Environment Effects Act 1978

Pipelines Act 2005

Planning and Environment Act 1987

Inquiry, Advisory Committee and Panel Report No. 1

Crib Point Gas Import Jetty and Crib Point – Pakenham Gas Pipeline

Report No. 1: Key considerations, findings and recommendations

22 February 2021

Environment Effects Act 1978

Inquiry report pursuant to section 9(1)

Pipelines Act 2005

Panel report pursuant to sections 40 and 47

Planning and Environment Act 1987

Advisory Committee report pursuant to section 151

Report No. 1: Key considerations, findings and recommendations

Crib Point Gas Import Jetty and Crib Point – Pakenham Gas Pipeline

22 February 2021

Kathy Mitchell, Chair

Michael Kirsch, Deputy Chair

Jacquelle Gorski, Member

Chris Harty, Member

Trevor McCullough

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Glossary and abbreviations

ACCC	Australian Competition and Consumer Commission
AEMO	Australian Energy Market Operator
AGL	AGL Wholesale Gas Limited
APA	APA Transmission Pty Ltd
ASS	Acid sulfate soils
BC	*Batrachochytrium dendrobatidis*
BLCAC	Bunurong Land Council Aboriginal Corporation
BOC	Brominated Organic Compounds
CEG	Combined Environment Groups (Environment Victoria, Save Westernport Inc and the Victorian National Parks Association)
CEMP	Construction Environmental Management Plan
CHMP	Cultural Heritage Management Plan
CPO	Chlorine Produced Oxidants
CPRF	Crib Point Receiving Facility
CPS	Critical Components, Processes and Systems
CSIRO	Commonwealth Scientific and Industrial Research Organisation
D	Document number
DAWE	Department of Agriculture, Water and Environment
dB	Decibels
DELWP	Department of Environment, Land, Water and Planning
EES	Environment Effects Statement
EES Act	*Environmental Effects Act 1978*
EOLSS	End of Line Scrapper Station
EPA	Environment Protection Authority
EPRs	Environmental Performance Requirements
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ESV	Energy Safe Victoria
EVC	Ecological Vegetation Class
FICA	French Island Community Association
FSRU	Floating Storage and Regasification Unit
GDE	Groundwater Dependent Ecosystems
GHG	Greenhouse gas
GIJW	Gas Import Jetty Works

GV	Guideline Value
HAZID	Hazard Identification
HAZOP	Hazard and Operability
HCMT	High Capacity Metro Rail
HDD	Horizontal Directional Drilling
HHRA	Human Health Risk Assessment
HIPAP	Hazardous Industry Planning Advisory Papers
IAC	Crib Point Gas Import Jetty and Crib Point-Packenham Gas Pipeline Inquiry, Advisory Committee and Panel
ISO	International Organisation for Standardisation
IWRG	Industrial Waste Resource Guidelines
Jetty	Crib Point Jetty
KP	Kilometre Point
LAC	Limits of Acceptable Change
L_{eq}	Equivalent continuous sound level
LNG	Liquefied Natural Gas
LSC	Light Spill Calculations
LSIR	Location Specific Individual Risk
mg/L	Milligrams per litre
MHF	Major Hazard Facility
ML	Megalitres
MLA	Marine Loading Arm
MLV	Mainline Valve
MM	Mitigation Measure
mmscf/d	million standard cubic feet per day
MNES	Matters of National Environmental Significance
MPLPS	Mornington Peninsula Localised Planning Statement
MPPS	Mornington Peninsula Planning Scheme
MSL	Monopole Sound Level
NOx	Nitrogen oxides
NO_2	Nitrogen dioxide
NSW ICNG	New South Wales Interim Construction Noise Guidelines
OEMP	Operations Environmental Management Plan
PC	*Phytophthera cinnamoni*

PDF	Pakenham Delivery Facility
PDS	Port Development Strategy
PHDA	Port of Hastings Development Authority
PIG	Pipeline Inspection Gauge
PM	Particulate Matter
PML	Pipeline Measurement Length
POS	Performance Objectives and Standards (Pipeline CEMP, Appendix J)
ppb	Parts per billion
Proponents	AGL Wholesale Gas Limited and APA Transmission Pty Ltd
PSP	Precinct Structure Plan
PTV	Public Transport Victoria
QRA	Quantitative Risk Assessment
RFI	Request for Further Information
ROW	Right of Way
RSA	Road Safety Audit
S	Submission number
SCO	Specific Controls Overlay
SEL	Sound Exposure Level
SIL	Safety Integrity Level
SO_2	Sulfur dioxide
Save Westernport	Save Westernport Inc
Scoping Requirements	Scoping requirements for the Gas Import Jetty and Pipeline Project Environmental Effects Statement
SEPP	State Environment Protection Policy
SFAIRP	So Far As Is Reasonably Practicable
SMS	Safety Management Study
SPL	Sound Pressure Level
TAC	Time Averaged Concentration
TBH	Tribromophenol
the Project	Gas Import Jetty and Pipeline Project
TIA	Traffic Impact Assessment
TMP	Traffic Management Plan
TN	Technical Note
TOC	Total organic carbon

TRH	Total Residual Chlorine
μg/L	Micrograms per litre
UNESCO	United Nations Economic, Scientific and Cultural Organisation
VOC	Volatile organic carbon
VPA	Victorian Planning Authority
VRCA	Victorian Regional Channels Authority
VTS	Victorian Transmission System
WAA	Works Approval Application

Executive summary and recommendations

Overview

AGL Wholesale Gas Limited (AGL) and APA Transmission Pty Ltd (APA) propose to develop a Gas Import Jetty Facility at Crib Point and 57 kilometre gas transmission pipeline (the Project) to supply imported liquified natural gas (LNG) into the Australian gas market for industrial, commercial and residential purposes. AGL and APA are joint Proponents for the Project.

The Proponents prepared an Environment Effects Statement (EES) to provide for the integrated assessment of the Project, which was placed on public exhibition for eight weeks in July and August 2020. A combined Inquiry, Advisory Committee and Panel (the IAC) was appointed by the Minister for Planning and the Minister for Energy, Environment and Climate Change to consider the EES, associated approvals and public submissions, and to hold a public Hearing to receive and consider evidence and submissions.

A total of 6,058 submissions were received in relation to the public exhibition, including one submission from Environment Victoria that contained an additional 4,853 attachments from individuals not included in the overall submission numbers. Overwhelmingly, most written and verbal submissions opposed the Project.

The Hearing was held for 37 days over 10 weeks from 12 October to 17 December 2020, at which the Proponents, four local Councils (Mornington Peninsula, Bass Coast, Casey and Cardinia), the Environment Protection Authority Victoria (EPA), Department of Environment, Land, Water and Planning (DELWP), Bunurong Land Council Aboriginal Corporation (BLCAC), Port of Hastings Development Authority (PHDA), various environment and community groups and individual submitters provided evidence and submissions to the IAC.

Due to COVID restrictions, the Hearing was held by video conference, and while presenting the occasional technical challenges, it enabled all parties and submitters seeking to be heard, the opportunity to present evidence and submissions to the IAC, as well as the ability to listen in at any stage of the proceedings.

The Proponents presented significant evidence in support of the Project. Jointly, Mornington Peninsula and Bass Coast Shire Councils provided counter evidence, as did the Combined Environment Group (CEG, comprising Save Westernport, Environment Victoria and Victorian National Parks Association). Additionally, various other parties provided evidence.

Context for assessment

The starting point for this assessment is the locational context and policy settings for the Project. The site for the gas import works at the Crib Point Jetty is one of three jetties comprising the Port of Hastings, which is one of four state significant ports in Victoria. Crib Point is currently a receiving point for fuel that is then transported by pipe to a distribution hub. The Port of Hastings, which has been operating since the 1960s, is supported by State and local policy, is well established and has significant land holdings extending from Hastings to Stony Point. It sits in Western Port Bay on the east side of the Mornington Peninsula, south of the Koo Wee Rup agricultural area and west of French Island.

The Project will include the permanent mooring at Berth 2 (currently unused) of a large floating storage regasification unit (FSRU) for up to 20 years and the conversion of LNG to natural gas from up to 40 carriers a year.

The Project's location within the Port of Hastings needs to be balanced against the environment in which it is situated. The Port of Hastings is located in Western Port Bay, which is a Ramsar wetland of international significance, recognised for its inherent and diverse marine and coastal wetlands biodiversity and values. Further, Western Port Bay is recognised internationally as a United Nations Economic, Scientific and Cultural Organisation (UNESCO) Biosphere Reserve, the only such Reserve in Victoria. The tension between the Project's setting within the Port of Hastings and the environmental values of Western Port Bay has been a key consideration in the IAC's deliberations.

This report provides an analysis of the EES in response to the exhibited material, scoping requirements, evaluation objectives, evidence and submissions, and other material provided to the IAC during the Hearing.

The IAC has prepared two reports:

- Report No. 1 provides the key considerations, findings and recommendations of the IAC.
- Report No. 2 provides the Appendices, including:
  - Terms of Reference
  - List of submitters
  - Parties to the Hearing
  - Document list
  - Legislation and policy context
  - Recommended Incorporated Document
  - Recommended Environmental Performance Requirements (EPRs).

Report No. 1 has three Parts:

- Part A provides background information about the IAC process, a summary of the Project and the Project rationale and alternatives.
- Part B provides the review and analysis of each of the environment effects of the Project, using the same subject themes as in Volume 2 of the EES.
- Part C provides the summary and conclusions of the IAC in relation to Project implementation and its integrated assessment.

Summary of environmental effects

The summary of findings of the IAC in relation to the environmental effects of the Project are:

(i) Effects that are acceptable, no additional mitigation measures are required:

- Project rationale
- Surface water
- Groundwater
- Business.

(ii) Effects that are acceptable, subject to additional and/or revised mitigation measures and/or additional work:

- Terrestrial and freshwater biodiversity

- Contamination and acid sulfate soils
- Greenhouse gas
- Air quality
- Noise and vibration
- Landscape and visual
- Transport
- Safety, hazard and risk
- Land use
- Social
- Agriculture
- Heritage
- Pipeline alignment and options.

(iii) Effects that are unacceptable:

- Marine biodiversity:
  - Adequacy of assessments
  - Chlorine discharge
  - Coldwater discharge
  - Seawater intake and entrainment
- Matters of National Environmental Significance – Ramsar wetland.

Summary of findings, conclusions and recommendations

Overall, the IAC concludes that while most effects can be effectively mitigated when considered in isolation, the direct and indirect effects on the marine environment are not sufficiently understood and cannot be satisfactorily mitigated to enable the Project to proceed with confidence. This results in impacts to Matters of National Environmental Significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* not being adequately addressed nor understood.

While the IAC accepts the clear policy and land use direction of the Port of Hastings and Crib Point as a State significant port, the significance of the site within a designated Ramsar wetland and a UNESCO Biosphere Reserve elevates the importance of the environmental considerations. It has not been demonstrated that the likely and potential environmental impacts on the marine environment are able to be mitigated to an acceptable level and the cumulative impacts of the Project, specifically the impacts associated with the FSRU, are considered unacceptable. In seeking to balance the role of the Port and the Project's impacts on the sensitive marine environment, the IAC does not consider the impact on marine biodiversity and overall cumulative impacts would achieve an acceptable environmental outcome.

The key reasons for these conclusions include:

- The Crib Point Jetty continues to be an important part of the Port of Hastings, but the recognition and understanding of the environmental significance of Western Port Bay has significantly changed in recent years.
- Western Port Bay is a tidal embayment with important intertidal mudflats that provide critical foraging habitat for migratory shorebirds protected under a number of International Conventions and agreements. It is one of few similar intertidal environments along the Victorian coast that support migratory shorebirds, and conservation of existing environmental values is of significance.

- Definition and understanding of the marine environment around the Crib Point Jetty is inadequate, resulting in uncertainty and the inability to:
  - enable a clear assessment of the extent of impacts
  - establish a clear baseline for ongoing monitoring necessary to determine if impacts exceed what is modelled and predicted by the assessment.
- The Project would discharge a seawater plume that would alter the physico-chemical properties of the surrounding environment and marine ecosystem. The combination of acute lethality at the discharge and mortality from entrainment during intake would result in unacceptable environmental impacts in a wetland of international importance.
- Continuous operation of the FSRU, with its intake of seawater from Western Port Bay and discharge of altered seawater would have unacceptable impacts. Although direct impacts might be localised around the Crib Point Jetty, the IAC has concerns about the potential for broader indirect impacts and changes to the ecological character within the Ramsar wetland.
- The proposed 20 year operation of the FSRU within a water based environment results in a higher probability of a greater inter-connected level of impact with potential for unforeseen effects.

The construction and relatively benign operation of the pipeline component of the Project will primarily create short term and temporary effects that can be acceptably mitigated.

If the Project proceeds, the IAC provides recommendations to improve the mitigation measures as well as further actions to be undertaken.

Primary conclusion

Based on the reasons set out in this Report, the IAC concludes that while most of the Project's environmental effects can be acceptably managed, the Project would have unacceptable effects on the marine environment within an area of high conservation value and should not proceed.

Recommendations

If the Project is approved, the IAC makes the following recommendations:

1 For the whole Project:

<u>Environmental Performance Requirements</u>

1a) Adopt and apply the revised Environmental Performance Requirements provided at Appendix G of Report No. 2 to relevant components of the Project.

<u>Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)</u>

Adopt and apply the following changes:

1b) Revised Performance Objective and Standard R14:

The following measures will be implemented to reinstate area of Southern Brown Bandicoot habitat:

i. A clear and appropriate Southern Brown Bandicoot-specific revegetation plan should be incorporated in the relevant CEMP that explicitly states times

frames and monitoring for rapidly re-establishing habitat which is impacted upon.

ii. **Dense cover of suitable native shrubs or vegetation of similar structure will be reinstated, other than directly above the pipeline and a narrow track as identified in the Environmental Line Lis (Attachment G) to allow ground access for surveillance patrols. Easement agreements with landholders will require that this vegetation be reinstated and protected.**

iii. **Rapid re-establishment of dense ground cover will be achieved at any of the sites of known or assumed presence for the Southern Brown Bandicoot impacted by the construction footprint, but not subject to HDD, by planting of semi-mature native shrubs, or fast-growing tubestock, at an appropriate density during rehabilitation. The aim is to re-establish dense understory vegetation in the 0.2-1 metre height range.**

1c) Revised Performance Objective and Standard B10:

Swamp Skink

Implement the following measures where areas of Swamp Skink habitat are identified in the Environmental Line List (Attachment G), to reduce impacts:

i. **Clear and grade activities will occur preferentially in warmer months (late Spring to early Autumn) when skinks are more active and better able to avoid activities.**

ii. **A suitably qualified and authorized fauna handler will complete an inspection of the habitat area immediately prior to any vegetation removal (including ground cover).**

iii. **If clear and grade occurs during cooler months, when skinks may be in burrows (April to September or as determined by a fauna ecologist), a suitably qualified and authorized fauna handler will be present during topsoil stripping to monitor the area and inspect stripped material.**

iv. **A suitably qualified and authorized fauna handler will complete an inspection of topsoil and vegetation stockpiles prior to respreading.**

v. **Erosion and sediment controls and temporary fencing will be inspected for sheltering skinks prior to removal.**

vi. **Relocate any individuals that are captured during the inspections described above to the nearest adjacent habitat away from the construction area.**

vii. **A specific protocol will be developed for clearing Swamp Skink and Glossy Grass Skink habitat, in consultation with Mornington Peninsula Shire Council, which will refer to the Guidelines for Management Activities in Swamp Skink Habitat on the Mornington Peninsula by Robertson and Clemann (2015).**

1d) Revised Performance Objective and Standard T11: (Contaminated Soils)

Add the following dot point:

Intrusive soil contamination sampling at KP7.3 to KP7.6 in accordance with EPA IWRG 621 and IWRG 702, prior to excavation to confirm the presence or absence of contaminated soils.

1e) Revised Performance Objective and Standard W3:

Develop a strategy in consultation with EPA which outlines the methods for disturbing and disposing soils contaminated with PFAS.

1f) Revised Performance Objective and Standard T13:

Manage all soils in accordance with the Acid Sulfate Soils Management Protocol (Attachment K). The Acid Sulfate Soils Management Protocol will be finalised in consultation with EPA and following additional soil investigations in locations considered by EPA as medium to high risk of PASS.

1g) Revised Performance Objective and Standard HH3:

Rename HH3 'Unexpected cultural heritage finds procedure'.

1h) New Performance Objective and Standard B15:

Consider the opportunity for a contribution to predator control management along the pipeline alignment that would be developed in consultation with appropriate land managers and authorities.

1i) Revised POS E5

Remove reference to the independent and qualified environmental assessor. Approval of out of hours work is required by an independent environmental auditor.

1j) Revised POS E6: Managing noise from construction activities

Require site specific Construction Noise and Vibration Management Plans (CNVMP) which will include specific noise targets/triggers and mitigation measures for locations where critical works through townships or other sensitive regions are proposed. Each CNVMP is to be approved by an independent environmental auditor.

1k) Revised POS E7: Offsite noise management measures

Revise EPA Normal working hours to allow works on Monday to Friday between 7.00am and 6.00pm, Saturday 7.00am to 1.00pm, EPA Night hours and unavoidable hours 10.00pm to 7.00am.

Remove reference to the independent and qualified environmental assessor. An independent environmental auditor is required to approve night time works during the hours of 10.00pm and 7.00am.

<u>Construction Environment Management Plan, Attachment G (Environmental Line List)</u>

Adopt and apply the following changes:

1l) Include the following sites where the removal of native vegetation and large scattered trees is to be avoided:

- **i. Pipeline alignment option BJ-11 located at KP5 in the northern end of Warringine Park/Reid Parade, Hastings with Horizontal Directional Drilling**
- **ii. Tree #1 Manna Gum (Eucalyptus viminalis) a large scattered tree containing hollows and spouts located at the proposed access track entry off Stony Point Road just south and over the railway crossing and intersection with Frankston-Flinders Road through either a change to the track entry location or use of an alternative access point**
- **iii. Habitat Zone ID KOJH23 EVC175 with greater than 0.5 condition score located at the entry to access track off Frankston-Flinders Road that leads to KP4.5 and small scattered Tree #655 Swamp Gum (Eucalyptus ovata) located approximately 140 metres along the proposed access track through access entry design and changes to the track alignment**

iv. **Tree #662 Manna Gum (Eucalyptus viminalis) a large patch tree at KP2.23 containing hollows through reducing the width of the pipeline Right of Way, changes to the pipeline alignment or Horizontal Directional Drilling**
v. **Between KP3.6 to KP4 Habitat Zone IDs KOJH13 and KOJH14 EVC53 Endangered Swamp Scrub with greater than 0.5 condition score in close proximity to Ramsar wetland and Warringine Park through Horizontal Directional Drilling**
vi. **From KP4.3 to the revised BJ-11 alignment at KP5 near Railway Crescent, Hastings associated with Habitat Zone IDs KOJH15 (EVC53 Swamp Scrub), KOJH16 (EVC83 Swampy Riparian Woodland) and KOJH21 (EVC175 Grassy Woodland) all with greater than 0.5 condition scores through Horizontal Directional Drilling**
vii. **KP6.9 Tall Marsh EVC821 Habitat Zone ID HZ24 with condition score of 0.49 and wetland area through Horizontal Directional Drilling**
viii. **Between KP13.7 to KP14.4 adjacent to the former Tyabb landfill area (can avoid exposure of contaminants) at Habitat Zone IDs JHCC56 and JHCC57 or Brett Lane's Peer Review report Habitat Zone ID NA8 - EVC83 avoiding fragmentation with adjoining vegetation areas and potential Southern Brown Bandicoot habitat through Horizontal Directional Drilling without impacting vegetation for pipe stringing**
ix. **KP17.3 Tree #333 Manna Gum (Eucalyptus viminalis) a small scattered tree with hollows and Tree #337 a stag inside the proposed footprint containing hollows through changes to the pipeline alignment or Horizontal Directional Drilling**
x. **Between KP18.5 to KP18.7 large patch of EVC 48 vegetation with numerous large trees to prevent fragmentation of habitat in close proximity south of Watsons Creek through Horizontal Directional Drilling**
xi. **Between KP20 to KP20.3 coastal saltmarsh, Estuarine Scrub and potential Southern Brown Bandicoot habitat in close proximity to Ramsar wetland by eliminating right angle changes in direction and through diagonal crossing of private land and avoiding impacts from access which could be achieved from following the alignment of the pipeline from the south through Horizontal Directional Drilling**
xii. **KP22.1 large scattered trees Tree #260 and 262 both Manna Gums (Eucalyptus viminalis subsp pryoriana) that contain spouts through changes to the pipeline alignment or Horizontal Directional Drilling**
xiii. **KP26.1 Tree #36 containing hollows and nesting material through reducing the width of the pipeline Right of Way, changes to the pipeline alignment or Horizontal Directional Drilling.**

<u>Aboriginal Cultural Heritage</u>

1m) Review and update Construction Environment Management Plan, Attachment J (Performance Objectives and Standards), Environmental Performance Requirements and other relevant approvals to include any necessary changes needed to implement the three Cultural Heritage Management Plans when approved.

1n) 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.

Pakenham Delivery Facility

1o) Prepare a site specific Construction Environmental Management Plan for the Pakenham Delivery Facility in response to environmental 'no-go' zones associated with Southern Brown Bandicoot and Growling Grass Frog habitat and addresses:

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

2 For Works Approval Application number 1003907:

2a) Adopt and apply the relevant Environmental Performance Requirements provided at Appendix G of Report No. 2.

2b) Adopt and apply the relevant Construction Environment Management Plan requirements, including the changes in Recommendation 1.

3 For draft Planning Scheme Amendment C272morn:

3a) Include the revised Incorporated Document provided at Appendix F of Report No. 2.

3b) Review the extent of the proposed Port Zone south of the Jetty to coincide with the existing Port boundary.

4 For Pipeline Licence Application No. PL006610:

4a) Adopt and apply the relevant Environmental Performance Requirements provided at Appendix G of Report No. 2.

4b) Adopt and apply the recommended changes to the Construction Environment Management Plan, Attachment J (Performance Objectives and Standards) and Attachment G (Environmental Line List)

PART A: INTRODUCTION AND BACKGROUND

1 The inquiry process

1.1 The Inquiry, Advisory Committee and Panel

The Minister for Planning appointed a five-member Inquiry and Advisory Committee on 19 July 2020 pursuant to section 9 of the *Environment Effects Act 1978* and section 151 of the *Planning and Environment Act 1987* to inquire into and report on the proposed Crib Point Gas Import Jetty and Crib Point-Pakenham Gas Pipeline Project (the Project).

The Minister for Planning signed the Terms of Reference for the IAC on 1 June 2020 (Appendix A of Report No. 2).

The Minister for Energy, Environment and Climate Change appointed the IAC members as a Panel on 11 September 2020 pursuant to section 40 of the *Pipelines Act 2005* to consider submissions in relation to Pipeline Licence Application No. PL006610.

The IAC comprises:

- Ms Kathy Mitchell, Chair
- Mr Michael Kirsch, Deputy Chair
- Dr Jacquelle Gorski
- Mr Chris Harty
- Mr Trevor McCullough.

Clause 3 of the Terms of Reference provides for the IAC to seek additional specialist expert advice to assist it in undertaking its role. In this regard, the IAC retained the services of:

- Ms Sarah Auld – pipelines
- Ms Elizabeth Hui - noise
- Mr Colin McIntosh – air emissions.

The IAC retained the services of Mr Jason Kane of Counsel to provide legal advice and support.

The Project proponents are AGL and APA (the Proponents).

This is Report No. 1 of the IAC.

The Minister for Planning issued amended procedures and requirements under section 8B(5) of the *Environmental Effects Act 1978* on 1 July 2020. The amendments were in response to the various constraints associated with the COVID 19 pandemic and included:

- an increase in the EES exhibition period from 30 to 40 business days
- requirements relating to the notification of the EES and the provision of EES documents to parties and submitters
- provision for the Hearings to be held via video conference if necessary
- requirements relating to the recording of Hearings and their public availability.

1.2 The IAC's role

1.2.1 Terms of Reference

The Terms of Reference require the IAC to:

- Hold an inquiry into the environmental effects of the Project and report its findings and recommendations to the Minister for Planning.

- Review draft planning scheme Amendment C272morn and report its findings and recommendations to the Minister for Planning.
- Provide advice to inform the EPA's consideration of the Works Approval Application (WAA).
- Provide advice to the Minister for Energy, Environment and Climate Change in relation to the Pipeline Licence Application.
- Provide advice to the Minister for Planning in relation to MNES pursuant to the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*.

Clause 23 notes the Project might require other approvals, including:

- Cultural Heritage Management Plans (CHMP) under the *Aboriginal Heritage Act 2006.*
- Consent for the use of Crown land under the *Marine and Coastal Act 2018.*
- A permit to remove listed flora and fauna under the *Flora and Fauna Guarantee Act 1988.*
- Authority to take or disturb wildlife under the *Wildlife Act 1975.*
- Consents for works on, over or under waterways under the *Water Act 1989*.

Clause 39 requires the IAC produce a written report containing:

a. conclusions with respect to the environmental effects of the project and their significance and acceptability;

b. findings on whether acceptable environmental outcomes can be achieved, having regard to legislation, policy, best practice, and the principles and objectives of ecologically sustainable development;

c. recommendations and/or specific measures that it considers necessary and appropriate to prevent, mitigate or offset adverse environmental effects having regard to legislation, policy, best practice, and the principles and objectives of ecologically sustainable development;

d. recommendations as to any feasible modifications to the design or management of the project that would offer beneficial outcomes;

e. recommendations for any appropriate conditions that may be lawfully imposed on any approval for the project, or changes that should be made to the draft PSA in order to ensure that the environmental effects of the project are acceptable having regard to legislation, policy, best practice, and the principles and objectives of ecologically sustainable development;

f. recommendations as to the structure and content of the proposed environmental management framework, including with respect to monitoring of environmental effects, contingency plans and site rehabilitation;

g. recommendations with respect to the structure and content of the draft PSA;

h. recommendations with respect to the WAA, including recommendations about conditions that might appropriately be attached to a works approval if issued; and

i. specific findings and recommendations about the predicted impacts on matters of national environmental significance and their acceptability, including appropriate controls and environmental management [1].

The IAC provides its consolidated response to the Terms of Reference in Chapter 23.2.

[1] Terms of Reference, Clause 39

The *Pipelines Act,* requires the Panel to consider all submissions referred to it (section 40), give the applicant and any submitter a reasonable opportunity to be heard (section 45), and prepare a report making recommendations as to the action that it believes should be taken with respect to the application (section 47).

1.2.2 Scoping Requirements

The EES draft evaluation objectives are included in the Scoping Requirements for the Gas Import Jetty and Pipeline Project EES January 2019 (Scoping Requirements Report).

Clause 25 of the Terms of Reference requires the IAC to:

> b. draw conclusions on the potential environmental effects of the project, their significance and acceptability, having regard to the draft evaluation objectives in the EES scoping requirements and relevant policy and legislation [2].

The Scoping Requirements Report was issued by the Minister for Planning in January 2019 following a three-week public exhibition. It sets out the specific matters to be investigated and documented in the EES. It was prepared in the context of the Ministerial Guidelines for Assessment of Environmental Effects under the *Environmental Effects Act*.

The Scoping Requirements Report includes the following draft evaluation objectives that identify the '*desired outcomes in the context of potential project effects and legislation*' [3]:

> **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 [4].

Each of the draft evaluation objectives is supplemented by descriptions of key issues, priorities for characterising the existing environment, design and mitigation measures, assessment of likely effects and approach to managing performance.

The IAC discusses the draft evaluation objectives throughout this report and provides its consolidated response in Chapter 23.3.

1.3 Exhibition and submissions

The EES was exhibited from 2 July to 26 August 2020.

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2 Terms of Reference, Clause 25

3 Scoping Requirements Report, page 10

4 Scoping Requirements Report, page 11

The Minister for Planning extended the exhibition period by 10 business days (from 30 to 40 business days) in response to the constraints associated with the COVID 19 pandemic.

Clause 24 of the Terms of Reference provided for submissions to be lodged through the Engage Victoria website and collected by Planning Panels Victoria.

A total of 6,058 submissions were received (Appendix B of Report No. 2), including:

- 1,086 individual submitters
- 4,853 submissions associated with the Environment Victoria submission
- 75 from community and environment groups
- 16 from businesses and industry groups
- 6 from State agencies
- 4 from local government municipalities
- 1 from a Commonwealth agency
- 17 unknown (where attachments had not been included).

The Environment Victoria submission (Submission (S) 3088) included various attachments, including a spreadsheet that included 9,484 supporting letters. The 9,484 supporting letters were reconciled with the 6,058 individual submissions received. From that, 4,702 had lodged their submission through the Engage Victoria platform and were included in the 6,058.

Due to submissions being incorrectly forwarded to and collected by DELWP from members of Environment Victoria, the submission period was further extended from 11.59pm on 26 August 2020 to 11.59pm on 1 September 2020.

1.4 Hearings

The Directions Hearing was held via video conference on 17 September 2020 and approximately 200 people participated in or viewed this. At the Directions Hearing, the IAC introduced itself and its team, explained its role, made various declarations, discussed exhibition and submission issues, and discussed various directions in relation to the Hearing dates, site inspections, experts and cross examination, and the public availability of tabled documents.

The recording of the Directions Hearing was made available on the Engage Victoria website on 18 September 2020.

The main Hearing was held via video conference over 37 days between 12 October and 17 December 2020, including an accompanied site inspection on 2 December 2020. Typically, between 60 to 80 people participated in or viewed the Hearing each day. Daily recordings of the Hearing were made available on the Engage Victoria website, generally on the following business day. The Hearing participants are shown in Appendix C of Report No.2.

All documents and materials tabled during the IAC process were assigned a document number, recorded on the IAC's document list, and published on the Engage Victoria website generally within one business day of being provided. Tabled documents are shown in Appendix D of Report No. 2.

1.5 Site inspections

The IAC undertook unaccompanied inspections prior to the Hearing on 8 and 10 September 2020. The first day included various public sites and areas associated with the Crib Point-Pakenham pipeline and the general area of the Project. The second day included a land-

based inspection of the Crib Point area, including the Crib Point Jetty, and a boat based inspection of various areas and view lines extending from Cowes to Long Island. The itineraries and associated maps are shown in Document (D) 19.

The IAC undertook an accompanied inspection 2 December 2020. The inspection included a formal welcome and acknowledgment of Country provided by Uncle Shane Clarke on behalf of the BLCAC. The inspection focussed on the Crib Point area, including the Crib Point Jetty (the Jetty), Woolleys Beach and the Victorian Maritime Centre, and included a boat trip from Stony Point to Tankerton Pier on French Island. The inspection included representatives from the Proponents and key parties, including the PHDA, Mornington Peninsula Shire Council (Mornington Peninsula), Bass Coast Shire Council (Bass Coast), the Combined Environment (CEG), which included Environment Victoria, Save Westernport Inc, and the Victorian National Parks Association (VNPA) and the French Island Community Association (FICA). The itinerary is shown in Document D502.

In addition, various IAC members undertook unaccompanied inspections of:

- sites and areas on French Island
- transport infrastructure, including rail infrastructure, roads and intersections
- sites and areas of native vegetation and habitat along the pipeline route
- Crib Point and the broader area when tankers were present at Berth 1 at Jetty.

1.6 Procedural and other matters

1.6.1 Request for Further Information

The IAC prepared a Request for Further Information (RFI) that was provided to the Proponents on 16 September 2020 and tabled at the Directions Hearing on 17 September 2020 [5].

The request directed further information from the Proponents about various matters, based on its preliminary review of the EES and submissions.

The Proponents subsequently responded to the request through submissions, evidence and 52 Technical Notes (TN).

1.6.2 Submission of the IAC's report

In light of the number of submissions, the length of the Hearing and the intervening Christmas and new year period, the IAC requested the Minister for Planning to approve an extension of time for submission of its report. The Minister agreed to the request (D283) and issued revised Terms of Reference that required the report to be submitted within 30 business days from 11 January 2021.

1.6.3 Notice under s22 of the *Environment Protection Act*

On 19 November 2020, the EPA issued AGL with a notice under section 22(1) of the *Environment Protection Act* to provide further information by 1 February 2021 [6]. The request was for the purpose of assessing the WAA and related to:

[5] D45

[6] A draft of the notice was provided to the IAC on 17 November 2020 (D431)

- demonstrating compliance with the State Environment Protection Policy (Waters) (SEPP Waters)
- analysis of options to optimise operations
- best practice justification
- revised environmental impact assessments.

The IAC noted this was a matter for the EPA and Proponents and it made no comment about that request at the Hearing.

1.6.4 Supplementary expert statements

During the course of the Hearing, it became apparent that some experts had not had the opportunity to undertake site inspections as part of their preparation of expert evidence because of the COVID 19 restrictions on travel and movement. Following the lifting of those restrictions, the IAC invited experts to undertake inspections and provide supplementary evidence reports if necessary. Four supplementary reports were received and circulated (D494-497).

1.6.5 Submissions in confidence and in camera

The IAC agreed to a request from S70 that the submission be kept confidential.

The IAC agreed to a request from S487 that their submission be heard in camera and only by female members of the IAC and female representatives of the Proponents and Mornington Peninsula.

1.6.6 Post hearing documents

In its closing, the IAC affirmed that it would not receive any documents submitted post Hearing. If any documents or emails were provided, the IAC would upload these and give them a post Hearing document number. The Proponents provided some updated changes to the EPRs as they noted an error in the final version (D600, D601 and D602).

On 15 January, the Chair was forwarded an email from a DELWP staff member that had been sent by Mornington Peninsula to the Secretary of DELWP. The Chair read the letter, which made comments about some issues relating to the marine experts called by Mornington Peninsula and an issue raised on the final day by Mornington Peninsula in relation to the Proponents' final submissions. At that time, the Chair noted in the Hearing it would not make a ruling on the issue but would comment on it in the IAC's report.

The Chair sought an opinion from the IAC's Counsel assisting about disclosure of this letter. That advice made it clear the letter should be disclosed and it was then tabled as a post Hearing document. These documents are included in D603.

The parties who were invited to make an opening/closing submission were provided with a copy of the email/letter and invited to make any comment. Comments were received from:

- BLCAC (D604)
- The Proponent (D605)
- Save Westernport (D606)
- Cardinia Shire Council (D607).

The IAC has reviewed the issues raised in the responses to the email letter and it has found that none of the issues raised, either on the final day of Hearings and through the email

letter and the responses received are determinative in the key considerations of the IAC in reviewing and considering the marine biodiversity matters.

1.7 Report structure

The material before the IAC is significant. It includes the EES, over 6,000 submissions, over 45 statements of evidence, over 600 tabled documents and the submissions of many who spoke to the IAC at the Hearing. The IAC has distilled its considerations through identifying the key issues and what it considers to be the determinative issues.

The IAC has prepared two reports:

- Report No. 1 – Key considerations, discussion, findings and recommendations
- Report No. 2 – Appendices.

The IAC has included recommended versions of the Incorporated Document and EPRs at Appendices F and G in the event that that the Project is approved. Those versions include the changes recommended by the IAC and are based on the Day 4 versions of those documents (D587 and D602 respectively).

Changes to other approval documents such as the Pipeline Construction Environmental Management Plan (CEMP) are dealt with by individual recommendations based on the following versions of those documents:

- Pipeline CEMP Attachment J (Performance Objectives and Standards) (D583)
- Pipeline CEMP Attachment G (Environmental Line List) (D529).

Changes to other approval documents proposed by the Proponents are supported, unless otherwise recommended.

The report uses the term 'mitigation measures' as a generic reference to specific controls such as the EPRs, POS and Incorporated Document throughout this report.

1.8 Acknowledgements

It is not possible to acknowledge all who contributed to the EES process, both through submissions and the evidence before it, and through those submitters who presented to the IAC.

The IAC thanks all who participated in this process thorough written submissions and those who supplemented their written submissions through evidence and/or by speaking at the Hearing. It appreciates the way in which all parties and submitters embraced that the Hearing could only be conducted by video conference, and while it presented some minor challenges at times, it all worked very well. One of the benefits was that anyone could log in at any time and listen to any aspect of the Hearing. The IAC acknowledges the Proponents for engaging AV Select to manage the video conferencing for the Hearing.

The IAC is aware that many submitters were new to this Hearing process and some felt confronted by the way in which some cross examination was conducted. In a highly contested process such as this, robust cross examination is critical for the IAC to ensure it can understand the extent and impact of the evidence before it. The IAC found the evidence and the cross examination useful in its deliberations.

The IAC particularly thanks the office of Planning Panels Victoria for its ongoing support and assistance throughout the process, with special acknowledgment to:

- Ms Andrea Harwood, Senior Project Manager

- Ms Georgia Thomas, Project Officer
- Mr Tom Milverton, Project Officer.

2 The Project

2.1 Introduction

This chapter provides a high level overview of the key elements of the Project drawn from the EES documentation, particularly EES Chapter 4. This provides context for the discussion of specific issues in Parts B and C of this report. Readers should refer to the relevant elements of the EES documentation for more specific or detailed information about the Project.

2.2 Project description

The Project involves the importation and supply of natural gas from interstate and international suppliers into the south-eastern Australian gas market for industrial, commercial and residential use.

The gas would be imported as liquefied natural gas (LNG) in LNG carriers and converted to natural gas on a Floating Storage and Regasification Unit (FSRU) moored at the Jetty. Following treatment, the natural gas would be piped to Pakenham East where it would join Victoria's gas network through the Victorian Transmission System (VTS).

The Project has two key components:

- Gas Import Jetty Works (GIJW) based at the Crib Point Jetty
- Pipeline Works to link the Crib Point facility with the VTS.

2.2.1 Site descriptions

(i) The Crib Point Jetty

The Jetty is located within Western Port Bay and is part of the Port of Hastings (the Port) that is managed by the PHDA. It is located within Mornington Peninsula Shire.

Western Port Bay

Western Port Bay is a large tidal bay opening into Bass Strait. It encloses French Island. Most of Western Port Bay is within the Western Port Bay Ramsar site (Ramsar site) that covers approximately 59,950 hectares [7].

The Bay has around 260 kilometres of coastline, connected to Bass Strait by a wide channel between Flinders and Phillip Island, and a narrow channel between San Remo and Phillip Island. The Bay has deep channels, extensive intertidal flats, mangroves, saltmarsh, seagrass beds, several small islands and two large islands (French Island and Phillip Island).

Six rivers from the north and east of the catchment flow into the northern and eastern shores of Western Port Bay and several minor rivers and creeks on the eastern slopes of the Mornington Peninsula drain into the western shores.

Western Port supports important feeding and roosting areas for numerous species of native and migratory shorebirds, many of which are listed under the international bilateral Migratory Birds Agreements Australia has with Japan, South Korea and China. The Bay

[7] Ramsar Convention on Wetlands of International Importance 1971

periodically supports over 10,000 waders and 10,000 ducks and swans, and a rich invertebrate fauna of 1,381 species. There is intensive use by commercial shipping. Human activities include urban settlement, recreation, fishing, water extraction, and livestock grazing.

The Port of Hastings

The Port is a commercial port that has been used for the import and export of petroleum and other goods and products since 1965 when BP established a petroleum facility at Crib Point. The Jetty has three berths:

- Berth 1 is used by United Petroleum for transferring liquid fuels
- Berth 2 (the proposed FSRU berth) is not currently in use
- Berth 3 is used for offshore oil and gas pipe spooling projects.

The Port includes the Long Island Point precinct (to the north) that was established in 1969 to support the adjacent Esso refinery and provides for the processing, storage and distribution of petroleum products. This precinct contains the existing steel works wharf, owned by BlueScope Steel, and the Long Island Point Jetty, used by Esso for the movement of Liquid Petroleum Gas (LPG) and crude oil. The precinct includes a heavy industrial estate.

Port services, including tugboats, line boats and maintenance are provided out of Stony Point to the south. The Stony Point Jetty is used as a terminal for ferry services to French Island and Phillip Island.

The extent of the Port, including the associated channels, wharves and jetties, is shown in Figure 1. The PHDA advised that in recent years, the Port has accommodated approximately 100 – 140 ships per annum and has in the past accommodated over 700 ships per annum. It advised it has significant capacity to take more ships.

The PHDA is responsible for the provision and maintenance of port infrastructure and maintains and coordinates the Port of Hastings Emergency Management Plan and the Port of Hastings Maritime Security Plan. The Victorian Regional Channels Authority (VRCA) manages the Port's channels and anchorages, vessel navigation and maintenance, and Harbour Control. The VRCA and Harbour Master (employed by VRCA) are responsible for ship safety in port waters during approach and at berth, and for the Port's Safety and Environmental Management Plan.

(ii) Pipeline route

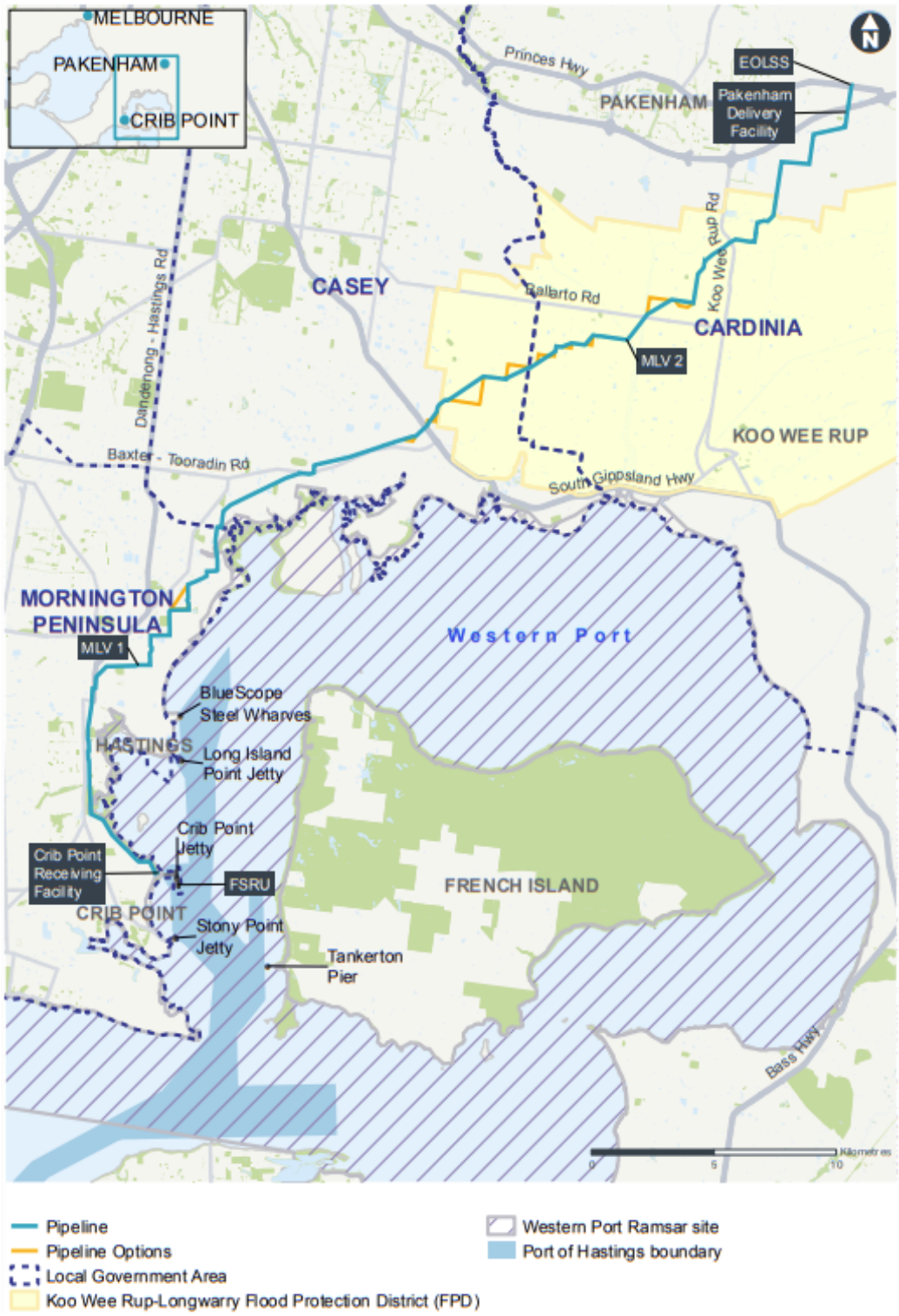
The pipeline route is proposed to traverse approximately 57 kilometres from Crib Point to the Pakenham Delivery Facility (PDF), passing through the Mornington Peninsula Shire, City of Casey and Cardinia Shire. Most of the route is within agricultural areas, although some sections are within or in proximity to settlements such as Crib Point and Hastings.

Part of the pipeline route is within the Ramsar site (including Warringine Park), while some sections are adjacent to or in proximity to its boundary.

Some sections of the pipeline share or are adjacent to existing pipeline easements and infrastructure.

The location of the Project, including the key components, is shown in Figure 1.

Figure 1 **Project location and pipeline route** [8]



2.2.2 Gas Import Jetty Works

The GIJW include:

- the mooring of the FSRU at Crib Point Jetty Berth 2

[8] EES Summary Document, Figure 1

- infrastructure, including Marine Loading Arms (MLA) and gas piping on the Jetty
- the Crib Point Receiving Facility (CPRF).

The GIJW are proposed to operate for 20 years, after which the FSRU would depart and the associated infrastructure be decommissioned.

Figure 2 depicts the general arrangement of the FSRU berth, LNG carrier, the Jetty and the CPRF.

Figure 2 Gas Import Jetty Works [9]

NOTE

To reduce the electronic size of this document, Figure 2 has been removed from this version of the report. Contact Planning Panels Victoria to obtain a complete copy of the report.

(i) Floating Storage Regassification Unit

The FSRU would convert the LNG into natural gas. It would be approximately 300 metres long and 50 metres wide, with an air draft (highest point above sea level) of approximately 50 metres. It would have an LNG storage capacity of approximately 170,000 cubic metres. The FSRU would store LNG at minus 163˚C until it is required to be supplied into the gas network and converted into gas.

The FSRU would be continuously moored at Berth 2 and would be supplied by LNG carriers on an 'as required' basis. The EES indicated that between 12 and 40 LNG carriers would supply the FSRU each year depending on gas demand and the capacity of the carriers. The refilling process would take up to 36 hours, after which the LNG carrier would depart. The LNG carriers would require the assistance of tugboats to moor at and depart from the berth.

Figure 3 depicts the gas transfer infrastructure, including the FSRU, LNG carrier and receiving works on the Jetty.

[9] EES Chapter 4, Figure 4-1

Figure 3 Gas transfer infrastructure [10]

NOTE

To reduce the electronic size of this document, Figure 3 has been removed from this version of the report. Contact Planning Panels Victoria to obtain a complete copy of the report.

The FSRU would use seawater:

- to convert stored LNG into natural gas (regasification)
- for emergency fire water
- for a water curtain to protect the hull from cryogenic temperatures
- as ballast water to maintain the vessel's stability and longitudinal strength.

The regasification process involves warming the LNG with seawater to convert it to a gas and can be operated in 'open loop' or 'closed loop' modes. In the open loop mode, seawater is drawn into the FSRU and is used to heat the LNG and convert it into a gas. The cooled seawater is discharged back into Western Port Bay. In the closed loop mode, seawater is drawn into the FSRU and recirculated in the vessel, with steam generated on the FSRU continuously reheating the water. The Project proposes to primarily use the open loop regasification mode.

Figure 4 depicts the proposed seawater intake and discharge configuration in open loop regasification mode.

[10] EES Summary Document, Figure 3

Figure 4 **Simplified diagram of the proposed seawater intake and discharge configuration in open loop regasification mode** [11]

NOTE

To reduce the electronic size of this document, Figure 4 has been removed from this version of the report. Contact Planning Panels Victoria to obtain a complete copy of the report.

(ii) Jetty infrastructure

The Jetty infrastructure includes MLAs, gas piping and electrical and instrumentation equipment. Other works to Berth 2 necessary to accommodate the Project will be undertaken by the PHDA and have been separately approved.

The key infrastructure works are shown on Figure 5 and include:

- two MLAs that will extend approximately 30 metres above the deck of the Jetty
- approximately 1.5 kilometres of piping to deliver the gas from the MLAs to the CPRF.

Associated infrastructure includes a hydraulic gangway tower to access the FSRU, a substation, air compressor, fire system, contaminated spill containment equipment, lighting and a CCTV security system.

[11] EES Chapter 4, Figure 4-7

Figure 5 Jetty infrastructure [12]

NOTE

To reduce the electronic size of this document, Figure 5 has been removed from this version of the report. Contact Planning Panels Victoria to obtain a complete copy of the report.

(iii) Crib Point Receiving Facility

The CPRF would receive the natural gas from the FSRU via the Jetty piping and provide for:

- gas metering
- odorant injection (a safety requirement that enables the normally odourless gas to be smelled)
- nitrogen injection (to dilute the natural gas when required)
- measurement of gas composition.

[12] EES Chapter 4, Figure 4-9

The key elements of the CPRF are shown in Figure 6 and include one liquid nitrogen storage tank (approximately 20 metres high and 25 metres in diameter) and four vaporiser towers (approximately 15 metres high with a three metre by three metre footprint) to convert the liquid nitrogen into nitrogen gas using ambient air.

The nitrogen tank would be painted white, and the vaporiser towers would have stainless steel finishes. Trucks would deliver the liquid nitrogen, which would be unloaded via two nitrogen unloading gantries. Gas odorant would be delivered to the site via trucks and stored in tanks.

The CPRF would be automated and operate unmanned under normal operating conditions.

Figure 6 Crib Point Receiving Facility layout [13]

NOTE

To reduce the electronic size of this document, Figure 6 has been removed from this version of the report. Contact Planning Panels Victoria to obtain a complete copy of the report.

[13] EES Chapter 4, Figure 4-12

2.2.3 Crib Point to Pakenham East pipeline

The Pipeline Works comprise a gas transmission pipeline from the CPRF to the PDF, east of Pakenham, where it would connect to the VTS and have a design life of 60 years.

The key elements of the pipeline are shown on Figure 1 and include:

- Approximately 57 kilometres of underground gas pipeline with a nominal diameter of 600 millimetres, constructed within a temporary construction right of way (ROW) generally 30 metres wide and an operational easement generally 15 metres wide.
- Two mainline valve (MLV) stations that would enable isolation and depressurisation of the pipeline (via a temporary portable vent) if required during an emergency.
- A cathodic protection system to protect the pipeline from corrosion.
- A pipeline inspection gauge (PIG) launcher at the CPRF, with the PIG to be received at the PDF receiver once it has traversed the pipeline.
- The PDF, located adjacent to the Pakenham East Rail Depot at Pakenham, including a pig receiver, filtration, metering, heating, pressure control and a vent stack.
- The End of Line Scrapper Station (EOLSS), a buried facility located at the connection point to the VTS east of Pakenham.

The EES included a number of minor pipeline alignment alternatives, generally within the same parcel of land. The EES indicated these options are intended to provide some flexibility to address specific landowner requirements (see Chapter 20).

(i) Pipeline construction

The pipeline would be underground, other than at surface facility locations, and would have a minimum depth of cover of 1.2 metres. The pipeline would be bi-directional, to allow gas to flow in both directions as required. The pipeline wall would be thicker where the pipeline traverses an urban environment, sensitive locations, special crossings and possible future urban development as an additional protection measure.

The construction footprint would typically comprise a 30-metre-wide pipeline construction ROW, as well as extra workspace for temporary facilities to support construction. Indicative locations for extra workspace and temporary facilities have been identified. The typical layout of the construction ROW is shown in Figure 7.

Figure 7 Typical layout of the construction right of way [14]

NOTE

To reduce the electronic size of this document, Figure 7 has been removed from this version of the report. Contact Planning Panels Victoria to obtain a complete copy of the report.

Most of the pipeline would be installed via open trenching, although in some areas or sites of ecological or other significance or where constraints exist, it would be constructed using trenchless construction techniques such as Horizontal Directional Drilling (HDD) or shallow horizontal boring, to avoid construction disturbance.

HDD would generally be used for crossing major and sensitive watercourses where standard open cut methods would be less desirable from an environmental viewpoint. HDD might also be used for road, railway or third-party asset crossings as an alternative to shallow horizontal boring.

Shallow horizontal boring (referred to as thrust boring or micro-tunnelling) involves constructing a horizontal bore hole for installing the pipeline and would be used at sealed roads and other feature crossings, including railways, or where access is required on a 24-hour basis. The method is not suitable for boring under features where a greater depth is required, such as a major waterway. In these instances, HDD construction methodology would be used.

(ii) Mainline valves

The pipeline would include two MLVs (Figure 1). The MLVs are in-line block valves that allow for isolation and depressurisation of sections of the pipeline for maintenance or during emergency conditions. The MLV sites would be acquired by APA. A typical MLV is shown at Figure 8.

[14] EES Chapter 4, Figure 4-16

Figure 8 Typical mainline valve [15]

NOTE

To reduce the electronic size of this document, Figure 8 has been removed from this version of the report. Contact Planning Panels Victoria to obtain a complete copy of the report.

MLV1 would be located at approximately Kilometre Point 11.5 (KP) (south of Denham Road, Hastings) and have a construction footprint of approximately 50 metres by 18 metres.

MLV2 would be located at approximately KP40 (north of Bloomfield Lane) within a triangular area of land that measures 60 metres by 65 metres by 85 metres.

(iii) Pakenham Delivery Facility

The PDF site would be approximately two hectares in area, located on land currently owned by Public Transport Victoria (PTV) adjacent to the Pakenham East High Capacity Metro Rail (HCMT) Depot. The land would be acquired for the Project.

The PDF would include:

- filters for the removal of solid particulates from the gas
- meters for metering gas volume
- meters for the measurement of gas composition
- water bath heaters for the heating of the gas
- multiple gas flow valves for safety and pressure reduction
- a vent stack for use during emergency situations and during occasional maintenance.

The PDF would be automated and designed to operate unmanned under normal operating conditions. The indicative PDF layout is shown at Figure 9.

[15] EES Chapter 4, Figure 4-13

Figure 9 Indicative Pakenham Delivery Facility layout [16]

NOTE

To reduce the electronic size of this document, Figure 9 has been removed from this version of the report. Contact Planning Panels Victoria to obtain a complete copy of the report.

(iv) End of Line Scrapper Station

The EOLSS connects the pipeline into the VTS between the Longford to Dandenong Pipeline and the Bunyip to Pakenham Pipeline. The permanent footprint of the EOLSS would be fully contained within the existing 24 metre wide easement.

The EOLSS would be buried, with below ground valves and buried flange connections accessible via concrete pits. The EOLSS allows for connection of a temporary scraper station for pipeline pigging to inspect the pipeline during operation. During these events, excavation of the site would be required to enable access to the buried EOLSS.

[16] EES Chapter 4, Figure 4-14

(v) Construction

The EES outlined the indicative construction schedule for the various components of the Project [17]. It noted the Project construction would require various construction laydown and pipe stockpiling areas. These include:

- a construction laydown area on the CPRF site
- a construction laydown area to the west of The Esplanade and the CPRF site
- construction laydown areas within the PDF, MLV and EOLSS sites
- a 4.14 hectare pipe stockpiling site south of Denham Road (owned by BlueScope Steel) that would provide for the gas pipes to arrive by ship and be transported from the wharf to the pipe stockpiling area
- an additional 5.2 hectare pipe stockpiling site indicatively located at the intersection of the Koo Wee Rup Bypass and Railway Road, Koo Wee Rup.

Any additional laydown areas would be situated within existing commercial or industrial hardstand areas.

(vi) Decommissioning

The proposed operational life of the FSRU is 20 years, after which the ship would depart Crib Point. The CPRF and associated Jetty infrastructure would be decommissioned and removed under the requirements of the *Gas Safety Act 1997* and relevant legislative requirements at the time of decommissioning. The Jetty would remain as an operational jetty under the management of PHDA.

The pipeline would be designed and built with an operational life of 60 years although it could operate for longer if pipeline integrity was maintained. When the pipeline and associated facilities are no longer required, they would be decommissioned in accordance with Australian Standard AS2885 (Pipelines – Gas and Liquid Petroleum) (AS2885) and relevant legislative requirements at the time of decommissioning. A detailed decommissioning or abandonment plan and rehabilitation program would be developed and implemented in consultation with landholders and the appropriate regulator/s at the relevant time. The Proponents advised that decommissioning would be subject to separate environmental assessment and does not form part of the EES.

2.3 Project assessment and approvals

Figure 10 outlines the EES assessment framework as described by the Proponents.

[17] EES Chapter 4, Tables 4-8 to 4-12

Figure 10 Environmental Effects Statement Assessment Framework [18]

NOTE

To reduce the electronic size of this document, Figure 10 has been removed from this version of the report. Contact Planning Panels Victoria to obtain a complete copy of the report.

The assessment framework was developed in the context of the EES scoping requirements issued by the Minister for Planning (discussed in Chapter 1.2.2) and by relevant legislation and policies. The scoping requirements informed the specialist studies that were undertaken and the matters that were investigated. The scope of these studies was informed by issues raised through stakeholder engagement before and during preparation of the EES and by issues identified as the Project design was refined. The outputs from the specialist studies were brought together in the completed EES, which seeks to inform decisions on the key approvals for the Project as outlined in Figure 11.

The key elements of the legislative and policy contexts are described in Appendix E.

[18] EES Chapter 4, Figure 5-1

Figure 11 Key Project approvals [19]

NOTE

To reduce the electronic size of this document, Figure 11 has been removed from this version of the report. Contact Planning Panels Victoria to obtain a complete copy of the report.

[19] EES Chapter 5, Figure 5-2

3 Project rationale and alternatives

3.1 Project rationale

3.1.1 Introduction

The project rationale was discussed in EES Chapter 2. In summary, the rationale is that the Project would provide a secure, flexible supply of natural gas over a 20-year period that will augment future gas and energy needs in the industrial, commercial and residential sectors. It responds to projected natural gas supply limitations and cost increase issues and was noted to be consistent with Commonwealth and State policies that support natural gas as a transition fuel to a low carbon economy.

The relevant draft evaluation objective is:

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

Table 1 lists the relevant evidence that was provided.

Table 1 Project rationale evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Bolt	Nous Group	Energy policy
Proponents	Mr Fahrer	ACIL Allen Consulting	Energy market
Proponents	Mr Kelp	ACIL Allen Consulting	Energy market
CEG	Mr Robertson	Institute for Energy Economics and Financial Analysis	Energy market
Ms King (S3272)	Mr Beinat	Ecomaster	Retrofit industry

3.1.2 Key issues

The key issues are:

- The scope of matters relevant to the IAC's consideration of the project rationale.
- The extent to which the Project is consistent with Commonwealth and Victorian energy policy.
- The extent to which the Project would be safe and cost effective.

3.1.3 Evidence and submissions

The Proponents submitted the Project rationale was sound and '*natural gas currently constitutes a critical component of the Victorian and national energy mix, and that both the State and Federal Governments recognise that it will continue to play an important role into the future*' [20].

[20] D589

They submitted '*it is not the role of the IAC to review or assess the merit of the State or Federal Government's energy or climate policies. The IAC must instead assess the merits of the proposal pursuant to the policies that are presently in place*' [21].

The Proponents relied on the energy related evidence of Mr Bolt, Mr Fahrer and Mr Kemp.

Mr Bolt provided an overview of relevant Commonwealth and State legislation and policy, including Australian Energy Market Operator (AEMO) forecasts. He noted that the possible importation of LNG was referenced in various policy documents, including the recent AEMO assessment that:

> Committed annual gas supply forecasts provided to AEMO by Victorian gas producers have increased by approximately 10% for 2020-23 compared to the 2019 VGPR, due to some anticipated projects progressing into committed projects. Despite the near-term increase in forecasts, committed supply is forecast to reduce by 37% from 2022 to 2024 due to field decline. Without additional gas supply, removal of pipeline constraints, or a liquefied natural gas (LNG) import terminal, gas supply restrictions and curtailment may be necessary from 2024 [22].

He gave evidence that the Project:

- Is consistent with Federal and State policies that support a more secure supply of natural gas and this will remain the case, even as the energy mix shifts to lower emission energy sources.
- Is flexible and its timeframe presents the '*least impediment*' to adopting more ambitious emission targets, compared to other gas supply options.
- Would reinforce electricity supply reliability and contribute to decarbonisation by supplying gas for flexible power plants to back up renewable power and enable the closure of coal-fired power stations.

Mr Bolt concluded:

> Both the Australian and Victorian governments have policies to maintain reliable and affordable gas and electricity supplies, and to reduce carbon emissions to net zero. A gas import terminal utilising a FSRU and pipeline is consistent with those policies.
>
> The modest scale of the development, and the likely critical role of gas in securing energy while decarbonising over coming decades, means that a decision by AGL and APA to proceed with this investment is unlikely to impede the adoption of more ambitious decarbonisation policies in future [23].

Mr Fahrer gave evidence in relation to energy supply and cost that:

- The supply of gas from Bass Strait is declining and will need to be replaced given the projected consumption of gas in Victoria.
- The Project would contribute to replacing this supply, including peak demand in winter.
- Options for alternative gas supplies from Queensland are limited by contractual obligations and pipeline capacity limits, while the Port Kembla gas import project might not proceed and if it did would only make a small contribution to Victorian peak winter demand.

21 D589

22 Victorian Gas Planning Report Update, March 2020, AEMO

23 D66

- Increased energy efficiency has already been factored into demand forecasts and is unlikely to close the increasing gap between gas supply and demand.
- The Project will reduce gas prices, compared to other supply sources and provide additional security for consumers, especially on peak demand days in winter.

Mr Fahrer relied on Mr Kelp's modelling of the Project's market implications which was based on the GasMark Global platform developed by ACIL Allen. That assessed the market implications over the 2020 – 2040 period, based on a range of reference case assumptions. The modelling concluded that:

- The Project will put downward pressure on Victorian gas prices over the projection period, although this will be dependent on a range of demand and supply developments.
- The Project will augment declining supplies, particularly from Bass Strait, and will enable Victoria to be self-sufficient for longer, although it will still be reliant on imported gas from interstate in peak winter months.
- If the Project does not proceed, Victorian gas consumption will marginally decrease because of the expected increase in wholesale prices.

The Proponents concluded that:

> (a) The Project's stated rationale in Chapter 2 of the EES is sound and robust;
>
> (b) The Project would deliver marked benefits to the operation of the East Coast Gas Market and would enhance the security, reliability and affordability of energy provision within Victoria; and
>
> (c) The Project is not inconsistent with and would not preclude the implementation of policies directed to achieving Victoria's commitment to achieve net zero greenhouse gas emissions by 2050 [24].

Mornington Peninsula and Bass Coast (the Councils) made extensive submissions about climate change impacts, summarised as:

> a. Climate change is a real and current crisis that is already adversely affecting Australia and Victoria. In order to meet that crisis, Victoria has expressly adopted a goal of net zero by 2050.
>
> b. The Project will contribute to the occurrence of dangerous climate change by causing the consumption of additional natural gas over and above that which is predicted in the 'no project' scenario. This is expressly recognised in the evidence of Mr Kelp, who predicts that the Project will lead to the consumption of an additional 300 PJ of natural gas relative to a 'no project' scenario.
>
> c. To the extent the Project may offer some limited short-term benefits, these are substantially outweighed by the long-term contribution it will make to climate change occurring [25].

The Councils submitted the key element of the policy framework the IAC should have regard to is the *Climate Change Act* 2017, including the long term target of net zero greenhouse gas emissions by 2050. They referred to the associated policy objectives and guiding principles and concluded that:

> … a proper balancing of the modest and short term benefits associated with the proposal against the long term harms contributed to by the emissions associated with

[24] D589
[25] D426

> the Project leads to the conclusion that the Project should be refused on climate change grounds alone [26].

Cardinia raised concerns about the project rationale, particularly in relation to climate change, and supported the submissions by Mornington Peninsula and Bass Coast.

Casey noted the scope for alternative energy solutions to reducing carbon emissions and recommended:

> That a 'no build' option is considered as part of the feasibility assessment for the project including a detailed analysis and comparison of environmental, social and economic impacts and benefits [27].

The CEG submitted the project rationale does not justify the environmental effects and that:

- From an energy security and gas supply perspective, the Project is not '*indispensable*' and there are other alternatives to source gas and/or manage gas consumption.
- There is no guarantee that the Project will result in lower gas prices or that it will support energy transition.
- Recent developments in the energy market, including policies that will lower the demand for energy, question whether there is a convincing rationale for the Project in the context of energy security, efficiency and affordability.
- Projections provided on behalf of the Proponents overstate the demand for gas and do not adequately account for recent developments such as the Port Kembla proposal and the upgrade of the Eastern Gas Pipeline to create a bi-directional capacity, consequently, the Project is not required.
- The Project would '*prop up*' the use of a fossil fuel, particularly for the residential and commercial sectors which have the capacity to switch to electricity.

The CEG relied on the evidence of Mr Robertson that the Project and the importation of gas was a reflection that energy policy in eastern Australia had failed and that gas producers have fixed domestic prices above international prices. Mr Robertson added that:

- AEMO demand projections were unrealistically high, particularly in light of falling demand for gas-powered electricity and industry.
- Technological advances, including battery usage, had not been sufficiently reflected in gas demand forecasts.
- The residential use of gas will decline because it is now cheaper to heat houses with heat pumps and as other policy measures to replace gas use are introduced.
- Importing gas is highly inefficient and will add significantly to greenhouse gas emissions.
- A full lifecycle analysis of importing LNG shows that it is the highest greenhouse gas emitting fuel available in the market and will not assist the transition to a low carbon economy.
- Importing gas embeds the cost of liquefaction and shipping into the domestic price.

Mr Robertson concluded the Project was inconsistent with the Victorian Government's policy of net zero emissions by 2050 but should be rejected on economic grounds alone.

[26] D426
[27] D429

The CEG concluded:

> … there is no credible rationale to proceed with the project on the grounds of energy security, efficiency and or affordability. There is limited evidence to demonstrate that the project will exert a beneficial influence on Victoria's energy security and costs, particularly in the context of established legislative and policy requirements to transition away from fossil fuels [28].

Save Westernport supported the submission of the CEG in relation to the project rationale but added an inadequate site selection process contributed to the inadequacy of the its rationale.

S3272 called evidence from Mr Beinat who discussed the scope for increased energy efficiency in existing housing stock. Many other submitters challenged the project rationale, particularly in terms of greenhouse gas emissions and climate change impacts.

3.1.4 Discussion

(i) Scope of the Committee's considerations

It was clear from many submissions there is widespread concern and dissatisfaction about the extent to which domestic energy policies are responding to greenhouse gas emissions and climate change impacts. The IAC acknowledges these concerns but agrees with the Proponents that its role is to assess the Project in the context of existing policy.

Related issues raised by submitters, such as greenhouse gas emissions attributable to the Project are discussed in Chapter 9.

(ii) Energy policy

The IAC acknowledges that Commonwealth and Victorian government policy responses to climate change and energy needs are evolving and this is likely to continue into the foreseeable future. As Mornington and Bass Coast noted, the Victorian Government's draft Infrastructure Policy was released during the Hearing and included various recommendations about energy efficiency and transition [29]. Similarly, the most recent report of the Victorian Gas Supply Program was released during the Hearing and reflects the role of gas as a transition fuel [30]. As noted, the IAC's role is to consider whether the Project is consistent with existing energy policies rather than to review those emerging policies or anticipate future policies.

In this context, the IAC recognises the policy support for moving away from fossil fuels but is satisfied that there remains support for the continuing use of gas, particularly as a transition fuel [31]. This is evident at the Commonwealth level and, as Mr Bolt noted, reflected by the Prime Minister's recent National Energy Address in which the Prime Minister indicated '*Gas is not only central to our industry plan, it's also central to our energy plan*' and that '*…there is*

[28] D483

[29] Victoria's Draft 30 year Infrastructure Strategy, Infrastructure Victoria, December 2020

[30] Victorian Gas Program Progress Report No 5, Geological Survey of Victoria, December 2020

[31] Expressed in the Victorian context through the Climate Change Act 2017 and Victoria's Climate Change Framework 2016

no credible energy transition plan for an economy like Australia that does not involve the greater use of gas' [32].

The Commonwealth Technology Investment Roadmap highlights the ongoing role that existing energy sources, including gas, will play in the future energy mix [33]. These issues are the subject of continuing analysis by various national agencies, including the Australian Competition and Consumer Commission (ACCC) and AEMO which have highlighted gas supply, delivery and cost issues, including expected shortfalls [34],[35]. They recognise the potential role of LNG importation, including the Crib Point Project.

Victorian government support for the use of gas as a transition fuel was recently affirmed when legislation providing for recommencement of onshore gas exploration was approved [36]:

> Gas will continue to play a role in supporting Victoria's transition to a cleaner energy future, in line with the Government's commitment to net zero emissions by 2050 [37].

This position is reflected in various Victorian government policy documents, including the Renewable Energy Action Plan that advocates for '*secure, reliable and fairly priced gas for renewable energy generation*' and the Victorian Gas Program Progress Report that noted [38]:

> The government acknowledges that in the medium to longer term, emissions associated with natural gas usage need to be reduced to align to Victoria's net zero emissions future. With around two million Victorian customers currently dependent on gas for heating, cooking and industrial uses, it is also important Victoria has a secure and reliable supply of gas as the state transitions to renewable sources of energy [39].

It is clear to the IAC that the continued use of gas, particularly as a transition fuel, is consistent with Commonwealth and Victorian government energy policies and reflected in various high level energy planning documents. It is also clear that importation of LNG is acknowledged as a potential source of that gas, including projects such as Crib Point.

For these reasons, the IAC accepts that the Project is broadly consistent with Commonwealth and Victorian energy policies and the importation of LNG to supply the Victorian gas market is acknowledged in policy as an option for augmenting future gas supplies.

(iii) Cost effectiveness

The draft evaluation objective refers to the 'cost effectiveness' of the Project, an issue that was referred to in submissions and evidence, particularly the evidence of Mr Fahrer, Mr Kelp and Mr Robertson. Assessing cost effectiveness with any certainty is problematic given the range of variables that might affect the cost of delivering the Project, the future mix of

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32 Prime Minister's National Energy Address, 15 September 2020

33 Technology Investment Roadmap: First Low Emissions Technology Statement - 2020, Department of Industry, Science, Technology and Resources, September 2020

34 Gas Inquiry 2017-2025 Interim Report, ACCC, July 2020

35 Gas Planning Report Update, AEMO, March 2020 and Gas Statement of Opportunities, AEMO, March 2020

36 Petroleum Legislation Amendment Act 2020

37 Media release, the Hon Jaclyn Symes MLC, 16 June 2020

38 Renewable Energy Action Plan, Victorian Government, July 2018

39 Victorian Gas Program Progress Report No 5, Geological Survey of Victoria, December 2020.

energy alternatives, including other gas supply options, the evolving regulatory and policy environment, including incentives to reduce gas demand, and investment decisions by the Proponents and other energy suppliers. The complexity and interrelationships of these issues were reflected in relevant evidence.

If the Project is approved, the judgement of whether it is cost effective will ultimately be an investment decision by the Proponents, taking into account all these factors, as well as the conditions of approval and any costs or restrictions they might impose. This is consistent with the market-based approach that underpins much of Australian energy policy.

Many submitters noted other possible supply options, such as the approved Port Kembla facility and the Viva Energy importation proposal at Geelong, could potentially impact on the cost effectiveness of the Project. While this may be true, the IAC agrees with Mr Bolt's observation that having alternative gas supply options can increase market competition and help avoid future supply shortfalls with reduced cost and delay.

For these reasons, the IAC has not reached any definitive conclusions about whether the Project would be cost effective, other than to acknowledge that energy policies and supporting documents anticipate the potential role that imported LNG might have in augmenting gas supply, including the Crib Point Project.

(iv) Other issues

The draft evaluation objective refers to the Project's safety. EES Chapter 16 examined safety, hazard and risk, and noted the different approvals required for the different components of the Project, as well as the iterative nature of risk assessment. It concluded:

> With the implementation of the identified mitigation measures and further risk assessments, potential hazardous risks during construction and operation to people, property and the environment would be reduced so far as is reasonably practicable.

