

Section 13
Economic & Land Use
Planning Impacts



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13. Economic and Land Use Impacts

13.1 Introduction

This section provides a description and assessment of the potential impacts on local economies and land use that are expected to, or may potentially, occur as a result of the proposed development and discusses the appropriate preventive measures to reduce potential impacts to an acceptable level. Both positive and negative impacts have the potential to materialise.

The potential negative impacts include:

- disturbance or destruction of archaeological and historical heritage sites;
- changes and restrictions to land use.

Potential positive impacts include:

- creation of direct and indirect employment opportunities during the construction phase;
- enhanced revenue streams into the local and Northern Territory economies.

13.2 Land Use and Land Tenure

Impacts

The Blacktip Project is located entirely within the Daly River/Port Keats Aboriginal Lands Trust. This land is utilised predominately by Aboriginal communities for traditional activities such as hunting, fishing and gathering food. Potential temporary and permanent impacts are associated with the loss of access for local aboriginal people during construction and operation. Further, potential impacts include the inappropriate and unapproved movement of project personnel through aboriginal land.

During the conduction of the Social Impact Assessment for the Blacktip Project, it was identified that the area affected by the gas plant and associated infrastructure is not considered significant when compared to the lands available for hunting and gathering (**Section 14**). It is not anticipated that hunting, gathering or fishing activities will be curtailed as a result of the Blacktip Project (IMPAXSIA 2004).

The Blacktip Project is not expected to have any significant impacts on zoning requirements at the shore crossing, along the pipeline route or surrounding the plant site. The Wadeye Land Use Structure Plan and Infrastructure Development Strategy has been developed to provide structure to land use planning within the immediate vicinity of the Wadeye Township.

Preventative and Management Measures

The project infrastructure components have been designed and sited to ensure that impacts on surrounding land use activities are avoided or minimised as far as practicable.

All access to the areas by project personal will be strictly controlled to avoid unauthorised and inappropriate access.

13.3 Infrastructure and Transport

Impacts

Potential impacts on the existing transport network will depend on the anticipated traffic volumes associated with the construction phase of the project. Traffic volumes during operation will be minimal. Potential impacts include:

- Damage to existing road surfaces from heavy construction vehicles entering and leaving site.
- Disruption to existing users of roads primarily during peak construction periods.
- Off-road driving and the creation of tracks or new vehicular paths associated with sourcing fill and construction raw materials.

The development of the onshore component of the Blacktip Project if unmanaged has the potential to place added pressure on existing infrastructure and utilities that are unlikely to have the capacity to deal with this increased demand. This would be most visible during the high intensity short duration construction period. Existing infrastructure and utilities that have the potential to come under pressure if not managed include:

- pressure on existing sewage treatment and disposal facilities in the event that these become the facilities for the project;
- pressure on water supply;
- pressure on local waste facilities.

Preventative and Management Measures

The project will be self sufficient in its requirements for utilities, infrastructure and local access, either through the development of dedicated facilities for the plant, or through the use of existing facilities which may require upgrading in order to handle the increased capacity. Where existing facilities may be used, for example sewerage and waste treatment and disposal, agreements would need to be reached with the local authorities on upgrade requirements and the management of these facilities, particularly during the construction period.

Potential impacts will be mitigated by implementation of the following measures:

- Existing tracks leading into the onshore gas plant will be upgraded in consultation with the regulatory authorities.

- A Traffic Management Plan will be developed by Woodside prior to construction activities commencing as part of the overall Environmental Management Plan for the project.
- Dedicated sewage treatment and disposal facilities will be provided, or alternatively existing facilities will be used subject to them having the necessary capacity and treatment facilities.
- Potable water supplies will be provided from a dedicated bore.
- All operations will be self sufficient with regards to power generation.
- Waste disposal and treatment will be conducted in accordance with regulatory and Woodside's requirements. Local waste disposal facilities will be used where possible, subject to confirmation that necessary handling facilities and capacity is available.

13.4 Military Zones

Impacts

Potential impacts to onshore and offshore military operating zones include loss of training exercise area resulting from project footprint and project related exclusion zones (for example, 500 m exclusion zone around offshore wellhead platform). There is also a potential conflict that exists between aircraft servicing the Blacktip Project and military aircraft using the area for exercise.

Preventative and Management Measures

During consultation the Defence Department 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, given that project related aircraft are likely to fly at a lower altitude (5000 feet) than the military aircraft (NT Dept of Defence, Squadron Leader Busser, *pers comm*, 2004).

