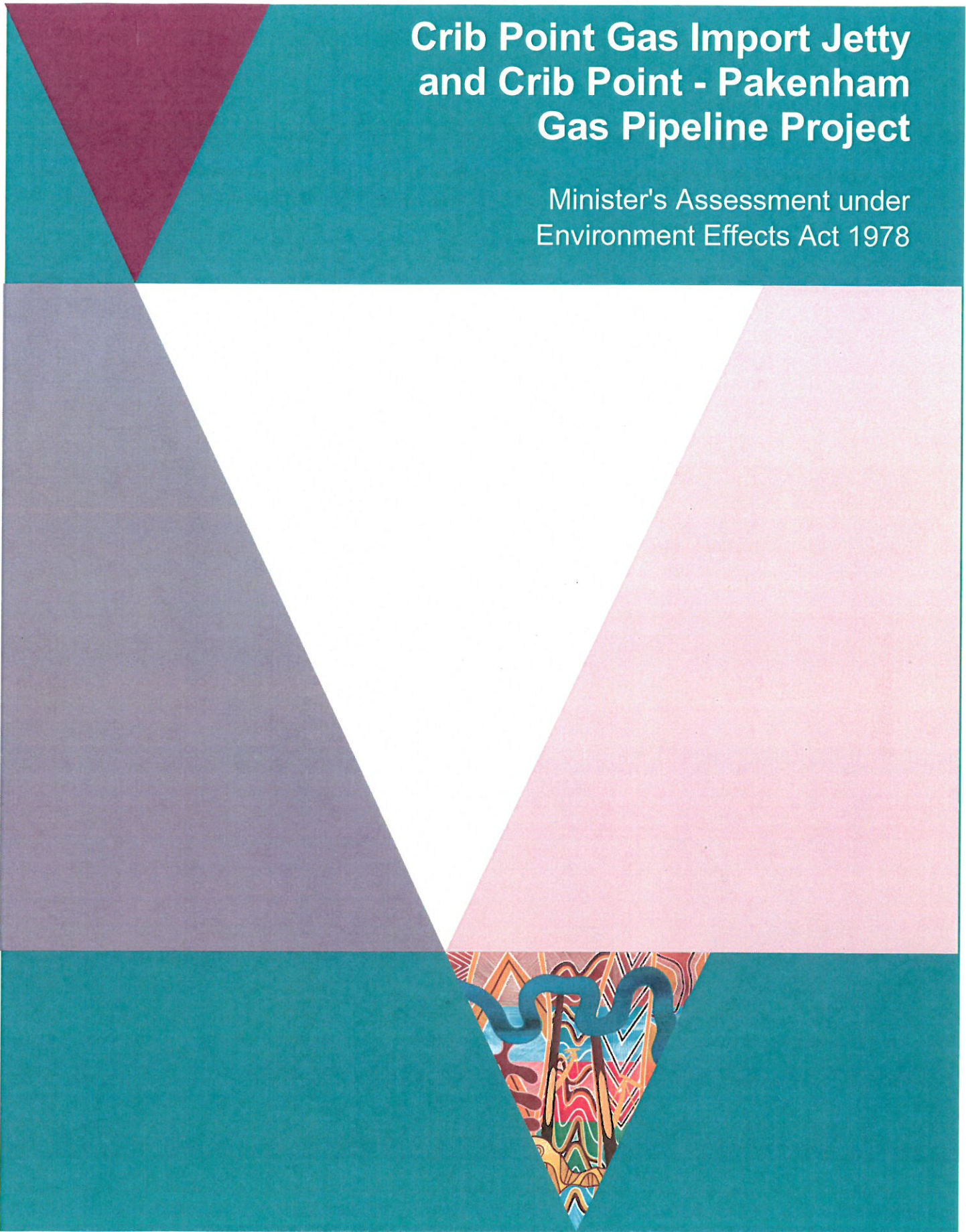


Crib Point Gas Import Jetty and Crib Point - Pakenham Gas Pipeline Project

Minister's Assessment under
Environment Effects Act 1978



Minister for Planning
March 2021



Environment,
Land, Water
and Planning

OFFICIAL

Acknowledgment

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.



© The State of Victoria Department of Environment, Land, Water and Planning 2021



This work is licensed under a Creative Commons Attribution 4.0 International licence. You are free to re-use the work under that licence, on the condition that you credit the State of Victoria as author. The licence does not apply to any images, photographs or branding, including the Victorian Coat of Arms, the Victorian Government logo and the Department of Environment, Land, Water and Planning (DELWP) logo. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>

Disclaimer

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

Accessibility

If you would like to receive this publication in an alternative format, please telephone the DELWP Customer Service Centre on 136 186, email customer.service@delwp.vic.gov.au, or via the National Relay Service on 133 677 www.relayservice.com.au. This document is also available on the internet at www.delwp.vic.gov.au.

Contents

Glossary	3
Executive summary.....	4
1. Introduction	5
1.1 Purpose of this document.....	6
1.2 Structure of the assessment.....	6
2. Project description	7
3. Statutory processes	10
3.1 Environment Effects Act	10
3.2 Planning and Environment Act.....	11
3.3 Environment Protection Act	11
3.4 Pipelines Act.....	11
3.5 Aboriginal Heritage Act	12
3.6 Marine and Coastal Act	12
3.7 Other Victorian statutory approvals	12
3.8 Commonwealth statutory approval.....	12
4. Environmental assessment	13
4.1 Impact acceptability.....	13
4.2 Consideration of project alternatives	16
5. Environmental effects	17
5.1 Evaluation objectives	17
5.2 Marine biodiversity	17
5.3 Terrestrial and freshwater biodiversity	24
5.4 Surface Water	28
5.5 Groundwater.....	29
5.6 Contamination and acid sulphate soils	30
5.7 Greenhouse gas and climate change	33
5.8 Air quality.....	35
5.9 Noise and vibration.....	37
5.10 Landscape and visual.....	40
5.11 Traffic and transport.....	42
5.12 Safety, hazard and risk.....	43
5.13 Land use planning	45
5.14 Social.....	47

5.15 Business	50
5.16 Agriculture	51
5.17 Aboriginal cultural heritage	52
5.18 Historic heritage.....	53
5.19 Port operations.....	54
6. Conclusion.....	56
Appendix A Matters of national environmental significance	57
Appendix B Management of environmental effects	73

Glossary

ASS	Acid sulphate soil
CEMP	Construction environment management plan
CHMP	Cultural heritage management plan
DELWP	Department of Environment, Land, Water and Planning
EES	Environment effects statement
EPA	Environment Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPR	Environmental performance requirement
GDE	Groundwater dependent ecosystem
GHG	Greenhouse gas
HDD	Horizontal direct drilling
IAC	Inquiry and advisory committee
LAC	Limits of acceptable change
LNG	Liquified natural gas
MNES	Matters of national environmental significance
OHS	Occupational health and safety
PAH	Polycyclic aromatic hydrocarbons
PFAS	Per- and polyfluoroalkyl substances
PM ₁₀	Particulate matter 10 micrometres or less in diameter
PM _{2.5}	Particulate matter 2.5 micrometres or less in diameter
PML	Pipeline measurement length
POS	performance objectives and standards
PSA	Planning scheme amendment
RAP	Registered Aboriginal party
SEPP	State environment protection policy
SIA	Social impact assessment
TRG	Technical reference group

Executive summary

On 8 October 2018, following receipt of a referral from AGL Wholesale Gas Ltd and APA Transmission Pty Ltd under the *Environment Effects Act 1978*, I decided that an environment effects statement (EES) was required for the Crib Point Gas Import Jetty and Crib Point-Pakenham Gas Pipeline Project.

The proponents, AGL and APA, jointly prepared an EES which I authorised for public exhibition and comment. The EES was exhibited for public comment from 2 July to 26 August 2020.

On 19 July 2020, I appointed an inquiry and advisory committee (IAC) to consider the project's EES, a draft planning scheme amendment and a works approval application. Planning Panels Victoria registered 6,058 submissions and the IAC held a public hearing from 12 October to 17 December 2020. The IAC provided its report to me on 22 February 2021. The IAC's report, EES documentation and other material including submissions and documents tabled at the hearing, and presented before the IAC, have informed the preparation of my assessment of the environmental effects of the project.

It is my assessment that the project will have unacceptable environmental effects.

Marine discharges from the proposed floating storage and regassification unit (FSRU) will result in ongoing stress to the environment over the 20 year life of the project. The adverse direct and indirect effects of that discharge on environmental values, fundamental to the Ramsar status of Western Port are not compatible with the level of protection required in a wetland of recognised international significance.

I am satisfied that the environmental effects of other parts of the project, particularly the pipeline component, could be managed within acceptable limits, provided that the project modifications, mitigation, management and monitoring measures I recommend in this assessment are adopted. However, while I see little scope for other components of the project to be delivered or operated without unacceptable environmental effects resulting from operation of the FSRU, I make no determination in respect of this matter. It remains for relevant decision-makers to determine whether the basis or bases disclosed in my assessment for the conclusions I have reached should be accepted.

Accordingly, my assessment includes specific recommendations for the attention of decision-makers including the Minister for Energy, Environment and Climate Change, the Environment Protection Authority, Aboriginal Victoria and Melbourne Water, as well as for the proponent. My assessment is provided to relevant statutory decision-makers responsible for the provision of approvals for the project under Victorian law. Decision-makers must consider this assessment before deciding whether and how the project should proceed. I also expect decision-makers to write to me to advise how my assessment was considered and applied.

The project comprises two controlled actions under the *Environment Protection and Biodiversity Conservation Act 1999* due to potential impacts on matters of national environmental significance. Accordingly, the Victorian EES process served as an accredited assessment process for EPBC Act purposes, pursuant to the bilateral agreement between the Commonwealth and Victorian governments. My assessment will be provided to the Commonwealth Minister for the Environment to inform her decisions about whether and under what conditions to approve the controlled actions that comprise the project.

1. Introduction

On 13 September 2018, AGL and APA jointly referred the Crib Point Gas Import Jetty and Crib Point-Pakenham Gas Pipeline Project to me under the *Environment Effects Act 1978*.

On 8 October 2018, I decided that an environment effects statement (EES) was required under the Environment Effects Act. My decision to require an EES included my procedures and requirements for the EES, in accordance with section 8B(5) of the Environment Effects Act, specifying that the EES must investigate and report:

- a. effects on biodiversity and ecological values within and near the proposed pipeline and gas import facility at Crib Point, including potential impacts associated with the loss of native vegetation, indirect and direct impacts on the habitat for listed threatened species of flora and fauna, and risks to other ecological values and ecosystem services of conservation areas, nature parks, marine reserves and Ramsar sites in proximity to the proposal;
- b. effects from seawater intake to and cold water/residual chlorine discharges from the gas import jetty facility, including potential medium and long-term effects on the ecology of the North Arm of Western Port associated with changes to seawater quality and entrainment of larvae of marine species (threatened and non-threatened);
- c. effects from construction on surface water environments, including local waterways and the broader catchment, as well as groundwater (hydrology, quality, uses and dependent ecosystems), including risks associated with potential acid sulphate soils;
- d. effects on the landscape values and land-uses of the sites and surrounding areas, including the implications for any directly affected agriculture and the proposed rehabilitation of the pipeline corridor;
- e. effects on soil and land-uses from contamination during the construction and operation of the proposal;
- f. effects on Aboriginal and historic cultural heritage values;
- g. effects of project construction and operation on air quality and noise on nearby sensitive receptors (in particular residences);
- h. effects on socio-economic values, at local and regional scales, potentially generated by the project, including increased traffic movement and indirect effects of the project construction workforce on the capacity of local community infrastructure; and
- i. effects of waste (solid, liquid and gas) that might be generated by the project during construction and operation.

On 1 June 2020, I issued amended procedures and requirements addressing aspects of the exhibition and inquiry process in the context of the state of emergency declared in Victoria in response to the coronavirus pandemic. The amended procedures and requirements did not make any change to the required topical coverage of the EES.

AGL and APA were jointly responsible for preparing the EES. The EES addresses the effects of delivering liquified natural gas (LNG) to Crib Point using LNG carriers, storing and regasifying the LNG and operating the pipeline. The EES also addresses effects arising from the construction or installation of project components but does not address the construction of the floating storage and regasification unit (FSRU), the liquefaction of natural gas prior to delivery to the FRSU or the downstream consumption of natural gas.

1.1 Purpose of this document

This document constitutes my assessment of the environmental effects of the project. It represents the final step in the EES process and provides authoritative advice to decision-makers on the likely environmental effects of the project and their acceptability. My assessment is informed by the report of the inquiry and advisory committee (IAC) that I appointed, together with the EES and the submissions and evidence provided to, and presented before, the IAC.

This assessment will inform decisions required under Victorian law about the statutory approvals required if the project proceeds. As the EES process has also been accredited for the assessment purposes of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), it will also inform the Commonwealth Minister for the Environment in making decisions about approvals required for the discrete elements of the project as controlled actions under that Act.

1.2 Structure of the assessment

My assessment follows the general structure:

- Section 2 provides a brief description of the project.
- Section 3 outlines the EES process under the Environment Effects Act and summarises the statutory approvals required for the project.
- Section 4 describes my overarching assessment of the environmental effects of the project within the context of the project's physical, social and government policy settings.
- Section 5 assesses the effects of the project across a broad sweep of environmental themes.
- Section 7 contains my conclusions.
- Appendix A contains conclusions about matters of national environmental significance (MNES) under the EPBC Act, for the specific consideration of the Commonwealth Minister for the Environment under the assessments bilateral agreement between the Australian and Victorian governments.
- Appendix B contains my advice about the environmental management of the project, including recommendations for environmental performance requirements (EPRs) and performance objectives and standards (POS).

2. Project description

The EES described the project as an LNG import terminal comprising an FSRU to be moored permanently at Crib Point Jetty Berth 2. Gas would be transferred from the FSRU to an onshore receiving facility, odorised and corrected to specifications and then delivered via a new pipeline to the Victorian transmission network east of Pakenham. The FSRU and the Crib Point Receiving Facility would be operated by AGL and the Crib Point-Pakenham pipeline including the Pakenham delivery facility would be operated by APA.

The project area for the proposal being assessed via the EES is shown in Figure 1. Figure 2 depicts the main elements of the proposed gas import jetty works at Crib Point. The area proposed to be occupied by the FSRU and the Crib Point receiving facility comprises land currently used for port purposes, partly within the Western Port Ramsar site (wetland of international significance). The pipeline would traverse land used for a variety of urban and rural purposes. The project is described in more detail in Volume 1, Chapter 4 of the EES.

The EES identified the project as comprising the following broad components:

- the FSRU, a modified LNG carrier approximately 300m in length with regasification capability, to be moored permanently at Berth 2 (the southernmost berth) of Crib Point Jetty;
- visiting LNG carriers (between 12 and 40 per year) which would moor alongside the FSRU and transfer LNG cargo to it;
- marine loading arms and other infrastructure including pipes which would be installed on the jetty to convey natural gas from the FSRU;
- a receiving facility to be constructed on land owned by the Port of Hastings Development Authority immediately to the north of the jetty, between high water mark and The Esplanade, where the gas would be metered, odorised and corrected as necessary (for example by adding nitrogen) to meet Victorian specifications; and
- a high pressure gas pipeline to convey the gas from the Crib Point receiving facility to a connection with the Victorian transmission network east of Pakenham, and including ancillary components such as a delivery facility at Pakenham East, mainline valves and pipeline inspection gauge launching and capture facilities.

The project involves the long term (nominally 20 years) continuous mooring of an FSRU at Crib Point Jetty Berth 1. The FSRU would receive cargoes from visiting LNG tankers, each of which would moor alongside the FSRU and transfer its cargo in an operation lasting up to about 36 hours.

The FSRU would store the LNG at a temperature in the vicinity of -163°C and progressively regasify it according to market demand. Up to $468,000\text{ m}^3$ of seawater per day could be extracted, used and discharged for regasification, although daily volumes would vary depending on demand for gas. Discharged seawater would contain residual chlorine, generated through electrolysis for antifouling, and would be up to 7°C cooler than ambient seawater.

Gas would be transferred via marine loading arms and dedicated pipes on the jetty deck to the Crib Point Receiving Facility. From there a new pipeline would convey the gas some 57km to the connection point with the Victorian transmission network.

Visiting LNG carriers would be likely to be larger than any of the other ships visiting the Port of Hastings. They would travel no further into the Port than Crib Point, noting that the port extends north to Long Island Point.

The project presented in the EES and considered for the purposes of this assessment does not include any dredging. Declared depths in the Port of Hastings waters which the FSRU and visiting LNG tankers would use are adequate for those purposes. Works to refurbish Crib Point Jetty Berth 2 and to undertake minor sweeping (to maintain declared depth at the vicinity of the berth) were approved under the *Marine and Coastal Act 2018* prior to my decision to require an EES for the project.

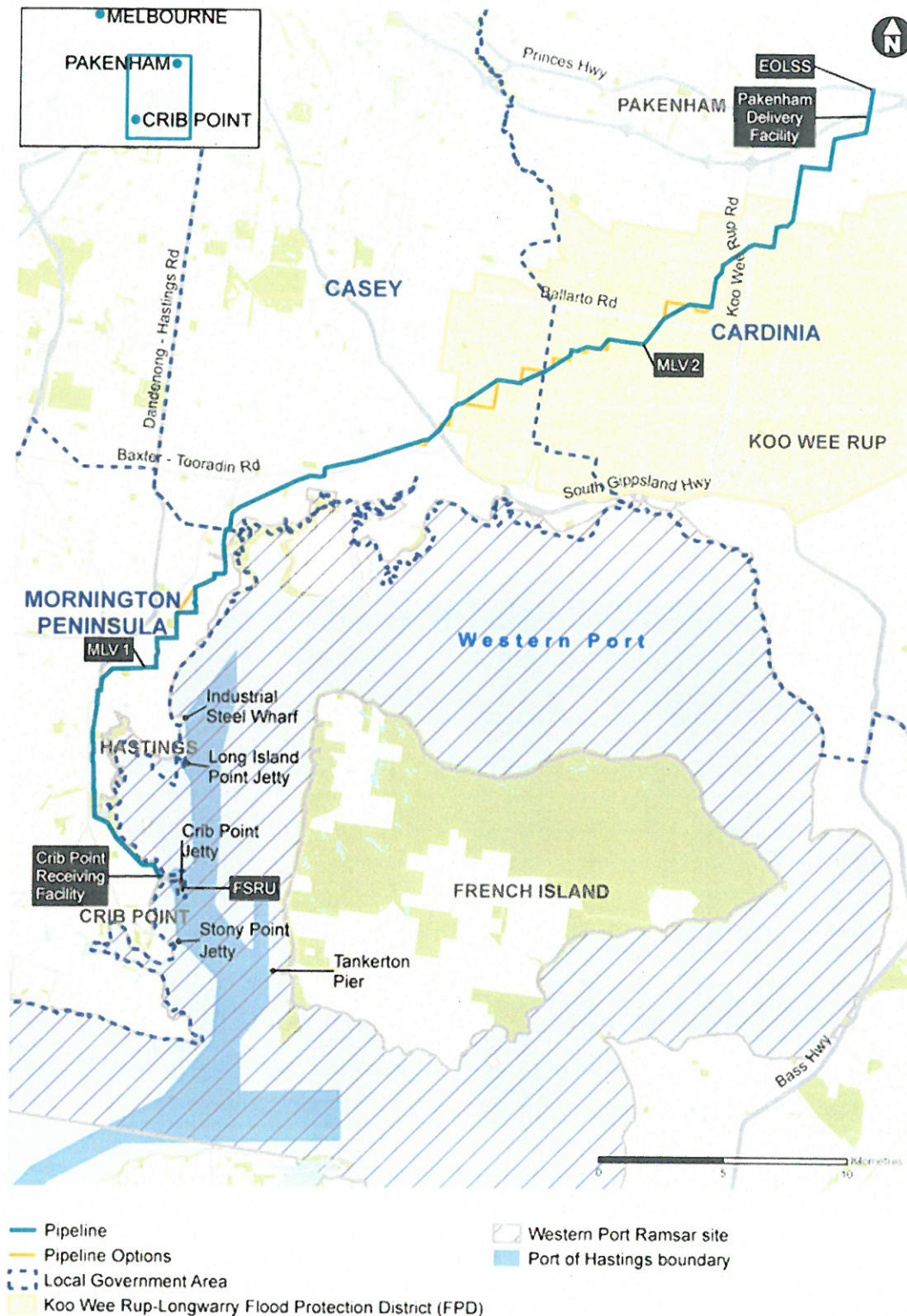


Figure 1: Locality plan showing Crib Point and proposed pipeline route to Pakenham East.

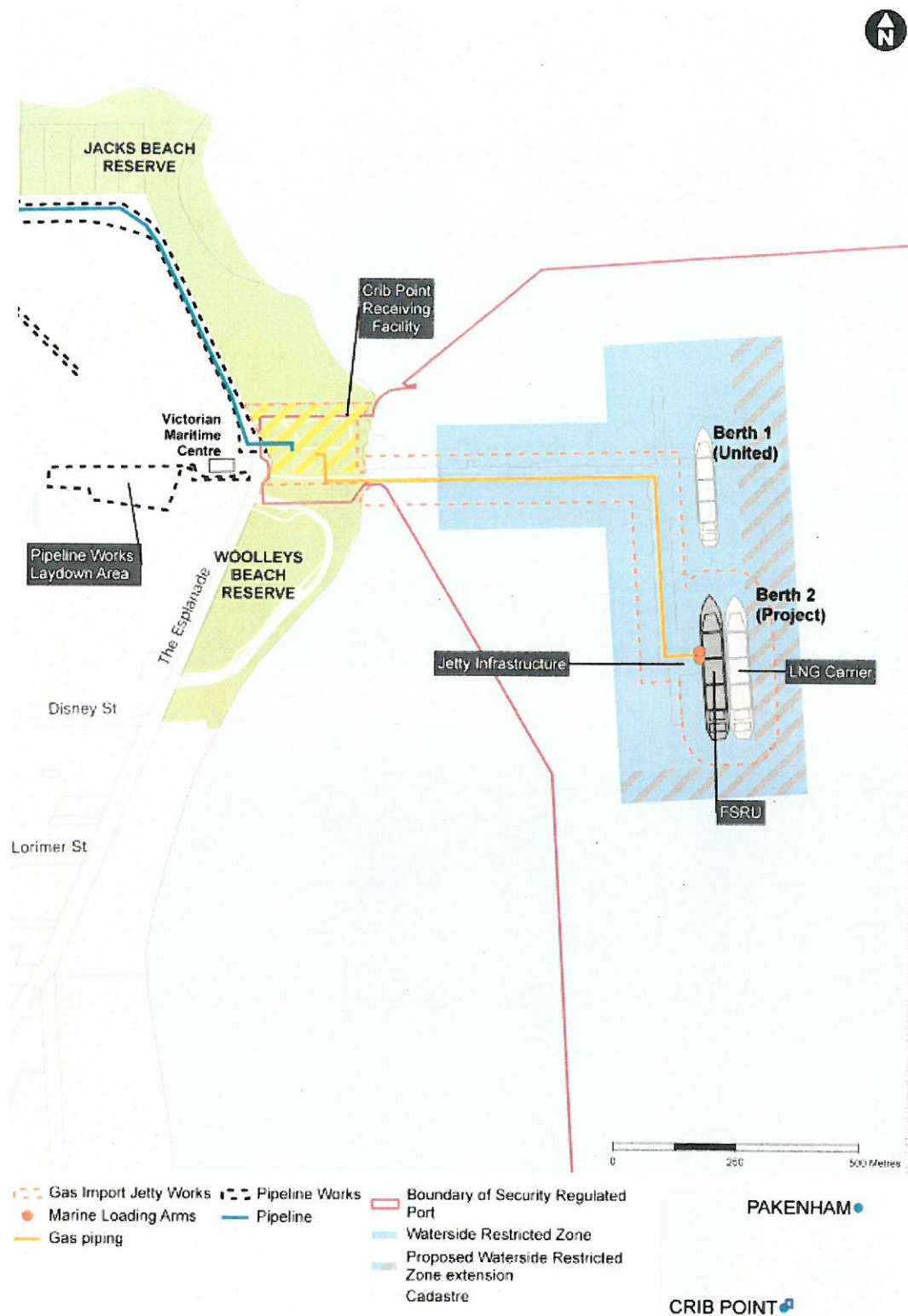


Figure 2: Detail of proposed gas import jetty works at Crib Point.

3. Statutory processes

To proceed, the proponents require a variety of statutory approvals under Victorian and Commonwealth law. My assessment will inform decisions under the *Planning and Environment Act 1987*, the *Environment Protection Act 1970*, the *Pipelines Act 2005*, the *Aboriginal Heritage Act 2006* and the *Marine and Coastal Act 2018*, as well as a range of other consents as detailed below. In addition, the project was referred to the Commonwealth Minister for the Environment and Energy in accordance with the *Environment Protection and Biodiversity Conservation Act 1999*.

On 19 July 2020, with the consent of the Governor in Council, I appointed an inquiry under section 9(1) of the Environment Effects Act to review submissions and inquire into the environmental effects of the proposal, in accordance with terms of reference, which I approved on 1 June 2020. I also appointed the inquiry members as an advisory committee under section 151 of the Planning and Environment Act to consider the draft amendment. This assessment refers to the inquiry and advisory committee as the Crib Point IAC.