Safety, hazard and risk issues are discussed in Chapter 14, where the IAC concludes that while some aspects of the initial safety assessment were lacking, the EES assessment is reasonable given the Project's stage of development.

Casey submitted the EES should address the 'no build' case as part of the feasibility assessment for the Project. The IAC is satisfied this issue has been adequately addressed in the Proponents submissions and evidence.

3.1.5 Findings

The IAC finds:

- The Project rationale must be considered in the context of existing energy policies and it is not the role of the IAC to review those policies.
- Commonwealth and Victorian government energy policies support the continued use of gas, particularly as a transition fuel to renewable energy sources.
- The importation of LNG is one of the recognised options to augment the supply of gas within Victoria.
- The judgement about whether the Project is cost effective is an investment decision that would need to be made by the Proponents.
- The Project rationale is consistent with Commonwealth and Victorian government energy policies, subject to the Project specific assessment of greenhouse gas emissions.

3.2 Project alternatives

3.2.1 Introduction

In addition to setting out the Project rationale, the Scoping Requirements Report required the EES include:

- an explanation of the selection of the FSRU approach in preference to a land-based alternative
- an explanation of the rationale for selecting the proposed site for the FSRU
- an explanation of selection process for the proposed pipeline route.

Discussion of these issues was contained in EES Chapters 2 and 3. The assessment of design alternatives, mode of regassification, environmental considerations and short and long term advantages and disadvantages of the Project are discussed in EES Chapter 3 and under the relevant chapters dealing with environmental effects.

3.2.2 EES evaluation of alternatives

Having concluded that LNG import was a viable policy option, EES Chapter 2 discussed a range of Project delivery alternatives.

(i) Offshore or land-based regasification and storage facility

Both offshore and land-based regasification and storage technologies were considered during the gas import options screening phase. Offshore facilities were assessed as preferable for several reasons:

> Onshore development takes around three and a half to four years to construct and requires a large onshore footprint. In comparison, an FSRU is an LNG vessel that includes regasification equipment which can be moored at the end of a jetty, providing additional separation from nearby communities, with a small onshore facility situated near the end of the jetty. On conclusion of the Project the FSRU can be relocated elsewhere [40].

Few submissions suggested a land-based facility was preferable at Crib Point.

(ii) Selection of the FSRU site

Eight sites were initially evaluated by AGL as potential locations to import LNG into south-eastern Australia, including Port of Newcastle, Port Botany and Port Kembla (New South Wales), Corio Quay Precinct, Port of Melbourne and Crib Point (Victoria), Port Adelaide (South Australia) and Bell Bay (Tasmania).

Initial screening of those locations was based on initial screening criteria and the following short-listed options were subjected to a more detailed assessment:

- Port Adelaide in South Australia
- Port Kembla in New South Wales
- Crib Point in Victoria.

The three sites were assessed against the following factors:

- access to key gas markets
- marine and port suitability

[40] EES Chapter 2, page 2-24

- land availability
- environmental effects
- economics
- synergies with other gas assets.

The evaluation of the three short-listed sites was set out in EES Chapter 2 [41]. In summary, Crib Point was chosen as the preferred site for the following reasons:

- Its proximity to the largest gas market in south-eastern Australia.
- The Port of Hastings is an existing international shipping port already handling LPG imports.
- The Crib Point Jetty is part of an existing industrialised area.
- The Project would be compatible with development and use of the Port under existing planning controls.
- The Jetty provides a large deep-water shipping port and a wide swing basin to enable the safe passage of vessels as well as exclusive access to a berth capable of accommodating vessels measuring up to 300 metres long, with separation from adjacent berths.
- Locating the Project on the eastern side of Melbourne was optimal as it provides access to the Longford-to-Melbourne pipeline, which is the main gas transmission pipeline supplying Melbourne.
- Other Port options lacked the required depth or infrastructure to accommodate a continuously moored FSRU.

(iii) Options for the pipeline route

Chapter 2.6 of the EES provided an explanation of the selection process for the pipeline alignment.

APA commissioned reports by IDM Partners Pty Ltd in 2017 and 2018 to consider the possible pipeline alignment options. This process considered pipeline alignments from Crib Point to several different connection locations on the VTS and considered environmental, safety, social, constructability and cost constraints [42].

Pipeline alignment identification and selection requirements are set out in Australian Standard AS2885. The Australian Pipelines and Gas Association Code of Environmental Practice: Onshore Pipelines provides industry accepted guidance on environmental management through the planning and acquisition, construction, operation and decommissioning phases of a pipeline's lifecycle.

The initial assessment of corridor options considered two broad corridors (Figure 12):

- A western corridor running direct from the Jetty through Hastings to APA's existing Dandenong South LNG Facility.
- An eastern corridor, which consisted of onshore and offshore options to the existing Dore Road MLV near Pakenham.

Eight alignment options were identified, two through the western corridor and six through the eastern corridor.

41 EES Chapter 2, pages 2-26 to 2-31

42 EES Section 2.6.3

The eastern corridor connection point to the VTS was subsequently revised to be near the Pakenham East HCMT depot in response to the inclusion of the existing Dore Road MLV within the Pakenham East Precinct Structure Plan area.

Investigation of the Dandenong South option identified this corridor as highly constrained, due to the pattern of development, urban growth and industrial subdivision in these areas. The social impacts associated with land use and tenure would have resulted in a high impact to these existing communities during construction.

Subsequent assessment discounted an offshore option due to potential impacts on the Western Port Ramsar site and significant costs associated with construction, operation and maintenance of offshore pipelines.

Figure 12 Pipeline route options [43]

NOTE

To reduce the electronic size of this document, Figure 12 has been removed from this version of the report. Contact Planning Panels Victoria to obtain a complete copy of the report.

Pipeline alignment CP-DR#3b was ultimately identified as '*the preferred pipeline alignment as it traverses mainly grazing land and uses existing pipeline corridors, while avoiding congested road reserves, rail yards and areas of high value intensive agriculture'* [44]. The EES noted this alignment minimised potential impacts on existing and future land use, including avoiding land within the Pakenham East Precinct Structure Plan (PSP) area and maximising co-location with existing infrastructure and transport corridors.

[43] EES Figure 2-21
[44] EES Chapter 2 page 2-36

Several alignment issues are worthy of note:

- The pipeline route through Hastings was moved from the Frankston-Flinders Road corridor to the Stony Point rail corridor to significantly reduce potential business disruption and amenity impacts to the Hastings community during construction. VicTrack provided in principle support for the revised alignment [45].
- The Tarago Water Supply Main pipe track reserve (Hastings to Pakenham South) was avoided due to the risk of impacts to water infrastructure during construction and potential impacts on landowners.
- Local and VicRoads managed roads were generally avoided as there is risk of damage to a pipeline in an area of high use where other services are located, and regular excavation can occur.

The majority of the pipeline alignments assessed by APA intersected the Western Port Ramsar site to varying degrees. Other options to avoid the Ramsar site, including an alignment west of Hastings, were considered but shown to have unacceptable outcomes. Alignments that intersect with the Ramsar site propose to use underground HDD methodology to avoid surface impacts, including at Warringine Park and Watson Creek.

The preferred alignment was subject to further assessment, refinement and design, with changes resulting from further investigations and engagement with relevant stakeholders. APA advised further refinement of detailed route options is ongoing.

APA refined the alignment through 11 design revisions summarised in EES Chapter 3, Table 3-5. Chapter 3 provided an account of the site selection process for the PDF and MLVs.

3.2.3 Key issues

The key issues are:

- Whether a land-based regasification and storage facility should be considered.
- Whether alternative FSRU sites been properly assessed.
- Whether the pipeline route alternatives have been properly assessed.

3.2.4 Evidence and submissions

(i) Offshore or land-based regasification and storage

Other than the work recorded in EES Chapter 3, the IAC was not presented with any evidence or submissions on this issue. The IAC is not aware of any support for a land-based regasification and storage facility at Crib Point.

(ii) Selection of the FSRU site

The Proponents submitted the proposed FSRU and CPRF are within the Port of Hastings which is strategically supported to serve commercial shipping, including the import and export of products such as crude oil, ethanol, LPG and steel. The Proponents submitted the GIJW are proposed to be developed and operated wholly on land and waters that form part of the Port. They submitted use of the land and further development as proposed is well supported in State and local planning policy.

[45] D494

Mornington Peninsula submitted:

> … the planning scheme does not prioritise the expansion of the Port over the achievement of other strategic planning objectives. Rather, the correct reading of the policy framework as it applies to the Port of Hastings is that policy support for the any material expansion of the Port is contingent on that expansion delivering acceptable environmental outcomes. As has been stated, MPSC does not consider the current proposal will do so [46].

Mornington Peninsula submitted there is limited information on alternative sites such as Corio Bay and Port Kembla in the EES.

The CEG supported this position and added the permanent mooring of the FSRU goes well beyond the existing port and industrial purposes of Westernport.

Several submitters, including Save Westernport, asserted the use of Crib Point has declined in recent years, the Port is in the process of being de-industrialised and the proposed intensification of development on the site was not appropriate. Further, they submitted the site selection process was inadequate and safety matters should have been given greater weight at the site selection stage. They contended the IAC should seek further submissions about alternative project locations.

Several submitters raised concerns about the selection of Crib Point compared to other locations such as Port Kembla, Corio Bay and other locations in the Port of Hastings. Other submitters were concerned the environmental impacts of the Crib Point location had been understated in comparison to alternatives.

The Proponents submitted these contentions were based on a false premise and failed to recognise existing strategic documents, the long term vision for the Port, the current zoning of the Port and the historic and ongoing use of the Port.

The PHDA supported the Project based on its consistency with government policy, planning policies and the Port Development Strategy (PDS) [47]. It noted the site is recognised in both Plan Melbourne and Victoria's Industrial Land Use Strategy as a State Significant Transport Gateway. It submitted that recent strategic developments in relation to the role of the Port do not suggest that its long term future should or will be diminished. Nor it submitted, do recent and proposed port developments suggest that the Port is de-industrialising.

(iii) Options for the pipeline route

The Department of Transport supported the alignment of the pipeline along the Stony Point rail corridor subject to a number of conditions to protect rail assets and to preserve future rail upgrade options.

Several submitters, including Cardinia raised concerns about the impact of the pipeline alignment on specific properties. Site specific pipeline route issues were raised by several submitters, and these are discussed in Chapter 20.

46 D564

47 2018 Port Development Strategy, PHDA

3.2.5 Discussion

(i) Offshore or land-based regasification and storage facility

The IAC accepts the Proponents reasoning not to pursue a land-based regasification and storage facility at Crib Point.

(ii) Selection of the FSRU site

The IAC accepts that the assessment of options for the FSRU site used a sound methodology.

The IAC accepts that assessment of alternative sites presented in the EES, while not a detailed assessment of all aspects of all sites, is a reasonable preliminary assessment of the advantages and disadvantages of the alternatives. In the IAC's view, there are no omissions or flaws in the preliminary site assessment that would prevent the Project from being further assessed.

The IAC is aware the analysis of alternative FSRU locations could be a 'moving feast' as new alternatives and further details about other alternatives become known over time. This should not stop the Project from being assessed on its merits through this process.

The main site assessment criteria in dispute was the extent of strategic support for the Crib Point site. The IAC accepts submissions from the Proponents and the PHDA there is broad policy and strategic support for the Project within the Port of Hastings. The IAC accepts arguments this policy support is not over-riding and is subject to assessing the environmental and other impacts of the Project. This is discussed further in Chapter 15 in relation to the strategic role of the Port.

(iii) Options for the pipeline route

The pipeline alignment has gone through an extensive process over a four-year period. The IAC accepts the reasons why some alternative alignments have been discarded and agrees with the reasoning for recent refinements to the preferred alignment such as adoption of the Stony Point rail corridor. Any pipeline route will have impacts and the proposed route seeks to achieve a balance between environmental, economic and social impacts. The IAC notes APA's commitment to continual refinement of the route as required, in consultation with landowners and other stakeholders.

The IAC agrees with the rationale for the location of the CPRF, the PDF and other pipeline infrastructure.

More detailed site specific pipeline issues relating to the pipeline alignment are discussed in Chapter 20.

3.2.6 Findings

The IAC finds:

- A land-based regasification and storage facility is not an option that has been assessed as part of the EES process.
- The EES assessment of alternative locations for the FSRU is acceptable, and the Crib Point site is a legitimate option that warrants more detailed assessment.
- The EES assessment of broad pipeline route alternatives is acceptable, and the proposed alignment is a legitimate option that warrants more detailed assessment.

PART B: ENVIRONMENTAL EFFECTS OF THE PROJECT

4 Marine biodiversity

4.1 Introduction

Marine biodiversity effects are discussed in EES Chapter 6 and Technical Report A.

The relevant draft evaluation objectives are:

> **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.
>
> **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.

The EES proposes 16 mitigation measures included in the EPRs to manage the impacts of the Project on marine biodiversity. These include:

- EPR-ME01: Design of intake, velocity and screening grilles
- EPR-ME02: Limit seawater regasification flows between September and February
- EPR-ME03: Use 6 port design to increase mixing
- EPR-ME04: High velocity discharge to increase dilution
- EPR-ME05: Port of Hastings Handbook
- EPR-ME06: Compliance with the environment management plan, regulations or policies
- EPR-ME07: No unauthorised cleaning
- EPR-ME08: Operation within dredged area
- EPR-ME09: Class and International Maritime Organization (IMO) standards
- EPR-ME10: FSRU mooring and LNG carriers pilotage
- EPR-ME11: Limiting lights to the number for safe operations
- EPR-ME12: Appropriate antifoul, cleaned and inspected in accordance with regulations
- EPR-ME13: Exclusion zone around FSRU
- EPR-ME14: Policing of exclusion zone
- EPR-ME15: Speed restrictions and Master watches for whales
- EPR-ME16: Monitoring program.

In response to the IAC's RFI, the Proponents provided the following TNs relating to potential impacts to the marine environment:

- TN06: Operation of the FSRU
- TN07: Chlorine and temperature discharge conditions
- TN15: Regasification when LNG tanker is present
- TN28: Seawater use
- TN32: Risk methodology – assessment of spills
- TN33: FSRU operation
- TN34: Seawater use
- TN35: Chlorine and temperature discharge conditions
- TN36: Consequence criterion Clarification of the risk register and methodologies

- TN53: FSRU chlorination discharge.

The IAC benefited from extensive submissions and wide-ranging evidence in its consideration of potential impacts to marine biodiversity.

Table 2 lists the marine biodiversity evidence that was provided.

Table 2 Marine biodiversity evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Chidgey	CEE Consulting	Marine ecology
Proponents	Dr Wallis	CEE Consulting	Hydrodynamics
Mornington Peninsula and Bass Coast	Dr Lincoln Smith	Cardno TGM	Marine ecology
Mornington Peninsula and Bass Coast	Dr Blount	Cardno TGM	Shorebird ecology
CEG	Dr Edmunds	Australian Marine Ecology	Marine ecology
CEG	Professor Baldock	University of Queensland	Hydrodynamics
CEG	Mr Waldrop	Safety, Environment and Emergency Response Associates	Marine science
CEG	Professor Cook	Monash University	Environmental Chemistry

Mr Chidgey and Dr Wallis both lodged supplementary evidence and responses to other evidence and matters raised during the Hearing (D163, D164, D395, D540 and D541). Dr Lincoln Smith and Dr Blount lodged supplementary evidence in reply (D158), Dr Edmunds lodged supplementary evidence with suggested changes to the EPRs (D491) and Professor Baldock responded to questions from the IAC (D521).

4.2 Key issues

The key issues are:

- The understanding of the marine environment and the adequacy of assessments conducted to predict the impact to the marine environment.
- Seawater discharge containing residual chlorine and cold water.
- Seawater intake and entrainment of biota.

4.3 Understanding the marine environment

4.3.1 Background

EES Chapter 6 and Technical Report A Section 5 describe the existing physical, biological and environmental features of Western Port Bay. The existing conditions reference a range of literature that published describing the characteristics of the marine environment. Technical Report A was supported by several Annexures that described the outcomes of assessments conducted in Western Port Bay, namely:

- Annexure A-A: Behaviour and regulation of chlorine in waters

- Annexure A-B: Phytoplankton sampling program
- Annexure A-C: Zooplankton sampling program
- Annexure A-D: Subtidal benthic habitats and biodiversity
- Annexure A-E: Water temperature - monitoring results
- Annexure A-F: Threatened ghost shrimp survey
- Annexure A-G: Ichthyoplankton sampling program
- Annexure A-H: Hydrodynamic modelling report
- Annexure A-I: Underwater noise impact assessment
- Annexure A-J: Underwater acoustic modelling.

Technical Report A focussed on a range of ecosystem components, particularly around Crib Point. The marine biodiversity assessments considered potential impacts at the GIJW, primarily from operations of the FSRU and mooring of the LNG carrier when offloading the LNG. Biological and physico-chemical monitoring was conducted which included sampling plankton populations, seabed surveys and water quality monitoring. Computer modelling was performed to understand the hydrodynamic conditions of the marine waters of Western Port Bay and the localised Crib Point environment. The hydrodynamic modelling of the marine environment was conducted to predict the path and dispersion of discharge plumes from the FSRU and the potential rate of particle entrainment including plankton and small biota.

The Proponents relied on the evidence of Mr Chidgey and Dr Wallis of CEE Pty Ltd who were the primary authors of Technical Report A. Mr Chidgey and Dr Wallis were supported by a range of other specialists who contributed to technical input into the twelve Annexures that supported EES Chapter 6 and Technical Report A.

The marine biodiversity assessment was independently peer reviewed by GHD Pty Ltd and presented as Technical Report A Annexure A-L. The scope of the peer review was to review the assessment conducted and determine if it adequately addressed the EES Scoping Requirements. The peer review surmised that generally '*the marine ecology assessment methodology is appropriate to the assessment required and the conclusions presented can be reasonably drawn from the methods used*'. GHD concluded the hydrodynamic modelling methodology adequately assessed the cool and warm water exchanges, the chlorine discharges on the seabed habitat, and the entrainment predictions of planktonic organisms in the water column into the FSRU over a number of scenarios.

The relevant near-field and far-field hydrodynamic modelling reports were independently reviewed by eCoast Marine Consulting and Research, New Zealand. The findings of the peer review were presented in Technical Report A Annexure A-K. The peer review concluded that the '*tools and methods used for the nearfield and regional modelling are appropriate and the results seem reasonable*'.

4.3.2 The Western Port Ramsar site

(i) Evidence and submissions

In their opening submission, the Proponents asserted the Project is consistent with State and local planning policies that support the operation of the Port of Hastings, without undermining policies that seek to maintain and improve the overall ecological character of the Western Port Ramsar site. They submitted the operation of the FSRU at Crib Point compared favourably with existing industry within the Port (see Chapter 15).

The Proponents submitted the Western Port Ramsar Ecological Character Description and the ecosystem Components, Processes and Systems (CPS) can be protected during operation of the FSRU. They noted the information in Technical Report A was prepared by experienced experts, with input from other experts as necessary. They submitted the EES is highly conservative and assessed impact to Western Port Bay based on worst case operational scenarios. They presented the outcomes of the Project to marine biodiversity would be undetectable within the context of the entire Bay.

Mornington Peninsula and Bass Coast submitted that a balance needed to be struck between expanding the Port and protecting the Western Port environment. They submitted that balancing the different values and uses and applying the principles of ecologically sustainable development is key to development in Western Port.

The Councils submitted the Proponents only considered Crib Point's primary function as a working port and its impact assessments to inform the EES only considered the immediate area of impact within the Port.

The Councils raised the point on numerous occasions that Crib Point is dissimilar to other working Port environments such as Long Island Jetty. Mr Chidgey gave evidence that Crib Point will continue to be used as it was intended and impacts would be negligible in the context of the operating Port and across the broader environment of Western Port Bay.

In their closing submission, Mornington Peninsula and Bass Coast stated '*the Proponents have acknowledged the environmental and biodiversity significance of Western Port but have been unable to establish that those assets will be 'protected' let alone 'enhanced' or 'improved' as called for by State Planning Policies and Plan Melbourne'* [48]*.*

The Commonwealth Department of Agriculture, Water and Environment (DAWE) submitted it is not appropriate:

> to link the potential impacts of the proposed action to the fact that the environment is a working Port, and that impacts of the action should be assessed relative to the critical components, processes and services of the Ramsar site.

The CEG stated in its opening submission:

> … acceptable environmental effects and outcomes are those that provide for a protected environment, and that are consistent with 'a trajectory of improvement.

It added:

> …effects and outcomes that allow for the environment to be further deteriorated by ongoing incremental losses and trajectories of decline are not acceptable [49].

(ii) Discussion

Western Port Bay was designated as a Ramsar listed wetland of international significance in 1982 (one of approximately 65 in Australia), and a UNESCO Biosphere Reserve in 2002 (only one in Victoria and one of nine in Australia). Both designations were made in the context of Western Port Bay being an existing operating Port.

[48] D564
[49] D155

The role and importance of the Port are discussed in Chapter 15, where the IAC notes that future land use decisions about the Port must balance potentially competing policies that support the use of the Port and environmental protection.

Within the EES and throughout the Hearing, the Proponents submitted the Port has co-existed in Western Port Bay since the 1960s and has continued since the Ramsar designation in 1982. State and local policy seek co-existence and encouragement of the Port's industrial activities, while ensuring appropriate environmental safeguards are maintained. The Proponents emphasised the Port is widely recognised within Western Port Bay and is a significant State economic asset with national importance.

The EES recognised the status of Western Port Bay as a Ramsar Wetland and stated:

> The Ramsar Convention encourages signatory countries to designate wetland sites in order to conserve their ecological, botanical, zoological, limnological or hydrological importance. By listing a Ramsar site, countries agree to establish and oversee a management framework to conserve a wetland and ensure its wise use. Western Port All Ramsar sites are MNES under the EPBC Act [50].

Western Port Bay is part of the Mornington Peninsula and Western Port Biosphere Reserve under the UNESCO '*Man and Biosphere'* program. Its uniqueness is recognised as one of Victoria's thirteen most significant environments that supports a number of endangered, vulnerable and threatened marine and avifauna species [51].

At the national level, the *Environment Protection and Biodiversity Conservation Act* establishes the basis for managing Ramsar sites, which are recognised as a MNES under the Act. This significance is discussed in Chapter 21.

A number of submissions referred to the Shapiro study, the first study on the environment of Western Port Bay [52]. The IAC recognises the Shapiro report placed particular emphasis, some 46 years ago, on considering the Western Port Bay environment and the operations of the Port with balanced weighting.

Western Port Bay was variously described as vulnerable, unique, complex, delicate and compromised in submissions. Its social, economic, environmental and cultural heritage importance was raised throughout the Hearing. The designation of Western Port Bay under the Ramsar Convention was highlighted in many submissions as a distinctive characteristic that recognises the importance of the area. Designation of a wetland as a Ramsar site carries with it certain obligations, including managing the site to maintain its '*ecological character'* and to have procedures in place to detect if any threatening processes are likely to, or have altered, the '*ecological character'*.

The Ramsar Convention defines '*ecological character'* and '*change in ecological character'* as:

> Ecological character is the combination of the ecosystem components, processes and benefits/services [CPS] that characterise the wetlands at a given point in time.

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50 EES Technical report A page 203

51 https://www.melbournewater.com.au/sites/default/files/2018-02/Understanding_the_Western_Port_Environment_0.pdf

52 Shapiro M.A. (ed.) (1975) Westernport Bay Environmental Study, 1973 -1974. Environmental Study Series No. 502. Ministry for Conservation, Victoria

> Change in ecological character is defined as the human induced adverse alteration of any ecosystem component, process and or ecosystem benefit or service.
>
> Changes to the ecological character of the wetland outside natural variations may signal that uses of the site or externally derived impacts on the site are unsustainable and may lead to the degradation of natural processes and thus the ultimate breakdown of the ecological, biological and hydrological functioning of the wetland [53].

The ecological character description identified the following critical components, processes and services (CPS) to the Ramsar site:

- wetland bathymetry
- geomorphology and sedimentation
- seagrass
- saltmarsh
- mangroves
- waterbirds
- invertebrates
- fish and threatened species.

The Proponents' marine experts noted the extent of knowledge of Western Port Ramsar and its critical CPS is limited. The intertidal mudflats, mangroves and seagrass beds support a diversity of local and migratory shorebirds, important commercial and recreational fish species and benthic biota. These habitats are critical as juvenile fish nurseries and are important for carbon capture and sequestration of atmospheric carbon. Western Port Bay is connected by tidal movement and provides critical foraging and roosting habitat for migratory shorebirds.

The IAC acknowledges existing activities within the Port have operated and will continue to operate in Western Port Bay with minimal adverse impacts to the ecological character of the Ramsar wetland. The EPA and PHDA indicated the number of environmental incidences in Western Port Bay is historically low [54]. On balance, the IAC considers existing activities have been effectively managed by Port users to protect the environmental values broadly recognised in these waters of high conservation value.

The IAC notes the primary objective of the updated Western Port Ramsar Site Management Plan:

> To maintain, and where necessary improve, the ecological character of the Western Port Ramsar Site and promote wise and sustainable use [55].

The IAC considers that future activities in Western Port Bay must align with the objectives of the Management Plan to maintain the ecological character and where possible improve the ecological values widely recognised in this Ramsar wetland.

(iii) Findings

The IAC finds:

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53 https://www.environment.gov.au/system/files/resources/6d7408dc-2519-4294-9820-f7b2284816dd/files/module-2-framework.pdf

54 D498

55 https://www.water.vic.gov.au/__data/assets/pdf_file/0029/66269/Western-Port-Ramsar-Site-Management-Plan-Summary.pdf

- The Port of Hastings and the Western Port Ramsar wetland have co-existed in relatively balanced manner.
- Existing Port related activity has been managed by its stakeholders to minimise adverse impacts to the ecological character of the Ramsar wetland.
- There are key policy and environmental imperatives to balance of the Port and the marine sensitivities of Western Port Bay in recognition that the Ramsar wetland is afforded a higher level of protection.

4.3.3 Adequacy of environmental assessments

(i) Evidence and submissions

The Proponents submitted the EES was prepared in direct response to the targeted requirements of the Scoping Requirements, including the draft evaluation objectives. It was subject to a Technical Reference Group (TRG) process and determined by DELWP to be appropriate for public exhibition.

The Proponents submitted the EES was to include '*descriptions of the existing environment to the extent relevant to the assessment of potential effects*'. The Proponents noted Dr Blount and Dr Lincoln Smith agreed in cross-examination that determining what is and is not relevant in this respect, is a matter for professional judgement.

The Proponents closing submission responded:

> The assessment approach has properly been informed by detailed assessments of the potential impacts of the Project, which in turn informed the scope and focus of the environmental effects assessments and the characterization of the existing environment. The EES accordingly did not seek to fully characterize the ecological values of Western Port. This was not its scope. It instead characterised those parts of the environment that would potentially be impacted by the construction or operation of the Project, and went on to document the various detailed and targeted environmental impact assessments completed in respect of the Project [56].

Mr Chidgey and Dr Wallis gave evidence that the information on which the marine impact studies relied upon in the EES was comprehensive and fit for purpose. Their evidence was:

- The monitoring and sampling programs and physical modelling provided an understanding of the impact to Western Port Bay under a range of operating scenarios.
- The lack of direct and indirect impact outside the defined impact zone justified the sampling and analysis conducted to inform the EES.

Submitters raised concerns with the marine assessments used to predict potential impacts of the Project to marine biodiversity and argued the scope of the assessments were significantly lacking. Mornington Peninsula and Bass Coast submitted the onus was on the Proponents to demonstrate the Project's impacts can be adequately managed. They submitted significant gaps exist in the EES and further emphasised the EES did not adequately describe the environment of Crib Point nor sufficiently assessed the potential impacts on marine biodiversity and waterbirds.

Many submitters noted a considerable amount of the EES relied on existing literature to define the ecosystems around Crib Point. Dr Lincoln Smith, Dr Blount and Dr Edmunds each

[56] D589

gave evidence that assessment of marine habitats and biota at Crib Point was insufficient and the descriptions of the local environment and potential Project impacts were limited. Further, their evidence noted there was heavy reliance on the risk assessment to define the marine biodiversity assessments in the EES.

EES Attachment III reported the findings of the extensive risk assessment conducted across all elements of the Project. Evidence from Dr Wallis indicated:

> The marine impact assessment includes an extensive combination of field studies, review of historical literature, hydrodynamic modelling and risk assessment in accordance with standard methods. A total of 53 potential risks are analysed and assessed, and 9 Ramsar Limits of Acceptable Change also are assessed [57].

Of the 53 potential risks identified to marine biodiversity, all but one (*Contamination-spills from vessels)* was considered to have residual risks of very low to low following mitigation.

Dr Lincoln Smith and Dr Blount gave evidence that:

> There are significant shortcomings evident in the marine ecology component of the risk analysis. These shortcomings fall into two broad categories: underestimation of the risk (either likelihood, consequence or both); and insufficient information available in the EES to make an appropriately informed assessment [58].

Mr Chidgey and Dr Wallis generally agreed the extent of knowledge across ecosystems within Western Port Bay is limited. Mornington Peninsula and Bass Coast submitted a precautionary approach should be applied where there is potential for impact in a sensitive environment, such as Western Port Bay. The Councils submitted it is important to understand existing baseline conditions and extent of effects from existing activities, prior to attempting to understand impacts of additional activities within the Crib Point environment.

Mr Chidgey agreed that:

- an impact assessment was conducted to understand potential effects of a proposed activity on the receiving environment, prior to an action being undertaken
- it was important to identify the range of natural variability to understand impacts from future activities.

The Proponents submitted the independent reviews of the marine biodiversity assessment and the near-field and far-field hydrodynamic modelling reports concluded that the methods used to assess the Project were adequate.

Dr Lincoln Smith and Dr Blount identified the following key issues with the EES:

- data limitations to adequately predict impacts
- shortcomings in the approach to identify hazards, risk and impact
- cumulative impacts not well understood
- lack of alternative options, appropriate mitigation measures and poorly defined management options
- impacts to Ramsar and threatened/migratory shorebirds.

Dr Edmunds identified the following issues in relation to assessment of marine impacts:

- significance of ecological assets undervalued

57 Technical Report A Section 7.3
58 D232

- lack of consideration of ecosystem effects
- mitigation measures not tailored to predicted impacts
- cumulative impacts and larger scale ecosystem implications.

Mornington Peninsula and Bass Coast submitted that an improved understanding of potential for impact was required where impact may occur, which would assist with tailoring mitigation measures to reduce any potential impacts.

There was criticism from submitters that the marine assessments were not intrinsically linked. It was noted that understanding the intrinsic linkages within an environment is an effective way to adequately predict potential direct and indirect impact pathways.

Dr Edmunds indicated in evidence that the EES lacked a holistic ecosystems assessment approach to understanding the potential impacts of the Project. He noted Western Port Bay contains a patchwork of communities that are interactive and tightly linked. He argued the systematic evaluation of all potential impact pathways across Crib Point, and more broadly, is required to adequately understand and predict the Project's impact pathways. The Proponents submitted it was not their responsibility to assess the entire marine environment within Western Port Bay, but rather to focus on the environment where direct and indirect impacts may be likely.

Dr Edmunds noted that FSRU vessels are operational worldwide and information specific to their activities and impacts could have been accessed to better inform the EES.

The DAWE submitted:

> Fundamental issues such as potential impacts of increased shipping have not been satisfactorily assessed nor has the potential cumulative impacts of the project on the Ramsar CPS [59].

The DAWE submitted the following issues were not covered adequately in the EES:

- Impacts from increased shipping, including:
  - ship wakes and sediment liberation
  - impacts to seagrass, saltmarsh and mangrove as a result of pollution/contaminants and ship wash
  - impacts of additional noise associated with increased frequency of shipping and operation of the FSRU on waterbirds (roosting and foraging)
  - noise, lighting, collisions from ships, boat wash on ghost shrimp, southern right whale, humpback whale, planktonic and pelagic marine species.
- Cumulative impacts of gas import works, noting:
  - risks and impacts have only been addressed for localised impacts of 20 hectare and 5 hectare plumes
  - a simplistic approach to conclude impacts to the Ramsar site would not be expected.
- the Marine Monitoring Program does not contain specific objectives or remedial actions to address the Ramsar CPS.

The DAWE submitted the statement in the EES that '*the likelihood of any effect from the GIJW and discharge of the FSRU on the subtidal reef or seagrass, estuarine areas, intertidal mudflats, intertidal forested wetlands, salt marshes, mangroves and waterbirds is low*' was

[59] S2871

too simplistic and did not address the cumulative impact of the additional Port activity and shipping movements on the Ramsar site.

In response to the DAWE submission, the IAC requested further information from the Proponents who provided TN30 that advised:

- An adequate baseline dataset was compiled from desktop databases and literature reviews and field surveys to predict the impacts of the Project on Ramsar wetland MNES.
- Cumulative impacts on CPS from increased shipping and Port related activities '*are properly categorised as impacts associated with the existing, ongoing, policy-supported use of the Port for port activities',* noting any potential impacts are consistent with port related impacts elsewhere within Western Port [60].
- Turbidity from tug wash would be localised and disturbed sediment would settle back to the seabed. The evidence of Dr Wallis was that '*the resuspension by tugs of 640 t/yr is only 0.01 % of the amount of sediment naturally resuspended by tidal currents and waves'* within the Western Port Ramsar wetland [61].
- Cumulative impacts of other shipping and Port related impacts, including marine pest introduction, seabed scouring, spills in transit and whale strike (if relevant to the IAC's Terms of Reference) were deemed negligible.

The Proponents submitted that criticism of the impact assessment and the claim that it lacked robustness was a distraction for the IAC. They noted the methodology and approach to assess the potential environmental impacts was agreed by the TRG.

(ii) Discussion

The IAC acknowledges that a significant number of submissions raised concerns the EES did not adequately characterise the Crib Point environment and the existing marine biodiversity that may be directly or indirectly impacted by the Project. The IAC notes the EES described the ecological character of Western Port Bay, placing a high reliance on a range of literature that described its marine biodiversity. The EES relied heavily on historic literature to describe the ecological character of the Ramsar site and its critical CPS. The EES relied on established Limits of Acceptable Change (LAC) for Western Port Bay to confirm the acceptability of potential change within the Crib Point environment and impacts of the Project.

As highlighted in Technical Report A, the Proponents assessed the Project's risks against the relevant LAC for the entire environment of Western Port Bay. By comparing the Project impacts to the LAC, the Proponents concluded:

> … the Project is acceptable on the basis that it does not cause a significant impact and is well within the limits of acceptable change [62].

The IAC considers application of the broader Ramsar LAC to assess the impacts of the Project to the localised conditions at Crib Point is inappropriate. It presents an assessment that does not accurately assess the Project's effects on the extent of marine biodiversity impacts

60 D264
61 D70
62 D589

on parts of the Ramsar site. Comparison to the LAC does not provide a reflection of the impacts to the CPS within this segment of Western Port Bay.

The IAC considers the EES would have been better informed if site specific assessments had been conducted at Crib Point to benchmark conditions of the CPS specific to Crib Point. The site specific benchmarked conditions could then be compared against the broader Western Port Bay LAC and used as a more appropriate measure of change to critical CPS at Crib Point.

The IAC agrees with the evidence of Drs Lincoln Smith, Blount and Edmunds that the Proponents appeared to use the risk assessment as a guide to define their assessments of biological impacts to Western Port Bay. The IAC agrees with evidence from Drs Lincoln Smith, Blount and Edmunds that the risk assessment is flawed because a significant number of risk pathways were inappropriately ranked and impacts in the localised environment were measured against the whole of Bay.

Of particular concern to the IAC were risks of chlorinated water deemed in the EES to have a negligible consequence to mangroves, saltmarsh, seagrass, subtidal invertebrate fauna, local pelagic and demersal fish, listed protected species and accumulation in the food chain. The consequence of entrainment and cold seawater were generally considered negligible to minor. While the risks considered to the entire Western Port Bay may be low, the focus should have been on risks to the localised environment of Crib Point in the first instance, of which the consequence would be greater. The EES described impacts as certain, particularly to plankton, post larvae fish, the seabed and higher trophic species and this should have been correctly considered in the risk assessment.

The IAC notes the independent reviews of the marine biodiversity impact assessment and hydrodynamic modelling commissioned by the Proponents. The peer review of the marine biodiversity impact assessment appeared to only confirm the methodologies were correct, and the results drawn from the completed assessments were technically appropriate. The peer review did not confirm the extent of potential impacts of the Project, nor did it conclude on the acceptability or unacceptability of impacts to the marine environment.

The independent reviews of the near-field and far-field hydrodynamic modelling concluded the methodologies to model the chlorine, temperature and particle entrainment were sound and results were reasonable. This is in contrast to the evidence of Professor Baldock who queried the near-field inputs and the method for predicting particle entrainment (discussed further in Chapter 4.5.3). Dr Wallis countered the claims by Professor Baldock by advising particles were not added or removed within the model, and instead the modelling tracked particles in each zone to calculate:

- (1) the number that are flushed to Bass Strait;
- (2) the number that have moved to other zones due to tidal currents and dispersion;
- (3) the number that remain in the same zone; and
- (4) the number that are entrained in the intake of the FSRU [63].

As described in Chapter 4.5.3, it appears the assumptions of plankton and fish larvae being replenished every seven to 21 days respectively raised concern about the predictions on replenishment particles modelled to predict the extent of entrainment.

63 D540

(iii) Findings

The IAC finds:

- The EES contains a substantial amount of information describing the characteristics of Western Port Bay which relies heavily on existing literature, most of which is historic in nature.
- The biological assessments were limited and only considered potential Project impacts on phytoplankton, zooplankton, ichthyoplankton, fish eggs and larvae. Impact to seabed was assessed as certain. The mapping of the seabed was patchy and disjointed, and species specific diversity and abundance of epibenthic and infauna assemblages that may be exposed to impacts from the FSRU were not described in any detail.
- The risk pathway modelling was flawed and considered consequence of most Project marine risks as negligible with varying likelihoods, yet the EES and supporting evidence acknowledged direct impacts are certain and will have an adverse impact to the Ramsar wetland on a localised scale.
- A more comprehensive understanding of the existing site specific conditions within Crib Point is required to predict potential impacts from the Project and better describe the baseline conditions.
- The lack of information in the EES on existing baseline conditions at Crib Point, within a segment of Western Port Bay creates uncertainty that potential direct and indirect impacts from the Project to marine biodiversity are measurable and can be acceptably managed.

4.3.4 Assessed impacts to Western Port Bay

(i) Evidence and submissions

The Proponents acknowledged the operation of the FSRU will have an impact on the marine environment, and contended this impact is not unacceptable. The key impacts of the Project to the marine environment would be the seawater intake entraining and impinging marine biota, and the discharge plume of chlorine and cold water extending from the FSRU across the water column and seabed.

Technical Report A stated:

> Operation of the proposed FSRU would result in shading caused by the two vessels, changed hydrodynamic conditions due to the presence of the vessels and local scour due to the discharges and tug-assisted berthing and departure of the LNG carriers as well as a zone of cooler seawater from the heat exchanger discharge.
>
> The effects on seabed fauna would be due to the combined effects of these processes.
>
> There would also be a minor increase in the quantity of non-living organic material from plankton damaged in the passage through the FSRU heat exchangers.

In giving evidence, Dr Wallis noted there would be:

- adverse impact to areas within the discharge plume envelope
- low impact outside the discharge plume
- negligible impact well outside the discharge plume.

Many submitters believed the Project would result in significant changes to the Crib Point marine environment. Submitters expressed concerns about the scale of potential impacts

on the existing environmental values in Western Port Bay. The concern of most significance was the discharge of chlorine from the FSRU.

In evidence, Drs Lincoln Smith and Blount argued there was not an adequate baseline of existing conditions in Western Port Bay that could be used to assess potential changes. They indicated an improved monitoring program is required to better understand baseline conditions prior to commissioning the FSRU. They considered additional baseline information would assist with developing an adaptive management and monitoring framework necessary for the Project's operation beyond the proposed mitigation measures. Dr Lincoln Smith and Dr Blount believed triggers that initiate particular mitigation measures and remedial actions should be developed to manage potential operational impacts.

The potential impacts, either direct or indirect, from the GIJW to the primary productivity of Western Port Bay was questioned by Drs Edmunds, Lincoln Smith and Blount. Dr Edmunds' evidence was that the '*extensive sediment flats were likely to be the main primary production component of Western Port*' [64]. Dr Edmunds noted that microalgae forms a microfilm on unvegetated sediments and stands of intertidal seagrass and contributes to the nutrient cycling and productivity within the sediments. He added the microalgae was intrinsically linked with the secondary productivity of burrowing invertebrates (infauna), bacterial cycles and plankton and plays a critical role within the diet of migratory birds.

Drs Lincoln Smith and Blount expressed concern the intertidal and shallow subtidal habitats were not sampled to inform the EES [65]. They noted the decision by the Proponents not to sample was based on predictions of the hydrodynamic modelling that seawater discharged from the FSRU would not extend to the intertidal environment of Crib Point. During questioning by Mr Kane, Mr Chidgey gave evidence that microalgae is usually distinguishable on the seabed, but observations during seabed surveys to inform the EES did not identify the presence of microalgae.

The Proponents acknowledged that impacts from the FSRU are likely to occur to benthic seabed epibiota and infauna, and pelagic (free-swimming) organisms. The EES described the seabed and its benthic and infauna habitats as heterogenous, and stated:

> The species present in the dredging-modified soft seabed habitat at Crib Point Jetty (Berth 2) are widely represented throughout the 36,000 ha of soft seabed in Lower North Arm, are likely to be distributed widely throughout the coastal environment of Victoria (e.g. Poore 2019).
>
> The proportion of the species at any particular location is dependent on the natural characteristics of the seabed at that location, which is patchy at small spatial scales (metres to tens of metres) but relatively homogeneous at larger scales (hectares and kilometres) [66].

Mr Chidgey gave evidence that the seabed at Crib Point is variable, containing a mosaic of benthic biota. The seabed was described as having variable sediment grain size, with undulating ripples, rubble and soft seabed communities. Technical Report A Section 8.3.4 stated:

> In recognition of the importance of seabed character in determining epibiota and infauna characteristics, our major effort in documenting seabed epibiota and infauna in

64 D108
65 D232
66 Technical Report A Section 7.7.12

> Lower North Arm focussed on mapping habitat in representative areas using towed video.

The IAC requested the underwater towed video footage. On review, the IAC noted the footage did not present a clear image of the seabed and it would be difficult to verify benthic species, distribution and abundance across the surveyed transects. The seabed was heterogenous and appeared consistent with the general descriptions of the Proponents' marine experts, though visibility was lacking.

The Proponents submitted throughout the EES and in evidence that during seabed surveys, Ghost shrimp were not identified, and Lamp shells were noted as present on deeper sediment. Dr Edmunds raised concern about potential impacts to Lamp shell communities that are present only at Crib Point and have not been identified anywhere else in Victoria.

Dr Wallis recognised there would be changes to seabed assemblages in the area around the FSRU. The Proponents submitted this would be acceptable as impact would be confined to waters within the Port area of the Jetty.

The marine experts for the Councils and CEG were concerned that spatial variability in benthic assemblages was not adequately addressed in the EES. The Councils and CEG submitted there was inconsistent sampling and inadequate description of benthic infauna, the diversity of benthic habitat was not well understood, and the extent of potential impact remained unknown.

Mornington Peninsula and Bass Coast submitted that according to the risk assessment, the Proponents considered annihilation of benthic habitats within nine hectares of the FSRU as a negligible consequence.

The EES stated that shading, particularly with the LNG carrier moored adjacent to the FSRU, would be a significant stress as it would '*reduce light in the water column and also reduce the biota in the water column occupied by the vessels*' [67].

Many submitters expressed concern the Proponents did not adequately recognise the presence of a range of marine fauna species that frequent Crib Point and the North Arm. For example, higher trophic order fauna such as seabirds, seals, penguins, dolphins and whales were noted as frequently navigating the North Arm of Western Port Bay. (Whale strike is discussed in Chapter 14.)

EES Technical Report A noted the ichthyoplankton survey discovered:

> Fish larvae came from 28 fish families, dominated by the Gobiidae (gobies) and to a lesser extent by the Syngnathidae (seahorses and pipefish) and Tetrarogidae (scorpionfish and cobblers).
>
> Larval fish from ten families were potentially of recreational and commercial fishing interest.

The Proponents noted flathead, King George Whiting, pipefish, seahorse, flounder, and an Australian Grayling were identified during the ichthyoplankton surveys. Submitters noted Western Port Bay provided important habitat for a range of recreational and commercial fish species and considered that information and potential impacts to fish was lacking in the EES.

[67] Technical Report A Section 8.5.2

Concerns were raised as larger, post larval pelagic and demersal fish had not been surveyed in any of the habitats surrounding Crib Point. A common theme in submissions was recreational and commercial fishers would experience less catch as a result of impacts from the Project to the important nursery habitats surrounding the Jetty. Submissions expressed concern the Project may compromise the quality of important recreational and commercial fish, questioning whether fish tissue may become damaged and tainted by the seawater discharge.

The CEG raised concern that continuous operation of the FSRU may cause barrier effects from underwater noise, vibration, lighting, chlorine plumes and colder water, impacting on the behaviour and movement of fauna.

Mornington Peninsula and Bass Coast raised concerns during cross examination of Mr Chidgey that Little Penguins inhabiting Barrallier Island were not surveyed to better inform the EES. Mr Chidgey indicated State government agencies preferred the presence of penguins north of Crib Point not be widely publicised. Mr Chidgey noted penguins may frequent the vicinity of Crib Point, but were not detected during unrelated surveys to inform Technical Report A.

Other issues commonly raised by submitters included the risk of introduced marine pests and invasive species, sediment disturbance by tugboat wash and oil spills. Mr Waldrop submitted:

> The EES has made little attempt to identify species that could be impacted by oil (either surface or subsurface oil) and does not provide a foundation for subsequent impact assessment. Consequently, the assessments of potential effects is limited and inadequate [68].

The Proponents submitted '*risk of oil spills is a risk that exists where there is shipping'* and the EES had given ample consideration to oil spills deemed the greatest risk to marine biodiversity of Western Port Bay [69]. In closing, the Proponents concluded the EES had adequately considered the risk of routine and non-routine spills, noting there was no basis to suggest any special risk associated with the LNG tankers servicing the Project. They contended management plans would consider the prevention and management of non-routine spills from the GIJW.

Submitters, including Mornington Peninsula and Bass Coast, CEG and the local community, argued there was a lack of information that described potential risk of turbidity and seabed scouring that could occur from the four tugboats required to manoeuvre the LNG carrier in place. Drs Lincoln Smith and Blount indicated that additional sampling should be required during tugboat operations. They noted that tributyltin (TBT) is present in sediment at Berth 1, which warranted further consideration.

Technical Report A included a desktop assessment of introduced marine pests and invasive species in Western Port Bay. The Proponents relied on historic surveys conducted in 1997 and 2000 to describe the distribution of marine pests and invasive species in Western Port Bay and more specifically Crib Point. Dr Edmunds submitted that there was inadequate consideration of marine pests.

68 D107
69 D589

Several submitters suggested the marine biodiversity risk assessment was not transparent, it lacked quantitative scientific evidence and was subjective. Dr Edmunds questioned the process and outcomes of the risk assessment which the EES placed heavy emphasis on to predict environmental effects. He raised concerns the risk assessment had little supporting information on how and why each impact pathway was chosen or the logic for the likelihood and consequence ratings.

Drs Lincoln Smith and Blount noted the Project risk assessment was broadly based on the LAC which apply to determining impacts across the entire Western Port Ramsar site.

Mr Lane gave evidence that:

> The components, processes and services approach to Ramsar site impact assessment is an Australia-wide, accepted framework for monitoring and assessing impacts on the ecological character of Ramsar sites. These have not been proposed by the authors of Technical Report B; rather they have been correctly adopted by them as the impact assessment framework for an Australian Ramsar site [70].

The Proponents submitted in closing:

> … when this [Australia-wide, accepted] framework is applied, the outcome is clear: the Project is acceptable on the basis that it does not cause a significant impact and is well within the limits of acceptable change [71].

Drs Lincoln Smith and Blount noted the LAC has a Bay-wide application and was not appropriate to assess the impact on a local scale. They contended broad scale assessments performed in the risk assessment carried the risk that local scale impacts from the Project may be missed. Their evidence and that of Dr Edmunds was that consequence ratings did not directly relate to local scale impacts that may result from the Project.

(ii) Discussion

Western Port Bay is listed under the Ramsar convention, protected by the *Environment Protection and Biodiversity Conservation Act* as a MNES and recognised by and recognised by State Environment Protection Policy SEPP (Waters) as an area of high conservation value. The Australian and New Zealand Water Quality Guidelines (WQ Guidelines) state:

> For ecosystems highly valued for their unmodified state and outstanding natural and conservation values, there should typically be no change in biodiversity beyond natural variability. Where possible, there should also be no change in water/sediment chemical and physical properties, including toxicants [72].

The Proponents acknowledged the Project will impact Western Port Bay, and the impact is predicted to occur within proximity to the FSRU and within designated Port waters. The EES relied on the outcomes of its marine biodiversity risk assessment to determine the focus of biological assessments.

Many submitters criticised the marine biodiversity risk assessment. The Proponents submitted the outcomes of the risk assessment were informed by the hydrodynamic modelling and biological assessments. The risk assessment identified 53 potential risks to the marine environment. The IAC agrees with submissions and the Mornington Peninsula

70 D210

71 D589

72 https://www.waterquality.gov.au/anz-guidelines/resources/key-concepts/level-of-protection#high-conservation-or-ecological-value-systems.

and Bass Coast and CEG marine experts that several elements in the risk assessment were flawed.

The IAC questions the validity of findings that the marine biodiversity risks are generally considered low or very low in the Environmental Risk Report (EES Attachment III). The IAC agrees with evidence from Drs Lincoln Smith and Blount that the risk assessment appears to be unsupported by baseline condition surveys and environmental assessments.

Based on the evidence and submissions, the IAC considers there is:

- an underestimation of the likelihood, consequence or both of identified risks
- a lack of direct relationship between the consequence ratings and local scale impacts
- a disconnect between broad scale assessments and local scale impacts from the Project
- insufficient information available in the EES to conduct an appropriately informed risk assessment.

The IAC notes the varied criticisms of the EES, with Dr Edmunds asserting that the Proponents' predictions of physical impacts to the marine environment were used as surrogates for biological responses to marine biota. Similarly, it agrees with submissions opposing the Project 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 considers the biological monitoring and physical modelling focused on a limited range of potential impact pathways where direct impacts are certain.

The EES would have been assisted if the heterogeneity of the epibenthic invertebrates and infauna across each of the transects surveyed was characterised in more detail. The IAC notes the survey transects were lacked uniformity and information collected would not provide an adequate baseline for future assessments. It was suggested by Dr Edmunds that Lamp shell populations are only in the vicinity of Crib Point, and impact from the Project to the isolated population is unknown.

The Proponents submitted there would be no direct or indirect impact to the Crib Point intertidal environments where microalgae, infauna, mudflats, seagrass, mangrove and coastal saltmarsh exist. On balance, the IAC supports the assumption that the Project is unlikely to cause direct adverse effects to these sensitive CPS. However, the IAC considers indirect impact pathways are not properly understood and cannot be ruled out, particularly as intertidal environments are critically important for migratory shorebirds that inhabit the broader area.

During the Hearing, the IAC directed the Proponents to provide advice on alternative operational scenarios, including reducing chlorine produced oxidants (CPO) discharge from the high velocity discharge ports to 2 μg/L to minimise impacts to marine biodiversity (discussed in Chapter 4.4). A number of TNs were provided that considered various operational scenarios (TN033, TN34, TN35 and TN53). From these, the IAC was able to explore alternative options to achieve net improvements to environmental outcomes. The IAC welcomed the opportunity to understand the limitations in operating the FSRU, yet it considers further operation and design alterations to the FSRU would be required to maintain environmental values in Western Port Bay.

The IAC finds the EES has not adequately recognised the variety of marine fauna species likely to frequent the North Arm. The Proponents have not undertaken surveys of higher

trophic order species known to frequent the area, a number of which are listed threatened and migratory species. It is difficult to qualify the risks to marine fauna as negligible or low without survey data to confirm or discount Crib Point as habitat for higher order marine species.

The IAC notes that recreational fishing is a popular past time with angling around Crib Point and North Arm, noted in the EES and a number of submissions. The IAC notes that commercial fishing is not practiced in North Arm but recognises number of important commercial fish species use the seagrass of Western Port Bay as important nursery habitats. The IAC considers more information is warranted on the distribution and importance of the Crib Point environment to the recreational and commercial fisheries.

Several submitters observed that modelling does not equate to fact. The modelling completed was based on a range of physical conditions and ecosystems at Crib Point. The impacts from the FSRU are within a sensitive and unique environment with recognised high conservation value and which is internationally recognised. There is an expectation that the modelled assumptions and the outcomes require a high degree of confidence. The IAC considers the information presented in the EES does not confidently demonstrate that the Project's impacts would result in an acceptable outcome.

The assessment of cumulative impacts from the Project to the marine environment is lacking. The IAC considers there would be combined stresses due to temperature change, CPO, shading and scour of sediments (periodically due to tugboats and locally due to the discharged seawater on the seabed), as well as entrainment resulting from seawater intake. The Proponents submitted:

> There is a significant distance between the areas above the temperature and chlorine Guideline Values and the various habitat types recognised under the Ramsar Convention. Due to the distance, the likelihood of there being any effect from the discharge on the subtidal reef or seagrass, estuarine areas, intertidal mud flats, intertidal forested wetlands, salt marshes, mangroves and waterbirds is low [73].

The DAWE submitted:

> This statement is too simplistic and does not address the cumulative impact of the additional port activity and shipping movements on the CPS Ramsar site [74].

The IAC considers the Proponents have not given adequate consideration to qualify that exotic marine pests and invasive species do not exist at Crib Point. The IAC considers the Proponents should have conducted targeted surveys to assess the presence or otherwise of exotic marine organisms around the GIJW area in order to understand baseline conditions.

The criticism from a number a submitters regarding the lack of information on sediment dispersion from tug wash and impacts from oil spills is noted by the IAC, but it is not significant to the conclusions of the EES.

The IAC recognises the EES contributes to understanding the direct impacts of the Project, but considers some assessments were completed in isolation and linkages between ecosystems assemblages across Crib Point were not adequately described. The Proponents acknowledged impacts of the use of the Jetty for the FSRU are likely from chlorine, temperature, shading, lighting and tugboat scouring. Each in isolation may have minimal

[73] EES Technical Report A Section 3.2.6

[74] S2871

impact, but the combined or cumulative impacts are not well understood. In the context of impacts to the Western Port Ramsar site and recognition that critical CPS are intrinsically linked, but not well understood, the IAC concludes the EES is significantly lacking in its assessment of the Crib Point marine environment in the Western Port Ramsar site.

The IAC concludes EPR-ME16 should be revised to require further marine biodiversity assessments. Additional assessments would gather additional baseline data, prior to commissioning the GIJW, to benchmark existing conditions and contribute to an GIJW Operations Monitoring and Adaptive Management Plan, including triggers for remedial action.

(iii) Findings

The IAC finds:

- Crib Point is located within Western Port Bay which is widely recognised as an area of high conservation value, a wetland listed under the Ramsar convention, and a wetland of international of international importance.
- 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.
- A number of potential impacts have not been adequately addressed, including:
  - species specific distribution and diversity of seabed and infauna assemblages
  - impact to commercial and recreational fisheries
  - extent of exotic pests
  - extent and distribution of listed species.
- Additional habitat mapping across the Crib Point seabed and Jetty would improve the baseline data against which ecological change can be better understood.
- The assessments and data that inform the EES are not adequate to predict that the direct and indirect, short and long term impacts on marine biota are acceptable.
- The cumulative impacts of the Project to marine biodiversity and the ecological character of Western Port Ramsar were not adequately addressed.

4.3.5 Recommendation

The IAC recommends:

<u>Environmental Performance Requirements</u>

Include the following change:

- **Revised EPR-ME16 (Monitoring Program)**

This change is included at Appendix G.

4.4 Seawater discharge from the FSRU

4.4.1 Background

The regasification of the FSRU would require the pumping of seawater from Western Port Bay, with a natural temperature range of approximately 11°C to 23°C, to heat the LNG from a temperature of minus 163°C to gas at ambient temperature. According to the EES, the FSRU can be operated using three regasification scenarios with differing seawater discharge characteristics as follows:

- Open loop regasification is proposed to occur for 90 per cent of the year. At peak production, open loop would involve the discharge of approximately 468,000 m^3 per day of seawater approximately 7°C colder than ambient.
- Closed loop regasification is an alternative to open loop. This process uses the FSRU's boilers as the source of heat, whereby ambient seawater is heated using steam from gas-fired boilers and recirculated through heat exchangers. At peak production, closed-loop regasification would discharge up to 187,000 m^3 per day of seawater approximately 5°C warmer than ambient. Closed loop is significantly more energy intensive than open loop.
- Combined loop regasification mode operates with similar seawater use as open loop. Seawater is continuously drawn into the FSRU through seawater inlets and the seawater is warmed by heat exchange with steam when the water temperature is close to 10 °C or below. This operational scenario is expected to operate no more than 30 days a year.

Additional discharges of seawater in minor concentrations would occur intermittently, including ballast water (which is taken in and released to maintain vessel stability), a water curtain and fire water testing.

Seawater would be treated by electrolysis to create chlorine, which would prevent growth of biota in the internal pipework and heat exchangers of the FSRU. An estimated concentration of 500 μg/L chlorine would be produced by electrolysis within the FSRU, which would rapidly degrade before discharge. According to the FSRU supplier, the seawater discharged from the six high velocity outlets would contain a residual concentration of 100 μg/L CPO.

In average open loop regasification operating scenarios, the EES reported that two of three regasification trains would discharge 312,000 m^3 per day from the FSRU. Peak regasification would result in a maximum seawater discharge from three trains of 468,000 m^3 per day. Hydrodynamic modelling simulated the dilution and transport of the open loop seawater discharge at the peak production rate (six ports) and at a normal average production rate (four ports) over a typical year to predict the behaviour of the discharged seawater.

The complex hydrodynamic mixing and transport patterns in Western Port Bay were reproduced in near-field models of plume behaviour and development and use of 3-D regional models of dilution and transport. The hydrodynamic modelling indicated that during open loop operation, seawater containing residual chlorine would be discharged as plumes with colder water, which would be denser than the surrounding seawater. Under moderate to strong tidal currents, the plume is predicted to mix with the tidal flow 20 to 40 metres from the FSRU. During low currents, estimated in Western Port Bay during the turn of the tide, the denser discharge plumes would descend and form a pool or 'pancake' of cooler seawater on the seabed. As the current speeds increase, the model predicted the pancake layer thickness would decrease, due to tidal currents stripping the upper layer off the 'pancake', while the currents also push the residual pool along the seabed.

Dilution of the pancake was predicted to occur as the current speed increased. The pancake dilution of 20:1 was reported for the temperature pancake at 20 hectares during discharge when the FSRU and LNC carriers are together. The 20:1 dilution would still apply but the area where dilution would occur (the mixing zone) would be based on the strength of the currents, the nominated Guideline Value (GV) and the discharge concentration.

The GV adopted for temperature change was 0.5□C from ambient, which the EES reported was consistent with the short term variability in water temperature that local biota is

currently accustomed to. During average open loop production, the discharge plume was predicted to be below 0.5□C ambient temperature over a potential impact area of 0.5 hectares under the FSRU. During closed loop, the area of seabed with a seawater anomaly of more than 0.5°C was reported as very small and approximately 50 metre diameter at the rear of the FSRU, corresponding to an area of about 0.3 hectares.

The FSRU would discharge 100 μg/L CPO from its six high velocity ports. The dilution of CPO from 100 μg/L was predicted to reduce to 5 μg/L at the end of the near-field plume. The end of the near-field plume was based on current speeds. At times of moderate to strong north/south tidal currents, the diluting plumes would entrain seawater in the tidal currents flowing across the path of the plumes. After a travel distance of about 40 metres, the plumes would be mixed vertically and be mixed into the tidal currents.

A default CPO GV for 99 per cent marine species protection was calculated by Commonwealth Scientific and Industrial Research Organisation (CSIRO) at 2.2 μg/L. This concentration of CPO was suggested to protect all but 1 per cent of exposed marine species in situations where the concentration is:

- relatively constant over time
- predominantly chlorine compounds.

The EES suggested a GV of 6 μg/L CPO as a TAC over a 12 hour tidal cycle in Western Port Bay. The tidal cycle includes six hours each for an incoming and outgoing tide, with an hour of slack water between.

Seawater discharged from the FSRU during peak operation while an LNG carrier is moored adjacent was identified as the worst case operating scenario. Under the worst case scenario, the discharge plume would extend five hectares from the FSRU before the GV of 6 μg/L CPO as a tidally averaged concentration was achieved. Colder water was modelled to extend for 20 hectares before the GV of 0.5□C was achieved. The Proponents committed to avoid seawater discharge under the worst case scenarios when an LNG carrier is unloading LNG and during slack tides.

Irrespective of GV for temperature and chlorine, a mixing zone will be required where the defined GV or environmental quality objectives for CPO and temperature may be exceeded and beneficial uses may not be protected. Beyond the defined mixing zone, it is expected that environmental quality objectives will be achieved. A Works Approval is required for the FSRU, and a licence would be required prior to operations commencing. In accordance with SEPP (Waters), the EPA would be responsible for approving the extent of the mixing zone.

4.4.2 Chlorine

(i) Evidence and submissions

The Proponents submitted the FSRU supplier recommended electrolysis to achieve a chlorine dose of 500 μg/L and prevent biofouling of heat exchangers and the pipe network in the FSRU. The FSRU suppliers indicated that, following treatment, a residual chlorine concentration of 100 μg/L would be discharged from the FSRU. As stated in the EES, the electrolysis process converts the chloride ions (Cl-) in seawater to hypochlorite ion and hypochlorous acid, which further react rapidly with bromine in seawater to form hypobromite ion and hypobromic acid, known as CPO.

The majority of submissions raised chlorine discharge into Western Port Bay as the most significant issue associated with the marine impacts of the Project. The CEG and others

submitted the impacts from the FSRU are environmentally unacceptable due to the discharge under peak regasification of 468,000 m^3 per day of chlorinated and cooled seawater. They raised concerns the Project would have substantial adverse effects on biodiversity and the overall functions, values and beneficial uses of Western Port Bay. The CEG submitted the '*seawater would impact a range of flora and fauna that inhabit the area, compromising the intertidal mudflats, seabeds, the water column, and the air*' [75].

The evidence of Mr Chidgey was that CPO are short lived and the strong tidal currents would effectively dilute the CPO within close proximity to the FSRU. Using internationally recognised methods to derive default GV, CSIRO undertook work to derive short term default GV's for CPO of 2.0 μg/L and 7.3 μg/L for 99 per cent and 95 per cent marine species protection respectively. The outcome of this work was provided in Annexure A-A to Technical Report A, which stated the GV's can be applied '*at and beyond the boundary of a mixing zone in situations where the concentration at the boundary is relatively consistent over time*'.

In Annexure A-A, CSIRO noted:

> A 99% species protection short-term GV of 6.0 μg/L should apply to CPO concentration at and beyond the boundary of a mixing zone where concentration at the boundary of a mixing zone is intermittent or variable over time such as North Arm of Western Port.

The Proponents presented 6 μg/L as the time averaged concentration (TAC) and the site specific GV for 99 per cent species protection in Western Port.

The CEG cross examined the marine experts for the Proponents regarding the acceptability of a GV of 6 μg/L for Western Port Bay and its application as a TAC over a 12 hour tidal cycle. The CEG expressed concern with the interpretation and application of the GV for the purpose of extrapolating discharge impacts from the FSRU and the extent of the mixing zone. Dr Wallis confirmed the hydrodynamic model predicted instantaneous concentrations in the field every 10 minutes and then averaged the concentrations over a 12 hour period. This was then compared to CSIRO's GV of 6 μg/L to determine the extent of the dispersed seawater plume.

The CEG submitted that 6 μg/L should be considered as an instantaneous peak value, which it claimed changed the basis on which the Proponents marine experts formed their views. The CEG tabled an email to Professor Cook, containing advice from one of the CSIRO authors, Dr Batley, which indicated that '*the value of 6 μg/L refers to an instantaneous concentration on the assumption that where there is intermittent exposure, a time averaged concentration will be nearer to 2 μg/L*' [76]. The CEG submitted it was not appropriate to use a TAC of 6 μg/L as a GV. Mr Chidgey agreed, that based on this advice, the TAC should instead be 2 μg/L instead of 6 μg/L. Dr Wallis acknowledged that if the 2 μg/L GV is to be applied, the chlorine impact zone is extended.

Dr Wallis submitted additional advice from Dr Batley that the derived default GV was 2.2 μg/L for 99 per cent species protection, and from a regulatory perspective should be applied at the edge of a mixing zone [77].

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Dr Batley noted the default GV was based on exposure of test organisms to a relatively constant chlorine concentration. He indicated the derived default GV was conservative and did not consider the rapid degradation that would occur in the field and diluting effects to other products such as chloramine and brominated compounds (e.g. bromoform, which he noted has a lower toxicity). He further described that '*application of a TAC-based GV would require validation based on sampling and analysis, eg. every 2 h and calculation of a TAC to characterise the concentrations that may result in biological effects*' [78].

Submitters raised concerns with the GV as the CPO discharge from the FSRU would be continual and the marine water quality guidelines outlined by CSIRO were derived using test species exposed over a short term, generally three to seven days [79]. There was criticism the default GV was based on marine species endemic to the northern hemisphere. It was submitted by a number of parties the default GV are concentrations assumed to protect species under short term, acute pulse doses.

The CEG cross examined Mr Chidgey and Dr Wallis on the interpretation of acute compared with chronic exposure. Dr Wallis confirmed the hydrodynamic model predicted that exposure to the seabed above 1 μg/L CPO under the FSRU could be experienced for approximately 50 per cent of the time every 24 hours, continuously over the 28 day modelled period.

Mr Chidgey accepted that chronic toxicity is defined as an effect that occurs following exposure to an organism for a considerable proportion of its lifespan, according to Warne et al and a substantial portion of an organism's life span is typically greater than 10 per cent [80]. Mr Chidgey noted that as CPO is short lived and non-persistent, chronic GV were deemed irrelevant.

Dr Batley noted during his work to derive the default GV for CPO (Annexure A-A): '*many of the test data sets had endpoints derived over durations >96 hours, this is expected to provide suitable protection from longer-term chronic effects lasting a significant portion of an organism's life span*' [81].

The CEG highlighted Annexure A-A that referenced unrelated studies in which chronic GV's were suggested concentrations for 95 per cent species protection and 99 per cent species protection of 0.9 μg/L CPO and 0.03 μg/L CPO, respectively. Mr Chidgey accepted that chronic GV are expected to be lower than acute GV and gave evidence that if a toxicant is not accumulative, then chronic toxicity may not be displayed at lower concentrations deemed acutely effective.

Professor Cook gave evidence the GV is based on chronic toxicity. He stated the derivation of a GV is usually a default standard that is a starting point without considering site specific conditions. He advised the derived GV is appropriate for determining acute toxicity

78 D395 Annexure

79 Technical Report A Annexure A-A

80 Warne MStJ, Batley GE, van Dam RA, Chapman JC, Fox DR, Hickey CW and Stauber JL 2018. Revised Method for Deriving Australian and New Zealand Water Quality Guideline Values for Toxicants – update of 2015 version. Prepared for the revision of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra, 48 pp.

81 D395

following short term exposure or pulse dosing. He noted that given there is a constant supply of CPOs from the FSRU, the exposure regime of the Project should be considered chronic. His evidence was that a zone would exist where sedentary organisms would experience a variable but continuous exposure to CPO for the life of the Project. He concluded exposure should be considered chronic to sedentary organisms within the discharge plume.

The Proponents predicted that for the open loop operation at full production, there would be no zones with a tidally averaged concentration exceeding 2.0 µg/L. The highest tidally averaged concentration contour on the seabed for open loop operation at full production was reported at 1 µg/L CPO [82].

Dr Wallis and Mr Chidgey indicated the total area of the chlorine impact zone for a minimised mixing zone is three hectares (including open and closed loop operations) considering a GV of 2 µg/L. This was reported as smaller than the five hectare 'chlorine impact zone' originally presented in the EES. Dr Wallis added:

> As the CPO in the pancake is mostly bromoform and bromine compounds, a GV for CPO based on chlorine tests has a large margin of safety [83].

He noted the assessment of biodiversity risks for different habitats had regard to the impact zone defined using a 24-hour average GV for CPO of 6 µg/L and that it matched the definition of 'short term' as advised by CSIRO.

The marine experts and the Proponents indicated CPO will have an impact within the mixing zone. Dr Wallis and Mr Chidgey concluded that '*whether a tidally-averaged GV of 2 µg/L or 6 µg/L is used, the chlorine impact zone for the project will be within the port zone and well away from seagrass, intertidal zones, mangroves, reefs and saltmarsh*' [84].

Dr Wallis agreed there will be an adverse effect on infauna within the chlorine impact envelope, possibly out to the extent of the temperature impact envelope. He indicated he did not expect a measurable impact beyond the plume envelope. The degree of impact remains unconfirmed. Technical Report A (Section 6.2.1) notes that chlorine will stress infauna communities resulting in composition changes, similar to changes noted on the Bass Strait seabed at the Wonthaggi desalination plant's brine discharge location.

(ii) Discussion

The modelling of the FSRU seawater discharge was undertaken on the basis that the concentration of chlorine or CPO within the seawater at the point of discharge would be 100 µg/L. The Proponents contended an instantaneous exposure to CPO levels up to 100 µg/L would have a negligible impact.

The IAC accepts that reductions in chlorine concentrations would be driven by the discharge velocity from the designated discharge ports and the effect of tidal currents which would result in a mixing zone extending three hectares from the FSRU, where species protection would not be guaranteed.

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There was debate between the experts on the efficacy of whether 2 μg/L or 6μg/L should be deemed the more appropriate GV for Western Port Bay. The IAC acknowledges the Mornington Peninsula and Bass Coast submission that a precautionary approach should be applied where there is potential for impact in a sensitive environment such as Western Port Bay. As such, the IAC considers that a TAC of 2 μg/L CPO is more appropriate than 6 μg/L.

The Proponents submitted a time averaged chlorine concentration over the 12 hour tidal cycle is applicable: '*plumes are episodic, resulting from the diluting pancakes of seawater discharge being carried away from the FSRU by the flood and ebb tidal currents, respectively*' [85].

The Proponents described at length the discharge results in short term acute exposure, which is a short lived pulse dosing scenario influenced by the strong tide and currents diluting chlorine in the vicinity of the FSRU. Discharge of chlorine at 100 μg/L would result in plumes of CPO extending a distance from the FSRU, either over the seafloor or through the water column. The Proponents submitted that plumes are episodic, resulting from the diluting 'pancakes' of seawater discharge being carried away from the FSRU by the flood and ebb tidal currents. The IAC notes the average rate of regasification occurs for about 90 per cent of the year.

The FSRU would discharge a continuous concentration of chlorine into the marine waters resulting in benthic biota within the plume being consistently exposed every other 6 hours for the life of the Project. The IAC considers this to be more akin to chronic exposure, rather than acute exposure.

The IAC recognises the extent of work completed by the Proponents' marine experts to describe the behaviour of CPO once it is discharged from the FSRU. They described that while the chlorine concentration at the seabed would vary throughout the tidal cycle, the tidally averaged concentration at all locations on the seabed was predicted to be below that identified as achieving species protection.

Annexure A-A referenced Batley et al that reported [86]:

> Acute toxicity tests usually (but not necessarily) measure lethality and are appropriate in cases of a spill event, or pulse exposures as can occur with pesticides in rivers, or where contaminants are short-lived and non-persistent due to dispersion, volatilisation or degradation. The minimum exposure period is generally 96 hours, but there might be circumstances where a lesser exposure time is relevant.

