."*<br>Until sufficient evidence is provided the TSF should be managed under the assumption a significant proportion of PAF will be stored within the TSF. | Refer response to Question E6. There is no PAF material on site. |
| 58 | **2.7.3 Sewage**<br>*"Treated effluent from the Sewage Treatment Plant will be used around the site for landscaping purposes*."<br>Nutrient monitoring is required to ensure that effluent use around the mine site does not significantly enhance the risk of algal blooms. | There are no permanent water bodies in which an algal bloom could develop.<br>Monitoring of soils subjected to effluent application will be undertaken. |
| 59 | **2.8.2 Waste Rock Dump and Run of Mine Pad**<br>A number of closure and rehabilitation objectives have been developed for the WRD and ROM Pad, however the list of objectives does not elaborate on revegetation of the site at the time of closure and rehabilitation.<br>Additional objectives are required to define revegetation standards for the site. The objectives should describe revegetation commitments aimed at revegetating the site to resemble pre-mining species composition, assemblages and density. Please define your revegetation objectives for the site. | The primary objective is that post-mining these landforms are safe, stable, non-polluting and rehabilitated. Revegetation will use local provenance species. Species selection and endpoint criteria need to be further defined following rehabilitation trials. As the landforms created by the TSF, WRD and ROM Pad do not occur in the area local natural analogues do not exist.<br>TNG will consult with DME on the development of completion criteria with criteria documented in subsequent versions of the Mine Closure Plan.<br>Given the artificial nature of the constructed landforms it is unreasonable to expect that revegetation will resemble pre-mining species composition, assemblages and density. |
| 60 | *"The WRD will have an ultimate height of 40 m and a footprint of 90 ha with capacity to store up to 70 Mt of mine waste. The following objectives have been developed."*<br>The design of the WRD should ensure that there are no adverse groundwater impacts as well, especially given the proximity | Refer response to Question E6. Waste storage facilities have limited potential to cause groundwater contamination and will not require lining. Mud Hut |

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| | to Mud Hut Swamp. This may require importing material with low permeability for lining the TSF and WRD. | Swamp is over 7 km from the WRD. |
| 61 | **2.8.3 Tailings Storage Facility**<br>*"Drainage or seepage from the TSF does not cause significant contamination of local surface waters or harm to local vegetation*."<br>Groundwater should be included here as well. | Noted. |
| 62 | **2.9 Environmental Offsets**<br>*"The assessment concluded that there was no significant residual impact to any of these species*."<br>This is based on inadequate information and insufficient data. The groundwater modelling undertaken by GHD which indicated there would be no significant impacts on the Stirling Swamp (habitat of the Dwarf Desert Spike-rush); however this study was based only on steady-state conditions and no sensitivity or uncertainty studies. Additionally estimates of recharge in the region were most likely over estimated. Recharge occurs once in a 12 year cycle (Australian Natural Resources Atlas) suggesting that the average rates quoted will not adequately account for climatic variation. See groundwater general comments for more information.<br>The conclusion of no significant impact cannot therefore be accepted. | The Groundwater Supplementary Report models no recharge for 12 years and a reduced inflow head to better understand model sensitivity (Appendix D, s6.3 of the Supplement). The modelling again confirms that Stirling Swamp will not be impacted by groundwater extraction. |
| 63 | **3.4.1 Site selection for mine site project components**<br>Given there is only minimal information regarding groundwater modelling the location of the WRD should be reviewed prior to commencing work and after groundwater modelling has been undertaken. | Groundwater under the WRD is at a depth of over 20 mbgl. Additional test work has demonstrated that seepage will not be contaminated (s3.3 and Appendix F of the Supplement). Groundwater modelling will not assist in siting the WRD. |
| 64 | **3.1.4, Figure 3-1 Train loading facility**<br>"*Alternatives considered included locating infrastructure to the north of Bloodwood Creek or to the east of Murray Creek*".<br>Why has the WRD location further southwest not been considered? | Refer Volume I, s3.4.5 of the Draft EIS. |
| 65 | **3.4.5 Waste Rock Dump**<br>"*Due to the benign nature of the waste material it is not expected that specific handling of waste will be required*".<br>The waste rock dump is expected to be constructed using mostly sand, gravel and rock size material, allowing for water to penetrate into the PAF material and carry leachate into the surrounding environment. Appropriate cover material will need to be sourced before the current design method is considered acceptable. If crushed NAF is proposed as the cover material, permeability analysis should be undertaken on the crushed NAF prior to use. | Refer response to Question E6. Waste material is considered to be benign and no PAF material has been identified. The WRD will not require an impervious cover. |
| 66 | **3.4.6 Tailings Storage Facility**<br>"*For the three options considered, lining of the tailings facility will not be necessary given the nature of the material to be deposited – non-magnetic silts and sands*".<br>Please justify why a liner for the TSF is not required. This requires an assessment of the following aspects: | Additional test work has demonstrated that seepage will not be contaminated (s3.3 and Appendix F of the Supplement).<br>No impact is predicted on surface water, |

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| | • Hydraulic characteristics of the foundation beneath the TSF<br>• Hydraulic characteristics of the TSF containment wall.<br>• The impact of any seepage from the TSF on surface and groundwater, and flora and fauna. | groundwater, flora or fauna.<br>The TSF does not require lining. |
| 67 | **Option 1 – dry stacking of tailings**<br>This section is referencing the wrong part of the process. The filtrate will contain the liquid after filtration. Please clarify this section and detail where the filtrate will be stored | If this option was adopted the filtrate would be returned to the process water circuit with the dry tails (10% water) trucked to a dry stacking area.<br>Dry stacking has been considered but rejected due to cost. |
| 68 | "*For the three options lining the TSF will not be necessary as no tailings material contains contaminating material*".<br>This has not been adequately demonstrated yet. See general comments on waste characterisation. | Refer response to Question E6. |
| 69 | **5.3.2, Table 5-5 Project Risk Assessment (by Aspect)**<br>The table provided here merges preventative measures (critical controls), with mitigation measures.<br>Please re-format this table to segregate the critical controls and mitigation measures. More work is required to identify the critical controls for each impact identified in the risk assessment.<br>The "discussion" section of this table should be utilised to discuss your assessment of the risks. This should include discussion on how critical controls may reduce residual risk, and how they will be implemented. | The risk table serves its intended purpose of identifying the key management and mitigation measures for each identified risk and assigning a residual risk level. It is designed to be a summary with cross references provided to relevant chapters of the Draft EIS.<br>Preventative and mitigation measures do not need to be separated.<br>The discussion column was included to provide Project context to support the assessment. |
| 70 | **5.3.2, Table 5-5 Project Risk Assessment (by Aspect) SE08**<br>"*Resource activities and Organic Farming - Guidelines for organic producers and resource development companies in Queensland, July 2012*".<br>Please provide evidence that the considerations in the above document have been taken into account and discussed with the landholder. | This is a high level and generic document. Specific issues relating to organic certification are addressed in s3.4 of the Supplement. |
| 71 | "*No hazardous chemicals are proposed for use on the Project*".<br>Diesel is classified as a hazardous substance according to the criteria of the National Occupational Health and Safety Commission (NOHSC), and may cause long term adverse effects in the aquatic environment.<br>Please amend your risk assessment to include diesel as a hazardous substance, including an assessment of possible effects on aquatic ecosystems, and applicable critical controls and mitigation measures that may be required. | It is noted that diesel should have been included as a hazardous chemical.<br>The risk of diesel release to the environment is assessed for groundwater (GW11), surface water (SW09), vegetation and flora (VF31, VF32), fauna (FA8 – FA12), and transport (TR01) (Volume I, Chapter 5, Table 5-5 of the Draft EIS). Control and mitigation measures are similar for all environmental factors. |

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| 72 | **5.3.2, Table 5-5 Project Risk Assessment (by Aspect) GW01**<br>"*Groundwater assessment indicates that there should be sufficient water available from the Hanson River palaeovalley to supply project needs. The assessment is based on limited drilling*".<br>The evidence provided in the groundwater analysis is insufficient. See general groundwater comments. | Further drilling and assessment work was undertaken to better refine the understanding of the Hanson River palaeovalley and sustainable yield. Results are provided in s3.1.2 and Appendix D of the Supplement. |
| 73 | **5.3.2, Table 5-5 Project Risk Assessment (by Aspect) GW03**<br>"*Groundwater extraction from the borefield will lower existing water table levels by approximately 12 m*".<br>The evidence provided in the groundwater analysis is insufficient. See general groundwater comments. | Refer response to Question 72. |
| 74 | **5.3.2, Table 5-5 Project Risk Assessment (by Aspect) GW04**<br>"*Groundwater drawdown impact would be limited to the mineral lease and unlikely to affect any potentially groundwater dependant ecosystems*".<br>A portion of Murray Creek is contained within the proposed mining area (MLA29855).<br>Will groundwater drawdown impact affect phreatophytic vegetation along Murray Creek? Please provide details and include in your risk assessment. | s3.2.4 and Appendix K of the Supplement identifies that vegetation along Murray Creek will not be impacted by dewatering activities. |
| 75 | **5.3.2, Table 5-5 Project Risk Assessment (by Aspect) GW05**<br>Groundwater drawdown affects Mud Hut Swamp.<br>The evidence provided in the groundwater analysis is insufficient. See general groundwater comments. | Groundwater levels measured at pastoral bores near Mud Hut Swamp indicate that regional groundwater is >10 mbgl in this area, therefore the swamp is unlikely to be maintained by groundwater.<br>The proposed groundwater monitoring includes a monitoring well at this location which will assist in demonstrating groundwater depths and any seasonal changes or impacts from mining. |
| 76 | **5.3.2, Table 5-5 Project Risk Assessment (by Aspect) GW07**<br>Will a localised increase in groundwater levels beneath the TSF result in salts/metals coming to the surface?<br>Has an assessment of groundwater quality been conducted at the site of the proposed TSF? If so, did water quality analysis indicate groundwater increases could mobilise elements in the upper soil profiles? | Similar to the area of the pit, groundwater levels beneath the TSF are expected to be >20 m below ground level and saline. Seepage from the TSF will migrate to groundwater and are not expected to mobilise metals. |
| 77 | Localised increase in groundwater levels. Seepage of AMD causing contamination. Increased long term risk to groundwater.<br>Current analysis of ore material is inadequate. See general comments on waste rock classification. | Refer response to Question E6. |
| 78 | Release of AMD causing contamination.<br>Current analysis of ore material is inadequate. See general comments on waste rock classification. | Refer response to Question E6. |
| 79 | **5.3.2, Table 5-5 Project Risk Assessment (by Aspect) SW01** | The hydrological assessment will be updated |

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| | Adverse impacts on downstream water quality, aquatic environment, and downstream users.<br>The lack of a surface water model and appropriate surface water data means that sediment produced from mining activities could potentially impact on wetland areas downstream. Without sufficient data to suggest there will be no detrimental impacts appropriate management measures should be detailed that show sediment runoff does not impact downstream areas. | following detailed project design.<br>Details of drainage, erosion and sediment control management of all proposed infrastructure will be included in the updated DESCP following detailed project design.<br>The assessment of the fate and transport of contaminants of concern will be updated following detailed project design.<br>An adaptive site water monitoring and management plan will be developed to further define ambient conditions regarding sedimentation. |
| 80 | **5.3.2, Table 5-5 Project Risk Assessment (by Aspect) SW02**<br>Water retention ponds sized to capture an ARI Wet Season rainfall appropriate to their hazard category plus an appropriate freeboard allowance for sedimentation.<br>The ARI values used do not provide adequate contingency for rainfall events. A 72h 1 in 100 year rainfall event should be used for the design of water holding facilities. Additionally the sediment dam is not included in any surface water schematics. | No water retention ponds are proposed, only sediment control ponds.<br>Sizing of sediment control ponds will be based on the contributing catchment areas, events for a range of ARIs and durations (including the 72-hour 100-year ARI event), a range of sediment capture rates and the pond maintenance (clearing) requirements. Sizing criteria will be based on maintenance frequency and capture performance requirements.<br>Details of drainage, erosion and sediment control management of all proposed infrastructure will be included in the updated DESCP following detailed Project design. |
| 81 | **5.3.2, Table 5-5 Project Risk Assessment (by Aspect) SW05**<br>A preliminary flood risk assessment indicates that the mine site is not expected to experience any significant flooding for events up to the 50-year ARI.<br>The ARI values used do not provide adequate contingency for rainfall events. A 72h 1 in 100 year rainfall event should be used for the design of water holding facilities. | The flood risk assessment of Murray Creek for the 72-hour 100-year ARI storm event has been updated following acquisition of higher resolution elevation data (s3.1.1 and Appendix E of the Supplement). |
| 82 | Design to ANCOLD guidelines. Protection of toe of TSF through construction of diversion drains and installation of rock armour.<br>The tailings have not been shown to be completely benign. The analysis used to demonstrate the extent of PAF material is questionable and no NMD analysis has been undertaken. See waste rock classification general comments. This indicates that the TSF design does not comply with ANCOLD, as ANCOLD suggests that TSFs with the potential to contaminate stock drinking water should be lined. | Refer response to Question E6. Waste has shown to be benign. |

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| 83 | **5.3.2, Table 5-5 Project Risk Assessment (by Aspect) VF25**<br>Modelling indicates that Mud Hut Swamp, Stirling Swamp and the broader Anmatyerr North SOCS will not be impacted by groundwater.<br>There is insufficient data to demonstrate this. See general comments on groundwater. | Refer to response to Question 75 regarding Mud Hut Swamp being unlikely to be impacted by groundwater drawdown. Stirling Swamp and Anmatyerr North SOCS are too far from the borefield to be impacted (refer to drawdown contours provided in s3.1.2 of the Supplement and Appendix D). |
| 84 | **5.3.2, Table 5-5 Project Risk Assessment (by Aspect) VF30**<br>Consider modifying extraction (the rate of extraction and distribution of operating bores) if significant impacts to vegetation occur.<br>This is not a satisfactory mitigation method as the impacts would already have occurred. | Refer response to Question E42. |
| 85 | **5.3.2, Table 5-5 Project Risk Assessment (by Aspect) WA01, WA05 & WA06**<br>No significant Potentially Acid Forming (PAF) materials have been identified within the ore body.<br>See general comments on waste and ore classification. | Refer response to Question E6. |
| 86 | **5.3.2, Table 5-5 Project Risk Assessment (by Aspect) CL01**<br>Closure Plan updated and refined throughout mining operations including life of mine closure planning, contingency planning, tailings management plan, waste rock management plan and a care and maintenance plan.<br>The closure plan assumes that the waste classification and water management sections of the report contain accurate and adequate information, this is not necessarily the case and the closure plan should incorporate more contingencies in light of this. | The closure plan will be a living document which will be reviewed and updated multiple times over the life of the Project. The updates will incorporate new information as it becomes available. Appropriate contingencies will be included and these will change as the new information increases confidence in the closure plan meeting agreed completion criteria.<br>Recent test work has demonstrated that waste is non-acid forming (s3.3 and Appendix F of the Supplement). |
| 87 | **5.3.2, Table 5-5 Project Risk Assessment (by Aspect) CL07**<br>Are soil profile studies planned for areas in which major disturbance is planned (i.e. open pit, WRD and TSF been conducted), so that these can be recreated during closure activities?<br>If so, please provide details of the planned activities. | Given the artificial nature of the constructed landforms it is unreasonable to expect that pre-mining soil profiles can be recreated.<br>The Project site is overlain with between 2 m and 12 m of aeolian sand. The top 200 mm contains some organic matter and seed. No significant clays or hardpan are present.<br>Constructed landforms will be covered with a base layer of aeolian sand (nominally 500 mm) with a top layer of the sand containing the organic matter and seed. This will provide the growing medium for vegetation. |

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| 88 | **6.6, Consultation Outcomes Results**<br>Table 6-3 - Studies indicate that sufficient water will be available from the Hanson River paleochannel.<br>These studies are inadequate. See general groundwater comments. | Refer response to Question 72. |
| 89 | "*Waste rock and tailings are benign and the process does not use any hazardous chemicals. There will be no direct discharge of any contaminated water from the site*".<br>This is unlikely to be true as some PAF material was identified in the waste rock analysis and the WRD and TSF designs do not allow complete exclusion or collection of water. Additionally, the methods used for analysis are unreliable. See general comments on waste rock characterisation. | Refer response to Question E6. Recent test work has not identified the presence of PAF material. |
| 90 | "*The Project will not result in any significant residual impact and offsets are not currently proposed*".<br>This is still uncertain and the reasoning and offsets should still be considered. | TNG does not expect the project to result in any significant residual impact. |
| 91 | **7.1 Introduction**<br>"*The environmental objectives pertaining to water resource protection (NT EPA 2014) are: demonstrate that available water supplies will be sufficient to fulfil the Project needs over the predicted life-of-mine, without causing environmental or social impacts; and ensure that surface water and groundwater resources and quality are protected both now and in the future, such that ecological health and land uses, and the health, welfare and amenity of people are maintained*".<br>Based on the groundwater assessment and waste rock classification these have not been achieved. See general comments on groundwater and waste rock classification for more detail. | Refer response to Question 72 for additional groundwater investigations.<br>Additional test work has demonstrated that waste rock is benign (refer response to Question E6). |
| 92 | **7.3.1 Existing Surface Water Environment**<br>"*Sediment sampling was undertaken to characterise sediment quality as a proxy for water quality for the preliminary assessment of ambient conditions at Mount Peake*".<br>Please identify the justification for this method of analysis; the NT EPA contains no documents which identify the use of sediment quality data as a proxy for water quality.<br>ANZECC guidelines recommend that "the decision to apply a certain protection level to a specific ecosystem is the prerogative of each particular state jurisdiction or catchment manager, in consultation with the community and stakeholders."<br>Additionally<br>"The highest protection level (99%) has been chosen as the default value for ecosystems with high conservation value, pending collection of local chemical and biological monitoring data."<br>Given the national significance listing of downstream areas the 99% species protection should be employed. If a more appropriate surface water model is developed and demonstrates no impacts on the areas of significance, the ANZECC 95% values may be applicable. | Refer response to Question E60 for justification for adopting sediment sampling. The term "proxy" may be misleading.<br>The highest protection level (99%) has been assumed recognising a default conservation value of the receiving environment. The level of protection is based on the conservation value of the sensitive receptor or endpoint and cannot be changed based on the nature or extent of any potential impact. The updated assessment of the fate and transport of contaminants of concern (Question E36) will inform which receptors or endpoints are at risk. |
| 93 | **7.3.2 Hydrological assessment of target catchments**<br>The surface water modelling and analysis is based on minimal local data and generalised assumptions. More work should be done to improve the current model by include local flow and rainfall data. If no current data exists monitoring stations | Observed records have been used where available. Streamflow monitoring is only possible during streamflow events, which are rare in the ephemeral |

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| | should be set up and data evaluated prior to commencing mining operations. | systems on the site.<br>Streamflow monitoring will be incorporated into the adaptive site water monitoring and management plan and will include the installation of water level recorders at key locations. |
| 94 | **7.3.2 Sheetflow shadows resulting from the access road**<br>"*TNG will regularly space culverts to prevent the creation of sheetflow shadow zones downgradient of the access road*".<br>Culverts may create gullies or channels of water flow and reduce water availability for some trees. | Flow velocities of sheet flow are very low so erosion is unlikely. Appropriately spaced culverts will minimise the potential for drainage shadow effects. This approach has been adopted successfully with linear infrastructure around Australia. |
| 95 | **7.4.3 Groundwater Impact Assessment**<br>"*Ti Tree basin will also not be impacted by either borefield abstraction or pit dewatering based on the modelling results*".<br>The groundwater modelling methodology contains a significant number of issues and the absence of impacts on the Ti Tree basin has not been demonstrated to a reasonable standard. See general groundwater comments. | The Groundwater Supplementary Report models no recharge for 12 years and a reduced inflow head to better understand model sensitivity (Appendix D, s6.3 of the Supplement). The modelling again confirms that Stirling Swamp (considered an expression of the Ti Tree aquifer) will not be impacted by groundwater extraction. |
| 96 | "*The predicted inflow to the pit is expected to be relatively low, reflective of the low permeability of the pit wall*".<br>Where is the justification for this? How was pit wall permeability calculated? | The groundwater assessment undertaken on exploration holes within the pit demonstrates very low permeability (Appendix D of the Supplement). |
| 97 | "*The pit lake will become increasingly saline as salts from groundwater, surface water and rainfall accumulate. By around 7 years post-closure a salinity of around 35,000 mg/L is predicted*".<br>As water in the surrounding region is scarce the closure plan needs to ensure that pit water will not be accessible by any fauna. Additionally the closure plan needs to address the potential over topping of the pit and the release of highly saline water into Murray Creek. | Following closure the pit will not be accessible to cattle. Other fauna (e.g. avifauna) will have access to the pit. This cannot be prevented.<br>The pit will act as a groundwater sink with a shallow lake (~10 m deep) forming at cessation of mining. The lake will be over 100 m below ground level and will not overflow the pit (Appendix D of the Supplement). |
| 98 | **7.5 Water Contamination and Management**<br>"*The intrusive rock is oxidised resulting in there being negligible magmatic sulphide within this material*".<br>Sufficient evidence that the intrusive rock is oxidised has not been presented. Please provide evidence of this through laboratory analysis. | Refer response to Question E6. |
| 99 | **7.5 Ore stockpiles**<br>"*Geochemical investigations by TNG have confirmed the orebody does not contain significant Acid Mine Drainage (AMD)* | Refer response to Question E6. |

