Consideration of Access to Barrow Island for Gas Development

Advice for Government's Environmental, Social, Economic and Strategic Deliberations

Overview

July 2003

Information Pack and Overview

J.M Limerick, Chair
Standing Interagency Committee of CEO's (SIAC)

SIAC Membership

Dr Jim Limerick (Chair)	Director General, Industry and Resources
Dr John Bailey	Chairman, Conservation Commission of WA
Mr Derek Carew-Hopkins	A/CEO, Environment
Dr Wally Cox	Chairman, Environmental Protection Authority
Mr Richard Curry	Director General, Indigenous Affairs
Mr John Langoulant	Under Treasurer, Treasury and Finance
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Ms Anne Nolan	A/Co-ordinator of Energy, Office of Energy
Mr Graham Searle	A/CEO, Land Administration
Mr Mal Wauchope	Director General, Premier and Cabinet

Public Comment

This information is being released for a six week public review period. Please direct any comments or inquiries, by **12 August 2003**, to:

Mr Douglas Betts
Department of Environment
PO Box K 822
PERTH WA 6842

Or

Level 9, Hartley Building
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Background

Barrow Island is a class A Nature Reserve situated about 70 km off the Pilbara coast of Western Australia. The Gorgon area gas fields lie 60km to 130km north west of Barrow Island and contain Australia's largest undeveloped reserves of natural gas.

ChevronTexaco, as project operator for the Gorgon Venture, has asked the Government of Western Australia to consider whether it would be in the public interest to allow a gas processing plant to be located on Barrow Island. ChevronTexaco claim that access to Barrow Island is the only commercially viable way for the Gorgon area gas reserves to be developed.

The plan to use Barrow Island is of major significance for all Australians. This significance stems from the size and potential economic value of the Gorgon area gas fields, the very high conservation values of Barrow Island and the social importance of these economic and environmental values.

In November 2001 the Minister for State Development advised ChevronTexaco that the WA Government was prepared to consider giving access to Barrow Island for development of the Gorgon area gas fields, after all relevant environmental, social, economic and strategic issues had been examined, and provided that the proposed development would yield net benefits for conservation.

There is no existing process in Western Australia to weigh up, at a strategic level, the environmental, social, economic and strategic costs and benefits of significant development proposals. So a strategic assessment process was established to advise Government about the implications of allowing a gas processing plant to be located on Barrow Island. The advice covers all aspects of the plan to use Barrow Island which are relevant to the Government's decision, namely its environmental, biodiversity conservation, social, economic and strategic implications. A key feature of the assessment process is a high level of public consultation to encourage all interested parties to provide input to the Government's decision.

This Overview explains the process which is being used to assess the Gorgon gas development plan for the use of Barrow Island; provides a summary of the environmental, biodiversity conservation, social, economic and strategic advice to Government about access to Barrow Island; and describes the next steps in the Government decision making process.

The result of the strategic assessment process will be an in principle decision by Government on whether it is in the public interest for the Gorgon Venture to be given access to Barrow Island as the location for a gas processing plant, after weighing up all of the costs and benefits. This process does not replace any requirements for formal environmental assessment which would be necessary under the Environmental Protection Act 1986 and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999, if the Government does give its in principle approval to the plan.

Strategic Assessment Process

Weighing Up the Environmental, Social, Economic and Strategic Aspects of the Barrow Island Proposal

The Standing Interagency Committee of Chief Executive Officers (SIAC) is responsible for co-ordinating the across Government strategic assessment process. SIAC's role is to advise the Minister for State Development on whole of Government strategic and approvals matters for major resource development projects. In this particular case, SIAC has acted as a steering committee for the assessment process and has been involved in establishing the elements of the process.

SIAC is made up of the heads of the following agencies:

- Department of Industry and Resources (Chair)
- Department of Environment
- The Environmental Protection Authority (EPA)
- Department of Treasury and Finance
- Department of Land Administration
- Department of Planning and Infrastructure
- Department of Indigenous Affairs

For this special case SIAC was expanded to include the:

- Conservation Commission of WA
- Department of Premier and Cabinet
- Department of Conservation and Land Management
- Office of Energy

In May 2002 the WA Government released guidelines setting out how it would evaluate the social, economic and strategic (SES) aspects of the Gorgon gas development plan. In June 2002 the Gorgon Venture published its scoping document for the review of Environmental, Social and Economic (ESE) aspects of the Gorgon gas development proposal, which integrated the requirements contained in the SES guidelines with the administrative requirements of the EPA in relation to environmental aspects.

The Gorgon Venture conducted wide-ranging stakeholder consultation during the scoping phase and during development of the ESE Review document, as required by Government.

In February 2003 the Gorgon Venture released the "Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island", for a six week public comment period.

