Northern Territory Government

DEPARTMENT OF
NATURAL RESOURCES, ENVIRONMENT, THE ARTS AND SPORT

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Our ref EN2011/0214
Your ref

Mr David Ritchie
Chief Executive
Department of Lands and Planning
GPO Box 2520
Darwin NT 0801

Attn: Mr Ken Gardner

Dear Mr Ritchie

The Supplement to the Environmental Impact Statement (EIS) for the East Arm Wharf Expansion Project was received on 3 November 2011. Review of the Supplement by this Department and other government agencies has revealed a number of areas where information in the draft EIS and Supplement is insufficient to enable an adequate assessment of environmental impact from the proposal. In order to facilitate examination of the proposal, I have determined that further information is required.

In accordance with the clause 14(2)(a) of the *Environmental Assessment Administrative Procedures*, I direct Department of Lands and Planning to provide the necessary information set out in Attachment A. Please note that the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) have provided advice to the Environment and Heritage Division that they require information related to dredging, acid sulfate soils, piling, appropriate mitigation measures for matters of National Environment Significance and proposed offsets before consideration of the action can continue and without such, may be required to "stop the clock" again to seek this information if it is not supplied to its satisfaction.

I note that on 21 November 2011 you wrote to me, advising that you have now removed the rail loop component of the project scope. If this variation is approved by the Minister for Natural Resources, Environment and Heritage under the *Environmental Assessment Act,* and the Australian Government *Environment Protection and Biodiversity Conservation Act 1999,* I will be satisfied that the information relating to the rail loop identified in Attachment A will no longer be required.

Once I am satisfied that the necessary information has been received, the Environment and Heritage Division has up to 35 days to complete the assessment report for this proposal for approval by the Minister for Natural Resources, Environment and Heritage. Given the tight timeframes for the project, this office will aim to complete the assessment well within the statutory timeframe.

In the first instance, any questions of clarification in relation to this matter should be directed to Lisa Bradley on (08) 8924 4136.

Yours sincerely

Matt Darcey
Executive Director, Environment and Heritage

22 November 2011

Attachment A

Further Information Request –
East Arm Wharf Expansion
November 2011

The following issues are being raised because they are environmentally relevant and have not been adequately addressed in the Supplement, as requested in the comments provided on the draft Environmental Impact Statement (EIS). Information on these environmental issues is necessary to facilitate examination required under the *Environmental Assessment (EA) Act*. The final Dredge Management Plan (DMP) is to be informed by the environmental assessment process. Information requested here is to be provided to satisfy the EA process and a further commitment to submit requested information in a DMP or Environmental Management Plan will not be considered a suitable response. The Assessment timeframe is suspended until the proponent submits the information requested and it is adequate for assessment to continue.

Previous correspondence from NRETAS to the proponent regarding the information requested below has been summarised as an appendix to this attachment (Appendix 1).

Rail loop and spur

There is a lack of certainty and detail on the design of the rail loop and spur, in particular the potential direct and indirect impacts to the marine environment, management of acid sulphate soils (ASS), and runoff. The draft EIS indicated that construction is expected to commence in 5-10 years. In the Supplement, the commencement date changed to 10-15 years with the possibility that the preferred location may change during this period. In the Supplement, the current design (Fig 6-4) is to retain the mangroves encircled by the loop and install culverts to allow tidal exchange of sea water between the enclosed mangroves and Darwin Harbour, aiding mangrove health. However, the proponent also states that this land inside the loop may be filled in the longer term in which case the mangroves within the loop would be cleared.