Woodside will undertake ongoing consultation with the Defence Department to discuss potential future conflicts and to identify suitable management measures, if required.

13.5 Marine Traffic and Navigation

Impacts

The potential impacts to existing marine traffic and navigation users during construction, operation and decommissioning activities are likely to include:

- loss of access to the area due to the presence of the pipe laybarge, support vessels, drill rig, unmanned wellhead platform and condensate export mooring;
- navigational hazard represented by permanent structures.

Shipping traffic within the Joseph Bonaparte Gulf is considered relatively minimal as outlined in **Section 9.6**. It is therefore envisaged that impacts on existing shipping activity will be minimal.

Preventative and Management Measures

Woodside recognises the potential risk to existing marine traffic. Preventative measures associated with marine traffic are discussed in **Section 11.2** and are also presented in this section for completeness.

A gazetted safety exclusion zone of 500 m radius from the outer edge of the Blacktip wells and associated structures or equipment will be requested from the regulatory authority to protect the facilities and to reduce the risk of marine collisions. This safety zone will appear on Australian navigation charts. Safety equipment such as markers, navigation aids, fog horns and illumination lighting will be installed on the wellhead platform and condensate export mooring. Lights and markers will adhere to the internationally recognised International Association for Lighthouse Authorities (IALA) standards.

13.6 Fisheries

Impacts

The potential impacts to fisheries associated with the proposed development include both negative and positive impacts:

- loss of access to commercial, recreational and traditional fishing grounds due to construction activities and exclusion zones around permanent features;
- loss of livelihood or income resulting from potential oil or chemical spills in the vicinity of the project development;
- disturbance to fish habitat, feeding and spawning areas and migration routes from presence of project;
- ‘snagging’ of fishing nets on subsea equipment;
- exclusion zone may act as an artificial habitat for fish feeding, nursery and development and subsequent long term increase in commercial catches. Research into the effectiveness of marine reserves or exclusion areas has recorded increases in abundance and size of fish within the reserves with spill over effects outside the reserves in some cases (Russ and Alcala 1997).

Potential impacts are likely to be limited when considering that commercial or recreational fishing effort is not intensive in the project area (**Section 9.7**).

Preventative and Management Measures

Woodside will implement the following preventative:

- The offshore gas export, condensate and PW pipelines will be trenched below natural seabed level where possible along the route to prevent the potential for fishing gear to be damaged during trawling activities.
- Construction of the offshore pipeline will be limited to a 60 m corridor to reduce potential impacts to fish habitat.

- Information relating to the location of permanent project components will be provided to the relevant authorities for representation on charts.
- An Oil Spill Contingency Plan will be developed specific to the Blacktip Project (**Section 11.19.2**).

Given that fishing activities in the project vicinity are minimal preventative measures will be implemented to mitigate potential impacts.

13.7 Tourism and Recreation

Impacts

There are no known tourism resorts or activities in the vicinity of the project area. The project area is classified as Aboriginal Freehold land and any access into the area is granted through the NLC. Road access to Wadeye is not open to the general public and the number of visitors is low. Potential negative impacts include the loss of access and wilderness appeal, and the diminishing of natural values. Based on the absence of tourism from the area at present, it can be concluded that impacts on tourism as a result of the Blacktip Project are expected to be minimal. However, any future plans for tourism in the area are currently unknown. Better road access and increased facilities in the area as a result of the project may also assist in the development of the tourist industry.

Preventative and Management Measures

Preventative and management measures are not considered necessary due to the limited tourism and recreational activities existing in the area. Should these industries develop in the vicinity of the Blacktip Project area during the lifetime of the development, appropriate management measures will be developed in consultation with key stakeholders.

13.8 Archaeology

Impacts

Potential impacts on existing archaeology are considered as impacts to marine archaeology (for example historical shipwrecks etc) and impacts to terrestrial archaeology.

Terrestrial Archaeology: Construction of the pipeline shore crossing will destroy a section of the archaeological site, Shell Midden 1, which is a prescribed site under the *Northern Territory Heritage Conservation Act 1991* (**Section 9.9**). Earthworks at the shore crossing and along the export pipeline route are likely to cause short-term destabilisation of the sand dunes. The likelihood of previously unrecorded sites and sub-surface archaeological materials being disturbed by vegetation clearing and earthworks is considered to be high at the shore crossing, but low along the onshore pipeline route and at the gas plant site.

