16. Draft EIS Section 13 Economic and Land Use Impacts

16.1 Section 13.1 Introduction

NTG 90: This section should include the disturbance or destruction of sacred sites as elsewhere in the EIS there is an indication of possible damage to WALPINHTHI REEF, a sacred site may be damaged.

NTG 90: Discuss the disturbance or destruction of sacred sites in terms of economic and land use impacts.

No destruction or disturbance to sacred sites will occur. It is possible that the laybarge will need to anchor in the vicinity of Walpinhthi Reef during the pipelay operations. The barge will not anchor on the physical hard structure of the reef. The reader is also directed to the response to **NTG 66a** and **b** (**Section 12.4**), **NTG 41b** (**Section 8.3**) and **OEH 67** (**Section 12.4.1**).

16.2 Section 13.3 Infrastructure and Transport

NTG 91: The EIS acknowledges the potential for damage to existing road surfaces from heavy vehicles accessing the site during construction (13.3). However, the need to maintain road pavement at or above existing levels is not mentioned in the preventative and management measures in this section (although this issue is picked up in the Framework Traffic EMP Table 15-17).

The proponent should recognise that there are particular sacred site problems regarding the Daly – Wadeye access road.

NTG 91a: Discuss the need to maintain road pavement at or above existing levels.

NTG 91b: Discuss issues relating to sacred sites regarding the Daly – Wadeye access road.

The Proponent is aware that there needs to be consultations regarding any alterations to the Wadeye to Daly River Road and any potential impacts on sacred sites. The Proponent therefore proposes that this consultation be undertaken during the dry season of 2005. Traffic associated with construction of the onshore gas plant during this time on existing roads would not represent a significant increase in current levels. The Proponent would proposes to undertake the necessary level of works to roads which would be impacted to allow for the project to be constructed, and to leave the roads in no worse condition after construction than they currently are.

NLC 65: P. 454 the EIS does not satisfactorily identify and deal with the road safety issues, which will arise with, increased traffic.

NLC 65: Identify the road safety issues which will arise from the increased traffic.

These issues will be discussed in the Traffic Management Plan (refer to **Appendix B** to this Supplement).

Development of Unofficial Highways

NTG 120: The issue of preventing the pipeline corridor from developing into an unofficial access way is identified but no solution to preventing such a development is provided. The proponent may have seen this as more of an issue with the Trans Territory pipeline but there is a proposed corridor from the plant to the beach which would not otherwise exist. The development of that access way into a thoroughfare is not addressed.

NTG 120: The issue of preventing the pipeline corridor from developing into an unofficial access way is identified but no solution to preventing such a development is provided.

The proposed pipeline corridor from the beach to the gas plant will not be accessible from the existing tracks and is highly unlikely to turn into an "unofficial highway. The corridor is only likely to be used for pipeline inspection purposes during operation.

There are already a number of more existing tracks leading north–south along the beach and east–west from the beach. Furthermore, the pipeline route will be rehabilitated which will make the corridor largely unsuitable for driving.

Traffic Management Plan

NLC 3: The EIS fails to recognise the high level of social impact and safety issues that a radical increase in road use between Daly River and Wadeye (900%) will bring to the region and the physical impact on the current road surface. The EIS advises simplistically that impacts will only occur during the dry season (ES page 12) knowing that this the only time of the year when local people can travel by vehicle with any assurance of arriving at their destination.

As senior Yek Diminhin traditional owners have commented to the NLC:

"Its important that we understand the humbug that will be created on this road for two years. No good just humbug for two years and leave the road as it is now…what benefit in that?"

All road traffic associated with the Blacktip gas Plant project has to travel through the Daly River Crossing which in the dry season is occupied by tourists camping in the confined space at the crossing. The road, (better described as River sand heaps graded out with some flagging,) travels directly through the area allocated for camping. The impact of construction traffic for the TTP Pipeline is greater than the gas plant and accumulative total vehicle movements will prohibit the safe camping use of the crossing by the NT people and tourist's who visit the camping area each year.

This matter will need to be addressed well before the first dry season, taking into account it will occur for three dry seasons.

There is no quantitative data on truck movements or advice on current pavement quality along the main road, yet the Social Impact Assessment carried out early in 2004 identified the risk of increase in injury and death during the construction period. "Disruption" is the term used in the EIS to describe impacts on local users. The NLC at this stage of the project considers the numerous large vehicle movements required for the Blacktip and the Yelcherr Beach to Gove gas pipeline would create a real risk of road accidents involving local drivers potentially resulting in severe injury or death. This amounts to more than "disruption" mentioned in the EIS.

The NLC advised Woodside prior to submission of their Draft EIS that "there were no numbers presented of large truck movements or their impact on the road surface or any statements on road upgrading, only advice about maintaining the current road surface. Much of the main road surface would be reduced to thick bulldust in areas of minimal sheeting by the truck movements creating unsafe conditions for other road users. Page 465 advises that vehicle speeds would be kept to as low as possible to reduce dust impact. This management method would impact on local users by increasing travel times. The EIS needs to consider whether overall access road upgrading is an optimum economic and social means of substantially contributing to reducing impacts on the road and other users. The EIS on page 120 advises that a road study will be undertaken for Blacktip and incorporated into the EIS once available. Page 431 recognises the combined impact on road surface and road users by concurrent construction of the proposed gas pipeline to Gove. Heavy use of the pipeline ROW moves some traffic issues elsewhere but also means the ROW would need a higher standard of upkeep then simply maintaining a graded surface i.e. greater expense for pipeline construction. Increased ROW use for the pipeline project potentially moves costs from the Blacktip Project to the pipeline project."

The above advice on road impacts and road upgrading have been ignored-not even dismissed as irrelevant. It is possible the EIS treats road traffic management and road use impacts at a shallow level at this stage of project development for political and financial reasons. Woodside may have fair commercial reasons for doing so but not if failure to disclose the real potential impacts of traffic increase for proper analysis by stakeholders potentially threatens the well being of other road users.

The EIS does not recognise that increased traffic on the Daly River to Wadeye road and other roads will pose a significant safety risk to local residents using these roads.

Quantitative data on truck movements allied with the gas pipeline project, their impacts on other road users and road surfaces and management strategies should be provided and analysed by Woodside and a Traffic and Road Management Plan agreed with stakeholders before any approval of the final EIS.

Clearly, the combined effect from the Daly River crossing to Wadeye of road use for the purposes of construction of both the Blacktip Project and the Trans Territory Pipeline will, over a period of two years have a significant and substantial disruptive and negative social and economic impact for current road users. Anyone travelling for family or domestic purposes, anyone travelling for work related purposes, any travel associated with existing commercial or service industries or agencies will all be affected by what could well be a three fold increase in travel time. This is major regional disruption. Commercial entities and service agencies will need to plan how they will operate in this new travel context and may need to examine the economic implications. Neither the SIA report nor this Draft EIS appropriately recognises or quantifies this impact.

NLC 3: Discuss the planned traffic management, road upgrade and maintenance plans, providing a quantitative description of the likely increase in traffic contributed by this project.

The Blacktip Project does not have the resources or mandate to undertake improvements to the Port Keats road. However, the Blacktip Project has an allowance to undertake some maintenance of the Port Keats road. This will be done with consultation with the NT roads division and the local communities.

The project has developed a Traffic Management Plan (**Appendix B** at the end of the Supplement) to cover the safety issues related to road transport, this plan will be expanded by the Contractors and a community education/awareness campaign will be conducted.

Flaring

NTG 117: The following issues related to flaring should be addressed:

- impacts on aircraft movements utilising Wadeye air strip;
- control of air traffic at Wadeye; and
- coordination for aircraft movements if flare operation is an issue.

NTG 117: Address impacts of flaring on aircraft movements, control of air traffic at Wadeye and coordination for aircraft movements if flare operation is an issue.

As stated in response to **NTG 16b** (**Section 7.3.7**), flaring is not expected to have any significant impacts on aircraft movements on Wadeye Airstrip. However, given that the heights of the flares could be quite substantial on some occasions some low-level risks associated with the following aspects of flaring are identified:

- Flare exhaust gases and particulate matter may be ingested into aircraft engines reducing engine performance to some extent.
- There may be some reduction in pilot-visibility due to smoke plumes.
- There is a possibility that, from a distance, pilots may confuse flaring with an aeronautical beacon.

For the reasons listed above the flaring regime will be properly communicated to the aeronautical community via Airservices Australia. Subsequently, if deemed necessary the relevant aeronautical authorities would publish notices of the hazards for pilots.

The gas plant flare should have no impact on aircraft movements at Wadeye airstrip.

16.3 Section 13.9 Aboriginal Heritage

NTG 92: The term, "Aboriginal sensitive cultural sites" should be replaced with "sacred sites". Some discussion of the requirements of the *NTASSA*, the definition of a sacred site and the Authority Certificate process and the particular arrangements with regard to the issue of Authority Certificates between the Northern Land Council and the AAPA would be appropriate here.

Potential Impacts on Sacred Sites (Page 459)

All raw material sources require Authority Certificates. Restricted areas should be placed on maps so they can be avoided. The report indicates, "… the near-shore export pipeline laying activities may impact the area in the vicinity of the off-shore WALPINHTHI REEF". This contravenes earlier statements that the pipeline route was positioned deliberately to avoid sensitive areas. There needs to be specific discussion of the potential for disturbance, the nature of disturbance, an assessment of any possible special mitigation measures. This includes the consideration of alternative routes that avoid any damage to the WALPINHTHI REEF.

The EIS states that:

"Discussions with traditional owners and anthropological surveys were undertaken and the proposed pipeline route and on-shore gas plant location were positioned deliberately to avoid sensitive areas". If this is the case, then explanation is required about assertions in other sections of the report that the WALPINHTHI REEF could be damaged.

NTG 92a: The term, "Aboriginal sensitive cultural sites" should be replaced with "sacred sites".

NTG 92b: Discuss the requirements of the NTASSA and the particular between the NLC and the AAPA.

NTG 92c: Discuss the potential for disturbance, the nature of disturbance, an assessment of any possible special mitigation measures for the collection of raw material.

The reader is directed to the response to **NTG 66a** and **b** (**Section 12.4**) and **OEH 67** (**Section 12.4.1**).

Table 13.1 – Summary of Economics of Land Use Impacts - Preservation and Management Measures (Page 469)

NTG 93: The site protection processes for the consultation stage requires more discussion and clarification in the EIS. The report also states that consultation will take place with traditional owners to agree on appropriate mitigation measures associated with the potential disturbance to WALPINHTHI REEF during the off-shore pipeline installation. This contradicts earlier assertions that the proposed pipeline route was positioned deliberately to avoid sensitive areas. Again, discussion is required on possible routes away from the reef.

Aboriginal Heritage

Authority Certificates are necessary for all earth-disturbing activities.

NLC 9: Aboriginal Cultural Sites

The EIS advises that great care was taken to avoid disturbance to any sites during the planning and site selection phase of the project. This assertion is contradicted by two and perhaps three examples where project proposals encroach on sites in the area already advised to Woodside by the NLC. In this respect the Draft EIS is misleading concerning Woodside's intentions for sites in the area. Woodside need to explain its intentions. (The NTG AAPA has received an application from Woodside for a construction approval certificate. The AAPA will need to be satisfied before issue of a certificate that all site clearances and issues have been resolved to the traditional owners and the NLC's satisfaction).

At section 4.5.4 the Draft EIS advises that:

"It will be necessary for the laybarge to anchor in several different locations in the nearshore area. As illustrated on Figure 4-8, this will require anchoring within the boundary of a site known as Walpinhthi Reef identified as being culturally sensitive (Section 9 & 13)".

The NLC is not satisfied that it is technically necessary for the laybarge to anchor within the restricted area boundary and advises that traditional Aboriginal owners are unlikely to wish to compromise the integrity of their sacred site.

NTG 93: Discuss the site protection processes for the consultation stage and possible routes for the offshore pipeline away from Walpinhthi Reef.

NLC 9a: Explain intentions with regards to avoiding disturbance of sacred sites.

NLC 9b: Provide further technical information justifying the need for the laybarge to anchor within the restricted area boundary.

The reader is directed to the responses to **NTG 41b** (**Section 8.3**), **NTG 42** (**Section 8.4**) and **OEH 67** (**Section 12.4.1**). Further information is provided below to explain the required positions of the anchors with respect to the laybarge.

The Proponent has examined in detail all the prospective laybarges that may be offered to perform the offshore pipeline installation work. In essence, they all have similar anchoring system characteristics. In general they are fitted with 8 to 12 No. 40–50T capacity winches with anchor wire sizes in the range of 44 to 52 mm diameter. The breasting anchors are placed on the port and starboard side of the barge and provide lateral restrain to the barge as it moves forward and lays the pipeline. Due to the strong tidal currents in the area and the 'sail' size of the barge, it will be subjected to a significant lateral loading from these currents and therefore the breasting anchors will be crucial in maintaining the position of the barge and therefore the safety of all personnel on board. The Proponent has used proprietary software to perform catenary calculations to demonstrate where the anchors need to be positioned in relation to the barge to ensure that they are able to provide the necessary holding force. The anchor wires must be a minimum length from the barge to the anchor under this loading to ensure that there is no vertical force imparted onto the anchor which would break it out of the seabed with the result being all holding force would be lost. The Proponent's calculations reveal that this minimum length needs to be 500 m in this location.

ECNT 18: Nearshore export pipe laying activities may impact the area in the vicinity of the offshore Walpinhthi Reef. There are no details provided as to the level of impact on the reef yet it is acknowledged that this is a sensitive Aboriginal cultural site (13.9. Aboriginal Heritage, p459). Discussion of what might be part of the Cultural Heritage Management Plan is somewhat vague. Will Woodside support projects to strengthen environmental cultural values, knowledge and practices or not? (13.10.3. Summary of Impacts and Management Measures, p464).

ECNT 18a: There are no details provided as to the level of impact on Walpinhthi Reef yet it is acknowledged that this is a sensitive Aboriginal cultural site.

ECNT 18b: Clarify details of the Cultural Heritage Management and discuss projects to strengthen environmental cultural values, knowledge and practices.

The Draft EIS lists a range of potential strategies and actions and associated key goals that have been recommended by the Consultant who undertook the study. A detailed set of proposals will be included in the Cultural Heritage Management Plan, after further consultation with the traditional Aboriginal owners. These will include due consideration of the matters raised by the Consultant.

In addition to the Cultural Heritage Management Plan, the SIMP and EMPs will contribute to the protection, maintenance and enhancement of indigenous cultural values.

