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## 15. Environmental Management

### 15.1 Environmental Management Programme

Preventative and management measures will be applied throughout the life of Blacktip Project to ensure that all significant environmental effects associated with the proposed project are minimised or avoided. Various tools will be implemented by Woodside and its contractors to ensure sound environmental management. These include compliance with Woodside's Environmental Policy, audits of environmental performance, hazard registers, environmental management and performance in tendering and contracting procedures, inductions and Environmental Management Plans (EMPs).

The Environmental Policy is central to Woodside's environmental management system (EMS) (**Appendix D, Volume 1**). It seeks to ensure that planning and performance of all company activities are undertaken to either avoid adverse effects wherever possible or keep impacts within acceptable standards. The Environmental Policy also aims to make certain that all statutory requirements are observed throughout the Blacktip Project. It includes a public statement of the corporate commitment to protecting the environment.

An internal Register of Environmental Hazards will be developed as part of project planning to further identify environmental issues, thus enabling project management to ensure issues were addressed, along with other business priorities, in the early screening and design stages. Progress will continue to be periodically reviewed and documentation updated during project design and execution.

A two-tiered system of inspection and internal audits will be utilised to assess specific activities or facilities during the various project phases. External audits will be carried out to assess the Blacktip Project's environmental management performance.

Environmental performance issues relevant to contractors will be managed through the requirements of Woodside's tendering and contracting procedures. Furthermore, in accordance with Woodside's Environmental Standards, it will be necessary for all Woodside contractors to demonstrate their ability to achieve the required level of environmental performance. Contract tender evaluation will incorporate the following:

- 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.

All employees involved in the various phases of the Blacktip Project will undertake health, safety and environmental (HSE) inductions, which will involve input from professional HSE staff.

Detailed Environment Plans (EPs) and Environmental Management Plans (EMPs) will be prepared to relevant regulatory agency requirements for activities identified as potentially impacting on the environment.

## 15.2 Environmental Management Plans

Environmental aspects of the Blacktip Project will be managed primarily through development and implementation of EPs and EMPs. The purpose of these plans is to identify potential and actual environmental aspects and effects of all project phases, onshore and offshore, including:

- drilling;
- installation, construction and commissioning;
- production;
- decommissioning.

The plans also describe or reference the procedures and equipment proposed to prevent, monitor and manage possible effects, and will include monitoring programmes (**Table 15-1**). All plans will be drawn up in accordance with the Blacktip Project commitments presented in **Table 15-2**.

Offshore Environment Plans (EPs) follow different requirements to onshore EMPs as the former are drawn up in accordance with the *Petroleum (Submerged Lands) (Management of Environment) Regulations 1999*. A framework EP for offshore developments has been developed as an example of the intended approach to the detailed Blacktip Project EPs, which will be developed once sufficient detailed design information is available. The Blacktip Framework EP is provided in **Appendix O, Volume 2** of this EIS. In addition, the framework Ballast Water Management Plan is provided in **Table 15- 3**.

EMPs governing onshore and nearshore impacts are structured differently from the offshore EPs. Individual framework EMPs have been developed for the onshore/nearshore impacts during construction covering: Waste, Dust, Noise, Light, Sediment and Erosion Control, Groundwater Protection, Vegetation Clearing, Terrestrial Fauna, Biting Insects, Exotic Species and Weeds, Rehabilitation, Fire, Traffic, Turtles, Social Impacts and Cultural Heritage. Many of these plans for example the Social Impact and Cultural Heritage Impact Management Plans will be amended for operations also. Framework EMPs developed specifically for onshore operational impacts include Flaring and Greenhouse Gas. The framework for each of these plans is contained in the tables at the end of this section (**Table 15-4** to **Table 15-21**). These frameworks will be developed further in accordance with the anticipated construction schedule, once detailed design information is available and the construction contractors are commissioned.

A consolidated overarching EMP document will be developed to bring together all the individual onshore/nearshore EMPs, in accordance with recognised standards and applicable Commonwealth, Western Australian and Northern Territory legislation. The EMP will be submitted to the relevant authorities for approval prior to construction. Upon the commencement of construction, EMPs will be reviewed according to a regular timeframe and updated if necessary. These updates will be made in consultation with relevant decision making authorities (DMAs).

### 15.3 Framework Monitoring Programmes

Specific environmental monitoring programmes for the offshore/marine and onshore components of the Blacktip Project will be undertaken. A Framework Marine and Intertidal Monitoring Programme is presented in **Appendix P, Volume 2** of this Draft EIS. Onshore, weed and biting insects monitoring programmes will also be undertaken. The monitoring programmes will be outlined in detail within the EMP, and will include:

- Information needed to provide a suitable baseline for subsequent monitoring.
- The types of project effects that are likely to need monitoring.
- The ecosystems parameters to be monitored.
- The timing and frequency of monitoring.
- Policies for evaluating and amending the monitoring programme.

Once detailed design information is available for the Blacktip Project the monitoring programme will be finalised and submitted for approval with the respective EPs and EMPs. A summary indicating the parameters to be monitored is given in **Table 15-1**.

#### ■ Table 15-1 Summary of Proposed Monitoring

Monitoring Plan	Issues Covered	Phase
Open Trench Monitoring	Inspections of open trench to remove trapped fauna	Construction
Archaeological and Cultural Heritage Monitoring	Archaeologists to monitor ground disturbance associated with laying the pipeline. Monitoring of shell midden 1 to ensure integrity maintained	Construction
Clearing and Rehabilitation Monitoring	Habitat disturbance Rehabilitation measures and success	Construction
Turtle Monitoring	Monitoring of nesting activity during construction and move nests to safe location	Construction
Safety and Maintenance	Routine inspection details for offshore facility, pipeline and gas plant	Operation
Greenhouse Gas Emissions	Volumes of greenhouse gases produced	Operation
Weed Monitoring Plan	Presence of declared noxious weeds Identification and removal of grassy weeds that may cause fire risk	All phases
Biting Insect Monitoring	Monitor artificial receptacles and drains for mosquito larvae Inspections for mosquito breeding during the wet season	All phases
Erosion and Sediment Control Monitoring	Effectiveness of erosion and sediment control techniques and maintenance of all controls.	All phases
Discharge Monitoring	Monitoring of PW water and any other contaminants	All phases
Offshore Monitoring	Marine ecology, species diversity, indicator species	All phases
Intertidal Monitoring	Ecology, species diversity, impacts, indicator species	All phases
Pest Species Monitoring	Presence of Cane Toads <i>Bufo marinus</i>	Construction

## 15.4 Commitments

Woodside is committed to achieving a level of environmental management and performance consistent with national and international standards and statutory obligations in its pursuit of sound business and financial objectives. The most economically effective, environmentally sound technology and procedures will be incorporated into the design of the project to ensure optimal management of all emissions, discharges and waste.

Furthermore, Woodside is committed to ensuring that the Blacktip Project will be undertaken in a manner that minimises impacts on the surrounding biophysical and social environments. Accordingly, Woodside proposes several environmental management commitments. As the project concept advances, the full list of these commitments will be refined. The draft environmental commitments are summarised in **Table 15-2**.

■ **Table 15-2 Blacktip Commitments**

Id No	Implementation phase				Management Commitment/Action	Objective
	Design	Construction/ Commission	Operation	Decommissioning		
<b>Waste and Chemical Hazardous Waste</b>						
1.	✓	✓	✓	✓	Prepare and implement a <b>Waste Management Plan</b> with specific measures to reduce, reuse and recycle waste, such as: <ul style="list-style-type: none"> <li>▪ Include waste minimisation in contractor and supplier selection criteria</li> <li>▪ Demonstrate continual improvement in waste management practices</li> <li>▪ Minimise chemical usage and incorporate HSE risk into chemical selection process.</li> <li>▪ Segregate all process areas and fuel oil storage on all vessels for drainage collection and restrict contamination of clean run-off.</li> </ul>	To reduce impacts on the environment and pressure on waste disposal facilities
<b>Spills and Discharges</b>						
2.	✓	✓	✓		Prepare and implement a <b>Produced Water Management Plan</b> . Specify: <ul style="list-style-type: none"> <li>▪ Chemicals to be used</li> <li>▪ Expected composition of PW</li> <li>▪ Agreed PW discharge specs with the NT regulators</li> <li>▪ Discharge location and process.</li> </ul>	Minimise the potential for adverse impacts on water quality
3.			✓		Monitor the quantity and hydrocarbon content of PW.	Minimise the potential for water quality reduction
4.		✓	✓	✓	Specify auditing procedures for vessels and rigs.	To prevent spills and ensure adequate recovery controls in place.
5.		✓	✓	✓	Specify spill reporting requirements to all contractors.	Minimise the potential for water quality reduction and subsequent impacts on marine and terrestrial biota
6.			✓	✓	Monitor and supervise the transfer of condensate to tankers.	To prevent spills