There was general consensus amongst the marine experts that chronic toxicity occurs at lower concentrations than acute toxicity. Longer exposure results in greater toxicity at lower concentrations. Chlorine discharged from the FSRU is short lived but continuously discharged. This was referred to in evidence as a press dose (chronic, continuous) contrasted with pulse dose (short term, intermittent). Chronic toxicity is usually based on a 10 per cent effect concentration, referred to as EC10. The IAC is concerned the permanent cyclical exposure to benthic biota in the vicinity of the FSRU for the life of the Project reflects a press dose consistent with chronic exposure, rather than a pulse dose.

[85] Technical Report A Section 6.5.5

[86] Batley, G.E., van Dam, R.A., Warne, M.St.J., Chapman, J.C., Fox, D.R., Hickey C.W. and Stauber, J.L. (2018)

The IAC notes Annexure A-A reported that sea urchin early life stages were the most sensitive test species to CPO (Annexure A-A) with acute toxicity reported at 6 μg/L. The IAC notes in Annexure A-A, Batley and Simpson observed chronic toxicity to sea urchin larvae would be likely after more than one hour exposure. The IAC is concerned about this, as sea urchins are endemic to Crib Point and important within the marine ecosystem, early life stages could be directly impacted by chlorine at concentrations discharged by the FSRU.

It was noted by the Proponents that Crib Point is within Port waters and within a slightly to moderately disturbed ecosystem. The Proponents suggested a 95 per cent species protection GV could be considered relevant as the area within the impact zone has been historically disturbed by Port related activities including dredging and seabed levelling.

The IAC considers this argument may be applicable if the proposed site was within a port environment that was not within a Ramsar wetland. As Crib Point is within a significant Ramsar conservation area, a level of 99 per cent species protection should prevail in accordance with the WQ Guidelines [87]. The WQ Guidelines note highly valued ecosystems in their unmodified state with outstanding natural and conservation values, should typically have no change in biodiversity beyond natural variability. Where possible, the aim should be no change in water/sediment chemical and physical properties, including toxicants.

The suggested default GV for CPO was derived for inclusion in the WQ Guidelines. At the time of the IAC's report, the devised default GV had yet to be adopted as the default CPO GV for marine waters.

The IAC believes that to understand the implications of the continuous discharge of CPO from the FSRU, tailored ecotoxicity tests should be conducted with marine species endemic to Western Port Bay. Ecotoxicity testing should be performed whereby test species are exposed to CPO for periods of seven days or more, to understand chronic exposure responses.

The IAC concludes that the following changes to the EPRs are necessary:

- EPR-ME02 should be amended to require a maximum discharge concentration of 2 μg/L CPO from the FSRU, a maximum mixing zone extending 10 metres from the FSRU's high velocity discharge ports, avoid discharge for one hour either side of slack tide and discharge no more than a 7□C variation in temperature compared to in situ conditions.
- EPR-ME04 should be amended to specify discharge from the FSRU discharge ports is prohibited when an LNG carrier is moored adjacent the GIJW and one hour before and after slack tide.
- EPR-ME16 should be amended to require ecotoxicity testing under chronic exposure conditions.

(iii) Findings

The IAC finds:

- The extent of the chlorine plume and its dilution efficacy have not been adequately demonstrated, and the extent and persistence of residual chlorine or chlorine by-products are unknown.

[87] https://www.waterquality.gov.au/guidelines/anz-fresh-marine

- Indirect impacts of CPO to the marine environment are not well understood and although it readily disperses in seawater, evidence indicates that the spatial and temporal extent of CPO and its derivatives can persist within the marine environment well after discharge.
- The discharge of chlorine from the FSRU, a recognised toxicant, will result in an unacceptable impact to marine biodiversity.
- Direct impacts of discharge are expected to be localised to waters immediately around the vessel.
- The default CPO GV has been derived using widely recognised methods which provide a sound understanding of likely CPO toxicity to a range of marine species in conditions of short term, acute exposure.
- The long term discharge for the life of the Project should be considered as chronic exposure instead of pulse dose, of which impacts are usually expressed at lower concentrations than acute toxicity responses.
- The long term impacts of CPO and continuous discharges have not been adequately predicted.

4.4.3 Chlorine Produced Oxidants and by-products

(i) Evidence and submissions

Evidence from the Proponents' marine experts described the highly reactive behaviour of CPO and brominated oxidants in seawater. Dr Wallis submitted that following discharge:

> … *in the North Arm of Western Port, the modelled concentration is not constant, as it varies with the speed of the tidal current and with the path of the diluting plume, which changes direction through the tidal cycle* [88].

The Proponents marine experts were confident that residual chlorine or CPO would quickly convert through a series of reactions back to the natural seawater salts, chloride and sodium.

The Proponents submitted that bromine products would be created in the discharge and convert back to the natural seawater salt bromide, and there would be no long term accumulation of chlorine or related products. Bromine products were reported in the EES as much less toxic than chlorines and naturally distributed in the marine environment. The Proponents suggested background bromine concentrations in the marine waters of Western Port Bay were assumed to be 1-3 μg/L [89].

Professor Cook gave evidence that in the presence of bromine and organic matter brominated organic compounds (BOC) are created. BOC are found in chlorine treated water, which are dominated by concentrations of bromoform and other brominated compounds including tribromethane, dibromoacetic and tribromophenol. Professor Cook noted the risk of acute toxicity of BOC in chlorinated heat exchanger outlets was low.

Mr Chidgey's evidence in reply to Professor Cook was that BOC, including tribromethane, dibromoacetic and tribromophenol, were much less toxic than CPOs [90]. Mr Chidgey

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89 Technical Report A Section 7.8.25
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indicated the background concentrations of BOC in Western Port is expected to be 0.2 μg/L, and naturally occurring in the marine environment. He suggested the Transplanted Mussel Monitoring in EPR ME16 would provide a measure of the CPO and BOC accumulation potential during operation of the FSRU and '*monitoring HPBs would be an important and interesting component of a monitoring program'.*

During cross examination of Mr Chidgey and Dr Wallis, the EPA referenced Boudjellaba et al which reported that CPO were elevated in seawater and fish within an industrialised bay in France housed multiple chlorinated discharges, including two FSRUs, a position also referenced by the CEG.

Professor Cook suggested sediment accumulation could be a chronic exposure pathway of TBH. During cross examination of Professor Cook, Mr Townshend questioned his assumptions that accumulation of TBP would be an issue in sediment exposed to discharges from the FSRU. The Proponents submitted that sediment results at Crib Point Berth 2 indicated low total organic carbon (TOC) concentrations and bioaccumulation potential of CPO TBP in sediment could be considered negligible.

(ii) Discussion

The IAC recognises the effects of CPO to the Ramsar site are not well understood. Professor Cook's evidence indicated there could be a wide spectrum of halogenated organic compounds produced in the event chlorine discharged from the FSRU reacts with organic matter in seawater. The IAC considers their potential occurrence in the marine environment and potential impacts have not been adequately studied for the purpose of the EES.

The IAC notes Dr Wallis stated in evidence there will be some bioaccumulation of brominated contaminants in the food chain and there would be an expectation of some uptake by local infauna, which will pass on to starfish, crabs, prawns and small fish that eat infauna.

Annexure A-A noted there have been few studies that examined the toxicity of chlorine reactive products, including bromoform and chloroform. The toxicity of chloroform and bromoform produced by reactions with organics was described in Annexure A-A as '*moderate to high'*.

Evidence indicated that residual chlorine is likely to extend much further than a defined mixing zone. Bromoform was measured at concentrations higher than background concentrations of 1-3 μg/L reported in the EES. The IAC acknowledges the site in France (referenced by the EPA to Boudjellaba) appears more industrialised than Western Port Bay and a number of CPO sources exist, however, this study indicated CPO has the capacity to be persistent.

The EES described that naturally elevated CPO derivatives, such as bromides occur in the marine environment, which the Proponents asserted to be naturally produced by marine biota. The EES suggested background bromine concentrations in marine waters of Western Port Bay was assumed to be 1-3 μg/L, although there was no evidence to confirm this.

The IAC notes the EES does not consider in detail that naturally occurring bromine derivatives are produced by marine biota in minute concentrations (less than residual concentrations discharged from the FSRU) and these compounds are produced as a defence to protect organisms from natural biofouling. The IAC considers the EES would have

benefited from reporting the background concentrations of CPO and derivatives within Western Port Bay.

Professor Cook's evidence indicated there to be a wide spectrum of halogenated organic compounds (HOC) produced when chlorine reacts with organic matter in seawater. The IAC agrees their potential occurrence in the marine environment and potential impacts are poorly understood. Mr Chidgey attempted to provide context about their occurrence by citing scientific literature indicating low to very risk of chronic toxicity, but the IAC considers the risks of HOCs to Western Port Ramsar wetland from the FSRU is not immaterial.

The FSRU is located within proximity to intertidal mudflats and seagrass, and the threat of residual chlorine to Western Port Bay sediment and water was not well explored. The risk was deemed negligible without sufficient supporting evidence. Dr Wallis recognised there may be accumulation in sediment, but this was not explored further. The IAC acknowledges that marine sediment sampled to understand potential contamination at Berth 1 and 2 (EES Technical Report E) indicated heterogeneity in TOC which varied between 600 mg/kg to 6800 mg/kg across the twenty sediment samples taken at Berth 2. Bioaccumulation potential of TBP in sediment at Crib Point is not well understood and should be explored further.

The IAC concludes the impacts to Crib Point from continual discharge of CPO from the FSRU is not adequately understood, particularly the background concentrations in Western Port Bay, and the bioaccumulation potential in sediment and tissue of exposed biota. The monitoring program in EPR-ME16 should be amended to improve the transported mussel monitoring program, increasing the frequency of tissue analysis and to monitor CPO, including brominated and chlorinated organics in the analytical suite.

(iii) Findings

The IAC finds:

- Though it might occur naturally, evidence indicates the spatial and temporal extent of bromine as a derivative of CPO can persist in marine waters and tissue of biota in areas with chlorinated discharges.
- Indirect impacts of CPO and its reactive by-products to the marine environment have not been adequately explored in the EES. In particular, TBH is known to accumulate in sediment and tissue and long term impacts at Crib Point are unknown.
- The discharge of CPO will result in an unacceptable impact to marine biodiversity of the Western Port Ramsar site.

The IAC recommends:

<u>Environmental Performance Requirements</u>

Include the following change:

- **Revised EPR ME16 (Monitoring Program)**

This change is included at Appendix G.

4.4.4 Water temperature

(i) Evidence and submissions

The Proponents submitted that during open loop operation, the FSRU would discharge seawater through the six high velocity discharge ports 7□C below ambient seawater temperature. They advised that when ambient temperatures are at 10□C or lower, the FSRU must operate in combined or closed loop mode. As a consequence, discharged seawater would be around 5□C warmer than ambient water temperatures during closed loop operation. The original worst case scenario modelled temperature changes extending 20 hectares during discharge with an LNG carrier moored adjacent. The Proponents committed to avoiding discharge from the six high velocity ports when the LNG carrier is moored adjacent to the FSRU and during slack tide. They submitted this will significantly reduce the extent of the plume and mixing zone.

The option supported by Dr Wallis to locate two of the six discharge ports on the west side of the FSRU and discharging to the west was considered to improve dispersion when an LNG carrier was moored adjacent. The option of amending the discharge port design was later disregarded by the Proponents.

The Proponents submitted the cold discharge plume would descend rapidly through the water column, slowing as it mixes with ambient seawater. Plumes would be rapidly mixed at times of medium to strong tidal currents. They submitted that temperature changes would vary between 0.5 – 1.0 degrees below ambient levels under open loop which will operate 90 per cent of the year. Dr Wallis gave evidence that '*the temperature limit (Guideline Value) has an averaging time of 30 minutes (short-term average concentration > 0.5 °C)'* [91].

Submissions raised concerns there was lack of understanding of seabed benthic biota impacts from temperature changes. The discharged plumes of cooler seawater were reported as denser than adjacent seawater and would descend to the seabed (TN07). The Proponents acknowledged that temperature changes would extend over the seabed over a greater area than the chlorine plume but contact with the seabed would be more pronounced during low currents and periods around slack tide.

The Proponents argued that impact would be localised to less than 1 per cent of the channel seabed habitat in the Lower Arm and 0.11 per cent of channel subtidal habitat in Western Port.

During cross examination of the Proponents' marine experts, the EPA referenced Boudjellaba et al and elaborated the paper indicated colder water as a surface layer may act as a thermal barrier, reducing the volatilisation potential of CPO [92]. Influences on temperature to CPO degradation was also recognised by Batley and Simpson (2019) [93].

Mr Chidgey acknowledged that colder waters in Western Port may reduce the volatilisation potential of CPO in deeper waters. He agreed it may be possible that the colder waters in

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92 Zeng, J., Jiang, Z., Chen, Q., Zheng, P. and Huang, Y. (2009). The decay kinetics of residual chlorine in cooling seawater simulation experiments. Acta Oceanologica Sinica, 28, 54-59.

93 Batley, G.E and Simpson, S.L (2019). Short term Guideline Values for Chlorine in Marine Waters. Environmental Toxicology and Chemistry, Vol.39 No.4 pp.754-764

Western Port may cause bromoform to persist longer than the approximate 28 hours reported in Boudjellaba. He further indicated the assessment of the risks of bromoform and other brominated compounds in Western Port may require further consideration if the derived GV had not considered toxicity under colder temperatures.

The Proponents submitted risks to sensitive environs from temperature changes were low to very low as impacts are localised and during medium to strong currents, the colder water would dissipate rapidly. Risks to mangroves, seagrass, saltmarsh and intertidal mudflats were presented as negligible as these habitats are one kilometre from the FSRU. Intertidal mudflats are approximately 500 metres west of the FSRU. Temperature changes were likely to be expected on the seabed within the immediate vicinity of the plume.

Modelling to inform the EES indicated the temperature plume extended most dramatically when the LNG carrier is moored adjacent to the FSRU and when the FSRU is operating at maximum capacity. Under this operating scenario, a maximum seabed area of approximately 20 hectares would be impacted by reduced temperature, with the plume being more pronounced around slack tide. The Proponents advised the FSRU would cease discharge when the LNG carrier was moored alongside.

The Proponents acknowledged that formation of a pancake of cooler seawater on the seabed would have an impact on seabed epibiota and infauna during periods of reduced currents and slack tide. The extent of impact has not been quantified as the heterogeneity of the seabed assemblages were yet to be assessed. Species specific tolerances to temperature changes are not understood for benthic biota of Western Port Bay.

The Proponents committed to avoiding discharge from the FSRU during periods of slack tide and this was included as an amendment to EPR-ME02.

(ii) Discussion

The IAC considers Technical Report A Annexure A-A and Boudjellaba confirmed the risk of CPO appeared to be elevated within colder waters. This information suggested that chlorine volatilisation is contingent on temperature, with colder waters reducing the decomposition potential of CPO. Technical Report A Annexure A-A notes '*the higher the water temperature, the faster the reactions and the reduction in chlorine concentration*'.

Annexure A-A reported Zeng et al that *'noted that in summer, the CPO had fully decayed before discharge, whereas in winter, the CPO decomposition was slower and might be incomplete'* [94].

The EES reported that Western Port Bay has a wide water temperature ranging from 10□ C to 24□ C. The seasonal influence on CPO degradation in Western Port Bay was not considered in the hydrodynamic modelling that simulated the dispersion of the plumes. The IAC considers information about the behaviour of chlorine under varying water temperatures is lacking in the EES.

Water temperature is critical to the reproduction of marine biota. A number of marine species use temperature cues to initiate reproduction, with elevated temperatures during spring and summer starting mass spawning and increased reproductivity. This is consistent

94 Zeng, J., Jiang, Z., Chen, Q., Zheng, P. and Huang, Y. (2009)

with the elevated plankton concentrations reported in the EES during spring and summer. Discharge from the FSRU when an LNG carrier is moored adjacent was reported to create colder water across an area of 20 hectares during maximum production. The IAC supports the commitment from the Proponents to cease seawater discharge when the LNG carrier is present and during periods of slack tide.

The EES reported large heterogeneity of seabed biota and sensitivity of species exposed to temperature variation, particularly during periods of fertility, was unknown. Temperature can alter the reproductive capacity of a number of species if the plume extended to the seabed. This is a particular concern for the Lamp shell which was described in evidence from Dr Edmunds to exist only in the Crib Point area, with increased abundance around Berth 2. He indicated that Lamp shells do not exist anywhere else but Western Port Bay. The sensitivity of Lamp shells to chlorine and colder water is not well understood.

The effects of the cooler seawater discharge was reported in the EES as confined to the marine ecosystem components around the Jetty, with negligible consequences to roosting and feeding habitats of waterbirds and wading birds, intertidal mudflat, seagrass, mangrove and saltmarsh habitat and associated communities. The IAC accepts that it is unlikely that colder water will extend to intersect with the more sensitive intertidal habitats at Crib Point.

Even though closed loop mode is estimated to be used no more than 30 days a year, the impact of increased temperature during winter months should have been further considered in the EES.

The IAC agrees that Jetty and seabed epibiota and infauna assemblages would be most exposed to CPO and colder waters discharged from the FSRU but is not satisfied that species specific sensitivity was adequately quantified. The IAC believes the EES should have considered the combined effects of chronic exposure to CPO and the effect of cooler waters to a range of species under conditions of continual pulse dosing for periods greater than seven days. Test species should be consistent with epibiota and infauna species endemic to Crib Point. This is lacking and creates additional uncertainty.

The IAC concludes the following changes to the EPRs are necessary:

- EPR-ME02 be amended to require a maximum discharge concentration of 2 μg/L CPO from the FSRU, a maximum mixing zone extending 10 metres from the FSRU's high velocity discharge ports, avoid discharge for one hour either side of slack tide and discharge no more than a 7□C variation in temperature compared to in situ conditions.
- EPR-ME16 be amended to require regular monitoring and recording of water flow rate and temperature discharge from the FSRU and monitoring at the edge of the mixing zone.

(iii) Findings

The IAC finds:

- Avoiding discharge from the FSRU when the LNG carrier is unloading and during periods of slack tide will avoid the plume extending at distances across the seafloor.
- Cold water dilution is more efficient during moderate to strong currents.
- The influence of colder waters on CPO has not been adequately explored in the EES and warrants further analysis.

- The continual discharge of cooler water for the life of the Project, coupled with CPO discharge, would result in an unacceptable impact to Western Port Bay.
- In isolation, the cold water discharged from the FSRU is unlikely to result in an unacceptable impact to the marine biodiversity, if discharges avoid periods of low currents and slack tides.

(iv) Recommendations

The IAC recommends:

Environmental Performance Requirements

Include the following changes:

- **Revised EPR-ME02 (Seawater discharge)**
- **Revised EPR-ME04 (Use 6 port design to increase mixing)**
- **Revised EPR-ME16 (Monitoring program)**

These changes are included at Appendix G.

4.4.5 Alternative chlorine discharge concentrations

(i) Evidence and submissions

The IAC directed the Proponents to provide advice on whether a CPO discharge concentration of 2 μg/L was feasible. This concentration reflected the default GV of 2.0 CPO mg/L derived by CSIRO for 99 per cent species protection. The Proponents responded in TN53, which described options to discharge 20 μg/L CPO from the FSRU instead of the proposed 100 mg/L. TN53 described options to manage seawater and discharge of 20 μg/L CPO from the FSRU.

The Proponents claimed it would be technically feasible to reduce the chlorine discharge, but it was not practicable at all times when the FSRU is operating. TN53 suggested that limitations exist precluding the efficacy of alternative chlorine treatment and discharge regimes. TN53 stated '*a reduction in chlorine discharge to 20 μg/L is technically feasible and has consequences for maintenance and operation*'.

Mr Chidgey and Dr Wallis agreed that mechanical cleaning would benefit the marine environment by reducing the chlorine dosage requirements.

TN53 did not consider a chlorine discharge concentration from the FSRU less than 20 μg/L. In response to the IAC's direction to consider a discharge concentration of 2 μg/L, the Proponents asserted that it was not feasible to operate the FSRU under this condition. The IAC questioned the ability to dechlorinate prior to seawater discharge. The Proponents advised it was not an option due to the large volumes of seawater requiring treatment prior to discharge.

TN53 presented two options for chlorine discharge considered by the Proponents to be practicable for the operation of the FSRU. They were included in EPR ME02:

> **Option 1 – Varying chlorination rate at point of discharge**
>
> Except as approved or required by the EPA, the OEMP must include requirements that seawater discharges from the regasification system must:
>
> - have a chlorine residual concentration of up to 0.1mg/L other than at Slack Tide
> - have a chlorine residual concentration of 0mg/L during Slack Tide

- not exceed a tidally averaged chlorine residual concentration of 0.0022mg/L beyond a distance of 100 metres from the FSRU
- not exceed a temperature variation of 7°C from ambient

Note: The time of Slack Tide is half an hour either side of high tide or low tide at Crib Point. High tide and low tide at Crib Point are to be calculated by reference to the BOM Victorian Tide Tables or other source to the satisfaction of the EPA.

Option 2 – Constant chlorination rate at point of discharge

Except as approved or required by the EPA, the OEMP must include requirements that seawater discharges from the regasification system must:

a. have a chlorine residual concentration of 0.02 μg/L
b. not exceed a tidally averaged chlorine residual concentration of 0.0022 μg/L beyond a distance of 100 metres from the FSRU;
c. not exceed a temperature variation of 7°C from ambient.

The Proponents submitted they had consistently recognised their obligation to minimise any area of impact to the extent practicable, and to implement mitigation measures to this effect. They advised that eliminating chlorine at and around slack tide was considered superior to the constant chlorination option, given the extent to which tidal currents influence dispersion. They submitted either option demonstrated their willingness to implement measures to minimise potential impacts beyond objective tests of acceptability.

In cross examination of the Proponents' marine experts, the EPA noted the FSRU approved in Port Kembla was granted an Infrastructure Approval in accordance with the NSW *Environment and Planning Assessment Act 1979* to discharge 20 μg/L Total Residual Chlorine '*under the full range of operating conditions and during all seasons'.* The EPA referred to a FSRU in Croatia that had been configured to apply mechanical cleaning as an alternative to chlorine.

(ii) Discussion

During the Hearing, alternative seawater discharge conditions were presented by the Proponents. The worst case operating scenario for the FSRU was predicted during seawater discharge from the six ports to the east when the LNG carrier was moored adjacent and the FSRU was operating at peak regasification. The Proponents confirmed seawater would not be discharged from the FSRU high velocity ports during periods when an LNG is moored adjacent, and as a consequence they claimed the impact zone is considerably reduced by avoiding discharge at these times.

It was noted during evidence that a number of FSRUs are in operation across international waters. Details of these vessels were not presented to the IAC. The Proponents' marine experts advised they were aware of alternative FSRUs but were unable to elaborate on alternative options as their scope of work did not require investigating alternatives to chlorine.

The IAC requested the Proponents consider whether it is technically feasible to operate the proposed FSRU to achieve a zero chlorine discharge rate, or an absolute maximum of 0.002 mg/L (2 μg/L), at the point of discharge. The Proponents submitted there were constraints in the use of alternative technologies to electrolysis for biofouling prevention [95]. The

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Proponents advised they were not aware of any operating FSRU or comparable land-based facility using seawater that is operated to achieve a chlorine discharge of 0 μg/L.

The IAC is cognisant there are alternatives to discharging 100 μg/L CPO from the FSRU, such as mechanical cleaning as proposed in the FSRU at Krk Island, Croatia and the maximum discharge of 20 μg/L TRC approved for the Port Kembla FSRU. The IAC considers an FSRU within Western Port Bay needs to adopt best practice and avoid CPO discharge. It is evident from FSRU's operating elsewhere that discharge of 100 μg/L CPO cannot be considered best practice.

While the IAC considers the amendments to EPR-ME02 are superior to the original Day 1 version, it considers a maximum concentration of 0.002 mg/L or 2 μg/L of CPO should be discharged from the FSRU. The concentration of 2 μg/L is based on the derived GV of 2 μg/L to protect 99 per cent of marine species.

(iii) Findings

The IAC finds:

- Discharge of chlorine into Western Port Bay will result in an unacceptable impact.
- Avoiding or reducing the discharge of chlorine to a maximum concentration of 2 μg/L CPO would appropriately protect the receiving environment.
- Some FSRU's proposed in marine waters within Australia and Croatia propose lower or no chlorine discharges, indicating the FSRU proposed for Western Port Bay should be optimised to avoid chlorine entering the Ramsar wetland.

(iv) Recommendation

The IAC recommends:

Environmental Performance Requirements

Include the following changes:

- **Revised EPR- ME02 (Seawater discharge)**

This change is included at Appendix G.

4.4.6 Compliance with SEPP (Waters)

(i) Evidence and submissions

Submitters expressed concern the discharge from the FSRU does not comply with the requirements of SEPP (Waters), particularly Clause 22(3). The Proponents, in introducing the marine evidence, said *'the impacts are reasonable in the context of the environmental objectives of SEPP (Waters)'* [96].

Clause 23 (2) of SEPP (Waters) states:

> The Authority must not approve a mixing zone which, according to tests approved by the Authority, will result in any of the following –
>
> (a) acute lethality at the point of discharge;

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(b) chronic toxicity outside the mixing zone;

(c) risks to beneficial uses at the boundary of the mixing zone;

(d) harm to humans;

(e) harm to plants or animals;

(f) loss of aesthetic enjoyment;

(g) objectionable odour.

Clause 22(3) of SEPP (Waters) states:

> The Authority must not approve an application for a new wastewater discharge to surface waters in the following areas unless the Authority is satisfied that the wastewater discharge will be consistent with the requirements of clause 25 –
>
> (a) aquatic reserves;
>
> (b) waters of high conservation value as set out in Schedule 5;
>
> (c) wetlands or estuaries segments.

Clause 25 states:

> The Authority may approve an application to discharge wastewater to surface waters to provide water for the environment or other uses, if –
>
> (a) the Authority is satisfied that the wastewater can be treated and managed to a level to protect beneficial uses, and
>
> (b) the waterway manager (if applicable) is satisfied that the discharge is consistent with environmental flow requirements.

SEPP (Waters) allows discharge into areas of high conservation value if discharge provides a net benefit to the receiving environment. During cross examination by the EPA, the Proponents' marine experts agreed there is sufficient seawater in Western Port Bay and there is no need to supplement supply with additional water. Mr Chidgey acknowledged the seawater discharge does not provide a net benefit to the environment or waters at Crib Point.

In closing, the Proponents concluded impacts on the marine environment will be minimised to the extent practicable and in accordance with best practice and with SEPP (Waters).

(ii) Discussion

The IAC recognises an objective of SEPP (Waters) is to achieve water quality that is suitable to achieve a nominated level of environmental quality required to protect the beneficial uses of waters. The beneficial uses most relevant to the Project are '*Water dependent ecosystems and species, Human consumption of aquatic foods (natural populations – commercial and recreational catch), Water-based recreation*, and *Navigation and shipping'*. SEPP (Waters) requires the objective for toxicants in Western Port's Entrances and North Arm achieves a 99 per cent marine species level of protection.

CPO impact is assumed by the Proponents to be localised and minimal impact is expected outside the 2 or 6μg/L CPO mixing zone. A mixing zone is allowed by the EPA to manage seawater discharges into an aquatic environment. The IAC notes that SEPP (Waters) Clause 23 regulates the approval of a mixing zone to manage seawater discharges.

Mixing zones are designed to accommodate the residual impact on the environment from a discharge. The application of a mixing zone regulated by the EPA allows for a defined area where specified GV or environmental quality objectives do not apply within the defined

zone. Environmental impact is accepted within a mixing zone, yet the mixing zone is to be reduced to the maximum extent practicable. In principle, the specified water quality criteria or GV is met at and beyond the boundary of a mixing zone. Within the mixing zone of the FSRU and where the plume of CPO or temperature cannot achieve environmental quality objectives or the nominated GVs, it can be generally accepted that some biota within the mixing cannot be protected.

As indicated in SEPP (Waters), a mixing zone identifies an area of the environment that will be compromised, and SEPP (Waters) recognises that some or all of the environmental quality objectives for surface waters set out in SEPP (Waters) are not required to be achieved. Within the mixing zone of the FSRU and where the plume of CPO or temperature cannot achieve environmental quality objectives or the nominated GVs, it is expected some species may not be protected.

Based upon the evidence presented at the Hearing, the IAC considers the Project may not meet the requirements of Clause 23(2) (a) and (b). It is likely that a discharge of 100 μg/L CPO would result in acute toxicity to some species at the point of discharge. The likelihood of chronic toxicity from the continual discharge of CPO into Western Port waters in the vicinity of Crib Point is unconfirmed.

SEPP (Waters) allows new wastewater discharges into areas of high conservation value if it can be demonstrated the discharge will provide water for the environment and the wastewater can be treated to protect beneficial uses. Mr Chidgey acknowledged the seawater discharge does not provide water for the environment or other uses, described in Clause 25.

In making its assessment, the IAC considers that discharge of 100 μg/L CPO is unlikely to protect the beneficial uses of water dependent ecosystems at the point of discharge, it is not necessary for the net benefit of the environment of Western Port Bay and could result in acute lethality in the immediate vicinity of the FSRU. The final decision of the Project's compliance with SEPP (Waters) is a matter for the EPA.

(iii) Findings

The IAC finds:

- Based on the evidence presented to the IAC, the Project does not, at a minimum, comply with the requirements of SEPP Waters Clause 23(2) (a) and Clause 22(3).
- The seawater discharged from the FSRU is considered a new wastewater discharge into an area of high conservation value.
- Discharge from the FSRU would not provide water for the environment and discharge concentration of 100 μg/L CPO may impact water quality, compromising the beneficial uses of water dependent ecosystems and species.

4.5 Seawater intake and entrainment

4.5.1 Background

The EES assessed the potential rate of entrainment of plankton and other biota into the FSRU. Normal operations of the FSRU would involve open loop regasification, with ambient seawater taken in through sea chests on the sides of the FSRU, circulated through three heat exchange units and discharged through six high velocity ports on the east side of the FSRU.

The FSRU would draw seawater from Western Port Bay and discharge an average volume of 468,000 m^3 per day of seawater.

The seawater intake has been designed with a low, horizontal velocity that would draw seawater at a rate of 0.15m/sec to minimise the possibility of fish impingement. Intake screens will be sized 100 x 100 millimetres to prevent larger biota such as penguins and large fish from entering the intake and becoming trapped, injured or killed.

4.5.2 Evidence and submissions

The Proponents submitted the potential adverse effect of seawater intake is entrainment of smaller marine organisms (small fish, zooplankton and phytoplankton, drifting eggs and larvae) in the central part of the water column adjacent to the intake. The Proponents advised the FSRU was designed to reduce the impact of seawater intake and discharge and will have minimal impact because of the distance from the shoreline and the significant size of Western Port Bay with its strong tidal currents [97].

The Proponents relied on evidence from Dr Wallis that plankton would be entrained by the intake at a rate that is insignificant when compared to the whole of Western Port Bay. Dr Wallis was responsible for the hydrodynamic dispersion and entrainment model. That model predicted the rate of particle entrainment whereby the release of neutrally buoyant particles into a range of zones within Western Port Bay was simulated for 28 days (assuming peak open loop operations every day).

Dr Wallis submitted that data published for plankton life cycles indicated the period for assessing entrainment for phytoplankton should be seven days (phytoplankton have a life cycle of a few days) and 21 days for zooplankton and fish larvae. His evidence concluded that:

> … entrainment rate depends on the duration of the simulation (which is determined from the life cycle of plankton) and the volume of water from which the plankton are sourced (which can include all of Western Port and part of Bass Strait). Because of this large volume, the percentage entrainment is very small in relation to other processes (growth, predation, exchange with Bass Strait) that affect phytoplankton and zooplankton [98].

The peer review of the hydrodynamic modelling concluded '*the methodologies were sound and modelling approaches were deemed to be suitable for assessing behaviour of the plume in the marine environment*' [99].

Professor Baldock's evidence generally accepted the hydrodynamic model was well used for Western Port conditions, but he raised concerns about the validity of the modelled conditions to estimate the rate of plankton entrainment. He expressed concern the particles appeared to decrease over the 28 day simulation period.

In his response, Dr Wallis contended that Professor Baldock appeared to misinterpret the particle distribution calculated using the 3-D particle transport and dispersion model, hence his concerns were incorrect [100]. Dr Wallis gave further evidence that the alternative

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99 Technical Report A Annexure A-K
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modelling methods suggested by Professor Baldock would predict similar entrainment rates to those predicted in the EES.

Dr Wallis advised the plankton entrainment modelling using the 3-D particle transport and dispersion model took the conservative approach in that all biota entrained into the seawater intake would die [101]. He stated it was likely that entrained biota could survive chlorine and cold water treatment in the heat exchangers, suggesting that 50 per cent of entrained biota may survive. The risk assessment assumed zero percent survival rate.

Dr Lincoln Smith and Dr Blount questioned the assumptions of the EES that entrained biota would survive the exposure to electrolysis, chorine, and temperature changes during entrainment. Their evidence was that the combination of effects would cause mortality and moribundity and would likely increase predation at the discharge.

Dr Wallis recommended that monitoring be undertaken once the FSRU is commissioned so plankton survivorship could be established. He indicated the monitoring proposed in EPR-ME16 would be sufficient. The Proponents submitted the objective of EPR-ME16 was to determine percentage survival of zooplankton and fish larvae, so that the Project's effect on primary productivity could be quantified. Dr Lincoln Smith and Dr Blount questioned how impacts to phytoplankton and chlorophyll, which are the measure of primary productivity, could be assessed by sampling zooplankton and fish larvae.

Mornington Peninsula and Bass Coast submitted the phytoplankton, zooplankton and ichthyoplankton sampling monthly for a 13-month period was not representative of spatial and temporal variability in plankton that may be entrained. They submitted a single sample at a point in time is not representative of the heterogeneity that is likely at a nominated site at the time of sampling. The Councils commented that more intensive sampling was required to understand site specific variability. They expressed further concern as replicate sampling was not conducted at each site to provide statistical robustness to the results.

Dr Edmunds gave evidence that survey methods for plankton were not well designed for impact assessment, given the assessment made many assumptions about stratified depth distributions and the monitoring integrated sampling across the whole water column. Assumptions that plankton are evenly distributed throughout the water column were questioned by Drs Lincoln Smith and Blount as work referenced in the EES indicated this may not be the case. The EES noted variability may exist in plankton behaviour:

> Most plankton are weak swimmers and are carried horizontally by ambient water currents. Some plankton move vertically through the water column in response to time of day, this in known as diurnal migration. Others maintain themselves at a certain depth range in waters that are stratified by temperature or salinity layers. Still others may be associated with certain seabed habitats, such as seagrass or mudflats in shallow water and have strategies to maintain their position on, in or close to those habitats [102].

In response to cross examination, Mr Chidgey agreed the consequence of entrainment on the Ramsar as a whole, is accepted as low. He acknowledged that if the focus on rate of entertainment was concentrated more locally, the consequence would be greater. The risk assessment considered the potential for fish larvae and eggs to be entrained during peak

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open loop regasification was likely. The EES recognised that eggs and larvae of a number of recreational and commercial fish species exist in the North Arm of Western Port Bay and Western Port serves as a nursery for a range of species.

Mornington Peninsula and Bass Coast questioned the division of Western Port Bay into zones for the purpose of modelling the entrainment rate across the North Arm, and the ecological considerations used to define the zones. They argued there did not seem to be any basis for the separation.

The CEG expressed concern there would be short and long term impacts on marine biota due to either entrainment of organisms in seawater or discharge of cooled seawater after use for regasification.

The Proponents submitted the seawater intake was designed to minimise the entrainment and impingement of marine biota. EPR ME01 outlined the structure of the intake, velocity and screening grilles.

The Proponents submitted that fish and other mobile biota would avoid entrainment by detecting the intake flows and swim away from the intake, which would be 14.5 metres long by 2.5 metres high. Drs Lincoln Smith and Blount were critical of this and noted a number of fish are cryptic and attracted to dark places. In evidence, they referred to the intake as a '*really big cave'* and raised concern that '*the proposed screen grid (100 x 100 mm) could admit virtually all plankton, but also many biota of moderate (e.g. jellyfish, eels, pipefishes, blennies, gobies juvenile and adult forms) size*' [103]. They noted there was a lack of information within the EES on local fish assemblages and species biology and behaviour. This created uncertainty in the predictions of what fish larvae and eggs could be entrained and the impact on local populations.

The Proponents submitted EPR-ME03 limits seawater regasification flows to minimise potential entrainment impacts. In questioning of Mr Chidgey and Dr Wallis, the EPA raised concern about entrainment of fish eggs by the FSRU during the peak periods when fish eggs were recorded as most abundant. The EPA recommended that operation of the FSRU be restricted between August and February inclusive when fish eggs and larvae were reportedly more abundant, noting that peak periods of egg abundance commenced in August. The Proponents amended EPR-ME03 to reflect the EPA's suggestion.

4.5.3 Discussion

The EES reported the intake would entrain a range of biota into the pipe network and heat exchangers. Two mitigation measures (EPR-ME01 and EPR-ME03) were proposed to reduce the impact of entrainment. The mitigation measures appear acceptable to the IAC and will contribute to minimising entrainment and impingement. However, the plankton monitoring in EPR-ME16 is lacking in detail and the IAC considers that a better understanding of the inter diurnal variability in plankton density and entrainment between months is required to better predict variability in plankton numbers and entrainment rates. The IAC recommends improvements to this program, reflected in revised EPR-ME16 at Appendix G.

The IAC notes the amendment to EPR-ME03 suggested by EPA to limit seawater regasification and subsequent seawater intake between August and September to minimise

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entrainment impacts. It remains unconfirmed if a reduction in seawater intake would reduce the entrainment rate. Plankton is more abundant in spring and summer, with fecundity of a number of species increasing with warmer water and air temperatures. There is the potential that EPR-ME03 would be ineffective at reducing the rate of entrainment if plankton numbers are more concentrated during these warmer periods.

EES Technical Report A stated:

> Phytoplankton and zooplankton (holoplankton) reproduce in the water column, with different rates of reproduction or turnover between species, seasons and years. The characteristics and duration of the life stages of meroplanktonic invertebrates are highly variable between species.

The IAC recognises that a significant number of parties emphasised the complex system in Western Port is not well understood. The IAC further acknowledges that early life stages of marine biota are highly complex which determine the population abundance and diversity of species. Larval recruitment is critical to success of many important ecological community components, including commercial fishery species and is contingent on a range of contributing factors. The seagrass meadows, mangroves and saltmarsh communities are important nursery habitats for a range of important fish species and little attention was given in the EES to understand the variability that may exist.

The IAC accepts there is significant movement of plankton around North Arm and a high degree of particles are flushed to Bass Strait. The Proponents submitted that plankton entrainment by the FSRU will be inconsequential within the broader Western Port Bay environment. The likelihood of plankton entrainment is certain. The IAC considers the Project is likely to have an impact on plankton and another biota entrained by the FSRU, with the extent of impact unknown.

The IAC considers the 3-D particle transport used to calculate the entrainment rate is adequate, but it remains concerned with the modelled rate of particle entrainment and the assumptions of particle densities in the 28 day simulation. The IAC acknowledges the short life cycles of plankton and fish larvae and eggs but recognises that larvae populations are continuously replenished during fecund periods, with inter diurnal variability in plankton density and abundance between months, particularly during warmer periods.

The IAC is concerned the modelling conducted of peak FSRU production appears to predict that particles originating within a particular zone are not replenished by particles (e.g. larvae in zone 2) within that zone, but instead particles are replaced by a particle entering from an adjacent zone. Dr Wallis' evidence does not appear to predict phytoplankton particles being replenished within a particular zone more frequently than every seven days, and fish larvae and zooplankton being replenished every 21 days [104]. Dr Wallis gave evidence that '*based on data for published plankton life cycles, the period for assessing entrainment for phytoplankton should be 7 days (phytoplankton have a life cycle of a few days) and 21 days for zooplankton and fish larvae'* [105].

The plankton sampling methodology was criticised by a number of submitters. The IAC agrees the monthly sampling and analysis of plankton over 13 months may not adequately characterise the intra-month and inter-annual variation in plankton, particularly as the life

104 D540
105 D540

cycle of plankton was reported by the Proponents to be between seven and 21 days. An increased frequency in the plankton sampling would provide a better understanding of the variability in plankton and provide a more comprehensive understanding of entrainment rates.

The Proponents submitted that fish and other biota will swim away from the intake but there was little evidence to support the assertion that biota will not be attracted to the intake. The commitment in EPR-ME01 to design the intake, velocity and screening grilles goes some way to mitigate entrainment and impingement. The IAC accepts evidence from Mr Chidgey and Dr Wallis that further refinements to the intake design would compromise the efficiency of the FSRU. The IAC considers entrainment of plankton and biota sized to at least 100mm is likely and unavoidable.

The EES considered that entrainment would contribute an additional '*supply of food to the infauna under the discharge ports'* which the EES purports would enable filter feeders and their predators to flourish [106]. According to the Proponents, there would be no loss or addition of organic carbon or nutrients. The Proponents indicated the composition of the infauna community could be compromised, and the IAC acknowledges this is contingent on the size and extent of the seawater plume dispersion.

Consideration of impingement risks to the variety of marine biota potentially impacted was lacking in the EES. The IAC considers the long term impacts of recruitment and viability was not adequately considered for the range of species within North Arm that may be impacted by the seawater intake.

The IAC acknowledges plankton entrainment was modelled during peak open loop regasification which is not expected to occur between August and February and entrainment numbers were predicted under worst case scenarios. Based on evidence from Professor Baldock and the assumptions applied by Dr Wallis to the hydrodynamic entrainment model of plankton distribution and rate of replenishment within each modelled zone, the IAC is unclear on the magnitude of entrainment and impingement, and consequential impacts on a local scale.

The IAC concludes that EPR-ME16 should require additional baseline plankton surveys for 13 months prior to commissioning the GIJW and subsequent monthly sampling from the FSRU and nominated distances from the GIJW.

4.5.4 Findings

The IAC finds:

- The EES plankton monitoring and hydrodynamic entrainment modelling provides an understanding of the likely rate of entrainment by the FSRU seawater intake.
- Irrespective of the configuration of the FSRU seawater intake, biota will be entrained up to a minimum size of 100mm, and this is an unacceptable impact to ecology of Crib Point.
- The entrainment and impingement of marine biota may be acceptable in the context of the entire marine environment of Western Port Bay, but on a local scale at Crib Point, the impacts are considered to be greater.

[106] Technical Report A section 8.5.2

- Entrainment of biota will continue for the life of the Project, and it is not possible to determine if the continual entrainment will create an unacceptable impact to the North Arm and Western Port Bay.
- A more comprehensive understanding of intra-month plankton diversity is required to better inform the rate of entrainment and variation, particularly during spring and summer and improve the statistical validity of results measured for each month and locations sampled.
- The risk of impingement was not adequately considered in the EES for the range of species within North Arm and further consideration of species likely to be impinged is necessary.

4.5.5 Recommendation

The IAC recommends:

Environmental Performance Requirements

Include the following change:

- **Revised EPR-ME16 (Monitoring program)**

This change is included at Appendix G.

4.6 Overall conclusions on marine biodiversity

- The likely marine biodiversity impacts do not achieve the relevant draft evaluation objective.
- 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 20 year life of the Project will result in continued exposure to adverse environmental impacts.
- The marine discharges into Western Port Bay are inconsistent with the legislative, policy and guideline requirements and commitments to conserve, maintain and enhance the wetland as a consequence of its recognition as:
  - a listed wetland under the Ramsar Convention
  - a MNES under the EPBC Act
  - an area of high conservation value by SEPP (Waters)
  - 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 proximal to the Jetty, including impacts to the seabed habitat and changes to epibiota and infauna assemblages.
- The aggregate direct impacts from chlorine and coldwater discharges, entrainment of biota sized to at least 10 centimetres, impingement of pelagic biota and indirect impacts of CPO are potentially threatening processes to the ecological character of Western Port Ramsar site.
- Marine biodiversity impacts cannot be acceptably managed through the recommended mitigation measures.
- For these reasons, the IAC concludes the Project will result in unacceptable impacts on the marine environment. If the Project is approved, the recommended Environmental Performance Requirements in Report No. 2 should be adopted.

5 Terrestrial and freshwater biodiversity

5.1 Introduction

Terrestrial and freshwater biodiversity effects are discussed in EES Chapter 7 and Technical Report B. Additional material was provided in TN01, TN17, TN21, TN27, TN41, TN44 and TN46.

The Study Area for terrestrial and freshwater biodiversity includes the pipeline ROW, the PDF, EOLSS, MLVs, pipe stringing areas, vehicle access tracks and land-based area required for the GIJW. It includes the adjacent exposed intertidal and coastal habitats at Crib Point with respect to impacts on shorebirds.

The relevant draft evaluation objectives are:

> **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.

Table 3 lists the terrestrial and freshwater biodiversity evidence that was provided. Mr Lane lodged supplementary evidence and responses (D210, D330, D346, D530 and D567). Dr Lorimer, Mr Urlus and Dr Cole lodged supplementary reports (D427, D441 and D486).

Table 3 Terrestrial and freshwater biodiversity evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Lane	Nature Advisory	Terrestrial Biodiversity
Proponents	Mr Cook	AECOM	Lighting
Mornington Peninsula Bass Coast	Dr Lincoln Smith and Dr Blount	Cardno (NSW/ACT) Pty Ltd	Shorebird Ecology
Mornington Peninsula and Bass Coast	Dr Lorimer	Biosphere Pty Ltd	Orchids
Mornington Peninsula and Bass Coast	Mr Urlus	Tactecol Consulting	Terrestrial Fauna Ecology
Western Port and Peninsula Protection Council Inc	Dr Cole	Agpath Pty Ltd	Plant Pathology
CEG	Dr Edmunds	Australian Marine Ecology	Shorebird Ecology
S3272	Ms Thomas	Animalia Wildlife Shelter	Wildlife Handling

The following EPRs apply to terrestrial biodiversity associated with the CPRF:

- C07 – Operation waste management (requirement 'e' relates to lidded waste containers to mitigate fauna access)
- FF01 – Unplanned vegetation loss
- FF02 – Invasive weeds, pests, pathogens and waste

- FF03 – Contractor awareness
- FF04 – Topsoil management
- FF05 – Injury and/or disturbance to fauna
- FF06 – Migratory birds
- FF07 – Surface water sedimentation and runoff
- FF08 – Surface water contamination
- FF09 – Lighting impacts to fauna
- FF10 – Dust impacts to flora/fauna.

The following POS environmental controls in the CEMP Appendix J apply directly or indirectly to terrestrial and freshwater biodiversity:

- B1 to B14 relating to Biodiversity including native vegetation and threatened species
- S1 to S6 relating to Biosecurity
- R12 to R15 relating to reinstatement works.

5.2 Key issues

The key issues are:

- Native vegetation loss, including large scattered trees.
- Threatened species habitat loss, fragmentation and disturbance including migratory shorebirds.
- Biosecurity risks with pathogens.
- The impacts of lighting on wildlife.

5.3 Native vegetation loss, including large scattered trees

5.3.1 Background

The EES assessed potential impacts of the Project on land-based and freshwater aquatic flora and fauna values. In relation to native vegetation, the assessment involved the GIJW area which is restricted to the area of the proposed CPRF on land currently owned by the PHDA and the Pipeline Works alignment.

According to the EES, the total area of native vegetation proposed to be removed is 16.955 hectares comprising:

- 1.603 hectares for the CPRF, which includes 1.573 hectares of Heathy Woodland (EVC48), 0.030 hectares of Swamp Scrub (EVC53) and the loss of two large patch trees (trees located within a patch of native vegetation and not identified as a scattered tree). Most of the native vegetation within the CPRF area was removed by the PHDA in early 2020 to manage bushfire risk [107].
- 15.352 hectares for the Pipeline Works, including 12.3 hectares associated with the removal of habitat patches of native vegetation, 48 large patch trees, 29 large scattered trees and 50 small scattered trees.

[107] The IAC is aware this removal raised community concern and is subject to ongoing investigation by Mornington Peninsula Shire Council.

The removal of native vegetation is proposed within the pipeline impact area which includes not only the pipeline ROW, but pipe stringing areas associated with HDD and access tracks for construction machinery that will either upgrade and use existing access tracks or construct new ones for pipeline construction.

5.3.2 Evidence and submissions

The GIJW would be located within an environment that has been substantially modified with past vegetation clearing associated with development of the former BP refinery, the existing land-based infrastructure associated with the Jetty and the recently cleared area of the proposed CPRF site. In his presentation to the IAC, S2912 provided an excellent historic image of the Crib Point Jetty and former BP refinery in the 1960s that showed the extent of vegetation at that time, much of which has now been removed [108].

Some submitters were concerned the clearing of the CPRF site reflected poorly on the assessment process. The Proponents submitted removal of native vegetation at the CPRF site was included in the EES assessment with a commitment to offset this vegetation loss.

In relation to the pipeline, the Proponents submitted it runs through a heavily modified landscape which includes co-location with existing pipeline infrastructure (approximately 19 kilometres), areas of cleared and fragmented vegetation including areas of regrowth, farmland, and urban areas (Hastings) [109].

The Proponents considered that through the process of pipeline alignment selection and review, significant effort was made to avoid the extent of native vegetation removal where practicable. They submitted this work was supported by design elements such as narrowing the pipeline construction footprint within the ROW in sensitive areas to minimise the extent of vegetation removal.

The Proponents submitted that, although there will be native vegetation removal, offsets are proposed for this in conjunction with promoting natural regeneration of vegetation removed along those sections of the pipeline alignment where open trench construction is proposed.

Mr Lane provided evidence that mapping of native vegetation followed the *Guidelines for the removal, destruction or lopping of native vegetation*, DELWP 2007 (Guidelines) as required by the EES Scoping Requirements, with all four key categories of native vegetation (native vegetation, large trees in patches, scattered trees and mapped wetlands) assessed. Mr Lane identified native vegetation mapping by Biosis and Monarc Environmental in the EES was incomplete in some instances. He provided a peer review report attached to his evidence which included an update on the extent of native vegetation removal for the Project. That report responded to:

- unidentified and inaccurate mapping of areas of native vegetation
- assignment of an inappropriate EVC
- unidentified scattered trees and large trees in patches.

Generally, Mr Lane considered the assessment in Technical Report B was appropriate and condition (habitat) scores of mapped native vegetation were accurate.

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108 DR1-42

109 Attachment IX – Pipeline Licence Application page 9.

His report found the Project would remove an additional 0.988 hectares of native vegetation and an additional 15 large trees, culminating in a total loss of 17.953 hectares of native vegetation and a total of 94 large trees, comprised of 31 large scattered trees and 63 large patch trees. Mr Lane identified the removal of 54 small scattered trees.

Generally, submitters, such as the Western Port and Peninsula Protection Council (WPPC) (3194), and the Southern Peninsula Indigenous Flora and Fauna Association (SPIFFA) (S1694), were concerned about the extent of loss of native vegetation, including the loss of large trees. Large trees identified through benchmarks under relevant EVCs include long lived specimens, many of which are hollow bearing or contain spouts that can offer habitat value. The IAC notes these trees are difficult to replace due to their age and condition and the time required for the development of such hollows and spouts.

Fragmentation of vegetation and associated habitat values, and edge effects and loss of connectivity with other vegetation areas were raised by many submitters.

The WPPC highlighted that damage may occur from vegetation removal through the disturbance of soils resulting in the loss of soil structure, the soil microbiome and soil mycorrhiza that can provide connectivity amongst trees and other vegetation in heathland areas.

Casey submitted that land use impacts have reduced the pre-settlement biodiversity of that municipality to about seven per cent of its former extent. It considered the management of remnant vegetation and fauna throughout the City is important to achieve a net gain in the extent and quality of native vegetation and to protect and conserve biodiversity including biolink corridors. Although Casey acknowledged the extent of clearing within its municipal boundaries was small and the quality of the vegetation degraded, it maintained that due to the proximity of the Western Port Ramsar wetland, there remains a connection with vegetation by virtue of direct habitat contiguity, connectivity and shared characteristics. Casey considered much of this vegetation could be considered an extension of the Ramsar site.

Casey submitted the impacts to native vegetation at South Boundary Road East, Pearcedale (KP20.1) were unacceptable and that vegetation in this location is of high conservation significance due to:

- The presence of the ecological community Subtropical and Temperate Coastal Saltmarsh listed under the *Environment Protection and Biodiversity Conservation Act* as Vulnerable.
- The vegetation at this location (Estuarine Scrub EVC 953) being identified as habitat for Southern Brown Bandicoots.
- The proximity and direct habitat contiguity to the Western Port Ramsar site and its links with and contribution to the ecological character of the wetlands.
- The area identified in the Casey Planning Scheme under Schedule 1 to Clause 42.01 – Environmental Significance Overlay relating to Coastal Environs (ESO1), which seeks to conserve and enhance the ecological values of environmentally sensitive land fringing Western Port and to maintain and enhance the rural character of areas fringing Western Port.

Consequently, Casey submitted all vegetation in this location should be retained and HDD be considered.

Based on EVC bioregional conservation status, Mr Lane's evidence was that approximately 50 per cent of the native vegetation proposed to be removed by the Project is listed as an Endangered EVC within the Gippsland Plain Bioregion (approximately 8.905 hectares), with much of the vegetation being Swamp Scrub (EVC 53) [110]. Most of the vegetation loss occurs in the southern portion of the pipeline alignment. Mr Lane considered this extent of removal to not be significant given the pipeline alignment attempts to follow existing pipeline alignments in areas where Swamp Scrub vegetation has experienced past disturbance. He considered these past disturbances have tended to result in regrowth of patches dominated almost exclusively by Swamp Paperbark (*Melaleuca ericifolia*), which out-competes other species and therefore results in poor quality vegetation lacking native ground cover elements. He stated this situation was observed in the vast majority of this mapped EVC, with relatively low condition scores representative of low quality, modified vegetation.

Mr Lane gave evidence that almost 8.2 kilometres, or almost 15 per cent of the Project area, has been subject to deliberate changes in construction methods to avoid impacts on remnant areas of native vegetation. A further 1.75 kilometres (three per cent) of the Project area has been subject to such modifications to avoid impacts on habitat for threatened fauna that is not native vegetation. These changes to the Project represent avoiding and minimising impacts in most areas where the Project potentially directly affects biodiversity. Mr Lane considered such a strategy to be consistent with the avoid and minimise requirements of the Guidelines and would significantly reduce the potential direct impacts on native vegetation and the biodiversity that it supports.

The Proponents referred to TN01, which included a draft offset strategy. This sought to demonstrate that a strategic approach for any required offsets for both general and species specific purposes can be provided. Mr Lane provided an update on offset requirements in his peer review report and an explanation for variations in offsets based on the combination of vegetation loss for the CPRF and the pipeline alignment (D567).

The Proponents submitted the extent of work conducted in preparing the EES with respect to terrestrial and freshwater biodiversity including Technical Report B prepared by Biosis and the peer review report prepared by WPS Australia Pty Ltd in 2020 were adequate and sound.

The Proponents submitted that through pipeline alignment and realignment, reductions in the construction footprint at sensitive locations, and use of trenchless construction techniques such as HDD to avoid native vegetation, there were no further practicable avoidance or mitigation measures of any significance available. A modification to the alignment was suggested by the Proponents at KP5 in the northern end of Warringine Park/Reid Parade, Hastings (Pipeline alignment option BJ-11) [111]. This option replaces open trenching of the pipeline with HDD and the need to remove native vegetation in an area of the Park that is covered by a conservation covenant. It involves construction within land parcels on the north side of Reid Parade that were not previously impacted. There are some native trees on these parcels, but there is expected to be a net reduction in native vegetation impacted. HDD rigging would be required closer to residences on the north side of Reid Parade.

110 Approximately 5.425 hectares.

111 D326, information bulletin (D130) and TN17.

With respect to South Boundary Road (KP20) and the *Environment Protection and Biodiversity Conservation Act* listed vulnerable coastal saltmarsh ecological community, the Proponents indicated that HDD is not suitable for avoiding the habitat at this location due to the angle of the alignment. The location of HDD equipment, particularly the location of the welded pipeline drill string prior to pull in, would create further impacts to land use, including properties not otherwise impacted, and/or other areas of sensitive vegetation.

This response was reiterated by Mr Lane who gave evidence that the coastal saltmarsh in this location occurs in a highly modified nature. It occurs within a drainage line and extends into a low depression in the corner of a paddock. These areas are subject to sea water inundation at extreme high tides flowing through a culvert under a road which segments this area from an extensive coastal saltmarsh area. He considered the area is not directly continuous with the Ramsar wetland and provides limited contribution to its ecological character. Although considered to be the *Environment Protection and Biodiversity Conservation Act* listed ecological community, Subtropical and Temperate Coastal Saltmarsh, it only meets the condition thresholds due to the area's proximity to an extensive area of intact coastal saltmarsh. As this community is listed as Vulnerable under that Act, it is not considered a MNES for the purposes of referral under the Act.

5.3.3 Discussion

(i) Native vegetation condition and policy

The IAC considered the following sources of information to identify areas of native vegetation and some large scattered trees worthy of further investigation by the Proponents to further avoid native vegetation removal:

- APA's GIS mapping tool, including the native vegetation patch and large scattered tree data.
- Information provided in TN41 and TN44.
- Site inspections.
- Information about Habitat Zone Condition Scores provided in the appendices to EES Technical Report B, in Mr Lane's peer review evidence and the Flora and Fauna Assessment prepared by Monarc Environmental in 2018 [112].
- Information cross referenced to the endangered status of EVCs.

The IAC acknowledges the Proponents efforts in demonstrating consistency with the Guidelines' avoid, minimise, or offset policy with respect to native vegetation removal. However, the IAC considers the environment around Western Port Bay is a sensitive location that retains a strong environmental character. It includes areas of connected native vegetation close to the Western Port Ramsar site such as Warringine Park and the North Western Port Nature Conservation Reserve. This is despite the area including Port related activity, industrial development and land zoned for such purposes.

The IAC's considers native vegetation close to Western Port is of environmental importance due to its connection between the land and the coast. This view is consistent with State planning policy under Clause 12.01-1S (Protection of biodiversity) and its objective '*To assist the protection and conservation of Victoria's biodiversity'*. Strategies supporting this

[112] For the purposes of the Guidelines the condition score is the Habitat Score.

objective relevantly include '*Use biodiversity information to identify important areas of biodiversity, including key habitat for rare or threatened species and communities, and strategically valuable biodiversity sites'*. This includes sites listed as Ramsar wetlands. In addition, the policy includes the strategy:

> Ensure that decision making takes into account the impacts of land use and development on Victoria's biodiversity, including consideration of:
>
> - Cumulative impacts.
> - Fragmentation of habitat.
> - The spread of pest plants, animals and pathogens into natural ecosystems.

The policy includes the strategy '*Avoid impacts of land use and development on important areas of biodiversity'*. Parts of the pipeline alignment affect areas of important biodiversity such as Warringine Park, vegetation around the Tyabb Resource Recovery Centre (former Tyabb landfill site), Watsons Creek and other areas with close association with the Western Port Ramsar site and its associated mangrove and coastal saltmarsh vegetation communities.

The IAC considers this policy, combined with the locational attributes of the Project study area strengthens the focus on avoidance as an important measure for managing impacts on terrestrial and freshwater biodiversity.

(ii) Additional mitigation of vegetation loss

The IAC considers there are opportunities to further reduce the extent of native vegetation loss. There are Habitat Zone patches of EVCs with an endangered bioregional conservation status that have condition (habitat) scores greater than half their mature natural state. These warrant revisiting for avoidance of removal. In addition, large scattered trees that contain hollows or spouts warrant avoidance from removal.

In relation to the open trenched sections of the pipeline alignment in Warringine Park, the IAC notes the response has generally been that the pipeline follows existing pipeline easements (TN41). This forms part of the Proponents response to minimise impacts to surrounding land use where much of the vegetation proposed to be removed is within or between existing pipeline easements. These easements have previously been disturbed or cleared and are subject to ongoing vegetation management by the pipeline operator. Despite this, it is stated in TN44 that maintenance of the pipeline easement in areas above HDD locations is unlikely to require vegetation removal. This was confirmed in the evidence of Mr Lane. This presents a contradiction to the IAC with respect to the difference with easement maintenance between areas trenched and those where HDD is applied. To the IAC, it highlights the need for additional avoidance of native vegetation removal in Warringine Park through the extension of HDD.

The Proponents submitted that within Warringine Park, the width of the construction ROW has been reduced to 20 metres (from 30 metres) to reduce vegetation impacts. The pipeline is proposed to be installed between existing pipelines, limiting alignment flexibility, and the native vegetation is assessed as occurring across almost the full width of the reduced construction ROW. The Proponents stated that as a result, it is not possible to further avoid the vegetation through pipeline micro-siting. The IAC considers this response further reinforces the benefit of avoidance given the constraints on micro-siting – a minimisation measure rather than one of avoidance.

The identification of trees includes those associated with EVCs that have a Bioregional Conservation rating of endangered and which have been identified with the presence of hollows and spouts – good habitat values. As large scattered trees are usually old trees, the presence of habitat values makes them valuable, as is recognised in the Guidelines that place greater emphasis on their biodiversity value. The value of large scattered trees is further heightened in cleared landscapes, such as those in the northern portion of the pipeline alignment, where they take on a more prominent role regarding habitat connectivity. The IAC considers greater effort is required to avoid the loss of such trees. The IAC considers this could be achieved either through changes to the pipeline alignment or HDD and has made recommendations for retaining identified trees accordingly.

The IAC agrees with Casey regarding the coastal saltmarsh area at KP20 at South Boundary Road. The IAC does not accept the arguments of the Proponents concerning the constraints on applying HDD in this area to avoid the coastal saltmarsh, wet areas and the potential habitat for Southern Brown Bandicoots offered by the Estuarine Scrub in this location. It appears the physical reasons for not entertaining any change can be overcome, most likely through angled crossing of some private land rather than trying to follow boundaries. The area of coastal saltmarsh was accepted by Mr Lane as having a tidal connection with the broader Ramsar coastal saltmarsh. This connection, together with the vegetation community's status as vulnerable, highlights a need to ensure that coastal saltmarsh is avoided and not merely dismissed, due to it not triggering a referral action under the *Environment Protection and Biodiversity Conservation Act* and failing to provide appropriate consideration of its values as a wetland system. The IAC considers it appropriate to recommend the coastal saltmarsh community at KP20 be avoided from removal through HDD.

(iii) Pipeline changes, offsets and soil effects

The pipeline alignment option BJ-11 located at KP5 in the northern end of Warringine Park/Reid Parade, Hastings is supported by the IAC and would assist in ensuring that open trenching within the whole of Warringine Park is avoided. The IAC considers it appropriate to accept and support the alignment change.

Regarding offsets, the IAC is generally satisfied the provision of the draft offset strategy in TN01 provides surety that these can be locally provided, and that quantum of species specific offsets provided in Mr Lane's further calculations (D567) can be satisfied.

Other than these matters, the IAC is satisfied that impacts from removal of native vegetation along the pipeline alignment to soils, the soil microbiome and soil mychorrhiza will not be significant given the narrow width of the ROW and the narrow extent of construction for a 600mm diameter pipeline structure. The POS for reinstatement of soil profiles provided by the Proponents should provide suitable safeguards.

The IAC concludes that with respect to terrestrial and freshwater biodiversity, impacts from the proposed loss of native vegetation, will generally be acceptable subject to reducing the extent of loss of endangered of EVCs and large scattered trees as set out in the IAC's recommendations. The relatively defined, narrow and lineal nature of the pipeline construction and its operation means the extent of environmental impact should not be significant.

The IAC notes that POS B3 in Appendix J to the CEMP provides for the retention of native vegetation that is identified to be retained in Attachment G – *Environmental Line List* to the

CEMP. Accordingly, the IAC recommends that the Environmental Line List in Attachment G to the CEMP be amended to include those sites identified by the IAC for avoidance from removal and additional retention.

5.3.4 Findings

The IAC finds:

- Impacts from the loss of native vegetation are acceptable subject to additional native vegetation sites and large patch and scattered trees being retained.
- Offsets requirements have been demonstrated in the draft offset strategy to be capable of being provided.

5.3.5 Recommendation

The IAC recommends:

Construction Environment Management Plan in Attachment G (Environmental Line List)

Include the following sites where the removal of native vegetation and large scattered trees is to be avoided:

a) Pipeline alignment option BJ-11 located at KP5 in the northern end of Warringine Park/Reid Parade, Hastings with Horizontal Directional Drilling.

b) Tree #1 Manna Gum (*Eucalyptus viminalis*) a large scattered tree containing hollows and spouts located at the proposed access track entry off Stony Point Road just south and over the railway crossing and intersection with Frankston-Flinders Road through either a change to the track entry location or use of an alternative access point.

c) Habitat Zone ID KOJH23 (EVC175 Grassy Woodland) located at the entry to access track off Frankston-Flinders Road that leads to KP4.5 and small scattered Tree #655 Swamp Gum (*Eucalyptus ovata*) located approximately 140 metres along the proposed access track through access entry design and changes to the track alignment.

d) Tree #662 Manna Gum (*Eucalyptus viminalis*) a large patch tree at KP2.23 containing hollows through reducing the width of the pipeline Right of Way, changes to the pipeline alignment or Horizontal Directional Drilling.

e) Between KP3.6 to KP4 Habitat Zone IDs KOJH13 and KOJH14 (EVC53 Swamp Scrub) close to the Ramsar wetland and Warringine Park through Horizontal Directional Drilling.

f) From KP4.3 to the revised BJ-11 alignment at KP5 near Railway Crescent, Hastings associated with Habitat Zone IDs KOJH15 (EVC53 Swamp Scrub), KOJH16 (EVC83 Swampy Riparian Woodland) and KOJH21 (EVC175 Grassy Woodland) through Horizontal Directional Drilling.

g) KP6.9 Habitat Zone ID HZ24 (EVC821 Tall Marsh) and wetland area through Horizontal Directional Drilling.

h) Between KP13.7 to KP14.4 adjacent to the former Tyabb landfill area at Habitat Zone IDs JHCC56 and JHCC57 or Brett Lane's Peer Review report Habitat Zone ID NA8 - EVC83 avoiding fragmentation with adjoining vegetation areas and

potential Southern Brown Bandicoot habitat through Horizontal Directional Drilling without impacting vegetation for pipe stringing.

i) **KP17.3 Tree #333 Manna Gum (*Eucalyptus viminalis*) a small scattered tree with hollows and Tree #337 a stag inside the proposed footprint containing hollows through changes to the pipeline alignment or Horizontal Directional Drilling.**

j) **Between KP18.5 to KP18.7 large patch of EVC 48 vegetation with numerous large trees to prevent fragmentation of habitat in close proximity south of Watsons Creek through Horizontal Directional Drilling.**

k) **Between KP20 to KP20.3 coastal saltmarsh, Estuarine Scrub and potential Southern Brown Bandicoot habitat in close proximity to Ramsar wetland by eliminating right angle changes in direction and through diagonal crossing of private land and avoiding impacts from access which could be achieved from following the alignment of the pipeline from the south through Horizontal Directional Drilling.**

l) **KP22.1 large scattered trees Tree #260 and 262 both Manna Gums (*Eucalyptus viminalis* subsp *pryoriana*) that contain spouts through changes to the pipeline alignment or Horizontal Directional Drilling.**

m) **KP26.1 Tree #36 containing hollows and nesting material through reducing the width of the pipeline Right of Way, changes to the pipeline alignment or Horizontal Directional Drilling.**

5.4 Threatened species habitat loss and fragmentation

5.4.1 Background

Construction and operation of the proposed GIJW and pipeline has the potential to impact through direct and indirect loss of habitat for, or on, flora and fauna species listed as threatened or migratory under the *Environment Protection and Biodiversity Conservation Act*, *Flora and Fauna Guarantee Act* and/or DELWP advisory lists.

For the GIJW, species potentially impacted include various migratory and shorebird species. The primary impacts relate to disturbance from construction and operational activities such as lighting, noise, dust and increased human activity.

For the pipeline alignment, there is a range of threatened species potentially affected by construction works and operation/maintenance of the pipeline easement. The EES identified the Project has the potential to result in short term loss and fragmentation of habitat for the Southern Brown Bandicoot, the loss of potential habitat for the Southern Toadlet and removal of habitat for the Swamp Skink.

The pipeline crosses several waterways which has the potential to impact on aquatic fauna and fish species such as the Growling Grass Frog, Dwarf Galaxias and Australian Grayling.

The proposed use of HDD raised some concerns in relation to 'frac outs' and ground subsidence affecting various species of orchids including Merran's Sun-orchid.

There were also concerns regarding direct impacts from construction works on wildlife.

The EES was informed by targeted surveys focussing on species such as the Southern Brown Bandicoot, River Swamp Wallaby-grass, Growling Grass Frog, Swamp Skink, Southern

Toadlet, Dwarf Galaxias, orchid species between KPs 1.13 and 1.7 and for shorebirds around the GIJW study area.

5.4.2 Evidence and submissions

The EPA and many submitters considered the EES terrestrial and freshwater biodiversity assessment lacked rigour. Mr Lane's evidence refuted such criticism and indicated that Technical Report B was prepared with methodological rigour and had undertaken assessments in accordance with relevant Commonwealth and State assessment criteria and guidelines, as applicable at the time of assessment.

Many submitters, including the Victorian National Parks Association (S3004), Mornington Environment Association (S2724), Mornington Peninsula and Western Port Biosphere Reserve Foundation Ltd (S2768) and S2827 expressed concern the Project would result in the direct loss of habitat for threatened species such as the Southern Brown Bandicoot, leading to further local extinction of the species.

Ms Thomas provided evidence suggesting that vegetation clearance for pipeline construction would compromise wildlife corridors and cause significant harm to wildlife where salvage and relocation of wildlife is proposed.

Mr Lane's response in reply was that such impacts would be acceptable through a combination of avoidance, minimisation of vegetation removal and appropriate wildlife handling and management arrangements under the *Wildlife Act*.

The evidence from Mr Lane and Mr Urlus generally identified that Southern Brown Bandicoot prefer habitat with a dense cover between 0.2 -1 metre in height, regardless of whether the vegetation is native or introduced. The EES and Mr Lane's evidence was that suitable habitat for this species is extensive between the South Gippsland Highway (KP 30) and the EOLSS. In this area, most roads and creeks crossed by the pipeline contain dense weedy vegetation that provides suitable habitat for the species. Other suitable habitats are varied, ranging from relatively intact Heathy Woodland, to degraded Swamp Scrub as well as exclusively exotic vegetation.

The Proponents submitted the species utilised long linear habitats within the pipeline alignment for foraging, shelter and movement/dispersal. It is of note that the species' use of weedy environments presents a dilemma in that these areas are targeted for removal under obligations established by the *Catchment and Land Protection Act*. Thus, actions that attempt to improve the environmental condition can create a risk to the species.

Submissions from the Proponents and evidence from Mr Lane was that, although the southern half of the pipeline alignment (generally south of KP20) contained extensive low lying areas of vegetation compared to the more cleared farming areas in the northern half, Southern Brown Bandicoots had likely disappeared from that part of the alignment. This was disputed in evidence of Mr Urlus who considered the species may still be present and was not detected because of the limited survey effort.

Mr Urlus gave evidence that the presence of relatively good quality and generally well-connected habitat along the Western Port coast, the sizeable population of Southern Brown Bandicoots at Quail Island and the presence of several records within the last 15 years from the Crib Point and Hastings area, suggested the species might be present in the Mornington Peninsula. He suggested places like Warringine Park and the area around the Tyabb Resource Recovery Centre offered potential habitat for the species. He considered that even

if the species were absent, recolonisation of the area was possible given the species' ability to disperse in a landscape with suitable habitat that is linked.

Mr Lane recommended that the Project acknowledge the broader planning context for Southern Brown Bandicoot and consider including all 35 areas identified by Monarc Environmental (2018) as potential habitat for the species. All of these areas should be subject to rapid revegetation to suitable habitat, except where HDD is proposed, and direct impacts are avoided. This was later qualified to reflect rapid revegetation of those habitat areas in the northern half of the alignment where Southern Brown Bandicoots had been recorded from survey work to be undertaken, while other habitat areas proposed to be removed where the species had not been recorded would be allowed to regenerate naturally (POS R13).

