SUPPLEMENTARY REPORT

PUBLIC ENVIRONMENTAL REPORT

VICTORIA HIGHWAY

UPGRADING TO IMPROVE
FLOODING IMMUNITY

JULY **2006**

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1 Introduction

1.1 Background

The Northern Territory (NT) Department of Planning and Infrastructure (DPI) proposes to upgrade sections of the Victoria Highway (the Highway) between Katherine, in the Northern Territory, and the Northern Territory–Western Australia border.

The proposal involves the construction of new bridges and minor realignments of the Highway at the Victoria River, Joe Creek, Lost Creek and Sandy Creek bridge sites, raising two sections of the Highway, and construction of two passing lanes. Access and use of extraction materials and strengthening and widening parts of the Highway are an integral part of the proposed works.

A Public Environmental Report (PER) was advertised and exhibited for public comment. The closing date for comments was 14 July 2006.

A number of submissions on the PER were received and this Supplementary Report has been prepared to address the issues raised in submissions.

1.2 Submissions Received

The following is a list of submissions received on the proposal.

- Dept Employment, Education and Training – John Hassed, Deputy Chief Executive
- Tourism NT – John Colemean, General Manager Destination Development
- Dept Primary Industry, Fisheries and Mines – Neil MacDonald, Regional Director Katherine
- Dept Health and Community Services – Tracy Ward, A/Director Environmental Health
- NT Police – Paul White, Commissioner of Police
- Dept Natural Resources, Environment and the Arts – Dianne Bensley, Heritage Conservation Services, and Brett Easton, Manager Vegetation and Land Management
- Dept Business, Economic and Regional Development – Mike Burgess, Chief Executive Officer
- Environment Protection Agency – Lyn Allen, Executive Director Environment and Heritage

Issues raised in these submissions are addressed in Section 2 of this Supplementary Report. Copies of all comments received are included in Appendix A

2 Responses to Submissions Received

2.1 Dept Education Employment and Training

By Email sent to the Environment Protection Agency (EPA) on 26 June 2006, John Hassed advised that DEET had nil comment on the proposal.

Response.

Noted.

2.2 Tourism NT

In a letter dated 26 June, Tourism NT supported the project proposal, stating that "Tourism NT welcomes the proposed upgrading of the Victoria Highway…", and that "Upgrading the Victoria Highway will improve visitor access to the Victoria River Region and Katherine in the wet season…".

Response.

Noted.

2.3 Dept Primary Industry, Fisheries and Mines

In a letter dated 5 July, the Regional Director provided a consolidated response from the Department.

Overall, the Department supported the plan to upgrade the highway, and stated "no major environmental impediments have been identified".

The letter went on to discuss the aquatic fauna report submitted by Paul de Lestang and Dion Wedd (which was attached in Appendix D in Volume 2 of the PER). The letter also discussed the six recommendations from the de Lestang and Wedd report, as well as three points concerning extraction of materials for the project. These nine points are discussed in detail below.

2.3.1 Aquatic Fauna

Comment.

> *To maintain where possible a buffer zone of 25m or greater from the existing river channel. Alternatively gravel disturbance within 25m of the existing river channel can be carried out provided that a visual survey to identify and thus avoid turtle and crocodile nests occurs.*

Response.

It is increasingly unlikely that site RG3 will be used for gravel extraction. However, if the site RG3 is used for gravel extraction, a buffer zone of 25m between the river flow and any excavation will be maintained. Also, a survey to identify any turtle and crocodile nests will be undertaken, identified by flagging or similar, and avoided by ensuring that excavation does not occur within a suitable distance (to be advised by DPIFM).

Comment.

Maintain existing river flow.

Response.

It is increasingly unlikely that site RG3 will be used for gravel extraction. However, as the 25m buffer will be maintained and there will be no excavation in the actual water area, the existing river flow will be maintained.

Comment.

Rehabilitate excavated area to ensure a hydraulic linkage with the existing channel so as to prevent isolated water bodies forming in the disturbed area as water levels recede after the wet season.

Response.

It is increasingly unlikely that site RG3 will be used for gravel extraction. However, noting that the above 25m buffer is to be maintained, the excavation will be shaped to minimise water bodies forming, and drained at the downstream end so that any ponding water drains back to the river flow. It is noted that the river experiences significant replenishment of bed load material during a Q20 flow, and it can be reasonably expected that there would be some replenishment at lower flows. Such replenishment will aid in the reduction in the possibility of water bodies forming.

Comment.

Conduct a further aquatic faunal survey immediately after the flood waters recede (May – June 2006) using the described sampling methodology (Section 3.0) to describe the seasonal change in aquatic fauna especially the presence (or otherwise) of the freshwater sawfish (Pristis spp).

Response.

The follow up aquatic faunal survey has been completed, and a copy of the report is included in Appendix B.

Comment.

That a survey be conducted concurrently as listed in recommendation 7.4 to establish the presence of and species composition of Pristis spp prior to construction of the bridge in the pools adjacent to the existing bridge structure.

Response.

It is assumed that this comment refers to the construction of the bridge over the Victoria River, as the other three locations (Joe Creek, Lost Creek

and Sandy Creek) become dry early in the dry season. The follow up aquatic fauna survey (at Appendix B) found that:

> "given that only one whip ray was captured in two intensive sampling periods, the abundance of this species and the two species of sawfish is considered very low.
>
> This survey and the previous pre-wet season aquatic fauna survey identified no species of elasmobranch, fish or reptile that appeared to be area specific but rather were representative of the aquatic fauna distributed above, in and below the proposed impacted areas. We therefore consider that any impact to the aquatic fauna community by the proposed works will be of very minor local significance."

Comment.

> *In the event that Pristis spp are present in the area as listed above, all affordable effort is spent to remove the Prisits spp and relocate them into an area not affected by bridge construction.*

Response.

Should the *Pristis* spp be found during construction, DPI will seek advice and assistance from DPIFM to relocate the species to an area not affected by bridge construction.

2.3.2 Permits for Material Extraction

Comment;

> *Any of the listed sites for gravel and fill extraction that are outside the road corridor would fall within the realm of Mining Management Act and the Mining Act. The Proponent will need to be aware of their requirements under these acts.*

Response.

Noted.

Comment.

> *Additionally, if the underlying tenure of the site is freehold, this may require that the Proponent acquire an EMP or EML before removing material.*

Response.

Noted.

2.3.3 Camp Rehabilitation

Comment.

> *While the contractor has been delegated the responsibility for rehabilitation of any camp, there should be some clear delineation of responsibility and details of proposed rehabilitation.*

Response.

DPI will specify in the construction contract specification that the construction contractor must establish his camp within the area of Victoria River Inn. Preliminary discussions with the Inn manager indicate that this will be acceptable (this will be confirmed in writing prior to preparing the contract specification). Any such camp must be established under a commercial arrangement between the contractor and the Inn manager, and as part of the DPI contract specification DPI will require that the Inn manager signs off that the camp area has been satisfactorily rehabilitated before making final contract payments to the contractor.

2.4 Dept Health and Community Services

DHCS submitted comments to EPA in a letter dated 30 June 2006. All three comments referred to the establishment of a contractor's camp. As stated above (in the response to DPIFM's comment about camp rehabilitation), DPI will specify in the construction contract specification that the construction contractor must establish the camp within the area of Victoria River Inn. Preliminary discussions with the Inn manager indicate that this will be acceptable (this will be confirmed in writing prior to preparing the contract specification). Any such camp must be established under a commercial arrangement between the contractor and the Inn manager.

The individual comments from DHCS are discussed below.

2.4.1 Kitchen Facilities

Comment.

> *Should the contractor elect to establish an independent work camp away from the Victoria River Inn they must ensure that the kitchen facilities and accommodation comply with the Food Act 2004 and Food Standards and the Public Health act and Regulations respectively. For Further information please refer to the Environmental Health Attachment – Information Bulletin No. 6 Requirements for Mining, Construction and Bush Camps.* (Note: the Attachment was attached to the DHCS letter and is included with the letter in Appendix B).

Response.

DPI will now require contractor to establish the camp within the Victoria River Inn land. While that will be a commercial arrangement between the

contractor and the Inn manager, DPI will ensure via its contract specification and ongoing compliance audits that the contractor complies with all relevant acts.

2.4.2 Sewage Wastes

Comment.

> *Reference is made to the possibility of the contractor connecting to the existing sewage treatment plant at the Victoria River Inn, please be advised that the Katherine West Health Board / Department of Health and Community services would not approve this unless a hydraulic consultant has assessed the system and confirmed that the capacity of the system is adequate for the proposed increase in daily load.*

Response.

As part of the project-specific requirements for establishing the camp site, DPI will ensure that such an assessment is conducted by the contractor prior to requesting approval from the Katherine West Health Board to connect to the system. If the system is insufficient to handle the proposed increased load, the contractor will be required to install an additional system or upgrade the existing system to a sufficient capacity, and obtain approval from the Katherine West Health Board. It cannot be determined at this stage if the Victoria River Inn system is currently able to handle the proposed increased load, as the actual load will be determined by the numbers of people that the (as yet unknown) contractor will have on-site at any time during the 2 year construction contract period.

2.4.3 Potable Water

Comment.

> *The potable water supply must comply with the NH&MRC Australian Drinking Water Guidelines. Bore setbacks to on-site wastewater disposal must be in accordance with the Code of Practice for Small On-site Sewage and Sullage treatment Systems and the Disposal or Reuse of Sewage Effluent.*

Response.

This requirement will be included in the project-specific requirements for the establishment of a camp area. The Environmental Health Information Bulletin No 6, Requirements for Mining, Construction and Bush Camps (the Attachment to the DHCA letter) will be included in the construction specification.

2.5 Northern Territory Police

The Commissioner of Police wrote to the EPA on 3 July. The Commissioner responded not only on behalf of the NT Police, but also in his role as Territory Controller under the Disasters Act. The response was

generally supportive of the proposed works, and added two specific comments in the body of the letter. These issues are discussed in detail as follows.

2.5.1 Flood Forecasting Devices

Comment.

> *"… I support the incorporation of flood forecasting devices during construction on any new infrastructure in areas subject to inundation."*

Response.

DPI had a gauging station with telemetry installed 3 years ago at the Victoria River crossing of the Victoria Highway for the sole purpose to provide an alarm system of the rising river at the bridge to enable road closure prior to bridge inundation. This station will be maintained as part of the current works to ensure an effective flood management regime for flooding at the Victoria River crossing.

This conduit, etc is adjacent to bridge on the upstream side linking back to the logger at the Victoria River Inn. NRETA are prepared to disable & remove the conduit to avoid damage during construction & then reinstall once foundation works are completed. The alarm levels will need to be reset for the new structure.

2.5.2 Road Closures and Traffic Management

Comment.

> *I trust road closures and disruption to traffic will be kept to a minimum during the upgrade period. I ask that construction management maintain close liaison with the Timber Creek police and the Superintendent of the Katherine and Central Division, James O'Brien in relation to any traffic related matters. Superintendent O'Brien can be contacted on (08) 8973 8023.*

Response.

Road closures and disruption will be kept to a minimum. It is in DPI's interest, under a duty of care to the users of the road network owned and maintained by DPI, to ensure that traffic is delayed as little as possible. While the contractor will take responsibility for the day to day management of traffic, DPI will retain the overall approval and control of traffic management through the contract specification, and in particular the Traffic Management section of the specification. The contract will be required to comply with the appropriate Australian Standard for traffic management, as well as NT-specific requirements.

The DPI construction management team will ensure that close liaison is maintained with the Timber Creek Police and Superintendent O'Brien during the course of the project.

2.6 Dept Natural Resources, Environment and the Arts

Through EPA, DPI received three submissions from DNRETA. The first was via the internal e-mail system from Dianne Bensley from Heritage Conservation Services, sent on 3 July.

The second submission was by Internal Memorandum sent to EPA, dated 18 July, from Brett Eason, Manager Vegetation and Land Management.

A third was provided by Brett Easton by email on 21 July 2006, and asked for this additional response to be added to NRETA's CNR 263 response.

The comments raised in all three submissions are discussed below as a continuous submission.

2.6.1 Heritage Values

Comment.

> *Section 4.11 (of the PER) adequately sets out the results and recommendations of the archaeological surveys that were undertaken by ESHS in 2005 and 2006.*

Response.

Noted.

2.6.2 Aboriginal Heritage (archaeology)

Comment.