Id No	Implementation phase				Management Commitment/Action	Objective
	Design	Construction/ Commission	Operation	Decommissioning		
7.		✓			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.	Minimise the impact of drilling mud spills
8.		✓	✓		Prepare, implement, review and test <b>Spill Contingency Plan</b> for offshore, nearshore and shore-based spills.	Ensure adequate recovery controls in place and protect marine environments
<b>Hydrottest</b>						
9.	✓	✓			Prepare and implement a <b>Pipeline Construction Environmental Plan</b> , which will specify chemicals to be used during hydrotesting and dewatering procedures.	Minimise the potential for water quality reduction and subsequent impacts on marine and terrestrial environment
10.	✓	✓			Prepare and implement a <b>Drilling Environment Plan</b> : <ul style="list-style-type: none"> <li>▪ Select drilling fluids and pipe dope with least toxicity and persistence</li> <li>▪ If non-water-based drilling muds are used ship back to shore for recycling or disposal by an approved method</li> <li>▪ Release WBMs from the Jack-up close to or above the sea surface to assist dispersion through the water column.</li> </ul>	To manage environmental impacts during drilling and minimise the potential for water quality reduction and subsequent impacts on biota
<b>Drilling</b>						
11.	✓	✓	✓		Prepare and implement a <b>Greenhouse Gas Management Plan</b> . Specify: <ul style="list-style-type: none"> <li>▪ Life-of-facility greenhouse gas emissions</li> <li>▪ greenhouse improvement opportunities</li> <li>▪ Methods to reduce methane emissions.</li> </ul>	Minimise generation of greenhouse gases and associated impacts
12.	✓	✓	✓		Prepare and implement a <b>Flaring Management Plan</b> . Specify design measures to reduce flaring and venting to ALARP during operation.	Minimise and manage atmospheric emissions arising during planned or unplanned flaring and venting
13.					Monitor and report atmospheric emissions – with the view to achieving reductions in these emissions.	



Id No	Implementation phase				Management Commitment/Action	Objective
	Design	Construction/ Commission	Operation	Decommissioning		
14.					Prepare and implement a Greenhouse Gas Management Plan, including: <ul style="list-style-type: none"> <li>▪ avoid excessive flaring of natural gas.</li> <li>▪ ensure the quantity of hydrocarbons flared is measured.</li> <li>▪ identify responsibilities for monitoring and reporting emissions.</li> <li>▪ define a process to review flared gas quantities and seek to reduce these.</li> </ul>	
<b>Atmospheric Emissions</b>						
15.		✓	✓		Prepare and implement a <b>Dust Management Plan</b> .	Minimise the impact from dust generation. Minimise short term impacts on fauna.
16.		✓	✓		Control vehicle speeds: <ul style="list-style-type: none"> <li>▪ 40 kph along construction corridor</li> <li>▪ 5 kph when passing personnel</li> <li>▪ 80 kph on access roads or less in any dusty conditions.</li> </ul>	Minimise the impact from dust generation on air quality, vegetation, fauna, construction workers and the public.
<b>Dust</b>						
17.	✓	✓	✓		Prepare and implement a <b>Noise Management Plan</b> including: <ul style="list-style-type: none"> <li>▪ Installation of noise attenuation controls eg silencers cladding where practicable</li> <li>▪ Adopt <i>NT Draft Waste Management and Pollution Control (Environmental Noise)</i> Regulations.</li> </ul>	Minimise impact on sensitive receptors and workers. Minimise short term loss of fauna.
<b>Noise, Vibration and Light</b>						
18.		✓			Prepare and implement a <b>Blasting Management Plan</b> if blasting is required.	Minimise impact on sensitive receptors and workers should blasting be required.

Id No	Implementation phase				Management Commitment/Action	Objective
	Design	Construction/Commission	Operation	Decommissioning		
19.		✓	✓		Prepare and implement a <b>Lighting Management Plan</b> , including: <ul style="list-style-type: none"> <li>▪ Lighting for the onshore facilities will be designed to minimise light spill.</li> <li>▪ Where possible minimise light spill zone around the nesting turtle beach.</li> <li>▪ Appropriate design for minimising biting insects.</li> </ul>	Minimise impact on any sensitive receptors and visual amenity Minimise the impact of light spill on nesting turtles or hatchlings.
<b>Marine</b>						
20.		✓	✓		No antifouling will be used on the wellhead platform, export pipeline and associated subsea infrastructure.	Minimise the impact on marine organisms and comply with IMO regulations
21.		✓			Monitor beach during construction in the turtle-nesting season for nests and hatchlings.	Ensure that nesting continues.
22.		✓			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.	Ensure hatchlings are not harmed by construction activities.
<b>Acid Sulfate Soils</b>						
23.	✓				Determine presence of Acid Sulfate Soils in accordance with regulatory requirements.	To ensure any ASS are identified before construction
<b>Hydrology and Freshwater Quality Resources</b>						
24.	✓	✓	✓		Prepare and implement a <b>Groundwater Protection Management Plan</b> : <ul style="list-style-type: none"> <li>▪ Specify methods of obtaining fresh water with minimal impact.</li> <li>▪ Set targets for fresh water consumption.</li> <li>▪ Undertake groundwater monitoring programme if required</li> </ul>	Minimise the risk to receiving water bodies and long term risk to water resources
25.		✓	✓	✓	Prepare and implement a <b>Sediment and Erosion Control Management Plan</b> .	Minimise the impacts from turbidity and runoff during construction and operation

Id No	Implementation phase				Management Commitment/Action	Objective
	Design	Construction/ Commission	Operation	Decommissioning		
<b>Terrestrial Vegetation</b>						
26.		✓			The construction working area will be marked with construction pegs or other temporary measures.	Minimise unnecessary clearing
27.		✓			<p>Prepare and implement a <b>Vegetation Clearing Management Plan</b>:</p> <ul style="list-style-type: none"> <li>▪ Cleared vegetation will be stockpiled and respread for rehabilitation where possible, and excess burnt or otherwise disposed of.</li> <li>▪ 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 DIPE prior to dumping</li> <li>▪ Previously disturbed areas will be utilised where possible</li> <li>▪ Where possible low impact construction techniques will be employed in all environmentally sensitive areas.</li> <li>▪ Construction personnel will be inducted about the importance of vegetation protection.</li> <li>▪ Sensitive vegetation communities in the vicinity of construction activities will be marked to ensure that these areas are avoided by a sufficient distance.</li> </ul>	Minimise the effects of vegetation clearing activities
28.	✓	✓		✓	<p>Prepare and implement a <b>Rehabilitation Management Plan</b> prior to construction for temporarily disturbed areas. The plan will include:</p> <ul style="list-style-type: none"> <li>▪ Restrict use to native species</li> <li>▪ Top soil management</li> <li>▪ Species suitability will be determined in consultation with experts in rehabilitation techniques in tropical environments.</li> </ul>	Minimise the effects of vegetation clearing activities. Ensure that the area is suitably rehabilitated with acceptable levels of risk and impact remaining to surface and groundwater beneficial uses

Id No	Implementation phase				Management Commitment/Action	Objective
	Design	Construction/Commission	Operation	Decommissioning		
29.		✓	✓		Environmental and heritage values of routes chosen for access roads, laydown areas and borrow pits will be comprehensively assessed prior to disturbance.	Minimise the impacts on areas of environmental or heritage significance
30.	✓	✓			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.	Minimise the impacts of vegetation clearing on communities and species of conservation significance
31.		✓	✓	✓	Prepare and implement a <b>Fire Management Plan</b> .	Minimise the impact of fire on project infrastructure and the surrounding environment
<b>Introduction and Exotic Species/Ballast Water Exchange</b>						
32.		✓	✓	✓	Prepare and implement a <b>Ballast Water Management Plan</b> : <ul style="list-style-type: none"> <li>▪ Include requirement to abide by AQIS guidelines in contracts for marine activities</li> <li>▪ Implement vetting procedures for trading tankers, installation, support and decommissioning vessels</li> <li>▪ Restrict ballast water exchange to deep ocean waters</li> <li>▪ Implement vetting procedures for the Jack-up, pipe-laying vessels, condensate trading tankers, installation and support vessels throughout the various phases of the Project.</li> </ul>	Prevent introduction of the introduced species
33.	✓	✓	✓	✓	Prepare and implement an <b>Exotic Species and Weed Management Plan</b> , which will incorporate a <b>Weed Monitoring Programme</b> .	Minimise the introduction and spread of weeds
34.	✓				All existing weeds infestations will be treated at the project area, along access routes and at borrow pits, prior to construction activities.	Minimise the introduction and spread of weeds