Public submissions on the ESE Review were received by the EPA, on behalf of SIAC. ChevronTexaco responded to specific questions raised in the public submissions and the whole of Government evaluation phase commenced, overseen by SIAC. A summary of the public submissions can be found at www.epa.wa.gov.au and ChevronTexaco's responses are at www.gorgon.com.au.

Three Government agencies were asked to provide independent advice to Government about different aspects of the Gorgon ESE Review, in line with their areas of expertise and responsibility. The focus of the EPA advice is on environmental aspects of the proposal; the Conservation Commission's advice focuses on biodiversity conservation; and the Department of Industry and Resources appointed an expert panel to provide advice with a focus on social, economic and strategic issues.

The advisory bodies have completed their assessments and the full text of their advice to Government is contained in the enclosed reports.

Next steps

SIAC is releasing this Overview and Information Pack so that the community has access to the key pieces of environmental, social, economic and strategic advice which Government will use to make its in principle decision on the use of Barrow Island.

The EPA Services Unit will provide a secretariat to receive any comments or further input which the public may wish to provide ahead of the Government's decision. Comments should be forwarded by **12 August 2003** to:

Mr Douglas Betts
Department of Environment
PO Box K 822
PERTH WA 6842

The Minister for State Development will convene a Ministerial Sub-Committee with the Treasurer/Minister for Energy and the Minister for the Environment and Heritage, to co-ordinate and oversee the finalisation of all matters which are relevant to Government's decision.

If the Government does decide to give in principle approval for the use of Barrow Island there will be a need for legislative authority which would provide an opportunity for parliamentary scrutiny. Any project would also need to go through the usual statutory project approvals processes, including environmental assessment.

The following sections contain the three Executive Summaries of the environmental, biodiversity conservation, and social, economic and strategic advice to Government. The Executive Summaries highlight the key findings of:

- the Environmental Protection Authority in relation to environmental aspects;
- the Conservation Commission of WA in relation to biodiversity conservation; and
- an expert panel appointed by the Department of Industry and Resources in relation to social, economic and strategic issues.

Where to Obtain Information

Full copies of the reports are available online. Hard copies may be obtained from Barbara Harris of the Department of Industry and Resource by telephoning +61 93275530 or by email to gorgon.info@doir.wa.gov.au.

The "Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island" is available on the Gorgon website at www.gorgon.com.au.

A summary of the questions raised in public submissions is available on the EPA and DoIR websites at www.epa.wa.gov.au and www.doir.wa.gov.au. The full text of public submissions is contained in the EPA Library.

Responses made by the Gorgon Venture to the public submissions are available on the Gorgon website at www.gorgon.com.au.

Environmental Advice on the Principle of Locating a Gas Processing Complex on Barrow Island Nature Reserve

Advice to Government from the Environmental Protection Authority

Executive Summary

Introduction

Barrow Island is a class A Nature Reserve situated about 70 km off the Pilbara coast of Western Australia. The waters around Barrow Island have recently been proposed for reservation as part of a Barrow-Montebello Islands Marine Conservation Reserve.

This report is the environmental contribution to the Government's strategic economic, social and environmental assessment of a proposal to locate a gas processing complex on Barrow Island. Part A provides the EPA's advice on access to Barrow Island for industry. Should Government decide to agree to access, Part B provides the EPA's recommendations on managing the environmental issues that would arise. This strategic level process is designed to guide and assist in the making of an in-principle decision by Government. Formal environmental assessment would still be necessary under the provisions of Section 38 of the *Environmental Protection Act* and the Commonwealth *Environment Protection and Biodiversity Conservation Act.*

PART A

EPA Advice – Industry on Barrow Island

Barrow Island has been recognized, in statute and by the community, for its high and unique conservation values for over ninety-five years. It is classified as a class A Nature Reserve to reflect its status as a jewel in the crown of the conservation estate and to protect its environmental values.

In 1966 legislation provided for a petroleum lease on Barrow Island and a producing oil field was subsequently established.

The internationally recognized environmental values of Barrow Island are its unique combination of taxa and communities and its island status. Of the known taxa of Barrow Island, there are 24 terrestrial species that occur nowhere else in the world and another 5 that are restricted in their distribution. The high density and diversity of species is largely due to Barrow Island being naturally quarantined from invasive species by its island status and legislatively protected by its statutory status.

Given the very high environmental and unique conservation values of Barrow Island, which are reflected in its status as a class A Nature Reserve, it is the view of the EPA that, as a matter of principle, industry should not be located on a nature reserve and specifically not on Barrow Island.

EPA Advice – Alternative Locations

On environmental grounds, there are other preferred options available for the location of the Gorgon gas development.

The developer has considered and, at this stage, dismissed other locations and concluded that Barrow Island is the only commercially feasible location. The developer also considers Barrow Island is environmentally and socially acceptable. The EPA understands that independent analysis indicates that Trimouille Island would be economically competitive with Barrow Island and that Thevenard Island without CO_2 injection could also be economically competitive with Barrow Island with CO_2 injection. The environmental advantages of either of these alternative locations are significant.

