Jansz Feed Gas Pipeline
Barrow Island Nature Reserve

Mobil Australia Resources Company Pty Ltd

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 1278
December 2007

Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
28/2/06	**Referral received – assessment subsequently suspended at proponent request**	
2/11/07	**Assessment recommenced at proponent request**	**88**
3/12/07	**Proponent's final referral documentation received by EPA**	**4**
10/12/07	**ARI Level of Assessment set and EPA report to the Minister for the Environment.**	**1**

Report Released: **10.12.07**
Appeals Close: **24.12.07**

Assessment No. 1716

Contents

1. Introduction and background

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment on the environmental factors relevant to the proposal by Mobil Australia Resources Company Pty Ltd to construct a feed gas pipeline to carry natural gas from the Io/Jansz offshore gas field, through State waters and across Barrow Island nature reserve to the Gorgon gas processing plant.

Background

The Jansz feed gas pipeline is proposed to bring natural gas to Barrow Island from the Io/Jansz field located in Commonwealth waters approximately 200km off the Pilbara coast of Western Australia (Figure 1). The proponent is Mobil Australia Resources Company Pty Ltd, a wholly owned subsidiary of Mobil Exploration and Producing Australia Pty Ltd which is part of the ExxonMobil group of companies.

Gas from the Io/Jansz field would be piped to the Gorgon gas plant on Barrow Island Nature Reserve. The Jansz feed gas line would augment the supply to the Gorgon plant from the Gorgon gas fields. Components of the proposal in Commonwealth waters have been assessed and approved under the provisions of the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (DEH, 2006).

The proposal components being assessed by the EPA are the pipeline through 5.5km of State waters and 14km onshore across Barrow Island, up to the inlet flange of the Gorgon gas plant (Figure 2). The Jansz feed gas pipeline is proposed to parallel the Gorgon feed gas pipeline, on its northern side. The Jansz pipeline would fit within the terrestrial easement approved for the Gorgon project and no additional on-shore clearing for the Jansz pipeline is proposed. The Gorgon gas development has previously been subject to a separate assessment at the level of Environmental Review and Management Programme (ERMP) and the EPA provided its advice on the Gorgon proposal in June, 2006 (Chevron, 2005; EPA, 2006). The Minister for the Environment released a statement that the Gorgon proposal could proceed, subject to 36 environmental conditions, on 6 September, 2007.

The Jansz pipeline proposal is entirely dependent on construction of the Gorgon gas development. Without the Gorgon plant, the Jansz proposal could not proceed. The EPA's assessment of the Jansz proposal is separate from the Gorgon assessment because Jansz has a separate proponent, requiring a separate legally binding set of conditions which would apply to a separate legal entity. The Jansz feed gas pipeline is, however, proposed to be constructed at the same time and by the same contractors as the Gorgon gas feed pipeline.

The Jansz proponent originally referred this proposal on 28 February, 2006 but subsequently requested that the assessment be suspended until the Gorgon assessment had been completed. The Jansz proponent subsequently requested, by letter dated 26 October 2007, that this assessment be re-started.

The proponent has submitted a referral document setting out the details of the proposal, potential environmental impacts and actions to manage those impacts

(Appendix 3). Recognising that the Jansz feed gas pipeline is dependent on the Gorgon gas plant, the similarity of the Jansz feed gas pipeline parallel to the Gorgon line, and that the Gorgon operators would supervise the construction and operation of the Jansz pipeline in concert with the Gorgon feed gas pipeline, the Jansz proponent expects to meet all relevant conditions set for the Gorgon project.

The EPA has therefore determined under Section 40(1) of the *Environmental Protection Act 1986* that the level of assessment for the Jansz feed gas pipeline proposal is Assessment on Referral Information (ARI), and this report provides the EPA advice and recommendations in accordance with Section 44(1) of that act.

The issues surrounding the Gorgon feed gas pipeline were set out in the Gorgon ERMP and assessed by the EPA in its Bulletin No. 1221. The Gorgon ERMP foreshadowed the addition of extra feed gas infrastructure. The wider issues of the Gorgon proposal are dealt with in the Gorgon assessment and are not repeated here.

The EPA had concluded that the Gorgon development as proposed would not be environmentally acceptable. Following Ministerial consideration of appeals and the development of 36 conditions, a statement enabling the implementation of the Gorgon proposal was issued by the Minister for the Environment on 6 September, 2007.

2. The proposal

Mobil Australia Resources Company Pty Ltd is the proponent for the Jansz Feed Gas Pipeline proposal which includes all elements of a gas pipeline and support infrastructure to carry natural gas from the offshore Io/Jansz field to the inlet of the Gorgon gas plant on Barrow Island. The proposal under assessment here comprises those components that are within State waters and on land in Western Australia. The main characteristics of the proposal comprise a pipeline through 5.5km of State waters and 14km across Barrow Island. This assessment is complementary to that already completed by the EPA on the Gorgon proposal. The balance of the Jansz feed gas pipeline in Commonwealth Waters has been assessed on preliminary documentation by the then Commonwealth Department of Environment and Heritage (DEH, 2006). The Jansz proposal is dependent upon construction of the Gorgon development, as the Jansz feed gas pipeline would supply gas to the Barrow Island gas processing facilities, share the onshore and State waters pipeline corridor with Gorgon, and rely on the Gorgon development's Barrow Island infrastructure for execution.

Details of the proposal are summarised in Table 1 below.

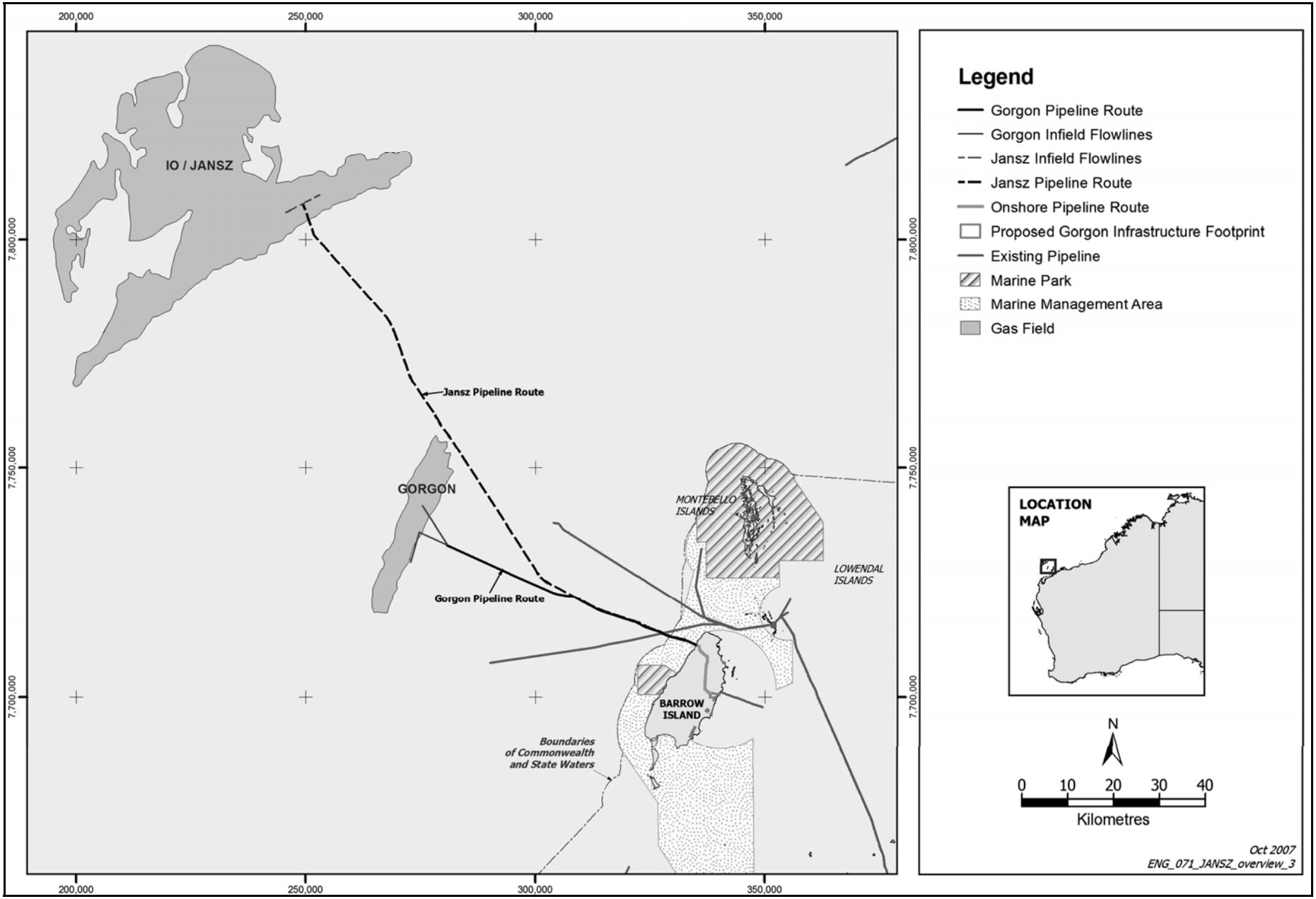

Figure 1: Location of Io/Jansz gasfield offshore Barrow Island.