> *On page 4-60 (of the PER) under the heading **4.11.1 Aboriginal heritage (archaeology)** the line "All aboriginal sites are protected under the Heritage Conservation Act" should read as "All aboriginal **archaeology** sites are protected under the Heritage Conservation Act".*

Response.

Noted.

2.6.3 Further Archaeological Surveys

Comment.

> *ESHS have recommended that no further archaeological surveys are required within a 50m zone from the centreline of the Victoria Highway from chainage 185km to 220km. Heritage Conservation Services (HCS) supports this recommendation. However, if works are required outside this zone, then further archaeological surveys are to be undertaken to ensure that no breaches of the Heritage Conservation Act 1991 occur*

Response.

Noted. Further surveys will be undertaken as required.

2.6.4 Surface Water

Comment.

> *Any extraction of surface water for construction or any other use associated with this project will require a Surface Water Extraction Licence issued under the Water Act……Amounts extracted will be required to be reported to the Controller of Water Resources.*

Response.

Noted. The contractor is required to obtain approval from NRETA to extract water from any source as part of DPI's standard construction contract conditions.

Comment.

> *Any areas utilised for extraction of construction materials located within the primary banks of any river or steam will need to be rehabilitated to ensure that any interference of flows in the water course or river bank and bed erosion are minimised.*

Response.

Noted.

The only location where this is likely to occur would be at gravel site RG3. While excavation will not occur within the water flow area, nor within the 25m buffer zone (as mentioned above in Section 2.3.1), there will be a requirement the construct a vehicle and machinery access track to the RG3 site. This track will need to traverse one bank of the river, and the track location will be chosen to minimise disturbance to the bank (there is an area to the south-west of RG3 – downstream – where the bank is shallow and low, allowing easy access to RG3). Prior to the intervening wet season (between the two dry season construction periods), and following completion of the extraction works, the access track will be rehabilitated to prevent erosion. This rehabilitation will include earthworks to replace the excavated bank, and the placement of firm materials (rock rubble, timber etc) to limit to erosion of the area.

However, it is increasingly unlikely that site RG3 will be used for gravel extraction.

2.6.5 Ground Water

Comment.

> *Ground water extraction from any bore NOT located within the road reserve will require express permission from the land owner. Information regarding location of bores can be obtained from this department.*

Response.

Noted.

DPI works closely with NRETA regarding bore locations, ownership and flow rates, and will continue to do so. The consent of the owner of any bore will be obtained before the bore is used.

2.6.6 Vegetation Removal

Comment.

> *…….Part of the present uncertainty related to the eventual area of disturbance is the unknown depths and distribution of material in the Sandy Creek area. It can be expected that the total area proposed will now increase as a consequence of the additional material required.*

Response.

This comment appears to relate to vegetation which would be removed to allow for the excavation of material from the possible extraction area to the south of the highway near the Sandy Creek valley (the area colloquially known as "little Italy"). As will be discussed in detail later in the supplement, the precise location of the extraction area(s) are not yet known. It is DPI's intention that "little Italy" will serve as the main area for excavation, but negotiations are continuing with NLC and Traditional Owners to finalise the details.

It is anticipated that depths of excavation would be limited to 2 m. Locating the pit on the lower slopes will facilitate drainage of the excavation.

The volume of excavation will not increase due to the additional funding and the PER was hypothecated on requiring the total volume of material based on receiving the desired funding. This "additional" funding now only confirms that the whole project can now be constructed.

Comment.

> *It is not clear whether any further vegetation removal is proposed to establish the construction camp and stockpile and storage areas near the Victoria River Inn (section 2.4.7).*

Response.

It is now proposed that the construction contractor will be directed under the terms of the specification to establish his camp within the lands of the Victoria River Inn, under a commercial agreement with the Inn manager. The area of the Victoria River Inn has been previously cleared of native vegetation. Some clearing of existing vegetation would be required to erect accommodation and office units for the camp. The extent and nature of rehabilitation will be dependent on the agreement between the contractor and the Inn manager, but DPI will need to see written evidence that the

Inn manager is satisfied with the rehabilitation measures prior to DPI approving the final payment to the contractor.

Storage and stockpile areas for bridge building materials will generally be on new road alignments leading to the new bridges. Consequently there will not be additional areas cleared of vegetation for these storage areas.

2.6.7 Extraction of Road Gravel and Fill Material

Comment.

> *The PER identifies the main materials required for road construction as up to 80,000m^3 of gravel and 430,000m^3 of fill material. As a result of an increase in Commonwealth Government funding, the proposed amount of fill has increased to 500,000m^3 (EPA meeting held on 10 July).*

Response.

The requirement of both fill material and gravel will remain at 430,000 m^3 of fill and 80,000 m^3 of gravel, despite the additional funding. The additional funding will provide for the project to be completed in full, which was not certain at the time of preparation of the PER.

There needs to be a distinction made between the two types of materials. Fill material is a lower grade of material which can normally be excavated from the lower areas of terrain and is normally transported directly to the worksite without further processing or mixing. Gravel, however is a higher quality structurally stronger material which often requires some form of mixing, blending or even crushing, prior to its delivery to the work site.

Subsequent to the production of the PER, the AAPA have provided DPI with a Authority Certificate that prohibits excavation on the foothills of the area known as "little Italy", opposite Coolabah Station and provides significant restrictions on access to the other nominated areas in the Sandy and Skull Creek areas.

DPI is currently investigating alternative procedures for obtaining these materials, and therefore is not yet in a position to definitely identify the particular source locations for the gravel excavation.

Accordingly a separate section of the Supplementary Report (section 3 – Clearance of Gravel and Fill Extraction Pits) has been devoted to the issue of gravel extraction, as this is seen as an important aspect of the development of the project.

Comment.

> *It was determined that material extraction should be undertaken in accordance with "accepted standards and published guidelines". The appropriate guidelines for extraction pit rehabilitation is Technical*

report No. 13 Guidelines for Effective Rehabilitation of Borrow Pits in the Top End [R.J. Applegate 1983].

Response.

Noted.

The excavation of the extraction material will require specific environmental management.

The "accepted standard" will include

- Archeologically investigation,
- Anthropological investigation,
- Fauna assessment
- Flora assessment
- Geotechnical investigation,
- Design of specific quarry plan,
- Development of Environmental Management Plan, utilising relevant industry guidelines such as Managing Urban Stormwater, Soils and Construction Vol 1, 4th Edition (Landcom, NSW, 2004) (the "Blue Book") as the basis for soil erosion mitigation and control, and including relevant issues such as management of flora and fauna habitat, water quality, erosion and sedimentation, dust, pest animals and weeds and rehabilitation.
- Supervision of contractor's conformance to the EMP.

Comment.

The use of existing stockpiles of material in three sites outside Gregory National Park (identified at sites 20, 21 and 22 in Appendix C to the PER) as a supplement to other potential sources should be considered. All pits and access roads, apart from those required for ongoing maintenance should be closed and rehabilitated on completion of the project. Consideration should also be given to closure and rehabilitation of pits containing unsuitable materials and their access roads.

Response.

The existing stockpiles in these areas will be used. All existing pits and roads within the proposed large area of "little Italy" will be rehabilitated at the end of the project.

The sites 20 and 22 are scrapings only and are not really stockpiles of any significance.

The detailed philosophy and practice of developing and rehabilitation the extraction pits has been discussed in section 3.

2.6.8 Flora and Fauna

Comment.

> *There is little discussion of the expected general impacts of the project on non-threatened fauna species in the appropriate section "Fauna species" (section 4.4.4).*

Response.

The impact on non-threatened fauna species by all activities other than the gravel extraction areas will be minimal. At each bridge site, the waterway area will be at least retained but generally increased. For land dwelling fauna, there will be no restriction on the longitudinal migration and dispersal corridors, and only minor impediment to the transverse corridors because of the higher embankments on the roadway.

Additional studies will be undertaken on the specific effect on threatened and non-threatened fauna species once the actual location(s) of gravel extraction areas are clearly defined.

A second, post 2005-2006 wet season aquatic fauna survey was undertaken as a supplement to the Aquatic Fauna Survey of Proposed Road Pavement Quarry RG3 (de Lestang and Wedd, 2006). The study showed that any impact to the aquatic fauna community by the proposed works will be of very minor local significance.

The study recommend that the existing river inflow be maintained during excavating and the proposed excavated site (RG3) be rehabilitated to ensure a hydraulic linkage with the existing channel so as to prevent isolated water bodies forming in the disturbed area as water levels recede after the wet season.

This has been discussed in section 2.3.1 of this Report.

Comment.

> *Two threatened aquatic species are known to occupy pools located adjacent to RG3 and below the Victoria River bridge at the end of the wet season. These are the freshwater sawfish Pristis microdon (NT Vulnerable) and dwarf sawfish Pristis clavata (NT & Commonwealth Vulnerable).*

Response.

Studies undertaken to date have not found any of the threatened species in the project area. The second survey undertaken by de Lestang and Wedd (2006) indicated that the species are unlikely to occur in the study area.

2.6.9 Species of Particular Conservation Interest

Comment.

> *Thirteen species of plants of conservation significance have been recorded in the region and the project area. Surveys to date have not located any of these species in areas likely to be disturbed by the project. Further surveys of the final locations of the borrow areas are proposed. The results of these surveys should be presented in a supplement to the PER.*

Response.

Refer to section 3 which details procedures to be adopted when the final locations of the fill and gravel sources are known.

Comment.

> *Purple-Crowned Fairy Wrens are reportedly easy to capture using Mist nets after being attracted by playing back the calls. One approach that could be considered is to relocate resident pairs or groups of fairy-wrens to more distant or unoccupied patches of suitable habitat to avoid further disturbance or crowding and competition in adjacent areas*

Specialist advice indicates that the Fairy-wren should not be captured and relocated, as it causes too much stress on the bird (Paul Horner, NRETA, pers.com. Sept 2006). Mr Horner sites the successful relocation of the wren from the nearby Boat Ramp behind the Victoria River Inn where the birds moved voluntarily during construction of the facility are now living immediately adjacent the ramp.

The wet of 2005-2006 was very good for propagation and growth of cane grass. The density and area of cane grass habitat has noticeably increased since the first studies were undertaken. It is considered that by the birds relocating voluntarily they are more likely to find suitable uncontested habitat.

Comment.

> *The preferred locations for construction of the four bridges in the proposal have yet to be approved (Section 2.4.2 Bridge structures and approach roads). In the case of the Lost Creek Bridge (one of the most important areas for the fairy-wren), if the preferred location is not acceptable to the Aboriginal Areas Protection Authority (AAPA), the alternative location may result in additional impacts on the habitat of the birds. These additional impacts have not been described in the PER.*

Response.

AAPA approvals have now been received for the road alignment, including the bridge locations. The Lost Creek site has been approved as the preferred site, which minimises the impacts on fairy-wren habitat

Comment.

> *The lack of availability of construction drawings to the consultant and incorrect identification of sites (Escarpment Creek) calls into question the accuracy of survey results for the species. The interpretation in the PER is that the incorrect identification of sites resulted in an over-estimation rather than an under estimation of the potential damage (section 4.4.4). There is no indication as to whether these mistakes were corrected and a follow-up survey conducted by the contractor. This interpretation should also be explained.*

Response.

The map which refers to Escarpment Creek (Figure 14, HLA report, Addendix D of the PER) is incorrectly labelled. The site is actually the Escarpment Walk car park. It is now obvious that the survey was accurate at the locations of Victoria River, Escarpment Walk and Lost Creek.

The location of the bridge at Lost Creek has been deliberately altered from the downstream side (where the fairy-wren cane grass habitat is most prevalent) to now be on the upstream side, at a sufficient distance from the highway where there is virtually no cane grass present. The PER indicates that "impacts on cane grass over-estimated the potential damage on this habitat", as the Lost Creek bridge site has been relocated to the opposite side of the existing road, minimising the impacts on fairy-wren habitat.

Comment.

> *The possible interruption of dispersal corridors by the expanded footprint of road and bridgeworks is not included as a potential impact of the proposal. It should be indicated whether the importance of this aspect was considered.*

Response.

The project is not expected to have any adverse effect on longitudinal dispersal corridors.

Due to the increased length of bridges proposed, the project will in fact increase the availability of the transverse dispersal corridors at these points. Specifically at Joe Creek, the narrow culvert, which currently can not be used as a transverse dispersal corridor (since the culvert spills directly into ponded water), will be replaced by a bridge with access for dispersal.