On 11 September 2020 the Minister for Energy, Environment and Climate Change appointed the IAC members as a panel pursuant to section 40 of the Pipelines Act to consider submissions in relation to the pipeline licence application.

The EES was placed on public exhibition from 2 July to 26 August 2020. A draft planning scheme amendment (Amendment C272morn) to the Mornington Peninsula Planning Scheme, a works approval application prepared in accordance with the provisions of the Environment Protection Act and pipeline licence application No. PL006610 prepared in accordance with the Pipelines Act were also exhibited with the EES. Planning Panels Victoria registered 6,058 submissions in response to exhibition of the EES, including six from state government bodies and four from local government. All submissions registered were considered in the context of all documents in the EES package: EES and statutory applications.

The IAC held its directions hearing on 17 September 2020, followed by public hearings, which commenced on 12 October and concluded on 17 December 2020. The IAC provided its report to me on 22 February 2021. The report, along with a range of other matters, has informed the preparation of this assessment of the environmental effects of the project under the Environment Effects Act.

3.1 Environment Effects Act

My decision to require an EES obliged AGL APA jointly to prepare an EES to investigate the potential extent, significance and related uncertainties of the project's environmental effects, particularly related to:

- biodiversity and ecological values;
- intake and discharge of seawater for regasification, particularly with regard to residual chlorine and temperature;
- surface water, groundwater and potential acid sulphate soils;
- landscape values and land use, especially with regard to the proposed pipeline works and easement;
- Aboriginal cultural heritage and historic heritage;
- amenity and socio-economic values; and
- waste management.

Following public exhibition and amendment in light of submissions, in January 2019, I issued scoping requirements that specified the matters to be addressed in the EES. The Department of Environment,

Land, Water and Planning (DELWP) convened a technical reference group¹ in accordance with normal EES practice to provide advice to the proponents and DELWP on the preparation of the EES.

In response to the coronavirus pandemic and the resultant declared state of emergency, I issued amended procedures and requirements on 1 June 2020. The amended procedures and requirements required the proponents to give two rounds of notice of exhibition and provided for interested parties to register their desire to receive their own copies of the exhibited EES. I extended the exhibition period to 40 business days and made provision for the inquiry's hearing to be conducted by video-conference.

The next step under the Environment Effects Act is for me to provide an assessment of the environmental effects of the Crib Point Gas Import Jetty and Crib Point-Pakenham Gas Pipeline Project to statutory decision-makers under Victorian law (i.e. this document). The decision-makers must consider this assessment before deciding whether and how the project should proceed.

3.2 Planning and Environment Act

The Planning and Environment Act sets out processes for the amendment of Victorian planning schemes. An amendment to the Mornington Peninsula Planning Scheme to apply a site-specific control to the site would be required to enable the use and development of the land for AGL's gas import jetty works component of the project, subject to conditions. APA's pipeline works component of the project would be exempt from the need for planning approvals under the Pipelines Act.

3.3 Environment Protection Act

A works approval is required under the Environment Protection Act before commencing works associated with AGL's gas import jetty works, specifically the FSRU. An application for a works approval has been received by the EPA and was advertised jointly with the EES (Attachment VIII to the EES), in accordance with Section 20AA of the Environment Protection Act.

Matters relevant to the assessment of the works approval application are addressed in Sections 5. With specific regard to the works approval application and EPA's decision, the EPA will assess the project's compliance in the context of applicable state environment protection policies (SEPPs), particularly SEPP (Waters), SEPP (Ambient Air Quality) and SEPP (Air Quality Management) and other policies under the Environment Protection Act.

I note that the remaining provisions of the *Environment Protection Amendment Act 2018* have been proclaimed to commence on 1 July 2021, at which time the *Environment Protection Act 1970* will be repealed and the amended *Environment Protection Act 2017* will apply.

3.4 Pipelines Act

A pipeline licence would be required under the Pipelines Act before commencing works associated with APA's pipeline works component of the project. APA's application for a pipeline licence formed Attachment IX to the EES and was jointly advertised with the EES. Potential effects of the pipeline works on the environment (primarily arising from construction) are discussed under various headings in Section 6 of this assessment.

1. The technical reference group comprised representatives of DELWP (Planning, Environment, Water and Energy portfolios), Environment Protection Authority, Parks Victoria, Heritage Victoria, Aboriginal Victoria, Worksafe Victoria, Energy Safe Victoria, Melbourne Water, Port Phillip and Westernport Catchment Management Authority, Port of Hastings Development Authority, Cardinia Shire Council, Casey Shire Council and Mornington Peninsula Shire Council.

3.5 Aboriginal Heritage Act

Three cultural heritage management plans (CHMPs) would be required under the Aboriginal Heritage Act before commencing works. One CHMP would be required for AGL's gas import jetty works component of the project, one for the southern portion of APA's pipeline works within country for which Bunurong Land Council Aboriginal Corporation (BLCAC) is the appointed registered Aboriginal party and one for the northern portion of the pipeline which traverses country for which no RAP has yet been appointed. Aboriginal Victoria is responsible for determining whether to approve the latter CHMP. The CHMP for AGL's gas import jetty works is subject to approval by BLCAC.

I gave notice to Aboriginal Victoria under the Environment effects Act when I decided that the EES was required. At that time in 2018 it was established practice that notice under the Act was not given to RAPs. Therefore, BLCAC is not bound to consider this assessment before deciding whether to approve the CHMPs under its authority. However, I commend this assessment to BLCAC to the extent that it may assist it to reach its decisions on those CHMPs.

3.6 Marine and Coastal Act

Consents under the Marine and Coastal Act from the Minister for Energy, Environment and Climate Change would be required for AGL's gas import jetty works component of the project and for those portions of APA's pipeline works that traverse coastal Crown land as defined in the Act. For the purposes of the Act, use of coastal Crown land includes water overlying coastal Crown land.

3.7 Other Victorian statutory approvals

The project requires other Victorian statutory approvals. Those approvals or consents are generally less significant and/or technical in nature:

- consent to undertake works on or across a waterway under the *Water Act 1989*;
- a permit to remove listed flora and/or fauna from public land under the *Flora and Fauna Guarantee Act 1988*;
- permits or consents under the *Heritage Act 2017* with respect to sites on the Victorian heritage register or the Victorian heritage inventory;
- if needed, a permit to take wildlife under the *Wildlife Act 1975*;
- consent to undertake works on a road under the *Road Management Act 2004*; and
- consent under the *Conservation, Forests and Lands Act 1987*.

3.8 Commonwealth statutory approval

In October 2018, AGL referred its gas import jetty works component of the project to the Commonwealth Minister for the Environment and Energy (Referral 2018/8298) for a determination on whether the project is a controlled action under the EPBC Act. At the same time, APA referred its pipeline works component of the project (Referral 2018/8297) for a determination on whether the project is a controlled action under the EPBC Act.

On 28 November 2018, the delegate for the Minister determined each of the two referred components of the project to be controlled actions requiring assessment and approval under the EPBC Act because of their potential for significant impacts on matters of national environmental significance (MNES). The EES is an accredited assessment process under the bilateral agreement between the Australian and Victorian governments. Hence, my assessment will inform the Commonwealth Minister's decision about whether and under what conditions to approve the controlled actions, therefore fulfilling the assessment requirements for MNES under the EPBC Act. My assessment of the potential impacts on MNES is addressed in Appendix A.

4. Environmental assessment

My assessment has been informed by consideration of the EES, public submissions, evidence tabled with the IAC, information and submissions presented at the IAC's public hearing and the IAC's report. Legislation, policy, strategies and guidelines, summarised in Chapter 5 and Attachment II of the EES, and the objectives and principles of ecologically sustainable development, also contextualise my assessment.

4.1 Impact acceptability

Following careful consideration of all available information, with particular regard to the IAC's findings, it is my assessment that the project presented in the EES and considered by the IAC would result in unacceptable effects on the environment.

I concur with the IAC's conclusions that the project's expected environmental effects are unacceptable, including by reason of the fact that those effects are likely to conflict with the imperative of the Ramsar site to protect ecosystem conditions, products and services within the limits of acceptable change. The project would lead to unacceptable adverse change through:

- discharge of chlorine and chlorine-produced oxidants, which are toxic in the environment;
- a change in water temperature in the vicinity of the discharge outlet over an area of at least some hectares; and
- entrainment and loss of plankton, fish larvae or other marine organisms with a dimension <100mm.

These effects would continue throughout the project's operation and could lead, or contribute, to cumulative or other downstream effects which could further damage the ecological condition of the Ramsar site.

I acknowledge that the Crib Point project site, specifically the proposed FSRU berth, is within a declared port. The Port of Hastings pre-dates the Ramsar listing of Western Port. The description of the Ramsar site's ecological character and the setting of its limits of acceptable change allow for the port's operation. Nothing in my assessment precludes ongoing port operations in Western Port. However, the proposed continuous mooring and operation of an FSRU at Crib Point for a nominal period of 20 years is intrinsically different from conventional port operations. That the FSRU meets the definition of a "scheduled premises" under the Environment Protection Act only serves to highlight the FSRU's use as a departure from conventional operations.

Inherent in its proposed use is the FSRU's continued discharge of cooled water and chlorine and chlorine-produced oxidants. I note that the IAC found that the discharge would not be consistent with the statutory provisions of SEPP (Waters). That said, I understand the statutory weight of SEPP (Waters) is scheduled to change on 1 July 2021 with repeal of the *Environment Protection Act 1970* and proclamation of the *Environment Protection Act 2017* and the *Environment Protection Amendment Act 2018*. If the IAC's finding is correct, I expect the responsible exercise of the general environmental duty provisions provided for in the new legislation would continue to preclude a project found to have unacceptable effects on a Ramsar site, noting that my expectation does not affect my conclusion that the environmental effects of the project are unacceptable.

Victorian decision makers considering project approvals under the Planning and Environment Act and the Marine and Coastal Act should note my assessment that the project will have an unacceptable environmental effect on Western port's marine environment. Moreover, my finding of unacceptable impacts on the Western Port Ramsar site should be given careful consideration by the Commonwealth's Minister for the Environment when considering approvals for the controlled actions under the EPBC Act (noting that further detail supporting my conclusion and advice is contained in Appendix A).

While the IAC did not identify unacceptable environmental effects arising specifically from the proposed Crib Point-Pakenham gas pipeline, I am conscious that, for the purposes of the Environment Effects Act, the Crib Point Gas Import Jetty and the Crib Point-Pakenham Gas Pipeline were presented in a single EES and are subject to a single assessment. Accordingly, and in the context of the interdependency of the gas import jetty works and the pipeline works, decision makers who will consider approvals under the Pipelines Act, the Aboriginal Heritage Act, the Water Act and the Flora and Fauna Guarantee Act should also note my assessment.

Key contextual matters

I wish to stress that this assessment is made in the context of existing Victorian government energy policy and legislation. This assessment does not reflect any different view in terms of fossil fuel usage from that expressed in the *Climate Change Act 2017*. Nor does it support or rely upon views expressed by some submitters that ongoing port operations or development within the Port of Hastings should not be entertained or should be discouraged. But it does acknowledge and affirm the obligations that arise in the context of managing such operations and development in a manner that does not result in an unacceptable effect on the environment.

Project need

The EES, written submissions, evidence and oral submissions presented at the IAC's hearing addressed the question of the need or otherwise for the project. Need, however defined, is not an important consideration for this assessment. The project is a private sector commercial proposal representing one way, but not the only possible way, of addressing a forecast natural gas supply shortage. I have assessed the environmental effects of the project on their merits and have not weighted my assessment with the proponents' expressed view that there is a need for the project.

Climate change and energy policy

Victoria has a legislated renewable energy target. However, the legislation does not impose limits on the continued use of fossil fuels. There is no Victorian legislative or policy imperative relating to climate change with which the project conflicts.

Clearly, for the existing legislated targets (and longer-term aspirational targets yet to be given legislative expression) to be met, a progressive and increasingly challenging transition away from fossil fuels towards renewable energy sources must continue. I understand the arguments that permitting new infrastructure dedicated to and facilitating ongoing consumption of fossil fuels would not contribute positively towards that transition.

The Andrews Government is actively encouraging the necessary changes in our energy usage patterns to enable our ambitious targets to be met, and recognises the driving need to reduce greenhouse gas emissions to avoid disastrous climate change. Since 2016, the renewable contribution to electricity generation in Victoria has risen from 16%² to 26%³, significant progress towards the 2030 target of 50%.

Accordingly, my assessment is not weighted against the project for enabling continued use of natural gas over the indicative life of the project. Other policy levers will operate at a broader level to ensure that Victoria can meet its targets and its moral obligations in addressing the global threat of climate change.

Industrialisation of Western Port.

Western Port is characterised by deep navigable channels, a large (western) opening to Bass Strait enabling a substantial tidal influence, its extensive intertidal flats and its two large islands, French and Phillip Islands.

² Renewable Energy Action Plan, DELWP 2017, p 19.

³ [Victoria's renewable energy targets](#) – DELWP website, viewed 18 March 2021

Despite a range of anthropogenic changes, it remains relatively closer than, say, Port Philip Bay to its pre-1800 condition.

In Victoria's expanding post World War II economy, then Premier Sir Henry Bolte identified and promoted the potential of Western Port for industrial development. The Port of Hastings was slated for major expansion to support petrochemical plants, refineries and even a nuclear power station. BHP, Esso and BP were among the multinational businesses which established operations in Western Port with Victorian Government encouragement.

It is not the role of this assessment to dissect the reasons why Bolte's vision did not materialise. It is appropriate, however, to note that the *Westernport Bay Environmental Study*⁴ of the early 1970s highlighted Western Port's impressive range of environmental qualities and assets. Perhaps one of Victoria's first true strategic environmental assessments, findings from the study have been reflected in state government planning policy and environmental regulation. The study also provided data and impetus for the subsequent listing of Western Port as a wetland of international significance, especially for waterbirds, under the Ramsar Convention and, later, the successful nomination of Western Port and its surrounds as a Biosphere Reserve under the United Nations Educational, Scientific and Cultural Organisation's *Man and the Biosphere program*.

Through all of this, the Port of Hastings has continued to operate as a commercial port under government direction and in accordance with government policy. Currently, its management is vested in the Port of Hastings Development Authority. No Victorian government has legislated for the closure of the Port of Hastings. Indeed, successive governments since 1975 have entertained a variety of scenarios for expansion of the port. In that vein, it is my expectation that the port will continue to operate and serve Victoria on an ongoing basis.

Damage to native vegetation at the proposed Crib Point receiving facility site

In February 2020 native vegetation on land owned by the Port of Hastings Development Authority, and proposed for the Crib Point receiving facility, was extensively cleared. Mornington Peninsula Shire Council, as the responsible authority for the Mornington Peninsula Planning Scheme, initiated an investigation as to whether an offence had occurred and to determine what if any enforcement action might be appropriate. I understand that the matter has not yet been concluded. I do not wish to prejudice those investigations and make no comment on the nature of the vegetation removal which occurred, including the legality of that removal.

Selection of expert witnesses

I note with some concern that most of the expert witnesses whom the proponents chose to call for the IAC hearing were not involved in the preparation of the EES. This meant that at the hearing the IAC and other parties were not able to question witnesses with first-hand knowledge of how the EES investigations were carried out and documented. While the expert witnesses called by the proponents were able to offer their own perspectives on their respective topics, in my view the approach chosen by the proponents (which extended to all specialist topics except marine biodiversity) had the potential to divert focus from the EES.

Proponents, DELWP and the other authorities on the technical reference group convened by DELWP all invest heavily in the process by which the EES is prepared. The EES is the primary source of information about the project and its potential environmental effects available to interested parties to inform their decisions about whether and in what terms to make submissions. Accordingly, the EES ought to be central to the consideration of the IAC and other parties at the hearing stage. This would be assisted by proponents calling, as expert witnesses and in addition to any other expert witnesses that a proponent may

⁴ Shapiro, M.A. and D.W. Connell (1975). *The Westernport Bay Environmental Study*. Royal Society of Victoria, Melbourne.

wish to call, the persons who contributed directly to preparing the EES to respond to matters raised about the topics which they have investigated.

4.2 Consideration of project alternatives

As set out in the scoping requirements and the EES procedures and requirements issued by the Minister under the Environment Effects Act, this EES was required to describe and assess effects of relevant alternatives. The proponents provided an explanation of the basis for selecting Crib Point as its preferred site for the FSRU in Chapter 2 of the EES. Chapter 3 of the EESs sets out the consideration of alternatives for preferred regasification mode (open loop, closed loop or combination) and for the proposed pipeline route from Crib Point to Pakenham East.

The investigation of environmental effects presented in the EES focussed on the preferred options selected. I note that some decisions by the proponents about aspects of the preferred option, in terms of regasification mode and some sections of the pipeline route occurred during the preparation of the EES, in response to information gathered through the EES process. This assessment responds to the environmental effects of the proponents' preferred form of the project, refined from the alternatives that they considered, as presented in the EES and at the IAC hearing.

5. Environmental effects

On balance, it is my assessment that the project's environmental effects are not acceptable. However, other decision-makers remain responsible for determining whether certain approvals should be granted for the project. The determinations to be made by those decision-makers requires them to consider my assessment. Accordingly, in the event that the project is approved, I provide recommendations in this section to minimise adverse effects on the environment, noting that some specified impacts would still be unacceptable.

The IAC made extensive findings and recommendations in respect of the project. My assessment generally supports these findings and recommendations. My response to its key findings and recommendations, along with my assessment of the main environmental effects of the project, are detailed in the sections below. Appendix B contains further detailed advice about the environmental management of the project, including recommendations for environmental performance requirements (EPRs) and performance objectives and standards (POS).

5.1 Evaluation objectives

To provide an integrated structure for this assessment, key aspects of legislation and statutory policy have been synthesised into a set of evaluation objectives. These objectives were published in the scoping requirements for the EES and used by the proponents in their assessment of alternatives and effects within the EES. The IAC also considered the project having regard to the evaluation objectives. Assessment topics in this section are considered within the context of the evaluation objectives, as indicated in Table 1.

Table 1: Assessment evaluation objectives

Evaluation objective
Energy efficiency, security, affordability and safety – To provide for safe and cost-effective augmentation of Victoria's natural gas supply in the medium to longer term.
Biodiversity – To avoid, minimise or offset potential adverse effects on native flora and fauna and their habitats, especially listed threatened or migratory species and listed threatened communities.
Water and catchment values – To minimise adverse effects on water (including groundwater, waterway, wetland, estuarine, intertidal and marine) quality and movement particularly as they might affect the ecological character of the Western Port Ramsar site.
Cultural heritage – To avoid or minimise adverse effects on Aboriginal and historic cultural heritage.
Social, economic, amenity and land use – To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.
Waste – To minimise generation of wastes by or resulting from the project during construction and operation, including accounting for direct and indirect greenhouse gas emissions.

5.2 Marine biodiversity

Evaluation objective

To avoid, minimise or offset potential adverse effects on native flora and fauna and their habitats, especially listed threatened or migratory species and listed threatened communities.

To minimise adverse effects on water (including groundwater, waterway, wetland, estuarine, intertidal and marine) quality and movement particularly as they might affect the ecological character of the Western Port Ramsar site.

To minimise generation of wastes by or resulting from the project during construction and operation, including accounting for direct and indirect greenhouse gas emissions.

Assessment context

Marine biodiversity impacts are addressed in Chapter 6 and Technical Report A of the EES and in Section 4 of the IAC's report. The IAC recommended 16 EPRs dealing with marine biodiversity matters (see Appendix G in Part 2 of the IAC's report).

Ramsar status of Western Port

Western Port supports many thousands of waterbirds, including thousands of migratory shorebirds of many species. The habitat it provides for waterbirds includes relatively undisturbed locations for roosting and (for some species) breeding, as well as extensive areas of water, intertidal and littoral habitats for foraging. Western Port was listed under the *Convention on Wetlands of International Importance Especially as Waterfowl Habitat* (Ramsar, Iran, 1971), commonly referred to as the Ramsar Convention, in 1982. It is one of some 60 Ramsar sites in Australia, including 12 in Victoria.

As a Ramsar site, Western Port meets defined criteria for listing, has a documented ecological character description, comprises defined ecosystem components, processes and services and functions within specified limits of acceptable change. Those aspects of the Ramsar site are documented in the *Western Port Ramsar Site Management Plan* and discussed in the EES. They provide an objective basis against which to consider the potential environmental effects of the project.

The EES and the IAC's report both present discussions on the limits of acceptable change⁵ as criteria for assessing the impacts of the project. I note that the limits of acceptable change generally apply across the whole of the Ramsar site and, as identified by the IAC, might not provide the most appropriate benchmark for assessing project impacts originating from a specific location within the Ramsar site.

The Western Port Ramsar Site Management Plan also sets out resource condition targets⁶ which have been established for priority ecological values. Achieving the resource condition targets will enable the objectives of management plan to be fulfilled. The resource condition targets respond to the limits of acceptable change but generally set substantially higher thresholds compared to the limits of acceptable change, reflecting the purpose of maintaining and where necessary enhancing the ecological values of the Ramsar site, as opposed to identifying benchmarks below which the site could be at risk of failing to continue to satisfy applicable Ramsar site criteria.

Western Port's Ramsar status was a factor in my decision to require an EES for the project. It is also a controlling provision for both EPBC controlled actions comprising the project for the accredited assessment purposes of the EES.

Threatened and migratory species

Species listed as migratory and/or as threatened under the EPBC Act serve as controlling provisions under their own right (see Appendix A), as well as potentially contributing to the Ramsar values of Western Port. The scoping requirements for the EES included a list of those EPBC migratory and/or threatened species known to occur in Western Port or in the vicinity of the pipeline alignment, comprising two whales, one

⁵ Western Port Ramsar Site Management Plan, DELWP 2017, p. 29

⁶ Western Port Ramsar Site Management Plan, p. 48

terrestrial mammal, three turtles, two fish, one frog, 14 birds and one plant (Appendix A). Of those species, Southern Brown Bandicoot, Dwarf Galaxias, Growling Grass Frog and Dense Leek-orchid are unlikely to be affected in the context of marine ecology and are not considered further in this section.

I note that Western Port also provides habitat for an extensive variety of species which are protected (some listed as threatened) under Victorian legislation. This assessment addresses those values as well as the values listed under the EPBC Act.

Waterbirds and shorebirds

Waterbirds and shorebirds use the wetland habitats in Western Port for shelter and foraging with most species relying primarily on littoral and intertidal habitats. The EES presented birds and potential impacts on birds in the context of terrestrial ecology. However, as birds are intrinsically significant to the Ramsar concept, they are addressed in this section in terms of their relationship with the Western Port Ramsar site. Other aspects of the project's potential impacts on birds are addressed in Section 5.3.

Most of the shorebird species found at Western Port are non-breeding migratory visitors, with breeding grounds in the Northern Hemisphere. They are listed in international agreements between Australia and other countries in the East Asian-Australasian Flyway, including China, Japan and the Republic of Korea. As well as being migratory, Far Eastern Curlew and Curlew Sandpiper are both listed as critically endangered. This assessment considers migratory bird species as a guild, without distinguishing between species in assessing the potential impacts except as mentioned below.

Marine fauna

Turtles are likely to visit Western Port only as exceptional wandering individuals. Southern Victorian waters are not within the regular range or the scope of regular movements of any marine turtle species.

Both Humpback and Southern Right Whales travel through Bass Strait regularly in the course of annual migrations. Occasionally, individuals enter Western Port, but Western Port is not a recognised destination for either species. Whales are most likely to be present in Western Port (or in Bass Strait, in the vicinity of Western Port) in the May-October period. This period coincides with the period when domestic demand for gas peaks and therefore LNG carrier movements might also peak. However, LNG carrier movements and resultant risks to whales need to be considered in the context of the long-standing existence of the Port of Hastings and the relative rarity of whales entering Western Port.

Seals regularly occur in Western Port. A large colony of Australian Fur Seals breeds at The Nobbies, at the western end of Phillip Island and individuals range into Western Port. Seals commonly use built infrastructure including the Crib Point jetty for resting.

Discussion

The IAC acknowledged that the Ramsar site includes an operating commercial port. The IAC found that operation of the port since Western Port's Ramsar listing has generally been sensitive to and consistent with the maintenance of Western Port's Ramsar values.

The IAC identified the key elements of the project that could affect marine ecological values as:

- entrainment of biota including plankton, fish eggs and larvae and organisms with a dimension <100mm in water extracted from Western Port for regasification, resulting in potential death or injury;
- discharge of used seawater following regasification at a temperature up to 7°C below ambient temperature; and
- discharge of used seawater containing residual chlorine and chlorine produced oxidants.

The IAC concluded that the proponents' consideration of the impacts of the project against the limits of change for the Ramsar site were inappropriate. The IAC found a generalised approach, across the whole site, created the possibility that the impact of the project on specific environmental assets in the vicinity of Crib Point that contribute to the Ramsar site's values might be underestimated. Further, the IAC concluded that the proponents relied on a flawed environmental risk assessment that ranked some potential risks as of lower concern than it should have done. That approach in turn led to the proponents ranking many of the potential environmental impact pathways associated with the project lower than they should have been ranked. Although some field data were gathered, the IAC identified heavy reliance on literature to provide environmental data for describing and ranking risks, and therefore impacts, as a further limitation which limited the utility of the proponents' impact assessment for marine biodiversity.