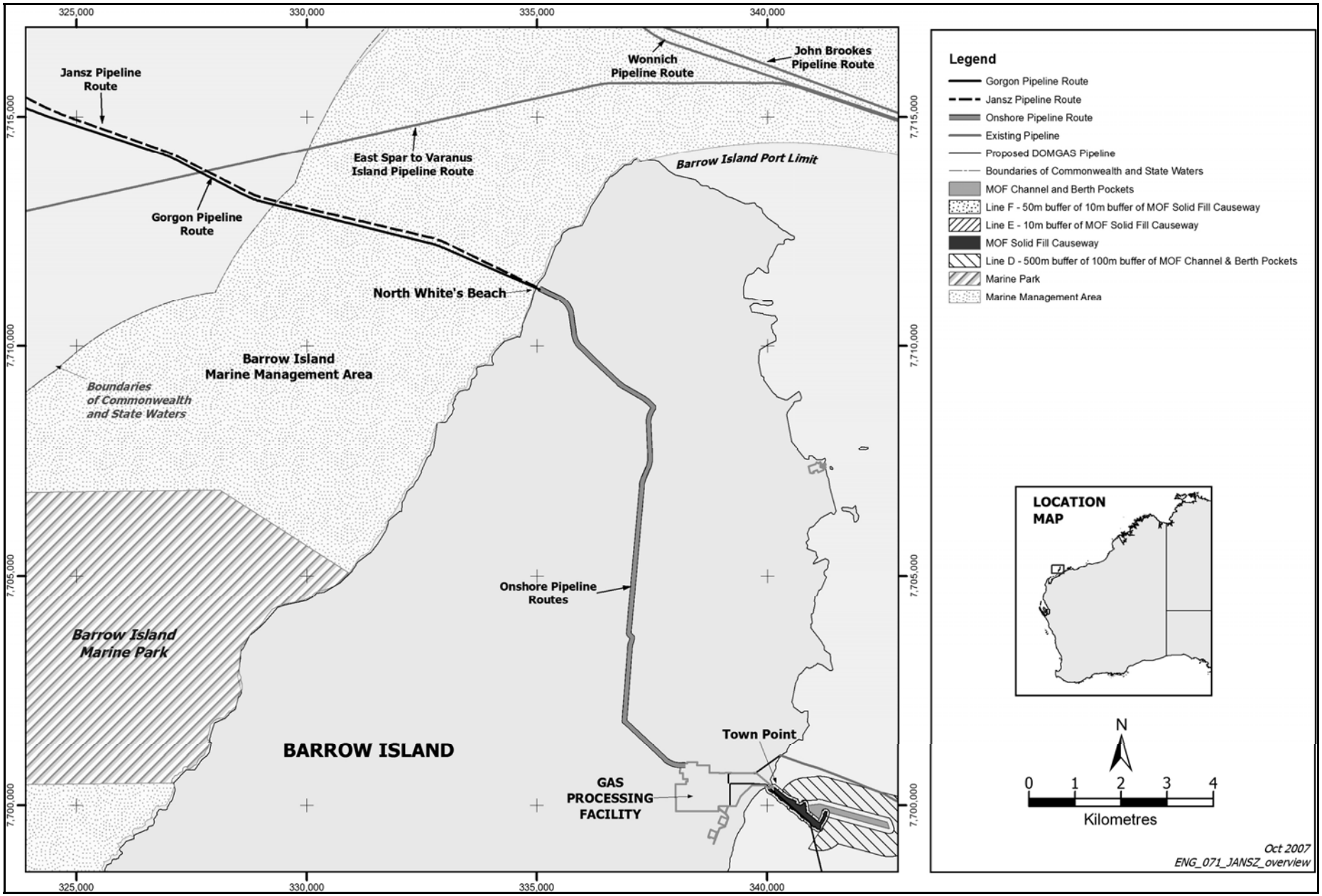

Figure 2: Feed gas pipeline route across Barrow Island.

Table 1: Summary of key characteristics – Jansz proposal

Element	Description
Feed gas pipeline offshore	Single, 864mm nominal outside diameter carbon steel line 5.5km long in State waters; 30ha footprint in common ~54m wide corridor with Gorgon feed gas pipeline
Feed gas pipeline shore crossing	Horizontal directional drilled shore crossing, 150m setback from high tide level, emerging at ~12m depth contour
Feed gas pipeline onshore	Single, 864mm nominal outside diameter carbon steel, buried line; 14km across Barrow Island, 42ha footprint, in common 30m wide easement with Gorgon feed gas pipeline; not more than 2km of trench to be open at any one time
Feed gas composition	<1% CO_2, 2% N_2, no detectable H_2S, balance hydrocarbons, almost no condensate
Mono ethylene glycol (MEG) supply pipeline	219mm nominal outside diameter
Utility pipeline	219mm nominal outside diameter
Electro/ hydraulic umbilicals	Well control and chemical injection (scale prevention, pH stabiliser, acids)
Commissioning	~2014
Decommissioning	Year 40+

The potential impacts of the proposal are discussed by the proponent in the referral document (ExxonMobil, 2007 – see Appendix 3 to this report).

3. Consultations

The proponent has advised that consultation has occurred predominantly with government agencies including the EPA Service Unit, Department of Industry and Resources and the Conservation Commission. The non-government WA Marine and Coastal Community Network was also consulted. The Commonwealth environmental assessment included a public comment period from 23 November to 20 December 2005 (DEH, 2006). No submissions have yet been made to the EPA on this proposal, because the opportunity for public comment will occur when this report is released under the normal arrangements for an ARI level of assessment.

4. Key environmental factors

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the key environmental factors relevant to the proposal and the conditions and procedures, if any, to which the proposal should be subject. In addition, the EPA may make recommendations as it sees fit.

It is the EPA's opinion that the following key environmental factors relevant to the proposal require evaluation in this report:

(a) Conservation areas;

(b) Flora and fauna;

(c) Groundwater;

(d) Terrestrial values;

(e) Marine values; and

(f) Light.

Details of the key environmental factors and their assessment are contained in Sections 4.1 - 4.2. The description of each factor shows why it is relevant and how it would be affected by the proposal. The assessment of each factor is where the EPA decides whether or not a proposal meets the environmental objective set for that factor. Information about the key factors and the existing environment is contained in the proponent's documentation (ExxonMobil, 2007) and in the Gorgon ERMP (Chevron, 2005), noting that the current proposal is dependent on the Gorgon proposal and the Jansz pipeline would parallel the Gorgon line onto and across Barrow Island.

4.1 Terrestrial factors

A number of factors are relevant for those parts of the proposal located on the Barrow Island, as set out below.

4.1.1 Conservation areas

Description

Barrow Island is a class A nature reserve. The pipeline would require excavation of a trench on land. Onshore trenches would be backfilled and rehabilitated to re-establish native vegetation.

Assessment

The EPA's objective for this factor is to protect the environmental and conservation values of areas having significant environmental and conservation attributes.

Detailed documentation of the pre-development conservation values of the terrestrial and subterranean areas to be disturbed during pipe-laying would establish a baseline for the design of rehabilitation and for subsequent monitoring to determine its success.

Pipeline trenching and laying on land is now a routine operation. Trenching, pipe-laying and rehabilitation techniques are well established and demonstrated to be successful if properly implemented with appropriate environmental conditions. Rehabilitation of roadways, gravel pits, other hardstand areas and seismic lines has previously been undertaken on Barrow Island. Rock on Barrow Island is particularly hard, and it is likely that ripping and blasting may be required in some areas. Appropriate techniques would be required to manage these activities successfully.

Pipeline construction for this proposal is planned to occur in concert with pipe laying for the Gorgon proposal. The proponent has undertaken to use the same techniques and management measures as those committed to by the proponents of the Gorgon project and set out in General Appendix B of the Gorgon ERMP (Chevron, 2005).