Marine Archaeology: There are no archaeological features within the immediate vicinity of the project development. Comprehensive geotechnical surveys of the proposed platform location, pipeline route and condensate export mooring locations, failed to detect any evidence of ship wrecks (**Section 9.9.1**).

Preventative and Management Measures

Woodside will implement the following preventative and management measures to mitigate potential impacts on archaeology:

- The archaeological materials present in the Shell Midden 1 site will be thoroughly recorded and collected in accordance with the requirements of the Heritage Conservation Branch.
- Prior to construction, an application to disturb or destroy the archaeological site will be required to be made to the Heritage Conservation Branch (DIPE) as directed by the *Northern Territory Heritage Conservation Act 1991*.
- The boundaries of the sections of the Shell Midden 1 site that will not be directly impacted by construction of the shore crossing and onshore pipeline will be appropriately fenced to prohibit all vehicle and pedestrian access.
- Identification and implementation of appropriate erosion techniques and materials to reduce disturbance to the Shell Midden 1 site.
- A Cultural Heritage Management Plan will be developed. The plan will incorporate procedures to raise construction workforce awareness of heritage conservation issues and legal requirements for site protection.

By undertaking additional site surveys and implementation of a Cultural Heritage Management Plan, Woodside are committed to ensuring that potential impacts are reduced as far as possible.

13.9 Aboriginal Heritage

Impacts

Aboriginal sensitive cultural sites in close proximity to the Blacktip Project include (**Figure 9-10**):

- Maning Point located less than 1 km to the north of the proposed export pipeline route.
- *Karrinthanmoi* stone located among rocks on northern side of Maning Point north of the proposed export pipeline route, exposed at low tide.
- *Kurlangor* Trees at Maning located near the coast approximately 1 km from the proposed export pipeline route.
- *Walpinhthi* Reef located in the nearshore waters approximately 1.5 km from Yulow Point south of the proposed export pipeline route.
- *Mamut* trees located north of the proposed export pipeline route on the northern side of Maning Point.

Potential impacts are mainly confined to the construction phase of the project and may include:

- Disturbance to Aboriginal sacred sites through off-road driving, sourcing or fill or raw materials and through exploration of the area surrounding the onshore facilities by construction workforce.
- Disturbance to Walpinhthi Reef during nearshore pipelaying and shore pull (**Figure 4-7**).
- Inappropriate access of construction and operation workforce.

The potential impacts on Aboriginal cultural sites as a result of the Blacktip Project are expected to be minimal as great care has been taken to avoid disturbance to any sites during the planning and site selection stage of the project. Discussions with traditional owners and anthropological surveys were undertaken and the proposed pipeline route and onshore gas plant location were positioned deliberately to avoid sensitive areas.

Preventative and Management Measures

Woodside will implement the following preventative and management measures to mitigate potential impacts on Aboriginal cultural sites:

- A Cultural Heritage Management Plan will be developed in consultation with the NLC and traditional owners. This plan will incorporate procedures to raise the awareness of the workforce of Aboriginal site issues and the associated legal and project requirements.
- Where necessary, traditional owners will be employed as monitors during construction activities.
- Consultation will be undertaken with the traditional owners to agree appropriate mitigation measures associated with the potential disturbance to Walpinhthi Reef during the offshore pipeline installation.

In summary, potential impacts to Aboriginal heritage sites will be minimised through implementation of agreed management measures with the NLC and landowners. However, the nearshore export pipe laying activities may impact the area in the vicinity of the offshore Walpinhthi Reef.

13.10 Species with Indigenous Conservation Values

13.10.1 Impact of Blacktip Proposal on Environmental Cultural Values

There are two potential types of impact on environmental cultural values from the Blacktip proposal:

- Temporary or permanent damage to environments and biological communities including species of cultural significance.
- Change in status of cultural knowledge and practices associated with species and environments, as a result of economic and social change over time.

Disturbance to Environments and Species of Cultural Significance: The construction of the pipeline, gas plant and access road will cause temporary or permanent damage to some environments and biological communities including species of cultural significance to traditional owners. In particular, plant and animal communities living at the gas plant site and on the access road corridor will be totally removed.