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| | *materials, with geological logging rarely encountering visible sulphides and, when so, they were in the order of ~2% of the sample over a few metres. Generally the sulphides seen are associated with structural zones and faults/fractures.*<br>*Accordingly, the ore body is considered to be benign and the ore stockpiles should not pose any discernible risk to sensitive receptors and endpoints. TNG will undertake periodic testing of the stockpiled ore to confirm the absence of potentially acid forming (PAF) material during mining operations*".<br>Confirmation that there is no AMD material in the ore has not been demonstrated by TNG. The analysis undertaken was insufficient as it was only based on XRF data which was not verified by laboratory analysis. The classification of PAF or NAF was based on incorrect values 10 kg/t $H_2SO_4$ instead of 0.<br>Visual identification of sulfides is not an adequate measurement of sulfide content. There are not details regarding frequency of stockpile sampling or methodology.<br>See general comments on waste rock classification. | |
| 100 | **7.5 Waste Rock Dump**<br>"*The material to be stockpiled in the WRD is likely to have well below 1 wt% sulphide content, while the gabbro ore has a lower sulphide content (less than 0.5 wt% sulphide). This sulphide content will not generate a significant AMD issue. Therefore, the WRD should not pose any discernible risk to the identified receptors and endpoints*".<br>Confirmation that there is no AMD material in the ore has not been demonstrated by TNG. The analysis undertaken was insufficient as it was only based on XRF data which was not verified by laboratory analysis. The classification of PAF or NAF was based on incorrect values 10 kg/t $H_2SO_4$ instead of 0.<br>Visual identification of sulfides is not an adequate measurement of sulfide content. There are not details regarding frequency of stock pile sampling or methodology.<br>See general waste rock and ore classification comments. | Refer response to Question E6. |
| 101 | **7.5 Tailings Storage Facility**<br>"*The tailings stream will consist of non-magnetic silts and sands and will be dewatered using a flocculant in a tailings thickener. The potential hazard of the flocculant to humans is low and there are no known ecotoxicological effects*".<br>Is the lack of ecological data because studies have not been undertaken? A lack of information is not sufficient evidence of a lack of harm. Ecotoxicology studies will need to be undertaken by TNG on any chemicals used for which the environmental impacts are not known. | MSDSs are provided in Appendix H of the Supplement.<br>Ecotoxicological studies are not warranted. |
| 102 | "*The TSF will be unlined but will be constructed with under-drains, toe drains and over drains connected into the sump. There is potential for seepage loss, therefore boreholes will be constructed and monitored to assess the potential interaction between the TSF and the surrounding environment. Details of the management measures and monitoring are detailed in the site Water Management Plan*".<br>"Based on the non-toxic nature of the tailings, the impacts from seepage are expected to be negligible".<br>Given ore material was found with 4 %S and the ANC of the ore was determined using unreasonable assumptions, the tailings have not been shown to be benign. Additionally no NMD analysis has been undertaken indicating a further lack of evidence for the tailings being benign. | Refer response to Question E6. |

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| 103 | **7.6.3 Contamination**<br>"*The following is noted with regard to the ore and waste characterisation:*<br>• *the ore body and overburden have low sulphide contents and are considered benign in terms of potential acid formation, so the waste rock dump and ore stockpiles should not pose any discernible risk to the identified receptors and endpoints;*<br>• *the magnetite concentrate is inert and non-toxic and does not constitute a threat to identified receptors and endpoints; and*<br>• *the tailings stream will consist of non-magnetic silts and sands and will be dewatered using a flocculant in a tailings thickener. The potential hazard of the flocculant to humans is low and there are no known ecotoxicological effects*".<br>No NMD analysis evidence is still lacking for NAF classification.<br>See General comments on waste and ore classification. | Refer response to Question E6. |
| 104 | **8.1.3 Results**<br>Figure 8-1<br>No flora/fauna survey points were located within the Ammatyerr North area of conservation significance. Given the current proposal include constructing a road through this area it is essential that the influenced area is assessed. | The fauna survey did include a site in this area and also coverage in areas that were accessible.<br>The flora survey mapped vegetation within Anmatyerr North with survey points representative of the vegetation occurring within Anmatyerr North being sampled where access was possible |
| 105 | **8.1.6 Summary of Impacts and Conclusions**<br>"*No threatened flora species were recorded during the survey, although there is potential habitat for one threatened species*".<br>Targeted sampling should be undertaken on the known location of Dwarf Desert Spike Bush. | The Dwarf Desert Spike Rush is known from Stirling Swamp, 12 km north of the access road at its closest point. No targeted sampling is warranted. |
| 106 | **8.2.2 Methodology**<br>TNG is required to undertake baseline fauna surveys of the borefield, associated pipeline and access road and road base borrow pit areas, and the results reported in supplementary information to this EIS. | Targeted fauna surveys of the access road have been completed (s3.2.3 and Appendix C of the Supplement).<br>A habitat assessment of the borefield and pipeline has been completed (Appendix B of the Supplement).<br>Borrow pit areas occur largely within the previously surveyed access road corridor. Additional habitat assessment has been completed (Appendix B of the Supplement). |
| 107 | **8.2.6 Impacts and Conclusions**<br>"*Impacts to threatened fauna species were assessed and it was concluded that no species will be significantly impacted as a result of the project*".<br>Groundwater and potential surface water contamination analysis does not currently provide adequate evidence that no | Additional test work has confirmed that waste and ore is benign (refer response to Question E6).<br>Additional surface water modelling has been undertaken for the road crossings of Murray Creek |

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| | species will be impacted.<br>Until further waste and ore characterisation, surface water modelling and groundwater modelling are improved the potential for fauna impacts are uncertain and it should be assumed that detrimental impacts may occur. | and the Hanson River. Crossings will be constructed at grade (refer to s3.1.1 and Appendix E of the Supplement).<br>Additional groundwater modelling has been undertaken (refer s3.1.2 and Appendix D of the Supplement).<br>Only the Common Brushtail Possum could be considered as being somewhat depend on Groundwater Dependent Ecosystems (it also inhabits rocky areas). This species is considered as 'possible' within the study area with recent surveys only recording this species in the West MacDonnell Ranges in the NT. |
| 108 | **9.6.1 Air Emissions**<br>"*Due to the relatively large separation distances between the non-mining sensitive receptors and the Project, no adverse air quality impacts are predicted to occur during construction or operation*".<br>How will TNG validate this prediction after commencement of mining?<br>Will TNG continue to measure air emissions (i.e. dust) during the life of the Project? Please provide details. | Dust will be monitored using a high volume air sampler installed at the accommodation village (the closest sensitive receptor to the mine). The sampler will operate from the start of construction through to one year following establishment of Stage 2 operations, at which time the need for continued monitoring will be reviewed. |
| 109 | **16.1 Background**<br>"*The pit, which will be approximately 77 ha in area, will remain as an open void and not be rehabilitated*".<br>Given the risk of PAF material lining the pit walls, the elevated EC of the groundwater and the potential for the pit to overflow into the surrounding natural environment leaving the pit without rehabilitation could cause unacceptable risks.<br>Please address this issue. | Additional test work has not shown the presence of PAF material and that any seepage will not be contaminated (s3.3 and Appendix F of the Supplement).<br>The pit will act as a groundwater sink with a shallow lake (~10 m deep) forming at cessation of mining. The lake will not overflow the pit. |
| 110 | **16.3.4 Tailings Storage Facility**<br>Table 16.1<br>"*A 'store and release' cover design is considered a valid rehabilitation option for the TSF*".<br>The store and release design is unacceptable until more detailed laboratory analysis has been undertaken on the ore which indicates there is no acid forming potential within the TSF, or that the ANC (based on lab data) will neutralise the acid formation. Additionally NMD assessment is also required and the current design is unacceptable until there is evidence that the TSF will not produce any NMD. | Refer response to Question E6. A store and release cover will not be required as waste is shown to be benign. |
| 111 | **Appendix F, 2.2 Construction**<br>Borrow pits – when will the size and location be determined as this is an important part of environmental impact | Borrow pits are located adjacent to the access road. They are shown in Appendix B of the Supplement |

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| | assessment. | (Figure 2, pages 6, 7, 10, 12, and 14 of sub Appendix A). |
| 112 | **Appendix F, 2.6 Waste Management**<br>Is there a design for the WRD – slopes, erosion management, revegetation, and risk assessment against large rainfall events? | Refer response to Question 25. |
| 113 | **Appendix F, 2.6 Waste Management**<br>Unlined – how will seepage through the wall affect geotechnical stability at the downstream toe of the TSF embankments? There needs to be more information about seepage rates and contaminant presence.<br>What is the geotechnical design of the TSF embankments?<br>There is also mention of a "dry stacked tailings cell in the document. If this is a proposal, it should be avoided and there would need to considerable assurances based on solid research that there would be no adverse environmental impact approval was considered.<br>"…*nominal height of 2m*."<br>The height will vary between 1m and 4 m. Does this mean it is the final height of the dam? This needs to be more clearly explained considering the annual raise rate is 1m+.<br>Runoff collector drain along toe… - What about erosion and contamination from erosion on the embankment from direct rainfall (accepted it doesn't rain very often but intense events happen and "90% of erosion is caused by 10% of rainfall events").<br>How will the toe drain prevent erosion of the perimeter banks? | The primary purpose of the perimeter embankment is to contain the lateral extent of the tailings. A design of the embankment will be provided as part of the Mining Management Plan once more information is obtained on the nature of construction materials.<br>The benign nature of the tailings has been confirmed (refer response to Question E6).<br>Detailed design of the TSF and its embankments will be provided in the Mining Management Plan.<br>There is no plan for dry stacking of tailings. This option was considered but rejected due to cost.<br>The final height of the perimeter bund is expected to vary between 1m and 4m subject to detailed consideration of the slope of the terrain and the final angle of repose of the tailings. |
| 114 | **Appendix F, 3. Mine Site Water Balance**<br>The borefield appears to an unconfined aquifer in an alluvial unit associated with a water course. What will be the impact of drawdown on flora and fauna reliant on this groundwater? | Refer response to Question E41. |
| 115 | **Appendix F, 4. Surface Water Resources Setting**<br>The risk assessments need to be for 1:100 ARI events | Refer responses to Questions 80 and 81 for discussion on flood event design criteria. |
| 116 | **Appendix F, 4.2 Landform**<br>Are dispersive clays present? If so the distribution and type should be mapped to assess risk especially if they will form part of the waste rock dump. | Refer response to Question E89. |
| 117 | **Appendix F, 4.3 Vegetation**<br>Table 4-2 Vegetation units across the Project area (NRETA 2004) doesn't mention *E. camaldulensis*. This species is reliant on alluvial aquifers and provides fauna habitats. These are a long-lived species and susceptible to die-back in changed hydrology conditions. Has the risk to this species been assessed with respect to drawdown that may occur at the proposed borefield? | Table 4-2 in Volume II, Appendix F of the Draft EIS is a high level description of the vegetation units across the project area based on NRETA mapping. Most species are not individually listed. Table 4-2 in Volume II, Appendix G of the Draft EIS is based on |

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| | | site specific mapping and does recognise the occurrence of *E. camaldulensis.*<br>The risk to *E. camaldulensis* is addressed in s3.2.4 and Appendix K of the Supplement. |
| 118 | **Appendix F, 4.7.1 Mud Hut Swamp**<br>Mud Hut Swamp, located downstream of the proposed mine site (Fig. 2.1.) and may be fed by Bloodwood Creek, which drains the proposed mine site, by both surface and groundwater therefore there is risk to the swamp.<br>Has a hydrological and groundwater risk assessment been conducted, with regards to impacts on Mud Hut Swamp? | Refer response to Question E51 for discussion on hydrological impacts on Mud Hut Swamp.<br>Appendix D of the Supplement (s6.2.2) identifies that there will be no groundwater impacts on Mud Hut Swamp. Refer responses to Questions 75 and 143 for additional discussion.<br>Refer response to Question E36 for discussion on the fate and transport of contaminants of concern. |
| 119 | **Appendix F, 5.3.4 Estimation of Peak Floodway Flow Depths**<br>When will the further surveys and assessments be conducted? A 1:100 ARI event should be assessed. | Additional modelling has identified maximum flow depths and the period of inundation for Murray Creek and the Hanson River (s3.1.1 and Appendix E of the Supplement). |
| 120 | **Appendix F, 5.3.7 Estimation of Murray Creek flood extents**<br>"*Further investigation is required to establish the need for flood protection measures in this vicinity*".<br>TNG is required to undertake further investigation to establish if flood protection for the pit will be necessary, and the results reported in supplementary information to this EIS. | Refer response to Question 81. |
| 121 | **Appendix F, 5.5.2 Sample and Analysis Methodology**<br>Appendix C indicates that the river bed sediments are sand with the exception of one sample. The focus needs to be on over-bank deposition sites where it is likely that fine sediment <75µm has accumulated.<br>It is likely this would be a better indication of water quality as contaminants are more likely associated with the silt and clay fraction of the <75µm fraction then the sand in the river bed as in this deposition environment most of the fine suspended sediment would have been flushed through the system. | Although sediment deposition occurs in overland flow / inundation areas, these are more likely to be confined to the river channel. The initial assessment focussed on easily accessible in-channel areas that may form sediment traps. Future sediment sampling, including overland flow / inundation areas, will be incorporated into the adaptive site water monitoring and management plan. |
| 122 | **Appendix F, 5.5.3 Analysis Results**<br>This section refers to sediment sample analysis and the PSD in this section is mostly sand (see comment above re fine sediment analysis).<br>The one sample of clay sand (SS10) in Appendix C has different chemical properties than the river sand and perhaps more sample testing needs to be done in similar deposition environments as SS10.<br>SS10 is a number of kilometres from the site and looks to be in a different catchment. The other sample to have higher fines | Site SS10 is located in the head water of Stirling Swamp receiving overland flow and discharge from Wood Duck Creek. The resulting sediment characteristics represent a different drainage area.<br>Refer response to Question 121 for discussion on sediment sampling including overland flow/inundation areas. |

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| | then the river beds is SS8, Mud Hut Swamp. Mud Hut Swamp is a site of Conservation Significance and there should be more sediment sampling in the swamp and overbank slack water deposits to assess water quality. | |
| 123 | **Appendix F, 5.5.3 Analysis Results**<br>"*The sediment pH of the majority of sediment samples (excluding sediment sample SS-03) is considered strongly acid to very strongly acid based on the interpretation of sediment pH (1:5 soil/water ratio) by Bruce and Rayment (1982)*".<br>Re the comment above "…considered strongly acid…", where is the acidity coming from and how will this acidity impact the environment? | Refer response to Question E61 for discussion on sediment pH, which indicates that the near-surface environment is naturally acidic. These results are in line with Geoscience Australia mapping. |
| 124 | **Appendix F, 5.5.3 Analysis Results**<br>Reference is made to metal and metalloid analysis of sediment samples as a surrogate for water quality.<br>The samples are mostly sand from the river bed. If analysis involved total digestion of the sample then some of the analytes may come from the actual sand particle? If so it doesn't really represent water quality.<br>When there are floods once the mine is built fine suspend sediment may wash past the sand sample locations but accumulate in overbank deposits.<br>As stated earlier there is a need to collect samples from overbank deposits which would likely be fine suspended sediment and be more representative of the water quality. | Metals/metalloids were analysed by inductively coupled plasma-atomic emission spectrometry.<br>Refer response to Question 121 for discussion on sediment sampling including overland flow/inundation areas. |
| 125 | **Appendix F, 8.2.1 Ore Stockpiles**<br>With regard to the geological logging: this assessment of sulfide presence is qualitative. As a rough estimate sulfide presence over 1Ha = SG gabbro 3t/m3*2m thick*10000m2*2%=1200t of sulfides.<br>This assessment needs to be quantitative. A "look" during logging and a statement that it looks okay isn't good enough considering the long term risk to the environment of sulfide presence.<br>"*It is recommended that periodic testing of the stockpiled ore be conducted to confirm the absence of potentially acid forming (PAF) material during the mining operations. Further characterisation of the ore body should be conducted to determine salinity profiles*".<br>With regard to the statement above, "*It is recommended that periodic testing of the stockpiled ore be conducted to confirm the absence of potentially acid forming (PAF) material during the mining operations*", this needs to be a rigid commitment in the EIS and subsequent MMP. | Refer response to Question E6.<br>Routine testing of ore and waste materials will occur over the life of the mine backed up by barrel leach testing to confirm the findings of the recent test work that leachate will be non-acid forming. This will be reflected in the Mining Management Plan. |
| 126 | **Appendix F, 8.2.2 Waste Rock Dump**<br>There should be quantitative assessment of sulfide presence in the WRD.<br>From the description it appears that the pre-strip is not a gossan. This description doesn't sound correct geologically.<br>"*…comprises desert sand aeolian and colluvial/alluvial sediment, which is weathered material that formed at the surface…"* this statement indicates that the sediments at the site have been moved there through aeolian, colluvial and alluvial processes and not formed at the surface.<br>With regards to the assumption that the fresh and weathered gabbro is likely to have lower sulfide content: Sulfide presence has the potential to be a serious, long term impact on the environment and its presence should be confirmed through testing | Refer response to Question E6 on additional test work undertaken on waste and ore.<br>The response to Question 125 discusses ongoing waste and ore testing. |

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| | and analysis for confirmation.<br>Periodic testing should be rigidly enforced. An estimate of sulfide presence is not good enough. | |
| 127 | **Appendix F, 8.3.2 Waste Rock Dump**<br>Not only should the "…*nature and sizing of the sedimentation ditch/pond should be addressed in an ESCP*" but also the slope angles of the batters, the types of erosion control measure to make the batters "non-erodible" and the details of the geotechnical design. | Noted. A detailed project design will provide greater detail of the WRD design, which will be referenced in the updated DESCP. |
| 128 | **Appendix F, 8.3.4 Tailings Storage Facility**<br>What AEP is the TSF and associated bunds, drains and ponds designed for, 1 in 100 AEP?<br>Has seepage chemistry been confirmed?<br>Confirmation of tailings chemistry and rate of increasing salinity in the tailings should be confirmed. This is particularly important give the statement that the facility will be unlined.<br>What are the potential impacts of salinity on groundwater and what is the rate of increase of salinity and plume transport in the groundwater. Without this knowledge an unlined TSF should not be approved. | All water containment structures will be designed to accommodate a 72-hour 100-year ARI storm event.<br>Additional test work has confirmed the benign nature of waste and tailings (refer response to Question E6), hence seepage will not be contaminated.<br>Refer response to Question E25 in relation to salinity. |
| 129 | **Appendix F, 8.4.1 Ambient Conditions**<br>"*Groundwater quality monitoring indicates that the electrical conductivity of the existing bores sampled ranged between 3,630 and 6,880 uS/cm, with the electrical conductivity of new investigation bores ranging between 6,800 and 41,600 uS/cm*".<br>What is the source of high salinity mentioned in the bores above? Is it possible it is from the ore body? | The high salinity in the area is over 20 km from the orebody. Salinity is likely to relate to the accumulation / mobilisation of salts from runoff. |
| 130 | **Appendix F, 8.4.2 Potential Saline Drainage**<br>Has solute transport been considered in the groundwater model? It should be used to assess how a saline plume from the TSF will move into and through the system and the impacts this will have on water quality. | Water quality at the mine site is already brackish.<br>There is no reliance on groundwater at the mine site for potable or stock use. |
| 131 | **Appendix F, 8.5.2 Potential for AMD**<br>The presence of sulfides needs to be confirmed not "anticipated". | Refer response to Question E6. |
| 132 | **Appendix F, 9. Recommendations**<br>The Ground and Surface Water Assessment Report recommends the preparation of an Erosion and Sediment Control Plan, a Water Management Plan and design criteria for elevated infrastructure at the borefield.<br>TNG is required to provide the design criteria, including a detailed design of the elevated infrastructure in supplementary information to this EIS. | A Water Management Plan is provided in Volume III, Appendix N, sub Appendix H of the Draft EIS. Design criteria for the Raw Water Dam and Process Water Dam are provided in s3.7 of sub Appendix H.<br>A Drainage, Erosion and Sediment Control Plan is provided in Volume III, Appendix N, sub Appendix K of the Draft EIS.<br>Elevated infrastructure is no longer required at the borefield as a power line will be constructed to |

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| | | replace the use of diesel (Chapter 2 of the Supplement). |
| 133 | **Appendix H, 8.1 – 8.13 Mitigation**<br>All recommendations made by GHD should be taken on board when undertaking mining activities. Additionally further mitigation measures should also be implemented including reducing the risk to burrowing animals by relocation animals in areas influenced by ground compaction prior to commencing work.<br>Additionally the assumption that waste material is benign contains insufficient evidence and therefore all waste should be assumed to produce contaminated water. The potential impact of runoff from the tailings dam and WRD should therefore be managed accordingly and the current designs be adjusted appropriately. | Recommendations adopted are tailored to the issue being addressed.<br>Additional mitigation and monitoring is covered in an updated Biodiversity Management Plan (Appendix I of the Supplement).<br>Additional test work has been undertaken to demonstrate the benign nature of tailings and waste (s3.3 and Appendix F of the Supplement). No design changes are required. |
| 134 | **Appendix H, Haul road**<br>Given the risk that dust may be propelled from the back of trucks and reduce visibility of road users on the Stewart Highway, speed restrictions should apply when travelling through the underpass. | The underpass will be sealed to minimise the potential for dust generation. Concentrate trucks will also be covered to remove dust generation from their load. |
| 135 | **Appendix C, 5.2**<br>Table 5-3<br>"*Waste rock and tailings are benign and the process does not use any hazardous chemicals. There will be no direct discharge of any contaminated water from the site*".<br>The waste rock analysis contains too many assumptions to be considered reliable. The ANC calculations are most likely a gross overestimate of the actual ANC of the waste rock and tailings material. Refer to WRC section general comments and notify stakeholders. | Refer response to Question E6. |
| 136 | **Appendix C, 5.2**<br>Table 5-3<br>"*Surface water modelling has demonstrated that impacts can be managed. Floodways are proposed across creeks and rivers which removes the potential for upstream flooding. Drainage design has been incorporated into the design of the access road*".<br>Surface water modelling has been undertaken based on assumptions that have the potential to be inaccurate; more analysis is required to adequately understand surface water dynamics. Stake holders should be notified of assumptions made. | Refer responses to Questions E5, E51, 80 and 81 for discussion on additional surface water assessments. |
| 137 | **Appendix F, Executive summary, Hydrological Assessment**<br>"*A mine site flood risk assessment was undertaken using the HEC-RAS 1-D hydraulic model assuming steady flow water surface profile computations. The resulting flooding extents along Murray Creek in the vicinity of the mine site indicate that the mine site is not expected to experience any significant flooding for events up to the 50-year ARI. However, the bench of lower lying topography in the vicinity of the proposed pit may be prone to flooding during more extreme events. Further* | Refer responses to Questions E5, 80 and 81 for discussion on design criteria. |