As the major barrier to transverse dispersal is the trafficked width of the Highway (the seal and shoulder width, which is not being altered), the

overall effect on the transverse dispersal corridors outside the location of the bridges will not be altered other than an increase in the height of the batters.

2.6.10 Fencing of Revegetation Areas

Comment.

> *Detailed mitigation measures are stated to have been developed for implementation via an EMP in consultation with NRETA. There are references to possible mitigation measures throughout the PER but no explicit statements or commitments in the review. For example, it is suggested that existing cane grass sites could be expanded by transplanting grasses from areas that are cleared and that existing sites may be maintained through fencing to exclude feral animals and livestock (section 3.5). If such mitigations have already been developed, details should have been included in the PER and should now appear as commitments in a supplement.*

Response.

Ongoing discussions regarding appropriate mitigation measures have indicated that whole-sale fencing of existing stands of cane grass is not favoured for a number of reasons including ability to access the sites for fire control, maintenance of the fences following floods, and the cost of erecting large lengths of fencing in areas which are not impacted by the project works.

It is now DPI's intention to transplant cane grass from areas which will be cleared during construction (for example along the route of the Victoria River bridge), or from other areas where the current density of cane grass is insufficient to support populations of the Purple-crowned Fairy-wren. Transplanting will be made into areas which have a low density of cane grass, or where none currently exists but is capable of growing. Preliminary discussions have been held with representatives from the "Caring for Country" group in Timber Creek, who are willing, eager and capable of carrying out this transplanting work. Advice will be sort from Greening Australia (Katherine) which has already carried out transplanting of cane grass, and have developed methods which achieve a reasonable strike rate for the transplanted material.

Following transplanting, the new areas will be fenced with stock-proof fencing until the cane grass has established sufficiently. This period is expected to be one to two wet seasons. Following the satisfactory establishment of the cane grass, the fences will be removed to avoid on-going maintenance issues discussed above.

Comment.

Fencing was proposed to occur in conjunction with the clearing of vegetation at the start of the project (Section 2.4.3 Construction phases, timing and construction methods- Road construction) but at the 10 July EPA meeting it was suggested that fencing was outside the scope of the project and was no longer being actively pursued due to a number of considerations. These considerations included the difficulty of fencing longer stretches of the river to effectively control cattle, problems with flooding and fence maintenance and a suggestion from the proponents that Parks and Wildlife Service did not support the fencing proposal

Response.

Refer to comments above.

Comment.

Feral stock are recognised as a major disturbance to the fairy-wren habitat and strategic fencing had been proposed for revegetation areas (as also proposed in various sections of the PER and the draft EMP), this option should be pursued as a positive offset to the proposal. The current position on fencing and ongoing management of cane grass habitats should have been explicitly stated in the current PER and should now be clarified in a supplement

Response.

Refer to comments above.

2.6.11 Known Weed Incursions

Comment;

The current list of NT Declared Weeds was updated in 2006 and is available by phoning Weed Management on (08) 8973 8107 or online at:
http://www.nt.gov.au/nreta/naturalresources/weeds/weedslist.html

Response.

Noted.

2.6.12 Timing of Construction

Comment.

To ensure compliance with the Weeds Management Act and as per Section 2.9.1 of DPI Construction Division Request for Tender, contractors should ensure that preventative weed control is carried out where required prior to beginning road works.

Response.

Noted.

The quoted Section is just one of the many areas where DPI construction supervision staff will be enforcing the specification requirements under contractual conditions.

2.6.13 Weed Management of Extraction Areas and Access Tracks

Comment.

> *Sourcing that fill and gravel from other locations increases the risk of weed seed spread. Several weed seed species have seeds that can remain dormant for extended periods of time, germinating only when conditions are favourable. It is important to minimize the risk of weed seed spread by sourcing fill/gravel from areas of no weed incursions or by controlling known weeds prior to setting of seed (ie. During the preceding the wet season)*

Response.
The main area of risk in spreading weeds will be in the winning of the fill and gravel. All topsoil and vegetation material from the overburden will be pushed into stockpiles at the extraction site(s). The seed bank of native and weed species is expected therefore to the contained within those stockpiles. As such fill and gravel delivered to the roadworks should be relatively clear of weeds.

Once the actual area(s) for sourcing the fill and gravel have been identified, a strategy for weed control will be developed in conjunction with the flora investigations and study. The control strategy will be included as an obligation under the construction contract.

Comment.

> *If existing vegetation includes weed species, it should not be pushed into adjacent natural vegetation. Weeds should be destroyed prior to any vegetation being pushed into surrounding bushland. It is important to ensure there are no weed seeds in the seed bank of the surface cover.*

Response.

Extraction pits will be examined before they are opened to check for the presence of weeds. Appropriate weed management will be undertaken and any identified weeds will be removed before vegetation is cleared,

Weed spread resultant from clearing next to the existing carriageway would be minimal, as the stripped topsoil would not be transported instead it would be re-spread on the adjacent batters. Similarly, on the new bridge approach roads, the existing topsoil will be re-spread onto adjacent batters.

Comment.

> *Borrow areas and access tracks can also act as corridors for weed seed dispersal and must be regularly monitored for new weed incursions.*

Response.

As stated in Section 4.4.3 of the PER, a weed management plan will be developed and implemented for construction whilst extraction areas and access tracks are operational and for one year post-construction, for species and populations considered to be moderate to high risk weeds.

2.6.14 Machinery Hygiene

Comment.

> *The washdown areas will become a major collection point for weed seeds, and should be closely monitored and managed to prevent these points becoming the source of future weed infestations.*

Response.

Section 2.9.3 of DPI's specification (included in Appendix B of the PER) will be amended to ensure that all vehicles, plant and equipment will be washed down before they are bought onto the project site. Such wash down is usually carried out at a commercial facility.

2.6.15 Existing Hydrographic Equipment

Comment.

> *A surface laid and partially buried orifice line (galvanised iron pipe) runs parallel to the existing highway bridge, on the left bank looking downstream, several meters upstream of the bridge. The orifice line is connected to instrumentation that measures river heights at that location. Prior to removal of the existing bridge or any construction work in the area of the orifice, contact with the NRETA Hydrographic Manger will be required to determine a course of action to minimise data loss and arrange for reinstallation of the orifice line at an appropriate location.*

Response.

Noted.

Since the new bridge and approach roads will be built downstream of the existing bridge, there should be no interruption to data flow when managed appropriately.

DPI had a gauging station with telemetry installed 3 years ago at the Victoria River crossing of the Victoria Highway for the sole purpose to

provide an alarm system of the rising river at the bridge to enable road closure prior to bridge inundation. This station will be maintained as part of the current works to ensure an effective flood management regime for flooding at the Victoria River crossing.

This conduit, etc is adjacent to bridge on the upstream side linking back to the logger at the Victoria River Inn. NRETA are prepared to disable & remove the conduit to avoid damage during construction & then reinstall once foundation works are completed. The alarm levels will need to be reset for the new structure.

Comment.

> *In addition the Hydrographic unit have two disused gauging station towers (Amco section stilling wells) immediately upstream of the current bridge on the left bank (looking downstream). The lower of the two towers was knocked over by flood waters earlier this year. Consideration is requested for the removal of these two towers and back filling the wells during the bridge construction process whilst suitable heavy moving equipment is at site. Again please contact the NRETA Hydrographic Manager for details*

Response.

Noted, the Hydrographic Manager will be consulted.

2.6.16 Recommendations

Comment.

> *The principal contractor should employ a specialist biologist/s (as agreed to by the Department of Natural Resources, Environment and the Arts) for undertaking environmental management of the project and to advise on fairy-wren habitats and to independently audit this component of works (draft EMP).*

Response.

The appointment of a suitability qualified and competent person (as agreed to by the Biodiversity Conservation Unit) is mentioned several times throughout the PER, and in the Draft EMP.

Comment.

> *The Supplement should address the following ……The results of geotechnical investigations, proposed scope of further environmental investigations, updated estimation of the total amount of material required and exact definition of areas proposed to be disturbed by gravel extraction.*

Response.

Because of the current uncertainty with respect to the definitive identification of the fill and gravel extraction site(s), section 3 of the Supplement addresses the procedure to be followed regarding the associated environmental investigations.

The amount of fill and gravel is known and will be 430,000 m^3 of fill and 80,000 m^3 of gravel. At the time of compilation of the PER, details of the funding had not been confirmed, but the PER was hypothecated on the total funding being available which presented the scenario with the greatest environmental impact.

Comment.

> *The Supplement should address the following …… The revised position of the proponent on fencing and proposed management of existing and relocated cane grass habitats*

Response.

Refer to section 2.6.10 above.

Comment.

> *The subsequent Environmental Management Plan [EMP] should address the following:*
>
> - *A Rehabilitation and Management Plan for cane grass (Chionachne cyathopoda and Mnesithea rottboellioides) habitat and the Purple-Crowned Fairy Wren (Malurus coronatus coronatus) populations and proposed management and mitigation measures for "low risk" fauna species.*
> - *Management strategies for the freshwater sawfish and dwarf sawfish if these species are identified in the remnant pools below the final bridge location.*
> - *Floristic surveys, in addition to the report Flora of Conservation Significance (Lewis et al., 2006), are recommended in areas proposed for gravel extraction. Floristic surveys are to provide information on sensitive or significant vegetation communities and the presence/absence of rare, endangered or threatened species to make comment on the appropriateness of native vegetation clearing at these proposed sites.*
> - *A Weed Management Plan that includes:*
>   - *Mission grass and Hyptis suaveolens as Class B Declared Weeds present in the project area.*
>   - *Proposed control measures for the 2006-07 wet season (October 2006 to May 2007) to prevent seed production, including borrow pit locations.*
>   - *Acknowledgement that any fill, gravel or vegetation containing weed species seeds should not be moved from one location to another.*

- *The removal of weeds prior to disturbance and the use of clean machinery to work on borrow areas and access tracks.*
- *The control of any new weed incursions as soon as practical.*
- *Clearly defined wash down facilities with strict management guidelines assigned and monitored by the appropriate party.*

- *A Borrow Pit Management Plan that includes:*
  - *Compliance or otherwise with the Land Clearing Guidelines in relation to setbacks off riparian habitats.*
  - *Rehabilitation strategy to be implemented upon completion of material removal.*

Response.

Noted.

These issues will be addressed in the EMP.

2.7 Dept Business, Economic and Regional Development

DBERD forwarded comments on the project to EPA in a letter dated 15 July. The following issues are addressed.

2.7.1 Employment and business opportunities.

Comment.

Under Section 3.2 of the Guidelines the proponent was required to identify employment and business opportunities in the different sections of the road works and at different stages of the project. This has not been addressed in sufficient detail by the proponent.

Response.

There are several employment and business opportunities available under this project, and include:

- The entire construction package is open to local civil contractors, and represents one of the largest rural construction contracts let in the Northern Territory.
- There is a current Memorandum of Understanding signed between DPI and several of the traditional owner groups, identifying the opportunity for DPI to enter into a commercial agreement with traditional owners to win and process the fill and gravel components of the project.

  Much of the detail of this agreement will be developed in conjunction with the Northern Land Council (representing TOs, including the Wamynin people) and DPI. It could take the form of a Principal Nominated Sub-contract, or even Principal Supplied Product including delivery to site.

DPI is keen to foster a commercial arrangement which would ensure local indigenous employment and training, rather then simply pay a royalty payment to traditional land owners.

Details of any business arrangement would depend on the final location of the extraction pits and the willingness and abilities of the traditional owner groups.

It is expected that the local indigenous groups would need to Joint Venture with a commercial establishment which would provide the majority of necessary skills and equipment to carry out the work. This would not exclude the local group from owning and operating its own plant in the venture.

- The construction contractor will establish the construction camp at the Victoria River Roadhouse, which will ensure significant continuous patronage of the establishment, thereby creating additional employment opportunities in catering, housekeeping and maintenance.
- During the bridge building phase, there will be skilled and unskilled employment opportunities in the concrete and carpentry fields, and well as in labouring and semiskilled fields.
- The construction contract will be a quality assured contract, which involves significant project management and record keeping obligations, which will also lead to employment opportunities for clerical, quantity survey and engineering professions.
- The roadworks component will provide and ideal opportunity for the employment of local indigenous employees, in the unskilled and semi skilled areas, where they can be trained in set-out tasks, labouring, OHS & R, traffic control, small plant maintenance, pipe laying and minor concrete works.
- The construction contractor could also employ a significant local sub-contract industry in the provision of major road making plant, equipment and maintenance.

