ASSESSMENT REPORT 50

BLACKTIP GAS PROJECT

ENVIRONMENTAL ASSESSMENT REPORT

AND

RECOMMENDATIONS

by the

OFFICE OF ENVIRONMENT AND HERITAGE

NORTHERN TERRITORY GOVERNMENT

October 2005

Northern Territory Government
Office of Environment and Heritage

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Abbreviations

AAPA	Aboriginal Areas Protection Authority
AQIS	Australian Quarantine and Inspection Service
DBIRD	Department of Business, Industry and Resource Development (now the Department of Primary Industry, Fisheries and Mines and the Department of Business, Economic and Regional Development)
DEH	Department of the Environment and Heritage [Australian Government]
DEIS	Draft Environmental Impact Statement
DHCS	Department of Health and Community Services
DIPE	Department of Infrastructure, Planning and Environment (now the Department of Natural Resources, Environment and the Arts; and the Department of Planning and Infrastructure)
DNRETA	Department of Natural Resources, Environment and the Arts (formerly part of the Department of Infrastructure, Planning and Environment)
DPI	Department of Planning and Infrastructure (formerly part of the Department of Infrastructure, Planning and Environment)
DPIFM	Department of Primary Industry, Fisheries and Mines (formerly part of the Department of Business, Industry and Resource Development)
EMP	Environmental Management Plan
EIS	Environmental Impact Statement
EPBC Act	*Environment Protection and Biodiversity Conservation Act* [Australian Government]
H_2S	Hydrogen sulphide
IMO	International Maritime Organisation
MEB	Medical Entomology Branch
NLC	Northern Land Council
nm	nautical miles
NORM	Naturally Occurring Radioactive Materials
NT	Northern Territory
NTU	Nephelometric Turbidity Unit
NWBM	Non Water Based Mud
OEH	Office of Environment and Heritage
SCP	Spill Contingency Plan
ppm	parts per million
P(SL)A	*Commonwealth Petroleum (Submerged Lands) Act 1967*
PW	Produced water
ROW	Right of Way
SEIS	Supplement to the Draft Environmental Impact Statement
SIA	Social Impact Assessment
SIMC	Social Impact Management Committee
SIMP	Social Impact Management Plan
TOs	Traditional Owners
WA	Western Australia
WADoIR	Western Australian Department of Industry and Resources
WBM	Water Based Mud
WHP	Wellhead Platform

Executive Summary

This report assesses the environmental impact of a proposal by the Blacktip Venture (joint venture between Woodside Energy Ltd and ENI Australia, hereafter referred to as the proponent) to construct and operate a gas wellhead platform, bringing gas and condensate onshore from the Blacktip field via a 120km export pipeline which will connect to onshore gas infrastructure located close to Wadeye (Port Keats).

The Assessment Report reviews the draft Environmental Impact Statement, public comments and the proponent's Supplement to the draft EIS. Information, comments and advice provided by Northern Territory Government agencies and previous studies undertaken in the region have also been used in the preparation of this report.

Environmental assessment is the process of defining those elements of the environment which may be affected by a development proposal and of determining the significance, risk and consequences of the potential impacts of the proposal. Recommendations arising from the assessment address methods to mitigate these impacts.

Major Issues

The principal environmental issues associated with the proposal are:

- Social impacts – particularly on the Wadeye community.
- Sites of cultural or heritage significance – particularly potential for disturbance to Walpinhthi Reef and a shell midden.
- Solid and liquid hazardous and non-hazardous wastes - the generation and management and disposal of these associated with construction and operation of the onshore and offshore components of the facility.
- Marine impacts - disturbance to the seabed habitat and marine biota, particularly flatback and Olive Ridley sea turtles.
- Light and noise emissions – particularly from flaring.
- Surface and ground water management around the onshore facility – particularly impacts on Wadeye water supply.
- Potential for, and impacts of, hydrocarbon spills.
- Safety concerns - increased traffic on the Darwin-Wadeye road.
- Onshore disturbance - including monsoon forest, Eucalypt woodland, beach dunes, fauna, weeds.

Conclusions

The Office of Environment and Heritage considers that the environmental issues associated with the proposed project have been adequately identified. Appropriate environmental management of a number of these issues has been resolved through the assessment process, while the remainder will be addressed through monitoring and management actions detailed in Environmental Management Plans and the Social Impact Management Plan proposed to be developed for the project.

The final management plans for the proposal will be subject to review to the satisfaction of the relevant Northern Territory and Western Australian Government agencies prior to their incorporation into the pipeline and facility licence requirements. It is recommended that management plans also be developed in consultation with key stakeholders, including the

Northern Land Council. They will be working documents for the life of the project and will require continual review in the light of operational experience and changed circumstances.

Based on its review of the EIS and the proponent's response to submissions from relevant Northern Territory Government agencies, affected stakeholders and the public, the Office of Environment and Heritage considers that the project can be managed without unacceptable environmental impacts, provided that the environmental commitments, safeguards and recommendations detailed in the EIS, this Assessment Report and in the final management plans are implemented and managed under the environmental management system for the project and are subject to regular reporting and compliance auditing.

List of Recommendations

Recommendation 1

The proponent shall ensure that the proposal is implemented in accordance with the environmental commitments and safeguards:

- **identified in the Blacktip Project Environmental Impact Statement (the draft EIS and Supplement constitute the EIS); and**
- **recommended in this Assessment Report (No. 50).**

All safeguards and mitigation measures outlined in the EIS are considered to be commitments by the proponent. Key safeguards and mitigation measures are included in Appendix 2 of this report.

Recommendation 2

In accordance with clause 14A of the Administrative Procedures of the *Environmental Assessment Act 1982*, the proponent shall advise the Minister of any changes to the proposal for determination of whether or not further environmental impact assessment is required.

Recommendation 3

The proponent shall advise the Minister when a customer for Blacktip gas is confirmed and provide the Minister with details of any changes to the proposal (including a revised project justification) for determination of whether or not further environmental impact assessment is required. If a user for the Blacktip gas is not secured within five years of the completion of the NT environmental assessment process (within the meaning of the *Environmental Assessment Act*), the proposal is to be re-referred for consideration under the *Environmental Assessment Act*.

Recommendation 4

The Social Impact Management Plan (SIMP) is to be finalised and endorsed by the Social Impact Management Committee prior to the commencement of any works.

Recommendation 5

The proposed Social Impact Management Committee (SIMC) is to be established prior to the commencement of any works and include at least one representative from the Northern Territory Government. The terms of reference for the SIMC must be agreed by the Northern Territory Government and key stakeholders, including the Northern Land Council and the Thamarrurr Regional Council.

Recommendation 6

A Cultural Heritage Management Plan is to be prepared in consultation with relevant stakeholders to the satisfaction of the Office of Environment and Heritage and Aboriginal Areas Protection Authority prior to the commencement of any works. The plan must include procedures for ceasing works and contacting Heritage Conservation Services of the Office of Environment and Heritage if archaeological objects are discovered during earthworks and construction activities.

Recommendation 7

The proponent will ensure that:

- **placement of additional infrastructure and auxiliary areas occurs in accordance with the archaeological predictive model developed in the DEIS;**

- **additional surveys are undertaken during the design phase of the project for all Onshore-Related Components as specified in Table 4.2 (DEIS, pg 48) not within the gas plant footprint or not previously subject to archaeological survey.**

The proponent should note that these recommendations for the construction and operational phases are based on the information currently available and may be revised pending further archaeological surveys.

Recommendation 8

Details of proposed borrow pits and quarries (including locations and tonnes of material required) are to be provided to the Office of Environment and Heritage for further consideration under the *Environmental Assessment Act* as per Recommendation 2 of this Assessment Report prior to the commencement of any works. Appropriate authorisations are required from the Department of Primary Industry, Fisheries and Mines for the extraction of these materials.

Recommendation 9

A Sea Turtle Management Plan and Lighting Management Plan must be prepared to the satisfaction of the Department of Natural Resources, Environment and the Arts prior to the commencement of any works.

Recommendation 10

A Production Drilling Environment Plan is to be submitted to the Western Australian Department of Industry and Resources for approval prior to the commencement of any offshore drilling activities.

Recommendation 11

Appropriate modelling is to be completed to assess the potential for the hydrotest water discharge plume to impact on the offshore and nearshore marine environments. The modelling results are to be used to develop the procedures for Pipeline Flooding and Hydrotesting, Pipeline Precommissioning and the appropriate management plans for these activities. The disposal of borewater used for hydrotesting of the onshore gas plant must be included in the relevant procedures. These procedures and management plans must be developed in consultation with relevant stakeholders to the satisfaction of the Department of Primary Industry, Fisheries and Mines and the Department of Natural Resources, Environment and the Arts prior to the commencement of any works.

Recommendation 12

Once a user of the Blacktip gas is secured, information is to be provided to the Office of Environment and Heritage to support the proponent's proposed Produced Water (PW) disposal method, including the options assessed, means and outcomes of evaluation and a discussion of proposed option in terms of industry best practice.

A draft PW Management Plan must then be developed in consultation with key stakeholders, particularly Traditional Owners, and approved by the Office of Environment and Heritage prior to the finalisation of the design of PW treatment and disposal facilities. As a minimum, the draft plan must include a description of strategies to achieve the following requirements related to PW:

- **a) determining PW chemistry;**
- **b) establishing baseline conditions to enable identification of possible impacts on the marine environment;**
- **c) conducting proposed ecotoxicological, bioaccumulation and biodegradation studies to determine the potential for toxic effects on marine flora and fauna;**
- **d) developing indicators for detecting and measuring impacts on the marine environment;**
- **e) developing proposed monitoring programmes (including assessing and monitoring for potential tainting of traditional foods); and**
- **f) developing preventative and management strategies and triggers for actions.**

An outline of contingency plans for PW disposal options or PW treatment must be included in the draft PW Management Plan. These should plan for the scenario that trigger levels are exceeded and/or studies determine that PW cannot be discharged to the near-shore environment without unacceptable impacts. The strategies of the draft

PW Management Plan must inform the design of the gas processing facility to ensure contingency plans can be practicably implemented if required. If PW is shown to present a risk to biota or result in unacceptable impacts, alternate treatment or disposal options must be assessed as per Recommendation 2.

The draft PW Management Plan must be finalised using available findings of PW studies to inform specific management strategies and re-submitted for approval to the Office of Environment and Heritage prior to the commencement of any works.

Recommendation 13

An Erosion and Sediment Control Plan, Rehabilitation Management Plan, Terrestrial Fauna Management Plan and Vegetation Clearing Management Plan must be prepared in consultation with relevant stakeholders and submitted to the Department of Primary Industry, Fisheries and Mines and the Office of Environment and Heritage for approval prior to the commencement of any works.

Recommendation 14

A Fire Management Plan must be prepared to the satisfaction of the Bushfires Council of the NT and the Office of Environment and Heritage, and a Waste Management Plan must be prepared to the satisfaction of the Office of Environment and Heritage prior to the commencement of any works. A feasibility study for the suitability of Wadeye Landfill for the disposal of waste from the project must be completed as part of the Waste Management Plan. The Waste Management Plan must also list all waste streams with projected quantities and planned disposal sites and identify in detail the opportunities for recycling, reuse and minimisation of wastes.

Recommendation 15

A Spill Contingency Plan must be developed for all onshore and offshore hydrocarbon and other hazardous substance spill events to the satisfaction of the Department of Planning and Infrastructure and the Department of Primary Industry, Fisheries and Mines prior to the commencement of any works. The offshore component of the plan must be developed in accordance with the NT Oil Spill Contingency Plan and the NT Marine Oil Pollution Manual. The spectrum of consideration should cover small spill events to worst-case scenarios. A rationale for level of spill equipment stored on-site must also be included within the plan.

Recommendation 16

The Groundwater Protection Management Plan must be prepared in consultation with relevant stakeholders to the satisfaction of the Department of Natural Resources, Environment and the Arts and the Department of Health and Community Services prior to the commencement of any works. The plan must demonstrate that there will be no adverse impact on groundwater supplies to the Wadeye community, outstations or other users, or on groundwater dependant ecosystems due to groundwater extraction or disposal of hydrotest water.

Recommendation 17

The proponent is to commit to ongoing membership of the Australian Government's Greenhouse Challenge Plus program, including future versions of the program.

Recommendation 18

The Greenhouse Gas Management Plan shall include a section specifically addressing commitments and strategies aimed at reducing greenhouse gas emissions. This shall include, but not be limited to, provisions for regular greenhouse gas audits, a process for continuous review of new technologies to identify opportunities to reduce emissions, and benchmarking against other gas plants with a view to achieving international best practice in terms of CO2 emissions per unit of production. Opportunities for offsetting greenhouse gas emissions, particularly in the NT, shall also be addressed. The Greenhouse Gas Management Plan must be prepared in consultation with relevant stakeholders to the satisfaction of the Office of Environment and Heritage prior to the commencement of any works.

Recommendation 19

A Dust Management Plan must be prepared in consultation with relevant stakeholders to the satisfaction of the Office of Environment and Heritage prior to the commencement of any works.

Recommendation 20

The proponent must assess opportunities to reduce emissions and must, as a minimum, establish a monitoring system for oxides of nitrogen (NO_x) from key emission sources at the facility. Procedures for monitoring and reporting shall be developed in consultation with the Office of Environment and Heritage.

Recommendation 21

Once a user of the Blacktip gas is secured, information is to be provided to the Office of Environment and Heritage as part of the licensing process under the *Waste Management and Pollution Control Act* to support the proponent's proposed flare design. The information is to include the flaring options assessed, the means and outcomes of evaluation (including modelling results for noise impacts on Tchindi camp and the Wadeye Township) and a discussion of proposed option in terms of industry best practice.

A Flaring Management Plan and a Noise Management Plan must be prepared in consultation with relevant stakeholders to the satisfaction of the Office of Environment and Heritage (OEH) prior to the commencement of any works. If blasting is required, a Blasting Management Plan is to be submitted to the OEH for approval prior to the commencement of any blasting activities.

Recommendation 22

Management measures for biting insects must be developed in consultation with Traditional Owners and incorporated in a Biting Insects Management Plan to be prepared to the satisfaction of the Office of Environment and Heritage and the Department of Health and Community Services prior to the commencement of any works.

Recommendation 23

The proponent will prepare and implement an exotic marine species monitoring program with appropriate baseline data and a Ballast Water Management Plan to the satisfaction of the Department of Primary Industry, Fisheries and Mines and the Western Australian Department of Fisheries prior to commencement of any works.

Recommendation 24

An Exotic Species and Weed Management Plan must be prepared to the satisfaction of Department of Natural Resources, Environment and the Arts prior to the commencement of any works.

Recommendation 25

A Preliminary Onshore and Offshore Decommissioning Plan must be developed in consultation with key stakeholders and submitted to the Department of Primary Industry, Fisheries and Mines, the Office of Environment and Heritage and the Western Australian Department of Industry and Resources for approval prior to the commencement of any works. The plan must include contingency planning for sudden closure, financial provisioning for both planned and sudden closure, and potential social as well as environmental impacts resulting from decommissioning and closure.

Recommendation 26

The proponent must liaise with the Australian Defence Force during all phases of the project to be aware of all possible interaction between Blacktip and defence operations.

Recommendation 27

The overarching Environment Management Plan, all Environment Plans and Environmental Management Plans for the Blacktip Project are to be submitted to the Office of Environment and Heritage for Northern Territory and/or Western Australian Government approval prior to commencement of any works.

In preparing each plan, the proponent will include any additional measures for environmental protection and monitoring contained in this Assessment Report and Recommendations. The plans shall be referred to relevant Northern Territory and Western Australian Government agencies and key stakeholders for review prior to finalisation. The plans shall form the basis for approvals and licences issued under relevant legislation.

1 Introduction and background

This report assesses the environmental impact of a proposal by the Blacktip Venture (joint venture between Woodside Energy Ltd and ENI Australia, hereafter referred to as the proponent) to construct and operate a gas wellhead platform (WHP), bringing gas and condensate onshore from the Blacktip field via a 110km export pipeline which will connect to onshore gas infrastructure located 12km west of Wadeye (Port Keats). Figure 1 shows the location of the proposed activity. Figure 2 shows the site at a finer resolution.

This Environmental Assessment Report is based on a review of the Draft Environmental Impact Statement (DEIS); comments from the public and Northern Territory (NT) Government agencies on the DEIS; and the Supplement to the Draft EIS (SEIS) in response to these comments (the DEIS and SEIS together constitute the Environmental Impact Statement (EIS)).

1.1 Environmental Impact Assessment process

Environmental impact assessment is based on adequately defining those elements of the environment that may be affected by a proposed development, and on evaluating the significance, risks and consequences of the potential impacts of the proposal at both local and regional levels.

This Assessment Report describes the adequacy of the EIS in achieving the above objectives and evaluates the undertakings and environmental safeguards proposed by the proponent to avoid or mitigate potential impacts. Further safeguards may be recommended as appropriate. The safeguards may be implemented at various levels within the planning framework of a project and include (but are not limited to):

- design and layout of offshore, delivery and onshore facilities;
- management of construction activities; and
- management of processes used in operation at the facility (i.e. inputs and outputs).

A list of undertakings made by the proponent in the DEIS and in the SEIS in response to submissions from the public, NT Government and the Australian Government is provided in Appendix 2.

The contents of this Assessment Report form the basis of advice to the NT Minister for the Environment and Heritage on the environmental issues associated with the project.

1.2 Environmental Impact Assessment history

The Blacktip Venture is proposing to construct and operate an offshore natural gas supply facility, inclusive of the offshore, delivery and onshore infrastructure. The Blacktip Gas Project was referred to the Commonwealth Department of Environment and Heritage, formerly Environment Australia, under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999.*

In September 2003, the proponent submitted a notice of intent to the NT Department of Business, Industry and Resource Development (now the Department of Primary Industry, Fisheries and Mines, DPIFM) for the proposal to develop the gas field.