The IAC concluded a range of potential impacts that could arise from the project have not been characterised or addressed in ways that demonstrate the adverse environmental impacts of the project will be prevented or will be manageable within acceptable limits. A broader range of potential indirect impacts on environmental conditions, that might accrue progressively over the extended period of the project's operations or that might result from specific incidents, such as spills, would contribute to the potential aggregate impact of the project on its receiving environment in terms of marine ecology.

The IAC found that potential impacts on higher order aquatic species cannot be ruled out. Potential indirect impacts could extend over wider geographic areas or for longer timeframes than suggested in the EES.

Entrainment

Adverse impacts on marine biota could result from entrainment of organisms in the FSRU's seawater intake used in the regasification process. Those organisms would be exposed to chlorine generated to prevent biofouling of equipment, rapid temperature changes and physical trauma as they are conveyed through the pumps. The EES assumed that all entrained organisms would be killed.

The IAC expressed concern that considering the overall impact of entrainment as "averaged" across the whole of the Ramsar site understates the potential impact in the part of Western Port where impacts might be most severe. For example, eggs or larvae of fish species that use Western Port as a "nursery" may be disproportionately affected. I note that Australian Grayling, listed as vulnerable under the EPBC Act and as threatened under the Flora and Fauna Guarantee Act, occurs in streams in the Western Port catchment and moves through marine waters during its larval and juvenile phases. Its movement patterns through Western Port are not well known, but field work for the EES captured one late larval individual. The Australian Grayling could be susceptible to entrainment.

Modelling and predictions of impacts from entrainment relied on other assumptions as well, including that fish would choose to swim away from the intake current. Other parties challenged that assumption. The grille covering the inlet ports is proposed to have a 100mm by 100mm mesh. The IAC noted arguments that organisms with at least two dimensions smaller than 100mm could be entrained, including larger organisms such as pipefish, eels and adult fish of a variety of species. The IAC accepted that this entrainment would be both likely and unavoidable. The IAC determined that this would be an unacceptable impact on the ecology of Crib Point.

The IAC concluded that impacts would accrue from entrainment but could not determine from the available information the level of significance of those impacts. It noted the assessment, including relevant modelling of the impacts of entrainment, relied on assumptions that might or might not be valid. However, the IAC identified entrainment impacts on biota up to 100mm (that fit through the grille) as unacceptable.

Residual chlorine, chlorine-derived compounds and other toxicants

The EES proposed a discharge limit of 100µg/L residual chlorine⁷. However, the IAC found that substantially lower thresholds should apply because a higher level of protection should be afforded to marine organisms in a Ramsar site. The proposed regular and at times continuous regasification means that chlorine-exposure should be addressed as chronic rather than as acute, requiring adoption of lowered thresholds. The IAC also noted concerns expressed in submissions that reliance on toxicity tests using Northern Hemisphere species rather than locally occurring native Western Port species does not provide sufficient confidence in applying the test results. The IAC expressed concern that some of the species naturally occurring in waters around Crib Point, such as sea urchins⁸, may be close to the more sensitive end of the spectrum in terms of vulnerability to chlorine produced oxidants.

Some chlorine produced oxidants are unstable and relatively short-lived in the marine environment but some are more persistent, especially those resulting from reaction with bromine to form brominated organic compounds. Brominated organic compounds are moderately to highly toxic and can occur naturally; the EES did not present data on naturally occurring levels of brominated organic compounds at Crib Point or elsewhere in Western Port. The IAC also expressed concerns about potential impacts from tributyltin residues in sediments adjacent to the Crib Point jetty.

The IAC sought additional information from the proponents about options for applying substantially reduced chlorine discharge limits than proposed in the EES. The additional information provided indicated that a reduced chlorine discharge concentration of 20µg/L could be achievable, as required for the FSRU recently approved for Port Kembla, NSW. The IAC also considered information presented in submissions about discharge parameters for FSRUs operating elsewhere in the world and noted that a discharge of 100µg/L could not be regarded as best practice⁹.

The IAC concluded that the adverse effects of chlorine produced oxidants discharged as proposed from the FSRU into a Ramsar site is unacceptable. It found exposure should be considered as chronic rather than acute, and that it was not satisfied the potential of impacts of the operation of the proposed FSRU over many years was acceptable. The IAC further noted the need for an operation proposed in a Ramsar site to demonstrate best practice. Given the proposed duration of the project and its near-continuous discharge regime, the IAC concluded that a maximum discharge concentration of 2µg/L residual chlorine would represent the upper limit for acceptability in Western Port.

Discharge temperature

Under open loop mode, the FSRU would discharge used seawater back into Western Port approximately 7°C cooler than the ambient seawater. The FSRU would also be capable of operating in closed loop mode with a reduced, but still substantial, discharge warmer than the ambient seawater. The EES proposed that closed loop mode would operate only when the ambient seawater temperature was less than 10°C, expected to be the case for no more than about 30 days per year.

Cooled water from open loop regasification would tend to sink to the seafloor and mixing would be inhibited during periods of slack water (shortly before and after the turn of the tide), when the cooled water might form a “pancake” on the seabed. The EES did not investigate the potential for degradation of chlorine produced oxidants to occur more slowly at lower temperatures. As the FSRU’s discharge ports would be on the same side as the LNG carriers, discharges at those times would be blocked and mixing inhibited. The proponents undertook to avoid discharges during slack water or while an LNG carrier was moored alongside. However, the potential for the discharge to affect benthic infauna, such as Lamp Shells,

⁷ EES Volume 2, Table 6-18.

⁸ IAC Report, Volume 1, p. 79.

⁹ IAC Report, Volume 1, p. 87.

Magellania flavesceus (for which the IAC heard evidence that Crib Point represents the only extant occurrence in Victoria) was not adequately explored in the EES. The IAC could not rule out potential impacts to other species further afield.

The IAC found that the discharge of cooled water as an impact in isolation might be manageable and acceptable, especially if avoided in identified circumstances when mixing would be inhibited. However, the impact of the cooled water discharge cannot be considered in isolation because that discharge would also contain chlorine produced oxidants. The lower temperature of the discharge could contribute to the slower degradation of the chlorine produced oxidants and hence potentially result in more extensive adverse effects on the environment.

Underwater noise

The IAC considered evidence and submissions about the potential impacts of underwater noise from the project on marine fauna, especially mammals and birds. It noted that the treatment of the issue in the EES included neither empirical data from an operational FSRU nor background ambient underwater noise data for Western Port. While it did not conclude that impacts from underwater noise on fauna would be unacceptable, it noted deficiencies in the information that the proponents had presented. It recommended that additional data should be collected prior to project commissioning and assessed, and that post-commissioning monitoring should be required.

State Environment Protection Policy (Waters)

The IAC considered submissions from the proponents and from submitters objecting to the project about the project's capacity to comply with provisions of SEPP (Waters), which carries statutory weight under the Environment Protection Act. In particular, the IAC's attention was drawn to clauses 22(3) and 25 of SEPP (Waters). Clause 22(3) prohibits EPA from approving a new wastewater discharge in "waters of high conservation value" (which includes Ramsar sites). Clause 25 provides an exemption to allow a discharge to provide an environmental flow.

As the IAC was not appointed under the Environment Protection Act, the IAC left it to EPA to determine whether the proposed discharge would comply with SEPP (Waters). However, its discussion makes it clear that the proposed discharge would be into waters of high conservation value and would have adverse impacts. The IAC noted that the proponents' marine experts agreed that there is sufficient water in Western Port.

IAC conclusions

The IAC drew the following conclusions on marine biodiversity.

- The likely marine biodiversity impacts do not achieve the evaluation objectives.
- An adequate baseline of conditions within Crib Point has not been established and future predictions of direct and indirect impacts from the project are not certain.
- The project will result in Western Port's continued exposure to adverse environmental impacts over the decades of the project's proposed operation.
- The project's marine discharges are inconsistent with the legislative, policy and guideline requirements and commitments to conserve, maintain and enhance Western Port as:
 - a listed wetland under the Ramsar Convention;
 - a MNES under the EPBC Act;
 - an area of high conservation value by SEPP (Waters); and
 - an ecosystem highly valued for its unmodified state and outstanding natural and conservation value.
- Discharge from the FSRU is expected to result in an adverse impact near the jetty, including impacts to the seabed habitat and changes to epibiota and infauna assemblages.

- The aggregate direct impacts from chlorine and cold water discharges, entrainment of biota sized to at least 100mm, impingement of pelagic biota and indirect impacts of chlorine produced oxidants are potentially threatening processes to the ecological character of the Western Port Ramsar site.
- Impacts from underwater noise on marine biodiversity should be further investigated.
- Marine biodiversity impacts cannot be acceptably managed through the recommended mitigation measures.

The IAC observed that conventional port operations have been conducted compatibly with the Ramsar site since its designation as such almost 40 years ago. However, establishment and operation of an FSRU would be fundamentally different from those operations. It would create a real threat to the composition of the marine biota and possibly even to the viability of some species or biotic associations within the sphere of influence of the FSRU.

While the IAC identified information gaps in the data used for predicting entrainment impacts, it was not convinced that robust data to fill those gaps could practicably be collected prior to commissioning the project.

Discussion

Ramsar

I accept the IAC's conclusions that the potential impacts of the project are unacceptable in the context of Western Port's Ramsar status. The IAC considered that the application of the broader Ramsar limits of acceptable change to assess the impacts of the project to the localised conditions at Crib Point to be inappropriate because it involved an assessment that does not accurately assess the project's effects on the extent of marine biodiversity impacts. Further, I note that the Commonwealth Department of Agriculture, Water and the Environment in its submission recommended that resource condition targets would be more appropriate indicators than limits of acceptable change. As the resource condition targets represent a higher standard of environmental protection than the limits of acceptable change, I support the IAC's conclusion that consideration of the project's impacts relative to the limits of acceptable change is inappropriate.

Potential impacts on fauna

While the project would not directly affect most of the habitats used by waterbirds and shorebirds during establishment or routine operations, unintended non-routine events such as spills may affect birds. By affecting the health and composition of marine biota in the vicinity of the FSRU, in ways discussed below, the project could have indirect effects over the medium and longer term on the quality of foraging habitat further afield in Western Port. The information that the proponents presented in the EES and at the IAC's hearing does not enable the likelihood, extent or severity of such impacts over the operational duration of the project (or beyond) to be characterised adequately. In the context of the known range of threats to significant waterbird and shorebird species occurring in Western Port, and indications of declines in the numbers of most species in Western Port over time, further adverse incremental effects on those species would be of serious concern. Western Port's status as a Ramsar site and its known importance for several waterbird and shorebird species highlights the need to protect the habitat quality of Western Port in the long term and minimise further impacts on those species.

Whales, turtles and other marine vertebrates including seals, penguins and fish may be affected by noise from the project. I note and support the IAC's conclusions and recommendations about underwater noise effects and the need for further and more detailed information. Marine vertebrates could also be at risk of collisions with arriving or departing LNG carriers or with tugs assisting LNG tankers mooring alongside the FSRU and leaving their berth. However, even added to current movements, the additional shipping would

result in aggregate movements well below historical maxima and will likely result in little additional impact with that impact being within acceptable limits. Similarly, I am satisfied that the direct adverse effects of the project on seals would be negligible. Like other predatory species, seals rely on a healthy ecosystem to provide prey and may be susceptible to indirect impacts on ecosystem health.

I cannot rule out potential impacts to benthic infauna species further afield due to the long-term discharge of cooled seawater containing residual chlorine, chlorine produced oxidants and brominated organic compounds. I consider the IAC's findings and conclusions with respect to chlorine produced oxidants, temperature change and entrainment weighty because they go to the heart of Western Port's listing as a Ramsar site. Given the continuity and duration of proposed FSRU operations, I concur with the IAC's finding of unacceptable effects on the environment.

Assessment

- Impacts resulting from entrainment and from discharge of residual chlorine, chlorine produced oxidants and brominated organic compounds are unacceptable and, hence, the project's impacts on marine biodiversity values in the context of Western Port's Ramsar status are unacceptable
- Potential impacts on whales, turtles and other marine fauna, including species listed as threatened under the EPBC Act or Victorian legislation are not likely to be significant and would be manageable within acceptable limits, subject to further work on underwater noise as recommended by the IAC.
- The approach taken through the EES to characterise environmental impacts in the context of environmental risk assessment was flawed and is likely to have underestimated impacts on the Ramsar values of Western Port.
- The EES did not demonstrate potential indirect impacts and potential incremental accumulating impacts would or could be mitigated or managed within acceptable limits, having regard to the project's potential operating term and the sensitivities of the Western Port Ramsar site.
- The proposed discharge conflicts with provisions of SEPP (Waters).
- In a complex and deeply interconnected marine ecosystem of recognised and statutorily protected high value, a precautionary approach requires that indirect and aggregating impacts, and the likely efficacy of mitigation and management measures must be soundly understood before they can be found to be acceptable.
- The potential for adverse impacts to aggregate or to compound cannot be eliminated, creating the serious possibility that accumulated impacts may be appreciably worse than predicted in the EES and considered by the IAC, especially over the duration of the project's proposed operating term.
- If the project is approved, the recommended EPRs in Appendix B (largely consistent with those provided by the IAC in its Appendix G) should be adopted.

5.3 Terrestrial and freshwater biodiversity

Evaluation objective

To avoid, minimise or offset potential adverse effects on native flora and fauna and their habitats, especially listed threatened or migratory species and listed threatened communities.

To minimise adverse effects on water (including groundwater, waterway, wetland, estuarine, intertidal and marine) quality and movement particularly as they might affect the ecological character of the Western Port Ramsar site.

Assessment context

Terrestrial and freshwater biodiversity impacts are addressed in Chapter 7 and Technical Report B of the EES and in Chapter 5 of the IAC's report. Several technical notes tabled during the IAC hearing provided further information on terrestrial and freshwater biodiversity matters. Ten EPRs as recommended by the

IAC focus on terrestrial and freshwater biodiversity matters. Several POS also apply to terrestrial and freshwater biodiversity values associated with the pipeline alignment.

The IAC identified the key issues for terrestrial and freshwater biodiversity as:

- native vegetation loss, including large scattered trees;
- habitat loss, fragmentation and disturbance;
- biosecurity risks with pathogens; and
- impacts of lighting on wildlife.

Native vegetation

The IAC noted the importance of remnant vegetation, even if modified, in the area where the project is proposed to be located, and especially vegetation close to the Western Port Ramsar site. It stressed the need for the proponents to minimise impacts on native vegetation, particularly large old hollow-bearing trees, as far as practicable. It identified sites where impacts on native vegetation should be reduced if the project is to proceed, including specific trees which should be retained at the expense of project modifications.

The IAC accepted evidence that vegetation removal in connection with pipeline or easement maintenance would not be likely to be required above HDD segments of the pipeline. Accordingly, it supported extension of HDD under areas supporting important vegetation, such as at Warrangine Park and where coastal saltmarsh community extends across the pipeline alignment.

Threatened species and migratory shorebirds

The IAC supported monitoring of shorebird use of intertidal foraging habitat at Crib Point for two years before project operations commence. It found that this information was lacking in the EES but would contribute to a better understanding of the project's effects on the birds and, in turn, inform potential mitigation measures.

The IAC noted that pipeline construction impacts would be confined to a narrow strip and would generally be temporary in nature, other than the loss of large hollow-bearing trees. It made detailed recommendations about variations to the pipeline alignment or works to retain several specific habitat assets and methods for revegetation to accelerate habitat recovery.

The IAC noted views expressed in evidence and submissions that a dearth of recent records of Southern Brown Bandicoot near the southern portion of the pipeline alignment should not be interpreted as the total or permanent absence of the species from that area. Existence of substantial populations nearby and the dispersive ability of the species means that it could recolonise nearby areas of suitable habitat if conditions allow.

The IAC concluded that management of impacts on Growling Grass Frog, Swamp Skink and Southern Toadlet, all of which rely on variably moist habitats, would be manageable within acceptable limits, subject to specific recommendations.

Biosecurity

The IAC concluded that biosecurity impacts, specifically associated with pathogens *Phytophthora cinnamomi* (Cinnamon Fungus) and *Batrachochytrium dendrobatidis* (Amphibian Chytrid Disease), could be managed with the application of measures set out in provisions attached to the CEMP for the pipeline works.

Lighting impacts

The IAC accepted the proponents' submissions with regard to potential impacts of lighting, particularly from the FSRU and the Crib Point Receiving Facility, on wildlife, concluding that impacts would not be significant and would be manageable through EPRs, in conjunction with specified monitoring of shorebird habitat usage near Crib Point.

Discussion

Native vegetation

I note that coastal saltmarsh community is listed as vulnerable under the EPBC Act and therefore is of conservation importance. Beyond that, I generally accept the IAC's conclusions and endorse its recommendations on native vegetation impacts. The specified native vegetation sites and scattered trees should be retained, and I agree the draft offset strategy demonstrates offsets can be provided.

Threatened species and migratory shorebirds

Much of the habitat used by migratory and threatened shorebirds is intertidal. The designation of Western Port as a Ramsar site and its well-documented support of significant populations of migratory and threatened waterbird and shorebird species highlights the significance of the habitat values that it provides. While intertidal flats where shorebirds forage might not be subject to direct adverse effects from the project, the potential for indirect effects on habitat quality and productivity over time cannot be ruled out. Those indirect effects were an important consideration of the IAC and inform my assessment. While further monitoring, for a period of two years prior to, and for years after, the commencement of the project as recommended by the IAC, could provide a better understanding of shorebird habitat usage near Crib Point, it will not inform decision-making now.

Direct impacts on migratory and threatened shorebirds due for example from disturbance or disorientation could be of concern at key times such as immediately prior to migration. In that context I note the IAC's finding that such impacts from land-based sources would be likely to be manageable within acceptable limits. However, reduced habitat quality from the effects of entrainment or residual chlorine discharges (see Section 5.2) poses a potentially more significant impact on shorebirds, and possibly other waterbirds. When considered in conjunction with the Ramsar status and values of Western Port, to which those birds contribute and on which those birds rely, over the project's proposed period of operation, I endorse the IAC's conclusion that the adverse impacts of the project are unacceptable.

Given the pipeline alignment generally follows existing pipeline easements or other disturbance corridors, the keys to keeping terrestrial biodiversity impacts of the pipeline within acceptable limits would be to retain habitat features as far as possible through avoidance and to reinstate habitat as quickly and effectively as possible after the completion of construction works. Accordingly, I endorse the IAC's recommendations of enhanced rapid revegetation of all potential Southern Brown Bandicoot habitat that might be disturbed by pipeline construction and the proponents' contribution to predator control programs.

Similarly, I support the IAC's recommendations in connection with Swamp Skink, Growling Grass Frog and Southern Toadlet relate to habitat management, including ensuring that revegetation in potential Swamp Skink habitat areas is sensitive to the species' needs, and timing of works relative to the breeding season for Southern Toadlet.

Dwarf Galaxias and Australian Grayling are threatened native freshwater fish known to occur in streams which the pipeline would traverse. Australian Grayling larvae and juveniles are marine, with juveniles returning to freshwater as they approach adulthood. Most of the streams known or likely to provide habitat for the species would be traversed by horizontal directional drilling (HDD), which would minimise if

not eliminate potential pipeline-impacts on the species. Trenched crossings of other waterways are proposed to be carried out at periods of no or low flow. I have noted elsewhere that trenching across any waterways should be permitted only when there is no flow, consistent with the submissions of EPA with respect to protecting water quality.

Historically, Orange-bellied Parrot has occurred in association with saltmarsh habitat around Western Port. As the population declined, records in Western Port became rarer. However, an intensive recovery program is underway with the release of captive-bred Orange-bellied Parrots in Western Port. I am satisfied that the project's potential impacts on Orange-bellied Parrot would be negligible.

I also note the EES identified populations of listed orchid species, especially Merran's Sun-orchid, in the existing pipeline easement adjacent and parallel to The Esplanade between Crib Point and Jack's Beach. The project presented in the EES proposes the use of HDD to avoid surface disturbance to the listed orchids that grow within the easement. I am satisfied that this would avoid direct impacts on those plants. Elsewhere, impacts on River Swamp Wallaby-grass would be similarly avoided by HDD. However, the plants remain susceptible to impacts arising from ongoing management of the easement, which hosts existing pipelines. For example, compaction due to vehicular access to the easement when soils are soft or slashing when orchids are flowering but have not yet set seed could adversely affect the survival of those species, irrespective of whether the project proceeds as presented in the EES and at the IAC hearing.

I encourage the parties with interests in the easement and responsible for its management to liaise with DELWP through the Regional Director, Port Phillip Region, to agree and implement a management plan which will ensure the long-term protection of the significant biodiversity values that the easement supports.

Biosecurity

I note that the pathogens *Phytophthora cinnamomi* and *Batrachochytrium dendrobatidis* can be spread by poor hygiene practices associated with project delivery. I accept the IAC's conclusion that appropriate controls as presented in the CEMP would enable the impacts arising from those pathogens to be managed acceptably.

Lighting impacts

While I agree that there are already artificial light sources in the vicinity of Crib Point, I consider that the lighting associated with the continuous mooring and operation of the FSRU and the Crib Point Receiving Facility would represent a significant change from the present situation. In particular, the location of the FSRU offshore, albeit moored at an existing jetty, could create disorientation for birds at night. In this regard, I note that Short-tailed Shearwater, a migratory species which breeds on French Island, has been found to be vulnerable to impacts resulting from artificial lighting on Phillip Island, especially shortly before departing for its northward migration in autumn, when fledglings first leave their burrows and take wing.

If the project proceeds, practical management of lighting to minimise as far as practicable adverse impacts on wildlife, especially Short-tailed Shearwaters but also other birds, should be further investigated and suitable measures implemented under an appropriate EPR. Such measures should address options for shielding, especially from above, or using lighting modes less likely to disorient birds.

Assessment

- I generally accept and support the IAC's findings, conclusions and recommendations about terrestrial and freshwater biodiversity matters.
- Further monitoring of shorebird habitat usage near Crib Point may be useful but could be difficult to interpret because of difficulty in detecting foraging shorebirds.

- Indirect impacts on shorebirds, both in their own right and as they contribute to the Western Port Ramsar site, could be substantial over the term of the project.
- All potential Southern Brown Bandicoot habitat removed or damaged should be replaced or rehabilitated as if Southern Brown Bandicoot are present.
- Parties with interests in the pipeline easement between Crib Point and Jack's Beach, where Merran's Sun-orchid and other listed flora have been recorded, should engage with the Regional Director, Port Phillip Region, DELWP to agree a management regime for vegetation within the easement that will enable those significant populations to be sustained in the long term.
- The EPRs require amendment to provide for adequate protection of wildlife, especially Short-tailed Shearwaters, from disorientation or other adverse impacts of project lighting.

5.4 Surface Water

Evaluation objective

Water and catchment values – To minimise adverse effects on water (including groundwater, waterway, wetland, estuarine, intertidal and marine) quality and movement particularly as they might affect the ecological character of the Western Port Ramsar site.

Assessment context

Surface water impacts are addressed in Chapter 8 and Technical Report C of the EES and in Chapter 6 of the IAC's report. Six EPRs and six POS environmental controls deal directly with surface water matters and have been considered by the IAC.

The five sub-catchments flowing into Western Port from the project area have been modified extensively for rural and green wedge land uses. The higher parts of the catchment are largely cleared while the lower, naturally swampy parts (e.g. Koo Wee Rup Swamp) have been drained. Many of the waterways in the project area suffer from reduced water quality and contribute high sediment loads to Western Port, which affect Western Port Ramsar values.

Construction activities at the proposed delivery and receiving facilities and along the pipeline route have the potential to modify surface water flows and mobilise soils into waterways. Risks for surface water also include accidental spills of hazardous materials during construction or operation. The Crib Point Receiving Facility site is potentially at risk of inundation due to sea level rise.

Discussion

The IAC found that the impacts on surface waters are not significant and subject to the recommended EPRs and CEMP, are acceptable. I note that surface water was not a focus for submissions or a matter of contention during the hearing and agree with the IAC that impacts on surface waters can be managed.

A major potential impact on waterways has been avoided through horizontal directional drilling of most of the waterway crossings. Proposed surface water and watercourse EPRs and POS, respectively, will drive design and management measures to effectively manage overland flows, especially at the Crib Point Receiving Facility, and minimise water quality impacts from erosion and hazardous materials spills. I note that other EPRs and POS (e.g. those for topsoil management and rehabilitation) will also serve to control impacts on surface waters.

In regard to the EPA's request to change POS WC4 to require trenching of waterway crossings only under no flow conditions, I agree with the IAC that such crossings can also be constructed during low flow conditions due to the limited potential for any sediments to reach Western Port.

I support the IAC's position that the risk of inundation of the Crib Point Receiving Facility during its 20-year life from sea level rise is acceptable given there will be opportunity to monitor, re-assess and respond to that risk if necessary.

Assessment

- Surface water impacts from terrestrial construction and operation of the receiving facilities and the pipeline are acceptable subject to implementation of the proposed EPRs and POS.
- Sea level rise poses a low and acceptable risk to the Crib Point Receiving Facility.

5.5 Groundwater

Evaluation objective

Water and catchment values – To minimise adverse effects on water (including groundwater, waterway, wetland, estuarine, intertidal and marine) quality and movement particularly as they might affect the ecological character of the Western Port Ramsar site.

Assessment context

Groundwater impacts are addressed in Chapter 9 and Technical Report D of the EES and in Chapter 7 of the IAC's report. Two EPRs (HG01 and C03) and POS G4 deal with groundwater matters.