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| | *investigation is required to establish the need for flood protection measures in this vicinity*".<br>Given the probability of the ARI event and the length of the mining operation there is a 29% chance of having a fifty year ARI or higher event during the life of the mine. This is an unacceptable level of risk and should be addressed. | |
| 138 | **Appendix F, Executive summary, Hydrological Assessment**<br>"*Sediment sampling was undertaken to characterise sediment quality as a proxy for water quality given the infrequent nature of flow events in the region. Samples revealed that particle size distribution ranges from sand and gravel to fines and sand*".<br>This is not an appropriate proxy for water quality, especially given the river is a high energy environment and settlement of contaminates in the Murray Creek sediment is unlikely. Sampling of surface water needs to occur prior to mining if background water quality is to be taken into account when developing trigger values. If no back ground values are taken the ANZECC 95 or 99% should be used. | Refer responses to Questions E60 and 121 for discussion on sediment sampling. These rivers are not considered high energy. Most sediment transport will remain within the defined channels.<br>Refer response to Question 92 for discussion on use of 99% species protection level. |
| 139 | **Appendix F, Executive summary, Groundwater Setting**<br>"*Stirling Swamp is thought to be connected to groundwater through a topographic low forming a 'window' to the relatively shallow Ti Tree aquifer water table. This area is therefore considered a discharge zone of the Ti Tree aquifer. Mud Hut Swamp is formed from a flood-out of the Bloodwood Creek and, based on its location as an outflow of the creek, it is unlikely that the swamp is maintained by groundwater. There are no known permanent or semi-permanent water holes along the Hanson River*".<br>This is based on various assumptions and actual groundwater analysis should be undertaken to determine the potential impacts in the Mud Hut area. See general groundwater comments. | Refer response to Question 75. |
| 140 | **Appendix F, Executive summary, Groundwater Setting**<br>"*Large rainfall events and subsequent flooding is known to significantly increase groundwater levels in areas close to active flow channels. However, a lack of monitoring data for the Hanson River channel means that recharge volumes for this system cannot be accurately quantified*".<br>Given the large lengths of time between significant rain events (up to 12 years) this should be modelled more accurately prior to commencing operations. Given the heavy reliance of the project on groundwater this should have been undertaken in the feasibility phase. | The Groundwater Supplementary Report models no recharge for 12 years and a reduced inflow head to better understand model sensitivity (Appendix D, s6.3 of the Supplement). This analyses confirm that groundwater extraction rates are unaffected with extraction relying on aquifer storage rather than recharge mechanisms. |
| 141 | **Appendix F, Executive summary, Groundwater Setting**<br>"*Groundwater was measured at a depth around 22 mbgl and airlift tests typically yielded low volumes with flow only being sustained in five of the boreholes. This testing also allowed the determination of indicative aquifer parameters through the analysis of groundwater recovery data at each test site. Test results indicate the pit will not be subject to significant groundwater inflow so is unlikely to require substantial dewatering infrastructure*".<br>Given airlift testing is highly inaccurate the values calculated for pit dewatering should be recalculated using transient measurements over 72 hours. | This would provide the same result. Length of time would not result in increased flow. All drilling data from the pit indicates very low groundwater volumes. |
| 142 | **Appendix F, Executive summary, Groundwater Setting**<br>"*All bores produced significant water during drilling and 150 mm wells were constructed, with a 200 mm well installed at* | 8.5 L/s was airlift yield from an uncased bore. The cased bore pumped at 12 L/s and 8.5 L/s was |

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| | *WB05, the most productive investigation site. Pump testing of borehole WB05 allowed the determination of aquifer properties and recommendations for operational pump rates of 8.5 L/s for the proposed production bores*".<br>All data uses 8.5L/s as an average production rate not a maximum rate. All values associated with the 8.5L/s average production rate should be reassessed. | adopted as a conservative recommended pump rate.<br>Revised pumping rates based on additional groundwater assessment are provided in s6.1, Appendix D of the Supplement. |
| 143 | **Appendix F, Executive summary, Groundwater modelling**<br>"*Of note, depth to groundwater in the area of Mud Hut Swamp is modelled as being around 20 mbgl (i.e. conceptually the swamp is not connected to the regional groundwater system)".*<br>As this site is of significant ecological importance and there is a high likelihood that impacts of the mine will influence the groundwater in the region near Mud Hut, the actual depth of groundwater at Mud Hut should be assessed. | We cannot determine the exact depth to water in this area as access restrictions limit drilling. Historic data from pastoral wells and current station bores support data presented that levels are 10-20 mbgl depending on elevation. Hydrology suggests that Mud Hut Swamp is a feature relating to the flood out of Bloodwood Creek, and not related to groundwater. |
| 144 | **Appendix F, Executive summary, Potential for contamination**<br>"*The following is noted with regard to the ore and waste characterisation:*<br>*The ore body and overburden have low sulphide contents and are considered benign in terms of potential acid formation, so the waste rock dump and ore stockpiles should not pose any discernible risk to the identified receptors and endpoints.*<br>*The magnetite concentrate is inert and non-toxic and does not constitute a threat to identified receptors and endpoints; and*<br>*The tailings stream will consist of non-magnetic silts and sands and will be dewatered using a flocculant in a tailings thickener. The potential hazard of the flocculant to humans is low and there are no known ecotoxicological effects*".<br>There is insufficient evidence to support the first two statements given this information is based only on XRF data for the ore and waste rock material. The potential environmental impacts of the flocculent should be investigated if current impacts on relevant organisms are not known due to a lack of testing TNG should conduct ecotoxicology tests on the product prior to use. | Refer response to Question E6.<br>The MSDS for flocculant is provided in Appendix H of the Supplement. No ecotoxicological testing is warranted. |
| 145 | **Appendix F, 2.2 Construction**<br>"*Flood ways will be constructed across the Hanson River, Murray Creek and some minor watercourses that bisect the access road. Crossing design incorporates a 300 mm thick stabilised fill road boarded with rock filled gabion baskets to sit at grade. The crossing will be designed to tolerate small river flows and to wash out during significant flood events to eliminate the potential for backup of flood waters*".<br>A schematic representation of this should be included in this section. The current schematic indicates that the gabion baskets will not wash out during flood events and floodwaters may breach the banks of the Murray River, has this risk been accounted for appropriately? | Refer response to Question 39 for discussion on floodway design. |
| 146 | **Appendix F, 2.6 Waste management**<br>"*Excess water from the deposited tailings will be collected in a recovery water pond located at the north-east part of the TSF. Shortly after discharge, the tailings will settle and release excess water. The expected initial settlement of the 65% solid content of the slurry to a 75% solid content at the beach will result in the release of about 70 m3 of water per hour). This water, together with rainfall collected within the TSF, will flow to a lined 20,000 $m^3$ recovery water pond and returned to* | The TSF will exclude external runoff into the facility.<br>Direct rainfall has been ignored as this is unreliable and intermittent. The water balance assumes that there is no rainfall input to the system and makeup water supply from the borefield has been calculated |

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| | *the process water dam for use in the process plant*".<br>Calculations of runoff and seepage should include rainfall and a contingency for the fact that evapotranspiration will be reduced within the tailings storage facility and hence runoff will be increased. Evidence that the net water balance will be negative should be shown in more detail. | on this basis. If significant rainfall can be harvested then pumping can be reduced during these times.<br>The water balance does not change. |
| 147 | **Appendix F, 5.3.4 Estimation of peak discharge**<br>Table 5-7<br>Time of concentration for Murray creek is 24h, why wasn't the 72h convention used? | Revised floodway depths for Murray Creek and the Hanson River are provided in s3.1.1 and Appendix E of the Supplement based on the 72-hour 100-year ARI storm event. |
| 148 | **Appendix F, 5.5.1 Water quality approach**<br>"*Sediment sampling was undertaken to characterise sediment quality as a proxy for water quality given the infrequent nature of flow events within the region as outlined in Section 4.4. The accumulation of elements in the sediment will provide an indicator of baseline sediment quality, as well as an indicator of surface water quality and contaminant progression within the vicinity of the proposed project site, and at upstream and downstream locations*".<br>This method of analysis is insufficient – ANZECC 95 or 99% trigger values should be applied in the absence of a lack of background data. | Refer response to Question 92 for further discussion on trigger levels. |
| 149 | **Appendix F, 7.3.3**<br>Table 7-1<br>The numbers used for Kh (m/d) should have references unless they are measured values, in which case they should be labelled as such. | Model layer properties have been assigned from a combination of drilling and testing data (within the palaeochannel), airlift and recovery data (within the pit), and a general understanding of the lithology within the project area. Various sensitivity assessments for these parameters were also undertaken. |
| 150 | **Appendix F, 8.2.4 Tailings**<br>"*The tailings stream will consist of non-magnetic silts and sands. Geochemical testing of the tailings has been completed by Outotec Laboratory (2015) and identifies that the non-magnetic tailings are composed of silicate wastes. The chemical composition includes:*<br>*13% Fe;*<br>*44% $SiO_2$;*<br>*12% MgO;*<br>*12% $Al_2O_3$; and*<br>*1% $TiO_2$*".<br>Data for this analysis should be included in an appendix. | The test work is commercial in confidence and cannot be provided. |
| 151 | **Appendix F, 8.3.4 Tailings storage facility**<br>"*Accordingly, there is potential for salt concentrations to build up within the process water cycle resulting in the salinity of the* | The salt cycle is outlined in the response to Question E25. |

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| | *tailings stream increasing over time*".<br>While there is mention of an issue here there is no mention of a solution. Please clarify how the salt will be dealt with. | Environmental impacts of salt are discussed in the response to Question 34. |
| 152 | **Appendix F, 8.4.1 Ambient conditions Saline drainage**<br>"*Groundwater quality monitoring indicates that the electrical conductivity of the existing bores sampled ranged between 3,630 and 6,880 uS/cm, with the electrical conductivity of new investigation bores ranging between 6,800 and 41,600 uS/cm. Two of these bores had elevated electrical conductivity values (bore MPWB02 upstream of the confluence of the Hanson River and Murray Creek and bore MPWB03 located downstream from Wollogolong Bore) and seem to be isolated locations of elevated salinity as the balance of bores had electrical conductivity values < 8,000 uS/cm*".<br>Given water will be used to control dust emissions on site how will the environmental impacts of the elevated EC be managed? | Refer response to Question 34. |
| 153 | **Appendix F, Acid mine drainage, 8.5.2 Potential for AMD**<br>"*It is noted in Section 8.2 that negligible magmatic sulphide is anticipated in the ore body and associated waste material. Accordingly, the risk of PAF material leaching from the waste landforms and stockpiles is considered to be negligible*".<br>There is insufficient information to show this. See general comments on waste classification. | Refer response to Question E6. |
| 154 | **Appendix F, 8.8 Contamination assessment and risk management**<br>Table 8-1<br>Prior/during and after pre-strip clearing how will erosion controls be implemented? | Details will be included in the updated DESCP following detailed project design. |
| 155 | **Appendix F, 9.2 Groundwater**<br>"*Based on results of the groundwater flow modelling recommendations*".<br>All these recommendations should have already been taken into consideration prior to the development of the EIS as changes to these will have a significant impact on many other aspects of the project. | The additional groundwater assessment and modelling addresses the recommendations (Appendix D of the Supplement). |
| 156 | **Appendix F, 9.3 Contamination management**<br>"*The operation of the various water storages should ensure mixing and that any outflow to the environment considers the salinity of discharges*".<br>There shouldn't be any release of contaminated water (including heavily saline water) to the natural environment unless it occurs under the conditions of a waste discharge licence. | Noted. A Waste Discharge Licence will be applied for where necessary. |
| 157 | **Appendix F, Sub appendix A**<br>The calculations of the water balance are based on 8.5L/s sourced from the bore field, as discussed earlier these figures are unreasonable as this is the maximum capacity of the most efficient bore. | Incorrect. Refer response to Question 142. |
| 158 | **Appendix G, 1.3** | Refer response to Question E6. |

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| | Table 1-1. WRD<br>TNG need to provide evidence that all acid will be neutralised prior to being released into the environment - This will require laboratory analysis of Kinetic testing, NMD, NAPP, flow rates and retention time within the WRD. | |
| 159 | **Appendix G, 3.5 Field Survey**<br>"*The area surveyed included the proposed mine area, accommodation area, a 1 km wide corridor along the proposed access road and the proposed rail siding facility. Field survey of the proposed borefield and associated pipeline and access road were not undertaken as part of this assessment as the locations of these features were not known at the time of the survey. Similarly, the location of borrow pits to provide construction materials for the access road have not been surveyed as their location has not yet been determined*".<br>Given the potential risk to highly sensitive flora habitat (i.e. Stirling and Mud Hut swamps). Why weren't these areas surveyed? | The flora of Mud Hut Swamp was surveyed (Volume II, Appendix G, p32 of the Draft EIS).<br>At the time of the survey Mud Hut Swamp was a dry wetland bed with Coolibah overstorey. The real value to fauna would only occur when inundated (waterbirds etc).<br>Stirling Swamp was not surveyed due to the swamp occurring 12 km to the north of the access road at its closest point. |
| 160 | **Appendix G, 3.5 Field Survey Flora Quadrats**<br>"*Survey sites for vegetation mapping and habitat characterisation included the collection of data from forty-five (45) 20 m x 20 m quadrats (or in the case of narrow riparian areas 10 x 40 m quadrats). For each quadrat surveyed the following data were recorded*".<br>How was the number of quadrats chosen? Should there have been 1500 sites for an area of this size and a mapping resolution of 1:50,000. | The NT Guidelines and Field Methodology for Vegetation Survey and Mapping has a section on site selection and sampling intensity.<br>Based on the guidelines for mapping at 1:50,000 the recommended sampling density is 1 quadrat / $km^2$ which for this project (a disturbance of around 11 $km^2$) would require 11 quadrats. 45 quadrats were surveyed. |
| 161 | **Appendix G, 3.5 Field Survey**<br>Aerial Survey<br>The area covered by the aerial survey should be detailed in this section. | The aerial survey focussed on the alignment of the access road and a no longer required infrastructure corridor between the mine and rail head. |
| 162 | **Appendix G, 3.5 Field Survey**<br>Figure 3-1<br>No flora quadrats were located on the proposed haul road area, which runs through areas of conservation significance. These areas should be reassessed prior to commencing any further work. | Refer response to Question 104. |
| 163 | **Appendix G, 5.3.1**<br>"*If it proposed to disturb habitat potentially able to support this species it is recommended that targeted surveys for the species are undertaken following substantial rain within the region*".<br>Given the lack of groundwater data detail it could be assumed that dewatering will impact on the Mud Hut and Stirling swamps. Target surveys should therefore be considered. | Groundwater drawdown will not impact Mud Hut or Stirling swamps (s3.1.2 and Appendix D of the Supplement). |

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| 164 | **Appendix G, 5.3.5 Groundwater dependant ecosystems**<br>There is no consideration for riparian vegetation in this section. The impact of dewatering on riparian vegetation should be detailed – both as a result of groundwater movement into the pit and dewatering from the bore field. | Refer response to Question E40. |
| 165 | **Appendix G, 7.1 Clearing of flora and vegetation**<br>All recommendations made in this section should be included into the project design. | Recommendations adopted should be tailored to the issue being addressed.<br>Additional mitigation and monitoring is covered in an updated Biodiversity Management Plan (Appendix I of the Supplement). |
| 166 | **Appendix G, 7.2.2 Lowering of the water table**<br>"*A new borefield will be established within the alluvial aquifer of the Hanson River. Six supply bores with two standby bores will provide water for the first four years of the project with an additional four bores installed from year 5. Bores will be spaced approximately 1,800 m apart and will pump at around 8.5 L/s each*".<br>The quoted 8.5L/s is the maximum production rate - other bores show 4L/s and less. How is the production rate justified? | Incorrect. Refer response to Question 142. |
| 167 | **Appendix G, Sub appendix A, EPBC Protected Matters Search**<br>Other Matters Protected by the EPBC Act.<br>Why are there 10 listed marine species? | The search tool recognises that the species or its habitat is likely to occur in the area. This may be because there are inland waterways or wetlands that the species could use. They are not solely restricted to marine habitats. |
| 168 | **Appendix G, Sub appendix A, EPBC Protected Matters Search**<br>Evidence that TNG (GHD) have appropriately sampled the fauna in the surrounding area to ensure that *Notoryctes typhlops* presence would have been detected should be detailed. | This species has been de-listed under the EPBC Act, therefore further assessment is not required. |
| 169 | **Appendix H, Fauna assessment, 1.2 Objectives and assessment**<br>"*The main objective of this report is to satisfy the fauna assessment requirements of the Terms of Reference set by the Northern Territory Environment Protection Authority (NT EPA) for assessment of the Mount Peake Project*".<br>This is not true. The aim is to enhance TNGs understanding of the local environment so that they can manage the project accordingly. | Noted. |
| 170 | **Appendix H, Baseline fauna survey, 4.2.1 Scheduling**<br>"*A baseline fauna survey across the Project Area was conducted by eight GHD ecologists from the 9th to 14th April 2013*".<br>There is no seasonal variation in this data collection survey. Given that many species will not have been present during this sampling period how is seasonal variation accounted for? | Seasonal variation has been addressed for threatened species by the spring 2016 targeted survey (s3.2.3 and Appendix C of the Supplement).<br>20 native mammals, 58 birds and 34 reptiles are a reasonable return for an autumn survey. Possibly if the weather was a little warmer several additional reptiles may have been detected but none of these |

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| | | would probably be threatened species (Great Desert Skink is more likely detected via its latrine site and warren).<br>A number of rare and hard to find species such as Grey Falcon, Grey Honeyeater, Woma Python and Desert Death Adder were also detected. |
| 171 | **Appendix H, Baseline fauna survey, 4.2.4 Survey techniques**<br>"*Typically, three diurnal active searches are conducted at each site (in accordance with NT EPA 2013). However, due to the hot dry conditions during the site visit, and the unsuitability of those conditions for detecting fauna, more effort was devoted to nocturnal active searches (see next paragraph) than to diurnal active searches for this project. Diurnal active searches at sites were conducted opportunistically*".<br>How many diurnal searches were conducted in total? How many per day? How were these searches distributed throughout the sites? | Three diurnal active searches were still conducted at each of the 16 fauna survey sites (Volume II, Appendix H, Figure 4-1 of the Draft EIS), for a total of 48 active searches. |
| 172 | **Appendix H, Baseline fauna survey, 5.2 Weather conditions experienced**<br>The three months leading up to the sampling period only received roughly 35% of the average rainfall for the region (based on the closest monitoring station data). Given the extremely low rainfall it is unlikely that a representative number of species were observed. In light of this previously collected data from other sampling trips should be used under the assumption that all species identified in the mine region will be present.<br>This means that actions undertaken on site should assume that any endangered species living in the region will be impacted, even if none were detected during TNG (GHD) sampling. | 20 native mammals, 58 birds and 34 reptiles is considered a good representation of what is present on-site. In fact, native mammal diversity was good and some species such as Spinifex Hopping Mouse were common (116 actual captures and many more animals observed on fauna cameras and when driving around on-site).<br>Previous surveys following high rainfall events (e.g. 2010) indicate that in such an unpredictable climate it's possibly more likely that abundant aggregations of breeding birds such as Budgerigar, Diamond Dove, Zebra Finch may have been missed in 2013, however these species were still recorded. It is unclear in a landscape dominated by sandplain and mulga habitats which species would not have been recorded during the drier conditions as suggested in the question.<br>Previous records from databases and predictions from the PMST were used to inform potential threatened species that may be present on-site.<br>A targeted threatened species survey in spring 2016 has also been undertaken (s3.2.3 and Appendix C of the Supplement). |
| 173 | **Appendix H, Baseline fauna survey, 5.4.1 Species detected** | There are no threatened amphibians either known or |

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| | No amphibians were identified during the survey, however given that only minimal rainfall occurred in the previous 3 months this is potentially due to a lack of water availability. Many amphibians in the region burrow. How was the sampling methodology designed to ensure that amphibians were appropriately represented by the study?<br>If no evidence can be provided that the sampling was robust enough to account for seasonality more sampling should be undertaken, this is supported by the statement;<br>"*The trajectory of the smoothed curve at Day 5 was steeper than the Actual curve, suggesting that the survey results had not sampled the fauna quite as adequately as was apparent from the Actual curve, and that additional sampling, or sampling over a longer period, would benefit the results*." | predicated to occur within the study area or bioregion, therefore surveys were not tailored to target amphibians specifically.<br>Additional sampling in different years at different times of the year would quite rightly result in the detection of additional species, however, in the case of frogs, given none are threatened it is not clear what the implications of additional survey would indicate. |
| 174 | **Appendix H, Baseline fauna survey, 7.2.17 Poisoning of fauna from drinking contaminated water**<br>"*The tailings dam at Mount Peake will contain benign silts and sands. No hazardous substances are expected to be stored in the dam*".<br>There is insufficient evidence to suggest this and therefore the material should be treated as though it has the potential to impact on wildlife. | Refer response to Question E6.<br>Additional test work has shown that tailings will be benign. |
| 175 | "*The tailings dam will contain a 'slurry' rather than standing water. It is unlikely that the majority of the threatened species that do or could occur with the Project area (Black-footed Rockwallaby, Brush-tailed Mulgara, Greater Bilby, Common Brushtail Possum and Great Desert Skink and to a lesser extent, Princess Parrot, Night Parrot, Grey Falcon and Red Goshawk) would access liquid contained within the tailings dam"*.<br>As the water from the TSF will eventually be held in an open air dam this assumption is unreasonable. | The TSF will not contain significant amounts of standing water with water being collected for reuse. Further test work has also confirmed that the tailings will be benign (refer response to Question E6).<br>It is highly unlikely that any of these species would access the TSF to drink with any regularity. Species such as the Great Desert Skink would be highly unlikely to ever access the TSF. It is highly unlikely that Black-footed rock-wallaby would move down from rocky habitats to access the TSF. Princess Parrot, Night Parrot, Grey Falcon and Red Goshawk are so rare across the landscape that their presence on-site would be highly notable let alone the slim chance that they would fly to the TSF to drink. Bilby and Mulgara prefer sand plain habitat and are unlikely to frequent the mine site. |
| 176 | **Appendix H, 8.3 Mitigation of soil compaction**<br>Has the impact of this on burrowing animals been assessed? If so what was the outcome? | Preclearance surveys will be undertaken prior to clearing activities occurring. This is outlined in the updated Biodiversity Management Plan (Appendix I of the Supplement). |
| 177 | **Appendix H, 9.3**<br>Table 9-5 | Additional test work has demonstrated the benign nature of waste material and associated leachate (s3.3 and Appendix F of the Supplement). No update |