2.7.2 Workforce composition figures

Comment.

Whilst recognising that DPI will be letting a construction contract for the works, section 4.10 of the PER would be enhanced by provision of indicative figures, in particular, for workforce size and skill and value of construction work to be done.

Response.

It is difficult to provide these indicative figures, because most of those decisions will be the responsibility or prerogative of the contractor.

The anticipated workforce skill requirements would include:

- Professional engineering;
  - Civil project management.
  - Bridge construction – structural
  - Mechanical engineering – plant and equipment utilisation and maintenance.
  - Quantity surveying
  - Quality assurance
- Para-professional;
  - Road foreman and supervisors
  - Bridge foreman and supervisors.
  - Gangers and leading hands (minor management and technical roles).
- Clerical Functions;
  - General office reception and clerical duties, including payroll
  - Specific quality assurance record keeping.
- Skilled tradesmen;
  - Bridge and formwork carpenters.
  - Concrete workers.
  - Steel fixers .
  - Crane operators and dogmen.
- Semi-skilled labourers;
  - Pipe layers.
  - Minor works concrete workers. (headwalls and protection works)
  - Traffic control officers.
- Labourers;
  - Both bridge and roadworks labouring positions.
- Plant Operators;
  - Both major and minor plant operators and owner-operators

As a general rule it is anticipated that about 15% of the value of the project will be spent on personnel hire which on this $12.5M project, would equate to roughly $1.9M.

The actual break-up of employees to sub-contract and contract employees would be a matter for the construction contractor's management to arrange.

2.7.3 Joint Armed Forces Training Initiative

Comment.

> *Section 4.10.5 of the PER should also make reference to future road users, in particular expected large increases in heavy armoured traffic associated with activity as part of the Australia-US Joint Combined Training Centre initiative commencing at the Bradshaw Field Training Area in May 2007.*

Response.

A response to requests for information from the Armed Forces related to the expected increase in traffic volumes and changes in composition due to the 2007 Australia – US Joint Combined Training Centre has not been provided by the Defence Department. However, since all road traffic will need to be either legally loaded or transported under permit, it is not expected to have any significant effect on the construction.

Allowance will be made in the Traffic Control plans submitted by the contractor for the movement of heavy / wide loads, including those of the Defence Department.

After the project is complete, access to the Joint Training Centre will be improved, as closures of the Highway due to flooding will be reduced.

Comment.

> *Additionally the proponent states that the requirement for an Industry Participation Plan is shown in the Request for Tender (Appendix B). This reference cannot be found in the Appendix.*

Response.

On checking, it appears that the Industry Participation Plan requirement was inadvertently left out of Appendix B. However, as the inclusion of an Industry Participation Plan is a NT Government requirement for all projects with a contract over $5 million, the IPP will be included in the final RFT.

2.8 Environmental Protection Agency

The EPA supplied detailed comments in a letter dated 13 July. These comments are addressed below.

2.8.1 Description of Project Works

Comment.

> *The guidelines requested detail on project schedule, including staging of project and timing of stages. Although it is recognised that it will be up to the contractor to establish which specific methods will apply to construction at specific sites – based on studies conducted for the*

PER, the proponent needs to indicate recommended timing for certain construction works to minimise environmental impacts (eg no disturbance to cane grass communities during breeding season July to September, no construction activities within Victoria River inside potential spawning season for sawfish etc

Response.

Noted.

The PER states that there will be no significant earthwork construction activities undertaken during the wet season.

DPI will be in a better position to provide details of specific measures (such as work in cane grass areas, excavation for bridge foundations etc) when the contract has been awarded. Only after award of the contract, will DPI be able to plan specific activities for certain dates.

There are several environmental commitments included in the PER like those mentioned which will be included in the contract documents, thereby ensuring the contractor's observance and adherence. These commitments will be listed in the Principal's EMP which will form the basis of the Contractor's EMP. DPI will be providing full time site surveillance for this quality-assured project and so the contractor's EMP will be constantly monitored for conformance.

Comment.

Request for Tender should indicate DPI's preference for the construction camp eg Victoria River Inn or private homestead.

Response.

The RFT documents will specify that the Contractor's camp must be established at the Victoria River Roadhouse.

2.8.2 Applicable Legislation and Statutory Obligations

Comment.

In Miscellaneous Provisions (Appendix B) for stream sites the condition "leave sizeable islands to ensure groupings of trees that will withstand stream bed erosion" – how large should these islands be and should "sizeable islands" be quantified to the contractor?

Response.

In regard to excavating extraction material from stream beds, DPI's environmental provisions prohibit excavation inside the drip line of trees. The only time DPI would be excavating in stream beds is at RG3, and the only trees there are the sacred site trees. As mentioned earlier, it is unlikely that RG3 would be used for a source of gravel. If RG3 was used, the restriction zone implied by the fact that the trees are Sacred Sites, would far exceed that required for their general security.

There are no trees in the stream beds at the bridge sites.

2.8.3 Description of Environment

Comment.

> *Section 2.3.4 Water Resources – A map of existing bores and road construction bores previously used by DPI and any quality/quantity monitoring results of these bores may be useful to determine likely hydrology impacts. Will there be groundwater drawdown impacts for regional land users/associated disturbance to wetland and aquatic flora/fauna?*

Response.

Any existing or proposed bores to be used will be subject to NRETA approval.

2.8.4 Impacts of the Proposal and the Impact Areas

Comment.

> *Table 2.1 indicates the maximum impact area (ha) – how will disturbance area be monitored and managed to ensure impacts are not greater than maximum impact areas for each site?*

Response.

The impact areas as defined have been calculated after consideration of the normally expected construction methods employed throughout the industry on these types of projects.

The limit of the impact area will be managed and monitored by:

- Reliance on the construction contractor employing sound economical construction methods which would not involve over-clearing. The area of clearing will be included in the schedule of rates and clearing beyond that are will not be paid for. This approach will be implemented in areas which have not been identified as being environmentally significant.
- Clearing undertaken by the construction contractor will be monitored by both the contractor's quality assurance plan and DPI supervisors.
- In areas of environmental significance, (such as cane grass areas), the actual boundaries of the clearing will be nominated on construction plans, and closely monitored under the construction contractors EMP.

Comment.

> *Section 2.4.1 Aerial photographs of each of the sites are not included in Appendix B. It may be beneficial to indicate the maximum impact area on these photos to indicate to Contractor the extent of maximum disturbance allowed.*

Response.

The contractor will be provided with construction contract drawings for each site, and the maximum disturbance areas allowed will be included on those drawings. This will provide a much more accurate definition than would be available on aerial photographs.

2.8.5 Extraction pit and borrow areas (fill and gravel sources)

Comment.

> *Table 2.2 – could these gravel/fill sources be ranked in preference to environmental issues and gravel/fill suitability? For example, discussions seem to indicate that if all AAPA clearances are issued and gravel/fill material is good quality, Area 3 would be the preference. What haul distance is it uneconomical to haul gravel so it is known what sites in the table will definitely not be an option?*

Response.

DPI preference is to utilise fill material from the large area opposite Coolabah Station ("little Italy"), and gravel from the areas near Skull Creek. The final decision depends on availability, access and quality.

The gravel material is a higher quality and therefore attracts a premium payment, and therefore DPI is prepared to accept higher production and haulage charges for gravel material. Fill material on the other hand is of a much lesser quality and therefore cheaper, meaning that DPI would be keen to minimise the haulage of this material. Hence DPI would be seeking minimum haul distances for fill material and would be prepared to haul the gravel further.

The selection of fill and gravel sources is further discussed in section 3.

Comment.

> *Are Areas 1-3 the three likely sites available for gravel/rock use for this assessment? (Table 2.2).*

Response.

Areas 1-3 are the currently preferred options, but the matter of fill and gravel sources is further discussed in section 3.

Comment.

> *Amount of area involved in gravel borrow, processing and stockpiling is 10 ha – is this area for extraction of 30 000m3 or 80 000m3*

Response.

The upper limit estimate of 10 Ha of excavation area applies to the 80,000m3.

It would be most unlikely that extraction at any site would exceed 2 m in depth. Hence the plan projected area involved in 80,000 m3 of gravel extraction would be 4 Ha. There would be some additional clearing and a provision of access roads, which would increase the area a little.

Should the gravel material be won from RG3 the rock would be transported to an area adjacent the Fitzroy Station entrance and stockpiled pending crushing. These stockpiles would the "just-in-time" meaning that they would not be extensive and the rock would be processed almost immediately. Once the rock had been crushed, it would blended and stockpiled separately into stockpiles approximately 3 m high (maximum). These stockpiles would occupy approximately 4 Ha. To ensure that DPI did not underestimate the potential impact area, and to allow for access road and machinery areas, all these areas (minimum 8 Ha in total) were aggregated to total 10 Ha.

Comment.

> *Is there a commitment to long term monitoring and management of extractive gravel and fill areas?*

Response.

The rehabilitation procedure should ensure that the long term regeneration of the gravel pits would be assured. It would not be feasible for the long term monitoring of the rehabilitation could be included as a contractual requirement and any such commitment will have to be made as part of DPI's Auslink Corridor Maintenance program,

2.8.6 Water sources

Comment.

> *It is stated in the PER that the Contractor's use of water will be regulated and managed by Natural Resources group of NRETA which allows use of up to 20% of flowing surface water. How will the contractor know flow rates and how much they can take?*

Response.

The construction contract will be a quality assurance format contract and as such the contractor will have to present a process control procedure on how water use will be managed. Through this process, wastage can be avoided and the site management team can continually monitor the efficiency of water use.

Estimates can be made of the flow rates by taking depth measurements and flow velocities at known locations and calculating available volumes

of water. These can then be used to allocate water availability to the contractor. These measurements would preferably be made by the contractor within the process control procedure, which would ensure that the contractor is constantly aware of the limitations of supply.

Comment.

> *Possible management measures to safeguard downstream water quality will need to be provided (as per section 5.3.3 of PER Guidelines)*

Response.

In this project, only the construction of the four bridges, and their immediate approaches, may have an affect on water quality. The rest of the project (raising of the road, and strengthening and widening works) will not impact on the permanent and temporary water ways, as any silt will be trapped at those locations before getting to the water ways.

The Victoria River Bridge is the only bridge over permanent water, and will consequently require special attention.

- The construction of this bridge will require temporary rocky access ramps to be built into about 70% of the width of the river bed to allow the construction of the bridge foundations.
- These ramps will be covered in geotextile fabric to prevent the erosion of fines into the river.
- A floating silt trap will be constructed down stream of these ramps, but will allow for fish dispersal corridors.
- The level of the ramps will be only marginally above the low flow level of the river.
- The ramps will be removed, and the river bed restored, at the completion of the bridge foundations (even though the bridge will still not be complete).
- Monitoring at this location will include turbidity measurements above and below the construction site.
- Any increase in the relative readings will trigger corrective action in accordance with the contractors EMP.
- Methods to control chemical and fuel agents (such as curing compounds and hydraulic oils) will be identified in the contractors EMP.

The other three bridges are generally over dry stream beds. Water quality measures will be specific for their sites, but include issues such as;

- Removal of any excavated soils.
- Construction of a silt fence down stream of the site.
- Applicable treatment of the river bed where disturbed as a consequence of construction traffic.

- Control of chemical and fuel agents (such as curing compounds and hydraulic oils).

Comment.

It is estimated that 200kL/day of water will be required for construction and domestic use for up to 10 months over two dry seasons. Is there a commitment to ensure this water use/source will not impact on regional users and any associated disturbance to wetland, aquatic flora and fauna? (as per 5.3.2 PER Guidelines)

Response.

Any existing or proposed bores to be used will be subject to NRETA approval. This would include coordination with other users. If there are impacts on other users the contractor will be required to source water from other locations which will not cause that impact.

Refer also to Clause 4.3 of the PER, which describe the mitigation measures.

2.8.7 Rehabilitation of sites

Comment.

More details are required on proposed rehabilitation. In the event that rehabilitation works have not been done or unsatisfactory then how is this conveyed to contractor and who decides whether the rehabilitation is complete or whether more work is required?

Response.

Table 5.2 of the PER sets out the Draft EMP, which includes rehabilitation strategies. Rehabilitation would include as a minimum;

- Deep ripping (approx 400 mm deep) of the disturbed ground with a dozer or grader as applicable to the site.
- Ripping would generally be done along contour lines to prevent erosion and encourage re-growth by trapping wind blown seeds from nearby vegetation.
- Re-spreading the cleared top-soil and vegetation material over the ripped surface.
- If deemed necessary according to the cleared site and the amount of top-soil and cleared vegetation material available, seeding of the site with natural grass seeds endemic to the area. Any seed mixes will be designed and approved in conjunction with National Parks Service and NRETA.
- Weed control.