Summary

Having particular regard to the:

- established and routine nature of environmental management measures for pipe laying and rehabilitation, and
- the proponent's undertaking to adopt environmental management measures consistent with those for the Gorgon proposal,

it is the EPA's opinion that the proposal is capable of being managed in a manner such that it is unlikely that significant additional environmental impacts would occur beyond those that have already been authorised by the Minister for the Environment for the implementation of the Gorgon proposal, provided the recommended conditions set out in Appendix 2 are adopted.

4.1.2 Flora and fauna

Description

The Jansz pipeline route onshore would be common with the Gorgon pipeline easement. Both pipelines would be constructed in the same easement using the same contractors at the same time. Clearing of the common easement would result in the removal of 42 hectares (ha) of vegetation on Barrow Island. This vegetation has been mapped and is documented in the Gorgon ERMP (Chevron, 2005). The area of clearing proposed falls within the 300ha provided for development by the *Barrow Island Act 2003*. According to the Gorgon ERMP, the area and types of vegetation to be cleared are represented elsewhere on Barrow Island Nature Reserve, no declared rare flora would be affected by clearing and restricted vegetation communities along the pipeline route are well represented outside the development area (Chevron, 2005). The ERMP also states that the pipeline route has been selected to avoid all significant fauna habitats. Rehabilitation of the common easement would be undertaken as a single exercise, consistent with the requirements for the Gorgon proposal.

Assessment

The EPA's objective for this factor is to maintain the abundance, diversity, geographic distribution and productivity of flora and fauna at genetic, species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge.

Clearing would have a temporary impact on the productivity of flora and the provision of fauna habitat and food resources. The extent and duration of the clearing is not, however, likely to have a significant impact on these factors, given that most of the right of way would be rehabilitated. Twice daily trench clearance measures are capable of recovering and relocating fauna that may become trapped in the open trench. The proponents intention to limit the length of trench open to two kilometres at a time (Table 1) would assist in this regard.

The proponent has undertaken to adopt the same plans and procedures for pipe laying and rehabilitation as set out in General Appendix B of the Gorgon ERMP (Chevron, 2005).

Summary

Having particular regard to the:

- established and routine nature of environmental management measures for pipe laying and rehabilitation, and
- the proponent's undertaking to adopt environmental management measures consistent with those for the Gorgon proposal,

it is the EPA's opinion that the proposal is capable of being managed in a manner such that it is unlikely that significant additional environmental impacts would occur beyond those that have already been authorised by the Minister for the Environment for the implementation of the Gorgon proposal, provided the recommended conditions set out in Appendix 2 are adopted.

4.1.3 Groundwater

Description

A range of groundwater dependent organisms occur on Barrow Island. A number of these are poorly known and some are restricted to Barrow Island. Spills of hydrocarbons or other chemicals could pollute groundwater and deleteriously affect these organisms.

Mono-ethylene glycol (MEG) is pumped from onshore, out to the production wells, to prevent freezing of liquids in the production wells and pipelines. Other chemicals, including scale inhibitors, pH adjusters and acids are used from time to time to manage the lines and offshore wells. Some condensate (liquid hydrocarbons which exist as gas below ground but become liquid once they are brought to the surface) would come ashore with the gas. Spills of hydrocarbons or chemicals onshore could impact on groundwater.

Assessment

The EPA's objective for this factor is to maintain the quality of groundwater so that existing and potential environmental values, including ecosystem maintenance, are protected. Jansz gas is reported to contain very little condensate. Consequently the likelihood and scale of a potential hydrocarbon spill is considered low, although some liquids may build up in the line over time. Prevention of spills would depend on standard management measures and is subject to routine licence conditions.

MEG usage would be controlled by adherence to a management plan as required by licensing provisions. These licence provisions are capable of adequately managing MEG use and hydrocarbon spill control.

Summary

Having particular regard to the:

- low level of condensate present and limited scope for spills, and

- capacity of licensing provisions and the proponents management plans to adequately manage potential spills,

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor.

4.1.4 Terrestrial values

Description

Vegetation clearing and trenching can lead to accelerated erosion of soils and landforms. Some 42ha would be cleared for the pipeline route across Barrow Island. A trench would be excavated within the cleared right of way and the pipeline would be buried in it.

Assessment

The EPA's objective for this factor is to maintain the integrity, ecological functions and environmental values of soils and landforms. Pipeline trenching is a routine activity with well established techniques for controlling erosion, including the use of sack breakers in the trench and the use of erosion control structures and re-vegetation on the surface.

The EPA is satisfied that development of an appropriate management plan and proper application of well established erosion control techniques can manage this issue adequately. Routine licensing requirements can be applied to properly control these functions.

Summary

Having particular regard to the:

- routine nature of pipeline construction and well established methodology for erosion control, and
- capacity of licensing provisions and the proponents management plans to adequately manage erosion potential,

it is the EPA's opinion that the proposal is capable of being managed in a manner such that it is unlikely that significant additional environmental impacts would occur beyond those that have already been authorised by the Minister for the Environment for the implementation of the Gorgon proposal, provided the recommended conditions for pre-development survey, environment protection and monitoring set out in Appendix 2 are adopted.

4.1.5 Light

Description

The western beaches of Barrow Island support a major part of the Northwest Shelf genetic stock of green turtles. Small numbers of green turtles nest on North White's Beach, where the feed gas pipeline is proposed to come ashore.

Horizontal directional drilling of the shore crossing is proposed to occur about 150m back from the shoreline. Lighting on the drilling equipment has the potential to deter nesting turtles and disorient hatchlings.

Assessment

The EPA's objective for this factor is to avoid or manage potential impacts from light overspill and ensure significant impacts on the turtle population do not occur.

The level of nesting on North White's Beach has been described as trivial (Limpus, 2006) and lighting impacts are not considered likely to result in significant impacts to the population of green turtles off the west coast of Barrow Island. None - the - less, the EPA expects the proponent to ensure that all possible measures are taken to avoid light spill from its operations affecting turtles.

Careful planning to avoid the turtle nesting and hatching seasons and thorough screening of lighting from the horizontal directional drilling rig should adequately manage the potential impacts of lighting on green turtle nesting and hatchling survival so as not to be significant at a population level.

Summary

Having particular regard to the:

- low level of green turtle nesting on North White's beach, and
- capacity to either avoid the green turtle nesting and hatching seasons or thoroughly screen the beach from light from the horizontal directional drilling rig,

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor.

4.2 Marine factors

A number of key environmental factors relevant to the marine environment require assessment for this proposal, as set out below.

4.2.1 Conservation areas

Description

Much of the surrounding waters of Barrow Island are marine conservation reserves. A marine park is located about 5km to the south-west of the proposed pipeline route. The pipeline would require rock armouring or trenching offshore.

Assessment

The EPA's objective for this factor is to protect the environmental and conservation values of areas having significant environmental and conservation attributes.

Detailed documentation of the pre-development conservation values of the marine, areas to be disturbed during pipe-laying would establish a baseline for subsequent monitoring.

Pipeline laying at sea is now a routine operation. Pipe-laying and stabilisation techniques are well established and demonstrated to be successful if properly implemented with appropriate environmental conditions. Appropriate techniques would be required to manage these activities successfully.

Pipeline construction for this proposal is planned to occur in concert with pipe laying for the Gorgon proposal. The proponent has undertaken to use the same techniques and management measures as those committed to by the proponents of the Gorgon project and set out in General Appendix B of the Gorgon ERMP (Chevron, 2005).

Summary

Having particular regard to the:

- established and routine nature of environmental management measures for pipe laying offshore, and
- the proponent's undertaking to adopt environmental management measures consistent with those for the Gorgon proposal,

it is the EPA's opinion that the proposal is capable of being managed in a manner such that it is unlikely that significant additional environmental impacts would occur beyond those that have already been authorised by the Minister for the Environment for the implementation of the Gorgon proposal, provided the recommended conditions for pre-development survey, environment protection and monitoring set out in Appendix 2 are adopted.

4.2.2 Flora and fauna

Description

The Jansz pipeline route offshore would be common with the Gorgon pipeline corridor. Both pipelines would be constructed in the same corridor using the same contractors at the same time. Construction in the common corridor would result in disturbance of a combined area for the Gorgon and Jansz proposals of 30ha in State waters offshore from Barrow Island.

Assessment

The EPA's objective for this factor is to maintain the abundance, diversity, geographic distribution and productivity of flora and fauna at genetic, species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge.

Impacts on benthic primary producer habitats on the seabed would occur due to seabed disturbance, pipe laying and rock armouring but are expected to be limited, given that the extent of direct disturbance in State waters is expected to be 30ha. These impacts are not, therefore, expected to be environmentally significant, if they are appropriately managed.