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| | The likelihood of water quality impacts should be listed as higher, 4 instead of 3, as no NMD or PAF lab results have been assessed. This is also compounded by the lack of water in the surrounding environment and the high likelihood that native fauna will consume any water available.<br>The consequence should also be upgraded, from moderate to major, as there are endangered species in the region. None of the mitigation efforts are applicable to this scenario and the residual risk should be listed as high.<br>This also applies to the other water quality issues listed in this section of the document. | to the risk assessment is required. |
| 178 | **Appendix H, 9.3**<br>"*Implement clearing during autumn when breeding has ended. Avoid clearing during the winter/spring months when some animals (particularly reptiles) are inactive in burrows or breeding*".<br>This is contradicted later on in the document when it is stated that clearing will occur during the dry season (winter/spring). The time when clearing will be undertaken should be clarified and clearing should be avoided during breeding seasons. | Large-scale vegetation clearing or earthworks will be undertaken during autumn as far as possible. This will minimise impacts to breeding/hibernating fauna and recently independent fauna. |
| 179 | **Appendix H, 9.3**<br>"*Limit vehicle speeds and restrict vehicle movements to daylight hours only, to allow fauna (particularly nocturnal species) to cross corridors of cleared habitat more safely, thereby reducing the impact of habitat fragmentation*".<br>As above, this is contradicted later in the document and should be clarified. | This is a recommendation only.<br>The Project will require 24/7 trucking. Speed limits will be set to ensure driver safety. |
| 180 | **Appendix H, 9.3 Clearing of habitat**<br>"*A loss of 2.9 ha of potentially suitable riparian habitat, which equates to 0.29% of the vegetation proposed to be cleared as a result of the project. Removal of habitat is considered to be unlikely to result in impacts on the local population of Common Brushtail Possum, and to have a minor impact if it does*".<br>The impact on other riparian fauna is not mentioned. The impact of riparian clearing and modification on burrowing and amphibian populations should be detailed. If this wasn't assessed more analysis should be undertaken. | There are no threatened amphibians known or predicted to occur within the study area or bioregion, therefore there is no reason to undertake such an assessment. |
| 181 | **Appendix H, 9.5.5, 9-13**<br>"*Lead to a long-term decrease in the size of an important population of a species.*<br>*Local population unlikely to be considered 'important population'*".<br>Based on what information?<br>"*Impacts are not expected to result in long-term decrease in population size of this species*".<br>The availability of contaminated water for consumption by endangered or vulnerable species may result in a reduction in the number of these species.<br>This applied to Table 9-15 also. | Targeted fauna surveys have demonstrated that there are no important populations of threatened species present in the project area (refer s3.2.3 and Appendix C of the Supplement).<br>Additional testing has shown that tailings will not result in the production of contaminated water (refer response to Question E6). No other potential storages of contaminated water are being considered. |
| 182 | **Appendix H, 9.5**<br>How are the potential high risks being managed? | A targeted fauna survey of conservation significant species has been undertaken (Appendix C of the Supplement). On the basis of the survey the risk assessment has been revisited and there are now no |

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| | | potentially high residual risks to species of conservation significance. |
| 183 | **Appendix I, Greenhouse gases**<br>"*Average annual emissions are estimated at 178,000 t CO2-e. This is approximately 1%, 0.3% and 0.001% of annual NT, Australia and global emissions respectively*".<br>The percentages don't match with data from the Australian Bureau of Statistics. Please recalculate the percentages. | Data was obtained from the then Department of the Environment and are correct. |
| 184 | **Appendix I, 3.1.1**<br>Equation 3-4<br>The assumption that the tails will be wet is an unreasonable assumption. While the interior of the TSF is expected to remain wet the exterior will dry rapidly in the desert climate resulting in the majority of the area which will contribute most to particulate emissions being dry. | Continued deposition and migration of tailings across the impoundment will maintain moisture levels in the surface layer of tailings. It is acknowledged that some areas of the impoundment may periodically dry out but this is not expected to be a major contributor to overall dust levels (wheel generated dust and dust from dumping operations are typically the highest dust sources from mining operations). |
| 185 | **Appendix I, 3.1.1 Calibration of B**<br>*"In the absence of measured hourly dust concentration data for the typical site conditions, B values were adjusted to give the overall hourly emission rates in line with the National Pollutant Inventory (NPI) default emission values of 0.4 and 0.2 kg/ha/h for TSP and $PM_{10}$, respectively*".<br>Presumably the default values are national averages, will Mount Peake values be higher due to the low rainfall and high wind speeds? | In the absence of measured data NPI default emission factors have been used. These factors are conservative (i.e. they over estimate emission rates). They are not averaged data. |
| 186 | **Appendix I, 3.1.3 Controlling factors**<br>The use of water for supressing dust emissions while hauling is likely to cause potential issues due to the high EC. Other dust suppression methods will have different control factors and this will need to be revised if alternatives to water are used in suppression dust emissions while hauling. | Water is still proposed for dust suppression. |
| 187 | **Appendix I, 3.1.3**<br>Table 3-2<br>Where does the 5% moisture value come from? How was this calculated? | 5% is a general industry default and is considered conservative (i.e. it under estimates moisture content). |
| 188 | **Appendix I, 9.3.2**<br>Table 9-3<br>"Taken as 20% NOx"<br>Where is this 20% NOx value taken from? | 20% for the conversion of $NO_x$ to $NO_2$ is considered a conservative industry standard. |

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| 189 | **Appendix J, Conclusions, 9.2**<br>"*Available literature suggests that the impact of noise from the Project is unlikely to result in negative impacts to either livestock or native fauna. As such, no specific management measures, other than those proposed in regard to management of impacts to human receptors, are suggested*".<br>Most noise-related impacts appear to involve behavioural responses across four categories:<br>(1) changes in temporal patterns,<br>(2) alterations in spatial distributions or movements,<br>(3) decreases in foraging or provisioning efficiency coupled with increased vigilance and anti-predator behaviour and;<br>(4) changes in mate attraction and territorial defence.<br>How has the potential impact of noise on fauna been assessed against these potential changes? | A targeted fauna survey has confirmed that conservation significant fauna are unlikely to be present in high numbers in the project area (s3.2.3 and Appendix C of the Supplement).<br>The noise assessment (Volume I, Chapter 10 of the Draft EIS) concludes that noise levels are low and confined to close proximity of the mine site.<br>The primary response to fauna from noise is likely to be avoidance of the area. |
| 190 | **Appendix M, 3.6 Closure Domains, 3.7**<br>Why have the raw water dam and sediment dam not been included in this list? | These are included in the Process Plant and Power Station domain. |
| 191 | **Appendix M, 7.2 Completion criteria**<br>Table 5<br>Open pit - Has backfilling been considered?<br>WRD - No mention of revegetation growth on the WRD, please include this.<br>TSF - Given the uncertain nature of the tailings material (see general waste rock comments) the TSF closure should include the encapsulation of the TSF with a stable cover material. | Backfilling of the pit was considered (Volume I, s3.5 of the Draft EIS.<br>The WRD will be revegetated. Refer response to Question 59).<br>Recent test work has demonstrated that tailings are non-acid forming (s3.3 and Appendix F of the Supplement). Encapsulation is not required. The response to Question 87 outlines the approach to covering the TSF. |
| 192 | **Appendix M, 7.2 Completion criteria**<br>The WRD pre-mine confirmation of contaminants should be required so that targeted placement of waste rock can be implemented.<br>Anticipation of lack of contaminants is not sufficient.<br>With respect to the TSF and the proposal to have it unlined, there needs to be confirmation of contaminants that will move in the seepage, and movement of the plume needs to be modelled.<br>With respect to the open pit, there needs to be groundwater plume modelling of contaminants that maybe be present. | Recent test work has demonstrated that waste and tailings are non-acid forming (s3.3 and Appendix F of the Supplement). Targeted placement of material is unnecessary.<br>Seepage from the TSF will mound during operations and migrate vertically to the underlying saline groundwater, 20 to 22 mbgl.<br>The pit will act as a groundwater sink with a shallow lake forming at cessation of mining. Water will become progressively more saline. A groundwater plume is not expected to form. |
| 193 | **Appendix M, Closure Data, 8.1 Baseline Data**<br>No surface water baseline data was collected please remove it from the list until it has been completed. | Sediment quality data was presented as a proxy for water quality due to the absence of surface water |

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| | | flows during the assessment period. Data will be collected to establish baseline conditions prior to operations commencing. |
| 194 | **Appendix M, 8.2 Closure Related Data**<br>The availability of key materials for rehabilitation such as competent waste rock could be defined from drill cores.<br>Information of subsoil and topsoil would be part of a site survey and should be available.<br>Early stage landform evolution modelling should be conducted. What models will be used?<br>A lot of information can be obtained in the early stage drill cores and used in planning as a basis for managing impact from the start.<br>It is too late once 40Mt of waste rock is put in place and it is suddenly realised that there is high sulfide content present in deeper unweathered section of the ore and host rocks.<br>"Anticipation" is not appropriate.<br>Confirmation through preliminary planning and analysis is required. | The Project site is overlain with between 2 m and 12 m of aeolian sand. The top 200 mm contains some organic matter and seed. No significant clays or hardpan are present.<br>For rehabilitation purposes the top 200 mm will be preferentially stripped for use as "top soil" on constructed landforms. There is an excess of material remaining that can be used to provide a base layer (nominally 500 mm).<br>Drilling has confirmed that there is competent waste rock available, principally from the granite waste surrounding the pit.<br>Recent test work has demonstrated that waste and tailings are non-acid forming (s3.3 and Appendix F of the Supplement).<br>Landform evolution modelling will be undertaken as the concepts for closure are refined to allow confirmation of closure features such as final batter slopes. There are a number of packages available (e.g. Siberia). |
| 195 | **Appendix M, 9.2 High risk outcomes**<br>Table 9 – TSF<br>Control methods listed are inadequate as monitoring will not ensure no contamination of surface water occurs.<br>The TSF should include controls that reduce the potential interaction of water with tailings until it is clear that the tailings material is benign. See general waste classification comments. | Recent test work has demonstrated that waste and tailings are non-acid forming (s3.3 and Appendix F of the Supplement).<br>There is little potential for contamination to occur. |
| 196 | **Appendix M, 10.2.8**<br>Monitoring should continue indefinitely or until TNG has shown that there are no environmental risks associated with the mine. | TNG will consult with the DME to agree on completion criteria. Once all criteria are met TNG can relinquish the site. |
| 197 | **Appendix M, 10.4 General Earthworks Strategies**<br>What is the final rehabilitation design, including batter slope angle and water control structures? Non-erodible is a term used earlier with respect to WRD batter slope rehabilitation. How will non-erodibility be achieved?<br>A cap thickness of 0.5m is not very thick and will not prevent infiltration of rainfall. How will the batter slopes of the TSF be | The rehabilitation design has not been finalised. The Draft EIS presents closure concepts (Volume III, Appendix M) with pictorial designs provided in s16.4. Designs will be refined and updated for inclusion in the Mine Closure Plan prepared as part of the Mining |

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| | stabilised?<br>With respect to water diversion structures being removed so pre-mining flows are returned, is a detailed drainage plan available? | Management Plan.<br>Erosion will be controlled through battering the TSF slopes to between 14 and 16 degrees, construction of bunds along berms, ripping placed soils along the contour and establishing a vegetation cover.<br>A detailed drainage plan will be prepared following detailed design. |
| 198 | **Appendix M, 10.5 General Rehabilitation Strategies**<br>Where is the source of the topsoil?<br>Will the batter slopes be ripped?<br>What is the proposed batter slope angle? | Topsoil and subsoil will be obtained from the natural aeolian sands occurring across the site (refer response to Question 87.<br>Batter slopes will be ripped (Volume 1, s16.4.3 of the Draft EIS).<br>TSF batter slopes will be between 14 and 16 degrees. |
| 199 | **Appendix M, 10.8 Materials Balance**<br>With regards to the high clay content in the capping material, there may be alternate opinions:<br>1. The presence of clay, particularly dispersive clay will cause a washed in layer to develop and result in surface seal and no infiltration unless it is through desiccation cracks.<br>2. Preventing infiltration may cause runoff if the cap is domed and this may induce erosion.<br>3. It is anticipated that the tailings will be benign but it is also mentioned earlier that there will be increasing salinity. Perhaps rainfall infiltration may reduce salinity. However, since the proposal is for no liner then there is a possibility that the ingress of rainfall will increase seepage of tailings contaminants and saline water into the groundwater.<br>4. However the 0.5m cap thickness may not be sufficient. | Recent test work has demonstrated that waste and tailings are non-acid forming (s3.3 and Appendix F of the Supplement). As a result, clay is not necessary to prevent rainfall infiltration.<br>Groundwater in the area is already saline.<br>Topsoiling of landforms is proposed rather than capping. |
| 200 | **Appendix M, 10.8 Materials Balance**<br>Will these sites be lined to prevent seepage to the environment? | Recent test work has demonstrated that waste and tailings are non-acid forming (s3.3 and Appendix F of the Supplement). As a result no lining of structures is proposed. |
| 201 | **Appendix M, 11.2.1**<br>Table 12<br>The TSF and WRD should be monitored for stability and water respectively. Seepage from the WRD will potentially occur and wind erosion may impact the stability of the TSF. Additionally there is no mention of any dams in this section. | Monitoring will occur until agreed completion criteria are met.<br>There is no proposal for any dams to remain on-site post mining. |
| 202 | **Appendix M, 11.2.4**<br>"*As the site is in an arid environment, surface water monitoring is only possible on an opportunistic basis, immediately after* | Monitoring will occur until agreed completion criteria are met. |

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| | *significant rainfall events.*<br>*No regular surface water monitoring is proposed to be conducted after mine closure. Groundwater monitoring is proposed to be conducted annually for 5 years. If the results show compliance with defined targets, it is proposed that the groundwater closure objectives are deemed to have been met*".<br>The analysis of surface water should continue after mine closure until TNG has demonstrated that there are no detrimental impacts arising as a result of any mining activity.<br>Groundwater data should be taken fortnightly at least to ensure that any impacts on groundwater from mining do not occur for prolonged periods without detection. | Monitoring of groundwater will be risk based. General monitoring could occur 3-monthly during operations with an increase in frequency if there is the potential for, or actual release of, a contaminant. The program will be regularly reviewed. |
| 203 | **Appendix M, 11.2.6**<br>"*At this time no toe drain interception trenches or seepage recovery bores have been planned.*<br>*The dry stacking tailings disposal method greatly reduces the volume of water disposed to the TSF during the life of mine. In the absence of the TSF developing a seepage or groundwater contamination plume during the life of mine, it is not intended to conduct any specific seepage monitoring program post closure. Visual monitored of the TSF will occur as part of other site inspections undertaken post closure*".<br>Given the high permeability of the TSF material combined with the lack of evidence that the material stored in the TSF is benign additional measures need to be taken to ensure that the TSF will not contribute to groundwater or surface water contamination. Visual monitoring is an insufficient form of monitoring as a standalone monitoring method. | Recent test work has demonstrated that waste and tailings are non-acid forming (s3.3 and Appendix F of the Supplement). As a result no lining of structures is proposed.<br>Reference to dry stacking was a typo. The reference should have been slurry disposal.<br>Monitoring bores are proposed around the TSF with regular monitoring conducted. |
| 204 | **Appendix N, 3.1.2 Road Construction Bores**<br>Final locations of these bore should be established so that assessment of impacts can be undertaken.<br>Investigations into availability of, and potential impacts to, groundwater for the four proposed road construction bores needs to occur.<br>The results are required to be reported in supplementary information to this EIS. | Construction bores are located adjacent to the access road. They are shown in Appendix B of the Supplement (Figure 2, pages 6, 8, 10, 11, 12, and 14 of sub Appendix A).<br>Water volumes for construction are low and intermittent, and potential impacts will be minimal. Volumes are likely to be less than volumes currently abstracted from stock bores. |
| 205 | **Appendix N, 7.1.2**<br>"*Large scale vegetation clearing or earthworks will be undertaken in the Dry Season and staged (where practical).*<br>*Clearing will be restricted to times when fauna are least vulnerable (e.g. avoiding breeding period) where possible".*<br>These two statements are contradictory. Given the potential to impact on endangered species all clearing should be undertaken outside breeding times. | Refer response to Question 178. |
| 206 | **Appendix N, 7.1.7, Groundwater**<br>Given the heavy reliance on groundwater for the project groundwater quality should have already been assessed and the data included in the EIS. Groundwater data should be collected prior to commencing operations. | Groundwater quality has been assessed, and considered in the design. The mine site will have a water treatment plant, and this has been designed to reflect the water quality tested at the proposed borefield. Further testing has now been undertaken |

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| | | and is presented in Appendix D, sub Appendix A,s5.3 of the Supplement). |
| 207 | **Appendix N, Sub appendix C**<br>Section 3.1 - Table 3-1<br>The consequence of vulnerable species consuming contaminated water would presumable be >1. What are these classification based on? This comment applies to all consequence classifications in the table.<br>Additionally the likelihood of negative impacts should also be reviewed, particularly for water contamination as there is uncertainty surrounding the waste classification. | Additional test work has demonstrated the benign nature of waste material and associated leachate (s3.3 and Appendix F of the Supplement). No update to the risk assessment is required. |
| 208 | **Appendix N, Sub appendix E**<br>Table 3-3 - Section 3.3, F5<br>Include local wildlife groups where possible and check for wildlife in region prior to commencing controlled burn. | Noted. |
| 209 | **Appendix N, Sub appendix F**<br>Table 3-4 - Section 3.4, Trigger, Action and Response Plan.<br>What are the values in the table based on? | Values are nominal to allow an appropriate level of response (TARP) to be assigned. Values can be reassessed in the final Hazardous Materials Management Plan. |
| 210 | **Appendix N, Sub appendix G, 2.5 Landfill design**<br>"*No landfill design is available. The location, size and layout of the landfill will be determined during the initial construction phase. However, the siting will be in general accordance with the Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the Northern Territory (NT EPA)".*<br>Given the landfill design has not been made available for review the design should strictly adhere to the guidelines wherever possible. | The design will adhere to the guidelines wherever possible. |
| 211 | **Appendix N, Sub appendix G**<br>Table 3-1<br>How will burning waste impact on air quality? Has this been taken into account in the air quality analysis? | No burning of waste is proposed. Materials not recycled will be disposed to an on-site landfill and buried. |
| 212 | **Appendix N, Sub appendix G**<br>Table 3-3<br>W05 – What are the distances based on? | Values are nominal to provide guidance on an appropriate separation distance from water sources. Values can be reassessed in the final Management Plan. |
| 213 | **Appendix N, Sub appendix H, 1.1 Project overview**<br>The sediment and raw water dams are not included in the list – please include them in this section as they are important to the water management plan. | They will be included in the final WMP. |

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| 214 | **Appendix N, Sub appendix H, 2.1.2 Hydrological assessment**<br>"*Further investigation is required to establish the need for flood protection measures in this area*".<br>This area has an increased density of woodland and if clearing is required consideration must be given the local fauna. Relocating animals prior to clearing/managing or modifying the landscape is required. | Additional assessment of flooding potential has been undertaken and flood protection will be required along a portion of the eastern side of the pit (s3.1.1 and Appendix E of the Supplement).<br>This area has been surveyed and no flora or fauna of conservation significance have been identified. Clearing will be consistent with the Biodiversity Management Plan. |
| 215 | **Appendix N, Sub appendix H, 2.1.2 Hydrological assessment**<br>"*Sediment sampling was undertaken to characterise sediment quality as a proxy for water quality given the infrequent nature of flow events in the region*".<br>This is not a reasonable proxy for water quality. | Refer responses to Questions E60 and 121 for discussion on sediment sampling. |
| 216 | **Appendix N, Sub appendix H, 2.2 Surface water quality**<br>The location of SS-01 is not sufficiently upstream to be considered not to be impacted by mine activities. While this site is suitable as a pre mining background a new upstream site is required once mining commences. | Site SS01 is up-gradient of the proposed access road crossing of Murray Creek. The site is considered to be suitable to establish ambient conditions. |
| 217 | **Appendix N, Sub appendix H, 2.3.1 Cainozoic basins and palaeovalley systems**<br>"*Groundwater within the basin generally flows from south to north, with discharge known to occur towards the Hanson River and Stirling Swamp. The Stirling Swamp area may be an expression of discharge from the Ti Tree aquifer where evapotranspiration could be a major component of the water balance for the aquifer*".<br>Groundwater flow should be modelled in more detail, especially given the importance of groundwater in the region and the lack of evidence that the waste rock material is benign. | Refer response to Question 72. |
| 218 | **Appendix N, Sub appendix H, 2.4 water control districts**<br>Table 2-2<br>There is no margin of error included in these values, given the dependence of the local environment on groundwater these values need to be measured accurately and a factor of conservatism included. | These values come from the Western Davenport Water Allocation Plan. |
| 219 | **Appendix N, Sub appendix H, 2.6 Groundwater quality**<br>"*Detailed laboratory analysis was undertaken on the proposed abstraction bore in the borefield to assist in determining the treatment requirements of borefield water. The data for this site (WB05) indicated that according to the Australian Drinking Water Guidelines (2011), the groundwater at this site contains elevated levels of Turbidity, Iron, Manganese and Ammonia. It should be noted that some of these results may be due to insufficient bore development and concentrations could improve over time with continued pumping*".<br>Was a full metal analysis undertaken? Where is this data? Why has it not been included?<br>Given the dependence of the project on groundwater quality it is essential that the information is provided prior to mining | Groundwater metal concentrations are provided in the Groundwater Supplementary Report (Appendix D, sub Appendix A, s5.3 of the Supplement). |