Although the Proponents considered this would be consistent with the Sub-Regional Species Strategy for the Southern Brown Bandicoot, it was not supported by Mr Urlus. He continued to support the concept of rapid revegetation (specified in POS R14 in Appendix J to the CEMP) being undertaken in all potential Southern Brown Bandicoot habitat throughout the entire pipeline alignment, and not be limited to the portion north of KP20. He considered this aligned with the original recommendation made by Mr Lane in his evidence.

Mr Urlus and many submitters expressed concern the linear nature of pipeline construction and removal of vegetation including habitat for species like the Southern Brown Bandicoot, would have the potential to facilitate the movement and/or predation success of introduced predators, particularly foxes, which are a major threatening process for the species.

The Proponents and Mr Lane considered that such predators were most likely already present in the study area given the presence of existing pipeline infrastructure along much of the proposed alignment and the Project would not make a significant difference.

The Proponents considered that, although the Project would result in the short term loss and fragmentation of some habitat for Southern Brown Bandicoots and other threatened species, the impacts would not be significant. Proposed POS' would ensure that risks to terrestrial and freshwater ecology are appropriately managed and impacts acceptable.

Generally, the Proponents submissions and the evidence of Mr Lane were that the pipeline construction impacts on fauna species would be short term and temporary. Mr Urlus referred to the construction period of 18-24 months, which might impact over multiple breeding seasons for the Southern Brown Bandicoot. However, Mr Lane's evidence in reply referred to works at any one site consisting of 6-8 weeks, after which the first stage of site reinstatement would be completed, which would alleviate effects on breeding.

Once completed, the alignment will be rehabilitated and allowed to naturally recover, apart from those areas identified for active revegetation.

Temporary impacts on ground-dwelling fauna populations such as Swamp Skinks are expected during construction of the pipeline where removal of native vegetation is unavoidable. The extent of the area of terrestrial habitat affected has been minimised through the adoption of modified construction methods, including HDD and narrowed construction width, no greater than 27 metres, that meet the 'avoid and minimise' principles of the Guidelines. Mr Lane considered populations of affected species in the Project Area would be expected to recolonise the temporary disturbance area once site revegetation occurs.

Other critical species would have the benefit of tailored POS requirements to minimise impacts (B10 – Swamp Skink and B13 – Growling Grass Frog).

For aquatic species such as Dwarf Galaxias and Australian Grayling, Mr Lane's evidence was those waterways potentially supporting these species are not proposed to be open trenched. There are four ephemeral waterways (Craigs Lane, Western Outfall, Tooradin Inlet and Hagelthorn Drain) proposed to be open trenched, however, to avoid impacts on these species, they will only be trenched during dry conditions with no water flow.

Mr Urlus acknowledged in responding to mitigation measures that in reviewing the nature of the Project and the potential risks it poses to matters of terrestrial ecology, he did not consider these risks to be unacceptable subject to additional mitigation measures being included relating to:

- Rapid revegetation along the whole of the pipeline alignment for Southern Brown Bandicoot habitat loss.
- Provision of refuge shelters at regular points along the pipeline alignment for Southern Brown Bandicoots.
- Contributions to predator management.
- Development of a clearing and revegetation protocol for Swamp Skink.
- Avoidance of works in Southern Toadlet habitat or where HDD works could not be undertaken to avoid breeding and larval periods (approximately March to November).

The IAC heard evidence from Dr Lorimer concerning potential impacts on threatened orchid species, including land subsidence and frac outs from HDD activity[113].

The Proponents and Mr Lane's evidence suggested that Merran's Sun-orchid (along with other co-located orchids) is unlikely to be impacted at all, by virtue of the use of HDD under the orchids and a series of POS' designed to ensure safe HDD.

Questioning of Dr Lorimer and Mr Lane confirmed that appropriate mitigation measures can be applied to ensure impacts from smothering of orchids associated with a frac out of material from HDD works can be monitored and managed, and that ground subsidence is unlikely due to the geology of the area at Crib Point.

Many submitters such as Mornington Peninsula, Birdlife Australia, Save Westernport expressed concern over impacts on shorebirds from disturbance associated with human activity, noise, vibration and lighting.

The submission from DAWE stated:

> Western Port Bay is important habitat for migratory shorebirds and utilise the site regularly and predictably each year. The site is particularly important habitat post- and pre-migration. Western Port is in an area known for its declining number of shorebirds. Loss or degradation of habitat should be avoided, particularly altering water quality, nutrient cycles or hydrology. Human disturbance, including light and noise, of roost sites and feeding areas should be avoided.

DAWE suggested that further consideration of impacts to migratory species is required, including development of appropriate mitigation measures to minimise the risk of adverse impacts.

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113 The fluid from HDD work is under pressure and if it bursts can reach the ground surface and smother vegetation.

Mr Lane gave evidence that intertidal environs at the Jetty and within 200 metres either side do not support significant numbers of shorebirds. He considered this is supported by the findings of decades of detailed monitoring of shorebirds in Western Port since 1973. Mr Lane considered monitoring is highly unlikely to discern any statistically meaningful changes in bird activity in the affected areas as very few of these birds use these areas. Areas such as Hastings Bight were considered by Mr Lane to be more actively used as foraging habitat due to the more extensive mudflats found in that area. Hastings Bight was sufficiently distant from the Project to not be significantly affected by lighting, noise and vibration effects.

Mr Lane gave evidence that impacts on Orange-bellied Parrots would be unlikely to be impacted as no coastal saltmarsh habitats favoured by the species are proposed to be impacted by the Project.

The Proponents and Mr Lane considered the risk of either a significant impact on migratory birds, including waders and waterbirds, or a significant impact on the Ramsar site, would be very low during both construction and operational phases of both components of the Project. They submitted the reality is that key sites for these birds are too distant from the GIJW for the birds to be impacted, and there is no reason to expect the use of closer, secondary foraging habitat would be impacted. The Proponents accepted that additional baseline monitoring and adaptive management responses of birds at Crib Point would be required.

Dr Lincoln Smith and Dr Blount gave evidence there was insufficient baseline information on the extent of wading birds and shorebirds using Crib Point which limited the assessment of Project impacts to birds. They further observed that the spatial scale of waterbird impact assessments was inappropriate. Mr Lane responded that the impact assessment utilised the Australia-wide accepted framework of assessing the Project against the Bay-wide critical CPS and LAC [114].

Dr Blount and Dr Lincoln Smith suggested monitoring for a period of 24 months between August and February would provide valuable baseline information that would assist with predicting impacts from the Project.

In response to questions from the IAC, Mr Lane advised that four monitoring events between November and February for one or two years would provide a sound baseline of waterbirds at Crib Point prior to commissioning the FSRU. He noted monitoring for a minimum of two seasons before operation would be ideal.

Dr Edmunds gave evidence that the assessment of migratory birds failed to apply appropriate criteria to assess impacts. Mr Lane responded:

> Technical Report B provides a thorough assessment of the status, distribution and abundance of these birds in and near the Project Area based on the extensive long-term data sets on waterbirds in Western Port. Impacts are then assessed in Section 7.1.3.1 against the significant impact criteria published by the Commonwealth Government to inform assessments of impacts under the EPBC Act. Dr Edmond's assertion is therefore incorrect[115].

114 D210
115 D210

Mr Lane further advised that the prediction of impacts of the Project to waterbirds is thorough and fit for purpose, and '*usage by ecosystems in Western Port by waterbirds was extensively documented'.*

5.4.3 Discussion

(i) Impacts on threatened species and wildlife

There was conjecture by opposing evidence and many submitters over the adequacy of survey effort for the presence or otherwise of threatened species within both components of the Project. The IAC considers any shortcomings are overcome by the application of relevant guidelines and protocols for the assessment, the conservative approach of assuming the presence of habitat values suitable for threatened species irrespective of their presence and in applying suitable mitigating measures to manage residual effects to acceptable levels.

The fact remains that irrespective of whether a threatened species or quantum of species are present within the Project's impact area, the extent to habitat impact remains.

The IAC heard evidence from Ms Thomas that with respect to translocation of wildlife that may be within the pipeline ROW, DELWP generally does not approve translocation of non-threatened wildlife. She considered this leads to a misapprehension that all wildlife can be captured and translocated when this is not necessarily true. Helpfully, she directed the IAC to DELWP's website on wildlife, which explained that translocation of non-threatened wildlife is not possible because there may be limits on the availability of food and shelter, territorial issues with other members of the species, and stress and exposure to predation in finding a new home.

With respect to translocation of threatened wildlife, DELWP is generally more supportive as it considers it an important conservation technique offering the only method for some species to prevent extinction or to establish new populations. A good example of this referred to in the EES was the release of captively bred, Orange-bellied Parrots into the wild at Western Port Bay.

The IAC acknowledges the concerns of submitters and in evidence, about impacts from the Project on threatened species. However, it takes solace in the fact that unlike Ms Thomas' reference to the extent of impact on wildlife from projects like Peninsula Link, this Project has a confined footprint with respect to terrestrial and freshwater biodiversity, comprising the CPRF site and the 30 metre ROW for pipeline construction that is much narrower than the width of a two-way dual carriageway arterial road.

In addition, the IAC notes the extent of impacts from pipeline construction can be reduced so that it may not be necessary for the full 30 metre ROW width to be impacted. The IAC has also recommended the retention of additional native vegetation areas proposed for removal.

Construction of underground pipelines is not new and has occurred previously in the area. The IAC acknowledges the Proponents intend to construct the pipeline along easements of existing pipelines and other infrastructure such as roads, property boundaries and internal paddock boundaries. These approaches are encouraged through the Mornington Peninsula submissions, subject to the caveat of environmental considerations.

Underground pipelines, whether constructed through open trenching, HDD or boring is tried and tested. The length of construction is limited and short term, and the timing of construction can be controlled. This enables the avoidance of sensitive times of the year when breeding cycles are prevalent, or during wetter times when open trenching and waterway crossings can have higher risks of greater impacts, or when species may be more active with movement. It is a form of construction that can be planned and managed to avoid or at least minimise such effects.

What particularly comforts the IAC is that once pipeline construction is completed, significant impacts cease (apart from routine maintenance of a small scale). In accordance with pulse impact theory, this allows the environment to recover as occurs following bushfire or flood events.

The IAC acknowledges that there will be impacts to species' habitats. It finds the extent and level of impacts to terrestrial biodiversity are acceptable, given the opportunity to apply the principles of avoid, minimise and offset, supported by mitigation measures that will facilitate recovery of the environment and habitat values for threatened species and any direct losses of species from the proposed works.

The IAC finds the evidence of Mr Lane useful, however, it was somewhat dismissive of the value of habitat for threatened species. This was exemplified for the issue of rapid revegetation of Southern Brown Bandicoot habitat areas and where the species was recorded/not recorded. Similarly, the IAC found the evidence of Mr Urlus useful and helpful given his preparedness to concede on matters based on objective analysis.

The IAC considers the impacts on threatened species to be acceptable subject to the amended POS (Day 4 version). However, there are some outstanding matters to be addressed.

(ii) Impacts on shorebirds

In relation to impacts on shorebirds, the IAC reviewed the construction and operational effects of both components of the Project regarding noise, dust, vibration, and human activity, all of which are associated with disturbance of birds foraging on the exposed mudflats at low tide. These effects are not considered by the IAC to be unacceptable [116].

The IAC makes this finding on the basis that it accepts the intertidal mudflats around the Jetty are not primary foraging habitats and do not include roosting sites. It is clear to the IAC that these mudflats are much narrower and less extensive compared to areas elsewhere in Western Port Bay (such as Hastings Bight, the north-east part of the Bay or eastern arm of the Bay). This reflects the bathymetry of the western arm of the Bay, the proximity of a naturally deep channel and the scouring effect of high tidal currents.

The mudflats around Crib Point Jetty provide foraging habit for shorebirds but the numbers or extent of use of the area are not as high as other parts of Western Port Bay.

The IAC accepts that impacts to birds from noise, vibration and dust will be minimal. The effects from construction will be limited and operation impacts would likely generate habituation (unless there are periodic sudden loud noises which may frighten birds). Human activity or an increase in such activity runs a greater risk of disturbance. Increased

[116] The effects from lighting are addressed in Chapter 5.6.

disturbance of shorebirds risks reducing their ability to forage on mudflats that are only available at low tidal periods and can compromise the ability of migratory species to add weight in preparation of migration.

In this regard, the IAC considers the distances to primary foraging areas and roosting sites are such that physical effects from the Project are acceptable.

The IAC acknowledges the evidence that questioned the adequacy of the shorebird and waterbird survey data and assessments of the extent of birds using Crib Point. The Proponents considered assessment against the bay-wide LAC as appropriate to determine the distribution and abundance of birds at Crib Point, identified as a secondary foraging habitat and less utilised than other locations further north of Crib Point. The lack of baseline data specific to Crib Point was noted by several submitters. The IAC considers additional monitoring for two years before operation commences would provide an adequate baseline understanding of birds at and around Crib Point and addresses this issue in Chapter 5.6.

(iii) Mitigation measures

In relation to mitigation measures, the IAC notes the change in position of Mr Lane who in his primary evidence recommended:

> A clear and appropriate Southern Brown Bandicoot-specific revegetation plan should be incorporated in the relevant CEMP that explicitly states times frames and monitoring for rapidly re-establishing habitat which is impacted upon. This will ensure that potential impacts to SBB will remain negligible.
>
> Any suitable SBB habitat throughout the entire Project Area that is impacted should be revegetated as per the SBB mitigation measures MM-FF09c, d & e to provide additional habitat. Where this occurs on private land, landowners must be consulted[117].

In his evidence in reply to Mr Urlus, Mr Lane changed his opinion having regard to the likelihood that Southern Brown Bandicoot no longer occurs in areas south of KP20 [118]. He concurred that allowing natural regeneration of vegetation would be sufficient and unlikely to lead to impacts on the species as it is likely to be absent.

The IAC supports the recommendation from Mr Urlus to retain rapid revegetation along the length of the pipeline alignment for the Southern Brown Bandicoot. The IAC does not accept the Proponents' position that the absence of records of the species in the southern portion of the pipeline alignment means '*that there is no rush to re-establish potential habitat – it is sufficient to allow it to re-establish over a longer timeframe*'. The IAC considers it acceptable to require rapid revegetation for all potential habitat along the alignment, including a Southern Brown Bandicoot-specific revegetation plan with timeframes and monitoring. In addition to the IAC's recommendations about retaining additional native vegetation, this will ensure the effects from pipeline works are further minimised and contribute to habitat embellishment useful for other species. For these reasons, the IAC supports amending POS R14 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.

117 D76.
118 D330.

Regarding a contribution towards predator management programs, the IAC considers this is appropriate. It is not dis-proportionate to effects, considering predator risks may already be present and the Project is undertaking works within the area where such risks occur. The IAC notes the evidence of Mr Urlus that fox predation is currently a key factor influencing the Southern Brown Bandicoot in the region. The Project poses a risk of facilitating the movement of foxes to and through potential habitat of the Southern Brown Bandicoot as well as potentially increasing predation risk through reducing the availability of shelter and refuge from habitat loss.

Mr Urlus considered a contribution to the long term management of introduced predators along and adjoining the pipeline alignment would be appropriate. He noted it could include supporting existing introduced predator control programs for Southern Brown Bandicoots and be based on principles of strategic and integrated control of foxes, rabbits and domestic and feral cats and dogs. He considered any such predator control contribution should occur for at least a ten year period, which would cover the construction and revegetation periods where vegetation structure would suitably re-establish.

The IAC considers it appropriate to include a recommendation relating to a contribution to predator control management along the pipeline alignment to be developed in consultation with appropriate land managers and authorities. This is included in a new CEMP POS.

Regarding the Swamp Skink, the IAC notes the EES included MM-FF08, which referred to a specific protocol for management of Swamp Skinks during clearing works. The Proponents considered the protocols were incorporated into the relevant POS (POS B10). However, Mr Urlus considered POS B10 focused on salvage and relocation measures and that reference to key protocols such as avoidance of the planting or spread of trees or overstorey shrubs in Swamp Skink habitat and revegetation with a high cover of grasses and sedges remained overlooked. Mr Urlus preferred retention of MM-FF08 as contained in the EES, which includes reference to consultation with Mornington Peninsula and aligning with the *Guidelines for Management Activities in Swamp Skink Habitat on the Mornington Peninsula* (Robertson and Clemann 2015).

The IAC notes there may need to be some integration with the type of revegetation between the Swamp Skink with that of other species such as the Southern Brown Bandicoot where they may co-exist to ensure each species habitat requirements are considered.

The IAC supports collaboration in developing a protocol for Swamp Skink as set out in MM-FF08 and considers POS B10 should be amended to reflect what was originally exhibited in the EES. The IAC acknowledges the commentary on Southern Toadlet and considers that HDD should appropriately minimise impacts on this species. It notes that if open trenching is to occur in Southern Toadlet habitat, efforts to avoid breeding periods should be undertaken where practicable.

The IAC is satisfied the proposed management of frac out potential and the avoidance of impacts on orchids is satisfactory. Further, that wildlife handling arrangements are appropriately addressed in the proposed mitigation measures.

The IAC concludes that impacts on threatened species from habitat loss and fragmentation, including on migratory shorebirds from land-based effects, will generally be acceptable. The relatively defined, narrow and lineal nature of the pipeline construction and operation means the extent of environmental impact should not be significant. Efforts to avoid,

minimise and offset, including revegetation establishes a process whereby impacts are of a short duration and limited in extent.

5.4.4 Findings

The IAC finds:

- The terrestrial and freshwater biodiversity assessment documented in the EES Technical Report B provides a sound basis to assess the impacts on threatened species.
- Impacts on threatened species have been appropriately avoided and minimised, will not be significant and can readily be managed to within acceptable limits.
- The proposed mitigation measures should be implemented subject to modifications relating to rapid revegetation for Southern Brown Bandicoot habitat along the length of the pipeline alignment and an appropriate protocol for managing clearing of Swamp Skink habitat.
- The Proponents should consider making a contribution to predator control management along the pipeline.

5.4.5 Recommendations

The IAC recommends:

Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)

Include the following changes:

- **New B14 (Predator control management):**

  Consider the opportunity for a contribution to predator control management along the pipeline alignment that would be developed in consultation with appropriate land managers and authorities.

Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)

Include the following changes:

- **Revised R14:**

  The following measures will be implemented to reinstate area of Southern Brown Bandicoot habitat:
  - **A clear and appropriate Southern Brown Bandicoot-specific revegetation plan should be incorporated in the relevant CEMP that explicitly states times frames and monitoring for rapidly re-establishing habitat which is impacted upon.**
  - **Dense cover of suitable native shrubs or vegetation of similar structure will be reinstated, other than directly above the pipeline and a narrow track as identified in the Environmental Line Lis (Attachment G) to allow ground access for surveillance patrols. Easement agreements with landholders will require that this vegetation be reinstated and protected.**
  - **Rapid re-establishment of dense ground cover will be achieved at any of the sites of known or assumed presence for the Southern Brown Bandicoot impacted by the construction footprint, but not subject to HDD, by planting of semi-mature native shrubs, or fast-growing tubestock, at an appropriate**

density during rehabilitation. The aim is to re-establish dense understory vegetation in the 0.2-1 metre height range.

- **Revised B10:**

  Swamp Skink

  Implement the following measures where areas of Swamp Skink habitat are identified in the Environmental Line List (Attachment G), to reduce impacts:
  - **Clear and grade activities will occur preferentially in warmer months (late Spring to early Autumn) when skinks are more active and better able to avoid activities.**
  - **A suitably qualified and authorised fauna handler will complete an inspection of the habitat area immediately prior to any vegetation removal (including ground cover).**
  - **If clear and grade occurs during cooler months, when skinks may be in burrows (April to September or as determined by a fauna ecologist), a suitably qualified and authorised fauna handler will be present during topsoil stripping to monitor the area and inspect stripped material.**
  - **A suitably qualified and authorised fauna handler will complete an inspection of topsoil and vegetation stockpiles prior to respreading.**
  - **Erosion and sediment controls and temporary fencing will be inspected for sheltering skinks prior to removal.**
  - **Relocate any individuals that are captured during the inspections described above to the nearest adjacent habitat away from the construction area.**
  - **A specific protocol will be developed for clearing Swamp Skink and Glossy Grass Skink habitat, in consultation with Mornington Peninsula Shire Council, which will refer to the *Guidelines for Management Activities in Swamp Skink Habitat on the Mornington Peninsula* by Robertson and Clemann (2015).**

5.5 Biosecurity risks and pathogens

5.5.1 Background

Biosecurity risks associated with soil and fungus pathogens were highlighted in the EES. They have potential for spreading due to construction works and through human activity.

Biosecurity risks *Phytophthera cinnamoni* (PC) and *Batrachochytrium dendrobatidis* (BC) are specifically addressed by proposed POS (B13 – Growling Grass Frog and S13 – Cinnamon Fungus).

5.5.2 Evidence and submissions

The IAC heard evidence from Dr Cole on PC and BC. PC is already present in the soil and cannot be removed. It is spread through construction works. BC is solely related to transportation by human activity and, for example, can be transmitted by human handling of frogs.

Dr Cole was concerned these pathogens could be spread due the Project, impacting on native vegetation and frogs, and on croplands including asparagus crops.

The Proponents submitted that asparagus growing areas have been avoided by the Project.

Dr Cole considered the locations where pathogens are present needed to be identified and that because the EES had not done this, it would be difficult to manage. Her evidence recognised the importance of managing runoff from ground disturbance in order to contain sediment within work site boundaries.

Dr Cole acknowledged the benefit of avoiding works during winter or wet periods to minimise the risk of runoff.

The Proponents and the evidence of Mr Lane considered mitigation measures POS B13 and S1 to S6 would appropriately address biosecurity and pathogen risk, including appropriate hygiene associated with vehicle washdown facilities.

5.5.3 Discussion

The IAC acknowledges the evidence of Dr Cole and is satisfied the EES and the response of the Proponents, including the amended POS, will appropriately address biosecurity risks.

5.5.4 Findings

The IAC finds:

- Biosecurity risk can be appropriately managed.

5.6 Lighting

5.6.1 Background

The EES assessed the impacts of 'light spill' associated with the GIJW on fauna, particularly shorebirds and noted that the increase in illuminated area is very small, in the broader context of Western Port Bay. It found the potential effects in the small area around Crib Point would be minor and concluded the risk rating was low.

Similarly, the EES assessed the lighting impacts on terrestrial fauna and shorebirds and concluded possible impacts would be minor. It recommended a construction related mitigation measure that has been translated into EPR-FF09 (Lighting impacts to fauna) and the preparation of an '*artificial light management plan'* for migratory birds (EPR-FF06). It concluded that the operational lighting associated with the Project would not constitute '*a measurable impact on terrestrial fauna or waterbirds*'. It concluded the Project was consistent with the *National Light Pollution Guidelines for Wildlife including Marine Turtles, Seabirds and Migratory Shorebirds*, Commonwealth of Australia 2020 (National Light Pollution Guidelines) and relevant lighting impacts would be further addressed through EPR-FF09 and EPR-FF06.

5.6.2 Evidence and submissions

The DAWE noted the potential for light impacts from the Project to *Environment Protection and Biodiversity Act* listed threatened and migratory species. It submitted the EES did not adequately refer to the National Light Pollution Guidelines. The submission noted the '*Guidelines are relevant for all migratory and other species that may be impacted by artificial light including Southern Brown Bandicoot and Growling Grass Frog*'.

Other submitters were concerned there had been inadequate consideration of the National Light Pollution Guidelines and that the EES had not considered the spatial extent of sky glow and broader impacts particularly to migratory shorebirds. Mr Cook advised he had not assessed the lighting and skyglow impacts to the ecology around the GIJW.

The Proponents noted the EES assessment of lighting and review of information on impacts of light to fauna found:

> The construction phase of the Project is unlikely to disrupt or displace wildlife from important habitat, nor is it likely to prevent wildlife from undertaking critical behaviours including foraging, reproduction and dispersal [119].

The Proponents concluded that with appropriate management of lighting during the operation of GIJW, wildlife is unlikely to be disrupted or displaced from important habitat. They committed to integrating an adaptive management framework into the OEMP '*to detect and respond to any documented impacts of artificial light on migratory birds and/or Ecological Character of the Ramsar site'.*

5.6.3 Discussion

The IAC agrees with the Proponents' submission that the permanent lighting associated with the FSRU and CPRF, in combination with the existing lighting across intertidal areas and over areas of Western Port, is unlikely to cause a measurable impact on threatened and migratory species, nor impact on the foraging success of birds. The IAC accepts that lighting and skyglow during the operation of GIJW, may temporarily alter the behaviour of wildlife but it is unlikely species would be disrupted or displaced from important habitat, nor prevented from undertaking critical behaviours such as foraging, reproduction and dispersal.

The IAC supports the proposed EPRs and has recommended (in Chapter 12.6 the Incorporated Document include a requirement that the lighting plan for the GIJW '*Configure the number, intensity and direction of lights, and the reflectivity of surfaces on the FSRU in order to minimise its landscape and visual impact*'. Although this is focussed on landscape and visual impacts, it will also assist in minimising any wildlife impacts.

Regarding EPR FF06 and EPR FF09 concerning lighting and shorebirds, the IAC notes the evidence of Mr Lane, his responses to questions from the IAC and the Proponents and TN46 relating to the timing for shorebird monitoring around the Crib Point Jetty of one to two years before and two years after the FSRU commences operating. The IAC accepts the suggested changes, however, considers a more conservative approach is necessary given the uncertainty of effects and recommends EPR FF06 require monitoring from November to February for two years before and four years after the FSRU commences operations. This will ensure the establishment of an adequate baseline and assist with identifying any changes with shorebird activity and lighting effects from the operation of the GIJW.

5.6.4 Findings

The IAC finds:

- Lighting impacts on wildlife will not be significant and can be appropriately managed.

5.6.5 Recommendation

The IAC recommends:

<u>Environmental Performance Requirements</u>

[119] Technical Report B Section 7.1.1.5

Include the following changes:

- **Revised EPR-FF06 (Migratory birds).**
- **Revised EPR-FF09 (Lighting impacts to fauna).**

This change is included at Appendix G.

5.7 Terrestrial and freshwater biodiversity conclusions

The IAC concludes that:

- The terrestrial and freshwater biodiversity impacts are consistent with the draft evaluation objective.
- Terrestrial and freshwater biodiversity impacts can be acceptably managed through the recommended EPRs and CEMP.
- There are no terrestrial and freshwater biodiversity impacts that preclude the Project being approved.

6 Surface water

6.1 Introduction

Surface water effects was discussed in EES Chapter 8 and Technical Report C. Additional material was provided in TN12, TN21 and TN22.

The relevant draft evaluation objective is:

> **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.

The review of surface water is closely aligned with the IAC's review of groundwater (Chapter 7) and contamination and acid sulphate soils (Chapter 8).

Table 4 lists the surface water evidence that was provided.

Table 4 Surface water evidence

Party	Expert	Firm	Area of expertise
Proponents	Dr McCowan	Water Technology Pty Ltd	Surface Water

6.2 Key issues

The key issues are:

- Impacts of the Project on surface waters, including Western Port Bay and waterways.
- Sea level rise risks on Project infrastructure.

6.3 Impacts on surface waters

6.3.1 Background

The location of the CPRF and pipeline potentially affects waterways within five sub-catchments that flow towards Western Port Bay [120].

Part of the area through which the pipeline traverses includes low lying land that was substantially altered in the 1800s when creeks were enlarged, and large open drains excavated to drain the Koo Wee Rup Swamp, known as the Koo Wee Rup-Longwarry Flood Protection District. Approximately 19 kilometres of the proposed pipeline alignment is within this floodplain, between Pearcedale and Pakenham.

The proposed CPRF site is close to the shoreline, north of the Jetty. Both its construction and operational risks would potentially impact on the quality of the waters of Western Port Bay from stormwater runoff, flooding, sedimentation and pollutants from spillages.

The pipeline passes through low lying flat areas which are subject to flooding, and several waterways where flooding occurs during large rainfall events. The pipeline crosses 64 declared waterways and more informal drainage depressions and drains. Risks from its

[120] Refer to Figure 5-1 in Technical Report C

construction include stormwater runoff, sedimentation, pollution from spillages and disruption to water flows.

The EES recognises that many of the waterways experience poor or reduced water quality, mainly due to changes in land use in the catchment.

The waters of Western Port Bay already experience high sediment loads that affect light penetration and seagrass growth. The EES acknowledges that sediment from the catchment is a significant contributor to this and that maintaining low sediment volumes is important in sustaining the Western Port Ramsar values.

The following EPRs relate to surface water:

- EPR-SW01 Managing runoff
- EPR-SW02 Fuel and chemical storage
- EPR-SW03 Spills prevention and management
- EPR-SW04 Refuelling of mobile machinery
- EPR-SW05 Facilities design
- EPR-SW06 Water Sensitive Urban Design treatments.

Other EPRs that relate indirectly to surface water include EPR-C05 – Fuel and chemical leaks/spills and EPR-C06 – Construction waste management.

The following POS environmental controls in the CEMP Attachment J directly apply to surface water:

- WC1 Waterways managed by the Catchment Management Authority
- WC2 Waterways managed by Melbourne Water
- WC3 Watercourse trenchless crossing
- WC4 Watercourse trenching
- WC5 Above ground blasting
- WC6 Soil stockpiles.

Other controls in the CEMP relate indirectly to surface water such as C7 - Managing soil stockpiles; C10 - Sediment pollution control; T4 to T7 relating to Trenching and de-watering; T12 - Contaminated groundwater/trench water and D1 to D11 relating to HDD.

6.3.2 Evidence and submissions

Surface water issues were not prominent in submissions to the IAC. The IAC notes there were no submissions from either Melbourne Water or the Port Phillip and Westernport Catchment Management Authority, both of whom have responsibilities for surface waters. No evidence was called to contest that of Dr McCowan. The Proponents noted there was little questioning of Dr McCowan and submitted his conclusions should be accepted.

The EES and Dr McCowan's evidence concluded it was unlikely the Project would cause significant impacts to surface water. The Proponents position was that surface water impacts have been comprehensively assessed, can be managed through mitigation measures, and are acceptable.

TN22 provided information relating to stormwater management at the CPRF. Existing overland flow paths are proposed to be maintained, with stormwater at the CPRF designed to avoid the risk of localised flooding. Overland stormwater flows are derived from local rainfall which runs into Western Port Bay. The CPRF is not affected by flooding from any waterways (see Chapter 6.4).

Dr McCowan gave evidence that stormwater management at both the CPRF and the PDF can be appropriately designed with overland flows managed to avoid increasing upstream flood levels. More specifically, Dr McCowan's evidence concluded that:

- Most of the waterways are small, with 60 per cent around 2 metres in width and 30 per cent less than 1 metre in width.
- The majority are ephemeral and only flow after rain or prolonged periods of wet weather.
- Upstream catchments of the pipeline alignment are predominantly rural and used for grazing and cropping with little or no buffer zones.
- The pipeline alignment crosses four main 'carrier drains' (drains built as part of the Koo Wee Rup drainage scheme and managed by Melbourne Water) that convey flows from upstream catchments directly to Western Port Bay (Cardinia Creek, Gum Scrub Creek, Toomuc Creek and Deep Creek).
- Most of the waterways are proposed to be crossed using HDD, effectively eliminating key risks associated with sedimentation and reduced water quality.
- Those proposed to be trenched will be done during no flow conditions where practicable and reinstated as soon as possible.
- Gaps in stockpiles will be used to avoid diversion of passage of flood waters.
- Any dewatering will be tested to ensure it is appropriate for disposal, otherwise it will be collected and disposed to an appropriately licensed landfill facility.

Dr McCowan considered appropriate mitigation measures to include:

- Avoidance of pipeline construction during the wetter months of the year, after periods of flooding or periods of prolonged wet weather.
- Avoidance of pipeline exposure due to bank erosion by providing a minimum depth of cover of 2 metres to the invert of any waterway or drain and greater than 2 metres depth of cover over HDD crossings of major waterways.

Dr McCowan considered risks related to construction can be appropriately managed by mitigation measures addressing:

- sediment and erosion control
- diversion of stormwater flows around work sites
- avoidance of concentrated flows
- diversion of stormwater flows around stockpiles
- minimisation of the area to be cleared for pipeline works
- provision of vegetation buffers to filter flows.

For operational matters, he considered risks can be appropriately managed by applying Water Sensitive Urban Design principles and vegetation buffers. In addition, he considered pollution risks from spillages of fuels, lubricants and chemicals could be satisfactorily managed through appropriate storage, bunding and containment, and spill management.

Dr McCowan recommended a further requirement be added to SW01 Managing runoff to divert stormwater around construction activities. This was adopted by the Proponents and included as item 'c' in SW01.

6.3.3 Discussion

The IAC accepts the evidence of Dr McCowan and considers the impacts on surface water from construction and operation of the Project will not be significant and can be managed to an acceptable level.

His evidence provided an objective and balanced consideration of the Project's effects on surface waters.

The EPA sought a change to POS WC4 to require waterway crossings to occur only when there is no flow. The Proponents suggested trenched crossings of ephemeral watercourses must only be constructed during no or low flow conditions. They considered this represented a proportional response to risk of sedimentation which in low flow conditions would likely see any mobilised sediments settling out long before there was any chance of these reaching Western Port Bay.

The IAC accepts the position of the Proponents and considers the risk of sedimentation from crossing ephemeral waterways low.

6.3.4 Findings

The IAC finds:

- The impacts on surface waters are not significant and subject to the recommended EPRs and CEMP, is acceptable, noting there was general agreement between the parties regarding this issue.

6.4 Sea level rise risks

6.4.1 Background

The CPRF is located close to Western Port Bay, a large tidal embayment and potentially subject to the effects of predicted sea level rise on the infrastructure.

6.4.2 Evidence and submissions

Dr McCowan provided evidence that the eastern part of the CPRF site may become vulnerable to inundation during a 1 per cent Annual Exceedance Probability (AEP) storm tide event by 2100. The expected life of the CPRF is 20 years and Dr McCowan advised at the level of the 1 per cent AEP storm tide, elevation by 2040 is expected to be 2.6 metre Australian Height Datum. Under these conditions, he considered only a narrow band of land along the inside of the eastern boundary of the CPRF site would be expected to be affected by storm tide inundation over the life of the CPRF. Dr McCowan considered the effects of sea level rise could be mitigated by:

- Modifying the layout of the Receiving Facility to only take up land outside the LSIO;
- Filling the eastern part of the site to an appropriate level; or
- Monitoring sea level rise and protecting the site by a sea wall, if and when it became necessary.

He advised any works required would need to be carried out to the satisfaction of Melbourne Water.

6.4.3 Discussion

The IAC accepts Dr McCowan's evidence and considers that over the 20 year timeframe of the Project, there will be opportunity to monitor, re-assess and respond to any risks from the effects of sea level rise as necessary.

6.4.4 Findings

The IAC finds:

- The risk of impact from sea level rise on the CPRF is acceptable and can be monitored over the 20 year life of the Project.

6.5 Surface water conclusions

The IAC concludes that:

- The surface water impacts are consistent with the draft evaluation objective.
- Surface water impacts can be acceptably managed through the recommended EPRs and CEMP.
- There are no surface water impacts that preclude the Project being approved.

7 Groundwater

7.1 Introduction

Groundwater effects were discussed in EES Chapter 9 and Technical Report D. Additional material was provided in TN09, TN10, TN11, TN13, TN27 and TN39.

The relevant draft evaluation objective is:

> **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.

The review of groundwater is closely aligned with the IAC's review of surface water (Chapter 6) and contamination and acid sulphate soils (Chapter 8).

Table 4 lists the groundwater evidence that was provided.

Table 5 Groundwater evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Medd	Golder Associates Pty Ltd	Groundwater
Mornington Peninsula and Cardinia	Mr Smitt	EHS Support Pty Ltd	Groundwater

Mr Medd provided supplementary evidence (D166).

One EPR is proposed relating directly to groundwater – EPR-HG01 – Suitably qualified contractors. Another proposed control EPR-C03 – Contaminated groundwater is relevant with regard to the CPRF.

The following POS environmental controls in the CEMP Appendix J apply directly or indirectly to groundwater:

- WC1 to WC6 relating to Watercourse crossing
- D1 to D11 relating to HDD and thrust boring.

7.2 Key issues

The key issues are:

- The impacts on groundwater levels, flows and quality.
- The risks to loss of groundwater bores and water supply.
- The impacts on Groundwater Dependent Ecosystems (GDE).

7.3 Groundwater levels, flows and quality

7.3.1 Background

The Project involves sub-surface works associated with the construction of structural piles required for the nitrogen tank at the CPRF and the construction of the pipeline. Both the construction and operation of these components of the Project have the potential to interact with groundwater.

The EES described the geology of the Project study area as mostly fine-grained clay, silts and sand with occasional gravels with a low permeability.

The central and northern portion of the proposed pipeline alignment falls within the Koo Wee Rup Water Supply Protection Area [121]. The Protection Area is managed by Southern Rural Water through a Groundwater Management Plan which documents all local management rules, including trade, groundwater monitoring and licenses [122].

Historical groundwater levels at the CPRF site have been recorded at six to eight metres below the ground surface where it is proposed to construct up to 100 piles up to 20 metres in depth for the nitrogen tank.

Groundwater levels along the pipeline alignment are described at less than four metres below the ground surface. Fluctuation of groundwater levels can vary between 0.5 metres to two metres with shallowest levels occurring in winter/early spring and deeper levels in summer/early autumn.

The maximum depth of trench excavation for the pipeline is approximately two metres but can be up to three metres. The depth for thrust bore holes are around four metres.

7.3.2 Evidence and submissions

Many submitters, including S2912, S3105 and S3129, expressed concern that groundwater flows would be impacted by construction of the pipeline, given that it passes through large areas of low lying land, much of which was previously the former Koo Wee Rup Swamp, an area prone to flooding, with groundwater levels close to the surface. Submissions from others such as S1479 were concerned the pipeline would risk damage to groundwater aquifers.

The general themes from submissions were:

- The depth of excavation for the pipeline would intersect with groundwater requiring trench dewatering which could result in a drawdown of groundwater levels to the detriment of the groundwater system.
- The placement and operation of the pipeline would potentially provide a preferential flow path for groundwater movement along the alignment or disrupt groundwater flows across the trench alignment.
- The quality of groundwater would degrade from:
  - use of drilling muds with HDD
  - soil disturbance with open pipeline trench construction that would allow stormwater runoff entering the open trenches and sedimentation
  - disturbance of contaminated soils
  - creation of acid sulphate soils.

The piling for the CPRF nitrogen tank was a concern to S2947 and the IAC in relation to interaction with groundwater and restrictions on flows or intersection between aquifers.

The Proponents submitted the assessment undertaken in the EES adopted a conservative, 'worst case' approach in considering potential risks with respect to groundwater. The EES assumed groundwater would be present close to the surface even though this was unlikely

[121] Refer to Figure 9-1 in Chapter 9, Volume 2 of the EES.

[122] A Permissible Consumptive Volume of 12,915 megalitres per year currently applies and if groundwater is required for construction of the Project, a temporary entitlement may need to be purchased from an existing licence holder as the area is fully allocated.

to be the case. The Proponents submitted the proposed mitigation measures appropriately address these worst case conditions and mitigate groundwater impacts to an acceptable level.

The evidence from Mr Smitt initially raised concern whether adequate seasonal groundwater monitoring had been undertaken as part of the EES. This was clarified by the Proponents in TN39 and through the evidence of Mr Medd. Groundwater levels were monitored in summer and winter to corroborate predictions of groundwater conditions and behaviour.

Mr Smitt gave evidence questioning errors and uncertainties in the EES relating to groundwater quality modelling and currency of information and findings. Many of these issues were responded to in Mr Medd's evidence in reply (D166).

Mr Medd gave evidence that soils in the pipeline alignment were generally of low permeability, which meant it would be unlikely dewatering of any groundwater encountered in the trenches would affect overall groundwater levels. His view was reinforced by:

- The typical two metre construction depth for the pipeline trench not intersecting groundwater levels were generally greater than 1.5 metres below ground surface levels in summer when it is proposed to undertake construction.
- The short duration of any dewatering of encountered groundwater which would typically be limited to no more than 100 metre section lengths of the trench for one to two days and up to 10 days for thrust bore holes.

Mr Medd considered such a short period of time associated with any dewatering of the trenching would not be long enough to cause any discernible impacts from drawdown on groundwater levels. In recognition of the possibility of longer dewatering timeframes, Mr Medd recommended a dewatering plan be prepared to evaluate risks and implement appropriate contingency measures. This was included in POS T14 in Appendix J to the CEMP.

Mr Medd considered changes caused by the pipeline to groundwater flow paths, would not be significant as:

- It would be unlikely for the backfilled trench to prevent all groundwater passing across it, particularly given the relatively shallow depth of pipeline excavation.
- Preferential groundwater flow along the pipeline alignment would be unlikely on the basis that the trench is to be backfilled with the same in situ material.

In relation to the effect from piling for the CPRF nitrogen tank, TN10 advised any intercepting flows between aquifers would be of short duration, limited to the time taken for drilling and pumping of concrete slurry. Upon completion of this work and once the piles were sealed, impacts on groundwater flows should cease.

In relation to groundwater quality, Mr Medd's evidence was that any potential for HDD works to intersect aquifers and for drilling muds to escape and contaminate groundwater would be unlikely, given the construction method includes maintaining bentonite-based drilling muds within the borehole. These should provide sufficient pressure to balance groundwater inflow and create a low permeability lining on the borehole walls. When the pipeline is drawn back through the borehole, this mud would remain to fill the small area between the pipe and the borehole wall. This would provide resistance to groundwater flow such that the risk of interconnection between aquifers is low. Mr Medd recommended drilling muds used in HDD should be non-toxic and where possible biodegradable (POS D7 of Appendix J of the CEMP).

The pipeline alignment is proposed to travel through areas adjoining industrial development in Hastings (KP7.3 to KP7.5) and the former Tyabb Landfill (KP13 to KP16). These locations have the potential to contain contaminants that may be disturbed by pipeline construction and with dewatering, could be mixed and mobilised with groundwater flow movement. Mr Medd gave evidence the shallow depths of excavation and short duration of dewatering mean that, although some temporal change in distribution might occur, the scale of this change would be minor. He noted it would be expected that over time, groundwater quality would re-establish to the condition prior to the disturbance. He found the quality of trench backfill material will be important to ensure potential for any contaminant movement is controlled. He recommended mitigation measure CEMP Attachment J, C04 include reference to using backfill material of a similar hydraulic conductivity to that of the surrounding soils. TN11 also refers to soil re-profiling and placement to avoid cross contamination.

Mr Medd considered any dewatering that encountered or had the potential to lead to acid sulphate soils should be carefully managed in accordance with the *National Acid Sulfate Soils Guidance: Guidance for the dewatering of acid sulfate soil in shallow groundwater environments*.

7.3.3 Discussion

The IAC acknowledges the concerns from submitters regarding groundwater and understands their significance. It acknowledges the evidence of Mr Medd and Mr Smitt in consideration of issues and effects. The IAC appreciates the willingness of both witnesses to provide objective responses to, and preparedness to concede, on issues.

The IAC notes the evidence of Mr Medd and Mr Smitt generally supported the conclusion in the EES that it was unlikely the Project would cause significant impact to groundwater. Mr Smitt had residual concerns about potential GDE.

Overall, the IAC accepts the findings of the EES and the evidence that impacts on groundwater levels, flows and quality will not be significant. The IAC agrees:

- The short duration and shallow construction of pipeline trenches that avoids the wetter months and wet conditions, and limits the extent and time of any dewatering, should avoid significant impacts on groundwater levels.
- The shallow form of trench construction and use of appropriate backfill material of similar hydraulic conductivity to that of the surrounding soil should avoid significant impacts on groundwater flows.
- Use of HDD with appropriate drilling muds should mitigate against intersecting between aquifers and avoid significant impacts on groundwater quality.
- Construction of piling for the CPRF nitrogen tank and sealing with concrete should mitigate aquifer intersection and avoid significant impacts on groundwater quality.

The IAC generally considers the temporary nature of construction means impacts on groundwater will be short, temporary, and designed to minimise changes to groundwater levels, flows and quality. This will be important, particularly with respect to contaminant disturbance and acid sulphate soils to ensure impacts from these effects do not materialise. The timing of construction will be important to ensure the EES predictions eventuate.

Similarly, the IAC does not consider the operation of the CPRF or pipeline will significantly impact groundwater levels, flows and quality, subject to appropriate backfilling with in situ

material and appropriate use of HDD drilling muds and concrete sealing of piles that prevents ongoing groundwater aquifer leakage.

The IAC agrees with the changes to EPRs and CEMP recommended by Mr Medd and notes these were incorporated into the final versions of the EPRs and CEMP where relevant.

7.3.4 Findings

The IAC finds:

- The impacts on groundwater levels, flows and quality are not significant and subject to the recommended EPRs and CEMP, are acceptable.

7.4 Groundwater bores and water supply

7.4.1 Background

Groundwater provides for beneficial uses including water supply and is provided using groundwater bores. The EES identified 69 registered groundwater bores within 200 metres of the pipeline ROW used for stock, domestic and irrigation purposes. Five bores were within 30 metres of the pipeline:

- One at Devon Meadows, KP28.7, that is used as an observation bore and with a depth of 114.3 metres.
- Two at the former BP Crib Point refinery, with depths of 8.1 metres and 12.7 metres.
- Two at Somerville, KP16.5, used for irrigation with depths of 42.6 metres and 47.5 metres.

The southern portion of the pipeline alignment travels through vegetated areas and the urban area of Hastings. The northern portion of the pipeline alignment travels though farming areas, including part of the Koo Wee Rup Water Supply Protection Area.

7.4.2 Evidence and submissions

Several submitters raised concerns that pipeline construction would impact on groundwater bores. Further, trench dewatering would result in drawdown of groundwater levels, resulting in reduced availability or loss of water supply from groundwater bores affecting farming and domestic use. For example, S1479 was concerned over loss of water supply from groundwater sources for the wine industry.

Mr Medd gave evidence that in a worst case scenario of a high-water table being drawn down by two days of trench dewatering, the magnitude of water level reduction away from the excavation may extend up to 25 metres from the trenched pipeline sections and around 60 metres from the thrust bore holes. The EES demonstrated there were no groundwater bores within these distances. Mr Medd generally considered any impacts would be minimal because construction is expected to occur in the drier months of the year and will be a short duration that allows for groundwater recovery.

In relation to the two groundwater bores used for irrigation purposes at Somerville close to the pipeline alignment, Mr Medd considered that due to the depth from which they extract groundwater, water supply is unlikely to be affected by the pipeline trench. This is because it is proposed to be installed approximately two metres below the ground surface level. Mitigation measures were provided for identifying and protecting surface infrastructure of groundwater bores near the construction areas.

7.4.3 Discussion

The IAC agrees with the EES assessment and the evidence of Mr Medd with respect to groundwater bores and water supply.

There are no groundwater bores that are close enough to the proposed pipeline alignment that would be affected by the construction and operation of the pipeline.

The limited extent and duration of trench dewatering of any intercepted groundwater should not have a discernible impact on groundwater supply due to the short duration and temporary nature of construction.

7.4.4 Findings

The IAC finds:

- Based on the evidence presented, there should be no impacts on groundwater bores.
- Impacts on groundwater supply will not be significant, and subject to the EPRs and CEMP, are acceptable.

7.5 Groundwater Dependent Ecosystems

7.5.1 Background

GDE are ecosystems that require access to groundwater to meet all or some of their water requirements to maintain the communities of plants and animals and ecological processes they support, and ecosystem services they provide. These can include vegetation with roots that access groundwater.

The EES identified there are numerous moderate to high potential terrestrial GDE crossed by the pipeline alignment, particularly in the southern portion as well as adjacent to the CPRF site. Potential GDE include woodland, coastal saltmarsh, swamp scrub and salt meadows.

The EES described that shallow groundwater is likely to discharge to waterways, and potentially to Western Port, particularly in wet seasons. Streams and drains may provide groundwater recharge in dry seasons. Aquatic ecosystems may be associated with freshwater waterways, saltwater marine environments (including the Western Port Ramsar site) and intertidal areas. Ecosystems that rely on groundwater discharge are referred to as aquatic GDE (waterways). Eleven potential aquatic GDE were identified within or near to the Project area and nine of these are to be bypassed by proposed HDD.

7.5.2 Evidence and submissions

Submitters such as Mornington Peninsula and Cardinia, together with S3149 and S1479 were concerned about potential damage to GDE.

Mr Medd's evidence was that impacts on any GDE would not be significant. He considered excavation works required to install the pipeline are shallow and impacts are of a temporary nature, i.e. days of dewatering. It would be reasonable to expect that groundwater levels would return to levels reasonably close to those prior to excavation over a similar number of days based on the shallow excavation depths and dewatering durations.

Mr Lane provided a response to GDE (D530). The two waterways proposed to be open trenched (Olivers Creek at KP9.6 and the Western Outfall Drain at KP31.5) described in the EES as cleared areas, with minimal existing vegetation and with minor flows.

Mr Lane confirmed vegetation along the pipeline corridor, including areas that may depend on groundwater, were mapped and indicated that most of the larger areas such as Warringine Park were bypassed by HDD. As groundwater levels naturally vary seasonally and on longer time scales, temporary changes in groundwater levels due to dewatering of excavations are not likely to affect terrestrial GDE.

Cardinia and the evidence of Mr Smitt expressed concern that groundwater monitoring was not undertaken for an area of basalt geology near the PDF and pipeline (KP 55). They both contended this may have missed a potential GDE associated with perched water tables that might be impacted.

Cardinia raised concerns about the possibility of perched aquifers in proximity to moderate and high potential GDE [123]. It noted Mr Smitt suggested there is a need for an ecological survey to determine the presence of GDE, along with a qualitative estimate of the degree of groundwater dependence. Cardinia noted that, depending on outcomes of further ecological survey, Mr Smitt suggested a watering management plan may be required at certain points.

Mr Lane's response was that this area has been highly altered due to past agricultural development, with planted shelter belt vegetation comprising non-indigenous and exotic trees. His view was that further assessment for GDE was not warranted.

7.5.3 Discussion

The IAC notes that although there was general agreement between the witnesses, Mr Smitt had residual concerns about potential GDE and impacts from the Project. Mr Smitt considered an ecological survey is required to determine the presence of GDE, along with a qualitative estimate on the degree of groundwater dependance. He considered that where they occur, mitigation measures should be implemented to manage dewatering and acid sulphate soil risks, as well as including a watering management plan in case activities dewater the perched systems.

The IAC agrees with the evidence of Mr Medd and the information provided by Mr Lane with respect to waterways and vegetation that:

- The two waterways (Olivers Creek and Western Outfall Creek) proposed to be trenched do not have intact vegetation and GDE are absent.
- Given the limited extent and, in particular, the short duration of groundwater drawdown, it is unlikely that aquatic fauna in these waterways will be affected as the temporary minor impact on creek flows will not be outside the natural range of flow variation to which this fauna is adapted.
- Impacts on vegetation at Warringine Park will now be avoided through the use of HDD as recommended by the IAC in Chapter 5.3.
- At around KP55, an ecological assessment of potential GDE prior to construction is not necessary given the nature of the planted vegetation and the conclusion of Mr Lane that there are no GDE in this location.

Generally, the IAC accepts Mr Lane's evidence that the short duration of any groundwater drawdown and changes in the availability of groundwater in the root zones of vegetation will

[123] D442 paragraphs 15-19

be within the range of natural variability. Impacts on GDE from the Project will not be significant and can be appropriately managed to an acceptable level.

7.5.4 Findings

The IAC finds:

- Impacts on Groundwater Dependent Ecosystems will not be significant and that subject to the CEMP, are acceptable.

7.6 Groundwater conclusions

The IAC concludes that:

- The groundwater impacts are consistent with the draft evaluation objective.
- Groundwater impacts can be acceptably managed through the recommended EPRs and CEMP.
- There are no groundwater impacts that preclude the Project being approved.

8 Contamination and acid sulfate soils

8.1 Introduction

Contamination and acid sulfate soils effects was discussed in EES Chapter 10 and Technical Report E. Additional material was provided in TN10, TN11 and TN13.

The relevant draft evaluation objectives are:

> **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.

The review of contamination and acid sulfate soils is closely aligned with the IAC's review of surface water and groundwater.

Table 6 lists the contamination and acid sulfate soils evidence that was provided.

Table 6 Contamination and acid sulfate soils evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Davidson	AECOM Australia Pty Ltd	Contamination and Acid Sulfate Soils
Proponents	Mr Medd	Golder Associates Pty Ltd	Groundwater and Contamination
Mornington Peninsula and Cardinia	Mr Smitt	EHS Support Pty Ltd	Groundwater
CEG	Associate Professor Wong	Monash University	Acid Sulfate Soils

Mr Davidson provided supplementary evidence (D168).

The following EPRs apply to contamination and acid sulfate soils associated with the Project:

- C01 – Contaminated soils
- C02 – Acid Sulfate Soil Management Plan
- C03 – Contaminated groundwater
- C04 – Unknown contamination
- C05 – Fuel and chemical leaks/spills
- C06 – Construction waste management
- C07 – Operation waste management.

The following POS environmental controls in the CEMP Attachment J apply directly or indirectly to contamination and acid sulfate soils:

- F1 to F12 relating to Fuels and chemicals
- W1 to W10 relating to Waste
- T11 and T12 related to Contaminated soils and trench water
- T13 for Acid Sulfate Soils Management Protocol.

Acid sulfate soils are proposed to be specifically addressed under the Acid Sulfate Soils Management Protocol in Attachment K to the CEMP. The following EPRs apply to contamination and acid sulfate soils associated with the Project:

- C01 – Contaminated soils
- C02 – Acid Sulfate Soil Management Plan
- C03 – Contaminated groundwater
- C04 – Unknown contamination
- C05 – Fuel and chemical leaks/spills
- C06 – Construction waste management
- C07 – Operation waste management
- C08 – Fuel and chemical leaks/spills
- C09 – Construction waste management.

The following POS environmental controls in CEMP Attachment J apply directly or indirectly to contamination and acid sulfate soils:

- F1 to F12 relating to Fuels and chemicals
- W1 to W10 relating to Waste
- T11 and T12 related to Contaminated soils and trench water
- T13 for Acid Sulfate Soils Management Protocol.

The following TNs were submitted by the Proponents:

- TN10 related to CPRF piling
- TN11 relating to Soil profiles and trench reinstatement
- TN13 relating to Mornington Peninsula and Bass Coast submissions.

8.2 Key issues

The key issues are:

- Disturbance of contaminated soils and groundwater during construction and marine sediments during operation.
- Impacts from disturbance of potential and actual acid sulfate soils.

8.3 Disturbance of contaminated soils, groundwater and marine sediments

8.3.1 Background

The potential impacts of the Project to human health and the environment from activities that may disturb or create contaminated soils, groundwater and marine sediment are discussed in Technical Report E. The assessment of existing conditions for contamination was based on desktop reviews of available information and intrusive field sampling.

The soil and groundwater investigations focussed on impact from construction. Investigations were concentrated along the pipeline ROW including alignment alternatives and a buffer area of 50 metres either side of the ROW, the PDF, EOLSS, and the landside component of the GIJW.

The assessment indicated that with the exceptions of a few locations, the majority of existing land uses were considered to have a relatively low potential for soil and groundwater contamination. Intrusive soil assessments identified contamination at the proposed CPRF, adjacent to the former BP refinery, and within the rail corridor in Hastings.

Groundwater contamination was described as limited in extent, with contamination only encountered adjacent to the former Tyabb landfill and adjacent to the metal recycling yard in Hastings.

The marine sediment assessment included sampling of sediments from the seabed surrounding the Jetty. The study area included Berth 1 and 2, and a buffer area of approximately 200 metres east of the berths. Four reference samples were collected from locations approximately 500 metres north of Berth 1 and south of Berth 2.

The marine sediment investigation indicated contamination exceeding adopted GV were not identified at Berth 2. Contamination from historical and/or existing activities at the Jetty was limited to Berth 1 only, with arsenic, polyaromatic hydrocarbons (PAH) and Tributyltin (TBT) reported as exceeding adopted GV. The EES concluded the existing beneficial use of protecting water dependent ecosystems and species at Berth 1 and 2 should be protected.

Assessment of risks to beneficial uses of land, surface water and groundwater (as specified in the SEPP (Prevention and Management of Contamination of Land) (SEPP (PMCL)) and the SEPP (Waters)) from construction and operation of the Project in accordance with Australian/New Zealand Standard AS/NZS ISO 31000:2009 Risk Management Process, was undertaken using information obtained through desktop and limited field investigation.

8.3.2 Evidence and submissions

The Proponents submitted contamination impacts to soil and groundwater were only likely during construction. In its closing submission, the Proponent stated:

> That it was unlikely that the Project would cause or be impacted by contamination. Hot spots of contamination and potential contamination will readily be dealt with by the proposed controls, which are standard practice and now incorporate several clarifications and additions in response to matters raised in submissions on the EES and in evidence [124].

(i) Soil contamination

The Proponents submitted the intrusive contaminated soil investigations indicated soil contamination is limited in extent and can be managed appropriately by applying relevant mitigation measures during construction. Contaminated soils were identified at:

- The proposed CPRF site (impacted by zinc and benzo(a)pyrene).
- The Esplanade adjacent to the former BP refinery (KP0.2 And KP0.3 impacted by benzo(a)pyrene).
- Railway corridor in Hastings between High Street and Cool Store Road (KP6.0 impacted by benzo(a)pyrene).

Submitters raised concerns contaminated soils would be inappropriately disposed, particularly soils containing Per- and polyfluoroalkyl Substances (PFAS) disturbed during construction of the CPRF. Mr Medd gave evidence that mitigation measures EPR-C01 and EPR-C07 satisfactorily address potential risks of encountered contaminated soils.

Casey raised the following concerns with potential soil and groundwater contamination:

- Additional investigations should be conducted if suspected soil or groundwater contamination is observed or encountered during excavation or backfilling.

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- The EES proposed that risk and impact assessment is to be an iterative process and procedures and mechanisms should be in place to adequately manage potential risks.
- The CEMP and risk assessment should be an iterative process, with regular reviews required.

Submissions raised concerns that an area adjacent to a metal scrap yard (KP7.3 to KP7.9) had not been sampled and analysed due to heavy cover in the area. The Proponents committed to conducting further intrusive works prior to pipeline construction, now included in POS T11. A number of submissions expressed concern that construction activities would cause contamination. Mr Medd gave evidence that risks from spills from machinery, fuel and chemical storage and landfill gas at the former Tyabb landfill were low and could be effectively managed during construction with the nominated EPRs and POS.

(ii) Groundwater

The Proponents submitted groundwater assessments identified limited sources of groundwater contamination. Contamination was detected adjacent to the former Tyabb landfill (KP13 to KP16), with trace concentrations of PFAS. Elevated nickel was encountered adjacent to the metal recycling yard in Hastings (KP7.3 to KP7.5).

Mr Medd gave evidence he was satisfied contaminated groundwater could be effectively managed, noting:

> Contamination impact assessment focusses on disposal of contaminated groundwater, should it be encountered during the pipeline works. The assessment does not directly address the potential for dewatering activities to result in migration of contaminated groundwater [125].

Mr Medd added the potential for migration of groundwater contamination during trenching was not well covered in the EES. Based on the proposed shallow excavations and short durations of groundwater dewatering during trenching, the scale of temporal changes in potential contamination would be minor. Any impacts would be re-established back to existing conditions relatively quickly. He found the low rate of groundwater drawdown would not result in the slow movement of contaminated groundwater, in the event migration was to occur.

Casey submitted construction may increase risk of cross contamination between inter-connected groundwater aquifers. It suggested monitoring and/or investigation should be carried out and plans updated to reflect this.

The IAC directed the Proponents provide additional information regarding the risk of intersection and potential cross contamination of groundwater at the CPRF. They responded in TN10 which noted:

> The risk of interconnecting aquifers and impacting groundwater quality such that beneficial uses and/or groundwater users are affected in one or more aquifers is low.

Mr Smitt expressed concern the persistence and widespread use of PFAS warranted further consideration in groundwater at additional hotspots, particularly KP13 to KP16. He noted ambiguity in the groundwater results at the former Tyabb landfill and recommended

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additional sampling to verify PFAS results. His evidence suggested additional groundwater investigations adjacent to the meat packer facility should include PFAS as he considered this a potential hot spot.

Mr Davidson gave evidence that groundwater, which is at an adequate depth below the CPRF, would preclude intersection during the construction works on site. The only intersection will be via pile driving, which he confirmed adequately justified the lack of analysis at this location.

At the direction of the IAC, the Proponent provided TN11 which described the proposed methods that would be employed to separate, stockpile and reinstate soils during trench works.

(iii) Marine contamination

In response to concerns by submitters that marine sediments would be disposed inappropriately, Mr Medd's evidence asserted marine sediments would not require removal as part of the Project. Submissions raised concerns that sampling and analysis of marine sediments in the EES was limited.

The Proponents submitted that PFAS was detected in marine sediment above the laboratory limit of reporting (LOR) at three locations within Berth 2. Arsenic, PAH's and TBT were identified in sediment above the Interim Sediment Quality Guidelines at Berth 1. A number of submitters expressed concern that contaminated sediment would be disturbed during commissioning of the FSRU and high velocity discharge ports and during tug wash scouring of the seabed each time an LNG carrier was moored adjacent to the FSRU.

Further submitter concerns related to the management of wastes from the FSRU. The Proponents submitted that wastes from various processes within the vessel would be removed by licensed contractors and disposed of to appropriate disposal facilities.

8.3.3 Discussion

The IAC acknowledges the submitter's concerns regarding soil, groundwater and sediment contamination and understands their significance. It acknowledges the evidence of Mr Davidson, Mr Medd and Mr Smitt in consideration of issues and effects. The IAC appreciates the willingness of each witness to provide objective responses to, and preparedness to concede, on issues.

The IAC notes the evidence of Mr Davidson and Mr Medd supported the EES conclusions that the Project would unlikely result in unacceptable environmental impacts from contamination of soil, groundwater and marine sediment. Mr Medd and Mr Smitt generally agreed groundwater impacts are likely to be minimal and managed effectively by applying the relevant mitigation measures.

The IAC notes the soil and groundwater assessments focussed attention on the land-based components of the Project, stretching from the CPRF to the EOLSS. The pipeline assessment considered soils every one kilometre, with more targeted sampling at locations where prominent change in land uses could potentially contaminate land. This is generally accepted by the IAC as appropriate.

Mr Davidson, Mr Medd and Mr Smitt recommended a number of amendments to the EPRs and CEMP POS and the IAC notes that these were largely adopted by the Proponents.

There were submissions that raised general concerns about the possible cross contamination of groundwater and soils during construction works within discrete locations, particularly around the CPRF, BP refinery and former Tyabb landfill. The IAC recommends that EPR-C04 is amended to require soil and groundwater be assessed in accordance with EPA Publications IWRG 702 and IWRG 621 in the event unknown contamination is encountered.

The IAC concurs with evidence from Mr Medd that in the event contaminated groundwater was intersected, the risks were considered low as trenches would be relativity shallow and potential contaminant movement would be reduced by trench backfilling with excavated soils. Mr Medd suggested mitigation measures included backfilling with materials that have a similar or lower hydraulic conductivity than surrounding soils. The Proponents adopted this suggestion in EPR-C03. TN11 described the proposed approach to soil reinstatement presented as a method to reduce potential migration of groundwater. The IAC recommends revision of EPR-C03 to require containment of contaminated groundwater prior to treatment and or disposal.

The IAC notes elevated Total Dissolved Solids was reported in the EES at a number of locations. This precludes the use of groundwater for a number of beneficial uses. The IAC considers groundwater dewatering and discharge to land and receiving surface waters should be restricted where suspected soil and groundwater contamination is assumed. The POS and EPR do not currently preclude groundwater reuse at identified hotspots. The IAC has suggested amendments to EPR-C03 that groundwater not be dewatered and discharged to the environment unless groundwater is deemed uncontaminated.

The former Tyabb landfill is a priority site along the pipeline alignment. The EES reported an environmental audit under s53V under the *Environment Protection Act* had been undertaken for the former Tyabb landfill owned by Mornington Peninsula. The audit identified a medium risk of groundwater leachate impacting on the groundwater beneficial use of '*Stock Watering*' and impacts of sub-surface landfill gas migration and accumulation to on the health of workers undertaking works in underground mains or trenches.

Mr Davidson advised he supported the assumptions in the audit that indicated risks of landfill gas generation and methane concentrations were considered low to very low, respectively. He noted risks to workers should be managed by inclusion of a mitigation measure to protect workers during pipe works adjacent to the former landfill. POS T12 was amended in response to Mr Davidson's evidence to require landfill gas monitoring as part of pre-start checks and prior to any hot works commencing during open excavations adjacent to the former landfill site.

Submitters identified the lack of intrusive soil and groundwater investigations between KP7.3 and KP7.9 due to site inaccessibility. They questioned the procedures to ensure that additional investigations would be conducted once vegetation was cleared. The Proponents included a requirement in POS T11 to ensure such an intrusive investigation occurs. The IAC recommends a further amendment, requiring soil sampling and analysis in accordance with EPA IWRGs to understand the potential contamination prior to excavation commencing.

During the soil contamination assessments, benzo(a)pyrene was detected in soils at the CPRF site, The Esplanade adjacent to the former BP refinery and in the rail corridor at Hastings. This organic compound is a carcinogen and formed as a result of incomplete fuel combustion. The EES noted the compound had negligible leaching potential and was unlikely to present risks to offsite receptors.

The IAC agrees with the evidence of Mr Smitt that PFAS are highly persistent in the environment and wide-spread use of PFAS related products warrants further intrusive sampling between KP7.3 to 7.6 to confirm the extent of groundwater contamination. This is reflected in POS T11 which the IAC recommends is amended to include further groundwater sampling at both locations in accordance with EPA IWRG 621 and 702.

Although not raised at the Hearing, the IAC acknowledges disposal of soils contaminated with PFAS has been problematic for recent projects within Victoria. The IAC recommends the Proponents assess the volume of likely PFAS contaminated soil and develop a strategy outlining how and where soils will be disposed of prior to soil disturbance. The IAC recommends revising POS W3 to require the Proponent to develop a strategy in consultation with EPA which outlines the methods for disturbing and disposing soils contaminated by PFAS.

The IAC considers the marine sediment assessment was consistent with relevant guidelines for assessing and categorising contamination and supported by Mr Davidson in his evidence. The IAC acknowledges that marine sediment sampling indicated sediments were either below the laboratory LOR or below the adopted sediment quality guideline values (SQGV) at Berth 2. PFAS was detected in marine sediment sampled from three locations at Berth 2 close to laboratory detection limits or LOR. An Australian SQGV for PFAS to maintain ecosystem health has not yet been established. As indicted in the EES and supported by Mr Davidson, risks to the beneficial use of protecting water dependent ecosystems and species was deemed low. On balance, the IAC considers this conclusion adequate.

The EES reported results collected from marine sediment at Berth 1 in 2018 by Jacobs. Concentrations of arsenic, PAH anthracene, fluoranthene, phenanthrene, pyrene and TBT were detected above the ISQG trigger values. The IAC accepts the assertion in the EES that exceedances are generally low and do not preclude the existing use of the Jetty.

The Project does not involve dredging marine sediments at Crib Point, and the IAC considers the only disturbance to marine sediment is likely to be minor levelling of the seabed and infrequent disturbance by the tugboats. As indicated in Chapter 4, the risk of tugboats dispersing sediment, particularly at Berth 2 when mooring the LNG carrier, was raised by several submitters. Similarly, the disturbance of sediment containing elevated TBT displacing from Berth 1 to Berth 2 during tugboat operations was raised as a concern.

A number of submitters and the marine experts for Mornington Peninsula and Bass Coast and the CEG submitted dispersion of contaminated sediment is likely during commissioning of the FSRU's discharge ports and during tugboat operations. The IAC acknowledges the evidence presented by Mr Chidgey and Dr Wallis that confirmed risk to the beneficial use of protecting water dependent ecosystems and species was low.

The Proponents concluded that as marine sediment contamination was not expected to impact beneficial uses, contaminated marine sediments were not addressed in the risk assessment. The IAC supports this conclusion as significant disturbance by the Project to marine sediment is unlikely.

The IAC considers the recommended mitigation measures should adequately manage any contaminated soils and groundwater disturbed within the Project area, including unknown contamination.

8.3.4 Findings

The IAC finds:

- Contamination of soil and groundwater was identified at a number of locations along the pipeline alignment and at the CPRF.
- Soil and groundwater contamination impacts can be adequately managed by the recommended mitigation measures.
- Contamination of marine sediments at Berth 1 exceeded adopted criteria and was attributed to historic activities. PFAS was measured marginally above laboratory limits of reporting at Berth 2 and the beneficial use of protecting water dependent ecosystems and species will be maintained.
- Based on the evidence presented at the Hearing, marine contamination at Crib Point is not expected to adversely impact Western Port Bay.

8.3.5 Recommendations

The IAC recommends:

Environmental Performance Requirements

Include the following changes:

- **Revised EPR-C03 (Contaminated groundwater)**
- **Revised EPR-C04 (Unknown contamination)**

These changes are included at Appendix G.

Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)

Include the following changes:

- **Revised POS T11: (Contaminated Soils), add the following dot point:**
  - **intrusive soil contamination sampling at KP7.3 to KP7.6 in accordance with EPA IWRG 621 and IWRG 702, prior to excavation to confirm the presence or absence of contaminated soils.**
- **Revised POS W3:**
  - **Develop a strategy in consultation with EPA which outlines the methods for disturbing and disposing soils contaminated with PFAS.**

8.4 Acid sulfate soils

8.4.1 Background

Acid sulfate soils (ASS) are soils affected by iron sulphide minerals, predominantly pyrite. They occur naturally along many parts of Victoria's coastal zone including estuarine systems, mangroves, saltmarsh ASS and in floodplain areas. ASS can be categorised as either:

- Potential Acid Sulfate Soils (PASS) are soils containing unoxidized metal sulfides in oxygen-less or waterlogged conditions. If left undisturbed, they are largely benign. However, if disturbed, such as when excavated and exposed to air, they can react with oxygen and produce sulfuric acid.
- Actual Acid Sulfate Soils are soils that have been exposed to oxygen and are already acidic.

ASS can be detrimental to the environment with impacts that include acidification of water and soil, de-oxygenation of water, poor water quality, dissolution of soil, rock and concrete,

and corrosion of metals. Sometimes impacts can be extreme, resulting in fish kills and a risk to human health.

The Project involves the disturbance of over 90,000 cubic metres of soil from construction excavations. The EES described that, although national mapping indicated 16 kilometres of the pipeline alignment has a high probability of ASS, it has assumed that ASS would be present along the length of the pipeline as well as at the CPRF site due to its location on the Crib Point Jetty foreshore.

The EES identified that soil disturbance activities undertaken during construction of the Project such as excavation, trenching, HDD and thrust boring have the potential to encounter ASS and oxidise PASS. The preferred management options are to prevent oxidation of ASS by staging soil excavations to minimise the amount of time soil is exposed to oxygen. Where soils are to be stockpiled for a longer timeframe and acidic leachate runoff poses a risk to the surrounding environment, they would be neutralised via addition of lime.

8.4.2 Evidence and submissions

Many submitters expressed concern over the disturbance of ASS and the effectiveness of mitigation measures. These related to:

- The frequency of sampling along the pipeline alignment that failed to comply with the 100 metre length intervals outlined in EPA Information Bulletin Publication 655.1 related to *Acid Sulfate Soil and Rock* to gauge the extent of ASS or PASS. As a result, an inaccurate understanding would occur about the extent of soil condition (including texture) and acidification risk and impact (S2912 and S2947), an issue noted in the evidence of Associate Professor Wong.
- The ability of the Acid Sulfate Soil Management Protocol to adequately address ASS risks and the management of contaminated slurry from HDD works (S1059).
- The potential for generation of acid leachate from soils excavated from open trenching that may be exposed to oxygen far longer than planned due to unforeseen circumstances or delays such as water flows in waterways (S2768 and Casey).
- The risks around the Project and ASS were inadequately assessed, the technical description was inaccurate, and control measures will not be effective (S2465 and Casey).