Groundwater levels along the pipeline route are generally close to the surface and vary from summer to winter by up to 2m. Ground intrusive works that could interact with groundwater comprise pipeline trenching (2-3m below surface), thrust boring (up to 4m below surface), horizontal directional drilling (up to 7m below surface) and structural piling (up to 100 piles, driven to 20m below surface) to support a nitrogen tank at the Crib Point Receiving Facility. The depth to groundwater at the receiving facility is 6 to 8m.

Potential impacts from the pipeline identified by the IAC from submissions and evidence provided at the hearing included: lowering of the groundwater table through dewatering, changes to groundwater movement across or along the pipeline trench and degradation of groundwater quality. Potential impacts from piling at the Crib Point Receiving Facility are flow restriction or aquifer intersection.

Concerns about impacts on groundwater bores and water supply were raised by several submitters due to pipeline trenching near existing bores and dewatering of trenches and excavations lowering groundwater levels. Five bores are located within the predicted maximum extent of drawdown for a pipeline trench (30m) and none are located within the predicted drawdown for thrust bore and HDD bell holes (60m).

Aquatic and terrestrial ecosystems that rely on access to groundwater are groundwater dependent ecosystems (GDEs). GDEs potentially occur at 11 watercourses, several locations along the southern section of the pipeline route and adjacent to the Crib Point Receiving Facility. Changes to groundwater levels, flows and quality can affect GDEs.

Discussion

The IAC contended that impacts on groundwater levels, flows and quality will not be significant, consistent with the findings of the EES and the evidence presented before the IAC. I agree with this assessment for pipeline construction given: it will occur in summer when groundwater levels are deepest; the short duration and shallow nature of excavations will limit dewatering; backfill will have a similar hydraulic conductivity to surrounding soil; and the use of non-toxic drilling muds for horizontal directional drilling. For piling at the Crib Point Receiving Facility, I also agree with this assessment since the piles themselves will block any connection between aquifers created by drilling and existing groundwater flow is expected to continue between the installed piles. My assessment is contingent on the proposed design, timing and durations of construction activities being implemented and meeting EPRs and POS.

I agree with the IAC that groundwater bores will not be affected by pipeline construction or operation because for the few that are close by, appropriate management measures can be made. In addition, I agree with the IAC that water supply from two bores located near the proposed pipeline trench at Somerville used for irrigation is not expected to be affected. This is because these bores extend to depths of 42.6m and 47.5m, which is well below the depth of the pipeline trench and any associated groundwater drawdown.

The IAC accepted the evidence of the proponents' witnesses that impacts on GDEs from the project will not be significant and can be managed to an acceptable level. I agree with the IAC's conclusion of acceptable impacts on GDEs given that:

- the pipeline will be laid by HDD under nine of the eleven potential aquatic GDEs;
- the proponents' field surveys indicate that GDEs are either absent or of very low quality at the two watercourse crossings with potential aquatic GDEs that will be trenched and on basalt with potential terrestrial GDEs where perched water tables could potentially occur; and
- groundwater drawdown will be of limited magnitude, extent and duration.

Assessment

- Impacts on groundwater levels, flows and quality due to the pipeline and Crib Point Receiving Facility will be minor, largely short-term and acceptable due to the proposed design, construction approach and EPRs and POS.
- Impacts on groundwater bores and water supply will not be significant and are acceptable.
- Impacts on GDEs are minor and acceptable.

5.6 Contamination and acid sulphate soils

Evaluation objective

Water and catchment values – To minimise adverse effects on water (including groundwater, waterway, wetland, estuarine, intertidal and marine) quality and movement particularly as they might affect the ecological character of the Western Port Ramsar site.

Waste - To minimise generation of wastes by or resulting from the project during construction and operation, including accounting for direct and indirect greenhouse gas emissions.

Assessment context

Contamination and acid sulphate soils impacts are addressed in Chapter 10 and Technical Report E of the EES and in Chapter 8 of the IAC 's report. Seven EPRs and 25 CEMP POS deal with contamination and acid sulphate soils matters and have been the subject of recommendations by the IAC.

Disturbance or inappropriate handling, storage or disposal of contaminated soils, groundwater and marine sediments or acid sulphate soils by the project could cause impacts on beneficial uses of land, surface water and groundwater. Key policies for assessing contamination risks to beneficial uses of land, surface water and groundwater are SEPP (Prevention and Management of Contamination of Land), SEPP (Waters), Per- and Polyfluoroalkyl Substances (PFAS) National Environmental Management Plan and EPA Victoria Interim Position Statement on PFAS.

Potential for soil and groundwater contamination relates to historical and current use of onshore and offshore areas, and most of the project area has a relatively low potential for soil and groundwater contamination. Exceptions for soil are benzo(a)pyrene at the Crib Point Receiving Facility (also elevated zinc), adjacent to the former BP refinery and within the rail corridor in Hastings. Groundwater exceptions are adjacent to the former Tyabb landfill (PFAS) and adjacent to the metal recycling yard in Hastings

(nickel). Marine sediment exceptions are at Berth 1, not Berth 2 where the FRSU will be continuously moored. However, the proponents found PFAS at Berth 2 close to the laboratory detection limit.

Acid sulphate soils (ASS) occur naturally in the project area, as is typical of coastal areas, and are benign when they remain in an oxygen-less, waterlogged state. However, if they are disturbed and exposed to air, sulphide minerals oxidise and can generate an acidic leachate with the potential to harm organisms, reduce soil structure, cause metal contamination and corrode infrastructure. Proposed earthworks along the pipeline route and at the Crib Point Receiving Facility are expected to encounter ASS. Key guidelines for managing acid generation is the Victorian Best Practice Guidelines for Assessing and Managing Coastal Acid Sulphate Soils (2010).

Discussion

Disturbance of contaminated soils, groundwater and marine sediments

Earthworks along the pipeline route and at the receiving facilities have the potential to disturb contaminated soils or interact with contaminated groundwater.

I agree with the IAC that the proponents' general approach to soil and groundwater sampling for identifying potential contamination is appropriate. I also support the IAC's recommended change to EPR-C04 to require contamination to be assessed in accordance with EPA Publications Industrial Waste Resource Guidelines (IWRG) 702 and IWRG 621.

Soil and groundwater contamination were detected at several locations in the project area. I accept the explanation in the EES, as did the IAC, that the benzo(a)pyrene contamination does not present an unacceptable environmental risk since it is not leachable. Similarly, elevated zinc at the Crib Point Receiving Facility was not considered problematic as it had not leached into the underlying soil. Any implications of elevated nickel near the metal recycling yard will be clarified through the further sampling. Along with the IAC, I support the proponents' changes to CEMP POS T11 to require additional soil sampling from KP7.3 to KP7.9, near the metal recycling yard, after vegetation clearing. Such sampling should be conducted in accordance with EPA IWRG 621 and 702, as recommended by the IAC.

I agree with the IAC and the proponents' witness that the potential for contaminated groundwater to move due to the project's construction activities is low due to the shallow and short duration of dewatering activities (see Section 5.5). If contaminated groundwater is extracted during dewatering, EPR-C03 would require it to be contained prior to its treatment and/or disposal, as recommended by the IAC.

Disposal of soils contaminated with PFAS has been problematic for recent projects in Victoria. I agree with the IAC that the proponents need to assess the volume of likely PFAS-contaminated soil and develop a strategy outlining how and where such soils will be disposed before soil disturbance. This is captured in a new EP-C08 and a proposed addition to CEMP POS W3.

While the project's construction could lead to fuel or chemical spills or leaks, I agree with the assessment in the EES that standard management measures (as reflected in EPRs and CEMP POS) will reduce potential impacts to low and acceptable levels.

I agree with the IAC that compliance with the EPRs, amended as recommended by the IAC, should adequately manage any contaminated soils and groundwater disturbed within the project area, including unknown contamination.

While dredging is not proposed, marine sediments at Berth 2 could be disturbed during mooring and commissioning of the FRSU and during mooring of LNG carriers alongside the FRSU during project operations. I accept the IAC's appraisal that the marine sediment assessment was consistent with relevant

guidelines for assessing and categorising contamination. Potential contamination of these sediments is limited to PFAS at close to laboratory detection limits. I note that these levels cannot be compared to Australian sediment quality guidelines values to maintain ecosystem health for PFAS as they have not yet been established. I agree with the IAC's overall acceptance of the information in the EES and the proponents' evidence that risks to the beneficial uses of protecting water dependent ecosystems and species were low.

The IAC considered that disturbance to marine sediment was likely to be limited to minor levelling of the seabed and infrequent disturbance by the tugboats. I am satisfied that scour of seabed sediments near Berth 2 will mainly be below the FRSU, near the discharge jets and near the ballast water jet, with more limited and temporary scour from tugboats and LNG carriers, as described in the EES. Considering information in the EES about marine sediment contamination and its expected disturbance at Berth 2, I agree with the IAC and the proponents' marine ecology and hydrodynamic witnesses' conclusion that the risk to the beneficial use of protecting water dependent ecosystems and species from marine sediment contamination was low.

Acid sulphate soils

I note that acid generation from coastal acid sulphate soils (CASS) in some circumstances can have serious detrimental impacts that are difficult to remedy once they become established. The prevalence of ASS and the large volumes of soil to be excavated for this project (approximately 91,500m³ for the pipeline and 2,500m³ for the Crib Point Receiving Facility) means this issue requires careful attention. However, the risk of acid generation during construction of this project is mitigated by the ability to limit exposure of CASS to air for pipeline construction through short durations of trench dewatering and spoil stockpiling.

The IAC proposed that additional CASS sampling be conducted in areas of medium to high risk (EPR-C02). It has not required sampling every 100m along the entire pipeline route, which was advised by EPA and the combined environmental group's witness. I agree with the IAC that additional sampling is needed prior to construction commencing where there is a medium to high risk of CASS occurring in consultation with the EPA. The results of this sampling will help to refine management measures in the acid sulphate soils management protocol.

I acknowledge, along with the IAC, that the proponents have taken a conservative approach in planning for CASS across the project area. This has included proposing an Acid Sulphate Soil Management Plan for the Crib Point Receiving Facility and an acid sulphate soil management protocol for the pipeline works. The plan and protocol will describe and require implementation of the key measures proposed by the proponents for controlling acid generation during project construction. The IAC noted that the plan and protocol were generally supported by the combined environmental group's witness, with outstanding reservations limited to sampling frequency and trench water disposal.

Key measures proposed by the proponents for controlling acid generation from pipeline trenching included avoiding trenching across many watercourses through using HDD, trenching the remainder of the watercourses in low or no flow conditions and careful staging of works to minimise the duration of trench dewatering (less than 2 days) and stockpiling. If exposure to air was extended beyond 1 to 5 days (depending on soil texture), then lime would be applied to stockpiles and during reburial in the trench, stockpiles may be covered and any acidic leachate would be contained and treated. Related measures were also proposed for the Crib Point Receiving Facility.

Along with the IAC, I am satisfied that the implementation of the key measures proposed for managing CASS through the management plan and protocol, subject to my proposed changes, will reduce potential impacts of CASS to acceptable levels.

Assessment

- Contaminated soil and groundwater disturbed or dewatered by the project during construction can be managed through existing EPRs and CEMP POS subject to the changes I recommend in Appendix B.
- Mobilisation of marine sediments by the project at Berth 2 will be limited and impacts will be low and acceptable.
- Acid sulphate soils encountered during earthworks can be managed to avoid significant effects under the ASS management plan and ASS management protocol in consultation with EPA subject to the changes below.
- Additional sampling for acid sulphate soils along the pipeline route is required in areas of medium to high risk of CASS prior to construction commencing in consultation with the EPA.

5.7 Greenhouse gas and climate change

Evaluation objective

Waste – To minimise generation of wastes by or resulting from the Project during construction and operation, including accounting for direct and indirect greenhouse gas emissions.

Assessment context

Greenhouse gas (GHG) effects are canvassed in Chapter 11 and Technical Report F of the EES and in Chapter 9 of the IAC's report. Six EPRs and three POS deal with GHG issues and have been considered by the IAC. Additional material was provided in TN04, TN13 and TN40.

Although there is no specific draft evaluation objective in respect of climate change, the EES notes that the Climate Change Act presents a set of policy objectives and guiding principles intended to embed climate change in government decision-making. As such, climate change risk is addressed in Chapter 23 and Attachment IV of the EES and features as part of the IAC's consideration of energy policy at Chapter 3 and GHG emissions at Chapter 9 of the IAC's report.

The project is described by the proponents as offering a flexible supply of gas for at least a 20-year period which will serve to augment Victoria's gas and energy needs. In contrast, a number of submissions raised concerns with the project's climate change impacts arguing that it is inconsistent with Victorian Government's policy to achieve net zero emissions by 2050.

Greenhouse gas emissions

The project will produce GHG emissions during its construction and operation phases through, among other things, burning fossil fuels in plant and vehicles, manufacture of materials necessary for construction and vegetation removal. The proponents are required to report energy use and GHG emissions under the Commonwealth's *National Greenhouse and Energy Report Act 2007*. GHG emissions from the project need to be managed in line with the EPA Victoria's *Protocol for Environmental Management: Greenhouse Gas Emissions and Energy Efficiency in Industry*.

The EES includes a GHG impact assessment of the likely impacts of the project on Victoria's total emissions as well as suggested mitigation measures that are intended to reduce these impacts. The GHG emissions from the project are calculated in line with principles set out in the *Greenhouse Gas Protocol, 2003* (GHG protocol). The GHG protocol separates GHG emissions into three categories as follows:

- Scope 1 – direct GHG emissions from vehicles or other assets operated by the reporting organisation;
- Scope 2 – indirect emissions from energy drawn from another source (i.e. purchasing electricity from the power grid); and

- Scope 3 – other indirect emissions not included within Scope 2, that can be directly related to the reporting organisation’s activities.

The proponents are required to report energy use and GHG emissions under the National Greenhouse and Energy Report Act. Notional boundaries are established as part of the applicant’s assessment and characterisation of the various aspects of its operational and construction phase emissions fall within the three GHG protocol categories. In setting these boundaries, a key consideration is the project’s capacity to control an emission generating activity (for instance, GHG emissions related to the LNG extraction and processing are not included because these would be accounted for as Scope 1 emissions by the reporting entity responsible for the LNG production in circumstances where the project does not control that entity’s activities).

The EES presents the project’s construction and operation impacts by drawing a comparison between the project’s projected GHG Scope 1, 2 and 3 emissions against Victoria’s annual emissions. The overall GHG emissions during construction (Scope 1 and Scope 2 emissions) are estimated to be below the NGER scheme reporting requirements and are equivalent of 0.02 per cent of Victoria’s total annual GHG emissions.

It is notable that the operation impacts have been assessed based on the FSRU operating on an open loop regasification mode. The open loop mode has been shown to be far more efficient than the closed loop mode when converting the same amount of LNG to natural gas. To that end, it is relevant that the project’s overall GHG emissions (Scope 1 and Scope 2) are anticipated to be equivalent to 0.23 per cent of Victoria’s annual greenhouse emissions under a closed loop scenario and 0.06 per cent under an open loop scenario. That is, the anticipated GHG emissions in open loop mode are approximately four times less than the closed loop mode.

Climate change

The EES includes a climate change risk assessment (Attachment IV) intended to inform the project by considering risk scenarios, understanding the potential consequences of those risks and developing controls designed to mitigate those anticipated risks.

Risks associated with climate change are identified and assessed as mainly relating to the operation and ongoing maintenance of the jetty works (including FSRU) and the pipeline works. In each instance the climate change risk assessment (at Appendix IV of the EES) identifies controls which will adequately manage the impacts associated with these assessed risks. These controls do not form the basis for any of the EPRs associated with the project.

Discussion

I agree with the IAC’s observation that national and state government policy responses in respect of climate change are evolving. To that end, I support the IAC’s acknowledgement that although Victoria is tending away from its historical reliance on fossil fuels towards renewable energy sources, a reliable ongoing gas supply remains important during this transition period.

I accept the IAC’s finding the EES appropriately assessed, accounted and provided actions to mitigate the impact of direct and indirect GHG emissions in accordance with the relevant legislative requirements and protocols. I also agree the impact of the emissions generated by the project which are under the proponents’ direct control (Scope 1 and 2 emissions) on the State’s overall GHG emissions is acceptable subject to emission offsets. I support the IAC’s position that it is not appropriate that emissions outside of the proponents’ control (such as downstream gas consumption or upstream LNG extraction and processing operations) be included as part of the project’s accounting and reporting of its GHG emissions.

I agree with the IAC's finding that the project should offset the Scope 1 and 2 GHG emissions as well as any Scope 3 emissions found to be generated or associated with the project. Accordingly, I consider the IAC's recommendation to include an EPR for purchasing certified carbon offsets to compensate for the long-term impacts associated with the project's GHG emissions to be appropriate. That said, I consider the wording of EPR-GG07, as recommended by the IAC should be strengthened, to make clear the expectation that certified carbon credits will be purchased in order to offset the project's emissions.

In light of the above, I agree that the project does not hamper the state's efforts to achieve net zero GHG emissions by 2050 but offers a resilient market response to natural gas' status as a transition fuel. I support the IAC's finding that the project is generally consistent with policy relating to energy supply and that the anticipated GHG emissions associated with the project are acceptable and consistent with the prevailing energy policy framework provided that the impacts are appropriately managed through the recommended EPRs and CEMP.

Assessment

- There are no GHG and climate change impacts that preclude the project being approved.
- EPR-GG07 (certified carbon offsets) should be included as an EPR as proposed at Appendix G of the IAC's report subject to amending the wording to ensure that offsets are purchased to compensate for any long term GHG impacts.
- The GHG (and, as a consequence, climate change) impacts of the project are consistent with the draft evaluation objective subject to these being appropriately managed through the recommended EPRs and CEMP as required by the incorporated document.

5.8 Air quality

Evaluation objective

Social, economic, amenity and land use – To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

Waste management – To minimise generation of wastes by or resulting from the project during construction and operation, including accounting for direct and indirect greenhouse gas emissions.

Assessment context

Air quality impacts are addressed in Chapter 12 and Technical Report G of the EES and in Chapter 10 of the IAC's report. Ten EPRs and four CEMP POS deal with air quality matters and have been the subject of recommendations by the IAC.

The main potential for air quality impacts during project construction is dust from earthworks. Project earthworks will be at the delivery and receiving facilities, the End of Line Scraper Station and along the pipeline route. Combustion emissions from equipment, vehicles and plant have limited potential to affect air quality as they are small scale and dispersed across the project area.

Air emissions from the FSRU have the greatest potential to impact air quality during project operations. Pollutants from these emissions were investigated due to their potential for harm to the environment or human health, viz.: nitrogen dioxide, carbon monoxide, particulates (PM10 and PM2.5), sulphur dioxide, formaldehyde, benzene and polycyclic aromatic hydrocarbons (PAH). Design criteria (ambient ground level concentrations) for new stationary emission sources applicable to the FSRU are provided by SEPP (Air Quality Management).

The odorant mercaptan is required to be injected into pipeline gas for safety reasons. This is proposed to occur at the Crib Point Receiving Facility. Accidental release of mercaptan during its use for the project could lead to offensive odours near this facility.

Discussion

Air quality impacts during construction

For this project, the EES identified earthworks associated with pipeline installation and the End of Line Scraper Station as the main sources of dust that could affect sensitive receptors. However, given much of the pipeline route, including near the End of Line Scraper Station, is sparsely populated, I agree with the IAC and the EES that the potential for nuisance or health impacts is low. The use of HDD through Hastings will minimise dust generation through this more densely populated part of the route. Regardless, dust generation from pipeline construction will be short-lived at any location due to the linear progression of the works. I agree with the IAC that conventional dust suppression techniques will be sufficient to control dust to an acceptable level.

Air emissions during operation

Predictions from dispersion modelling of air emissions from the FSRU in the EES reflected the worst possible conditions. Elements of conservatism included modelling the four peak capacity operating scenarios, which the proponents expect will occur no more than 10 percent of each year, and adoption of background air quality data from urban environments that are more polluted than the project area. In addition, it should be noted that where exceedances were predicted, they reflected the maximum levels using a five-year meteorological dataset.

Along with the IAC, I am satisfied that the modelling adequately predicts air quality impacts from project operations. I accept the exclusion of air emission sources other than the FSRU on the basis that they were minor and, generally, intermittent. I also accept the proponents have verified that modelling adequately predicts air quality impacts from the FSRU.

I agree with the IAC's findings that sulphur dioxide and carbon monoxide from the FSRU would comply with SEPP (Air Quality Management) design criteria and design criteria for all pollutants assessed will be met at the Victorian Maritime Centre and at all 38 nearby sensitive receptors (defined as hospitals, schools or residences by SEPP (Air Quality Management)) including the nearest residence approximately 1.2km away. I acknowledge that nitrogen dioxide and formaldehyde from the FSRU is predicted to exceed design criteria over water and, for formaldehyde, over a small area of the Crib Point foreshore.

Air quality predicted under worst case scenarios is well within widely recognised criteria for human health protection. This was investigated further by the proponents' human health and ecotoxicology witness in terms of nitrogen dioxide, formaldehyde, PAH and benzene. From this analysis, I agree with the IAC that concentrations of nitrogen dioxide where fishing and boating activities occur would be significantly lower than concentrations that cause adverse human health impacts. The proponents' human health witness's risk assessment into formaldehyde levels at Crib Point found that people there would not experience adverse health effects, notwithstanding that a slight, transient feeling of discomfort was possible but very unlikely. He also found that the carcinogenic risk from PAH or benzene from the FSRU is negligible. I accept the witness's conclusions, as did the IAC, that nitrogen dioxide, formaldehyde, PAH or benzene levels from project operation would not cause health effects.

Analysis provided by the proponents' human health and ecotoxicology witness and in TN42 regarding the potential effects of formaldehyde and nitrogen dioxide levels on ecological environments due to project operation found that formaldehyde and nitrogen oxide are unlikely to adversely impact aquatic environments and vegetation. I, along with the IAC, accept the witness's conclusions that impacts on aquatic environments and vegetation would be negligible due to factors such as rapid breakdown, low phytotoxicity, low or no potential for bioaccumulation and, for formaldehyde, studies on toxicity for birds or eggs.

The EPA submitted that the proponents should monitor formaldehyde levels during project operation to ensure exceedances of SEPP (Air Quality Management) design criteria are no worse than predicted. The proponents adopted a requirement for an initial 12-month air quality monitoring program in EPRAQ09. I agree with the IAC that this is sufficient on the basis that the EPA could use the results from the initial 12 months to determine whether to require ongoing air monitoring through the works approval.

To ensure that accidental release of mercaptans does not cause unacceptable nuisance, I support the IAC's recommended additional EPR. The new EPR-AQ10 would require that odour is not detectable outside the Crib Point Receiving Facility property boundary.

Assessment

- Dust from project earthworks will be managed to an acceptable level through the proposed EPRs and CEMP POS.
- Modelling of air emissions from the FSRU in the EES is conservative and appropriate for predicting compliance with design criteria and any impacts on human or ecological health.
- Design criteria for nitrogen dioxide, carbon monoxide, particulates (PM10 and PM2.5), sulphur dioxide, formaldehyde, benzene and PAH will be met at the Victorian Maritime Centre and all 38 nearby sensitive receptors and is acceptable.
- Predicted exceedances of nitrogen dioxide (within approximately 50m of the FSRU) and formaldehyde (within approximately 200m of the FSRU including a small area of Crib Point) design criteria will not cause significant human health or ecological effects and are acceptable.
- Benzene and PAH in FSRU emissions do not pose an unacceptable health risk.

5.9 Noise and vibration

Evaluation objective

Social, economic, amenity and land use - To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

Assessment context

Noise and vibration impacts are addressed in Chapter 13 and Technical Report H of the EES and in Chapter 11 of the IAC's report. Thirteen EPRs and six CEMP POS deal with noise and vibration matters and have been the subject of recommendations by the IAC. Underwater noise impacts on marine biodiversity is considered in Section 5.2.

The project is generally located in quiet rural areas where existing ambient noise and vibration levels are low. The exceptions are Hastings and near major roads such as the Princes Highway and the Princes Freeway. Residents in those rural areas are likely to notice new noise or vibration associated with project construction and operation. Project construction activities near residents could cause short-term nuisance and inconvenience due to the transient and sporadic nature of construction activities. Night-time noise from construction will be the most disruptive. Noise and vibration from project operations will be ongoing at some sites (e.g. FSRU operation and delivery and receiving facilities) and periodic at others (e.g. ship movements and maintenance activities). Sometimes, operational noise from the project will coincide with other nearby operations such as at Berth 1 of the Crib Point Jetty, leading to cumulative noise impacts at nearby residences. Criteria for assessing compliance during project operations, called 'recommended maximum levels', were determined from background noise data using the methods set out in EPA Victoria Publication 1411: Guideline noise from industry in regional Victoria.

Construction activities can cause vibration impacts to residents or buildings, but risks are low.

Operational noise levels from Crib Point Jetty at terrestrial habitats, including intertidal habitats at Crib Point, are similar to levels at other industrialised locations in Western Port and impacts are expected to be low (see Section 5.3).