The updated figure provided in Figure 6-4 in the Supplement shows the proposed location and design for the rail loop but an assessment cannot be made until potential impacts to the environment by loss of habitat, changes to hydrology and water quality and impacts to Bleesers Creek are adequately described, understood and management measures to avoid and mitigate potential impacts provided. The following information is required for assessment:

- Map of ASS and management - in the Supplement, the proponent commits to conducting a detailed ASS survey of the proposed rail loop site prior to commencement of the rail loop. Detailed mapping of ASS

is essential to determine the best location and construction for the rail loop and inform the management of ASS;

- An estimated 475 000 m^3 of marine sediments is proposed to be dredged for the rail loop bund and details of potential impact and management of this material must be provided as part of the Dredge Management Plan and incorporated into the Dredge dispersion model;
- Details of underlying benthic habitat and other sensitive habitat that the rail loop and spur may directly and indirectly impact to determine impacts to marine ecology. Figure 6-4 showing the proposed location and design of the rail loop, should provide an underlying map showing proximity of sensitive habitat including benthic communities;
- Details of occurrence of marine megafauna (marine turtles, dugongs and coastal dolphins) and likelihood of potential impacts from the construction of the rail loop; and
- Alternative designs and location of the rail loop, including detailed reasons for the selection of the particular option and the short, medium and long term potential beneficial and adverse impacts of each of the options should be considered and associated risks detailed and analysed.

Marine Ecology

The benthic habitat map provided in this assessment was extrapolated from only two data points, one off the north-western end of the wharf and one off the south-eastern end of the wharf. It appears anecdotal evidence from the proponent's consultants was used to indicate that moderate to high densities of benthic taxa are not present across the broad areas shown. (Section 14, Supplement). The area contains significant habitat for many species, including marine megafauna (Palmer, 2010). Furthermore, surveys for marine megafauna (i.e. marine turtles, dugongs and coastal dolphins) species have not sufficiently focused on the East Arm Wharf area. The lack of information presents a high risk of inaccurately representing and underestimating high biodiversity-value benthic habitats, incorrectly mapping the reef areas, and underestimating how local populations of marine megafauna use thi areas.

Relevant datasets exist for important hotspots of biodiversity such as those around South Shell Island and are available to the proponent (contact MAGNT to access this information (Alvarez, *et al,* 2003, Hooper *et al,* 2002, GHD 2006 (unpublished report – contact Marine Biodiversity, NRETAS). The following information needs to be provided:

- Up to date data and mapping of benthos types in the project area;
- Overlay the EAW Expansion project components and dredge dispersal modelling on benthic habitat map. Figure 6-3 in the Supplement indicates the revised, reduced scope of the Marine Supply Base (MSB) access channel and should illustrate the benthic habitat map underneath;
- Include the WBM (2011) report referenced in the Dredge Management Plan if this data was used to produce the Benthic habitat map so that it can be made publicly available as part of this assessment process. Supply details of other technical reports if they were used to describe

how the benthic habitat survey and mapping were conducted and how they were produced. The reports should clearly describe the mapping methods, classification systems and the decision rules applied to the data for the purposes of classifying it; and

- Include details in the Environmental Management Plan Outline (Appendix A) on documenting and monitoring the loss and/or recovery of coral/sponge species within East Arm and South Shell Island.

Classification of impact zones

The classification of impacts based on benthic habitat and occurrences of turbidity/sedimentation have been broadly discussed in the Dredge Management Plan and follow the recommended approach by WA EPA (2011). This guidance states it is not possible to predict the impacts of dredging without a good understanding of biological communities within the area bounded by and including the Zone of Influence. Accordingly, a benthic habitat map covering the area predicted to be influenced by dredging is a critical piece of information for assessment. The benthic habitat map must present the extent and distribution of each benthic habitat type within a predicted zone of influence and in selected areas outside this zone considered suitable for establishing reference sites for the purposes of monitoring (WA EPA, 2011).

The location of the outer boundaries of the Zone of High Impact, Zone of Moderate Impact and Zone of Influence are to be shown on the benthic habitat map relevant to East Arm in order to assess potential impact in the marine environment.

Provide the following:

- Evidence of field validation on the benthic habitat map provided, particularly in areas predicted to be directly impacted by project components or significantly affected by indirect impacts, such as turbidity and sedimentation;
- Identify habitats with higher biodiversity values that may be threatened by dredging activities (zones of moderate impact and influence).
- The range of likely impacts on different inhabitant benthos immediately adjacent to the dredged seabed area (zone of direct impact);
- Use existing scientific and NTG knowledge and compiled data sets (e.g. Attachment 2 Supplement, GHD 2006), to predict influence of dredging activities on nearby sensitive habitat; and
- Calculate areas occupied by each habitat type and amount of each type in the predicted impact zones (i.e. direct and indirect impact) and present as a percentage of the overall known habitat type in the Harbour for zones of direct, moderate and zone of influence.