The proponent has undertaken to adopt the same plans and procedures for pipe laying and rehabilitation as set out in General Appendix B of the Gorgon ERMP (Chevron, 2005).

Summary

Having particular regard to the:

- established and routine nature of environmental management measures for pipe laying offshore, and
- the proponent's undertaking to adopt environmental management measures consistent with those for the Gorgon proposal,

it is the EPA's opinion that the proposal is capable of being managed in a manner such that it is unlikely that significant additional environmental impacts would occur beyond those that have already been authorised by the Minister for the Environment for the implementation of the Gorgon proposal, provided the recommended conditions set out in Appendix 2 are adopted.

4.2.3 Marine values

Description

Laying, anchoring and armouring the feed gas pipeline offshore would result in the direct disturbance of some 30ha of seabed within State waters. These activities have the potential to disturb the substrate supporting benthic primary producer habitats on the sea floor. Pipe laying and support vessels have the potential to disturb marine vertebrates, including listed species, and horizontal directional drilling would release some drilling fluids to the water column when the drill breaks through the sea floor. Oil spills could occur as a result of a fuel spill from a work vessel or if the feed gas line is ruptured and accumulated condensate is released.

Assessment

The EPA's objectives for this factor are to maintain the integrity, ecological functions and environmental values of the seabed and coast and to ensure that emissions do not adversely affect environmental values, by meeting statutory requirements and acceptable standards.

These issues have been addressed in the Gorgon ERMP and similar considerations are relevant to the Jansz pipeline, with one important difference. The Jansz gas is understood to contain even less condensate than the Gorgon gas. Accordingly, the consequence of a condensate spill is likely to be less than it is from the Gorgon feed gas line because the amount of hydrocarbon carried in the line is significantly less.

Given that the scale of pipe-laying operations is the same as for the Gorgon proposal, the impacts on benthic primary producer habitat within the 30ha envelope of pipe-laying operations on the west coast of Barrow Island should not be so severe as to have significant additional impacts than those already authorised for the Gorgon proposal.

Careful scheduling of pipe laying to avoid whale migration periods and turtle aggregation periods should be used to mitigate impacts to these species.

Summary

Having particular regard to the:

- low level of condensate present and limited scope for spills,
- capacity of licensing provisions and the proponents management plans to adequately manage potential spills,
- potential for scheduling and management measures to mitigate impacts to listed marine species, and
- capacity of licensing to manage these aspects of the proposal,

it is the EPA's opinion that the proposal is capable of being managed in a manner such that it is unlikely that significant additional environmental impacts would occur beyond those that have already been authorised by the Minister for the Environment for the implementation of the Gorgon proposal, provided the recommended conditions set out in Appendix 2 are adopted.

4.2.4 Light

Description

The marine waters off the western beaches of Barrow Island support a major part of the Northwest Shelf genetic stock of green turtles. Small numbers of green turtles nest on North White's Beach, where the feed gas pipeline is proposed to come ashore. Lights on pipe laying vessels and work boats could attract hatchlings, leading to increased predation.

Assessment

The EPA's objective for this factor is to avoid or manage potential impacts from light overspill and ensure significant impacts on the turtle population do not occur.

The level of nesting on North White's Beach has been described as trivial (Limpus, 2006) and the proposal is not considered likely to result in significant impacts to the population of green turtles off the west coast of Barrow Island.

Careful planning to avoid the turtle nesting and hatching seasons and thorough screening of lighting from the pipe-lay barge and workboats should be able to adequately manage the potential impacts of lighting on green turtle pre-nesting aggregations and hatchling survival so as not to be significant at a population level.

Summary

Having particular regard to the:

- low level of green turtle nesting on North White's beach, and
- capacity to either avoid the green turtle nesting and hatching seasons or screen light from the pipe lay barge and workboats,

it is the EPA's opinion that the proposal is capable of being managed in a manner such that it is unlikely that significant additional environmental impacts would occur beyond those that have already been authorised by the Minister for the Environment for the implementation of the Gorgon proposal.

5. Conditions

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

In developing recommended conditions for each project, the EPA's preferred course of action is to have the proponent provide an array of management actions to ameliorate the impacts of the proposal on the environment. These actions are considered by the EPA as part of its assessment of the proposal and, following discussion with the proponent, the EPA may seek additional management actions.

The EPA recognises that not all of the management actions are written in a form which makes them readily enforceable, but they do provide a clear statement of the action to be taken as part of the proponent's responsibility for, and commitment to, continuous improvement in environmental performance. The undertakings are supported by recommended conditions to which the EPA believes the proposal should be subject, if it is to be implemented.

6. Other Advice

The EPA notes the proponent's statement that this proposal is dependent on construction of the Gorgon Gas development and refers to its advice in Bulletin 1221 about the Gorgon proposal (EPA, 2006). The EPA had concluded that the Gorgon development as proposed would not be environmentally acceptable. Following Ministerial consideration of appeals and the development of 36 conditions, a statement enabling the implementation of the Gorgon proposal was issued by the Minister for the Environment on 6 September, 2007. It is logical that any decision about the Jansz proposal should be subject to the same conditions as the corresponding parts of the Gorgon proposal.

While the EPA's conclusions below about the Jansz pipeline proposal stand alone, the EPA is aware that the Jansz proposal would not proceed if the Gorgon proposal is not implemented.

7. Conclusions

The EPA has considered the proposal by Mobil Exploration and Producing Australia Pty Ltd to pipe natural gas from offshore through State waters and across Barrow Island Nature Reserve.

The EPA has considered the following key factors when assessing this proposal:

a) Conservation areas

b) Flora and fauna

c) Groundwater

d) Terrestrial values

e) Marine values, and

f) Light.

As a matter of principle the EPA does not support the use of class A nature reserves for industrial development (EPA, 2003). The EPA recognises, however, that decisions on the implementation of proposals rest with Government.

The EPA notes that the Jansz proposal is dependent on construction of the Gorgon Gas development and refers to its advice in Bulletin 1221 on the Gorgon proposal. The EPA's advice concluded that the overall impacts of the Gorgon project as proposed would be environmentally unacceptable.

Given the recent Ministerial decision enabling the construction of the Gorgon proposal, subject to 36 environmental conditions, the EPA has framed its advice in this report by considering *additional* impacts from the Jansz proposal beyond those likely as a result of the already approved Gorgon proposal.

The EPA has concluded that the Jansz proposal is capable of being managed in a manner such that it is unlikely that significant additional environmental impacts would occur beyond those that have already been authorised by the Minister for the Environment for the implementation of the Gorgon proposal, provided there is satisfactory implementation of the recommended conditions set out in Appendix 2.

In coming to this conclusion, the EPA does not consider it to be a precedent for future development on Barrow Island. Barrow Island is a class A nature reserve with the primary purpose of conserving its natural values and the EPA would not support any proposal with the potential to compromise those values.

In recommending conditions for the Jansz proposal, the EPA recognises that it involves essentially the same pipe laying activity as the Gorgon proposal, in the same environment. The EPA has taken the pragmatic view that it is likely that any conditions applied to the Jansz proposal would end up very similar to those relevant to pipe laying already set for the Gorgon proposal. The EPA has therefore used the relevant Gorgon conditions as the basis for its recommended conditions for the Jansz proposal. The EPA was not, however, involved in the development of the Gorgon conditions and notes the lack of performance standards presented by the proponent for several important issues dealt with during the Gorgon assessment. The EPA considers that, where performance standards are lacking in the Gorgon case, measurable performance standards should be set through the condition setting process for tte Jansz proposal.

8. Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister notes that the proposal being assessed is to pipe natural gas from offshore through State waters and across Barrow Island;
2. That the Minister considers this report on the relevant environmental factors as set out in Section 4;

3. That the Minister notes that the EPA has concluded that this proposal is capable of being managed in a manner such that it is unlikely that the EPA's objectives would be significantly compromised beyond what has already been authorised by the Minister for the Environment for the implementation of the Gorgon proposal, provided there is satisfactory implementation of the recommended conditions set out in Appendix 2, and
4. That the Minister imposes the conditions and procedures recommended in Appendix 2 of this report.

Appendix 1

References

Chevron, (2005) Draft Environmental Impact Statement/ Environmental Review and Management Programme for the Proposed Gorgon Development. Chevron Australia Pty Ltd. September, 2005, Perth.

DEH, (2006) Development of the Jansz-Io Deepwater Gas Field in Permit Area WA-18-R, WA-25-R and WA-26-R. Environment Assessment Report Ref. EPBC 2005/2184. Department of Environment and Heritage, February, 2006, Canberra.