DCLM advises that the alternative sites considered have lower environmental and conservation values than Barrow Island, and that its ranking from most to least desired site for the development from an environmental point of view is Cape Preston, Maitland Estate/West Intercourse Island, Thevenard Island and Trimouille Island, if marine values could be adequately protected.

The EPA considers that, from an environmental point of view, alternative sites to Barrow Island could be found acceptable in the sequence (most to least desired location) of brown-fields mainland sites, green-fields mainland sites and Thevenard Island. Trimouille Island could be considered, provided marine values could be adequately protected.

EPA Advice - Threats to the Environmental and Conservation Values of Barrow Island

The most important potential threats to the unique conservation values of Barrow Island are terrestrial and marine invasive organisms, land clearing and fire. There are, however, many other significant threats associated with siting a gas processing complex on Barrow Island.

The primary potential threat is the introduction of invasive organisms, particularly animal pests and weeds, including disease.

The volume and number of proposed movements (barges, aircraft, personnel, equipment, construction material, food, supplies and stores) represents the single biggest pathway for the potential introduction of pests and diseases to Barrow Island. The ability to eradicate some pests and diseases remains unproven.

The operators of the existing Barrow Island oil field have recorded 27 breaches of quarantine since 1964. To date, potentially invasive animals have either not become established or have been eradicated. A number of weed invasions have established on Barrow Island and are currently contained, but not eliminated.

At this stage, there is little concrete information on which to base a judgment about the risk to conservation values from quarantine breaches for a proposal of the scale proposed by the Gorgon Venture.

While the current quarantine system on Barrow Island has served the historic level of operations reasonably well, the level of activity projected for the new proposal would require unprecedented levels and types of quarantine effort. Given the yet to be defined and untried nature of the intensity and combinations of controls likely to be required, the EPA's level of confidence in their success is currently low.

In the view of the EPA, a "try it and see" approach is unacceptable in a class A Nature Reserve with high and unique conservation values, given the dire consequences of failure. The EPA strongly recommends a precautionary approach, as advocated in EPA Position Statement No. 7, is most appropriate where the environment and conservation values are so high and unique. This approach requires any decision to proceed with development to be based on solid data, enabling sound judgment. If the project were to proceed, it could only be with a policy of a 'zero tolerance of invasions' target and an associated quarantine regime of sufficient, demonstrated rigor to achieve this.

The waters around Barrow Island have been proposed for reservation as part of a Barrow-Montebello Islands Marine Conservation Reserve. The marine values would be put at risk should marine pests from shipping ballast, hull fouling, dredging activity, oil spills, shipping accidents and industrial discharges become threats to the proposed marine conservation reserve.

The risk of a condensate spill from the gas delivery line, or from tanker operations, requires careful consideration. Similarly the potential for direct impacts or the introduction of exotic marine pests to an area proposed as a marine conservation reserve deserves careful scrutiny.

The clearing of 300ha, specifically for the proposed new facility, is particularly significant for a class A Nature Reserve, and would be cumulative on the impacts caused by previous clearing of over 1000ha. Causes for concern are the proposed clearing of a drainage channel (given their limited extent on the island), sedimentation, run-off of pollutants, groundwater contamination and impacts on stygofauna.

It is the EPA's view that the clearing of 300ha, in addition to the previous clearing of over 1000ha, is inconsistent with the purpose of preserving the natural attributes of a class A Nature Reserve, and would have direct, deleterious impacts on at least some Barrow Island organisms with high biodiversity values.

A major shift in fire frequency or intensity could render a significant change to the environmental and unique conservation values of Barrow Island. Spinifex grasslands dominate large parts of the Barrow Island environment. These grasses are adapted to dry, fire prone, low nutrient environments and ultimately depend on fires to persist against dominance by shrubs. Barrow Island has been subject to a fire suppression regime to protect the oil field assets for over 40 years. Long-term fire suppression poses a credible ecosystem-wide threat to Barrow Island.

The EPA recommends that fire research and trials should commence, and that a plan designed to safely manage extensive fire, consistent with a natural regime, should be developed, regardless of whether or not the Gorgon gas project proceeds. The EPA appreciates that this is a particular challenge in the existing oil field but believes that more can be done in the northern part of the island now and more extensively as techniques consistent with the oil field are developed and as the field is shut down.

The developer proposes to inject 4.2mtpa of reservoir CO_2 into the hyper-saline Dupuy Formation aquifer beneath Barrow Island, at depths below 2700m. Up to 3.3mtpa of CO_2 would still be released. The company's commitment to inject CO_2 is qualified by a proviso that it be technically feasible and not cost-prohibitive.

The EPA is of the view that CO_2 injection is a secondary issue to the conservation values of Barrow Island. In reaching this conclusion, the EPA notes that many of the conservation values occur only on Barrow Island whereas there are other possible locations for CO_2 injection.