Generally, the concern of submitters was that liming and re-burial is a reactive response to a problem that could be avoided by the Project not proceeding or locating clear of ASS risk. Actions such as liming and burial merely change the nature of the contamination and delays migration of contaminants unless anoxic conditions can be recreated. Generation of ASS cannot be reversed and is difficult to treat when dealing with the proposed quantity of soil volume.

The Proponents' position regarding ASS was that the evidence demonstrated that potential impacts from ASS have been well assessed. Field investigations were subsequently reported in the EES and the Proponents submitted the sampling frequency was '*considered sufficient to provide an indication of presence or absence or ASS in the study area'*[124]. The EES reported:

> Net acidity exceeding the 'Action Criteria' of 0.03 %S for disturbance exceeding 1,000 tonnes (BPMG, 2010) was exceeded in 78 samples of a total 180 samples.

> Therefore, soils must be managed in accordance with the EPA Victoria Publication IWRG655.1 [126].

A highly conservative, 'worst case' approach was adopted in considering the most significant potential risks associated with ASS. The EES assumed that all soils were ASS. The proposed controls included mitigation measures appropriate for worst case conditions, including the preparation of an Acid Sulfate Soils Management Plan (ASSMP) for the CPRF and including a draft ASSMP for the proposed pipeline in the CEMP.

Key mitigation measures outlined in the EES and in evidence to prevent and manage ASS included:

- Crossing most waterways and minimising significant soil disturbance and excavation using HDD.
- Not undertaking works across waterways when they are flowing or have low flows.
- Not leaving soil exposed for too long and then reburying them.

The Proponents submitted oils stockpiled for more than 10 days may require management to prevent oxidation and generation of ASS. Treatment with lime may be required to neutralise the drop in salinity and then re-burial.

The Proponents considered any acid leachate generation during the construction of waterway crossings using the open trenching method was considered unlikely due to the ephemeral nature of the waterways. The likelihood was further reduced with construction only being undertaken during no or low flow conditions.

The EES concluded the proposed construction methodology, including trenching timeframes, neutralisation with lime and avoidance of wet waterway crossings, was unlikely to result in generation and loss of acidic leachate to the surrounding environment and eventual discharge into Western Port Bay. Soils impacted during pipeline construction were considered by the Proponents to have a low risk of impacting human health and the environment.

Significant uncertainty was emphasised in the evidence of Associate Professor Wong who submitted the lack of soil sampling meant the evaluation objective was not satisfied because adverse effects associated with ASS from the Project could not be determined. She considered the default position of the Proponents to test as works commenced and assess liming rates, meant the presence and risk from ASS could not be quantified. This was particularly so with regards to acidic contaminant mobilisation, which could extend impacts beyond the construction zone of the pipeline.

In contrast, Mr Davidson's evidence was the sampling undertaken in the EES assessment was sufficient and any concerns over a shortfall in soil sampling was overridden by assuming the presence of ASS along the pipeline alignment.

Associate Professor Wong considered the EES did not adequately assess impacts other than associated with the generation of acidity including 'soil ripening' or irreversible changes to soil structure that may occur from collapse of soil micropores leading to soil subsidence.

[126] Technical Report E Part 2 of 3 Appendix A

She reiterated that many effects associated with oxidation of ASS are irreversible. Oxidation of sulfidic materials can not only occur during the construction phase, but also during the operations phase to generate chronic discharges of acidity. Once the sub-surface ASS soils are oxidised, it can take many years for pH to recover in shallow groundwaters. She contended the timescales for remediation to reform reduced iron and sulfide minerals in the absence of oxygen is much longer than the time taken for oxidation.

Mr Davidson gave evidence the short duration of works, the short timeframe for dewatering (at less than 7 days) and the small areas affected (around 30 metres radius), were within the thresholds outlined in the *National Acid Sulfate Soil Guidelines*.

In its closing submission, the EPA considered evidence from Associate Professor Wong reinforced the EPA's position that POS T13 should be amended to require that soil sampling for ASS and that texture be conducted every 100 metres along the pipeline alignment, consistent with relevant guidance. The EPA supported Associate Professor Wong's advice that in situ sampling would better inform understanding of the variability of soil texture and concentration of acidity to inform the degree of liming during construction activities and stockpiling.

The Proponents intend to utilise HDD techniques extensively, including across active waterways and most ephemeral water courses (minimising disturbance), undertake excavations and stockpiling within the recommended timeframes (prevent oxidation), and treat or neutralise soils as required as a last resort.

8.4.3 Discussion

Construction of the CPRF and pipeline involves excavation considered under the EPA's Best Practice Management Guidelines 2010 CASS (BPMG) 2010 as high risk activities.

The IAC acknowledges the Proponents adopted a conservative approach about the presence of ASS across the entire Project area and application of an ASSMP was sufficient to ensure risks can be managed as an early priority. This recognises the potential brevity of ASS impacts and a strong commitment to avoid and manage risks. The Proponents proposed to develop and apply an ASS management plan for the GIJW, including the CPRF site and an ASSMP for the pipeline, which was drafted and presented as Attachment K to the Pipeline Licence Application CEMP.

In this regard, the IAC notes Associate Professor Wong was generally satisfied with the ASSMP. Her evidence highlighted there could be serious potential impacts if ASS was not identified early and subsequently, managed properly. These include irreversible change to soil condition and contaminants that could be lethal to flora and fauna, damaging to farming productivity and dangerous to human health.

Associate Professor Wong was concerned consideration of environmental impacts in the EES did not address impacts in a cumulative sense or with regard to how changes to one part of the environment will affect another. For example, how oxidation and acidification would impact on terrestrial and freshwater biodiversity. Associate Professor Wong noted ASS frequently co-occurs with coastal wetlands and swampy scrublands and woodlands, and effects of acidic runoff on these and marine environments were not considered in detail.

The IAC considers these impacts are important and relevant to managing ASS because of their irreversibility and difficulty in preventing the veracity of detrimental effects on the environment.

The IAC notes State policy under Clause 12.02-1S relates to *Protection of coastal areas* to recognise, conserve and enhance coastal areas and ensure sustainable use of natural resources and to coordinate land use and planning to avoid disturbance of coastal ASS.

The Proponents relied on the short term exposure of soil to air anticipated by the construction works, and the generally short term dewatering expected to occur. They referred to the nature of pipeline construction in trenched sections, each open for a day or two and dewatering for a maximum of a day to argue that works would not generate acidification. On this basis, they considered the risk of ASS and its impacts were low.

The IAC considers the hierarchy approach to management of ASS follows a structured path with the starting point that, although soils will be excavated, the intent is to minimise the length of exposure to air to avoid triggering acidification processes. Concerns were expressed by submitters regarding the length of time proposed for stockpiling soils, and the EES suggested trenches may be open for several weeks before the pipe is installed and backfilled. The IAC notes Table 7-1 in Technical Report E Part 1 of 3 is an extract from the CASS BPMG (2010) (Table 4) which recommended stockpiling of soils between 18 and 140 hours, before treatment is necessary and/or required. The EES assumed this period for the minimum time of stockpiling is allowed before treatment occurs does not align with the IAC's interpretation of Table 4. The IAC considers stockpiles of PASS should be exposed to oxygen for the minimum amount of time possible to limit oxidation of the sulfide minerals and ideally stockpiles should not be exposed for more than 140 hours.

Despite the IAC's concerns regarding the risks of ASS, it is aware of existing pipelines in the area and notes that no party or witness made submissions or gave evidence of any known impacts associated with ASS from the works involved with these pipelines.

The IAC notes Associate Professor Wong's acknowledgement that the proposed use of the ASS management plan and ASSMP represents best practice, with her caveats relating to:

- The frequency of sampling being increased in accordance with the EPA Information Bulletin Publication 655.1 and BPM CASS (2010) to enable variation in soil condition to be adequately detected for a linear pipeline and to determine whether liming was necessary and how much liming may be required.
- How trench water is appropriately disposed of to avoid damage to land and its productivity.

The IAC acknowledges the Proponents' views that changes to the testing regime are not necessary and mitigation measures should be proportionate to risk. The IAC is cognisant that in closing, the EPA requested soil sampling at 100 metre intervals across the Project area consistent with BPM CASS (2010).

The IAC considers that requiring testing for PASS every 100 metres along the whole length of the pipeline alignment would be excessive. The IAC considers it appropriate to test at selected and identified locations along the pipeline alignment considered to be medium to high risk of PASS. This should be done in consultation with EPA to confirm such locations that may require additional assessment for PASS prior to construction commencing. The IAC recommends amending POS T13 to read:

> Manage all soils in accordance with the Acid Sulfate Soils Management Protocol (Attachment K). The Acid Sulfate Soils Management Protocol will be finalised in consultation with EPA and following additional soil investigations in locations considered by EPA as medium to high risk of PASS.

The IAC supports the Proponents' changes to the mitigation measures that provide for monitoring and discharge arrangement of trench water to minimise impacts on vegetation and have regard to water quantity and quality.

8.4.4 Findings

The IAC finds:

- Impacts from acid sulfate soils can be managed effectively in accordance with the Acid Sulfate Soils Management Plan and Acid Sulfate Soils Management Protocol, in consultation with EPA.
- Additional acid sulfate soil sampling should be conducted in areas of medium to high risk in consultation with the EPA.

8.4.5 Recommendations

The IAC recommends:

Environmental Performance Requirements

Include the following change:

- **Revised EPR-C02 (Acid Sulfate Soil Management Plan)**

This change is included at Appendix G.

Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)

Include the following changes:

- **Revised POS T13:**

  Manage all soils in accordance with the Acid Sulfate Soils Management Protocol (Attachment K). The Acid Sulfate Soils Management Protocol will be finalised in consultation with EPA and following additional soil investigations in locations considered by EPA as medium to high risk of PASS.

8.5 Contamination and acid sulfate soil conclusions

The IAC concludes that:

- Contamination and acid sulfate soil impacts are consistent with the draft evaluation objective.
- Contamination and acid sulfate soil impacts can be acceptably managed through the recommended mitigation measures.
- There are no contamination or acid sulfate soil impacts that preclude the Project being approved.

9 Greenhouse gas

9.1 Introduction

Greenhouse gas (GHG) effects was discussed in EES Chapter 11 and Technical Report F. Additional material was provided in TN04, TN13 and TN40.

The relevant draft evaluation objective is:

> **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.

Table 7 lists the greenhouse gas evidence that was provided.

Table 7 Greenhouse gas evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Sichlau	Point Advisory	Greenhouse Gas Emissions
Mornington Peninsula and Bass Coast	Mr Smith	Northmore Gordon	Greenhouse Gas Emissions

Mr Sichlau lodged supplementary evidence in reply (D209 and D425).

The following EPRs apply to greenhouse gas:

- GG01 – Equipment specification – fuel efficiency
- GG02 – Source local materials
- GG03 – Low embodies energy materials
- GG04 – Managing the quality of materials
- GG05 – Sustainable resource management practices
- GG06 – Implementation of the PEM (Protocol for Environmental Management (GHG emissions and energy efficiency in industry).

The following POS environmental controls in the CEMP Appendix J apply directly to greenhouse gas:

- SG1 to SG3 relating to Sustainability and greenhouse gas.

9.2 Key issues

The key issues are:

- The accounting of greenhouse gas emissions and its consistency with policy.
- The provision of greenhouse gas emissions offsets.

9.3 Greenhouse gas emissions accounting and consistency with policy

9.3.1 Background

GHG emissions associated with the Project are required to be considered in accordance with the EPA's *Protocol for Environmental Management (PEM): Greenhouse Gas Emissions and Energy Efficiency in Industry* and the *State Environment Protection Policy (Air Quality Management)* (SEPP (AQM)) under the *Environment Protection Act*.

A works approval is required for the FSRU, and a licence would be required prior to operations commencing.

The *Climate Change Act* has set a target for Victoria of net zero emissions by 2050. This legislation requires the EPA to consider the potential impacts of climate change, and the potential contribution to Victoria's GHG emissions when deciding about a works approval application.

Project activities that would cause the release of GHG into the atmosphere include:

- burning fossil fuels in vehicles, plant, and equipment
- the production of electricity from burning fossil fuels (such as coal or natural gas)
- manufacturing processes (for steel or cement, for example)
- vegetation clearance.

The EES recognised that direct and indirect GHG emissions are split into three categories, known as 'Scopes'. Scope 1, Scope 2 and Scope 3 are defined by the *Greenhouse Gas Protocol (GHG Protocol),* the World Business Council for Sustainable Development and the World Resources Institute as:

- Scope 1 – Direct emissions of greenhouse gas from sources that are owned or operated by a reporting organisation (examples include combustion of diesel in company-owned vehicles or used in on-site plant and equipment)
- Scope 2 – Indirect emissions associated with the import of energy from another source (examples include import of electricity from the grid, or heat)
- Scope 3 – Other indirect emissions, other than energy imports (above) which are a direct result of the operations of the organisation, but from sources not owned or operated by them and due to upstream or downstream activities (examples include indirect upstream emissions associated with the extraction, production and transport of purchased construction materials; and business travel (by ship, air or rail).

The operational elements of the Project included in the EES assessment of GHG emissions are:

- the LNG tanker delivering LNG to Crib Point
- the FSRU for regasification
- the CPRF for processing of the imported natural gas
- the pipeline for transport of the imported natural gas
- the PDF for connection with the VTS.

Upstream Scope 3 activities not accounted for in the GHG emissions assessment included the gas field source and extraction of natural gas, the liquefaction plant and process, and the LNG storage tanks. Scope 3 downstream activities included the VTS distribution pipeline and natural gas consumption.

The EES identified that with the proposed open and closed loop scenarios, the assumed supply of natural gas would be around 387 million standard cubic feet per day (mmscf/d) for 213 days, 500 mmscf/d for 122 days per year and 750 mmscf/d for 30 days per year, based on delivering a total of 40 cargoes of LNG into the VTS. This variation of gas supply was based on seasonal demand and equated to 160 petajoules (PJ) of natural gas proposed to be delivered per annum by the Project.

The EES noted that a combined loop regasification process would potentially be used when ambient seawater temperature in Western Port Bay became too low for open loop regasification to operate effectively. The EES assumed this would be around 30 days a year.

In Victoria, annual Scope 1 and 2 GHG emissions at 2017 levels (D315) are 110,200 kilotonnes of carbon dioxide equivalent (Kt CO2-e)[127]. The EES used these levels for comparison against the Scope 1 and 2 GHG emissions proposed to be produced by the Project.

Scope 1 and 2 annual GHG emissions from the operation of both components of the Project in closed loop mode is 249.9 Kt CO2-e. For open loop mode it is 69.3 Kt CO2-e. Scope 1 and 2 GHG emissions from construction of both components of the Project are 26.4 Kt CO2-e.

With respect to the legitimate indirect upstream Scope 3 GHG emissions of the Project mainly linked with transport of LNG to Crib Point, the levels are around 390.4 Kt CO2-e and for construction around 33.9 Kt CO2-e.

Adding these Scope 3 figures to the closed loop mode, operational Scope 1 and 2 GHG emissions of the Project amount to 640.4 Kt CO2-e. For open loop mode, they amount to 459.8 Kt CO2-e.

Annual GHG emissions associated with upstream Scope 3 production of 160 PJ of imported LNG (extraction and liquefaction processes) were estimated by the EES to be around 1,300 Kt CO2-e. For annual downstream Scope 3 GHG emissions associated with commercial and residential consumption of natural gas, the levels are estimated to be around 8,000 Kt CO2-e.

GHG emissions arising from the extraction and liquefaction and storage of natural gas at source would represent Scope 1 emissions for the operator that undertakes the production activities. Similarly, GHG emissions arising from Scope 3 downstream consumption of natural gas would represent Scope 1 emissions for the entity that consumes the gas. The EES identified that including these in the GHG emissions inventory would lead to double counting of these emissions.

The EES identified that:

- The Project's estimated Scope 1 and Scope 2 construction emissions are estimated to contribute the equivalent of 0.02 per cent of Victoria's annual GHG emissions.
- For operation, the Project would contribute the equivalent of 0.23 per cent of Victoria's annual Scope 1 and Scope 2 emissions under a closed loop scenario or 0.06 per cent under an open loop scenario.

Operating in closed loop mode clearly produces higher levels of GHG emissions and would make a greater contribution to Victoria's annual GHG emissions. Under the closed loop scenario, the Project would trigger requirements under the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (Safeguard Mechanism) including keeping annual GHG emissions below its set baseline [128].

9.3.2 Evidence and submissions

There was generally no dispute amongst the parties concerning the quantum of GHG emissions described in the EES.

[127] I Kilotonne (Kt) equals 1,000 Tonnes (t).

[128] This relates to direct (Scope 1) annual operational GHG emissions greater than 100,000 t CO2-e.

The Proponents advised the assessment of GHG emissions followed legislative requirements such as the *National Greenhouse and Energy Reporting Act 2007* (NGER Act) and *National Greenhouse and Energy Reporting (Measurement) Determination 2008* and accepted methodologies and GHG Protocol. The Proponents advised EES Technical Report F was independently peer reviewed by GHD and found to be acceptable.

Many submitters including Mornington Peninsula, Bass Coast, and the CEG expressed concern the Project would contribute to additional GHG emissions, which was inconsistent with the objective under the *Climate Change Act* for Victoria to achieve net zero GHG emissions by 2050.

The Proponents submitted these concerns were not supported by evidence and did not consider, in an integrated manner, policy concerning energy security, reliability, and affordability, which the IAC discussed in Chapter 3. The Proponents submitted the Project offered flexibility with the ability for the FSRU to cease operations and leave Crib Point if demand for natural gas declined without the risk of a stranded asset associated with more permanent fixed infrastructure. They further submitted the Project would precipitate transition away from coal as a source of electricity generation using natural gas and would support the continued development of renewable energy sources. They argued the Project would not preclude or materially impede the capacity for policies and other measures to be developed and implemented to achieve GHG emission reduction targets.

The matter of Scope 3 upstream and downstream GHG emissions associated extraction, liquefaction, storage, and consumption of imported natural gas and their inclusion in GHG emissions accounting was more vigorously contested between parties. The Proponents acknowledged the EES, the independent peer review and the evidence from both Mr Sichlau and Mr Smith had regard to these forms of direct and indirect GHG emissions.

The IAC notes there was general agreement between the experts with respect to the carbon accounting of GHG emissions and that relevant accounting methodologies had been appropriately followed. The exception was in relation to the variation of emissions that could be derived from the different sources of the imported natural gas (upstream Scope 3 sources). Mr Smith gave evidence the carbon accounting provided in the EES had used a superseded standard which excluded Scope 3 GHG emissions from the emissions inventory [129]. Mr Sichlau's evidence refuted this. The IAC notes that, although Technical Report F did not include the full suite of Scope 3 GHG emissions in the inventory, they were included in the text of the report.

The IAC notes the EES acknowledges that although Scope 3 GHG emissions have been calculated, emissions associated with downstream consumption of natural gas were not included in the assessment. This was because it would effectively represent double counting of GHG emissions as these would be separately accounted for in emissions reporting.

Mr Sichlau gave evidence that it would be anticipated over the life of the Project, natural gas and electricity related GHG emissions in Victoria will fall, irrespective of whether the Project proceeds. He noted Scope 1 GHG emissions would be approximately 3.5 times higher when the FSRU is operating in closed loop mode compared to operating in open loop mode. His

[129] A 2006 version instead of ISO 14064-1:2018 *Greenhouse gases – Part 1: Specification with guidance at the organisation level for the quantification and reporting of greenhouse gas emissions and removals*.

evidence was the overall Scope 1 and 2 GHG emissions would be imperceptible when compared against Victoria's annual Scope 1 and 2 GHG emissions. This was acknowledged by Mr Smith as being relatively low.

However, Mr Smith gave evidence the decarbonisation benefits of the Project are potentially overstated due to exclusion of liquefaction emissions (upstream Scope 3 emissions) from the inventory.

Mr Sichlau's evidence suggested that even when annual Scope 3 GHG emissions are considered, they will remain relatively constant in Victoria and nationally with or without the Project. By 2025 with the Project, they will be marginally lower at around 0.12 per cent and by 2040 marginally higher by around 0.19 per cent. The difference is most likely to be a reflection of modelled changes in GHG emissions generation towards 2050.

With respect to the Project contributing to additional GHG emissions, Mr Sichlau's evidence was that if the Project did not proceed, another source of natural gas would most likely take its place, given the demand for natural gas in Victoria. This could be from a source elsewhere in the State or from interstate. GHG emissions would most likely not vary with or without the Project as the demand for natural gas in Victoria would remain relatively steady, at least in the short to medium term when other circumstances or policy changes might occur.

The CEG and many other submitters expressed concerns that natural gas contributes fugitive emissions in the form of methane leakage with rates of around 3.2 per cent, resulting in natural gas being around 2.3 to 2.8 times more emissions intensive than coal. Methane has a longer residency time in the atmosphere, causing greater effect regarding climate change processes.

The Proponents relied on the evidence of Mr Sichlau who discounted the effects of the Project in contributing significant amounts of fugitive emissions. Mr Sichlau's findings were based on direct comparisons between electricity generated by coal and natural gas in Victoria and how levels of fugitive emissions can be compared between the situation in Victoria with that of findings relied upon by submitters in the USA, which has a much larger operating footprint. He estimated leakage rate tipping points would be in the order of 7.4 per cent, which is much higher than the estimate of 3.2 per cent from submitters, unlikely to be reached in Victoria.

Mr Sichlau was not confident that natural gas had greater emissions intensity than coal and found this proposition was not supported by clear evidence.

The Proponents indicated the pipeline would be designed not to leak. Measures are proposed by APA to ensure any leaks detected are repaired in accordance with relevant standards and statutory requirements regarding safety.

9.3.3 Discussion

The IAC acknowledges concerns expressed by parties regarding the effect from additional GHG emissions contributed by the Project. Climate change is a significant concern. The Victorian Government has taken action to mitigate contributions to climate change effects with the *Climate Change Act* to establish a zero net GHG emissions target by 2050 and interim targets beforehand. There is no doubt this Project will contribute additional GHG emissions.

The IAC acknowledges the EES has assessed, accounted, and provided actions to minimise direct and indirect GHG emissions associated with and generated from the Project directly under the control of the Proponents (Scope 1 and 2 emissions).

Appropriately, and in accordance with national legislative requirements, the Project has accounted for annual operating Scope 1 and 2 GHG emissions which, when compared to those at the State level, are relatively low. The IAC acknowledges these levels of GHG emissions are acceptable, subject to the consideration of emission offsets.

The IAC does not agree the GHG emissions produced from the Project will run the risk of undermining or preventing the development, implementation, or achievement of net zero reduction of GHG emissions by 2050. It sees no issue with how the Project can flexibly adapt to any Government policy in relation to future emissions reduction targets. The FSRU can adjust its gas outputs depending on policy and/or consumer demand or it can relocate elsewhere if the facility is no longer required.

Similarly, the IAC does not consider the aspirations of Councils, such as Mornington Peninsula regarding the setting or achievement of local net zero emissions reductions to be at risk from the Project. The Project represents flexibility in responding to future market demand for natural gas and how that may change in response to future policy requirements. The IAC agrees with Mr Smith that offsets are a relevant tool to assist with mitigating the effect of GHG emissions.

Regarding Scope 3 GHG emissions associated with transport of LNG, these can be legitimately included in accounting calculations. Including these results in significantly higher total GHG emissions from the Project under either open or closed loop operating scenarios.

Including those Scope 3 GHG emissions associated with upstream gas source extraction and downstream gas consumption would further significantly increase overall emissions.

The IAC notes the request from various submitters that all Scope 3 GHG emissions be included in the overall emission accounting calculations.

The IAC does not agree with including all upstream Scope 3 GHG emission associated with the extraction and processing of imported natural gas in the Project's GHG emissions calculations. These sources of GHG emissions should be accounted for by the source entity. Similarly, for downstream gas consumption, GHG emissions should not be included in the Project's accounting. These emissions would most likely occur whether the Project proceeded or not. Demand for natural gas will likely remain in the short term and supply would likely be provided, until such time as renewable energy sources begin to carry the greater load for securing energy supply. Hence, emissions from the consumption of natural gas should remain a matter that is reported and accounted for separately.

The accounting and reporting of GHG emissions is guided by the *National Greenhouse and Energy Reporting Act* and it only requires Scope 1 and 2 GHG emissions to be included in such requirements. Under this scenario, the Project's annual operating Scope 1 and 2 GHG emissions in open loop mode are relatively low compared to Victoria's levels, but in closed loop operating mode, the emissions would be much higher such that obligations under the *National Greenhouse and Energy Reporting Act* Safeguard Mechanism would be required. This highlights the dilemma where the Project, operating in closed loop mode creates less impact on the marine environment, yet has a greater impact on climate change processes compared to open loop mode.

Further, this dilemma presents a challenging problem for the Project. If legitimate Scope 3 GHG emissions from LNG transport to Crib Point are considered, noting that TN40 identified that the Project's Scope 3 emissions are 0.35 per cent of Victoria's annual total of Scope 1 and 2 emissions, then GHG emissions associated with open loop mode would probably warrant some consideration regarding offsets.

The IAC is satisfied the Project is generally consistent with policy relating to energy provision and it will provide for a secure and flexible source of energy for commercial and domestic consumption. Likewise, the IAC finds those GHG emissions produced by the Project (including Scope 1, 2 and transport related Scope 3) are acceptable and consistent with the policy framework around energy. The IAC acknowledges the Project will contribute additional GHG emissions. However, the IAC believes these emissions may vary over its 20 year life and potentially reduce as renewable energy sources continue to develop under the aim of carbon emission reduction into the future.

9.3.4 Findings

The IAC finds:

- The reporting and assessment of the Project's GHG emissions is in accordance with relevant legislative requirements and protocols.
- The assessment of the Project's annual operating Scope 1 and 2 GHG emissions, although additional to what is produced in Victoria, is reasonable and acceptable.
- The Project's annual operating GHG emissions in open loop mode are sufficiently low to avoid obligations under the *National Greenhouse and Energy Reporting Act* and Safeguard Mechanism compared to operating in closed loop mode.
- The consideration of Scope 3 GHG emissions associated with upstream transport of LNG to Crib Point is relevant and significantly increases the Project's GHG emissions.
- Other Scope 3 GHG emissions associated with upstream LNG extraction and processing, and downstream gas consumption should not be included in the Project's accounting and reporting.

9.4 Greenhous gas emissions offsets

9.4.1 Background

The EES describes that:

> Offsetting emissions associated with the Project could be pursued using a number of approved pathways in line with the Australian Government's National Carbon Offset Standard (NCOS).
>
> The NCOS provides a list of eligible offset units that have been assessed as meeting the Standard's offsets integrity principles. These principles are designed to ensure that eligible offset units represent genuine and credible emission reductions. Offset options described by NCOS include:
>
> - GreenPower®
> - Australian Carbon Credit Units (ACCUs)

- Certified Emissions Reduction (CER) under Kyoto Clean Development Mechanism (CDM)
- Verified Emissions Reductions (VERs) issued by the Gold Standard
- Verified Carbon Units (VCUs) issued by the Verified Carbon Standard [130].

EES Technical Report F recommended the following mitigation measure:

> **Certified carbon offsets**
>
> The Project should consider purchasing certified carbon offsets to compensate for the long-term impacts of the Project's greenhouse gas emissions [131].

That mitigation measure was not included in the EPRs.

9.4.2 Evidence and submissions

In relation to GHG emissions offsets, the Proponents submitted they were not included as a formal requirement because such commitments are not statutorily required under Victorian legislation. They noted these are only triggered under the *National Greenhouse and Energy Reporting Act* if the Project's Scope 1 and 2 GHG emissions are sufficiently high to reach baseline levels. Offsets are calculated on emissions above a baseline. The Proponents submitted any offsets provided would be voluntary.

Mr Sichlau gave evidence that the use of offsets does not minimise the generation of GHG emissions. Rather, they offset the impact of GHG once they have been emitted. He believed GHG emissions offsets can certainly provide benefits, however, he considered the draft evaluation objective does not call for the consideration of GHG emissions offsets.

Mornington Peninsula, Bass Coast and the CEG called for a mandatory offset requirement to be included in the EPRs. The CEG submission went further, suggesting any such obligation should extend to the full range of Scope 3 GHG emissions.

The Proponents submitted there is no support in the evidence or from legislation for such an obligation. Mr Sichlau specifically rejected the notion that any offset obligation (were one to apply to the Project) extend to the full range of Scope 3 emissions. So too did Mr Smith who gave evidence that any offset requirement would be voluntary and provided in respect of direct emissions associated with the Project.

The Proponents considered imposing an obligation in this respect would be to require the Project to offset emissions associated with the combustion of natural gas in homes, industry, and in electricity generation within Victoria, as well as emissions associated with extraction and processing of that gas. They submitted this would be wholly unreasonable and without precedent.

The Proponents submitted (including what is described in TN40) that AGL is acting responsibly to reduce GHG emissions within its portfolio while providing customers with secure and affordable energy. TN40 outlined AGL was developing renewable energy projects and it committed to closing down existing coal fired power stations.

The Proponents opposed the inclusion of any provision for GHG emissions offsets in the absence of any statutory basis upon which an offset could properly be required.

130 Refer to section 8.1 of Technical Report F.
131 MM-GG09

9.4.3 Discussion

The IAC has noted the impacts operating in open loop compared to closed loop modes on the marine environment and climate change.

The IAC believes voluntary provision of GHG emissions offsets would be a positive outcome of the Project, should it be approved. This is particularly so because the Project would continue to contribute an increase in GHG emissions over a relatively long period of time (up to 20 years). The IAC notes the EES originally recommended a voluntary offset mitigation measure, which was not carried over into the final draft EPRs. The IAC considers there would be merit in including this EPR and it should be a consideration in approval of the Project. This should include Scope 1 and 2 GHG emissions, and the legitimate Scope 3 emissions that would include transporting the imported LNG to Crib Point.

In this regard, the IAC considers the mitigation measure included in Technical Report F at MM-GG09 (that the Project should consider purchasing certified carbon offsets to compensate for the long term impacts of its GHG emissions) should be included in the EPRs.

The IAC further considers an additional option is to consider the recognised blue carbon value of coastal saltmarshes, mangroves and seagrasses in Western Port Bay as suggested by S940. The IAC considers this would be relevant and beneficial given the location of the Project in Western Port Bay.

9.4.4 Findings

The IAC finds:

- The Project would increase GHG emissions and would benefit from the voluntary offset of Scope 1 and 2 and legitimate Scope 3 GHG emissions generated or associated with the Project.
- The mitigation measure included in Technical Report F at MM-GG09 that the Project should consider purchasing certified carbon offsets to compensate for the long term impacts of the Project's GHG gas emissions, should be included as an EPR.
- The Proponents should consider enhancement of blue carbon as a form of GHG emissions offset for the Project, given its location in Western Port Bay.

9.4.5 Recommendations

The IAC recommends:

<u>Environmental Performance Requirements</u>

Include the following change:

- **New EPR-GG07 (Certified carbon offsets)**

This change is included at Appendix G.

9.5 Greenhouse gas conclusions

The IAC concludes that:

- The greenhouse gas impacts are consistent with the draft evaluation objective.
- Greenhouse gas impacts can be acceptably managed through the recommended EPRs and CEMP.

- There are no greenhouse gas impacts that preclude the Project being approved, although the Proponents should consider voluntary carbon offsets.

10 Air Quality

10.1 Introduction

Air quality impacts was discussed in EES Chapter 12 and Technical Report G. TN42 relates to air quality and the IAC engaged Mr McIntosh to provide expert assistance on air quality.

The relevant draft EES evaluation objectives for air quality are:

> **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.

The Air Quality Assessment (Technical Report G) covered the potential direct, indirect, on site and off site impacts to air quality from construction and operation of the Project.

Relevant standards and guidance are included in State Environment Protection Policy (Air Quality Management) (SEPP (AQM)) and State Environment Protection Policy (Ambient Air Quality) (SEPP (AAQ)).

The EES proposed the following mitigation measures to manage air quality during construction and operation of the Project:

- EPR-AQ01 Dust suppression
- EPR-AQ02 Restricted vehicle movements
- EPR-AQ03 Covering vehicle loads
- EPR-AQ04 Weather monitoring
- EPR-AQ05 Dust monitoring
- EPR-AQ06 Odorous soils management
- EPR-AQ07 Equipment maintenance
- EPR-AQ08 Maintenance of the FSRU burners
- EPR-AQ09 Monitoring FSRU air emissions.

The operational Air Quality Assessment focussed on air emissions likely from the FSRU during a range of operational conditions that would trigger the need for an EPA works approval and discharge licence.

The following CEMP POS relate to air quality:

- E1 Speed restrictions
- E2 Dust monitoring and control
- E3 Suspension of dust emitting activities
- E4 Maintenance of plant.

Table 9 lists the air quality evidence that was provided.

Table 8 Air quality evidence

Party	Expert	Firm	Area of expertise
Proponents	Dr Ross	CAMM	Air quality specialist
Proponents	Dr Drew	Drew Toxicology Consulting	Human health and ecotoxicology

10.2 Key issues

The key issues are:

- Air quality impacts during construction.
- Air emissions during operation of the FSRU.

10.3 Air quality impacts during construction

10.3.1 Background

Technical Report G reported that air emission generated from the Project construction will primarily be related to vehicle movements, earthworks and materials handling, in particular for the Pipeline Works. Emissions from plant and equipment during construction CPRF are likely but expected to a lesser extent than the Pipeline Works. Emissions during construction works on the Jetty are not expected as these works are over water.

The construction impact assessment method was described in Section 4.3 of Technical Report G. Air quality impacts during construction were assessed '*semi-quantitatively'* using methodologies provided in the UK Institute of Air Quality Management (IAQM) document, *Guidance on the assessment of dust from demolition and construction* and through consideration of industry standard practice.

Dust impacts from the Pipeline Works were assessed with a focus on sensitive receptors located within 350 metres of the boundary of the pipeline works.

The outcome of the air quality risk assessment showed the unmitigated air emissions from the construction works pose a low risk for dust soiling from demolition and construction, and a medium risk for earthworks and tracking of vehicles in and out of the Project area (trackout). Human health impacts from construction presented a negligible risk for demolition and construction, and a low risk for earthworks and trackout. The proposed EPRs and POS are expected to ensure the residual risk of construction resulting in adverse effects on air quality would be '*Very Low'* or '*Low'*.

To mitigate potential construction impacts to air quality, the EES proposed seven construction EPRs:

- EPR-AQ01 Dust suppression
- EPR-AQ02 Restricted vehicle movements
- EPR-AQ03 Covering vehicle loads
- EPR-AQ04 Weather monitoring
- EPR-AQ05 Dust monitoring
- EPR-AQ06 Odorous soils management
- EPR-AQ07 Equipment maintenance.

Additional EPRs related to manage air emissions included:

- EPR-FF10 Dust impacts to flora/fauna.

The CEMP Attachment J included the POS environmental controls E1 to E4 to manage potential direct and indirect construction impacts to air quality. POS A9, C12, T10 and T13 indirectly relate to air quality.

10.3.2 Evidence and submissions

In opening remarks for air quality, the Proponents submitted:

> The air quality impacts associated with the construction of the Project would be primarily attributable to the generation of dust and would be relatively short-lived. The application of conventional dust suppression techniques will be required pursuant to the applicable controls and will ensure that impacts of this type are limited to within acceptable parameters [132].

The peer review of the EES conducted by Dr Ross of the reported air quality impacts from construction indicated:

- Adoption of the IAQM methodology appeared appropriate, particularly given the absence of any Australian-based guidance and its apparent acceptance for other projects in Australia.
- A quantitative air dispersion modelling assessment was not deemed necessary.
- Unmitigated emission of dust during construction may cause:
  - a transient low risk for dust soiling from demolition and constructions, and a medium risk from earthworks and trackout
  - a negligible risk of potential health impacts from construction, and a low risk for earthworks and trackout.
- With the proposed mitigation measures, potential impacts from construction could be appropriately managed to ensure that the residual risk is either '*low'* or '*very low'*.

Dr Ross recommended dust monitoring during construction be extended to include monitoring of fine particulates to assess potential health impacts, which was accepted in EPR- AQ05. Similarly, POS E2 was amended to insert:

> Observational monitoring of dust will be undertaken along the construction right of way (ROW) where adjacent to sensitive receptors, including monitoring of fine particulates.

S2912 made several suggestions for changes to the EPRs relating to dust suppression, weather monitoring and dust monitoring, which the Proponents claimed had already been addressed.

10.3.3 Discussion

Based on submissions of the Proponents and evidence from expert witnesses, the IAC accepts impacts from construction on air quality will be relatively localised and short lived. Dust generated during pipeline construction may have a localised adverse environmental effect, but should be capably managed through normal construction techniques and adoption of the CEMP POS.

10.3.4 Findings

- The EPRs and POS (as modified) are adequate to manage potential air emission impacts predicted during construction.

132 D312

10.4 Air emissions during operation

10.4.1 Background

EES Chapter 12 and Technical Report G included the assessment of FSRU air emissions. The assessment excluded the CPRF, PDF, pipeline and LNG carrier for reasons set out in Section 4.4.2 of Technical Report G.

A description of the operational impact assessment methodology was set out in Section 4.4 of Technical Report G, including a description of the pollutants of interest.

The assessment completed by AECOM identified potential air emissions during operation of the FSRU and dispersion modelling of likely emissions under a range of worst case operating scenarios.

The key sources of identified air emissions were the four dual-fuel reciprocating engines and either two or three 60 megawatt (MW) boilers on the FSRU. The modelled sources were the FSRU engine stacks or funnels, or 'point' sources. AECOM modelled four operating scenarios to predict worst case emissions from the FSRU.

The pollutants emitted from the FSRU during operation were projected to be nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter (PM_{10} and $PM_{2.5}$), sulphur dioxide (SO_2) and volatile organic compounds (VOCs). Common VOCs likely to be emitted included benzene, formaldehyde and polycyclic aromatic hydrocarbons (PAHs).

The assessment concluded the modelled ground level concentrations under four worst case operating scenarios from the FSRU adopted a number of conservative assumptions. The air emissions modelled under worst case dispersion scenarios were well below SEPP (AQM) design criteria at sensitive uses such as schools, hospitals and residences in the broader area.

The SEPP design criteria for formaldehyde and nitrous oxide were modelled as exceeded over water and a portion of the Crib Point foreshore. The EES reported:

> NO_2 concentrations exceed the design criteria of 190ug/m3 (when combined with 54.7ug/m^3 background) within approximately 50 metres of the FSRU.
>
> Formaldehyde concentrations exceed the design criteria of 40ug/m^3 within approximately 200 metres of the FSRU, at a number of areas over water to the south and east of the FSRU and a small area of the Crib Point foreshore.

To mitigate potential impacts from air emissions during operation, the EES proposed the following EPRs relating to the FSRU:

- EPR-AQ08 Maintenance of the FSRU burners
- EPR-AQ09 Monitoring FSRU air emissions.

10.4.2 Evidence and submissions

(i) General concerns

The Proponents submitted air emissions during operation of the GIJW would not cause adverse environment impacts as air quality exceedances would be confined over water and a small area along the Crib Point foreshore. Air emissions were not likely to result in adverse health impacts as exposure to the SEPP (AQM) design criteria would be over water and limited due to the mostly transient nature of boating activities and an exclusion zone applied around the Jetty.

The independent peer review of the EES was conducted by Dr Ross and Dr Drew. Their evidence concentrated primarily on validating air quality impacts to sensitive uses.

The Proponents noted:

- The EES adequately modelled air emissions during operation of the FSRU under worst case scenarios.
- The worst case emissions scenario was estimated to be during continuous operation of the FSRU at peak capacity when operating in closed loop or open loop at 100 per cent load.
- Operation at peak capacity would occur for 10 per cent of the time.
- Emissions from the FSRU may exceed the EPA's Scheduled premises threshold for NO_2, CO and VOC during gas fuelled open and gas fuelled closed loop, with two of three boilers operating.
- All modelled scenarios indicated the concentration of pollutants NO_2, CO, PM_{10} $PM_{2.5}$, SO_2 and VOCs would not exceed SEPP (AQM) design criteria at any of the identified sensitive uses.
- Exceedances of the SEPP (AQM) design criteria would occur over water within approximately 50 metres of the FSRU for NO_2 (all scenarios).
- Concentration of particulates were modelled as exceeded during gas fuelled closed loop with three boilers operating.

The Proponents submitted air emissions during average and worst case operating scenarios would not have an adverse impact on sensitive uses in the broader Crib Point area. The Proponents advised use of the proposed FSRU '*for the Project is considered best practice from an air quality emissions perspective'*. They contended it was likely no further major benefits in air quality could be gained by choosing different plant or power source technology [133].

A number of submitters (including S102, S685 S2445 and S2912) expressed concern about emissions from the Project, particularly from the FSRU and CPRF. Some submitters noted the assumptions by the Proponents that the worst case operating scenarios occurring 10 per cent of the time or 36 days should be regarded as a significant time frame for air pollutants to be produced.

The IAC questioned the impact of potential air emissions to sensitive uses, including the Victorian Maritime Centre, and on aquatic and terrestrial flora and fauna. The Proponents responded in TN42 that modelled dispersal plumes for assessed air pollutants did not intersect with the Victorian Maritime Centre.

The Proponents deemed the Victorian Maritime Centre and recreational uses of the waters around Crib Point and Woolleys Beach were not sensitive uses as defined by SEPP (AQM). Several submitters countered these areas should be considered sensitive uses, with S2912 noting:

> Air quality impacts over water could affect local recreational fishing and boating activities downwind of the FSRU. Fishing boats are often immobile and located in fixed positions on water and could be subject to air emissions dispersed by the operations of the FSRU vessel [134].

133 Technical Report G Section 3.5
134 S2912

Submitters questioned the likelihood of adverse health impacts, odour and noxious gases. They were concerned with air emissions extending along the Crib Point foreshore and beyond, and potential impacts to residential homes around Crib Point from odorant (mercaptan) to be used at the CPRF (S2912).

The EPA proposed that odorant should not be detectable outside the CPRF property boundary. S2912 expressed concern the injection of mercaptan into the pipeline to give the odourless natural gas a strong and offensive smell could be sensed by people. The Proponents submitted in the risk assessment (EES Attachment III Environmental Risk Report) the accidental release of gas or spill resulting in emissions of odour (mercaptan) would be avoided as the CPRF would be '*… designed in accordance with relevant Australian standards and emergency spill response procedures developed as per EES Technical Report K: Safety, hazard and risk assessments'.*

During the Hearing, the EPA sought clarification and additional information about the assessment of air quality and later advised these were addressed to its satisfaction by the additional information provided in the evidence of Drs Drew and Ross.

(ii) Review of modelling

Dr Ross reviewed the methodology used to assess air emissions impact and noted a number of issues that required clarification and further information to be rectified before the EES was finalised. He advised that the methodology was considered appropriate because:

- the selection of the AERMOD atmospheric dispersion modelling system, meteorological data and input files
- suite of modelling files to predict air emissions from the four worst case operating scenarios at the GIJW.

Inputs into the dispersion model were questioned by a number of submitters. On behalf of the IAC, Mr McIntosh questioned the information presented in the dispersion modelling, including use of a 100 metre grid spacing. The Proponents submitted that a grid spacing of 50 a metre or 100 metre resolution had no impact on results at sensitive receptors locations and would not alter the predicted extent of air emissions, a position supported by Dr Ross.

Submitters expressed concern the elevated background data would be used as a benchmark for background air quality for Crib Point (S2912). Dr Ross responded that the background concentrations were regarded as conservative and over predicted the emissions during worst case operations.

Dr Ross noted the EES excluded air quality assessments for the CPRF, PDF, the pipeline construction, Crib Point Jetty Berth 1 and LNG carrier emissions. It was suggested by submitters that all emissions from the operation should be assessed, including fugitive emissions. In his peer review, Dr Ross advised exclusion of emissions from the CPRF, PDS, the pipeline construction and Crib Point Jetty Berth 1 as additional sources was justified. He noted there was '*insufficient detailed information with which to make an informed comment*' on the emissions from additional sources [135].

[135] D72

(iii) Review of worst case emissions

In his evidence statement, Dr Ross said:

> Emissions to air from the FSRU for the four operational scenarios assessed will:
> - Comply with the SEPP (AQM) design criteria at all sensitive receptor locations considered.
> - Produce exceedances of the design criteria within approximately:
>   - 50 metres of the FSRU for NO_2 for all scenarios.
>   - 200 metres of the FSRU, within a number of over-water areas to the south and east of the FSRU, and a small area of the Crib Point foreshore, for Formaldehyde for the gas-fuelled scenarios.[136]

Dr Ross further concluded that impacts of exceedances of NO_2 were negligible as the design criteria was confined to areas over water. He advised predicted exceedances for NO_2 would be reduced significantly if a '*less ultra-conservative background concentration'* was adopted.

TN42 outlined in relation to flora and fauna impacts of nitrogen oxide (NOx):

- Deposition rates for NOx is expected to be negligible, and uptake via soil pore water has not been considered a complete exposure pathway.
- NOx is broken down rapidly in the atmosphere and in water.
- NOx does not accumulate in the food chain.
- Nitrogen is a macronutrient; therefore, the addition of nitrogen can result in a physiological response such as the stimulation of growth.
- The lowest adverse phytotoxic effect reported is more than two orders of magnitude greater than the 1-hour maximum NO_2 concentration predicted overland for the Project.
- NO_2 reacts immediately with water and can change composition effectively.
- NOx does not bioaccumulate in the food chain.

Dr Ross noted a human health risk assessment (HHRA) was required for formaldehyde as the SEPP (AQM) design criteria was exceeded in a small area of Crib Point foreshore. He concluded in his witness statement:

> Application of the Tier 1 screening approach indicates that the predicted formaldehyde concentrations are almost an order-of-magnitude less than the screening criterion, and as such, there will be no adverse health impacts expected for workers or receptors in the vicinity of the FSRU.

Dr Drew was requested by the Proponents to review the air quality impact assessment and HHRA, and comment on human health implications of possible emissions from the proposed FSRU operations. He noted the EES reported on a Tier 1 HHRA assessment which he deemed inappropriate as the criteria used in the EES was developed for dealing with emergencies.

Dr Drew considered the extension of formaldehyde onto sections of the Woolleys Beach foreshore. He advised formaldehyde concentrations would be between 1.5 - 10 times lower than the relevant health assessment criterion and therefore persons who may be exposed to modelled concentrations would not experience adverse health effects [137]. Dr Drew concluded there was very little likelihood of a person at Crib Point experiencing an effect from exposure.

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136 D72

137 D73

Dr Drew further noted in evidence the EES did not deal with carcinogenic risks, particularly from PAHs and benzene. Based on worst case emission predictions modelled from the FSRU and cancer potency from the World Health Organisation, Dr Drew concluded a negligible risk of cancer occurring as a result of exposure to emissions. He opined that workers on the FSRU would be the most likely to be exposed to air emissions from the Project. The HHRA) indicated risks of chronic human health effects at concentrations likely to be emitted were low.

Dr Drew advised the predicted worst case modelled ground level concentrations easily met the air quality objectives proposed in the draft Environment Reference Standard which is part of the new *Environment Protection Act*.

In his advice to the IAC, Mr McIntosh questioned the operation and potential for a +/- 20 per cent fluctuation in formaldehyde emissions during worst case operations[138]. The Proponents responded in TN42 that tolerances in formaldehyde emissions were considered during the air quality impact assessment [139].

The Proponents submitted in TN42 that if the FSRU operated continuously at peak capacity (750 mmscf/d) for the entire year, formaldehyde concentrations would be below the SEPP (AQM) design criterion for at least 99 per cent of the time at locations greater than 60 metres from the FSRU. TN42 described the more realistic scenario of operation at 500 mmscf/d formaldehyde concentrations would be below the criteria at locations greater than 150 metres from the FSRU, 100 per cent of the time.

The EPA recommended EPR-AQ09, specific to monitoring FSRU air emissions be adjusted to include additional monitoring of formaldehyde from the FSRU. Dr Ross supported this recommendation and the Proponents amended EPR-AQ09 (previously AQ11) to require monitoring of the FSRU for 12 months, and in accordance with any works approval issued. Review of monitoring results would determine compliance with design specifications and any future monitoring requirements in the event results became unacceptable.

Impact of formaldehyde to biodiversity was addressed in TN42:

- Atmospheric formaldehyde is not persistent and modelled maximum concentrations would be likely to remain in the atmosphere for a short period of time, limiting potential exposure to vegetation.
- Plants are known to absorb and metabolise gaseous formaldehyde with literature indicating that plants show no visible signs of injury following exposure to higher concentrations than predicted from the FSRU.
- Atmospheric formaldehyde efficiently transfers into surface water due to formaldehyde's high solubility.
- Formaldehyde is not expected to significantly sorb to suspended solids and sediments in the water column, and therefore exposure to benthic species is considered unlikely.
- The bioaccumulation potential of formaldehyde is negligible.

The Proponents submitted that operational air emissions were not expected to impact aquatic and terrestrial ecosystems in the vicinity of the FSRU. Dr Drew gave evidence that

138 D24
139 D332

birds would be most at risk from air-borne emissions and formaldehyde the pollutant of most concern. He noted scientific literature indicated formaldehyde would not kill birds or affect hatchability of eggs or viability of embryos.

10.4.3 Discussion

The IAC accepts the conclusions in the EES that that SO_2, CO_2, and particulate emissions from the FSRU would comply with SEPP (AQM) design criteria. Evidence from Dr Ross supported the EES that NO_2 and formaldehyde are the air pollutants likely to exceed SEPP (AQM) design criteria.

The EES reported that sensitive receptors were allocated at 38 locations surrounding the FSRU location with the nearest approximately 1.2 kilometres from the FSRU. The IAC accepts that, based on dispersion modelling of four worst case scenarios, estimated by the Proponents to occur no more than 10 per cent of the year, emissions from the FSRU are not likely to impact this nearest residence.

The Proponents did not consider the Victorian Maritime Centre as a sensitive use despite a contrary opinion by many submitters. The Proponents demonstrated in the worst case dispersion modelling; potential air pollutants would unlikely intersect with the Victorian Maritime Centre. The IAC accepts that assessment.

The EES considered the accidental release of gas or spill of mercaptan during operation would be effectively managed through the original mitigation measure MM-AQ09. The IAC notes that in the Day 4 version of the EPRs, this mitigation measure has been removed. The IAC recommends an additional EPR is included as EPR-AQ10 requiring that odour is not detectable outside the CPRF property boundary.

The IAC accepts the Proponents have verified the modelling adequately predicts air quality impacts from the FSRU. The inputs into the models are viewed by the IAC as valid, based on the evidence presented by Dr Ross and Dr Drew, and the advice from Mr McIntosh. The IAC recognises larger than expected background concentrations have been modelled to predict air emissions from the FSRU. These have resulted in predicted air emissions being overly conservative and background modelled emissions are somewhat greater than resulting air quality at Crib Point. The air shed of Crib Point is far less urbanised than metropolitan Melbourne where background data from EPA monitoring stations has been extracted, *'and therefore actual background concentrations at the Project site may be lower than the adopted concentrations'* [140].

The IAC acknowledges operation of the FSRU under a range of peak conditions will result in design criteria exceedances for NO_2 and formaldehyde over water. Formaldehyde is expected to exceed criteria over a small portion of the Crib Point foreshore. The IAC recognises the likely exceedances are not within areas deemed sensitive uses according to SEPP (AQM) including schools, residents and hospitals.

The IAC accepts the conclusions of the HHRA that chronic exposure concentrations of formaldehyde and nitrogen oxide are significantly greater than worst case emissions predicted from the FSRU. The IAC is comforted by evidence in the HHRA completed by Dr Drew indicates that formaldehyde and nitrogen oxide emissions from the FSRU would be at

[140] Technical Report G Section 4.7

significantly lower concentrations than concentrations that cause adverse human health impacts.

The IAC is satisfied that air emissions under worst case scenarios are considerably lower than widely recognised criteria for human health protection. The IAC is reassured by the evidence of Dr Drew and the outcomes of his additional HHRA which concluded health effects are unlikely. The assessment considered the potential carcinogenic substances emitted by the FSRU, notably VOC's including formaldehyde, benzene and VOCs, are not expected at concentrations that would result in chronic impacts to human health.

The IAC considers formaldehyde and nitrogen oxide are unlikely to adversely impact aquatic environments and vegetation. Evidence demonstrates that exposure to significantly higher concentrations of formaldehyde at Crib Point are required before impact to birds or eggs are likely. The IAC accepts the Crib Point intertidal environment is a secondary foraging habitat and eggs and newly hatched chicks of migratory shorebirds are unlikely to be present.

The EPA submitted additional monitoring of formaldehyde is recommended to confirm that emitted concentrations comply with design criteria and do not result in SEPP (AQM) exceedances beyond those predicted in the dispersion model. The requirement for additional monitoring during the first 12 months of FSRU commissioning is supported by the IAC as are the amendments to EPR-AQ09 included in the final version of the EPRs. The IAC considers they align with requirements of the EPA and recommendations by the Proponents' air experts.

The FSRU requires a Works Approval and environmental licence as a result of its general air emissions. The Works Approval and Licence will prescribe limits requiring compliance with the general emissions to air. The additional formaldehyde monitoring suggested by the EPA can be a condition of any Project approval by the EPA. It is expected any Project approvals granted by EPA will need to align with its new Act.

The SEPP (AQM) aims to safeguard the environmental values and human activities (beneficial uses) that require protection in Victoria from the effect of air pollution and waste. The IAC appreciates Dr Drew's evidence that modelled air emissions would comply with the new Environment Quality Standards that will accompany the amended *Environment Protection Act* to be introduced in 2021.

There were submissions that nominated air emission monitoring should continue for the life of the Project. The IAC considers the EPA, within its relevant approvals, should be responsible for determining ongoing air monitoring requirements, particularly if results collected over the initial 12 months are deemed unacceptable.

The IAC notes concern raised by submitters that not all emissions associated with the Project have been modelled. Submitters contended cumulative impacts of the FSRU, LNG carrier and four tugboats could have been modelled for completeness of the Air Quality Assessment. On balance, the IAC considers the additional emissions from the LNG carrier and tug boats are intermittent and would not significantly increase emissions predicted in the EES.

10.4.4 Findings

The IAC finds:

- The EES predictions of possible air emissions from the FSRU are acceptable, based on the completed dispersion modelling presented in EES Technical Report G.
- Dispersion modelling presented in the EES can be considered conservative as:
  - Modelled emissions are based on maximum predictions for emissions assuming worst case operating scenarios and peak operating capacity operating every day of the year. These scenarios are estimated to occur for 10 per cent of the year.
  - The dispersion modelling has applied higher than expected background concentrations and SEPP AQM design criteria is predicted to be achieved at all identified sensitive uses around Crib Point, including the nearest resident 1.2 kilometres from the FSRU.
- Under worst case operating scenarios formaldehyde and NO_2 were both modelled to exceed SEPP (AQM) design criteria over water. Formaldehyde was modelled exceeding SEPP (AQM) design criteria over a small area of Crib Point foreshore. Exceedances are not expected to result in adverse impacts to human health and do not affect sensitive receptors.
- Modelled air emissions will not exceed SEPP (AQM) design criteria at Woolleys Beach and the Victorian Maritime Centre.
- Additional evidence from the Proponents indicates aquatic and terrestrial flora and fauna, including birds, are not expected to be adversely affected by predicted air emissions.
- Emissions modelled during worst case scenarios are predicted to comply with the new *Environment Protection Act* and draft Environment Reference Standards.
- EPRs AQ08 and AQ09 are considered appropriate for operation of the FSRU and should be consistent with EPA approvals.
- Inclusion of a new EPR-AQ10 is recommended requiring that mercaptan odour is undetectable beyond the boundary of the CPRF.
- Amendments to EPR's may be required to comply with Environment Reference Standards of the new *Environment Protection Act* and other relevant EPA requirements.

Environmental Performance Requirements

Include the following changes:

- **Insert EPR-AQ10 (Managing mercaptan odour)**

10.5 Air quality conclusion

The IAC concludes that:

- Air quality impacts are consistent with the draft evaluation objectives.
- Air quality impacts can be acceptably managed through the recommended mitigation measures.
- Based on the evidence presented at the Hearing, there are no air quality impacts that preclude the Project being approved.

11 Noise and vibration

11.1 Introduction

Noise and vibration effects were discussed in EES Chapter 13 and Technical Report H. Underwater noise and vibration impacts were discussed in EES Chapter 6 and Technical Report A, Annexures A-I and Annexures A-J. Section 10 of the WAA discussed surface noise.

Terrestrial acoustic impacts from the Project was discussed in EES Chapter 7 and Technical Report B.

Additional material was provided by the Proponents within TN03, TN26 and TN43.

The relevant draft evaluation objectives are:

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

Table 10 lists the noise and vibration evidence that was provided.

Table 9 Noise and vibration evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Marks	Marshall Day	Acoustics
Proponents	Mr McPherson	Jasco Applied Sciences	Underwater acoustics
Proponents	Mr Lane	Nature Advisory	Underwater acoustics
Mornington Peninsula and Bass Coast	Mr Antonopoulos	SLR Consulting Australia Pty Ltd	Terrestrial Biodiversity
Mornington Peninsula and Bass Coast	Dr Lincoln Smith and Dr Blount	Cardno TGM	Marine and Shorebird Ecology
CEG	Dr Edmunds	Australian Marine Ecology	Marine and Shorebird Ecology

Mr Marks and Mr McPherson lodged supplementary evidence and responses on behalf of the Proponents (D83 and D165). Mr Antonopoulos lodged a supplementary report (D119) on behalf of Mornington Peninsula and Bass Coast. Ms Hui provided technical advice to the IAC (D22, D148 and D565).

The Proponent submitted the following TNs:

- TN03: Background noise levels
- TN26: Background noise levels and mitigation measures
- TN43: Underwater acoustic modelling and underwater noise impact assessment.

11.2 Key issues

The key issues are:

- Operational noise and vibration.
- Underwater noise.
- Construction noise.

11.3 Operational noise and vibration

11.3.1 Background

EES Chapter 13 and Technical Report H provided details regarding surface noise and vibration impacts and management during operation. Noise and vibration impact assessments were conducted for a range of operational scenarios. Technical Report H focussed on noise and vibration impacts at the Jetty and PDF and considered the potential for cumulative impacts.

The FSRU operating at peak regasification was assumed as the worst case scenario at the Jetty. Noise modelling was conducted on five operating scenarios under peak regasification with an LNG carrier unloading LNG. The modelling included potential noise produced by nitrogen injections. The modelled scenarios included continuous operation of each facility for 24 hours each day, seven days per week.

The modelled scenario for the PDF captured the worst case operational mode with all site equipment operating continuously.

Noise and vibration impact to fauna and the underwater environment were assessed in EES Technical Reports A and B.

The following EPRs apply to operational noise:

- EPR-NV06 Managing cumulative noise impacts
- EPR-NV09 Operations Noise Management Plan
- EPR-NV10 Operational noise controls
- EPR-NV10A Recreational noise control
- EPR-NV11 Operational noise cumulative control
- EPR-NV12 Notification for mooring LNG carriers
- EPR-NV13 Post-commissioning measurements.

11.3.2 Evidence and submissions

The Proponents submitted Technical Report H provided a detailed assessment of operational industrial noise and vibration impacts at the PDF and GIJW, being the two new above ground infrastructure installations. The Proponents submitted noise levels at sensitive receptors closest to the PDF were predicted to exceed the Recommended Maximum Levels for the night period, but mitigation could be effectively applied to achieve compliance [141].

The Proponents submitted the FSRU operating at peak regasification (three trains) with the LNG carrier berthed alongside was the worst case scenario for the GIJW. Modelling suggested noise at the GIJW under worst case scenarios would achieve compliance with applicable Recommended Maximum Levels specified in EPA Publication 1411 *Noise from industry in regional Victoria* (NIRV) at the closest sensitive uses.

Mr Marks gave evidence that Technical Report H addressed operational and construction noise and vibration impacts. He considered continuous operational and short term construction noise and vibration could be properly managed and impacts could be suitably addressed through the Project's mitigation measures.

[141] Noise from industry in regional Victoria: Recommended Maximum Levels from commerce, industry and trade premises in regional Victoria (NIRV; EPA publication 1411)

Concerns were expressed by many submitters about potential noise impacts during operation, including:

- The ISO 9613-2 method for calculating the attenuation of sound from industrial sources, and the potential that noise levels were underpredicted due to limitations in assessing noise propagation over large distances, over water bodies, and elevated noise sources [142].
- Compliance with NIRV Recommended Maximum Levels, particularly at the nearest sensitive receptor at 103 The Esplanade Crib Point.
- Cumulative noise impacts, particularly with Berth 1 and Berth 2 operations occurring simultaneously.
- Amenity impacts to Woolleys Beach and HMAS Otama Lookout, where operational noise is predicted to reach 45-52 dBA.
- Reliance on assumed noise attenuators in both the LNG carriers and the FSRU.

(i) Issues with noise modelling

The EES noise modelling completed by AECOM applied the ISO 9613 modelling method. This was accepted by Mr Marks but critiqued by Mr Antonopoulos.

Mr Antonopoulos questioned the suitability of ISO 9613 method for modelling noise from the GIJW. His evidence was that the ISO 9613 algorithm might underpredict noise levels from elevated sources, it had limitations over water surfaces, and its accuracy beyond one kilometre was undetermined [143]. In their opening submission, Mornington Peninsula and Bass Coast submitted the ISO 9613 algorithm failed to make allowance for noise from existing industrial operations [144]. In evidence, Mr Antonopoulos noted his request to access the AECOM noise model had been unsuccessful. Consequently, he had been unable to validate the results of the noise modelling against his own model that '*provided concerningly variable results'.*

The Proponents submitted that adopting the ISO 9613 method and modelling software was acceptable and the modelling approach was routinely utilised within Victoria for the purposes of similar planning and environmental assessments. They advised the modelling adequately predicted noise from worst case operational noise emitted.

(ii) Noise from the GIJW

The Proponents submitted the modelling demonstrated the capacity for operations at the GIJW to achieve compliance with applicable Recommended Maximum Levels specified in the NIRV in all worst case scenarios.

In her review of the EES and Technical Report, Ms Hui identified that details of background operational noise levels used for determining the NIRV Recommended Maximum Levels for operation at the nearest receivers were missing in the EES. Following a request from the IAC, background noise levels were provided by the Proponents in TN03.

142 ISO 9613-2: 1996 'Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation'

143 D119

144 D160

The EPA submitted a number of the EPRs and POS should be amended to better adhere to noise criteria and manage out of hours activities to avoid excessive noise. The Proponents amended most mitigation measures during the course of the Hearing to align with the EPA's suggestions, and those of other submitters.

The Proponents considered the recommendations by the EPA and Ms Hui to amend a number of EPR and POS to require appointment of an independent environmental auditor, particularly to approve night time works, was not necessary, rather a qualified environmental assessor was sufficient.

Cumulative noise at Crib Point with operations occurring concurrently at Berth 1 and Berth 2 was noted by a number of submitters as the most significant operational noise issue. This was supported by the EES that the existing operations at Berth 1 have the capacity to produce noise within close range to the night time NIRV Recommended Maximum Levels when vessels are offloading petroleum.

To inform the EES, one attended noise measurement at 103 The Esplanade, the nearest dwelling, was taken while a United Petroleum vessel was moored at Berth 1. In his evidence, Mr Marks noted the overall LAeq sound pressure level audible from the Jetty was approximately 40 dBA at the dwelling. This was higher than the night time Recommended Maximum Level of 35 dBA $L_{Aeq,30min}$ specified in NIRV. Weather conditions at the time of monitoring were reported as still and overcast [145]. Mr Marks noted that levels could increase if the wind came from the south south-west and especially as a prevailing wind direction [146].

Several submitters expressed concern that compliance with relevant night time operational noise limits may not be achieved, especially if an LNG carrier arrived during the night when the FSRU and United Petroleum were both operating. Cumulative noise during night time operations was identified as a higher risk than day time operations. Ms Hui advised the IAC that cumulative noise impact assessments were not based on a comprehensive assessment of existing noise from operations at Berth 1 and suggested EPR-NV13 include a requirement to assess cumulative noise levels [147].

Mr Marks gave evidence that noise levels that meet the EPA NIRV guideline usually provided a satisfactory level of amenity for affected residents. Mr Marks recommended NIRV recommended levels be included in the EPRs so that compliance with the noise targets would be enforceable. The EPA suggested amendments to EPR-NV10 and NV13 to better align with the requirements of NIRV and measures for managing cumulative noise. The EPA noted achieving the intent of the NIRV included implementing best practice noise control measures, considering noise from multiple premises, and considering the effect of noise on quiet rural areas.

Mr Antonopoulos gave evidence the LNG carriers are a significant noise source and the Proponents had modelled noise from those vessels fitted with high performance exhaust stack silencers. He advised the LNG carrier is the loudest and most critical noise source

145 Technical Report H Section 5.2.2.1
146 D83
147 D148

associated with the proposed operations and appeared to be the source the Proponents would likely have least control over.

Mornington Peninsula and Bass Coast submitted:

> … that the FSRU might be built "to spec" to incorporate the assumed attenuation, it remains concerned about the possibility that LNG carriers delivering to the FSRU which are not owned or operated by the project Proponent might not incorporate the same attenuation. Additionally, it remains unconvinced that an appropriate allowance was made to the noise model having regard to its known limitations stated above[148].

The Proponents submitted noise sources not in their direct control (such as the LNG carrier and Berth 1 operations) could effectively be ameliorated by implementing the EPRs. They noted there is scope to implement further noise amelioration to achieve compliance with Recommended Maximum Levels in the event this may be required.

The Proponents advised EPR-NV11 was intended to manage cumulative noise from the Project and existing activities at Berth 1. The Proponents submitted in the event noise from the United Petroleum pumps, FSRU, or the combination of both, exceeded the NIRV targets, then EPR-NV11 would require '*appropriate noise amelioration measures*'. The Proponents suggested offsite noise mitigation might be considered.

EPR-NV11 would require the establishment of a working group to include the PHDA, commercial operators at the Crib Point Berths 1, 2 and 3, and a community representative within a 1.5 kilometre radius of the Jetty to manage noise.

(iii) Sensitive uses

Submitters expressed concern the Project would have a detrimental effect on the amenity of the Crib Point foreshore, including Woolleys Beach south of the Jetty and Jacks Beach to the north. The EES found that changes in ambient noise level were expected to be noticeable at Woolleys Beach and at the Victorian Maritime Centre. Mr Antonopoulos gave evidence that operational noise from Berth 2 would be audible for significant periods at Woolleys Beach due to its different character from existing noise sources. He added predicted noise from the GIJW would '*be well above'* typical background noise levels at Woolleys Beach and HMAS Otama lookout.

Mornington Peninsula and Bass Coast submitted '*these beaches provide a valuable recreational asset for the community, not least because of their peaceful natural environment*' [149]. They submitted the Project should incorporate, where practicable, operational noise limits for open spaces such as Woolleys and Jacks beaches.

Under cross examination by Mornington Peninsula and Bass Coast, Mr Marks accepted that Woolleys Beach and the HMAS Otama lookout should be considered noise sensitive sites. He agreed that:

> … operational noise from the Project would be both audible at these locations for potentially 4-6 hours per day if the FSRU was operating continuously over that period and different in character to the existing ambient sources excluding the United Energy operations (which are currently relatively limited in duration over the year) [150].

148 D564
149 D564
150 D564

Ms Hui suggested an assessment of operational noise to recreational areas be considered [151].

(iv) Terrestrial biodiversity

The Proponents submitted that operational noise and vibration at the GIJW under the worst case combining the FSRU, the LNG carrier berthed and nitrogen offloading (closed loop) would represent the worst case for fauna, but impacts are unlikely as this operational scenario. The EES considered predicted noise extending from the GIJW to secondary foraging habitats at Crib Point in the range of 40 to 50 dB $L_{eq(15min)}$ are unlikely to interfere with bird behaviour.

Mr Marks gave evidence that birds were relatively unperturbed by moderate levels of impulsive or continuous noise, consistent with noise generated by the GIJW. The Proponents submitted concerns raised by submitters about impacts on shorebirds and wetland birds were:

> … largely expressed in terms of "uncertainty" about impacts rather than actual or likely impacts. They indicated that criticism is 'largely made without any reference to the applicable standard of acceptability of impacts' [152].

Mr Lane gave evidence that impacts of noise on birds and other wildlife were adequately assessed in the EES and *'… predicted noise levels in primary foraging habitats for significant bird populations are the same as or less than current ambient noise levels in these habitats'* [153]. He advised significant impacts on birds from noise were not anticipated and noted a review of existing information on impacts of noise and artificial lighting on wildlife had been undertaken in accordance with relevant guidelines.

The EES predicted noise levels extending into foraging areas would be consistent with noise experienced by birds in other industrialised locations in Western Port, including Long Island.

The DAWE submitted that '*it cannot be assumed that existing operational noise levels at these primary habitats is not adversely affecting the birds*' [154]. They noted further analysis may be required on potential impacts on waterbirds (roosting and foraging), resulting from additional noise associated with increased frequency of shipping and operation of the FSRU. It expressed concern that modelling of worst case scenarios '*predicts noise levels reaching 45 DBA at closest shorebird habitat, Woolleys beach (secondary foraging habitat) to the FSRU*' [155].

A number of submitters similarly expressed concerns about operational noise emissions adversely impacting terrestrial biodiversity. Further, they contended the EES assessment of noise impacts on wildlife was lacking.

The evidence from Drs Lincoln Smith and Blount was that, as a minimum, the EES should have considered the cumulative and interactive effects of noise, boat wash and other disturbances on shorebirds from the Project's vessels and other vessels/operations at the

151 D565
152 D589
153 D76
154 S2871
155 S2871

Jetty [156]. In cross examination, Drs Lincoln Smith and Blount agreed that noise levels predicted at Crib Point were quite low and impacts to shorebirds would be unlikely.

11.3.3 Discussion

The IAC notes the EES noise and vibration assessment considered a number of Project related noise sources and modelled worst case operational scenarios. Air-borne noise and vibration impacts were considered two kilometres out from the proposed pipeline alignment, which encompassed the pipeline construction ROW, proposed operational facilities as well as works on and adjacent to the Jetty. Operational noise generated was reported to include continuous noise from the PDF and the GIJW. The IAC notes that with amelioration, operational noise at the PDF will achieve Recommended Maximum Levels.

The worst case noise generating scenario was deemed to be the GIJW operating at peak regasification with an LNG carrier moored alongside. The IAC notes the criticism of Mr Antonopoulos who doubted the noise modelling and inputs used to predict operational noise, noting the modelling results were unverified. The IAC acknowledges there is value in independent validation of the noise modelling, but on balance, it considers the noise modelling provides a relatively sound understanding of the likely noise emissions and sources at the Jetty.

The IAC acknowledges the robust discussions about the noise sources and potential exceedances from operations at Berth 1 and 2, both in isolation and combined. It accepts that individual operations proposed at Berth 2 are likely to meet the NIRV Recommended Maximum Levels during gas import operations. However, the combined operations at Berth 1 and 2 are likely to result in exceedances of Recommended Maximum Levels at the nearest residence at 103 The Esplanade, particularly when the landside pump is offloading petroleum from a vessel docked at Berth 1.

The IAC considers the most sensitive noise receptor is 103 The Esplanade. The single noise assessment completed at that location does not conclusively predict the noise from the existing Crib Point operation. One measured event does not consider variability in meteorological conditions that could influence the dispersion of noise. Based on evidence from Mr Marks, the IAC considers compliance measurements at the nearest sensitive receptor should be undertaken over an extended period to provide a representation of prevailing conditions at the site. This will assist in developing targeted noise amelioration measures to minimise cumulative noise exceedances likely to occur at night during concurrent operations at Berths 1 and 2.

The Proponents submitted a three-decibel reduction would be applied to the Recommended Maximum Levels for the GIJW, in accordance with EPA Publication 1413 (Guidelines on applying NIRV). The IAC considers this is an important contribution to managing cumulative noise and achieving the Recommended Maximum Levels for each of the GIJW noise sources during concurrent activities at Berths 1 and 2.

The IAC notes proactive responsiveness by the Proponents and third parties to ameliorate noise would be critical to the success of EPR-NV11 which outlines operational noise cumulative control measures. The IAC recommends the working group proposed in EPR-NV11 include a representative from the residents located within 1.5 kilometres of the Jetty.