The gas plant site is part of an extensive open woodland area periodically used for hunting, gathering and collection of other cultural material, particularly by traditional owners residing at a nearby outstation. Clearing of the site and construction of the gas plant will therefore to some extent reduce the area available for traditional Aboriginal owners to carry out these activities. The extent to which clearing of the gas plant site will impact on Aboriginal resource use will be determined not only by the size of the clearing, but its ecological impact in the surrounding area, as well as the ecological impact of the construction and operation of the gas plant. Factors impacting on Aboriginal use of animal and plant resources in the vicinity of the gas plant will therefore include:

- loss of animals and plants within the area of clearing;
- changes in ecology of surrounding area caused by clearing;
- ecological impacts of construction and nearby road use;
- ecological impacts of operation of the gas plant (for example caused by light, noise, vehicle use etc.).

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

Traditional owners made the following observations concerning the potential impact of the Blacktip proposal on their country and resources:

- Habitats and species to be permanently removed along the access road corridor and at the gas plant site are well represented elsewhere within Yak Maninh and Yak Diminh clan estates.
- Although some loss of resources will occur as a result of road and gas plant construction, the scale of the impact is not expected to significantly reduce access to plant and animal resources that are available elsewhere in their clan estates.
- Country damaged during the laying of the undersea pipeline, shore crossing and pipeline corridor to the gas plant should recover in a relatively short period, with no long term loss of resources expected in these areas.
- Construction of the undersea pipeline, shore crossing and pipeline corridor to the gas plant must avoid mangroves and jungle patches, which are culturally very significant and which make up only a small proportion of clan estates.

- Every effort must be made to avoid disturbing nesting turtles during the construction of the undersea pipeline and shore crossing.
- All country has value to traditional Aboriginal owners, over and above the value of particular species or environments on country.

Status of Cultural Knowledge and Practices: Traditional owners stressed the importance of maintaining environmental cultural values within their clan groups and within the broader Wadeye society. Knowledge of plant and animal language names, uses and other cultural attributes are currently widely held by people in Wadeye community, and this information is passed on to younger generations through family outings, time spent on outstations, hunting, gathering and fishing trips etc, as well as through formal programs at the local school.

Nevertheless, traditional owners are aware that social changes in the Wadeye region over the last couple of generations, and particularly more recently, are impacting on the extent to which cultural knowledge and practices are passed on and will continue into the future. These social changes include:

- Trends to more sedentary lifestyles;
- Increasing formal education opportunities;
- Access to TV and internet;
- Availability of processed foods;
- Access to manufactured medicines;
- The transition of their local economy from a total reliance on local resources to a mixed subsistence/welfare/employment economy.

Some of these social changes are also contributing positively to the maintenance of cultural values, for example through cultural lessons at school, the use of computers and other technology to record and access cultural information, and access to transport and other resources to establish outstations on country.

The Blacktip proposal is part of this pattern of social change and therefore has the potential to impact both negatively and positively on environmental and other cultural values in the region. Education, training and employment associated with the construction and operation of the gas plant and pipeline, while bringing economic benefits to individuals and the community, may further contribute to weakening the traditional link between traditional Aboriginal owners and the environmental resources of their clan estates. Conversely, initiatives associated with the Blacktip proposal that support the relationship between traditional Aboriginal owners and their country have the potential to contribute to the maintenance of environmental cultural values held by Aboriginal people of the Wadeye region.

13.10.2 Current Initiatives to Support Environmental Cultural Values

In addition to the cultural education provided within family and clan groups, there are two significant initiatives underway at Wadeye to support the management of country and the

maintenance of environmental cultural values. These are the Thamarrurr Rangers and the Wadeye Aboriginal Languages Centre.

Thamarrurr Rangers: The broad objectives of the Thamarrurr Rangers, as outlined in McIntyre (2003) are:

- 1) Drawing together people from different land owning groups to work together to look after Country;
- 2) Facilitating the traditional passing down of knowledge and stories from elders to the young; and
- 3) By making sure the country is in good condition, providing land management conservation and development opportunities for future generations

Current and planned activities of the Thamarrurr Rangers, outlined in their 'Land and Sea Management Plan' (Thamarrurr Rangers 2003), include:

- weed control;
- feral animal control;
- exotic disease monitoring;
- revegetation and erosion control;
- waste recycling;
- monitoring turtle nesting;
- fire management;
- family-based planning for managing country;
- enterprise development based on natural resources (for example aquaculture);
- development of a system for managing land access;
- cooperation with the Wadeye Aboriginal Language Centre in collecting and documenting traditional knowledge of country.