Id No	Implementation phase				Management Commitment/Action	Objective
	Design	Construction/ Commission	Operation	Decommissioning		
<b>Terrestrial Fauna</b>						
35.		✓			<p>Prepare and implement a <b>Fauna Management Plan</b>. Impacts of trenches upon fauna will be minimised by:</p> <ul style="list-style-type: none"> <li>▪ Restricting length of trenches between escape ladders.</li> <li>▪ Leave the pipe trench open for the minimum period of time.</li> <li>▪ Ensuring that trench excavation is progressive and qualified personnel will continually monitor and remove any trapped fauna species from the trench daily</li> <li>▪ Locating soft plugs and trench breakers where required to allow fauna to escape/cross.</li> <li>▪ Monitoring of the open trench to be undertaken by expert wildlife personnel and animals identified, recorded and released</li> </ul>	To minimise the impact of construction activities on fauna and habitats.
36.		✓	✓		Where possible restrict vehicle travel to access routes during daylight hours, avoiding dusk and dawn.	Minimise fauna casualties
37.		✓			Where possible large mature fruiting trees will be avoided during clearing.	Minimise the effect of habitat loss and fragmentation associated with the project
38.		✓	✓		Prior to construction report large bird nesting sites to the environmental officer so that they can be assessed prior to disturbance.	Minimise the impact on fauna species of conservation significance
39. *		✓			Undertake construction in the most benign season (the dry season).	Minimise capture and mortality of fauna in the pipeline trench
40.		✓	✓		Inspect vehicles and equipment for cane toads prior to crossing the Daly River.	To prevent the spread of introduced species
41.		✓			Report cane toad sightings in project area.	To prevent the spread of introduced species
42.		✓	✓		Ban all domestic animals from the project area.	To prevent the spread of introduced species

Id No	Implementation phase				Management Commitment/Action	Objective
	Design	Construction/ Commission	Operation	Decommissioning		
<b>Biting Insects</b>						
43.	✓	✓	✓		Prepare and implement a <b>Biting Insects Management Plan</b> .	To prevent the spread of disease and introduction of pests
<b>Archaeology and Cultural Heritage</b>						
44.		✓			Prepare and implement a <b>Cultural Heritage Management Plan</b> : <ul style="list-style-type: none"> <li>▪ Archaeologist to supervise pipeline trenching from HWM to the plant site.</li> <li>▪ 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.</li> </ul>	To protect cultural heritage
45.		✓			The area to be disturbed around the Shell Midden area is appropriately fenced.	To protect cultural heritage
46.		✓			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.	To protect cultural heritage
<b>Socio-Economic</b>						
47.		✓	✓	✓	Issue Notice to Mariners alerting them of development and associated activities.	Ensure that the risk to fisheries is as low as reasonably practicable and complies with acceptable standards.
48.		✓	✓	✓	In consultation with local groups prepare and implement a <b>Social Impact Management Plan</b> .	Minimise impacts on stakeholders and the community.
<b>Transport and Infrastructure</b>						
49.	✓	✓	✓		Prepare and implement a <b>Road Maintenance Plan</b> .	To ensure that the roads are maintained and restored to their original state or better
50.		✓	✓		Prepare and implement a <b>Traffic Management Plan</b> .	Minimise the impact on road users

Id No	Implementation phase				Management Commitment/Action	Objective
	Design	Construction/ Commission	Operation	Decommissioning		
<b>Environmental Management</b>						
51.			✓		Implement an <b>Environmental Management System</b> and obtain ISO14001 certification.	To manage and minimise environmental impacts and continually Improve environmental performance.
52.	✓	✓			Prepare and implement <b>Construction Environmental Management Plans (EMPs)</b> for onshore activities and <b>Environment Plans (EPs)</b> for offshore activities.	To manage environmental aspects associated with the construction phase
53.	✓	✓	✓		Prepare and implement <b>Commissioning and Operation EMPs</b> .	To manage environmental impacts during commissioning and operation
54.	✓	✓	✓	✓	Prepare and update a <b>Blacktip Project Environmental Hazard Register</b> .	To manage all environmental aspects.
55.	✓	✓	✓	✓	All personnel working on site will undertake environmental and cultural inductions before commencing site work.	To manage and minimise environmental impacts.
56.		✓	✓	✓	Develop <b>Preliminary Onshore &amp; Offshore Decommissioning Plans</b> . Plans to include “drivers, costing and timing” and rehabilitation requirements for ‘permanently’ disturbed areas.	To manage and minimise environmental impacts associated with decommissioning.
57.					Contract tender evaluation to incorporate: <ul style="list-style-type: none"> <li>▪ HSE performance</li> <li>▪ EMP compliant to regulatory and Woodside requirements</li> <li>▪ Auditing of compliance including corrective actions</li> <li>▪ Workshops and inductions for all staff and contractors focussed on HSE management and performance</li> <li>▪ Presence of on-site HSE Representative during construction activities.</li> </ul>	
<b>Health Safety and Emergency</b>						
58.		✓	✓	✓	Maintain a gazetted safety exclusion zone of 500m radius from the outer edge of the Blacktip wellhead platform and associated structures or equipment.	Protect the facilities and to reduce the risk of marine collisions

Id No	Implementation phase				Management Commitment/Action	Objective
	Design	Construction/Commission	Operation	Decommissioning		
59.		✓	✓	✓	Implement an <b>Emergency Response Plan (ERP)</b> which will include an <b>Oil Spill Contingency Plan</b> for both offshore and onshore related spills.	Minimise the risk to the receiving environment, workers and public
60.		✓	✓		Prepare and implement a <b>Health Programme</b> .	Minimise health risks to workers and local community
61.		✓	✓	✓	Prepare and implement a <b>Safety Management Plan</b> .	Minimise risks to workers and local community
62.		✓	✓		Prepare and implement a <b>Fire Management Plan</b> .	Protect the facilities and to reduce the risk of fire
63.		✓			Erect temporary fences along the pipeline corridor where required.	Protect the public and livestock



■ **Table 15- 3 Framework Ballast Water EMP**

<b>Ballast Water Management Plan Format</b>	
<b>Management Issues</b>	<ul style="list-style-type: none"> <li>■ The potential for the introduction of exotic marine species in ballast water</li> <li>■ Pollution of marine environment by hydrocarbon contaminated ballast water</li> </ul>
<b>Objectives</b>	To minimise the potential environmental impacts associated with the discharge of ballast water
<b>Management and Monitoring Strategies</b>	<ul style="list-style-type: none"> <li>■ Vetting procedures for the Jack-up, pipe-laying vessels, condensate trading tankers, installation and support vessels will be used throughout the various phases of the Blacktip Project. These vetting procedures will require all vessels to have segregated ballast water tanks to minimise the potential for contaminated ballast water to be discharged.</li> <li>■ All vessels will comply with all relevant legislation including MARPOL, <i>Northern Territory Marine Pollution Act</i>, <i>Australian Quarantine Act</i> and the AQIS guidelines for ballast water management where such are applicable.</li> <li>■ Segregated ballast tanks will be used on the Jack-up, laybarge and support vessels to prevent hydrocarbon contamination of the ballast water.</li> </ul>
<b>Reporting</b>	Report these as required.

## 15.5 Construction Environmental Management Plans

### ■ Table 15- 4 Framework Turtle EMP

<b>Turtle Management Plan Format</b>	
<b>Management Issues</b>	<ul style="list-style-type: none"> <li>■ Construction activities, including installation of the pipeline, coincides with the period in which turtle nesting occurs.</li> <li>■ Construction operations will be carried out on a 24 hour basis</li> <li>■ Construction must be illuminated at night for safety reasons, and subsequently there is the possibility of light spill affecting turtles.</li> </ul> <p>Construction activities have the potential to impact on turtles by:</p> <ul style="list-style-type: none"> <li>■ Direct loss of habitat</li> <li>■ Construction lighting disorientating turtles and hatchlings</li> <li>■ Construction vibration affecting turtles hatching success.</li> </ul>
<b>Objectives</b>	To minimise the impact of construction activities on turtle nesting and hatchlings activity
<b>Management</b>	<p>Restricting shore crossing construction activities and personnel to a 60 wide construction corridor (beach is approximately 700 m wide). Fencing the construction corridor to prevent turtles entering and direct turtles back to water after nesting.</p> <p>Minimise night time shore crossing construction activities where possible.</p> <p>Monitoring of nesting activity at the proposed pipeline crossing beach and beaches to the north and south by dedicated, trained personnel which includes:</p> <ul style="list-style-type: none"> <li>■ Assisting or coaxing disorientated turtles back to the water after nesting, as required.</li> <li>■ Removal and translocation of nests to Yelcherr Beach to the south.</li> <li>■ Enclosing transplanted nests so hatchlings can be collected and returned to the proposed pipeline crossing beach for imprinting of natal cues.</li> <li>■ Restoration of the proposed pipeline crossing beach profile to the pre-construction shape.</li> </ul>
<b>Monitoring</b>	Monitoring of nesting activity during construction and move nests to safe location
<b>Reporting</b>	<p>Reports will be compiled on:</p> <ul style="list-style-type: none"> <li>■ the number of turtles that nested on Yelcherr beach during construction of the pipeline landfall</li> <li>■ the numbers of eggs relocated to the hatchery</li> <li>■ the hatching success of nests from within the hatchery and those nests left to hatch on neighbouring beaches.</li> </ul>