The reader is also directed to the response to **NTG 10** (**Section 7.3.3**), **NTG 66b** (**Section 12.4**), **NTG 41b** (**Section 8.3**), **OEH 67** (**Section 12.4.1**) and **NTG 42** (**Section 8.4**).

16.4 Section 13.12 Economic Environment

ECNT 19: The EIS does not say how much employment will be generated (13.12. Economic Environment, p465). However it is stated that there will be only a minimal number of fulltime jobs after the construction phase (Exec Summary, pES2). Only 12% of the predicted $450 million in capital will be spent in the NT. The revenue benefits to the Australian economy during operations are not even quantified (13.12. Economic Environment, p466).

ECNT 19: Quantify the economic benefits to the local community, the Northern Territory and the Australian economy, including the level of employment which is likely to be generated.

In 2004, the Blacktip and the Trans Territory Pipeline Projects provided the NT Government with a report on the summary of the economic benefits of both projects. This study was conducted by a leading consultant – ACIL Tasman. Details on economic benefits and employment are contained in the Report.

NLC 7: Employment and Training

The EIS places T & E in Woodside's proposed Social Impact Management Plan (SIMP) and is made a part of a consultation programme it wishes to implement. As much as a SIMP may monitor the impact or benefit of a T & E Plan, it should not be carried in the SIMP consultation process-it is a far too important an issue to be caged in a proposed Woodside controlled process for SIMP development.

Indigenous employment & training is not adequately covered to the detail sought by the EIS guidelines. T&E is a fundamental social and economic issue and the EIS does not even describe basic timing factors that would affect the success or failure of any T & E programme for indigenous people, matters already covered by the NLC with Woodside. Eg a minimum of 6 months lead-time is needed before construction is scheduled before construction is planned. The Woodside Project Schedule has onshore plant construction planned for Q2 and Q3 of 2005 and no T & E plan is in place despite NLC urging. Either Woodside is not serious about its Timetable or is not serious about T & E or hopes to pass T & E onto a contractor or an assignee.

The EIS guidelines seek that local indigenous employment be addressed. While the EIS recognises the success of the TCA-NLC targeted training programmes in the construction of the Alice Springs to Darwin railway (p33 Vol 1) it does not mention any potential arrangement involving this training scheme.

It would be useful if the EIS had presented a graph of the expected workforce numbers over the construction and operation period and a broad breakdown of positions and skills needed to fill those positions.

NLC 7: Provide further detail on indigenous employment & training.

The reader is directed to the response to **OEH 60a** (**Section 5.2.1**).

NLC 27: Page 32. The EIS claims socio-economic benefits to/for remote areas of the NT and indigenous communities. These potential long-term benefits have not crystallised for indigenous people from the direction of the proponents. Gas to communities from the Blacktip field has no net benefit to communities and initial public offers to indigenous people of supply of gas to their communities were withdrawn to TOs in the field due to problems with Blacktip gas reserves. The infrastructure associated with the Blacktip and the Wadeye to Gove gas pipeline offer no special infrastructure spin-offs to indigenous communities. For example, road use during construction would impact heavily on indigenous road users, but there are no offers to leave better roads behind after the project or even a proposal to promote such a policy in Government to enhance economic development through better communications. It has been left to indigenous people themselves to attempt to create potential economic benefits or value adding projects associated with this project. Eg substantial indigenous equity in the gas pipeline, sealing of the Daly River to Wadeye road and a bridge over the Daly River.

The proponents write about employment and training for indigenous people yet its project time lines and lack of substance in the EIS on T & E actioning work against success in this important area of social and economic development for indigenous people.

NLC 27: The infrastructure associated with the Blacktip and the Wadeye to Gove gas pipeline offer no special infrastructure spin-offs to indigenous communities. More detail and quantification of the socio-economic benefits of this project to the indigenous people of the area is required.

The Proponent has maintained a consistent position on infrastructure requirements for the project. The construction of a sealed road and bridge from the Daly River to Wadeye is not required for the construction and operation of the proposed gas plant near Wadeye. The cost of this level of infrastructure is very significant and would make the Blacktip Project uneconomic.

As the project has not yet been approved by traditional Aboriginal landowners, governments or the proponents, the NLC's statement about 'long term benefits to indigenous communities not being crystallised' is nonsensical. Negotiations with the NLC regarding the terms and conditions for the grant of land for the project will indubitably result in long term benefits to communities and, it should be noted, that the NLC submission was prepared in November 2004, ahead of substantive progress in this regard during December 2004.

It needs to be formally recorded that there were no commitments or promises made by the Proponent to supply gas to communities from the Blacktip field, nor were such offers withdrawn "…due to problems with the Blacktip reserves." It is a fact that during the 2001 consultations undertaken by Alcan in Arnhem Land and in the production of their 'Gas to Gove' video, statements were made committing that gas would be supplied to communities. At the time, Alcan was considering a range of gas suppliers and so, assuming that sales contracts were entered into with the Power and Water Corporation for such supply, it was a real possibility.

When the Heads of Agreement between Alcan and the Proponent for the supply of gas from Blacktip was concluded and community consultation commenced in July 2003, the position of the Trans Territory Pipeline Project proponent was that there remained the possibility of gas supply to communities, subject to decisions by the Power and Water Corporation to convert remote community power supply to gas and then enter into sales contracts with the Trans Territory Pipeline Project.

The Proponent's position has always been that the Blacktip reserves have been solely earmarked for sale to Alcan at Gove.

The reader is also directed to the response to **OEH 60a** (**Section 5.2.1**).

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17. Draft EIS Section 14 Social Impact Assessment

OEH 61: The Social Impact Management Plan (SIMP) is intended to address potential social impacts identified in the Draft EIS Social Impact Assessment and during a two-day workshop, which was to be held in Wadeye. It is assumed that this workshop has not been conducted. It is requested that the appropriate assessment officer from this Office be invited to attend the workshop. Since timelines for the beginning of construction are tight following approval, it is advised that the Draft SIMP be provided with the Supplement to facilitate a comprehensive review of the document prior to finalisation.

OEH 61: Details are required on the outcomes of a two-day workshop which was to be held in Wadeye.

It would be the Proponent's intention to include all relevant stakeholders in workshops and consultations. It is expected that a draft SIMP will be prepared by the end of the 1st Quarter 2005.

ECNT 6: No Social Impact Management Plan (SIMP) is in place yet. There are a lot of social impacts identified that will have negative consequences as well as there being obvious deficiencies in consultation processes. There seems little reason for confidence that a further 2 day workshop, leading to the development of an SIMP, will adequately address these issues. Again one has to question the speedy approvals process for this and related projects (14. Social Impact Assessment, p471-475).

ECNT 6: Address further the social impacts of the project.

It should be noted that the proposed two day workshop was only a part of the proposed SIMP development process. The proponent views social impact management as an ongoing process.

NTG 94: General: The apparent delay in completing the Social Impact Management Plan (SIMP) is of concern. This plan should be submitted and endorsed by the regulator prior to the commencement of construction. This plan should include:

- A Communication Strategy to ensure **all** affected persons are informed, have the opportunity to have their concerns addressed in an appropriate manner.
- A plan which looks at maximising realisation of the economic opportunities identified in Appendix M.
- A review mechanism which assesses the success of mitigation strategies adopted to minimise negative impacts.
- A reporting mechanism to the regulator.

It is noted by officers from the Community Development Sport and Cultural Affairs that there is increasing concern amongst the community at Wadeye regarding the size of the plant. This links to the need for effective communication with all local stakeholders' and not just the affected land holders.

The issue of access to alcohol should be thoroughly investigated as it has the potential to significantly impact upon the local community. Comment is required here on sacred site disturbance (eg WALPINHTHI REEF) as a possible social impact. It is noted that a Social Impact Assessment Plan (SIMP) will be developed in consultation with the affected community and other key stakeholder organisations. DHCS would like to be included as a stakeholder to ensure that the SIMP addresses health impact assessment. DHCS has multiple programmes with an ongoing commitment to the Wadeye Community, hence it is important that health input is sourced across DHCS programmes, not just the Health Centre.

Issues of particular concern to DHCS include:

- Community interaction with the non-indigenous workforce particularly with regard to alcohol and drug issues. Wadeye is a "dry" community with respect to alcohol and there is no information in the EIS about the availability of alcohol to the project workforce.
- The SIMP should refer to evidence of the social & health impacts of the Alcan and GEMCO plants on their respective local indigenous communities.
- Access to petrol supplies at the project site by members of the Wadeye Community.
- Ongoing monitoring of air emissions and water quality in the project area.
- Mechanisms for complaint response by the Wadeye Community.
- Impact on the Wadeye Health Centre, particularly since there will be approximately 250 personnel during the construction phase of the project.
- Employment opportunities for the Wadeye Community during the construction and operational phases.

The proponent will need to have formal discussions with DHCS concerning the expectation of service (if any) from the Wadeye Health Centre.

NTG 94: The Social Impact Management Plan should be submitted and endorsed by the regulator prior to the commencement of construction.

It is expected that a draft SIMP will be prepared by the end of the 1st Quarter 2005.

This plan will include the following:

- A Communications Strategy.
- A plan which looks at maximising realisation of the economic opportunities.
- A monitoring and review process which assesses the success of mitigation strategies adopted to minimise negative impacts will be included in the SIMP.
- A reporting mechanism to the regulator in the SIMP.

Size of the Plant: Phase 1 of the Social Impact Assessment involved undertaking consultations with the Wadeye community about the project as discussed in **NLC 11** (**Section 6.1**). However, the second phase of consultations has been proposed and is yet to be undertaken.

Further communication with the general population of the town of Wadeye and Daly River Region will be undertaken during the second phase of the SIMP development.

Access to Alcohol: The Proponent agrees with the comment regarding the potential impact of access to alcohol (and other drugs) and this will be appropriately addressed in the SIMP. The initial view of the Proponent is that the construction camp will be alcohol (and other drug) free. Also, the SIMP will address the management of the workforce interaction with the local community.

Sacred Site Disturbance: The reader is directed to the response to **NTG 66a** and **b (Section 12.4)**.

Development and Implementation of the SIMP: The Proponent will seek the active participation of DHCS in the development and implementation of the SIMP.

Social and health impacts of the Alcan and GEMCO Plants: The SIMP will examine a range of relevant information and acknowledges this comment.

Access to Petrol Supplies: This will be addressed in the SIMP. Refer also to the response to **NTG 32d** (**Section 7.6.1**).

Monitoring of Air Emissions and Water quality: The proponent has committed to conducting a baseline groundwater monitoring programme, to characterise the groundwater at the site. Refer also to the response to **OEH 55a** and **OEH 82** (**Section 11.1.2**) and **NTG 89b** (**Section 15.6**).

Mechanisms for Complaint Response: A process for ongoing dialogue with the Wadeye Community will be included in the SIMP. Refer also to the response to **NTG 47c** (**Section 9.2**).

Impacts on the Wadeye Health Centre: Consultation with the DHCS will be undertaken in relation to this matter and appropriate arrangements will be put in place under the Health Programme and SIMP.

Employment Opportunities: The reader is directed to the response to **OEH 60a** (**Section 5.2.1**).

Hunting and Fishing

NLC 64: 13.2. Page 453. The EIS claims that hunting and fishing will not be curtailed as a result of the Blacktip Project (IMPAXSIA 2004). This is nonsense and is the view of the researchers, not of the TOs or the NLC, particularly in the construction phase when construction activities simply on safety grounds will require restriction on public movements. Eg TOs would be impeded travelling along the track beside the beach while laydown areas and pipe trenching and pulling operations are involved. Acceptance of this impact by the TOs is of course a part of the compromise they may make in seeing the project proceed. As the statement stands, it is misleading.

NLC 64: Construction activities will require restriction of public movements on safety grounds and should be acknowledged in the EIS.

The statement in the Draft EIS would be more accurate if it is stated that hunting and fishing will not be curtailed in the long term, given the area impacted in relation to the surrounding available land. There will certainly be restrictions to access around the construction and operational areas with the greatest level of disturbance occurring during the construction period. After construction,

access to land will only be restricted in the plant site area and the access road to the plant site and so the impact on hunting and fishing will be limited. Access to and along the beach will be restored after construction.

NLC 67: The EIS advises on page 453 that the area affected by the project is not considered significant by TOs when compared to the lands available for hunting and fishing. This conclusion is simply one about plant communities and their abundance in the estate of the TOs and the current preparedness of the TOs to consider reaching mutual settlement over forest areas of their estate needed by the proponents. The EIS fails to point out that conditional on destruction of forest areas is achievement by the parties of an agreement that makes it worthwhile losing that area of their estate.

NLC 67: Recognise the need for all stakeholders to come to an agreement with regards to the clearing of forested areas.

The proponent acknowledges the comments made by the NLC and notes that it seeks agreement with the NLC, on behalf of the traditional Aboriginal owners in relation to the use of the land.

17.1 Section 14.5 Management Strategies/Way Forward (Phase 2)

NTG 95: The following comment would be more relevant to Local employment strategies than the EIS forum. With an operational life span of 30 years could consider the benefits of have specialised /apprenticeships available for local residences. The use of such initiatives may enhance engagement and acceptance from the local community.

NTG 95: Consider the benefits of specialised training/apprenticeships for local residents.

The Blacktip Project will consider the range of training and employment strategies that it engages across the various phases of the project in its Indigenous Training and Employment Plan. This will include strategies for long term training and employment opportunities. The reader is also directed to the response to **OEH 60a** (**Section 5.2.1**).

18. Draft EIS Section 15 Environmental Management

18.1 Section 15.1 Environmental Management Programme

OEH 76: The Supplement should specify how the requirements of EIS assessment will be imparted to the various contractors who will undertake the construction of Blacktip.

OEH 76: Specify how the requirements of EIS assessment will be imparted to the various contractors who will undertake the construction of Blacktip.

The Proponent recognises that it is critically important that the environmental management safeguards, including the environmental commitments made by the proponent in the Draft EIS and any conditions of approval set by the regulatory authorities, are imparted to the contractors who will undertake the construction. This is also extended to the design and operation phases of project. Through the project's assurance process there are a number of safeguards that will be in place which will ensure that environmental protection is an integral component of all phases of the project. These safeguards include:

- Pre qualification of contractors that can demonstrate competency and an understanding of the environmental issues associated with the Blacktip Project.
- The use of Action Tracking Registers and Close Out Forms to ensure environmental commitments made by the Proponent are reflected in the detailed design.
- Monitoring contracts to monitor environmental performance and to identify and implement corrective actions if necessary.
- Contractor inductions to ensure all contracts are aware of their responsibilities and the responsibilities of the Proponent with regards to environmental commitments and environmental protection.
- Providing environmental advisers on site during construction to monitor performance.