Figures

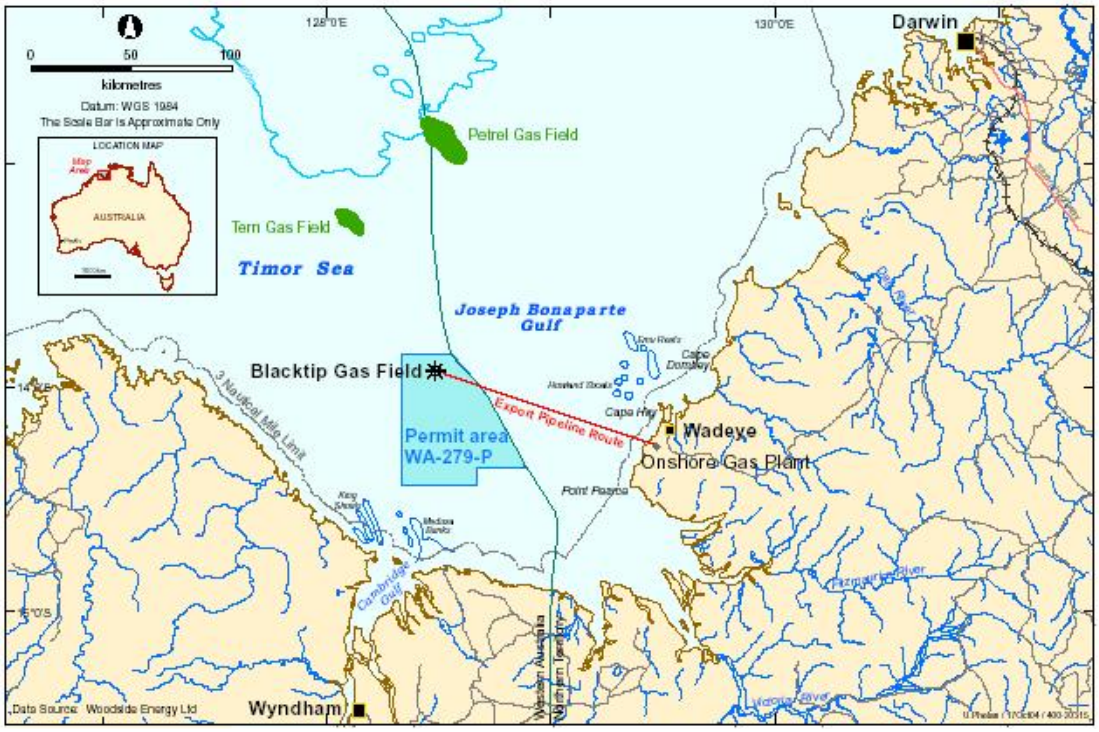

Figure 1 – Location of proposed Blacktip facility (Figure ES1, DEIS)

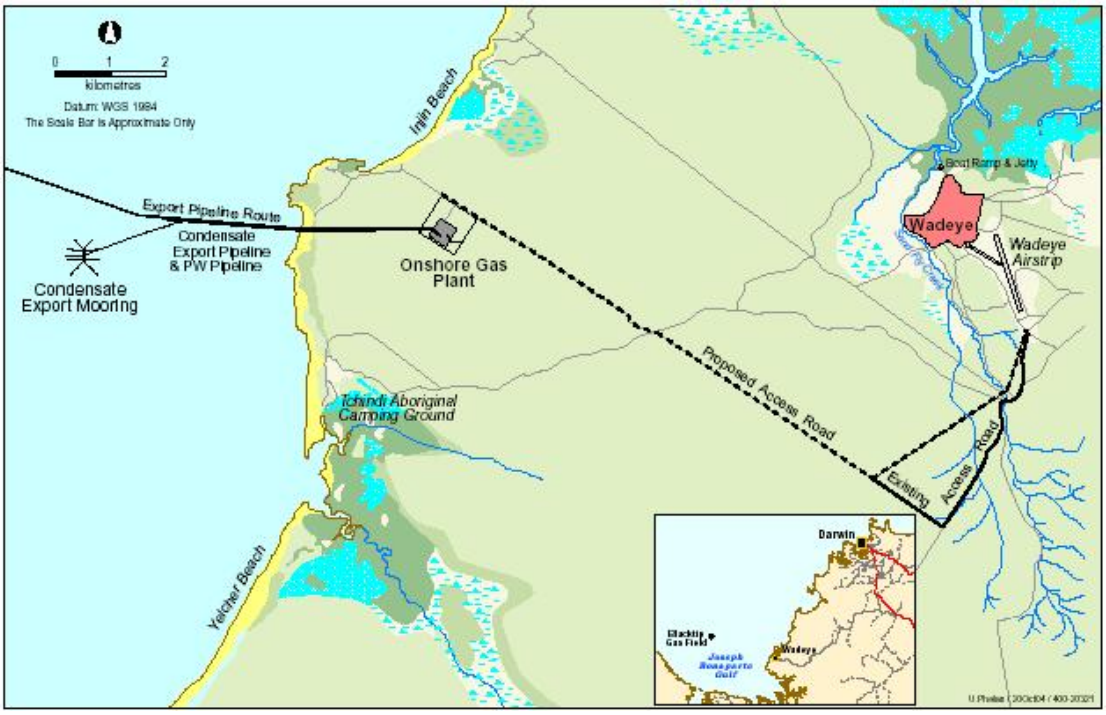

Figure 2 – Onshore and nearshore components of the Blacktip project (Figure 4.1, DEIS)

In October 2003, the NT Minister for the Environment and Heritage determined that the proposal would be assessed under the *Environmental Assessment Act* at the level of an EIS. The proponent referred the project to the Australian Government under the EPBC Act. The Commonwealth Government determined that the proposal was a controlled action under the EPBC Act. The Australian and NT Governments agreed to direct the proponent to prepare one EIS to meet guidelines agreed by both jurisdictions. Draft guidelines covering issues to be addressed in the EIS were subject to public review in February 2004.

Guidelines for the EIS were finalised on 17 March 2004, taking into account submissions and comments from various non-government groups and NT Government agencies. The NT Minister for the Environment and Heritage directed the proponent to prepare the EIS addressing matters set out in the final guidelines.

The draft EIS was submitted to the NT Office of Environment and Heritage (OEH) and the Commonwealth Department of the Environment and Heritage (DEH) on 29 October 2004 and placed on public review for the period 2 November 2004 to 18 January 2005. It was also circulated to NT Government advisory bodies for review and comment. Three public submissions were received over the review period. Comments from NT Government agencies, with the exception of the Northern Territory Police and OEH, were consolidated into one submission and forwarded, with the public submissions, to the proponent at the close of the public review period. OEH provided its comments on the DEIS to the proponent separately, as did the Northern Territory Police. The proponent prepared a SEIS addressing issues raised by the public, NT Government and the Australian Government. A list of respondents to the DEIS and issues raised in their submissions are provided in Appendix 1.

The SEIS was received by OEH and DEH on 18 March 2005. OEH circulated the SEIS to NT Government advisory bodies for review and comment. DEH required further information not included in the SEIS in order to make their assessment. DEH requested that a Turtle Management Plan be presented for approval prior to acceptance of the Supplement for lodgement under the EPBC Act.

In accordance with the *Environmental Assessment Act*, the NT Minister for the Environment and Heritage had 35 days from receipt of the SEIS to issue an assessment. However, as the Blacktip Gas proposal was assessed concurrently by both the Northern Territory Government and the Australian Government, the assessment process was managed to allow a concurrent determination. As such, release of the NT Assessment Report was delayed to be aligned with the timeframes of the DEH. Further to this, the completion of the Assessment Report was suspended following the public announcement by Alcan Pty Ltd (Alcan) on 27 June 2005 that it had terminated its arrangement with Woodside to purchase gas from the Blacktip Project. The Northern Territory Government (NTG) received notification from Woodside on 29 July 2005 advising that while it did not have an alternate use for the gas it wished to finalise all Government approvals for the project. The assessment report was subsequently completed on this basis. Under the EPBC Act, the Australian Minister for the Environment and Heritage has 30 business days in which to issue an environmental determination, following lodgement of the NT Assessment Report to the DEH.

The DEIS, the SEIS, the pubic comments and comments from NT Government agencies have been taken into account in the preparation of this Assessment Report.

1.3 Regulatory Framework

The Blacktip gas resource is located in Commonwealth waters in an area adjacent to the Western Australian coast. The export pipeline traverses Commonwealth waters in the vicinity of the well head platform (WHP) and NT administered waters to shore. Environmental

assessment is therefore being undertaken by the Australian and NT Governments. Any approvals and licences for construction and operation of this proposal will be, for the purposes of the WHP, administered by WA Government under the Australian Government Petroleum (Submerged Lands) Act; and for the export pipeline from the WHP to NT coastal waters, the NT Government under the same legislation, the NT Petroleum (Submerged Lands) Act within NT coastal waters, and the NT Energy Pipelines Act for the shore-based pipeline.

Although separate licences will be required for these various sections of pipeline, a Pipeline Management Plan will be required that covers all aspects of construction, commissioning, operation and decommissioning of the pipeline, and will satisfy all relevant legislative requirements and conform with the Australian Government's Petroleum (Submerged Lands) (Management of Environment) Regulations 1999.

The proposed gas facility has been scheduled under the *Waste Management and Pollution Control Act* through the *Trans-Territory Pipeline and Blacktip Gas Projects (Special Provisions) Act 2005*, which will include the facility itself, produced water (PW) outfall, condensate pipeline and mooring, and the access road to the facility.

2 The proposal

The Blacktip Gas Project involves bringing gas and condensate onshore from the Blacktip field in the Joseph Bonaparte Gulf, via a 110 km export pipeline which will connect to onshore gas infrastructure located close to Wadeye in northwest NT.

The original proposal was for the gas to be treated at a facility near Wadeye and piped to Nhulunbuy for power generation at Alcan's alumina refinery. On 27 June 2005, Alcan announced that it had terminated its arrangement with Woodside to purchase gas from the Blacktip Project. At the time of writing, an alternate end use for the Blacktip Gas had not been announced.

In summary the current proposed development comprises the following infrastructure:

- drilling of wells in Australian waters (Permit WA-279-P);
- installation of an offshore WHP in Australian waters;
- installation and operation of sub-sea gas export pipeline from Blacktip WHP to an onshore facility via both Australian and NT waters;
- installation and operation of onshore processing facilities located at a suitable location close to the shore crossing in the vicinity of Wadeye; and
- the development and tie-in of other fields in the area.

Following are brief descriptions of the major components of the proposed project.

2.1 Wellhead platform aspects

2.1.1 Production wells and facilities

At least two, and up to six production wells will be drilled into the seabed at the Blacktip Project site, initially from 5 reservoirs. The wells are expected to be drilled using a conventional jack-up mobile offshore drilling unit, which will be self-sufficient providing facilities for up to 200 personnel, and is expected to remain on site for two to three months. Following the drilling and casing procedure, the reservoir subsea production facilities will be connected to prevent fluid escape and to maintain well pressure.

2.1.2 Wellhead platform (WHP)

The WHP will control the flow and pressure of the reservoir fluids from the wells to the export pipeline and is expected to comprise a fixed steel platform located in water of approximately 52m depth. It will be unmanned and remotely operated. The substructure of the WHP is expected to comprise a four leg jacket secured to the seabed by deep or shallow foundations and will be designed to withstand extreme environmental conditions, including cyclones. The wellheads are expected to be located on the top side of the wellhead platform and flow from each well will be collected in a choke manifold and flow down into the export pipeline.

2.2 Pipeline aspects

2.2.1 Subsea gas export pipeline

The gas export pipeline will be a three-phase pipeline capable of handling simultaneous flows in the gas, condensate and water phases. The offshore component is to be 107.5 km in length and is likely to be buried in a trench for the majority of its length between wellhead platform and landfall.

The pipeline will be transported to the site by barge in 12m lengths. These will be welded together and lowered into the water from the laybarge, which will be held in position by eight to twelve anchors. The laybarge will move progressively along the pipeline route, positioning the pipeline directly on the seabed. Where seabed conditions permit, post-lay trenching will be undertaken to bury the pipeline.

2.2.2 Condensate and produced water pipelines

The condensate export pipeline and produced water (PW) pipeline diffuser are expected to be manufactured offsite and transported to the site for assembly and installation. The condensate export pipeline will run from the gas plant to an offshore condensate mooring, where condensate will be loaded into tankers. The mooring will be located in approximately 15m of water depth. The PW pipeline will be “piggybacked” onto either the condensate export pipeline or the gas export pipeline. The condensate and PW pipelines will be laid in the same trench as the gas export pipeline for 1.7km from the high water mark, at which point they will deviate. The condensate pipeline will continue for another 2.5km to the condensate export mooring; the PW pipeline will continue for another 1.3km to a discharge point.

2.2.3 Shore crossing

The gas export pipeline will to cross Yelcherr Beach, approximately 12km to the south-west of Wadeye. Temporary laydown areas (100m by 100m) will be created near the shore crossing construction site for the storage of materials, vehicles, machinery, pipe lengths and other components during site preparation and construction. Construction at the shore crossing is expected to take 20 weeks using an open cut technique, involving: dredging near shore, excavating a trench, installing a pipeline, backfilling and rehabilitation.

2.2.4 Onshore pipeline

The onshore section of the export pipeline will extend for approximately 2.5km from the high water mark to the gas plant. No water courses are expected to be crossed by the pipeline.

Construction of the pipeline will involve: surveying, preparing a Right of Way (ROW) area, stripping and grading the topsoil, digging a trench, stringing, welding and lowering the pipeline, dewatering and backfilling the trench, and rehabilitation.

2.3 Gas facility and ancillary aspects

All onshore facilities, including the gas plant and ancillary systems are expected to be prefabricated as components offsite and assembled in an onshore plant laydown area.

2.3.1 Onshore gas plant

The gas plant will separate the reservoir fluids into gas, condensate and produced water, and then dehydrate and compress the gas in preparation for export.

Gas plant construction will include the establishment of accommodation, clearing of vegetation, preparation of the construction site, laying foundations, installing equipment and services, testing and rehabilitation. The plant is expected to cover 15.4ha of the total footprint for onshore facilities of 64ha.

2.3.2 Condensate treatment

Condensate that remains following the separation of the reservoir fluid into gas and other components will be heated and stabilised before being pumped to a storage tank on the gas plant site.

Stabilised condensate will be pumped offsite via the condensate pipeline to a condensate export mooring, consisting of six conventional drag anchors connected to chain mooring lines and secured in approximately 14 to 16m of water. Condensate will be tankered from the site approximately four times per year.

2.3.3 Produced water treatment

Following separation from condensate, the PW is expected to be treated onshore in water treatment facilities to remove, as much as possible, free oil, dissolved oil and chemical contaminants such as corrosion inhibitor, before being discharged to sea through a PW diffuser under licence through the NT *Waste Management and Pollution Control Act*.

2.3.4 Concrete batch plant

The concrete batch plant is expected to provide concrete for footings and paving. Within the 64ha gas plant footprint, the concrete batch plant is expected to take up 1ha.

2.3.5 Construction waste facilities

Construction waste facilities are to provide an area for the safe storage and classification of construction waste. These facilities are expected to occur within a 1ha area of the plant footprint.

2.3.6 Access and haul routes

During operation, access to the gas plant and related infrastructure will be via the Wadeye airstrip, road to the facility and barge. A new access road will be built, 13km long and 4m wide, to accommodate construction and local traffic during the construction period. A construction corridor of 50m width is expected to be required to accommodate laydown areas at various intervals along the corridor.

2.3.7 Groundwater

Groundwater will be used for human consumption, dust suppression and hydrotesting of onshore storage tanks and pipes.

2.3.8 Accommodation

A 'pioneer' camp (0.5 ha) will be established whilst main camp is under construction. The main camp will be 4.1ha in size and be positioned within the 64ha gas plant footprint. Up to 130 personnel would be housed at the main camp during peak construction periods. The majority of the camp will be removed once the three year plant construction is completed. Minimal facilities will remain on site for the life of the project to accommodate the two operational personnel and up to 40 maintenance personnel.

2.4 Other ancillary aspects

A variety of ancillary systems and facilities will be required throughout the production and operation phases of the development to support the onshore gas plant and personnel and maintain a safe working environment. Electrical power supply, diesel and chemical storage, cooling and heating systems, water supply, safety systems, navigation and communication systems, lighting, drainage, sewage and security are planned to be installed within the 64ha plant footprint.

2.5 Decommissioning

Decommissioning of the Blacktip Project is expected to occur approximately 30 years after commencement of production.

3 Regional setting

The project area is located approximately 350km south west of Darwin, both offshore in the Joseph Bonaparte Gulf and onshore near Wadeye. The Joseph Bonaparte Gulf, part of the greater Timor Sea, lies off the coast of the NT and Western Australia (WA).

3.1 Physical

The project area covers both marine and terrestrial environments in the tropical north of Australia. The region has distinct wet and dry seasons. The six months from November to April account for 95% of the annual average rainfall at Wadeye of 1464.2mm (Bureau of Meteorology records, Port Keats, 1938-2004).

The offshore component of the project area is in the Joseph Bonaparte Gulf, part of a Cambrian to Recent, large petroleum-producing basin on the north western Australian multiple-rifted margin. The climate is influenced by the shift in the monsoon between the wet and dry seasons. During the wet season the winds are north westerly, generating regular thunderstorm activity and high rainfall. Tropical cyclones may occur in the wet season. Four major rivers drain into the southern end of the Gulf: the Ord, Keep, Victoria and Fitzmaurice Rivers. These rivers flush a significant sediment load into the Gulf with the consequence that waters of the Gulf are highly turbid.

The Blacktip reservoir is located in approximately 52m of water. The seabed is generally flat and is characterised by soft sediment. The majority of the proposed pipeline route is also generally flat, sloping gently along a relatively featureless seabed.

The onshore component of the project area is on flat land within the defined boundaries of the Moyle River Basin, though no water course exists in the project area.

3.2 Areas with significant conservation values and/or management issues

3.2.1 Biological

3.2.1.1 Marine (and inter-tidal)

The Joseph Bonaparte Gulf comprises a diverse range of conditions and therefore provides habitat for a diverse range of species. Threatened and protected marine fauna species within the Gulf include, but are not restricted to:

- the freshwater sawfish (*Pristis microdon*), expected to inhabit the upper estuarine regions of northern Australia;
- the dugong (*Dugong dugon*), a migratory species;
- the sperm whale (*Physeter macrocephalus*) and Bryde's whale (*Balaenoptera edeni*), both known to pass close to the area;
- the Irrawaddy dolphin (*Orcaella brevirostris*), spotted bottlenose dolphin (*Tursiops aduncus*), Risso's dolphin (*Grampus griseus*), Indo-Pacific humpback dolphin (*Sousa chinensis*) and pantropical spotted dolphin (*Stenella attenuata*); all have northerly distributions;
- migratory birds of international significance known to inhabit the area, including the Australian painted snipe (*Rostratula australis*), white-bellied sea-eagle (*Haliaeetus leucogaster*), oriental plover (*Charadrius veredus*), oriental pratincole (*Glareola maldivarum*), little curlew (*Numenius minutus*), painted snipe (*Rostratula beghalensis*), magpie goose (*Anseranas semipalmata*) and barn swallow (*Hirundo rustica*);
- threatened turtle species known to inhabit the area, including the loggerhead turtle (*Caretta caretta*), green turtle (*Chelonia mydas*), leatherback turtle (*Dermochelys coriacea*), hawksbill turtle (*Eretmochelys imbricata*), olive ridley turtle (*Lepidochelys olivacea*) and flatback turtle (*Natator depressus*). Flatback turtles nest on the beach proposed for the pipeline crossing; and
- the saltwater crocodile (*Crocodylus porosus*), a protected species known to inhabit the intertidal and estuarine reaches of northern Australia.

Marine flora is poorly defined in the Joseph Bonaparte Gulf, however macroalgae, mangroves and seagrasses are all known to occur within the project area.

3.2.1.2 Terrestrial

The terrestrial landscape from the proposed pipe landfall at Yelcherr Beach to the proposed onshore processing plant comprises five distinct flora assemblages: (i) mixed species open woodland; (ii) Darwin Woollybutt (*Eucalyptus miniata*) and Darwin Stringybark (*E. tetrodonta*) forest; (iii) Darwin Woollybutt and Darwin Stringybark tall open woodland with a tree/shrub layer of mixed species and *Sarga sp.* tussock grasses; (iv) sand dune community; and (v) monsoon vine forest. Of these, monsoon vine forests are of highest conservation value as they contain a diverse range of species and habitats.

Threatened species known to exist close to the proposed project site include: *Zeuxine oblonga*, a wet rainforest plant, and *Schoutenia ovata*, found in monsoon vine thickets. The protected cycad *Cycas maconochiei ssp. maconochiei* and orchids *Cymbidium canaliculatum* and *Dendrobium spp*., are also found in the proposed project site. Species of the Cycadaceae and Orchidaceae families are protected in the NT.

Rocky headlands to the north and south of the proposed pipe landfall feature the uncommon Cheesefruit Tree (*Morinda citrifolia*).

Vulnerable or threatened fauna of the area include, but are not restricted to:

- Brush-tailed tree-rat (*Conilurus penicillatus*) and false water-rat (*Xeromys myoides*);
- Yellow chat (*Epthianura crocea tunneyii*), red goshawk (*Erythrotriorchis radiatus*), Gouldian finch (*Erythrura gouldiae*) and Partridge pigeon (*Geophaps smithii smithii*);
- Yellow-snouted ground gecko (*Diplodactylus occultus*);
- Speartooth shark (*Glyphis sp. A*) and freshwater sawfish (*Pristis microdon*).

3.2.2 Cultural

Thamarrurr Regional Council is the responsible authority in the area occupied by the Blacktip Project. Wadeye is the main community in the Thamarrurr Region and is populated by traditional owners of land from Cape Scott in the north to the Fitzmaurice River in the south. Wadeye is the largest Aboriginal community in the Northern Territory with a diverse population of around 2000. The community is made up of people from seven indigenous groups from the Daly River area, speaking seven different languages. The dominant language spoken around Wadeye is Murrinhpatha.