Discussion

Construction noise

The IAC accepted the proponents' predictions of noise and vibration generated by project construction activities. I acknowledge pipeline construction will produce significant noise increases above ambient daytime levels for a few days in any one location along the pipeline route. Night-time construction noise will be heard for one to two weeks at continuous horizontal directional drilling, horizontal boring or hydrostatic testing sites, affecting many residents at Hastings, Warrigine Park and elsewhere.

Construction works at the Crib Point Jetty and the Pakenham Delivery Facility will periodically cause noise nuisance at the nearest residences and public open spaces and, sometimes, this will be in the evening or on weekends.

Construction noise levels will need to be minimised and nuisance and inconvenience for nearby residents and users of open space will need to be managed through the EPRs and CEMP POS. The EPRs and CEMP POS largely reflect standard noise amelioration techniques and established protocols. However, recommendations to strengthen the EPRs and CEMP POS are discussed in the following paragraphs.

The proponents' witness considered that further noise assessment was required to inform management of noise associated with works in towns and other sensitive locations. To implement this, he proposed site-specific construction noise and vibration management plans be required through EPR-NV01. I support this approach, as did the IAC. The IAC also recommends that such plans be approved by an independent environmental auditor, include a stakeholder communication strategy and detail a resident relocation and respite program, which I support.

Noise management measures and mitigations in the EPRs and CEMP POS for construction activities need to adequately respond to their predominantly quiet rural setting. The IAC recommends incorporating the requirements of the NSW Construction noise and vibration guideline through EPR-NV02 and establishing criteria and trigger levels based on background noise levels representative of the area and time of day that construction works may be occurring. I support this recommendation.

I agree with the IAC and the EPA that the proponents should take all practicable actions to minimise construction noise and impacts, rather than being driven by compliance. The IAC further recommends that unavoidable works should be subject to the approval of an independent environmental auditor instead of a qualified environmental assessor, which I support. These recommendations have implications for EPR-NV3 and CEMP POS E7, including amendment to reflect no noisy activities before 7.00am, as committed to in the EES. I support the IAC's recommended revision to EPR-N05 for noise monitoring following complaint, as one element of complaint response which could help both to investigate the complaint and to verify whether corrective action has been effective.

The potential for vibration impacts is low and can be managed appropriately through standard management protocols provided by the EPRs and CEMP POS.

I am generally satisfied that the short duration of the noisiest of the construction works combined with implementation of EPRs and CEMP POS, with the additional changes recommended above, would ameliorate noise and vibration impacts to an acceptable level.

Operational noise

Operational noise modelling was conservative in that worst case, peak capacity operating scenarios were assessed for the Crib Point Jetty and the Pakenham Delivery Facility sites. For example, the assumed FSRU operating scenarios were expected over no more than 10 percent of each year. I agree with the IAC that, on balance, the noise modelling in the EES provided a relatively sound basis for understanding the likely noise impacts of these two sites during operations.

The EES predicted that recommended maximum levels could be exceeded at several residences near the Pakenham Delivery Facility during the evening and at night-time. However, along with the IAC, I accept the proponents' position that, with additional standard controls, it will be able to comply with the recommended maximum levels. I am comforted in this regard by the conservative modelling assumption that all equipment at the site was operating simultaneously.

I agree with the IAC and modelling in the EES that proposed operations at Berth 2 of the Crib Point Jetty and at the Crib Point Receiving Facility during gas import operations are likely to meet the recommended maximum levels. However, they could be exceeded at residences on the Esplanade when these activities occur concurrently with operations at Berth 1 of the Crib Point Jetty, such as the landside pump offloading petroleum from a ship. To address this matter, the IAC made several recommendations that I discuss in the following paragraphs.

The IAC considered additional background noise measurements should be taken over an extended period at the nearest residence (103 The Esplanade) to provide a full representation of prevailing conditions at the site via changes to EPR-NV06, which I support. The importance of this issue was evidenced by attended noise monitoring for the EES, which measured an exceedance of the recommended maximum levels at this residence. This additional data would be used to inform further noise assessment to determine compliance with recommended maximum levels. This site-specific information will help the proponents to develop targeted noise controls to minimise noise exceedances at the nearest residences at night when Berths 1 and 2 are operating simultaneously.

I support, along with the IAC, the proponents' commitment to mitigation of normal operations at the Crib Point Jetty to reduce noise at the nearest residences by three decibels below the recommended maximum levels (except for 103 The Esplanade, where a one decibel reduction is proposed). This will assist with managing cumulative noise from concurrent activities at Berths 1 and 2 and achieving the recommended maximum levels.

The proponents' proposed EPR-NV11 establishes a working group, with representatives from the Port of Hastings Development Authority and commercial operators at the Crib Point Jetty to develop a cumulative noise impact strategy in consultation with EPA. The IAC recommended inclusion of a representative from residents located within 1.5km of the Crib Point Jetty in the working group and development of a compliance plan. I agree that these recommendations would likely contribute to addressing cumulative noise impacts.

Given the proponents' limited capacity to control noise from LNG carriers, which may not have high performance exhaust stack silencers fitted, the IAC recommended augmenting the proposed post-commissioning noise monitoring program through amendments to EPR-NV13. Additional monitoring included measuring noise fortnightly for the first 12 months of commissioning and developing the monitoring program in consultation with the EPA. I support these recommendations because these monitoring results will drive implementation of noise mitigation measures if they are found to be required.

Together, I consider that these recommendations will likely achieve the additional noise amelioration necessary to achieve compliance with maximum recommended levels from cumulative noise at residences near the Crib Point Jetty in the medium term.

Submitters and the Mornington Peninsula Shire Council's witness expressed concern about reduced amenity at Woolleys Beach due to a significant increase in noise above background levels and its audibility caused by a different noise character compared to existing ambient sources. These views were accepted by the proponents' witness. Therefore, I consider, like the IAC, that the proposed operations noise management plan required by EPR-NV09 should include further assessment of potential noise impacts on the amenity of Woolleys Beach Reserve. In addition, I support the IAC's recommendation that this plan be approved by an independent environmental auditor rather than a qualified environmental assessor.

Subject to the implementation of my recommendations, I consider that noise impacts from project operations can be managed to acceptable levels.

Assessment

- Noise impacts from construction activities will cause nuisance and inconvenience to nearby residents and users of open space but will generally be limited to short or sporadic periods. I am satisfied that the revised EPRs and CEMP POS will manage these impacts to acceptable levels.
- Vibration impacts will be negligible and acceptable provided standard management protocols provided for by the EPRs and CEMP POS are applied.
- Modelling is sufficiently robust to support an understanding of operational noise impacts.
- The implementation of the EPRs will allow compliance with recommended maximum levels to be achieved at residences near the Pakenham Delivery Facility.
- Compliance with recommended maximum levels is expected to be achieved at residences near Crib Point Jetty with the implementation of amended EPRs. However, cumulative noise from the combination of project and other operations at Crib Point Jetty is predicted to exceed the night-time recommended maximum level. Compliance at night-time will depend on careful and co-ordinated management response by individual operators, as provided for by the revised EPRs.
- Further evaluation of potential noise impacts on Woolleys Beach Reserve from operations at Crib Point Jetty is needed due to its recreational and ecological values.

5.10 Landscape and visual

Evaluation objective

Social, economic, amenity and land use – To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

Assessment context

Landscape and visual impacts are addressed in Chapter 14 and Technical Report I of the EES and in Chapter 12 of the IAC's report. Six EPRs (EMP and development plan to be prepared to the satisfaction of the Minister for Planning under the incorporated document) and four POS deal directly with landscape and visual amenity issues and have been considered by the IAC.

The project traverses a diverse landscape. It crosses agricultural land, towns, infrastructure (e.g. the Stony Point Rail Line) and nature reserves (including Warringine Park forming part of the Western Port Ramsar Site).

The pipeline works will result in a temporary loss of visual amenity and character across the project area during the construction phase as a result of vegetation clearing, demolition of agricultural buildings, open cut trenching, HDD and shallow horizontal boring. Although described in terms of having a temporary

impact on the landscape and visual amenity, I note that large shrubs and trees removed along the alignment will not be reinstated due to the operational risks and maintenance issues. These changes, though not regarded to be significant, will collectively result in impacts to the landscape and visual amenity along the project corridor.

The more discernible, and permanent, visual impacts associated with the project are associated with the jetty works. The jetty works will accommodate the FSRU, LNG carriers and, among other things, a 20m high nitrogen storage tank at the Crib Point Receiving Facility. The jetty works will create visual impacts during the day and night.

Discussion

The IAC accepted that the proponents' landscape and visual impact assessment methods offer an appropriate framework for assessing the landscape and visual impacts of the project. I agree with the IAC in this regard, acknowledging the subjectivity involved in assessing acceptable or unacceptable visual impacts.

I agree with the IAC that any visual impacts of the pipeline works will be appropriately managed through the recommended EPRS and are acceptable.

I accept that the visual impacts of the Crib Point Receiving Facility will be limited by topography and existing vegetation which serve to obstruct lines of sight. Views from Phillip Island and French Island will be limited owing to distance. Noting the IAC's finding that the FSRU and the LNG carriers will be very prominent when viewed from Woolleys Beach Reserve and The Esplanade, I acknowledge and agree with the IAC that there are opportunities to further limit the visual impacts of the jetty works. Therefore, I support the IAC's suggested revision of EPR-LV01 to ensure that landscape screening is prioritised.

Although the infrequent mooring of petroleum tankers does not equate with the more significant FSRU and associated LNG carriers proposed by the project, the visual impacts of increased shipping at this location is neither unreasonable nor unacceptable. This is particularly the case, given the status of the Port of Hastings as a state significant transport gateway and state significant industrial precinct (Plan Melbourne).

Although the Crib Point Receiving Facility and jetty infrastructure will not, in and of themselves, significantly change the existing illumination and visual prominence of the area at night, I agree with the IAC's finding that the night-time lighting impacts of the project will be related principally to the FSRU, in its exposed position and prominence within the surrounding coastal landscape. However, these impacts, being relatively confined to the port context, are acceptable subject to:

- the inclusion of the new EPR-LV07 (FSRU lighting) as set out at Appendix G of the IAC's report; and
- the requirement that the development plan to be endorsed in accordance with the incorporated document, includes a more expansive requirement at Clause 4.4.2 (f) as set out at Appendix F of the IAC's report.

Assessment

- The landscape and visual impacts are consistent with the draft evaluation objective subject to the preparation of a development plan addressing the mitigation measures (set out in the EPRS and CEMP) to my satisfaction.
- There are no landscape and visual impacts that preclude the project being approved.
- EPR-LV01 (Reinstate ground surface) should be revised to adopt the wording set out at Appendix G to the IAC's report.
- EPR-LV07 (FSRU Lighting) should be included as an EPR as proposed at Appendix G to the IAC's report.

- Clause 4.4.2 (f) of the incorporated document should be amended in accordance with the wording set out at Appendix F of the IAC's report.

5.11 Traffic and transport

Evaluation objective

Energy efficiency, security, affordability and safety - To provide for safe and cost effective augmentation of Victoria's natural gas supply in the medium to longer term.

Social, economic, amenity and land use - To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

Assessment context

Traffic and transport impacts are addressed in Chapter 15 and Technical Report J of the EES and in Chapter 13 of the IAC's report. Six EPRs and 4 POS deal directly with traffic and transport matters were considered by the IAC.

Traffic and transport impacts associated the project are largely confined to road capacity and safety effects during the construction phase (featuring increased traffic and car parking demand) and road maintenance and safety during the operation phase (focussing on preferred routes for on-site workers and delivery trucks).

The traffic and transport effects of the project will be most significant during the project's construction phase. The combination of changed road conditions (including reduced speed limits, lane closures etc.) and a construction workforce in a localised area will largely depend on what component of the project is being delivered. For instance, traffic impacts associated with the construction of the Crib Point Receiving Facility and Pakenham Delivery Facility will result in increased traffic volumes on local roads for between 18 and 27 months whereas the progressive nature of the pipeline works will result in increased traffic volumes lasting between one to three weeks.

In comparison, during the operation phase, workforce traffic generation is expected to be very low (i.e. less than 100 vehicles per day). In addition, it is estimated in the order of 900 trucks per annum will deliver liquid nitrogen to the Crib Point Receiving Facility, while additional odorant deliveries would occur bi-monthly.

Discussion

I note the IAC accepted evidence put to it by the proponents' expert traffic engineer that the additional traffic generated by the project's construction phase would have minimal impact on local road networks particularly given that construction workers' travel to construction sites would be diffused and would not impact the PM peak travel period.

I agree with the IAC's observation that the traffic management plan required under EPR-TP01 and POS A-08 will necessitate the thorough consideration of safety and operational issues for public transport and road users/operators following a more comprehensive analysis of the transport routes impacted. I accept that the preparation of the traffic management plan, at a time when the project's final alignment and construction timetable will be more defined, will enable stakeholders (including relevant Councils and road authorities) and the proponents to have more informed and productive discussions.

Accordingly, I support the IAC's recommendation that EPR-TP01 (traffic management plan) should be revised to adopt the wording set out at Appendix G to the IAC's report. This will ensure that the traffic management plan required pursuant to EPR-TP01 and POS A-08 (CEMP) will address car parking

management. On that basis, I agree with the IAC's finding that the traffic and transport impacts of the project during its construction phase can be acceptably managed through the recommended EPRs and CEMP.

During the operation phase of the project, transport impacts associated with the transport of nitrogen and odorant products to the Crib Point Receiving Facility by, in the order of 900 trucks (mostly B-Doubles) have been assessed. I note that expert traffic engineering evidence presented to the IAC on behalf of the proponents indicated that these trucks would, most likely, use already approved B-Double routes for the majority of the journey once the nitrogen truck route was confirmed.

I support the IAC's position that it will be unnecessary to require road pavement strength assessments for sections of the nitrogen truck route proposed to be on designated B-Double routes. I also agree with the IAC's finding that it would be useful to amend EPR-TP06 (nitrogen transport plan) to require a road safety audit to be conducted in respect of the nitrogen truck route. This will ensure that any additional mitigation measures that may be required once the preferred route is identified are considered and appropriately addressed.

Assessment

- The traffic and transport impacts are consistent with the draft evaluation objectives subject to implementation of the proposed EPRs and CEMP.
- There are no traffic and transport impacts that preclude the project being approved.
- EPR-TP01 (traffic management plan) should be revised to adopt the wording set out at Appendix G to the IAC's report.
- EPR-TP06 (nitrogen transport plan) should be revised to adopt the wording set out at Appendix G to the IAC's report.

5.12 Safety, hazard and risk

Evaluation objectives

Energy efficiency, security, affordability and safety - To provide for safe and cost-effective augmentation of Victoria's natural gas supply in the medium to longer term.

Social, economic, amenity and land use – To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

Assessment context

Safety, hazards and risks are addressed in Chapter 16 and Technical Report K of the EES and in Chapter 14 of the IAC's report. Marine biodiversity impacts related to safety, hazards and risks are discussed in EES Chapter 6 and Technical Report A and are addressed in Chapter 4 of the IAC's report. The EES contains eight mitigation measures that deal with safety, hazard and risk. One EPR was subsequently deleted or omitted for the exhibited iteration. No EPRs were subject to recommendations by the IAC.

A series of safety, hazard and risk studies involving quantitative and qualitative methods were undertaken by the proponent. These include hazard identification studies, a hazard and operability study, quantitative risk assessment and a safety management study.

I acknowledge that the process of developing safety, hazard and risk studies is iterative with further work to be conducted as the detailed design is finalised. Further safety, hazard and risk studies are required by the *Gas Safety (Safety Case) Regulations 2018* for the jetty gas piping and Crib Point Receiving Facility and through safety case regimes under the *Gas Safety Act 1997* and the *Occupational Health and Safety Act 2004* should the FSRU be classed as a major hazard facility in the future.

As identified in the IAC's report, the FSRU is not currently designated as a major hazard facility under the *Occupational Health and Safety Regulations 2017* (OHS regulations). While the FSRU is consistent with the characteristics of a major hazard facility, the current definition of 'facility' in the OHS regulations does not include offshore facilities. If the OHS regulations are varied to include offshore facilities in Victorian waters a safety case for the FSRU will likely be required. In the EES the proponents committed to prepare a safety case, safety management system and emergency management plan for the FSRU, consistent with the requirements of a major hazard facility under the OHS regulations (Technical Report K, p. 30).

The results of the preliminary quantitative risk assessment show that fatality risk from a potential major incident at the jetty or Pakenham Delivery Facility meet adopted tolerable criteria and do not present an unacceptable risk to adjacent land uses. The physical protective measures of wall thickness and depth of cover exceed the requirements of AS/NZS 2885.1 for known threats to the pipeline in the study area.

Many submissions to the IAC expressed concern about the increase in shipping traffic in Western Port associated with the project and the potential for this to increase the risk of collisions and accidents and result in oil spills. Concerns were also raised in submissions to the IAC that the EES did not assess the impact of increased shipping traffic or the risk of an oil spill, but as the IAC pointed out, these risks are assessed in Technical Report A.

Discussion

I agree with the IAC that the preliminary quantitative risk assessment for the Jetty, FSRU and Crib Point Receiving Facility shows no unacceptable risk levels for nearby land uses. I also agree with the IAC that existing regulations and the CEMP will adequately control and mitigate risks associated with the pipeline and associated infrastructure.

Based on the evidence provided by the proponents' expert witness I agree with the IAC that the risk identification and assessment work completed to date for the jetty, FSRU, Crib Point Receiving Facility and pipeline and associated infrastructure is of an appropriate standard for the current stage of the project. I note that the recommendation by the expert witness that the next revision of the proponents' quantitative risk assessment include an assessment of societal risk compared with published societal risk criteria was met by the proponents providing an additional report. The report concluded that the proposed facilities met the indicative societal risk criteria stated in the New South Wales *Hazardous Industry Planning Advisory Paper No.4*.

Shipping activity and oil spills

The IAC's report discusses risks associated with increased shipping activity. Based on the evidence provided by the proponents' expert witness and the submission by the Port of Hastings Development Authority, I agree with the IAC that appropriate systems and protocols are in place or will be in place to minimise the risk of an oil spill and manage the effects if such a spill were to occur. I acknowledge that this was an issue of concern to many submitters, including Mornington and Bass Coast Shire Councils and agree with the IAC that it would have been beneficial to include modelling in the EES of spill scenarios specific to Crib Point. The inclusion of this information in the EES may have assisted in allaying some of these concerns. I agree with the IAC that future risk assessment work should incorporate specific modelling of potential spill impacts at Crib Point.

It seems unlikely that LNG carriers would create substantially greater or different risks from those currently being managed during routine port operations. While I agree with the IAC that greater investigation of impacts from additional shipping movements is needed, it seems appropriate that this be conducted as a part of the ongoing risk assessment work for the port.

Evidence presented at the hearing by the proponents' expert witness was that existing controls on ship navigation in Western Port will be adequate in managing shipping traffic associated with the project. I note that the IAC accepted this evidence and agreed with the expert witness recommendation that the decommissioned submarine be included in future hazard and risk assessments.

Assessment

- Safety, hazards and risks can be acceptably managed through existing regulatory requirements, recommended EPRs and the CEMP.
- More detailed risk assessments must be undertaken as a part of the iterative risk assessment approach applied to the project.
- The proponents must conduct modelling of oil spill scenarios specific to Crib Point as a part of future risk assessment work for the project.

5.13 Land use planning

Evaluation objective

To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

Assessment context

Land use planning impacts are addressed in chapter 17 and technical report L of the EES and in Chapter 15 of the IAC's report. There are no specific EPRs for land use mitigation.

The main impacts of the project on land use planning are:

- consistency with the role of the Port of Hastings, as expressed in relevant land use policy;
- consistency with environmental policies that seek to protect and enhance areas of identified environmental significance; and
- the extent to which the project might have unacceptable land use impacts on existing and future land uses.

Discussion

Strategic assessment of the project

The relevant objectives of planning in Victoria, as specified in the Planning and Environment Act, seek to:

- provide for the fair, orderly, economic and sustainable use and development of the land;
- provide for the protection of natural and manmade resources and the maintenance of ecological process and genetic diversity;
- facilitate development in accordance with these objectives; and
- balance the present and future interest of all Victorians.

These objectives have informed the Victoria Planning Provisions and the planning policy framework. All decision making under the Planning and Environment Act must support these objectives.

The Port of Hastings is identified in planning policies, including *Plan Melbourne 2017-2050* and the planning policy framework, as a state significant transport gateway (seaport), with land immediately to the west of the port identified as a state significant industrial precinct. The role of the port is further reinforced in other policy documents, including the Mornington Peninsula Localised Planning Statement, Port of Hastings Port Development Strategy, the Hastings Port Industrial Area Land Use Structure Plan and the Mornington Peninsula Planning Scheme. I support the IACs findings that there is strong policy support for the continued operation and future growth of the Port of Hastings and that this policy does not anticipate or seek to promote the closure of the port or its de-industrialisation.

The FSRU and the Crib Point Receiving Facility, are to be located on land that is either currently zoned Port Zone or is proposed to be rezoned Port Zone via the proposed draft planning scheme amendment. The purpose of the Port Zone is to implement the planning policy framework and the relevant Port Development Strategies and to provide for shipping and the development of Victoria's seaports as key areas of the state for the interchange, storage and distribution of goods. I am satisfied that the use of the land for industry is one that is contemplated by the Port Zone and supported by relevant policies relating to the port. However, I note that the Port Development Strategy highlights the need for the future development of the port to consider the context of the Western Port Ramsar designation, the protection of the coastal mangroves and saltmarshes, the recreational values of the bay, and traffic noise, landscape and visual issues. Therefore, I consider that a decision on whether the proposed use is acceptable under the zone, needs to consider the effects of the use on the surrounding environment as per the strategies in the Port Development Strategy.

I note that the planning policy framework and local planning policies seeks to protect, enhance and conserve environmentally sensitive areas. Specifically, Clause 12.05-1S identifies Western Port as an environmentally sensitive area that should be protected from development that would diminish its environmental conservation or recreational values. Clause 21.10 emphasises the need to find the balance in pursuing the economic advantages of the Western Port area whilst ensuring the protection of the environment. Given the IAC's conclusion that the project will result in unacceptable impacts on the marine environment, I do not consider that the proposed land use meets the relevant environmental policies in the planning policy framework and local policy.

Land use impacts

The ongoing impacts of the project on existing and future land uses are mainly related to the pipeline component of the project. I support the assessment of the IAC that the potential land use impacts associated with the jetty works are generally confined to the industrial area (zoned Special Use Zone 1) that generally surrounds the jetty. The industrial land forms a buffer to sensitive residential land uses and I am satisfied that the potential impacts on the industrial land can be adequately mitigated as discussed in other sections of this assessment.

To ensure the ongoing protection of the gas pipeline, a pipeline measurement length (PML) 640m either side of the pipeline was established by the proponents as part of the risk assessment study. APA will monitor the land uses within the PML. A separate smaller notification area extends 50m either side of the pipeline and this notification area represents the area within which sensitive uses might be exposed to an unacceptable safety risk. AS2885 defines a sensitive land use as one that may increase the consequence of a pipeline failure due to its use by members of the community that may be unable to protect themselves from the consequence of a pipeline failure. Uses that might be included in this definition include residential aged care facilities, hospitals and schools. It does not include standard residential areas. The PML and notification zone are not an exclusion zone or buffer rather a method that is used to inform risk. APA has raised its intention to consult with the relevant councils on any future planning applications within the notification zone and request it be notified of applications for sensitive uses. Generally, APA would not support the establishment of a sensitive use within the notification zone. However, if one was to establish, mitigation measure could be introduced to mitigate the safety risk.

I agree with the IACs conclusions that that the PML and notification area have been appropriately determined and that the intentions of APA to ensure that they are notified of any future applications for sensitive uses is consistent with current practice. I am also satisfied that based on the current zoning of the land the pipeline is proposed to traverse, there are limited areas where sensitive uses would be able to establish within the pipeline notification area. I note that since the preparation of the EES, Cardinia Planning Scheme Amendment C234card has been approved rezoning land within the Urban Growth

Boundary immediately west of the proposed pipeline and Pakenham Delivery Facility from Farming Zone to Urban Growth Zone. The effect of this amendment on the project is that it changes anticipated land use within this area of the PML and notification zone, making 'sensitive uses' allowable under the new zone. Amendment C234card included provisions that required the notification of applications for sensitive uses to the relevant pipeline management authority for other high-pressure gas easements within the Pakenham East Precinct Structure Plan area. However, no such provision is proposed as part of this project for the new pipeline. I note the conclusions drawn by the IAC in relation to this matter and recommend APA consults with Cardinia Shire Council and DELWP on whether a planning scheme amendment is required to the Cardinia Planning Scheme to include a similar requirement, now the change of zoning could allow for sensitive uses to establish within the PML.

Many submitters raised concerns regarding the impact of the pipeline on agricultural land uses. The pipeline is proposed to cross the Koo Wee Rup – Long Warry Flood Protection District, which is identified in both the Casey and Cardinia Planning Schemes as highly productive agricultural land.

I support the observations of the IAC that the potential land use impacts from the pipeline were predominantly confined to the pipeline notification area and that the potential land use impacts associated with the jetty works were predominantly confined to the Special Use Zone 1 area. I agree with the conclusions of the IAC that these impacts are consistent with the draft evaluation objectives and can be appropriately mitigated.