- Other processes deemed appropriate for the site following clearing and excavation works.

Construction projects of this size have a Defects Liability and call back provision for 12 months after completion of the works. The contractor then has a contractual obligation to monitor and repair any erosion issues for 12 months. DPI will be responsible for monitoring and maintaining soil erosion and sedimentation controls beyond this period.

2.8.8 Employment and Business Opportunities

Comment.

Where in Appendix B are:
- *Aboriginal employment and training requirements?*
- *Industry Participation Plan?*

Response.

The Indigenous training and employment requirements are not included in the generic version of the RFT and hence were not included in Appendix B. These particular clauses are constantly being enhanced and refined and the final version for inclusion in the actual RFT for this project may be a further enhancement on the current clauses. Below is the current clause.

"EMPLOYMENT AND TRAINING OF INDIGENOUS WORKERS

The contractor will, in its execution of the work under the contract, either directly or indirectly through sub-contractors, employ Indigenous workers on the site of the work from local Indigenous communities for the number of labour hours not less than 15 per cent of the total labour hours for the project.

Where "labour hour" L_o is defined as:

$$L_o = \frac{\text{Contract value at time of award}}{\$35/\text{hr}} \times 15\%$$

Minimum Indigenous labour hours (L) are then calculated as 15% of L_o.

A minimum of 50 per cent of labour hours for indigenous workers (L) determined pursuant to this sub-clause will be trainees or workers from local Indigenous communities undertaking accredited training.

The contractor will:
- within ten (10) working days of the date of acceptance of tender submit to the Superintendent, a completed compliance plan; and
- within five (5) working days of the expiration of each successive thirteen week period commencing from the date of

acceptance of tender submit to the Superintendent, a completed interim compliance report; and

- within ten (10) working days of the date of practical completion, or if there is more than one, the last occurring date of practical completion, submit to the Superintendent a completed practical completion compliance report.

The contractor acknowledges that failure to comply in part or in whole with the obligation to employ Indigenous workers from local Indigenous communities to the percentage will be a factor taken into account in the report rating which Contractor Accreditation Ltd may attach to "Contract Relations/Administration" and "Local Development" and in the awarding of future contracts by the Northern Territory.

For the purposes of this clause, the contractor will be responsible for relevant applications to the Australian Government and/or Territory training assistant bodies for assistance with indigenous employment and training, including funding.

The obligations under this clause are in addition to any other requirement to engage trainees under the terms of the contract.

Definitions - Accredited training means any program through which:

- competencies are specified and may lead to the attainment of a nationally recognised qualification;
- learning is planned, organised and sequenced in order to assist the trainee achieve workplace competence;
- methods of training delivery appropriate to the achievement of competence are chosen;
- quality training resources are used to assist the trainee learn; and/or
- assessment events are planned and undertaken at appropriate points throughout the traineeship.

Trainees shall include any workers engaged in the following arrangements:

- a formal apprenticeship or formal traineeship that results in a nationally recognised construction qualification; or
- a cadetship or scholarship incorporating formal or technical education that results in a nationally recognised construction qualification."

The Industry Participation Plan requirement was inadvertently left out of Appendix B. However, as the inclusion of an Industry Participation Plan is a NT Government requirement for all projects with a contract over $5 million, the IPP will be included in the final RFT.

2.8.9 Terrain and land systems, geology and geomorphology

Comment.

> *Mitigation measures to reduce soil is that "if material is highly weathered, fractured, unconsolidated or unstable, the batter slope needs to be flatter". What needs to measured/monitored to trigger the requirement for flatter batters and will this be part of Erosion Management Plan?*

Response.

The decision to adopt a particular batter slope will be taken at the time of design. Once the fill source is identified, DPI's Geotechnical Manager will test and assess the soil quality and the appropriate batter slopes will then be incorporated into the design drawings.

Comment.

> *As per PER guidelines (Section 5.2.1) is there a baseline map of topographic features, soil types, land units at the location of proposed road works?*

Response.

This has been included in Appendix C of this Report.

2.8.10 Soils

Comment.

> *In mitigation measures for minimising loss of soils, the Erosion Management Plan would need to address sediment control during and post construction and detail monitoring requirements.*

Response.

Noted.

Construction projects of this size have a Defects Liability and call back provision for 12 months after completion of the works. The contractor then has a contractual obligation to monitor and repair any erosion issues for 12 months. DPI will be responsible for monitoring and maintaining soil erosion and sedimentation controls beyond this period.

Comment.

> *How will surface water run-off be managed to prevent accelerated soil erosion incidences?*

Response.

Control of run-off is the responsibility of the construction contractor, and a clause similar to the following will be included in the RFT to ensure compliance.

"PROTECTION OF EARTHWORKS

The Contractor's responsibility for care of the Works shall include the protection of earthworks.

The Contractor shall install and maintain effective erosion and sedimentation control measures in accordance with [insert appropriate clauses].

Adequate drainage of all working areas shall be maintained throughout the period of construction to ensure run-off of water without ponding, except where ponding forms part of a planned erosion and sedimentation control system.

When rain is likely or when work is not proposed to continue in a working area on the following day, precautions shall be taken to minimise ingress of any excess water into earthworks material. Ripped material remaining in cuttings and material placed on embankments shall be sealed off with a smooth roller.

Should earthworks material become over wet the Contractor shall be responsible for replacing and/or drying out the material and for any consequent costs."

Further specific erosion and sedimentation measures can be added to the RFT, for example, the contractor will be required to develop an erosion and sediment control plan that may describe the following:

- the erosion and sediment control measures required before clearing and grubbing of the site.
- how upstream water will be managed so that it is not polluted by the construction activities
- scour protection measures for haul roads and access tracks when these are an erosion hazard due to either the steepness, soil erodibility or potential for concentrating runoff flow
- the methods for stabilising temporary drains
- the methods to minimise erosion during construction of embankments
- the methods for constructing batters to assist the retention of topsoil on batter slopes.
- the methods for stabilising temporary drains
- the methods for maintenance of erosion and sediment control basins including measures to restore the capacity of sediment basins
- the detail of the inspection and maintenance program for all anti-erosion and sediment controls to ensure that no disturbed area is left without adequate means of containment and treatment of contaminated water

- the measures to minimise erosion and control sedimentation from stockpiles

Comment.

What performance indicators will be used to ensure appropriate erosion management?

Response.

Primary control will be maintained by the level of conformance with the Contractor's Environmental Management Plans and quality assurance procedures.

Comment.

Section 4.3.1 indicates "stabilisation, rehabilitation and revegetation of disturbed areas would be undertaken progressively to ensure erosion events are minimised in the wet seasons following construction". Do the Specifications (Appendix B) require the Contractor to provide examples of these stabilisation techniques as revegetation would most likely not be established enough to prevent or reduce erosion?

Response.

The contractor is not required to provide examples.

The RFT will include specific measures which the contractor will be obliged to comply with. The EMP will present the framework for the rehabilitation and revegetation processes.

Comment.

The Erosion Management Plan should include erosion controls required when construction stops for the wet season

Response.

Agreed.

These specific requirements would be called up in the RFI for inclusion in the Contractor's EMP.

2.8.11 Gravel extraction material

Comment.

Section 5.2.3 of the PER Guidelines (Management of Landform Impacts) have not been addressed in the PER – eg what are the standard DPI clauses for gravel borrow rehabilitation and what are the best practice operation and rehabilitation techniques to be used?

Response.

Best practice generally refers to the latest Departmental and inter-government standards and specifications. It is a shorthand way of

describing a myriad of specific techniques that would be designed for particular purposes.

One of the documents most commonly referred to when speaking of "best practice" is the "Blue Book" and is used extensively by Local, State and Federal Government agencies.

The specific clauses will be developed in conjunction with EPA officers, once the actual gravel/fill extraction site(s) have been identified.

The quantity of extraction is significant, and any extraction and rehabilitation procedures need to be relevant to the particular site.

The overall concept is to minimise the disturbance to the immediate environment, which in some instances may require amendment to some of the standard clauses. For example, there is a general requirement that extraction should be limited to 50 m wide strips with a 25 m plantation corridor that is not disturbed. Because of the quantity of material required, if this clause were to remain the area of the excavation would need to increase dramatically. Hence it would be better to remove the requirement to retain the 25 m wide strips.

Section 3 of this Report addresses the environmental considerations and procedures associated with the extraction of fill and gravel material.

Comment.

> *Will NLC and AAPA assessment of new sites be completed at the time of compiling the Supplement? Any results of AAPA consultations that do become available should be included in the Supplement.*

Response.

As discussed earlier, the AAPA Authority Certificate excluded all the slope area from "little Italy" and placed significant restrictions of other areas. The Authority Certificate number C2006/081 has been included as Appendix D.

Further discussions with the NLC and AAPA are under way in order to overcome the current situation, but the outcomes of these have not been concluded prior to submission of this Report.

Comment.

> *What gravel extraction guidelines are referred to for riparian source RG3? In mitigation measures it is stated "river bed material will be extracted in accordance with accepted standards and published guidelines" – provide specific reference to these standards*

Response.

It is increasingly unlikely that site RG3 will be used for gravel extraction.

The best published guideline is the "Blue Book". If RG3 is used, recommendations made by NRETA and other relevant government agencies regarding extraction of gravel from the site will be implemented.

Comment.

> *While it is recognised gravel quantity would be easily replenished in the following wet season - how will habitat diversity and abundance within the river be impacted? Will extracting loose gravel mobilise other sediments and create environmental impact?*

Response.

It is increasingly unlikely that site RG3 will be used for gravel extraction.

Studies have shown that the sediment concentration in any flood event of significance is massive in the Victoria River compared to the volume that would be extracted if RG3 was used. The net effect of any extraction by DPI in RG3 would be negligible.

There will be strict conditions applied to the extraction of the gravel material from the river bed/banks as described in the PER. The material is mainly sand deposits and river rocks between 10 mm to 150 mm in size. In the unlikely event that this source is utilised, it is expected that a primary screen on site would ensure that all finer material would be retained on site and only the courser material removed for crushing and blending. The finer component would then be backfilled into the extraction site and covered with sand.

Comment.

> *Can an example be provided of any previous successful riparian source gravel extraction similar in nature to proposed extraction? i.e. where else has it been done in the Top End?*

Response.

There are no known records available to DPI of similar extraction sources being utilised for road construction.

Comment.

> *Mitigation measures indicate "extraction of river bed material will only be conducted in the dry season and not be within 20m of river banks". Recommendation made in aquatic fauna survey was "maintain a buffer zone of 25m (or greater) from existing river channel". It needs to be made clear where the excavation of gravel is expected to occur.*

Response.

Extraction will be kept 25 m clear of existing river channel as recommended in the aquatic fauna study.

Comment.

Will extraction in river bar not be carried out within certain proximity to permanent pools? Are the locations of these permanent pools (will they be biologically sensitive areas?) known so to recommend a minimum distance for riparian gravel extraction works?

Response.

If the site RG3 is utilised, then the extent of the extractive area is well known and will be defined to the construction contractor, or the gravel crushing contractor.

There is a defined river channel adjacent the site which is expected to remain as a permanent pool in times of low flow. The biological sensitivity has been reported and the extractive procedures and restrictions described in the PER have been developed to protect the specific local environment. The permanent pool will not be disturbed.

2.8.12 Fill (soil) extraction material

Comment.

In the PER as mitigation measures it is stated that:

- *"Operation and management of borrow sites using best practice techniques"*
- *"Rehabilitation of borrow sites using best practice techniques".*

What are the best practice techniques for operation, management and rehabilitation of borrow sites – are these listed on page 28 Appendix B or will more detail be provided to the contractor?

Response.

The practices identified in Appendix B of the PER are DPI's standard Clearing and Grubbing clauses. Rehabilitation of Extraction Pits is specified under the Miscellaneous Provisions section.

However, the RFT for this project will include specific rehabilitation clauses which will be appropriate to the sites once those sites are identified.

These clauses may include;

Regular maintenance inspections by DPI personnel would be conducted with appropriate recording to identify and rectify general problems, including:

- Any areas of erosion and/or sediment deposition
- Poor vegetative cover
- Breached diversion banks
- Blocked drains

- Slumped batters
- Sediment basins requiring repair or de-silting.