Noise from the LNG carriers was noted as a potential noise source beyond the control of the Proponents, and the IAC considers this warrants further consideration by the Proponents to determine how noise from combined sources, particularly during night time can be managed to ensure compliance with Recommended Maximum Levels. The IAC recommends amendments to EPR-NV13 to strengthen the program of noise monitoring post-commissioning, whereby noise is measured fortnightly for the first 12 months of commissioning the GIJW. Post-commissioning measurements will provide valuable information to assist with mitigating cumulative noise sources at Crib Point.

The IAC considers the amenity of the Woolleys Beach Reserve is important and noise impacts should be further assessed. The IAC recommends an addition to EPR-NV09 (Operations Noise Management Plan) to include '*the identification and assessment of noise sensitive receptors, including habitat for listed threatened fauna, likely to be impacted by the project'* include reference to 'the Woolleys Beach Reserve'. The IAC considers the Operations Noise Management Plan should be approved by an independent environmental auditor rather than an assessor before approval by EPA.

Impacts from operational noise to terrestrial biodiversity, particularly to migratory shorebirds utilising the intertidal habitats at Crib Point are considered low and not dissimilar to noise experienced at other industrialised jetties in Western Port Bay.

11.3.4 Findings

The IAC finds:

- The noise generated from the GIJW will likely achieve the NIRV Recommended Maximum Levels at the nearest sensitive receptor under worst case operational scenarios.
- Cumulative noise generated during combined operations at Crib Point is expected to exceed night time NIRV Recommended Maximum Levels and will require careful management by individual operators contributing to the operational noise to achieve compliance.
- The opportunity to attenuate noise from LNG carriers and United Petroleum vessels may prove difficult as these noise sources are not controlled by the Proponents.
- The amenity of the Crib Point foreshore is considered valuable to a range of users and potential noise impacts from the GIJW warrant further assessment.
- Impacts to terrestrial fauna species, particularly birds, are expected to be negligible and consistent with other locations in Western Port Bay.

11.3.5 Recommendations

The IAC recommends:

<u>Environmental Performance Requirements</u>

Include the following changes:

- **Revised EPR-NV06 (Managing cumulative noise impacts)**
- **Revised EPR-NV09 (Operations Noise Management Plan)**
- **Revised EPR-NV11 (Operational noise cumulative controls)**
- **Revised EPR-NV13 (Post-commissioning measurements)**

These changes are included at Appendix G.

11.4 Underwater noise

11.4.1 Background

EES Technical Report A Annexure A-I and Annexure A-J detailed the underwater noise impact assessment and underwater acoustic modelling, respectively, which assessed the potential impacts of underwater sound on four marine fauna taxa – marine mammals, fish, invertebrates and diving birds. The assessment was based on model predicted sound levels with special consideration given to species listed as threatened or vulnerable under the *Environment Protection Biodiversity Conservation Act* and species listed under the *Flora and Fauna Guarantee Act.*

The underwater acoustic modelling utilised acoustic models to estimate the underwater sound emissions during four operational scenarios involving the FSRU, LNG carrier and the existing offload operations of liquid petroleum at Berth 1. The report indicated limited data was available to determine monopole source levels (MSL) for berthed FSRU, LNG and petroleum carriers. The modelling considered Floating Production Storage and Offload (FPSO) facilities as a conservative proxy to derive sound pressure levels (SPL) and accumulated sound exposure levels (SEL). The predicted extent of underwater sound propagation was assessed against marine mammal criteria used to predict temporary and permanent effects from underwater sound.

The underwater acoustic modelling indicated an SEL causing a permanent threshold shift (PTS) in cetaceans and seals would extend a maximum distance of 80 metres from the combined operations of the FSRU, LNG carrier offloading and petroleum carrier offloading. The marine mammal behavioural response criterion of 120 dB re 1 µPa1 (SPL) or temporary threshold shift (TTS) would extend up to 2.09 kilometres from Crib Point during combined operations of the FSRU and the LNG and petroleum carriers during offloading.

An independent peer review of the underwater noise assessment by GHD concluded '*the underwater noise assessment methodology is appropriate for the assessment required and the conclusions presented can be reasonably drawn from the methods used'.*

The following EPRs apply to underwater noise:

- EPR-NV14 Underwater Noise: Detailed Design
- EPR-NV15 Underwater Noise: Ambient Noise Study
- EPR-NV16 Underwater Noise: Post-Construction Monitoring and Assessment.

11.4.2 Evidence and submissions

The Proponents noted the underwater noise assessment reported in Annexure A-I that '*planned operations at the Gas Import Jetty will contribute to the soundscape in this harbour area but not change the ecological character or reduce the biodiversity of this environment*'. Annexure A-I noted the GIJW is located at an operating port jetty and '*it is assumed that the existing harbour operations create a noise field that already alters the natural sound field and impacts the marine receptors in the surrounding area*'.

The Proponents acknowledged operations at the Jetty, including the FSRU, LNG carrier and petroleum tanker would generate underwater noise. Noise from tugboats would be sporadic, limited in duration and not expected to be major noise sources.

The Proponents advised suitable underwater noise data was unavailable to determine the sound emitted by the GIJW. They instead relied on noise measurements from a FPSO unit as

a proxy to predict underwater noise. The modelling reported in Annexure A-J assumed the FSRU, LNG carrier and petroleum tanker emitted the same MSL of 174 dB.

Mr Marks conducted a peer review of the Underwater Noise Assessment and Underwater Noise Modelling reports prepared by Jasco Applied Sciences (Annexure A-I and Annexure A-J). His evidence was that:

- The underwater noise assessment was conservative, with the four operational scenarios considered for the noise modelling all showing a limited impact zone.
- The assessment considered continuous sounds only, which is appropriate given the noise sources considered in the assessment.
- The criteria for marine impact were absolute averaged and weighted sound levels, assessed over a nominated duration (e.g. 24 hours).
- Underwater construction would be minimal, and the impact would not be material [157].

Mr Marks noted the following limitations to the underwater noise modelling and assessment:

- A comprehensive description of a wide general range of species and their response to noise was provided but the impact on the specific subset of marine life normally found in Western Port Bay was not discussed in detail.
- An ambient noise survey would have provided clarity of existing conditions, including details of ambient levels and the impact of existing marine traffic.
- Some commentary and assessment of how added vessel movements could change the acoustic environment in Western Port Bay and Crib Point specifically would have been beneficial.

The Proponents made Mr McPherson available to assist Mr Marks address any issues raised regarding underwater noise. Consequently, Mr McPherson gave evidence to the IAC and was cross examined by a number of submitters. He advised that underwater noise was modelled using underwater noise measured from a FPSO vessel, a similar vessel to the FSRU.

There was criticism by the CEG and other submitters that the substituted underwater noise source was lacking high velocity discharge ports, which were anticipated would create more intense underwater noise at the Jetty. Submitters considered this to be a deficiency in the underwater noise assessment. During cross examination, the CEG criticised the modelling of the FPSO as a proxy for the FSRU. It noted the FPSO was dissimilar to the FSRU as the FPSO did not discharge water through high velocity discharge ports.

The FSRU, LNG carrier and petroleum tanker vessel noise were all assumed to produce the same MSL spectrum, being 174 dB MSL. Mr Marks noted it was '*unlikely in reality that all vessels will create the same noise, and he considered the FSRU is likely to be noisier than the other two vessels*' [158]. He further noted that Jasco advised no comparative data was available to warrant any changes to the model and assumptions based on the FPSO. Mr McPherson indicated that LNG carrier noise levels have been reported to range from 150-186 dB MSL depending on vessel size. In evidence, Mr Marks advised the FSRU noise data was not quantified, but tests obtained by him on other FSRUs indicated levels used in the

157 D83
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underwater modelling report were conservative. He further noted detailed information on actual FSRU noise was difficult to obtain or validate, and subsequently recommended that testing be carried out in situ.

S1715 submitted the underwater acoustic modelling was below industry standard as it lacked ambient underwater acoustic data, did not consider the benthic substrate nor the water depth profiles. She added the modelling and assessment did not factor in the various acoustic frequency ranges marine mammals respond to.

Mr Marks recommended commissioning measurements to verify that FSRU source levels were consistent with the MSL values referenced in the Jasco assessment.

(i) Impacts to marine biodiversity

The Proponents advised the Underwater Impact Assessment (Annexure A-I) considered four taxonomic groups: marine mammals (whales, seals), fishes (finfish, sharks, rays), avifauna (penguins, cormorants, swans, waterfowl) and invertebrates. They submitted underwater noise modelling indicated severe impacts on cetaceans and seals (such as PTS) was predicted to occur within 80 metres or less of vessels, and usually exposed mammals will swim away. The TTS zone for cetaceans, equivalent to the 120 dB MSL contour, was reported to vary in distances of 1.42 to 2.09 kilometres, depending on operating scenarios.

The Proponents advised underwater noise emitted during operation of the GIJW was modelled on results measured from a similar operation, and:

> … the assessment of likelihood and consequence of impact shows that individual animals can be at a medium or high risk of being impacted by the sound while on population level the impact risk is low or very low for all species and species groups considered [159].

The EES concluded there would be negligible risk for direct loss of fauna species listed as threatened under the *Flora and Fauna Guarantee Act* or *Environment Protection and Biodiversity Conservation Act*. Annexure A-I reported:

> The assessment of likelihood and consequence of impact shows that individual animals can be at a medium or high risk of being impacted by the sound while on population level the impact risk is low or very low for all species and species groups considered

Various submissions noted the EES inadequately described the potential impacts of underwater noise from the GIJW to marine biota. Mr Edmunds gave evidence that underwater acoustic modelling of the FSRU and LNG carrier indicated behavioural impact thresholds would be exceeded across the width of North Arm [160]. Submitters expressed concern that underwater noise from the GIJW would result in behavioural effects, such as avoidance, and create faunal movement barriers in North Arm. Mr Edmunds suggested the FSRU could alter behaviour and restrict movement of fauna groups, including impact on mobile squid, sharks and fish that traverse back and forth through the North Arm.

The Proponents provided TN43 in response to the IAC's RFI, which described potential impacts on marine fauna within Western Port Bay, and indicated:

159 Annexure A-I
160 D108

> … behavioural responses, which are not necessarily equivalent to disturbance, in marine mammals could occur between 1.42 and 2.09 km, depending upon the scenario. Because of the attenuating effect of bathymetry, the maximum ranges to thresholds, were predicted to occur within the deeper waters of the channel to the southeast and northeast of the Crib Point Jetty.

Evidence from the Proponents further indicated data had not been gathered to quantify temporal and spatial distribution of marine mammals proximal to GIJW, species specific sensitives to underwater noise is not easily predicted from existing literature, and additional effects from underwater noise may result in '*… reduction in prey availability as prey responds to anthropogenic sound and is displaced from a feeding area*'.

The Proponents submitted that marine mammals may deflect their swimming path to avoid higher noise levels in closer proximity to the sound source. It was noted in TN43 that Western Port Bay is already a '*disturbed environment with its existing port activities and marine mammals are likely to be accustomed to human-made noise*'. TN43 noted the noise induced impacts of temporary or permanent impairment of the animals hearing was extremely unlikely to occur as these thresholds assume an animal remains in proximity to the noise source for more than 24 hours.

The underwater noise impact assessment indicated it was possible that fish species would likely detect the operational noise and exhibit behavioural responses, avoiding the area. Annexure A-I indicated:

> Sound produced by the vessels in the considered scenarios could cause physiological effects, and recoverable injury, to some fish species, but only if the animals are in very close proximity to the sound sources–within a maximum planar distance of 50 metres for 48 hours.

The Proponents relied on Mr McPherson and the modelling by Jasco to assert that underwater noise was not anticipated to materially impact on the colony of Little Penguins known to inhabit Barrallier Island. Similarly, the Proponents indicated the noise would unlikely impact shorebirds utilising Crib Point as a secondary foraging habitat.

(ii) Underwater ambient noise levels

Technical Report A Annexure A-I noted:

> The existing underwater ambient sound field at the Gas Import Jetty has not been measured and cannot be approximated from measurements other locations.

It further noted the lack in information on ambient noise levels created difficulties in quantitatively assessing likely impact of exceedances to the range of audibility and behavioural responses of cetaceans and pinnipeds.

A number of submitters expressed concern that the existing underwater noise environment was not assessed. Ms Hui noted the existing underwater ambient sound field at the Jetty had not been measured and predicted sound levels were based on data derived from a similar FPSO [161]. Ms Hui advised the IAC that EPR-ME16 should be amended to require a baseline study of underwater noise in the Crib Point area [162].

Mr Marks said in his witness statement:

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> Although not material, some baseline line monitoring would have better informed the community in relation to the existing noise environment, including from current shipping, and would have helped to quantify the changes or impacts arising from the predicted Facility underwater levels [163].

The Proponents responded that ambient underwater noise would be assessed prior to commissioning, and indicated ambient assessments were included as a requirement in EPR-NV15.

Submitters expressed concern that post-construction monitoring and assessment of underwater noise were not addressed in the EES. Subsequent amendments to the EPR-NV16 resulted in refinement of the post-construction monitoring program to measure underwater noise during the GIJW operations.

11.4.3 Discussion

FSRU's are in operation worldwide and it would have been valuable to monitor and subsequently simulate the underwater noise emissions from a similar vessel in operation with the conditions that exist at Crib Point. The IAC considers the modelled predictions applying the FPSO MSL as a proxy highlights that underwater noise generated during the GIJW and Berth 1 operating together could alter the behaviour of marine fauna within a two kilometre radius of the Jetty. The IAC accepts the underwater noise may cause acoustic masking and stress to marine mammals, with mammals likely to avoid the area where the TTS is exceeded during different operational scenarios.

The IAC considers modelled underwater noise predictions should apply real time FSRU noise emission data to predict underwater noise more accurately, particularly as Mr Marks noted underwater acoustic data or MSL would be available from other vessels operating in international waters. The IAC recommends revisions to EPR-NV14 to ensure design of the FSRU applies best practice operational requirements to reduce underwater noise, particularly from the high velocity discharge ports. There is the opportunity to integrate information from existing FSRU operations in other ports to optimise the design of any FSRU proposed in Western Port Bay.

The Proponents acknowledged the existing soundscape in Western Port Bay has not been measured. The IAC considers it worthwhile to conduct additional underwater noise modelling applying real time MSL data. Underwater MSL could be measured during operation of the United Petroleum vessels at Berth 1 and modelled with real time acoustic measurements during unloading of LNG carriers and FSRU operating in other ports. The IAC considers an ambient underwater noise assessment is critical to understanding existing acoustic conditions in and around Crib Point, and the lack of ambient acoustic information is acknowledged by the Proponents as a limitation to comprehensively understanding impacts to marine mammals. The IAC recommends amending EPR-NV15 to require ambient noise conditions be measured continuously for six months at a number of locations around Crib Point and North Arm prior to commissioning the FSRU to provide a benchmark for further assessments post-commissioning.

The peer review by GHD considered the methods used during the underwater noise modelling and assessment. The IAC is of the view the review did not appear to consider

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whether the underwater noise assessment and modelling sufficiently determined the extent of noise impacts to the receiving environment and potentially exposed biota.

There was a general theme in submissions that the combination of noise, vibration, odour and light from the GIJW could deter marine species from the North Arm and potentially, alter migration routes. The IAC considers the extent of impacts to species has not been adequately quantified. Evidence suggested marine mammals and fish are likely to be most affected as they have the greatest sensitivity to sound at the frequencies likely to be generated by the combined activities at the Jetty.

The IAC considers the most likely scenario is marine fauna would experience acoustic masking and behavioural changes as a consequence of underwater noise exceeding the sound level 120 dB re 1 µPa[1] MSL. There is a risk marine mammals may avoid the area around the GIJW where the sound levels exceed the behavioural threshold of 120 dB re 1 µPa[1] SPL. The IAC accepts the assumption in TN43 that large cetaceans are unlikely to remain in proximity of the FSRU for extended periods and permanent impacts are considered as highly unlikely.

The IAC considers that the underwater soundscape across the North Arm is likely to alter, with potential barrier effects created during combined operations at Crib Point. With the exception of penguins, the species specific sensitivities to noise predicted during operations at GIJW and Berth 1 were not thoroughly considered by the Proponents. This was agreed by both Mr Marks and Mr McPherson. The IAC notes penguins readily co-exist close to shipping areas such as ports and harbours in Victoria, and the population at Barrallier Island, north of Crib Point is unlikely to be adversely impacted by the GIJW.

The IAC noted that the EES generally considered impacts from underwater noise to marine mammals and fish and noted qualitative information was lacking to fully characterise the sensitivities to the marine mammals and fish known to use the North Arm. The IAC considers EPR-NV15 should require further assessment to better understand underwater noise sensitivities of the range of marine species known to use the Lower North Arm.

11.4.4 Findings

The IAC finds:

- Underwater noise generated under various GIJW operational scenarios is predicted to extend 1.42 to 2.09 kilometres at SPL known to result in behavioural changes to marine fauna. Marine fauna will experience temporary behavioural changes such as acoustic masking and stress, and a barrier effect could deter marine fauna movement within the Lower North Arm.
- The PTS is predicted to occur a maximum distance of 80 metres from the GIJW, but permanent damage is unexpected as marine mammals and fish are unlikely to stay at this distance over a period of 24 hours.
- Impacts of underwater noise to marine fauna have been simplified to consider impacts more generally across marine fauna. There is a lack in understanding species specific sensitivities of underwater noise to species known to exist in the North Arm where barrier effects are likely.
- The underwater noise assessment is deficient as it has not adequately considered the ambient noise levels in the vicinity of Crib Point. This creates uncertainty in the EES predictions as the actual extent of underwater noise

generated during various operational scenarios of the GIJW and their impacts to marine fauna cannot be confirmed.
- Modelled underwater noise predictions would have benefitted from real time FSRU noise emission data to provide a greater understanding and certainty about impacts.

11.4.5 Recommendations

The IAC recommends:

Environmental Performance Requirements

Include the following changes:
- **Revised EPR-NV14 (Underwater Noise: Detailed Design)**
- **Revised EPR-NV15 (Underwater Noise: Ambient Noise Study)**
- **Revised EPR-NV16 (Underwater Noise: Post-Construction Monitoring and Assessment).**

These changes are included at Appendix G.

11.5 Construction noise

11.5.1 Background

The following EPRs apply to noise management during construction of the GIJW:
- EPR-NV01 Construction Noise and Vibration Management Plan
- EPR-NV02 Managing noise and vibration from construction activities
- EPR-NV03 Construction noise criteria.

The following POS in the CEMP Attachment J apply directly or indirectly to construction noise and vibration:
- E6 Managing noise from construction activities
- E7 Offsite noise management measures
- E8 Scheduling out of hours work
- E9 Vibration safe working distances
- E10 Noise and vibration monitoring
- D9 HDD noise control
- H10 Cleaning, hydrostatic testing.

11.5.2 Evidence and submissions

The Proponents recognised construction activities would create temporary disruption and inconvenience, that would vary over time and be dependent on the nature of the construction activities along the alignment. The Proponents submitted noise and vibration impacts during construction will be limited in duration in any given location and materially less than for other major infrastructure projects.

The Proponents submitted it was common ground between Mr Marks and Mr Antonopoulos there was scope for construction noise to be acceptably managed subject to the adoption of standard noise amelioration techniques and adherence to established protocols. This view was shared by Ms Hui.

Impacts of noise and vibration during construction of the pipeline was highlighted by submitters as having the greatest potential to impact amenity of residents. The Proponents

amended several EPRs and POS following suggested changes by Mr Antonopoulos, Mornington Peninsula and Bass Coast and the EPA, which were reflected in the Day 4 version of CEMP Attachment J.

Mr Marks recommended site specific CNVMP be required for critical works through townships or other sensitive regions affected by the pipeline works, including Hastings. Mr Antonopoulos, and to some degree the EPA, supported site specific CNVMP to protect residential amenity during the construction period. Ms Hui suggested the CNVMP should include, but not be limited to, details of agreed noise targets/triggers and mitigation measures [164].

The Proponents submitted noise could be managed by adopting on site best practice measures as well as off site management measures such as respite and relocation. EPR-NV04 included reference to a Project relocation policy. Ms Hui noted details describing the respite and relocation mitigation measures are required within the CEMP and EPRs [165].

The Proponents submitted that adoption of mitigation measures during unavoidable works and the opportunity for respite or relocation would ameliorate adverse impacts of out of hours work. The generation of noise and vibration during out of hours works was raised by several submitters, particularly based on the Proponents intention to continuously construct the pipeline over 24 hours. The EPA expressed concern regarding the efficacy of the proposed night time target detailed in EPR-NV02 to meet the inaudibility criteria of EPA Publication 1254 during the Jetty works.

In closing, Mornington Peninsula and Bass Coast submitted the proposed mitigation measures had not responded appropriately to the quiet rural environment in which the construction will take place. The EPA, Mr Antonopoulos and Ms Hui considered the NSW noise guidelines should be adopted. They would provide a more intensive and conservative management approach, more reflective of the rural environment associated with the Crib Point/Hastings area.

Ms Hui advised the IAC that defined noise criteria and trigger levels should be based on background noise levels representative of the area and time of day when construction works may be occurring [166].

S2912 suggested a number of changes to the noise and vibration EPRs for the GIJW.

11.5.3 Discussion

In order to minimise construction impacts, the Proponents proposed various mitigation measures. Submitters proposed various amendments to a number of the EPRs and CEMP POS. The Proponents accepted some of the suggested changes during the course of the Hearing. With the additional changes recommended by the IAC, it is generally satisfied the mitigation measures would ameliorate noise and vibration impacts.

The IAC accepts the Proponents' assessment of the potential for noise and vibration to be generated during construction of the entire Project. Noise and vibration impacts during construction are expected to be greatest during construction of the pipeline, rather than the

164 D148
165 D148
166 D148

Jetty works and PDF, given the geographic extent of the pipeline works. Night time noise was a concern to a number of submitters.

Construction of the pipeline will create the greatest noise impacts, particularly where the route is in close proximity to commercial and urban areas, such as in and around Hastings. Mr Marks' evidence noted Technical Report H did not fully address the risk of adverse impact from construction activities in Hastings. He recommended further assessments once details of the nominated equipment, daily construction rate variations and actual processes to be used by the successful construction contractors are known. This is supported by the IAC.

The IAC considers site specific CNVMP should be developed for locations where the Project is in close proximity to sensitive uses. Further, these should be approved by an independent environmental auditor and include a targeted stakeholder communication strategy and be supported by background monitoring and site specific risk assessments prior to works proceeding. The CNVMP will be particularly valuable during pipeline construction within corridors close to townships, including Hastings. The requirement for the site specific CNVMP has been included in EPR-NV01.

The EPRs and CEMP include management measures and mitigations to reduce adverse impact of noise and vibration during construction. Witnesses indicated Victorian noise guidelines are not as robust as the NSW Construction Noise and Vibration Guideline (CNVG). The EPRs and CEMP should incorporate the requirements of the NSW CNVG. The IAC recommends establishing criteria and trigger levels based on background noise levels representative of the area and time of day when construction works may be occurring, as recommended by Ms Hui[167].

The adoption of work practices to minimise noise and impacts is critical. The IAC supports the EPA's recommendation that all reasonably practicable actions to minimise construction noise and impacts should be taken from the outset of the Project, rather than being conditional upon exceedances. This should apply to regular works, night time works, and unavoidable works. The IAC recommends EPR-NV03 and CEMP E7 be amended to reflect no noisy activities before 7.00am.

11.5.4 Findings

The IAC finds:

- Construction of the GIJW is unlikely to create unreasonable noise and vibration impacts. Any impacts can be appropriately managed.
- Construction activities for the Pipeline are localised, and with the adoption of relevant construction mitigation measures and noise criteria, are not expected to result in unacceptable noise and vibration impacts.
- Site specific CNVMP should be prepared, informed by a more detailed risk assessment and baseline monitoring to identify areas where adverse impact to amenity will be greatest.
- The appointment of an independent auditor is appropriate to review procedures, noise management plans and mitigation measures, and to verify construction activities are consistent with EPR and CEMP requirements.

[167] D148

11.5.5 Recommendations

The IAC recommends the following amendments to:

Environmental Performance Requirements

Include the following changes:

- **Revised EPR-NV01 (Construction noise and vibration management plan)**
- **Revised EPR-NV02 (Managing noise and vibration from construction activities)**
- **Revised EPR-NV03 (Construction noise criteria)**
- **Revised EPR-NV05 (Noise and vibration monitoring).**

These changes are included at Appendix G.

Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)

Include the following changes:

- **Revised POS E5**
  - **Remove reference to the independent and qualified environmental assessor. Approval of out of hours work is required by an independent environmental auditor.**
- **Revised POS E6: Managing noise from construction activities**
  - **Revise to require site specific Construction Noise and Vibration Management Plans (CNVMP) which will include specific noise targets/triggers and mitigation measures for locations where critical works through townships or other sensitive regions are proposed. Each CNVMP is to be approved by an independent environmental auditor.**
- **Revised POS E7: Offsite noise management measures**
  - **Revise EPA Normal working hours to allow works on Monday to Friday between 7.00am and 6.00pm, Saturday 7.00am to 1.00pm, EPA Night hours and unavoidable hours 10.00pm to 7.00am.**
  - **Remove reference to the independent and qualified environmental assessor. An independent environmental auditor is required to approve night time works during the hours of 10.00pm and 7.00am.**

11.6 Noise and vibration conclusions

The IAC concludes that:

- Noise and vibration impacts from construction are consistent with the draft evaluation objectives.
- Noise and vibration impacts from construction can be acceptably managed through the recommended mitigation measures.
- Surface noise and vibration impacts from the operation of the GIJW can be acceptably managed through the recommended mitigation measures.
- The underwater noise assessment and modelling is deficient and as such, it is not possible to confirm if the impacts from the operation of the GIJW to the underwater soundscape are acceptable. Gaps exist in the underwater acoustic modelling and assessment and additional operational assessments are required to assess underwater ambient noise in North Arm and species sensitivity of endemic in Western Port Bay to underwater noise.

12 Landscape and visual

12.1 Introduction

Landscape and visual effects were discussed in EES Chapter 14 and Technical Report I. Additional material was provided in TN14, TN24 and TN37.

The relevant draft evaluation objective is:

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

The landscape and visual impact assessments were conducted by Ethos Urban and peer reviewed by William James.

The Proponents recommended various mitigation measures in order to address landscape and visual impacts.

Table 10 lists the landscape and visual evidence that was provided.

Table 10 Landscape and visual evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Burge	Jacobs	Visual impact
Proponents	Mr Cook	AECOM	Lighting
Proponents	Mr Biacsi	Contour	Town planning
Ms King (3272)	Mr Hanson	Frank Hanson Urban Design	Urban design

Mr Burge and Mr Cook lodged supplementary reports that further addressed night time lighting impacts following their inspections of the Crib Point area [168].

The following EPRs apply to landscape and visual issues:

- EPR-LV01 Landscape screening
- EPR-LV02 Materials and finishes
- EPR-LV03 Preventative maintenance
- EPR-LV04 Reflective surfaces
- EPR-LV05 Design of lighting for land-based works
- EPR-Lv06 Vegetation outside construction footprint.

The following CEMP Attachment J controls relate to landscape and visual:

- A2 Access track planting and screening vegetation
- A12 Landscape screening
- A13 Materials and finishes
- A14 Reflective surfaces.

12.2 Key issues

The key issues are:

[168] D537 and D538

- The adequacy of the landscape and visual impact methodologies.
- The landscape and visual impacts of the pipeline and associated infrastructure.
- The landscape and visual impacts of the FSRU and LNG carriers.
- The landscape and visual impacts of the CPRF.
- The visual impacts of night time lighting particularly associated with the FSRU and CPRF.

12.3 Landscape and visual impact methodology

12.3.1 Background

EES Chapter 14 and Technical Report I provide the landscape and visual impact assessments including:

- an overview of relevant legislation and policies
- a description of landscape character areas
- a description of landscape significance and susceptibility to change
- an assessment of visual impacts, including the pipeline and associated works, the GIJW and light spill.

The EES recommended a range of mitigation measures, including EPRs and CEMP controls.

12.3.2 Evidence and submissions

The Proponents submitted the methodology that underpinned the landscape and visual impact assessment in the EES was sound and noted it was supported in the peer review undertaken by Mr Williams. The methodology was based on the Guidelines for Landscape and Visual Impact Assessment 2013 [169].

The Proponents relied on the evidence of Mr Burge who undertook his own review based on the methodology outlined in his evidence report. He used this as a basis for comparison with the methodology and findings of the EES assessment. He noted his methodology has been applied in other significant projects in Australia and overseas, and peer reviews considered it to be '*best practice'*. A key element of the methodology is assessment of impacts in terms of:

- visibility
- distance
- landscape character and sensitivity
- viewer numbers [170].

The assessment of these criteria included reference to the time or duration of the effect and was ranked on an impact scale that included nil, negligible, low, medium/moderate, high or unacceptable visual impacts, as well as positive impacts.

Although many submissions raised concerns about visual impacts or took issue with various findings in the visual impact assessments, there were few substantive submissions and no evidence that challenged the underlying methodologies used in the Ethos Urban assessment or Mr Burge's evidence. Mr Hanson's evidence for example, noted that '*the landscape and*

169 Guidelines for Landscape and Visual Impact Assessment 2013, Third edition, published by the Landscape Institute (UK) and the Institute of Environmental Management and Assessment (UK)

170 D77, paragraph 65

visual impact assessment for the project has been undertaken according to prevailing industry standards'. Mr Hanson's concerns were primarily focussed on the extent to which overshadowing from the FSRU might have marine impacts.

Some submitters such as Save Westernport, raised issues about application of the methodologies and resultant conclusions, including the extent to which some of the impact analysis was subjective. S3296 noted that '*the differing and unique sensitivities of people to the visual landscape*' had not been addressed in either the visual and landscape assessment or the social impact assessment (where Mr Burge suggested it might occur). Save Westernport expressed similar concerns.

Other submitters took issue with the reliance and accuracy of the various photo montages and other representations of existing and future views. They submitted these did not provide a sound basis on which to assess visual impacts. The IACs attention was drawn to some of the potentially misleading wireframe images in the EES report. Figures 64 and 66 in Technical Report I (see Figure 13) for example, gave the appearance the CPRF was proposed to be located on the foreshore at Woolleys Beach. It was apparent from some of the submissions received that some people had interpreted it that way.

Figure 13 Wireframe positioning (eastern boundary) of the Receiving Facility from Viewpoint 7(a), Woolleys Beach North Facing North [171]

NOTE

To reduce the electronic size of this document, Figure 13 has been removed from this version of the report. Contact Planning Panels Victoria to obtain a complete copy of the report.

12.3.3 Discussion

The IAC accepts the landscape and visual impact assessment methodologies relied on by Ethos Urban and Mr Burge were appropriate and provide a sound basis for assessing the Project's impacts. While some elements of these methodologies and how they were applied rely on varying degrees of subjectivity, this is unavoidable given the nature of the issues being assessed and the varying perceptions of the landscape, including what might constitute acceptable and unacceptable change.

171 EES Technical Report I Figure 66

The IAC agrees that some of the visual images in the EES were misleading and it is unfortunate this appears to have led to unnecessary alarm about the location of some elements of the Project.

The IAC undertook extensive inspections of various views referred to in the EES, evidence and submissions. It has reached its own conclusions about the issues raised by submitters, including the accuracy of the impact assessments and the veracity of any subjective judgements that informed those assessments. Where relevant, these issues are discussed further with regard to specific visual impacts.

12.3.4 Findings

The IAC finds:

- The visual impact assessment methodologies in the Ethos Urban EES assessment and Mr Burge's evidence provide an appropriate framework for assessing landscape and visual impacts.

12.4 Pipeline and associated infrastructure

12.4.1 Background

The EES assessed visual impacts by landscape character type and impact significance. In relation to the Pipeline Works, it concluded the mitigated impact significance (post-construction) would be either '*negligible*' or '*minor*', depending on the landscape character type, its sensitivity and the nature of the works. Impact significance during construction would range from '*minor*' to '*moderate*', although would be limited to within the construction phase.

In relation to associated infrastructure, the EES concluded the mitigated impact significance would be:

- '*minor*' for the two MLVs and the PDF
- '*negligible*' for the EOLSS.

The EES included a proposed a mitigation measure relating to reinstating the ground surface within the construction footprint (addressed in various CEMP controls).

12.4.2 Evidence and submissions

The Proponents submitted landscape and visual impacts from the pipeline element of the Project will be primarily related to construction, which will be temporary and of short duration.

Mr Burge agreed pipeline impacts would be mainly confined to the construction phase, particularly where open cut-trenching is used. The only noticeable visual change after construction would be signage associated with the easement and the temporary loss of vegetation. He noted the construction impacts would be more limited in areas where HDD is used and concluded visual impacts would be '*negligible*' or '*low*', depending on the landscape character area.

In relation to other pipeline infrastructure, Mr Burge concluded the visual impacts would be:

- '*nil*', '*negligible*' or '*low*' for the MLVs, depending on the landscape character area
- '*nil*' or '*negligible*' for the PDF and EOLSS, depending on the landscape character area.

He did not consider any additional mitigation measures, beyond those required as part of the pipeline CEMP, were necessary.

Submitters raised concerns about the visual impacts during pipeline construction, including vegetation and ground surface clearing.

12.4.3 Discussion

The IAC agrees landscape and visual impacts of the pipeline will be most prevalent during the construction phase, particularly where open cut trenching is used. This is unavoidable given the nature of the works, although the various mitigation measures, including extensive POS that relate to construction and reinstatement works, will assist in mitigating those impacts. Similarly, the EOLSS is an underground facility that will have minimal visual impact once constructed.

The two MLVs and PDF are above ground facilities and will be visible during construction and operation. The MLVs are relatively small structures located in remote rural areas where their impacts will be limited. The PDF would be a larger, more visible facility, but its impacts need to be assessed within the context of the adjacent Pakenham East Train Maintenance Facility, limited access to and visibility of the site, and the scope for landscape screening. These facilities would be subject to various POS related to landscape screening, materials and finishes, and reflective surfaces. In combination, these mitigation measures will provide an acceptable framework for managing landscape and visual impacts.

12.4.4 Findings

The IAC finds:

- The landscape and visual impacts of the pipeline and associated works will mainly be confined to the construction phase of the Project, while the impacts associated with its operation will be negligible.
- Visual impacts of the pipeline and associated works can be managed through the recommended mitigation measures and are acceptable.

12.5 The Crib Point Receiving Facility

12.5.1 Background

The EES assessed visual impacts by landscape character areas and impact significance. In relation to the CPRF, it concluded impacts would be '*minor*' although lighting impacts (see Chapter 12.7) would be '*moderate*' for some receptors. It proposed various mitigation measures relating to:

- landscape screening (EPR-LV01)
- materials and finishes (EPR-LV02)
- preventative maintenance (EPR-LV03)
- reflective surfaces (EPR-LV04)
- vegetation outside the construction footprint (EPR-LV06).

A lighting mitigation measure for land-based works was included in EPR-LV05.

12.5.2 Evidence and submissions

The Proponents submitted visibility of the CPRF from surrounding land is limited by its location and surrounding vegetation, while visual impacts from Phillip Island and French Island would be mitigated by distance. They relied on the evidence of Mr Burge and Mr Biacsi.

Mr Burge noted the main land-based view of the CPRF will be from a small section of The Esplanade that runs along the western boundary of the Jetty area. He gave evidence that vegetation will screen or filter views from other public areas, including Woolleys Beach Reserve, although the upper edge of the nitrogen tank will be visible from the north. Views from within Western Port Bay and French Island will be partly screened by the Jetty and FSRU and will sit within a backdrop of the Victorian Maritime Centre and the oil tanks on the former BP site to the west.

Mr Burge concluded visual impacts of the CPRF would be '*low*' or '*negligible*', although he noted additional planting along The Esplanade and retention of existing vegetation around the site would be beneficial.

Mr Biacsi concluded built form changes associated with the GIJW are unlikely to generate unreasonable visual or related amenity impacts.

Some submitters raised concerns about the visual impact of the CPRF, including lighting, although more were concerned about the impact of the FSRU. Some raised concerns about the visual impacts of additional truck traffic servicing the CPRF, particularly the estimated 900 truck movements per annum that would deliver nitrogen to the CPRF.

12.5.3 Discussion

The IAC agrees with the EES visual impact assessment and Mr Burge's evidence that the visual impacts of the CPRF will be minimal given its location and siting, together with the topography and the extent of existing vegetation that screens much of the site. From a visual impact perspective, it is satisfied this type of facility is appropriate within the Port Zone (and the part of the site being rezoned to the Port Zone) in light of policy support for its port related development and use. For these reasons, port related industrial development is to be expected on the site, as are some off site amenity impacts, including landscape and visual impacts.

Nevertheless, there is scope to minimise visual impacts through detailed design of the facility, including the retention and addition of screening vegetation. This would be addressed through the Incorporated Document that will require the approval of a Development Plan that addresses relevant landscape and visual EPRs. These include landscape screening, materials and finishes, preventative maintenance, reflective surfaces, design of lighting and vegetation. While the IAC supports these EPRs, it believes that EP-LV01 should be expanded and clarified to ensure that landscape screening is used to the maximum extent possible.

The following revised EPR-LV01 is included in the recommended EPRs at Appendix G:

> **Landscape Screening**
>
> Retain and introduce, to the maximum practicable extent, appropriate indigenous vegetation to screen facilities within the viewshed of roads (such as the Esplanade), other public places (such as the Victorian Maritime Centre and the Woolleys Beach reserve) and residences (if requested by affected landholders).

In terms of additional truck traffic, the IAC accepts there will be some visual impact in the Crib Point area during peak nitrogen delivery periods, but this is not inconsistent with the role of the Port or the use of existing road infrastructure. Road capacity and safety issues are discussed in Chapters 13 and 14.

12.5.4 Findings

The IAC finds:

- The CPRF is consistent with the zoning and policy intent for the site.
- The CPRF will have minimal visual impact.
- The recommended EPRs will provide an acceptable framework for managing the visual impacts of the CPRF.

12.5.5 Recommendations

The IAC recommends:

Environmental Performance Requirements

Include the following changes:

- **Revised EPR LV01 (Landscape screening)**

This change is included at Appendix G.

12.6 The Floating Storage and Gasification Unit and LNG carriers

12.6.1 Background

EES Chapter 14 and Technical Report I provided the assessment of visual impacts associated with the FSRU and LNG carriers.

The EES assessed visual impacts by landscape character areas and impact significance. It concluded visual impacts of the FSRU and moored LNG carriers would be '*minor*'. It noted lighting impacts (see Chapter 12.7) would be '*moderate*' for some nearby receptors but did not believe this warranted a change to the overall assessment rating.

The EES did not specifically assess visual impacts associated with movement of LNG carriers through Western Port Bay and its approaches, although it noted movement of large ships is in character with the area and consistent with the operation of the Port.

12.6.2 Evidence and submissions

The Proponents submitted the permanent presence of the FSRU, and increased shipping activity should be considered within the context of the existing Port and the use of the Jetty. Relying on the evidence of Mr Burge and Mr Biacsi, they submitted visual impacts from Phillip Island and French Island would be mitigated by distance.

Mr Burge generally supported the EES assessment but undertook his own assessment in order test the EES findings. This involved identifying key viewpoints, assessing their potential sensitivity and rating the extent of any visual impact. He concluded visual impacts caused by the FSRU and additional shipping would for the most part be '*low*' or '*negligible*', while for some viewpoints there would be '*nil*' impact. These conclusions reflected his assessment that the number and extent of direct viewpoints was limited by vegetation and topography, the significant distance of many viewpoints from the Jetty would ameliorate

visual impacts and the number of people who might view the FSRU were typically '*low*' to '*moderate*'.

In relation to additional shipping movements, including tugboats, Mr Burge noted this would be consistent with the nature of an active port and was anticipated in various State and local policy documents, including the PDS.

Mr Biacsi gave evidence that built form changes associated with the GIJW, coupled with the increased presence of vessels moored at the Jetty, were unlikely to generate unreasonable visual or related amenity impacts.

The visual impact of most concern to many submitters was the permanent mooring of the FSRU and to a lesser extent the mooring and movement of the LNG carriers. This was highlighted by the CEG which dismissed the Proponent's proposition that the FSRU was consistent with the Port's function and the current use of the Crib Point Jetty for the delivery of petroleum. The CEG submitted it was unreasonable to compare the fortnightly mooring of a petroleum tanker (typically 180 metres long and 35 metres wide) with the permanent mooring of the FSRU (approximately 300 metres long, 50 metres wide and with an air draft of approximately 50 metres). The CEG was concerned about night time impacts associated with FSRU lighting. Many submitters likened the FSRU to a '*permanent floating factory*', which in their view, was a change of use to the existing operations of the Port.

Other submitters raised similar concerns about the FSRU, while the additional shipping was seen by many as part of an '*undesirable industrialisation of Western Port Bay*', including many submitters from French and Phillip Islands.

12.6.3 Discussion

The IAC agrees with the CEG and others that the visual impacts of infrequent mooring of petroleum tankers at the Crib Point Jetty does not equate with the permanent mooring of the much larger FSRU and the associated LNG carriers. The IAC's views on this were assisted by inspecting the area when petroleum tankers were present at Berth 1, during daylight and night time hours, and comparing this with the anticipated visual impacts of the much larger FSRU and LNG carriers. It is clear from those inspections and the IAC's analysis, that the FSRU will have a more prominent visual presence than the petroleum tankers, and this will be exacerbated by being permanently moored at the Jetty.

However, the IAC must have regard to the context of the site within a State significant port and the possibility that more and/or larger ships might use the Jetty in the future without any additional approvals being required. In this context, the IAC believes that the visual impacts of additional shipping are neither unreasonable nor unacceptable.

Having reviewed the Project against the four assessment criteria used by Mr Burge, the IAC concludes the visual impact of the FSRU from some viewpoints will not be as significant as many submitters fear, particularly long distance views from Phillip Island and French Island.

This is certainly the case in relation to Phillip Island given that its northern most areas, including Cowes, are over 10 kilometres from the Jetty. To the limited extent that the FSRU would be visible, it would be within a broader viewshed that includes Stony Point, Long

Island and ships that are anchored off Cowes [172]. For these reasons, the IAC is satisfied the visual impacts of the FSRU from Phillip Island would be negligible.

The western shoreline of French Island (approximately four kilometres from the Jetty at its closest point) and the elevated viewing points such as the Pinnacles lookout (approximately seven kilometres from the Jetty), would be closer to the FSRU, but views would still be distant and sit within a broader viewshed that includes existing Port facilities and shipping at Crib Point, Stony Point and Long Island, as well as the Hastings waterfront and urban area. Some views would sit within the Jetty's immediate visual backdrop that includes the higher topography and petrol tanks on the former BP refinery site. For these reasons, the FSRU will be one of several competing elements in various views from French Island and its overall impact will not be as significant as some submitters suggested. The IAC is satisfied these limited impacts would be acceptable given the Port's role and what might be reasonably expected to occur at Crib Point in the future.

The FSRU will have a more prominent presence when viewed from recreational boats within Western Port Bay, but the extent of the impacts will depend on the view context and background (as is the case for French Island) and the distance from which the FSRU is viewed. Observer numbers from within the Bay will be limited and the IAC does not believe these impacts are a significant consideration.

The IAC agrees with Mr Burge the scope for short distance views to the FSRU will be limited given the topography and vegetation in the area, although it agrees with many submitters that in some views, such as from areas of the Woolleys Beach Reserve (to the immediate north and south of the Jetty), the FSRU will be visually prominent [173]. It will be visible from the Victorian Maritime Centre and The Esplanade opposite the Jetty, although that view will be somewhat obscured by the CPRF and potential for some additional landscape screening.

The IAC notes Mr Burge's observation that for some people and in some contexts, views of ships can be a positive experience, but recognises for many others, this is unlikely to be the case, particularly in relation to the permanently moored FSRU.

Some submitters expressed concerns about the visual impact of the LNG carriers being moored at the Crib Point Jetty and traversing the Port area and the entrance to Western Port Bay. The LNG carriers will typically be moored at the Jetty for up to 36 hours while unloading and will not add any significant visual impacts to those already associated with the FSRU. In terms of additional ship movements, forty additional ships would be a discernible, but not significant increase on the recent average of approximately 100 -140 calls per annum. The increase would be relatively minor compared to earlier years when there were over 700 calls per annum.

The PDS includes projections for future cargo movement, and although the '*high*' growth scenario provides for a significant increase in tonnage, the '*moderate*' scenario provides for more modest, incremental growth. Even if the number of additional ship movements associated with the Project is a large proportion of total calls, the IAC does not consider the

[172] The PHDA advised that in the two year period between July 2018 and June 2020 over 56 ships (including support vessels) were anchored off Cowes (D350)

[173] Amenity impacts on Woolleys Beach North are discussed in Chapter 16.4

visual impacts of additional ships transiting through Western Port Bay and its approaches would be significant or unacceptable.

On balance, the IAC is satisfied that while the FSRU and associated LNG carriers will have some negative visual impacts, these impacts are relatively confined and when considered within the context of the Port, are acceptable. Although the scope to reduce these impacts is limited, some mitigation measures, such as those related to landscaping, will have potential to mitigate impacts from some vantage points and are supported.

12.6.4 Findings

The IAC finds:

- The visual impacts of the FSRU and LNG carriers are consistent with the context of the Port and its role as State infrastructure.
- The FSRU will have some visual impact, most notably within short range views from the public domain, including the Woolleys Beach Reserve and The Esplanade.
- LNG carriers will have minimal additional visual impact, either when moored or transiting to the Crib Point Jetty.
- The EPRs will provide an acceptable framework for managing the visual impacts of the FSRU and LNG carriers.

12.7 Lighting

12.7.1 Background

This sub chapter specifically addresses the visual impacts associated with the lighting of the FSRU and CPRF. Environmental impacts associated with lighting in relation to shorebirds is discussed in Chapter 5.6.

The IAC is satisfied that lighting issues associated with the pipeline element of the Project (specifically the above ground MLVs and PDF) can be managed through the CEMP requirements and do not require further assessment or discussion.

Technical Report I assessed the impacts of light spill from the FSRU and CPRF, based on light spill calculations (LSC) provided by AECOM. The assessment reached two overarching conclusions:

> There are no highly sensitive publicly accessible night-time views or viewpoints impacted.
>
> The LSC demonstrates that no receptors in the surrounding area are subject to increased lux levels from direct light sources [174].

However, the assessment noted that it was difficult to quantitatively assess secondary light sources (such as reflections or glow) and their impacts given the limitation of the modelling. Instead, the analysis primarily relied on qualitative assessments that adopted what it described as a '*conservative*' approach to determining impacts.

The assessment identified five viewpoints and assessed the combined extent of direct light spill and increase in sky glow for each site. It concluded the significance of the impacts

174 EES Technical Report I, Appendix E

would range from '*negligible*' (the HMAS Otama lookout and the Pinnacles on French Island), '*minor*' (the Victorian Maritime Centre and Woolleys Beach North) and '*moderate*' (the residential property at 103 The Esplanade).

The assessment found that:

> The proposed changes to light sources around Crib Point are within an area of existing port and maritime industrial associated activities, and as such are in keeping with the night-time character of the foreshore landscape as a generally dark landscape punctuated by concentrated locations of lighting associated with port and maritime industrial activities [175].

The assessment concluded the impact would be consistent with the draft evaluation objective, subject to the recommended mitigation measures and recommended that:

> The reflectivity of all surfaces of proposed infrastructure, built form and ground surfaces illuminated by the proposed light sources is minimised to the greatest extent possible to minimise reflection, illumination and sky glow [176].

12.7.2 Evidence and submissions

The Proponents submitted lighting impacts were acceptable, subject to proposed mitigation measures. This was particularly so when considered in the context of an '*existing, operating port and industrial facilities that enjoy long-term policy support'*. They submitted this was true, regardless of whether the views were during the day or night, or whether they were from '*Phillip Island or French Island, from open water, or from nearby land – public or private*'.

Mr Burge included an assessment of lighting impacts in his evidence and provided a supplementary report following a night time inspection of the area when a petrol tanker was moored at Crib Point Berth 1 [177]. He viewed the tanker and Jetty from the Stony Point Jetty, Woolley's Beach (south of the Jetty), the Victorian Maritime Centre, the HMAS Otama lookout and the Hastings Marina.

Mr Burge noted the CPRF and FSRU would be in an area that includes many light sources of various intensity, including existing lighting at the Jetty and other foreshore locations inspected. He concluded the EES assessment of lighting impacts was appropriate and that, based on his methodology, there would be a '*minor to low level of change*'. His supplementary report confirmed his initial assessment.

Mr Cook gave evidence in relation to the AECOM light modelling that was relied upon in Technical Report I and provided updated advice about the applicable lighting standards and guidelines. In response to submissions about visual impacts, Mr Cook referred to the role of AS 4282:2019 Control of the Obtrusive Effects of Outdoor Lighting and advised '*there are no current design and project impediments to prevent the detailed design documentation achieving design compliance in accordance with the standards*'. He recommended a lighting report be commissioned to demonstrate adherence to the applicable standards and guidelines, including the relevant mitigation measures.

175 EES Technical Report I, Appendix E
176 EES Technical Report I, Appendix E
177 D537

Many submitters raised concerns about night time lighting impacts associated with the FSRU and CPRF. Save Westernport raised concerns about the methodology relied on by Mr Cook and submitted he took '*an inappropriately rigid quantitative approach to the assessment of lighting impacts on amenity*'. Save Westernport contended Mr Burge's evidence underplayed lighting impacts and his subjective assessments were, in general, *'selective and inconsistent'*.

FICA submitted lighting on the FSRU would be highly visible from French Island and there were no mitigation measures to address this. Other submitters expressed similar concerns in relation to views from Phillip island.

12.7.3 Discussion

The IAC is satisfied night time lighting issues are mainly related to the FSRU, rather than the CPRF or Jetty infrastructure. The shielded location and comparatively small size of the CPRF would reduce its visibility. There is scope to design the lighting to minimise off site impacts. It will sit within existing lighting on the Jetty and with associated onshore infrastructure, including the gatehouse and the United Petroleum pump station. The Jetty is currently illuminated for security and access purposes and is already reasonably visible from some viewpoints during the night. For these reasons, it is not expected the CPRF would significantly change the existing level of lighting or visual prominence of the area.

The FSRU lighting is potentially more problematic given its size and relative prominence, and because it is in a broader area where background lighting is generally confined to particular sources and areas such as Stony Point, Hastings and Long Island. This is in contrast, for example, with the Port of Melbourne that sits within a broader urban area that is highly illuminated.

In reviewing the FSRU's impacts, the IAC notes the EPRs include two amenity related landscape and visual EPRs and a related marine environment EPR:

> **EPR-LV04**
>
> **Reflective surfaces**
>
> Minimise reflective surfaces on infrastructure to reduce reflection of artificial light where practicable.
>
> **EPR-LV05**
>
> **Design of lighting for land-based works**
>
> Design the land-base components of the Gas Import Jetty Works to comply with Australian Standard AS 4282:2019 Control of the Obtrusive Effects of Outdoor Lighting.
>
> **EPR-ME12**
>
> **Limiting lights to the number for safe operations**
>
> Limit lights to the number for safe operations. Reduce direct light spill where possible subject to meeting navigation and vessel safety standards.

Notably, there is no EPR that directly addresses the visual impacts of FSRU lighting, despite this being an issue that would benefit from careful design and management. Mr Cook was not aware of the lighting regulations or requirements that relate to ships but supported a recommendation that FSRU lighting be further considered as part of the Project's approval. Consequently, the IAC has recommended the following additional landscape and visual EPR:

> **FSRU lighting**

> Configure the number, intensity and direction of lights, and the reflectivity of surfaces on the FSRU in order to minimise its landscape and visual impact, subject to meeting navigation and vessel safety standards.

Mr Cook was not concerned about '*reflectivity*' because of the extent of piping on the FSRU photos that he had seen, however the IAC is not certain this is representative of all FSRUs, or all parts of FSRUs, and has therefore included reflectivity in the EPR.

The IAC agrees with Mr Cook's recommendation that a lighting report be prepared to demonstrate adherence to the relevant guidelines, standards and EPRs. The Incorporated Document includes a requirement that the Development Plan include '*Lighting details for the Project*' but does not provide any guidance about what it might contain or what it should address [178]. The IAC recommends this be replaced with the following requirement, consistent with Mr Cook's general recommendation:

> A lighting plan that describes the key lighting details of the project (including the CPRF, associated Crib Point Jetty infrastructure and FSRU) and demonstrates how it implements and complies with relevant standards, guidelines and EPRs.

103 The Esplanade, Crib Point

S2785 raised concerns about the visual impacts (particularly light impacts) on the residential property at 103 The Esplanade, Crib Point. At the invitation of the submitter, the IAC was able to inspect the property as part of the accompanied inspections held during the day on 2 December 2020. The FSRU will be directly visible from parts of this property and will be particularly prominent when lit up during the night time. While there would be scope to filter this view and reduce visual impacts through additional landscaping, this would potentially impact on other views from the property and would be unlikely to block all views of the illuminated FSRU or the associated skyglow. The IAC accepts this will affect the residential amenity of the property and is not a good outcome for the landowners.

However, the IAC has to balance residential amenity expectations associated with one property, with policy support for developing a State significant port. In this context, the IAC supports the siting of the FSRU, although the additional and revised EPRs recommended by the IAC will better mitigate lighting impacts.

12.7.4 Findings

The IAC finds:

- The lighting impacts associated with the pipeline and associated infrastructure, the CPRF and the Crib Point Jetty are acceptable and can be appropriately managed.
- The lighting on the FSRU will be the most impactful element of the GIJW, particularly from some short range views.
- An additional EPR related to lighting on the FSRU should be included.
- A lighting plan should be prepared under the Incorporated Document that demonstrates how relevant lighting standards, guidelines and EPRs are implemented and achieved.

[178] Clause 4.4.2 f)

12.7.5 Recommendations

The IAC recommends:

Environmental Performance Requirements

Include the following changes:

- **New EPR LV07 (FSRU lighting)**

This change is included at Appendix G.

Incorporated Document

Include the following change:

- **Revised Clause 4.4.2 f) (Development plans)**

This change is included at Appendix F.

12.8 Landscape and visual conclusions

The IAC concludes that:

- Landscape and visual impacts are consistent with the draft evaluation objective.
- Landscape and visual impacts can be acceptably managed through the recommended mitigation measures.
- There are no landscape or visual impacts that preclude the Project being approved.

13 Transport

13.1 Introduction

Transport effects were discussed in EES Chapter 15 and Technical Report J, (Traffic Impact Assessment (TIA) prepared by AECOM).

TN05 and TN45 provide further information from the Proponents on transport issues.

The relevant draft EES evaluation objectives are:

> **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.

Table 11 lists the transport evidence that was provided.

Table 11 Transport evidence

Party	Expert	Firm	Area of expertise
Proponents	Ms Dunstan	Traffix Group	Traffic
Mornington Peninsula	Ms Marshall	Ratio Consultants	Traffic

13.2 Key issues

The key issues are:

- Road capacity and safety issues relating to construction of the Project.
- Road maintenance and safety issues relating to operation of the Project.

13.3 Construction issues

13.3.1 Background

EES Technical Report J identified the following construction transport impacts:

- road link capacity
- road closure impacts on local access in Hastings
- road Network Infrastructure Assessment
- dirt from construction on roads
- pedestrian/cyclist access in Hastings
- public/school bus impacts
- road closures outside of Hastings
- access tracks, particularly sight distance issues
- railway level crossings.

In response to these issues, the EES proposed six EPRs to manage transport impacts of the Project, five of which related to construction impacts as follows:

- EPR-TP01 Traffic Management Plan (TMP)
- EPR-TP02 Stakeholder consultation on transport changes
- EPR-TP03 Road Safety Audit (RSA)
- EPR-TP04 Pavement strength survey
- EPR-TP05 Public Transport Disruption Management sub-plan.

Attachment J to the CEMP included POS A8 that combined the relevant parts of the relevant EPRs into controls to be applied to the construction of the gas pipeline. EPR-TP01 requires the TMP required in the EPRs be coordinated with the TMP required in CEMP POS A8.

One difference of note between the EPRs and CEMP POS is that POS A8 requires the TMP to include car parking management, whereas the TMP in the final version of the EPRs (applying to the CPRF) did not.

13.3.2 Evidence and submissions

Ms Dunstan's evidence was, in summary, that the TIA identified the key impacts of the Project and the EPRs and CEMP would sufficiently manage any traffic impacts. With respect to construction, she opined the traffic volumes used in the TIA were overly conservative and the impacts were overestimated.

The submission of Mornington Peninsula relied on evidence from Ms Marshall that the TIA did not sufficiently include accurate data to allow a proper assessment of existing or future traffic conditions. Ms Marshall was critical of the lack of actual count data and the absence of more detailed peak hour traffic movements. Concerns about the traffic volume inaccuracies in the TIA were raised in the Cardinia submission which called for more accurate up-to-date traffic information to be used in preparation of the TMP.

Other concerns raised by Ms Marshall included:

- The proposed RSA and TMP ought to specifically nominate six intersections for assessment which she considered may be at higher capacity and safety risk due to construction traffic.
- Access track locations should be fixed early in the design process so that any impacts on road users and property owners could be assessed.
- A car park management plan should be prepared for the construction phase of the Project as part of the TMP.

Ms Dunstan provided a response to the criticisms of the TIA traffic volumes and Ms Marshall's evidence as follows:

- The TIA, perhaps confusingly, used one way traffic volumes instead of two-way volumes in Table 5-5. Ms Dunstan agreed that this was not the normal convention.
- The TIA used a combination of actual traffic volumes (where available) and estimated volumes in its analysis.
- The actual traffic count data from Mornington Peninsula was more reliable than the Department of Transport database relied upon by AECOM in the TIA. This led to significant differences in (corrected) actual traffic volumes for Tyabb-Tooradin Road, The Esplanade and Dandenong-Hastings Road.
- The AECOM estimates of construction traffic generated by the Project were overly conservative.
- Despite the corrections required, the projected change in level of service in the more critical PM peak for most roads was marginal.
- The TMP required in EPR-TP01 and POS A8 would provide a more detailed analysis with up-to-date traffic data and more 'known' construction details. She noted the TMP is required to be approved by Councils and the relevant road authorities.

- All critical intersections should be reviewed as part of the TMP, but she did not agree that it was necessary to specifically nominate intersections.
- Access track locations did not need to be resolved prior to preparation of the TMP and it is more appropriate to finalise access track configuration once construction schedules and methods are more defined.

Ms Dunstan did not object to a car park management plan being included as a sub-plan in the TMP.

Several submitters, including S583, raised general concerns about risks to local drivers, pedestrians and cyclists of additional traffic generated by the Project.

TN45 responded to the issue of sight distance at access track intersections with local roads, and noted the TIA recommended:

> The proponents investigate access track alignment modifications to improve safe intersection sight distances, and if access track alignments cannot be altered due to constraints, the proponent consider:
>
> (a) Management measures such as advanced warning signage and a reduced posted speed limit to be agreed with the road authority
>
> (b) Avoidance measures such as removing the access track with construction vehicles accessing the ROW via other tracks [179].

The TIA recommended a RSA be undertaken upon finalisation of the proposed routes and access tracks to ensure safe vehicle movements to the satisfaction of the responsible road management authority. This approach was reflected in the revised CEMP POS J A8 requirements for the TMP.

TN5 (D94) documented consultation undertaken between the Proponents, VicTrack and the Department of Transport on the Project. VicTrack confirmed in principle approval of the proposed pipeline alignment, subject to APA entering into an Asset Licence which covers access to VicTrack land, as well as requirements and procedures for any activity or works associated with the Project.

13.3.3 Discussion

The issues in dispute between the Proponents and Mornington Peninsula were essentially resolved through the response provided by Ms Dunstan to Ms Marshall's evidence and the agreed changes to EPR-TR03 shown in the Day 4 version of the EPRs [180].

The TMP required in the EPRs and CEMP provide for a more detailed analysis of local road capacity and safety issues and require that public transport (including school buses), pedestrians, cyclists, level crossings, car parking, pavement strength and access points are all considered in consultation with stakeholders. Ultimately the TMP is to be approved by the relevant Councils and road authorities.

The IAC accepts the TIA contained some confusing and inaccurate existing traffic data, identified in Ms Marshall's evidence and acknowledged by Ms Dunstan. The IAC agrees with Ms Dunstan the estimates of construction related traffic in the TIA were very conservative. The IAC accepts the overall conclusion of Ms Dunstan that the additional traffic generated by

179 D327

180 D426 paragraphs 117-123

construction is modest in volume and likely to have little impact on the local road network. The movement of construction workers will be spread out over time and, even in the more critical PM peak period, will likely have little impact on the capacity of existing intersections. Traffic from pipeline construction will result in very localised issues that can be controlled by temporary and short duration road closures and other traffic control measures.

The IAC notes the construction sequencing and method would be much better known by the time the TMP is prepared. Any as yet unidentified issues can be drawn out in consultation with stakeholders at the time it is prepared.

While it would be ideal to be able to finalise all the access track locations early in the assessment process, the IAC accepts this is not possible until the final pipeline alignment is known, and construction methods determined. The IAC has made recommendations in Chapter 5 in relation to avoiding impacts on native vegetation, these must be considered in siting of any access tracks.

The IAC is satisfied the EPRs and CEMP POS A8 adequately allow for proper safety assessments to be made and acted upon.

One difference of note between the EPRs and the CEMP is that POS A8 requires the TMP to include car parking management, whereas the TMP in the final version of the EPRs (applying to the receival facility) do not. The IAC considers that car parking issues are just as likely, if not more likely, to occur at the construction site for the CPRF and Jetty works.

13.3.4 Findings

The IAC finds:

- The road traffic impacts of the Project during construction are not likely to be significant.
- The proposed EPRs TP01 to TP05 and CEMP POS A8 that require the preparation of a TMP and RSA to be approved by the relevant Councils and the road authority are supported as modified in the final versions, subject to the addition of a requirement for a car parking management sub-plan in the TMP [181].

13.3.5 Recommendation

The IAC recommends:

Environmental Performance Requirements

Include the following change:

- **Revised EPR TP01 (Traffic Management Plan)**

This change is included at Appendix G.

13.4 Operation issues

13.4.1 Background

EES Technical Report J identified the following impacts during the operation of the Project:

- road deterioration due to Nitrogen Trucks

[181] D602 and D582

- safety and amenity impact of B-Doubles through Hastings/Somerville
- impact of workforce and heavy vehicle movements during operation.

The EES proposed the preparation of a TMP and RSA that will assist in mitigating any Project impacts during the operation phase. Two EPRs were specifically designed to mitigate the impacts on the nitrogen and odorant transport route:

- EPR-TP04 Pavement strength survey
- EPR-TP06 Nitrogen transport plan.

13.4.2 Evidence and submissions

Ms Dunstan's evidence was that, once completed, the Project would have minimal impact on the transport network. She noted the number of workers and vehicle movements (less than 100 vehicles per day) would be very low.

Ms Dunstan commented on the use of B-Double trucks to transport nitrogen and odorant to the CPRF. She noted there are at least two alternative routes that bypass the Somerville and Hastings town centres, the most logical route via Coolart Road. She identified the number of deliveries will be low (six deliveries per day or around 900 per year) and trucks will be able to use already approved B-Double routes for the majority of their journey, with the exception of Woolleys Road. She noted EPR TP06 requires the preparation of a Nitrogen Transport Plan that identifies the preferred route, management measures at key intersections and permit requirements for non B-Double parts of the route.

Ms Marshall made the following comments in her evidence:

- Due to the regularity and extensive time frame that B-Doubles are expected to deliver Liquid Nitrogen to the CPRF, the preferred route once identified, should be included in the Pavement Strength Survey (EPR-TP04).
- Coolart Road seems the most appropriate route for nitrogen and odorant trucks.
- The Nitrogen Transport Plan should be updated every five years.
- A RSA should be undertaken of the preferred route.

Ms Marshall generally agreed the EPRs and CEMP were otherwise acceptable in relation to operational traffic impacts of the Project.

Ms Dunstan responded to Ms Marshall's evidence as follows:

- It is only necessary that a pavement strength survey be undertaken for those sections of the Nitrogen Truck route that is not an approved B-Double route.
- She had no preferred route for the Nitrogen Trucks but agreed the RSA should examine critical intersections along the route once chosen.

Several other submitters (including S476, S932, S1514 and S2385), raised general concerns about the safety of nitrogen and odorant travelling through Crib Point or Hastings.

Mornington Peninsula's closing submission supported Ms Marshall's position the Nitrogen Transport Plan be updated every five years to assess the ongoing suitability of the route having regard to changes in land use and road safety conditions [182]. Council supported the evidence of Ms Marshall that an RSA should be carried out for the preferred Nitrogen Truck route.

[182] D426 paragraphs 122-123

TN45 responded to questions from the IAC regarding the removal of oily sludge from the FSRU. It was explained that oily sludge would be removed by trucks, but required 12 truck movements per year, negligible in traffic impact terms.

13.4.3 Discussion

Acknowledging the requirements in the TMP, the IAC agrees it is unnecessary to require pavement strength assessments for any part of the Nitrogen Truck route that is on approved B-Double routes. The IAC agrees with the submissions of the Proponents and the evidence of Ms Dunstan in this regard.

The IAC believes it would be useful to include a RSA for the preferred Nitrogen Truck route and actions taken to mitigate any issues in EPR-TR06. The IAC is of the view that it is not clear in EPR-TR03 if the RSA is to cover the Nitrogen Truck route, so it is better to spell it out.

The IAC is not convinced of the need for the Nitrogen Transport Plan to be reviewed every five years. The IAC considers it is self-evident that if land use circumstances change, the Plan can be reviewed when required.

13.4.4 Findings

The IAC finds:

- The proposed EPRs and CEMP POS A8 adequately address transport issues in the operational phase of the Project, subject to adding to EPR-TP06, a requirement to carry out a RSA for the Nitrogen Truck route once a preferred route is determined.

13.4.5 Recommendation

The IAC recommends:

<u>Environmental Performance Requirements</u>

Include the following changes:

- **Revised EPR TP06 (Nitrogen Transport Plan)**

This change is included at Appendix G.

13.5 Transport conclusions

The IAC concludes that:

- The transport impacts are consistent with the draft evaluation objectives.
- Transport impacts can be acceptably managed through the recommended EPRs and CEMP.
- There are no transport impacts that preclude the Project being approved.

14 Safety, hazard and risk

14.1 Introduction

Safety, hazard and risk effects were discussed in EES Chapter 16 and Technical Report K. The following documents provided to the IAC are relevant:

- EES Attachment IX Pipeline Licence Application
  - Attachment 3a - Draft Safety Management Plan
  - Attachment 3b - Peer Review of Safety Management Plan
  - Attachment 4 – Safety Management Study summary
- Technical notes TN16, TN18, TN19, TN30, TN32, TN48, TN49, TN50, TN51 and TN52
- Pipeline Safety Management Study (SMS) (D96) (provided to the IAC in confidence)
- Quantitative Risk Assessment (QRA) Report – Gas import jetty and pipeline project (D128)
- QRA Report – Pakenham Delivery Facility (D129)
- EES Technical Report A.

14.1.1 Scope of the IAC's consideration

Safety, hazard and risk in this context relate to the construction and operation of the Project.

The Proponents focussed submissions on safety, hazard and risk on gas safety. They submitted the scope of the IAC's consideration should be limited in the following way:

> Although safety is part of the IAC's Terms of Reference, the IAC is not tasked with making recommendations about the specifics of safety regulation. Because of the regulatory regime, the IAC is not required to examine potential impacts in the same way as for other specific potential environmental effects. The IAC should consider, on all the available information, whether the Project appears able to meet safety standards under applicable legislation [183].

The IAC accepts this proposition in general terms and limited its assessment to the following aspects of each component of the Project:

- establishing whether the safety and risk assessments have been adequately carried out considering the stage the Project is at
- whether all reasonably foreseeable risk categories have been considered
- whether risks can be appropriately mitigated through existing regulations, EPRs or the CEMP
- whether there any identified risks that appear fatal to the Project proceeding.

14.1.2 Background

The relevant draft evaluation objectives are:

> **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.

[183] D589, paragraph 380

Table 12 lists the safety, hazard and risk evidence that was provided.

Table 12 Safety, hazard and risk evidence

Party	Expert	Firm	Area of expertise
Proponents	Captain Noon	Port Operation Management Services	Maritime and port operations/safety
Proponents	Ms Filippin	R4Risk	Safety
CEG	Mr Wardrop	Safety, Environment and Emergency Response Associates	Environmental science (oil spills)

Mr Ramsay gave evidence in relation to gas safety issues solely at the G and K O'Connor site (see Chapter 20.2).

(i) Safety study and risk management methodology

The methodology for assessing process hazards and their associated risks for the purposes of land use planning is well established in Australia. Key guidelines are documented within NSW Hazardous Industry Planning Advisory Papers (HIPAP) and associated guidelines [184].

Appendix A to Technical Report K sets out the methodology adopted for each of the respective safety studies, hazard and risk assessments either completed or planned to be completed for the Project. The studies and assessments are summarised below.

HAZID

A Hazard Identification (HAZID) study is a qualitative technique for identification of hazards and threats and can be applied all stages of a Project.

HAZID studies completed included all the main elements of the Project including the FSRU, CPRF and PDF. Credible risk scenarios identified in the HAZID studies were carried forward into the QRA and fire safety studies.

Fire Safety Study

The objective of the fire safety study is to ensure fire protection systems in place and available at a facility are suitable to meet risks presented by potential fire scenarios. This is achieved by modelling likely impacts of a fire and then determining fire protection resources needed to protect against those events.

HIPAP Paper No. 2 provides guidance on fire safety studies and was adopted for the FSRU and Jetty piping.

Safety Integrity Level (SIL) Assessment

The main objective of a SIL assessment is to assess the integrity level for all instrumented protection functions (known as safety instrumented functions or SIFs) provided to reduce the likelihood and consequences of major incidents to personnel.

The FSRU design development included SIL assessment and verification to assure the required integrity of instrumented protection systems on board the vessel. In addition, SIL

184 Extracted from evidence of Ms Filippin (D81)

Assignment workshops were undertaken to assess the requirements for instrumented protective functions for operation of Jetty Infrastructure, CPRF and PDF. The outcomes from the SIL assessment will be included in the design of protective functions for the pipeline. A copy of the SIL was provided to the IAC in TN50 (D365).

Pipeline Safety Management Study

The pipeline Safety Management System (SMS) assigns location classes along the route of the pipeline to:

- identify and validate threats to the pipeline
- provide assurance threats to the pipeline and associated risks are identified and understood by those responsible for addressing them
- develop appropriate controls, plans and action items to manage the risks.

The Crib Point to Pakenham Preliminary Pipeline SMS Workshop was conducted using methodology as defined in standards AS 2885.1 and AS 2885.6.

An SMS was prepared for the pipeline and provided to the IAC on a confidential basis (D96).

HAZOP

A Hazard and Operability (HAZOP) study is a design review technique used for hazard identification, and for identification of design deficiencies which may give rise to hazards or operability problems.

HAZOPs have been conducted for all areas of the Project, including a HAZOP that looked specifically at interfaces between Project areas that have different operating organisations.

Quantitative Risk Assessment

The objective of the QRA is to systematically address the likelihood and consequence of all potential hydrocarbon related risks for the Project in order to determine if such risks are tolerable in accordance with the established risk criteria. Recommendations are made for risk reduction measures where the resulting risk levels have potential to exceed the tolerable risk criteria. The QRA process focuses on the effects of a potential major incident and those atypical events with the potential to have impacts outside the boundaries of the Project.

The output from the QRA is a set of risk numbers that estimate the risk at each specific location. The risk from each individual event is combined to form contours of cumulative risk resulting from all modelled events.

Preliminary QRAs were completed for the FSRU, Jetty Infrastructure, CPRF and the PDF.

Appendices C and D of Technical Report K set out the results of the QRA for the GIJW and PDF respectively.

Copies of the more detailed QRA reports were provided to the IAC:

- D128 QRA Gas import jetty and pipeline project - DNV GL Australia
- D129 QRA Pakenham Delivery Facility – Advisian.