Thamarrurr Rangers have received some funds from the NT Government to supplement Thamarrurr Regional Council and Commonwealth Community Development Employment Project funding, but they are currently severely under-funded to carry out their existing and proposed environmental and associated cultural activities. They are actively seeking project based funding as well as more strategic recurrent funding to enable the Ranger program to further develop their capacity to meet the needs of traditional Aboriginal owners to look after country and culture.

Wadeye Aboriginal Languages Centre: The Wadeye Aboriginal Languages Centre (WALC) is co-located with the Kanamkek Yile-Ngala Museum in a building constructed by local Aboriginal people in the 1960s and formerly used as the community hospital. WALC aims to preserve local Aboriginal languages and document information relating to:

- traditional knowledge of country, including stories;

- mapping of country and place names;
- bush foods, medicines and other uses of plants and animals;
- educational materials for use in the local school;
- oral histories.

Since October 2002 WALC has been collecting Aboriginal knowledge of plants and animals from the Wadeye region, as part of a collaborative project with the Merrepen Art Centre at Nauiyu, the Batchelor Institute of Indigenous Tertiary Education and the Department of Infrastructure, Planning and Environment, with initial funding from the Australian Institute of Aboriginal and Torres Strait Islander Studies. To date the project has accumulated a large amount of data and produced a draft document 'Marri Ngarr and Magati Ke Plants and Animals'. Subject to availability of further funding, WALC aims to publish a book and interactive computer data base containing comprehensive information about the ethnobiology of the Wadeye region, including names of plants and animals in all local languages, including Murrinh Patha (the language spoken by the Yak Maninh and Yak Dimininh clans), with colour photographs of each species.

The WALC coordinator expressed the view (Crocombe *pers com.*, September 2004) that there is an urgent need to document detailed linguistic and associated cultural knowledge of older Aboriginal people in the region, so that this information will be available for future generations. WALC is seeking funding partners to enable it to complete the collection, processing of environmental cultural data and production of the ethnobiology publication and computer program. WALC is also in need of strategic funding to cover long term professional and administrative costs.

13.10.3 Summary of Impacts and Management Measures

A summary of the key potential impacts and management measures for species with Indigenous Conservation values are presented below.

- Species, habitats and biological communities with 'Indigenous conservation values' exist in all environments potentially impacted by the Blacktip proposal.
- All country impacted by the Blacktip proposal has value to traditional owners over and above the value of particular species living within that country.
- Clearing of the gas plant site and road corridor will reduce the area available for hunting, gathering and other cultural resource use by traditional owners. The extent of this reduction beyond the clearing will depend on the ecological impact of the construction and operation of the plant and road in the surrounding area.
- Traditional Aboriginal owners reported that culturally significant resources at the gas plant site and along the road access corridor are also available in similar open woodland environments elsewhere in the clan estates.
- The areas of diverse habitat adjacent to the proposed shore crossing are particularly culturally significant, because of the diversity of resources they contain, and because these environments comprise a relatively small proportion of country within clan estates.

- Traditional knowledge, practices and other environmental cultural values are widely held by Yak Maninh and Yak Dimininh and other Aboriginal people in the Wadeye region.
- Ongoing social and economic changes in the Wadeye region, including the Blacktip proposal, have the potential to impact both negatively and positively on the status of environmental cultural values held by Aboriginal people.
- There are opportunities for Blacktip to contribute positively to the maintenance of environmental cultural values by supporting community initiatives already underway, including projects being undertaken by the Thamarrurr Rangers and the Wadeye Aboriginal Languages Centre.

These issues will be addressed by Woodside, in collaboration with traditional owners through the development of strategies and actions to minimise and monitor the impact of the Blacktip proposal on species and environments of cultural significance, and to support Indigenous environmental values where possible. These strategies and actions may form part of the proposed Cultural Heritage Management Plan. Key goals of these strategies and actions will be:

- Collecting baseline data on Aboriginal resource use and other cultural values relating to environments potentially impacted by the Blacktip proposal;
- Devising methods to minimise the impacts on culturally significant species and environments during the construction and operational phases of the project;
- Monitoring the impact of construction and operation of Blacktip infrastructure on environments and species of cultural significance, including the impact on hunting resources in the surrounding region;
- Developing and/or supporting projects to strengthen environmental cultural values, knowledge and practices in collaboration with traditional owners, the Thamarrurr Rangers and the Wadeye Aboriginal Languages Centre.