■ **Table 15-5 Framework Waste EMP**

<b>Waste Management Plan Format</b>	
<b>Management Issues</b>	<p>During construction, waste will comprise three main streams:</p> <ul style="list-style-type: none"> <li>■ Solid waste including construction, domestic and green waste;</li> <li>■ Liquid waste including sanitary wastewater; and</li> <li>■ Used oils and greases.</li> </ul> <p>Volumes associated with these waste streams cannot be defined at this stage.</p> <p>Waste Management Issues include:</p> <ul style="list-style-type: none"> <li>■ Disposal and storage of construction waste, excess materials or surplus excavated material;</li> <li>■ Disposal and storage of domestic and green waste;</li> <li>■ Disposal of liquid wastes ;</li> <li>■ Disposal of used oils and greases;</li> <li>■ Waste, if inappropriately managed, has potential to contaminate groundwater and surface water and pose a risk to human health leading to; <ul style="list-style-type: none"> <li>— Spread of disease through the introduction of vermin;</li> <li>— Generation of leachate leading to contamination of groundwater and surface water, which could adversely impact local ecosystems;</li> <li>— Spread of litter and odour; and</li> <li>— Creation of fire hazards.</li> </ul> </li> </ul>
<b>Objective</b>	<p>Manage waste according to Woodside's Environmental Standards and Aspirations document (Woodside 2003c) and relevant Woodside guidelines and legislative requirements.</p> <ul style="list-style-type: none"> <li>■ Identify opportunities to prevent and/or reduce waste generation from the proposed development through design and operation standards.</li> <li>■ Identify opportunities to re-use, recycle or reprocess waste generated during all phases of the proposed development.</li> </ul>
<b>Targets</b>	<p>Compliance with the Northern Territory Government's Waste Management and Pollution Control Act 1998;</p>
<b>Management and Monitoring Strategies</b>	<ul style="list-style-type: none"> <li>■ Required waste management plans for each Construction Contract, based on the waste management hierarchy of waste reduction, reuse and recycling.</li> <li>■ Ensure all waste is contained appropriately, taking into consideration fire safety, pest and odour control, and protection of water and soil resources.</li> <li>■ Treated and/or dispose of sewage and putrescible in accordance with regulatory requirements.</li> <li>■ Minimise and recycle waste where practicable, or dispose of at approved facilities.</li> <li>■ Reuse green waste in rehabilitation wherever possible.</li> <li>■ Segregate used oils and greases from other waste and dispose of by recycling, incineration or landfilling, according to relevant legislation and guidelines.</li> <li>■ Make visual inspections for litter and general waste (and clean up if required) within and around the site perimeter.</li> </ul>

<b>Waste Management Plan Format</b>	
	<ul style="list-style-type: none"><li>■ Inspect waste storage and disposal facilities to ensure they are functioning sufficiently and dealing adequately with the quantities of waste.</li></ul>
<b>Reporting</b>	Details of waste production will be compiled, including type, amount and disposal method, to track final destinations and identify opportunities for improvement.

■ **Table 15-6 Framework Dust EMP**

<b>Dust Management Plan Format</b>	
<b>Management Issues</b>	<p>Dust emissions may adversely affect vegetation and fauna, human health and safety and public amenity. Due to the distance of the proposed site from the nearest residential areas no impact residents is expected.</p> <p>Dust impacts on vegetation and fauna and the local workforce are possible during construction works and will need to be managed.</p> <p>During construction dust will be generated as a result of:</p> <ul style="list-style-type: none"> <li>■ Clearing of vegetation</li> <li>■ Earthmoving activities</li> <li>■ Truck unloading</li> <li>■ Vehicular movement on unsealed tracks</li> <li>■ Blasting (if required)</li> <li>■ Wind action on cleared/graded areas, stockpiles (topsoil/waste/excess)</li> <li>■ Spillage of soil and other materials onto roads.</li> </ul>
<b>Objective</b>	To ensure that dust generated during construction does not cause any environmental or human health problems.
<b>Performance Indicators</b>	<ul style="list-style-type: none"> <li>■ Northern Territory Work Health (Occupation Health and Safety Regulations), 2003</li> <li>■ Construction activities conform to all dust control strategies;</li> <li>■ No complaints logged on proponents register; and</li> <li>■ No visible dust crossing the site boundary or resulting from accidental spills offsite.</li> </ul>
<b>Management and Monitoring Strategies</b>	<ul style="list-style-type: none"> <li>■ Inform the construction contractor of the requirements to minimise ambient dust levels through an induction programme.</li> <li>■ Maintain good housekeeping practices to ensure there is no accumulation of waste materials, within the lease area, that may generate dust.</li> <li>■ Ensure that vehicles and machinery are properly maintained or covered to minimise air emissions</li> <li>■ Regularly water unsealed roads, exposed surfaces and stockpiles with water tankers/carts using non-saline water.</li> <li>■ Exposed surfaces will be minimised.</li> </ul>
<b>Reporting</b>	Develop reporting procedures consistent with regulatory, local and project requirements.

■ **Table 15-7 Framework Noise EMP**

<b>Noise Management Plan Format</b>	
<b>Management Issues</b>	<p>Noise during construction will be highly variable. Plant and pipeline construction activities will increase the noise levels within and immediately adjacent to the site. Due to the distance from Wadeye, noise impacts on the community are not expected to occur.</p> <p>Noise from the construction phase of the project will be generated by:</p> <ul style="list-style-type: none"> <li>■ General civil or earthworks operations;</li> <li>■ Blasting (if required);</li> <li>■ Construction works on site</li> <li>■ Traffic of vehicles and excavators etc.</li> </ul>
<b>Objective</b>	To minimise the impacts of noise on the amenity of the surrounding areas during the construction phase of the project.
<b>Performance Indicators</b>	<ul style="list-style-type: none"> <li>■ Compliance with the provisions of the Northern Territory Government's Draft Waste Management and Pollution Control (Noise) Regulations;</li> <li>■ Construction Activities undertaken in accordance with AS 2436-1981 "Guide to Noise Control on Construction, Maintenance and Demolition sites".</li> </ul>
<b>Management and Monitoring Strategies</b>	<ul style="list-style-type: none"> <li>■ Inform all employees and contractors of the importance of minimising noise levels through an induction programme.</li> <li>■ Issue all site personnel with protective hearing equipment if required.</li> <li>■ Investigate methods of controlling noise and take actions to control noise if unacceptable noise levels occur. Control methods may include:               <ol style="list-style-type: none"> <li>a) Use of silencers;</li> <li>b) Use of exhaust mufflers; a</li> <li>c) Repair, modification or replacement of a noisy item with a quieter item.</li> </ol> </li> <li>■ Where possible, conduct excessively noisy activities between 7am–7pm to reduce annoyance.</li> <li>■ Maintain and monitor the noise control strategies to determine effectiveness</li> </ul>
<b>Reporting</b>	Develop reporting procedures consistent with regulatory, local and project requirements

■ **Table 15-8 Framework Lighting EMP**

<b>Lighting Management Plan Format</b>	
<b>Management Issues</b>	<p>Construction of the plant and laydown area will result in increased lighting around the sites and at the beach. Light spill has the potential to impact upon fauna, particularly turtle hatchlings. While light management is therefore most important near the ocean, a “glow” from a facility inland can be disruptive if visible from the beach.</p> <p>The impact of light spill on visual amenity in the surroundings needs to be considered.</p> <p>Light spill will be generated by:</p> <ul style="list-style-type: none"> <li>■ Construction lights</li> <li>■ Plant lighting – interior and exterior</li> <li>■ Lighting at the landfall site</li> </ul> <p>Impacts to be managed are:</p> <ul style="list-style-type: none"> <li>■ Attraction of biting insects</li> <li>■ Impacts on fauna</li> <li>■ Impacts on visual amenity</li> <li>■ Safety of construction crew</li> </ul>
<b>Objective</b>	Minimise negative impacts upon local fauna or visual amenity resulting from light spill from the plant or landfall site.
<b>Performance Indicators</b>	<ul style="list-style-type: none"> <li>■ Compliance with AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting; and</li> <li>■ Minimise faunal impacts.</li> </ul>
<b>Management and Monitoring Strategies</b>	<p>Light spill will be managed by:</p> <ul style="list-style-type: none"> <li>■ Confining construction activities to daylight hours where possible.</li> <li>■ Select lights so that the light spill is limited to the greatest extent possible commensurate with functional and safety requirements.</li> <li>■ Lighting design will take into account effects on biting insects.</li> <li>■ Particularly ensure that light spill over the plant site (contributing to a “glow”) is minimised.</li> </ul>
<b>Reporting</b>	Develop reporting procedures consistent with regulatory, local and project requirements