These diverse peoples came together during the 1930s, following the establishment of a Roman Catholic Mission in 1935. From 1938 to 1975 the Mission ran a cattle station in the 5000 square mile Daly River Aboriginal Reserve.

In 1975 the Australian Government recognised Aboriginal claims to the Reserve and the land passed back to its traditional owners (Commonwealth of Australia 2001). The underlying land tenure of the proposed Blacktip Project site is therefore inalienable Aboriginal freehold (Commonwealth), vested in the Daly River/Port Keats Aboriginal Land Trust, which holds all lands in the area to the north of the Fitzmaurice River.

Two clan groups are traditional owners for the areas proposed to be disturbed by the project. The Yak Maninh are traditional owners of the coastal area in the vicinity of the proposed pipeline shore crossing; the proposed route of the pipeline corridor between the shore and gas

plant; the proposed gas plant site; and the largest portion of the proposed all-weather access road. The Yak Dimininh are traditional owners of the lesser portion of the proposed all-weather access road.

Several sacred and significant sites to these two Aboriginal groups are located in the vicinity of the Blacktip Project area. One archaeological site was identified in the project area. This is identified as a large shell midden located within the sand dunes immediately landward of the proposed shore crossing.

The Yak Maninh and Yak Dimininh traditional owners, and the other Aboriginal groups of the Wadeye region, have a holistic view of their traditional country, in which all elements (land, sea, estuaries, rivers, animals, plants, people etc.) are linked through creation stories, tracks of creation ancestors, kinship systems, traditional knowledge, subsistence use and other cultural mechanisms (Ward 1983).

The plant and animal species in the vicinity of the proposed Blacktip gas plant, pipeline, shore crossing and access road form part of Yak Maninh and Yak Dimininh cultural landscapes. A large number of species have specific utilitarian and other cultural values, and collectively they are an integral part of country for which traditional owners have an inherited responsibility.

Subsistence fishing continues to form an important part of Aboriginal culture in the Thamarrurr Region and is a source of food. The most important species reflect those typically important across the territory and include mullet for bait, barramundi and catfish. Species of mussels and mudcrabs are also highly significant. There is limited harvest of dugong and turtle species according to season and as traditionally appropriate.

3.2.3 Socio-economic

The economic circumstances of the Wadeye Township indicate that it is a relatively poor community. As employment opportunities are limited in the Thamarrurr Region, there is an almost exclusive reliance on the Community Development Employment Projects Scheme for employment. There are no data on expenditure patterns at Wadeye, but a common pattern in similar communities is one of cash “feast and famine” against a background of high costs for essentials such as food and transport (DEIS).

Wadeye is the focus of an interjurisdictional indigenous trial program of shared resource input. It is the second community to implement the Council of Australian Governments whole-of-government approach to improve the way governments work with Indigenous communities. A Shared Responsibility Agreement for Wadeye was signed in March 2003 by representatives of the Thamarrurr Regional Council.

4 Environmental Impact Assessment

4.1 Introduction

The purpose of this Environmental Assessment Report is to evaluate the environmental protection measures of the project proposal and to determine whether the proposal meets relevant environmental criteria. This is done by identifying all potential environmental impacts of the proposal and evaluating the corresponding safeguards or prevention measures suggested by the proponent. Where proposed safeguards are considered insufficient, or where

a particular safeguard is deemed to be significantly important, recommendations are made in this Report to complete or emphasise those commitments made by the proponent.

The environmental assessment of this project is based on consideration of the following from the EIS:

- completeness of information concerning the proposal (particularly with reference to construction or activities that are likely to impact on the environment);
- completeness and detail regarding the existing environmental condition and sensitivities;
- thoroughness regarding the description of the range and extent of potential impacts; and
- appropriateness of any proposed mitigation measures or safeguards.

Conclusions are based on comments from both a review of the DEIS by relevant government agencies and the public and also the SEIS in response to these comments.

It has been identified through the EIS process that there are a number of investigations to be completed or undertaken to fill gaps in project information and potential impacts not provided in the environmental assessment process. Where this is the case, the proponent has made commitments to undertake additional work and for this to provide input into the development of preventative and management strategies and management plans for subsequent review by regulatory authorities. In assessing aspects of the project where these gaps exist, the NT OEH has sought additional information from the proponent, gained specialist advice and consulted scientific literature.

Acceptable environmental outcomes for this project are very much dependent on the proponent completing the further investigations, developing the EMPs in consultation with relevant stakeholders to the satisfaction of the NTG, and implementing all environmental safeguards identified both in its EIS and presented in this Environmental Assessment Report. It should be noted that, as a significant proportion of the proponent's management measures will be described in EMPs developed following the formal assessment process, opportunities for public review and participation in the EIS process is reduced as these are not generally subject to public review. One opportunity to address this is to provide EMPs to all respondents to the DEIS for appraisal at the same as review by the NTG and other relevant stakeholders.

With the likelihood of minor changes to the project design occurring following the EIS process, some degree of flexibility will be necessary in adapting the environmental safeguards defined in the EIS and this Assessment Report. Where it can be shown that changes to the project design are unlikely to have a significant impact on the environment, an adequate level of environmental protection may still be achieved by following either the recommendations, modifications to these recommendations or conditions attached to relevant statutory approvals for these modifications.

Each recommendation (in **bold**) is preceded by text that identifies concerns, suggestions and undertakings associated with the project. For this reason, the recommendations should **not** be considered in isolation.

Subject to decisions that permit the project to proceed, the primary recommendations of this assessment are:

Recommendation 1

The proponent shall ensure that the proposal is implemented in accordance with the environmental commitments and safeguards:

- **identified in the Blacktip Project Environmental Impact Statement (the draft EIS and Supplement constitute the EIS); and**
- **recommended in this Assessment Report (No. 50).**

All safeguards and mitigation measures outlined in the EIS are considered to be commitments by the proponent. Key safeguards and mitigation measures are included in Appendix 2 of this report.

Recommendation 2

In accordance with clause 14A of the Administrative Procedures of the *Environmental Assessment Act 1982*, the proponent shall advise the Minister of any changes to the proposal for determination of whether or not further environmental impact assessment is required.

4.2 Project Justification

The project justification presented in the DEIS is that Blacktip gas would be a competitively priced and secure energy source for Alcan Gove, result in economic benefits to the NT and Australian economies and deliver environmental benefits such as reduced greenhouse gas and sulfur dioxide emissions.

Since the termination of the Alcan agreement to purchase gas from the Blacktip project, the proponent had not announced any alternate uses for the Blacktip gas if the proposal is to proceed, other than advising the NTG on 29 July 2005 that it intends to pipe Blacktip gas to Katherine (which would be subject to a separate application). As no alternate end user for the gas has been identified, there is currently no justification for the project to proceed. Therefore, the purpose of this assessment report is limited to the examination of the environmental constraints of the proposed project and the setting of environmental recommendations that would need to be met if the project were to proceed unchanged from the current proposal.

In light of this situation and in accordance with clause 14A of the Environmental Assessment Administrative Procedures, the NTG must be provided with details of a proposed end use for the Blacktip Gas, details of any changes to the project this may require, and a detailed project justification based on the revised proposal prior to the commencement of any works for the project. A determination on whether or not further environmental impact assessment would be required will be made on this basis.

Recommendation 3

The proponent shall advise the Minister when a customer for Blacktip gas is confirmed and provide the Minister with details of any changes to the proposal (including a revised project justification) for determination of whether or not further environmental impact assessment is required. If a user for the Blacktip gas is not secured within five years of the completion of the NT environmental assessment process (within the meaning of the

***Environmental Assessment Act*), the proposal is to be re-referred for consideration under the *Environmental Assessment Act*.**

4.3 Summary of major environmental issues

The principal environmental issues associated with the proposal are:

- Social impacts – particularly on the Wadeye community.
- Sites of cultural or heritage significance – particularly potential for disturbance to Walpinhthi Reef and a shell midden.
- Solid and liquid hazardous and non-hazardous wastes - the generation and management and disposal of these associated with construction and operation of the onshore and offshore components of the facility.
- Marine impacts - disturbance to the seabed habitat and marine biota, particularly flatback and Olive Ridley sea turtles.
- Light and noise emissions – particularly from flaring.
- Surface and ground water management around the onshore facility – particularly impacts on Wadeye water supply.
- Potential for, and impacts of, hydrocarbon spills.
- Safety concerns - increased traffic on the Darwin-Wadeye road.
- Onshore disturbance - including monsoon forest, Eucalypt woodland, beach dunes, fauna, weeds.

The remainder of Section 4 deals with issues identified in the public and government submissions to the EIS and the commitments of the proponent to environmental management provided within the DEIS and the SEIS. In addition, recommendations to complement or strengthen environmental management strategies and safeguards are presented.

Some issues were adequately addressed in the SEIS and require no further discussion. The outstanding environmental issues that remain are addressed below.

4.4 Alternatives

The proponent provided some discussion on alternatives for the recovery, export and processing of gas and condensate from the Blacktip reservoirs. The proponent states in the DEIS that a combination of environmental, economic and technical selection criteria were used to assist in the review and consideration of each option, however it is not stated what weighting or importance was given to each of these considerations in the decision-making process.

It is a concern of the Office of Environment and Heritage that in some instances it appears economic considerations have been the deciding factor in the evaluation of alternatives at the expense of environmental and social considerations, for example, in selecting the option of open trenching through the sand dune and midden at the shore crossing as opposed to directional drilling; discharging produced water to the near-shore environment as opposed to the usual practices of offshore disposal to the sea or aquifer/reservoir reinjection; and proposing flaring gas via a stack rather than a ground flare to minimise light and noise emissions and the visual impact of the gas facility.

It is a requirement of the NT *Environmental Assessment Act* that all matters which could be considered to have a significant effect on the environment are to be fully examined and taken into account in the formulation of proposals. It is considered by this Office that the proponent

has not fulfilled this requirement in line with the intent of the Act. Relevant recommendations in this report therefore state that once a user of the gas is secured, the proponent is to provide to the NTG, information to support decisions taken around these components of the of project, including the options assessed, means and outcomes of evaluation and a discussion of proposed option in terms of industry best practice. This to ensure that due and proper consideration is given to the implementation of best practice technologies to reduce impacts to the environment and that the development meets the standards and practices applicable at the time of project implementation.

4.5 Social impacts

The proponent is taking a staged approach to potential social impact issues associated with the development of the Blacktip Project:

1. An independent consultant to prepare a Social Impact Assessment (SIA) report to assist in identifying potential social impacts and to provide information to statutory regulators involved in the approvals process.
2. Develop a Social Impact Management Plan (SIMP) in consultation with the affected community and other key stakeholder groups.
3. Implement the SIMP and institute appropriate monitoring and review mechanisms.

Stage one, the SIA, has been completed. Since the submission of the SEIS, the proponent has met with the OEH to present a draft SIMP.

Some potential impacts to the Wadeye community were compiled during the SIA phase. Other concerns were highlighted by respondents to the DEIS and include:

- Opportunities for training and employment for members of indigenous communities not realised in the construction phase of the project.
- Limited employment opportunities for members of indigenous communities during the operation phase.
- Community interaction with the non-indigenous workforce particularly with regard to alcohol and drug issues, disease and cross-cultural relationships.
- Health impacts of the Blacktip plant on the local indigenous communities, such as the possible tainting of food resources due to discharges to the marine environment.
- Access constraints and safety concerns in accessing Yelcherr Beach during construction.
- The ability of the proponent to manage the project so as to not interfere with places and times of ceremonial significance around Wadeye.
- Road safety issues associated with construction traffic and upgrades to roads.
- Impacts on public health due to access to petrol supplies at the project site by members of the Wadeye community.
- Changes to air and water quality in the project area.
- Impacts on the Wadeye Health Centre due to personnel on site during the construction phase of the project.
- Management of compensation payment to traditional owners.
- Misunderstandings in the community about the project due to insufficient communication by the proponent.

The primary instrument for minimising and managing potentially negative social impacts and maximising positive opportunities associated with the project will be the SIMP. This document will also have links to other project management plans eg the Pipeline Construction

Environmental Plan for access to Yelcherr beach during pipeline laying, the Produced Water Management Plan for potential issues regarding discharges to the marine environment.

A primary mechanism for implementation and ongoing activity of the SIMP is the establishment of a Social Impact Management Committee (SIMC). The proponent has indicated that the SIMP will be an evolving document for the life of the project and will require periodic review in light of changed circumstances. Therefore, it is advised that SIMC maintain its charter during the operational life of the project with a Terms of Reference that could include:

- endorsement of the SIMP;
- monitoring and evaluation of the SIMP implementation; and
- review of the SIMP.

The Terms of Reference will be developed in consultation with appropriate NTG agencies and key stakeholders, including the Northern Land Council and the Thamarrurr Regional Council.

The SIMP will address potential social impacts identified in the SIA, presented in the DEIS, raised during the DEIS review period and as identified and agreed in future consultation with stakeholders. OEH notes that the SIMP is being developed in consultation with the affected community and other key stakeholder organisations including appropriate government and non-government agencies. It is also recognised that some of the social issues and opportunities related to the project are also being pursued through other avenues and initiatives occurring outside of the EIS process.

The SIMP should include as a minimum:

- a discussion regarding measures to address all of the impacts identified through the SIA and EIS processes and in other government and community consultations;
- a communication strategy to ensure all affected persons are informed and have the opportunity to have their concerns addressed in an appropriate manner;
- a plan which looks at maximising realisation of the economic opportunities identified in DEIS Appendix M;
- an implementation plan;
- the composition and terms of reference for the SIMC;
- a review mechanism which assesses the success of mitigation strategies adopted to minimise negative impacts and ensures actions are taken to facilitate continuous improvement; and
- a reporting mechanism to the NTG.

The SIMP is to be completed in full to the satisfaction of NTG agencies and the SIMC prior to the commencement of any works.

Recommendation 4

The Social Impact Management Plan (SIMP) is to be finalised and endorsed by the Social Impact Management Committee prior to the commencement of any works.

Recommendation 5

The proposed Social Impact Management Committee (SIMC) is to be established prior to the commencement of any works and include at least one representative from the Northern Territory Government. The terms of reference for the SIMC must be agreed by the Northern Territory Government and key stakeholders, including the Northern Land Council and the Thamarrurr Regional Council.

4.6 Cultural and heritage impacts

4.6.1 Shell midden

An archaeological survey report was included in the DEIS. Recommendations in that report represent a comprehensive approach to managing any potential impact on prescribed archaeological places and objects located within the Blacktip onshore pipeline and gas plant footprint (Appendix I, DEIS). Recommendations provided for the linear midden site are considered appropriate to minimise impact. Prior to trenching, an application to disturb or destroy the archaeological site will be made to the Heritage Conservation Services of the Office of Environment and Heritage. Any decision concerning the exact location of the pipeline and permit to disturb that section of the site should made be in consultation with the traditional owners and the OEH. The midden site should be taken into consideration by the proponent evaluating the options for bringing the pipeline across the shore and dune environment (see Section 4.10.2).

Prior to trenching and disturbance of the site for pipe laying, the opportunity for further research on the midden is encouraged, given that "the site has a high potential for further research" (DEIS 9.9.2).

4.6.2 Walpinhthi Reef

Offshore from the proposed location for the gas processing plant is a culturally sensitive rocky reef called Walpinhthi Reef. The DEIS suggested that the laying of the nearshore export pipe and the deployment of laybarge anchors had the potential to impact on the area in the vicinity of Walpinhthi Reef. It was acknowledged that this is a sensitive Aboriginal sacred site but no details were provided on the potential impacts to the reef itself.

In response to the DEIS, the proponent was asked to explain how Walpinhthi Reef would not be damaged or impacted on by the proposed development and to update results of the discussions between the proponent, the NLC and the Aboriginal Areas Protection Authority (AAPA) to determine mutually agreeable arrangements.

The proponent has advised that consideration of the planned disturbance to Walpinhthi Reef was undertaken with traditional owners following submission of the SEIS. The Walpinhthi Reef area was delineated during an offshore surveying exercise and trenching areas agreed by relevant stakeholders, and it was determined that the area of disturbance for pipeline construction and anchoring of the laybarge would not impinge on the agreed reef boundaries.

Issues regarding Walpinhthi Reef will be thoroughly considered in the proposed Cultural Heritage Management Plan.

4.6.3 Future site disturbance

For disturbance to occur in any additional areas that have not received clearance from the appropriate authorities, Authority Certificates will be required from the Aboriginal Areas Protection Authority to ensure sacred sites are not inadvertently disturbed, and archaeological clearances are required under the *Heritage Conservation Act 1991* to ensure prescribed archaeological places and objects are not disturbed. The proponent should note that it is an offence to disturb or destroy without the consent of the Minister, regardless of whether or not sites have been previously identified and reported to OEH.

Recommendation 6

A Cultural Heritage Management Plan is to be prepared in consultation with relevant stakeholders to the satisfaction of the Office of Environment and Heritage and Aboriginal Areas Protection Authority prior to the commencement of any works. The plan must include procedures for ceasing works and contacting Heritage Conservation Services of the Office of Environment and Heritage if archaeological objects are discovered during earthworks and construction activities.

Recommendation 7

The proponent will ensure that:

- **placement of additional infrastructure and auxiliary areas occurs in accordance with the archaeological predictive model developed in the DEIS;**
- **additional surveys are undertaken during the design phase of the project for all Onshore-Related Components as specified in Table 4.2 (DEIS, pg 48) not within the gas plant footprint or not previously subject to archaeological survey.**

The proponent should note that these recommendations for the construction and operational phases are based on the information currently available and may be revised pending further archaeological surveys.

4.7 Infrastructure

4.7.1 Offshore

The offshore section of the gas export pipeline is expected to be trenched for the majority of its length between the WHP and landfall unless seabed conditions dictate otherwise. Trenching options for the offshore pipeline presented in the DEIS were plough or jetting sled techniques. These options were still under consideration by the proponent at the time of writing this report. Both techniques will involve seabed disturbance either through physical pushing by the plough or high-pressure water jets of the jetting sled. Impacts due to trenching are expected to be localised along the pipeline route, however, the thickness of the settled sediment depends upon variations in seabed topography, sediment density and currents. The proponent states in the DEIS that resulting sedimentation will not reach sensitive environments, as there are no known coral reefs, seagrass beds or other areas of sensitive bottom habitat along the pipeline route. In the SEIS, the proponent states in reply to a query on the corridor of seabed disturbance that the total width of disturbance is dependent on the final trenching methodology selected but will typically be in the order of 10–50m. Where

trenching is not geotechnically viable, only the seabed directly under the pipeline will be affected (0.5 m width).

The proponent was asked to consider and describe the consequences of damage to the pipe by accidental anchor strike. The DEIS identified very minimal marine activity in the vicinity of the pipeline and the risk of occurrence was reported as exceedingly low. Furthermore the pipeline is likely to be placed in a trench for the majority of the route, which would substantially mitigate the effects of an anchor impact. In the unlikely event that anchor impact does occur, the concrete coating on the pipeline will form an effective barrier against damage to the steel pipeline. Typically, the concrete coating is designed to withstand trawlboard impact well in excess of that from trawlers expected to be operating in this area. Furthermore, the proponent will ensure that the pipeline location is shown on admiralty charts for the region and is requesting from the regulatory authority a 500m exclusion radius.

The potential for development of other petroleum facilities in the Joseph Bonaparte Gulf and their importance to the future energy demands for Darwin and the Northern Territory is identified in the EIS. It is stated in the DEIS Supplement that the offshore export pipeline may potentially transport third party gas under contractual arrangements with the proponent. As the NT Power and Water Corporation support the pipeline being 18" in diameter, the proponent should notify the NT Government should it plan to reduce the diameter of the export pipeline from the specification described in the DEIS.

The proponent has committed to developing a Pipeline Construction Environmental Plan in the DEIS, however little detail is provided as to the proposed content. This plan will need to be developed to the satisfaction of the Western Australian Department of Industry and Resources (WADoIR) and the NT OEH and DPIFM prior to the commencement of any works.