13.11 Visual Amenity

Potential Impacts

In 2004 a site survey was undertaken to characterise the existing visual and landscape environment (**Section 9.11**). The results of the survey revealed that the flat nature of the land and the tall standing vegetation generally obscured views from other locations. The location offering the clearest views of the plant was Site B, Airforce Hill (**Figure 9-11**), which is located approximately three kilometres east of the Wadeye Township and approximately 14 km away from the Blacktip gas plant. From this distance neither the sea nor landfall location were visible. Site E, a low ridge at the Wadeye Town offered a better view of the landscape than all other sites but presented only a very limited foreground view towards the plant of a couple of kilometres at most. All other sites offered a very limited foreground view towards the plant, in most cases for less than 100 m.

Potential impacts from project related activities include:

- impact of flare stack (20–60 m in height) on existing landscape;
- impact of flaring activities during commissioning and non routine events;
- impact of plant construction equipment on visual amenity during construction activities.

Preventative and Management Measures

Preventative and management measures for the site will rely upon the natural screening provided by the flat terrain and the heavy vegetative cover. Additional measures will include:

- Revegetation of cleared areas at the site using native flora and appropriate design of plant features.
- Minimising tree felling as far as practicable during construction activities.
- Flaring to be kept to a minimum.
- A high standard of housekeeping at the site.
- A Flaring Management Plan will be developed and implemented to reduce non emergency flaring.

It is unlikely that the development will have a negative impact upon visual amenity from any vantage points. The limited vantage points offering extensive views of the landscape are more remote from the development and it is unlikely to be visible from these distant sites. Vantage points close to the development are low-lying and forested, without extensive views. Therefore, it is concluded that the plant will only be visible by people in very close proximity to the gas plant and from Airforce Hill.

13.12 Economic Environment

Impacts

Potential impacts associated with the Blacktip Project on the existing economic environment are likely to be positive. A wide range of economic benefits from the Blacktip Project will be delivered to the local area, the Northern Territory and Australia, including:

- employment benefits;
- business opportunities;
- benefits on the Australian and Northern Territory economies;
- government revenue;
- indirect or flow-on benefits.

Employment Benefits: Employment will be generated during the construction, and to a lesser extent, during the operational phases of the project. Employment onsite during the construction phase is expected to occur over 6–8 months in any one construction year, and to consist of the ‘fly-in and fly-out’ of employees from the Northern Territory and the rest of Australia.

In terms of construction and operations expenditure, approximately 12% of the predicted \$450 million capital anticipated to be spent in the Northern Territory, with the remainder to be spent elsewhere. Construction expenditure in the Northern Territory is expected to include materials, equipment, labour, engineering and management costs. Operational expenditure is anticipated to be limited.

Benefits on Australian and Northern Territory Economies: The construction phase of the Blacktip Project is expected to add an average of \$12 million per annum to the Northern Territory's economy. The anticipated impact on the rest of Australia is \$14 million per annum.

During operational activities, the Blacktip Project will add additional revenue to the Australian economy during the life of the project.

There will also be taxation benefits accruing to the Australian Government from the Blacktip Project. The major applicable taxes are the Petroleum Resource Rental Tax (PRRT) and income taxes.

The existence of gas supply infrastructure and available new reserves is likely to stimulate further gas customers, replacing the expensive liquid fuels currently used for power generation by many operators in the Territory. Potentially the development of Blacktip could stimulate the development of a Northern Territory Gas Grid

Benefits on the Local Economy: Local business development opportunities are likely to arise from the servicing of the offshore construction phase, and the use of local suppliers in civil works, construction, transport and servicing of the onshore processing plant construction phase.

Additionally, regional services such as transport, crainage and machinery hire, civil works, camp construction, service and maintenance; site rehabilitation and accommodation and catering services could be provided during construction.

Long term impacts will result from increased capacity, skills, demonstration of the Territory's capacity, and ongoing services to the Blacktip Project.

The remote location of the Blacktip Project provides an opportunity for Indigenous business development or employment of Indigenous people living close to the operations. Examples include the provision of security services at the Blacktip gas plant and maintenance of rights of way and access tracks. Skilled opportunities also exist for road maintenance and general maintenance of equipment and infrastructure.

Skills developed during the construction phase of the project can be utilised for future opportunities in new developments requiring such skills.

Indirect Benefits: It is anticipated that there will be a need to employ workers from outside the Northern Territory to provide the numbers of construction workers required for the Blacktip Project. This will result in a large number of workers employed on a short term or 'fly-in fly-out'

basis in the area, typically young and male. While this demographic profile is consistent with the demographic of the Territory at large, the impacts maybe felt, particularly during the construction phase of the project. A small but noticeable population increase in Darwin is expected during construction.