Protection of Matters of National Environmental Significance

The Australian Government Department of the Sustainability, Environment, Water, Population and Communities (DSEWPaC) requires the following

additional information on *Environment Protection and Biodiversity Conservation* (EPBC) listed species to make an informed decision on whether or not to approve the proposal. It is recommended the proponent liaise directly with the DSEWPaC if clarification is required on the below information request:

- The benthic habitat map near East Arm Wharf does not show all areas impacted by the dredge plume. Unless further information can be provided, the department will assume these areas are biologically important to each of the relevant matters of National Environmental Significance (NES);
- Further information is required on appropriate mitigation measures for matters of NES and offsets;
- The marine fauna surveys have not been identified as occurring within the EAW project area or in all affected by the dredge plume. Survey techniques remain unclear – more detail is required on the timing and duration of the surveys conducted and studies other than the GHD, 2011 used for the INPEX project. The proponent is encouraged to contact Marine Biodiversity, NTG to access surveys and information relevant to the EAW area;
- Further information about the piling activities to validate the exclusion zone of 500 m and the extent of piling to be undertaken is to be provided;
- Three species of sawfish have been recorded in Darwin Harbour and as such information regarding the potential impacts needs to be provided;
- On page 192 of the draft EIS it is stated "*development of harbour facilities serviced by heavy vessel traffic will also elevate local background levels, and may cause some species to avoid former nearby breeding or feeding areas owing to the amount of vessel movement and disturbance as well as noise".* The location of this referred habitat for the Australian Snubfin dolphin must be provided. The DSEWPaC species profile for the Snubfin dolphin identified that it *can be expected to exhibit vessel avoidance behaviour, potentially negatively affecting their extent of occupancy and life history, as per other nearshore dolphins. Additionally, the frequencies of whistles produced by snubfin dolphins are likely to fall within the range often emanating from boat traffic, suggesting that noise pollution may be a problem for this species".* All impacts from increased vessel traffic must be provided (noise and collision) and proposed monitoring and mitigation measures and their efficacy be addressed. An estimation of the number of current vessels using EAW and the number of additional vessels expected due to the proposed expansion would aid assessment of vessel impacts on this species;
- Comments made for the above Australian Snubfin dolpin should also be used for Spotted Bottlenose Dolphin, Indo-pacific Humpback Dolphin, Dugong and Marine turtles.
- Impacts from increased vessel traffic (noise and collision) and proposed monitoring and mitigation measures for marine turtles need

to be addressed. Foraging habitat areas for marine turtles also need to be discussed;

- Acid sulfate soils (ASS) have a number of negative implications for the Water Mouse relating to habitat degradation, poor plant productivity and can impact negatively upon important food resources. Given that construction of the rail loop has the potential to produce ASS, and it is within a likely habitat area for the Water Mouse, impacts on the species and mitigation measures are to be provided;
- The dredge plume modelling provides one very specific scenario modelled for a cutter suction dredge (best case scenario) and it is assumed the proponent will accept dredging methodology is restricted to this method as a condition, should the project be approved; and
- Provide information on the surveys conducted for migratory birds and how they relate to the *Draft EPBC Act policy statement – Significant impact guidelines for 36 migratory shorebird species.* Further information is required to substantiate the suggestion that migratory birds can and will use other nearby areas if displaced. Provide detail on current use of area by the birds (roosting/feeding?), and impacts of terrestrial noise.

There are provisions for the Commonwealth to also request further information and the statutory timeframe for undertaking the decision stops on the date of the letter, and restarts when suitable information is provided to the department.

References

BMT WBM December 2011, East Arm, Elizabeth River, Blackmore River and Middle Arm Marine Habitat Survey, Rev 1.

GHD (2006) Darwin Wharf Project Coral Monitoring – 2006 Post Dredge Survey Report (available upon request from Marine Biodiversity, NRETAS).