Formal Safety Assessment

A Formal Safety Assessment is a requirement of both the Gas Safety (Safety Case) Regulations that apply to the Jetty piping and CPRF, and the Occupation Health & Safety (MHF) Regulations which AGL are using as a basis for their assessment of the FSRU.

A Formal Safety Assessment includes:

- A process of HAZID that ensures all hazards with the potential to result in a major incident (as defined in the OH&S (MHF) Regulations) are identified.
- Identification of control measures for major incidents that enable the risk from those events to be managed to a level that is reduced 'So Far As Is Reasonably Practicable' (SFAIRP).

(ii) Iterative process

Each of the risk studies and assessments emphasised that risk assessment is an iterative process, and further work will be undertaken on each study as the design of the Project is further developed.

The EES noted:

> The safety, hazard and risk studies are an iterative process that will be updated at different stages of the Project as the level of design detail and definition develops. The hazard and risk studies will be revisited when detailed designs for Project infrastructure are finalised after the EES process. Final approvals related to safety and risk will be required from relevant regulatory authorities before the Project starts operating [185].

14.2 Key issues

The key issues are:

- Safety, hazard and risk associated with the Jetty and CPRF works.
- Safety, hazard and risk associated with the Pipeline and associated infrastructure.
- The impacts of increased shipping activity and oil spills.

14.3 Jetty and CPRF works

14.3.1 Background

(i) Relevant safety protocols and regulations

The CPRF and the Jetty infrastructure will be regulated under the *Gas Safety Act* 1997 and the *Gas Safety (Safety Case) Regulations* 2018.

The FSRU is not currently designated as a Major Hazard Facility (MHF) under the *Occupational Health and Safety Regulations* 2017 but was assessed in the EES as if it will be in the future. Worksafe Victoria advised the Proponents it expects the FSRU will be classified as an MHF.

(ii) EPRs

The following EPRs relate to safety, hazard and risk at the GIJW, FSRU and CPRF:

- EPR-HR01 Gas Import Jetty Works safety standards
- EPR-HR02 Process control system and automated emergency shutdown systems
- EPR-HR03 Fire protection
- EPR-HR04 Dangerous goods

[185] EES Chapter 16, page 16-1

- EPR-HR05 Monitoring of chemical and fuel storage facilities
- EPR-HR06 Emergency response plans
- EPR-HR07 Site safety advisor.

14.3.2 Evidence and submissions

The Proponents relied on the peer review evidence of Ms Filippin of work done to date. She considered the range of preliminary HAZID and risk assessment studies undertaken for the GIJW were suitable for this stage of the Project.

Ms Filippin noted the QRA was undertaken based on the preliminary design for the GIJW and in accordance with widely accepted HIPAP guidelines. Her evidence noted that, in line with guidance from HIPAP and the approach considered appropriate for this type of project, an iterative approach to assessing risk is being undertaken. Ms Filippin concluded the definition of hazardous scenarios, assumptions related to consequences and likelihood of potential major incidents were considered acceptable and suitably conservative for the Project.

She noted further risk studies will be undertaken as part of the Formal Safety Assessment required by the Gas Safety (Safety Case) Regulations for the Jetty gas piping and CPRF. This will include studies to demonstrate the adequacy of controls and to demonstrate risks are reduced SFAIRP.

Ms Filippin made the following recommendations:

- The next revision of the QRA should include an assessment of societal risk compared with published societal risk criteria [186].
- As part of the iterative risk process, consideration needs to be given to the Victorian Interim Risk Criteria and WorkSafe Victoria advisory areas and potential implications for future land use within the immediate vicinity.
- The iterative risk approach for the GIJW should continue to be followed and future risk studies should address the general requirement to demonstrate that risks have been reduced so far as is reasonably practicable.

In response to the first of these recommendations, the Proponents provided TN19: Societal Risk Technical Memorandum for AGL FSRU QRA report [187]. The report analysed offsite risk of multiple fatalities based on average and maximum population density of nearby land use and concluded the proposed facilities met the indicative societal risk criteria as stipulated in HIPAP-4.

In relation to the ongoing iterative review, the Proponents submitted safety and hazard risks will continue to be assessed and addressed through Safety Case regimes under the *Gas Safety Act* and (if the FSRU is classed as an MHF) the *Occupational Health & Safety Act*. Should the FSRU be classified as an MHF under the OHS Regulations, there will be a further requirement to develop a safety case for the FSRU which must incorporate an adequate demonstration that risks from the facility have been reduced SFAIRP.

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186 Societal risk is a measure of the risk that the events pose to the local population, taking into account the distribution of the population around the facility. It is expressed in terms of the likelihood of event outcomes that affect a given number of people in a single incident (e.g. the likelihood of event outcomes that affect up to 10 people, or the likelihood of event outcomes that affect up to 100 people).

187 D239

In response to potential implications for future land use, the Proponents drew the IAC's attention to Technical Report K, Appendix C – QRA results for the GIJW. Figure 13-4 (reproduced as Figure 14) of that report maps the risk of individual fatality or injury from a major explosion on the FSRU.

Figure 14 LSIR contours Gas Import Jetty Works - FSRU[188]

The following observations were made in the EES about these risk contours [189]:

- The '*50 in a million likelihood of fatality*' (pink line), the 5.0E-05 risk contour, considered tolerable for industrial land use, is restricted to the immediate area around the FSRU and Berth 2.
- The '*10 in a million likelihood of fatality*' (orange line), the 1.0E-05 risk contour, tolerable for active open spaces, extends across the Jetty approach but does not extend to the shoreline.
- The '*5 in a million likelihood of fatality*' (white line), the 5.0E-06 risk contour, considered tolerable for commercial developments extends to the shoreline and encroaches upon a public access recreational area, identified as the closest point at which the public can get near to the FSRU. This area was assessed as an open space and meets the criteria of not exceeding 1.0E-05 per year likelihood as defined in HIPAP 4.
- The *'1 in a million likelihood of fatality'* (yellow line), the 1.0E-06 risk contour, considered tolerable for residential areas extends to the western side of the CPRF and crosses over a number of roadways. The land use within this contour is

188 EES Technical Report K Appendix C Figure 13-4
189 EES Technical Report K Appendix C pages C-1, C-2

a mix of industrial land and open space with some commercial development, including the Victorian Maritime Museum.

- The '*5 in 10 million likelihood of fatality'* (blue line), the 5.0E-07 risk contour, considered tolerable for sensitive land use remains on industrial, commercial and open space areas around the berth and the CPRF. There are no hospitals, schools or other sensitive receptors impacted by this contour.

The Proponents submitted:

> The reality is that the Crib Point Jetty has the benefit of, on one side, a large buffer of land zoned for industrial and ports uses and, on the other side, open water. This buffer of non-sensitive uses greatly reduces safety risks by reducing the consequence of any safety incident. From a safety perspective, the Gas Import Jetty Works are well located [190].

The IAC requested a Location Specific Individual Risk (LSIR) contour map in the event of blast and/or fire at CPRF. This was provided in TN52 (extracted from D128). The further information shows the impact of a blast from the CPRF presents a very similar risk to the Victorian Maritime Museum and somewhat lower risk to Picnic Point.

Captain Noon's evidence provided the IAC with an appreciation of the process of navigating Western Port, berthing vessels at Crib Point (including tugboat operation) and safety protocols in place to operate the Jetty. He noted the various existing operating responsibilities for the Port and concluded that '*from a purely operational perspective, which includes Pilots, tugs, linesmen etc bringing in these vessels is business as usual'*.

TN16 (FSRU Safety: International classification and regulation) provided background on how FSRUs are regulated for safe design and operation.

Save Westernport raised concerns about the adequacy of the preliminary risk and safety assessments undertaken to date and whether AGL could be relied upon to do the necessary follow up work to a standard required. Several submitters raised similar concerns (including S2136, S2465, S3004, S3129, S3130 and S3197). S2086 provided a detailed submission on the flaws of the risk assessment that was critical of identification of risks and lack of detail in assessment.

A number of submitters raised general concerns about the risk to residents of Crib Point and users of the foreshore relating to the location of the FSRU and CPRF. Several submitters raised concerns about the impact of bushfire on the CPRF and the increased risk that this may present for residents.

14.3.3 Discussion

The IAC notes the extensive work done to date on identifying and assessing risks associated with the Jetty, FSRU and CPRF.

The IAC accepts the evidence of Ms Filippin that the risk identification and assessment for the Jetty, FSRU and CPRF has been rigorous and to an appropriate level commensurate with the stage of the Project. No risks have so far been identified that cannot be either eliminated or mitigated to an acceptable level.

[190] D589 paragraph 384

The IAC notes the results of the preliminary QRA that show acceptable quantitative risk levels for the nearby land use including residential areas, the Victorian Maritime Centre and the foreshore.

The IAC understands the concerns of some submitters that there are still some unknowns that have not been fully assessed, but is comfortable that further, more detailed assessment will follow if and when the Project proceeds.

The IAC accepts the evidence of Captain Noon that operation of the Jetty, including berthing and unloading of the LNG tankers, presents no unusual challenges for the Port and procedures are well covered by existing operating practices.

The IAC is comfortable that regulation through the *Gas Safety Act*, *Gas Safety (Safety Case) Regulations* and, in the case of the FSRU, most likely as a MHF under the *Occupational Health and Safety Regulations*, combined with the identified EPRs will properly control and mitigate risks associated with the Jetty works, FSRU and CPRF.

The IAC notes concerns raised in relation to bushfire risk and is comfortable that fire protection systems and emergency management plans required for the Project will adequately address fire risk. A Bushfire Management Plan is required to be prepared in accordance with the Incorporated Document.

14.3.4 Findings

The IAC finds:

- The risk identification and assessment work done to date for the Jetty, FSRU and CPRF is to a standard appropriate to the current stage of the Project.
- The preliminary QRA shows no unacceptable risk levels for nearby land uses including residential areas, the Victorian Maritime Centre and the foreshore.
- Further, more detailed risk assessments must be undertaken if and when the Project proceeds.
- The proposed operation of Jetty, including berthing and unloading of the LNG tankers are well covered by existing Port operating practices.
- Existing regulations combined with identified EPRs will properly control and mitigate risks associated with the Jetty works, FSRU and CPRF.

14.4 Pipeline and associated infrastructure

14.4.1 Background

(i) Relevant safety protocols and regulations

The Pipeline Works will be regulated under the *Pipelines Act* 2005 (Pipelines Act), the *Gas Safety Act* 1997 and the *Gas Safety (Safety Case) Regulations,* administered by Energy Safe Victoria (ESV).

The PDF includes additional monitoring and regulating the gas and process integrity and was assessed for risk as a hazardous development. The NSW HIPAP guidelines were used as the methodology for assessing process hazards and their associated risks for the PDF.

(ii) EPRs and CEMP controls

The following CEMP POS apply directly to the pipeline works:

- F1 to F12: Fuels and chemicals

- P1: Pakenham delivery facility.

The risk assessment study area for the pipeline included an area 640 metres on either side of the pipeline (the Pipeline Measurement Length or PML) [191].

14.4.2 Evidence and submissions

(i) Gas pipeline

The Proponents noted the following information in TN18 (D171) on design of the pipeline:

- AS2885 imposes different design standards for each Location Class. However, APA has designed the physical protection measures for the pipeline to a 'T1 – Residential' standard for the entire length. That is, the depth of cover (minimum 1200mm) and wall thickness (minimum 10.41mm) are sufficient for all expected threats for the length of the pipeline.
- In addition, APA decided to implement 12.7mm wall thickness in Sensitive areas ('S – Sensitive' secondary Location Class, in which a 'T2 – High Density' Location Class standard applies), although that is not a mandatory requirement for Sensitive locations.

The Proponents advised AS2885.6 requires the SMS for the pipeline to be updated at least every five years or whenever there is a change in land use. The process of an SMS includes an assessment of land use within the PML. If the appropriate location class changes as a result of new, more sensitive, uses within the PML of the pipeline, APA may be required to implement additional control measures – such as additional patrols and marker posts. The Proponents submitted that, because the pipeline has been designed to a 'T1 – Residential' standard, APA is well placed to adapt to changes in land use in the future.

The Proponents relied on the evidence of Ms Filippin who noted the work done to date on risk assessments for the pipeline and PDF in accordance with AS/NZS 2885 Pipeline – Gas and liquid petroleum.

Ms Filippin's evidence was threats identified, definition of the hazardous scenarios and assumptions related to consequences and likelihood of potential major incidents, were generally considered acceptable and suitably conservative for the stage of the Project. She reviewed the SMS process undertaken for the pipeline and considered it suitable and detailed to a level that would be typically expected for the stage of the Project.

Ms Filippin noted:

> An iterative approach to risk assessment is being undertaken as the project design progresses. It is expected that further risk studies will be undertaken as part of the FSA required by the Gas Safety (Safety Case) Regulations for the pipeline. This will include studies to demonstrate the risks have been reduced SFAIRP and that the pipeline and associated facilities can be operated safely. This is in line with the guidance from AS/NZS 2885 and the Pipeline Licence requirements and is considered appropriate for this type of project.

Ms Filippin's recommendation in relation to the pipeline and PDF was:

[191] The pipeline measurement length is the area of consequence in the extremely unlikely event of a full loss of containment of the gas (full-bore rupture of the pipeline) plus the gas being ignited, which may cause injury after 30 seconds of exposure.

- The iterative risk approach for the Pipeline Works continue to be followed and that future risk studies address the general requirement to demonstrate that risks have been reduced so far as is reasonably practicable.

No substantive submissions were received challenging the safety and risk assessment process for the pipeline.

(ii) Pakenham Delivery Facility

Ms Filippin noted the QRA undertaken for the PDF and accepted the assumptions and assessments made. She noted, however that changes have occurred to nearby land use and made several recommendations for further analysis [192].

Ms Filippin proposed the PDF be treated as an MHF for the purposes of assessing the cumulative risk from the facility and how it might affect nearby land use. Her recommendations in relation to the PDF included:

- Given the changes that have occurred to the industrial site near the PDF since the QRA was completed, and the potential for further development in the vicinity of the facility in future, it is recommended that an evaluation of the societal risk is undertaken for this facility considering the current and potential future land uses.
- Given the changes that have occurred to the industrial site near the PDF since the QRA was completed, and the potential for further development in the vicinity of the facility in future, it is recommended that an evaluation of the risk of property damage/accident propagation is undertaken for this facility.
- As part of the iterative risk process, consideration needs to be given to the Victorian Interim Risk Criteria and Work Safe Victoria advisory areas and the potential implications for future land use within the immediate vicinity.

Societal risk

In response to the first of these recommendations, APA commissioned a further QRA report from Advisian that estimated risk levels associated with an accidental gas release leading to a fire event against various criteria proposed in HIPAP-4, '*Risk Criteria for Land Use Planning'*, including societal risk [193]. The analysis concluded the facility does not pose a level of risk on surrounding land which exceeds the limits outlined in the HIPAP-4 criteria. The report assessed the level of risk is within the limits of what may be accepted from a societal perspective.

The report noted the ALARP (as low as reasonably practicable) principle requires that regardless of risk level, all practicable risk reduction measures should be implemented. The report recommended a physical barrier between the facility and the freeway '*as an effective means of diverting gas with high horizontal momentum upwards, significantly reducing the risk associated with release events towards the proposed Pakenham East precinct'*.

Land use risk assessment

The Proponents drew the IAC's attention to Technical Report K, Appendix D – QRA results for the PDF which maps the risk of individual fatality or injury from a major explosion within the PDF. The assessment indicated the risk criteria for the current land uses including nearby residential areas, rail yard and freeway are all met.

192 QRA Pakenham Delivery Facility – Advisian 2018 (D129)
193 TN48 (D355)

In order to properly plan for the proposed future development of the Pakenham East PSP, the Proponents suggested the following [194]:

> Risks associated with the PDF should be mitigated such that the location specific individual risk (LSIR) contour for '1 in a million per year' (1.00E-06) does not affect any area subject to an applied residential zone under Cardinia Planning Scheme clause 37.07 – Urban Growth Zone, schedule 5 - Pakenham East PSP to the satisfaction of ESV.
>
> The area between the '1 in a million per year' (1.00E-06) and the '0.1 in a million per year' (1.00E-07) LSIR contours should be subject to controls requiring notification to APA of proposals for sensitive uses (for purposes of AS2885).

The Proponents proposed new POS P1 in the CEMP Attachment J designed to cover the first of these recommendations. In relation to the second risk, the Proponents submitted that it would best be addressed by adding controls to the Pakenham East PSP (see Chapter 15.4).

14.4.3 Discussion

The IAC notes the extensive work done to date on risk identification and assessment for the pipeline and associated infrastructure.

The IAC accepts the proposed design for each location class is conservative and agrees this will build in some resilience of the pipeline design to accommodate future intensification of land use along the alignment.

The IAC accepts the evidence of Ms Filippin that the risk assessment in EES Technical Report K and the SMS are generally considered acceptable and suitably conservative for the stage of the Project.

The IAC notes the iterative nature of safety assessments and that more detailed analysis will be completed as the Project design develops and the fine detail of the pipeline alignment.

The IAC accepts the regulations that apply the *Pipelines Act*, *Gas Safety Ac*t and *Gas Safety Regulations*, combined with the proposed controls in the CEMP Attachment J, will properly control and mitigate risks associated with the pipeline and associated infrastructure.

The IAC accepts the evidence and recommendations of Ms Filippin in relation to the PDF. The IAC notes the recommendation to assess societal risk has been responded to. The other two recommendations for further work can be acted upon in the next version of the safety assessment as the Project proceeds.

The IAC agrees with the proposed approach to include a new POS P1 in the CEMP to ensure appropriate mitigation of risks associated with the PDF. This was included in the Day 4 version of the EPRs and has been retained in the recommended EPRs at Appendix G.

14.4.4 Findings

The IAC finds:

- The risk identification and assessment work done to date for the pipeline and associated infrastructure is to a standard appropriate to the current stage of the Project.

194 D376

- More detailed risk assessments must be undertaken if and when the Project proceeds. The next versions of the risk assessment for the PDF should act on the further work and recommendations of Ms Filippin.
- Existing regulations combined with the CEMP will properly control and mitigate risks associated with the pipeline and associated infrastructure.

14.5 Impact of increased shipping activity and oil spills

14.5.1 Background

Section 7.4.2 of EES Technical Report A lists potential risks of the Project associated with increased shipping activity, including spills, vessel grounding, seabed scouring and whale strike.

Although many of the operational issues are picked up in the general safety assessment for the Jetty, FSRU and CPRF, the IAC received a substantial number of submissions more specifically relating to the impacts of increased shipping activity and particularly oil spills.

14.5.2 Relevance of additional shipping traffic

(i) Evidence and submissions

The Proponents submitted that shipping to and from the Port is an approved activity, shipping is not part of the IAC Terms of the Reference and the EES therefore does not include a detailed analysis of the potential for oil spills [195]. This was somewhat contradicted by evidence called by the Proponents on shipping from Captain Noon and responded to submissions and evidence on oil spills.

In TN30 (D264), the Proponents submitted that:

- The Jetty is located within the Port of Hastings, which has operated as a commercial port serving domestic and international shipping for over 50 years.
- There is no cap on the number of vessels that may use the Port in a given year.
- The Port has significant capacity, and historically has accommodated over 700 vessels in some years.
- Over the last decade, around 100-140 vessels have entered and left the Port each year.
- The number of ships associated with the Project – expected to be a maximum of 40 per annum – fits within the normal variation in annual visitation.

The Proponents submitted any potential impacts associated with increased shipping and port activity are properly categorised as impacts associated with the existing, ongoing, policy-supported use of the Port for port activities. They noted potential impacts associated with increased shipping will be closely managed in accordance with existing procedures and no environmental approval would typically be required for increased shipping and port usage.

The Proponents submitted:

> Potential impacts associated with increased shipping and port activity will be the same whether they arise from the Project or the increased use of existing berths and any

[195] D589, paragraphs 413, 414

> additional or cumulative impact of additional port activity and shipping movements is therefore outside the scope of the IAC's Terms of Reference [196]. (IAC emphasis)

The Proponents noted that, '*despite these impacts being outside the IAC's Terms of Reference'*, EES Technical Report K and Attachment I: MNES dealt with potential risk pathways due to extra ship movements associated with the Project. They submitted analysis of potential impacts of these shipping and port activities demonstrated the cumulative impact of additional port activity and shipping movements associated with the Project is, if relevant to the IAC's Terms of Reference, negligible.

Mornington Peninsula made submissions in relation to increased shipping traffic from the Project increasing the risk of oil spill and therefore increasing risk to the Ramsar site [197]. It submitted in the context that the number of vessels in the Port of Hastings has declined significantly over recent years, the projected increase in shipping due to the Project ought to be seen as significant.

Further, that while the expansion of the Port may have broad policy support, that is by no means certain and in any case should not necessarily be assumed to apply to Crib Point. Mornington Peninsula submitted that it is not valid to argue that the impact of the Project is not relevant, because it may have happened anyway. In other words, it challenged the Proponents' argument that because increased shipping did not need approval it was outside the scope of the IAC to consider the impact.

(ii) Discussion

The IAC does not agree that risks associated with shipping are outside the scope of the IAC's review. The Scoping requirements identify the following key issue:

> Workforce, nearby operations and public safety risks associated with the construction or operation of the project, including risks associated with or compounded by potential external threats (e.g. bushfire).

The IAC is of the view the additional shipping traffic generated by the Project is directly associated with operation of the Project and is therefore relevant. The IAC notes that, in any case, the EES assessed the impacts of shipping movements associated with the Project, including the risk of oil spills.

(iii) Findings

The IAC finds:

- The impacts of increased shipping traffic generated by the Project is directly associated with the operation of the Project and is relevant to the IAC's considerations.

196 TN30
197 D426

14.5.3 Oil spills

(i) Background

EES Technical Report A Section 7.9 assessed risks and potential impacts on the marine environment from oil or fuel spills from LNG tankers or the FSRU in the event of accident or collision. The assessment included examination of contamination from:

- spill from break in hydraulic hose
- small diesel spill
- large spill of diesel or fuel oil
- LNG spill.

Of these, the report identified a large spill of oil or diesel as having potential for widespread effects. EES Technical Report A included analysis, reviews and modelling undertaken for spills that would be similar to what may be expected to be more likely in Western Port Bay. In particular, the analysis referred to the Asia-Pacific Applied Science Associates (APASA) oil spill model which assessed spills of 200 tonnes of heavy fuel oil at McHaffie's Reef on Phillip Island and two scenarios of 66 tonnes of diesel from Long Point Jetty. The APASA model examined the effects of those assumed spills under tidal currents and northerly winds (during winter) and southerly winds (during summer).

Relevantly, the assessment noted:

> The FSRU and LNG carriers are not transporting crude oil or refined oil products and have very limited volumes of bunker fuels or marine diesel onboard as they are primarily powered by boil-off gas from their own cargo. This reduces the consequence of a spill substantially from oil or petroleum transport tankers which are the basis of historical concerns about an oil spill in Western Port [198].

The assessment noted the FSRU and LNG vessels are double-hull vessels, making the likelihood of a breach of fuel tanks much less.

Technical Report A assessed the risk of contaminant spills during operation of the FSRU and Jetty infrastructure, concluding the likelihood for contamination due to leaks or spills of significant quantity from vessels ranked as rare. The consequence for a spill was ranked as major. This resulted in a risk rating of Medium.

Technical Report A assessed the risk of contaminant spills during construction of the FSRU and Jetty infrastructure, concluding an unlikely likelihood and minor consequence result in a risk rating of Low. Any spills are most likely to be small to negligible and contained before reaching the marine environment.

Section 7.9.5 of Technical Report A summarised the protocols that would be in place to manage any potential spill:

- All vessels are equipped with a Shipboard Oil Pollution Emergency Plan which provides guidance to the crew onboard on the measures to be taken if an oil pollution incident has occurred or is likely to occur.
- The risk of spills and leaks during FSRU operation would be managed with documented standard operation procedures and by ensuring compliance with

[198] EES Technical Report A page 395

the PHDA Safety and Environmental Management Plan and Port Operating Handbook.

- Emergency management and response in the event of a spill or leak, would be a component of the emergency management structure implemented at Crib Point under the PHDA Emergency Management Plan.
- The FSRU requires an EPA Works Approval and would operate pursuant to an operating licence for a scheduled activity under the *Environment Protection Act*.

(ii) Evidence and submissions

The Proponents relied on evidence from Captain Noon who noted the Harbour Master, under the *Marine Safety Act*, must ensure the safety of persons and the safe operation of vessels, and minimise the effect of vessel operations on the environment. Strict International Conventions, Regulations and Guidelines coupled with the Australian Acts, Regulations and Inspection Authorities ensure design, management and operation of vessels have the lowest possible impact on the environment. This includes requirements that the FSRU hold international maritime certificates, including the Safety Management Certificate, Certificate of Fitness and a valid International Oil Pollution Prevention Certificate (IOPP).

Captain Noon noted '*since the modern day inception of the port in the 1960's there has been no major oil spill and no major shipping accident, including collision and grounding'*.

He gave evidence the EES correctly identified possible scenarios where an FSRU and LNG carrier could potentially harm marine biodiversity and how, based on existing Port requirements, each scenario would be managed. He noted oil spill modelling was not presented in the EES and '*as there is no example to draw from in Western Port the dynamic nature of the tides and weather conditions make for an almost unlimited amount of scenarios'*. He opined Technical Report A correctly stated the area impacted would depend on the time and duration of the spill in relation to tides and wind patterns. He advised the mitigation measures evolving from the identified risks were correctly identified and are already part of the operating standards and protocols within the Port operating boundaries.

In response to S27, Captain Noon gave evidence the costs associated with ship sourced oil spills are met by those responsible through a number of International Conventions, agreements and National arrangements, and added:

> For FSRU and LNG carriers, as non oil tankers, The International Convention on Civil Liability for Bunker Oil Pollution Damage 2008 provides strict liability for fuel oil spills for owners of ships >1000 gross tonnage and requires them to carry compulsory insurance to cover any pollution damage. In other words it is the owners of a tanker that spills the oil that are liable regardless of whose fault [199].

Mornington Peninsula and Bass Coast submitted that oil spills, if they occur, would have long term impacts [200] The Ramsar site management plan for Western Port noted impacts of oil spills have been observed to last for decades [201].

The Councils submitted an increase in the number of ships necessarily leads to an increase in the risk of an oil spill – an event that all parties recognised could be disastrous for Western

199 D69 page 26
200 D426
201 Melbourne Water, Western Port Site Management Plan (2016), p.102

Port. They submitted no attempt was made to understand the environmental effects of a spill at Crib Point, rather than anywhere else in Western Port. Further, more specific modelling should have been undertaken to '*at least provide a preliminary understanding of what that impact looks like in spatial terms, what receptors (e.g. seagrass) would be likely to be affected, and how long any impact is likely to last'*.

The Councils said the IAC supported the Project, it should at least recommend the preparation of a Supplementary EES which assesses, among other things, assess what the impact of an oil spill at Crib Point would be. They submitted no mitigation is proposed, and instead reliance is placed on terms of the *International Convention on Civil Liability for Bunker Oil Pollution Damage* 2001, referred to in evidence of Captain Noon. Further, they contended that consideration be given to requiring AGL to pay a refundable bond to meet a percentage of the cost of an oil spill if it occurs.

Save Westernport raised concerns about the impact of additional shipping traffic in the channel and the risk of accident on docking or unloading and subsequent risk of gas explosion. Several other submitters (including the Victorian National Parks Association, S425, S524, S932, S1032, S1069, S1118, S1632, S1680 and S2089) raised general concerns about spills, accidents, fires and explosion risk.

The CEG submitted it was deeply concerned about potential for significant impacts on the marine environment resulting from accidental or unintended leaks or spills (including oil spills). It said in order to properly assess the acceptability of potential spill risks, the environmental impacts of those risks need to be understood. It submitted that it was not sufficient to merely assert that spills are '*rare*' and '*would be managed by PHDA'*.

CEG relied on the evidence of Mr Wardrop that, due to the speed at which currents move in Western Port Bay, potential exists for shoreline impacts to occur from a spill at Crib Point in under an hour. His evidence was that it would not be possible to respond in time to prevent environmental damage.

Mr Wardrop's evidence critically reviewed the EES assessment against what he submitted was a widely accepted systematic methodology. In summary, Mr Wardrop found the EES analysis presented in Technical Report A lacked sufficient detail to provide an adequate basis for Project assessment. He detailed materials not addressed and scenarios not analysed. His opinion was that particular oil spill scenarios for Crib Point had not been modelled and impacts on local sensitive receptors not assessed. Mr Wardrop was critical of the PHDA Safety and Environment Management Plan and the Port Operations Handbook, which he claimed did not contain procedures for responding to oil spills. He gave evidence there is no Australian Maritime Safety Authority spill management plan for Western Port.

In response, the Proponents submitted Mr Wardrop misunderstood the stage of the assessment process at which the EES sits and added in their closing statement:

> He was looking for a level of detail – specifics of products and quantities – that undoubtedly will be required, but cannot sensibly be, and is not required to be, considered at this stage. He had not allowed for further, subsequent layers of assessment. The EPRs include requirements in relation to equipment maintenance (EPR-AQ09), fuel and chemical leaks/spills (EPR-C08), and emergency planning (EPR-HR07) [202].

[202] D589

The Proponents submitted the Incorporated Document required both a CEMP and an OEMP be prepared, both of which must address hazardous substances management. They submitted these requirements would ensure Mr Wardrop's concerns are addressed at an appropriate level of detail at the appropriate time.

Under cross examination, Mr Wardrop accepted the EPRs, CEMP and OEMP were appropriate.

In closing, PHDA advised it has developed a 'whole of port' Emergency Management Plan (EMP) for management of emergencies within the Port [203]. This plan aligns with the State Emergency Response and Recovery Planning arrangements, under which the PHDA manages the first strike response for oil spills within the Port's waters. The PHDA listed additional emergency and safety management measures for the general safety of Port operations including:

- State owned oil spill equipment which is located at the PHDA Stony Point Depot and allows for a rapid response and deployment, if required.
- The PHDA undertakes regular oil spill training, drills and exercises, and specific works to minimise the impact of emergencies through effective preparation, coordination response and recovery.
- The PHDA undertakes regular oil spill response training with Port stakeholders, contracted services and support agencies to maintain the competency and capability of Port personnel.

(iii) Discussion

The IAC accepts the evidence of Captain Noon and submissions of PHDA that there are competent and effective systems and protocols in place to both minimise the risk of oil spill and manage the effects in the unlikely event of a spill.

The IAC notes the work done on reviewing spill scenarios undertaken in Technical Report A but shares the concerns raised by several submitters and the evidence of Mr Wardrop that no modelling was done for the immediate vicinity around Crib Point for the most likely spill scenarios. The IAC considers it would have been better if the EES included this work at an early stage.

The fact that this modelling has not been done to date is not fatal to the Project and the IAC notes there are mitigating factors that reduce the risk of any oil spill, such as the use of double hulled ships, the relatively low number of additional ship movements and reliable existing controls (including speed limits) on shipping.

The IAC accepts the Proponent's submission that more detailed modelling and risk assessment can be done in the next stages of the Project. The IAC is of the view that future risk assessment work should include more specific modelling of potential spill impacts at Crib Point and further review the impacts of additional shipping movements.

(iv) Findings

The IAC finds:

[203] D562

- 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.
- If the Project proceeds, future risk assessment work should include more specific modelling of potential spill impacts at Crib Point and further review of the impacts of additional shipping movements.

14.5.4 Other shipping impacts

(i) Background

Technical Report A provides an assessment of the other potential risks of shipping activity discussed below. Several submissions made general or specific reference to these risks.

(ii) Seabed scour (FSRU)

Expected local seabed scour is assessed as negligible, as very small quantities of sediment are involved, there would be a brief local increase in turbidity but no large scale or long term increase, and Western Port benthic biota are adapted to relatively strong currents. The likelihood for seabed scour is ranked as likely. The combination of likely occurrence and negligible consequence results in a risk rating of Low.

(iii) Seabed scour (LNG carriers and tugs)

The consequences of the expected local seabed scour due to tugboat operations was assessed as negligible, as very small quantities of sediment are involved, there would be a brief local increase in turbidity but no large scale or long term increase, and Western Port has a naturally mobile seabed. The likelihood for seabed scour is ranked as likely. The combination of likely occurrence and negligible consequence results in a risk rating of Low.

(iv) Vessel grounding

The consequences of an LNG carrier grounding on the edge of the channel is assessed as negligible, as the vessel can be retrieved on the following high tide and the risk of storm damage to a large vessel is minimal. In summary, the likelihood of vessel grounding is ranked as possible. The combination of a likelihood of possible and negligible consequence results in a risk rating of Low.

(v) Whale strike

Humpback Whales and Southern Right Whales visit Western Port during seasonal migrations between summer feeding in the productive Southern Ocean and winter breeding in the warmer coastal Australian waters. Killer Whales have been reported around the seal colony at the western entrance of the Bay.

Phillip Island Conservation Society (S2915) raised concerns about potential whale strike, including possible measures to avoid whale strike through observation and warning systems [204]. It made reference to systems in place in the United States and Canada [205].

Whale strike was briefly addressed in the evidence respectively of Mr Chidgey and Dr Wallis [206] [207]. Mr Chidgey noted Western Port is not known to be an aggregation or breeding area for Southern Right Whales. These whales rarely enter Western Port or are spotted around the entrance to the Bay. Dr Wallis calculated the probability of an LNG carrier striking a whale is 0.005 (or 1 in 200) in 25 years.

The EES assessment concluded the increase in likelihood of whale strike resulting from the addition of up to 40 LNG carriers to the existing and future shipping traffic in these areas is not significant, noting LNG carriers are operating at relatively low speed compared to the much larger number of smaller recreational vessels.

EES Attachment I (MNES) noted:

> Operations of LNG carriers would be in accordance with 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 including measures relating to vessel speed (see mitigation measure MM-ME05).
>
> FSRU and LNG carriers would comply with the maximum allowed vessel speeds and with operational instruction if a marine mammal is encountered. The risk of LNG carriers colliding with Humpback Whales or Southern Right Whales is considered very low [208].

(vi) General navigation issues

Captain Noon gave evidence the DNV-GL QRA referenced in Technical Report K section 6.4 considered appropriate hazards and risks associated with approach, mooring, ship to ship transfers, and ship and berth collisions at the Crib Point Jetties. From an operational perspective, the methodology and measurable factors used in the study appear reasonable. He added in terms of the roles and responsibilities, PHDA and the VRCA are correctly identified as regulating the safe movement of the FSRU, safety at the berth and the movement of the LNG carriers within the Port limits.

Captain Noon gave evidence that, with the exception of the nearby decommissioned submarine, hazard identification, risks assessments, and mitigation measures have been adequately identified and assessed. He recommended the decommissioned submarine be included future hazard and risk assessments.

(vii) Discussion

The IAC notes the low risk ratings for seabed scour and vessel grounding and sees no reason to question the findings of the EES on these issues.

The IAC notes the concerns of submitters in relation to potential whale strike, but accepts the EES conclusion, supported by the evidence of Mr Chidgey and Dr Wallis, that the

204 D293
205 D2-6
206 D71, pages 27-28
207 D70, section 8.6.4
208 EES Attachment I page 117

marginal increase in the probability of whale strike from the Project is very small and does not warrant any Project specific response. There may be merit in improved whale monitoring and warning systems in Australian waters generally but that is not a matter for this EES.

The IAC accepts the evidence of Captain Noon that existing controls on ship navigation in Western Port will adequately address shipping traffic from the Project and agrees with his recommendation to include the decommissioned submarine in future hazard and risk assessments.

(viii) Findings

The IAC finds:

- The risk of the Project from other shipping impacts, including whale strike, is generally low and the existing port navigation and operating practices are adequate.
- Future iterations of Project hazard and risk assessments should review risks associated with increased shipping and the navigation risk of the nearby moored decommissioned submarine.

14.6 Safety, hazard and risk conclusions

The IAC concludes that:

- Safety, hazard and risk impacts are consistent with the draft evaluation objectives.
- Safety, hazard and risk impacts can be acceptably managed through the recommended EPRs and CEMP.
- There are no safety, hazard and risk impacts that preclude the Project being approved.

15 Land use

15.1 Introduction

Land use effects were discussed in EES Chapter 17 and Technical Report L. Additional material was provided in TN04 and TN47.

The relevant draft evaluation objective is:

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

Table 13 lists the land use evidence that was provided.

Table 13 Land use evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Biacsi	Contour	Town planning (GIJW)
Proponents	Mr McBride-Burgess	Contour	Town planning (pipeline)
Proponents	Ms Filippin	R4Risk	Safety

Mr Biacsi provided an addendum to his evidence report in response to questions from the IAC and a supplementary report following his inspection of the Crib Point area [209] [210].

The are no specific 'land use' mitigation measures although various EPRs and CEMP POS are applicable.

15.2 Key issues

The key issues are:

- The Project's consistency with role of the Port, as expressed in relevant land use policy.
- The extent which the Project, particularly the pipeline, might have unacceptable land use impacts.

15.3 The role of the Port of Hastings

15.3.1 Background

EES Chapters 2 and 17 outlined the benefits of locating the Project within the Port. Technical Report L describes the role of the Port, including the Crib Point Jetty, and the broader land use policy and planning context within which its sits. This includes an overview of relevant documents that are referred to in Appendix E of Report No. 2.

209 D176
210 D494

15.3.2 Evidence and submissions

The Proponents submitted the Project, specifically the Crib Point elements, was consistent with the role of the Port as defined in a range of land use policy and planning documents were described at length in their submissions and in Mr Biacsi's evidence.

The Proponents highlighted that:

(a) the Crib Point Jetty and the surrounding waters form part of the Port of Hastings;

(b) the entirety of the Port of Hastings is designated under Plan Melbourne as constituting "state significant infrastructure";

(c) the land in the immediate vicinity of Crib Point Jetty is designated under Plan Melbourne as being regionally significant; and

(d) local policy expressly recognises the important contribution that the Port of Hastings makes to the Victorian economy, and its significant competitive advantages [211].

In this context, they submitted that '*the strategic significance of the Port, and the designated role that it plays within the network of ports within Victoria, is not within the scope of the IAC's Terms of Reference and is accordingly not before the IAC*'. They added the IAC's assessment of acceptability of the impacts associated with the Project '*must proceed on the basis of the Port's existing strategic designation*' and recognise that:

(a) the Proponents do not need permission for shipping;

(b) the Minister's decision to require an EES did not refer to shipping;

(c) the description of the Project in the Scoping Requirements makes no reference to shipping; and

(d) the only mention of shipping in the Scoping Requirements is in relation to cetaceans [212].

Mr Biacsi's evidence highlighted the strategic significance of the Port and referred to various land use policy documents that describe its role [213]. These include the Mornington Peninsula Planning Scheme, Plan Melbourne, the Port of Hastings PDS, the Hastings Port Industrial Area Land Use Structure Plan and the Mornington Peninsula Localised Planning Statement (MPLPS). This review led him to observe that '*it is appropriate from a land use planning viewpoint that the potential afforded by the Port of Hastings to accommodate the Project at Crib Point should be seriously entertained as it is aligned with the strategic planning that has secured the designation and significance of the Port as an important infrastructure asset to the State*'.

In response to concerns raised in submissions about industrialisation of the Port, Mr Biacsi's evidence was '*the Project is not a catalyst for further industrialisation but an example of a use that is consistent with the long-standing designation and functioning of the Port*.' He noted the Port '*has a long history of accommodating and handling hazardous cargo*' and '*is supported by significant pipeline infrastructure that complements its functioning as a bulk fuel trading port*'. He noted planning for the Port, including establishment and protection of significant land buffers, protected the opportunity for future Port growth and development.

211 D589
212 D589
213 D68

Mr Biacsi acknowledged other issues raised in submissions, including environmental impacts, and noted these needed to be considered in light of the technical evidence and assessed in terms of the likely impacts and the extent to which the mitigation measures would be '*effective and deliver the necessary certainty*'.

Mr Biacsi reviewed the exhibited Incorporated Document and land use related mitigation measures. He generally supported these, subject to some minor refinement to the Incorporated Document and in the expectation the mitigation measures would be further refined to take account of other technical evidence.

The PHDA provided an overview of the history of the Port, its broader role within the Victorian port system and its current and projected operations, including those at Crib Point [214]. The PHDA emphasised the role of the PDS in port planning and the Port's capacity to meet '*the logistics needs of the State given its transport links, land availability, and existing and potential port infrastructure'*.

Mornington Peninsula and Bass Coast, who did not call planning evidence, acknowledged the Crib Point Jetty and associated Port Zone land were within the declared Port, and that the Port was designated as 'State significant' in policy. They further noted the Special Use Zone 1 industrial land to the west of The Esplanade was designated as '*regionally significant industrial land*' and seemed to argue this in some way diminished the role or State significance of the Crib Point facility.

Both Councils submitted the industrial nature of the Project went beyond what should typically be expected of a port related use and noted Mr Biacsi's similar observation. They submitted the Port Zone is not '*generally available*' for industrial uses and highlighted other policy considerations that needed to be balanced against policy support for port related activities. They concluded that '*whilst the Port of Hastings is an operating commercial Port of State significance – recreation, nature conservation and tourism are nevertheless intended to be 'major considerations' in decision-making and there is no basis for treating development of the Port as being of such overriding significance as to justify ignoring clearly demonstrated impacts*' [215].

The CEG supported the Mornington Peninsula and Bass Coast submissions, particularly in relation to their concerns about an '*industrial facility*' at Crib Point and the need to consider the Project within the broader policy framework, not just port related policy.

Save Westernport described what it called the '*location fallacy*' and submitted that although the Jetty was within the Port, the Project would introduce a different type and level of industrial activity, particularly compared to the past and current use of Crib Point [216].

Many submitters shared the concerns about the' industrialisation' of the Port, particularly at Crib Point, and questioned whether the Port had a viable future given the environmental values and sensitivities of Western Port Bay.

214 D562 and 231
215 D426
216 D485

15.3.3 Discussion

There is clear, unambiguous policy support for the continued operation and future growth of the Port of Hastings, including operations at Crib Point. This policy support exists in a comprehensive range of policy documents, including those at State level (Plan Melbourne, the PDS and the Victorian Freight Plan), regional level (the MPLPS) and local level (the Mornington Peninsula Planning Scheme). This policy framework does not anticipate or promote the closure of the Port or its de-industrialisation, despite the aspirations of many submitters who queried its ongoing environmental viability. On the contrary, the policy framework not only supports its ongoing operation but actively promotes its growth and development. In this context, it is notable that although the recent Victorian Freight Plan identified Bay West as the preferred location for Victoria's second container port, the Port of Hastings is retained as a reserve option in the event Bay West does not proceed.

Despite the strong policy support for the Port, the IAC agrees with submitters that the Port's future development and growth will be contingent on how it responds to the environmental values and sensitivities of its location. It will need to take into account a broad suite of policies, not just port related policies. This is reflected in a range of policy documents, including the PDS that highlights the need to consider the Port's future development in the context of the Ramsar designation, the protection of coastal mangroves and saltmarshes, the recreational values of the Bay, and traffic, noise, landscape and visual issues. This is reflected in the MPLPS that includes the port related strategy:

> Planning will provide for the protection of the important values and resources of Western Port and its land catchment having regard to the importance of recreation, nature conservation and tourism. These will be major considerations in the planning and management of the area for port and port related industrial purposes [217].

The need to balance potentially competing policies was noted and acknowledged by many during the Hearing, including the Proponents (through Mr Biacsi's evidence), Mornington Peninsula and Bass Coast. The IAC understands a balanced assessment of the Project must have regard to the complexities and potential contradictions within the policy framework. It agrees with the Proponents that a balanced assessment must have regard to the ongoing role of the Port. This approach underpins the IAC's discussion of many of the issues raised by submitters and provides an important part of the policy context within which it has assessed the acceptability of various impacts.

15.3.4 Findings

The IAC finds:

- There is clear land use policy support for the continued operation and future growth of the Port of Hastings, including Crib Point.
- Land use decisions about the Port must be made within the broader policy framework that recognises the environmental and other values that might be impacted by future development, including the Project.

[217] PDS strategy 43

15.4 Land use impacts

15.4.1 Background

The key land use impact raised in submissions related to the pipeline element of the Project and the extent to which safety concerns might impact on land use planning, particularly in relation to urban and agricultural areas.

EES Chapters 16 and 17, and Technical Reports K and L assessed the Project's safety and related land use impacts. The study area for the pipeline assessment included a 200 metre buffer either side of the pipeline and a 500 metre catchment around the CPRF and the PDF. The assessment had regard to existing conditions and reasonably foreseeable future land uses, taking into account existing planning scheme provisions and planning policies that guide future land use and development.

15.4.2 Evidence and submissions

The Proponents outlined how the pipeline route had been determined and the basis for its construction standard. They relied on the evidence of Ms Filippin and Mr McBride-Burgess and provided supplementary material in TN04 and TN47.

In summary, the PML represents the radial distance heat contour for an ignited full bore rupture of the pipeline and is used to determine the standard to which the pipeline is designed, constructed and operated. It extends for 640 metres either side of the pipeline. For this project, the pipeline has been designed to at least a 'T1 – Residential' standard with some sections designed with a secondary location class of 'S – Sensitive'.

The Proponents advised APA would be obliged to monitor land uses within the PML on an ongoing basis and potentially introduce additional pipeline control measures[218]. The IAC notes it would be open to APA to have input in land use decisions within the PML where appropriate. They noted that because of the proposed pipeline design standard, there would be negligible chance of land use changes within the PML requiring a higher standard pipeline. In the event the Urban Growth Boundary is expanded within the PML and a new PSP is prepared, APA would anticipate seeking the inclusion of PSP pipeline controls similar to those it sought for the recent Pakenham East PSP.

The 'notification area' or 'area of consequence' applies within 50 metres either side of the pipeline. The Proponents advised this was determined based on the energy release rate from the worst credible hazard scenario identified at the SMS workshop (as discussed in Chapter 14). It represented the area within which particular sensitive uses might be exposed to an unacceptable level of safety risk. Within this area, APA would request that relevant Councils notify it of any applications for sensitive uses as defined in AS2885.6 and listed in TN04. The Proponents added that APA does not expect notification of other proposals and does not have an interest in other land uses, including '*standard or medium density residential or retail development*'.

The Proponents' advice about the PML and notification area was generally consistent with Ms Filipin's evidence in which she noted the PML is not an exclusion zone or a buffer, rather it is used to inform risk assessment. She made various recommendations about further risk

[218] AS2885.6

assessment work that should be done, including recommendations relating to the GIJW and PDF (see Chapter 14).

Mr McBride-Burgess supported the pipeline alignment although he recommended various changes discussed Chapter 14. In terms of land use impacts, his assessment of the various planning controls and policies, particularly within the notification area, led him to conclude:

> The introduction of the Pipeline will not unreasonably limit the ability for Hastings to grow as envisioned with the adopted Hastings Structure Plan.
>
> Between Hastings and the Pakenham Delivery Facility the pipeline alignment typically extends through agricultural and rural living land uses which would only experience short term amenity impacts during the construction phase. End use impacts largely relate to the introduction of easements along the pipeline alignment [219].

In relation to the GIJW, Mr Biacsi supported the EES finding that land use impacts would largely be confined to the Special Use Zone 1 area that operates as a defacto buffer around the Jetty. He concluded this was consistent with the zoning regime and land use policies for this area.

The Proponents noted Cardinia Planning Scheme Amendment C234 (Pakenham East PSP)[220] included a requirement in Clause 66.06 that the pipeline licensee/operator be notified of applications for various sensitive uses within 50 metres of the existing high pressure gas transmission pipeline. They submitted the IAC should recommend that similar controls be applied to:

> (a) the notification area of the proposed pipeline;[221] and
>
> (b) the area where the Pakenham Delivery Facility results in a comparable level of risk (with this area to be determined following a revised QRA)[222].

Cardinia raised concerns about the pipeline's land use impacts in relation to growth corridor land (particularly the Pakenham East PSP area) as well as non-growth corridor land. These concerns were twofold:

> - Firstly, the extent to which adjacency to the measurement length (and/or the notification area) might impact upon future changes of use and/or development of land; and
> - Secondly, the extent to which landowners/occupiers affected by land in the measurement length have been notified of the proposal and had the opportunity to participate in the IAC process [223].

Cardinia sought clarity in relation to:

> - what is a sensitive use for purposes of the pipeline adjacency; and
> - the extent to which APA will seek to prevent the use, influence the nature of the use (scale, density, other conditions) and/or need to make procedural control changes of its own through the SMS [224].

Casey raised concerns about pipeline impacts on agricultural productivity (see Chapter 18).

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219 D86

220 The Amendment, including Clause 66.06, was approved on 21 January 2021

221 The IAC assumes that this refers to the area within the Pakenham East PSP and not the entire length of the pipeline

222 D589

223 D442

224 D442

Mornington Peninsula and Bass Coast raised issues relating to the role of the Port and Crib Point, and potential business, tourism and agricultural impacts (see Chapters 17 and 18).

The Victorian Planning Authority (VPA) made a written submission in relation to the pipeline and the Pakenham East PSP. It noted various discussions held with APA about potential land use impacts and how they might be addressed. The VPA requested that:

- Implications for the Pakenham East PSP are clearly discussed within the EES inclusive of a reassurance within the document (consistent with advice provided to the VPA by APA) that the pipeline will be designed and constructed such that there will be no adverse impacts upon the future development within this precinct, which will be predominately residential.
- The EES be more specific about the 640m measurement length that applies to both sides of the proposed pipeline and should articulate how the increased design and construction standards of the pipe, particularly in the vicinity of the PSP area, will lead to a reduction in its length or a change in how it is the measurement length is interpreted / responded to;
- The Advisory Committee require APA and AGL to engage with the VPA when revising the EES to ensure that it adequately addresses the above matters and remains consistent with advice already provided to the VPA by APA. I note also that the VPA, Melbourne Water and DELWP are not referred to in the stakeholder engagement sections of the EES and have apparently have not previously been included in this process [225].

15.4.3 Discussion

(i) The Pipeline Measurement Length and notification area

The IAC is satisfied the definition of the PML and notification area are consistent with AS2885 and notes the notification area was supported at the SMS workshop. It accepts Ms Filippin's evidence and her recommendations for further risk assessment work (see Chapter 14).

The IAC agrees the PML is not an exclusion zone or a buffer, rather it is used to inform pipeline risk assessment. Nevertheless, APA would be obliged to monitor land uses within the PML and would have the opportunity to respond to relevant land use proposals.

The IAC is satisfied the notification area has been appropriately determined and that APA's intention to consult with relevant Councils and to request it be notified of applications for sensitive uses is generally consistent with current practice. The IAC is satisfied the proposed list of sensitive uses is appropriate.

The IAC has broadly reviewed the pipeline route through the PML and notification area and agrees with Mr McBride-Burgess the land use impacts, particularly through Hastings, will be negligible. Impacts on agricultural areas and specific sites raised by submitters are discussed in Chapters 18 and 20.

(ii) Statutory mechanisms for managing land uses in the pipeline notification area

The Proponents sought a recommendation from the IAC that the pipeline and PDF be the subject of a planning scheme amendment that would introduce a planning permit application referral requirement for sensitive uses within the associated notification areas.

225 D234

This would be similar to the changes to Clause 66.06 included in the approved Cardinia Planning Scheme Amendment C234.

While the IAC acknowledges the rationale for the request, it was not anticipated in the exhibited EES and was only raised late in the Hearing process. For these reasons, the IAC is not prepared to support this, particularly in the absence of further consultation with stakeholders, including APA, the VPA, Cardinia, DELWP and landowners.

Nevertheless, the IAC would not have any in principle concerns about an appropriate control being implemented, subject to APA reaching agreement with the relevant stakeholders.

(iii) Pakenham East Precinct Structure Plan area

The VPA's submission raised issues related to the treatment of the pipeline in the Pakenham East PSP area and referred to various discussions it held with APA about related matters. Cardinia raised similar concerns about these issues, particularly in relation to potential land use impacts outside the notification area.

The IAC is satisfied the concerns raised by the VPA and Cardinia have been addressed by the advice and commitments provided by the Proponents in their submissions and evidence and these do not require any further response or recommendations. Nevertheless, the IAC encourages the Proponents to continue their discussions with the VPA and Cardinia about how the Project might impact the Pakenham East PSP and whether and how a referral control might be implemented.

(iv) Consultation

Cardinia raised concerns about the adequacy of community consultation related to potential land use impacts within the broader PML. The Proponents provided comprehensive material about the nature and extent of consultation during the EES process and submitted they had met the approved consultation plan required under the Scoping Requirements Report and had complied with the requirements of the *Pipelines Act*.

The IAC is satisfied affected landowners within the notification area were adequately consulted, including direct consultation regarding acquisition of the pipeline easement. In terms of the broader PML area, the Proponents advised that a project 'flyer' was circulated within most of this area, and the majority of landowners had received this. They highlighted other consultation mechanisms used, including newspaper and radio advertisements. The IAC is satisfied there has been adequate consultation within the PML, either directly or indirectly, and landowners have had the opportunity to inform themselves of the PML and its possible implications. The IAC notes submissions and evidence from the Proponents that land use implications for the area outside the notification area, but within the PML, are negligible.

(v) Land use impacts resulting from the Gas Import Jetty Works

There were few specific submissions about possible land use impacts associated with the GIJW, although there were general concerns about safety issues. These were addressed in the evidence of Ms Filippin who referred to the inner and outer advisory areas and the land use risks and limitations associated with them. As discussed in Chapter 14, she recommended further risk assessments be undertaken as part of the iterative risk assessment process, a position the IAC supports. As noted in Chapter 14, the results of the

preliminary QRA show acceptable quantitative risk levels for the nearby land uses including residential areas, the Victorian Maritime Centre and the foreshore.

In a broader sense, the IAC agrees with Mr Biacsi that the Jetty is extensively buffered by areas zoned Special Use Zone 1 (Port related uses) and distant from the Crib Point and Hastings urban areas. These are some of the factors that support the ongoing use and development of the Jetty area and make it suitable for uses that might have off site impacts.

15.4.4 Findings

The IAC finds:

- Potential land use impacts associated with the pipeline would be predominantly confined to the pipeline notification area and are considered to be acceptable.
- Potential land use impacts associated with the GIJW would be predominantly confined to the surrounding Special Use Zone 1 area and are generally acceptable.

15.5 Land use conclusions

The IAC concludes that:

- Land use impacts are consistent with the draft evaluation objective.
- Land use impacts can be acceptably managed through the recommended mitigation measures.
- There are no land use impacts that preclude the Project being approved.

16 Social

16.1 Introduction

Social effects were discussed in EES Chapter 18 and Technical Report M. Stakeholder engagement was discussed in EES Chapter 26. Additional material was provided in TN08 and TN14.

The relevant draft evaluation objective is:

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

Technical Report M – Social Impact Assessment (SIA) was prepared by Mr Weston of Public Place Melbourne Pty Ltd.

Table 15 lists the social evidence that was provided.

Table 14 Social evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Boushel	Jacobs	Social impact assessment/research
CEG	Ms Rosen	Symplan	Social impact assessment, planning
Bill Genat	Professor Small	La Trobe University	Health and social research

Mr Boushel's evidence was supplemented by reply evidence (D169) and a PowerPoint presentation at the Hearing (D341).

Ms Rosen's evidence was supplemented by a PowerPoint presentation at the Hearing (D476).

Professors Small's evidence was supplemented by reply evidence (D152) and a PowerPoint presentation at the Hearing (D506).

The following EPRs apply to social impacts:

- SO01 Consultative mechanisms for information and enquiries
- SO02 Consultation on recreational activities at Woolleys Beach
- SO03 (deleted from exhibited iteration)
- SO04 Source local workers
- SO05 Community fund
- SE01 Stakeholder Engagement Management Strategy
- SE02 Complaints management system.

16.2 Key issues

The key issues are:

- Efficacy of and engagement through the SIA.
- Amenity impacts on the Woolleys Beach North reserve
- Whether social impact mitigation can be managed.

16.3 Efficacy and engagement

16.3.1 Background

The EES notes the SIA '*was compiled in accordance with well-established procedural steps'*, these being:

- scoping
- profiling/data collection
- impact assessment/prediction and evaluation
- mitigation.

These steps are unpacked in various ways in the SIA.

In the context of the Project, Mornington Peninsula was described in the SIA as:

> … a well-known tourist destination boasting a wide variety of attractions, such as beaches, wineries, and golf courses, and the area is home to numerous holiday homes. In contrast, the urban settlements of Crib Point and Hastings accommodate largely permanent populations with a relatively 'low' socio-economic status compared to the Hastings-Somerville District, nearby rural areas and Greater Melbourne [226].

The SIA is largely descriptive, with little in the way of specific fit for purpose new research. The key focus of assessment noted the impacts of the Jetty works largely related to impacts on the Bay and changes to access and amenity to the local communities of Crib Point and Hastings. For the Pipeline works, these related to occupation of private land and changes to access and amenity. The SIA noted that for both key components, there will be changes to socio-economic conditions.

Community engagement was primarily undertaken by the Proponents in the early inception stages of the Project. Chapter 26 of the EES considered Stakeholder Engagement and the IAC was advised the Proponents engaged with a variety of stakeholders since the inception of the Project in July 2017.

16.3.2 Evidence and submissions

(i) Efficacy

In acknowledging the range of various social impact issues raised by submitters, the Proponents contended:

> At a high level, the Proponents' response to these issues is to acknowledge that some impact will occur, but that, first, the social impact assessment undertaken has been sufficient for the purpose of developing appropriate mitigation measures for the Project's potential social impacts. And second, that the proposed mitigation measures – in the form of EPRs and the CEMP – are well-designed to address the community's concerns, enhance benefits for the local community, and improve the social outcomes of the Project [227].

The evidence of Mr Boushel was descriptive and focussed on the exhibited SIA, the social issues raised through the public submission process and the mitigation measures (D82). In that regard, he provided additional mitigation measures in response to his review of

226 Technical Report M, p29
227 D340

submissions. He made a supplementary statement in response to the RFI from the IAC and the evidence of Ms Rosen and Professor Small (D169).

In response to Ms Rosen's evidence where she was critical about the efficacy of the SIA, Mr Boushel did not support that contention. While noting he too had some criticisms of the exhibited SIA, he said '*The findings of the assessment, however, can be relied upon as the issues raised in the submissions are largely considered and assessed within the assessment*' [228].

Mr Boushel gave evidence about the tangible social benefits, such as increased gas availability, potential employment opportunities, and the community fund. He noted that for the community fund to be successful, the whole community would need to accept it (for which he noted that would be highly unlikely).

Mr Boushel spoke of the intangible social impacts and observed that new environmental projects often generate fear within communities, especially in the planning phase of road and energy proposals. In this case, he noted that very few people have seen a project of this type before, hence the heightened concerns.

Mornington Peninsula did not address social impacts, nor did it call social planning evidence.

The CEG provided detailed submissions on social impacts and called evidence from Ms Rosen. With regard to the efficacy of the SIA, CEG contended:

> As is relevant to the Scoping Requirements, the EES SIA is insufficient to form the basis of any conclusion as to the:
>
> a. characterisation of the existing environment; or
>
> b. assessment of likely effects – that is, the likelihood and significance of any social impact.
>
> That is because of three interrelated factors:
>
> a. first, a lack of necessary and appropriate primary research;
>
> b. second, inadequate consideration of the vulnerability of the affected community; and
>
> c. third, a failure to consider the cumulative effects of those individual potential impacts identified in the EES [229].

(ii) Engagement

The SIA noted consultation about the Project occurred in late 2018 and early 2019, well before the technical studies were completed and well before the EES could be considered holistically. One of the difficulties in undertaking a SIA as part of the EES process is that such work is undertaken early in the process, usually in parallel with the various technical studies. The authors of a SIA generally rely on the findings of those technical studies to inform their considerations about social impacts. These findings are generally taken at face value, well before they can be tested in a public hearing process, both directly and through competing evidence and through submissions. In reality, it is not until the submission and hearing process that the full range of social impacts – both positive and negative – can be fully understood.

228 D169, paragraph 13

229 D483, paragraphs 205, 206

The Proponents expressed concern about how the Project was portrayed by the CEG and particularly Save Westernport, including for example, showing the Project as an oil rig in early publicity material. There was significant use of social media in generating opposition to the Project and while that was a fair avenue to generate interest, The Proponents noted '*the deliberate avoidance of the official information was regrettable and inappropriate'*. Through the very high number of submissions and the high number of community groups and submitters seeking to be heard, there is no doubt the social media campaign had an impact.

The Proponents questioned Ms Rosen about what he considered her over reliance on social media and other material published by Save Westernport. He contended she did not bring a fair and balanced approach to her evidence. While Ms Rosen disagreed with that contention, she did concede that she did not look much beyond what was provided to her by Save Westernport.

Mr Boushel was cross examined at length by the IAC and Mr Forrester for the CEG. Amongst other issues, the IAC explored the methodology of his evidence statement and his reliance on the primarily desktop research of others.

In giving her evidence, Ms Rosen focused mainly on the Crib Point elements of the Project. She summarised her opinion that the social disbenefits outweigh the social benefits and the proposed mitigation measures would be unlikely to mitigate potential social impact. She highlighted the relative socio-economic disadvantage of the Hastings and Crib Point communities, noting the vulnerability of these communities and their capacity to cope with the Project. Ms Rosen highlighted the temporary construction and the permanent operational changes, including the impact on visual amenity from various areas along Western Port Bay. She argued AGL did not have a social licence to operate the facility, a position with which the Proponents rejected. They said social licence *'… is not an objective test for decision makers'*.

Ms Rosen was critical of the SIA in that it was inadequate for the type of project under assessment and that '*Best practice should go beyond compliance with evaluation objective and scoping requirements'*, which '*should seek to avoid rather than minimise'* [230]. She concluded Western Port Bay was an inappropriate setting for the Project, the cumulative disbenefits on the local community outweigh the cumulative benefits to the broader community and the proposed mitigation measures would be unlikely to address community concerns. Further she contended the SIA findings should not be relied upon as the evidence base lacked rigour.

The CEG concluded that Ms Rosen's evidence supported a conclusion that the limitations and failures of the SIA meant its findings should not be relied upon.

Professor Small gave evidence on the community engagement process and her perceived inadequacy of the SIA, including the way in which the social research was undertaken. She concluded that *'… there remains a need for a much more comprehensive and robust assessment of social impact to be conducted'* [231]. She was critical of the methodology employed through the EES, in that it did not respond to the scoping requirements, and that

230 D476, page 35
231 D113, page 14

the lead author for the SIA relied too heavily on secondary data with no or little contact or communication with the local community.

Most submitters did not support the Project, and many spoke of the impacts the Project would have on them and their families/friends. Fear of amenity impacts (light spill, noise, visual bulk), fear of loss of valued open space, fear of fire and explosion, fear of irreparable damage to the marine environment, fear of loss of access to the Bay, fear of impacts for continuing use of gas as a fossil fuel and fear of the unknown were common issues raised.

Many submitters spoke passionately about their relationship with Western Port Bay, the peacefulness of Woolleys Beach, the opportunity to engage with the extensive marine environment and the overall ambience of the area.

Many local submitters advised they have lived harmoniously with the Port of Hastings and with Crib Point in particular for long periods but were adamant the permanent mooring of the FSRU and its operations would liken the Bay to a *'floating industrial factory'* that would have continuous 24 hour impacts. Submitters from further afield, both elsewhere on the Mornington Peninsula and beyond shared many of these views.

The IAC notes several issues were raised about consultation regarding Aboriginal cultural heritage (see Chapter 19.3).

16.3.3 Discussion

(i) Efficacy

While the IAC accepts the SIA considered the relevant scoping requirements, it did not undertake new research to support the overall assessment. In particular, it did not conduct one on one research in the form of community engagement or surveys. Nor did the peer review witness for the Proponents do this. The key engagement was undertaken by the Proponents directly through the early community engagement program. The SIA noted that since 2017, the Proponents held over 30 open public meetings with more than 1,500 attendees. Since that time *'… there is a network of community led environmental groups which have taken an active interest in and/or oppose the Project due to its potential environmental impacts'*.

Mr Boushel observed similarly and noted the SIA is *'… largely reliant on feedback sourced from the broader consultation undertaken by APA and AGL with limited consultation undertaken directly for the social impact assessment'*. Further, in relation to the secondary information relied upon, he observed *'As this feedback was collected for a different purpose, it is less likely to capture the kind of social information that social impact assessments seek to consider'*. In saying that, Mr Boushel did not undertake direct consultation either, including by telephone or survey, which could have been attempted, even in the COVID period.

In response to questions from the IAC, Mr Boushel argued the purpose of the SIA was not to increase community buy-in but to consider the relevant social impacts and mitigation measures. He acknowledged that the lesser the level of consultation, the greater the risk, but noted in this case, the high number of submissions did support that there was significant community awareness of the Project. He agreed with the IAC that it was very important to ensure people are aware of a project such as this and that while the SIA is not deficient, it does have some limitations.

In considering community impacts, the SIA provided the following summary:

> The environmental, commercial, and recreational values of Western Port currently coexist in relative harmony. However, there is a clear tension between the aspirations of different sections of the community with regard to Western Port and in particular the balance struck between preserving and enhancing the bay's environmental values and natural landscape setting, and the utilisation of port infrastructure for industrial purposes [232].

The IAC considers this comment to be the essence of the differing views of parties and submitters. The key issue is whether those views can be reconciled, and if not, how they can best be mitigated, if at all.

The Proponents addressed many aspects of the SIA and social impact evidence in its closing submissions. They reiterated the continual presence of the Port since the 1960s and the type of activity it undertakes, including as an industrial Port that has long been used for fuel transport, amongst other uses. The Proponents observed:

> … the Port and its industries are important resources within the social and economic fabric of Hastings and Crib Point. The sustainability of the Port should not be seen as a negative social effect. Rather, the Port will continue to provide a basis for employment and careers in the area. While the Bay's tourism values are also a resource it is stretching the facts and local policy to place this resource above the Port in the area around the jetties. …
>
> This analysis should lead to the conclusion that there are no unacceptable social effects and that the level of social impact is within policy expectations for the area and capable of management as proposed in the EPRs [233].

The IAC disagrees *'that there are no unacceptable social effects'* and ultimately concludes that while there are some impacts that are acceptable, there are others that are unacceptable to others in the immediate local community. Many of these impacts are intangible, such as the fear and anxiety expressed by many submitters. It is difficult to nuance the psychological impacts the Project may have on people, and while many of the tangible parameters relating to noise, lighting, visual impact can be quantified and benchmarked as mitigation measures through the EPRs, the genuinely held concerns of many submitters cannot be reconciled in this way, nor should they be underestimated.

The IAC accepts the role of the Port and its place as one of four main Ports in Victoria, as well as the State and local planning policy and land use context of the Port. However, what is proposed is the permanent mooring of an FSRU for up to 20 years and the conversion of LNG to gas for transport to Pakenham through a new pipeline. The FSRU is a new and a different use, with different issues and impacts. Most other jetties in the Port and the Crib Point Jetty in particular, have ships calling in and leaving over a short period of time. Indeed, it was difficult during the course of the Hearing to find a time to observe a ship that was calling into Crib Point.

What was not considered well was the extent of community interest in the Project from wider areas in and around Western Port Bay, the Mornington Peninsula and well beyond. The overall conclusion of the SIA and the evidence of Mr Boushel noted the wide range of concerns that in the opinion of the IAC, were not appropriately acknowledged. Significant reliance was given to the positive technical assessment in the EES, thus influencing the general findings of the SIA and the recommended mitigation measures.

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232 Technical Report M, page 38

233 D589, paragraph 454 (h), (i)

The IAC considers that while the SIA was adequate, it was not sufficiently robust for this particular matter. While potential social (and environmental) effects can technically be mitigated, little regard was given to the intangible impacts resulting from fear, anxiety and psychological stress.

(ii) Engagement

The authors of the SIA did not undertake direct and meaningful social research or engagement with potential stakeholders, nor did the social impact experts. All relied on what was prepared by the Proponents in the Stakeholder Engagement report and various secondary resources, and the technical information in the EES. Ms Rosen conceded she largely relied on secondary research and information provided to her by Save Westernport. By the time of the Hearing, there was significant community opposition to and about the Project.

Due to the nature of this Project, the IAC is concerned about the low level of meaningful consultation with directly impacted communities. Apart from consultation for the pipeline route, there should have been an attempt to undertake consultation in a more inclusive and rigorous manner. There is no doubt that AGL attempted to consult in the early phases of planning for the Project, but that did not carry through to the SIA process. It has caused the IAC to wonder whether this did not occur due to early engagement being unsuccessful, and the view that there was 'little point' due to the vehement nature of opposition.

The IAC heard from submitters who spoke of the early engagement process where executives of AGL reportedly told the local community that '*you will need to take one for the team here'* in relation to the Project being located at Crib Point. No doubt that was a poor choice of words to a concerned and in the terms described by Ms Rosen, a sometimes vulnerable community, but having been said, it stuck in people's minds and heightened concerns about the Project.

Mr Forrester explored the issue of community vulnerability with Mr Boushel who agreed the most vulnerable socio-economic groups of Mornington Peninsula are those likely to be the most affected by the Project. Further, the type of employment opportunities that might accrue from the Project might not necessarily be the skill set available from within the Crib Point/Hastings communities. There was significant concern about potential employment opportunities, to which the Proponents amended EPR SO04 to develop a local procurement plan for employment of local communities and contractors, which the IAC supports.

Through cross examination, the Proponents were very critical of Ms Rosen about her reliance on what they termed the very deliberate campaign by Save Westernport in particular to produce material in opposition to the Project that painted it in a very negative way. The Proponents contended that much of what was produced in this campaign was inflammatory, exaggerated and untrue. There is no doubt in the IAC's mind the campaign was very successful in turning people's minds against the Project. In saying that, the IAC considers community leaders and organisers have a responsibility to ensure they are fair and balanced in such campaigns, as they play on the sensitivities of many people to feel fear and concern in a very real way.

However, the IAC read and heard from many articulate submitters who did express genuine and sincere concerns about the impacts of the Project on their livelihood, their perceptions about the impacts on the Bay, and their concern about the change in the nature of port

activity at Crib Point as part of the Port of Hastings. These submissions, while not backed with evidence, were important in the considerations of the IAC.

That the CEG called social impact evidence in support of its position was helpful to the IAC. It agrees with the concerns raised by the Proponents about the reliance of Ms Rosen on material produced by Save Westernport and it was not helpful to the IAC that Ms Rosen, like Mr Boushel, did not undertake primary research. However, Ms Rosen did provide a detailed evidence report (D105) and PowerPoint (D476) that well documented the concerns about community engagement.

In responding to the SIA and the evidence of Mr Boushel, the Proponents noted '*the scope of the social impact assessment was limited at the outset*' due to what they said was the agreement of DELWP that a standalone SIA social impact risk assessment need not be undertaken. They noted that direct consultation was invited, but only three local residents sought to participate [234].

The Proponents noted they consulted as required in relation to the scoping requirements and that '*The fact that some submitters are not happy with the consultation does not mean that it was inadequate, and it is unfair to castigate the Proponents for following their obligations in relation to consultation*' [235].

One of the difficulties in assessing social impacts for this Project (and other large scale infrastructure) is that there are, no doubt, many silent voices. Due to the campaign waged by Save Westernport, those who perhaps might support the Project might have been reluctant to put their names on a submission. This is not able to be quantified but there may be some unknown local support for the Project.

A further observation is that the advantage of the Crib Point location is that apart from the five properties along the Esplanade, there are no direct communities living close to the Jetty who are immediately and directly impacted. The foreshore and jetty infrastructure are separated from Crib Point township by various port related infrastructure and bushland. If driving directly through Crib Point, there is very little sense of the Jetty and Port infrastructure. This is a key locational advantage that raises different locational contexts compared with some major road and other significant infrastructure projects.

The IAC undertook various site inspections during its proceedings. Recognising the COVID restrictions and typical spring weather, the IAC was surprised by the low numbers of people walking in and around the foreshore during its visits. On one day, one member noted little recreational water activity while on another day another member noted significant recreational/fishing boat activity. On one inspection, while a ship was docked at the Jetty, a member observed the key noise impact was from speed boats in the Bay.