4.7.2 Onshore

4.7.2.1 Roads

A significant increase in traffic along the Darwin to Wadeye road will occur as a result of the project, primarily during peak construction periods. The current condition of this road is not amenable to the projected increased volume of traffic. Increased traffic on the Daly River to Wadeye road is also considered to translate to a significant safety risk to local residents. A new section of road to link an existing track to the proposed onshore processing plant site with a track from the Wadeye air strip will be constructed. The existing tracks will also be upgraded as part of the project.

The proponent has committed to ensuring that the roads are maintained and restored to their original state or better through a Road Maintenance Plan and to minimising the impact on road users through a Traffic Management Plan. This will occur in consultation with the Road Network Division of the NT Department of Planning and Infrastructure, (DPI) (formerly the Department of Infrastructure, Planning and Environment) and the local communities.

In a response to the DEIS, it was highlighted that all road traffic associated with the Blacktip gas plant project must travel through the Daly River Crossing which, in the dry season, is occupied by tourists camping in the confined space directly adjacent to the road crossing itself. It was suggested that the impact of construction traffic will prohibit safe camping in this area. The proponent responded that a Traffic Management Plan has been developed to cover the safety issues related to road transport. This plan will be expanded by the road construction contractors and will include community education/awareness campaigns.

4.7.2.2 Borrow pits and aggregate quarries

It is stated in the DEIS that the total area of land-based disturbance due to the project does not account for any disturbance arising from borrow pits or the upgrade of access tracks to the project area. No response was provided in the SEIS to a query by a respondent to the DEIS regarding what the disturbance arising from borrow pits or the upgrade of access tracks will entail. However, the proponent has committed in the DEIS and SEIS that borrow pits will not be located in areas of environmental sensitivity.

Potential sources of aggregate for construction activities include igneous rock present in the vicinity of the Moyle River crossing, although quarrying this aggregate source has not yet been confirmed. Other potential sources for aggregate include existing quarries near Darwin or left over spoil from the Alice to Darwin railway.

It was highlighted by one respondent to the DEIS that in accordance with the Northern Territory *Mining Act* and *Mining Management Act* construction materials including rock and fill aggregates need to be sourced from valid mining tenements with appropriate authorisations. Once determined by the proponent, the details of volumes of material required and locations of proposed borrow pits and quarries are to be provided to the Office of Environment and Heritage. Extraction of these materials may require referral to the Minister for Environment and Heritage for further consideration under the *Environmental Assessment Act* as per Recommendation 2 of this Assessment Report. Any new tenements will also require archaeological and sacred site clearances as discussed in Section 4.6 of this report. This will need to be completed in consultation with the Titles and Mining and Petroleum Management Divisions of DPIFM and the Office of Environment and Heritage prior to the commencement of any works.

Recommendation 8

Details of proposed borrow pits and quarries (including locations and tonnes of material required) are to be provided to the Office of Environment and Heritage for further consideration under the *Environmental Assessment Act* as per Recommendation 2 of this Assessment Report prior to the commencement of any works. Appropriate authorisations are required from the Department of Primary Industry, Fisheries and Mines for the extraction of these materials.

4.7.2.3 Air Traffic

The proponent was requested to assess the capacity of the Wadeye airstrip to handle competing usage and increased maintenance requirements. The proponent responded that during operation, airstrip usage will be insignificant and have no impact on the current airstrip usage. No comment was provided on the potential for significant increases in usage of the airstrip and subsequent maintenance requirements during the construction phase of the Project. This will need to be addressed in the SIMP as well as the road maintenance and traffic management plans.

4.8 Offshore ecology

The project has the potential to impact habitats and associated biota in the offshore and intertidal marine environments, through the following means:

- physical disturbance of benthic communities through construction activities;

- contamination of sediments, water column and biota through inputs of drilling wastes, produced water and other chemicals;
- hydrocarbon spills;
- creation of artificial reefs through the presence of structures such as the wellhead platform; and
- introduction of exotic species.

4.8.1 Ecological data

Respondents to the DEIS were critical of the proponent for providing insufficient data for its studies of the marine environment, particularly with respect to appropriate methodologies, sampling effort and the failure to use other available data sources. There was concern that without adequate characterisation of the offshore environment, the true nature of potential impacts to marine communities and biota could not be properly assessed.

The SEIS addressed some of these issues adequately; however, some were not fully resolved and in ensuing discussions with NTG, the proponent committed to preparing and implementing a monitoring program that would include further baseline studies of the marine habitats that could possibly be impacted by the development. Baseline data is required prior to the commencement of relevant activities in the marine environment. This monitoring program will particularly target the produced water (PW) outfall site, the WHP with respect to drilling wastes, any stationary structures with respect to exotic marine species, and selected habitats and biota that could be impacted from the accumulation of any PW effects. Additionally, the program will account for the values placed on the marine and estuarine habitats and biota by the Aboriginal people of the region, and be responsive to those elements in the project area that require protection under the *EPBC Act* as identified in the Australian Government assessment process. These monitoring programmes are described in the relevant sections of this report, together with related recommendations.

4.8.2 Dugongs

Concerns were raised be respondents to the DEIS with respect to the potential impacts of an oil spill on dugongs passing through the area.

The proponent asserts that dugongs must be considered to be potentially sensitive to oil in the absence of any data to the contrary and has committed to preparing a Spill Contingency Plan (SCP) prior to the commencement of any works. The SCP will address, amongst other things:

- Identification of oil-sensitive marine and coastal resources and priority protection areas, including the identification of fauna that may be attracted to affected areas.
- Spill response and clean up strategies for offshore and shoreline.
- Identification of local capacity to maintain and implement rapid response equipment and assist with habitat and wildlife rehabilitation.

Potential hydrocarbon spills are discussed further in Section 4.12 of this Assessment Report.

4.8.3 Sea Turtles

The DEIS states that the abundance and distribution of sea turtles in the Joseph Bonaparte Gulf is relatively unknown. The flatback turtle is listed as vulnerable under the *EPBC Act* due to its restricted global distribution. According to the DEIS, there are up to 20 flatback turtles which nest on Yelcherr Beach. There is also evidence provided by local Aboriginal people

during the preliminary survey of the coastline, of an Olive Ridley turtle nest found at a nearby beach (DEIS 7.3.9) and it is anticipated that Olive Ridley turtles would nest on Yelcherr Beach as well. Olive Ridley turtles are listed as endangered under the *International Red List 2000* and the *EPBC Act* (DEIS Appendix C) due to over-exploitation in Central America and Indonesia.

Due to the possibility for impacts on nesting and hatchling turtles during the dry season, the activity with the most likely potential to impact on sea turtles is beach disturbance during the construction phase of the project. Landfall construction and rehabilitation is expected to be completed over approximately 20 weeks during one dry season.

Several DEIS respondents raised concerns regarding the potential impacts to turtles of offshore and onshore pipeline construction (noise, lights, hatchling mortality, loss of habitat, beach disturbance, acid sulphate soils, hydrocarbon spills) and in relation to the adequacy of the single turtle survey completed for the preparation of the DEIS and the regional importance of nesting sites in the eastern portion of the Joseph Bonaparte Gulf. Management strategies were also requested by respondents to be addressed and presented for evaluation.

In response, the proponent prepared and submitted for review to the DEH and OEH a draft Sea Turtle Management Plan (TMP), which included details of proposed management and monitoring of shore crossing activities, and provided information on plans for relocating clutches of sea turtle eggs if required during construction. The proponent also committed in the DEIS to the preparation of a number of other EMPs which would act to provide additional support to the TMP eg. Lighting Management Plan, Rehabilitation Management Plan etc. While the draft TMP does identify blasting impacting on incubating sea turtle eggs as a management issue, this issue is not addressed in the management and monitoring strategies proposed in the plan. If blasting is required, a Blasting Management Plan is to be submitted to OEH (as per Recommendation 21).

The short-term nature of the disturbance to the shore at the beach crossing site and the relatively narrow corridor of disturbance of the beach, along with the assessment of other information provided by the proponent suggests that the issues identified in relation to sea turtles can be adequately managed by the proponent. This will be primarily through the TMP which is to be finalised prior to the commencement of any works. Turtle monitoring reports submitted to NT Government departments under this plan and made available to other organisations will also assist in identifying impacts on turtles and assessing the adequacy of mitigation measures. In addition, the Blacktip SCP and the Lighting Management Plan, together with a number of other EMPs, will contribute to the mitigation of any impacts to turtles.

Recommendation 9

A Sea Turtle Management Plan and Lighting Management Plan must be prepared to the satisfaction of the Department of Natural Resources, Environment and the Arts prior to the commencement of any works.

4.9 Offshore waste management

4.9.1 Drilling waste discharges

Drill cuttings, drilling muds and small quantities of pipe dope are expected to be discharged to sea during the construction of the production wells. The potential impacts associated with these materials in the marine environment include increases in turbidity, smothering of

benthic sediments, oxygen depletion in surface sediments, and toxicity of some drilling mud constituents.

The toxicity of drill cuttings depends on their drilling mud component. Drilling muds are used to assist with removal of drill cuttings and debris, to stabilise the well bore, and lubricate and cool the drill bit, and may be water-based (WBMs) or non-water-based (NWBMs). WBMs are the most commonly used muds. NWBMs are only used under conditions where WBMs are unsuitable, such as in long wells or difficult geology. If a NWBM is used to drill the lower section of holes, it is most likely to be the Synthetic Based Mud (SBM) Syntec™. SBMs, including the Olefin-based Syntec, are manufactured to contain minimal (< 0.001% w/w), if any, aromatic hydrocarbons. Olefin based drilling fluids are generally rated as non-toxic (96 hr LC50 >100,000 ppm) to almost non-toxic (96 hr LC50 10,000–100,000 ppm) (ERM 1997). As NWBMs contain hydrocarbons, they are recovered where possible and returned to shore for recycling; however, a proportion (~10%) of NWBMs can remain entrained in discharged drill cuttings.

Another possible contaminant of drill cuttings is pipe dope, a blend of lubricating grease and fine metallic particles that prevents thread galling (a particular form of metal-to-metal damage) and seals the roots of threads between pipe strings. Excess pipe dope can become mixed with drilling mud and cuttings as they are forced along a pipe string and may be lost to sea with the drilling waste discharge.

The proponent was requested to provide more information with regard to the expected magnitude of the impact footprint, the possible cumulative effects associated with drilling waste discharges, and the persistence of the constituents. The proponent was able to provide further information based on experience from other wells in Australia indicating that the likely impacts would be minimal and very localised. Plume impacts to biota in the water column would likely be negligible due to the limited spatial and temporal extent of the plume and the fluid toxicity rating for drilling muds. With the exception of the benthic sediment environment, there are no known sensitive habitats in the vicinity of the drilling locations. The impacts of smothering and oxygen depletion on the benthic environment is predicted to be minor due to the relatively small area affected and the wide distribution of similar community types throughout the region.

The proponent proposes to minimise the impacts of drilling wastes on the environment by using WBMs wherever possible, designing and operating equipment to prevent loss of containment of these products, selecting products that have the least potential to cause adverse effects on the environment while meeting technical requirements, and recovering NWBMs where possible. Drilling will be conducted under a WADoIR-approved Production Drilling Environment Plan detailing these controls. It is expected that all drilling will occur in compliance with this plan.

Assessment of the proponent's proposed management measures to reduce the impacts of production well drilling and the limited spatial and temporal nature of the predicted impacts indicates that these impacts can be minimised through management under the Production Drilling Environment Plan.

Recommendation 10

A Production Drilling Environment Plan is to be submitted to the Western Australian Department of Industry and Resources for approval prior to the commencement of any offshore drilling activities.

4.9.2 Hydrotest water

Hydrostatic testing (hydrotesting) of the gas export and condensate pipelines will be undertaken by flooding the pipelines with filtered seawater. The seawater will contain other additives including oxygen scavengers and biocides.

The integrity of the condensate storage tanks and pipework in the onshore gas processing plant will be tested separately using approximately 6000m^3 of freshwater from bores. Similar chemical additives may be required for the freshwater testing.

At the conclusion of hydrostatic testing, the facilities will be dewatered. Seawater from the gas export pipeline will be discharged through the condensate export line approximately 3km offshore and bore water will most likely be discharged via irrigation to land, though this has not yet been fully determined. The main impact of seawater discharge would be oxygen deprivation for marine biota exposed to the de-oxygenated plume of water. Hydrotest water released to land has the potential to cause erosion, and contaminate surface and ground water in the area of discharge.

The proponent proposes to minimise the potential impacts of the discharged hydrotest water primarily through the pre-commissioning of some components of the systems off-site, selection of chemical products with low potential for environmental harm and carefully determining the quantities and concentrations required. While the proponent was not able to confirm the exact chemical brands and types to be used on request, it did provide estimates of chemical concentrations likely to be required. Environmental approvals for use of these and similar chemicals have been granted for recent projects by designated authorities under the Australian *Petroleum (Submerged Lands) Management of Environment Regulations 1999* (PSLMER).

As the volume of hydrotest water expected to be discharged within 3km of the coastline will be significant, approximately 17,000m^3, modelling of the hydrotest discharge plumes to assess the risk to the marine environment, particularly nearby sensitive environmental receptors such as Emu Reef and Howland Shoals, was requested. The proponent responded in the SEIS that once the chemical additives to the hydrotest water are selected, the risk to the marine environment will be assessed using modelling – most likely using the ratio of the Predicted Environmental Concentration to Predicted No Effect Concentration approach, similar to that used for the PW.

Following assessment of the proponent's proposed management strategies, it is considered that impacts of hydrotest water on the receiving environment may be adequately managed through the Pipeline Flooding and Hydrotesting Procedure, the Pipeline Precommissioning Procedure and the appropriate management plans approved for these activities under the *Waste Management and Pollution Control Act*. The management plans must, however, include procedures for disposal of borewater used for hydrotesting onshore and must be developed following hydrotest chemical selection and the results of near-shore modelling of the fate of the hydrotest water.

Recommendation 11

Appropriate modelling is to be completed to assess the potential for the hydrotest water discharge plume to impact on the offshore and nearshore marine environments. The modelling results are to be used to develop the procedures for Pipeline Flooding and Hydrotesting, Pipeline Precommissioning and the appropriate management plans for these activities. The disposal of borewater used for hydrotesting of the onshore gas plant must be included in the relevant procedures. These procedures and management plans

must be developed in consultation with relevant stakeholders to the satisfaction of the Department of Primary Industry, Fisheries and Mines and the Department of Natural Resources, Environment and the Arts prior to the commencement of any works.

4.9.3 Produced water

At the onshore gas processing plant, separation of reservoir fluids will take place as the fluids flow directly from the export pipeline into slug catchers (devices that dissipate the energy of the 'slugs' of liquid that intermittently propagate through a gas pipeline). Condensate will be separated from produced formation water (PW). The PW will then be treated onshore to remove free oil, dissolved oil and chemical contaminants such as corrosion inhibitor to the greatest extent possible before being discharged to sea approximately 3km offshore. The rates and composition of the PW will vary over the life of the field as reservoirs mature and new wells are brought on line.

In determining the preferred option for the disposal of PW, the proponent considered the alternatives of offshore versus onshore treatment of PW. Offshore treatment was discounted on the basis of unknowns regarding the separation technology reliability and performance and the need for a manned wellhead platform. Offshore processing would have allowed treated PW to be discharged from the wellhead platform directly to the sea or reinjection into the reservoir. The disposal of PW to the near-shore environment was the only option presented in the DEIS for the onshore processing scenario. The only variation to this option investigated in the DEIS was the distance from shore that the PW would be discharged. The proponent presented modelling to indicate that a discharge site 3km offshore would have minimal impacts on the near-shore marine environment. In the SEIS, the proponent states that due to dispersion provided by strong tidal currents in the Joseph Bonaparte Gulf, even at slack tides, PW within the sea water will have been diluted to 1 part to 1,000 parts sea water at a distance of 25m from the discharge point.

In reply to DEIS respondent's concerns that nearshore PW disposal is not a common practice, the proponent cited the Harriet Platform in WA located 6km offshore from the nearest island as the one operation where PW is discharged to a near-shore environment. However additional gas operations cited by the proponent where PW is discharged into the near-shore environment or treated onshore (other than the Harriet Platform) were utilising deep aquifers or depleted reservoirs to receive the PW, or burning the PW off through thermal oxidation. No other examples of PW discharge to the near-shore environment were provided. The proponent states in the SEIS that the decision to dispose PW offshore rather than injection has been driven by the technical evaluation of the alternatives. The proponent states that there is no indication of a suitable reservoir near the Blacktip facility and the PW would then need to be injected into a local aquifer, with the potential to contaminate groundwater supply. No discussion of reinjection to an offshore aquifer/reservoir is provided.

Potential impacts of discharging PW to the near-shore marine environment include potential toxicity impacts to marine flora and fauna and an oily sheen occurring on the water surface. Additionally, there are concerns that the hydrocarbons and other constituents in PW could taint biota such as fish and shellfish that are consumed by Aboriginal people in the Wadeye Community.

The DEIS states that the risk posed by PW is low based on expected contaminant levels, treatment, volumes released, and dilution. Following treatment to capture the entrained hydrocarbons, the scrubbed water would then be pumped to a break tank with enough capacity to store a peak load if required, for a time period that would allow minor repairs to be undertaken during continued operation. Continuous monitoring for hydrocarbon concentrations would occur prior to discharge of the water. Normally, the break tank would

be kept at minimum capacity whilst the PW contaminant concentrations were maintained within prescribed limits. However, in the event that excedences were detected through monitoring, the PW discharge would be stopped and the flow diverted back into the process facility for further treatment. The break tank would then act as a storage vessel until such time as the PW complied with discharge requirements and discharge was then allowed to continue.

Peak production of PW is expected to only occur on several days during the 30-year life of the project, corresponding with the decline in the productive life of each reservoir in the gas resource. It would be at these times that the risk of an oily sheen would be elevated.

The volume and chemistry of the PW will not be known with certainty until the production wells are drilled. Given the proximity of the outfall to the shallower intertidal waters, characterisation of the PW is essential. The proponent proposes to undertake some PW studies, indicating that the quality of Blacktip PW will be assessed when it becomes available from the resource. This assessment would include chemical characterisation, ecotoxicology, bioaccumulation and biodegradation tests to determine any toxic effects the PW could have on marine fauna and flora in the project area. The proponent has stated in the SEIS that, should the PW be found to be toxic or show the potential for bioaccumulation or persistence in the marine environment, further treatment can be put in place in the interim between commissioning and when peak volumes occur.

The proponent has committed to preparing and implementing a PW Management Plan to minimise the potential for adverse impacts due to PW discharge. Nevertheless, enough uncertainty exists with the PW disposal issue to merit careful scrutiny and a comprehensive monitoring program to detect impacts to marine biota will be required. A reporting mechanism to provide traditional owners with the findings of the monitoring will also need to be established.

Should further tie-ins be proposed with the potential to boost PW loads from the Blacktip facility in the future, these will need to be assessed in accordance with Recommendation 2 of this report.

Recommendation 12

Once a user of the Blacktip gas is secured, information is to be provided to the Office of Environment and Heritage to support the proponent's proposed Produced Water (PW) disposal method, including the options assessed, means and outcomes of evaluation and a discussion of proposed option in terms of industry best practice.

A draft PW Management Plan must then be developed in consultation with key stakeholders, particularly Traditional Owners, and approved by the Office of Environment and Heritage prior to the finalisation of the design of PW treatment and disposal facilities. As a minimum, the draft plan must include a description of strategies to achieve the following requirements related to PW:

a) determining PW chemistry;

b) establishing baseline conditions to enable identification of possible impacts on the marine environment;

c) conducting proposed ecotoxicological, bioaccumulation and biodegradation studies to determine the potential for toxic effects on marine flora and fauna;

d) developing indicators for detecting and measuring impacts on the marine environment;

e) developing proposed monitoring programmes (including assessing and monitoring for potential tainting of traditional foods); and

f) developing preventative and management strategies and triggers for actions.