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EPA, (2006) Report and Recommendations on the Gorgon Gas Development, Barrow Island Nature Reserve. Environmental Protection Authority, June, 2006. Perth.

Limpus, C.J. (2006) Marine turtle conservation and Gorgon gas development, Barrow Island, Western Australia. Report to Environmental Protection Authority WA and Department of Environment and Conservation, WA. May, 2006. Perth.

ExxonMobil Development, (2007) Jansz Feed Gas Pipeline. EP Act Section 38 Referral. Document Number AUJZ-DER-07-SG-580-G03-0037. ExxonMobil Development, December, 2007. Perth.

Appendix 2

Recommended Environmental Conditions

RECOMMENDED ENVIRONMENTAL CONDITIONS

JANSZ FEED GAS PIPELINE
BARROW ISLAND NATURE RESERVE

Proposal: The Jansz feed gas pipeline is proposed to supply natural gas from the Io/Jansz field located in Commonwealth waters approximately 200km off the Pilbara coast of Western Australia and pipe it across the Barrow Island Nature Reserve to the Gorgon Gas Treatment Plant on Barrow Island.

Proponent: Mobil Australia Resources Company Pty Ltd (MARC), a wholly owned subsidiary of Mobil Exploration and Producing Australia Pty Ltd (MEPA). MEPA is part of the ExxonMobil group of companies.

Proponent Address: Level 30 QV1 Building
250 St Georges Tce
Perth WA 6000

Assessment Number: 1716

Report of the Environmental Protection Authority: 1278

The Proposal may be implemented. The implementation of the Proposal is subject to the following Conditions and Schedule.

Conditions

1. Proposal Implementation

1. The Proponent shall implement the Proposal as documented and described in Schedule 1 of this statement subject to the conditions of this statement.

2. Proponent Nomination and Contact Details

1. The Proponent for the time being nominated by the Minister for the Environment under sections 38(6) or 38(7) of the *Environmental Protection Act 1986* is responsible for the implementation of the Proposal.

2. The Proponent shall notify the Chief Executive Officer of the DEC (CEO) of any change of the name and address of the Proponent for the serving of a notice or other correspondence within 30 days of such change.

3. Time Limit of Authorisation

1. The authorisation to implement the Proposal provided for in this statement shall lapse and be void within five years after the date of this statement if the Proposal to which this statement relates is not substantially commenced.

2. The Proponent shall provide the CEO with written evidence which demonstrates that the Proposal has substantially commenced on or before the expiration of five years from the date of this statement.

4. Compliance Reporting

1. The Proponent shall submit annually an audit compliance report, for the previous twelve-month period. The date of the first compliance report shall be 12 months from the date of formal authority issued to the decision-making authorities under section 45(7) of the Act.

2. The audit compliance report shall:
    i. Be endorsed by the Proponent's Managing Director or a person, approved in writing by the Department of Environment and Conservation, delegated to sign on the Proponent's Managing Director's behalf;
    ii. Include a statement as to whether the Proponent has complied with the Conditions, procedures, commitments and actions within the management plans, reports, systems, and programs referred to in the Conditions;
    iii. Identify all non-compliances and describe the related corrective and preventative actions taken;
    iv. Review the effectiveness of all corrective and preventative actions taken;
    v. Provide verifiable evidence of compliance with the Conditions;
    vi. Describe the state of implementation of the Proposal; and
    vii. Be prepared in accordance with an audit program and in a format acceptable to the Department of Environment and Conservation.

5. Environmental Performance Reporting

1. The Proponent shall submit annually to the Minister an Environmental Performance Report covering the topics listed in Condition 5.2, covering the previous 12 month period as determined by the Minister. The date of the first Environmental Performance Report (the Report) shall be 15 months from the date of formal authority issued to the decision-making authorities under section 45(7) of the Act, with each subsequent report 12 months from the date of the previous report.

2. The Report shall cover the following topics:
    i. Terrestrial and subterranean environment baseline state;
    ii. Fire management;

iii. Spill management.

3. Every five years from the date of the first annual Environmental Performance Report the Proponent shall submit to the Minister an Environmental Performance Report covering the previous five year period, comprising:
   i. The topics listed in Condition 5.2;
   ii. A five year overview of environmental performance; and
   iii. Proposed environmental management improvements.

6. Terrestrial and Subterranean Baseline State and Environmental Impact Report

1. Prior to commencement of construction of terrestrial facilities on Barrow Island, as defined in Condition 6.3, the Proponent shall submit to the Minister a Terrestrial and Subterranean Baseline State and Environmental Impact Report (the Report) that meets the purposes set out in Condition 6.4, as determined by the Minister. The report shall cover the following ecological elements:
   i. flora;
   ii. vegetation;
   iii. fauna (including subterranean fauna and short range endemics);
   iv. habitat;
   v. ecological communities;
   vi. groundwater;
   vii. surface water landforms; and
   viii. other significant landforms.

2. The Proponent shall consult with DEC in the preparation of the Report required by Condition 6.1, including the methodology to be used to survey, collect and collate the baseline data and information for all ecological elements identified in Condition 6.1.

3. The terrestrial facilities referred to in Condition 6.1 are:
   i. Onshore Feed-gas Pipeline System and terrestrial component of the Shore Crossing.

   As defined in Schedule 1.

4. The purposes of the Report are to:
   i. Define and map the pre-development baseline state for the ecological elements within the areas that are expected to, or may be at risk of Material or Serious Environmental Harm due to any works associated with the terrestrial facilities listed in Condition 6.3;
   ii. Define and map the ecological elements within the Terrestrial Disturbance Footprint; and
   iii. Define and map the ecological elements which are at risk of Material or Serious Environmental Harm due to construction or operation of the terrestrial facilities listed in Condition 6.3.

iv. Define and map the ecological elements of reference sites to be used as part of Condition 8, which are not at risk of Material or Serious Environmental Harm due to construction or operation of the terrestrial facilities listed in Condition 6.3.

5. The Report shall include:
   i. A review of the results of the existing qualitative ecological risk assessments of the likelihood and consequence of Proposal impacts on the ecological elements identified in Condition 6.1;
   ii. Details of the methodology that was used to survey, collect and collate the baseline data and information for all ecological elements identified in Condition 6.1;
   iii. A description and map of the ecological elements within the Terrestrial Disturbance Footprint;
   iv. A description and map of the ecological elements which are at risk of Material or Serious Environmental Harm outside the Terrestrial Disturbance Footprint due to construction and operation of the terrestrial facilities listed in Condition 6.3;
   v. A review of the results to include existing areas of disturbance, including clearing, existing non-indigenous species (including weeds) and disturbed landscapes;
   vi. Spatially accurate (e.g. rectified and geographically referenced) maps showing the baseline data and information for the ecological elements identified in Condition 6.1;
   vii. Discussion of the data on the baseline biological, physical and chemical variables including any significant relationships, for the ecological elements identified in Condition 6.1;
   viii. Significant ecological elements to be protected in areas of risk - e.g. Declared Rare Flora (DRF), threatened ecological communities, Threatened Species under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), habitats of rare fauna;
   ix. An analysis of, and procedures to address reasonable data and information gaps associated with the baseline data for the areas identified in iv. above for the ecological elements identified in Condition 6.1 and associated relationships; and
   x. A description and map of the ecological elements of reference sites in locations which are not at risk of Material or Serious Environmental harm due to construction and operation of the terrestrial facilities listed in Condition 6.3.

6. The Proponent shall not cause or allow Material or Serious Environmental Harm outside the Terrestrial Disturbance Footprint.

7. Terrestrial and Subterranean Environment Protection Plan

1. Prior to commencement of construction of any of the terrestrial facilities identified in Condition 6.3, the Proponent shall submit a Terrestrial and Subterranean Environment Protection Plan (the Plan) that meets the objectives identified in

Condition 7.4 and the requirements of Condition 7.5 as determined by the Minister, unless otherwise allowed in Condition 7.2.

2. In the event that any portions of the Plan related to specific elements or sub-elements (Schedule 1) is not submitted as required by Condition 7.1, the Proponent shall submit the portions of the Plan relevant to that element or sub-element to the Minister prior to the commencement of construction of that element or sub-element. All portions of the Plan shall meet the objectives identified in Condition 7.4 and the requirements of Condition 7.5 as determined by the Minister.

3. The Proponent shall consult with DEC in the preparation of the Plan.

4. The objectives of the Plan are:
    i. To reduce the adverse impacts from the construction and operation of the terrestrial facilities within the Terrestrial Disturbance Footprint as far as practicable; and
    ii. To ensure that construction and operation of the terrestrial facilities does not cause Material or Serious Environmental Harm outside and below the Terrestrial Disturbance Footprint.