CO_2 injection on Barrow Island in isolation from a gas processing plant may be possible without putting the conservation values at undue risk. However, management plans would need to be developed to ensure that the risks from CO_2 injection would not have unacceptable environmental impacts.

The EPA recommends that the risk of carbon dioxide leakage at the point of injection and by leakage from underground storage should be specifically investigated with a view to determining the risks to the natural environment of Barrow Island.

Given adequate plant design, including appropriate stack heights and avoidance of building effects, it is likely that National Environmental Protection Measure values could be met for NO_2 on Barrow Island. No details of the effects of NOx or other gases on the natural environment of Barrow Island are available. The developer would also need to undertake detailed investigations in order to

determine if the long term impacts from the deposition of acid gases and other pollutants on the natural environment would be acceptable.

Should the proposal proceed, the EPA recommends that attention be given to adequate plant design, including appropriate stack heights, avoidance of building effects, and appropriate emission standards, with particular reference to employees and the natural environment of Barrow Island. Dispersion modelling would be required to confirm if near field and regional impacts on health and the environment are likely to be acceptable once details on source parameters are available.

The EPA believes that the proposal to place a large scale gas complex on Barrow Island is fatally flawed because such a complex is inconsistent with the purpose of a class A Nature Reserve, and is likely to significantly increase the risk of invasions by pests and weeds which could put the high and unique conservation values of Barrow Island at serious risk. It is the EPA's judgment that the ability to manage that risk has not at this stage, been convincingly demonstrated.

Having weighed the environmental values, the limited available data about risks, and the current level of knowledge on their management, the EPA is of the view that the proponent has failed to demonstrate that establishing a gas processing complex on Barrow Island could achieve an acceptably low level of risk to Barrow Island's outstanding environment and unique conservation values.

PART B

EPA Recommendations – Management Plans to Address the Risks to the Environmental Values of Barrow Island

The EPA strongly recommends that industrial development should not proceed on Barrow Island. Should the Government decide, for economic or industry development reasons, to allow the proposal to proceed on Barrow Island, a package of comprehensive management plans should be required to address the risks posed by the development.

The overarching principles underpinning any development on Barrow Island should be:

- the class A Nature Reserve status of Barrow Island should have primacy; and
- the environmental and conservation values of the island should not be compromised.

The level of performance required to guarantee the maintenance of Barrow Island's conservation values would need to be extremely high (exceeding current standard practice on Barrow Island) to approach an acceptable level of confidence

in their success. Such performance would likely set new standards in the oil and gas industry worldwide.

If Government agrees to a gas processing complex on Barrow Island the following non-negotiable environmental requirements should be imposed.

Class A Nature Reserve Status to be Paramount

The EPA recommends that the class A Nature Reserve status of Barrow Island should be superior to any industrial lease and fixed by statute, with the primary purpose being the preservation of environmental and conservation values of the island. Tenure should be vested in the State conservation agency (Conservation Commission), consistent with the primary purpose of nature conservation in such a way that any change which may be contemplated in future requires the agreement of both Houses of Parliament.

Development Envelope to be Strictly Limited

The EPA recommends that the limit of 300ha for new development should be enshrined in statute, in a way that requires the agreement of both Houses of Parliament should any increase be contemplated in future.

Reservoir CO_2 Management – Barrow Specific Requirement

In the event that in-principle access to Barrow Island is agreed, the EPA recommends that it should be on the proviso that sequestration or other appropriate management of the CO_2 must be committed to, either by sub-surface injection as proposed, or by an alternative acceptable to Government, on the advice of the EPA.

The EPA further recommends that standards for the risk of environmental impacts from CO_2 releases would need to be developed and data collected to demonstrate that such risks would be acceptably low.

Government Agency Control and Resources

The EPA recommends that arrangements should be put in place for appropriate powers and adequate resources to be provided to DCLM to ensure it can properly manage the conservation values of Barrow Island for the duration of any approved development.

Independent Expert Advice and Transparent Public Processes to Decide Acceptable Risk to Conservation Values

Should Government agree in-principle to access to Barrow Island for a gas processing complex, the EPA recommends that:

The proponent be required to engage in the development of a set of standards for acceptable risks to the conservation values of Barrow Island. Such a process should include appropriate technical experts and be structured to ensure a high level of transparency and community involvement.

The proponent be required to demonstrate to the EPA, on the advice of DCLM and the DoE, that the risk standards can be met, with a very high level of confidence.

Beyond Current Best Practice Environment and Conservation Management

The EPA recommends that the developer be advised that the formal environmental impact assessment process under Part IV of the *Environmental Protection Act* will require clear demonstration of the developer's ability to meet any environmental and conservation risk standards. In so doing, they can expect to set new benchmarks in conservation management performance that go significantly beyond current best practice.

