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21<sup>st</sup> February 2020

Mode of delivery  
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21<sup>st</sup> February 2020

Dear Environmental Assessment Unit.

## **Re: Draft Environmental Impact Statement, Darwin Processing Facility – TNG Limited**

The Environment Centre NT (ECNT) is the peak community sector environment organisation in the Northern Territory raising awareness amongst community, government, business and industry about environmental issues. We assist people to reduce their environmental impact and support community members to participate in decision making processes and action. ECNT welcomes the opportunity to comment on the TNG Limited (TNG) Darwin Processing Facility (the Project).

The ECNT is concerned about the significant environmental impact of this Project as presented in the Draft Environmental Impact Statement (EIS), particularly regarding the large volume of water extraction required for process input and the large volume of post- process contaminated water discharge to Darwin Harbour. We maintain that the management hierarchies have not been adequately applied in this EIS. It is a fundamental flaw that consideration to reusing and recycling the process water has not been offered as a feasible alternative.

### **Terms of Reference**

We have identified the following significant areas where we believe the EIS does not address the Terms of Reference (TOR) identified for this project:

1. **Alternatives** – The TNG EIS does not adequately describe feasible alternatives to processing methods particularly regarding the use of alternative sources and re-use opportunities for water. The TOR identified the need for alternatives to be presented that will reduce net water use. The EIS simply identifies Darwin Water Supply as the water source at a rate of up to 13 GL per year.
2. **Waste Management** – The EIS has not identified alternatives to discharging the contaminated waste stream into the Darwin Harbour. It has failed to apply the waste management hierarchy of avoid, minimise, re-use, recycle, recovery and appears to go directly to treatment and disposal of the waste stream.
3. **Assessment of risks** – This EIS has failed to adequately identify the risks for the water discharge waste stream. The approach of seeking an approved discharge level for contaminants and then retrospectively designing the treatment plant to meet the requirements is unacceptable and means that the risks of the Proposal can not be assessed. The period of model data selection in the EIS of four weeks of a wet season in 2016 and four weeks of a dry season in 2019 does not consider inter-annual variability in water movement in the harbour, especially given recent ‘dry wet’ seasons. This missing data renders the hydrodynamic modelling of the discharge and the pollutant outfall as unreliable and the risk unable to be assessed. The absence of ‘whole effluent toxicity’ testing results means there are no details of how the chemicals in the waste discharge will

interact with the environment nor whether the collective mixture will be more toxic than the individual components. It is also not possible to assess the cumulative impact of heavy metal build up in the Darwin Harbour. Again the risk to the Darwin Harbour from the discharge chemicals and metals are unable to be assessed.

The only time the Proposal considers the alternatives in design or operating parameters is in their 'contingency management frameworks' in figures 7-23 to 7-26 pages 201 to 207 of the EIS main report. If their management triggers are exceeded regarding the wastewater then as 'corrective actions' they will consider extra processing trains to achieve greater levels of water treatment. Other corrective options also include redirecting the wastewater back through the process for further treatment or consider wastewater options onsite. This is a totally inadequate and an incorrect approach. These alternatives should be considered upfront, the preferred option should be clearly explained, including how it complies with the principles ecological sustainable development. The Proponent should seek to avoid impacts of their Project as a priority.

### **Approval and Regulatory Framework**

The EIS has identified that following the commencement of the *Environment Protection Act 2019 (EP Act)* the Project will require an environmental approval from the Minister for Environment and Natural Resources (the Minister) in accordance with section 301 of the EP Act. Under section 73 of the EP Act, in deciding on whether to grant an environmental approval, the Minister will need to be satisfied that the community has been consulted on the potential environmental impacts of this Project and the significant impacts have been appropriately avoided, mitigated and managed. We maintain that the EIS has not adequately demonstrated how the chemicals in the wastewater will interact with the environment, their cumulative effect and what the impact of the collective mixture will be. Without this knowledge the community cannot comment on the potential environmental impacts of the project. If the risks and impacts cannot be adequately identified, then meaningful consultation is not possible. Nor can the impacts from the Project be avoided or mitigated nor appropriately managed. We submit that if further information outside of the supplementary submission process is provided that addresses the potential environmental impacts of this Project and how the significant impacts have been appropriately avoided, mitigated and managed, then this information needs to be provided for comment to the community to satisfy the condition of adequate consultation. If the Proponent chooses to significantly alter the project, for example by changing the process method to reuse and recycle the wastewater, then we maintain this is a significant variation and must be referred as an action needing assessment under the EP Act.

### **Consultation**

We assert that consultation has been minimal for this project. ECNT received a briefing on this project to ascertain our 'potential interest areas'. It was at our insistence and organising that the Project was presented to the Darwin Harbour Advisory Committee, that included industry and community groups. A significant number of community and industry stakeholders identified have not directly and adequately been consulted.

### **Key Environmental Factors**

#### **Terrestrial Environmental Quality**

##### Acid Sulfate Soils

We note that that Acid Sulfate Soils (ASS) were detected at numerous sites. The estimated time frame for initial construction is approximately 2 years, with erosion and sedimentation risks expected to be the highest during the construction phase of the project. This means that a large portion of the 'industrial area'

will leave the soils exposed to increase run off and may generate acid from oxidation of sulphide minerals (generation of ASS), that may result in a degradation of groundwater quality. The EIS maintains that with proper management sedimentation and erosion will not present a long term significant impact. We note that there may be an impact in the short term particularly given the risk of the area to be impacted by increased storm surge activity as shown in figure 7-1. In the erosion and sediment control plan (ESCP – Appendix N) there is a recommendation for a diversion bund around the site infrastructure to be implemented. The freeboard or spillways in place must be adequate to capture the sediment/drainage to reduce the impact mangroves and waterways.