Other more specific matters that may need to be addressed include:

- The management of sediment basins for three (3) months into the operational period or until formerly bare and disturbed surfaces are 70% revegetated. (i.e. this point is to ensure water quality issues are not disregarded at the completion of construction).
- The effective conversion of sediment basins to 'spill' basins and their subsequent maintenance.

2.8.13 Underground water resources

Comment.

> *As a mitigation measure in the PER it is stated that "assessment of existing bore quantity, quality and drawdown effects for any proposed bores is to be undertaken by construction contractor". This should be provided to NRETA and will need to address the PER Guidelines detailed in section 5.3*

Response.

Noted.

2.8.14 Vegetation communities

Comment.

> *How will the extent and level of disturbance in restricted vegetation communities be limited to that only necessary to complete works? The Specifications indicate compensation to be paid for trees – can specifications also include penalties incurred if maximum impact area for each site is exceeded?*

Response.

Penalties can be included, after consideration of equity under the contract, but it is considered that adequate control can be maintained by precise definition of available areas for disturbance being shown on the plans. Site communication will also play a significant role in avoiding accidental extension of these disturbed areas.

It is most unlikely that any major contractor will deliberately extend the work into restricted vegetation areas, but special reference to the restrictions will be emphasised in the RFT and pre-tender meetings.

Comment.

Has statutory obligations under all relevant NT legislation, including the Planning Act, Pastoral Land Act and Territory Parks and Wildlife Conservation Act for permits to clear native vegetation (include appropriate timelines to allow for approvals) been mentioned in the RFT documents?

Response.

Planning Act – NRETA's response has confirmed that the clearing of native vegetation provisions do not apply to roads.

Pastoral Land Act – No clearing will be undertaken on Pastoral Land (all clearing is within road reserve or on Aboriginal Land).
Territory Parks and Wildlife Act – NRETA has been consulted regarding this issue and noted that a detailed response on the PER including vegetation removal has been provided. Ongoing liaison will be maintained with NRETA throughout the implementation of the project.

Comment.

In the PER, a mitigation measure is for rehabilitated areas to be "monitored on a regular basis during construction and for one year following construction". The contract specifications need to specify that if one year of monitoring indicates the area is not establishing then more rehabilitation works and monitoring would be required

Response.

Noted.

The standard contractual conditions would cover the eventuality of the contractor inadequately carrying out the specified rehabilitation.

If the rehabilitation processes defined in the contact documents has been competently undertaken by the construction contractor, but for reasons beyond the contractor's control, the rehabilitation has not been successful, the contractor can not be held liable for its failure. Accordingly any neccessary follow-up rehabilitation works will be undertaken under the normal maintenance program after the contractual Defects Liability Period has expired. DPI will be responsible for the ongoing monitoring and maintenance of the site.

2.8.15 Weeds

Comment.

Post construction areas of weed infestation should be marked on maps to demonstrate weed infestation has not increased as a result of construction activity prior to signing off completion of works.

Response.

Noted

2.8.16 Fauna species

Comment.

> *Aquatic fauna at site RG3 – Mitigation measures for extraction of material to include the full six recommendations made in the aquatic faunal report (de Lestrang & Wedd).*

Response.

Noted.

In the event that this site is actually selected for the extraction of gravel, the six recommendations will form part of the EMP.

Comment.

> *The commitment to conduct the end-of-wet season aquatic fauna survey should be included in mitigation measures for Fauna habitat*

Response.

A second, post 2005-2006 wet season aquatic fauna survey was undertaken as a supplement to the Aquatic Fauna Survey of Proposed Road Pavement Quarry RG3 (de Lestang and Wedd, 2006). The study showed that any impact to the aquatic fauna community by the proposed works will be of very minor local significance.

The study recommend that the existing river inflow be maintained during excavating RG3, and the site be rehabilitated to ensure a hydraulic linkage with the existing channel so as to prevent isolated water bodies forming in the disturbed area as water levels recede after the wet season. These measures will be included in the project EMP.

2.8.17 Conservation of significant fauna species

Comment.

> *Transplanting cane grass clumps – will the whole 5ha of cane grass area that will be cleared be transplanted or just selected clumps? Where specifically is the 5ha of disturbance for this community – can it be shown on Figure 4.2 with other vegetation communities?*

Response.

The cane grass area affected is that immediately under the new bridge and approaches at Victoria River and a smaller area of the western approach to the new Lost Creek bridge, within the existing road reserve. Cane grass habitat immediately outside the road reserve at Lost Creek has been completely eaten out by cattle.

It is anticipated that healthy clump specimens within the affected area would be transplanted with the intention of increasing the density of approx 5 Ha of cane grass as compensatory habitat.

Site inspections subsequent to the preparation of the PER have indicated that the density and area of suitable crane grass habitat has significantly increased following the 2005 – 2006 wet season. A visual assessment of the area of suitable habitat for the Fairy-wren has indicated significantly more natural regrowth than would be affected by the proposed planting of compensatory habitat. It appears that an assessment of "normal" habitat area is very seasonally dependent.

Because of this apparent seasonal viability, any representation on a map could be misleading in either good or poor seasons.

Comment.

> *RG3 gravel extraction site – In the PER it is stated that "large areas of cane grass are present on the banks near the extraction site" and "processing sites will not be located in or adjacent to areas of cane grass". Is there a recommended minimal buffer distance for these activities to occur?*

Response.

The cane grass is located on the southern back (left hand side – looking downstream) and is sufficiently clear of the excavation area for it to be unaffected by the works. The area available for excavation is covered with sand and is on the river side of the clearly defined banks, and does not support cane grass. However, RG3 is now unlikely to be used.

Comment.

> *Appendix D also recommends removal of Noogora burr in cane grass communities not impacted by construction as a mitigation measure.*

Response.

Noted.

Comment.

> *From recent discussions, the first two mitigation measures for impacts to the purple crowned fairy wren may no longer be an option:*
> - *"Investigation of possible opportunities for protection of cane grass areas in the near vicinity of the project*
> - *Investigation of fencing of the road reserve boundary to prohibit cattle and feral pigs from entering cane grass areas along the reserve"*
>
> *The Supplement should discuss the outcomes of those investigations and detail the possible flushing of individuals prior to works, and working with NPWS for control of feral cattle*

Response.

As discussed earlier, the natural proliferation and densification of cane grass in the work area following the good wet season of 2005 – 2006 has had a very significant impact on the extent of the cane grass habitat. It would seem that this species is seasonally dependent and without undertaking a single positive strategy to protect or propagate the cane grass, the available habitat for the Fairy-wren is significantly greater than it was at the time of the fauna survey snapshot.

NRETA has advised that the Purple-crowned Fairy-wren is apparently easy to capture with mist nests and by playing its own chirping within its habitat area. In conjunction with NRETA, DPI will commission such a capture to be undertaken with the intention of relocating any individuals of the species in the direct impact areas to nearby suitable sites.

Comment.

> *What mechanisms will be employed to ensure water pollution is prevented as a mitigation measure for freshwater and estuarine crocodiles?*

Response.

There are no specific strategies to accommodate the crocodiles, however the measures included in the EMP will accommodate the crocodiles.

The Victoria River becomes very turbid in times of flow, particularly early in the wet season, and DPI is confident that with the sound basic environmental measures to be implemented, the construction activities will have a negligible impact on water quality and therefore the affect on crocodiles.

Comment.

> *Any results from follow-up aquatic fauna survey to determine presence of sawfish species should be included in the supplement if available.*

Response.

The follow-up post wet season supplement report by de Lestang and Wedd was undertaken as indicated in the PER, and a copy is attached as Appendix B. This survey and the previous pre-wet season aquatic fauna survey identified no species of elasmobranch, fish or reptile were area specific but rather were representative of the aquatic fauna distributed above, in and below the proposed impact areas. The report therefore considered that any impact to the aquatic fauna community by the proposed works will be of very minor local significance

2.8.18 Air Quality, Noise and Vibration

Comment.

> *The mitigation measure of "a complaints register will be kept by the construction contractor. Complaints regarding noise, vibration or dust will be actioned immediately". How will people know who to make complaint to?*

Response.

There will be an information sign at either end of the project, identifying the construction contractor together with contact details. There will also be "National Highways" signs strategically placed adjacent the project which will identify the funding source and nominating DPI as the project managers. Contract management details and relevant contacts will be made available at the Victoria River Inn.

2.8.19 Waste Management

Comment.

> *The burial of old bridge material in old borrow pits is not an option as it is assumed old borrow pits have already been re-mediated*

Response.

The demolition of the old bridges could well be carried out concurrently with the road construction. For example some bridges could be demolished while others are being built.

Regardless of this, it would be possible for the construction contractor to reserve a section of the extraction pit specifically for burying old bridge components and still meet his obligations with respect to rehabilitation.

Comment.

> *An estimate of approximate workforce numbers should be provided in Supplement to provide a better indication of waste management requirements for domestic waste*

Response.

The actual workforce numbers will vary depending on the stage of the work and level of effort by the construction contractor.

At most, it would be expected that the Victoria River Roadhouse site would need to accommodate up to 40 people associated with the project.

Comment.

> *Methods of collection, storage and ultimate disposal of chemicals and hazardous materials need to be provided in the Waste Management Plan and submitted to EPA Program*

Response.

Noted.

A waste management plan will be included in the contractor's EMP.

2.8.20 Licences, approvals and special conditions and requirements

Comment.

> *In the PER it is stated "all necessary registrations, permits and licences for the project will be obtained and maintained by the contractor". Are these listed anywhere in PER?*

Response.

They are not separately listed in the PER. The RFT will identify the relevant acts for which permits, licences and registrations are required, for example:

Under the Heading, "Conditions of approvals, licences and permits to meet statutory requirements" the contractors are advised that they must comply with the following:

- Aboriginal Sacred Sites Act
- Bushfires Act
- Dangerous Goods Act
- Environmental Assessment Act
- Environmental Offences and Penalties Act
- Environment Protection and Biodiversity Conservation Act
- Heritage Conservation Act
- Soil Conservation and Land Utilisation Act
- Territory Parks and Wildlife Conservation Act
- Waste Management and Pollution Control Act
- Water Act
- Weeds Management Act

Throughout the RFT there are references to the requirements for permits etc, for example in the Special Conditions of Contract, clause 3.13 headed By Laws, Fees and Notices, states

> "Unless otherwise specified the Contractor is responsible for connection of all water, drainage, sewerage, gas and electricity services and he shall apply for all relevant permits and pay all associated fees and/or charges which are levied by the appropriate Authority".

The contractor will also need to ensure that all vehicles are registered for use on the highway.

2.8.21 Monitoring and Reporting Strategies

Comment.

> *In section 5.2.3 "project reviews are to be conducted at the commencement, half-completion, completion and one year post construction" and "monthly audits will be undertaken by DPI with annual reporting through the EPA". More details are required on project reviews and compliance auditing and when third party independent audits will be undertaken*

Response.

DPI conduct 50% and 90% design reviews on major projects which provides the Project Management Team the opportunity to consider the design concepts and progress. At those reviews, the project team member responsible for environmental issues will review the design from the environmental perspective and offer comment to the designers regarding omissions and amendments.

The monthly site audits mentioned in the PER refer to planned audits undertaken by the Superintendent's full time surveillance staff. These audits will be undertaken against a checklist developed specifically for the project. The contractors EMP will include a schedule of environmental audits.

Comment.

> *Monitoring of rehabilitation areas to occur for up to one year following the completion of construction – is this enough time to indicate whether areas are successfully rehabilitated? What measures will be used to indicate success?*

Response.

The reference to the one year timescale relates to the conditions of contract whereby the construction contractor has a one year defects liability period during which he must correct any non conformance discovered within that period.

From a contractual standpoint, if the contract complies with the provisions of the contract with respect to rehabilitation, but for some reason beyond his control the rehabilitation is not successful, there would be no contractual grounds to insist that the contractor makes good. The responsibility for continuing with the rehabilitation would then rest with DPI.

Comment.

> *In table 5.3 (pg 5-9) it is stated that "no evidence of water pollution in construction corridor and sites. If water testing is carried out then results must meet ANZECC requirements". What ANZECC requirements must water monitoring results meet?*

Response.

The reference to ANZECC requirements in the PER was an error.

It is intended to ensure that the project does not negatively impact on water quality. It is therefore proposed to routinely take water samples immediately upstream and then downstream of the works (at each location) and monitor any difference in turbidity. If any significant negative difference is detected, then a suitable response would be triggered through the EMP.