The Project Assurance Processes include the following elements that address both the timing and frequency of monitoring, environmental reporting and the processes for correcting detrimental effects.

Key elements include:

- Overall Project HSE Management and Verification Plan.
- Detailed EMPs.
- Contract specific HSE Verification Check Plans which detail specific verification activities for a particular portion of the work.
- Contractors Inspection and Test Plans that will include environmental monitoring requirements and level of surveillance to be performed by Contractors and the Proponent.

- The Proponent and Contractor Non Conformance Control processes which identify responsibilities for reporting and resolving deficiencies. This also includes requirements for correcting any deficiencies and preventing their recurrence.

ECNT 7: 21 management plans are still to be developed! No approvals should be granted until the bulk of these are completed (Tables ES-1, ES-2, ES-3, Executive Summary, pES-15 to ES-21).

ECNT 7: No approvals should be granted until the bulk of the twenty one management plans still to be developed are completed.

The Proponent believes that it is solely the responsibility of Government to approve EMPs, considering submissions made to it during the public comment period on the Draft EIS.

ECNT 21: We also have serious concerns about the following impacts. Approval should not be granted until best-practice management plans are developed to prevent and/or mitigate each of these.

- the 1-1.4 kilometre wide construction corridor for the pipeline offshore. An estimated 200,000 cubic metres of material will be displaced during trenching (at least).
- produced water from the onshore plant to be discharged at sea approximately 3km offshore. Up to 7800 bpd of produced water is to be discharged during the start up phase of the pipeline.
- fauna falling into the pipeline trench during construction.
- Weeds being introduced into the Wadeye area by workers, trucks etc.

ECNT 21: Develop best-practice management plans to prevent and/or mitigate a number of impacts of the proposed project.

The Proponent has made a very clear commitment to prepare a number of detailed EMPs that will provide further details on the safeguards measures to be employed during the various construction and operational phases of the project. Examples of these EMPs, in the form of Draft Strategic Framework Plans, are provided in **Section 15, Volume 1** of the Draft EIS, as specified in the EIS Guidelines prepared by the Northern Territory Government. The proponent strongly believes that to maximise the value of these plans these plans are best finalised once full details of the construction schedule and construction activities are known so that these details can be reflected in the safeguard measures presented in the EMPs. Furthermore, the value of these plans is significantly improved with the involvement of the appointed contractors in their preparation.

The Proponent proposes that the finalised EMPs will be prepared and submitted to government for review and approval once the full details of the individual contracts are known and the contractors have been appointed. The timing for this will vary according to the contracting and construction schedule. Once finalised, these EMPs will be submitted to the appropriate Northern Territory Government departments and DEH for review and approval before the activity commences. A detailed schedule for the submission to government of these various EMPs will be prepared and

submitted to government for review to ensure that sufficient time is provided to government for review and approvals of these EMPs.

NTG 96: Management Plans General: The EIS has identified the environmental issues of concern to Conservation and Natural Resources Division, but have not developed management plans outlining how these issues will be addressed. These plans are identified and outlined throughout the EIS, and for some of the plans a framework is presented in Chapter 15. These need to be further developed and approved prior to construction.

The plans relevant to Conservation and Natural Resources, Department of Infrastructure Planning and Environment are:

- Turtle Management Plan
- Lighting Management Plan
- Rehabilitation Management Plan
- Sediment and Erosion Control Management Plan
- Drilling Environment Plan
- Waste Management Plan
- Acid Sulphate Soils Management Plan
- Fauna Management Plan
- Exotic Species and Weed Management Plan
- Groundwater Protection EMP
- Pipeline Flooding and Hydrotesting Procedure
- Pipeline Pre-commissioning Procedure

In addition, Table 15-1 identifies proposed monitoring programmes associated with some of the above EMP's. These monitoring plans are required but have yet to be developed.

Erosion and Sediment Control Plan is mentioned in several locations throughout the EIS, but the actual plan is not provided. The Erosion and Sediment Control Plan needs to address the beach area (especially the dunes), the pipeline corridor, plant site and road works. The Erosion and Sediment Control Plan needs to be submitted for review and approval prior to construction.

NLC 10: Much of the operational success of the Project in respect of environmental impact minimisation will depend on the detailed application of the EMPs referred to in the EIS. These EMPs are yet to be drafted and approved by Government and Government will assess most outside of the public comment process. Moving a very considerable volume of impact mitigation strategies and actions into documents in the non-public forum defeats the purpose of the legislation requiring public presentation of the EIS.

The EIS advises on page 478 that EMPs will be consolidated into a single overarching document and will be submitted to the relevant authorities for approval prior to construction. The NTG EIS Guidelines sought that strategic draft EMPs be provided with the draft EMP. This has not happened.

The below is a list of EMPs that the NLC advises it will need to be satisfied with, inter-alia, prior to providing its approval to Woodside to commence construction of the project. The compression of timelines to meet an April 2005 FID date for the project suggests that the quality of the EMPs identified below that need to be produced ahead of that date could well be compromised.

Cultural Heritage Management Plan

Traffic Management Plan

The Social Impact Management Plan.

Produced Water Management Plan

Vegetation Management Plan

Waste (hazardous and non-hazardous),

Dust, Noise, Light

Sediment and Erosion Control

Groundwater Protection

Terrestrial Fauna

Oil Spill Management Plan

Biting Insects (fire management issues)

Exotic Species and Weeds

Rehabilitation, including the Revegetation Management Plan

Fire

Turtles

Flaring and Greenhouse Gas (focus on flaring)

Relevant Nearshore Marine EMPs

The Marine and Onshore Environmental Monitoring programmes

As the NLC would be involved in the assessment and approval of many aspects of EMPs, it would make sense for the NLC to work with Government, as well as the proponents, when assessing the developing draft EMPs prior to Government giving its approval to them.

Woodside when discussing environmental information on page 40 propose to translate certain project information into Murinbatha. The NLC would support the translation of key EMPs with an overview of the operation of the EMP system for distribution by the NLC to TOs and affected people.

NTG 96: Management plans for environmental issues need to be further developed and approved prior to construction.

NLC 10: EMPs are yet to be drafted and approved, so most will be assessed outside of the public comment process, this defeats the purpose of legislation requiring public presentation of the EIS.

The Proponent is committed to ongoing consultation with key stakeholders in relation to the development of EMPs.

The Draft EIS has provided framework EMPs which contain potential risks and impacts and proposed mitigation responses to form the basis of the detailed EMPs.

The Proponent will detail what information it will prepare for dissemination in the community and the modes of communication it will use in the draft SIMP and will take the NLC's suggestions into consideration. The current project video that is available in the community and is shown on BRACS, the community television network, is in both English and Murinbatha.

Erosion and Sediment Control Plan: The Erosion and Sediment Control Plan has not yet been developed in full. An outline is provided in **Section 15**, **Volume 1** of the Draft EIS. A copy of the Erosion and Sediment Control Plan will be provided to relevant government departments for review and comment prior to construction activities taking place. The Erosion and Sediment Control Plan will address the beach area (especially the dunes as these are recognised as the habitat type that will be most at risk to erosion), the pipeline corridor, plant site and all associated road works.

18.2 Section 15.2 Environmental Management Plans

NTG 98: It is suggested that environment plans (EP) for pipeline activities will utilise the *Petroleum (Submerged Lands) (Management of Environment) Regulations 1999* for the length of the pipeline license i.e., from the wellhead platform to the processing plant site boundary. The EP's will outline environmental performance objectives, standards and measurement criteria within the construction and operations pipeline corridor.

NTG 98: It is suggested that environment plans outline environmental performance objectives, standards and measurement criteria.

Environment Plans for the pipeline route will be prepared in accordance with the PSLA (Cwth & NT) and the associated Regulations. The *Petroleum (Submerged Lands) Act 1967* (Cwth) and the associated Petroleum (Submerged Lands) (Management of Environment) Regulations 1999 are the primary legislation under which Environment Plans will be drawn up for the offshore section of the pipeline.

Similarly, the *Petroleum (Submerged Lands) Act 1982* (NT) (the complimentary legislation of the Commonwealth legislation) establishes the basis to manage and regulate offshore petroleum development in NT coastal waters. EMPs for the onshore section of the pipeline route will be approved in accordance with the *Energy Pipelines Act 1982,* which also applies to pipelines under

the P*etroleum Submerged Lands Act 1982* (NT). The Energy Pipelines Act regulates the development, construction and operation of petroleum and gas pipelines onshore and offshore of the Northern Territory. The Act contains provisions for environmental management.

Environment Plans will as a minimum outline environmental performance objectives, standards and measurement criteria within the construction and operation of the pipeline.

Oil Spill Management Plan

NLC 43: P 191. There are rocky shoals at the north and south end of Yelcherr beach. The southern shoal was surveyed and observations were made of increasing faunal species density and diversity toward the seaward area of the rock platform than found in the near shore environment. As established elsewhere in the EIS, the fauna of these rock platforms would be vulnerable to oil spills from the offshore condensate loading system. The EIS needs to detail in the Oil Spill management plan how an oil slick could be prevented from reaching the rock platforms, the location of equipment to achieve such prevention and an evaluation of the impact if oil reached (as possible in the computer modelling) the rocky platforms and the expected impact on habitat obligate species living on the seaward edge of the rocky platforms.

NLC 43: The EIS needs to provide further details in the oil spill management.

Modelling to assess the fate and likely consequence of an oil spill from the proposed Blacktip facility was undertaken for the purposes of the Draft EIS. The complete findings presented in **Appendix K**, **Volume 2** of the Draft EIS.

In response to these findings and as stated in **Section 11.19**, **Volume 1** (p.375) of the Draft EIS, the Proponent committed to the preparation of a Blacktip-specific OSCP which will be prepared prior to the commencement of production. This document will include:

- Oil spill trajectory modelling capability based on site specific metocean conditions and knowledge of oil weathering rates (**Technical Appendix K**, **Volume 2**). Oil spill trajectory modelling indicates that spills occurring during the dry season are directed offshore with only a small probability of impacting the coastline. It is the spills occurring during the wet season that are of primary concern.
- Identification of oil-sensitive marine and coastal resources and priority protection areas, including the identification of fauna that may be attracted to affected areas.
- Spill response and clean up strategies for offshore and shoreline, including the use of dispersants, booms, skimmers and sorbents and the restrictions of weather and oil type on the various response strategies. Vessels supporting the trading tankers during condensate loading will carry spill response equipment to combat spills immediately.
- Identification of internal and external emergency organisations, responsibilities and resources (human and equipment and materials) for oil spill response, and call out details.
- Identification of local capacity to maintain and implement rapid response equipment and assist with habitat and wildlife rehabilitation.

A Framework Draft OSCP is provided in **Appendix C**.

18.3 Section 15.3 Framework Monitoring Programmes

NTG 97: A plan is required for the monitoring of sacred sites during construction and to ensure all Authority Certificate conditions have been met.

NTG 97: A plan is required for monitoring of sacred sites during construction and to ensure all Authority Certificate conditions have been met.

This will be contained in the Cultural Heritage Management Plan.

NTG 85: The Entomology Branch of the Department of Health and Community Services request that the proponent discuss the potential to include within the monitoring programme (refer tables 15-1 and 15-13) larval identification.

NTG 85: Discuss the potential to include within the monitoring programme larval identification.

Larval identification will be conducted by the NT Medical Entomology branch who will analyse all biting midge and mosquito related samples collected for the project.

Section 12.4.1 (biting insects), **Volume 1** of the Draft EIS states that where larvae are found (during regular, routine inspections of bunded areas, all drains on the onshore gas plant site and laydown areas and waste disposal areas) they will be sent to Medical Entomology Branch (MEB) laboratory for analysis with appropriate remedial action to be advised by MEB.

Section 12.4.2 (mosquito-borne diseases) **Volume 1** of the Draft EIS also states that any larvae found will be sent to the MEB laboratory in Darwin for analysis.

Site inspections and monitoring commitments will be elaborated on in the Biting Insects Management Plan that will be incorporated into both the Construction EMP and the Operational EMP and will be submitted to relevant government bodies for review and approval prior to construction or operation beginning respectively.

18.4 Section 15.4 Commitments

Table 15-2 Commitments Id No. 49

NTG 99: (page 488) indicates that a Road Maintenance Plan will be prepared. This commitment should include that the Road Maintenance Plan will apply to public roads (i.e. the route from Darwin to Wadeye). Additionally, this Plan does not appear to be mentioned elsewhere in the EIS (notably in section 13.3) and it would be useful for the proponent to provide a Framework Road Maintenance EMP, similar to the Framework Traffic EMP. The Road Maintenance Plan should include measures which will ensure that current levels of service are maintained during construction and plans for reinstatement on completion of work.

NTG 99: Provide a Framework Road Maintenance EMP, including measures to ensure that current levels of service are maintained during construction and plans for reinstatement on completion of work.

The project will develop a road maintenance plan in consultation with NT roads division and the local communities. The plan will address maintenance of all roads. However, the project's position is that NT ` will always be responsible for the maintenance of public roads.

18.5 Section 15.5 Construction Environmental Management Plans

Waste Management Plan

NLC 8: There are 34 references in Vol 1 of the Draft EIS to preparation of a Waste Management Plan but nowhere is there information on a disposal strategy, except for some types of hazardous waste. It is important to the NLC and the proponents to know what may be the potential land use requirements of this plan so environmental assessments can be carried out consultations over future land use can occur with TOs.

NLC 8: Discuss the potential land use requirements of the waste management plan so that environmental assessments & consultation can be carried out.

There will be no land use requirements for the development of any new waste facilities outside of the gas plant boundary. If the Wadeye Landfill Facility is not deemed suitable to receive waste it will be backloaded to Darwin for appropriate disposal. The reader is also directed to the response to **OEH 38** (**Section 9.1**).

OEH 77: Interpretative phrases such as "Site X will be rehabilitated as soon as possible" should be replaced with specific commitments against which the proponent will be made accountable.

OEH 77: Replace interpretative phrases with specific commitments against which the proponent will be made accountable.

Section 15, **Volume 1** of the Draft EIS provides a basic framework of the various management plans that are planned to be developed over the various stages of the Blacktip Project. This will include all rehabilitation commitments.