■ **Table 15-9 Framework Sediment & Erosion Control EMP**

<b>Erosion Management Plan Format</b>	
<b>Management Issues</b>	<p>Removal of vegetation and disturbance of soils during construction exposes the underlying soils and can lead to soil loss via wind or water erosion.</p> <ul style="list-style-type: none"> <li>■ Loss of topsoil and sub-soils</li> <li>■ Siltation and sedimentation of land and water</li> <li>■ Reduced potential for rehabilitation success</li> <li>■ Long term stability of disturbed areas</li> <li>■ The requirement for costly rectification measures</li> </ul>
<b>Objective</b>	<p>To minimise soil disturbance, degradation and erosion.</p> <p>To minimise turbidity impacts on marine and surface and ground waters.</p> <p>To optimise rehabilitation success.</p>
<b>Targets</b>	<ul style="list-style-type: none"> <li>■ No accelerated erosion during and post construction.</li> <li>■ Erosion control structures in place prior to significant rain events and adequately maintained.</li> <li>■ No visible increase in the turbidity of marine and surface waters.</li> <li>■ Topsoil and vegetation matter reused in rehabilitation and landscaping.</li> </ul>
<b>Management Strategies</b>	<ul style="list-style-type: none"> <li>■ The total area to be disturbed will be restricted to the minimum area required to construct.</li> <li>■ A site-specific erosion and sediment control plan will be developed and implemented in accordance with the guidelines in the NT Soil Erosion and Sediment Control Guidelines (Sedman 2000).</li> <li>■ Construction activities involving significant land disturbance will be confined to the 'dry' season as much as possible.</li> <li>■ Construction of the shore crossing and access and lay down areas, which present a higher risk of erosion, will be prioritised for construction as early as possible in the dry season.</li> <li>■ Vegetation will be cleared progressively to minimise the period that bare soil is left exposed to erosion.</li> <li>■ Vegetation will be stockpiled and will be reused to stabilise the work areas and in rehabilitation.</li> <li>■ Topsoil will be stripped and stockpiled in stabilised piles and will be reused in rehabilitation and landscaping.</li> <li>■ Temporary drains and banks, stabilised to prevent erosion in areas of high water flows, will be installed where required to control surface runoff.</li> <li>■ Sediment traps and silt fences will be installed to minimise soil loss from the working areas where necessary.</li> <li>■ Rehabilitation of disturbed areas will be undertaken as soon as possible following construction.</li> <li>■ A storm water and drainage management system will be developed and implemented for the plant site.</li> </ul>
<b>Monitoring</b>	<p>Monitoring of the effectiveness of erosion control will be undertaken regularly during and post construction, with particular attention paid to the shore crossing, soil and vegetation stockpiles, and crossings of drainage lines along access tracks.</p> <p>Rehabilitation success will be monitored.</p>
<b>Reporting</b>	<p>Develop reporting procedures consistent with regulatory, local and project requirements</p>



■ **Table 15-10 Framework Groundwater Protection EMP**

<b>Groundwater Protection Management Plan Format</b>	
<b>Management Issues</b>	<p>Shallow aquifers are present in the sandstones, siltstones and claystone sediments around the proposed development. The aquifers supply domestic water to local communities including Wadeye, and support wetlands and spring-fed vegetation. Local aquifers are of high quality and local importance, and therefore require a high level of protection.</p> <p>Spillage or leaking of chemicals on the site may result in contamination of this groundwater, preventing its use for drinking or domestic water supply or potentially damaging local waterways and vegetation.</p> <ul style="list-style-type: none"> <li>■ Chemical management on site to minimise the risk of spillage or leaking.</li> <li>■ Design of drainage on site to isolate potentially contaminated water.</li> </ul>
<b>Objective</b>	<p>To maintain the quality of groundwater; and</p> <p>To minimise the potential for groundwater contamination</p>
<b>Targets</b>	<ul style="list-style-type: none"> <li>■ Meet criteria as appropriate from the ANZECC Guidelines.</li> <li>■ Maintain groundwater quality at levels within 10% of baseline measurements.</li> </ul>
<b>Management and Monitoring Strategies</b>	<ul style="list-style-type: none"> <li>■ Undertake baseline groundwater monitoring to characterise groundwater at the site;</li> <li>■ Construct bunds around condensate tanks and other chemical storage or handling equipment according to appropriate legislative requirements and Australian Standards 1940 and 3740;</li> <li>■ Establishing and maintaining a Hazardous Materials Register detailing the location and quantities of hazardous substances including their storage, use and disposal;</li> <li>■ Design site drainage systems to separate potentially contaminated stormwater for treatment and disposal;</li> <li>■ Maintain ancillary infrastructure to identify and corrosion or leaks;</li> <li>■ Undertake groundwater monitoring to provide information about environmental performance and hydrological impacts.</li> <li>■ Train operators in implementation of safe work practices to minimise risks of spillage.</li> <li>■ Implement contingency plans if a spill or overflow incident occurs.</li> </ul>
<b>Reporting</b>	<p>Develop reporting procedures consistent with regulatory, local and project requirements</p>

■ **Table 15-11 Framework Vegetation Clearing EMP**

<b>Vegetation Clearing Plan Format</b>	
<b>Management Issues</b>	<p>Native vegetation will be cleared to construct the shore crossing, onshore export pipeline and gas plant.</p> <p>Construction activities have the potential to negatively impact on terrestrial vegetation and flora by:</p> <ul style="list-style-type: none"> <li>■ removing native vegetation</li> <li>■ disturbing native vegetation and flora outside of approved work areas</li> <li>■ destabilising the sand dunes that protect landward vegetation communities and habitats outside of the project area</li> <li>■ disturbing areas of potential environmental sensitivity</li> <li>■ introducing weed species and causing changes to fire regimes.</li> </ul>
<b>Objectives</b>	<p>To prevent impacts on vegetation and flora adjacent to work areas.</p> <p>To prevent impacts on vegetation communities of conservation significance.</p> <p>To prevent the introduction and spread of weeds.</p> <p>To prevent changes to fire regimes.</p>
<b>Targets</b>	<ul style="list-style-type: none"> <li>■ No disturbance to vegetation outside of the approved working areas.</li> <li>■ No disturbance to sensitive vegetation communities, especially the monsoon vine forests that occur near to the working area, drainage lines traversed by access tracks and the coastal inlets at Injin Beach and the southern end of Yelcherr Beach.</li> <li>■ Rapid restoration of vegetative cover on the sand dunes following construction of the shore crossing.</li> <li>■ No new weed species introduced to the project area.</li> </ul>
<b>Management Strategies</b>	<ul style="list-style-type: none"> <li>■ The total area to be cleared will be restricted to the minimum area required to construct.</li> <li>■ Boundaries of the working area will be clearly marked on all construction drawings and flagged on the ground.</li> <li>■ Clearing will be staged to minimise the time between clearing and rehabilitation.</li> <li>■ Traditional Owners will be advised prior to any significant clearing of vegetation.</li> <li>■ Areas required during construction for lay down, access roads, turning circles and sourcing of construction materials will not be located near to areas of environmental sensitivity.</li> <li>■ Sensitive vegetation communities in proximity to working areas will be fenced off.</li> <li>■ Construction of access tracks in the vicinity of water courses, and the pipeline shore crossing, will take place as early as possible in the dry season.</li> <li>■ Cleared vegetation will be used as far as possible to rehabilitate cleared areas.</li> <li>■ Excess vegetation (for example at plant site) will be burnt or otherwise used for timber or firewood, and windrows will be destroyed.</li> <li>■ A Rehabilitation Management Plan will be developed.</li> <li>■ A Exotic Species and Weed Management Plan will be developed.</li> <li>■ A Fire Management Plan will be developed.</li> </ul>
<b>Monitoring</b>	<p>Monitoring of vegetation disturbance adjacent to the working areas will be undertaken during construction.</p> <p>Rehabilitation success will be monitored in accordance with the Rehabilitation Management Plan.</p>
<b>Reporting</b>	<p>Unauthorised clearing or disturbance of vegetation will be reported to the Office of Environment and Heritage.</p> <p>Reports on monitoring will be retained in the Construction EMP.</p>