5. The Plan shall include the following:
    i. Management measures to reduce the adverse impacts from the construction and operation of the terrestrial facilities on the Terrestrial Disturbance Footprint as far as practicable; and
    ii. Management measures to ensure that construction and operation of the terrestrial facilities does not cause Material or Serious Environmental Harm outside and below the Terrestrial Disturbance Footprint.

6. The measures required by 7.5.i. and ii. shall address but not be limited to:
    i. Vegetation Clearing Audit Procedures to determine the extent of clearing and rehabilitation on an annual basis;
    ii. Procedures in relation to and protocols for capturing, relocating, handling, housing and caring for significant fauna found within the Terrestrial Disturbance Footprint that are not required by DEC for translocation to other islands;
    iii. Procedures to avoid secondary impacts to fauna as a consequence of risks such as animals being trapped in construction trenches or subject to vehicle strike;
    iv. Measures including detailed drainage and containment designs for all works and infrastructure that control stormwater run-off outside the Terrestrial Disturbance Footprint with the aim of ensuring that runoff is consistent with the pre-development runoff regime as far as practicable, and any recharge does not cause pollution; and
    v. Measurable limits which specify the performance standards to be met when undertaking actions controlled by the Plan.

7. The Proponent shall report any Material or Serious Environmental Harm outside the Terrestrial Disturbance Footprint to DEC within 48 hours of their detection.

8. The Proponent shall implement the Plan.

8. Terrestrial Environment Monitoring Program

1. Prior to commencement of construction of the terrestrial facilities listed in Condition 6.3 the Proponent shall prepare and submit a Terrestrial Environment Monitoring Program (the Program) to the Minister that meets the aim set out in Condition 8.3 and the requirements of Condition 8.4 as determined by the Minister, unless otherwise allowed in Condition 8.2.

2. In the event that any portion of the Program related to specific elements or sub-elements (Schedule 1) is not submitted as required by Condition 8.1, the Proponent shall submit the portion of the Program relevant to that element or sub-element to the Minister prior to the commencement of construction of that element or sub-element. All portions of the Plan shall meet the objectives identified in Condition 8.3 and the requirements of Condition 8.4 as determined by the Minister

3. The objective of this Program is to establish a statistically valid ecological monitoring program to detect any Material or Serious Environmental Harm to the ecological elements outside the Terrestrial Disturbance Footprint.

4. The Program shall include:
    i. Indicators, parameters and /or criteria to be used in measuring changes on the ecological elements identified in Condition 6.1 that are at risk of Material or Serious Environmental Harm as identified in Condition 6.3.
    ii. Protocols for on-going reporting of adverse changes to the ecological elements identified in Condition 6.1;
    iii. Protocols for identifying additional areas not originally identified that are at risk of sustaining Material or Serious Environmental Harm from the proposal, and for adding monitoring sites to include these additional locations if required;
    iv. Establishing an ecological monitoring program with the ability to detect at a statistical power of 0.8 or greater, or an alternative statistical power as determined by the Minister, any environmental harm to the ecological elements listed in Condition 6.1;
    v. Location of monitoring sites in areas that are at risk of Material or Serious Environmental Harm due to construction and operation of terrestrial facilities listed in Condition 6.3; and
    vi. Location of reference sites (see Condition 6.4iv.).

5. The Proponent shall implement the Program.

9. Advice from a Quarantine Expert Panel

1. Prior to commencement of construction of the terrestrial facilities listed in Condition 6.3, the Proponent shall demonstrate it has access to the advice of a Quarantine Expert Panel (QEP) with the roles set out in Condition 9.2 with membership as described in Condition 9.3.

2. The role of the QEP is to provide advice to the Proponent and the Minister on Proposal related terrestrial and marine quarantine matters including:
    i. Development and implementation of the Terrestrial and Marine Quarantine Management System (QMS) as required by Condition 10;
    ii. Preventing the introduction of Non-indigenous Terrestrial Species and Marine Pests to Barrow Island through all Proposal attributable introduction pathways;
    iii. Detecting the presence of introduced species and detecting environmental change caused by the presence of introduced species;
    iv. Control and eradication measures in the event that an introduced species is detected;
    v. Improvements to effectiveness of the QMS;
    vi. Biological baselines and surveys conducted for quarantine management;
    vii. Source of Non-indigenous Terrestrial Species and Marine Pests;
    viii. Auditing the effectiveness of the QMS;
    ix. Review and recommend quarantine studies; and
    x. Any other Proposal-related quarantine matters as requested by the Proponent or the Minister.

3. The membership of the QEP shall include :
    i. Independent Chair to be appointed by the Minister (NOTE: the Minister may seek advice from any source, including DEC, on nominees for Independent Chair);
    ii. invitation to DEC, Western Australian Department of Agriculture and Food (DAF) and Western Australian Department of Fisheries (DoF) to nominate suitably qualified subject matter expert(s) to participate in the QEP; and
    iii. independent expert(s) as required to fulfil the roles set out in Condition 9.2, to be appointed by the Minister (NOTE: the Minister may seek advice from any source, including DEC, on nominees for independent expert(s)).

4. The Terms of Reference for the QEP shall be consistent with the roles as set out in Condition 9.2 in consultation with the Minister and the Independent Chair.

10. Terrestrial and Marine Quarantine Management System

1. Prior to commencement of construction of any terrestrial facilities listed in Condition 6.3 and the marine facilities listed in Condition 12.3, the Proponent shall submit the Quarantine Management System (QMS) to the Minister, taking into

account the advice of the Quarantine Expert Panel (QEP) that meets the aim and objectives set out in Condition 10.3 and the requirements of Condition 10.4, as determined by the Minister, unless otherwise allowed in Condition 10.2.

2. In the event that any portions of the QMS related to specific elements or sub-elements (Schedule 1) of the Proposal are not submitted as required by Condition 10.1, the Proponent shall submit the QMS portions relevant to that element or sub-element to the Minister prior to the commencement of construction of that element or sub-element, taking into account the advice of the QEP that meets the aim and objectives set out in Condition 10.3 and the requirements of Condition 10.4, as determined by the Minister.

3. The overall aim of the QMS is that the Proponent shall not introduce or proliferate Non-indigenous Terrestrial Species and Marine Pests to or within Barrow Island or the water surrounding Barrow Island, as a consequence of the Proposal. The specific objectives of the QMS are:
    i. To prevent the introduction of Non-indigenous Terrestrial Species and Marine Pests;
    ii. To detect Non-indigenous Terrestrial Species (including weed introduction and/or proliferation) and Marine Pests;
    iii. To control and, unless otherwise determined by the Minister, eradicate detected Non-indigenous Terrestrial Species (including weeds) and Marine Pests; and
    iv. Mitigate adverse impacts of any control and eradication actions taken against detected Non-indigenous Terrestrial Species (including weeds) and Marine Pests.

4. The QMS shall address the following topics.:
    i. Risk Assessment, Supply Chain Management, Vessel Management and Inspection;
    ii. Detection, Control and Eradication Program;
    iii. Mitigation (of introductions or weed proliferations and any Control and Eradication) Program;
    iv. Reporting and Recording;
    v. Integrating with whole of Island Quarantine Management;
    vi. Reviewing and further studies; and
    vii. Measurable limits which specify the performance standards to be achieved by the QMS within the Terrestrial and Marine Quarantine Controlled Access Zones and Terrestrial and Marine Quarantine Limited Access Management Zones.

5. The Proponent shall implement the QMS required by Condition 10.1.

6. The Proponent shall review and update the QMS required by Condition 10-1 annually during the construction phase of the Proposal and then at least every five years thereafter unless varied by the Minister.

11. Fire Management Plan

1. Prior to commencement of construction of any terrestrial facilities identified in Condition 6.3 the Proponent shall prepare and submit a Fire Management Plan (the Plan) that meets the aim and objectives set out in Condition 11.4 and the requirements of Condition 11.5, as determined by the Minister, unless otherwise allowed in Condition 11.2, consistent with the requirements of the *Occupational Safety and Health Act 1984* (WA).

2. In the event that any portions of the Plan related to specific elements or sub-elements (Schedule 1) of the Proposal are not submitted as required by Condition 12.1, the Proponent shall submit the portion of the Plan relevant to that element or sub-element to the Minister prior to the planned commencement of construction of that element or sub-element. All portions of the Plan shall meet the objectives identified in Condition 12.4 and the requirements of Condition 12.5 as determined by the Minister.

3. The Proponent shall consult with DEC, Conservation Commission, the BICC Participants, DOCEP and DoIR in the preparation of the Plan.