Appropriate controls to minimise the impact of any incidents such as chemical spills will be implemented according to the EMP and water quality monitoring undertaken as required.

Comment.

> *When developing an EMP – the Alice to Darwin Railway EMP may provide similarities for linear developments*

Response.

Noted

3 Clearance of Gravel and Fill Extraction Pits

The Environment Protection Agency, other Government Departments, and a number of specific comments received regarding the draft PER, have highlighted that the location, assessment and appropriate clearance of the fill and gravel extraction pits (also known paradoxically as borrow pits) is a potential major environmental impact associated with this project.

The following section intends to address the issues raised, and set out the procedures which will be followed when investigating, assessing, testing and clearing gravel and fill extraction pits.

Although rehabilitation of the pits following the completion of excavation works has been mentioned elsewhere in this Supplementary Report, this section will also discuss the methods and controls proposed to be implemented.

3.1 Quantities for Extraction

Throughout the PER, and elsewhere in this Supplementary Report, DPI has quoted the following quantities which will be required for the project;

- 30,000 m^3 of gravel required for the flood plain project (i.e. four new bridges and raising the level of the highway),
- Up to a maximum of 80,000 m^3 of gravel, allowing for the flood plain project (30,000 m^3), strengthening and widening work along the highway in the vicinity of the flood plain, and future maintenance activities,
- Up to 430,000 m^3 of fill, required for the construction of the bridge approaches and the raising of the highway.

Comments and questions from various Government departments have centred on these figures, and DPI's responses to these questions in this Supplementary Report have also quoted these figures.

Separate to the production of this Supplementary Report, the preliminary design of the project has continued (however the project would not proceed to tender without appropriate clearances and approvals being obtained first).

The original figures were quoted on a very preliminary design, and without any survey investigations being carried out. Knowing this, those figures were quoted on the upper limit of what might have been the actual figures.

Now that the project field survey has been completed, and that DPI has been able to progress the design based on the survey, more accurate figures for all three items (above) are now available. The current figures for gravel and fill requirements can now be confirmed as:

- 20,000 m^3 for the flood plain project,
- 30,000 m^3 for strengthening and widening, making a total of 50,000 m^3 (compared to the predicted original 80,000 m^3), and
- 350,000 m^3 of fill material.

Consequently, it is these figures which will now be used when discussing the quantities to be extracted.

3.2 Selection of Possible Extraction Areas

The following section sets out a standard method of identification of possible extraction pits, applicable to all projects carried out by DPI, which will be applied to the Victoria River Flood Plain project.

On identification of a project, DPI firstly assesses the type and quantity of material which may be required to construct that project.

A desk-top study is conducted to ascertain whether these materials are available close to the project, and if any additional process methods are required. For instance, DPI would check with its own road construction and maintenance people to find out if there are any useable pits in the area, what sort of clearances cover those pits, does the material require crushing or blending with another product etc.

As is the case in the Victoria River project, these discussions sometimes indicate that all existing pits are worked out, or that only poor material remains (which is therefore expensive to modify to make it useable for the current project). Consequently new extraction pits need to be found, cleared, and tested.

DPI's geotechnical engineers are then consulted, who provide advice on possible areas where the required material may be found, in both quality and quantity. That advice is based on local NT knowledge of the terrain, and checking geomorphology maps (maps showing the make up and geological age of the underlying strata – refer to Figure B.1, Appendix B of the PER).

Following identification of possible areas, field checking is carried out either by helicopter traverses over the area, or by 4WD vehicle if access is possible. From these initial surveys some areas are marked for further investigations, while some are ruled out as being unsuitable.

3.3 Preliminary Clearances

GPS coordinates can be obtained during the initial helicopter or 4WD surveys, which are then used to request clearance of Sacred Sites from the Aboriginal Areas Protection Authority (AAPA).

AAPA clearances can often take a considerable amount of time (6 months or more), which needs to be accounted for when planning project delivery.

At the same time, and as appropriate for the area under consideration, the appropriate Land Council is approached to gain approval to access aboriginal owned land. If the proposed pits are on pastoral or free hold land, the lease or land holder is approached for the same sort of approval to access. It is during these discussions that payment of royalties or other commercial discussions commence.

If the pits are cleared by AAPA, and as necessary approval to access is granted by the Land Council or lease/land holder, actual field testing can commence to determine the quantity and quality of material present.

3.4 On-site Testing and Clearances

Because testing of pits is often an iterative process, in order not to waste valuable time of both DPI testers and the other experts who are required to approve clearances of the pits, DPI now work with other clearance specialists (including flora and fauna experts and archaeologists) during the field testing of the pits to obtain the clearances. The way DPI work with these other experts is described below.

3.4.1 Material Sampling

In order to determine the quality and quantity of the material which may exist in the proposed pits, test pits are dug and samples of the material taken, so that it may be further tested in a materials laboratory.

The sample would be collected by excavating test pits in the proposed pit having dimensions of approximately 2m long by 1m wide, and a depth of 2 to 2.5m, using a backhoe. One or two sample bags of material would be taken for each sample location. These sample bags hold about 20 kg of material each.

The number of test pits required depends on the size of the pit and degree of variation of soil type in the proposed pit. It also depends of whether the pit is for fill (lower quality material) or gravel (higher quality material). As a general expectation, DPI would test on a 50 to 60 m grid pattern for gravel and about 150 to 200 grid pattern for fill material. However, it will generally be 5 to 25 test pits per pit.

The actual number of sample bags collected depends on the quality of the material encountered in the test pit. If the material looks unsuitable in

the test pit, then no sample would be taken and the pit would be immediately backfilled. Photos of the excavations, including the side walls of the test pits, would be taken before the pits are back filled.

The sample sites / test pits would be properly backfilled with the excavated material and compacted using backhoe bucket. The topsoil which is stripped before the test pit is excavated would be laid back for natural regeneration.

This work would be done on the same day as the pit is excavated. If the pit appears suitable from the viewpoint of quality, then a marker, usually a 1m high steel or plastic marker would be placed at each test hole where samples were taken, so that the sample sites can be found at a later date.

3.4.2 Testing Machinery

As indicated above, when on-site testing is carried out the principle item of excavation equipment would be a wheeled back-hoe. This machine has the ability to dig reasonable depths for investigation, and then back fill the holes using its front loading bucket.

Where the terrain of the pits is steep, the back-hoe may need to be upgraded to a 4WD back-hoe. Due to the additional cost of this bigger machine, and the higher transport costs, DPI generally tries to use a normal back-hoe as much as possible.

Further, if the material being investigated is very rocky or very firm (difficult to excavate) DPI may need to resort to a larger tracked excavator.

It is impossible to identify which machine would be required where, but the current feeling is that a normal back-hoe would be sufficient for excavations in the areas under consideration in this project.

The excavation machine would be supported by one or two utes, generally 4WD, to transport samples and for use for supervisory staff.

In summary therefore, the impact of the test pits would be minimal following the field work. There would be some evidence of access to the site, and there would be some local minor disturbance to vegetation.

3.4.3 Archaeology & Heritage Clearances

DPI commissioned a full archaeological study of the area generally affected by the project to be carried out by earth Sea Heritage Surveys (Daryl Guse and Richard Woolfe). The review of the known archaeological record and this survey found that the banks of the Victoria River are an archaeologically significant zone. The Victoria River has been a focal point and resource for Indigenous people over millennia. Since European settlement, early explorers and the pastoral industry have used the Victoria River for a number of activities, further contributing to this rich archaeological resource. Therefore the levee bank zone along either side of

the Victoria River tends to have a high archaeological potential. This includes a high sub-surface potential in this area. Despite this, the survey found that there tended to be areas away from the river where the archaeological potential diminished significantly. The gravel search zones are generally some distance from the River and therefore are not expected to provide a significant resource of archaeological artefacts.

When DPI first gains clearance to enter a potential gravel source area from lease/land holders, and prior to the taking of gravel samples, an initial archaeological investigation will be undertaken, this will include both site and desk top library studies. The objective of this initial study is to identify any obvious areas that should be avoided during investigations.

If that initial study identifies no apparent sites, this would increase the likelihood of the area being utilised for gravel extraction. If, as well the initial geotechnical study indicates that the site may be suitable, a full study will be commissioned, and that archaeological study will:

- Identify archaeological material (prescribed archaeological places and objects) within the proposed development areas by means of a survey. Archaeological sites are to be recorded in such detail as to permit independent assessment of their significance. Location of archaeological places and objects are recorded using Global Positioning System.
- Test previous archaeological site location models and evidence from previous archaeological surveys.
- Assess the cultural heritage significance of archaeological places and objects located during the survey.
- Make recommendations to ensure compliance with the Northern Territory Heritage Conservation Act and its Regulations and other relevant cultural heritage legislation.
- Develop an archaeological risk management for the area of interest which may involve avoidance of the area.

The Victoria Highway has been extensively researched in the last 20 years by a succession of archaeological consultants surveying before road and bridge works, as well as the Telecom optical fibre cable which was installed in the mid 1990s. Robin Gregory and Daryl Guse documented a number of surveys in March 1995 for the Heritage Unit, Conservation Commission of the Northern Territory. This document, A Review of Archaeological Surveys along the Victoria Highway, Northern Territory, lists the work leading up to 1995 and makes recommendations as to the areas of the road reserve that do not require further surveying. This report suggests that within the road corridor from chainage 185km to 220km that no further archaeological surveys are warranted.

Gregory (1998) has undertaken, to date, the most comprehensive review of the Victoria River region archaeological record. Gregory (1998) divided the

Ord-Victoria River region into primary geographical zones by which to investigate the archaeological settlement patterns. The three primary geographic zones consist of the Lowlands, Uplands, and the Inland Plains. The current study area is located wholly within the region which Gregory (1998) identifies as the Uplands. Therefore the archaeological patterns of this environmental region will be described in this report. The Uplands geographic zone is defined by Gregory (1998:20) as:

> Uplands: The majority of the Ord-Victoria River region consists of rugged dissected sandstone country incorporating part of both the Kimberley Plateau and Ord-Victoria geomorphic regions. The plateau consists of a series of structural plateau and benches, cuestas, mesas and buttes, hogbacks, and vales formed of Carpentarian siltstone, sandstone and volcanics. The Victoria River Plateau is a large dissected plateau formed of Adelaidian sediments and rarely exceeds 300m AHD. The topography consists of rounded hills, tablelands, rugged scarps and ridges. The rugged topography results from numerous small streams dissecting the plateau. (After Gregory 1998:20).

Gregory (1998:130) examined 385 previously recorded archaeological sites in the Uplands zone. Sites occurred most frequently on river/stream banks (31.1%), rock outcrops (18.5%), escarpments (17.8%), and slopes (9.6%). The majority of sites were located in rock shelters (63%) on the rock outcrops, escarpments, and slopes. Over half of the Uplands sites are located within 200 meters of an ephemeral stream. Archaeological site components consist of rock art, stone artefacts, grinding features, stone and ochre quarries, stone arrangements, modified trees, middens and burials. The majority of sites consist of single archaeological features, however some are recorded in various combinations.

DPI has requested clearance to enter the lower half of the slope region approaching the escarpment on the eastern side of the area known as little Italy, and is prepared for the discovery of some archaeological sites.
If any sites are discovered, the sites will be avoided and protected from interference by any of the material extraction activities.

All archaeological and heritage assessments undertaken will be forwarded to EPA.

3.4.4 Flora Clearances

When DPI gains clearance to enter an area proposed for gravel extraction it will also commission a flora study to be undertaken. This study will comprise two parts. Initially the flora consultant will visit the site together with the geotechnician, who will identify likely extraction areas. The consultants will then carry out an initial visual assessment of the area and provide initial feedback on findings.

Should this feedback not identify areas of avoidance, then the geotechnical testing will be initiated and the second phase involving a fully detailed flora study of the area will be commissioned.

The objectives of this second phase assessment are to:

- Identify the presence of plant species with IUCN conservation significance within the broader region of the proposed developed sites for the Upgrade;
- Determine the distribution and frequency of plant species that have IUCN conservation significance status;
- Describe associated habitats of these species including vegetation communities, landform and in some instance soils, and
- Provide comment on the implications of the proposed development on these plants species and associated habitats.

The methodology for the study will be similar to that already carried out as part of the PER. This will include a search of the NT Herbarium's Holtze specimen database to search species of IUCN conservation significance within the proposed area for gravel extraction as was used in the PER study.