The construction EMPs that are to be developed will be forwarded to the relevant government bodies for review, comment and approval prior to construction taking place. Likewise, operation of the plant and associated infrastructure will not occur until approval of the operational EMPs has been granted. The framework provided will be greatly expanded upon and interpretative phrases eliminated where possible.

In regards to rehabilitation, the following commitment is made under **Table 15-15** (Framework Rehabilitation EMP):

> A site specific rehabilitation strategy will be developed in consultation with the Traditional Owners and experts in rehabilitation in tropical environments prior to the commencement of

construction activities. The strategy will include a rehabilitation timetable and rehabilitation method proposed for each aspect of the project.

Table 15.14 Framework for Exotic Species and Weed EMP

NTG 100: The EIS gives a commitment to the development of an Exotic Species and Weed Management Plan which includes a monitoring component. This plan must be developed in detail and approved prior to commencement of any construction activities. Exotic plants and weeds have been identified on site, and there is the potential for the introduction of more species during the construction phase. These plants have the potential to create the largest terrestrial impact if not properly managed, especially as the Blacktip facility will eventually link in with the Trans-Territory Pipeline. This provides a corridor across the NT through which exotic plants and weeds may rapidly spread if not properly managed.

NTG 100: The Exotic Species and Weed Management Plan must be developed in detail and approved prior to commencement of any construction activities.

As with all EMPs the Exotic Species and Weed EMP will be provided to the relevant government bodies for review, comment and approval prior to construction occurring. This plan will be revised and modified once construction is complete and an operational Exotic Species and Weed EMP will be developed. Again approval will be sought from the relevant government bodies prior to operation beginning.

Table 15-17 Framework Traffic Management Plan

NTG 101: (page 507), Management issues, dot point 3, needs to acknowledge damage to NTG roads used as haul roads (as well as municipal roads as stated). The Framework Traffic Management Plan should also include:

- minimising restrictions to community access as a result of construction traffic, obtaining all relevant approvals and providing adequate advance notice of any potential disruptions to access.
- that the use of any NT managed roads by non-complying vehicles will be subject to approval from DIPE Road Network Division.
- any construction or impacts on NT road infrastructure will need approval from DIPE Road Network Division.

NTG 101: Include further provisions in the Framework Traffic Management Plan.

The Traffic Management Plan is attached as **Appendix B** to this Supplement and will address the concerns raised.

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19. Draft EIS Section 16 Health & Safety Risk Assessment

19.1 Section 16.1 Summary of Potential Impacts

ECNT 20: The offshore risk assessment apparently satisfies 'Woodside's corporate acceptance criteria'. (16.2.3. Summary of Potential Impacts, p517). How do we know? There is no detail provided in the EIS Main Report or the Appendices. What are the possible consequences of a hydrocarbon explosion at the onshore gas plant? We are told that onshore 'societal risk contours satisfy the acceptance criteria'. What does this mean exactly? There is an unacceptable lack of information provided about the risks of major accidents in the EIS.

ECNT 20: Address the lack of information provided in the Draft EIS about the risks of major accidents.

The results of the Preliminary QRA for offshore wellhead platform are summarised in the following table. It can be seen that the Individual Risk Per Annum (IRPA) for the most exposed worker group on the wellhead platform is associated with the Designated Person in Charge (DPIC) and is 1.91 x 10^{-04}. This is significantly less than the acceptability criteria of 1 x 10^{-03} and less than the Blacktip target of 5 x 10^{-04}.

- **Table 16 Results of the Preliminary QRA for the Offshore Wellhead Platform**

Worker Group	Wellhead Platform Individual Risk Per Annum (IRPA)
Designated Person In Charge (DPIC)	1.91 E^{-04}
General Services Operator	1.05 E^{-04}
Fitter	7.22 E^{-05}
Vendor Rep	7.22 E^{-05}
Inelec (Instrument / electrical technician)	2.05 E^{-05}

The principal contributor to individual risk, associated with operation of the wellhead platform, arises due to transport to and from the facility, i.e. marine transport and transfer between the vessel and the wellhead platform. This contributes approximately 80% of an individual's risk exposure. The contribution due to the hydrocarbon risk is relatively low, in the order of 15%.

The design of the boat landing facility at the wellhead platform has been optimised to ensure that the risk to personnel is managed to as low as reasonably practicable. The design has been based upon the experience gained by Shell in south-east Asia, where numerous facilities are successfully operating a similar design of boat landing. In addition, the risk associated with helicopter access to the wellhead platform has been reviewed. The review has shown that there is a greater risk of fatality due to helicopter access than with marine access. Therefore, marine vessel has been selected as the primary means of wellhead platform access.

The consequences of a hydrocarbon fire or explosion at the onshore gas plant are: gas jet fire, liquid pool fire, liquid spray fire, vapour cloud explosion. The longest duration potential event would be associated with a catastrophic failure of the condensate tanks and subsequent ignition. Such a rupture would be contained within the bunds and controlled by the application of fire fighting foam.

A release from the processing or compression systems would likely lead to a short duration fire or explosion event. The fire and gas detection system is designed to allow shutdown of the processing facilities and depressurisation on the affected areas. This is designed so as to prevent the escalation any hydrocarbon event.

The potential outcomes of fire or explosion at the onshore gas plant include potential for fatality to personnel within the vicinity of the event. Personnel outside the immediate vicinity of the event are unlikely to be affected.

The reader is also directed to the response to **NTG 116**, **Section 9.2**.

NLC 52: Page 329 section 10.3 The environmental impacts of a fire or explosion at the gas plant is a risk which does not seem to have been properly addressed in the EIS. See also comment on the lack of important QRA information in the EIS.

NLC 52: Address the environmental impacts of a fire or explosion at the gas plant.

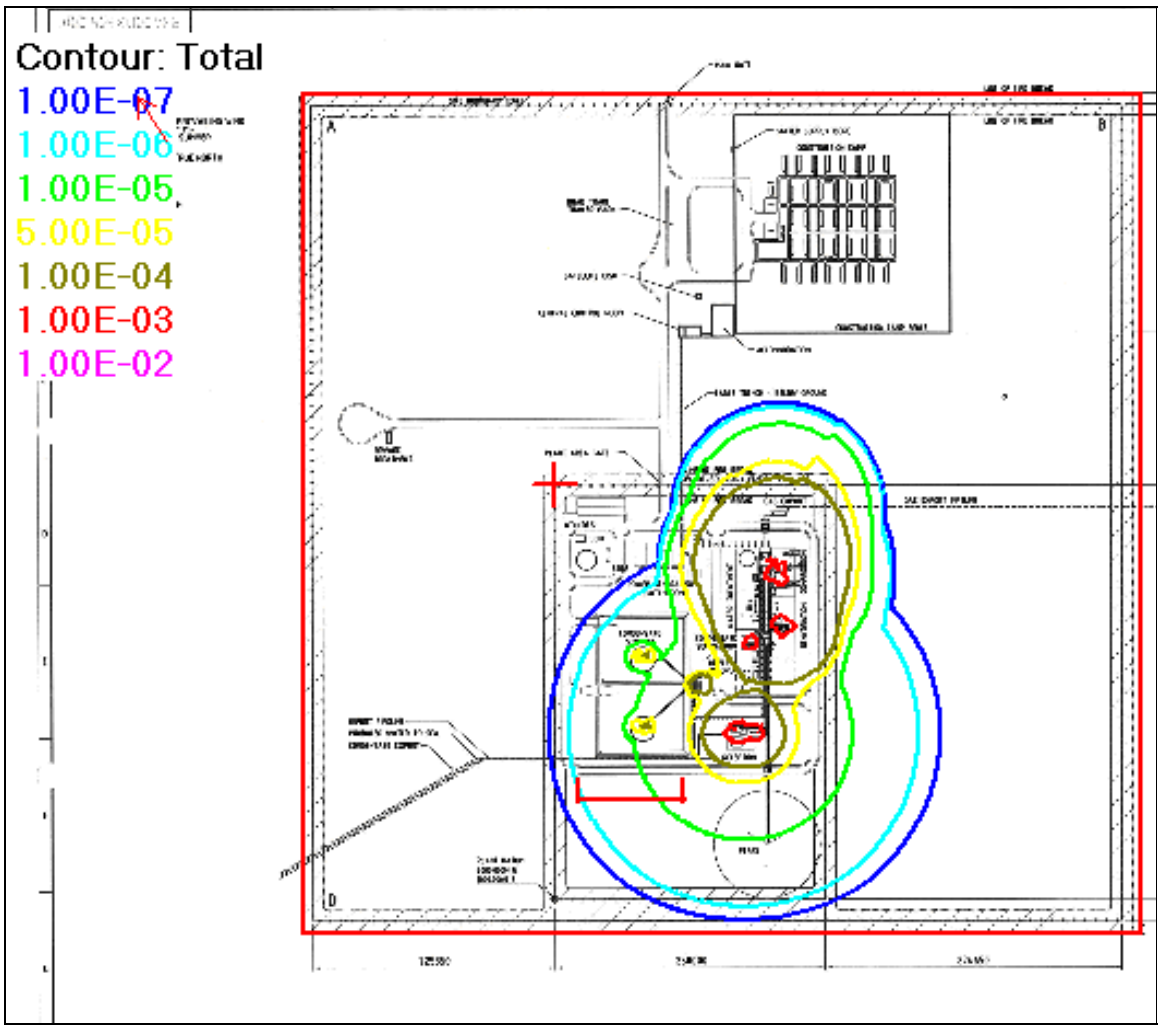
The environmental impacts from these events will be the same as from traditional burning. In the event of a fire the key focus will be on the safety and health of people in the vicinity of the fire. The Proponent strongly believes that the risk of fire or explosions at the gas plant that would result in significant environmental damage are extremely remote and do not warrant detail assessment from an environmental perspective.

The reader is also directed to the response to **NTG 116**, **Section 9.2**.

NLC 68: Page 517. Woodside has not presented a map showing the societal risk factor contours (or industry risk factors) surrounding the gas processing plant. The EIS simply advises that the societal risk contours satisfy the acceptance criteria. This information is required to advise TOs and to guide current and future land use and land use planning in the area of the onshore project. The contours, as in most industrial situations, will have an impact on land values and this is unknown while the contours are not made available in the EIS.

NLC 68: Present a map showing the societal risk factor contours (or industry risk factors) surrounding the gas processing plant.

Risk contours are shown in **Figure 14**. It can be seen that the worst case risk contour at the site boundary is on the southernmost fence line. In this case the risk contour is 1 x 10-^{07}. This is an order of magnitude lower than the Blacktip Project target of 1 x 10-^{06} and two orders of magnitude lower than the tolerability criteria of 1 x 10-^{05}.



- **Figure 14 Blacktip Gas Plant Risk Contours**

19.2 Section 16.2 Preliminary Safety Risk Assessment

19.2.1 Section 16.2.4 Safety Risk Management Measures

NTG 102: A 'safety bridging document' should be prepared between Woodside and it's contractors to ensure that safety management systems are aligned. Has pipeline design considered the potential for future increased capacity for petroleum developments utilising the export pipeline as a carrier to processing facilities?

NTG 102a: A 'safety bridging document' should be prepared between Woodside and its contractors to ensure that safety management systems are aligned.

Safety Management Systems: All Blacktip Contractors will be required to produce HSE Management Plans which clearly define the alignment between HSE management systems and the means of achieving the Blacktip Project and Proponent's goals and objectives in terms of HSE.

The selection of contractors involves a rigorous review of their HSE management capability and previous performance.

NTG 102b: Has pipeline design considered the potential for future developments utilising the export pipeline as a carrier to processing facilities?

The reader is directed to the response to **NTG 119** (**Section 7.3.2**) and **NTG 39** (**Section 7.7.2**).

19.3 Section 16.6 Emergency Response Plan

NTG 103: Will a copy of the Emergency Response Plan be forwarded to Northern Territory Emergency Services?

NTG 103: Will a copy of the Emergency Response Plan be forwarded to Northern Territory Emergency Services?

The NT Emergency Services will be consulted in the development of emergency response planning and associated arrangements. Emergency Plans will be provided to third parties as appropriate.

20. Volume 2 Draft EIS Technical Appendices

20.1 Appendix A Noise

Operational Noise Impacts

NTG 104: This report uses the current Australian Standards for environmental noise during the construction phase. Further noise monitoring at the commissioning and operational phases should occur in accordance with Australian Standards.

Noise Level Readings

NLC 16a: The noise level readings obtained at the proposed plant site and described in Appendix A of Volume 2 of the Draft EIS are not representative of noise levels normally evident at this location, rather, they are likely to have been elevated by virtue of placement of the recording device at the edge of the site immediately adjacent to the Injun beach road. Noise level recordings were then obtained during a period when the road was experiencing abnormal use as a result of a number of surveys being conducted from a camp location established at near Yelcherr Beach. There were 8 NLC vehicles and a number of Blacktip survey vehicles utilising the Injun beach road either directly in transport associated with surveys or indirectly in terms of transit from the camp to Wadeye for supplies, communications etc. In normal circumstances the NLC considers it unlikely that more than one vehicle per day would transit this road past the proposed plant site location.

Noise level recordings for the plant site should either be redone or recalibrated to eliminate nearly all of the recorded traffic noise. The Draft EIS does not present a true picture of current noise levels at the proposed plant site.

NLC 16a: Discuss the results of current noise level readings at the proposed plant site and the placement of the recording device.

It is noted that vehicle use of the road was more frequent than would normally be the case, but still represents an extremely low traffic flow from a noise impact assessment perspective. The additional vehicle movements could have lead to an increase in localised noise levels in the vicinity of the noise logging position for short periods of time. However, to assess the potential for these additional vehicle movements to affect the noise monitoring results presented in **Table 3.1** of **Appendix A**, **Volume 2** of the Draft EIS the frequency of occurrence of the noise emissions must be considered in the context of the sampling time periods and the noise indices adopted.

The noise levels presented in **Table 3.1**, **Appendix A**, **Volume 2** of the Draft EIS represent averages over periods of 3 hours (evening) to 11 hours (day). During these periods, average noise levels (based on samples taken every 1/8th of a second) were recorded every 15 minute period for a range of noise indices.

For each vehicle movement, the duration of the localised noise increase would be expected to be no more than a minute. The majority (if not all) of the vehicle movements would have occurred during daylight hours. Assuming that up to 15 vehicles made a return trip past the noise logging position during the monitoring, overall the localised noise levels could have been elevated for up to 30

minutes out of 11 hours of data. In the context of the 11 hour sample averaging period this estimated duration of additional vehicle noise is not significant.