4. The specific objectives of the Plan are to ensure that:
    i. The Proposal does not cause Material or Serious Environmental Harm outside the Terrestrial Disturbance Footprint due to fire; and
    ii. Fire risk reduction measures are built into the design of the facilities to protect the Proponent's assets from the impact from fire on Barrow Island.

5. The Plan shall include the following:
    i. A fire risk assessment of all terrestrial project infrastructure identified in Condition 6.3 and measures to protect infrastructure and the surroundings from fires on Barrow Island; and
    ii. On-going management of infrastructure for fire prevention, suppression and management including incident control systems so that fires do not escape from the Terrestrial Disturbance Footprint.

6. The Proponent shall implement the Plan.

7. The Proponent shall review the Plan at least every five years unless otherwise determined by the Minister.

8. In the event that a fire attributable to the Proposal occurs outside the Terrestrial Disturbance Footprint and the Conservation Commission requires that site to be rehabilitated, the Proponent shall develop and implement rehabilitation measures in consultation with DEC, BICC and the Conservation Commission.

12. Coastal and Marine Baseline State and Environmental Impact Report

1. To establish the methodology to be used in the Report required by Condition 12.2, the Proponent shall submit to the Minister a Scope of Works reporting the methodologies to be used in the preparation of the Report that covers the following:
    i. Survey methods for each of the ecological elements;
    ii. Location and establishment of survey sites;
    iii. Timing and frequency of surveys;
    iv. Habitat classification schemes;
    v. Mapping methodologies;
    vi. Treatment of survey data; and
    vii. Method for hydrodynamics data acquisition and reporting.

2. Prior to commencement of construction of marine facilities, as defined in Condition 12.3, the Proponent shall submit a Coastal and Marine Baseline State and Environmental Impact Report (the Report) that meets the purposes set out in Condition 12.5, as determined by the Minister, unless otherwise allowed in Condition 12.4. The report shall cover the following ecological elements:
    i. Hard and soft corals;
    ii. Macro algae;
    iii. Non-coral benthic macro-invertebrates;
    iv. Seagrass;
    v. Demersal fish; and
    vi. Surficial sediment characteristics
    vii. As well, water quality (turbidity and light) and deposited surficial sediment characteristics will be required where the construction of marine facilities will adversely affect the environment.

3. The facilities to which this condition apply are:
    i. Offshore Feed-gas Pipeline System and marine component of the shore crossing.

4. In the event that any portions of the Report related to specific elements or sub-elements (Schedule 1) of the Proposal are not submitted as required by Condition 12.1, the Proponent shall submit the portion of the Report relevant to that element or sub-element to the Minister prior to the commencement of construction of that element or sub-element. All portions of the Plan shall meet the purposes identified in Condition 12.6 and the requirements of Condition 12.7 and 12.8 as determined by the Minister.

5. In preparing this Report the Proponent shall consult with DEC, DPI, DoF and DEW.

6. The purposes of this Report are to:

i. Define and map the ecological elements within the Marine Disturbance Footprint;
ii. Define and map the ecological elements which are at risk of Material or Serious Environmental Harm due to construction or operation of the marine facilities listed in Condition 12.3; and
iii. Define and map the ecological elements of reference sites which are not at risk of Material or Serious Environmental Harm due to construction or operation of the marine facilities listed in Condition 12.3, including water quality (turbidity and light).

7. The geographic extent of the Report shall be:
    i. The facilities and locations listed in Condition 12.3
    ii. Benthic habitats within 200m of the facilities listed in Condition 12.3 in State Waters.

8. The Report shall:
    i. Contain spatially accurate (e.g. rectified and geographically referenced) maps showing the locations and spatial extent of the marine facilities in Condition 12.3;
    ii. Present the results of the surveys described in Condition 12.1;
    iii. Record the existing dominant and sub-dominant hard and soft coral species and the dominant species of macro algae non-coral benthic macro-invertebrates, seagrass, and demersal fish assemblages that characterise these communities;
    iv. Record the population structure, as size class frequency distributions, and other population statistics of recruitment, survival and growth, of dominant hard coral species and selected other key indicator species that characterises these communities;
    v. Contain a description and map of the ecological elements within the Marine Disturbance Footprint;
    vi. Contain a description and map of the ecological elements which are at risk of Material or Serious Environmental Harm due to construction and operation of the marine facilities listed in Condition 12.3;
    vii. Present data in an appropriate Geographic Information System (GIS) format;
    viii. Establish background water quality (turbidity and light) where the consequences of sea bed disturbance may affect the environment;
    ix. Report on the distribution and characteristics of surficial sediments where the consequences of sea bed disturbance may affect the environment; and
    x. Report on the natural rates and spatial patterns of sediment deposition, and the physical characteristics of the deposited sediment where the consequences of sea bed disturbance may affect the environment.

9. To meet the requirements of Condition 12.8, the Proponent shall collect water quality data, data on metocean conditions if considered useful by the proponent and data on natural rates, and spatial patterns of sediment deposition for at least one full annual cycle prior to the construction of the marine facilities listed in 12.3.

13. Horizontal Directional Drilling Management and Monitoring Plan

1. Prior to the commencement of construction of the Feed Gas Pipeline System Shoreline Crossing on the west coast of Barrow Island, the Proponent shall prepare and submit to the Minister a Horizontal Directional Drilling (HDD) Management and Monitoring Plan (the Plan) for the management of HDD activities associated with the construction of the shoreline crossing on the west coast of Barrow Island that meets the objectives set out in Condition 13.3 and the requirements set out in Condition 13.4, as determined by the Minister.

2. The Proponent shall consult with the DEC, DoF and DoIR in the preparation of the Plan.

3. The objectives of the Plan are to:
    i. Reduce the impacts of HDD activities on the Terrestrial and Marine Disturbance Footprints as far as practicable; and
    ii. Ensure that HDD activities do not cause Material or Serious Environmental Harm outside the Terrestrial and Marine Disturbance Footprints or result in coral loss beyond the Marine Disturbance Footprint.

4. The Plan shall include:
    i. Management measures to reduce the impacts from HDD activities as far as practicable; and
    ii. Management measures to ensure that HDD activities do not cause Material or Serious Environmental Harm outside the Terrestrial and Marine Disturbance Footprints or result in coral loss beyond the Marine Disturbance Footprint.
    iii.
    iv. The measures required by 13.4.i. and 13.4.ii. shall address:
    v. The generation and dispersion of turbidity associated with discharge of drill cuttings and fluids to the marine environment;
    vi. Noise and percussion;
    vii. Direct disturbance of habitat;
    viii. Preventing harm to, or fatalities of turtles;
    ix. The use of low toxicity polymer drilling fluids unless otherwise authorised by the Minister;
    x. Management and disposal of drill cuttings and fluids returned to the surface by circulation to prevent pollution; and
    xi. A marine monitoring program to detect changes to ecological elements outside the Marine Disturbance Footprint identified in Condition 14.

5. No mortality of coral assemblages for the HDD activities associated with the construction of the shoreline crossing on the west coast of Barrow Island shall occur.

6. The Proponent shall implement the Plan.

14. Offshore Gas Pipeline Installation Management Plan

1. Prior to commencement of installation of the Feed Gas Pipeline System the Proponent shall submit to the Minister an Offshore Gas Pipeline Installation Management Plan (the Plan) that meets the objectives set out in Condition 14.3 and the requirements of Condition 14.4 as determined by the Minister.

2. In preparing the Plan the Proponent shall consult with DEC, DEW and DoIR.

3. The objectives of the Plan are to:
   i. Reduce the impacts of pipeline installation activities on the Marine Disturbance Footprint as far as practicable; and
   ii. Ensure that pipeline installation activities do not cause Material or Serious Environmental Harm outside the Marine Disturbance Footprints.

4. The Plan shall include:
   i. Management measures to reduce the impacts from pipeline installation activities as far as practicable; and
   ii. Management measures to ensure that pipeline installation activities do not cause Material or Serious Environmental Harm outside the Marine Disturbance Footprint.