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| | activities commencing. | |
| 220 | **Appendix N, Sub appendix H, 3.2.1 Pit inflow**<br>"*The dewatering volumes have not been included in the overall water balance due to their uncertainty*".<br>This should be measured accurately and the model reassessed to include this data. Given the proximity to Mud Hut this should be undertaken prior to any further mining activity commencing. | Pit inflow was measured and included in the groundwater model but not included in the water balance due to the very low modelled volumes. |
| 221 | **Appendix N, Sub appendix H, 3.4.1 Potential for acid mine drainage**<br>"*The rock types that will contribute to the waste dumps exhibit oxidising conditions so are expected to have low sulphide content as follows:*<br>*Surface overburden (pre-strip) comprises desert sand aeolian and colluvial/alluvial sediment, which is weathered material that formed at the surface under strongly oxidising conditions and will not contain sulphides*<br>*A small amount of overburden will be gabbro hanging wall (which is either weathered or fresh) containing some magnetite thereby indicating oxidising conditions and is likely to have low sulphide content*<br>*Some waste adjacent to the orebody material comprises granite which may have a small sulphide component (up to 2%)".*<br>Data doesn't support the benign classification of all waste material - there is insufficient evidence to support this. Refer to general comments on waste rock classification. | Refer response to Question E6. |
| 222 | **Appendix N, Sub appendix H, 3.6**<br>"*Depending on the concentration of sparingly soluble salts in the raw water, the desalination process is expected to have a recovery of around 70%".*<br>What is the 70% recovery based on? Does it account for the high concentration of soluble salts in the water? | This is based on a typical recovery rate from a RO plant used in this situation. |
| 223 | **Appendix N, Sub appendix H, 3.8**<br>"*The mine water balance has been developed to return all process water to the water circuit. This includes decant water from the TSF and brine effluent from the Water Treatment Plant. There will be no uncontrolled discharges of untreated process water from the Mount Peake Project area*".<br>What evidence is there for adequate controls to prevent this occurring? Much of the data presented is based on the 50 year ARI – which has a 29% chance of occurring over the 17 year life of the mine. | 50 year ARI hydrological assessment originally only applied to waterways. Flood modelling has now been undertaken for a 72-hour 100-year ARI storm event (s3.1.1 of the Supplement).<br>All water containment structures will be designed to accommodate a 72-hour 100-year ARI storm event.<br>To provide protection of the structures emergency overflows need to be provided. |
| 224 | **Appendix N, Sub appendix H, 5.1.4**<br>"*Use of existing pastoral wells could also be used for regional monitoring*".<br>Only if a groundwater model indicates the groundwater moves toward the bores. | Noted. |
| 225 | **Appendix N, Sub appendix H, 5.3 Assessment criteria**<br>"*Although Australian and New Zealand Environment and Conservation Council (ANZECC 2000) freshwater criteria are an* | Refer response to Question 92 on trigger levels.<br>Some baseline water quality has now been collected |

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| | *important benchmark assessment level for water quality in Australia, baseline groundwater quality at the site may be naturally degraded and may not meet the ANZECC criteria as a result of salinity impacts, and/or metal impacts from mineralised geology*".<br>Until background water quality results are provided, not just sediment results, the ANZEC 99 or 95% triggers should be used.<br>"*Baseline data should be collected over a period of at least a year in order to detect any natural seasonal variations*".<br>This should occur prior to mining activities commencing, if mining is intended to commence before a sufficient amount of background data is obtained ANZECC 99 or 95% triggers should be used as trigger values. | and is provided in Appendix J of the Supplement. Additional data will be collected when flow events occur. |
| 226 | **Appendix N, Sub appendix H, 5.3 Assessment criteria**<br>The use of stock water drinking guidelines is not considered best practice under ANZECC guidelines. Background water quality should be assessed prior to mining and after bores have been given time to settle. | Refer response to Question 225. |
| 227 | **Appendix N, Sub appendix H, 5.4**<br>The groundwater data should be collected more frequently as biannual assessment will not ensure contamination is captured within a reasonable timeframe. Fortnightly assessment is recommended until there is enough data to suggest that groundwater contamination is unlikely to occur. This includes having data which represent seasonal variation.<br>Surface water should be collected and analysed by a laboratory (for a reasonable range of potential contaminates) at least twice prior to commencing mining activities to obtain a baseline water quality.<br>Surface water should be collected during first flush and residual flow events at least. | Noted. Water quality data from the borefield will be collected on a regular basis. Surface water samples will be collected when flow events occur.<br>Refer response to Question 225. |
| 228 | **Appendix N, Sub appendix I, 3.1**<br>Table 3-1 - Chemical controls<br>How might these chemical controls impact the organic certification of the surrounding pastoral leases? This should be discussed with the relevant stakeholders. | Specific issues relating to organic certification are addressed in s3.4 of the Supplement. |
| 229 | **Appendix N, Sub appendix K, 4.2.1**<br>"*The WRD will be located along the western side of the pit. The base of the WRD is expected to be unlined. The profile of the WRD (e.g. height and slope angles) should be designed to ensure that the final structure is safe, stable and not prone to significant erosion. The final shape of the dump should blend into the surrounding landscape providing that surface stability can be achieved and surfaces remain non-erodible in the long term".*<br>Given the lack of laboratory data for waste rock classification the WRD should not be unlined and should be managed in an appropriate way to prevent the potential acidification/contamination of groundwater. The runoff from the WRD should also be captured and processed according to the physiochemical characteristics of the runoff. | Refer response to Question E6. |
| 230 | **Appendix N, Sub appendix K, 4.3.1 TSF design**<br>"*Runoff and decant from the tailings area will be collected in a return water pond(s) and transferred to the Process Water Dam for reuse. This will ensure that no water affected by the tailings is discharged. An emergency spillway will be* | Refer response to Question E91.<br>Tailings are not contaminated (refer response to Question E6). |

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| | *constructed at the lowest part of the perimeter area for discharge into Bloodwood Creek*".<br>Bloodwood Creek feeds the Mud Hut swamp and the water that is lost via the spillway has the potential to be highly contaminated. As a result having a spillway that feeds into Bloodwood Creek is not recommended. | |
| 231 | **Appendix N, Sub appendix K, 4.3.2 Construction and operation**<br>"*Routine inspections of the collector and toe drains should be undertaken, which should be maintained in proper working order throughout the life of the mine*".<br>Water quality samples should be taken routinely to assist in understanding the risks posed by the TSF to the surrounding environment. | Noted. An adaptive site water monitoring and management plan will include post event monitoring during operation. |
| 232 | **Appendix N, Sub appendix K, 4.5.1 Haul road design**<br>"*The details of the road design and construction have not yet been finalised. Roads without good drainage will degrade very quickly*".<br>Has the potential to seal the road been considered? If so please include details of the analysis and outcome. | The potential to seal the road was considered. Sealing results in significant capital expenditure but with lower maintenance costs. It was determined that sealing was unnecessary as the road could be maintained through regular grading and dust controlled as necessary through the application of water. |
| 233 | **Appendix O, Executive summary**<br>"*Key findings from this assessment indicated the following:*<br>*99.35% of the samples analysed for sulfur returned values of below 0.3% total sulfur. This equates to 99.35% of the samples having a Maximum Potential Acidity (MPA) of less than 10 kg of $H_2SO_4$ per tonne. This assumes that all sulfur is present as reactive pyrite and is therefore an inherently conservative assessment as it discounts non-acid forming sulfur species or any inherent neutralising capacity*".<br>A %S <0.3 does not suggest that the rock material will not produce acid mine drainage, basing conclusion on this values alone is illogical.<br>"*The Acid Neutralising Capacity (ANC) of each sample was assessed based on the assumption that calcium and magnesium are present as carbonates"*.<br>This assumption is unreasonable as many other forms of Ca and Mg may exist in rock material. Additionally this doesn't account for the how leachable the material may or may not be. | Refer response to Question E6. |
| 234 | "*Additional AMD testing (static NAG and NAPP, kinetic NAG and ABCC testing) will be carried out. The results of these tests will be reviewed to develop revised combined sulfur/calcium/magnesium based PAF cut-off grades which can be further developed within a revised block model*".<br>Given that the results of these tests will impact almost every other aspect of the EIS; this analysis should have already been undertaken. Additionally there is no mention of NMD analysis, NMD analysis also needs to be undertaken prior to commencing mining. | Refer response to Question E6. |
| 235 | "*This equates to 99.35% of the samples having a Maximum Potential Acidity (MPA) of less than 10 kg of $H_2SO_4$ per tonne*". | Refer response to Question E6. No PAF material has |

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| | The size of the WRD will be such that it can contain 70Mt of waste. For 99.35% MPA <10kg/t of $H_2SO_4$, this equates to the potential of up to 695,450t of $H_2SO_4$ and for the remaining 0.63% >4550t of $H_2SO_4$ in the WRD.<br>"*Where sulfur was detected at concentrations above 0.3%, they tend to be in relatively thin bands and at a variety of depths, but predominately in the upper 40 m and typically occurring over less than 3 m intervals*".<br>Will the PAF levels of this higher risk zone be confirmed and the waste encapsulated in the WRD to prevent impact? | been identified. |
| 236 | "*The greatest potential for acid generation is potentially found within the fault zone located in the far west of the pit, where limited data has indicated generally higher sulfur content.*<br>*However there is also relatively high calcium data for this unit suggesting a good buffering capacity. The actual volume of the fault related material is expected to be very low.*<br>*Although the geochemistry indicates a low risk of AMD, the management plan takes in to consideration the highest AMD risk material observed.*<br>*PAF material, or material with potential to leach metals or salinity, should be encapsulated within the WRD, and potentially returned to the pit progressively if mining schedules allow.*<br>*The key aspect of the management plan is early identification of PAF material through additional analyses".*<br>The uncertainties raised in this paragraph should be confirmed. | Refer response to Question E6. |
| 237 | **Appendix O, Executive Summary**<br>"*In addition to the pre-production testing, a program of regular testing as part of ongoing grade control and regular updating of the AMD model is required*".<br>Ongoing testing of mining needs to be a requirement, as does encapsulation of high risk material. Encapsulation should be such AMD cannot percolate to the surface of the WRD and be washed into drainage lines. | Refer response to Question 125. No high risk material has been identified. |
| 238 | **Appendix O, 1.5 Proposed Waste Rock Management**<br>*"Due to the largely impervious nature of the waste (and unsaturated alluvial cover) (section 2.4), minimal groundwater is expected to drain from the waste rock*".<br>The waste will be granite and gabbro so it is expected that waste rock fragments will be large.<br>1. What is the size of the waste rock boulders/cobbles and how will this be impervious?<br>2. What is the expected matrix?<br>3. What is unsaturated alluvial cover?<br>4. What are the batter slopes of the WRD and how will water be shed from the surface without sheet or gully erosion?<br>It is stated elsewhere that the WRD is non-erodible.<br>1. How will this be achieved?<br>2. How regularly will the drains be monitored?<br>Will there be an alarm system should AMD be detected?<br>What is the contingency plan to dispose of AMD should the worst case scenario occur? | Detailed design of the WRD has not yet been undertaken. Details will be provided in the Mining Management Plan.<br>Design parameters for the WRD are presented in Volume I, s2.7.1 of the Draft EIS.<br>Stormwater drainage, erosion and sediment controls will be designed and constructed to minimise erosion and channel scour. Stormwater collected on dump benches will be conveyed to a sedimentation basin on the toe of the WRD through engineered channels located on the benches. After settling of any sediment load, water will be either used around the site, for example in dust suppression, or allowed to discharge to natural drainage lines.<br>The size of waste rock material has not been |

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| | | determined.<br>Unsaturated alluvial cover refers to the 20 -22m of alluvial material sitting above groundwater in the area underlying the WRD.<br>No AMD is present in the waste material (refer response to Question E6) and no specific AMD management measures are proposed. |
| 239 | **Appendix O, 1.5**<br>"*Due to the nature of the orebody and the host rocks/cover material, there is little likelihood of significant volumes of sulfide or saline mineralisation*".<br>There is currently insufficient evidence to support this statement.<br>"*Prior to and during mining, additional testing will be carried out to confirm the low AMD risk of all material and confirm the appropriate management procedures*".<br>Given that the results of these test will impact most other section in the EIS this should have already been done. | Refer response to Question E6. |
| 240 | **Appendix O, 3.1 Introduction**<br>"*The objective of the geochemical assessment was to provide an overall understanding of the AMD risk at Mount Peake based on information supplied to GHD from previous work. The geochemical assessment was informed by the following main components:*<br>*Laboratory X-Ray Fluorescence (XRF). Assessment of TNG's laboratory XRF database sourced during exploration and resource definition drilling (2012 RC drilling and 2015 PQ core drilling). The laboratory XRF dataset consisted of a suite of 20 elements on a total of 5301 primary samples (5002 from the 2012 drilling program, and 299 from the 2015 drilling program)*<br>*XRF Assessment of select chip tray samples. In order to provide additional assay data on waste material (in particular sulfur data at low detection levels), a full 'soils' suite assessment was undertaken on 1023 primary samples*<br>*Metals data. Geochemical abundance indices (GAI) were calculated using the above datasets to assess if any metal species of potential environmental risk were concentrated in the ore and waste, relative to average crustal values for similar geological provinces. The metals data helps inform potential metalliferous drainage risk".*<br>This analysis is a preliminary assessment only and does not provide sufficient evidence that no AMD or NMD will occur. Laboratory tests need to be conducted to enable an accurate assessment of the NMD and AMD capacity of the waste rock material.<br>See general comment on waste classification. | Refer response to Question E6. |
| 241 | **Appendix O, 3.2.1 Method**<br>"*The project XRF dataset included 6324 samples within and immediately surrounding the pit shell. Geochemical relationships were formulated from the data in both datasets to build an initial understanding of the AMD risk at Mount Peake".* | Refer response to Question E6. |

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| | The project is beyond the initial feasibility phase and appropriate tests should have been carried out to reflect this. | |
| 242 | **Appendix O, 3.2.1 Assay based ABA**<br>"*This observation would be particularly relevant for total sulfur as identified in the deposits at Mount Peake formed from oxidised melts, where there would remain little potential for nonoxidised, sulfide species, with sulfur likely to be present as sparingly soluble secondary sulfate minerals, such as gypsum. Total sulfur values of less than 0.3 % S or 10 kg $H_2SO_4$/t are considered uncertain (DITR2007)".*<br>Uncertain classifications require further analysis, as stated in the AMIRA guide. Why has the further analysis not been included in the EIS?<br>Given that many metals become much more soluble below pH 4.5 any liquid that is in contact with waste or TSF material should have no more than 0.00155g/L $H_2SO_4$. Without kinetic testing it is impossible to prove that no AMD will occur at any given %S value above 0%. | Refer response to Question E6. |
| 243 | **Appendix O, 3.2.1 Assay based ABA**<br>"*An analysis of the ratio of likely acid-neutralising elements (calcium and magnesium) to acid forming elements (sulfur) was undertaken to identify the units that may present a risk of producing acid. This was based on the assumption that all calcium and magnesium is present as carbonates and sulfur is present as reactive pyrite, and therefore available to consume and produce acid respectively. It is important to note that calcium and magnesium may be present as non-neutralising silicates, hence the assay-derived NPR should be used with caution*".<br>This contains too many assumptions to be justified. | Refer response to Question E6. |
| 244 | **Appendix O, 3.2.1 Assay based ABA**<br>Table 4<br>The table shown does not match any of the data from the paper referenced. It is clear from the paper referenced that $MgCO_3$ actual ANC is roughly 1/20th the calculated ANC.<br>Please quote the section of the paper where a NAPP value of 0-10 kg/t $H_2SO_4$ relates to an uncertain rock classification for waste rock in the Mount Peak region. | Refer response to Question E6. The question is no longer relevant. |
| 245 | **Appendix O, 3.3.1 Sample density**<br>"*Further, DITR (2007) recommends that at feasibility stage, the proponent should; 'Improve density of NAPP data for block model if necessary, and conduct sufficient Net Acid Generation (NAG) test work to cross check NAPP data for key lithologies. If there are still insufficient data to assess AMD potential and provide a convincing Management Plan for approval, additional sampling, test work and refinement of block models will be required. TNG has included recommendations for NAG and NAPP testing herein as discussed later in this report*".<br>Given the project is now at the EIS stage and beyond the feasibility stage this should have already been undertaken. This analysis should be undertaken prior to project approval from the NT EPA. | Refer response to Question E6. |
| 246 | **Appendix O, 3.3.5 Summary**<br>"*Based on the low geological risk, available analytical parameters and the commitment to acquire additional samples prior to* | Refer response to Question E6. |

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| | *mining, the number and density of analyses available are adequate for the current stage of the project*".<br>This is untrue. See general waste classification comments and previous DME Appendix O comments. | |
| 247 | **Appendix O, 3.4.2 Assay based ABA**<br>"*A net potential ratio (NPR) using the sum of calcium and magnesium oxide-derived ANC divided by the total sulfur-derived MPA (noting that no reduction for sulfate sulfur was used)".*<br>This is not an accepted method of analysis at this stage of the project. | Refer response to Question E6. |
| 248 | **Appendix O, 3.4.2 Net Potential Ratio (NPR)**<br>"*As calcium and magnesium carbonates (Ca/MgCO3) react with H2SO4 to neutralise the acid on a 2:1 stoichiometric ratio, then it is also useful to calculate the relative acid neutralising capacity (expressed in terms of kg H2SO4/t equivalent) of the materials being tested based on calcium and magnesium content*".<br>Given the pKa1 of $CO_3^{2-}$ is 6.37 and the pKa2 of $H_2SO_4$ is 1.97 – how is the 1:2 ratio quoted here justified? | This question is no longer relevant given that actual laboratory data is available (s3.3 and Appendix F of the Supplement). |
| 249 | **Appendix O, 3.4.2 Net Potential Ratio (NPR)**<br>"*Samples with an MPA of less than 10 kg $H_2SO_4$/t (equivalent to 0.3%S) are also unlikely to produce significant acidity even in the absence of neutralising capacity so are classified as UC*".<br>Where is the reference for this? Without sufficient evidence that this statement applies to all geologies and the inclusion of appropriate references this cannot be considered a reliable statement. | Refer response to Question 248. |
| 250 | **Appendix O, 3.4.2 Net Potential Ratio (NPR)**<br>"*It is also unlikely to contain sulfide mineralisation and it is more likely that it contained sulfate salts such as gypsum*".<br>Please provide the evidence or logical analysis for this argument. | Refer response to Question 248. |
| 251 | **Appendix O, 3.4.2 Net Potential Ratio (NPR)**<br>Figure 13<br>Figure is for Na not Ca – irrelevant to ANC. Remove figure and replace with appropriate figure. | Refer response to Question 248. |
| 252 | **Appendix O, 3.4.2 NAPP conclusions**<br>"*Based on the findings from the XRF assay data, and within the limiting assumptions of S, Ca and Mg mineral types, none of the broad lithological or ore/waste stream groupings are classified as PAF*".<br>There are too many assumptions made to ensure that these conclusions are reliable. All waste rock should be reclassified using appropriate laboratory analysis. See general waste classification comments. | Refer response to Question E6. |
| 253 | **Appendix O, 3.4.1 Metal assay and GAI**<br>"*As demonstrated by Table 12 only arsenic, lead, selenium and vanadium exceeded a GAI of 3 for over 1% of samples, considered to indicate significant elevation above "background" crustal abundance*". | Refer response to Question E6. |

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| | Which other potential contaminants were assessed? All other potential contaminants should be assessed.<br>How easily leached are these contaminants? Is the 1% of samples expected to impact on aquatic organism health if seepage from the WRD ends up in local waterways? | |
| 254 | **Appendix O, 4.1 Overview**<br>"*A key component of waste rock management for the Project is the storage of waste rock within a designated WRD that will be designed and engineered to allow appropriate storage and segregation of waste should any potentially acid, saline or metalliferous leachate generating waste be encountered during excavation. This is consistent with industry best practice as detailed in INAP (2009)".*<br>Given the lack of clay available from the surrounding environment and the high porosity of the waste rock material how will contact between PAF or NMD material and water be prevented? If crushed NAF material is to be used how permeable is this material? | Refer response to Question E6. PAF material has not been identified and waste segregation is not required. |
| 255 | **Appendix O, 4.2 WRD encapsulation of PAF materials**<br>"*If disposal of these materials due to operational activities cannot take place immediately, materials will be provisionally encapsulated with NAF materials to then adequately be disposed of when operations permit. On completion of mining, or progressively where the mine plan permits, PAF material will be returned to the pit for permanent encapsulation and flooding*".<br>Will the NAF material be crushed to create an impermeable layer? | Refer response to Question 254. |
| 256 | **Appendix O, 5.2.1 Introduction**<br>"*The risk assessment recognises the limitations of the input data (i.e. no NAG, kinetic ABA testing or Australian Standard Leaching Procedure (ASLP) or column leaching tests). However, the use of a large laboratory and site XRF dataset, of generally in excess of 6000 samples, has provided a suitably sized input for the stated purposes of assessing AMD risk, and developing high level management strategies for site implementation throughout the operational mine stage and into closure*".<br>While an increase in the number of samples will result in obtaining a more representative average value it does not eliminate the inherent inaccuracy of the assumptions that have been made (ie: ANC). Therefore the conclusion that the high number of samples collected negates the need for laboratory analysis is not justifiable. | Refer response to Question E6. |
| 257 | **Appendix O, 5.4**<br>Table 17<br>Many of the comments made in this table rely on the assumption that the current analysis is sufficient to classify the waste rock as not producing any contaminated runoff. Based on the current data there is not enough evidence to show this and therefore the current residual risk should be upgraded for all relevant risks. | Refer response to Question E6. |
| 258 | **Appendix O, 6.1**<br>"*The lack of kinetic geochemical data to inform likely contaminant release rates of ore and waste categories means that it is not possible to determine the rate of contaminant release*". | Refer response to Question E6. |