Assessment

- While there is strong policy support for the continued use and growth of the Port of Hastings as a state significant seaport and industrial area, this growth needs to be considered relative to the port's location within the Western Port Ramsar site.
- I consider that the use of the land as proposed by the project is not supported by planning policies that seek to ensure development protects places of recognised environmental significance.
- I am satisfied the potential impacts on current and existing land uses can be appropriately mitigated to reduce impact and risks are safety managed.

5.14 Social

Evaluation objective

Social, economic, amenity and land use – To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

Assessment Context

Social impacts are addressed in Chapter 18 and Technical Report M of the EES and in Chapter 16 of the IAC's report. Stakeholder engagement is addressed in Chapter 26 and Attachment V of the EES and Chapter 16 of the IAC's report. Four EPRs were the subject of recommendations by the IAC.

There has been significant community concern and opposition to the project. A number of submitters to the IAC also expressed concerns about how engagement on the project was conducted during the EES process and who was engaged. The EES community engagement reports outline how community feedback on the consultation process was responded to, including changes made to the process in response to community concerns.

The EES asserts that, in most cases, people living near the project have the capacity to cope with the social impacts identified. Exceptions are residents of the Hastings Cove Retirement Village and the Bays Aged Care Facility. The EES indicates that due to age and lifestyle patterns residents of these facilities are likely to have a higher sensitivity to construction noise compared to the general population. The proponents

have committed to establishing a \$7.5 million community fund to share project benefits and address local social disadvantage. Subject to the changes to EPR S004 recommended by the IAC and endorsed by this assessment, the community fund has the potential to facilitate delivery of beneficial social outcomes.

Construction of the jetty works has the potential to affect amenity and with it, disrupt existing lifestyles and activities. Changes to the noise and/or visual setting during construction have the potential to impact on the lifestyle of residents of a small number of dwellings on The Esplanade located near the jetty. Once in operation, these residents could also experience lifestyle impacts from increased noise and lighting from jetty works. The EES indicates that while operational noise can be mitigated to maintain a high level of acoustic amenity for these residents, the project would introduce an additional light source into a mainly dark setting.

Many submitters to the IAC indicated that they value the recreational opportunities afforded by Western Port such as recreational fishing, boating, kayaking, swimming, walking and other social activities. At times during construction, noise emissions near Crib Point Jetty would reduce the appeal of this area for recreational boating and other recreational uses. The EES indicates that during operation, changes to the visual setting and increased noise emissions may modify the character of the area surrounding Crib Point Jetty and reduce the appeal of this area for recreational boating and fishing. Access to these recreational activities would be unaffected.

The project would affect the recreational use of nearby open space areas, including Warringine Park and Woolleys Beach Reserve. Woolleys Beach Reserve is popular for walking, swimming, kayaking and socialising. The area is principally used by residents of Crib Point but also school groups and visitors from other areas. The EES indicates that Woolleys Beach typically provides a quiet and tranquil setting. The exception to this is when United Petroleum vessels berth and unload at Crib Point Jetty on a fortnightly basis and use facilities at Crib Point in close proximity to Woolleys Beach North. At these times, visitors avoid Woolleys Beach, particularly Woolleys Beach North. Warringine Park is a significant area of natural open space that attracts residents and visitors from Western Port, Mornington Peninsula and other areas. The EES indicates that the Bittern Coastal Wetlands Walk in Warringine Park is popular with visitors wishing to connect with the Ramsar wetlands in Western Port.

During construction of the pipeline works, noise emissions have the potential to affect use of the Bittern Coastal Wetlands Walk and the Ted Harris Walk, within Warringine Park. Changes to amenity during construction and operation of the jetty works will also affect the recreational use of Woolleys Beach Reserve. In particular, increased noise emissions and changes to the visual setting are likely to affect the use of the picnic area at Woolleys Beach North. Section 5.9 provides further information on the expected changes to amenity at Woolleys Beach from operational noise emissions. The EES notes that while recreational and social activities could be held at alternative locations to Woolleys Beach there are no other foreshore reserves in the local area that offer similar amenity.

Some submitters to the IAC expressed a strong concern for and connection to the natural environment of Western Port and highlighted the important role that areas such as this play in maintaining physical and mental wellbeing. This included residents living near Western Port and those from other areas who visit Western Port. There is uncertainty relating to how environmental impacts associated with the project, including perceived impacts, could affect the community's connection to the natural environment of Western Port. The EES does not discuss the potential for the project to impact on community connection to the natural environment or sense of place.

The project will generate employment during construction and operation. The bulk of the workforce is expected to require specialist skills that will not be sourced from the local area. The EES identifies that a

small amount of local employment would be generated during construction, contributing to the local economy of Hastings and surrounds.

Discussion

Amenity and open space

Due to predicted changes to amenity at Woolleys Beach North and the potential to displace recreational activities, the IAC has recommended the inclusion of EPR S002. This requires that the proponents identify a suitable foreshore location to provide appropriate recreational infrastructure to accommodate activity displaced from Woolleys Beach North, in consultation with the Crib Point Stony Point Committee of Management Inc and other stakeholders. Such recreational infrastructure may include picnic tables, public barbeques and toilet facilities. I support this recommendation.

Intangible social impacts

The IAC indicated that some social impacts associated with the project are intangible and cannot be quantified and benchmarked as mitigation through EPRs. For example, the IAC points to intangible impacts that may result from fear, anxiety or psychological stress associated with the project. The IAC found that intangible impacts were not appropriately recognised or addressed in the social impact assessment (SIA) but did not recommend any specific EPRs relating to health and wellbeing.

The IAC's report discusses the socioeconomic attributes of the local community and the community's capacity to cope with the project. Evidence presented to the IAC by the proponents' expert witness indicated that the most vulnerable socio-economic groups of Mornington Peninsula are those likely to be the most affected by the project. The community fund has the potential to mitigate impacts to vulnerable groups by funding programs that address social disadvantage in local communities. I support the IAC's recommended changes to EPR S004.

I acknowledge the strong community interest in the project and the fears and concerns expressed in a number of submissions to the IAC from residents of the local area and broader community. I also acknowledge that a number of submissions to the IAC expressed a strong connection to the natural environment of Western Port and that the EES has not assessed the potential for the project to impact on this connection. I have asked the Department of Environment, Land, Water and Planning (DELWP) to develop guidance to assist proponents to plan and structure SIA studies and reporting for future EESs and better incorporate these elements.

Stakeholder engagement

The IAC contends that local communities and interest groups were not well engaged as a part of the SIA. While I agree with the IAC's finding, I note that a key purpose of stakeholder and community engagement for an SIA is to understand their values and concerns about potential changes or project impacts to inform an assessment of social impacts. To this end, I note that a number of the key issues raised in submissions to the IAC were considered in the SIA.

Engagement is essential for gathering data to inform an analytical and rigorous SIA but it is important not to confuse engagement and the SIA. Stakeholder engagement by proponents preparing an EES is intended to inform people about a project and to gather information and feedback which can be addressed through the EES. It fulfills a broader and at times different role to engagement conducted for the purposes of preparing an SIA.

In my opinion, the experience that people have with a consultation process can be influenced by their views on a project. The degree of stakeholder support for or acceptance of a project may not be a measure

in itself of the adequacy or quality of the consultation program. However, I acknowledge the concerns raised and the potential for them to lead to social impacts.

Assessment

- There has been significant community concern and opposition to the project as well as concern about the engagement process during the EES. This has caused stress and uncertainty for some in the community.
- The project will cause social impacts. On balance, these impacts can be acceptably managed through the recommended EPRs.
- It is reasonable for the proponents to provide appropriate recreational infrastructure to accommodate activity displaced from Woolleys Beach North in line with EPR S002.
- The community fund under EPR S004, with changes recommended by the IAC, has the potential to deliver beneficial social outcomes to local communities and mitigate impacts to vulnerable groups.

5.15 Business

Evaluation objective

Social, economic, amenity and land use – To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

Assessment context

Business impacts are addressed in Chapter 19 and Technical Report N of the EES and in Chapter 17 of the IAC's report. One EPR was subject to recommendations by the IAC.

Changes to road and/or car parking conditions during construction of the pipeline and to a lesser extent the jetty works, have the potential to disrupt local businesses by temporarily restricting access for customers, staff and deliveries. Changes to amenity, including dust and noise emissions associated with construction of the pipeline and jetty works also have the potential to affect some businesses. For example, the visitor experience at the Victorian Maritime Centre may be affected by changes in noise and dust emissions during construction of the jetty. Access to the centre may also be temporarily affected during construction even though alternative access will be provided. Businesses located in the immediate vicinity of entry and exit points of trenchless pipeline sections may experience temporary changes in noise, vibration and dust emissions. Once the project is operational, impacts on businesses are expected to be minimal.

Some submitters to the IAC including Mornington and Bass Coast Shire Councils expressed concern over the potential for the project to impact on tourism, including the visitor economy of Phillip Island and surrounding areas. One area of concern raised was the potential for negative perceptions of the project to create reputational damage and impact on tourist visitation, particularly the region's status as a nature-based destination. Another area of concern for some submitters was the potential for environmental damage associated with the project to directly harm the environmental assets on which tourism is based. The EES does not discuss the potential for the project to impact on tourism.

Discussion

The IAC agreed with expert evidence provided by the proponents' peer reviewer that the realigned pipeline route through the existing Stony Point Rail corridor, instead of along Frankston-Flinders Road, will reduce access issues for business. The IAC was satisfied that other business impacts can be managed through the recommended EPRs. I agree with the IAC. The realignment is expected to avoid a number of business frontages and received support from businesses consulted by the proponents' team as a part of the EES.

The IAC found that the EES had inadequate regard to potential project impacts on local and regional tourism. One of the key issues in the EES scoping requirements is the potential for project works and

operations to affect business (including farming and tourism). The EES lacks an assessment of potential project impacts on tourism businesses, including the significance of any such impacts.

While noting the importance of tourism to the local and regional economies, the IAC concluded that construction and operation of the project are not expected to have discernible impacts on local and regional tourism, including nature-based tourism. I acknowledge the concerns raised by submitters on this issue, but I agree with the IAC's assessment. I agree with the IAC that it is unlikely that people's perceptions of the Port of Hastings and its effect on tourism will change noticeably if the project proceeds. It also seems unlikely that LNG carriers would create substantially greater or different risks from those currently being managed during routine port operations.

Assessment

- An assessment of potential project impacts on tourism businesses was lacking in the EES.
- Impacts on businesses are minor and acceptable.

5.16 Agriculture

Evaluation objective

To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

Assessment context

Agriculture impacts are addressed in Chapter 20 and Technical Report O of the EES, supported by information in Chapter 17 and 19 and Technical Reports L and N, and in Chapter 18 of the IAC's report. The proponents provided additional information in technical notes during the IAC hearing. As agricultural impacts arising from the project would be exclusively associated with the pipeline works, controlling provisions would be included in the CEMP under the pipeline licence, if the project were approved.

The IAC identified the key issue for agriculture as the potential loss and disruption of agricultural land and production arising from pipeline construction and operation.

Discussion

The Pipelines Act provides that an easement can be acquired for a pipeline in accordance with procedures set down under the *Land Acquisition and Compensation Act 1986*. Compensation payable acknowledges the disruption associated with pipeline construction and the limitations on use or development of the land within the easement.

The proposed pipeline alignment was revised and refined through an iterative process while the EES was being prepared. Where possible, the proponents sought to minimise impacts on landowners by aligning the pipeline within existing easements and along roads or property boundaries. Portions of the pipeline would be installed by trenchless methods, although those would protect ecological values or infrastructure assets and would benefit agriculture only incidentally.

The IAC concluded that impacts on farming from construction, while potentially inconvenient, would be temporary provided the land was appropriately reinstated and soil hygiene was adequate to prevent the introduction or spread of pathogens. Sound engagement with landowners to negotiate appropriate agreements will be the primary mechanism to ensure landowners' needs and concerns are properly addressed.

The IAC recognised that tailored approaches to rehabilitation associated with the three different soil associations mapped along the pipeline route will be needed and recommended that this issue should be addressed in the form of an amended POS attached to the pipeline CEMP. The IAC concluded that impacts

on agriculture would be consistent with the draft evaluation objectives and could be managed acceptably through the recommended mitigation measures.

I acknowledge that the selection of the pipeline alignment reflects current land use patterns and does not take account of possible future changes of land use to which landowners might aspire. If the project proceeds, I encourage the proponents to be responsive to landowner needs and requests in negotiating agreements tailored to reasonable future circumstances as well as existing conditions. I support the appropriate recognition of the different rehabilitation needs of the soil associations that would be traversed by the pipeline in the CEMP and attached POS.

Assessment

- Impacts on agriculture arising from the project, specifically the pipeline works, could be managed acceptably through negotiated arrangements with landowners and pipeline licence conditions.
- The IAC's specific recommendations and conclusions regarding agricultural impacts are supported.

5.17 Aboriginal cultural heritage

Evaluation objective

To avoid or minimise adverse effects on Aboriginal and historic cultural heritage.

Assessment context

Aboriginal cultural heritage impacts are addressed in Chapter 21 and Technical Report P of the EES and in Chapter 19 of the IAC's report. Three EPRs recommended by the IAC deal with Aboriginal cultural heritage matters.

Aboriginal cultural heritage protection is regulated under the Aboriginal Heritage Act, which provides for the preparation and approval of cultural heritage management plans (CHMPs) in response to specified triggers. A CHMP is required for any project for which an EES is required, irrespective of any other triggers that may apply. In country for which a body has been appointed as the registered Aboriginal party (RAP) under the Aboriginal Heritage Act, the appointed RAP is authorised to decide whether to approve a CHMP. For country for which no RAP has been appointed, Aboriginal Victoria exercises that statutory power.

The project requires three CHMPs. The Bunurong Land Council Aboriginal Corporation (BLCAC) is the RAP for the gas import jetty works and for the southern portion of the pipeline. There is no RAP for the northern portion of the pipeline.

Aboriginal Victoria is obliged to consider my assessment before deciding whether to approve the CHMP for which it is responsible. In accordance with standard practice at the time, I did not give notice to BLCAC under the Environment Effects Act when I decided in October 2018 that the EES was required. Therefore BLCAC is not obliged to consider my assessment, but nonetheless I encourage BLCAC to consider this assessment to the extent that it may be helpful in deciding whether to approve the CHMPs for which it is the statutory decision-maker.

I understand that a CHMP is not a public document. Once it has been approved the sponsor must lodge the CHMP with the Victorian Aboriginal Heritage Register. Access to the register is restricted under the Aboriginal Heritage Act.

Discussion

The IAC found that:

- further assessment of Aboriginal cultural heritage is required in order to inform the preparation of the CHMPs, particularly intangible cultural heritage and the geographic extent of impacts;

- the recording of Aboriginal places in Technical Report P should be reviewed for accuracy before being included in the CHMPs; and
- the recommended consultation processes will provide a suitable framework for advancing the CHMPs.

The IAC identified consideration of intangible cultural heritage as gap in the work reported in the EES and at its hearing with respect to finalising the CHMPs. I acknowledge the importance of intangible cultural heritage as an integral element of aboriginal cultural heritage, while also recognising the special challenges of appropriately investigating, documenting and evaluating intangible heritage values.

The IAC noted that BLCAC did not present itself as an objector to the project. However, the further consultation should not presume BLCAC's willingness to approve the CHMPs. The IAC also made recommendations about aligning the requirements of CHMPs with the requirements of other statutory approvals.

If the project proceeds, there could be a possibility of unintended conflict between CHMPs requirements and conditions of other statutory approvals, if granted, as other approving authorities would not be privy to the terms of an approved CHMP. It would therefore be desirable for BLCAC and AV to ensure that they engage with authorities responsible for other approvals that may have relevance to the manner of protecting Aboriginal cultural heritage, to minimise the risk that statutory requirements create conflicting obligations. I make no comment on whether it would be preferable for approved CHMPs to be amended to align with the conditions of other approvals or for other approvals to be amended to align with approved CHMPs.

The IAC's recommended EPRs include three dealing with Aboriginal cultural heritage. I note that CHMPs have their own status under the Aboriginal Heritage Act and that referring to CHMPs in EPRs might support broader awareness of CHMPs but would not change their statutory effect.

Assessment

- The conclusions about Aboriginal cultural heritage presented in the EES and the findings of the IAC do not preclude approval of CHMPs, subject to provision of additional information as appropriate regarding intangible cultural heritage.
- Decisions about other approvals required may be relevant to consideration of approval of CHMPs.
- While BLCAC is not bound to consider this assessment before deciding whether to approve the CHMPs within the Country for which it is the appointed RAP, it should consider itself free to have regard to the findings of this assessment.

5.18 Historic heritage

Evaluation objective

To avoid or minimise adverse effects on Aboriginal and historic cultural heritage.

Assessment context

Historic heritage impacts are addressed in Chapter 22 and Technical report Q of the EES and in Chapter 19 of the IAC's report. Two EPRs deal with historic heritage matters. Historic heritage matters are also addressed in the CEMP for the proposed pipeline licence.

The EES identified only two historic heritage sites that could be affected by the project. From its consideration of the EES and submissions, the IAC concluded that no other known sites of historic heritage significance are expected to be affected. It supported the inclusion of an EPR and an equivalent CEMP provision addressing the potential for discovery of previously unknown historic heritage values.

The IAC found that:

- the assessment of historic cultural heritage and the proposed EPRs and CEMP controls are appropriate; and
- the project is consistent with the cultural heritage evaluation objective.

Discussion

The IAC's findings are sound and respond appropriately to the nature of known historic heritage sites that could be affected. The IAC's recommended controls adequately address the potential for finding previously unknown historic heritage values while implementing the project.

Assessment

- Known and unknown historic heritage values would be adequately protected through implementation of the IAC's recommended EPRs and CEMP controls.

5.19 Port operations

Evaluation objectives

To provide for safe and cost-effective augmentation of Victoria's natural gas supply in the medium to longer term.

To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

Assessment context

Port operations are addressed in Chapters 2 and 17 and Technical Report L of the EES and in Chapters 14 and 15 of the IAC's report. Several EPRs recommended by the IAC under other headings, especially marine biodiversity, address matters relating to port operations, although there are no specific port operations EPRs.

Although port operation is not an area of environmental impact *per se*, it is relevant to the context of the environmental assessment of the project. Aspects of port operations were raised in many submissions on the project. This part of the assessment considers the integration of the project into the existing operations of the Port of Hastings, and potential impacts of the project on those operations as well as impacts of port operations on the project.

The EES investigated the potential environmental effects of the project in the context of the existing Port of Hastings. It did not investigate the environmental effects of the Port itself. Existing port operations involve facilities at Stony Point, Crib Point and Long Island Point. Existing operations are the present-day expression of an evolving process which has responded to historical planning and transport policy, land use change and economic activity. Shipping numbers have varied over time and are presently substantially lower than the historical maximum.

The project would see about 12 to 40 LNG carriers mooring alongside the FSRU each year. Tugs would manoeuvre the LNG carriers on arrival and departure. The IAC has found:

- competent and effective systems and protocols are in place or will be put in place to both minimise the risk of oil spill and manage the effects in the unlikely event of a spill;
- the EES would have benefited from modelling of spill scenarios specific to Crib Point;
- future risk assessment work should include modelling of potential spill impacts at Crib Point;
- the existing port navigation and operating practices are adequate; and
- future iterations of project hazard and risk assessments should review risks associated with increased shipping and the navigation risk of the decommissioned submarine moored nearby.

Discussion

The IAC's conclusions with respect to port operations reflect sound consideration of the issues raised given the project's context in an operational commercial port within a Ramsar site.

Although LNG carriers are larger than most if not all vessels currently (and historically) using the Port of Hastings, it seems unlikely that vessels associated with the project will create substantially greater or different risks from those presently being managed during routine port operations. LNG carriers are double-hulled and carry relatively small volumes of diesel or fuel oil, as they utilise boil-off gas from the cargo for powering engines and other equipment.

I note with concern the risk arising from the nearby decommissioned submarine. It is not clear that maintenance of the vessel or its mooring is adequately resourced. Given the vessel's location and the strong tidal currents in the North Arm, if its mooring were to fail on an ebb tide it could reach the Crib Point Jetty (or a point level with it) in a matter of minutes. A collision involving the submarine and the jetty, the FSRU or any petroleum tanker or LNG carrier moored at Crib Point could have significant consequences. I highlight this issue for the urgent attention of the vessel's owners and relevant authorities in Western Port including the Victorian Regional Channels Authority, Port of Hastings Development Authority and Parks Victoria. If the project were approved, establishing the FSRU at Crib Point without either an adequately funded maintenance program for the submarine, guaranteed for at least the life of the project, or alternative mooring arrangements in place would be undesirable.

Assessment

- The project, if approved, would not lead to shipping movement in the Port of Hastings that would materially change impacts of Port operations on the environment beyond those which are presently and have historically been managed consistently with Western Port's Ramsar designation since 1982.
- Dynamic risk assessment for potential risks to the environment arising from port operations should be amenable to managing the navigational and environmental impacts associated with visiting LNG carriers to Crib Point.
- If the project is to be approved, relevant authorities and the owners of the decommissioned submarine should confirm management and maintenance arrangements to eliminate so far as is practicable the risk of the submarine's mooring failing before an FSRU is established at Crib Point.

6. Conclusion

My overall conclusion is that the project will result in unacceptable environmental effects. Those unacceptable effects would result from the operation of the FSRU. The FSRU's marine discharge will cause an ongoing impact to the environment over the 20 year life of the project. The adverse direct and indirect effects of that discharge on environmental values, fundamental to the Ramsar status of Western Port, are not compatible with the level of protection required to be afforded to a wetland of recognised international significance.

The project's other environmental impacts are likely to be acceptable subject to my recommended mitigation and management measures outlined in Section 5 and Appendix B. That said, I am conscious that, for the purposes of the Environment Effects Act, the Crib Point Gas Import Jetty and the Crib Point-Pakenham Gas Pipeline were presented in a single EES and are subject to a single assessment. Accordingly, and in the context of the interdependency of the gas import jetty works and the pipeline works, I can only conclude that if one part of the project has unacceptable environmental effects, the project in its entirety, has unacceptable environmental effects.

I wish to express my sincere thanks to the IAC for the work it carried out in conducting the hearing and submitting to me its report which was of great assistance to me in making my assessment. I would also like to express my appreciation of the contributions made by the proponents and all stakeholders and submitters who engaged in the process.



HON RICHARD WYNNE MP

Minister for Planning

29/3/21

Appendix A Matters of national environmental significance

Under the bilateral agreement between the Commonwealth and Victorian governments, the EES and this assessment must examine the project's likely impacts on matters of national environmental significance (MNES), as identified in the Commonwealth controlled action decisions under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The project comprises two discrete controlled actions as determined under the EPBC Act. The gas import jetty works was referred under the EPBC Act by AGL and the Crib Point-Pakenham gas pipeline works was referred by APA. Each controlled action has its own controlling provisions, set out below in Appendix A1 for the gas import jetty works and in Appendix A2 for the pipeline works.

This appendix consolidates information on likely effects of the proposal on MNES protected under the EPBC Act, drawing upon the assessment of specific matters discussed in other sections of my assessment. This includes assessment findings on marine biodiversity (Section 5.2), terrestrial biodiversity (Section 5.3) and water quality (Section 5.4). Findings relevant to the maintenance of the ecological character of the Ramsar wetland are included in both biodiversity sections as birds are addressed in the EES and in this assessment in the context of terrestrial biodiversity, even though waterbirds and shorebirds in Western Port are intrinsically dependent on aquatic or marine environments, especially intertidal habitat.

The scoping requirements for the EES reflected the controlling provisions for the project. Species of potential concern to be addressed in the assessment identified in the scoping requirements were:

- Southern Right Whale (*Eubalaena australis*);
- Humpback Whale (*Megaptera novaeangliae*);
- Southern Brown Bandicoot (*Isoodon obesulus obesulus*);
- Loggerhead Turtle (*Caretta caretta*);
- Green Turtle (*Chelonia mydas*);
- Leatherback Turtle (*Dermochelys coriacea*);
- Australian Grayling (*Prototroctes maraena*);
- Dwarf Galaxias (*Galaxiella pusilla*);
- Growling Grass Frog (*Litoria raniformis*);
- Australian Fairy Tern (*Sternula nereis nereis*);
- (Far) Eastern Curlew (*Numenius madagascariensis*);
- Curlew Sandpiper (*Calidris ferruginea*);
- Sharp-tailed Sandpiper (*Calidris acuminata*);
- Red Knot (*Calidris canutus*);
- Great Knot (*Calidris tenuirostris*);
- Greater Sand Plover (*Charadrius leschenaultia*);
- Lesser Sand Plover (*Charadrius mongolus*);
- Bar-tailed Godwit (*Limosa lapponica*);
- Bar-tailed Godwit (Baueri) (*Limosa lapponica baueri*);
- Northern Siberian Black-tailed Godwit (*Limosa limosa menzbieri*)¹⁰;
- Red-necked Stint (*Calidris ruficollis*);
- Double-banded Plover (*Charadrius bicinctus*);
- Short-tailed Shearwater (*Ardenna tenuirostris*); and
- Dense Leek-Orchid (*Prasophyllum spicatum*).

¹⁰ In error – should have read Northern Siberian Bar-tailed Godwit (*Limosa lapponica menzbieri*)

Potential impacts on MNES are summarised in Attachment I to the EES. The more detailed information in the EES about potential impacts that relate to my assessment of impacts on MNES can be found in EES Chapters 6, 7 and 8 and Technical Reports A, B and C. The EES identifies the key issues for MNES as potential impacts from:

- vegetation clearance and loss of habitat;
- changes to marine water quality;
- entrainment of marine biota as part of the regasification process with the intake of seawater;
- discharge of seawater from the FSRU;
- spills and leaks;
- changes to surface water quality;
- contaminated and acid sulphate soils;
- noise and vibration;
- changes to air quality; and
- lighting.