Management

The EPA recommends that a comprehensive plan for the management of environmental and conservation values would need to be developed, to the requirements of the EPA in consultation with DCLM.

Protection

The EPA recommends that specific measures for the protection of the unique conservation values of Barrow Island would need to be developed, in consultation with DCLM, as part of a comprehensive management planning process.

Insurance

The EPA recommends that a substantive research and planning programme be required, in consultation with DCLM, to define the potential for establishing suitable habitat elsewhere and demonstrating successful translocation of species from Barrow Island.

Offsets

The EPA recommends that a suitable offset for any area cleared on Barrow Island should be negotiated to the satisfaction of the EPA, on the advice of DCLM.

Net Conservation Benefits

As required by Government, net conservation benefits (NCBs) should be provided by the project, in addition to the management, protection, insurance and offset actions that directly relate to the impacts or potential impacts of a proposed development.

Recognising the scale of the proposed project and the high and unique conservation values involved, the EPA recommends that an NCB decision of substance is required, which is commensurate with the scale of these factors.

Biodiversity Conservation Values on Barrow Island Nature Reserve and the Gorgon Gas Development

Advice to Government from the Conservation Commission of Western Australia

Executive Summary

Part 1. Should the Gorgon Gas Development be Located on Barrow Island Nature Reserve?

Barrow Island Nature Reserve is a class A reserve that has extremely high biodiversity conservation values and has been reserved from other uses to protect these values. It has been recognised for these values and particularly its unique fauna for over a century. It was one of the first permanent nature reserves in the country and was proclaimed as a "permanent reserve class A for the protection of flora and fauna" under the *Permanent Reserves Act 1899* on 18 February 1910.

Barrow Island Nature Reserve is recognised internationally as a unique biodiversity repository. The Commission's policy position is that national parks and nature reserves are not appropriate places for locating an industrial development.

The Commission recognises that the potential economic value of the proposed Gorgon gas development is high and that this may result in significant economic and social benefits for Australia. Thus as well as presenting its view based on the principle that national parks and nature reserves are not appropriate places for locating industrial developments, the Commission has taken the position that additional advice on future vesting and management of the nature reserve, and on net conservation benefits should be provided to aid Cabinet in making its decision based on detailed consideration of environmental factors in association with social and economic factors.

Barrow Island Nature Reserve has an area of about 23,000ha and is the second largest island off the Western Australian coast. It is best known for its abundant mammals; however, it also has a rich bird and reptile fauna, a unique and valuable assemblage of subterranean animals and valuable vegetation communities. Introduced stock or feral animals have not grazed its vegetation and introduced predators have not affected its animal assemblages. Barrow Island Nature Reserve is probably the largest

island in Australia and one of the largest land masses in the world that has no introduced animals.

It is in this context that decisions to be made with respect to granting access to the nature reserve for the Gorgon gas development should be seen. Given the risks to the biodiversity conservation values of Barrow Island Nature Reserve, to grant even in principle approval should only be contemplated on the basis of an overwhelming case that development must occur at this location and time. The Commission believes that such a case has not been made.

The Commission is especially concerned as to the risk of introduction of exotic invasive species. Quarantine can never be 100% effective. The risk of introductions cannot be eliminated under any known management regime, and while the likelihood of an introduction occurring is difficult to quantify, it is "virtually certain" according to reviews undertaken of the present proposal. The consequences of a quarantine failure occurring will most likely be severe, even with best standards of quarantine, detection and eradication.

The approval of the Gorgon gas development on Barrow Island would commit the State to a long-term, probably expanding, use of the nature reserve for industrial development purposes. Decisions made on the in principle approval of the Gorgon gas development will impact upon the future of the Barrow Island Nature Reserve in the long-term and will lead to an inevitable series of cumulative impacts of further developments that will substantially diminish its biodiversity conservation values. The risk of the introduction of an exotic invasive species leading to one or more extinctions of local species will persist throughout the life of the developments. This possible outcome presents a credible risk. The most effective way to mitigate this risk is to direct the Gorgon gas development and other proposed industrial projects to a location other than Barrow Island Nature Reserve.

The Commission's advice is that Government should not approve the location, construction and operation of any gas processing plant on Barrow Island Nature Reserve.

The principal reasons in support of this advice are:

The location of any industrial development within a nature reserve is inappropriate. Locating a major development in a nature reserve as important as Barrow Island is particularly inappropriate.

The environmental impacts associated with the Gorgon gas development's footprint are not insignificant, while the risk to the island's biodiversity conservation values (its unique ecosystems, species and populations) from the introduction of exotic invasive species is unacceptably high.

To approve the Gorgon gas development on the Barrow Island Nature Reserve would be likely to prevent a full return of the island to its nature reserve status and prevent any change in its classification for the foreseeable future.

In principle approval would also set a precedent for other developments that in the long-term will lead to an inevitable series of cumulative impacts that will substantially diminish Barrow Island's bio-conservation values.