■ **Table 15-12 Framework Terrestrial Fauna EMP**

<b>Fauna Environmental Management Plan Format</b>	
<b>Management Issues</b>	<p>The construction of the shore crossing, onshore pipeline and plant site will directly impact on fauna habitats within the area of disturbance.</p> <p>Construction activities have the potential to impact on terrestrial fauna by:</p> <ul style="list-style-type: none"> <li>■ increasing activity levels, vehicle movement, noise and dust;</li> <li>■ habitat removal and fragmentation;</li> <li>■ disturbing sensitive monsoon vine forest, riparian, and wetland habitats;</li> <li>■ capture in open excavations; and</li> <li>■ introduction and spread of exotic fauna species.</li> </ul>
<b>Objective</b>	<p>To prevent impacts on fauna and habitats outside of the working areas.</p> <p>To prevent impacts on sensitive fauna habitats</p> <p>To prevent the spread of exotic fauna species.</p>
<b>Targets</b>	<ul style="list-style-type: none"> <li>■ No disturbance of habitats outside of the approved working areas.</li> <li>■ No disturbance of sensitive fauna habitats.</li> <li>■ No Cane Toads introduced on construction equipment and vehicles.</li> <li>■ No increase in the numbers of feral animals in the area.</li> </ul>
<b>Management Strategies</b>	<ul style="list-style-type: none"> <li>■ Clearing of vegetation will be restricted to the minimum amount.</li> <li>■ Clearing will be staged to minimise the amount of vegetation cleared at any one time.</li> <li>■ Construction activities involving excavations will be restricted to the 'dry season' as much as possible to avoid the times of year when fauna are most active.</li> <li>■ Construction activities in the vicinity of sensitive fauna habitats at the shore crossing and at watercourse crossings along the access routes will be prioritised for as early as possible in the dry season.</li> <li>■ Areas required during construction for lay down areas, access roads, turning circles and sourcing of construction materials will not be located near sensitive habitat area.</li> <li>■ Sensitive fauna habitats that occur in proximity to work areas will be fenced off.</li> <li>■ Open trenches will be inspected frequently, and fauna identified and released; dead fauna will be preserved and deposited with the NT Museum.</li> <li>■ A Rehabilitation Management Plan will be developed.</li> <li>■ The construction workforce will be briefed about the importance of protecting vegetation communities, fauna species and habitats.</li> <li>■ Trench plugs with slopes no greater than 50% will be installed to allow fauna to escape from open excavations.</li> </ul>
<b>Monitoring</b>	<p>Monitoring of habitat disturbance adjacent to the working areas will be undertaken for the duration of construction.</p> <p>Excavations will be regularly inspected by an experienced wildlife handler while open.</p> <p>Weeds and feral animals will be monitored in accordance with an Exotic Species and Weed Management Plan.</p>
<b>Reporting</b>	<p>Fauna data from open trench inspections will be collated and reported to NT Parks and Wildlife Service in accordance with a Permit to Take Wildlife for Commercial Purposes.</p> <p>In the event that nest sites of 'threatened' or 'migratory' bird species are identified they will be reported to the NT Parks and Wildlife Service.</p> <p>Reports on monitoring will be retained in the Construction EMP.</p>

■ **Table 15-13 Framework Biting Insects EMP**

<b>Biting Insects Management Plan Framework Format</b>	
<b>Management Issues</b>	Biting insects can be a serious nuisance and health problem for workers and local communities. Existing sources of biting insects will contribute most biting insect pests. Construction works and poor management of constructed facilities can create additional habitats and sources of biting insects.
<b>Objective</b>	To prevent the creation of biting insects breeding sites. To minimise the impacts of biting insects on the construction workforce.
<b>Targets</b>	No biting insect breeding sites created during construction. Minimal impacts from biting insects on the construction workforce.
<b>Management Strategies</b>	<p><b>Biting midges</b></p> <ul style="list-style-type: none"> <li>■ Lighting will be designed to minimise impacts from biting insects where possible.</li> <li>■ The use of bifenthrin barrier treatments around personnel areas will be implemented to reduce adult biting midge numbers that could affect the workforce.</li> <li>■ The workforce and visitors will be notified of a potential minor to moderate biting midge pest problem in the development area in the months of August to November.</li> </ul> <p><b>Mosquitoes</b></p> <ul style="list-style-type: none"> <li>■ Periodic personal protection against mosquitoes at the Blacktip Project area to reduce pest problems and exposure to mosquito borne disease will be required.</li> <li>■ Possible malaria cases will be reported as soon as possible to health authorities, and mitigation measures (eg., isolation and treatment) will be put in place to ensure potential and actual cases are kept away from mosquitoes.</li> <li>■ High use personnel areas will be sited as far away as possible from Swamp 1 (the swamp 1.5 km north).</li> <li>■ Any vessels and cargo such as machinery or other receptacles capable of holding small amounts of water from overseas or Queensland, and road transport cargo from Queensland or Tennant Creek will be inspected as per DHCS guidelines to prevent the introduction of the dengue mosquito.</li> <li>■ Mosquito larval control with methoprene 30 day residual pellets may be implemented for Swamp 1 to control salt marsh mosquitoes before October monthly high tide, and every 30 days until end January. This is recommended for at least the construction phase and will be implemented if found to be warranted.</li> <li>■ Bifenthrin barrier treatment will be used where necessary around high use personnel areas, to reduce adult mosquito populations in these areas.</li> <li>■ Subject to agreement from landowners, swamps 1 &amp; 2 may be burned annually when the swamps dry after the wet season.</li> <li>■ Stormwater drains will be constructed in a manner that does not lead to the creation of new mosquito breeding sites.</li> <li>■ The processed water settling ponds will be constructed in a manner that does not lead to the creation of mosquito breeding sites. Hardy native fish species may be stocked in the settling ponds.</li> <li>■ Bunded areas will be managed to prevent mosquito breeding.</li> <li>■ Artificial receptacles will be managed to prevent mosquito breeding.</li> <li>■ Sewage treatment facilities will dispose of effluent through either sprinkler irrigation or to a regularly flushed tidal area, depending on final design considerations. Disposal to a regularly flushed tidal area is the preferred option.</li> <li>■ The laying of the underground pipeline must not result in the ponding of water or impediment of the natural flow of surface water. The land surface, including the windrows, will be re-contoured to original surface profiles to prevent ponding and impediment.</li> </ul>

<b>Biting Insects Management Plan Framework Format</b>	
	<ul style="list-style-type: none"> <li>■ Construction activities will be monitored to ensure activities such as machinery disturbance does not lead to the creation of new mosquito breeding sites.</li> <li>■ The construction of borrow pits must not lead to the creation of mosquito breeding sites, and should be avoided within 1.5 km of personnel areas and 1.5 km of Wadeye residential areas. If borrow areas are used, they will be rehabilitated to prevent the creation of mosquito breeding sites.</li> <li>■ Access roads will be fitted with culverts where necessary, to prevent the upstream ponding of water that can lead to mosquito breeding.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>■ An induction program will be implemented and the results monitored.</li> <li>■ Complaints will be monitored and remedied.</li> <li>■ Plant, equipment, vessels etc will be inspected when they arrive and in the monthly inspection program.</li> <li>■ Monthly inspections of artificial receptacles will be conducted until construction is completed.</li> <li>■ Inspections of Swamps 1 and 2 for burning will be conducted in June or July.</li> <li>■ Implementation and outcomes of monthly methoprene treatments will be monitored.</li> <li>■ Monitoring for areas subject to water ponding will be undertaken monthly for mosquitoes during construction.</li> <li>■ Monitoring of water impoundments and potential breeding sites within the project area will be conducted monthly.</li> <li>■ Monitoring of construction activities will be conducted to prevent creation of new mosquito breeding sites.</li> <li>■ Biting insect minimisation programs, such as bifenthrin treatment, will be monitored.</li> </ul>
<b>Reporting</b>	<p>Cases of people infected with malaria will be immediately reported to the Medical Entomology Branch of the NT Dept of Health.</p> <p>Reports on incidents of larvae, disease, etc, reportable to MEB, will be reported as described in the EMP.</p> <p>Reports on monitoring will be retained in the Construction EMP.</p>

■ **Table 15-14 Framework Exotic Species and Weed EMP**

<b>Exotic Species and Weed Management Plan Format</b>	
<b>Management Issues</b>	The use 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. Vegetation clearing and soil disturbance creates conditions of maximum suitability for the establishment of weed species.
<b>Objective</b>	To prevent the introduction and spread of weed species. To prevent the spread of fauna pests.
<b>Targets</b>	<ul style="list-style-type: none"> <li>■ Existing weed infestations treated prior to construction.</li> <li>■ No new weed species introduced into the project area.</li> <li>■ No Cane Toads transported in construction vehicles and equipment.</li> <li>■ New weed infestations identified, reported and treated in a timely manner.</li> </ul>
<b>Management Strategies</b>	<ul style="list-style-type: none"> <li>■ Existing weed infestations will be identified and treated prior to construction.</li> <li>■ The locations of all work areas, including borrow pits and lay down areas, will be accurately recorded so that they can be monitored for weed infestations post construction.</li> <li>■ Plant, vehicles, equipment and materials will be required to be certified weed and pest free prior to being brought into the project area.</li> <li>■ Construction materials will be certified 'weed free' by the suppliers.</li> <li>■ A washdown pad will be constructed and vehicles, plant and construction components and materials will be subject to washdown prior to entering the project area if not already certified pest-free.</li> <li>■ Washdown wastewater will be collected and disposed of in a manner approved by the regulatory authority.</li> <li>■ Construction and operation workforces will be trained in weed and Cane Toad identification and awareness.</li> <li>■ Systems will be established for reporting of new weed infestations and Cane Toad sightings to DIPE.</li> <li>■ Rehabilitation and landscaping will be undertaken in accordance with a Rehabilitation Management Plan, which will specify that only native vegetation species will be used.</li> <li>■ Domestic animals will not be permitted in the project area.</li> </ul>
<b>Monitoring</b>	A weed monitoring and control program will be implemented prior to the commencement of construction and will continue for the duration of construction and operation.  Regular inspections of vehicles, equipment, construction materials and fill will be undertaken to monitor the success of washdown and other preventative measures.
<b>Reporting</b>	Infestations of 'declared' weed species in project work areas will be reported to the regulatory authority.  Sightings of Cane Toads outside of their current known distribution will be reported to the regulatory authority.  Reports on monitoring will be retained in the Construction EMP.