For the statistical noise indices, the elevated noise levels would need to occur for more than 90% of the sample time to affect the LA90 noise level, more than 50% of the sample time to affect the LA50 and more than 10% of the time to affect the LA10. This is because these statistics consider only the noise levels exceeded for 90 %, 50 % and 10 % of the sample period respectively. This % occurrence of vehicle noise is not likely to have occurred based on the information provided.

For the LAeq noise levels, while individual 15 minute monitoring periods may have given slightly higher noise levels if a vehicle movement occurred during that period, again the overall average is unlikely to have been affected.

The only noise parameter that could have been influenced by the additional vehicle movements is the LAmax noise level as presented in **Table 3.1, Appendix A**, **Volume 2** of the Draft EIS. However, as with the other noise indices, the small number of events and the duration of events in the context of the averaging periods adopted suggests that the influence of the additional vehicle movements is likely to be negligible.

Overall, it is acknowledged that additional vehicle movements may have occurred, but the recorded noise levels remain valid and representative for the noise indices and time periods presented.

NTG 104: Further noise monitoring at the commissioning and operational phases should occur in accordance with Australian Standards.

Noise monitoring will be undertaken at commissioning. Providing the noise levels are similar (or lower) than those predicted monitoring will then be undertaken annually unless valid complaints occur which warrant a specific investigation.

NLC 16b: From Volume 2, Appendix A, Blacktip Project – Environmental Noise Assessment, we learn that: "There is the possibility that an underground valve may be located at the shore crossing...During venting, gas may be released at this location".

There is no reference in the main body of the Draft EIS to this proposed underground valve which may be located at the shore crossing or to the assertion in Appendix A of Volume 2 that during venting, gas may be released at this location". Traditional owners have not been advised of this proposed "underground venting valve". There is no discussion in the Draft EIS of the noise or other impacts associated with a gas venting valve at the Yelcherr Beach shore crossing.

4. Frequency of "flaring" and noise associated with it is unclear. Page 12 of Appendix A refers to, amongst other descriptions of when flaring will occur during plant maintenance, "Flaring will occur quarterly, for a period of 1to 24 hours." No clarification of what is meant by "quarterly" is provided.

NLC 16b: Discuss noise or other impacts associated with a gas venting valve at the Yelcherr Beach shore crossing.

NLC 16c: Clarify the frequency of "flaring" and associated noise.

There will be no valve at the beach crossing. The isolation valve will be located within the gas plant site. When venting, the gas release will be at the flare, not at the valve.

Quarterly means every three months. It should be noted however that maintenance flaring frequency is an estimate and will actually occur as and when maintenance is required rather than at specific three monthly intervals.

20.2 Appendix B Offshore Environmental Survey

Technical Appendix B, Volume 2

NTG 49: The marine offshore fauna survey generally is inadequate: it is based on four days' grab-sampling only, a technique that collects sediment infauna and the occasional benthic animal. Use of dredge or underwater video would have been more appropriate sampling methods.

From the data provided it would appear that the Western Australian Museum (WAM) or MAGNT do not appear to have been contacted for fauna records from the area? For example, there are hundreds of regionally relevant records in MAGNT databases.

All the conclusions about the fauna are based on this survey. It is stated that sand waves and soft featureless sediments dominate the offshore environment. However, a few grab samples do not give a good idea of what the fauna really is.

NTG 49a: Comment on the validity of the marine offshore fauna survey, based on four days of grab-sampling.

NTG 49c: All the conclusions about fauna are based on the marine offshore survey. A few grab samples do not give a good idea of what the fauna really is.

The primary objective of the intertidal and offshore environmental surveys was to provide information to assist with the description of the existing marine environment for the Blacktip Project Draft EIS. It is considered that the marine ecological data presented in **Section 7**, **Volume 1** of the Draft EIS, which incorporates the results of all field and desktop studies undertaken, is sufficiently detailed to enable an accurate assessment of the potential impacts resulting from the Blacktip Project. Therefore, the offshore environmental survey was adequate for its intended purpose.

Monitoring requirements are discussed in response to **NTG 69** and **NTG 113** (**Section 20.9**).

The sampling methodologies are discussed in response to **NTG 106d** and **NTG 106g** in this section of the Supplement.

NTG 49b: From the data provided it would appear that the Western Australian Museum (WAM) or MAGNT have not been contacted for fauna records from the area.

The Museum's databases were not referred to for records of the Joseph Bonaparte Gulf during compilation of the Draft EIS. The MAGNT database has subsequently been searched in February 2005. The results of this search indicate that, in comparison to other parts of the Northern Territory, little data is available from the Joseph Bonaparte Gulf. There were almost three hundred records in the MAGNT database of marine species recorded in the Joseph Bonaparte Gulf; mostly collected during two surveys conducted in 1990 and 1996. There are no records of marine mammals or reptiles from the Joseph Bonaparte Gulf. All records were of molluscs, fish, crustaceans and cnidarians in decreasing order of occurrence. The data is summarised below in **Table 17** and indicates that:

- The mollusc fauna was the most diverse and dominated by species that inhabit soft sediments.
- The corals comprise soft corals or hard corals that are ahermatypes (lack zooxanthelle) and are not reef building corals.
- The crustaceans recorded were mainly prawns and shrimps.
- The fish community was dominated by demersal fish including flatheads, soles, flounders and waspfish with few reef associated fish. These demersal species are likely to represent a significant proportion of prawn fishery by-catch in the Joseph Bonaparte Gulf.

Samples collected during the Blacktip intertidal and offshore environmental surveys have now also been deposited at the MAGNT.

- **Table 17 MAGNT Marine Records from the Joseph Bonaparte Gulf**

Genus	Species	Common name
Fish		
Antennarius	*Dorehensis ?*	Anglerfish
Apistops	*Caloundra*	Short-finned waspfish
Apogon	*Albimaculosus*	Cream spotted cardinal fish
Apogon	*Melanopus*	Cardinal fish
Apogon	*Quadrifasciatus*	Cardinal fish
Apogon	*Semilineatus*	Black tipped cardinal fish
Arius		Catfish
Arothron	*Stellatus*	Starry pufferfish
Aseraggodes	*Melanospilus*	Dark spotted sole
Austronibea		Jewfish
Batrachomoeus	*Occidentalis*	Western frogfish
Callionymus	*Belcheri*	Stinkfish
Callionymus		Stinkfish
Carangoides	*Hedlandensis*	Bump nose trevally
Carangoides	*Talamparoides*	White tongue trevally
Caranx	*Para*	Trevally
Chelonodon	*Patoca*	Milk spotted toadfish
Cynoglossus	*Maculipennis*	Sole
Cynoglossus		Sole
Dasyatis	*Annotatus*	Brown stingray
Drepane	*Punctata*	Sicklefish

Genus	Species	Common name
Eleutheronema	*Tetradactylum*	Giant threadfin
Epinephelus	*Sexfasciatus*	Six banned rockcod
Euristhmus	*Lepturus*	Long-tailed catfish
Harpadon	*Translucens*	Glassy bombay duck
Herklotsichthys	*Konigsbergeri*	Koningsberger's herring
Himantura	*Toshi*	Stingray
Ilisha	*Striatula ?*	Banded ilisha
Inegocia	*Harrisii*	Harris' flathead
Johnius		Croaker/jewfish
Lagocephalus	*Lunaris*	Smooth Golden toadfish
Liocranium	*Praepositum*	Blackspot waspfish
Lophichthys	Boschmai	Boschma's frogfish
Megalops	*Cyprinoids*	Oxeye herring
Nibea		Crocker
Paraplagusia	*Bilineata*	Patterned tongue sole
Paraplagusia	*Longirostris*	Sole
Platycephalus	*Endrachtensis*	Bar-tailed flathead
Polydactylus	*Multiradiatus*	Grunter's threadfin
Polydactylus	*Nigripinnis*	Black-finned threadfin
Polynemus	*Verekeri*	
Pomadasys	*Argenteus*	Spotted javelinfish
Pomadasys	*Maculatus*	Javelinfish
Protonibea	*Diacanthus*	Black jew
Pseudorhombus	*Arsius*	Large-toothed flounder
Pterocaesio	*Chrysozona*	Black tipped fusiler
Rhinoprenes	*Pentanemus*	
Scorpaenopsis	*Neglecta*	Stonefish
Sebastapistes		Scorpinfish
Setipinna	*Paxtoni*	Anchovy
Setipinna	*Tenuifilis*	Longfin anchovy
Siphamia	*Roseigaster*	Pink-breasted siphonfish
Sphyrna	*Blochii*	Hammerhead shark
Suggrundus		Flathead
Synagrops	*Philippinensis*	
Tathicarpus	*Butleri*	Frogfish
Terapon	*Theraps*	Banded grunter
Thryssa	*Brevicauda*	Anchovy
Thryssa	*Hamiltoni*	Hamilton's anchovy
Xiphasia	*Setifer*	Hair-tail blenny
Zabidius	*Novemaculeatus*	Short-finned Batfish
Molluscs		(**Common names not listed**)
Amoria	*Damonii ludbrookae*	
Amoria	*Turneri*	
Anadara	*Granosa*	
Anadara	*Inaequivalvis*	

Genus	Species	Common name
Ancillista	*Ngampitchae*	
Anomia		
Apixystus		
Arca	*Navicularis*	
Architectonica	*Perdix*	
Asaphis	*Violascens*	
Bathytoma		
Biplex	*Pulchrum*	
Botula	*Silicule*	
Bufonaria	*Rana*	
Bursa	*Granularis*	
Cerithidea	*Largillierti*	
Chicoreus	*Cervicornis*	
Conus	*Trigonus*	
Cryptopecten	*Nux*	
Cymatium	*Caudatum*	
Cymatium	*Pfeifferianum*	
Cypraea	*Brevidentata*	
Cypraea	*Miliaris*	
Cypraea	*Pyriformis*	
Cypraea	*Subviridis*	
Dentalium	*Octangulatum*	
Dentalium	*Robustum*	
Diodora	*Jukesii*	
Distorsio	*Reticulata*	
Donax	*Faba*	
Echinolittorina	*Trochoides*	
Euprymna		
Gafrarium	*Tumidum*	
Gastrochaena		
Glauconome	*Rugosa*	
Glorichlamys	*Quadrilirata*	
Hapalochlaena	*Cf. Maculosa*	
Harpa	*Articularis*	
Heterocardia	*Gibbosula*	
Hyotissa	*Imbricata*	
Inella		
Leionucula	*Cumingi*	
Leionucula	*Privigna*	
Leionucula	*Superba*	
Littoraria	*Articulate*	
Littoraria	*Filosa*	
Littoraria	*Ianthostoma*	
Loligo		Squid
Lunella	*Cinerea*	

Genus	Species	Common name
Mactra	*Turgida*	
Malleus		
Melo		
Mesophora	*Ustulate*	
Mitra		
Murex	*Coppingeri*	
Murex	*Macgillivrayi*	
Nassaria	*Acuminata*	
Nassarius	*Aff. Exculatus*	
Nassarius	*Cf. Exculatus*	
Nassarius	*Macrocephalus*	
Natica	*Stellata*	
Nautilus	*Pompilius*	
Nerita	*Balteata*	
Neritina		
Neverita	*Didyma*	
Notocorbula	*Hydropica*	
Nuculana	*Cf. Novaeguineensis*	
Octopus		Octopus
Ostrea		Oyster
Patelloida	*Saccharina*	
Pinna	*Incurva*	Razor shell
Plicatula	*Essingtonensis*	
Polymesoda	*Erosa*	
Pterynotus	*Acanthopterus*	
Pterynotus	*Bednalli*	
Saccostrea	*Echinate*	
Saginafusus	*Pricei*	
Semele		
Semicassis	*Bisulcata*	
Sepia		Cuttlefish
Sepiola		
Spondylus		
Telescopium	*Telescopium*	
Tellina	*Armata*	
Tellina	*Capsoides*	
Tellina	*Emarginate*	
Terebra		
Terebra	*Commaculata*	
Terebra	*Pumilio*	
Terebralia	*Palustris*	
Terebralia	*Sulcate*	
Tonna	*Allium*	
Trisidos	*Semitorta*	
Tudivasum	*Inermis*	
Venericardia	*Cardioides*	
Volutoconus	*Bednalli*	

Genus	Species	Common name
Xenophora	*Exuta*	
Xenophora	*Indica*	
Zafra	*Peasei*	
Crustaceans		
Alpheus		Snapping prawn
Anchistioides	*Willeyi*	Shimp
Bopyridae		Parasitise isopod
Calappidae		Box crabs
Cirripedia		Barnacle
Corystidae		Crab
Dromacea		Decorator *crabs*
Euphausiacea		Krill
Goneplacidae		Goneplacid crabs
Gonodactylus		Stomatopod, prawn killer
Lysmata	.	Cleaner shrimp
Majidae		Spider crabs
Odontozona	*Sculpticaudata*	Shrimp
Penaeus	*Indicus*	Red-legged banana prawns
Periclimenaeus	*Djiboutensis*	Shrimp
Periclimenaeus	*Pachydentatus*	Shrimp
Periclimenes	*Lanipes*	Shrimp
Porcellanidae		Porcelain crabs
Scyllarus		Bug
Stomatopoda		Stomatopod, prawn killer
Synalpheus		Snapping prawn
Trachypenaeus	*Gonospinifer*	Prawn
Cnidarian		
Anemone		Anemone
Astrogorgia		Soft coral
Balanophyllia	*Imperialis*	Hard coral
Dendronephthya		Hard coral
Heteropsammia	*Cochlea*	Free-living coral
Nephthyigorgia		Soft coral
Pteroeides		Sea pen
Truncatoflabellum		Hard coral
Truncatoflabellum	*Angiostomum*	Hard coral
Truncatoflabellum	*Spheniscus*	Hard coral
Truncatoflabellum?	*Martensi*	Hard coral

NTG 105: Technical Appendix B: 37 (also in main body of report). 'Nearly three times as many crustaceans were collected as polychaetes'. This seems highly unusual, and might reflect the sampling process. eg. screen size (1 mm rather than a more thorough 0.5 mm) and the fact that the samples were not fixed in formalin, the recommended fixative for soft-bodied animals. The worms may simply have turned to mush before laboratory identification could be done.

Looking at the figures in Appendix E (of Technical Appendix B). it is apparent that the figures relate to abundance not diversity. In terms of number of taxa, there are only slightly more Crustacea than Polychaeta. This is not unusual. Given the inappropriate fixative used in the study and the possibility of undercounting the polychaetes, it is not valid to describe the composition of the infaunal community along the pipeline route as 'unusual'.