Alternative sites, especially on the mainland, remain as options under appropriate economic conditions.

Part 2. Advice on Relevant Issues should the Government Approve the Location of the Gorgon Gas Development on Barrow Island Nature Reserve

Should Government decide that the Gorgon gas development (or other gas processing plants proposed in the future) could, in principle, be located on Barrow Island Nature Reserve, the Commission believes that the nature reserve should remain intact (ie, no land should be excised from the nature reserve to provide for the industrial development) and any lease to the gas plant operator should not diminish the powers provided by Parliament under the *Conservation and Land Management Act 1984* and the *Wildlife Conservation Act 1950*. The Commission should retain the vesting of the whole nature reserve as a Class A reserve, and remain empowered to exercise its normal functions as for other reserves so vested. The Commission is opposed to any arrangement whereby the island is managed by an agency other than the Department of Conservation and Land Management.

Best practice environmental decision-making requires that development proposals that impact upon the environment should meet minimum standards for environmental management, including risk management, and offsets.

In some cases it is not possible to deliver environmental offsets. When the key issues involved are concerned with the conservation of biodiversity, net conservation benefits (NCBs) should be required. This is certainly the case with the Barrow Island Nature Reserve and the proposed Gorgon gas development.

The Commission offers the following principles for NCBs:

The overarching principle of a net conservation benefit is that it should provide a demonstrable and substantial addition to, or improvement in, the conservation values of the State.

Net conservation benefits should also accrue, or at least begin to accrue, from the earliest stages of a project, preferably from the time of approval (in the case of the Gorgon gas development from the time of in principle approval); and certainly from the point construction commences. They should not be deferred or contingent on future actions.

They should be enduring, preferably in perpetuity, but at least for the duration of the project that requires them.

Net conservation benefits are to be provided in addition to the environmental management, risk management, and offset actions required to deal with the impacts and potential impacts of a proposed development. As such, they are over and above

what is required for good operational practice, however that is defined depending on the circumstances of each case.

Generally speaking, net conservation benefits should accrue to the same or very similar values as close as possible to the site of those values that are affected by the proposed development. They should occur within the same bioregion wherever practicable.

In order to determine a scale for the NCBs required in the case of Barrow Island, a net present value approach has been used on the basis of $10 million expended in year 1 with $2 million (indexed annually) expended in years 2 to 30 as the nominal end-point of the project. This results in a net present value of around $40 million which is the approximate quantum that the Commission believes should be committed by the proponent. It is noted that this is a small proportion of the development costs and is also only a portion of the cost differential of development when Barrow Island is compared with alternative development sites. A priority list of potential NCB projects is provided.

Should in principle approval to access Barrow Island Nature Reserve be granted further work will be required to define the necessary environmental management and risk management requirements, and to finalise an appropriate NCB package.

Proposed Access to Barrow Island for Gas Development

Advice on Social, Economic and Strategic Considerations

A report by the Allen Consulting Group for the Department of Industry and Resources

Executive Summary

Background

In its ESE Review, the Gorgon Joint Venture (GJV) has put forward a proposal for an initial $6 billion investment to develop the Gorgon Gas Fields with a processing plant on Barrow Island. The Allen Consulting Group was commissioned by the Western Australian Department of Industry and Resources (DoIR) to undertake an assessment of the social, economic and strategic aspects of the ESE Review.

Monetising the Gorgon Resource: a Challenging Commercial Proposition

The Greater Gorgon Gas Field constitutes the largest gas resource discovered to date in Australia or beneath its territorial waters. As such, it represents a very substantial national asset, with the potential to generate significant wealth for Western Australia and the whole Australian community. The value of the Gorgon asset, however, will be realised only if it is developed.

Apart from the significant issue relating to high conservation values on Barrow Island, which is addressed separately by the EPA and Conservation Commission, in assessing this proposal to develop Gorgon we need to be mindful of some important strategic considerations.

First, there are substantial barriers to developing major gas fields in the less populous regions of Australia. Since the relatively small domestic gas markets in those regions are already well supplied, development needs to be based on export markets, which in turn requires a much larger-scale and more risky investment. The main difficulty facing Australian projects is in producing a commodity in direct price competition with plants in other countries that often have lower cost structures.

Despite Australia's prodigious reserves, large-scale gas projects are few and far between. While a number of major GTL and LNG projects have been proposed in

recent times, only one, the Bayu Undan LNG project, has yet been finally committed. The North West Shelf (NWS) LNG development, commissioned some twenty years ago, remains Australia's sole large-scale, export-oriented gas project in operation. Notwithstanding the massive investment since made by the NWSJV in what was, at the time of its commissioning, a challenging greenfield development, the NWS project has nevertheless benefited substantially from State and Commonwealth Government support over time.