   The measures required by Conditions 14.4.i. and 14.4.ii. shall address:

   iii. The generation and dispersion of turbidity associated with pipeline installation activities;
   iv. Direct disturbance of habitat;
   v. Preventing harm to, or fatalities of turtles;
   vi. Program for pre and post pipeline installation seafloor survey of the Marine Disturbance Footprint and the areas at risk of Material or Serious Environmental Harm due to the construction of the pipeline in State waters;
   vii. Detail mooring pattern design, range and bearing from fairleads of individual anchor drops to show how the mooring pattern has been designed to limit impacts in significant benthic habitat areas within State waters;
   viii. Detail a typical mooring pattern design for other than significant benthic habitat areas within State waters;
   ix. Procedures to minimise as far as practicable the impacts resulting from anchoring, wire and chain sweep, and wash from thrusters and propellers, on benthic communities;
   x. Details of proposed hydrotest water discharge and how this will be managed to avoid Material or Serious Environmental Harm to the marine environment; and
   xi. A marine monitoring program to detect changes to ecological elements outside the Marine Disturbance Footprint for the Offshore Gas Pipelines identified in Condition 12.

5. The Proponent shall implement the Plan.

15. Post-Development Coastal and Marine State and Environmental Impact Report

1. Within three months following completion of offshore pipe laying, the Proponent shall repeat the surveys of marine habitats consistent with Condition 12.2 to determine the initial impacts on marine ecological elements consistent with the scope of works required by Condition 12.1.

2. Within 3 months of completion of the surveys required by Condition 15.1, the Proponent shall report the results of the survey to the Minister including detected changes to marine ecological elements.

3. The Proponent shall repeat the survey annually for at least three years following completion of pipe laying, unless otherwise determined by the Minister and within 3 months of completion of each survey report the results to the Minister including detected changes to marine ecological elements.

4. The report of the third and subsequent surveys shall contain a recommendation as to the need of continuing the surveys and reporting.

16. Solid and Liquid Waste Management Plan

1. Prior to commencement of construction of the terrestrial facilities listed in Condition 6.3, the Proponent shall submit a Solid and Liquid Waste Management Plan (the Plan) to the Minister that meets the objectives of Condition 16.2 and the requirements of Condition 16.3 as determined by the Minister to cover all solid and liquid wastes.

2. The objectives of the Plan are to:
    i. Ensure all Proposal-related solid and liquid wastes are either removed from Barrow Island or, if not, that all practicable means are used to ensure that waste disposal does not cause Material or Serious Environmental Harm to Barrow Island and its surrounding waters;

3. The Plan shall include a description of the facilities to be provided and management measures to be implemented to ensure wastes are managed to meet the objectives set in Condition 16.2.

17. Aboriginal Cultural Heritage Management Plan

1. Prior to commencement of construction of terrestrial facilities listed in Condition 6.3 the Proponent shall submit an Aboriginal Cultural Heritage Management Plan (the Plan) that meets the requirements of Condition 17.3 as determined by the Minister.

2. In preparing the Plan, the Proponent shall consult with the Department of Indigenous Affairs and Indigenous stakeholders.

3. The Plan shall include:
    i. Surveys for potential cultural heritage sites within the Terrestrial Disturbance Footprint; and
    ii. The retrieval and relocation of any heritage material which lies within the Terrestrial Disturbance Footprint in consultation with the Indigenous stakeholders.

4. The Proponent shall implement the Plan.

18. Project Site Rehabilitation Plan

1. Within five years following commencement of Operations the Proponent shall submit a draft Project Site Rehabilitation Plan (the Plan) for review by the DEC. The draft plan shall be informed by the monitoring, results of any ongoing studies and experience. The Plan shall meet the objectives set in Condition 18.3 and the requirements of Condition 18.4 as determined by the Minister.

2. In preparing the draft Plan the Proponent shall consult with DEC and DoIR.

3. The objectives of the Plan are to:
    i. Ensure that the rehabilitation of terrestrial areas following decommissioning is properly planned in a manner which promotes self-sustaining ecosystems able to be managed as part of their surroundings consistent with the conservation objectives of a class 'A' Nature Reserve;
    ii. Design rehabilitation of native vegetation to ultimately develop into sustainable ecological systems which are comparable and compatible with surrounding native vegetation and its land uses, and restores as closely as practicable the pre-disturbance biodiversity and functional values;
    iii. Ensure planning, implementation and reporting on rehabilitation is carried out in a manner consistent with industry best practice; and
    iv. Ensure management of rehabilitation continues until affected areas are self sustaining.

4. The Plan required by Condition 18.1 shall address the requirements as set out below for final rehabilitation purposes:
    i. Objectives for rehabilitation, including site-specific variation;
    ii. Plans for topsoil management;
    iii. Targets for completion criteria including nutrient cycling and self sustainability of ecosystems;
    iv. Targets for flora and fauna recruitment, including specific targets for:
        a. the return of recalcitrant species,
        b. the return of key fauna habitat,
        c. the translocation of viable specimens of long-lived species required for fauna habitat,
        d. the re-colonisation of invertebrate fauna, and
        e. the re-colonisation of mycorrhizal fungi;

v. Hydrological function;
vi. Integration with island-wide management;
vii. Monitoring, and adaptive management including climate change;
viii. Identification of knowledge gaps and on-going studies to address lack of knowledge;
ix. Plant species composition including consideration of species vulnerability to and dependence on fire;
x. Rehabilitation following Proposal-attributable fires;
xi. Reporting protocols including peer review; and
xii. Completion criteria agreed with DEC.

5. Within 12 months following receipt of formal advice from the DEC on the draft Plan, the Proponent shall prepare and submit the revised Plan, taking into account comments and recommendations (if any) received from DEC, to the Minister that meets the objectives set in Condition 18.3 and the requirements of Condition 18.4 as determined by the Minister.

6. The Proponent shall revise the Plan as required and submit the final Plan no less than five years prior to the anticipated date of decommissioning and closure, informed by the results of any studies, monitoring and experience. In preparing the revised Plan the Proponent shall consult with DEC.

7. The Proponent shall implement the Plan upon project closure and decommissioning.

19. Decommissioning and Closure Plan

1. At least four years prior to the anticipated date of decommissioning and closure, or at a time otherwise agreed by the Minister, the Proponent shall prepare a Decommissioning and Closure Plan (the Plan) for terrestrial and marine infrastructure facilities, that meets the requirements of Condition 19.3 as determined by the Minister.

2. In preparing the Plan the Proponent shall consult with DEC and DoIR.

3. The Plan shall include:
   i. Removal or, if appropriate, retention of plant and infrastructure;
   ii. The rationale for the siting and design of plant and infrastructure to be retained as relevant to environmental protection;
   iii. Identification of contaminated areas, including provision of evidence of notification and proposed management measures to relevant statutory authorities; and
   iv. Relationship to and consistency with the Project Site Rehabilitation Plan.

4. The Proponent shall implement the Plan.

20. Public availability of Plans, Programs etc.

1. Management plans, reports, systems, and programs referred to in the following conditions shall be made publicly available as determined by the Minister: 5.1, 6.1, 7.1, 8.1, 10.1, 11.1, 12.1, 13.1, 14.1, 15.2, 16.1, 17.1, 18.1 and 19.1.

21. Submission of Plans, Programs etc

1. Where a Condition requires that a plan, report, system or program meet certain aims, objectives or purposes and certain requirements 'as determined by the Minister', the plan, report, system or program is not deemed to have met the Condition unless and until the Minister finds that the aims, objectives or purposes and certain requirements have been met.

2. In the event that following the approval of a document (plan, report, system or program referred to in Condition 21.1) the document is found by the Proponent to no longer meet the requirements set out in Condition 21.1 or the Proponent has identified elements of works not appropriately covered by the document or the Proponent identifies measures to improve the document, an amendment or addendum to the approved document may be developed and submitted to the Minister.

3. All supplementary plans, reports, systems or programs submitted under Condition 21.2 are subject to Condition 21.1, and if agreed by the Minister, to constitute an approved amendment or addendum to the plan, report, system or program.

Schedule 1: Summary of key characteristics – Jansz proposal

Element	Description
Feed gas pipeline offshore	Single, 864mm nominal outside diameter carbon steel line 5.5km long in State waters; 30ha footprint in common ~54m wide corridor with Gorgon feed gas pipeline
Feed gas pipeline shore crossing	Horizontal directional drilled shore crossing, 150m setback from high tide level, emerging at ~12m depth contour
Feed gas pipeline onshore	Single, 864mm nominal outside diameter carbon steel, buried line; 14km across Barrow Island, 42ha footprint, in common 30m wide easement with Gorgon feed gas pipeline; not more than 2km of trench to be open at any one time
Feed gas composition	<1% CO_2, 2% N_2, no detectable H_2S, balance hydrocarbons, almost no condensate
Mono ethylene glycol (MEG) supply pipeline	219mm nominal outside diameter
Utility pipeline	219mm nominal outside diameter
Electro/ hydraulic umbilicals	Well control and chemical injection (scale prevention, pH stabiliser, acids)
Commissioning	~2014
Decommissioning	Year 40+