NTG 105: Discuss results of the offshore environmental survey and the sampling process used.

Formalin: Formalin is the preferred initial fixative for nearly all marine soft bodied animals. After fixing samples in formalin, the samples are typically transferred into alcohol for long term storage. However, formalin is a human carcinogen, which raises numerous health and safety issues for people exposed to formalin or formalin fumes and those involved in the transport of formalin.

Many laboratories, including the WA Museum and Murdoch University's Marine and Freshwater Research Laboratory do not use formalin to preserve small infaunal samples, such as those collected during the intertidal and offshore environmental survey, nor will they process infaunal samples stored in formalin. Alcohol is an effective fixative for small samples which are processed in the short term. Large fauna, such as fish, and samples which are stored for extended periods require initial fixing in formalin, as alcohol does not adequately penetrate large animals and does not completely fix fauna.

The offshore samples were identified by Murdoch University's Marine and Freshwater Research Laboratory within three months of collection. They confirm that the samples and infaunal specimens were received in good condition with no signs of decay.

Sieve Size: There is no doubt that a smaller sieve size would retain more infauna than a larger sieve size. However, many infaunal studies use a 1 mm sieve size and this size was deemed sufficient for the purposes of this survey. The CSIRO Centre for Research on Introduced Marine Pests, *Revised Protocols For Baseline Port Surveys For Introduced Marine Species* (Hewitt and Martin 2001) specifies the use of a 1 mm sieve for infaunal samples.

General Comment

NTG 106: What processes should be put in place to protect the environmentally sensitive mangroves and associated fauna from possible sediment overloads, oil spillages and other deleterious impacts, both during and after the construction phase?

The data in Appendix B are grossly inadequate to support the claim (Page 68) "Intertidal and subtidal infauna is species rich". In fact, the data presented, reveal a highly impoverished community compared to, for example, Darwin Harbour.

Why is there no mention of the rare, narrow-range endemic mollusc *Littoraria ianthostoma* in the Executive Summary? Surely this extra-special, rare species ought to be monitored very carefully and perhaps be monitored especially during, and after, the construction phase. This species is mentioned on Page 32, but its importance and the necessity for conservation are ignored.

The sampling of offshore infauna using only (subsamples from) 35 Van Veen Grab samples is grossly inadequate to get any impression of the community. The Proponent should have used video surveys in conjunction with trawls and dredge samples.

The offshore and intertidal habitats change dramatically seasonally. Therefore samples should have been obtained both in the Wet and in the Dry season. Indeed, a strategy for long-term monitoring is clearly called for.

Gastropod shown in Fig. 7H is *Terebralia semistriata*. Significantly (Page 31) the observed density of this indicator species was low (Page 53) and it was not observed in the southern mangrove forest. Why was there no replication at each sampling station?

Page 37 states that Van Veen Grab samples will be unsuccessful on reefs. Why were the reefs not sampled by other methods?

Given the rationale outlined previously regarding the limited nature of the survey there are insufficient grounds for the claim "the project area is unlikely to support significant benthic communities".

By extension the undertaking a statistical analysis (an NMDS ordination) for a grossly undersampled benthic community is meaningless.

Prawn trawlers were noted operating in the area of the proposed pipeline. So why was no attempt made to investigate the species (both target and bycatch) they were taking?

The anecdotal observations of vertebrates for only three days – is inadequate.

The genus name *Clypeomorus* is consistently misspelt (as "*Clypeomorphus*") on Page 51.

The identifications for the molluscs is grossly inadequate. For example, all known species of littorinids in Australia are strictly intertidal, so the identification of "Littorinid sp1" definitely has to be wrong. Who knows what "Mollusc sp1" through "Mollusc sp4" might be? Such serious mistakes highlight the inadequacy, and by implication unreliability, of the faunal sampling programme.

NTG 106a: Discuss strategies to protect the environmentally sensitive mangroves and associated fauna from possible sediment overloads, oil spillages and other deleterious impacts.

The response to the **NTG 106a** is addressed in **Section 14.9.2**.

NTG 106b: The data in Appendix B are grossly inadequate to support the claim (Page 68) "Intertidal and subtidal infauna is species rich".

It is acknowledged that the number of intertidal and subtidal species recorded would represent a highly impoverished community if these species accounted for the full extent of the intertidal and subtidal faunal community. The assessment that the intertidal and subtidal infauna is species rich

was based on the level of sampling undertaken for the Blacktip Intertidal and Offshore Environmental Survey (**Appendix B**, **Volume 2** of the Draft EIS). For example, of the samples collected offshore, no individual sample contained more than 22% of the total offshore species suggesting that greater effort would reveal more species. It is acknowledged that the statement in the Executive Summary that "*Intertidal and subtidal infauna is species rich*" should have been qualified as follows, *'Based on the level of sampling undertaken, the intertidal and subtidal infauna are likely to be species rich*'.

NTG 106c: Discuss the importance and the necessity for conservation of the rare, narrow-range endemic mollusc Littoraria ianthostoma.

The response to **NTG 106c** is addressed in **Section 14.9.2**.

NTG 106d: Discuss the sampling techniques used in the offshore environmental survey. Van Veen Grab samples were inadequate and video surveys should have been used with trawls and dredge samples.

Prior to the environmental survey, consideration was also given to the use of a Remotely Operated Vehicle (ROV) or other video survey technique for the offshore survey. However, the use of underwater video was considered impracticable due to the very high water turbidity levels in the Joseph Bonaparte Gulf (even in the dry season) and the strong tidal currents year-round which limit the effectiveness of these techniques. For example, nearshore turbidity values approaching 40 NTU (and consistently above 10 NTU) were measured during the offshore survey in May 2004. Experience with underwater video and diving operations has indicated that very little, if anything at all, is observed when water turbidity exceeds 7–10 NTU. In addition, an ROV would not be able to manoeuvre into position against the strong tidal currents.

Because of high turbidity, the only approach to the sampling of subtidal hard substrates in nearshore waters of the Joseph Bonaparte Gulf would appear to be the use of devices such as a rock or scallop dredge. However, all information available prior to the commencement of the offshore environmental survey in May 2004 indicated that only soft sedimentary habitats were present along the pipeline route and in the nearshore areas where the PW discharge and condensate export mooring are to be located. Therefore, a benthic grab was selected as the appropriate sampling device.

NTG 106e: Long-term monitoring of both the offshore and intertidal samples is requested both in the wet and in the dry season.

For information on offshore monitoring the reader is directed to the response to **NTG 69** in **Section 20.9**.

NTG 106f: Gastropod shown in Fig. 7H is Terebralia semistriata. Why was there no replication at each sampling station?

It is acknowledged that *Terebralia semistriata* is a common species in mangrove areas in northern Australia, and that it could be considered an indicator of good mangal community biodiversity. The observed low density of this species in the intertidal survey may be due to a genuine low density in the survey area, or may be due to the fact that the intertidal survey was a preliminary survey only. No other areas in the Joseph Bonaparte Gulf have been surveyed for *T. semistriata* (R Wallin [NT Museum]; pers comm., 17 February 05) therefore a comparison of abundance in the intertidal survey area to other areas of the Gulf cannot be made.

The intertidal survey was undertaken as a reconnaissance study, as there was no previous survey data available on habitats and fauna in the area. The data collected is deemed sufficient for the purposes of the study, which is to provide a description of the intertidal area and enable an ongoing monitoring programme to be planned. Further surveys will be undertaken prior to construction and during operation, as part of an ongoing monitoring programme.

The intertidal faunal sampling design is presented in **Section 3.2.3**, **Appendix B**, **Volume 2** of the Draft EIS. Sampling of the mangrove habitat consisted of sampling three stations within each area of mangrove (Yulow Point and Maninh Point), which resulted in a total of six sample stations. At each sampling station, fauna was sampled using a variety of techniques:

- timed observations of a 1 x 1 m quadrat;
- 0.01 m^2 anoxic mats left in place overnight;
- pitfall traps also left in place overnight;
- visual searches for larger fauna.

Two replicate samples were collected from each station for each of the four different survey techniques. The intertidal data is presented in **Appendix B**, **Volume 2** of the Draft EIS.

NTG 106g: Why were the reefs not sampled by other methods other than Van Veen Grab sampling?

The narrow band of hard substrate, located 1–1.5 km from the coast, was first encountered during the nearshore geotechnical investigation and offshore environmental survey in May 2004. The Van Veen Grab is ineffective on such substrates as it cannot remove or lift any pieces of hard substrate. No other equipment was available on the vessel to sample hard substrates because background information did not indicate its presence, therefore no samples could be taken. The presence of the reef was not confirmed until the results of the geotechnical and geophysical investigations were completed late in 2004 (Fugro 2004). Had prior knowledge of the area been available, sampling of hard substrates would have been accommodated through provision of equipment such as a dredge. Additional nearshore survey work will be undertaken prior to the installation of the Blacktip pipeline. However, as outlined in the response to **NLC 15** (**Section 10.2.2**), the epibenthic ecology of intertidal and nearshore reefs in the Joseph Bonaparte Gulf is considered to be depauperate.

NTG 106h: Given the limited nature of the survey there are insufficient grounds for the claim "the project area is unlikely to support significant benthic communities".

Contrary to the statement made above it is strongly believed that the data collected during the environmental surveys provides sufficient grounds for the claim that, 'the project area is unlikely to support significant benthic communities', namely significant coral reefs, large seagrass beds or macroalgal beds.

Coral reefs, macroalgae and seagrass beds require sufficient light to support photosynthetic activity, so they are more likely to occur in the shallow water adjacent to the coast in the Blacktip Project area than the deeper waters further offshore. For this reason and the nearshore location of some of the project infrastructure, subtidal sampling was concentrated in the nearshore waters surrounding the proposed shore crossing location. Twenty two of the 35 subtidal samples were collected within 10 km of the shore crossing location.

In addition, an extensive intertidal survey was also undertaken. No seagrass or macroalgae were collected subtidally or intertidally and no macroalgae or seagrass was observed floating in the water or washed up on the coastline. Furthermore, coral abundance was also observed to be very low. The finding of two small gorgonian corals during the survey is not evidence of an offshore reef, as gorgonians are not known to comprise reef building species and can live on sandy sediments.

Geotechnical studies indicate that the hard substrate observed at 1 and 1.5 km off the coast during the environmental survey consists of 'well cemented calcrete conglomerate that crops out of the seabed intermittently' (Fugro 2004). Conglomerate is sedimentary rock that is made up of pebbles and rocks cemented together, in this case, with calcium carbonate; indicating that the hard substrate is not a coral reef. The nearby Walpinhthi Reef is also likely to be constructed of well-cemented calcrete conglomerate. It is therefore contended that the project area is unlikely to support significant benthic communities. The reader is also directed to the response to **NTG 41a** (**Section 8.3**).

NTG 106i: Undertaking a statistical analysis for a grossly undersampled benthic community is meaningless.

The primary objective of the intertidal and offshore environmental surveys was to provide information to assist with the description of the existing marine environment for the Blacktip Project EIS (refer to response to **NTG 49**, **Section 20.2**.

It is considered that the marine ecological data presented in **Section 7** of the Draft EIS, which incorporates the results of all field and desktop studies undertaken by the Proponent, is sufficiently detailed to enable an accurate assessment of the potential impacts resulting from the Blacktip Project. Therefore, the offshore environmental survey was adequate for its intended purpose. The data collected during the offshore survey also enabled the following initial conclusions to be made concerning the infaunal communities in the Blacktip Project area:

- The project area is unlikely to support significant seagrass or macroalgal beds or coral reefs.

- Infaunal abundance and species richness is generally greater near the coast than at sites located further offshore, though no statistically significant correlation was recorded.
- The composition of the infaunal community is somewhat unusual as crustaceans, not polychaetes, were the dominant group numerically and in terms of diversity (refer to response to **NTG 105** earlier in this section). It is suggested that this is a result of coarse sediments limiting the development of a deposit feeding community.

NTG 106j: Why was no attempt made to investigate the species (both target and bycatch) that the Prawn trawlers, operating in the area of the proposed pipeline, were taking?

Extensive information on the target species of the Northern Prawn Fishery was available and collected from AFMA, the authority in charge of the fishery. This information is presented in **Section 9.7.2**, **Volume 1** of the Draft EIS. It was, however, not considered appropriate to interfere with operating prawn trawlers during the Blacktip environmental survey. Information has subsequently been collected on the bycatch of the Northern Prawn Fishery and is presented in response to **NTG 64a** (**Section 12.2**).

NTG 106k: The anecdotal observations of vertebrates for only three days is inadequate.

The offshore environmental survey (May 2004) was commissioned to investigate benthic habitats. However, given the limited information on the abundance of marine mammals and reptiles in the Blacktip Project area, the survey was also used as an opportunity to make observations on the occurrence of large marine fauna. Similarly, geotechnical and geophysical surveys were conducted throughout May and June 2004 and numerous other surveys over the preceding years. These surveys were also used as opportunities to make observations on the occurrence of cetaceans in the project area to Supplement existing information. Marine crews who conducted geophysical surveys are proficient with the observation and identification of marine mammals as it is a requirement for marine seismic operations. During the surveys undertaken in 2004 no cetaceans were observed (**Section 7.3.7, Volume 1** of the Draft EIS).

In addition to these non-targeted surveys conducted in May and June 2004, a targeted survey for turtle and dugong activity was also commissioned by the Proponent, the results of which are presented in **Volume 2**, **Appendix C** of the Draft EIS. This survey included discussions with Aboriginal elders on the distribution and level of turtle and dugong activity in the Blacktip Project area. In addition to the surveys, a literature and database searched on marine vertebrates in the Joseph Bonaparte Gulf was conducted for the Draft EIS. The results of the literature search and surveys were used to prepare **Sections 7.3.5–7.3.10**, **Volume 1** of the Draft EIS, which discuss the distribution and abundance of marine vertebrates in the Joseph Bonaparte Gulf.

NTG 106l: The faunal sampling programme is inadequate and unreliable.

The complete faunal data sets collected during the intertidal and offshore surveys are presented in **Appendix D** and **E** respectively of **Appendix B**, **Volume 2** of the Draft EIS. The data in **Appendix E**, with taxa presented in rows and the sites in column, has over 35 columns and only

the nominal species names were presented due to limited space. However, the data supplied by the laboratory who undertook the identification of the offshore infauna include separate columns identifying the fauna at a range of taxonomic resolution from phylum to nominal species level. "Mollusc sp1" through "Mollusc sp4" were identified as 3 bivalves and one gastropod species. The complete data set and specimens have now been lodged with the MAGNT where they are available for further taxonomic study.