GHD (2011a) *Report for Inshore Dolphin Survey, Darwin Harbour (Middle and West Arm): Summary Report for Survey Block 1 (28-31 January, 2011)*. Report prepared for INPEX Browse.

GHD (2011b) *Report for Inshore Dolphin Survey, Darwin Harbour (Middle and West Arm): Summary Report for Survey Block 2 (9-11 February, 2011)*. Report prepared for INPEX Browse.

GHD (2011c) *Report for Inshore Dolphin Survey, Darwin Harbour (Middle and West Arm): Summary Report for Survey Block 3 (6-8 March, 2011)*. Report prepared for INPEX Browse.

Palmer, C. (2010), *Darwin Harbour Coastal Dolphin Project Interim Report,* Biodiversity Unit, Department of Natural Resources, Environment, the Arts and Sport (NRETAS).

WA EPA (2011) *Environmental Assessment Guidelines for Marine Dredging Proposals* http://edit.epa.wa.gov.au/EPADocLib/EAG7-Dredging_230911.pdf

Appendix 1

Previous Correspondence regarding this further information request

From Letter of Response from NRETAS on adequacy of content of preliminary EAW Expansion draft EIS with respect to EIS Guidelines to Ken Gardner on draft EIS (dated 19-May-11)

Information requirements from: *Guidelines for Preparation of the EAW DEIS*	Addressed in East Arm Wharf Expansion preview DEIS?
5.1 Dredging	
The marine and intertidal sediments at this site are also expected to contain Acid Sulfate Soils - soils, sediment or rock that contain elevated levels of metal sulfides (principally pyrite). This is significant as the exposure of metal sulfides to oxygen (e.g. by drainage and excavation of these materials) can generate sulfuric acid. This may result in acid runoff and leachate adversely impacting aquatic communities and destabilising engineering works. The proponent must provide a detailed dredging management plan to address the environmental management of the key risks from dredging. The risks should be quantified and risk treatments discussed. Residual risks are to be clearly defined.	Not addressed (for ASS). Section 6.3.3 and 6.4 promises an ASS Management Plan, but it is not included in the EIS. *Dredging Management Plan* provided at Appendix B of the EAW DEIS, although consideration of Acid Sulfate Soil generation is not directly discussed or identified as a risk, such as for any onshore deposition. An EIS for any significant coastal development would be expected to contain at least a draft PASS/ASS Management Plan (for the project as a whole) not just a commitment to one, given it is identified as a key risk.
5.2 Hydrodynamics	
The presence of reclaimed land and physical structures within the estuary will modify tidal flows in those areas leading to changes in current velocities and tidal drainage patterns in the harbour. It is expected that patterns of sedimentation, areas of deposition, and the composition of deposited sediment will also be altered. The proponent must demonstrate that hydrodynamic changes around the East Arm Port will not lead to a profound change in the hydrodynamics of Darwin Harbour, and further, the proponent should quantify expected changes to hydrodynamics and the resulting impact on the physical and biological environment.	Not addressed. Modelling has occurred of changes to wave heights, current velocities, and current directions, but these figures have not been interpreted in terms of what effects or impacts these changes would have. Considerations are required of effects to sensitive receptors or to sensitive locations, such as nearby beaches, shipping lanes, mangrove areas, creeks and boat ramps, to show what the residual impacts will mean to stakeholders. Changes were reported in section 8.2.1, but the sites have not been identified. A map of impacted areas would be appropriate. Demonstration is required by the Guidelines *'that hydrodynamic changes around the East Arm Port will not lead to a profound change in the hydrodynamics of Darwin Harbour'.* Interpretation is required of the hydrological and ecological impacts on mangroves etc enclosed within the railway loop bund, and how this will be managed.

From Letter of Response from NRETAS to David Ritchie on draft EIS (dated 15-Aug-11)

Marine Ecology

The habitat mapping for marine habitat around the East Arm Wharf is sparse and restricted to the immediate areas surrounding East Arm Wharf which makes understanding the extent and significance of these habitats in the general Darwin Harbour difficult to assess. The draft EIS should describe seabed communities within all areas that can be identified through sediment dispersion modelling as possible impact areas. For monitoring purposes, species specific information is required to allow development of robust monitoring programs that can deliver impact assessments and management actions.