An outline of contingency plans for PW disposal options or PW treatment must be included in the draft PW Management Plan. These should plan for the scenario that trigger levels are exceeded and/or studies determine that PW cannot be discharged to the near-shore environment without unacceptable impacts. The strategies of the draft PW Management Plan must inform the design of the gas processing facility to ensure contingency plans can be practicably implemented if required. If PW is shown to present a risk to biota or result in unacceptable impacts, alternate treatment or disposal options must be assessed as per Recommendation 2.

The draft PW Management Plan must be finalised using available findings of PW studies to inform specific management strategies and re-submitted for approval to the Office of Environment and Heritage prior to the commencement of any works.

4.9.4 Scale

Under particular conditions (including high salinity), minerals can precipitate to form solid mineral scale within a production well and pipelines. The most common scales consist of barium sulphate, strontium sulphate or calcium carbonate. As water in a hydrocarbon reservoir has been in contact with rock structures over geological time frames, the water may also contain various concentrations of Naturally Occurring Radioactive Materials (NORMs) including uranium, thorium, radium and to a lesser extent potassium.

Scale formation will be restricted through the design of process equipment and by the addition of scale inhibitor chemicals. The proponent therefore predicts that scale formation will not be an issue of concern for Blacktip, however should disposal of scale containing NORMS be required during the project, appropriate disposal methods will be implemented in accordance with Western Australian Government and Northern Territory guidelines including the Guideline for Application for Approval to Dispose of Petroleum Related. NORM - EG 506 (DBIRD 2002).

The proponent suggested that the guidelines of the Australian Petroleum Production and Exploration Association Limited indicate that environmental effects of NORMS disposal to sea are negligible because of their low radioactivity and high dispersion. The SEIS states that PW discharged to sea can also contain radioisotopes , however as these have not been concentrated, their radioactivity is very low and any NORMS would be rapidly coprecipitated with barium sulphate.

The evidence provided and management strategies proposed suggest that the impact of small quantities of NORMS discharged to the marine environment will be negligible, however should scale containing NORMs be recovered from the production process, a detailed plan should be submitted to the Radiation Protection of Department of Health and Community Services Northern Territory (DHCS) to provide advice on the assessment of disposal options. Monitoring of scale and NORMS should be included in the marine monitoring programme established in accordance with Recommendation 12.

4.10 Onshore habitat and ecology

4.10.1 Ecology

The onshore project area, as described previously, is dominated by Darwin Woollybutt *Eucalyptus miniata* and Stringybark *E. tetrodonta* woodland and forest habitats. This habitat is currently widespread and well represented in the Darwin Coastal Bioregion and is the dominant vegetation association across the north of the Northern Territory. Smaller areas and patches of restricted vegetation including monsoon vine forest, sand dune communities, wetlands and riparian forests, occur within the Eucalyptus woodland\forest matrix that dominates the region surrounding the onshore project area. Due to their restricted distribution, and associated value as habitat for species of flora with a restricted distribution, these communities are considered to be of higher conservation value.

Fourteen species of fauna classified as 'threatened' in the Northern Territory, including four bird species, two fishes, one mammal, one reptile and six marine turtles, are known to occur in the wider Darwin Coastal Bioregion. The nationally 'threatened' mammal, the False Water-rat *Xeromys myoides,* also occurs in this bioregion. A review of the known distribution of all 'threatened' plant species that occur in the Northern Territory did not reveal any species with a distribution in proximity to the project area. No species declared as 'threatened' species under Northern Territory or Commonwealth legislation were recorded during field surveys of the project area.

Several respondents to the DEIS raised concerns that the survey effort completed for the project did not adequately identify the potential for threatened fauna species to occur in the project area and considered the data provided to be an underestimate of the terrestrial vertebrate species likely to be present. In the SEIS, the proponent provided a discussion of the survey effort and methods. The NTG was satisfied that the surveys followed protocols developed in line with DNRETA requirements.

In response to concerns over the clearing of protected *Cycas* spp., the proponent has stated in the SEIS that the project will work under the Management Plan for Cycads in the NT 2003-2008 and harvesting of individuals under relevant approvals will be encouraged by the proponent. The traditional owners of the area will be given first selection of the harvested plants.

Concerns raised over potential disturbance to sea turtles as a result of onshore construction activities are discussed as part of the assessment of project impacts on sea turtles provided in Offshore Ecology section 4.8 of this report.

4.10.2 Shoreline and terrestrial disturbance

The subsea export pipeline will cross the coastline at the northern end of Yelcherr Beach. There will be two laydown areas along the dune at the shore crossing approximately 100m by 50 m, generally seaward of the shell midden area. The pipeline laybarge may also require shore-based anchors in the dune while pipeline construction occurs in the inshore area; however the exact positioning of anchors is not yet confirmed. Degradation of the dune system will occur as a result of these activities and stringent controls will be required to prevent further impacts outside the prescribed areas of disturbance. The proponent has proposed to minimise impacts to the dune and shoreline through the relevant management plans described in the following paragraphs.

Blasting may be required at the shoreline crossing to allow excavation of the pipeline trench if rocky ground is intercepted. Impacts from blasting will be managed through the Blasting

Management Plan. The blasting impacts on turtles at Yelcherr beach are discussed in Section 4.8.3.

From the shoreline, trenching will continue for a further 2.5 km to allow burial of the pipeline to the onshore gas plant. The trench may be open for up to six weeks to allow hydrotesting to be completed. During this time it is likely that fauna will be trapped in the open trench, which will require careful management. Construction of both the gas plant and ancillary facilities, and the onshore pipeline will require the clearing of approximately 74 ha of vegetation dominated by tall open forest and eucalyptus woodland.

A 13 km long access road from south-east of Wadeye to the gas plant will also be required. An existing track will be upgraded for part of this route and the remainder will be constructed. Archaeological and ecological surveys for this road have been undertaken and no issues were identified. Gravel for road construction will be extracted from borrow pits under DPIFM approvals.

The proponent proposes to minimise environmental impact on these areas through a number of relevant management plans including the Erosion and Sediment Control Plan, the Rehabilitation Management Plan, the Terrestrial Fauna Management Plan, the Vegetation Clearing Management Plan, the Turtle Management Plan, and the Blasting Management Plan. The proponent has also made the commitment that the construction corridor and duration of shore crossing construction will be reduced to the minimum required. All areas disturbed will be rehabilitated as soon as practicably possible.

Some examples of management measures proposed by the proponent in response to concerns raised by respondents to the DEIS include encouraging the harvesting of cycads from areas to be cleared, using soil stabilising measures such as wood shaving-filled netting during rehabilitation where required for erosion control, potentially using wet hessian bags along the bottom of the trench to provide shelter for fauna and twice-daily inspection of the trench. These actions should be included in the relevant proposed Management Plans. In addition, once a user of the Blacktip gas is secured, information is to be provided to the Office of Environment and Heritage to support the proponent's proposed method of open trenching for the pipeline at the shore and dune crossing via an open trench as opposed to directional drilling methods. This information is to include the options assessed, the means and outcomes of option evaluation and a discussion of proposed option in terms of industry best practice.

Assessment of the information provided by the proponent to date suggests that the issues identified in relation to disturbance of the shoreline and terrestrial environment may be adequately managed through commitments made, including the review of further information provided and the approval by relevant NTG agencies of the proposed Management Plans prior to the commencement of any works.

Recommendation 13

An Erosion and Sediment Control Plan, Rehabilitation Management Plan, Terrestrial Fauna Management Plan and Vegetation Clearing Management Plan must be prepared in consultation with relevant stakeholders and submitted to the Department of Primary Industry, Fisheries and Mines and the Office of Environment and Heritage for approval prior to the commencement of any works.

4.11 Onshore waste management

4.11.1 Non-hazardous/controlled waste

The landfill at the Wadeye community is proposed to be used for the disposal of non-recyclable non- hazardous waste from the Blacktip project. No specific information is currently available in regard to the quantities of waste that will be generated by the project, however, waste will only be disposed of at this site if it has sufficient capacity and the correct handling facilities, and the use of the landfill for Blacktip waste is approved by the local council. All construction waste would be compacted prior to disposal. Use of the Wadeye landfill must be in compliance with the current *Waste Management and Pollution Control Act* Environment Protection Licence for the facility.

All waste not suitable for disposal at the Wadeye landfill site will be transported offsite for disposal at appropriate facilities. The proponent is investigating initiatives for the recycling of glass, paper and plastics to reduce the amounts of waste potentially disposed to the landfill.

Details of the Woodside Policy, Waste Guidelines and Woodside's Environmental Standards and Aspirations will be reflected in the Waste Management Plan which is being prepared for the project. Respondents' queries on the DEIS such as the handling of onshore packaging, the likely volume and nature of non-recyclable wastes, feasibility of disposal to the Wadeye landfill, and the burning of green waste not required for respreading or hydromulching should be addressed within this plan and the Fire Management Plan as per Recommendation 14.

4.11.2 Sewage

Sewage water will be treated and disposed of using an approved treatment system which will be an above ground proprietary package membrane reactor. There is expected to be minimal sludge from the wastewater treatment plant. Subject to approval from the local council, sewage sludge will be transported to the existing Wadeye Sewage Treatment Facility.

In reply to concerns raised by respondents to the DEIS regarding the use of the Wadeye Sewage Treatment Facility to dispose of sewerage sludge, the proponent indicated that if the facility is not capable of receiving effluent from the project facilities, the waste will be transported to Darwin (SEIS 15.5.2). This issue will be addressed in the approved Waste Management Plan.

4.11.3 Hazardous/controlled waste

Potential hazardous/controlled waste that will be generated onshore by the project includes recovered solvents, excess or spent chemicals, paints, oil contaminated materials such as filters and rags, spent X-ray films and used lubricating oils. Some biological waste from first aid facilities may also be generated.

All products brought on site will be entered into a waste management register and have a materials safety data sheet prepared which will detail the volumes of each product, a description of its hazardous/controlled content and a description of the handling and disposal procedures to be adopted.

No hazardous/controlled waste (classified as such by the proponent or by NT/ WA Waste Regulations) will be disposed of at the Wadeye landfill. Hazardous/controlled waste will be segregated from other waste and disposed of by recycling, incineration or contained landfill, in accordance with relevant legislation and guidelines, Woodside's Waste Minimisation and

Disposal guidelines, and the project Waste Management Plan. Details of hazardous/controlled waste will be compiled, including type, amount and disposal method, to track final destinations and identify opportunities for improvement.

All hazardous/controlled waste will be handled by licensed waste contractors who will be responsible for the transportation and disposal of the waste. Unless otherwise approved by the OEH, commercial waste including the following will not be disposed of at landfill sites as prescribed under Section 5.10 of the *Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the Northern Territory* (DIPE 2003):

- "dangerous goods" under the provisions of the *NT Dangerous Goods Act;* and
- any material scheduled as a "listed waste" under the NT *Waste management and Pollution Control (Administration) Regulations* (SEIS Appendix B).

Consultation will be undertaken with the OEH and DHCS regarding disposal of hazardous/controlled waste prior to any works commencing. This waste will need to be removed and disposed of by licensed waste contractors. The NT DNRETA '*Tracking System Procedures for the Transport of Controlled Wastes between States and Territories*' will be adhered to.

Silica gel, which is required at the gas plant for adsorbing water and condensate from the gas stream, will require replacing approximately every 3 years. One respondent to the DEIS had concerns regarding the handling and disposal of this gel. The proponent responded that the silica gel is a relatively inert, non-flammable substance and the major hazards associated with its handling and removal are related to localised dust generation. All removal, transportation, and reprocessing will be carried out by an approved supplier.

4.11.4 Contaminated stormwater

Stormwater from the site may generate a range of environmental impacts, including sedimentation, erosion, and contamination of surface and ground water resources. As the plant is located in a flat area, away from any major water bodies, rivers or wetlands, local sensitive receptors that may be adversely impacted by stormwater discharges are few.

The gas plant site will be sealed with a drainage management system to allow the segregation of clean water from potentially contaminated water. Clean surface water will drain offsite, potentially contaminated stormwater will be mixed with the PW, treated and discharged via the PW pipeline. Water not suitable for treatment in the PW treatment system, for example contaminated via chemical spills, will be contained and removed offsite for treatment before disposal.

Clean stormwater management and systems for the collection and treatment of contaminated stormwater should occur through the relevant Management Plans proposed for the project including the Groundwater Protection Management Plan, the Sediment and Erosion Control Plan and the Produced Water Management Plan.

Recommendation 14

A Fire Management Plan must be prepared to the satisfaction of the Bushfires Council of the NT and the Office of Environment and Heritage, and a Waste Management Plan must be prepared to the satisfaction of the Office of Environment and Heritage prior to the commencement of any works. A feasibility study for the suitability of Wadeye Landfill for the disposal of waste from the project must be completed as part of the Waste Management Plan. The Waste Management Plan must also list all waste streams

with projected quantities and planned disposal sites and identify in detail the opportunities for recycling, reuse and minimisation of wastes.

4.12 Spills of hydrocarbon and other hazardous substances

The main liquid hydrocarbon volumes associated with the Blacktip project will be:

- condensate produced from the reservoir and exported onshore to the gas plant (maximum 80m^3 per day);
- loading of condensate on to trading tankers (10,000m^3 per tanker);
- condensate stored on and transported by trading tankers (a fully laden tanker holds 100,000m^3);
- heavy fuel oil stored on the tankers (2,500m^3); and
- diesel stored on construction and support vehicles (100m^3 for support vehicles).

The proponent described a number of preventative and management measures in the DEIS regarding hydrocarbon and chemical spills, including the development of an Emergency Response Plan which will include a Spill Contingency Plan (SCP) for offshore, nearshore and shore-based spills. The proponent has committed to onshore storage of diesel and condensate in compliance with Australian Standards. Personnel will receive training in the SCP.

Large-scale spills in the near-shore marine environment, such as from accidents involving condensate tanker operations resulting in the full or part loss of cargo and or fuel, have the most potential for impacts on the environment, particularly sensitive mangrove and rocky intertidal areas and turtle nesting beaches. It is stated in the DEIS that condensate spilt to the sea at the wellhead platform would spread rapidly on the water surface due to its low density and would be readily lost through evaporation, dispersion into the water column and microbial degradation. A condensate spill of 8m^3 was modelled in the DEIS for potential during worst-case conditions as this was considered the most likely spill scenario by the proponent.

Concerns raised by respondents to the DEIS included:

- the prevention and recovery of oils entering tidal inlets and mangrove areas;
- traditional owner concerns over what spill response equipment will be stored at Wadeye or the gas plant;
- traditional owner concerns over impacts on land and food resources of oil spills;
- no assessment of the worst-case scenario of a spill of 100,000m^3 of condensate (complete rupture of tanker) - only one modelled condensate spill scenario was presented in the DEIS (8m^3 condensate spillage while loading the ship);
- insufficient attention to the assessment of the potential impacts of a 500m^3 heavy fuel oil spill; and
- the results of condensate spill modeling were not interpreted to identify potential impacts to the turtle nesting sites at Yelcherr beach.

The proponent responded that as the risk of a 100,000m^3 spill was assessed as having a one in a million likelihood of occurring, it was not considered a reasonable scenario to analyse further. However, as risk assessment comprises the evaluation of both likelihood and consequence, and it is reasonable to expect the environmental consequence of such a spill to result in a high risk rating, this scenario should be given further consideration and planned responses to such an incident should be provided in the SCP. Likewise, it is expected that other spill scenarios will also be covered in the SCP eg 500m^3 heavy fuel oil spill.

The proponent stated in the SEIS that measures to mitigate against potential impacts of hydrocarbon spills on turtle nesting sites and the potential for booming the mangrove tidal

inlets in the event of a spill will be incorporated into the Blacktip-specific SCP. Any spill headed for shore would be managed using appropriate equipment. Vessels supporting the trading tankers during condensate loading will carry spill response equipment to combat spills immediately. It is unlikely that extensive oil spill clean up kit required for large spills will be stored at the gas plant due to the regular maintenance and trained operators required for such equipment. Equipment for extensive spills would be required to be brought in from elsewhere.

The proponent has also stated (DEIS Table 15-1 and SEIS) that further intertidal baseline monitoring will be undertaken prior to construction and routine intertidal monitoring will be undertaken at intervals during the operational phase of the project.

The proponent should be cognisant of the Inter-Governmental Agreement on the National Plan to Combat Pollution of the Sea by Oil and other Noxious and Hazardous Substances 200 and the responsibilities of the Australian Maritime Safety Authority. In the NT State/Territory responsibility for the National Plan is held by the Marine Safety Branch of the Department of Planning and Infrastructure and all enquiries should be directed to the Director for Transport and Safety.

Recommendation 15

A Spill Contingency Plan must be developed for all onshore and offshore hydrocarbon and other hazardous substance spill events to the satisfaction of the Department of Planning and Infrastructure and the Department of Primary Industry, Fisheries and Mines prior to the commencement of any works. The offshore component of the plan must be developed in accordance with the NT Oil Spill Contingency Plan and the NT Marine Oil Pollution Manual. The spectrum of consideration should cover small spill events to worst-case scenarios. A rationale for level of spill equipment stored on-site must also be included within the plan.

4.13 Surface water management

The Blacktip project site is within the southern sub-catchment of the Moyle River basin. There is no well-defined surface drainage in the project area and coastal inlets and associated mangroves with seasonally inundated swamps occur 2-3 kilometres to the north of the project area and around the inlet to the south of Yelcherr beach. Many of the creeks and streams have small flows at the end of the dry season with most creeks drying up each year. There is no perennial stream network in the vicinity of the proposed development. Ephemeral runoff in or adjacent to the proposed gas plant site appear to support nearby coastal wetland ecosystems. The proponent has described several measures in the DEIS to minimise impacts on surface water including storage of potential contaminants in accordance with Australian Standards, development of an Erosion and Sediment Control Plan, capturing and treating contaminated runoff and directing clean stormwater off site.

In response to a request by a respondent to the DEIS to provide storm surge mitigation details, the proponent stated that the site location was chosen to minimise storm surge risk, with the plant and accommodation areas to be built on an elevated earth pad of 700mm. The access road has been designed for a 1 in 10 year rainfall event overtopping at floodways. Surface water is unlikely to be used for the construction or operation of the project.

This Office is satisfied with the measures outlined by the proponent for the management of potential surface water impacts.

4.14 Groundwater management

Groundwater at Blacktip comes from a high yielding, widespread shallow aquifer with water table depths of 10 to 15m. The proponent considers it a significant resource with potential to supply industrial or residential development. The NT Government has designated this aquifer system as a community resource that requires a high level of protection. Groundwater is of high quality and is used by local communities as a drinking water source.

Groundwater resources will be tapped via two bores installed within the gas plant footprint. Treated groundwater will be used for drinking, domestic washing, toilets, wash-down and safety showers. Untreated groundwater will be used for concrete mixing, dust suppression, soil compaction, service water and fire water. All bores that are drilled will be registered and approved for water abstraction by DNRETA under the *Water Act*. All bore data will be supplied to DNRETA.

In the early stages of the project proposal, approximately 6000m^3 of water will be required to hydrotest onshore storage tanks and pipelines. In the SEIS, the proponent indicated that groundwater will be used to test these onshore components of the plant infrastructure. It is stated in the DEIS that it is likely that no chemicals will be added to this water and that it will be discharged to sea through the condensate export pipeline or the PW pipeline. In later meetings, however, the proponent indicated that disposal of the hydrotest borewater could be through irrigation to land. Disposal of this hydrotest water must be managed under the approved Groundwater Protection Management Plan and approved through the *Waste Management and Pollution Control Act*.

In response to concerns over the capacity of the groundwater system to provide the required volume of water, the proponent specified that during the construction phase of the project, it was estimated that 405-430m^3 of water will be required daily (including both treated and untreated). This volume represents approximately 33% of the daily water requirements of the Wadeye community. Operational water requirements will be around 30 m^3 daily. Temporary localised drawdown of the groundwater table is expected in the immediate area of the project bores, but is not expected to impact on availability for local communities and outstations. Minor dewatering of the pipeline construction trench may also be required at the shoreline crossing.