Within this generally commercially-testing competitive environment, Gorgon presents some particular difficulties. It has been characterised as being 'distant, deep, dry, difficult and dirty'. Apart from the fields being far from shore and partly in relatively deep water, liquids (which provide valuable early cash flow) account for only a small proportion of the resource. The fields are 'difficult' because the geological structure of the Gorgon basins presents some challenges to efficient depletion. In terms of being 'dirty', Gorgon gas contains a high level of CO_2, which requires more intensive processing and raises complex greenhouse issues. In addition, unlike the initial situation for NWS, domestic sales of Gorgon gas would depend on the ability to win customers in what is now the most competitive gas market in Australia.

These perceived difficulties in bringing Gorgon gas to market are evidenced by the fact that the GJV has spent over twenty years and more than $800 million in attempting to do so. While the development proposal being put forward by the GJV at this time is in part a response to technical advances in relation to deepwater offshore gas fields, it also reflects prospective commercial opportunities in the LNG market, particularly in Asia, which may not be long-lived. In this context, the GJV's proposal may offer a rare opportunity to develop these important gas reserves and thereby monetise a substantial national asset.

Reference case

The development concept for Gorgon as set out in the ESE reference case is to establish a gas-processing facility on Barrow Island to produce LNG for export. Some concerns with this are that the DOMGAS component of any development strategy has not been emphasised and there is little reference to the possibility of a major GTL project using Gorgon gas.

On the first point, the Western Australian Government regards an additional source of DOMGAS as being critically important, both to increase competition further and to enhance security of supply. While DOMGAS may have been downplayed in the ESE document, the GJV has advised that DOMGAS is an integral part of its strategy and that preliminary marketing is already under way.

Turning to GTL, a major proposal by Sasol Chevron to use the Gorgon gas resource as feedstock for a world–scale plant producing low sulphur distillate for the domestic and international markets is currently on the table. One question for this report is whether a GTL project is a potential *alternative* to LNG as the basis for initial development or whether it could *supplement* LNG and DOMGAS as part of an integrated facility.

The GJV currently considers that LNG offers the best prospects as a vehicle for initial development but does not rule out the possibility of an initial GTL play. It is also possible that the proposed 300-hectare site could eventually accommodate LNG, GTL and DOMGAS operations together. In this context, it has been suggested that synergies potentially exist between LNG and GTL operations within an integrated project so as to reduce the cost of 'unstranding' major gas resources. Ultimately, a larger integrated development incorporating GTL would provide greater economic and strategic benefits to the State and national economies.

Site locations

A key question for this review is whether it would be commercially feasible to develop Gorgon in some other, less sensitive location than Barrow Island. If so, Australians could enjoy the economic benefits of the project while not being subject to such high risks to conservation values.

The main factors determining the relative costs in alternative locations are distance from the Gorgon Field, and distance from Barrow Island, where it is proposed to sequester the CO_2 in the Dupuy reservoir. In this context, three possible alternative locations to Barrow Island stand out:

- the Montebello Islands, particularly Trimouille Island;
- Thevenard Island; and
- the Burrup Peninsula.

The difference in Net Present Cost (NPC) between Barrow Island and *Trimouille Island* ($70 million) is not material in the context of a $6 billion project. Regardless of the economics, however, because of its history as an atomic weapons testing site in the 1950s, the GJV considers that an unacceptable level of risk would occur on Trimouille. This would arise in terms of its duty of care to employees and also its ability to attract and retain gas customers. The GJV is therefore unwilling to consider further the option of locating the plant on Trimouille Island and on that basis we have ruled it out.

The cost penalty (NPC) of the *Thevenard Island* option is estimated by the GJV as $500 million. While Thevenard is less environmentally sensitive than Barrow Island, its competitive disadvantage relates to its distance from Gorgon and the Dupuy reservoir. Our view is that, in the absence of substantial government assistance, Thevenard Island does not represent a commercial option.

While the cost disadvantage of processing the gas on the *Burrup Peninsula* is estimated by the GJV at around $1 billion, the JV partners have, in the past, evaluated the option of processing Gorgon gas at the NWS plant and sharing infrastructure and facilities with that project. Notionally, the synergies available in such an arrangement could provide significant cost savings to both parties.

Nevertheless, no satisfactory commercial arrangement has been reached and the GJV partners consider that the option does not offer a viable alternative to Barrow Island. Shell, formerly a proponent of the Burrup approach, has advised the

consultants that it no longer favours it and endorses the passage in the ESE Review stating that *Barrow Island currently represents the only commercial viable development option.* In the view of the consultants, while the NWS integration option cannot be ruled out in the future, the synergies involved in the sharing of facilities would need to give rise to significantly higher savings for the GJV than have been apparent in the past.