The draft EIS does not present a description of the species assemblages found in the impact areas and reference areas. The community habitat data is general in nature, and does not allow a robust assessment of biodiversity importance / uniqueness nor does it allow a comparison between sites within impacted and non-impacted areas. It is essential to have site-specific species information. The level of species identification should be described to at least family if not genus level. Dedicated field surveys do not appear have been undertaken of these habitats (no appendix for marine flora/fauna surveys). Significant data sets exist for important hotspots of biodiversity such as those around South Shell Island and the proponent is able to access relevant Museum and Art Gallery NT (MAGNT) records for that region (pers. comment Chris Glasby, MAGNT).

A lack of understanding of habitat extent in the harbour means that predictions of potential impact are not substantiated. For example, the proportion of the total hard substrate or coral communities in the harbour is unknown so there can be little understanding about how these communities will be impacted or the implications that impacts to one area might have on the sustainability of that habitat type in the harbour. There is little information provided on how the proponent constructed the benthic habitat map on page 230. They are inadequate for the intended purpose and give the impression of comprehensive habitat mapping.

The most likely marine benthic area to be impacted by this project is South Shell Island because of its close proximity to East Arm Wharf and high diversity of sensitive filter-feeding sponges and other communities (Alarez *et al.*, 2002). Its exact location has not been highlighted in the Executive Summary and the potential impacts of dredging on benthic communities of South Shell Island are only discussed with reference to hard corals. South Shell Island has the highest diversity of sponges and soft corals in Darwin Harbour and almost the entire diversity of sponges in the harbour is represented at South Shell Island (B. Glasby, pers. comm.; MAGNT database) The Dredge Management and Environmental Management Plans need to focus on minimising the impacts of dredging and other operations of the project in this area.

Section 8 of the EIS Guidelines, requires mapping of all benthic habitat for the development site and any other area which may be impacted on. Each EPBC listed threatened and/or migratory species habitat, including potential foraging areas, in the vicinity of the project should be mapped, including areas outside the immediate project area which may be impacted by project activities, and the importance of this habitat for the species described.

Matters of National Environmental Significance under the *Environment Protection and Biodiversity Conservation (EPBC) Act.*

The proposal is a controlled action under the *EPBC Act* and it is being assessed under the bilateral agreement between the Australian and Northern Territory Governments. The proponent has not demonstrated in the draft EIS that matters stated in Schedule 4 of the Environment Protection and Biodiversity Conservation Regulations 2000 have been addressed (Attachment 1, EIS Guidelines, December 2009).

The Guidelines, Section 8, identifies the need to consider marine and migratory species in surveying. Survey techniques were unclear, including concerning geographical extent, survey timing and targeted species. There are references to 'no known' important habitat for different EPBC listed threatened and/or migratory species, however the draft EIS must identify what surveys have been undertaken or what data has been used to establish these areas, particularly for the marine environment near the project site. Where survey data has been used, maps identifying where EPBC listed threatened and/or migratory species have been sighted should be included in the *Supplement*. For instance, the mapped data from the dolphin surveys should be included where relevant. In addition, the *Supplement* should evaluate impacts of the proposal on migratory bird populations in the context of cumulative impacts from existing and other proposed developments within the whole harbour area.

The Guidelines, Section 8, identifies that the draft EIS needs to describe all impacts on each EPBC listed threatened and/or migratory species and their habitats, and assess the importance of this impact (primary and secondary) to the species. The information in the draft EIS is not sufficient.