Preventative and Management Measures

No preventative measures apply while management measures will be focussed on maximising local content and providing opportunities for local employment.

13.13 Summary of Potential Impacts

Table 13-1 summarises the potential impacts, both positive and negative, to the economic and land use environment.

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■ **Table 13-1 Summary of Economic and Land Use Impacts**

Resource/ Receptor	Source	Potential Impact	Summary Impact, Preventative and Management Measures
Land Use and Land Tenure Section 13.2	Changes to existing land uses, particularly during the construction phase with the influx of the onshore construction workforce.	Loss of access by local Aboriginal people. Inappropriate and unapproved movement of project personnel through Aboriginal lands.	The project infrastructure components have been designed and sited to ensure that impacts on surrounding land use activities are avoided or minimised. All access to the areas by project personal will be strictly controlled to avoid unauthorised and inappropriate access. Staff inductions will be undertaken to emphasise requirement to avoid access to unauthorised areas.
Infrastructure and Transport Section 13.3	Increased traffic volumes associated with construction and operation of the onshore project activities. Provision of sewerage and waste facilities.	Damage to existing road surfaces from heavy construction vehicles entering and leaving site. Disruption to existing users of roads primarily during peak construction periods (for example major roads). Off-road driving and the creation of tracks or new vehicular paths associated with sourcing fill and construction raw materials. Potential impacts on existing infrastructure include likely project demand for water and sewage facilities. This has the potential to create pressure on existing facilities.	The upgrade existing tracks, and the provision of new tracks leading to the onshore plant, will be undertaken in consultation with the regulatory authorities. A Traffic Management Plan will be developed. Water, waste and sewage facilities required by the project will be provided by the project or existing facilities will be upgraded to manage increased capacity requirements.
Military Zones Section 13.4	Presence of onshore and offshore facilities restricting access to military exercise areas.	Loss of exercise area resulting from project footprint and project related exclusion zones (for example 500 m exclusion zone around offshore wellhead platform). Potential conflict between aircraft servicing the Blacktip Project and military aircraft using the area for exercise.	Ongoing consultation will be undertaken with the Department of Defence to discuss potential future conflicts and to identify suitable management measures, if required.
Marine Traffic and Navigation Section 13.5	Presence of pipe laybarge, support vessels, drill rig, unmanned wellhead platform and condensate export mooring.	Loss of access to the area due to the presence of the pipe lay barge, support vessels, Jack-up, unmanned wellhead platform and condensate loading facilities. Navigational hazard represented by permanent structures.	A gazetted safety exclusion zone of 500 m radius from the outer edge of the offshore facilities will be imposed. The locations of the wellhead platform, export pipeline and condensate export mooring will be shown on Admiralty charts. Safety equipment such as markers, navigation aids, fog horns and illumination lighting will be installed on the wellhead platform and condensate export mooring. Lights and markers will adhere to the internationally recognised International Association for Lighthouse Authorities (IALA) standards.
Fisheries Section 13.6	Presence of the offshore facilities restricting commercial, recreational and traditional fisheries.	Loss of access to commercial, recreational and traditional fishing grounds due to construction activities and exclusion zones around permanent features. Loss of livelihood or income resulting from potential oil or chemical spills in the vicinity of the project development. Disturbance to fish habitat, feeding and spawning areas and migration routes from the presence of project. 'Snagging' of fishing nets on subsea equipment. Exclusion zone may act as an artificial habitat for fish feeding, nursery and development and subsequent long term increase in commercial catches.	The offshore gas export, condensate and PW pipelines will be trenched and will bury naturally to prevent the potential for fishing gear to be damaged during trawling activities. Construction of the offshore pipeline will be limited to a 60 m corridor nearshore and will be short term. Information relating to the location of permanent project components will be provided to the relevant authorities for representation on charts. An Oil Spill Contingency Plan will be developed specific to the Blacktip Project.
Tourism and Recreation Section 13.7	Physical presence of fenced footprint including gas plant, accommodation camp, and supporting infrastructure.	Loss of access and wilderness appeal.	Preventative and management measures are not considered necessary due to the limited tourism and recreational activities in the area. Should these industries develop in the vicinity of the Blacktip Project area during the life of the development, appropriate management measures will be developed in consultation with key stakeholders.
Archaeology Section 13.8	Vegetation clearing and earthworks for trenching of the pipeline and construction of the plant. Installation of subsea pipeline, wellhead platform and condensate loading facilities.	Impact on archaeological site 'Shell Midden 1'. Short-term destabilisation of sand dunes. Disturbance of unrecorded archaeological material and cultural sites.	Permit to disturb/destroy part of the shell midden required prior to works commencing. The archaeological materials present in the Shell Midden 1 site will be thoroughly recorded and collected in accordance with the requirements of the Heritage Conservation Branch. The boundaries of the sections of the Shell Midden 1 site, that will not be directly impacted, will be appropriately fenced to prohibit all vehicle/pedestrian access. Identification and implementation of appropriate erosion techniques and materials to reduce disturbance to the Shell Midden 1 site. A Cultural Heritage Management Plan will be developed.