20.3 Appendix C Turtles, Dugongs, Seagrasses

Turtles: Survey Methodology

NTG 107a: A single survey (on 4 June 2004) to assess the coast at the impact site for sea turtles, dugongs, and seagrasses is totally inadequate. This report contains only anecdotal comments on dugongs and seagrasses in the area.

NTG 107a: A single survey to assess the coast at the impact site for sea turtles, dugongs, and seagrasses is totally inadequate.

Consultation with traditional Aboriginal owners: The presence of dugongs and seagrasses in the area came primarily from the anecdotal reports of the traditional Aboriginal owners who had lived in the area all of their lives and who had shared stories with others who had passed on observations and locations to the presence of dugongs. Two of the traditional Aboriginal owners had been eye witnesses to the killing of dugongs in the area. Sightings of dugongs during aerial surveys were, and will continue to be, hampered by the turbid water. It was reported that dugongs move through the area and are unlikely to be permanently resident. During the construction and operation of the pipeline, records should be kept by the appropriate personnel and recorded in a log book that would be made available to DEH along with other sightings of marine mammals such as whales and dolphins.

Survey Methodology: The presence of dugongs was assessed from the air during the aerial surveys for sea turtle tracks on the beaches. Observers were viewing on the landward facing and sea ward facing sides of the air craft during the flight northwards i.e. close to the coast, and southwards i.e. approximately 1 km seaward of the shore line. The water was extremely turbid and only animals on the surface were visible. This comprised a sub adult turtle and a crocodile. No other animals were seen on the surface of the water. Even in Darwin Harbour that has less turbid water than Port Keats and has a known population of dugongs, animals were not seen during the low level flights from Darwin to Dum in Mirrie Island. Such flights took place monthly during 2004.

In the absence of water clarity, estimates of dugong numbers are highly erroneous due to difficulty in estimating the numbers beneath the surface. Correction factors utilised in many dugong surveys have been established for animals in temperate regions feeding on seagrass. Due to the difficulty in estimating numbers of dugongs, and the highly mobile nature of the animals in that they travel hundreds of kilometres to feeding areas in a very short time, the traditional Aboriginal owners provided information about the presence of dugongs.

In short, dugongs are present in the area. They will move through the project area but are not known to feed in the vicinity of the pipeline. An intertidal feeding area is known near Dorcherty Island. The number of animals using this feeding site at any time of the year is unknown.

The construction of the pipeline is likely to have no detectable effect on the dugongs in the area. The intertidal macro algae areas near Dorcherty Island may be subject to degradation by a spill of heavy hydrocarbons. These macro algae flourish and establish themselves in the intertidal zone annually. Such degradation would possibly last no longer than one year. Dugongs are visual feeders and can discern between edible and inedible algae and seagrass. In the event of a hydrocarbon spill they would vacate the area to other feeding grounds. Hydrocarbons on the surface of the water could cause respiratory problems. Individuals so affected would require veterinary care if their health was compromised.

Turtle Number Estimates: As indicated in the report, the proportion of one track during the survey period being indicative of approximately 100 turtle nests is used as a 'Ball Park' figure and is more than an educated guess. The estimate agrees with data published by Chatto and Limpus as to the approximate nesting density of sea turtles in the Port Keats area. This ratio of tracks to nest is further supported by observations of the numbers of tracks observed on Bare Sand Island during the same aerial survey. The estimate of turtle numbers was further supported by surveys on foot of the same beaches and by discussions with the traditional Aboriginal owners of the beaches. In all there are three direct sources of information:

- The aerial survey gave a synchronous snapshot to the numbers of tracks in the project area at the time of the survey with a known reference turtle rookery i.e. Bare Sand Island, in the same bioregion.
- Ground surveys by foot and vehicles counting turtle nests for the season thus far were conducted to in excess of 20 km north and south of the proposed pipeline crossing.
- Consultation and discussions with the traditional Aboriginal owners and their family groups confirmed that what was observed on the ground patrols were about normal for visits to the respective beaches.

This direct evidence and that published either in the literature or on electronic databases indicated that the estimates of the numbers of sea turtle nests were justified.

There was little to gain by conducting any surveys by night as the species of sea turtles either nesting or attempting to nest are identifiable by their track morphology, the size of the eggs and their number in the clutch. With the existing personnel and the three family groups it would have been unfeasible to patrol all of the beaches in a single night. Night patrols would have presented an unacceptable health and safety risk given the presence of large saltwater crocodiles.

NTG 107b: How will turtles and dugongs be affected by the construction of the offshore pipeline?

NTG 107b: How will turtles and dugongs be affected by the construction of the offshore pipeline?

The below water section of the pipeline will have very little effect on sea turtles and dugongs. Both animals are vision feeders and can recognise food items even in turbid water. The pipeline will be covered with indigenous sediment and will be indistinguishable from surrounding areas. No seagrasses have been detected in the vicinity of the pipeline and hence will have little impact, if any, on turtles and dugongs in the area. Flatback Sea Turtles are carnivorous and feed on squid and cuttlefish which are not bottom dwellers. It is anticipated that the Flatback Sea Turtle will be unaffected by the pipeline.

ECNT 2: It is highly probable that, despite the listed mitigation measures, the local turtle population at Yelcherr Beach will be severely impacted by loss of habitat, noise, and lights. Onshore construction of the pipeline will occur in the dry season when the flatback turtles are nesting. According to the EIS, there are possibly less than 20 turtles which nest on Yelcherr Beach. Flatback turtles are also said to be 'common throughout northern Australian waters' (7.3.9. Sea Turtles, p203). Why then is it listed as vulnerable? There is also evidence, according to local Aboriginal people, of an Olive Ridley turtle nest found at a nearby beach (p204). This was reported during the survey period (Appendix C: p6). According to Appendix C, it is anticipated that they would nest on Yelcherr Beach as well. Olive Ridley turtles are listed as endangered under the International Red List 2000 and the EPBC Act (Appendix C, p8).

ECNT 2: Discuss the impacts of construction on turtles since it is highly probable that the local turtle population at Yelcherr Beach will be severely impacted by loss of habitat, noise, and lights.

The Flatback Sea Turtle is listed as vulnerable both nationally and internationally because of its restricted distribution globally. It is endemic to Australia and much of its habitat in Queensland has been compromised by coastal development and urban sprawl along the coast. In the Northern Territory it is data deficient because of the lack of information about its status and threats to its survival.

The Olive Ridley Sea Turtle is listed nationally and internationally as endangered because of over exploitation in Central America, and Indonesia. In Australia this species was thought to nest only in the Northern Territory until a small nesting population was discovered last year on the eastern side of the Gulf of Carpentaria. In the Northern Territory little is known of the status of this species and the threats to its survival.

20.4 Appendix F Vegetation & Flora Study

NTG 108: The field surveys for the floral analyses were conducted during the Dry seasons of 2002 and 2003. This is inadequate as several species of plants remain dormant underground or as seeds during the Dry Season. A series of replicate samples urgently needs to be taken prior to disturbance during the Wet Season.

Table 2 (Page 7) lists 21 weed species (notably Gamba Grass and Olive *Hymenachne*) that occur in the project area and in the areas that will be used for accessing landfill. The Proponent must develop a strategy to minimise the establishment and further spread of these weeds, some of which are serious environmental weeds.

The epiphytic orchids of the genus *Dendrobium* are well known in the Northern Territory. Therefore some explanation should be provided for the inability of the consultant to identify the *Dendrobium* plants occurring in the impact area to the level of species.

NTG 108a: Field surveys for floral analyses are inadequate as several species of plants remain dormant during the Dry Season.

NTG 108b: Develop a strategy to minimise the establishment and further spread of the 21 weed species that occur in the project area.

NTG 108c: Some explanation should be provided for the inability of the consultant to identify the Dendrobium plants occurring in the impact area.

In addition to the field surveys that were conducted over the mid-late dry seasons of 2002 and 2003, a thorough desktop study of the NT Herbarium database, NT Rainforest Database, various scientific papers and threatened species information at both the Territory and Commonwealth level was conducted to ensure information was as accurate as possible.

It is acknowledged that there may be a lack of information from the area regarding species of plants that survive the dry season as seeds or as an underground bulb or tuber. This is due to an inability to access this area during the wet season. Surveys were conducted in the early, mid and late dry season, spanning two years. Floral data was also recorded in all fauna survey sites in 2004. There had been no immediate impact on the site from fire prior to the early or mid dry season surveys or the fauna survey sites. There are no floral species within the vegetation community of the project area that are listed as 'threatened'.

Flora surveys will not be conducted during the wet season due to an inability to access the area.

The Proponent has committed to developing an Exotic Species and Weed Management Plan prior to construction beginning. Areas that will be used for accessing fill material will be surveyed prior to being disturbed and weed infestations treated accordingly. A weed monitoring and management programme will also be established for both the construction and operational phases of the project.

It is stated in **Section 5.2**, **Appendix F**, **Volume 2** of the Draft EIS, that the epiphytic orchids *Cymbidium canaliculatum* and *Dendrobium spp*. are abundant throughout the project area. The use of the abbreviation '*spp'*. indicated that more than one species of the genus are acknowledged to

possibly be present in the project area. Note that the species *Dendrobium affine* was identified in two of the woodland fauna survey sites as included in **Appendix 2** of the Terrestrial Fauna report (**Appendix H**, **Volume 2** of the Draft EIS). The consultant did correctly identify the well-known species, so no explanation is warranted.

20.5 Appendix G Biting Insect Survey & Assessment

NTG 109: Without any doubt, a single survey for biting insects conducted in the middle of the Dry Season (3 June 2004) is not adequate to draw any definite conclusions. The significant information from the technical research paper (Whelan 2002) dealing with exotic mosquitoes arriving on seagoing vessels could have been summarised without the incorporation of the entire report.

NTG 109: A single survey for biting insects conducted in the middle of the Dry Season is not adequate to draw any definite conclusions.

It is known that seasonal variations in biting insects occur. The June survey was timed to coincide with the most appropriate tides and moon to provide biting insect characteristics for this period, which provided a lot of data for the area.

As discussed in **Appendix G**, **Volume 2** of the Draft EIS, further trapping and field survey was undertaken in late September 2004. Due to access issues, the sampling that was proposed for November did not take place. Medical Entomology provided the advice that it was not imperative that the project area be sampled in November 2004. It is known that there will be biting midges on the gas plant site but densities are unknown. Sampling can be conducted in November 2005 by others as part of a standard monitoring programme. Samples will be sent to Medical Entomology for analysis.

The trapping that occurred in June 2004 provided good indications of the likely magnitude of the relative numbers of species due to the un-seasonal and above average rainfall experienced in May 2004. Evaluation of actual and potential mosquito breeding sites was made during intensive field inspections. Prospective habitats were inspected for the presence of mosquito larvae, aquatic predators and vegetation.

The report and data for the September survey is provided in **Appendix E** to this Supplement.

20.6 Appendix H Vegetation & Flora

NTG 110: The single field survey in the Dry Season (1-5 June 2004) is inadequate, so it is not surprising it only recorded less than half the number of terrestrial vertebrates from the area in the NT Fauna Atlas. For example only 2 (out of 9) species of frogs were found. No mammals at all were trapped during the survey.

The pictures of habitat types provided are unnecessary because they repeat those present in other appendices.

NTG 110: The single field survey of terrestrial vertebrates in the Dry Season is inadequate.

The field surveys were conducted in the dry season in June, when the site was first accessible. The desktop review of species that have either been recorded in the area or have the potential to occur

in the area was conducted in addition to the surveys. A search of the NT database within a 20 km radius of the project area was conducted. This large search area was chosen as it was recognised that the habitat types present within the project area are well represented in the surrounding environment and hence provide details of species fauna recorded for a region will always be richer than for single localities, so it is by no means surprising that fewer species were recorded. However, the fauna surveys that were conducted added an additional 28 species to the NT Fauna Atlas records for the region. The field surveys recorded 60 fauna species, including one mammal species, 46 bird species, 11 reptile and two frog species. It is not unusual in one trapping period in the tropical savannas to trap few and sometimes no mammals. This is not a reflection on the quality of the trapping methods, which followed the standard Bioregional Assessment Unit (NTP&WS), but may be a reflection on the adequacy of standard methodologies employed for trapping in the tropics.

To put the sampling effort in context of recent published findings, a study looking at trapping requirements in order to determine species richness of small reptiles, found that species accumulation or 'richness' continued to increase at different sites even after 14,000 and 16,000 pit-trap days (Thompson et al. 2003). While this is a recognised problem for all environmental assessments, no proponent should be expected to sample sufficiently to overcome these problems when even full-time scientific researches have not been able to overcome the difficulties. It is maintained that even with the limited data, the impacts from this project on fauna are likely to be negligible.

The question needs to be asked, at what point would a survey effort be adequate and for what purpose – collection of data or use for monitoring against background assemblages? Two frog species were recorded in dry-land terrestrial sites, which is reasonable considering that frogs are most commonly found in or around waterbodies. There was no waterbodies in the proximity of the gas plant and onshore pipeline footprint to sample.

It is anticipated that the fauna data collected during the pipeline construction will increase the knowledge of faunal assemblages in this region considerably.

The photos of the fauna survey sites are unique to **Appendix H**, **Volume 2** of the Draft EIS and are not repeated in any of the additional appendices. It is acknowledged that they may be similar to pictures included in other technical reports such as the Vegetation and Flora study, however, as these sites were used specifically for the fauna surveys, it was deemed appropriate to include them and does not detract from the report.

20.7 Appendix L Species with Indigenous Cultural Values

NTG 111: Table 1 (Page 7) records "many species' of fishes as Key Resources from offshore habitats, Table 1 (Page 7) indicated the traditional owners consider molluscs, crustaceans, fish and mangrove works [worms] as Key Resources from the mangrove habitat, yet the Proponent failed to assess them. Page 10. Where is the data to support the claim "Country damaged during the laying of the undersea pipeline, shore crossing and pipeline corridor to the gas plant **would recover in a relatively short period**"? In the event that marine pests or weeds (like the noxious *Calotropis procera*) gain access, then there would be permanent and irreversible alteration to these habitats.

NTG 111a: Traditional Aboriginal owners consider molluscs, crustaceans, fish and mangrove worms as Key Resources from the mangrove habitat, yet the Proponent failed to assess them.