The proponent has committed to prepare a Groundwater Protection Management Plan to minimise risks to water resources. The plan is to be approved by relevant NTG agencies, including DHCS Environmental Health Darwin Rural, prior to any commencement of any works. The plan needs to demonstrate that there will be no detrimental impact on the groundwater supply of the Wadeye Community. The Groundwater Management Plan should include, and assess the impacts of, various management options associated with potential impacts on groundwater resources including the location and management of impacts of the disposal of borewater used to hydrotest the onshore gas facility.

The SEIS states that a baseline groundwater monitoring effort to characterise groundwater at the site, and ongoing monitoring of groundwater levels and quality will occur. This programme should be designed to identify potential impacts to the groundwater resources utilised by the Wadeye community. The proponent also states in the SEIS that a hydrogeologist will be required to make an assessment of the impacts associated with extracting the estimated volumes of groundwater, especially any temporary impacts on groundwater dependant ecosystems, during the periods of construction where the water table will be lowered. The outcomes of this assessment must provide input into the strategies and management put forward in the Groundwater Protection Management Plan and be made available for review by relevant NTG agencies.

Recommendation 16

The Groundwater Protection Management Plan must be prepared in consultation with relevant stakeholders to the satisfaction of the Department of Natural Resources, Environment and the Arts and the Department of Health and Community Services prior to the commencement of any works. The plan must demonstrate that there will be no adverse impact on groundwater supplies to the Wadeye community, outstations or other users, or on groundwater dependant ecosystems due to groundwater extraction or disposal of hydrotest water.

4.15 Air emissions

4.15.1 Greenhouse gas emissions

The DEIS discusses ongoing action taken by the proponent in relation to sustainable and renewable energy investment and technology and commits to the preparation of a Greenhouse Gas Management Plan. The proponent did not identify options to offset greenhouse gas emissions specifically from the Blacktip project. However the proponent states in the SEIS that they "would be pleased to discuss the generation of offsets in the Northern Territory with the Greenhouse Unit as well as recognition of such offsets by the Northern Territory Government." It is suggested that this position leaves the proponent with considerable flexibility in pursuing emissions offsets.

The DEIS also states that if required, potential climate change impacts will be investigated in the Greenhouse Gas Management Plan (DEIS 12.6.1). The proponent was informed that this should indeed be a prerequisite. The proponent should also be aware that mandatory public reporting of greenhouse gas emissions by major industries will be introduced in the NT in the near future.

Most issues raised by respondents to the DEIS were addressed in the SEIS by the proponent. However, further detail such as additional information on greenhouse gas emissions from the commissioning and early production stages and greater detail on product life-cycle emissions will need to be provided in the proposed Greenhouse Gas Management Plan.

Recommendation 17

The proponent is to commit to ongoing membership of the Australian Government's Greenhouse Challenge Plus program, including future versions of the program.

Recommendation 18

The Greenhouse Gas Management Plan shall include a section specifically addressing commitments and strategies aimed at reducing greenhouse gas emissions. This shall include, but not be limited to, provisions for regular greenhouse gas audits, a process for continuous review of new technologies to identify opportunities to reduce emissions, and benchmarking against other gas plants with a view to achieving international best practice in terms of CO2 emissions per unit of production. Opportunities for offsetting greenhouse gas emissions, particularly in the NT, shall also be addressed. The Greenhouse Gas Management Plan must be prepared in consultation with relevant stakeholders to the satisfaction of the Office of Environment and Heritage prior to the commencement of any works.

4.15.2 Dust

Dust will be generated by construction activities such as the clearing of vegetation, movement of vehicles, earthworks, the formation of soil stockpiles and exposed surfaces. Dust emissions have the potential to affect the health of workers, to impact on vegetation and amenity, to reduce visibility and to lead to the loss of topsoil.

Amongst other management measures outlined in the proposed Dust Management Plan, the proponent has suggested the use of a chemical binder ($MgCl_2$) to suppress dust around the onshore facilities. Respondents to the DEIS requested that its volume, persistence, application, and impact on waterways should be fully detailed. In the SEIS, the proponent states that $MgCl_2$ bittern is hygroscopic (absorbs moisture) and therefore provides dust suppression by slowing the rate of roadway evaporation. The SEIS also included information that if too much water is used during application, the bitterns can leach into the soil and cited a study that showed product did not significantly reduce the germination of the seeds studied in the Pilbara region of Western Australia. No information on impacts on waterways was provided.

The proposed Dust Management Plan should be submitted to the OEH prior to the commencement of any works and should include an assessment of the potential for detrimental effects of dust suppression products on vegetation, soils and waterways and a proposed monitoring programme to identify impacts resulting from dust emissions and dust suppression measures implemented.

Recommendation 19

A Dust Management Plan must be prepared in consultation with relevant stakeholders to the satisfaction of the Office of Environment and Heritage prior to the commencement of any works.

4.15.3 Other atmospheric emissions

In response to concerns raised about air emissions impacting on the health of members of the Wadeye community, the proponents replied in the SEIS that atmospheric emissions from the onshore gas plant are “very unlikely” to cause any health impact on the Wadeye community as the low level of emissions and distance from the community will result on negligible emissions at the community. The proponent stated in the SEIS that mechanisms will be in place to record and resolve the concerns of any members of the Wadeye Community regarding environmental impacts from the plant, including air emissions. These include a complaints hotline and register, immediate action and follow-up actions. Monitoring of the community health statistics, through collaboration with the existing agencies and organisations responsible, will also be undertaken and acted upon to ensure that any long-term health effects of the proponent’s operations are detected.

The proponent also identified in the response to concerns regarding air emissions impacts on the Wadeye community that only in a worst case fire scenario, such as catastrophic failure of a condensate tank and subsequent fire, would smoke emissions have the potential for impact at Wadeye. It was also noted that in the event of a failure of critical equipment, safety equipment such as the automated shutdown and isolation system would be activated to minimise the duration of any releases.

Although the NOx and SOx emissions for the project are expected to be low due to a number of factors and management measures such as the inherently low sulphur content of the Blacktip gas, maximised plant efficiency, use of low sulphur diesel, monitoring of major emission sources should occur in order to assess opportunities to reduce emissions and for the purposes of reporting under the National Pollutant Inventory and the NT Waste Management and Pollution Control Licence for the facility.

The proponent was asked to include details of the consequences of an emergency flare in the consideration of worst case scenarios, as the impact of an emergency flare could be significant (DEIS 12.6.2, SEIS 15.6.2). The proponent suggested that the consequences of emergency flaring will not be significant from an air quality perspective due to the duration, location of permanent residents and substance being burnt. The role of the flare in emergency scenarios is primarily safety and secondly asset protection. As described in the DEIS, the design of the flare will need to take into consideration the need to minimise non emergency flaring to as low as reasonably practicable.

Recommendation 20

The proponent must assess opportunities to reduce emissions and must, as a minimum, establish a monitoring system for oxides of nitrogen (NO_x) from key emission sources at the facility. Procedures for monitoring and reporting shall be developed in consultation with the Office of Environment and Heritage.

4.16 Noise

4.16.1 Offshore

Increases in ambient noise will occur in the ocean caused by activities during construction, operation and decommissioning. Increased stress levels amongst marine fauna, disruption to underwater acoustic cue; behavioural avoidance and secondary ecological effects may occur, however, hearing impairment and pathological damage are unlikely for motile species as they are expected to practice avoidance before damaging noise thresholds are encountered.

There is a wide range of susceptibility among fish from noise; however disturbance to fish is likely to be minimal as fish are also expected to avoid acoustical emissions if levels are high enough to potentially cause pathological effects. Additionally, because of the sparse soft sediment habitat at the proposed wellhead platform location and along the main export pipeline route, fish numbers are likely to be relatively low at the drilling and installation locations.

Offshore equipment will be designed to normal petroleum practice standards, which includes specifications for noise levels, and standard installation and drilling facilities will be used.

4.16.2 Gas Plant and Flaring

Several submissions to the DEIS expressed concern that noise levels associated with the plant would detrimentally affect the Aboriginal community nearest to the onshore facility site, the Tchindi Camp Ground. Modelling of refinery noise predicts that noise levels at Tchindi will increase consequential to the operation of the plant.

In respect to noise resulting from flaring operations, the DEIS states that the Tchindi Aboriginal Camping ground and Wadeye local community would be notified at least 24 hours prior to the commencement of planned flaring. The proponent has committed to developing a Flaring Management Plan to reduce non-emergency flaring.

Respondents to the DEIS asked the proponent to include in the SEIS an indication of the flexibility of the flaring schedule according to cultural requirements, such as postponing the flaring should it be unsuitable for people at Tchindi. In response, the proponent outlined that the rate and therefore noise associated with maintenance flaring could be controlled and that noise levels would not exceed normal operational levels. The proponent also committed to ongoing consultation with the community regarding flaring events and their compatibility with the community cultural calendar.

It is recommended the project be implemented through design and procedural controls such that the occurrence and impacts of flaring are minimal. The development of design options for flaring should go beyond elevated design and operational controls and include the evaluation of alternatives such as ground flares and consider the expectations of the local community. Once a user of the Blacktip gas is secured, information is to be provided to the OEH as part of the licencing process under the *Waste Management and Pollution Control Act* to support the proponent's proposed flare design. The information is to include the flaring options assessed, means and outcomes of evaluation (including modelling results for noise impacts on Tchindi camp and the Wadeye Township) and a discussion of proposed option in terms of industry best practice.

Regardless of the design of the flare, close consultation with the community should occur so the community gains a better understanding of the role of the flare and the potential visible and audible characteristics of the flare. Post-flare communication may also be required in some instances. This community engagement should be included in the SIMP.

4.16.3 Blasting

If blasting is required to bury the pipeline at the shore crossing, noise and vibration will be minimised through measures described in the Blasting Management Plan to be submitted to the OEH for approval prior to the commencement of any blasting activities. Actions to minimise impacts on fauna such as cues to alert animals prior to blasts, acoustic screening with blast mats, and following the Australian Government's Best Practice Environmental Management modules, are proposed in the DEIS. Community consultations regarding the potential for blasting should occur and is recommended to be managed under the SIMP.

Recommendation 21

Once a user of the Blacktip gas is secured, information is to be provided to the Office of Environment and Heritage as part of the licencing process under the *Waste Management and Pollution Control Act* to support the proponent's proposed flare design. The information is to include the flaring options assessed, the means and outcomes of evaluation (including modelling results for noise impacts on Tchindi camp and the Wadeye Township) and a discussion of proposed option in terms of industry best practice.

A Flaring Management Plan and a Noise Management Plan must be prepared in consultation with relevant stakeholders to the satisfaction of the Office of Environment and Heritage (OEH) prior to the commencement of any works. If blasting is required, a

Blasting Management Plan is to be submitted to the OEH for approval prior to the commencement of any blasting activities.

4.17 Biting insects

Biting midges and mosquitoes are a nuisance and have the potential to spread illness among workers involved with the Blacktip Project and the Wadeye community. Climatic conditions at the project site are conducive to their proliferation. Works associated with the project can potentially increase the breeding habitat for mosquitoes and exotic mosquito larvae could be introduced on equipment brought to site.

The proponent has proposed to prepare a Biting Insect Management Plan to reduce the issues associated with midges and mosquitoes. The plan is proposed to include a number of control measures such as active management of standing water on site, regular inspections of potential breeding areas on site, personal protection measures, and burning nearby swamps annually.

Concerns were raised by respondents to the DEIS regarding:

- the lack of consultation with the traditional owners of the proposal to burn the swamp country annually;
- no proposed alternatives to burning the swamps; and rationale for burning the swamps.

The proponent explained in the SEIS that burning of the swamps in the late dry/early wet season would remove dead reeds resulting in fewer breeding sites, allowing ease of predator access to mosquito larvae when the swamp is flooded and enabling disruptive wave action to prevent larval development. If burning of the swamp areas is not acceptable to the traditional owners of the region, or if burning is not considered sufficient control then it is proposed to use chemical control methods.

Fire Management Plans will be developed and implemented in consultation with the traditional owners and relevant NTG agencies, such as the NT Bushfires Council, for both the construction and operational phases of the project. If planned burning of the swamps is approved, it would be incorporated into the Fire Management Plans.

The Entomology Branch of the DHCS requested that the proponent discuss the potential to include larval identification annually within the monitoring program (SEIS 18.3). The proponent indicated that larval identification will be conducted by the NT Medical Entomology Branch (MEB) which will analyse all biting midge and mosquito related samples collected for the project. Where larvae are found (during regular, routine inspections of bunded areas, all drains on the onshore gas plant site and laydown areas and waste disposal areas) they will be sent to MEB laboratory for analysis with appropriate remedial action to be advised by MEB (DEIS 12.4.1).

Recommendation 22

Management measures for biting insects must be developed in consultation with Traditional Owners and incorporated in a Biting Insects Management Plan to be prepared to the satisfaction of the Office of Environment and Heritage and the Department of Health and Community Services prior to the commencement of any works.

4.18 Exotic species

4.18.1 Marine

Exotic marine species can alter the ecology of an area by displacing native and endemic organisms, reducing diversity, and impacting on higher trophic organisms including commercially important species. Other effects include biofouling, toxicity to humans and other organisms, and introduction of disease. These potential pests may be introduced as encrusting organisms on the hulls of ships or may be present in ships' ballast water.

The Australian Quarantine and Inspection Service (AQIS) Australian Ballast Water Management Requirements Section 4 requires that "Ballast exchanges must be conducted outside the Australian 12 nautical mile limit. It is also recommended that ballast exchanges be conducted as far as possible away from shore and in water at least 200m deep." The WHP, though it fulfils one of these criteria, could provide a platform for transfer into coastal areas of the region by providing an offshore location for potential marine pests to establish. Vessels should conduct any ballast water exchange en-route to the Joseph Bonaparte Gulf rather than in the WHP vicinity, particularly if arriving from high-risk ports and/or undertaking full ballast water exchange.

Hull fouling as a possible introduction vector has not been considered adequately in the EIS. Although international efforts and focus for controlling invasive species has shifted from hull fouling management measures to ballast water management, the potential for invasion of exotic encrusting species must still be considered. This Office acknowledges that marine traffic will be relatively infrequent during the project life and appropriate anti-fouling hull treatments will be used on project vessels reducing the potential for introductions; however, monitoring of the WHP and condensate mooring will be required to ensure that species of concern have not been introduced.

Provided the proponent conducts its activities in accordance with the commitments and actions listed in the EIS, the *Australian Quarantine Act 2000* and the AQIS ballast water management requirements, it is expected that the risks associated with the establishment of exotic marine species in Joseph Bonaparte Gulf will be minimal.

Recommendation 23

The proponent will prepare and implement an exotic marine species monitoring program with appropriate baseline data and a Ballast Water Management Plan to the satisfaction of the Department of Primary Industry, Fisheries and Mines and the Western Australian Department of Fisheries prior to commencement of any works.

4.18.2 Terrestrial

Weeds are present in low numbers in the project area. Feral pigs are already known to be in the area and cane toads will inevitably arrive in the area in the very near future, regardless of the project's influence or control. The introduction to the project area of earthmoving equipment, vehicles, and construction materials and fill, sourced from elsewhere in the region, Australia and overseas, has the potential to introduce weeds and exotic fauna species that currently do not occur in the area. The Natural Resource Management division of DNRETA has raised concerns in response to the DEIS that exotic plants and weeds have been identified on site and there is the potential for the introduction of further species during the construction phase and for any pipeline route to become a corridor for the rapid spread of these plants to other parts of the Northern Territory.

The proponent will minimize risk of the introduction and spread of weeds, and feral and pest animals through the implementation of an Exotic Species and Weed Management Plan. This plan will include weed eradication and monitoring, vehicle washdown and inspection requirements, washbay management, workforce inductions, reporting, and rehabilitation species selection. A washdown pad will be constructed along the access routes to the project area.

The proponent lists 21 species of weed that occur in the project area and in areas that are expected to be used to access fill material, notably Gamba Grass and Olive Hymenachne (DEIS, Vol2, Appendix F, Table 2). Several respondents highlighted the need for the proponent to develop a strategy to minimise the establishment and further spread of these weeds. In response, the proponent reiterated its commitment to the development of an Exotic Species and Weed Management Plan that will include such measures as identifying and treating existing weed infestations and developing a weed eradication programme in consultation with DNRETA.

The proponent also stated in the SEIS that plant, vehicles and equipment will undergo an inspection for weeds or weed carrying material by a representative from Weeds Branch of DNRETA in Darwin prior to dispatch to the site. Notice would be provided to the Weeds Branch in advance and a meeting point agreed. In addition to this, the proponent states that it may still be a requirement for all vehicles and machinery to be washed in the washdown bay prior to entry onto the Blacktip Project area.

Recommendation 24

An Exotic Species and Weed Management Plan must be prepared to the satisfaction of Department of Natural Resources, Environment and the Arts prior to the commencement of any works.

4.19 Decommissioning

Decommissioning of the proposed Blacktip Project is expected to occur approximately 30 years after start-up. The Blacktip Project will be decommissioned in accordance with the legislation and guidelines prevailing at the end of the project life and in consultation with relevant stakeholders and regulatory authorities.

Decommissioning Plans will be drawn up for both offshore and onshore related project components well in advance of decommissioning to ensure appropriate environmental implications have been adequately addressed. The plans will address: drivers; costing; and timing as well as monitoring and rehabilitation requirements for ‘permanently’ disturbed areas. The proponent has indicated that a Preliminary Onshore & Offshore Decommissioning Plan will be developed during the construction phase of the project for approval by the regulatory authorities.

A number of respondents to the DEIS were concerned that the removal of the WHP and pipework infrastructure was not presented as a decommissioning option. The proponent replied in the SEIS that all reasonable options will be considered, including the total removal of the wellhead platform, during the development of the decommissioning plan. The proponent also stated that it is considered feasible to remove the entire length of pipeline, however a decision would be based on a risk assessment which examines increased risk profile that results from removal of the pipeline versus it remaining in-situ, particularly in the area of the shore crossing.

A further comment by respondents was that the consideration of later decommissioning requirements should be taken into account in the front-end design of the project. The proponent responded that if the WHP were to be removed at decommissioning, it is expected that the process would be the reversal of installation, thereby indicating that no special consideration for decommissioning would be required in up-front design of this structure It was also stated that decommissioning of the pipeline will be addressed in the Pipeline Management Plan which will be submitted to regulatory authorities as part of the Pipeline Licence approval process.

A comment was received on the DEIS that planning for decommissioning of the well head platform, pipeline and onshore plant could include financial provisioning in advance of closure and the evolving nature of industry best practice. The proponent replied that the preliminary plan which will be drafted during the construction phase, as well as subsequent plans will include financial provisioning.

Two respondents highlighted the absence of discussion in the DEIS regarding future facilities using the pipeline as a common carrier at the time of decommissioning the Blacktip facility. In response, the proponent stated that the offshore export pipeline will transport Blacktip gas and may potentially transport third party gas under contractual arrangements with the proponent; however, it does not believe that possible use of the pipeline as a future common carrier would affect the approved Decommissioning Plan apart from potentially the timeline for this.

Recommendation 25

A Preliminary Onshore and Offshore Decommissioning Plan must be developed in consultation with key stakeholders and submitted to the Department of Primary Industry, Fisheries and Mines, the Office of Environment and Heritage and the Western Australian Department of Industry and Resources for approval prior to the commencement of any works. The plan must include contingency planning for sudden closure, financial provisioning for both planned and sudden closure, and potential social as well as environmental impacts resulting from decommissioning and closure.

4.20 Defence

Defence areas are affected by the offshore and onshore components of the project. During consultation by the proponent, the Department of Defence has indicated that the offshore components of the Blacktip Project is likely to have minimal impact on existing training exercises. Similarly, potential impacts to onshore military operations are likely to be limited, as military aircraft using the area for exercise are likely to fly at a higher altitude than project related aircraft.