■ **Table 15-15 Framework Rehabilitation EMP**

<b>Rehabilitation Management Plan Format</b>	
<b>Management Issues</b>	Effective rapid rehabilitation strategies are required to stabilise and restore the land following construction activities so that erosion and establishment of weed species are prevented.
<b>Objective</b>	To maximise rehabilitation success.
<b>Targets</b>	<ul style="list-style-type: none"> <li>■ Rehabilitation work commenced immediately following construction activities.</li> <li>■ Soils stabilised prior to the wet season.</li> <li>■ Rehabilitation works proven to be successful.</li> <li>■ No new weed species introduced into the project area.</li> </ul>
<b>Management Strategies</b>	<ul style="list-style-type: none"> <li>■ A site specific rehabilitation strategy will be developed in consultation with the Traditional Owners and experts in rehabilitation in tropical environments prior to the commencement of construction activities. The strategy will include a rehabilitation timetable and rehabilitation methods proposed for each aspect of the project. The following are examples of actions that will be included in the strategy:               <ul style="list-style-type: none"> <li>■ Vegetative matter and topsoil cleared from the working areas will be stockpiled for use in rehabilitation.</li> <li>■ Rehabilitation will be staged so that recently constructed areas are rehabilitated as soon as practicable.</li> <li>■ The shore crossing will be stabilised with fast growing grass species immediately following construction to minimise wind and water erosion of the sand dunes.</li> <li>■ Only species of flora that naturally occur in the region will be used in rehabilitation.</li> <li>■ Seed for use in rehabilitation will be collected locally where possible.</li> <li>■ Remedial works will be implemented where necessary until the rehabilitation targets are achieved.</li> </ul> </li> </ul>
<b>Monitoring</b>	Rehabilitation works will be monitored monthly following completion of construction activities until rehabilitation targets are achieved.
<b>Reporting</b>	<p>Infestations of 'declared' weed species in project work areas will be reported to the regulatory authority.</p> <p>Reports on monitoring will be retained in the Construction EMP.</p>

■ **Table 15-16 Framework Fire EMP**

<b>Fire Management Plan Format</b>	
<b>Management Issues</b>	<p>There will be an increased risk of fire during the construction phase. Potential fire ignition sources include:</p> <ul style="list-style-type: none"> <li>■ vehicle and plant exhausts;</li> <li>■ sparks from contact with rock;</li> <li>■ cooking or camp fires and cigarettes; and</li> <li>■ deliberate ignition.</li> </ul> <p>Fires pose a threat to human safety and infrastructure. The integrity of the vegetation in and surrounding the project area would be diminished by more frequent fires.</p>
<b>Objective</b>	<p>To prevent uncontrolled fires igniting in the project area.</p> <p>To minimise the potential impacts of fire on the surrounding environment.</p> <p>To manage swamp vegetation for the control of mosquitoes.</p>
<b>Performance Indicators</b>	<ul style="list-style-type: none"> <li>■ No fires ignited by construction activities.</li> <li>■ Fire breaks and controlled burns implemented in accordance with advice from the NT Bushfires Council.</li> <li>■ Annual burns of the swamps north and south of the project area.</li> <li>■ Compliance with the <i>Bushfires Act</i>.</li> </ul>
<b>Management Strategies</b>	<ul style="list-style-type: none"> <li>■ Construction workforce will be trained in fire awareness, prevention and safety.</li> <li>■ A fire fighting unit and persons trained in fire response will be readily available at all times during construction.</li> <li>■ Spark arrestors will be required for all earthmoving equipment.</li> <li>■ Cooking and camp fires will be prohibited.</li> <li>■ Fire breaks will be established and maintained for the duration of construction and operation.</li> <li>■ Swamps 1 and 2 will be burnt annually to reduce the potential mosquito problem.</li> <li>■ Vegetation in the project area and along road verges will be managed to minimise fire risk.</li> <li>■ Stockpiles of vegetation which cannot be used in rehabilitation will probably be burnt in accordance with this Fire Management Plan.</li> <li>■ An Emergency Response Plan will be developed and implemented.</li> <li>■ A Weed Management Plan, incorporating weed monitoring and control, will be developed and implemented prior to construction.</li> </ul>
<b>Monitoring</b>	<p>Review feedback from Traditional Owners and Bushfires Council.</p>
<b>Reporting</b>	<p>All incidences of uncontrolled fires ignited by construction activities will be reported to the regulatory authority.</p> <p>Reports on monitoring will be retained in the Construction EMP.</p>



■ **Table 15-17 Framework Traffic EMP**

<b>Traffic Management Plan Format</b>	
<b>Management Issues</b>	<p>Transportation options during construction will use existing roads, boats, barges or a combination these.</p> <p>A temporary construction camp will be provided within the 64 ha onshore footprint to accommodate construction workers. As such commuters to the site are not expected, and the majority of roads use will be to provide supplies to the camp and construction site.</p> <ul style="list-style-type: none"> <li>■ Excess levels of dust produced from heavy vehicle movement;</li> <li>■ Structural damage to municipal roads used as haul roads; and</li> <li>■ Threat to wildlife from increased vehicle movement.</li> </ul>
<b>Objective</b>	To minimise potential traffic impacts and ensure safety of public and local environment during construction
<b>Performance Indicators</b>	<ul style="list-style-type: none"> <li>■ No complaints</li> <li>■ Minimise impact upon wildlife</li> <li>■ Zero-incidents safety record</li> </ul>
<b>Management and Monitoring Strategies</b>	<ul style="list-style-type: none"> <li>■ Inform all personnel of the site rules regarding traffic through an Induction Programme.</li> <li>■ Restrict site traffic to designated internal roadways and suitably sealed or gravelled areas within the approved construction disturbance boundary where practical.</li> <li>■ Adhere to posted speed limit on site.</li> <li>■ Park all vehicles and plant equipment not leaving site in designated areas after use</li> <li>■ Restrict heavy vehicles to travelling only on designated haul routes and ensure they are not loaded beyond legal limits.</li> <li>■ Maintain road pavement condition at or above existing levels and arrange maintenance as necessary.</li> <li>■ Strictly no road travel from site to be attempted during the wet season</li> </ul>
<b>Reporting</b>	Develop reporting procedures consistent with regulatory, local and project requirements

■ **Table 15-18 Framework Cultural Heritage Management Plan (CHMP)**

<b>Cultural Heritage Management Plan Format</b>	
<b>Management Issues</b>	<p>Potential loss or impairment of existing cultural environment through:</p> <ul style="list-style-type: none"> <li>■ Disturbance and destruction of shell midden on Yelcherr Beach through construction of onshore pipelines.</li> <li>■ Further disturbance to sand dunes / shell midden through erosion triggered by construction disturbance.</li> <li>■ Disturbance and destruction of fruit bearing trees through construction of onshore pipelines.</li> <li>■ Disturbance of environments and species that are of cultural significance at all areas of project land disturbance.</li> <li>■ Disturbance to previously unrecorded sites and sub-surface archaeological materials at all areas of project land disturbance.</li> <li>■ Intrusion into the exclusion zone around <i>Walpinthi</i> Reef during construction of the near shore pipeline.</li> <li>■ Unauthorised / inadvertent intrusion into restricted areas (sacred sites) during construction by construction workforce.</li> <li>■ Unauthorised / inadvertent disturbance of cultural heritage sacred sites or objects during construction by construction workforce.</li> <li>■ Unauthorised / inadvertent disregard for cultural difference and sensitivity during construction by construction workforce.</li> <li>■ Inadvertent intrusion into cultural knowledge and practices associated with environments and species</li> </ul>
<b>Objective</b>	<ul style="list-style-type: none"> <li>■ To manage the disturbance and destruction of the shell midden in the onshore pipeline corridor in a way that minimises impact and allows for an appropriate level of scientific research and salvage of archaeological material.</li> <li>■ To manage the disturbance and destruction of the shell midden in the onshore pipeline corridor in a manner that precludes unnecessary damage.</li> <li>■ To protect the remainder of the shell midden from erosion and unauthorised or inadvertent disturbance during the construction period.</li> <li>■ To manage the disturbance of fruit bearing trees and protect fruit bearing trees from unnecessary disturbance.</li> <li>■ To manage the disturbance of environments and species that are of cultural significance.</li> <li>■ To mitigate the impact of inadvertent disturbance of unrecorded sites and sub-surface archaeological material.</li> <li>■ To comply with the <i>Cultural Heritage Act 1991</i> and Northern Territory <i>Aboriginal Sacred Sites Act 1978</i> in relation to disturbance of cultural heritage sacred sites or objects.</li> <li>■ To manage the impact of construction workforce on the social and cultural environment.</li> </ul>
<b>Targets</b>	<ul style="list-style-type: none"> <li>■ No non-compliance with relevant legislation during all phases of the project.</li> <li>■ No instances of disturbance / inadvertent intrusion to cultural heritage sacred sites and objects, areas of cultural significance, unrecorded sites and archaeological material.</li> <li>■ No instances of disregard or insensitivity of cultural difference that may negatively impact the social and cultural environment.</li> </ul>
<b>Management Strategies</b>	<ul style="list-style-type: none"> <li>■ A Detailed Cultural Heritage Management Plan (CHMP) will be developed.</li> <li>■ Appropriate level of archaeological survey to be undertaken for all project areas.</li> <li>■ Appropriate archaeological material identified in the shell midden will be recorded and collected as specified under the statutory authority.</li> </ul>