In particular, further assessment of impacts to listed species is required for:

- The potential impact of the dredging plume on listed species, including from the plume affecting species' habitat, including foraging habitat. This should also consider the impact of any 'double handling' that may be proposed;
- The potential impact of terrestrial noise on migratory birds;
- The potential impact of the release of potential acid sulphate soils or acid sulphate soils on listed marine species or their habitat;
- The potential impact of any increase in lighting during construction or operations on listed species, including marine turtles and migratory birds;
- The potential impact of over-water maintenance, including the clean-up of anti-fouling coatings from steel structures on listed marine species or their habitat;

- The potential impacts of removal of habitat, including the removal of dredge spoil ponds, which are utilised by migratory birds;
- The potential impact of increased vessel traffic for EPBC listed marine species; and
- The potential impact of piling noise on listed marine species. In order to assess this impact, the duration of piling taking place is required. In addition, proposed exclusion zones need to be based on an understanding of the noise propagating characteristics of the area, the sound characteristics of the particular piling methodology and should be designed to avoid physical impacts (including temporary threshold shift) to marine species; including dugong, inshore dolphins and marine turtles. It is not clear from the information provided, how the proposed exclusion zones at Section 13 of the Main Report were derived. Acoustic noise modelling is referenced in the draft EIS, this should be provided in the *Supplement*.

The assessment documentation needs to provide transparent links to monitoring and mitigation measures. A discussion of the likely effectiveness of each of these measures in relation to the species and their habitat should also be provided. For instance, significant migratory shorebird numbers and number of species are reported from the development site. The existing ponds appear to be important habitat for these species. The comment in the Main Report (16.2.6, page 282) that birds currently using these ponds may move to 'offshore islands or adjacent areas' is insufficient.

Therefore where appropriate, for the potential impacts listed above, the *Supplement* should clearly describe proposed mitigation measures and the efficacy of these.

The above information for the following EPBC listed threatened and/or migratory species and their habitats is required to complete the assessment:

- Australia Snubfin Dolphin (*Orcaella heinsohni)*
- Spotted Bottlenose Dolphin (*Tursiops aduncus (Arafura/Timor Sea populations))*
- Indo-pacific Humpback Dolphin (*Sousa chinensis)*
- Dugong (*Dugong dugon)*
- Water Mouse (*Xeromys myoides*)
- Sawfish (*Pristis spp*)
- Marine turtles likely to be in the area according to the DSEWPaC Protected Matters Search Tool, and
- Migratory birds likely to be in the area according to the DSEWPaC Protected Matters Search Tool.

Marine Megafauna

The draft EIS describes that a number of species of marine megafauna are present in the project areas and may be impacted by the development. All species listed as matters of National Environmental Significance (NES) under the EPBC Act are iconic species in the Northern Territory. The project has the

potential to impact on these during construction (dredging and pile driving) and operation (boat strikes, maintenance dredging).

Section No.	Section name	Page No.	Relevant text draft EIS	Reviewer Comment
1.12.4 (Exec. Summary)	Marine water	35	Sediment disposed on land has the potential to release acidity, which may need to be neutralised (typically with lime) if there is insufficient natural acid neutralisation capacity present in the dredged sediment. An Acid Sulphate Soil (ASS) Management Plan would also be prepared for the construction activities at the site.	This is a very reactive way of dealing with potential acidic dredge spoil. Sediment should be characterised prior to disposal on land to determine whether it will be acid producing. Mixing acid producing sediment with clean material will contaminate spoil resulting in more costly treatment options. More details, including an ASS Management Plan are to be provided in *Supplement*.
1.12.10	Marine Ecology	47	Coastal dolphins, dugongs and sawfish are known to occur in Darwin Harbour, but there are no known habitats of significance to these species in the immediate Project area.	Dugongs are known to feed on the sponge gardens beside South Shell Island (see later comment to section 15.5.3 (main report). The fauna report summarised in the next section (1.12.11) states: 'An additional marine mammal, the Indo-pacific Hump-back Dolphin (Sousa chinensis), was also observed in offshore habitat adjacent to the study area'. This indicates the assumption "there are no known habitats of significance to these species" is unsubstantiated.
15.1 (Main Report)	Marine Ecology	226	The general zonation of hard substrates in Darwin Harbour has been described by Pope (1967), Ferns (1996), Russell and Hewitt (2000) and in environmental impact assessments for proposed developments.	Which specific environmental impact assessments describe marine ecology relevant to the proposed expansion works? The Draft EIS has not dedicated a section to describing in detail the fauna and flora present (to family if not species level); discussed its importance / relevance within the Darwin Harbour ecosystem; or the likely implications of loss of biodiversity for Darwin Harbour.