<p>Aboriginal Heritage Section 13.9</p>	<p>Vegetation clearing and earthworks for trenching of the pipeline and construction of the plant. Sourcing of fill material. Construction of access tracks. Off-road driving. Excavation for nearshore pipelay. Shore pull.</p>	<p>Disturbance to Aboriginal cultural sites through off-road driving, sourcing of fill or raw materials and through exploration of the area surrounding the onshore facilities by construction workforce. Disturbance to Walpinhthi Reef during nearshore pipe laying and shore pull.</p>	<p>A Cultural Heritage Management Plan will be developed. Consultation will be undertaken with the traditional Aboriginal owners to agree appropriate management measures associated with the potential disturbance to Walpinhthi Reef. Where necessary traditional Aboriginal owners will be employed as monitors during development/ construction activities.</p>
<p>Species with Indigenous Conservation Values Section 13.10</p>	<p>Vegetation clearing and earthworks for trenching of the pipeline and construction of the plant. Sourcing of fill material. Construction of access tracks. Off-road driving. Excavation for nearshore pipelay. Shore pull.</p>	<p>Reduction in area available for hunting, gathering and other cultural resource use by traditional Aboriginal owners. Culturally significant resources at the gas plant site and along the road access corridor are also available in similar open woodland environments elsewhere in the clan estates. Ongoing social and economic changes in the Wadeye region, including the Blacktip proposal, have the potential to impact both negatively and positively on the status of environmental cultural values held by Aboriginal people.</p>	<p>Gas plant site and access road are located in open woodland environments that are well represented elsewhere in traditional owners' clan estates, and hence loss of opportunity for hunting, gathering and collection of other cultural resources is expected to be minimal. Mangrove and jungle environments, which are culturally significant and not extensively represented in clan estates, will be avoided during pipeline construction. Methods will be devised to minimise the impacts on culturally significant species and environments during the construction and operational phases of the project. Every effort will be made to avoid disturbing nesting marine turtles during construction of the undersea pipeline and shore crossing. Monitoring of the impact of construction and operation on environments and species of cultural significance, including the impact on hunting resources in the surrounding region will be undertaken. Developing and/or supporting projects to strengthen environmental cultural values, knowledge and practices in collaboration with traditional owners, the Thamarrurr Rangers and the Wadeye Aboriginal Languages Centre.</p>
<p>Visual Amenity Section 13.11</p>	<p>Physical presence of fenced footprint including gas plant, accommodation camp, and supporting infrastructure. Support vessels, drill rig, condensate export mooring facilities and unmanned wellhead platform.</p>	<p>Impact of flare stack (20–60 m in height) on existing landscape. Impact of flaring activities during commissioning and non routine events. Impact of plant construction equipment on visual amenity during construction activities.</p>	<p>Revegetation of cleared areas at the site will be undertaken using native flora, and through appropriate design of plant features. Tree felling will be minimised as far as practicable during construction activities. Flaring will be kept to a minimum. A Flaring Management Plan will be prepared and implemented to reduce non emergency flaring.</p>
<p>Economic Environment Section 13.12</p>	<p>Construction and operational phases.</p>	<p>Potential impacts associated with the Blacktip Project on the existing economic environment are likely to be positive. A wide range of economic benefits from the Blacktip Project will be delivered to the local area, the Northern Territory and Australia, including:</p> <ul style="list-style-type: none"> ▪ employment benefits ▪ business opportunities ▪ benefits on the Australian and Northern Territory economies ▪ household consumption ▪ government revenue ▪ indirect or flow-on benefits 	<p>Capacity studies to maximise local content and opportunities for local employment will be undertaken.</p>