<b>Cultural Heritage Management Plan Format</b>	
	<ul style="list-style-type: none"> <li>■ The shore crossing will be stabilised and restored in manner that will prevent erosion on the sand dunes and shell midden site.</li> <li>■ Disturbance of fruit bearing trees during construction will be kept to a minimum. Consideration will be given to propagation for rehabilitation.</li> <li>■ Mitigation and reporting measures will be developed in the CHMP to deal with any inadvertent disturbance of previously unrecorded sites and subsurface archaeological materials.</li> <li>■ Intrusion into the exclusion zone around <i>Walpinthi</i> Reef will be kept to a minimum, and undertaken in consultation with traditional Aboriginal owners.</li> <li>■ Construction workforce will be thoroughly briefed on restricted areas, and rules and disciplinary measures will apply where breaches occur.</li> <li>■ Construction workforce will undertake cross-cultural awareness training to minimise the likelihood of inadvertent disregard for cultural difference and sensitivities.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>■ Monitoring of the CHMP will be undertaken against key performance indicators identified in the CHMP.</li> <li>■ Monitoring of the shell midden will occur during and post construction.</li> <li>■ Monitoring of effectiveness of stabilisation of erosion control at the shore crossing will be undertaken during and post construction.</li> <li>■ Monitoring of the activities and impact of the construction workforce on the social and cultural environment will be undertaken during and post construction through the processes established in the social impact management plan (SIMP).</li> </ul>
<b>Reporting</b>	<ul style="list-style-type: none"> <li>■ The results of the archaeological surveys will be reported to the regulatory authority prior to construction.</li> <li>■ Archaeological findings during construction will be reported to the regulatory authority in accordance with reporting and mitigation measures identified in the CHMP.</li> <li>■ Reporting requirements will be identified in the CHMP and the SIMP.</li> </ul>

■ **Table 15-19 Social Impact Management Plan (SIMP)**

<b>Social Impact Management Plan (SIMP) Format</b>	
<b>Management Issues</b>	<ul style="list-style-type: none"> <li>■ Potential impact on society in the Daly River / Port Keats Region (particularly Wadeye) through the following (summarised) issues:               <ul style="list-style-type: none"> <li>■ Lack of understanding of the Blacktip project.</li> <li>■ Language barriers.</li> <li>■ The appropriate methodology for consultations/community education sessions.</li> <li>■ Unrealistic expectation of benefits to be delivered by the project.</li> <li>■ Methodology and timing to communicate more specific information.</li> <li>■ Expectations, capacity and take-up of potential employment and training opportunities.</li> <li>■ Expectations, capacity and take-up of potential business development/contracting opportunities.</li> <li>■ List of concerns expressed by interviewees during the course of the Blacktip SIA consultations.</li> <li>■ Community interaction with non-Indigenous workforce(s).</li> <li>■ Potential for community to react violently to a serious negative social impact event.</li> <li>■ Alcohol and drug issues.</li> <li>■ Security services and communication/interaction with local police.</li> <li>■ Level of female employment in construction workforce.</li> <li>■ Access of construction workforce to recreational areas and town.</li> <li>■ Granting of favours.</li> <li>■ Wider affected Aboriginal community views about project.</li> <li>■ Distribution of land agreement benefits.</li> <li>■ Impacts of possible upgrades to roads and increased traffic.</li> <li>■ Capacity of the community to respond to change.</li> <li>■ Ongoing monitoring of social impacts.</li> </ul> </li> </ul>
<b>Objective</b>	To mitigate or avoid any negative impacts and optimise any positive impacts through an effective SIMP.
<b>Targets</b>	<ul style="list-style-type: none"> <li>■ Successful implementation of the SIMP.</li> <li>■ No instances of serious negative social impact events.</li> <li>■ Close and harmonious relationships between key local stakeholders and the Project.</li> <li>■ Exceeded Key Performance Indicators (KPIs) in social impact strategies.</li> </ul>
<b>Management Strategies</b>	<ul style="list-style-type: none"> <li>■ Phase 2 SI Management Planning</li> <li>■ Immediate commencement of a communications campaign throughout the Daly River / Port Keats Region, in particular at Wadeye.</li> <li>■ Consultation with key stakeholders including (but not limited to) Thamarrurr Regional Council, relevant Territory and Commonwealth agencies and the NLC.</li> <li>■ Conduct of an independently facilitated workshop in Wadeye to receive presentations on the SIA Report and to discuss and formulate potential mitigation / optimization strategies.</li> <li>■ Development of final SIMP, including negotiations with key contributors and participants.</li> <li>■ SIMP in place and ready for implementation by Project Final Investment Decision (FID).</li> </ul> <p>Phase 3: SI Management Plan Implementation</p>

<b>Social Impact Management Plan (SIMP) Format</b>	
	<ul style="list-style-type: none"> <li>■ Progressive increase in development and implementation as the Project moves toward FID.</li> <li>■ Full implementation during construction and operations phases of the Project.</li> </ul> <p>It is expected that the SIMP may include the following type of strategies:</p> <ul style="list-style-type: none"> <li>■ Project communications;</li> <li>■ Cross-cultural exchange/awareness;</li> <li>■ Cultural heritage management;</li> <li>■ Indigenous training and employment;</li> <li>■ Indigenous business development;</li> <li>■ Community/project protection;</li> <li>■ Traffic management;</li> <li>■ Community partnerships.</li> </ul>
<b>Monitoring</b>	<p>Monitoring of the implementation of the SIMP will be undertaken against Key Performance Indicators contained in the Plan.</p> <p>Monitoring of the SIMP will be an ongoing and intensive process during the construction phase of the Project.</p> <p>During the operations phase of the project it is expected that monitoring activity will reduce to the level manageable within normal day to day relationships between key local stakeholders and the Project.</p>
<b>Reporting</b>	<p>Consultation about the performance against KPIs in the SIMP will be held with key local stakeholders on an annual basis.</p>

## 15.6 Operational Environmental Management Plans

### ■ Table 15-20 Flaring Environmental Management Plan

<b>Flaring Operational Management Plan Format</b>	
<b>Management Issues</b>	Flaring at the gas plant will result in greenhouse gas emissions (predominantly CO <sub>2</sub> ), emissions of other combustion products, and noise emissions. Management of the greenhouse gas impacts will occur under the Greenhouse Gas Management Plan.
<b>Objectives</b>	<ul style="list-style-type: none"> <li>■ Minimise impact of flaring on local communities</li> <li>■ Minimise release of combustion products associated with flaring</li> </ul>
<b>Management and Monitoring Strategies</b>	<ul style="list-style-type: none"> <li>■ An absolute 115 dB(A) limit on noise emissions from the boundary will apply to the Blacktip Gas Plant</li> <li>■ Prior to planned maintenance flaring, all receptors will be consulted and given at least 24 hours warning</li> <li>■ Flaring events will be minimised to ALARP</li> </ul>
<b>Reporting</b>	Develop reporting procedures consistent with regulatory, local and project requirements

■ **Table 15-21 Greenhouse Gas Environmental Management Plan**

<b>Greenhouse Gas Operational Management Plan Format</b>	
<b>Management Issues</b>	<p>Release of greenhouse gases through flaring may contribute to the enhanced greenhouse effect.</p> <p>Minimisation of greenhouse gas release will minimise loss of gas and improve plant efficiency.</p>
<b>Objectives</b>	<ul style="list-style-type: none"> <li>■ Minimise flaring and venting of hydrocarbons</li> <li>■ No fugitive emissions</li> <li>■ Monitoring of greenhouse gas emissions</li> </ul>
<b>Management and Monitoring Strategies</b>	<ul style="list-style-type: none"> <li>■ Maximising facility reliability, thereby reducing the likelihood that gas will require flaring due to process upset.</li> <li>■ Monitor and report emissions and periodically assess opportunities to further reduce greenhouse gas emissions over time. Information obtained will be used to enable reporting of emissions, performance reviews and setting reduction targets in line with Woodside's corporate initiatives.</li> <li>■ Minimising releases by ensuring equipment is correctly specified and maintained.</li> <li>■ Minimising flaring and venting of hydrocarbons and fuel gas consumption by using best available technical and procedural solutions at a reasonable cost.</li> </ul>
<b>Reporting</b>	<p>Greenhouse gas quantities emitted will be reported to Woodside for inclusion in the National Greenhouse Inventory and Greenhouse Challenge reporting procedures.</p>

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