Section 21 of the Crib Point Inquiry and Advisory Committee (IAC) report examined the likely impacts on MNES. The overall finding of the IAC was that the project will have an unacceptable impact on MNES. The IAC recommended mitigation and management measures in the environmental performance requirements (EPRs) listed in Appendix G of its report. These measures are proposed to reduce the environmental effects of the project if the is approved and allowed to proceed. This is discussed in Appendices A1 and A2 below in relation to the two controlled actions and their respective controlling provisions. However, it is my assessment that the gas import jetty works project presented in the EES and considered by the IAC would have unacceptable effects on the environment, including MNES.

A.1 Appendix A1: Gas import jetty works, EPBC 2018/8298

The controlling provisions for the gas import jetty works are:

- Ramsar listed wetlands (sections 16 and 17B);
- listed threatened species and communities (sections 18 and 18A); and
- listed migratory species (sections 20 and 20A).

Western Port Ramsar site

Western Port is listed under the *Convention on Wetlands of International Importance Especially as Waterfowl Habitat* (Ramsar, Iran, 1971), commonly referred to as the Ramsar Convention. Western Port's Ramsar status was a factor in my decision to require an EES for the project and is a controlling provision for the Commonwealth's controlled action decision.

The IAC acknowledged that the Ramsar site includes an operating commercial port, and that the Ramsar listing of Western Port occurred in the context of the established Port of Hastings. The IAC found that operation of the port since Western Port's Ramsar listing has generally been sensitive to and consistent with the maintenance of the ecological character of the Western Port Ramsar site. However, establishment and operation of an FSRU would be fundamentally different from those operations.

The proponents assessed the project's risks against the relevant limits of acceptable change (LAC), as described in DELWP's Western Port Ramsar Site Management Plan (2017) for the entire environment of Western Port. The proponents concluded that the project is acceptable on the basis that it does not cause a significant impact and is well within the LAC. The IAC disagreed with that conclusion and found that the EES's consideration of the LAC does not correctly reflect the impacts to the ecological character within this segment of Western Port. The IAC found that impacts of the project to the ecological character within a segment of the Western Port Ramsar wetland are unacceptable. I accept and endorse that conclusion

The Western Port Ramsar Site Management Plan also sets out resource condition targets which have been established for priority ecological values. Achievement of the resource condition targets will enable the objectives of management plan to be fulfilled. The resource condition targets respond to the limits of acceptable change but generally set substantially higher thresholds compared to the limits of acceptable change, reflecting the purpose of maintaining and where necessary enhancing the ecological values of the Ramsar site, as opposed to identifying benchmarks below which the site could be at risk of failing to continue to satisfy applicable Ramsar site criteria. An assessment considering impacts of the project against the resource condition targets was not included in the EES.

The IAC expressed concern that the EES approach to assessing entrainment of biota, a key impact on the Ramsar site, relied on unverified assumptions. The entrainment model implicitly assumes that species which could be affected by entrainment are evenly distributed across the Ramsar site, which may not be the case. Species predominantly distributed in the Crib Point vicinity or moving through the channels in the North Arm may be disproportionately affected. This might include eggs or larvae of fish species that use Western Port as a "nursery", including Australian Grayling. Another assumption was that mobile species would swim away from the inlet. The IAC noted arguments that organisms with at least one dimension smaller than 100mm could be entrained through the 100mm x100mm inlet grill, including multiple fish species.

The IAC concluded that marine ecological impacts would accrue from entrainment but could not determine from the available information the level of significance of those impacts. It noted the reliance of modelled impacts of entrainment on assumptions which might or might not be valid, and which in some cases might not be replaced practicably with empirical data. However, it identified entrainment impacts on larger organisms as unacceptable.

The EES proposed a discharge limit of 100µg/L residual chlorine. The IAC found that substantially lower thresholds should apply because of the higher level of protection that should be provided for marine organisms in a Ramsar site and the chronic rather than acute nature of exposure. The IAC noted the EES relied on toxicity tests using Northern Hemisphere species rather than species native to Western Port. Some of the species endemic to Crib Point, such as sea urchins, may be much more sensitive to chlorine-produced oxidants.

The IAC noted that some chlorine-produced oxidants are more persistent in the environment than others, particularly those resulting from reaction with bromine to form brominated organic compounds, which may also be moderately to highly toxic. Brominated organic compounds can occur naturally, although the EES did not present data on naturally occurring levels of brominated organic compounds in Western Port.

The IAC sought additional information from the proponents about options for applying substantially reduced chlorine discharge limits than proposed in the EES. The additional information provided indicated that a reduced chlorine discharge maximum concentration of 20µg/L could be achieved, as has been required for the FSRU recently approved for Port Kembla, NSW, which is not in or near a Ramsar site. The IAC also considered information presented in submissions about discharge parameters for FSRUs operating elsewhere in the world and noted that a discharge of 100µg/L could not be regarded as best practice.

The IAC concluded that the adverse effects of chlorine-produced oxidants discharged as proposed from the FSRU into a Ramsar site would be unacceptable. It has found that exposure should be considered as chronic rather than acute, with resultant reduction in allowable levels, and that it cannot be satisfied about the potential acceptability of impacts in the context of the continuous operation of the proposed FSRU over a period of many years. The IAC noted the need for an operation proposed to operate in a Ramsar site to demonstrate best practice. In light of the proposed duration of the project and potentially near-continuous

discharge regime, the IAC concluded that a maximum discharge concentration of 2 µg/L residual chlorine would represent the upper limit for acceptability in Western Port.

Under open loop mode, the FSRU would discharge used seawater back into Western Port approximately 7°C cooler than the ambient seawater temperature. The FSRU would also be capable of operating in closed loop mode, under which the discharge would be of a lesser but still substantial volume, and warmer than ambient seawater temperature. The EES proposes that closed loop mode would operate only when the ambient seawater temperature was too low (<10°C) for efficient open loop regasification, expected to be the case for no more than about 30 days per year.

Cooled water from open loop regasification would tend to sink to the seafloor and mixing would be inhibited during periods of slack water (shortly before and after the turn of the tide), when the cooled water might pool, forming a “pancake” on the seabed. The EES did not investigate the potential for degradation of chlorine-produced oxidants to occur more slowly at lower temperatures. As the FSRU’s discharge ports would be on the same side as the unloading LNG tankers, discharges at those times would be blocked by the ship alongside, also inhibiting mixing. The proponents undertook to avoid discharges during slack water or while a visiting LNG carrier was moored alongside.

The potential for the discharge to affect benthic infauna was not adequately explored in the EES. Possible consequential impacts affecting other species further afield in than the modelled area cannot be ruled out.

The IAC found that the discharge of cooled water as an impact in isolation might be manageable and acceptable, especially if avoided in identified circumstances when mixing would be inhibited. However, the impact of the cooled water discharge cannot be considered in isolation because it would also contain chlorine-produced oxidants. The lower temperature of the discharge could contribute to the slower degradation and hence potentially more extensive adverse effects on the environment in the Ramsar site resulting from chlorine-produced oxidants.

The IAC concluded that the cumulative impacts of the project, particularly discharge of chlorinated and chilled seawater and continual entrainment of plankton, have the potential to result in significant and unacceptable impacts to the Ramsar wetland. It concluded that the 20-year life of the project would result in continued exposure of the Ramsar wetland to adverse environmental impacts, which could not be managed acceptably through the recommended mitigation measures. I accept and endorse those conclusions.

I also note that waterbirds, and especially migratory shorebirds, represent key components of the Ramsar site’s ecological character description. Adverse impacts on waterbirds including shorebirds would represent an adverse impact on the Ramsar site. Potential impacts on listed threatened and migratory shorebirds are addressed below.

Listed threatened species and communities

Seventeen taxa listed as threatened under the EPBC Act were identified in the EES scoping requirements and the EES as species as having the potential to be impacted by the gas import jetty works:

- Southern Right Whale;
- Humpback Whale;
- Loggerhead Turtle;
- Green Turtle;
- Leatherback Turtle;
- Australian Grayling;
- Australian Fairy Tern;

- Far Eastern Curlew;
- Curlew Sandpiper;
- Red Knot;
- Great Knot;
- Greater Sand Plover;
- Lesser Sand Plover;
- Bar-tailed Godwit (subspecies *baueri*);
- Northern Siberian Bar-tailed Godwit
- White-throated Needletail; and
- Dense Leek-orchid.

No EPBC Act listed threatened ecological communities were recorded or are predicted to occur within the gas import jetty works area. The surrounding Western Port Ramsar site supports one ecological community listed as vulnerable under the EPBC Act: Subtropical and Temperate Coastal Saltmarsh.

Southern Right Whale and Humpback Whale

Southern Right Whale is listed as endangered and migratory under the EPBC Act. Humpback Whale is listed as vulnerable and migratory under the EPBC Act. The EES states that both these species may sometimes visit Western Port during their seasonal migrations between their summer feeding areas in the Southern Ocean and winter breeding areas in warmer coastal Australian waters. It states that Western Port is not an aggregation point or breeding area for these species, and that whale visits to Western Port are the result of wandering from the usual migratory path which extends through Bass Strait (Attachment I). The EES did not include an assessment of the impacts of the project on these whale species against the Significant Impact Guidelines¹¹.

A number of submissions, including that submitted by DAWE, expressed concern about increased risk of whale strike resulting from additional shipping movements in Western Port's North Arm. The EES concluded that the increased risk of whale strike from the addition of up to 40 LNG carriers per year to current and future shipping traffic would not be significant (Attachment I). The proponents' expert witness Dr Wallis calculated that the probability of an LNG carrier striking a whale is 1 in 200 over the course of 20 years. Attachment 1 of the EES noted that LNG carriers would operate in accordance with existing regulations and directions related to vessel speed and interactions with cetaceans (including Part 8 of the EPBC Regulations Interacting with Cetaceans and Whale Watching) and the Port of Hastings Port Operating Handbook and Port of Hastings Harbour Master's Directions). Mitigation measures to minimise the risk of whale strike are included in EPR-ME15. The IAC found that the risk of whale strike resulting from the project is low.

DAWE's submission and others included concerns about the impacts of underwater noise on cetaceans. The EES included an assessment of the impacts of additional underwater noise generated by the gas import jetty operation on marine mammals including Southern Right Whales and Humpback Whales (Appendix I). The proponents provided additional information in Technical Note 43 in response to requests from the IAC. The technical note stated that there is a lack of information on the hearing sensitivity of baleen whales. However, it is likely the sound would be audible to marine mammals in most circumstances if they entered Western Port area. The proponents noted Western Port does not seem to play an important role for nursing calves or foraging. The proponents concluded that the severity of behavioural responses is likely to be low, with no measurable effect on the fitness of individuals of marine mammal species. The consequences of acoustic masking (where generated noise impedes the ability of an animal to perceive

¹¹ Matters of National Environmental Significance: Significant Impact Guidelines 1.1, *Environment Protection and Biodiversity Conservation Act 1999* (Department of Environment, 2013)

biologically relevant sounds such as communication) were considered to be minor and negligible on a population level (Technical Note 43). The EES concluded that Humpback Whale and Southern Right Whale are unlikely to be affected by noise to an extent that would negatively affect their population size, continuity or species recovery. The IAC considered long term and permanent adverse impacts from noise and vibration on listed species are unlikely.

The IAC found that overall impacts to listed threatened and migratory species, including whales, are likely to be low. I agree that a significant impact on Southern Right Whale or Humpback Whale would be unlikely.

Loggerhead Turtle, Green Turtle and Leatherback Turtle

Loggerhead Turtle and Leatherback Turtle are both listed as endangered and migratory under the EPBC Act. Green Turtle is listed as Vulnerable and migratory under the EPBC Act. The EES states that these species are all considered to have a low likelihood of occurrence near the gas import jetty works area as there have been very few occurrences of these species recorded within Western Port. None of these species breed within the vicinity of Western Port or on the Victorian coastline, as indicated by the Recovery Plan for Marine Turtles in Australia¹². The EES briefly described the potential impacts of discharge water from the FSRU and light impacts on these species (Appendix I). It stated that turtles that may occur occasionally near Crib Point would only be expected to be exposed to the cooler or warmer chlorinated discharge from the FSRU for a short period of time.

As discussed in the EES, artificial lighting is known to affect turtle breeding behaviour. However, as these species do not breed within the vicinity of Western Port, light from the FSRU and receiving facility would not impact on breeding or the behaviour of hatchlings. The EES states that adult turtles are unlikely to be displaced by light impacts as few have been recorded and the area is not considered to be important habitat. The EES did not include an assessment of the impacts of the project on these turtle species against the Significant Impact Guidelines. The three turtle species were not specifically considered in the IAC's assessment, however it concluded that overall impacts to listed threatened and migratory species are likely to be low. I agree with this finding and consider that based on the low number of records of these species within the area significant impacts on listed turtle species would be unlikely.

Australian Grayling

Australian Grayling is listed as vulnerable under the EPBC Act. The EES describes that populations of the species are known from Bunyip River, Lang Lang River and Cardinia Creek, each of which flows into Western Port. The species is amphidromous: adults spawn in the lower fresh water reaches of the streams, larval fish drift downstream into Western Port, and juveniles migrate back upstream into the streams to fresh water. It is not known whether the larvae remain in Western Port or disperse beyond the embayment. The larvae drift downstream from April to June and juveniles return upstream from September to December (Appendix I).

The EES assessed the potential for Australian Grayling larvae and juveniles to be impacted by entrainment by the FSRU during operation. The EES stated that hydrodynamic modelling undertaken for the project, along with only one Australian Grayling juvenile detected in the ichthyoplankton sampling program, indicate that it is unlikely that a significant proportion of the larvae disperse or remain in the section of Western Port near Crib Point (Lower North Arm). The eggs of the species are not viable in salt water so there is no risk of eggs being entrained by the FSRU. Consequently, the EES concludes that there is a low likelihood entrainment affecting Australian Grayling (Chapter 6, Appendix I).

¹² DoEE (2017) Recovery Plan for Marine Turtles in Australia, Department of the Environment and Energy, Commonwealth of Australia.

The EES stated that the hydrodynamic modelling indicates that the seawater entering North Arm from the Western Entrance is deflected to the eastern side of lower North Arm, where the stronger currents are. A late larval grayling was caught in Lower North Arm, which was likely returning to freshwater streams flowing into Upper North Arm. The EES inferred that most returning late larvae or juvenile graylings would follow migratory current paths and freshwater cues into the East Arm, and the risk of entrainment by the FSRU would therefore be low. The EES argued that implementation of a horizontal intake and an intake velocity of 0.15m/sec at peak production, which would allow fish and other biota to swim away from the intake, would also make it unlikely that Australian Grayling would be entrained (Chapter 6, Appendix I). The IAC did not comment on whether these intake parameters would prevent Australian Grayling entrainment.

The EES considered the impacts of cooled, warmed or chlorinated discharge water on Australian Grayling to be low, stating that the species is more likely to use the eastern channel of Western Port so they are not expected to occur at Crib Point (Appendix I). Attachment I of the EES included an assessment of potential impacts on the species in accordance with Significant Impact Guidelines 1.1 which determined that a significant impact was unlikely.

The IAC noted that the EES relied heavily on the assumption that the migration of late larvae and juveniles predominantly occurs through the eastern arm of Western Port. The IAC therefore concluded that the impacts on the species remain uncertain. I note that whilst an absence of Australian Grayling larvae in the ichthyoplankton sampling in Lower Northern Arm was used as evidence that the larvae of the species are in low abundance here, no ichthyoplankton sampling was undertaken in the East Arm, where the EES assumed the majority of the larvae would occur. Sampling of ichthyoplankton in the East Arm would be needed to demonstrate the majority of late larvae and juveniles migrate through this area. I therefore agree with the IAC that there is uncertainty about the impacts of FSRU operation on the species.

If the project proceeds, I would recommend that targeted ichthyoplankton surveys for Australian Grayling be developed in consultation with DEWLP and undertaken across both the North Arm and East Arm to demonstrate the movement pathways for larvae and juveniles. If a significant proportion of the larval and juvenile population is found to be present within the North Arm an Australian Grayling management plan should be developed in consultation with DELWP to ensure there would be no significant impact on this species.

Far Eastern Curlew, Curlew Sandpiper, Great Knot and Northern Siberian Bar-tailed Godwit

Far Eastern Curlew, Curlew Sandpiper, Great Knot and Northern Siberian Bar-tailed Godwit are listed as critically endangered as well as migratory under the EPBC Act. Western Port is noted for regularly supporting greater than 1% of the global population of the first two species which are also components of the ecological character of the Ramsar site.

The proponents did not undertake an impact assessment against the significant impact criteria for critically endangered species under the Significant Impact Guidelines for each of these species. The EES assessed impacts on migratory shorebirds as a guild, without distinguishing between species.

I find that the impacts on Far Eastern Curlew, Curlew Sandpiper, Great Knot and Northern Siberian Bar-tailed Godwit have not been adequately assessed. This is of particular importance given their EPBC Act status. Potential impacts could relate to behaviour of birds and to incremental impacts on habitat quality as well as impacts resulting from episodic events such as spills. I consider that a more detailed assessment of each of these species would be required to determine whether the action would have a significant impact under the Significant Impact Guidelines.

Australian Fairy Tern

Australian Fairy Tern is listed as vulnerable under the EPBC Act and is a component of the ecological character of the Ramsar site. This species nests within Western Port. There are two known breeding colonies of Australian Fairy Tern in Western Port: the larger one is at Rams Island, with only three breeding records for the nearby Tortoise Head¹³.

The EES addressed the impacts of noise and light on both this species. Technical Report B stated that Australian Fairy Tern has a low likelihood of being affected by noise and light from the project, as these impacts would be temporary, associated only with the construction phase, and would be unlikely to result in impacts on the population or harm to individuals. Mitigation measures were considered to further reduce the minor impacts on the species. The IAC considered Australian Fairy Tern would be unlikely to be affected by construction of the gas import jetty works as it is a mobile species which would be unlikely to remain within the impact area of the proposed works.

DAWE submitted that Australian Fairy Tern had not been adequately considered in the EES. The EES did not include an impact assessment against the significant impact criteria for vulnerable species under the Significant Impact Guidelines for Australian Fairy Tern. Neither the EES nor the IAC's report mentions an assessment of impacts on the breeding colonies of the species. I agree with DAWE's submission that further assessment of the impacts of the works and operation of the project on Australian Fairy Tern would be required to determine whether or not a significant impact would be likely and if so, to recommend appropriate mitigations to reduce impacts. An assessment against the significant impact criteria for vulnerable species under the Significant Impact Guidelines should be included in such an assessment. In the absence of that assessment I could not conclude or assume that impacts on Australian Fairy Tern would be acceptable.

Red Knot, Lesser Sand Plover, Greater Sand Plover and Bar-tailed Godwit

Red Knot and Lesser Sand Plover are listed as endangered whilst Greater Sand Plover and Bar-tailed Godwit are listed as vulnerable under the EPBC Act. The last taxon is also a component of the ecological character of the Ramsar site.

The EES assessed impacts on migratory shorebirds as a guild, without distinguishing between species. An impact assessment against the significant impact criteria for endangered and vulnerable species under the Significant Impact Guidelines was not undertaken for these taxa. In the absence of that assessment I could not conclude or assume that impacts on these taxa would be acceptable.

White-throated Needletail

White-throated Needletail is listed as vulnerable and migratory under the EPBC Act. The EES describes that the species has been recorded in the vicinity of the project area (Technical Report B). The species is mostly aerial within Australia, occurring over most types of habitat types but particularly wooded areas. It is not reliant on any habitat found within the project area. The EES states that any impact to this species would be negligible (Technical Report B). I agree with this assessment.

Dense Leek-orchid

Dense Leek-orchid is listed as vulnerable under the EPBC Act. Suitable habitat for the species was identified for the species in an area south of the Crib Point Jetty, which has since been determined to be outside of the project footprint. Targeted surveys were undertaken for the species at Crib Point within the area of gas import jetty works and the species was not detected. It was therefore considered to have a low likelihood

¹³ Hale, J. (2016) Ecological Character Description Addendum - Western Port Ramsar Site. Department of Environment, Land, Water and Planning. East Melbourne.

of occurrence (Appendix I). The exact location of these surveys is not indicated in Technical Report B. I note that mapping of the areas surveyed would improve confidence in the assessment methods. This is of particular importance given the area proposed for the receiving facility was substantially cleared in February 2020¹⁴. However, I generally accept that the project would be unlikely to have a significant impact on Dense Leek-orchid.

Subtropical and Temperate Coastal Saltmarsh

Subtropical and Temperate Coastal Saltmarsh is listed as vulnerable under the EPBC Act. This community occurs within the Western Port Ramsar site. As stated in the Significant Impact Guidelines listed ecological communities in the vulnerable category are not matters of national environmental significance for the purposes of Part 3 of the EPBC Act. Consequently, a significant impact assessment was not required for this community.

Listed migratory species

Twenty-nine taxa listed as migratory under the EPBC Act were identified in the EES scoping requirements and the EES as species as having the potential to be impacted by the gas import jetty works:

- Southern Right Whale;
- Humpback Whale;
- Loggerhead Turtle;
- Green Turtle;
- Leatherback Turtle;
- Far Eastern Curlew;
- Curlew Sandpiper;
- Sharp-tailed Sandpiper;
- Red Knot;
- Great Knot;
- Greater Sand Plover.
- Lesser Sand Plover;
- Bar-tailed Godwit;
- Bar-tailed Godwit (*baueri*); ;
- Northern Siberian Bar-tailed Godwit;
- Red-necked Stint;
- Double-banded Plover;
- Short-tailed Shearwater;
- Caspian Tern;
- Little Tern;
- Grey-tailed Tattler;
- Whimbrel;
- Common Sandpiper;
- Common Greenshank,
- Marsh Sandpiper;
- Pectoral Sandpiper;
- Rufous Fantail;
- Satin Flycatcher and
- White-throated Needletail.

¹⁴ The clearing is the subject of investigation and possibly enforcement action by Mornington Peninsula Shire Council.

Migratory shorebirds

As a listed Ramsar wetland, Western Port has international recognition as an important feeding and roosting area for numerous species of migratory shorebirds. The EES identified 21 EPBC Act listed migratory shorebird taxa which were considered to have a medium or higher likelihood of occurring within this area. Of these, nine taxa (Far Eastern Curlew, Curlew Sandpiper, Great Knot, Bar-tailed Godwit (*baueri*), Northern Siberian Bar-tailed Godwit, Australian Fairy Tern, Red Knot, Lesser Sand Plover and Greater Sand Plover) are also listed as threatened under the EPBC Act and have been described in the threatened species section above.

Impact pathways for migratory shorebirds explored within the EES and during the IAC hearing included indirect impacts to habitat quality, and disturbance caused by noise and light. Many submitters expressed concern about the impacts to shorebirds from disturbance associated with human activity, noise, vibration and lighting. DAWE stated in its submission “loss or degradation of habitat should be avoided, particularly altering water quality, nutrient cycles or hydrology”.

The EES focussed on the assessment of impacts on migratory birds in the immediate vicinity of Crib Point, with targeted surveys and habitat assessments centred on this vicinity (Technical Report B). The assessment of impacts was predominantly undertaken for migratory species as a guild, rather than for individual species. A single significant impact assessment, for all migratory shorebirds combined, was undertaken using the Significant Impact Guidelines for listed migratory species and the thresholds of significant impacts on migratory shorebirds outlined in EPBC Act Policy Statement 3.21¹⁵. EPBC Act Policy Statement 3.21 states that “several migratory shorebirds are listed as threatened under the EPBC Act and are subject to additional significant impact criteria (see EPBC Act Policy Statement 1.1 Significant Impact Guidelines—Matters of National Environmental Significance)”. Separate impact assessments were not undertaken in accordance with the significant impact criteria for listed threatened species as required by the Significant Impact Guidelines.

The proponents’ expert witness Mr Lane provided evidence that intertidal areas near the Crib Point Jetty and within 200m either side do not support significant numbers of shorebirds. Experts representing Mornington Peninsula and Bass Coast challenged this, stating that further surveys over a longer period would be required to determine this. The IAC generally accepted that habitat quality at Crib Point was not as high as for other areas but recommended further monitoring (for two years before operation commences) would provide an adequate baseline understanding of birds at and around Crib Point. I disagree with this recommendation. Given the difficulties of accurately monitoring foraging shorebirds over large areas of intertidal flats, further monitoring in this location prior to works is unlikely to provide sufficient further understanding of their use of the habitat near Crib Point.

The IAC found the construction and operational impacts of dust, vibration, and human activity disturbing shorebirds foraging on the mudflats not to be unacceptable. Similarly, the IAC considered that lighting impacts on wildlife would not be significant and could be appropriately managed with appropriate mitigation, including updates to EPR-FF06.

Many submissions raised concerns that the EES did not adequately characterise the Crib Point environment and existing marine biodiversity. The IAC agreed with these submissions that “the EES did not discuss the ecological implications of the project on the full range of direct and indirect biological impacts in sufficient detail”. The IAC agreed with the proponents that the project is unlikely to cause direct impacts on the intertidal environment but noted “indirect impact pathways are not properly understood and cannot be

¹⁵ Department of Environment (2017) EPBC Act Policy Statement 3.21—Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species

ruled out, particularly as intertidal environments are critically important for migratory shorebirds that inhabit the broader area”.