Although the PER study identified 13 species as being recognised as significant, the majority of associated habitats are confined to locations not proposed for development, therefore no substantial impact is expected. Species found in habitats in the vicinity of, or within the areas proposed for development, occur in representative habitats widely distributed throughout the Top End, and again no significant threat is anticipated. In addition, the area proposed for development is relatively small and located in areas already affected by human disturbance.

The two species with the highest threatened status in the broader region include Gleichenia sp. Victoria River and Adiantum capillus-veneris both of Vulnerable IUCN status. The two species are restricted to habitats on permanent springs at bases of sandstone cliffs (I. Cowie pers. comm.). Given no development occurs in these habitats, no direct threat is envisaged as a consequence of the proposed project.

The site selected for gravel extraction is located in habitats of least concern when considering species of IUCN conservation significance. However DPI will enter the gravel search area expecting to potentially find species of significance and will not carry out any disturbance until the flora study clears the area for excavation.

All flora assessments undertaken will be forwarded to EPA, NRETA and other Government Agencies as required.

3.4.5 Fauna Clearances

The detailed fauna study undertaken by Paul Horner and Jared Archibald from the Museum and Art Gallery of the Northern Territory which has been included in the PER showed that a total of 154 terrestrial vertebrate species were recorded during survey of the study area. Of these, 145 were native and nine were introduced feral species

The species most at risk from the project was the Purple-crowned Fairy-wren (western) Malurus coronatus coronatus Gould, 1858 which has a conservation status as: Vulnerable (EPBC Act); Near Threatened (IUCN).

The western subspecies of the Purple-crowned Fairy-wren has declined over much of its range, with its main stronghold now being along the Victoria River (Garnett and Crowley 2000). The species is apparently common in cane grass habitat surveyed, with numerous specimens observed and considerable vocalisations heard. The eastern subspecies of this taxon (M. c. macgillivrayi) has been given a status of Least Concern.

The areas involved in the extraction of gravel and fill will not impact on the Purple-crowned Fairy-wren as there is no cane grass within or near the proposed extraction areas.

Based on the outcome of the fauna studies undertaken as part of the PER, it is most unlikely that a species of significance will be encountered in the extraction areas, and therefore a preliminary study will not be carried out prior to geotechnical testing. However, a study will be undertaken prior to any excavation taking place.

The objectives of the fauna survey will be to:

- Describe the terrestrial vertebrate fauna (amphibians, reptiles, birds and mammals) of the area, and to provide information on the relative abundance and habitat requirements of each species.
- Determine the presence of any species of special conservation significance, such as rare, threatened or restricted species, and assess their local and regional status.
- Assess the ecological significance of the area as a wildlife refuge, roosting or breeding habitat.

All fauna assessments undertaken will be forwarded to EPA, NRETA and other Government Agencies as required.

3.4.6 Operation of Pits

General

It is not yet practical to identify the specific proposed extraction site by GPS co-ordinates since the investigation area is large and access to the proposed property is not available until clearances have been obtained. However a general description of the areas to be investigated is provided below.

The map below shows that the greater area of "little Italy" is under the Ngaliwurru/Nungali and the Wanimyn Aboriginal Land Trusts. The land is located on the southern side of the Victoria Highway, opposite the Coolabah Station access road. The preferred area is closer to the eastern escarpment and appears to involve only the Wanimyn Land Trust land.

To reiterate previous advice, DPI initially advised that it required approx 430,000 m^3 of fill material and a further 80,000 m^3 of gravel material in order to complete the proposed flood immunity work on the Victoria Highway, between Victoria River and Sandy Creek. It has now become apparent as the preliminary design has been advanced, that these quantities should be revised to a maximum of 350,000 m^3 of fill and 50,000 m^3 of gravel.

There are several constraints associated with the location of a pit for extracting this fill and gravel, and for clarity, these are outlined:

- The gravel extraction area should be located as close as possible to the Victoria Highway. This reduces the extent of access roads, and consequent environmental disruption and costs.
- The extraction area should be above the influence of flooding.
- The extraction site should be capable of being drained into the local drainage systems (with appropriate sedimentation controls) to avoid ponding of surface water.
- The extraction site should minimise the area of disturbance, implying that sites with deeper extractive layers of material would be preferable.
- The extractive area must be sufficiently distant from Sacred Sites, so as to ensure no disturbance during operation and subsequent rehabilitation. For the Victoria River Flood Plain project, it is foreseen that the extractive industry would comprise a joint venture between Traditional Owners and commercial entities, which will assist in providing additional security for the site.
- Generally the quality of material increases with height above the flood plain.
- It is desirable that the extraction area should not be visible from the road or domestic dwellings.

The proposed area of excavation as presented to AAPA for an Authority Clearance is best described as the foot slopes of the eastern side of the paddock on the southern side of the Victoria Highway opposite the entrance to Coolabah Station and the Crocodile farm. The altitude above sea level of

the flat low lying area in this paddock is about 40 to 50 m and the foot slopes extend between 50 m and about 220 m and from that point, the escarpment reaches a further 60 to 80 m vertically.

The section of the greater area that is of interest for gravel extraction is the foot slope region between AHD 50 m and AHD 150 m. This area is highlighted on the map below

The map shows a continual line of highlight representing a continuos excavation, but if that is not possible, DPI can accommodate several separate extraction sections within the highlighted corridor. This may be necessary to avoid areas of significance.

DPI would hope to blend the material in the lower areas to produce suitable fill material and selectively extract material from the upper sections of the excavation to produce gravel quality material.

Should it not be practicable to obtain gravel from this area, a fall-back position will be to examine the chert areas further west along the Victoria Highway in the Skull Creek area. Limited clearance has been provided with Authority Certificate C2006/081 which will provide for investigation into the chert reserves in this area, should it become necessary.

Access Roads

Access roads into and out of the excavation site would need to accommodate passing triple road trains and would therefore need to be constructed to a standard that would:

- Provide for preferably grades of less than 4%.

- Widths of 7 m clear carriageway with provision for rudimentary drainage beyond that.
- Provision for silt and erosion controls.
- Wide curve radii.
- Flat creek crossings, with rocky bases to provide for wet weather access.
- The roads would not be gravel surfaced unless the subgrade was particularly weak in that area, and would need some sort of dust control, since the surface material is quite fine.

As mentioned, DPI would endeavour to locate the excavation area as close as practicable to the Highway, which will minimise the length of access road.

Clearing of Vegetation

Generally, vegetation would be cleared from the excavation site, but the clearing would be limited only to the actual excavation site and access roads. Following vegetation clearing, top soil would be stripped and stockpiled separately for use when rehabilitating the pit. There will be contractual safeguards imposed by DPI to prevent over-clearing and a DPI Surveillance Officer will be present to over-see the process.

The vegetation will be pushed to the boundaries of the area and stockpiled for later re-distribution during the rehabilitation process. No shrubs or trees will be burned in an attempt to maximise the seed stock.

Should a significant stand of trees be encountered within the excavation area, they will be left standing together with a sufficient buffer of undisturbed soil to ensure their survival. This will not only save any significant stands, but will also assist in rehabilitation and provide some relief to the excavation on completion.

Excavation of Material

The fill material will be ripped by dozer and pushed into windrows. These windrows will then be loaded by tracked excavator or wheeled loader into the triple road trains for transport directly to the road works.

The trucks will be loaded to the legal ordinance loading and will not be covered unless dust becomes an issue. There will be no spillage of material since there will be no overloading and hence adequate freeboard will be maintained.

It may transpire that the gravel production may require secondary treatment. This could comprise the installation of a set of screens to separate certain particle fractions from the excavated mass. This machinery would be mobile and about 10 m long by 2 m wide usually connected to a conveyor belt. The raw material is loaded onto the delivery conveyor and passes through the screens. Waste material is discharged to one side (and is

returned to the excavation before rehabilitation) and the gravel material exits onto the conveyor for distribution to the stockpiles.

Alternatively, the material may have to be crushed. In that case the process is ostensibly the same as the screening process, except that the material would pass through a mobile crushing plant, probably after first passing through the screening plant. The mobile crushing plants are generally the same size as a semi trailer.

The screening and or crushing plants would be located within the excavation area and will not increase the amount of clearing or otherwise affect the operation of the pit.

A dust shaker will be installed on the access road towards the exit to the Highway if required to remove excessive dust and any rocks which may inadvertently be caught between the tyres and/or trapped on the bodies of the trucks and trailers.

Progressive Rehabilitation

The excavation is expected to be carried out over two dry seasons. An opportunity would therefore arise where progressive rehabilitation can be carried out to allow for germination and growth during the first wet season.

The contractor (or Aboriginal/Contractor Joint Venture) will be required to submit a Environmental Management Plan which would identify this progressive rehabilitation. The extent of the rehabilitation will be dependent on the stage of the excavation at the time.

Rehabilitation Procedures

The excavation is expected to be no more than 2 meters deep, and the excavation area will be designed so as to drain free of standing stormwater.

Before excavation commences, a thorough site investigation will be carried out to assess the existing vegetation which will identify any constraints to the operation of the pit, like species that must be retained and those stands of trees and shrubs which should be retained. This assessment will be carried by the DPI landscape architect in conjunction with NRETA or National Parks.

The DPI landscape architect will be involved early in the process and will have the discretion of sourcing specialist horticultural and scientific resources as necessary. The landscape architect will be responsible for designing the layout of the excavation in conjunction with the DPI civil engineers. Design of the excavation will therefore be specified prior to the "contract" for the winning of gravel and fill being let.

The design will assist in best retaining, modifying or building the facilities necessary to maintain or achieve successful growth conditions for ongoing soil and water management and rehabilitation of the site.

Grass species will be selected as the main type of plant material used for the rehabilitation. Grasses are simple to install and are a useful medium to prevent soil erosion. Care will need to be taken on this site as the area is continuously used for cattle grazing.

Rehabilitation is expected to be carried out over two successive wet seasons. The overburden and topsoil will be pushed back evenly over the exhausted areas of the pit and then the whole area will be deep ripped to 400 mm deep. This ripping loosens the substrata and allows for the retention of moisture and the scarifications also act as retainers for windblown seeds and dust. Thus the scarifications fundamentally assist in the germination process.
Following scarification and ripping, selected native grass and shrub seeds will be broadcast or direct drilled over the area.

An example of a recently rehabilitated gravel pit (prior to seeding) is shown below.

A sedimentation basin(s) will be constructed at the lower exit points of the excavation to trap any erosion from the rehabilitation areas until stabilisation. Maintenance of these sedimentation basins will remain a responsibility of the contractor for twelve months following completion of the contract and after that DPI will assume responsibility for the maintenance of the structures.

Responsibilities for Rehabilitation

The operation of the excavation pit can take several alternative forms, namely

- A stand alone contract with a commercial quarry contractor.
- A Joint Venture consortium, of Aboriginal and commercial enterprises responsible for the production of the gravel and fill into stockpile windrows.
- A Joint Venture consortium, of Aboriginal and commercial enterprises responsible for the production of the gravel and fill

into stockpile windrows as well as the delivery to site for use by the construction contractor, and

- The development operation of the pit will be part of the road construction contract and as such the construction contractor will be solely responsible for the entire operation.

No matter which of the above scenarios is actually utilised, the same contractual conditions will be specified by DPI. These will include the same rehabilitation techniques, and will be detailed to include:

- Details for re-distributing stripped topsoil and overburden evenly over the entire area.
- Details of deep ripping of the area to encourage moisture retention and seed entrapment.
- Details for re-spreading of trees and vegetation.
- Details for seeding with approved mixes of grasses and shrubs and trees.

Generally, major road and bridge construction contracts contain a 12 month defects liability period, during which time any defect must be repaired by the contactor. It would therefore be expected that if an erosion issue arose or a germination problem arise that was clearly the responsibility of the contractor, then the contractor would be bound to make good the defect.

The specification will include a monitoring and reporting program by the contractor for the twelve months after completion.

However, should such an issue not be the responsibility of the contractor, or should it occur outside the twelve month period then DPI would be responsible for the disposition of the defect.

On-going Monitoring

The contract will specify on-going monitoring and reporting for the first twelve months following completion of the works. This is expected to involve a site inspection every two months or following a significant storm event.

Following the expiration of the first twelve months officers from DPI will carry out bi-monthly inspections as part of their routine maintenance duties along the Victoria Highway. These staff will be based in Katherine and will therefore be aware of significant storm events. They will report directly to Major Projects unit in Darwin which will then organise any follow-up measures necessary.