One respondent to the DEIS queried whether appropriate procedures and processes have been established regarding identification of any unexploded ordinance in the construction area. In discussions with the ADF, the Royal Australian Navy (RAN) has advised the proponent of the possibility of live ordnance being encountered during the installation of the offshore export gas pipeline. The proponent has taken this into account in the pipeline surveys already conducted. To date there has been no ordnance encountered. During the installation of the pipeline, the Blacktip Project will work closely with the ADF in the event that any ordnance is detected (SEIS 12.1.1).

Agreements or relationships were also requested regarding the shared use of the offshore area particularly in relation to risks associated stray firing impacting on the project. The proponent

states in the SEIS that it has been advised by the ADF that it does not believe the offshore facilities will impact on their exercises.

Recommendation 26

The proponent must liaise with the Australian Defence Force during all phases of the project to be aware of all possible interaction between Blacktip and defence operations.

5 Environmental Management Plans

A number of management plans have been proposed through the course of the assessment process for the Blacktip Project. All management plans and procedures proposed to be developed for the project must be approved by, or developed to the satisfaction of, relevant government agencies and stakeholders in the timeframes specified. It is recommended that, as a minimum, the NLC should be a key stakeholder to which management plans are submitted for comment prior to finalisation. These approved plans and procedures will be one of the primary tools by which the proponent will implement management and monitoring commitments made in the EIS and the recommendations detailed in this Assessment Report.

The proponent employs a structured approach to the management of Health, Safety and Environment (HSE) issues via a formal and documented HSE management system (HSE-MS). Together with the ISO14001 certified Environmental Management System (EMS) which the proponent has committed to implementing for this project, this system will comprise the overarching tool for the management of environmental, health and safety issues. It is expected that the SIMP and other social management documents and issues will also be managed within this system. The implementation of the EMS should provide for continual improvement in the management plans and on-the-ground performance for the project as the management system elements and the requirements within each of these are applied ie. policy, planning, implementation, audit and review.

It is vital to the performance of the project that the requirements in management systems, plans and procedures are incorporated into the proponent's tendering and contracting procedures and that all contractors are fully aware of, and act in compliance with, relevant management plans.

Within the HSE-MS, the proponent has proposed to prepare Environment Plans for offshore activities and Environmental Management Plans for onshore facilities (prepared as separate plans for construction and operations phases). In some instances, however, plans will be relevant to both onshore and offshore activities and so have been listed under each heading below. The proponent has provided frameworks for many of the plans within the DEIS. The proposed plans and procedures for the Blacktip project are listed below.

Environment Plans for offshore activities:

- Blacktip Project Environment Plan
- Ballast Water Management Plan
- Drilling Environment Plan
- Emergency Response Plan
- Spill Contingency Plan (SCP)
- Pipeline Construction Environmental Plan
- Pipeline Management Plan
- Preliminary Onshore & Offshore Decommissioning Plan
- Produced Water Management Plan

- Safety Management Plan

Environmental Management Plans (Construction and Operational) developed for onshore and nearshore activities:

- Biting Insects EMP
- Blasting EMP
- Cultural Heritage Management Plan (CHMP)
- Dust EMP
- Emergency Response Plan
- Exotic Species and Weed EMP
- Fire EMP
- Flaring EMP
- Greenhouse Gas Management Plan
- Groundwater Protection EMP
- Lighting EMP
- Noise EMP
- Spill Contingency Plan (SCP)
- Pipeline Construction Environmental Plan
- Pipeline Management Plan
- Preliminary Onshore & Offshore Decommissioning Plan
- Road Maintenance Plan
- Rehabilitation EMP
- Safety Management Plan
- Sediment & Erosion Control EMP
- Social Impact Management Plan (SIMP)
- Terrestrial Fauna EMP
- Traffic EMP
- Turtle EMP
- Vegetation Clearing EMP
- Waste EMP

The proponent has stated that many of the Construction Environmental Management Plans for onshore and nearshore construction activities will be amended for the operations phase of the project. An overarching EMP document will be developed to bring together all the individual onshore/nearshore EMPs.

Proposed monitoring programs are associated with many of the EMPs. These monitoring plans may be detailed in the management plans or developed as separate documents linked to the relevant management plans.

Within this Assessment Report, recommendations have required EMPs to be developed prior to the commencement of any works. For the purposes of this Assessment Report, 'prior to the commencement of any works' means prior to any tasks which would require/cause any physical disturbance to any project area offshore or onshore eg drilling, clearing vegetation above the ground surface, trenching, grading etc.

Recommendation 27

The overarching Environment Management Plan, all Environment Plans and Environmental Management Plans for the Blacktip Project are to be submitted to the Office of Environment and Heritage for Northern Territory and/or Western Australian Government approval prior to commencement of any works.

In preparing each plan, the proponent will include any additional measures for environmental protection and monitoring contained in this Assessment Report and Recommendations. The plans shall be referred to relevant Northern Territory and Western Australian Government agencies and key stakeholders for review prior to finalisation. The plans shall form the basis for approvals and licences issued under relevant legislation.

6 Conclusions

The OEH considers that the environmental issues associated with the proposed project have been adequately identified. Appropriate environmental management of a number of these issues has been resolved through the assessment process, while the remainder will be addressed through monitoring and management actions detailed in Environmental Management Plans and the Social Impact Management Plan proposed to be developed for the project.

The final management plans for the proposal will be subject to review to the satisfaction of the relevant Northern Territory and Western Australian Government agencies prior to their incorporation into the pipeline and facility licence requirements. It is recommended that management plans also be developed in consultation with key stakeholders, including the Northern Land Council. The management plans will be working documents for the life of the project and will require periodic review in the light of operational experience and changed circumstances.

Based on its review of the EIS and the proponent's response to submissions from relevant Northern Territory Government agencies, affected stakeholders and the public, the OEH considers that the project can be managed without unacceptable environmental impacts, provided that the environmental commitments, safeguards and recommendations detailed in the EIS, this Assessment Report and in the final management plans are implemented and managed under the environmental management system for the project and are subject to regular reporting and compliance auditing.

7 References

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Appendix 1 – Respondent Matrix

Respondent	1. Northern Land Council	2. Museums and Art Galleries of the Northern Territory	3. Environment Centre NT	4. Aboriginal Areas Protection Authority	5. Department of Building, Industry and Resource Development	6. Department of Community Development, Sport and Cultural Affairs	7. Department Health and Community Services	8. Department of Infrastructure, Planning and Environment	9. Northern Territory Police	10. Office of Territory Development	11. Office of Environment and Heritage
1.4 Project Background	■										
1.6 Project Net Benefits											■
1.7 Environmental Approval Process	■										■
1.8 Regulatory Framework	■										
1.8.1 Northern Territory Primary Legislatation				■						■	
1.8.2 Commonwealth of Australia Primary Legislation				■	■						
1.9 Related Environmental Approvals				■	■						
1.10 Land Tenure Approvals	■										
1.11.1 Project Guidelines											■
2.1.4 Environmental, Health and Safety Policy Objectives	■										
2.2.1 Economic Benefits	■										■
3.1 Approach to Consultation	■										
3.1.1 Stakeholder Engagement				■							
3.2 Key Stakeholder Groups					■						
3.2.1 Indigeneous Communities	■			■							
3.3.1 Indigeneous	■				■						■
3.3.2 Non-Indigenous Groups											■
3.5 Ongoing Consultation Activities	■										
4.1 Project Overview	■				■						■
4.3 Preliminary Project Schedule	■		■								
4.4.2 Well Construction			■								■
4.4.3 Drilling Fluids											■
4.4.4 Drill Cuttings											■
4.5.2 Field Layout	■										■
4.5.4 Sub Sea Export Pipeline	■			■	■						■
4.5.6 Shore Crossing	■		■	■							■
4.5.7 Onshore Pipelines	■				■			■			
4.5.8 Onshore Gas Plant					■			■			■

Respondent	1. Northern Land Council	2. Museums and Art Galleries of the Northern Territory	3. Environment Centre NT	4. Aboriginal Areas Protection Authority	5. Department of Building, Industry and Resource Development	6. Department of Community Development, Sport and Cultural Affairs	7. Department Health and Community Services	8. Department of Infrastructure, Planning and Environment	9. Northern Territory Police	10. Office of Territory Development	11. Office of Environment and Heritage
4.5.10 Construction Access Routes											
4.5.10.1 Access and Haul Roads											
4.5.10.2 Existing Wadeye Ramp											
4.5.10.3 Beach Barge Landing											
4.5.10.4 Wadeye Airstrip											
4.5.11 Construction Materials and Infrastructure											
4.5.11.1 Quarantine and Staging Areas											
4.5.11.3 Construction Waste Materials											
4.5.11.4 Aggregate Sources Gravel											
4.5.13 Construction Workforce & Accommodation											
4.6 Commissioning Activities											
4.6.1 Offshore Facilities											
4.6.3 Export Pipeline											
4.7.1 Onshore Production and Onshore Pipeline Operation											
4.7.2 Onshore Gas Plant											
4.7.2.2 Excess Gas and Flare											
4.7.4 Produced Water Treatment											
4.7.5 Operational Access Routes											
4.8 Ancillary Systems, Facilities and Support											
4.8.2 Diesel and Chemical Storage											
4.8.3 Cooling & Heating Systems											
4.8.8 Drainage Systems											
4.8.9 Sewage and Putrescible Waste											
4.9 Decommisioning											
4.9.2 Offshore approvals framework											
4.9.4 Wellhead platform											
4.9.5 Export Pipeline											
5.2 No Development Option											
5.3.1 Offshore Processing											
5.3.4 Summary											
5.6 Pipeline Shore Crossing Location											
5.9 Condensate Treatment and Export											

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6.2.1.1 Non-Hazardous Solid Waste							■				■
6.2.1.2 Liquid Waste	■						■				■
6.2.1.3 Hazardous Waste			■								■
6.2.3.1 Non-Hazardous Solid Waste							■				
6.2.3.2 Liquid Waste							■				■
6.2.3.3 Hazardous Waste							■				
6.3 Atmospheric Emissions							■				
6.3.1 Greenhouse Gases			■								
6.4 Noise	■						■				
6.4.1 Sensitive Receptors	■										
6.4.2 Background Noise Levels	■										
6.4.3 Construction Phase Emissions			■								
6.4.4 Operation Phase Emissions	■										
7 Existing Marine Environment		■				■					
7.2.2 Climate					■						
7.2.3 Bathymetry and Seabed Features		■									■
7.2.4 Oceanography and Water Quality					■						
7.3.1 Regional Setting		■				■					■
7.3.2 Seabird Habitats and Communities	■	■				■					■
7.3.3 Intertidal habitats and communities	■	■				■					
7.3.4 Invertebrates		■				■					■
7.3.5 Fish	■	■	■			■					■
7.3.6 Dugongs			■								■
7.3.7 Whales and Dolphins			■								
7.3.9 Sea Turtles			■								■
8 Existing Terrestrial Environment						■					
8.2.2 Meteorology											■
8.2.5 Geology and Soils								■			
8.2.6 Hydrology, Hydrogeology and Water Quality											■
8.3.1 Regional Ecological Setting			■		■						
8.3.2 Vegetation and Flora											■
8.3.3 Conservation Significance of Vegetation and Flora											■
8.3.4 Weeds											■
8.3.5 Fauna habitats and species		■				■					
8.3.6 Biting insects					■						■
8.3.7 Conservation Significance of Fauna Species and Habitats	■										

Respondent	1. Northern Land Council	2. Museums and Art Galleries of the Northern Territory	3. Environment Centre NT	4. Aboriginal Areas Protection Authority	5. Department of Building, Industry and Resource Development	6. Department of Community Development, Sport and Cultural Affairs	7. Department Health and Community Services	8. Department of Infrastructure, Planning and Environment	9. Northern Territory Police	10. Office of Territory Development	11. Office of Environment and Heritage
9.4 Infrastructure and Transport	■										
9.5 Military zones								■			
9.5.2 Offshore military exercise zone					■						■
9.7 Fisheries		■				■					
9.9.2 Terrestrial archaeology				■							■
9.10 Aboriginal heritage	■			■							
9.10.1 Aboriginal sites of significance	■			■							
9.12.3 Northern Territory Main Industries	■										
10 Risk Assessment Approach					■						
10.3 Summary of Environmental Risk Assessment	■										
11 Marine Impacts						■					
11.1 Introduction	■										
11.2 Physical Presence		■									■
11.3 Seabed disturbance		■		■	■	■					■
11.4 Beach disturbance					■						■
11.5 Artificial Habitat											■
11.6 Marine Pest Species		■			■	■					
11.8 Drilling waste and discharge		■			■	■					■
11.13 Hydrotest waters					■						■
11.14 Scale	■				■		■				■
11.15 Cooling water	■										■
11.18 Produced water	■						■				■
11.19 Hydrocarbon Spills	■		■								
11.19.1 Oil Spill Fate and Trajectory Modelling	■										■
11.19.2 Effects on biota	■		■		■						■
11.20 Waste	■										
11.20.3 Hazardous Waste Stream and Chemicals	■				■		■				
11.21 Atmospheric Emissions											■
11.22 Noise and Vibration	■		■	■							
11.24 Summary of Marine Impacts				■							

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12 Terrestrial Impacts, Management and Prevention				■							
12.1 Introduction	■										
12.2.1 Topography and Soils	■						■				
12.2.2 Hydrology and Water Quality					■	■	■				■
12.3.1 Vegetation Clearing and Habitat Loss	■		■								
12.3.2 Significant Vegetation, Habitats and Individual Species of F&F	■										■
12.3.3 Fauna Capture in Open Trench		■				■					■
12.3.4 Weeds & Exotic Fauna											■
12.3.5 Fire	■										■
12.4 Biting Insects and Mosquito Borne Disease							■				
12.4.1 Biting Insects	■										■
12.5.1 Non Hazardous Solid Waste Stream	■						■				■
12.5.2 Liquid Waste Stream	■						■				■
12.5.3 Hazardous Waste Stream	■						■				■
12.5.4 Chemical and Hydrocarbon Spills						■					■
12.6 Atmospheric Emissions					■		■				
12.6.1 Greenhouse Gases	■		■								■
12.6.2 Other Combustion Products	■										■
12.6.5 Dust Emissions	■										■
12.7 Noise	■										■
12.8 Vibration											■
12.10 Summary of Impacts		■									
13.1 Introduction				■							
13.2 Land Use and Land Tenure	■										
13.3 Infrastructure and Transport	■			■				■			
13.8 Archaeology	■										
13.9 Aboriginal Heritage			■	■	■						
13.10.3 Summary of Impacts and Management Measures			■								
13.12 Economic Environment			■								
13.13 Summary of Potential Impacts	■										
14 Social Impact Assessment	■		■	■		■	■		■		
14.5 Management Strategies/Way Forward (Phase 2)					■						

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15 Environmental Management											
15.1 Summary of Proposed Monitoring											
15.2 Environmental Management Plans											
16.2.3 Summary of Potential Impacts											
16.2.4 Safety Risk Management Measures											
16.6 Emergency Response Plan											
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Appendix A - Noise Assessment											
Appendix B - Offshore and Intertidal Surveys											
Appendix C - Sea Turtles, Dugongs and Sea Grasses in the Region											
Appendix F - Vegetation and Flora											
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Appendix I - Archaeology and Historic Heritage											
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Appendix L - Species with Indigenous and Cultural Value											
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Appendix P - Marine and Intertidal monitoring											
General - Processing specifications											
General - Access Requirements											
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General - Flaring											
General - Environmental Parameters Governimg Design Criteria											
General - Redundancy in Pipeline Design											
General - Development of Unofficial Highways											
General - management plans should be completed											
General - Land-use requirements from Traditional Owners											
General - a 30 project, yet a 75 lease of land											
General - Gas or electricity supply to Wadeye?											

Appendix 2 – Summary of Environmental Commitments

The following table summarises the key commitments and statements of proposed preventative and management measures made by the Blacktip proponent in the DEIS, SIES and subsequent correspondence and consultations.

While not all preventative and management measures proposed by the proponent have been detailed in this table, all commitments and measures proposed, along with the recommendations in this Assessment Report must be fulfilled by the proponent for the project to be implemented in an acceptable manner.

These commitments and management measures are to be managed under the projects EMS and EMPs.

Commitment/Safeguard	Section References			Recommendation from Assessment Report 50
	Draft EIS	Supplement	Assessment Report 50	
Waste				
Prepare and implement a **Waste Management Plan** with specific measures to reduce, reuse and recycle waste, such as: ▪ Include waste minimisation in contractor and supplier selection criteria. ▪ Demonstrate continual improvement in waste management practices. ▪ Minimise chemical usage and incorporate HSE risk into chemical selection process. ▪ Segregate all process areas and fuel oil storage on all vessels for drainage collection and restrict contamination of clean run-off.	15.4	9.1	4.9, 4.11	14
Hazardous waste will be documented, tracked, segregated, and stored in bunded and signed areas.	12.5.3		4.9, 4.11	
All hazardous waste will be handled by licensed waste contractors who will be responsible for the transportation and disposal of the waste.		9.1	4.11	
All products brought on site will be entered into a waste management register and have a Materials Safety Data Sheet prepared which will detail the volumes of each product, a description of its hazardous content and a description of the handling and disposal procedures to be adopted.		9.1.1	4.11	

Commitment/Safeguard	Section References			Recommendation from Assessment Report 50
	Draft EIS	Supplement	Assessment Report 50	
The suitability and capacity of the Port Keats (Wadeye) Landfill Disposal Facility to accept Blacktip Project waste will be investigated prior to construction commencing and will be used for the project non-hazardous waste if possible. If the project does not have access to the Wadeye facility, then the waste will be backloaded to Darwin for disposal.		9.1.1, 15.5.1	4.11	14
Spills and Discharges				
Prepare and implement a **Produced Water Management Plan** specifying: ▪ Chemicals to be used. ▪ Expected composition of PW. ▪ Agreed PW discharge specs with the NT regulators. ▪ Discharge location and process.	15.4	7.4.2	4.9	12
Monitor the quantity and hydrocarbon content of PW.	15.4		4.9	12
Specify auditing procedures for vessels and rigs.	15.4			
Monitor and supervise the transfer of condensate to tankers.	15.4			
Transfer of drilling muds between the support vessel and Jack-up will be managed in accordance with Woodside's HSE management policy and procedures, and the rig contractor's marine operations and rig operating procedures.	15.4			
Prepare, implement, review and test an **Oil Spill Contingency Plan** for offshore, nearshore and shore-based spills and contain as a minimum: ▪ oil spill trajectory modelling; ▪ identification of sensitive receptors and priority protection areas; ▪ response strategies to clean up offshore and shoreline; ▪ communication with relevant internal and external emergency organisations; and ▪ availability of rapid response equipment and assistance.	15.4, 11.19.2	14.9	4.12	15

Commitment/Safeguard	Section References			Recommendation from Assessment Report 50
	Draft EIS	Supplement	Assessment Report 50	
▪ All hazardous materials will be handled and stored in accordance with the Materials Safety Data Sheet (MSDS) and Australian Standards as a minimum. Where possible, all hazardous materials will be handled and stored in bunded areas within the plant site. ▪ Appropriate spill kits will be stored where fuels and hazardous materials are used and stored. ▪ All personnel handling fuel and other hazardous materials will be trained and competent in the correct handling procedures and management of spills of applicable materials.	12.5.4	15.5.4	4.11, 4.12	14, 15
Any chemicals spilt at the plant which is not suitable for treatment in the PW system will be removed off site for treatment and disposal.		7.5.3		
The quality of Blacktip PW will be assessed once it becomes available. This will include chemical characterisation, ecotoxicology, bioaccumulation and biodegradation tests. Should the PW be found to be toxic or show the potential for bioaccumulation or persistence in the marine environment, then treatment can be put in place before volumes increase to their peak values.		14.8	4.9	12
The characteristics of the PW final effluent will be agreed with the regulatory bodies and appropriate treatment installed to ensure that the final effluent meets these agreed characteristics under all discharge conditions.		14.8	4.9	12
All diesel and chemical storage and handling associated with the onshore components of the Blacktip Project during construction and operation will be undertaken in accordance with Australian Standard AS1940–1993.	4.8.2	7.6.1	4.11	
Chemical loading areas on the wellhead platform will be bunded to contain any potential spills which will include the tote tank laydown area on the wellhead platform.		7.6.1		
If scale containing NORMS becomes an issue that has to be dealt with either during operation or decommissioning it will be managed in accordance with a detailed NORMS Management Plan which will be approved by the relevant regulatory authorities.		14.6	4.9	