The IAC considered the assessment of impacts, based on this guild approach described above. This approach did not allow for assessment of how each taxa may be impacted in relation to ecological and behavioural differences such as timing of presence, foraging and roosting habitat and population dynamics. Furthermore, migratory taxa which are also listed as threatened should be assessed in accordance with the significant impact criteria for listed threatened species, as required by the Significant Impact Guidelines. The significance of migratory shorebirds in Western Port is also elevated by its status as a Ramsar site and as a component of its ecological character. Therefore, whilst I accept the IAC’s findings for migratory shorebirds in general, I consider that further detailed assessment of each taxa, particularly those which are listed as threatened, would be required before I could determine that there would not be a significant impact. In the absence of that assessment I could not conclude or assume that impacts on any threatened migratory species would be acceptable.

I recommend that impact assessments for each taxa would be required to determine whether impacts are likely to be acceptable. Indirect impact pathways and cumulative impacts on migratory shorebirds, and the likely efficacy of mitigation and management measures must be understood before they can be found to be acceptable. The nature of the further information that would be needed may make it impracticable to confirm the level of potential impact of the project with sufficient certainty, particularly for threatened migratory shorebird species.

Short-tailed Shearwater

Short-tailed Shearwater is listed as migratory under the EPBC Act. This species nests within Western Port with breeding colonies at Phillip Island and French Island (on Tortoise Head) from which they migrate annually to the northern Pacific Ocean (Technical Report B). I consider that as this species breeds within close proximity to the project area it warrants additional consideration.

The EES addressed the impacts of noise and light on this species. Short-tailed Shearwater fledglings are known to be attracted to or disoriented by artificial light, leading to grounding of birds. The species struggles to take off from built-up areas and grounding can result in death from starvation, dehydration, predation or vehicle collision. This has been well-documented for Short-tailed Shearwaters nesting on Phillip Island¹⁶. The EES addressed the impacts of artificial lighting from the FSRU and Crib Point Receiving Facility on migratory shorebirds in Appendix I. The EES mentions that Short-tailed Shearwater are known to forage over the deeper waters of the Western Arm of Western Port, and states that mitigation measures for lighting would assist in reducing the attraction of shearwaters to the gas import jetty works. The IAC found that lighting impacts to wildlife will not be significant and can be appropriately managed through mitigation measures, including revised EPR-FF06 (migratory birds). Potential impacts on fledgling Short-tailed Shearwaters were not specifically addressed either in the EES or by the IAC.

I accept that EPR-FF06 should be adequate to manage lighting impacts for most migratory bird species. However, given the susceptibility of fledgling Short-tailed Shearwater to mortality resulting from light attraction, I would recommend that further assessment of the impacts of lighting from the FSRU and Receiving Facility and consideration of further mitigation options be undertaken for this species. In particular, if the project proceeds, I would recommend a Short-tailed Shearwater lighting management plan should be developed in consultation with DELWP to ensure there would be no significant impact on this species.

¹⁶ Rodríguez A, Burgan G, Dann P, Jessop R, Negro JJ, Chiaradia A (2014) Fatal Attraction of Short-Tailed Shearwaters to Artificial Lights. PLoS ONE 9(10): e110114. <https://doi.org/10.1371/journal.pone.0110114>

Other non- threatened migratory shorebirds

Bar-tailed Godwit, Red-necked Stint, Double-banded Plover, Caspian Tern, Grey-tailed Tattler, Whimbrel, Little Tern, Sharp-tailed Sandpiper, Common Sandpiper, Common Greenshank, Marsh Sandpiper and Pectoral Sandpiper are listed as migratory under the EPBC Act. The first six of these species are also a component of the ecological character of the Ramsar site.

As discussed above, the assessment of impacts was undertaken for migratory species as a guild, rather than for individual species. This included a combined impact assessment for all species under the Significant Impact Guidelines for migratory shorebirds. I recommend that impact assessments for each taxa be undertaken separately. As these species are not threatened, I consider the project is unlikely to have a significant impact.

Rufous Fantail and Satin Flycatcher

Rufous Fantail and Satin Flycatcher are both listed as migratory under the EPBC Act. The EES identifies that forested areas and woodland within the project area provide potential habitat for these species during their migration (Technical Report B). The EES does not include a discussion of the impacts of the project on these species. Based on the small amount of preferred habitat within the gas import jetty works area I consider the project is unlikely to have a significant impact on these species.

White-throated Needletail

White-throated Needletail is listed as migratory under the EPBC Act. This species is also listed as threatened under the EPBC Act and as such is described in the threatened species section above.

Migratory mammals

Southern Right Whale and Humpback Whale are listed as migratory the EPBC Act. They are also listed as threatened under the EPBC Act and as such are described in the threatened species section above.

Migratory reptiles

Loggerhead Turtle, Green Turtle and Leatherback Turtle are listed as migratory under the EPBC Act. They are also listed as threatened under the EPBC Act and as such are described in the threatened species section above.

Assessment of gas import jetty works, EPBC 2018/8298

- Impacts of the gas import jetty works to the ecological character within a segment of Western Port Ramsar site would be unacceptable. The project would have unacceptable impacts to the Ramsar wetland which could not be acceptably managed.
- Impacts of the gas import jetty works to EPBC Act listed whales, turtles and Dense Leek-orchid are unlikely to be significant.
- The impacts of the FSRU operation on Australian Grayling are uncertain.
- Further detailed assessment of impacts of the operation of the FSRU on migratory shorebirds would be required before it could be determined that there would not be a significant impact. The assessment of impacts should be for individual species rather than all species combined.
- Migratory species which are also listed as threatened should be assessed in accordance with the significant impact criteria for listed threatened species, as required by the Significant Impact Guidelines 1.1. In the absence of that assessment I could not conclude or assume that impacts on any of those species would be acceptable.
- If the project proceeds, I recommend a Short-tailed Shearwater lighting management plan should be developed in consultation with DELWP and implemented.

A.2 Appendix A2: Crib Point-Pakenham gas pipeline works, EPBC 2018/8297

The controlling provisions for the Crib Point-Pakenham gas pipeline works are:

- Ramsar listed wetlands (sections 16 and 17B); and
- listed threatened species and communities (sections 18 and 18A).

Western Port Ramsar site

The short stretches of the pipeline which traverse portions of the Ramsar site would be installed using trenchless construction methods. The IAC concluded that there would be no likely implications for the pipeline works to the Ramsar site. I accept that conclusion and find that the pipeline works would be unlikely to have a significant impact on the Western Port Ramsar site.

Listed threatened species and communities

Four species listed as threatened under the EPBC Act were identified in the EES scoping requirements as species as having the potential to be impacted by the Crib Point-Pakenham gas pipeline works:

- Southern Brown Bandicoot;
- Growling Grass Frog;
- Dwarf Galaxias; and
- Australian Grayling.

One community listed under the EPBC Act, Subtropical and Temperate Coastal Saltmarsh, was confirmed as present within the pipeline alignment.

The IAC found the likelihood of significant impacts to listed threatened species and ecological communities from the Crib Point-Pakenham gas pipeline works to be low providing the recommended mitigation measures were effectively implemented.

Southern Brown Bandicoot

Southern Brown Bandicoot is listed as endangered under the EPBC Act. The EES states that the species is known to occur within and near the pipeline alignment, north of South Gippsland Highway, with numerous records within the surrounding landscape in this vicinity. The species has been recorded at eight locations along the pipeline alignment including: Manks Road, Tooradin Station Road, Tooradin Inlet Drain, Cardinia Creek and Koo Wee Rup Road. A further eight locations are presumed habitat. Suitable habitat for the species within the area includes Swamp Scrub, Heathy Woodland and exotic vegetation.

The EES identified that the project could result in short term loss and fragmentation of habitat for the Southern Brown Bandicoot with lower risks associated with the impacts of disturbance during construction (light, dust and noise) and trench entrapment. Mitigation measures were proposed to minimise potential impacts on individuals and maintain the functionality of dispersal corridors (EES, Attachment I).

The EES states that it is unlikely that Southern Brown Bandicoot persists south of Watson Creek (KP 19) due to a lack of recent records and the results of targeted surveys undertaken for the project in 2018 (Attachment I). This was contested by a number of submitters, including Mornington Peninsula and Bass Coast Shire Councils. Expert witness Mr Jake Urlus, giving evidence for the councils, considered the species may still be present and was not detected because of the limited survey effort. He stated that the sizeable population of Southern Brown Bandicoots at Quail Island and the presence of high quality connected habitat means that the species might be present in these areas and that even if it were absent, recolonisation by the species was possible. The proponents' expert witness Mr Lane recommended that the assessment acknowledge the broader planning context (i.e. the Subregional Strategy for Southern

Brown Bandicoot¹⁷) and consider all 35 areas identified by Monarc Environmental (2018) as potential habitat for the species.

Mr Urlus recommended that all areas of potential habitat for Southern Brown Bandicoot should be subject to rapid revegetation, whilst Mr Lane proposed that those areas where the species had not been recorded should be allowed regenerate naturally. The IAC supported amending POS R14 of the CEMP to require rapid revegetation along the pipeline alignment where Southern Brown Bandicoot habitat is removed from areas where the species is known or has the potential to be present. The IAC recommended the inclusion of a Southern Brown Bandicoot-specific revegetation plan with timeframes and monitoring. I agree with these measures, including the revision of POS R14.

The IAC considered evidence presented by both Mr Lane and Mr Urlus which debated the impact that the project may have on facilitating increased predation by introduced predators, particularly foxes. The IAC recommended including a new CEMP POS, B14 (Predator control management), to consider predator control management along the pipeline alignment that would be developed in consultation with appropriate land managers and authorities. I support this addition to the CEMP.

The IAC heard concerns from Evolution Rail Pty Ltd, which is contracted to build and maintain the Pakenham East Rail Depot. Evolution Rail were concerned that the proposed Pakenham Delivery Facility, which would be constructed adjacent to its rail depot, might impact on no-go zones established as part of approvals for the rail depot under the EPBC Act, which protect Southern Brown Bandicoot and Growling Grass Frog habitat. The IAC recommended that a site-specific CEMP be prepared for the Pakenham Delivery Facility in response to environmental no-go zones protecting Southern Brown Bandicoot and Growling Grass Frog habitat. The IAC concluded that the CEMP should address:

- native vegetation removal;
- invasion by environmental weeds, pathogens or animals within retained native vegetation;
- habitat fragmentation and effects on ecosystem function;
- noise and vibration impacts causing stress/displacement of native fauna; and
- dust impacts on flora and fauna as an ecosystem function.

I support this recommendation.

The IAC identified areas of potential habitat for Southern Brown Bandicoot where habitat removal could be avoided by trenchless construction (HDD). This included native vegetation at South Boundary Road East, Pearcedale (KP20.1) and between KP13.7 to KP14.4 adjacent to the former Tyabb landfill area (see EES Attachment IX Pipeline licence application, Attachment G Environmental Line List). I support this recommendation.

The IAC found that impacts on Southern Brown Bandicoot could be appropriately avoided, minimised and managed with the addition of the recommended measures for revegetation, predator control and avoidance. The EES included an impact assessment against the significant impact criteria for endangered species under the Significant Impact Guidelines which concluded that it would be unlikely that the works would have a significant impact on Southern Brown Bandicoot (Appendix I). I accept this assessment and consider that the action would be unlikely to have a significant impact on the species.

Growling Grass Frog

Growling Grass Frog is listed as vulnerable under the EPBC Act. The species was detected within the pipeline alignment at Cardinia Creek and is assumed to be present within connected waterways including Western Outfall Drain and Lower Gum Scrub Creek. There are multiple records of the species within the

¹⁷ DEPI (2014) Sub-Regional Species Strategy for the Southern Brown Bandicoot. Department of Environment, Planning and Infrastructure.

surrounding area. Habitat for the species within and surrounding the alignment includes farm dams, waterways and terrestrial habitat surrounding these (Appendix I).

The EES identified potential impacts of the project on Growling Grass Frog as including temporary removal of habitat, short-term disturbance from construction activities (including lighting, noise and vibration) and the potential to spread known pathogens including Amphibian Chytrid Fungus *Batrachochytrium dendrobatidis* (Appendix I). Short-term indirect impacts to the species due to sedimentation and changes to water flow during the proposed trenching of Western Outfall Drain were also identified. A range of mitigation measures are proposed to reduce impacts on the species (Appendix I).

Pipeline construction would include HDD crossings of Cardinia Creek and Lower Gum Scrub Creek, which would reduce potential impacts on the species. Western Outfall Drain is proposed to be crossed by trenching.

As described above for Southern Brown Bandicoot, the IAC recommended that a site-specific CEMP be prepared for the Pakenham Delivery Facility which would manage impacts on no-go zones associated with Growling Grass Frog habitat. I support that recommendation.

The IAC found that likelihood of significant impacts to Growling Grass Frog to be low provided that recommended mitigation measures were effectively implemented. The EES included an impact assessment against the significant impact criteria for vulnerable species under the Significant Impact Guidelines and the Significant Impact Guidelines for the vulnerable Growling Grass Frog¹⁸ which concluded that it would be unlikely that the works would have a significant impact on Growling Grass Frog (Appendix I). I accept that conclusion and consider the action would be unlikely to have a significant impact on Growling Grass Frog.

Dwarf Galaxias

Dwarf Galaxias is listed as Vulnerable under the EPBC Act. The species has not been recorded within the pipeline alignment area, including during targeted surveys for the project. However, there are records for the species in rivers and drains south-east of Melbourne and around Western Port and suitable habitat for the species occurs in each of the important waterways crossed by the project (Table 8 in Appendix I). Of these, open trenching is proposed for crossing Craigs Lane Drain, Western Outfall Drain, Tooradin Inlet Drain and Hagelthornes Drain.

The EES identified potential impacts of the project on Dwarf Galaxias as including short-term habitat fragmentation during the proposed open trenching of waterways with suitable habitat (Appendix I). Proposed mitigation measures to minimise impacts on the species include trenching of watercourses during periods of low or no flow, flow diversion measures, the use of screened inlets, contractor awareness and measures for reinstatement. The EES asserted that implementation of these mitigation measures would result in a low risk of impacts to Dwarf Galaxias.

The EES included an impact assessment against the significant impact criteria for vulnerable species under the Significant Impact Guidelines which concluded that it is unlikely that the works would have a significant impact on Dwarf Galaxias (Appendix I). I accept that conclusion and consider that the action would be unlikely to have a significant impact on Dwarf Galaxias.

¹⁸ DEWHA (2010) Significant impact guidelines for the vulnerable growling grass frog (*Litoria raniformis*), Nationally threatened species and ecological communities EPBC Act policy statement 3.14, Department of the Environment, Water, Heritage and the Arts

Australian Grayling

Australian Grayling is listed as vulnerable under the EPBC Act and is a component of the ecological character of the Ramsar site. The species was not recorded during targeted surveys for the pipeline works. However, the EES states that suitable habitat for the species occurs within the pipeline alignment area at Cardinia Creek and Lower Gum Scrub Creek (Table 9, Appendix I). Records of the species occur within both these waterways. Both waterways are proposed to be crossed by HDD.

The EES included an impact assessment against the significant impact criteria for vulnerable species under the Significant Impact Guidelines, which concluded that it is unlikely that the works would have a significant impact on Australian Grayling (Appendix I). I accept that conclusion and consider that the pipeline works would be unlikely to have a significant impact on Australian Grayling.

Subtropical and Temperate Coastal Saltmarsh

Subtropical and Temperate Coastal Saltmarsh is listed as vulnerable under the EPBC Act. Field surveys undertaken for the EES confirmed the presence of this community within the pipeline alignment at Watson Creek (KP 19). As stated in the Significant Impact Guidelines, listed ecological communities in the vulnerable category are not matters of national environmental significance for the purposes of Part 3 of the EPBC Act. Consequently, a significant impact assessment was not required for this community.

Assessment of Crib Point-Pakenham gas pipeline works, EPBC 2018/8297

- The pipeline works would be unlikely to have a significant impact on the Western Port Ramsar site.
- The project is unlikely to have a significant impact on Southern Brown Bandicoot provided recommended mitigation measures for the species were implemented. I support the IAC's recommendations to include a Southern Brown Bandicoot-specific revegetation plan as a requirement of CEMP POS R14, and to include a new CEMP POS B14 (Predator control).
- A site-specific CEMP should be developed for the Pakenham Delivery Facility in response to no-go zones associated with Southern Brown Bandicoot and Growling Grass Frog habitat.
- The project would be unlikely to have a significant impact on Growling Grass Frog provided recommended mitigation measures for the species are implemented.
- The project would be unlikely to have a significant impact on Dwarf Galaxias or Australian Grayling.

Appendix B Management of environmental effects

If decision-makers choose to grant approvals, a sound regulatory framework and environmental control regime will be essential to ensure that adverse effects of the project on the environment are mitigated as far as practicable. I have considered key elements of an environmental management framework for the benefit of decision makers, statutory regulators and the proponents alike (Appendix B.1).

The environmental management regime for construction of the pipeline would be framed within a construction environmental management plan (CEMP), which would include as components performance objectives and standards (POS) and an environmental line list. The EES presented the proponents' proposed POS in the pipeline licence application (Attachment IX to the EES) as Attachment J and the environmental line list as Attachment G. I outline my assessment of the CEMP in Section B2.

Detailed advice on the management of environmental effects is provided by assessment topic in Section 5.

B.1 Environmental management framework

The EES proposed an environmental management regime based on integrated mitigation measures. The IAC expressed its preference for the mitigation measures to be reframed as environmental performance requirements (EPRs), consistent with what has become common practice for projects subject to the EES process and requiring planning approval over recent years. The proponents accepted the IAC's guidance and tabled successive versions of EPRs during the hearing.

The IAC presented recommendations to amend the proponents' EPRs in Appendix G to its report. The IAC's report also identified the appropriate approval(s) under which each EPR should be given statutory effect. In general, my assessment supports the EPRs as recommended by the IAC, subject to the exceptions set out in Table B1.

In its Appendix G, the IAC did not identify the pipeline licence as the appropriate statutory mechanism to give effect to any of its recommended EPRs. However, it appears from the IAC's recommendation 4a that the IAC intended relevant EPRs to be applied and implemented through the licence under the Pipelines Act. Accordingly, I encourage the Minister for Energy, Environment and Climate Change to have due regard for the IAC's recommended EPRs, as varied in Appendix B of this assessment, if a licence is to be issued, and to adopt and include relevant EPRs, whether as licence conditions or within the framework of the pipeline's CEMP.

The pipeline licence would be subject to a CEMP, included in the EES at Attachment IX (2). The CEMP would include an environmental line list (CEMP Attachment G) and performance objectives and standards (CEMP Attachment J).

The IAC made detailed recommendations in its report about changes that it considered should be made to the performance objective and standards (IAC recommendations 1b to 1k) and to the environmental line list (IAC recommendation 1l) relating to specific sites where trees or other environmental assets should be protected beyond that proposed in the EES and the pipeline licence application. If a licence is to be granted for the pipeline, this assessment endorses all the IAC's recommendations regarding enhanced environmental protection measures in the performance objectives and standards and the environmental line list to be attached to the CEMP.

B.2 Construction environmental management plan

In its summary of findings, conclusions and recommendations, the IAC provided detailed recommendations about changes to the POS and to the environmental line list if the pipeline component of the project is to proceed. The recommended changes (Table B2) should be read in conjunction with related EPRs as appropriate.

The IAC recommended 13 specific changes to the environmental line list (Recommendation 1l, i-xiii), generally to achieve protection of specified environmental assets on or in the vicinity of the proposed pipeline alignment. This assessment endorses the IAC's recommendation 1l in full.

IAC recommendations 1m and 1n relate to protection of Aboriginal cultural heritage. Recommendation 1m recommends a:

- review and update Construction Environment Management Plan, Attachment J (Performance Objectives and Standards), EPRs and other relevant approvals to include any necessary changes needed to implement the three CHMPs when approved.

My assessment generally supports the principle underpinning this recommendation. However, I note that approved CHMPs are not generally available to third parties such as approvals authorities and therefore co-operation between the Bunurong Land Council Aboriginal Corporation, Aboriginal Victoria and approval authorities would be required.

Recommendation 1n recommends a:

- review the documentation of Aboriginal places in Technical Report P in conjunction with the Bunurong Land Council Aboriginal Corporation and Aboriginal Victoria (for the relevant Cultural Heritage Management Plans) and update the relevant Cultural Heritage Management Plans where appropriate.

This assessment supports this recommendation.

Recommendation 1o recommends that a site-specific CEMP be prepared for the Pakenham delivery facility responding to pre-established "no go" zones for protection of Southern Brown Bandicoot and Growling Grass Frog habitat. This assessment supports this recommendation.

Recommendation 2a recommends the adoption of relevant EPRs through the works approval.

Recommendation 2b recommends the adoption of relevant CEMP provisions for the works approval. This assessment supports those recommendations.

Recommendation 3a recommends the inclusion of the IAC's recommended version of the incorporated document in Amendment C272morn. This recommendation would be supported if the amendment were to be approved.

Recommendation 3b recommends review of the proposed Port zone boundary south of the jetty to align with the existing Port boundary. This assessment concludes that even if Amendment 272morn does not proceed, it would be desirable for the Port boundary and the Port Zone boundary to be reviewed and the zone boundary aligned with the Port boundary at Crib Point if that is not currently the case.

Recommendation 4a recommend the application of relevant EPRs in the pipeline licence if it is issued. This recommendation is supported.

Recommendation 4b recommends the application of the IAC's recommended changes to the POSs and the environmental line list, as set out in recommendations 1b-1l. As noted above, this assessment supports this recommendation.

Table B1: Assessment of environmental performance requirements (EPRs).

EPR ID	EPR title	Ministers assessment
AH01-03	Aboriginal cultural heritage	Agreed
AQ01-10	Air quality	Agreed
C01-08	Contamination and acid sulphate soils	Agreed
GG01-05	Greenhouse gas emissions	Agreed.
GG06	Implementation of the PEM	Given that unacceptable environmental effects would result from aspects of open loop regasification, the EPR should be amended to require the operator to seek options to minimise GHG emissions consistent with other environmental objectives and standards.
GG07	Certified carbon offsets	I recommend the purchase should be required.
HG01	Groundwater	Agreed
HH01	Unexpected cultural heritage finds procedure	Agreed, with minor editorial correction: remove 'unknown'.
HH02	Historic heritage	Agreed.
LV01-06	Landscape and visual impact	Agreed.
LV07	FSRU lighting	Agreed, subject to variation as needed to align with EPR-FF06 and/or FF-09.
NV01-16	Noise and vibration	Agreed.
ME01	Marine biodiversity	Agreed.
ME02	Varying chlorination rate at point of discharge	Agreed, except that: residual chlorine discharge concentration must be no greater than 2µg/L at the point of discharge, with the mixing zone extending no farther than 10m from any of the discharge ports; and monitoring results must be published on the project website at least monthly.
ME03-09	Marine biodiversity	Agreed.
ME10	Class and IMO standards	Principle is agreed, recommend wording to restrict mooring to vessels compliant with standards endorsed for application in Australian waters.
ME11-13	Marine biodiversity	Agreed.
ME14	Exclusion zone around FSRU	Agreed, but renumber to reflect that this EPR would not serve a marine biodiversity purpose.
ME15	Marine biodiversity	Agreed.
ME16	Monitoring program	While monitoring would be essential, EPR requires review to ensure that monitoring and mitigation actions are specified separately and that requirements are practicable and consistent with other EPRs.
HR01-08	Hazard and risk	Agreed.
SO01-06	Social impact management	Agreed.
SW01-06	Surface water	Agreed.

/cont.

Table B1 (cont.): Assessment of environmental performance requirements (EPRs).

EPR ID	EPR title	Ministers assessment
FF01-05	Terrestrial and freshwater biodiversity	Agreed.
FF06	Migratory birds	Generally agreed, subject to: reorganising to deal with broader migratory bird issues in EPR FF06 and lighting impacts on fauna (including migratory birds) in FF09; reservations about reliance on visual monitoring of shorebird usage of foraging areas, especially low observed usage levels; and need for lighting management to address seasonal (autumn) susceptibility of Short-tailed Shearwaters to disorientation by lights.
FF07-08	Terrestrial and freshwater biodiversity	Agreed.
FF09	Lighting impacts to fauna	See FF06.
FF10	Terrestrial and freshwater biodiversity	Agreed.
TP01-06	Traffic	Agreed.
IEA01	Independent environmental auditor	Agreed.

Table B3: Assessment of performance objectives and standards (POS) recommendations.

IAC recommendation	Revised POS	POS subject	Assessment
1b	R14	Southern Brown Bandicoot habitat	Agreed.
1c	B10	Swamp Skink habitat	Agreed.
1d	T11	Contaminated soils (KP7-3-7.6)	Agreed.
1e	W3	Contaminated soils (PFAS)	Agreed.
1f	T13	Acid sulphate soils	Agreed.
1g	HH3	Unexpected cultural heritage finds	Agreed.
1h	B15	Predator control management	Agreed.
1i	E5	Independent environmental auditor	Agreed.
1j	E6	Construction noise management	Agreed.
1k	E7	Construction hours – noise management	Agreed.