Greenhouse gases

The high CO_2 content of Gorgon gas has always posed a potential problem affecting the development of the Field. Although there are currently no legislative or regulatory requirements to abate greenhouse gas emissions and the expenditure required to do so could compromise the international competitiveness of the project, the GJV believes such action is essential for commercial reasons. It has therefore developed a sophisticated proposal involving sequestration of the CO_2 in the Dupuy reservoir under Barrow Island. Its view that the technical risks involved are manageable is supported both by RISC and by Curtin Consulting Services in a more detailed study commissioned by DoIR.

However, some legitimate concerns regarding the possible impact of sequestration on hydrocarbon deposits in adjacent exploration permit areas would need to be evaluated in any detailed approvals process.

Economic impacts

Economic modelling was undertaken by the Centre of Policy Studies at Monash University in order to evaluate the economic impacts of two scenarios out to 2030. Under Scenario 1, an initial development of one LNG train plus DOMGAS is expanded later to include a second LNG train. Under Scenario 2, the development postulated in the first Scenario is supplemented, over time, by two phases of GTL production on the basis of a scaled down version of the Sasol Chevron proposal.[1]

The Monash modelling confirms the findings in the ESE Review that the positive economic impact of this project would be extremely high. Headline projections for Scenario 1 (Scenario 2 results in brackets) in terms of NPV_4 out to 2030 are:[2]

- GDP would be $21.0 billion ($31.2 billion) higher than under a business-as-usual assumption;
- the community's economic welfare, as measured by consumption, would be $7.1 billion ($6.6 billion) higher than otherwise; and
- Australian exports would be $9.1 billion ($4.7 billion) greater than under business-as-usual.

Western Australia would benefit substantially from the project in economic terms. Gross State Product would be $25.8 billion ($43.5 billion) higher than otherwise.

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1 The GTL operation modelled for the purposes of this review, while very substantial, is less than half the size of the full Sasol Chevron project proposal.

2 The relatively low discount rate used to calculate net present values reflects the fact that the modelling results are presented in 'real' (constant 2002 prices) terms.

The main region to benefit would be the Pilbara, where Gross Regional Product would be 37.1 per cent (54.6 per cent) higher in 2020 than under business-as-usual assumptions.

Governments would also benefit from the project, which, other things being equal, would allow the tax burden to be reduced. Thanks mainly to substantial net increases in revenue from company tax and PRRT, the net impact on the Commonwealth budget is estimated at $11.4 billion ($14.3 billion) in NPV terms to 2030. The equivalent figure for the Western Australian budget position is much smaller, at $1.0 billion ($1.9 billion).

Social impacts

The modelling suggests that the economic impact of the project on the Pilbara region is likely to be substantial and is likely to act as a boost to development of this region. The ESE Review identifies a broad and comprehensive range of potential social impacts that might arise from this development. Many of the public submissions to the ESE Review process were positive about the potential social impacts of the development.

Nevertheless, once the project has moved to a feasibility stage and more details are available, the GJV would be expected to consult further as the basis for an updated Social Impact Assessment for the proposal. In this context the GJV may wish to consider possible commitments in relation to community infrastructure and housing; education and training, particularly for the aboriginal community; local business development; and the proposed Gorgon Environmental Foundation. From a Western Australian Government perspective, any future assessment of the social effects of the Gorgon gas proposal should consider the cumulative impact of the full range of potential future projects proposed for the Pilbara region.

Conclusions

The fact that the GJV has put forward a substantial proposal for the development of the Gorgon Gas Fields is to be welcomed. The experience of the last two decades since its discovery is that there are significant technical and commercial impediments to the development of this very important resource. The current proposal would allow the Australian community to benefit from the monetising of a substantial national asset, the value of which otherwise may not be realised in the foreseeable future.

The GJV's proposal would produce a very high level of economic benefits, with GDP and consumption raised significantly above their projected levels under a business-as-usual situation. Although the GJV is foreign-owned, major community benefits would be delivered by the taxes appropriately levied on the profits and rents accruing from the development of an Australian resource. The benefits to the Commonwealth's budget, however, would be much higher than the projected budgetary gains for Western Australia.

Although the GJV is seeking in-principle approval to establish gas-processing facilities on Barrow Island, the final form of the development has yet to be

determined. While the LNG/DOMGAS operation proposed by the GJV offers major economic benefits, these would be even greater if a GTL facility, such as that proposed by Sasol Chevron, were incorporated into the project.

Finally, on the key question of location, Barrow Island possesses clear commercial advantages over the alternatives. Trimouille Island is ruled out for commercial reasons as a consequence of past nuclear contamination. A site on Thevenard Island would only be viable if very high levels of government assistance were provided. While we cannot rule out the possibility that, at some time in the future, commercial circumstances could change and agreement could be reached to share facilities on the Burrup Peninsula, on the basis of existing cost information this would be very difficult to achieve.

In the current circumstances, therefore, and on the basis of the information available to us, we conclude that Barrow Island represents the only commercial option for monetising the substantial national asset represented by the Gorgon resource.