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| | This data can and should be obtained. | |
| 259 | **Appendix O, 6.3.1 Introduction**<br>The list should include the TSF. | Noted. |
| 260 | **Appendix O, 6.3.2**<br>"*Leach columns are recommended (Table 20) using either the AMIRA (2002) free-draining column leach test method, Oxcon or similar, ensuring that the columns are representative of the different lithologies. This would require a total 10 columns, assuming duplicate columns for each major lithology*".<br>How will variation within each lithology be accounted for? | Refer response to Question E6. |
| 261 | **Appendix O, 6.3.3**<br>"*The locations, sampling procedures and schedule and analytes for AMD surface and groundwater monitoring are entirely consistent with the project Water Monitoring Plan and are therefore not reproduced herein*".<br>The monitoring plan is currently insufficient - see groundwater and surface water comments. | The monitoring plan is considered sufficient given the low level of risk posed by AMD. |
| 262 | **Appendix O, 6.3.4**<br>"*This plan will be revised annually until two years after the closure of the pit*".<br>Revision of the AMD management should continue until no environmental impacts have been identified. | Management will continue until site relinquishment occurs. |

## 4.9 NT Police, Fire and Emergency Services

| | Comment | Response |
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| 263 | The Northern Territory Police, Fire and Emergency Services has reviewed the draft Environmental Impact Statement and provide the following comments:<br>• The NT Fire and Rescue Service require compliance with Fire Protection in and around the workers camp and this should be considered at planning and approval stage ahead of construction;<br>• The Officer in Charge of the affected police district is the Local Controller under the Emergency Management Act. Consultation needs to occur with the Local Controller and also the Local Emergency Committee so any emergency management can be implemented into the Local Emergency Plan. The Officer in Charge of Ti Tree Police Station should be consulted;<br>• Consultation with Bushfires NT is recommended in terms of Chemical Hazards (regarding storage of fuel and other flammables on site);<br>• Chemical Hazard re oil spills etc needs to be addressed. It is not fully known what chemicals will be transported to the site, stored at the site and removed from the site. This should be discussed with the Local Controller referred to above; and<br>• Checks should be made with the Dept of Business by the proponent if the area is within an Alcohol Restricted Area. | Noted. |

## 4.10 Parks and Wildlife Commission

| | Comment | Response |
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| 264 | Having reviewed the documents, the Parks and Wildlife Commission is satisfied that there is no likelihood of detrimental impact to the natural, cultural or tourism values within our National Parks estate. | Noted. |

## 4.11 Power and Water Corporation

| | Comment | Response |
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| 265 | No comments from PWC on the Mount Peake EIS. | Noted. |

## 4.12 Department of Primary Industries and Fisheries

| | Comment | Response |
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| 266 | No comment from DPIF. | Noted. |

## 4.13 Tourism NT

| | Comment | Response |
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| 267 | The proposed Mount Peake Project is situated in a remote location of the Northern Territory; as such, the area is not a visitor location.<br>It is recommended the proponent confirm the schedule of daily train transport from the Adnera Loadout Facility will avoid disruption to the Ghan passenger rail service between Adelaide and Darwin.<br>The Traffic Management Plan, to be developed in consultation with the Department of Transport, should consider timing of the construction of the underpass and how to reduce impacts during the key domestic drive season (i.e. May through September). | Train scheduling will be the responsibility of the rail operator Genesee & Wyoming.<br>TNG is in discussions with the Department of Transport on construction timing for the underpass. |

## 4.14 Department of Transport

| | Comment | Response |
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| 268 | The proposed upgrade of the Ti Tree Aerodrome has complexities including CASA requirements the proponent will have to consider, however discussions between the proponent and our Department are underway to identify and work through these.<br>The Department is also working with the proponent for appropriate access to the Stuart Highway for haulage and staff transport movements.<br>Transport has no further comments regarding the EIS. | Noted. |

## 4.15 Department of the Environment

| | Comment | Response |
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| 269 | **Section 8 and 15, Flora and Vegetation Assessment Report, Fauna Assessment Report**<br>*1. The draft EIS should note that the project may result in one or more of the following significant impacts to species or communities listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act):*<br>• *long-term decrease in the size of an important population of a listed threatened species or community*<br>• *adverse effects on habitat critical to the survival of species or community*<br>• *fragmentation of an existing important population into two or more populations*<br>• *reduced area of occupancy of an important population or community*<br>• *modification, destruction, removal or isolation of the availability or quality of habitat, to the extent that a threatened species or community is likely to decline.*<br>The draft EIS should identify how much habitat critical to the Dwarf-desert Spike Rush, Greater Bilby, Great Desert Skink, Crest-tailed Mulgara and other threatened species, if any, occurs at the proposed project site (project site). The draft EIS should identify how much critical habitat, if any, could be impacted by the proposed action (either as a result of direct clearance or fragmentation), and where this habitat is located. Where the proponent does not consider that any critical habitat occurs within or adjacent to the project site, further information should be provided to justify this claim, e.g. by indicating where this habitat is located relative to the project site. | Critical habitat for the Dwarf-desert Spike Rush occurs 12 km to the north of the access road. This habitat will not be impacted.<br>The targeted fauna survey (s3.2.3 and Appendix C of the Supplement) concludes that threatened species are unlikely to be present in high numbers within the project area.<br>The targeted fauna survey report (Appendix C of the Supplement) does note that the project could impact on various significant impact criteria and then subsequently assesses each of the criteria for the various threatened species using a risk based approach. |
| 270 | **Sections 8 and 15, Flora and Vegetation Assessment Report, Fauna Assessment Report**<br>*2. The draft EIS should include details of survey methodology, sampling effort and qualifications of the survey team. Survey methodology should be in accordance with the Department of the Environment's Survey Guidelines for Australia's threatened mammals, Survey Guidelines for Australia's threatened reptiles, and Survey Guidelines for Australia's threatened birds.*<br>Details of the survey methodology, sampling effort and qualifications of the survey team should be provided for all surveys. The Draft EIS should clearly identify how these surveys have been conducted in accordance with these guidelines, and explain any | Survey methodology, sampling effort and consistency with guidelines are clearly set out in the Flora and Vegetation Assessment Report (Volume II, Appendix G, Chapter 3 of the Draft EIS) and the Fauna Assessment Report (Volume II, |

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| | inconsistency with these guidelines. | Appendix H, Chapter 4 of the Draft EIS).<br>Qualifications of the survey team are provided in Volume II, Appendix A of the Draft EIS. |
| 271 | **Sections 8 and 15, Flora and Vegetation Assessment Report, Fauna Assessment Report**<br>*3. When assessing the risk of impact to matters of national environmental significance (MNES), the draft EIS should include reference to relevant statutory plans including: action plans, recovery plans and threat abatement plans.*<br>The draft EIS does not appear to include reference to relevant action plans, recovery plans or threat abatement plans. Relevant recovery plans, threat abatement plans and conservation advice the draft EIS should have reference to includes, but is not limited to:<br>• Recovery plan for five species of rock wallabies: Black-footed rock wallaby (*Petrogale lateralis*), Short-eared rock wallaby (*Petrogale brachyotis*), Monjon (*Petrogale burbidgei*) , Nabarlek (*Petrogale concinna*), Rothschild rock wallaby (*Petrogale rothschildi*) (July 2013)<br>• National Recovery Plan for the Greater Bilby *Macrotis lagotis* (2006)<br>• Recovery Plan for Marsupial Moles *Notoryctes typhlops* and *N. caurinus*, 2005-2010 (2004)<br>• A Recovery Plan for the Great Desert Skink (*Egernia kintorei*) 2001-2011 (February 2001)<br>• Threat Abatement Plan for predation by the European red fox (2008)<br>• Threat abatement plan for predation by feral cats (2015)<br>• Threat abatement plan for competition and land degradation by rabbits (2008)<br>• Approved Conservation Advice for *Dasycercus cristicauda* (crest-tailed mulgara) (December 2013)<br>• Approved Conservation Advice *Erythrotriorchis radiatus* red goshawk (October 2015)<br>• Approved Conservation Advice for *Eleocharis papillosa* (Dwarf Desert Spike-rush) (October 2008)<br>• Approved Conservation Advice for *Polytelis alexandrae* (Princess Parrot) (July 2008)<br>Discussion is required of whether the action will be inconsistent with any relevant threat abatement plans, recovery plans and/or conservation advice. | Refer s3.2.2 of the Supplement. |
| 272 | **Table 15-4, Sections 2.1.4 and 5.4.3 of the Fauna Assessment Report, table 5-9 of the Fauna Assessment Report**<br>*4. The draft EIS should include a detailed assessment of the presence and potential impacts upon native fauna including consideration where relevant of:*<br>• *vegetation clearance*<br>• *habitat fragmentation*<br>• *creation of barriers to fauna movement*<br>• *altered hydrology*<br>• *water quality impacts*<br>• *erosion and sedimentation impacting on waterways* | Refer response to Question 273 in relation to the Dwarf-desert Spike Rush.<br>Refer s3.2.1 of the Supplement for discussion on the status of Mulgara.<br>The targeted fauna survey (s3.2.3 and Appendix C of the Supplement) confirms that Mulgara are unlikely to be present in high numbers in the project area. The risk assessment (Appendix C of the Supplement) confirms that any impacts |

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| | • *soil compaction*<br>• *inappropriate/ineffective rehabilitation*<br>• *groundwater contamination*<br>• *impacts on surface and groundwater systems*<br>• *waste material*<br>• *risks associated with transport and traffic during construction and operation*<br>• *weed and pest invasion*<br>• *dust and noise impacts.*<br>The draft EIS does not appear to have provided adequate information to determine whether the Crest-tailed Mulgara and Dwarf-desert Spike Rush are present at the project site and, where they are present, potential impacts from the proposed action.<br>For example, section 5.4.3 of the Fauna Assessment Report notes that evidence of Mulgara occurrence within the project site could be attributed to either the Brush-tailed Mulgara (*Dasycerus blythi*) or the Crest-tailed mulgara (*Dasycercus cristicauda*), and that the conclusion is that both are likely to occur in the project site possibly in small numbers. However, table 5-9 of the Fauna Assessment Report states that the Crest-tailed Mulgara is limited to the Simpson Desert, and thus is unlikely to occur within the project site. Please clarify whether the evidence of Mulgara presence can be attributed to either species or only the Brush-tailed Mulgara. Where adequate information cannot be provided please identify: the potential impacts from the proposed action on the Crest-tailed Mulgara, mitigation or avoidance measures where there are impacts, and any residual impacts where impacts cannot be avoided/mitigated. | can be adequately managed. |
| 273 | In addition, Table 15-4 of the draft EIS states that there was no evidence of Dwarf-desert Spike Rush during field surveys. However, the Dwarf-desert Spike Rush only flowers in response to seasonal rains and, as noted in the Fauna Assessment Report, no rain fell during the six days that surveys were conducted. Only 7.0 mm of rain fell in the area in the two weeks prior to the surveys.<br>Table 15-4 of the draft EIS states that there is suitable swamp habitat (Mud Hut Swamp and Stirling Swamp) located outside the project site, but that this will not be impacted by the proposed action. However, section 2.4.1 of the Fauna Assessment Report states that any interruption or alteration of surface water drainage in the vicinity of the project site has the potential to adversely affect Mud Hut Swamp. Section 8.1.4 of the draft EIS also states that the proposed borefield will result in progressive water drawdown from groundwater extraction which may impact riparian vegetation in Stirling Swamp. The draft EIS should clearly identify whether altered hydrological regimes and/or groundwater drawdown impacts could potentially impact the Dwarf-desert Spike Rush. Where the proponent does not consider that there are impacts, further information should be provided to justify this. | Volume I, Table 15-4 of the Draft EIS identifies that the Dwarf-desert Spike Rush is largely confined to swamp areas. It is known from Stirling Swamp, 12 km north of the access road, but not from Mud Hut Swamp.<br>Volume I, s2.4.1 of the Draft EIS identifies that there is a risk to drainage if surface water flows are interrupted or altered. Management measures proposed are designed to maintain existing flows e.g. the construction of river crossings at grade and installation of culverts to maintain overland flow.<br>Groundwater modelling clearly demonstrates that no swamp areas will be impacted by groundwater drawdown (Appendix D of the Supplement). |
| 274 | **Sections 8 and 15, Flora and Vegetation Assessment Report, Fauna Assessment Report** | An updated Biodiversity Management Plan is provided in Appendix I of the |

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| | *5. The draft EIS should contain a detailed Biodiversity Management Plan which outlines clear and concise methods to mitigate likely impacts to biodiversity and includes a description of proposed safeguard and mitigation measures to deal with relevant impacts of the action.*<br>Although the draft EIS has proposed mitigation and avoidance measures to reduce impacts resulting from the proposed action, more information as to how these measures will be implemented, defined outcomes, and how these outcomes will be monitored, is required.<br>Additionally, for some threatened species mitigation measures have not been proposed to ensure that there are no residual impacts e.g. a Traffic Management Plan has not been proposed for the Greater Bilby and Black-footed Rock-wallaby, both which are threatened by increased mortality from vehicle collisions.<br>The draft EIS should include a Biodiversity Management Plan which includes detailed measures which mitigate any potential impacts to threatened species resulting from the proposed action. | Supplement. |
| 275 | **Table 6-3, section 8.1.5**<br>*6. The Biodiversity Management Plan should include details of a Fauna and Flora Monitoring Program which is designed to monitor the effectiveness of the mitigation measures proposed. The Flora and Fauna Monitoring Program should identify the methodology for monitoring impacts to biodiversity and identify clear thresholds and contingency measures which will be implemented in the event that the mitigation measures appear ineffective.*<br>Although the draft EIS has identified that monitoring will occur at the project site for weed management, pest control, groundwater impacts, the effectiveness of rehabilitation and closure of the mine, the draft EIS does not appear to have identified a Fauna and Flora Monitoring Program which includes monitoring of all mitigation measures proposed to ensure that there are no residual impacts to MNES.<br>In addition, although table 6-3 of the draft EIS stated that funding to local Aboriginal rangers to undertake monitoring during construction and operation was considered, that it was decided that as there are no significant residual impacts that the monitoring was not required. Regardless of whether there are residual impacts or not, the Department considers that a monitoring program is required to ensure that the proposed mitigation measures are effective, and if mitigation measures are found not to be effective, that alternative mitigation measures will be proposed. | An updated Biodiversity Management Plan is provided in Appendix I of the Supplement.<br>Volume I, Table 6-3 of the Draft EIS identifies that TNG has a target to employ 15% of the workforce from local Aboriginal communities. The table also identifies that Aboriginal rangers will be employed for environmental monitoring and advice. |
| 276 | **Section 16.1**<br>*7. The draft EIS should demonstrate that identified risks associated with rehabilitation, revegetation and closure from the proposed action will be avoided, mitigated or otherwise minimised.*<br>Section 16.1 of the draft EIS states that 983 hectares (ha) of the project site will be either progressively rehabilitated during operation or will be rehabilitated at the conclusion of the operation. The Department considers that although this 983 ha will eventually be rehabilitated, that the loss of critical fauna habitat will need to be offset until the time that the rehabilitated area functions as critical habitat for threatened species'. | No critical fauna habitat has been identified from the project area.<br>The targeted fauna survey has confirmed that threatened species are unlikely to be present in large numbers in the project area (s3.2.3 and Appendix C of the Supplement). |
| 277 | **Sections 2.9, 8.1.5, 8.2.6**<br>*8. The EIS should provide information on:*<br>• *any identified impacts or detriments that cannot be avoided, reduced or mitigated at reasonable costs and whether these impacts could be considered 'significant' under the EPBC Act*<br>• *risks of failure of management actions and uncertainties of management efficacy should be identified* | An updated Biodiversity Management Plan (Appendix I of the Supplement) provides 'triggers' for change (e.g. threatened species populations, feral predator abundance etc) and contingence measures to be implemented if acceptable |

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| | • *proposed offsets for residual significant impacts to MNES and an explanation as to how these proposed offsets are in accordance with requirements of the Environmental Offsets Policy and Offsets assessment guide, where relevant.*<br>The draft EIS does not appear to have provided information on risks of failure of management actions and uncertainties of management efficacy. This information should be provided in the draft EIS. | thresholds are exceeded. |
| 278 | Section 2.9 of the draft EIS states that there are no significant residual impacts to any MNES and thus no offsets are proposed. Section 8.1.5 also states that, although there are some unavoidable residual impacts to fauna, these impacts are not expected to significantly impact the fauna that inhabit these areas. If in due course the Department does not agree with these statements, then offsets will be required. At this stage, further information is required to justify your statements, including:<br>a. The draft EIS does not appear to have identified how much suitable habitat, if any, for the Dwarf-desert Spike Rush and Crest-tailed Mulgara will be cleared as a result of the proposed action. As discussed above (issue 2), the draft EIS does not appear to have identified how much potential critical habitat for the Greater Bilby, Dwarf-desert Spike Rush, Black-footed Rock-wallaby, Great Desert Skink and Crest-tailed Mulgara occurs at the project site, if any. Without knowing how much critical/suitable habitat for these species is to be cleared, it is difficult to determine whether there are residual impacts resulting from the clearance and fragmentation of threatened species' habitat.<br>b. Maps should be provided identifying the location of known, suitable and/or potential critical habitat for MNES.<br>c. All surveys at the project site should be completed and the results of these surveys provided, so that it can be determined whether there are important populations of threatened species present and how much critical habitat will be cleared, and thus whether there are further residual impacts.<br>Additionally, section 8.2.6 of the draft EIS identified that 11 ha of rocky habitat would be cleared as a result of the proposed action. Rocky habitat is considered critical habitat for the Black-footed Rock-wallaby. The Department considers the loss of 11 ha of potential critical habitat for the Black-footed Rock-wallaby is likely to be a residual impact with an offset required. | Refer response to Question 269. |

## 4.16 Arid Lands Environment Centre

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| 279 | The Arid Lands Environment Centre (ALEC) is the peak regional environmental organisation servicing Central Australia. ALEC's vision for 'healthy futures for arid lands and people' is supported through its work on community education, strategic policy advocacy and developing local initiatives to support local sustainability and biodiversity conservation.<br>ALEC acknowledges the vast amount of work that has gone into this draft and welcomes the opportunity to comment on this Draft EIS. ALEC has no specific resources to engage in these processes and relies heavily on skilled volunteers to provide input and comment. However, ALEC is keen to remain engaged on this project due to the scale of its proposed impact on the environment.<br>**BIG PICTURE**<br>TNG Ltd wants to mine this site as an open pit mine for 19 years operating for ten of those years around the clock. They want trucks delivering a semi processed product to a rail siding thousands of times a year. They want predominantly FIFO work force housed in a camp nearby. They want to use underground water and lower the water table by at least 12m which is unlikely to recover half that | Noted. |

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| | level in a hundred years after the operation ceases. They want to interrupt water flows into swamp areas both north and south of the site. They propose to use diesel fired generators and produce 1% of the total NT emissions. They also state that rehabilitation does not include the pit which is to be left as a large hole in the ground with a dirt mound around it. There is no returning the waste rock and tailings into similar land forms and contours as is best practice.<br>**PROCESS**<br>There is no one in this EIS process who can be considered unbiased as to this mine being developed except for ALEC. And on that statement alone the project should not go ahead. TNG Ltd is the mining company who wish to mine the proposed site. They have paid GHD to research and prepare this EIS and they are a near neighbour to Subiaco, WA where TNG has its offices. The NT government will be entitled to a bond and royalties and the mining minister has the final say as to the project proceeding. That contravenes procedural fairness which is guaranteed under common law to ensure the impartiality of the decision maker. Even the CLC who is meant to represent Indigenous interests is to receive royalties from the proposed mine.<br>ALEC also has concerns about the consultation process where GHD staff and a couple of posters occupied a room in Alice Springs for a day. The depth of engagement was low and as an aspiring community member, the company should do more to engage the regional centre that could be servicing this project. | |
| 280 | **CLIMATE ISSUES**<br>There are a number of aspects about this mine and its impact on the climate that are of a concern. The use of carbon based fuels, a percentage of the waste that could produce sulphuric acid, vanadium dust, the amount of air borne emissions, the volume of road traffic and the lack of any real commitment to renewable energy sources. | These issues have all been addressed.<br>Gas with its lower greenhouse gas intensity is being used as a power source instead of diesel. Further work is also being done to assess the viability of incorporating solar power into the energy mix.<br>Waste has been shown to be benign (refer response to Question E6).<br>The project will not produce vanadium dust.<br>Airborne emissions are low.<br>Traffic volumes on public roads are very low. |
| 281 | TNG Ltd proposes to use gas and diesel fuelled generators for the power station and pumps. That decision would mean that this single mine would produce 1% of the NT emissions for the life of the mine. With more than 3 million tonnes of CO2 to enter the atmosphere with no carbon offset planned, ALEC views it as unacceptable and more needs to be done to reassure the community that this project will mitigate these impacts (P 5-48, vol. 1). | The views of ALEC are noted.<br>Further work is being done to assess the viability of incorporating solar power into the energy mix. |
| 282 | Most of the mine waste is of low risk but 0.3% has the potential to produce sulphuric acid and is considered a moderate risk. If that occurred in this landscape it would be very costly and difficult to cleanup. (Appendix O pp.41-42). | Refer response to Question E6. |
| 283 | The researchers indicated that solar power and battery storage may be considered but there seems to almost no commitment to that strategy (p.5-48, vol.1). Renewable energy for at least the mine camp would seem fairly easily installed and operated. | Agreed. Solar at the camp would be easily installed but there may be other opportunities such as at the borefield. This will be further investigated as the project moves into the |