Commitment/Safeguard	Section References			Recommendation from Assessment Report 50
	Draft EIS	Supplement	Assessment Report 50	
Hydrotest				
Prepare and implement a **Pipeline Construction Environmental Plan**, which will specify chemicals to be used during hydrotesting and dewatering procedures.	15.4		4.9	11
Flooding water for hydrotesting shall be treated with oxygen scavenger and biocide. Only those chemical brands with a minimum HQ category of 'Silver' or Offshore Chemical Notification Scheme (OCNS) Category D under the UK OCNS Notification Scheme will be used.		7.4.2		
Specific hydrotest and dewatering procedures will be contained in an Environment Plan, which will assess any predicted environmental impacts and stipulate management measures to reduce environmental risks to acceptable levels.		7.4.2	4.9	
The characteristics of the final effluent will be agreed with the regulatory bodies and appropriate treatment installed to ensure that the final effluent meets these agreed characteristics under all discharge conditions.		14.8	4.9	11
Drilling				
Prepare and implement a **Drilling Environment Plan**: ▪ Select drilling fluids and pipe dope with least toxicity and persistence. ▪ If non-water-based drilling muds are used ship back to shore for recycling or disposal by an approved method. ▪ Release WBMs from the Jack-up close to or above the sea surface to assist dispersion through the water column.	15.4		4.9	
Detailed well control mitigation measures will be developed and approved by the Designated Authority as part of the Drilling Environment Plan.		7.3.1		
Water Based Muds will be used wherever possible.	11.8	14.5	4.9	
Atmospheric Emissions				
Prepare and implement a **Greenhouse Gas Management Plan**. Specify: ▪ Life-of-facility greenhouse gas emissions. ▪ greenhouse improvement opportunities. ▪ Methods to reduce methane emissions.	15.4		4.15	18

Commitment/Safeguard	Section References			Recommendation from Assessment Report 50
	Draft EIS	Supplement	Assessment Report 50	
Prepare and implement a **Flaring Management Plan**. Specify design measures to reduce flaring and venting to ALARP during operation.	15.4		4.16	21
Monitor and report atmospheric emissions – with the view to achieving reductions in these emissions.	15.4		4.15	18, 20
Prepare and implement a Greenhouse Gas Management Plan, including: ▪ avoid excessive flaring of natural gas. ▪ ensure the quantity of hydrocarbons flared is measured. ▪ identify responsibilities for monitoring and reporting emissions. ▪ define a process to review flared gas quantities and seek to reduce these.	15.4		4.15	18
Control vehicle speeds: ▪ 40 kph along construction corridor. ▪ 5 kph when passing personnel. ▪ 80 kph on access roads or less in any dusty conditions.	15.4			
Dust				
Prepare and implement a **Dust Management Plan**.	15.4		4.15	19
Noise, Vibration and Light				
Prepare and implement a **Noise Management Plan** including: ▪ Installation of noise attenuation controls e.g. silencers cladding where practicable. ▪ Adopt *NT Draft Waste Management and Pollution Control (Environmental Noise)* Regulations.	15.4		4.16	21
Prepare and implement a **Blasting Management Plan** if blasting is required.	15.4		4.16	21
The Blasting Management Plan will be prepared in advance of construction and approved by the relevant regulatory authorities and will include mitigation measures associated with blasting in the marine and near shore environments.		7.3.5, 14.3	4.16	

Commitment/Safeguard	Section References			Recommendation from Assessment Report 50
	Draft EIS	Supplement	Assessment Report 50	
If drilling and blasting is required offshore, a watch will be maintained prior to and during blasting operations for the presence of marine mammals and turtles in the vicinity of the blasting work areas, and blasting delayed until fauna is at a safe distance.		15.8		
Impacts from blasting noise and vibration will be minimised in the following ways: (i) Scarce habitat such as monsoon vine forest will be avoided and remain buffered by surrounding vegetation communities. (ii) Cues prior to blasts will be used to alert animals, resulting in reduced stress associated with sudden noise and encouraging animals to vacate the area. (iii) Visual stimulation causing increased animal stress will be minimised by restricting worker movement beyond the construction corridor. (iv) Blasts will be acoustically screened with blast mats. (v) Shotfirers will follow Best Practice Environmental Management as described in Section 3.3.3 'Control Measures for Vibration,' and Section 3.3.4 'Control Measure for Airblast,' of the 'Noise, Vibration and Airblast Control' module on Best Practice Environmental Management in Mining (Environment Australia 1998).		15.8		
Prepare and implement a **Lighting Management Plan**, including: ▪ Lighting for the onshore facilities will be designed to minimise light spill. ▪ Where possible minimise light spill zone around the nesting turtle beach. ▪ Appropriate design for minimising biting insects.	15.4		4.8	9
Marine				
No antifouling will be used on the wellhead platform, export pipeline and associated subsea infrastructure.	15.4			
Monitor beach during construction in the turtle-nesting season for nests and hatchlings.	15.4		4.8	
Remove turtle eggs from beach each morning during construction period, and place in a hatchery to the south. Collect hatchlings and return to Yelcherr Beach to enter the sea.	15.4			
Conduct turtle and dugong monitoring during the construction phase of the Blacktip Project.		10.2.6	4.8	

Commitment/Safeguard	Section References			Recommendation from Assessment Report 50
	Draft EIS	Supplement	Assessment Report 50	
A Turtle Management Plan will be finalised (in partnership with the offshore installation contractor) and submitted to government for approval prior to construction.		14.3	4.8	9
Deck drainage water on all vessels will be either directed overboard if it is clean or to a sump or similar for treatment through an oily water separator.	11.6			
The groyne to facilitate pipeline trenching and laying will be completely removed following trench backfill.		14.3		
Acid Sulfate Soils				
Determine presence of Acid Sulfate Soils in accordance with regulatory requirements.	15.4			
Hydrology				
Prepare and implement a **Groundwater Protection Management Plan**: ▪ Specify methods of obtaining fresh water with minimal impact. ▪ Set targets for fresh water consumption. ▪ Undertake groundwater monitoring programme if required.	15.4	11.1.2, 15.2.2	4.14	16
Prepare and implement a **Sediment and Erosion Control Management Plan**.	15.4	14.9.2	4.10	
Undertake baseline groundwater monitoring to characterise the groundwater at the site.		15.2.2	4.14	
Undertake groundwater monitoring to provide information about environmental performance and impacts.		15.2	4.14	
Construction activities and rehabilitation will occur in the dry season prior to the onset of the rains. Construction of areas considered to pose a higher risk of sediment-laden run-off entering surface waters will be prioritised and conducted as early as possible during the dry season construction programme. This will allow for adequate time for rehabilitation and erosion control to stabilise sediments prior to the onset of the wet season. This includes the area landward of the beach with near surface clayey sands that may be highly erodible.		15.3.1		

Commitment/Safeguard	Section References			Recommendation from Assessment Report 50
	Draft EIS	Supplement	Assessment Report 50	
Stormwater generated from potentially contaminated areas will be captured in bunds and treated prior to discharge.	12.5.2	15.5.2	4.11	
Where necessary, sediment control structures will be installed across drainage, downstream from the onshore trench and prior to its final discharge destinations. Care will be taken to avoid discharging into potentially sensitive habitats.		7.3.5		
All water supply bores that are drilled for the project will be registered and approved under the *Water Act*.		11.1.2	4.14	
A hydrologist will make an assessment of the impacts associated with extracting the estimated volumes of groundwater especially any temporary impacts on natural ecosystems during the periods of construction where the water table will be lowered.		11.1.2		
Terrestrial Vegetation				
The construction working area will be marked with construction pegs or other temporary measures.	15.4			
Prepare and implement a **Vegetation Clearing Management Plan**: ▪ Cleared vegetation will be stockpiled and respread for rehabilitation where possible, and excess burnt or otherwise disposed of. ▪ Excavated soil will be stored on-site in an area previously cleared of vegetation, or removed to an appropriate area offsite. Any on-site or off-site location will be approved by the DNRETA prior to dumping. ▪ Previously disturbed areas will be utilised where possible. ▪ Where possible low impact construction techniques will be employed in all environmentally sensitive areas. ▪ Construction personnel will be inducted about the importance of vegetation protection. ▪ Sensitive vegetation communities in the vicinity of construction activities will be marked to ensure that these areas are avoided by a sufficient distance.	15.4	14.9.2	4.10	

Commitment/Safeguard	Section References			Recommendation from Assessment Report 50
	Draft EIS	Supplement	Assessment Report 50	
Prepare and implement a **Rehabilitation Management Plan** prior to construction for temporarily disturbed areas. The plan will include: ▪ Restrict use to native species. ▪ Top soil management. ▪ Species suitability will be determined in consultation with experts in rehabilitation techniques in tropical environments.	15.4	7.7	4.10	
Environmental and heritage values of routes chosen for access roads, laydown areas and borrow pits will be comprehensively assessed prior to disturbance.	15.4			
Clearing permits will be obtained from the Northern Territory Parks and Wildlife Service prior to conducting clearing activities that may have an impact on cycads and orchids.	15.4		4.10	
Prepare and implement a **Fire Management Plan** in consultation with the NT Bushfires council and Traditional Aboriginal Owners.	15.4	15.4	4.11, 4.17	14
If burning of the swamp areas is not acceptable to the Traditional Aboriginal Owners, then it will not occur.		15.4		
The Blacktip Project will encourage the harvesting of cycads and orchids prior to clearing activities occurring under permit from the NTPWC. Harvesting will take place in consultation with the traditional Aboriginal owners of the region, who will be given first selection of the harvested plants.		15.3.1	4.10	
Weeds and Exotic Species				
Prepare and implement a **Ballast Water Management Plan**: ▪ Include requirement to abide by AQIS guidelines in contracts for marine activities. ▪ Implement vetting procedures for trading tankers, installation, support and decommissioning vessels. ▪ Restrict ballast water exchange to deep ocean waters. ▪ Implement vetting procedures for the Jack-up, pipe-laying vessels, condensate trading tankers, installation and support vessels throughout the various phases of the Project.	15.4		4.18	23

Commitment/Safeguard	Section References			Recommendation from Assessment Report 50
	Draft EIS	Supplement	Assessment Report 50	
Prepare and implement an **Exotic Species and Weed Management Plan,** which will incorporate a **Weed Monitoring Programme**.	15.4	11.2.3	4.18	24
All existing weeds infestations will be treated at the project area, along access routes and at borrow pits, prior to construction activities.	15.4		4.18	
A washdown pad will be constructed along the access routes to the project area to the specifications of Department of Natural Resources, Environment and the Arts.	12.3.4	11.2.3	4.18	
Plant, vehicles, equipment and construction materials will be certified 'weed free' by the supplier and will be subject to random inspections.	12.3.4	11.2.3	4.18	
Terrestrial Fauna				
Prepare and implement a **Fauna Management Plan**. Impacts of trenches upon fauna will be minimised by: ▪ Restricting length of trenches between escape ladders. ▪ Leave the pipe trench open for the minimum period of time. ▪ Ensuring that trench excavation is progressive and qualified personnel will continually monitor and remove any trapped fauna species from the trench daily. ▪ Locating soft plugs and trench breakers where required to allow fauna to escape/cross. ▪ Monitoring of the open trench to be undertaken by expert wildlife personnel and animals identified, recorded and released	4.5.7, 15.4	7.3.5	4.10	
Where possible restrict vehicle travel to access routes during daylight hours, avoiding dusk and dawn.	15.4			
Where possible large mature fruiting trees will be avoided during clearing.	15.4			
Prior to construction report large bird nesting sites to the environmental officer so that they can be assessed prior to disturbance.	15.4			
Undertake construction in the most benign season (the dry season).	15.4			
Inspect vehicles and equipment for cane toads prior to crossing the Daly River.	15.4			

Commitment/Safeguard	Section References			Recommendation from Assessment Report 50
	Draft EIS	Supplement	Assessment Report 50	
Report cane toad sightings in project area.	15.4			
Ban all domestic animals from the project area.	15.4			
Trench escape ramps with slopes no greater than 50% will be installed at intervals determined in consultation with NTPWS.	12.3.3			
Whilst the trench is open, it will be inspected at least twice daily in order to remove any trapped fauna.	12.3.3	15.3.3	4.10	
Biting Insects			4.17	22
Prepare and implement a **Biting Insects Management Plan**.	15.4			
Where larvae are found (during regular, routine inspections of bunded areas, all drains on the onshore gas plant site and laydown areas and waste disposal areas) they will be sent to Medical Entomology Branch (MEB) laboratory for analysis with appropriate remedial action to be advised by MEB.	12.4.1	18.3		
Archaeology and Cultural Heritage				
Prepare and implement a **Cultural Heritage Management Plan**: ▪ Archaeologist to supervise pipeline trenching from HWM to the plant site. ▪ Siting for additional infrastructure including: new access roads, borrow pits, laydown areas, construction camps, anode beds, turning circles will be subject to a full archaeological survey prior to construction.	15.4		4.6	6
The area to be disturbed around the Shell Midden area is appropriately fenced.	15.4			
Stabilise the sides of the sand dunes on either side of the pipeline alignment so that further damage does not occur to the Shell Midden through erosion.	15.4			
Shell Midden 1 site will be thoroughly recorded and collected in accordance with requirements set out by the Heritage Conservation Branch.		12.3		
No destruction or disturbance to sacred sites will occur due to the proposed development.	9.10.1	16.1		
Formal consultations with traditional Aboriginal owners about the siting of a beach laydown area will be undertaken.		7.1	4.6	

Commitment/Safeguard	Section References			Recommendation from Assessment Report 50
	Draft EIS	Supplement	Assessment Report 50	
Consultation will be undertaken with traditional Aboriginal owners regarding appropriate measures to mitigate disturbance to Walpinhthi Reef.		12.4, 7.3.3	4.6	
A revised exclusion zone around Walpinhthi Reef will be agreed by all parties before pipelay operations commence.		8.3	4.6	
Ongoing consultation with the community in relation to the interaction of maintenance flaring events and the community cultural calendar will be undertaken.		15.7	4.16	
The barge will not anchor on the physical hard structure of Walpinhthi Reef.		16.1		
Socio-Economic				
Issue Notice to Mariners alerting them of development and associated activities.	15.4		4.7	
In consultation with local groups prepare and implement a **Social Impact Management Plan**.	15.4		4.5	4
The SIMP will contain: ▪ project communications ▪ cross-cultural exchange/ awareness ▪ cultural heritage management ▪ indigenous training and employment ▪ indigenous business development ▪ community/ project protection ▪ traffic management ▪ community partnerships.	14.5		4.5	4
Undertake appropriate consultation so that long term and mutually beneficial relationships can be developed with local communities.		6.1		
Direct employment opportunities with the Blacktip Project will be made available through a specific Indigenous Training and Employment Programme targeting the town of Wadeye.		5.2.1		

Commitment/Safeguard	Section References			Recommendation from Assessment Report 50
	Draft EIS	Supplement	Assessment Report 50	
A focus of the training and employment effort for 2005 will be to ensure people are prepared for entry level to the construction work force, irrespective of vocational level. There will also be a focus on identifying and drawing from the existing skills base in the area, particularly in relation to transport and civil works.		5.2.1		
Local indigenous people will have opportunity to participate in the project through the supply of goods and services on a commercial basis.		5.2.1		
Contractors will be required to submit an Indigenous Affairs Management Plan which includes the requirement to detail their proposals in relation to: ▪ the employment of indigenous people; ▪ the provision of work place training for indigenous people; ▪ the provision of opportunities for indigenous people to participate in businesses or similar commercial relationships with the Contractor, or by way of sub-contracting; ▪ community relationship management; ▪ cultural heritage management; and ▪ social impact management.		5.2.1		
Traditional Aboriginal owners and other community members will be able to have access to the significant body of detailed scientific knowledge about the land within the traditional Aboriginal owners' estate and nearby areas that was collected through the studies undertaken for the Draft EIS.		5.2.1		
Transport and Infrastructure				
Prepare and implement a **Road Maintenance Plan**.	15.4		4.7.2	
Prepare and implement a **Traffic Management Plan**.	15.4		4.7.2	
Environmental surveys for the proposed access road and associated drainage channels and ditch run-outs will be supplied to the NT Government once they are completed, the data reviewed and an assessment of impacts and mitigation measures is made.		7.3.7		

Commitment/Safeguard	Section References			Recommendation from Assessment Report 50
	Draft EIS	Supplement	Assessment Report 50	
Environmental Management				
Implement an **Environmental Management System** and obtain ISO14001 certification.	15.4		5	
Prepare and implement **Construction Environmental Management Plans (EMPs)** for onshore activities and **Environment Plans** (EPs) for offshore activities.	15.4		5	27
Prepare and implement **Commissioning and Operation EMPs**.	15.4		5	27
Prepare and update a **Blacktip Project Environmental Hazard Register**.	15.4			
All personnel working on site will undertake environmental and cultural inductions before commencing site work.	15.4			
Develop **Preliminary Onshore & Offshore Decommissioning Plans**. Plans to include "drivers, costing and timing" and rehabilitation requirements for 'permanently' disturbed areas.	15.4	7.7	4.19	25
Examine all reasonable decommissioning options, including the total removal of the wellhead platform, well in advance of decommissioning to ensure all relevant environmental implications have been adequately addressed in accordance with prevailing legislation.		7.7	4.19	
The Proponent remains committed to consultations with key stakeholders, including the NLC generally and in relation to the development of the EMPs that are submitted to the NT Government for approval and will give due consideration to those consultations.		6.4	5	
Contract tender evaluation to incorporate: ▪ HSE performance ▪ EMP compliant to regulatory and Woodside requirements ▪ Auditing of compliance including corrective actions ▪ Workshops and inductions for all staff and contractors focussed on HSE management and performance ▪ Presence of on-site HSE Representative during construction activities.	15.4			

Commitment/Safeguard	Section References			Recommendation from Assessment Report 50
	Draft EIS	Supplement	Assessment Report 50	
Undertake consultations with key stakeholders, including the NLC generally and in relation to the development of the EMPs that are submitted to the NT Government for approval.		6.4	5	27
Health Safety and Emergency				
Maintain a gazetted safety exclusion zone of 500m radius from the outer edge of the Blacktip wellhead platform and associated structures or equipment.	15.4			
Implement an **Emergency Response Plan** (ERP) which will include an **Oil Spill Contingency Plan** for both offshore and onshore related spills.	15.4		4.12, 5	15, 27
Prepare and implement a **Health Programme**.	15.4			
Prepare and implement a **Safety Management Plan**.	15.4		5	27
Prepare and implement a **Fire Management Plan**.	15.4		4.11, 4.17	14
Erect temporary fences along the pipeline corridor where required.	15.4			
Conduct routine health monitoring on groundwater sources that are utilised for potable water.		15.2	4.14	
Regarding atmospheric emissions: (1) a Complaints Hotline ("1800" number) and Complaints Register would be set up specifically for complaints in relation to environmental impacts from the plant including impacts from air emissions; and, (2) A plant site representatives will be available to manage community concerns including: ▪ registering the complaint in the Complaints Register; ▪ acting on the complaint immediately; ▪ following up on the complaint within a reasonable time to determine the state of progress of the complaint and the perceived or real impact.		9.2	4.15	
Monitoring of the community health statistics, through collaboration with the existing agencies and organisations responsible, will be undertaken to ensure that any long-term health effects of the Proponent's operations are detected.		9.2	4.15	