As discussed in response to **NLC 44** (**Section 14.9.2**), no mangroves will be disturbed during the construction, production and decommissioning phases of the Blacktip Project so there should be no loss of mangrove habitat or impact on the traditional use of any key resource from the mangrove habitat. Information on traditional fisheries is presented in **Section 9.7.6, Volume 1** of the Draft EIS. The most important species for the Thamarrurr Region are similar to the species important across the whole of the Territory and include mullet for bait, barramundi, catfish, mussels and mudcrabs. Mussels, mud crabs and mangrove worms are important resources found in the mangroves.

A Vegetation Clearing Construction EMP and Sediment & Erosion Control Construction EMP (**Table 15-9, Volume 1** of the Draft EIS) will be prepared prior to construction which will ensure that there will be no planned disturbance to mangroves. A comprehensive survey of the mangroves and associated fauna at Yulow Point and Maninh Point has been completed as part of the Draft EIS. The result of this work is presented in **Section 7.3.3**, **Volume 1** and **Appendix B**, **Volume 2** of the Draft EIS. The Proponent will also undertake further intertidal baseline work prior to construction and ongoing monitoring during the operational phase of the project.

As discussed in response to **NLC 44** (**Section 14.9.2**), the only risk to mangroves and associated fauna is from an accidental oil spill. Management of oil spills is discussed in detail in **Section 11.19**, **Volume 1** of the Draft EIS and in response to **NLC 44**.

NTG 111b: Justify the claim "Country damaged during the laying of the undersea pipeline, shore crossing and pipeline corridor to the gas plant would recover in a relatively short period".

This statement does not accurately quote what is stated in the Draft EIS (**Section 13.10.1**, **Volume 1**). The quote seems to refer to a sentence (p.460) of the Draft EIS report which states:

> Country damaged during the laying of the undersea pipeline, shore crossing and pipeline corridor to the gas plant should recover in a relatively short period, with no long term loss of resources expected in these areas.

This sentence reports comments made by traditional Aboriginal owners to the effect they expect the environments in the immediate vicinity of the pipeline *should* (not *would*) recover relatively

quickly. These comments were made by traditional Aboriginal owners in the context that the nearby mangrove and turtle nesting environments should be avoided. These comments were situated in the Draft EIS report following a statement which reads (p.460):

> "Plant and animal communities along the pipeline corridor, shore crossing and on the sea bed will be disturbed during the construction phase. The extent to which this disturbance will impact on long term Aboriginal resource use will depend on the care taken during construction, success of rehabilitation after construction and control of weeds.

Therefore, the intention of the sentence in the Draft EIS was to report what traditional Aboriginal owners believe should happen if all possible care is taken in construction and rehabilitation, rather than a statement of fact of what would happen.

20.8 Appendix M Social Impact Assessment

NTG 112: 5.15 Potential social impacts of upgrades to roads and increased traffic (page 42) highlights Traditional Owners and community members concerns regarding road safety issues associated with construction traffic. A number of suggestions are made to improve road safety, including a requirement for all construction workers to undertake an orientation course to highlight the different ways in which local Aboriginal people use roads, particularly the main access road from Darwin.

Road safety has not been acknowledged as a management issue in the Framework Traffic Management Plan and the need for road safety orientation for workers regarding off site issues is not addressed in the Traffic Management Plan or in the Social Impact Management Plan. Similarly the need for a bilingual road safety awareness campaign has not been considered. A more comprehensive consideration of road safety issues and proposed management strategies is required.

NTG 112: A more comprehensive consideration of road safety issues and proposed management strategies is required.

A Traffic Management Plan has been prepared and is attached as **Appendix B** to the end of this Supplement.

20.9 Appendix P Marine & Intertidal Monitoring Programme

NTG 113: This is supposed to be a framework for monitoring the offshore area etc. It is very brief, more a sketch than a framework as it is very light on plans and does not say what it WILL do, just what it MIGHT do. Monitoring as proposed here does not include: colonisation by marine fauna on artificial platforms or verifying presence/absence of marine pest species. It should include discussion of these.

NTG 69: One definite impact will be that of a large artificial reef – the wellhead platform. This is likely to be a positive impact, from the viewpoint of the marine fauna. There do not seem to be any plans to sample and monitor settling and colonisation of its structure and surroundings for fish and invertebrates. In addition, how else can aquatic pest management be effective unless the "fouling" fauna is regularly sampled and identified? This is an opportunity for the proponent to be proactive.

This monitoring should be seriously considered.

NTG 106e: The offshore and intertidal habitats change dramatically seasonally. Therefore samples should have been obtained both in the Wet and in the Dry season. Indeed, a strategy for long-term monitoring is clearly called for.

NTG 106e: Long-term monitoring of both the offshore and intertidal samples is requested both in the wet and in the dry season.

The offshore and intertidal environmental field surveys were conducted shortly after the end of an extended wet season in May and June 2004. The field surveys recorded 95 faunal species intertidally and 135 species subtidally. It is acknowledged seasonally variable species may have been undersampled or missed during a single survey. Algae, in particular, have seasonal growth cycles and may be missed during a single survey. However, *Sargassum*, the dominant algae in Tropical Australia achieves its greatest biomass around May yet no specimens were observed during the offshore and intertidal environmental field surveys (refer to response to **NLC 45**, **Section 10.2.2**). In addition to the surveys, a desktop review of species that have either been recorded in the area or have the potential to occur in the area, permanently or seasonally, was conducted as part of the Draft EIS. The information gathered during the surveys and desk-top studies were used to describe the existing marine environment for the Draft EIS and assess the environmental risks of the Blacktip Project (refer to response to **NTG 106i**, **Section 20.2**). The Proponent will undertake additional surveys as the project details are further developed, and in consultation with the relevant regulatory authorities. If warranted, these surveys may include seasonal sampling to assess seasonal variability.

NTG 113: Provide further detail in the framework for monitoring the offshore area and provide commitments to actions.

NTG 69: Monitoring of settling and colonisation of the structure and surroundings for fish and invertebrates is required.

The final selection of monitoring parameters will be chosen as the project detailed design develops. The Framework Monitoring Programme was presented to provide an outline or starting point, to be refined further during discussion with the regulatory authorities and stakeholders. The final Monitoring Programme may include further assessment of the infauna and epifauna community around the wellhead platform, mooring location and PW discharge, which would enable assessment of the fouling and benthic community, the presence of introduced species and assessment of seasonal influences. Development of the final monitoring programme and the selection of the parameters to be monitored will be advanced as detailed planning for the Blacktip Project progresses. The final selection of parameters to be monitored will be determined following discussion and agreement with the relevant regulatory authorities.

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22. Glossary

AAPA - Aboriginal Areas Protection Authority.

ADF – Australian Defence Force.

Aerobic- Requiring oxygen for respiration.

AFFF - Aqueous Film Forming Foam.

AFMA – Australian Fisheries Management Authority.

ALRA – *Aboriginal Land Rights (Northern Territory) Act 1976.*

Anaerobic - Not requiring oxygen for respiration.

ARPNSA - Australian Radiation Protection and Nuclear Safety Agency.

ASS - Acid Sulfate Soils.

Barg - Bar Gauge.

Bioaccumulation - Bioaccumulation refers to the amount of substance taken up by an organism through all routes of exposure (water, diet, inhalation, epidermal).

Bioavailability - The bioavailability of a chemical entity is its ability to gain entry into an organism by being transported through a membrane or the ability of a chemical entity to adversely affect the performance of an external membrane by being strongly absorbed to it.

Biocide - A chemical agent, such as a pesticide, that is capable of destroying living organisms.

Biodegradability - The potential of an organic substance to be broken down into simpler compounds or molecules through the action of microorganisms.

Biodegradation - The breakdown of material by a biological organism.

Biomagnification- A cumulative increase in the concentrations of a substance in higher levels of the food chain.

Blowout - A sudden, uncontrolled flow of drilling fluid, oil, gas, or water from a wellbore when the formation pressure in a permeable formation exceeds the pressure in the borehole.

Booms - Booms are used to contain oil on the surface of the water after an oil spill.

BOP - Blowout Preventer - A safety device for closing the wellhead, which has rubber rams which can be closed down on the logging cable in the event the well begins to blowout. Blowout preventers may be connected in series for improved control. Also, equipment installed at the wellhead at surface level on land rigs and on the seafloor of floating offshore rigs to prevent the

escape of pressurised fluids either in the annular space between the casing and drill pipe or in an open hole during drilling and completion operations.

BTEX - Benzene, Toluene, Ethyl-benzene, and Xylene.

Calcareous - Composed of calcium carbonate.

Carbonate - Compound containing carbon and oxygen.

Carcinogen - A substance or agent that is known to cause cancer.

CCR - Central Control Room.

CEFAS - The Centre for Environment Fisheries and Aquaculture Science. CEFAS is an internationally renowned scientific research and advisory centre working in fisheries management, environmental protection and aquaculture.

CO_2 e – Carbon dioxide Equivalent.

Coagulant - Material which will form a gelatinous precipitate in water, and cause the agglomeration of finely divided particles into larger particles which can then be removed by settling and/or filtration.

dB (decibel) - This is the scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and the reference pressure ($0.00002 N/m^2$).

dB(A) - This is a measure of the overall noise level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

dB(C) - Decibels C Weighted. A standard weighting of the audible frequencies used for the measurement of Peak Sound Pressure level.

DEET - Department of Employment, Education and Trading (NT).

Demersal - Living on and near the seabed.

Demulsifier - Additive that promotes oil-water separation in lubricants that are exposed to water or steam.

DHCS - Department of Health and Community Services Northern Territory.

DIPE - Department of Infrastructure Planning and Environment.

Dispersants - Chemicals that are applied to oil to break it up into tiny droplets.

DNV – Det Norske Veritas.

DOIR – Department of Industry and Resources (WA).

DPIC – Designated Person in Charge.

DTI - Department of Trade and Industry.

EBM - Ester Based Mud.

ECNT - Environment Centre Northern Territory.

Ecotoxicity – A measure of the effects (immediate or delayed) of substances or preparations on one or more sectors of the environment.

Elasmobranch - Any of numerous fishes of the class Chondrichthyes, characterised by a cartilaginous skeleton and placoid scales and including the sharks, rays, and skates. The Freshwater Sawfish is a shark.

EMP - Environmental Management Plan.

EP – Environment Plan.

EPBC Act - *Environment Protection and Biodiversity Conservation Act 1999.*

ESDV – Emergency Shut Down Valve.

FEED - Front End Engineering Design.

Feldspathic - Consisting of feldspar which are any of a group of abundant rock-forming minerals occurring in igneous, sedimentary, and metamorphic rocks and consisting of silicates of aluminium with potassium, sodium, and calcium.

FID - Final Investment Decision.

Flotsam and Jetsam - Any object found floating or washed ashore.

Formalin - A 10% solution of formaldehyde in water; used to preserve biological specimens.

Gyre - A circular ocean current.

Hazard Quotient (HQ) - The hazard quotient, calculated using the CHARM model, provides an indication of the likelihood of adverse effects occurring due to the use and discharge of the chemical under a realistic worst-case scenario.

HCONF - Harmonised Offshore Chemical Notification Format

Holocene – The last 10,000 years of the earth's history.

HSE – Health, Safety and Environment.

Hydrophilic - Having an affinity for water.

IMO - International Maritime Organisation.

IRCP - International Commission of Radiological Protection.

IRPA - Individual Risk Per Annum.

LAT – Lowest Astronomical Tide.

Lateritic - Red soil characterised by insoluble deposits of ferric and aluminium oxides.

Lipophilic - Having an affinity for lipids (oil).

LTS - Low Temperature Separator.

MAGNT – Museum and Art Gallery of the Northern Territory.

MEB - Medical Entomology Branch

MEG - Mono Ethyl Glycol.

Methanogenesis - Reduction of CO_2 to CH_4.

NES – National Environmental Significance.

NLC - Northern Land Council.

NOHSC - National Occupational Health and Safety Commission.

NORMs - Naturally Occurring Radioactive Materials.

NT - Northern Territory.

NTASSA - *The Northern Territory Aboriginal Sacred Sites Act 1989.*

NT-ICN - NT Industry Capability Network.

NWBM - Non Water Based Mud.

OCNS - The Offshore Chemical Notification Scheme - is administered by the Department of Trade and Industry, UK. The OCNS applies to all chemicals, which are used in the actual exploration, exploitation and associated offshore processing of petroleum on the UK Continental Shelf.

OSCP – Oil Spill Contingency Plan.

OSPAR - The Convention for the Protection of the Marine Environment of the North-East Atlantic (the "OSPAR Convention").

PAH - Poly Aromatic Hydrocarbon.

PASS - Potential Acid Sulphate Soils.

PEC - Predicted Environmental Concentration.

Permian - A period in the geologic time scale that spans from 286 to 245 million years ago.

Pleistocene - The time period between about 10,000 years before present and about 1,650,000 years before present.

PLONOR - Pose little or no risk.

PNEC - Predicted No Effect Concentration.

Precipitation - To fall out of solution.

PWCNT - Parks Wildlife and Commission Northern Territory.

QRA - Qualitative Risk Assessment.

Quaternary - The geologic time period comprising about the last 1.65 million years.

RAN – Royal Australian Navy.

ROV - Remotely Operated Vehicle.

SAP - Sampling and analysis plan.

SBM - Synthetic Based Mud.

Sheening - The visual property of oil on the surface of the ocean that shines with reflected light.

Sievert (Sv) - The unit of radiation dose.

Siliciclastic - Fragments of silicate rocks (rocks rich in silicate material).

SIMP - Social Impact Management Plan.

Skimmers - A skimmer is a device that collects and removes oil from the surface of the water.

Sorbents - Sorbents are materials that soak up oil from the water.

SPOCAS - Suspended Peroxide Oxidation Combined Acidity and Sulphate.

SSIV - Subsea Isolation Valve.

Surfactants - An active agent which operates at a surface, such as a water-oil boundary.

Sygnathid - Seahorse and sea dragon species (Family Sygnathidea).

Symbiotic - A relationship between two organisms in which both benefit.

Tainting - The unpleasant taste in food which has been exposed to hydrocarbons.

TCA – Territory Construction Association.

Te – Tonnes equivalent.

Terrigenous - Shallow marine sediments consisting of material derived from the land surface.

TEU – Training and Employment Unit.

Trepang - Sea cucumbers, holothurians.

Turbidity - Measure of clarity of a water body.

UCS - Unconfined Compressive Strength.

WBM - Water Based Mud.

WMP – Waste Management Plan.

Zooxanthellae – An algae that live symbiotically within the cells of other organisms.