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| | | detailed design phase. |
| 284 | It is likely that there will be at least a hundred truck movements a day and that has an impact on the environment; producing dust, interfering with run off of water, vehicle emissions and noise (p.5-50, vol.1). | Issues relating to dust and noise have been addressed in the EIS and no significant impacts to sensitive receptors are expected. Run off will be managed through installation of floodways and culverts along the access road. |
| 285 | There is some risk associated with dust being generated at the site and traffic corridor. Vanadium dust is highly toxic at low concentrations to both humans and animals. The workers at the mine would be most at risk because proximity is related to dust levels. However, Willowra which is 80 km away had the second highest concentrations of dust. It was stated that was because of prevailing winds. Refer to p.17, Appendix I, vol. 2. | The mine will not produce vanadium products. Air quality impacts have been assessed and no significant impacts to sensitive receptors are predicted. |
| 286 | **WATER ISSUES**<br>The proposed site is in a dry area. Water therefore is a precious commodity. The overall issue is the impact of drawing down the water table and its effect on both flora and fauna. If plants die because of a lowered water table then animals lose food sources and habitat. The EIS states that the water table will be drawn down 12 m and even after a hundred years will not reach the current levels. It is known that a large nearby agricultural project has applied for a very large amount of water from the same aquifer. It is also known that there are plans being made on water allocation processes at the territory level which may affect this project. | Refer response to Question E77. |
| 287 | The proposed use of 51L/s stage 1 and 82L/s at stage 2 is a very large amount of water in this area and in this climate for such a long time. And while monitoring of vegetation is proposed there are almost no options if the aquifer becomes insufficient for the environment and the mine. Refer to p.7-3, vol. 1. There is between 4 and 7 million litres of water per day proposed to be used by this mine. The fact that recharge is not clear this project is unsustainable and on this basis alone the project should not processed. | The Groundwater Supplementary Report models no recharge for 12 years and a reduced inflow head to better understand model sensitivity (Appendix D, s6.3 of the Supplement). This analyses confirm that groundwater extraction rates are unaffected with extraction relying on aquifer storage rather than recharge mechanisms. Groundwater availability is considered sufficient for the life of the mine.<br>Impacts to groundwater dependent vegetation are discussed in s3.2.4 and Appendix K of the Supplement. |
| 288 | Outside the area considered but less than ten km away is the Wood Duck Swamp and is filled from sheet runoff. The proposed road cuts across that runoff area. The proposal is to install culverts for water flow. However, water flows are interrupted by being channelled in such a way and may have an impact on both flora and fauna. Refer to p.7-11,7-12. | The access road runs approximately 10 km to the north, and downstream, of Wood Duck Swamp. There is no mechanism for water inflow to the swamp to be impacted by the Project. |
| 289 | Flood water management is based on hundred year flood levels in this EIS. As a result of climate change extreme weather events | A flood assessment based on a 72-hour 100- |

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| | are more common and it may be prudent to plan for a higher level to ensure water and environmental safety. | year ARI storm event is deemed to be sufficient for this Project. The Project life is less than 20 years. |
| 290 | The NT Government has indicated that mining and petroleum activities will be subject to the Water Act, this is also a policy of the Opposition too. Therefore, it would be prudent for the proponent to include this coming reality into its EIS. Given the amounts of water and the competition for the resource in the Western Davenport Water Allocation Plan, the Proponent should seek advice from the Department of Land Resource Management and Department of Mines and Energy. | Both agencies are aware of the Project and have provided relevant comments in their responses to the Draft EIS. |
| 291 | **BIODIVERSITY**<br>There are a number of species declared under threat or vulnerable that will be affected by the proposed mine to both flora and fauna.<br>The dwarf desert spike rush and seven near threatened species including the giant sweet potato were listed in the study. Refer to p. 8-3, vol. 1. | The Dwarf-desert Spike Rush is known to occur 12 km to the north of the access road. None of the threatened species recorded from the locality were actually recorded in the Project area and consequently none will be impacted. |
| 292 | The research also identified that the river red gums and the ghost gums which line the riparian areas will die with a lowering of the water table which negatively impacts the habitat of the common brushtailed possum. Refer to p. 8-13. | Some riparian sites were included in the surveys and there is a low likelihood of threatened fauna associated with Groundwater Dependent Ecosystems (Brushtail Possum would be the only possible species and this subspecies is only known from the West MacDonnell Ranges in the NT currently). |
| 293 | It also stated that altering ground water flows may affect species in the Mud Hut Swamp and Sterling Swamp. Refer to p. 53, Appendix G, vol.2. | Groundwater reduction was identified as a potential risk to groundwater dependent vegetation in Mud Hut and Stirling Swamp. The remainder of the paragraph states that groundwater modelling demonstrates that the swamps will not be impacted by groundwater drawdown.<br>Mud Hut really only provides important habitat for fauna when inundated. When dry there is an overstorey of Coolibah which would support hollow-bearing tree dependent fauna but it would be unlikely to support threatened species. |

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| 294 | And the vulnerable species dwarf desert spike-rush and giant sweet potato would certainly be impacted by the proposed mine. Refer to p8-13, vol. 1. | Neither species will be impacted by the Project, either directly or indirectly. |
| 295 | On page v, Appendix H, Vol.2 it states" Inadequate management and mitigation has the potential to lead to irreversible long term impacts on some threatened fauna species". Also in that Appendix, on pages 85-90 there are thirteen mitigation and management procedures to protect species that are threatened or near threatened. Given the nature of the potential impacts, will the NT EPA, Department Land Resource Management or NT Department of Mines and Energy be inspecting to ensure compliance? | As a component of the Mining Management Plan TNG will be required to finalise an Environmental Management Plan for the monitoring and management of a variety of environmental aspects. Biodiversity impacts will be addressed in a Biodiversity Management Plan (an updated draft is attached as Appendix I in the Supplement). This EMP will be approved by the DME.<br>The Mining Compliance Division of DME carries out audit and inspections of operational activities and management systems for mining activities and ensures close-out of any identified non-conformances. |
| 296 | There are threats from clearing, water draw down, fire, noise, light, dust, weed spread, road kill, water contamination, increases in feral predators all of which might affect the identified threatened species. They include the black footed rock wallaby, desert skink, greater bilby, night parrot, mulgaras, grey falcon, common brush tail possum, emu Australian bustard, et.al. | The impact assessment identifies that there will be no significant impact to threatened species from any project related activities. |
| 297 | It is worth noting that no work was done on invertebrates or stygofauna in the groundwater. | This was not requested in the Terms of Reference. |
| 298 | As to the water draw down, there is some doubt as to their modelling and its predicted effects on some of these species. Refer to p.62, Appendix H, vol. 2. | Groundwater drawdown is not predicted to significantly impact any fauna of conservation significance. |
| 299 | **CULTURAL ISSUES**<br>The investigation is stated as having consulted CLC and local Aboriginal community. It has also been identified that the short notice given to the CLC precluded any of the locals participating in the survey. Refer to p11-4, vol. 1 Why was the consultation not rescheduled the survey when locals were available? | TNG has carried out all of its Heritage Surveys and engagement with the TO's consistent with the directions and guidance of the CLC.<br>There are no sacred site issues preventing the development of the Project and TNG is satisfied that the interests of TO's are recognised and reflected in the results of the Sacred Sites Survey.<br>The archaeological survey was not conducted with TO's present due to their unavailability. The area surveyed was the same as the Sacred Sites Survey which identified sites of |

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| | | significance. The results of the archaeological survey are provided in Volume I, s11.4 and Volume II, Appendix K, s6.2 of the Draft EIS. |
| 300 | It was also noted in the original draft of the EIS the proximity of sacred sites to the mine, the miners camp and the road. The risk of an off duty miner exploring a nearby place of interest could impact a site. | As part of Project inductions all workers will be made aware of their obligations in relation to sacred sites. This will include recognition of Exclusion Zones and Restricted Work Areas. |
| 301 | A part of the mine site is also under a native title registration. Refer to p.19, Appendix K, vol. 2. | TNG via CLC is finalising a Native Title Agreement. |
| 302 | The researchers also claimed to have found 16 new sites of Aboriginal heritage ( see p. 11-8) and if that is so how many more would they have found with a Traditional Owner present. | The archaeological consultants are experienced in undertaking this type of work and it is not mandatory to include TO's in survey work. Archaeological materials generally found are artefact scatters of low cultural significance.<br>Sites of cultural significance, which could include archaeological sites, were identified as part of the Sacred Sites Survey. |
| 303 | **CLOSURE**<br>Over the past 25 years 70% of mines have had unplanned or unexpected closures. This phenomenon makes the necessity of a generous bond especially in some Australian jurisdictions mine rehabilitation and bonds provided by mining companies has been inadequate.<br>In AUSIMM Bulletin, Feb.2015 Chris Davis stated that "closed mine sites must be safe and become areas that add to the regional ecosystem".<br>The filling in of the proposed mine void at the end of the cycle is best practice as articulated by McCullough, C et al at Edith Cowan Univ in a paper " Pit lakes as Evaporative Terminals..." in 2012.<br>The observation was for mine pits in dry areas where evaporation exceeds rainfall and the lake can become full concentrated elements. He spoke at the International Minewater Association annual conference in 2012. | A bond will be applied to the Project.<br>Backfilling of the pit was considered but rejected (Volume I, s3.5 of the Draft EIS).<br>The pit will act as a groundwater sink with a shallow lake forming at cessation of mining. Water will become progressively more saline. A groundwater plume is not expected to form. |
| 304 | There is also best practice for the TSF and the WRD which that they should be returned to a shape and form of the surrounding landscape. The report hedges this standard with the phrase " as far as practicable" see p.16-2, vol.1. | This is an objective. In reality landforms remaining post-mining will not adopt the shape and form of the surrounding landscape due to its relatively flat nature. |
| 305 | **MISCELLANEOUS**<br>Given the growing body of health data demonstrating mental health risks for FIFO workers, more needs to be done to ensure that | Noted. |

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| | the mental health of workers is supported. | |
| 306 | The fire prevention section is very light on detail. Given the changes indicated in the Bushfire Management Bill 2016, fire management plans for the project will be required and ensuring adequate fire training and provision of fire fighting equipment essential. | A Fire Management Plan for the Project is provided in Volume III, Appendix N, sub Appendix E of the Draft EIS. |
| 307 | **CONCLUSION**<br>ALEC has a number of serious concerns about this proposal. Without adequate measures to reduce carbon emissions, reduce water consumption and provide a better option for rehabilitation beyond an open pit - ALEC does not support this project proceeding. There is a need for the proponent to get clarity on the removal of mining exemptions of the Water Act and the impact on Threatened Species. ALEC is keen to remain engaged on this project and welcomes the opportunity to meet with the proponent and/or its contractors to discuss this project going forward. Thanks. | Noted. |

## 4.17 Central Land Council

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| 308 | **Recommendation 1 - Water**<br>1. Modelling undertaken in this study is of low confidence. Further research work is needed to ensure project risks are appropriately addressed. | The Groundwater Supplementary Report provides an update to the groundwater model base on the collection and interpretation of new data collected during 2016 (Appendix D and s3.1.2 of the Supplement). The modelling confirms the sustainably of a project water supply. |
| 309 | 2. Drawdown and the potential for phreatophytic vegetation impacts have not been studied as part of this EIS. Further information is required with particular consideration paid to the following points".<br>a. Riparian vegetation (including River Red Gums along the Hanson River) has high cultural significance for traditional owners.<br>b. The risk to Murray creek riparian vegetation of drawdown from the mine pit has not been clearly addressed.<br>c. Monitoring broader drawdown impacts beyond the predicted 1km zone of influence is essential.<br>d. Mud Hut swamp is an area of high cultural significance. Further hydrogeological study should be undertaken to understand the groundwater flow including potential impacts of draw down on Mud Hut Swamp. | Appendix B of the Supplement describes the riparian habitats of Murray Creek and the Hanson River.<br>Potential impacts to groundwater dependent vegetation are discussed in s3.2.4 and Appendix K of the Supplement.<br>Groundwater levels measured at pastoral bores near Mud Hut Swamp indicate that regional groundwater is >10 mbgl in this area, therefore the swamp is unlikely to be maintained by groundwater.<br>Appendix D of the Supplement (s6.2.2) identifies that there will be no groundwater impacts on Mud Hut Swamp.<br>The proposed groundwater monitoring includes a monitoring well at this location which will assist in demonstrating groundwater depths and any seasonal changes or impacts from mining. |

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| 310 | 3. Monitoring bores should be established to verify the modelling of impacts of pit dewatering on groundwater and the Murray Creek ecosystem. | Monitoring bores are proposed, including adjacent to Mud Hut Swamp. |
| 311 | 4. Baseline water studies should be undertaken. | Baseline water quality data for the borefield has been collected (Table 5-1 of Appendix D of the Supplement) and will continue to be collected prior to mining. |
| 312 | 5. Extraction volumes and drawdown from production bores along the haul road should be included in the water balance modelling of the mine. | Construction bores have not been modelled due to their small (1-2 L/s) and intermittent production. |
| 313 | **Recommendation 2 - Biodiversity**<br>1. Whole of ecosystem study across the project footprint should include baseline invertebrate studies and data collection. | Refer response to Question 343. |
| 314 | 2. Further biodiversity studies should be undertaken across the current disturbance footprint of the haul road corridor. | Additional vegetation and flora surveys and targeted fauna surveys were undertaken in Spring 2016 (Appendices B and C of the Supplement respectively) |
| 315 | 3. Further haul road biodiversity studies should be undertaken to determine the extent of the *Ipomoea polpha subsp. latzii* (Giant Sweet Potato) populations and a risk assessment undertaken on the potential impacts to this population of surface flow changes from haul road construction. | Refer response to Questions 14 and 104.<br>All known populations of *Ipomoea polpha* subsp. *latzii* occur upstream of the alignment of the access road and will not be impacted by any changes to surface water flow. |
| 316 | 4. Information as to the timing and extent of further baseline studies recommended in the EIS is requested. | Refer response to Question 315. |
| 317 | 5. Staged vegetation clearance is recommended in the context of fauna management. More detail is required in regards to timing and identification processes that will be undertaken to identify and protect fauna during construction. | Staged vegetation clearing is proposed and is documented in the updated Biodiversity Management Plan (Appendix I of the Supplement).<br>Preclearance surveys will be undertaken prior to clearing activities occurring. This is also outlined in the updated Biodiversity Management Plan. |
| 318 | **Recommendation 3 - Aboriginal Sites and Cultural Heritage Management**<br>1. Damage to the sacred site located to the north east of the pit from mining and pit wall collapse is a key concern of the CLC and alternative proposals need to be considered which decrease the risk of damage to zero. The CLC is not satisfied that the risks of this occurring have been assessed in enough detail. | Refer response to Question E81. |
| 319 | 2. Risk to riparian vegetation communities as a result of pit de-watering and local groundwater drawdown is a concern at Mud Hut Swamp, Murray Creek and the Hanson River. | Mud Hut Swamp is approximately 7 km from the mine site and groundwater drawdown is not predicted to impact the swamp. |

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| | | Appendix D of the Supplement (s6.2.2) identifies that there will be no groundwater impacts on Mud Hut Swamp.<br>Risks to phreatophytic vegetation in Murray Creek and the Hanson River are discussed in s 3.2.4 and Appendix K of the Supplement.<br>TNG has committed to further discussions with Indigenous stakeholders on potential impacts to groundwater dependent vegetation. |
| 320 | 3. Archaeological fieldwork was not conducted across the entirety of the current haul road corridor and further work is recommended. | Refer response to Question 12. |
| 321 | 4. Reconsideration of the design for the planned causeway footings at the creek and river crossings along the haul road is essential to comply with conditions set out in SSCC2015-034. | Crossing the Hanson River is an essential requirement of the Project. A floodway crossing is being considered and this will result in the smallest disturbance footprint. The crossing will require some minor excavation to "key" the floodway into the river bed.<br>TNG has had further discussions with TO's who have now agreed to the design shown in Appendix G of the Supplement. |
| 322 | 5. The importance of the area for hunting and gathering by traditional Aboriginal owners should be acknowledged as well as important occurrences of bush foods such as *Ipomoea polpha subsp. latzii* (Giant Sweet Potato). | Noted. |
| 323 | 6. A strategic indigenous water reserve for the Western Davenport Water Control District should be considered in assessing the sustainable use of water for the Project. | This is not an issue that can be addressed by TNG. |
| 324 | **Recommendation 4: Waste and Hazardous Substances Management**<br>1. The CLC recommends that best practice landfill management be adopted which excludes burning of waste and that the facility is fully fenced to manage build up in number of feral animals and dingoes. | Burning of waste will not be undertaken. Waste will be disposed in trenches and regularly covered. The landfill will be fenced with monitoring undertaken to ensure that feral animal numbers do not increase. |
| 325 | 2. More consideration should be given to best practice around tailings management with emergency release into the local waterways being unacceptable. | The high level emergency release from the TSF was included to protect the structural integrity of the TSF during extreme rainfall conditions (as is required on all structures capable of storing water). Under extreme rainfall, emergency overflow of essentially clean rainwater would occur at a distance of 2.5 km from Bloodwood Creek<br>Refer also to response to Question E91. |

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| 326 | 3. More detailed plans are required addressing contaminated soil bioremediation, hydrocarbon sump management and oil water separation at wash down bays, sumps and bunded hydrocarbon storage areas. | Volume III, Appendix N, sub Appendix F of the Draft EIS provides a Hazardous Substances Management Plan. This plan will be reviewed and, if necessary, updated as a component of the Mine Management Plan.<br>The bioremediation facility will consist of a small (approx. 50m x 50m) hardstand area where any hydrocarbon contaminated soil can be stored. The natural actions of sunlight and oxygen result in the volatilisation of hydrocarbons with the remediated soil reapplied onsite. |
| 327 | **Introduction and context**<br>The Central Land Council (CLC) welcomes this opportunity to provide a submission to the Northern Territory Environmental Protection Agency (NTEPA) for the TNG Limited (TNG) Mt Peake Project Draft Environmental Impact Statement (EIS).<br>The CLC is a Commonwealth corporate entity established under the Aboriginal Land Rights (Northern Territory) Act 1976 ('ALRA'). Amongst other functions, it has statutory responsibilities for Aboriginal land acquisition and land management in the southern half of the Northern Territory. The CLC is also a Native Title Representative Body established under the Native Title Act 1993 ('NTA'). The CLC region covers approximately 780,000 km² of land, and 417,318 $km^2$ is Aboriginal land under the ALRA. Given existing pastoral land was not able to be claimed Aboriginal land tends to be very arid and remote. In addition, rights have been asserted and won under the Native Title Act 1993, and traditional owners unable to claim land under the ALRA have succeeded in obtaining rights to small areas known as Community Living Areas, under NT legislation.<br>Through its elected representative Council of 90 community delegates the CLC continues to represent the aspirations and interests of approximately 17,500 traditional landowners and other Aboriginal people resident in its region, on a wide range of land-based and socio-political issues.<br>The CLC aims to improve the lives and futures of its Aboriginal constituents through sustainable development and change. The CLC's development approach is based on an integrated and strengths-based strategy of building economic, social and cultural capital. Significant work is being done under the various functions of the CLC in each of these related areas through initiatives in: natural and cultural resource management; the development of remote enterprise and employment pathways; innovative community development work, ensuring land owners use income generated from land use agreements for broad community benefit; and land administration and land use agreements for third parties and traditional owners.<br>The CLC's primary concerns in submitting the following comments on the Draft EIS are to highlight traditional Aboriginal owners and/or Native Title Holders connection to the affected land and to ensure the protection of significant sacred sites and cultural interests on the land affected by the project. The protection of the environment is integral to Aboriginal attachment to country. Further the CLC wishes to ensure that social and economic benefits from the project are distributed for the benefit of traditional Aboriginal owners and local communities.<br>The CLC has had a long working relationship with TNG Ltd since it first acquired exploration tenements in the area of the Mt Peake Project in 2009. Two Deeds for Exploration were executed in 2010 and 2012 respectively and traditional Aboriginal owner and other meetings were held with the company. Negotiations toward a Mining | Noted. |

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| | Production Agreement are underway.<br>The CLC has coordinated several sacred site clearances in relation to the project footprint and as a result Sacred Site Clearance Certificates have been issued to the company setting out traditional Aboriginal owners instructions in relation to the protection of sacred sites. Cultural information is not included in the EIS as it is subject to confidentiality.<br>In general the coverage of risks and issues in the Draft Environmental Impact Statement (EIS) and the quality of information provided in the document is satisfactory, although the CLC believes some matters require further work in relation to cultural and environmental risks.<br>The main body of this document is set out as a topic summary of each of the CLC's concerns with EIS referenced text in italic and bold headings and related CLC comments. | |
| 328 | **Comments on the Draft Environmental Impact Statement**<br>**Water**<br>A summary of the limitations presented in the EIS shows that conceptual modelling and drilling investigations indicate the need for further research to provide more certainty in regards to environmental impacts of groundwater extraction for this project. | Additional groundwater drilling and modelling has been undertaken (refer s3.1.2 and Appendix D of the Supplement). |
| 329 | Further the EIS identifies that the hydrogeological studies undertaken for the project have modelled ground and surface water with a low level of confidence. The CLC is concerned that hydrological, hydrogeological and ecological studies have either not been undertaken or were not designed to develop understanding of project impacts on the ground water system and riparian ecology along the Hansen River and Murray Creek. Death of riparian vegetation including culturally significant mature trees along the waterways is a threat. | Refer s3.1.1 of the Supplement for additional flood modelling and s3.1.2 for additional assessment of groundwater.<br>Potential impacts to groundwater dependent vegetation are discussed in s3.2.4 and Appendix K of the Supplement. |
| 330 | Mud Hut Swamp is an area of high cultural significance which could be at risk with changed ground water flows. The EIS reports no connection between Mud Hut swamp and the palaeovalley groundwater, but the CLC is concerned that the modelling alone is insufficient evidence to confidently rule out a connection that could impact on Mud Hut Swamp. | Refer response to Question 75.<br>Appendix D of the Supplement (s6.2.2) identifies that there will be no groundwater impacts on Mud Hut Swamp. |
| 331 | The CLC also notes that production bores associated with the haul road have not been included in extraction modelling. Further that the location of these bores and the extent of their use during the operational phase of the project is not known. | Construction bores have not been modelled due to their small (1-2 L/s) and intermittent production.<br>Construction bores are located adjacent to the access road. They are shown in Appendix B of the Supplement (Figure 2, pages 6, 8, 10, 11, 12, and 14 of sub Appendix A). |
| 332 | The CLC does not support discharge of saline process water to the environment under any circumstances and as such has concerns about the proposed emergency discharge management for the tailings storage facility. There is insufficient information in the EIS to appropriately assess the risk of this discharge point. | Refer response to Question E91.<br>Tailings are not contaminated (refer response to Question E6). |
| 333 | The EIS identifies that there are no identified current or future users of the water resources in the project area. The CLC however believes that strategic indigenous water reserves will be acknowledged in the future in relation to the | Noted. |