Section No.	Section name	Page No.	Relevant text draft EIS	Reviewer Comment
1.12.10	Marine Ecology – Rail loop and spur	48	Engineering options such as installing culverts are being considered to mitigate the potential loss of mangroves inside the rail loop.	The proposal and commitments on this point need to be clarified and strengthened to optimise environmental outcomes. Engineering solutions exist, and should be clearly committed to at this stage of assessment.
1.12.10	Marine Ecology – Rail Loop and Spur	48	The mangrove tracts around the Darwin Harbour shoreline are extensive and the potential 74 ha mangrove loss associated with the project represents 0.3% of the 27,000 ha of mangroves that currently exist. In this context, the mangrove loss could not be considered as having a potentially significant impact upon mangrove ecosystems at the broader regional scale.	The proposal is unclear as to the future plans for the area enclosed by the rail loop, and whether the whole enclosed area, or just the rail corridor is being cleared. Impacts upon mangroves must be minimised as far as possible.
2.1.3 (Main Report)	Rail Loop and Spur	28	The footprint of this project component will be approximately 89ha, with the causeway comprising approximately 31 ha. The rail loop will enclose an area of approximately 58 ha.	How wide will the area of reclamation be? What will happen to current movements / hydrodynamics to the area enclosed by the loop? The Executive summary mentioned 74 Ha mangrove loss. How does this fit in? The rail loop is an example of lack of design detail making it difficult to assess the potential impacts. Commitment is required as to how the rail loop will be designed to ensure the best environmental outcome and that these details are stipulated in the environmental assessment process.
2.7.4	Rail Loop and Spur	41	The proposed construction methodology for the rail loop and spur is : Mud from the rail loop alignment will be excavated using a small CSD	Has the potential for disturbance of ASS at this construction stage been considered?
	Rail Loop and spur Mangroves	240-242	Impoundment of water at higher than natural levels, which can result in mangrove decline and death due to sustained inundation of pneumatophores…Again, culverts and other structures can mitigate these potential impacts	These culverts and other structures to mitigate the impact to mangroves inside the rail loop needs commitment that they will ensure the contractor incorporates them into final design of the rail loop.

Section No.	Section name	Page No.	Relevant text draft EIS	Reviewer Comment
			...the potential 74 ha mangrove loss associated with the project represents 0.3% of the 27 000 ha of mangroves that currently exist. In this context, the mangrove loss could not be considered as having a potentially significant impact upon mangrove ecosystems at the broader regional scale. The containment of large volumes of water or dredge/spoil/slurries in ponds...creating a zone of impact on adjacent mangrove habitats. Monitoring of shallow groundwater conditions has shown initial increases in salinities...	It may be true in a broad regional scale that 74 ha is not a great deal but in a local context, these mangroves may be critical in assisting in achieving local water quality objectives in this part of the harbour. The proponent needs to provide more description of the design of the rail-lop due to potential impacts to mangroves through loss of habitat, management of acid sulphate soils and run-off. It is not clear whether the 80/20% disposal option may impact adjacent mangrove vegetation not part of the detailed 74 ha of potential loss of mangroves. This will need to be assessed prior to choosing that dredge spoil disposal option.
6.3.2	Acid Sulphate Soils	114	An ASS Management Plan would be prepared for the construction activities at the site.	Provide an ASS Management Plan in the Supplement.
15.3	Protected Species in Darwin harbour	235	The draft EIS refers to dolphin surveys conducted as part of the INPEX Browse EIS. Based on these surveys, the draft EIS concludes that the density of all three species of dolphin is greater or comparable in the western part of Darwin Harbour compared to area close to EAW.	This conclusion is not accurate. The INPEX surveys recorded lower densities of all three species in West Arm and based on photo-identification of dorsal fins, the majority of individual dolphins occur in both the eastern and western parts of Darwin Harbour.
3.3 (draft EIS, main Report)	Alternative Dredging Methods and Dredge Spoil Reuse/Disposal	49	The proponent may investigate other alternatives to the dredging processes described within the Draft EIS	If alternative dredging scenarios are considered – modelling of the proposed methodology must be included in the Supplement.