### **Terrestrial Flora**

The EIS identifies the loss of 84 hectares of high quality native vegetation and indicates an unspecified area to be rehabilitated. There is an area of Lot 1817 to the west of the main development site that is outside of the development envelope. This area has the potential to be zoned conservation with a wide mangrove protection zone. Offset funds could be allocated to enable the management of this conservation site.

The EIS identifies suitable habitat for the *Typhonium praetermissum* (recognised under the *Territory Parks and Wildlife Conservation Act (TPWC Act)* as vulnerable) on the Project site but failed to locate these species in the Study area. We contend that the methodology to locate this species was flawed and that further onsite studies need to occur. Whilst the study period of February was an ideal time to locate the species, identification should have been via a vegetative survey of the leaf material and a genetic analysis rather than relying on flowering material and habitat. There is no evidence to suggest they visited a reference site nor that they performed an intensive habitat survey with close transects of 2 -5 metre spacing.

#### Recommendation

Further onsite surveys are needed to determine the presence or lack thereof for the *Typhonium praetermissum*

### **Marine Environmental Quality**

As asserted above we maintain that the EIS does not provide adequate information to assess the impact and risk to the Darwin Harbour and the marine environmental quality. The information that has been provided raises significant and serious inadequacies of the Project that are unacceptable. The EIS should identify the bioabsorption of heavy metals. By their very nature heavy metals don't disappear, they are taken up by the system somehow be it in the sediment, plants or animals. Understanding their discharge concentrations relative to the surrounding environment is important is vital.

We raise specific concerns as follows:

#### Appendix O: Technical report for hydrodynamic modelling of discharge

On page 31-32 the period of model data selection only uses one year and identifies that data is missing during the period. This reduces the reliability of the data. Page 34 details the modelling validation dates (wet season 05 January 2016 –05 February 2016 and dry season 01 April 2019 – 30 April 2019 and 20 June 2019 – 20 July 2019) are essentially the same as those used to develop the modelling (p 31-32 wet season 01 January 2016 – 31 January 2016, dry season 20 June – 20 July 2019 for wind and April 2019 for water). This is a very poor method of model validation as it means they are essentially checking that the model matches the data being inputted, rather than data from a different time period that you are trying to estimate using the model.

The Project will use an outfall to discharge 12 GL/year of treated process water into the Darwin Harbour. The company believes that the tidal processes in East Arm will adequately dilute the waste discharged from its outfall, but 'Darwin Harbour is poorly flushed, especially in the dry season when the residence time in the upper reaches is of the order of 20 days' because of the 'complex bathymetry of headlands and embayments generate complex currents comprising jets, eddies, and stagnation zones that can trap pollutants inshore'... 'The environment in Darwin Harbour has the potential to degrade and the water circulation in the harbour must be considered when planning developments'.<sup>1</sup>

#### Appendix P: Technical report for pollutant outfall modelling

This modelling is based on the modelling down in Appendix O so brings across the problem identified above. Detail on page 28 states that "The results confirm that whilst the background level of tracer has increased over the one-month seasonal scenarios, for the longer-term model cases (6-months) there is an equilibrium reached where the background level reaches stability for the locations examined in East Arm, upstream Elizabeth River and sites in Darwin Harbour." This means that the activity will permanently increase the salinity and temperature of the waters surrounding the discharge location. More than 6 months needs to be modelled to understand inter-annual variability in water movement in the harbour given our recent very 'dry wet' seasons.

#### Appendix Q: Technical report for marine environmental quality

As stated on page 30 the "Water samples collected by O2M along Elizabeth River provided results that only detected aluminium and manganese." This means that baseline studies have not yet been conducted for chemicals that we already know will be a component of the wastewater discharge.

#### Appendix R: Marine environmental quality monitoring and management plan

Limits of acceptable change on page 16 has interpreted "No change to natural values" as being the same as "within the limits of natural variation". This is problematic as you can have high natural variability where for example you have very high salinity for short periods of time. However, if the salinity in the area permanent shifts to that high end, it will still be within natural variability but have a significant impact on the environment and organisms adapted to cope with occasional high salinity but not a permanent shift.

The table 3.5 on page 23 seems to fundamentally misinterpret ANZECC Guidelines – it appears to suggest that the proponent can define an area of currently unimpacted waters as high impact under the project scenario and then say the ANZECC guidelines assumes pollutants at a certain level are acceptable. This is not the ANZECC guideline process. The EIS needs to identify the existing environment and ensure that the Project stays within an acceptable range of that.

It is stated on page 27 that the "Whole effluent toxicity (WET) testing results are not yet available for interpretation and application to the development of specific EQS, however Section 4.3.4 defines the process of collecting WET testing results and their application to establishing EQS". This suggests the EIS has not determined how the chemicals in the waste water will interact in the environment and whether the collective mixture will be more toxic than the individual components. TNG are not proposing to do this until the facility has effectively been commissioned. The full impacts would therefore be unknown until after the facility has been constructed.

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<sup>1</sup> Williams D, Wolanski E and Spagnol S 2006, p.475. Hydrodynamics of Darwin Harbour

The ongoing Marine Environmental Quality Monitoring detailed on page 60 is proposed to be done annually, this is completely inadequate and should be done at least monthly. The monitoring results must also be publicly released.

In conclusion, the risks and impact of this Proposal can not be adequately assessed. What has been presented raises significant concerns about the impact particularly to the marine environmental quality.

We look forward to being further consulted on this Project.

Yours Sincerely

A handwritten signature in black ink, appearing to read 'Shar Molloy', with a large, stylized flourish underneath.

Shar Molloy  
Director