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| | Western Davenport Water Control District. | |
| 334 | **2. Project description**<br>**2.2 Construction**<br>*- Several bores will be established along the access road to provide construction water*<br>**2.3.5 Access Road**<br>*- Several bores will be established along the access road to provide construction water*<br>CLC Comment: Production bores along the haul road corridor are mentioned but are not included in management documents. There is no haul road bore extraction volumes, water balance or reference to the ongoing use or otherwise of the water during the project. | Refer response to Question 331.<br>The bores will be used during construction and to supply water for dust suppression during operations. |
| 335 | **4.3 Groundwater Impact Assessment**<br>*- Drawdown decreases significantly with depth away from the palaeovalley. Although the 1 m drawdown contour extended to around 6 km south of the borefield.*<br>**Appendix F 6.2.4 Hanson River palaeovalley**<br>*- It is recognised that within the Hanson River area, drilling data is relatively limited (Section 6.4), therefore the mapped extent of the palaeovalley could be highly speculative* (Tickell 2013).<br>**7-8 Model Limitations**<br>*-…hence its results should be treated in line with the expectation of a low confidence mo*del.<br>*- The aquifer characteristics of the palaeovalley aquifer have been developed from a relatively limited drilling investigation. As such, the measured aquifer characteristics may not be representative of the whole of the borefield (i.e. additional bores could provide greater or smaller yields)*.<br>CLC Comment: The limitations around groundwater knowledge in the area generally are noted by the CLC. The uncertainty regarding the mapped extent of the palaeovalley is an example as to why the CLC has concerns regarding the effective monitoring of groundwater draw down. The EIS reports no connection between Mud Hut swamp and the palaeovalley groundwater, but the CLC is concerned that the modelling is not supported by empirical data and that the swamp may be impacted. The CLC recommends that further hydrogeological work be undertaken to understand any drawdown that may affect the swamp. | Refer response to Question 75.<br>Additional assessment and modelling of the borefield has been undertaken with the results provided in Appendix D and s3.1.2 of the Supplement.<br>Appendix D of the Supplement (s6.2.2) identifies that there will be no groundwater impacts on Mud Hut Swamp. |
| 336 | **5.3.5 Estimation of peak floodway flow depths** (**Figure 5-8 )**<br>*- Further topographical surveys and hydraulic assessments will be required to validate these findings*<br>CLC Comment: Any change in surface flows has potential to affect the Stirling Swamp and the population of the near threatened *Ipomoea polpha*. The CLC would like confirmation of the timing of further hydrological assessments to be undertaken on the Wood Duck Creek crossing/wash out zone. | These assessments will be undertaken during detailed design for the Project. The objective is to maintain existing flow through a combination of floodways and culverts. |
| 337 | **2.7.2 Tailings Storage Facility**<br>*- The emergency spillway will be constructed at the lowest part of the perimeter area. The emergency spillway will* | Refer response to Question E91.<br>Tailings are not contaminated (refer response to Question E6). |

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| | *discharge into Bloodwood Creek.*<br>**8-4-2 Potential Saline Drainage**<br>*- It is recommended that the various water storages be operated to ensure that they are well mixed and that any outflow to the environment considers the salinity of discharges*<br>CLC Comment: Saline process water may affect the environment if discharged from the dam and tailings storage facility. Discharge of saline process water is unacceptable. Other management options should be considered. | |
| 338 | **Table 8-2 Risk management**<br>*- Runoff of contaminated stormwater: Oily water separation and treatment*<br>CLC Comment: Oily water separation facilities need to be designed to control all contaminated water on site to ensure hydrocarbons are prevented from entering the environment (from wash down bays, work areas and storage sumps). | Noted. All facilities containing hydrocarbons will be designed to minimise the potential for release to the environment. |
| 339 | **Biodiversity**<br>The biodiversity information provided in the EIS is incomplete and both the report and the CLC note the need for more information and further studies to be undertaken. | Refer response to Question 316. |
| 340 | The EIS identified a high risk ranking for ground water drawdown effects on riparian ecosystems. The CLC is concerned about this high risk from an ecosystem perspective but also around the health of culturally significant trees particularly along the Hanson River and Murray Creek. | s3.2.4 and Appendix K of the Supplement identify the potential impacts on phreatophytic vegetation.<br>TNG has committed to further discussions with Indigenous stakeholders on potential impacts to groundwater dependent vegetation. |
| 341 | We note that the borefield and pipeline corridor ecosystems have not been studied and the CLC requests further work be undertaken to increase understanding and limit identified risks. | Habitats in these areas were documented in the Draft EIS (Volume I, s8.1.4). Further habitat mapping and assessment has been undertaken in spring 2016 (Appendix B of the Supplement). |
| 342 | The haul road transects the Stirling Swamp and travels very close to an NTEPA listed population of a near-threatened species.The *Ipomoea polpha* subsp. *Iatzii* (Giant Sweet Potato) population was not studied as part of this EIS. Combined with the species' delisting from the EPBC Act vulnerable species list in 2010 and the associated reasons for the amendment, the CLC believe that more information is required to determine what impact the project may have an on this isolated population. The species is mentioned in the EIS but no fieldwork sampling has been undertaken or a management plan set out to control risk to the species. The Giant sweet potato is an important food source for traditional Aboriginal owners and the CLC believes that a further study should be undertaken to determine strategies to protect the species. Further assessment should be undertaken to assess the risk from changes to surface water flows on the species as well as the Stirling Swamp | Refer response to Questions 14 and 315. |
| 343 | The EIS states that invertebrates have not been studied in the project area due to lack of historical data and few sampling tools available. This is a concern to the CLC as an invertebrate baseline study for the project provides a | There a no known or predicted threatened invertebrates from the study area, therefore no requirement based on database or |

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| | whole of ecosystem dimension to the study in assessing all potential risk posed by the project. | PMST results. NT standard fauna survey methods do not call for invertebrate surveys and the ToR do not request it. |
| 344 | With respect to the Haul Road route, it is noted that assessments undertaken were quadrat samples along a previous version of the route and the CLC is concerned that the current Haul Road corridor has not been sampled. | Quadrat sampling was undertaken in representative vegetation types with results then used to characterise the vegetation and flora of the study area. In addition a survey by helicopter of the access road allowed the entire alignment to be mapped. Additional targeted fauna surveys have been undertaken along the access road (Appendix C of the Supplement). |
| 345 | **Sites of Conservation Significance**<br>*- It encompasses the known extent of the near threatened Giant Sweet Potato (Ipomoea subsp. Latzii)…*<br>CLC Comment: The Giant Sweet Potato (*Ipomoea polpha subsp. latzii.*) was downgraded from the EPBC Act vulnerable species list in 2010. Some of the reasons given for this amendment were due to a large and stable population with no current potential threats. The construction of a haul road corridor with significant ground disturbance and the potential for surface water drainage changes is a threat to the species and should trigger re-assessment under the EPBC. It is noted that the flora survey for the EIS did not determine the current extent of the *Ipomoea* sp. or sample any quadrants in the vicinity of its known location. Threatened Species spatial data available from the Northern Territory Government shows the Haul road intersects the northern most portion of the mapped population of *Ipomoea polpha*. Further studies are needed. | Refer response to Questions 14 and 315. |
| 346 | **Field Survey**<br>*- Field survey of the proposed borefield, associated pipeline and access road and road base borrow pit areas were not undertaken as part of this assessment as the locations of these features were not known at the time of the survey.*<br>**Clearing**<br>*-The location and area of borrow pits still needs to be determined*<br>CLC Comment: The flora survey was undertaken in 2013 with the majority of sample quadrants set out along a previous route for the haul road. The Stirling swamp and Ipomoea distribution in the vicinity of the current haul road alignment has not been considered. The CLC recommends further biodiversity studies along the current haul road corridor. | Refer response to Questions 14 and 315. |
| 347 | **Predicted river and creek impacts on the access road**<br>*- There is no evidence of a single specific drainage line associated with Wood Duck Creek and surface flows in this vicinity are likely to present as sheet flow. Given the relatively long length of the crossing (~1,800 m) and the likely long duration of standing water, TNG intends to install regularly spaced culverts along this section of road.*<br>CLC Comment: The CLC recommends further study of the risk to sensitive ecosystems of changes to surface water drainage due to haul road construction plans. | The access road will be designed to avoid upstream ponding of surface water. This is partially to ensure that the integrity of the road is maintained. Drainage design will also ensure that overland flow is maintained to downstream vegetation. No additional study is warranted. |

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| 348 | **5-3-2 Risk Assessment Results**<br>*- Two high risks were identified as a result of the potential for groundwater drawdown from the borefield to impact phreatophytic vegetation (GW03, VF30).*<br>*- an additional flora survey to identify presence and distribution of phreatophytic vegetation*<br>*- GW-03 Impact on phreatophytic vegetation in the area of borefield groundwater drawdown*<br>CLC Comment:<br>A baseline riparian ecological study should be undertaken in conjunction with further hydrogeological studies to determine potential groundwater drawdown impacts to this ecological community. The CLC is concerned that significant trees may die over the long term and this would not be acceptable. | Potential impacts to phreatophytic vegetation have been identified (s3.2.4 and Appendix K of the Supplement).<br>Additional hydrogeological studies have also been undertaken (s 3.1.2 and Appendix D of the Supplement). |
| 349 | **7.1.2 Biodiversity Management Plan**<br>*- Flora survey to identify presence and distribution of phreatophytic vegetation and implement Borefield management strategy (if present): Prior to Borefield operation*<br>CLC Comment: Further studies are critical to the understanding of ecological communities at risk of ground water drawdown and should be undertaken in conjunction with hydrogeological assessment. | Refer response to Question 348. |
| 350 | **15.2.2 Nationally Threatened Species and Ecological Communities**<br>*- If bilby occur within the project area, the level of risk can be reduced…..:*<br>*a pre-clearance survey followed by staged vegetation clearing, undertaken during seasons that the bilby is less vulnerable*<br>CLC Comment: The information and actions recommended here require more detail. The CLC is sceptical that a staged clearance of vegetation provides a practical solution to protection of possible threatened and vulnerable fauna because once construction starts the project schedules take priority. | A targeted threatened species survey in November 2016 did not identify the Greater Bilby in any area to be impacted by the Project, despite extensive targeted searches of all areas of potentially suitable habitat (s3.2.3 and Appendix C of the Supplement).<br>Nonetheless, the updated Biodiversity Management Plan (Appendix I of the Supplement) identifies the possibility that this species could occur and commits to preclearance surveys of sandplain habitat prior to construction commencing. |
| 351 | **Appendix H – 4.4 Limitations of the baseline fauna survey**<br>*The fauna assessment focused on species of terrestrial vertebrate fauna (mammals, birds, reptiles and amphibians). Existing databases and species prediction tools are biased towards vertebrates. The occurrence of terrestrial invertebrates was not assessed. Unlike terrestrial vertebrate fauna, there are relatively few data or identification tools available for terrestrial invertebrates in the region.*<br>CLC Comment: It is unacceptable that invertebrate studies are not included for this project. The data deficiency or lack of identification tools should trigger a precautionary approach to establish at least a baseline understanding of invertebrates across the project footprint, particularly to provide key indicators for successful rehabilitation. | Refer response to Question 343. |
| 352 | **Aboriginal Culture**<br>Sacred sites are an integral part of traditional Aboriginal owners' custom and law and are an important aspect of their connection to country. Sacred sites are protected through the Aboriginal Land Rights (Northern Territory) Act | Refer response to Question E81. |

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| | 1976 and the Northern Territory Aboriginal Sacred Sites Act 1989. Traditional Aboriginal owner's expectations are that sacred sites will be protected. The CLC is very concerned about the risk of wall collapse posed to the sacred site within the exclusion zone bordering the mine pit. The geotechnical risk stated in the EIS is ranked as high, then as medium after management controls are applied. The CLC considers any risk to a sacred site as unacceptable and recommends re-assessment of mine planning so the risk is reduced to zero. | |
| 353 | Mud Hut Swamp is a culturally significant area outside of the immediate project footprint. However the CLC is concerned about the impact from possible groundwater depletion on the ecological and cultural values of the area given the lack of confidence in the groundwater modelling. | Refer response to Question 75. |
| 354 | Creeks and rivers in the project area are also of cultural significance and particularly the mature riparian trees growing along the waterways. Damage to these trees would cause considerable distress to traditional owners. Impacts on tree health from groundwater drawdown is of concern and mitigation steps proposed in this document should be taken. Construction of causeways for creek crossings at Murray Creek and the Hanson River must go no deeper than the current level of the creek or river track surface as required in Sacred Site Clearance Certificate 2015-034(SSCC2015-034) and **not** be excavated as proposed in the EIS (to a depth of 1000mm). | Refer response to Question E70 in relation to drawdown.<br>Refer response to Question 321 in relation to floodway crossings. |
| 355 | It is noted that the Giant Sweet potato is an important traditional food source still gathered. There is a population of the species that has potential to be at risk from road construction activities including borrow pits. The population should be protected. | Refer response to Questions 14 and 315.<br>The population occurs to the south of the access road (i.e. upstream) and will not be impacted. |
| 356 | The CLC supports the recommendation in the archaeological report that further field work should be undertaken along the amended haul road corridor. | Noted. |
| 357 | The EIS identifies no current or future substantial users of the water resources in the project area. The CLC however believes that traditional Aboriginal owners should be included in water management and planning including in relation to strategic indigenous water reserves for the Western Davenport Water Control District. | This is not a question for TNG. |
| 358 | **Appendix K**<br>**Table 5.5 Project Risk Assessment (by Aspect)**<br>*- HE05 Major open pit slope failure. Mitigation: Establish a geotechnical stability monitoring program for the sacred site situated near to the north eastern boundary of the pit. Residual Risk: Moderate.*<br>CLC Comment: The monitoring control stated here will not mitigate a wall failure if it occurs and that this risk will remain into the future beyond mine closure. The CLC requests consideration of an alternative mining plan. The CLC requests consideration be given to conservative pit wall design and blast engineering, coupled with pit expansion design restrictions. | Refer response to Question E81. |
| 359 | **7.1.3 Cultural Heritage Management**<br>*- Site works at the RWA will be undertaken in accordance with the CLC Clearance Certificate conditions including: Murray Creek and Hanson River RWA Construction of river crossing allowed for the Haul Road on the condition* | Refer response to Question 321 in relation to floodway crossings. |

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| | *the road goes no deeper than existing levels and works are supervised by traditional Aboriginal owners*<br>**2-8 Floodway detail**<br>CLC Comment: The plan shows the causeway depth of footing at 1000mm below current surface level of the creek/river beds. The CLC considers this causeway plan as contrary to SSCC conditions for Restricted Work Areas which states that causeway construction go no deeper than the current creek surface. | |
| 360 | **11.2.3 Consultation**<br>*- AM Consulting provided their draft report to CLC for community review comment, with feedback incorporated in the final report.*<br>CLC Comment:. A Draft Archaeological Report was not provided to CLC for comment. | TNG understands that a copy of the report has been provided to the CLC. The report was also provided with the Draft EIS (Volume II, Appendix K). |
| 361 | **9.4 Subsequent Design Changes**<br>*- The revised project design complies with Recommendation 1, and as per Recommendation 2, additional archaeological assessment in consultation with the Aboriginal community should be undertaken to assess the impact of the project on the new areas.*<br>CLC Comment:<br>Further archaeological studies and consultations are appropriate. | Engagement and participation will be undertaken and TNG will continue to work with the CLC and the TO's on these matters. |
| 362 | **Table 5.2 Commonwealth Legislation**<br>*- Aboriginal Land Rights (Northern Territory) Act: TNG has exploration licences and mineral leases granted by the Central Land Council.*<br>CLC Comment: The project titles are not subject to ALRA legislation and for clarification the CLC does not grant titles. | Noted. |
| 363 | **Waste and Hazardous Substances Management**<br>Waste and hazardous substance management is considered important for controlling the project's potential pollution impacts to the environment. The EIS set outs management plans for most potential pollutants but some information is missing. For example landfill management, waste tyres, oily water separation, waste hydrocarbon storage and bioremediation of contaminated soils. | Landfill management will be consistent with the Waste Management Guidelines for Small Communities in the Northern Territory.<br>Waste tyres will be used as delineators around the site (haul roads, WRD dump faces etc) or disposed within the WRD.<br>Volume III, Appendix N, sub Appendix F of the Draft EIS provides a Hazardous Substances Management Plan. This plan will be reviewed and, if necessary, updated as a component of the Mine Management Plan.<br>The bioremediation facility is discussed in the response to Question 326. |
| 364 | The CLC has concerns about hydrocarbon management through the construction and operational stages. There is mention of a Construction Environmental Management Plan (CEMP) although the EIS does not set out any detail. | A CEMP has not been prepared for the Project but will be submitted as a component of the Mining Management Plan. |

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| | Storage of hydrocarbons or contaminated containers at the Land fill should be avoided and be restricted to suitably bunded facilities. Oily water separation and management practice at vehicle wash down bays and within bunded areas is not clear. | Waste and hazardous materials management are addressed in the response to Questions 326 and 363. |
| 365 | The CLC is concerned that sufficient detail is not included in the EIS for the management of hydrocarbon waste including contaminated material and oily water. A contaminated soil bioremediation facility is mentioned in the EIS but no location or management plan are specified. | Refer responses to Questions 326 and 363. |
| 366 | The CLC notes that proposed landfill management procedures vary throughout the EIS. For example the EIS referenced NTEPA 2009 Guidelines for Small Community Landfills which recommend not burning as best practice. Yet the proposed management practice for the mine is to burn waste. This is unacceptable and the better practice is to dispose of suitable waste in trenches and to cover the tip face weekly. Fauna and feral animal control measures such as fencing should also be adopted. | Refer response to Question 326. |
| 367 | The proposed management of waste tyres requires more detail. | Waste tyres will be used as delineators around the site (haul roads, WRD dump faces etc) or disposed within the WRD. |
| 368 | **Landfill**<br>**7.1.2 Biodiversity Management Plan**<br>*- Wastes will be managed to prevent/reduce interaction with fauna. Waste management includes: -Regular burns of the landfill*<br>**7-1-4 Fire MGMT Plan**<br>*- Controlled burns are held at the landfill site as necessary to control amount of putrescible and windblown waste.*<br>**7.1.6 Non-mineralised Waste Management Plan**<br>*- Close landfill during the burning of wastes to reduce impact to human health (related to dioxins, sulphur dioxide, lead and mercury).*<br>**Waste Management Guidelines for Small Communities in the Northern Territory Working Towards Best Practice 2009**<br>**1.05 Burning of Waste**<br>*- Burning wastes changes otherwise safe materials (such as plastic) into dangerous toxic emissions and ash, including: dioxins; sulphur dioxide; lead; and mercury which may adversely impact on public health and the environment.*<br>*- Best Practice Statement: "Waste is not burnt in communities"*<br>**Risk Assessment**<br>*- GW-10 Liquid and solid waste disposal.*<br>*- Organic waste buried in an on-site landfill* | Refer response to Question 326. |
| 369 | **Table 3-1 Key Activities, Risks and Impacts** | Refer response to Question 326. |

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| | *- Loss of control leading to bushfire and subsequent loss of flora and fauna*<br>CLC Comment: The burning of waste at the landfill in terms of the risk of pollution is not assessed in the EIS. The referenced guideline documents recommend NOT burning waste as best practice. The CLC recommends alternatives to burning of waste are considered to control fauna and feral animal interactions at the facility, for example land fill site fencing, trench tipping and daily covering of waste with soil. More detailed information should be made available as to location and management plans for the facility including comprehensive risk assessment. | The location of the onsite landfill still needs to be determined. The site will be selected to avoid drainage lines and significant vegetation. A Landfill Management Plan will be prepared and submitted as a component of the Mine Management Plan. |
| 370 | **Hazardous Substances Management**<br>*Release of hydrocarbons due to a spill at the mine site.*<br>*- Waste hydrocarbons will be stored in a tank within a bunded area to be held for collection by a contractor for reprocess and recycling*<br>*Storage, handling and transport of hazardous materials*<br>*- Waste oil stored in tank within bunded area and held for collection by contractor for reprocessing and recycling. Diesel stored in self bunded tanks.*<br>*- Regular inspections of storages, tanks and bulk containers and the integrity of bunded areas and containment systems*<br>**-1-5 Hazardous Substances Plan**<br>*- Storage of IBCs at the landfill will not exceed 1,000 L at any one time.*<br>CLC Comment:<br>Waste hydrocarbon storage in bunded tanks is discussed but does not transfer to detail in management plans. More detail is expected on integrity checks and general monitoring | Volume III, Appendix N, sub Appendix F of the Draft EIS provides a Hazardous Substances Management Plan. This plan will be reviewed and, if necessary, updated as a component of the Mine Management Plan. |
| 371 | **APP F Hazardous Substance Management Plan**<br>**2.3 Management and Monitoring**<br>CLC Comment: The EIS does not detail oily-water separation at vehicle wash down bays, hydrocarbon storage sumps, drainage systems for vehicle workshops or other areas dealing with contaminated water. Monitoring of these areas is required to manage potential for pollution. | Refer response to Question 370. |