Consultation in relation to the pipeline route by the Proponents was more targeted and generally provided for one on one consultation with affected landowners. There were few submissions from landowners affected by the pipeline route. The IAC agrees most landowners appeared to engage with APA regarding the pipeline and as the works will move along that route in a systematic and coordinated manner, the impacts will be short term and likely negligible. The IAC agrees direct impacts for the pipeline will diminish over time.

234 D589, paragraph 454
235 D589, paragraph 482

16.3.4 Findings

The IAC finds:

- While the SIA was adequate, it has significant limitations through the lack of direct research and consultation with the local communities and interest groups.
- The SIA was heavily reliant on assuming that all technical components of the Project would be satisfactorily assessed and mitigated, so therefore the social impacts could be mitigated accordingly.
- Intangible impacts were not appropriately recognised or addressed in the SIA.
- Stakeholder engagement was evident since mid-2017 but did not result in demonstrated community understanding or acceptance of the Project.
- The engagement process for the Jetty component of the Project through the SIA and the evidence of the Proponents was limited and lack the benefit of ongoing and direct consultation.
- The engagement processes for the pipeline component of the Project was generally acceptable.

16.4 Woolleys Beach North

16.4.1 Background

The exhibited EES included the following mitigation measure (MMSO02):

> **Consultation on recreational activity at Woolleys Beach**
>
> The Crib Point Stony Point Committee of Management Inc. and the community will be consulted with to identify a suitable foreshore location and propose additional recreational infrastructure, to accommodate activity displaced from Woolleys Beach North.

This mitigation measure applies to the 'picnic area' within the Woolleys Beach Reserve that is immediately to the south of the Jetty and described in the EES as 'Woolleys Beach North'. The site is accessed from The Esplanade and includes a car park and some recreational infrastructure.

16.4.2 Evidence and submissions

The Proponents Day 1 version of the EPRs revised the mitigation measure (EPR-SO02) to read:

> The Crib Point Stony Point Committee of Management Inc. and the community will be consulted with to identify a suitable foreshore location and propose additional recreational infrastructure and measures to improve access, to accommodate activity displaced from Woolleys Beach North [236].

The additional text (underlined) was added in response to changes proposed by Mr Boushel who gave evidence that:

> This mitigation is appropriate. While the amenity impacts will have an adverse impact on users of Woolleys beach, the severity of this is reduced by the presence of the existing port and associated operations. Existing users have been able to coexist with existing operations and this mitigation will assist in them adapting to this change [237].

236 Day 1 EPRs (D174)
237 D82

The Proponents retained the Day 1 version of the EPR in the Day 2 and Day 3 versions but deleted it from the Day 4 version. In their closing submission, the Proponents proposed that it deleted because:

- access to or use of this area would not be prevented or limited
- noise from the FSRU and CPRF would be noticeable, but not enough to limit its use.

The Proponents submitted some submissions about this mitigation measure and the use of Woolleys Beach North were based on the incorrect assumption that the Project would physically prevent access to the picnic area. They advised this was not the case, nor was it ever the case, but accepted there was confusion about the access.

Mornington Peninsula raised concerns about the possible noise impacts within the Woolleys Beach Reserve, including the HMAS Otama lookout and Woolleys Beach North.

The CEG raised concerns about the meaning of the exhibited mitigation measure (EPR-SO02), the responsibility for actioning it, how it would be funded and whether an alternative site was capable of being provided. They relied on Ms Rosen's evidence and submitted the mitigation measure should require that '*All costs associated with mitigating severance and displacement are to be borne by the proponent*'.

Similar concerns were raised by other submitters.

16.4.3 Discussion

EES Appendix M assessed the amenity impacts along the Woolleys Beach Reserve, including discussions with the Crib Point Stony Point Foreshore Committee of Management Inc (Foreshore Committee). Those discussions indicated the Reserve '*typically offers a quiet and tranquil setting for visitors*' but noise associated with the occasional use of Berth 1 reduced visitation, particularly to Woolleys Beach North. The assessment noted that:

> Changes to amenity may permanently alter the pattern of use of the Woolleys Beach Reserve for some users during the life of the Project. Some existing activity may migrate southward to Woolleys Beach South and/or be displaced to other locations [238].

This conclusion led to the following recommendation being translated into the exhibited mitigation measure:

> In consultation with Crib Point Stony Point Committee of Management Inc. and the community, identify a suitable foreshore location to accommodate activity displaced from Woolleys Beach North. Develop comparable recreational infrastructure to that found at Woolleys Beach North at the replacement site, as required [239].

The IAC's reading of Appendix M is that the mitigation measure was intended to address the amenity impacts and consequent loss of open space utility that would result from the Project, including noise, lighting and visual impacts. Despite the Proponent's submissions, it was not based on a perceived lack of physical access.

The IAC agrees with the EES, experts and many submitters that the open space utility of Woolleys Beach North will be unacceptably impacted by the Project and that it would be appropriate to provide an alternative site. Despite Mr Boushel's observations about the extent of the impacts, he agreed with Ms Rosen they warranted a mitigation measure.

238 EES Technical Report M, page 3
239 EES Technical Report M, page 60

Whether or not this is possible and how it might be done are matters for the Proponents to discuss with the Foreshore Committee and other stakeholders, but it should be retained as an EPR. The EPR should require the associated costs are borne by the Proponents and funded separately to the proposed community fund included as EPR-SO02.

To facilitate this, the IAC has included the following EPR in Appendix G:

> **Woolleys Beach North**
>
> Consult with the Crib Point Stony Point Foreshore Committee of Management Inc., stakeholders and the community to identify a suitable foreshore location and provide appropriate recreational infrastructure that accommodates activity displaced from Woolleys Beach North (immediately south of the Jetty). All costs are to be borne by the Proponent and are to be funded separately from the Community Fund.

In reaching these conclusions, the IAC expects the existing picnic area would be retained given access to the associated beach area is important for groups such as the Victorian Sea Kayak Club (S995). The purpose of the EPR is to identify an additional site that would have an acceptable level of amenity for general community use.

16.4.4 Findings

The IAC finds:

- The Project will have unacceptable amenity impacts on the recreational utility of the picnic area at Woolleys Beach North (to the immediate south of the Jetty).
- The Proponents should fund the investigation and possible provision of a suitable alternative facility elsewhere in the Woolleys Beach Reserve.

16.4.5 Recommendation

Environmental Performance Requirements

Include the following changes:

- **New EPR-SO07 (Woolleys Beach North)**

This change is included at Appendix G.

16.5 Whether mitigation can be managed

16.5.1 Background

The exhibited EES included several mitigation measures in relation to social impacts, which in summary primarily related to:

- consultation for information and inquiries
- access and recreational activity at Woolleys Beach
- sourcing of local workers
- a community fund
- stakeholder engagement management strategy
- complaints management system.

The proposed mitigation measures were discussed and amended during the course of the Hearing, and there was particular emphasis on EPR SO05, which related to a proposed community fund of $7.5 million if the Project proceeded. Interestingly, that figure was not included in the relevant EPR.

16.5.2 Evidence and submissions

In discussing the social effects of the Project, the Proponents noted 'tangible' social impacts can be measured and managed by the EPRs relating to environmental impacts, and 'intangible' impacts in essence related to perceptions and fears were not supported by the evidence.

At the Hearing, Mr Boushel provided further recommended changes to the mitigation measures, including in relation to noise monitoring, further consultation, sourcing local workers for employment opportunities and improvements to the complaints management system. These were generally accepted by the Proponents.

As noted, Mr Boushel gave evidence about intangible social impacts such as fear, psychological concerns and the perceived threat of safety and risk. He noted the concern about the Project in the community and the level of uncertainty about what is proposed. Mr Boushel indicated the mitigation measures would allay some of those fears, and noted these allow for discussion, access to monitoring information and inquiries. He said:

> During construction, this information will address some of the community's fears, however it is likely that many of these concerns will persist until the community can witness first hand the operation of the project and demonstration that the environmental and safety controls are sufficient [240].

Many submitters did not share that view. Ms Rosen built on this, as did the submissions of the CEG.

While Mornington Peninsula did not call social impact evidence, Ms Morris questioned Mr Boushel about the scope and operation of the community fund in the context of social disadvantage of Hastings and Crib Point. In that regard, Mr Boushel affirmed his opinion the operation of the fund should be in concert with Council and the community to ensure it realises defined community benefits.

Mornington Peninsula conceded the Project will provide employment opportunities, and said:

> The vast majority of these are, however, short term construction jobs. While the provision of extra employment is always a positive outcome, the temporary nature of the jobs means that they do not provide long term benefits with the build period being estimated at 18 – 24 months. In terms of ongoing employment, the Project will employ relative few people – in the order of 40 persons [241].

In relation to the community fund, the CEG submitted there could be no certainty that the proposed community fund:

> a. is sufficient to provide for those works and measures required to mitigate social impacts, both in the context of the EES SIA not identifying what those social impacts will be, and in the context of not knowing what is to be provided to mitigate them;
>
> b. is to be managed and disbursed in a manner which will achieve effective mitigation [242].

240 D82, paragraph 113
241 D426, paragraph 75h
242 D426, paragraph 228

16.5.3 Discussion

The IAC agrees with the Proponents and most submitters that the operational phase of the GIJW is the most contentious aspect of the Project in terms of social impacts. In relation to the EPRs, the IAC considers that while they may go some way to assist in mitigation, they would not mitigate the social and other impacts of the Project in a manner that can resolve all concerns.

The IAC deals with each of the mitigation measures in turn.

(i) Consultation for information and inquiries

This EPR was amended in response to the evidence of Mr Boushel and the IAC is comfortable with the revised version.

(ii) Sourcing local workers

While the original EPR noted local workers will be sourced for employment, Mornington Peninsula and the CEG, amongst others, considered the EPR to be too vague. Both suggested expanding it to be clear there will be a specific plan to procure such workers, and that workers could be drawn from the whole Shire, rather than the loosely defined 'local' area.

While the IAC supports that change, it considers the final sentence relating to reporting back *'… via one of the reporting mechanisms already proposed for the Project'* to be vague. The IAC recommends this be amended to be more specific and read '*Provide a status report on the employment of local workers to Council and in the Stakeholder Engagement Management Strategy on an annual basis for the construction phase of the Project and then annually for its first five years of operation'*.

(iii) Community fund

As part of its RFI, the IAC directed the Proponents to provide further information to explain how the proposed community fund would be realised and how consultation with landowners proximate to the Jetty works was undertaken. These were addressed through the evidence of Mr Boushel in TN8 and TN14.

There was significant discussion about this fund and how it would operate. While Council and others supported the fund if the Project proceeded, there were differing opinions about how it should operate. The Proponents advised that:

> In addition, AGL has made a commitment to a Community Fund of $7.5 million to be managed by a panel of community-based representatives if the Project proceeds. The fund would be established as a mechanism for sharing some of the benefits of the Project with the local community, particularly the townships of Crib Point and Hastings.[243]

Three key issues need to be resolved here. Firstly, the figure of $7.5 million does not appear in the EPR, secondly, there is no guidance about the timing of this and thirdly, such a fund would require careful and inclusive management.

[243] EES Chapter 18, page 18-9

Taking the third point, most of the discussion relating to this fund at the Hearing was about its implementation. Some submitters suggested actioning of the fund could be likened to a 'bribe', but putting that to one side, many submitters suggested it could cause tension in the community if funds were allocated to particular organisations or groups. The Proponents were cognisant of that position and tried to work through it. However, the EPR leaves the issue wide open, and it relies on:

- identifying which community stakeholders should be involved in the allocation of fund decision making
- how it is to be managed
- what projects should be the recipients of funds.

The first and second issues relating to security of the fund and how it is to be expended are also unresolved. The Proponents agreed to funding an independent facilitator to help manage the fund, at its (the Proponents) expense.

The IAC recommends a number of changes to EPR SO05 that:

- the figure of $7.5 million is included in the EPR
- include relevant Council input (for example, this could be its community development team) as part of the decision making process for the fund
- determine that the fund should commence as soon as all permissions are granted to commence the construction works
- separate to the $7.5 million fund, the Proponents fund an independent facilitator to work with the Crib Point and Hastings communities to establish a Committee of Management to manage that fund
- the Committee of Management could then determine how the annual funds should be expended, assuming it will occur over a 5 to 10 year period (although that would be up to those managing it).

(iv) Stakeholder engagement and complaints management strategies

Should the Project proceed, these are good initiatives, and most are supported. One of the issues raised by the community (and by other communities for major projects) is the lack of clarity about who is responsible for such a strategy and for ensuring follow up. Stakeholder engagement is often tied in with complaints management and the IAC considers that a relevant heading and a hyperlink be included in the Stakeholder Engagement Management Strategy to ensure the complaints management system can be better accessed. The complaints management system is a key component of the overall stakeholder management strategy. The IAC has recommended changes to the EPR accordingly.

Further, the EPRs should be renumbered from SO01 to SO05 as follows:

- SO01 Consultative mechanisms for information and enquiries
- SO02 Consultation on recreational activity at Woolleys Beach
- SO03 Source local workers
- SO04 Community fund
- SO05 Stakeholder Engagement Management Strategy
- SO06 Complaints management system.

16.5.4 Findings

The IAC finds:

- If the Project proceeds, the EPRs should be amended and adopted as recommended in Appendix G.

16.5.5 Recommendations

The IAC recommends*:*

Environmental Performance Requirements

Include the following changes:

- **Consequential renumbering of the SO EPRs**
- **Revise EPR SO03 (Source local workers)**
- **Revise EPR SO04 (Community fund)**
- **Revise EPR SO05 (Stakeholder Engagement Management Strategy)**

These changes are included at Appendix G.

16.6 Social conclusions

The IAC concludes that:

- The social impacts are generally consistent with the draft evaluation objectives.
- The tangible social impacts can be acceptably mitigated but the intangible impacts less so.
- There are no social impacts that preclude the Project being approved.

17 Business

17.1 Introduction

Business effects were discussed in EES Chapter 19 and Technical Report N.

The relevant draft evaluation objective is:

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

The Business Impact Assessment (Technical Report N) covered the three directly affected municipalities (Mornington Peninsula, Casey and Cardinia) and the Western Port marine environment [244]. Within this broader area, the assessment largely focussed on Hastings and the associated commercial areas. It noted an earlier pipeline alignment through Hastings (along the Frankston-Flinders Road) had been shifted to the Stony Point rail corridor to minimise construction access issues for existing businesses.

The EES proposed two '*business*' mitigation measures (EPRs) relating to:

- implementing a stakeholder engagement management strategy
- realigning the pipeline alignment through Hastings along the Stony Point rail corridor.

The CEMP Appendix J included a control relating to sourcing local materials and labour, while Appendix D provided a complaint management process.

Table 15 lists the business evidence that was provided.

Table 15 Business evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr McNeill	Ethos Urban	Economics
Bass Coast	Mr Moore	EarthCheck	Tourism

Mr McNeill provided a supplementary report (D496) following his inspection of Hastings and Crib Point, in which he confirmed his initial evidence report.

17.2 Key issues

The key issues are:

- The business impacts resulting from the construction and operation of the Project.
- The employment impacts of the Project.
- The tourism impacts of the Project.

17.3 General business impacts

17.3.1 Background

EES Chapter 19 and Technical Report N assessed the potential impact on '*non-agricultural*' businesses. The assessment involved consultation with business stakeholders, together with

[244] Technical Report N, page 6

risk and impact assessments. It focussed on businesses within Hastings and construction impacts related to traffic, access and amenity issues. The assessment concluded the Project would satisfy the draft evaluation objective.

17.3.2 Evidence and submissions

Mornington Peninsula and Bass Coast acknowledged the Project would provide employment opportunities and agreed this would be a positive outcome. However, they noted the majority of these opportunities would be short term construction jobs and there will be few ongoing jobs. They submitted these employment opportunities did not outweigh the disbenefits of the Project.

Cardinia submitted Technical Report N should have assessed the possible impacts on businesses within the PML, particularly the impacts on agriculture.

Some submitters raised concerns about various amenity and access issues that might affect business operations during construction. Other submitters raised concerns about potential impacts on tourism and agricultural businesses (see Chapters 17.4 and 18). A number of organisations and businesses raised concerns about environmental damage within Western Port Bay and the possible impacts on commercial and recreational fishing. (see Chapter 4.3)

Some submitters supported the Project on the basis it would create employment opportunities and contribute to energy security.

The Proponents submitted the EES had adequately addressed business impacts, including agricultural and non-agricultural impacts. They submitted business impacts post-construction would be negligible and construction impacts on non-agricultural businesses would be minimal.

The Proponents highlighted the revised alignment through Hastings would minimise construction impacts on businesses.

They submitted the Project would bring employment and economic benefits to the local area, in addition to the contribution it would make to the State economy through the augmentation of Victoria's gas supply. The PHDA submitted the Port is a significant local employer and that this would increase if the Project proceeded.

The Proponents relied on peer review evidence of Mr McNeill who reviewed EES Chapter 19 and Technical Report N. Mr McNeill's assessment led him to conclude that:

- The Project is unlikely to cause adverse impacts of an unacceptable level during construction or operation.
- EES Chapter 19 and Technical Report N satisfactorily address business impacts.
- The Project includes various features (utilising the rail corridor through Hastings, the use of HDD, minimising the number of businesses impacted at any one time and regular stakeholder consultation) that will limit construction disturbance to an acceptable level.
- The underground pipeline (excluding the above ground MLV and PDF infrastructure) will have minimal operational impact.

Mr McNeill noted Technical Report N did not address regional tourism impacts or the positive business impacts associated with the construction and operation of the Project. He concluded the proposed mitigation measures were satisfactory.

17.3.3 Discussion

(i) Construction impacts

Business impacts during construction of the Project are likely to be more prevalent for the pipeline element, rather than the Jetty works, given the geographic extent of the pipeline and the likely disruption associated with laying the pipeline. This is particularly so where the pipeline route traverses commercial and other urban areas in and around Hastings.

In order to minimise these impacts, the Proponents proposed various mitigation measures, including:

- Shifting the pipeline route through Hastings from along the Frankston-Flinders Road to the Stony Point rail corridor in order to minimise access disruption to existing businesses (reflected in the exhibited pipeline route maps).
- Proposing a stakeholder engagement management strategy, including the participation of '*adjoining, affected landowners, businesses and other community groups*' (EPR-SO04).

Other relevant mitigation measures include:

- EPR-SO05 Complaints management system
- EPR-TP Stakeholder consultation on transport changes.

The IAC agrees the realigned route through Hastings will reduce business access issues and is satisfied that other business impacts can be managed through the recommended EPRs.

Business impacts associated with the GIJW will be more confined and will likely be limited to additional road traffic over the construction period. These impacts will not be significant and can be effectively managed through the recommended mitigation measures.

(ii) Operational impacts

Business impacts arising from the pipeline element of the Project will be minimal given that it largely underground. Above ground pipeline infrastructure, such as the MLVs and PDF, will have minimal impact given they are located in agricultural, rather than urban areas, and are of relatively small scale. Nevertheless, some submissions raised site specific pipeline issues (see Chapter 20).

In an overall sense, the operation of the CPRF and FSRU are expected to have minimal business impacts given their confined location and distance to commercial areas, however many submissions raised issues related to tourism, agricultural and fishery businesses.

Cardinia submitted the Business Impact Assessment should have considered the broader area within the PML rather than just the areas immediately adjacent to the pipeline. Land use impacts of the PML are discussed in Chapter 15, in which the IAC noted the area of impact is largely confined to the 50 metre notification area either side of the pipeline, rather than the broader PML.

(iii) Employment impacts

The Proponents advised the Project is expected to employ more than 500 workers at the peak of the construction phase, with the majority of the construction workforce being

specialists sourced from elsewhere in Victoria and interstate. They advised that the Project, when operational, would create 40 permanent positions at Crib Point, although the number was expected to be greater given the need for rotating shifts for some roles [245].

The Proponents proposed to develop '*a local procurement plan that focuses on Mornington Peninsula Shire, with targets for local employment and social procurement for the project and its contractors*' [246].

The IAC agrees with Mr McNeill these employment opportunities would be a positive business impact, and there will be opportunities to support local businesses. However, the IAC notes most jobs would be short term construction jobs and operational employment would not be significant.

17.3.4 Findings

The IAC finds:

- Business impacts during the construction and operation of the Project will be limited and can be appropriately managed.
- The Project will generate local employment and opportunities for local businesses, although this will be focussed on the Project's construction rather than its operation.

17.4 Tourism

17.4.1 Background

The only references to tourism in EES Chapter 19 and Technical Report N noted there are tourism developments in Mornington Peninsula and the Victorian Maritime Centre opposite the Crib Point Jetty is a tourist attraction. Technical Report L included some reference to tourism policies but did not provide a tourism impact assessment. This was despite the Scoping requirements specifically identifying the '*Potential for project works and operations to affect business (including farming and tourism) …*' as a key issue [247].

As many submitters noted, the coverage of tourism issues in the EES was inadequate.

The Proponents relied on the economic evidence of Mr McNeill who responded to tourism issues raised in submissions, but his assessment of possible tourism impacts was limited in scope and detail, and consequently not as helpful as a more thorough analysis as part of the EES might have been.

17.4.2 Evidence and submissions

Mornington Peninsula and Bass Coast expressed concerns about '*the lack of significant consideration given to potential regional tourism impacts*'.

Bass Coast relied on the evidence of Mr Moore who highlighted the significance of tourism, particularly nature-based tourism to the Phillip Island tourism region, including policy support at local, regional, State and Commonwealth levels. He noted the EES overlooked

245 EES Chapter 2, page 2-43
246 EPR-SO02
247 Scoping requirements for the Gas Import Jetty and Crib point to Pakenham Gas pipeline EES, page 17

potential impacts outside the Project area, including impacts within Bass Coast and Phillip Island.

Mr Moore identified two potential impact types associated with the Project:

- Reputational risk, particularly in terms of the region's status as a nature-based destination.
- Environmental damage that would directly harm the environmental assets on which tourism is based.

In relation to reputational risk, Mr Moore highlighted the impact of negative news cycles associated with the Project and possible impacts on tourism branding and positioning this might have. He cited recent environmental degradation of the Great Barrier Reef and resource development in northern Queensland as examples of how reputational damage can impact tourist visitation.

In relation to environmental damage, Mr Moore conceded that assessing the risk of environmental damage was outside his area of expertise but gave examples of where environmental accidents had impacted on tourism.

Mr Moore concluded the EES failed to adequately address possible tourism impacts, particularly within the broader region. In this context, he recommended that:

- The scope of the EES should have included Bass Coast Shire.
- The EES assessment should address regional tourism, including reputational risk and detrimental environmental impacts, including modelling and sentiment testing.

Other submitters, such as Save Westernport raised concerns about possible tourism impacts resulting from '*industrialisation*' of the region, particularly damage that might be done to the local tourism '*brand*', including the tourism values of the Mornington Peninsula, Phillip Island and French Island. The Mornington Peninsula Vignerons' Association Incorporated (S1479) and S23, for example, expressed concerns about possible negative impacts on the tourism, hospitality and wine industries on the Mornington Peninsula, while FICA (S3197) submitted the Project would harm the natural values that attract tourists to French Island. Other submissions expressed concerns about potential impacts on Phillip Island tourism.

The Proponents disputed Mr Moore's findings on the basis he had ignored the existing conditions of the Port, including the storage and shipping of hazardous materials since the 1970s. They submitted these activities had co-existed with the growth of regional tourism, including nature-based tourism, and noted the Phillip Island and San Remo Visitor Economy Strategy 2035: Growing Tourism 2016 did not mention the Port's existing function or identify as a tourism constraint or threat [248].

The Proponents submitted Mr Moore's concerns about '*reputational risk*' were '*speculative at best*' and all tourist areas have to manage such risks, including those in proximity to ports, airports and industry.

In relation to environmental damage, including oil spills from shipping, the Proponents agreed these impacts could be significant, but submitted they were a low probability. They

[248] Adopted by Bass Coast in August 2016 and prepared by EarthCheck Pty Ltd

noted that existing shipping movements (including cruise ships) represented a risk and that shipping numbers could increase significantly without any approvals being required and in addition to this project.

Mr McNeill supported the Business Impact Assessment in the EES, although he agreed it did not address the broader regional tourism issues raised by Bass Coast and others. He acknowledged the significant contribution tourism makes to the local and regional economies and agreed with Mr Moore's observations about this. Mr McNeill's review of the Business Impact Assessment and potential tourism impacts led him to note that:

- Potential impacts are likely to be restricted to the Gas Import Jetty works area. As much of the Gas Pipeline will be located underground, the impact on regional tourism can be expected to be negligible.
- The Port of Hastings is an established and operational port facility, and the Crib Point Jetty is presently used by other vessels on a regular basis. The port's existing and future function is supported in local and state policy.
- The majority of tourism activity on the Mornington Peninsula is located some distance from the Gas Import Jetty works area.
- In terms of the potential for landscape and visual impacts, I refer to Chapter 14 of the EES (Landscape and visual) and Technical Report I: Landscape and visual) Assessment, the risk assessment contained therein, and the proposed mitigation measures [249].

On the basis of this assessment, Mr McNeill did not support the further work recommended by Mr Moore and concluded that the Project is '*unlikely to result in a material risk to the regional visitor economy*'.

17.4.3 Discussion

Mr Moore's concerns about '*reputational risk*' were focussed on negative perceptions of the Project, particularly through negative news coverage and broader concerns about the environmental impacts that many submitters anticipated. These concerns were largely focussed on operation of the FSRU and to a lesser extent the additional shipping movements associated with the LNG carriers. The pipeline works were not specifically raised as a tourism concern.

The IAC agrees reputational risk is a relevant consideration and acknowledges the Project has received significant negative media coverage and is opposed by many in the community. However, it believes the likely or potential impacts on the region's tourism reputation or brand have been overstated by some submitters.

Firstly, the Crib Point element of the Project (including the FSRU and additional shipping) is broadly consistent with the function and reasonable expectations about the operation of a State significant port that has a 40 year history as a hub for importing, exporting and storing fuel. In light of this, it seems unlikely that people's perceptions of the Port and its influence on tourism will change markedly if the Project proceeds. As the Proponent's noted, the existence of the Port does not seem to have been a constraint on regional tourism in the past and there is no clear basis on which to expect this would change significantly in the future.

249 D78

Secondly, the IAC was not presented with any empirical or survey evidence that negative media reporting or public perceptions of the Project had or would influence travel or holiday preferences or had diminished the region's tourism reputation. Although Mr Moore cited examples of other areas where tourism visitation might have decreased in response to environmental issues, it is not clear they are directly relevant or comparable to this Project.

Mr Moore's second area of concern related to the tourism consequences of potential environmental damage, particularly significant events such as large scale oil spills. This is an understandable concern shared by many and noted by the Proponents. Their view was that while the consequences of such an event could be significant, the probability was low. They noted that many of these risks currently existed given the existing ship movements in the Port and nature of the cargo that many ships carried.

In assessing this issue, the IAC had regard to the EES safety, hazard and risk assessment and the relevant evidence as discussed in Chapter 14 [250]. The IAC had regard to the operational elements of the Project, particularly the FSRU, and their potential environmental impacts.

On balance, the IAC is satisfied the risks of a significant environmental event are limited and notes many of these risks already exist because of the nature and operation of the Port.

Submitters raised concerns about the visual and landscape impacts of the FSRU and additional shipping in the tourism context. As discussed in Chapter 12, the IAC acknowledges the FSRU will be a visible element of the local landscape, particularly at night time, and from some viewpoints. However, the IAC does not believe it will become a dominant feature as feared by some or that its visibility will have any discernible impact on tourism. Similarly, the IAC does not consider the additional shipping movements would be problematic given the increase would be relatively minor and shipping numbers could increase (or decrease) regardless of the Project. It is not clear that ships in a port, including the cruise ships that anchor off Cowes, are universally viewed as a poor landscape or tourism outcome.

17.4.4 Findings

The IAC finds:

- Tourism, including nature-based tourism, is a significant contributor to the local and regional economies.
- The EES had inadequate regard to possible impacts on local and regional tourism.
- The construction and operation of the Project are not expected to have discernible impacts on local and regional tourism, including nature-based tourism.
- Environmental accidents, such as large scale oil spills, would have significant tourism impacts but have a low probability of occurring.

17.5 Business conclusions

The IAC concludes that:

- Business impacts are consistent with the draft evaluation objective.

[250] EES Chapter 16 and Technical Report K

- Business impacts can be acceptably managed through the recommended mitigation measures.
- There are no business impacts that preclude the Project being approved.

18 Agriculture

18.1 Introduction

Agriculture effects were discussed in EES Chapter 20 and Technical Report O. Additional material was provided in TN04, TN11 and TN17.

The consideration of agriculture impacts was focussed on the proposed pipeline construction and operation. The GIJW would not impact on agricultural land. Other chapters relevant to agricultural impacts include Chapter 17 Business with respect to agricultural business activity and Chapter 21 Pipeline route options and site specific submissions.

The relevant draft evaluation objective is:

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

No evidence specific to agriculture was presented to the IAC. Table 17 lists evidence that has some relevance to agriculture.

Table 16 Agriculture related evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr McNeill	Ethos Urban	Economics
Proponents	Mr McBride-Burgess	Contour	Pipeline Planning

18.2 Key issue

The key issue is:

- The potential loss and disruption of agricultural land and production.

18.3 Loss and disruption of agricultural land and production

18.3.1 Background

The EES described the pipeline alignment as affecting approximately 173 hectares of agricultural land within Melbourne's inner food bowl between Crib Point and Pakenham [251]. Along the pipeline alignment, there is a mixture of land uses predominantly agriculture for grazing, beef, dairying, cropping and equine uses. There are some capital-intensive enterprises such as broiler production based in sheds.

There are three different soil associations along the pipeline alignment:

- Bittern Association
- Dalmore Heavy Clay Association
- Narre Association [252].

[251] The inner food bowl is part of the peri-urban land area surrounding metropolitan Melbourne and contributes to fruit and vegetable production.

[252] Refer to Figure 20-1 in Chapter 20, Volume 2 of the EES.

Each soil association supports various agricultural activities along the pipeline alignment and has significantly different profile textures, nutrient status and drainage characteristics requiring specific treatment methods during rehabilitation of soil disturbance.

North of the South Gippsland Highway, the pipeline alignment traverses the Koo Wee Rup-Longwarry Flood Protection District. This area is recognised in both the Casey and Cardinia Planning Schemes as highly productive agricultural land. Intensive cropping occurs within this area, including asparagus growing. The pipeline alignment has attempted to avoid the intensive higher-value vegetable growing areas, although some areas are affected.

The EES identified the following agricultural issues associated with the construction and operation of the pipeline:

- temporary removal of agricultural land from production
- restricted access to land
- loss of production from disturbance (such as dust or noise)
- facilities and capital improvements loss
- drainage and irrigation impacts
- biosecurity
- adequacy of rehabilitation.

The EES indicated the pipeline alignment has been progressively refined resulting in a reduced footprint affecting approximately 118 hectares of agricultural land, including 2.79 hectares of intensively higher-value agricultural land. The former represents 0.03 per cent of Melbourne's inner food bowl and the latter represents 0.06 per cent of land identified for seasonal vegetable production in the inner food bowl.

The EES described that temporary removal of agricultural land from production or restriction on access due to construction would be minimised through the selection of a pipeline alignment that avoided intensive higher-value agricultural land and minimised diagonal passage through landholdings. Where possible, the construction ROW would follow roadways, drainage reserves, existing easements and property boundaries. Where impacts are unavoidable, the EES outlined that compensation for the pipeline easement would address any temporary removal of agricultural land from production or restriction of access where direct losses were caused by the pipeline. Compensation would be agreed and paid directly to affected landholders under the *Pipelines Act* and *Land Acquisition and Compensation Act* as appropriate.

18.3.2 Evidence and submissions

Casey and Cardinia raised concerns regarding disruption to farming activity, additional costs to farmers due to interruption of access to farms where the pipeline would cross properties and lack of consideration to impacts on farming diversification or future changes to farming practices. Most of these concerns were based on construction and operation of the pipeline where it diagonally crosses farm paddocks.

Other submitters such as S1303, S1305 and S1309 and S3777 expressed concerns over easement acquisition and compensation processes.

The Proponents submitted these impacts have been minimised through careful alignment of the pipeline. They considered this has largely occurred through locating the pipeline within or adjacent to existing pipeline corridors and along property boundaries or in road reserves.

Direct impacts would be mitigated by compensation and through property management plans developed in consultation with landowners and occupiers.

The Proponents submitted in instances where properties have been diagonally crossed, benefits from a shorter construction time with less disturbance and less noise, dust and restrictions on access would be achieved.

In response to concerns over potential restrictions to current farming activity and future changes to farming practices such as infrastructure construction or introduction of cropping activity, the Proponents considered the Project would not have significant effects. They referred to Technical Report O and the evidence of Mr McNeill and Mr McBride-Burgess, suggesting the pipeline crossing of agricultural land has little impact on ongoing agricultural viability for current or future farmers. Grazing activities and cropping activity, which usually occurs to a depth of 0.3 metres would continue without restriction.

Technical Report O concluded that provided soil reinstatement is appropriately undertaken, no ongoing loss of production is expected to occur. The report acknowledged, however, that future agricultural uses may be impacted by restrictions on what can occur over the pipeline easement. A line of sight is required to be maintained between pipeline markers which would mean structures that restrict these sight lines would not be allowed. Further, tree roots and heavy items can damage the pipeline and the landowners would need to maintain access to the easement for maintenance and operational purposes.

Future changes to farming operations could be restricted where deep cultivation is proposed. Deep cultivation is typically defined as digging to a depth greater than 0.5 metres and would only apply to specialised crops or instances where it was considered necessary to mechanically dig to a greater than normal depth. Technical Report O and the Proponents recognised cultivation within the pipeline easement to a depth of 0.9 metres can typically continue to take place under the supervision of the pipeline operator. Fences, minor tracks and shallow drains are generally permitted to be constructed on the pipeline easement and are consistent with the continued use of land for agricultural purposes. Again, restrictions on constructing structures within the easement that may limit future expansion of farming operations would be subject to the compensation process.

18.3.3 Discussion

The IAC acknowledges that having farming land dug up for laying a pipeline across or along a paddock would be a concern to landowners and would disrupt farming activity, albeit on a temporary basis. The IAC notes the EES did not attract many submissions from affected farmers about pipeline issues, suggesting any concerns were not overly significant or consultation had satisfactorily addressed issues.

In addition to concerns expressed in submissions, the IAC understands there are biosecurity risks of transmission of pathogens and weeds from one property to the next by construction machinery and the inconvenience of a farmer having to wait until works are completed to get back to running the whole of their farm. There is concern about whether the land will be as productive post-construction and the effectiveness of reinstatement of the soil.

Another issue relates to landowners having a restrictions placed on their land with the pipeline easement and potential frustration in having to seek permission to construct buildings, works or to use the land affected by the easement and liaise with the pipeline operator.

Despite concerns about the impacts to agriculture from construction and operation of the pipeline, the IAC is satisfied they will not be overwhelming to the detriment of being able to continue to farm.

Impacts will not be ongoing or long term as the works will be temporary and of a short duration. The IAC agrees landowner agreements will be important to ensure appropriate arrangements can be temporarily put in place to minimise the extent of disruption and loss of productivity. This includes provision of alternative access arrangements to manage or exclude stock during construction.

There will be paddocks that are crossed diagonally because of the nature of linear construction associated with laying a pipeline. It may be that in balancing competing matters and policy issues, the alignment of the pipeline will need to run through farmland due to the importance of avoiding or minimising environmental impacts from removal of native vegetation or threatened species habitat. It may not always be possible to run the alignment along property or paddock boundaries or within road reserves as these often contain infrastructure and areas of both native vegetation and planted vegetation needed for biodiversity and farming sustainability. The IAC sees value in the Proponents continuing to work with landowners to achieve this balance.

Further landowner-specific biosecurity control measures to mitigate the movement of soil and plant materials between properties and in particular for cropping areas and broiler farms will require ongoing liaison.

The IAC considers an important mitigation measure will be soil reinstatement and rehabilitation following pipeline construction to ensure that soil productivity can be adequately reinstated, and ongoing impacts avoided and minimised.

Appendix C in Technical Report O of the EES includes useful guidance on excavation and soil reinstatement that recognises that although the three soil associations along the pipeline alignment will be subject to common excavation practices, reinstatement will need to be tailored to each soil association.

The IAC notes the soil separation, topsoil retention and reinstatement works, and post-construction monitoring described in TN11 as appropriate with regards to the POS. However, the IAC considers the recommended Part 'b' of the exhibited mitigation measure MM-RH01 from the EES relating to '*a specific rehabilitation method for each soil association based on soil testing of the different soil associations to determine their nutrient and physical characteristics'* should be included in POS R2.

18.3.4 Findings

The IAC finds:

- The impacts on agriculture would not be significant, subject to ongoing collaboration and liaison with landholders.
- The impacts on agriculture are acceptable subject to the recommended CEMP and POS and subject to amending POS R2 to include reference to a specific rehabilitation method for each soil association.

18.3.5 Recommendations

The IAC recommends:

Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)

Include the following changes:

- **Revised R2:**

  Reinstate stockpiled topsoil and sub soils to depths consistent with the original soil horizons.

  Reinstate soils using a specific rehabilitation method for each soil association as agreed with the landholder, based on soil testing of the different soil associations to determine their nutrient and physical characteristics.

  Inspect imported fill before use for insect pests and weeds.

18.4 Agriculture conclusions

The IAC concludes that:

- Agriculture impacts are consistent with the draft evaluation objective.
- Agriculture Impacts can be acceptably managed through the recommended mitigation measures.
- There are no agriculture impacts that preclude the Project being approved.

19 Heritage

19.1 Introduction

Heritage effects were discussed in EES Chapters 21 and 22, and Technical Reports P and Q. Additional material was provided in TN23.

The relevant draft evaluation objective is:

> **Cultural heritage** - To avoid or minimise adverse effects on Aboriginal and historic cultural heritage.

Table 18 lists the heritage evidence that was provided.

Table 17 Heritage evidence

Party	Expert	Firm	Area of expertise
Proponents	Ms Nicholson	Ecology and Heritage Partners Pty Ltd	Heritage
BLCAC	Mr Ogden	BLCAC	Aboriginal cultural heritage
BLCAC	Dr Tutchener	BLCAC	Aboriginal cultural heritage
BLCAC	Mr Ward	BLCAC	Aboriginal cultural heritage

There are specific EPRs and Pipeline CEMP POS in relation to Aboriginal cultural heritage and historic cultural heritage.

19.2 Key issues

The key issues are:

- The adequacy of Technical Report P and lack of draft or approved Cultural Heritage Management Plan (CHMP)s.
- The extent to which the assessment of Aboriginal cultural heritage impacts has had regard to intangible heritage and the broader geographic area where impacts might occur.
- The adequacy of consultation mechanisms to advance the CHMPs that involve the BLCAC and Aboriginal Victoria in the design and construction of the Project.

19.3 Aboriginal cultural heritage

19.3.1 Background

Three CHMPs are being prepared for the Project in accordance with section 49 of the *Aboriginal Heritage Act*. This Act requires where an EES is required, the proponent must, before commencing the works, prepare a CHMP for the area in which the works are to be carried out. The CHMPs will be the principal mechanisms for achieving compliance with the cultural heritage draft evaluation objective.

The EES included a range of mitigation measures, expressed as EPRs and CEMP controls, relating to implementing the CHMPs, various construction and salvage requirements and consultation.

Table 18 Cultural Heritage Management Plans

CHMP	Area	Registered Aboriginal Party (RAP)	Sponsor	Assessment level
15383	Pipeline works Crib Point to Tooradin	BLCAC	APA Transmission Pty Ltd	Complex
15384	Pipeline works Tooradin to Pakenham	No RAP Aboriginal Victoria is the evaluating body	APA Transmission Pty Ltd	Complex
16300	GIJW Crib Point Jetty	BLCAC	AGL Wholesale Gas Limited	Desktop

The CHMPs have not been finalised, although draft CHMPs are in the process of being prepared. The BLCAC indicated that CHMPs 15383 and 16300 were not yet at the draft stage and did not believe that they should be provided to the IAC[253]. In recognition of this, the IAC did not request copies of draft or associated CHMP documentation.

In response to questions from the IAC about the CHMP approval process and its relationship with the EES, the Proponents advised that:

- CHMPs 16300 and 15383 could be approved by the Registered Aboriginal Party (RAP) (BLCAC) before the EES is assessed by the Minister.
- Aboriginal Victoria cannot make a decision in relation to the approval of CHMP 15384 until after it has considered the Minister for Planning's assessment of the EES [254].

The Proponents advised their intention would be to progress all three CHMPs in parallel with the EES process, to the point where they can be approved upon release of the Minister's assessment.

19.3.2 Evidence and submissions

The BLCAC relied on the evidence of its three experts and submitted:

- The archaeological assessments relied on in the EES contain numerous errors and are incomplete.
- The assessments are focussed on tangible cultural heritage and have little regard to intangible cultural heritage.
- Western Port Bay is culturally important to the Bunurong people.

Mr Ogden gave evidence about what the Project area and the surrounding land and waters mean to Bunurong people and whether there are particular cultural heritage risks or issues that arise from the Project.

Mr Ogden concluded the cultural heritage assessments that would underpin the CHMPs were incomplete, they require further work and are too focused on a narrow understanding of heritage. He recommended:

253 TN23
254 D404

- The assessment of impacts on Bunurong cultural heritage must be properly completed.
- The assessment should include tangible and intangible places.
- The assessment should consider broader cultural heritage impacts, including how Bunurong people understand their lands and waters.

Mr Ogden agreed these recommendations could be achieved through further investigations and consultation with the BLCAC.

Dr Tutchener gave evidence about the ethnocultural record of the Bunurong and their use and occupation of land and waters in the vicinity of the Project, including Western Port Bay and French Island. He discussed issues and deficiencies associated with the EES, including Technical Report P.

Dr Tutchener noted analysis of tangible heritage was yet to be completed and recommended there be further analysis of potential impacts to intangible heritage before the CHMPs are approved. He noted this analysis would inform an appropriate risk assessment and could be achieved through further consultation with the BLCAC.

Mr Ward gave evidence about:

- Sites and places in the broader area of the Project and the antiquity of those places.
- The sites and places are currently identified within the pipeline alignment and/or Project area.
- The adequacy of assessment undertaken in support of the EES, particularly Technical Report P.
- Particular risks or sites at risk.

Mr Ward advised the background information in support of Technical Report P was incomplete and the assessment should have considered the broader Western Port Bay area, including further consideration of potential impacts on coastal sites through coastal erosion. He believed consultation with the BLCAC about proposed management conditions had been inadequate.

Mr Ward provided advice on various sites that had not been discussed or had been inadequately addressed in Technical Report P and recommended:

- The Proponents have further discussions with the BLCAC about cultural heritage management conditions and the cultural significance of Aboriginal places.
- There be further assessment of potential risks to coastal sites in Western Port Bay.
- The assessment of potential risks to cultural heritage be deferred until the complex assessment has been completed for CHMP 15383, including any additional assessment required for any changes to the current project activity area.

The BLCAC expressed concern the assessment of cultural values had not been finalised, although it noted discussions with the Proponents were continuing. It submitted it would be difficult for the IAC to reach any meaningful conclusions about the Project and the associated Aboriginal cultural heritage issues while critical work remains to be done.

The BLCAC concluded:

> … the entire broader Westernport region is highly significant, and the project ought to be seen in this light. Historically important as the place of their ancestors – it remains

> totemic and vital to Bunurong people today. The project must abide by the interests held by traditional Owners, listen to them – and understand how this project impacts on both the past, and the future – as well as the present [255].

Concerns about possible impacts on Aboriginal cultural heritage, including intangible heritage, and the lack of approved CHMPs were recurring themes in many submissions, including those from community groups such as Save Westernport. Individual submitters also raised these issues, including S487 who made a confidential submission focused on matters particular to Bunwurrang/Bunurong women. She submitted:

- the cultural assessment was incomplete
- the significance of the symbolic mother whale and her relationship with the Bay was not properly recognised
- the spirituality of Western Port has been overlooked
- the Project will have a detrimental impact on marine life that will result in environmental degradation
- the overall management plan does not take into account important intangible heritage considerations.

The submitter spoke eloquently about the importance of ensuring that traditional history and indigenous stories are not lost in the considerations of the Project by the IAC.

The Proponents acknowledged the concerns raised by the BLCAC and others. They submitted that '*extensive further consultation*' will be necessary in order to finalise the CHMPs and that intangible heritage can be dealt with through that process [256].

The Proponents relied on Ms Nicholson's evidence that outlined the CHMP process, the investigations that had been undertaken for the three CHMPs and the proposed mitigation measures, including the heritage places that would be impacted. Ms Nicholson was generally satisfied the proposed mitigation measures were appropriate but acknowledged the concerns raised by the BLCAC about intangible heritage. She agreed further consultation about intangible heritage was required and supported the establishment of a '*whole of project working group*' that would incorporate input from the Traditional Owners.

The Proponents advised they had established a '*working group*' with the BLCAC during the EES exhibition, which is focussed on:

- creating a relationship with the BLCAC
- understanding tangible and intangible impacts, including impacts on Western Port Bay
- developing appropriate mitigation measures [257].

In this context, the Proponents supported Ms Nicholson's recommendation that a working group be established to advance the CHMPs and proposed that a new '*construction*' EPR-AH03 be included in the EPRs:

> **Project Working Group**
>
> Develop a project working group that incorporates input from stakeholders relevant to CHMP 15383, 15384, 16300 including the Traditional Owners and Aboriginal Victoria.

255 D559
256 D589
257 D589

They proposed the Pipeline Works control (Consultation Plan, Appendix B – Stakeholder Engagement Matrix) includes a new '*desired outcome*':

> Coordinated consultation for the cultural heritage management plans for the Pipeline Works and for Cultural Heritage Management Plan 16300.

In relation to intangible heritage, the Proponents acknowledged it is defined in the *Aboriginal Heritage Act* and a CHMP can make provision for it. They noted Ms Nicholson's observation that although CHMPs are typically confined to tangible heritage, there has been a more recent move to acknowledge and address intangible heritage. The Proponents agreed the CHMPs should address intangible heritage in consultation with the BLCAC and submitted this could be achieved through the consultation processes that were in place and recommended. They submitted the IAC should be satisfied that the work done to date, together with the processes for further consultation and assessment, were adequate for it to conclude that the draft evaluation objective would be met. Ms Nicholson expressed a similar view.

Finally, the Proponents noted that Aboriginal place VAHR 7921-1752 (between Bungower Road and Watson Creek) was not included in Technical Report P. They indicated this had been an oversight resulting from a change to the pipeline alignment, but it had been considered and investigated, including test pits excavated in March 2020. They undertook to discuss this and other fieldwork issues with the BLCAC and to include appropriate references in the CHMP.

19.3.3 Discussion

(i) CHMP approval

Submitters expressed concern the CHMPs had not been approved or draft CHMPs had not been available as part of the EES exhibition. While the IAC understands those concerns, it acknowledges the process for their approval is governed by the *Aboriginal Heritage Act.* The Proponents indicated its intention and willingness to progress the three CHMPs to a point where they can all be approved on release of the Minister's assessment. While the EES process might have been better served if the CHMPs had been further advanced, particularly during the EES exhibition, this is not fatal to the IAC's assessment.

The key issue for the IAC is whether it can be satisfied the evaluation objective '*To avoid or minimise adverse effects on Aboriginal and historic cultural heritage*' is able to be met. Although the absence of approved or agreed CHMPs complicates this assessment, the IAC is satisfied processes are in place to advance the CHMPs. It is not aware of any impediments or factors that would lead it conclude that CHMPs could not be agreed with the BLCAC and Aboriginal Victoria in the future. The IAC recognises the Project cannot proceed without the necessary CHMPs being approved.

In forming these views, the IAC notes the BLCAC submissions and evidence (in relation to CHMPs 16300 and 15383) did not explicitly oppose the Project. Instead, they highlighted the inadequacy of the cultural heritage assessments undertaken to date and provided guidance about further work needed. These concerns focussed on the inadequate recognition of intangible cultural heritage and the need for a broader definition of the potential impact area, including the broader Western Port Bay area. The Proponents acknowledged these concerns, agreed that further assessments are required and recommended additional consultation requirements to advance the CHMPs.

While the IAC accepts that resolving concerns about intangible cultural heritage and the extent of the impact area will be challenging, it is satisfied the need to address these issues is understood by Proponents and processes are in place to provide a framework for this to occur. As Ms Nicholson noted in response to questions from the IAC, broader issues about intangible cultural heritage have not typically been the subject of CHMPs but have become more prevalent in recent times.

In relation to CHMP 15384, Aboriginal Victoria is the evaluating body in the absence of a Registered Aboriginal Party. Although Aboriginal Victoria did not make a submission to the IAC, it cannot approve the CHMP until it has considered the Minister's assessment of the EES. Nevertheless, it will be subject to any relevant consultation requirements if approved.

On the basis of the material before it, the IAC is satisfied the evaluation objective can be met, although it acknowledges further work remains to be completed in order to inform the CHMPs.

(ii) Implementing approved CHMPs

The POS and EPRs include general requirements relating to implementing and complying with approved CHMPs, as well as more specific technical requirements. While the general requirements are relevant to implementing approved CHMPs, the technical requirements are more focussed on matters of detail that might be included in the CHMPs. For this reason, they should be reviewed in order to identify and address any potential inconsistencies with the detail in the approved CHMPs. This is included as a specific recommendation.

(iii) Consultation mechanisms

As noted earlier, the Proponents proposed additional consultation requirements in the EPRs and the Pipeline Works control (Consultation Plan, Appendix B – Stakeholder Engagement Matrix). The IAC supports these additions and has expanded the application of EPR AH03 so that it applies to the '*design*' phase of the Project as well as the '*construction*' phase. This will provide for earlier input from the BLCAC.

(iv) References to Aboriginal places

The submissions from the BLCAC raised concerns about the accuracy with which various Aboriginal places had been recorded in Technical Report P, including VAHR 7921-1752.

The Proponents indicated the accuracy of this material would be reviewed with the BLCAC and correct references would be included in the CHMPs.

The IAC supports this and has addressed it in a specific recommendation.

19.3.4 Findings

The IAC finds:

- 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.
- The recommended consultation processes will provide a suitable framework for advancing the CHMPs.

19.3.5 Recommendations

The IAC recommends:

Environmental Performance Requirements

Include the following change:

- **Revised EPR AH03 (Project Working Group)**

This change is included at Appendix G.

Other recommendations

Review and update CEMP Attachment J (Performance Objectives and Standards), EPRs and other relevant approvals to include any necessary changes needed to implement the three CHMPs when approved.

Review the documentation of Aboriginal places in Technical Report P in conjunction with the BLCAC and Aboriginal Victoria (for the relevant CHMPs) and update the relevant CHMPs where appropriate.

19.4 Historic cultural heritage

19.4.1 Background

Technical Report Q identified 22 historic sites within the vicinity of the Project and provides risk and impact assessments for each site. It concluded two sites could be potentially impacted by the Project:

- Denham Road Farmhouse, 28 Bayview Road Hastings (Victorian Heritage Inventory H7921-0119).
- The former BP refinery Administration Building (Victorian Maritime Centre), 220 – 350 The Esplanade Crib Point (Victorian Heritage Register H1016 and Mornington Peninsula Heritage Overlay HO324).

It recommended site specific mitigation measures for these sites as well as a general mitigation measure (Unexpected cultural heritage finds procedure).

These have been translated into:

- EPR-HHO2 - Unexpected cultural heritage finds procedure.
- CEMP Attachment J, HH3 – Unexpected finds procedure.
- EPR-HHO3 - Condition surveys and monitoring (former BP refinery administration building H1016).
- CEMP Attachment J, HH1 - Condition surveys and monitoring (former BP refinery administration building H1016).
- CEMP Attachment J, HH2 - Horizontal directional drilling (Denham Road Farmhouse, VHI site H7921-0119).

19.4.2 Evidence and submissions

There were few submissions and no specific evidence in relation to historic cultural heritage, however some submissions referred to specific sites such as the Tyabb Waterholes and queried whether the EES heritage assessments were adequate.

19.4.3 Discussion

The IAC is satisfied the EES (Technical Report Q) provided a comprehensive overview of sites within the Project area and the risk and impact assessments of those sites are appropriate. In particular, the IAC supports the proposed '*Unexpected cultural heritage finds procedure*' and the specific mitigation measures in relation to the Denham Road Farmhouse (including the proposed use of HDD to protect the site) and the former BP refinery administration building (including the condition surveys and monitoring).

Although some submissions raised concerns about other sites, these concerns were not supported by specific evidence that would justify different risk or impact assessments. In relation to the Tyabb waterholes, the IAC notes they are heavily modified and some distance from the pipeline route. It is not expected there will be any impact on that site.

In the absence of any specific evidence to the contrary, the IAC is satisfied the Project is consistent with the draft evaluation objective and will avoid or minimise adverse impacts on historic cultural heritage.

Finally, the IAC believes that CEMP Attachment J (POS), HH3 – '*Unexpected finds procedure*' should be titled '*Unexpected cultural heritage finds procedure*' to be consistent with the corresponding EPR and to better explain its purpose.

19.4.4 Findings

The IAC finds:

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

19.4.5 Recommendation

The IAC recommends:

<u>Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)</u>

Include the following change:

- **Rename HH3 to 'Unexpected cultural heritage finds procedure'.**

19.5 Heritage conclusions

The IAC concludes that:

- Aboriginal cultural heritage impacts will require further assessment through the preparation and approval of the three CHMPs.
- Historic cultural heritage impacts are consistent with the draft evaluation objective.
- Historic cultural heritage impacts can be acceptably managed through the recommended mitigation measures.
- There are no historic cultural heritage impacts that preclude the Project being approved.

20 Pipeline route options/site specific submissions

20.1 Pipeline route options

20.1.1 Introduction

The pipeline element of the Project includes sections of pipeline where alternative alignments have been documented in EES Attachment VII (Map Book) and discussed in EES Chapter 4 (Project description). They are described as '*pipeline options*' and are generally within the same parcel of land. They are intended to provide some flexibility to address specific landowner requirements, while meeting the pipeline alignment criteria.

These alternative alignments were the subject of submissions from Casey and Cardinia, while some landowners raised site specific pipeline issues.

The relevant draft evaluation objective is:

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

Table 19 lists the pipeline options evidence that was provided.

Table 19 Pipeline options evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr McBride-Burgess	Contour	Town planning
Proponents	Mr McNeill	Ethos Urban	Economics

The pipeline options are shown in EES Attachment VII (Map book) and include:

- Option BB-10 (Mapsheets 9 and 10)
- Option BG-11 (Mapsheet 9)
- Option AN-9 (Mapsheet 14)
- Option AM-9 (Mapsheet 15)
- Option AE-8 (Mapsheet 16)
- Option Z-8 (Mapsheets 16 and 17)
- Option AU-9 (Mapsheet 17)
- Option D-8 (Mapsheets 17 and 18)
- Option AT-9 (Mapsheet 18)
- Option BE-10 (Mapsheet 18)
- Option AO-9 (Mapsheets 19 and 20)
- Option AG-8 (Mapsheet 20).

The Proponents' preferred alignments typically cross properties diagonally, while the options follow property or other defined boundaries.

A further option (BH-11) is being considered by the Proponents following further consultation with the landowner [258]. This option would realign the pipeline closer to the affected property boundary than shown in the EES (Mapsheet 19).

[258] EES Alignment Option Information, CPT107 Boundary alignment option, 18 August 2020

Changes to the Reid Parade/Warringine Park HDD arrangements (BJ-11) are being considered by the Proponents in response to a conservation covenant and discussions with the Trust for Nature [259]. Alignment change BJ-11 is specifically addressed in Chapter 5.3 relating to vegetation issues and Warringine Park.

20.1.2 Key issues

The key issues are:

- The merits of the EES pipeline options and how they should be assessed.
- The relative impacts of diagonal and boundary alignments on agricultural productivity and viability.

20.1.3 Evidence and submissions

The Proponents outlined the pipeline route selection criteria, including APA's preference for the shortest pipeline route, and advised the preferred alignment will primarily be resolved through land access negotiations with landowners. Where a landowner has identified an alignment preference (e.g. a boundary alignment), that alignment has been agreed with APA where reasonable and practicable. The IAC understands the Map Book reflects the alignments preferred by the Proponents and areas identified as pipeline options are still being discussed with landowners.

Casey submitted the pipeline route through its municipality passes through a '*highly productive agricultural area*' (the Western Port Green Wedge) that has '*a range of versatile soil types, access to water, close proximity to ports, airports, markets and a workforce*'. Casey noted for most of its length, the pipeline would be '*within existing easements, close to property boundaries and in road reserves*', however, it would dissect nine large agricultural properties and potentially reduce agricultural capacity by:

- reducing access and the amount of available land during construction
- prohibiting the construction of some farming structures and infrastructure
- limiting the depth to which land can be cultivated
- requiring the regulation and supervision of farming activities that would otherwise be permitted.

The Proponents advised that of the nine properties raised by Casey and affected by diagonal crossings, two followed an existing easement, one was aligned along a boundary, and the other six were under discussion with the relevant landowner.

Casey concluded the benefit of the pipeline is uncertain compared to the benefit of preserving productive agricultural land and recommended:

> Should the pipeline permit be issued, it should be conditional on relevant landholders identifying their preferred alignment, ensuring minimal disruption in the short and long term [260].

Cardinia raised similar concerns, including the high quality agricultural land that the pipeline route traverses and the potential impacts on its productivity. Cardinia cited the extensive policy support for protecting agricultural land and:

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259 EES Alignment Option Information, Reid Parade/Warringine Park HDDs, 17 August 2020

260 D429

> … it is unacceptable that the pipeline traverses through State significant Green Wedge farming land by dissecting and crossing properties. This pipeline alignment could have a direct impact on an owner's ability to conduct farming activities on the land, or introduce new farming opportunities to that land [261].

Cardinia proposed various changes to the pipeline route in order to minimise its farming impacts and to protect the viability of affected farms. These included:

- Implementing Options BE-10 and AG-8.
- Realigning the pipeline at 45 Bloomfield Lane, Cardinia, Lot 9 PS008853, to the adjacent road reserve, while retaining the MLV in the south-east corner of the property.
- Realigning the pipeline route at Crown Allotment 94A PP3272 Koo Wee Rup Road, Pakenham South to the adjacent road reserve.
- realigning the pipeline route along property boundaries (or if not possible, paddock lines) at 665–735 Manks Road, Cardinia; 2500 Ballarto Road, Cardinia; and 1025 McDonalds Drain Road, Pakenham.
- Realigning the pipeline route so that it does not unnecessarily cross the properties at 95 Adams Road, Cardinia, 765 Koo Wee Rup Road, Pakenham South and 825 Koo Wee Rup Road, Pakenham South.

Cardinia noted the evidence of Mr McBride-Burgess that, where possible, the pipeline should be aligned along property boundaries and avoid the diagonal crossing of properties.

The Proponents provided responses to all proposed changes (including those supported by Mr McBride-Burgess) and noting some were not achievable, were impractical, would have undesirable and unforeseen consequences or were under discussion with the landowners [262]. They highlighted '*All landowners who have requested a boundary realignment have been provided with a boundary realignment option*' and that discussions with landowners were continuing.

Cardinia advised that although it had received a petition about pipeline issues, it had not discussed its proposed route changes with all affected landowners and did not put its views forward as representing agreed landowner positions. Cardinia concluded:

> If the pipeline is to proceed, it should be located along property boundaries while avoiding important vegetation. If this cannot be achieved, the third best way is to locate the pipe along paddock lines whilst avoiding important vegetation [263].

The Proponents relied on Technical Report O and submitted the pipeline would have little impact on agricultural viability and there is not expected to be any ongoing loss of production.

Technical Report O noted:

> In order to protect the asset, pipeline easements contain some restrictions on future development. Erecting permanent structures or buildings over the underground pipeline will be prohibited in accordance with the Pipelines Act 2005 and pursuant to agreements with landowners. Generally, excavation works are permitted up to 300 millimetres deep and small plantings with limited root balls that do not impact line of sight of pipeline markers are permitted within the easement, subject to APA approval.

261 D153
262 D589, pages 149-150
263 D153

In relation to diagonal property crossings, the Proponents noted only a small portion of the pipeline route will have a diagonal or other non-boundary alignment and discussions were continuing with many affected landowners. They submitted that, in any event, these crossings would have little impact on agricultural production or viability. Mr McBride-Burgess recommended, where practical, diagonal crossings be avoided in order to '*reduce the impacts to private land, and existing and future uses*'. In this context, he supported nine of the options included in the Map book. Mr McNeill supported '*aligning the pipeline to the perimeter of agricultural properties wherever possible*'.

20.1.4 Discussion

The IAC agrees with Cardinia and Casey the pipeline route traverses high quality agricultural land recognised in policy and that it is appropriate to consider what, if any impacts, the pipeline will have on agricultural productivity. This broader analysis of agricultural impacts is provided in Chapter 18, where the IAC concluded the Project's impacts on agriculture would not be significant and would be acceptable subject to various mitigation measures.

In addition to those broader issues, Casey and Cardinia submitted the detailed alignment should avoid the diagonal crossing of properties and instead use property boundaries or other features such as paddock fencing. This position was based on the premise that the diagonal crossing of properties (typically involving pipelines running through the middle of paddocks) would be more disruptive during construction, constrain the siting of some farm infrastructure and restrict the opportunity for deep cultivation. In combination, these constraints would impact on agricultural productivity and farm viability.

The IAC acknowledges these concerns and agrees there could be some benefits from aligning the pipeline with property boundaries but believes the disbenefits of adopting diagonal alignments were overstated and not clearly supported in submissions or evidence.

Firstly, the IAC agrees pipeline construction will be disruptive, but it is not satisfied that using property or paddock boundaries will provide a significantly better outcome than using diagonal crossings. As the Proponents noted, using a diagonal route is typically shorter and faster to construct, and potentially creates less disturbance. The impacts will be temporary, and the IAC would expect the timing and detail of the works, and therefore their impacts, would be discussed and negotiated between APA and the landowners.

Secondly, it is not clear the restrictions on farming infrastructure will be significant or will necessarily be less significant if the pipeline was located diagonally, instead of along a boundary. Some farm infrastructure, such as shedding and storage, is typically located along the boundary of properties or paddocks, and it is conceivable that locating the pipeline in these areas might be more limiting than a diagonal alignment. In any event, possible impacts are best resolved through negotiation with the individual landowners who have a better understanding of how their farms operate, what infrastructure might be built in the future and what the impacts of alternative alignments might be.

Thirdly, the IAC agrees the 'default' 0.3 metre limit on the depth of cultivation is a potential constraint, but notes the Proponents' advice that cultivation within the pipeline easement to

a depth of 0.9 metre could continue to take place under the supervision of the pipeline operator [264]. This would not constrain typical farming activities in the area.

Finally, the IAC notes Casey and Cardinia have not discussed their proposed pipeline changes with all affected landowners or were aware of the current extent or status of various negotiations between APA and the landowners. While this is not a criticism, the IAC would be cautious in recommending specific changes to the pipeline route solely on the basis of possible agricultural impacts without landowner input. The IAC notes the Proponents' advice some of the proposed changes were impractical, would have consequences not foreseen in the submissions or were not supported by the landowners.

For these reasons, the IAC does not support the specific changes to the pipeline alignment sought by Casey and Cardinia, although it encourages the Proponents to continue negotiations with affected landowners as well as ongoing consultation with the Councils. It encourages the Proponents to consider the relative impacts of pipeline options on agricultural productivity and viability of the affected properties. This is in recognition of the policy support for protecting the high quality agricultural land in the Western Port Green Wedge and is generally consistent with the recommendation sought by Cardinia.

20.1.5 Findings

The IAC finds:

- The relative agricultural impacts of diagonal or property boundary pipeline alignments are best determined on a property by property basis through negotiation between APA and landowners.
- Ongoing discussions and negotiations between APA and landowners about pipeline options through agricultural areas should have regard to minimising any impacts on the agricultural productivity and viability of the property.

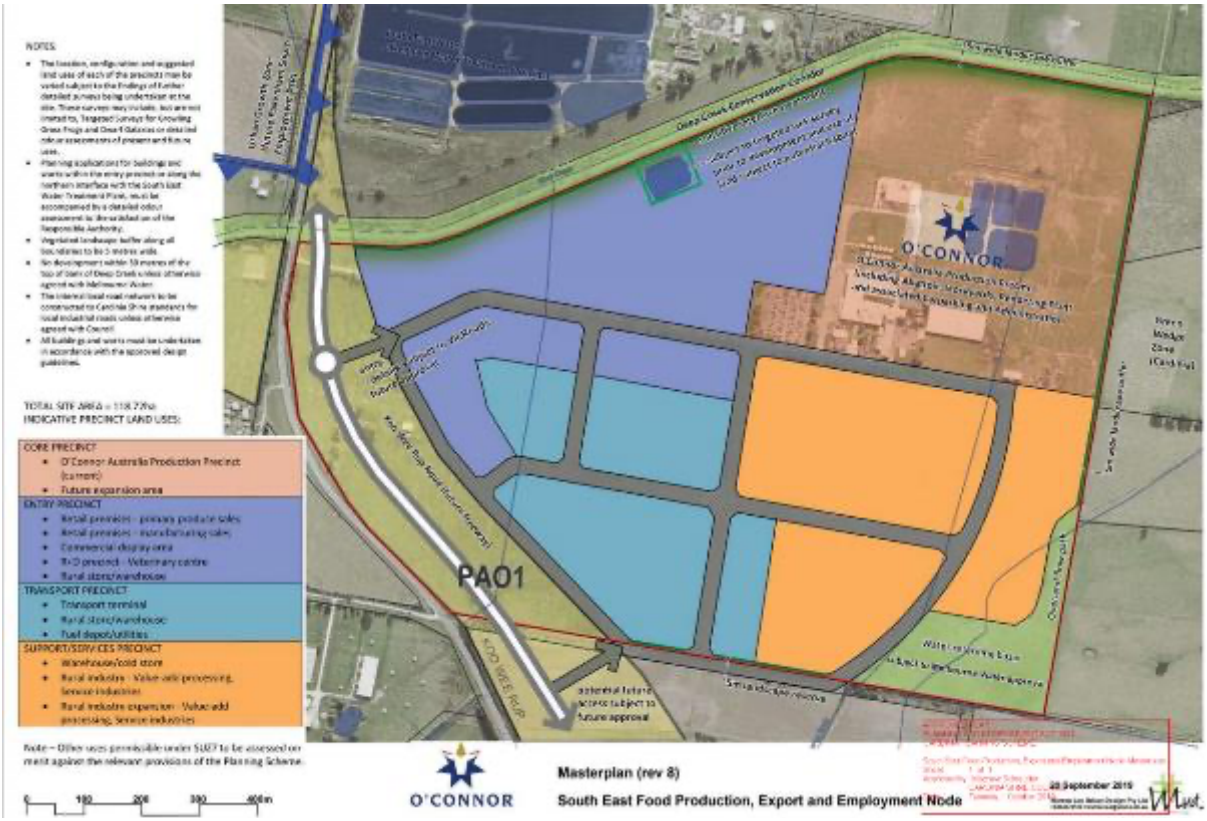
20.2 G and K O'Connor Pty Ltd

20.2.1 Introduction

G and K O'Connor (S2307) made a written submission in relation to its land at 910-940 Koo Wee Rup Road, Pakenham South. The submitter operates an abattoir and associated packing facilities on part of the site. The site is zoned Special Use 7 - South East Food Production, Export and Employment Node in the Cardinia Planning Scheme. A Master Plan has been approved by Cardinia Council for staged subdivision and development as a mixed-use agribusiness industrial cluster of businesses complementary to the abattoir at Figure 15. However, the Master Plan does not form part of the Cardinia Planning Scheme.

[264] Discussed in Chapter 18

Figure 15 Approved Masterplan for O'Connor site[265]



A permit is required for subdivision, buildings and works which must be generally in accordance with the Master Plan. The IAC understands that there are no current proposals for subdivision or development beyond the preparation of the Master Plan.

Once fully developed, it is anticipated that up to 2,000 employees would be working at the site.

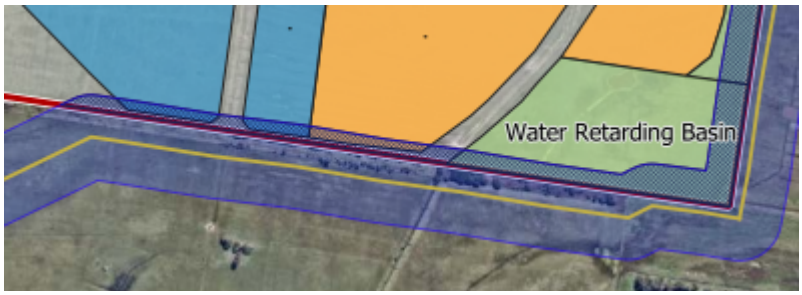
The pipeline is proposed to traverse the southern and eastern edges of the site as shown in Figure 16.

265 D553

Figure 16 Proposed pipeline alignment [266]

The 'notification area' for the pipeline, within which APA would request Cardinia to advise it of any proposed development is 50 metres either side of the pipeline. The 'consequence area' is also 50 metres. The pipeline is set back 10 metres inside the neighbouring farming property, there is a 20 metre road reserve immediately to the south of the O'Connor land and a Master Plan requirement for a 5 metre landscape reserve. This means the 50 metre notification area/consequence area overlaps the area on the land designated as a Transport precinct by approximately 15 metres (see Figure 17).

Figure 17 Southern boundary of the O'Connor land showing the pipeline alignment with a 50 metre 'buffer' [267]



266 D387
267 D387

A fuel depot is proposed to be located within the Transport precinct which abuts the southern boundary of the site (identified as the blue area on Figure 15).

20.2.2 Evidence and submissions

G and K O'Connor submitted they want to safeguard the future of the site and expressed concern about the potential safety and planning implications of the proposed pipeline.

In their written submission, they submitted the close proximity of the preferred pipeline alignment to their property would introduce a safety risk to future workers. They contended the pipeline should be relocated to eliminate that risk. Failing that, it should be designed in such a way that allows for the future use of their land.

At the Hearing, Mr Morris appeared for G and K O'Connor and submitted:

> G&K O'Connor seeks a new or corrected safety assessment which clearly evidences that APA has properly carried out a safety assessment in relation to the approved masterplan which demonstrates either that realignment is necessary or, if realignment is unnecessary, which O'Connor can rely on going forward in future including when it comes to submitted applications and having them referred to ESV.

He submitted that it should not be incumbent on G and K O'Connor to carry out the safety assessment.

G and K O'Connor submitted APA failed to properly recognise the intended future use of the site in locating the pipeline and had incorrectly classified the land as 'rural'. Further, that it had not been given the opportunity to be involved in the preliminary hazard analysis.

G and K O'Connor relied on the evidence of Mr Ramsay who referred to Section 4.7.1 of AS/NZS 2885.1:2018, Pipelines - Gas and liquid petroleum which notes Part 1: Design and construction requires '*the alignment of the pipeline shall be selected with consideration of 'public safety, pipeline integrity, environmental impact, and the consequences of escape of fluid'.*

The Standard sets out requirements to consider both the current and future land use change:

> A pipeline shall be designed in accordance with the requirements of this Standard:
>
> (a) For the land use existing at the time of design; and
>
> (b) For the future land use that can be reasonably determined by research of public records and consultation with land planning agencies in the jurisdiction through which the pipeline is proposed.

Mr Ramsay gave evidence the proximity of the proposed fuel depot may cause any pipeline failure event to escalate through release of flammable materials and therefore a secondary location class of Heavy Industrial should be assigned in accordance with AS/NZ 2885.

Mr Ramsay noted that, while AS/NZS 2885 does not specify which location classification should apply to Heavy Industrial, in his opinion T2 was warranted due to the potentially catastrophic outcomes of a failure event. He agreed with the proposition that it would be better to set the pipeline back 50 metres from the title boundary to avoid the consequence area and notification area.

The Proponents submitted that, while they acknowledged it would be possible to adjust the alignment of the pipeline adjacent to the O'Connor land boundary, their position was the exhibited alignment was preferable to that proposed, given negotiations with the affected landowner were well advanced [268].

The Proponents submitted their proposed alignment was the outcome of extensive technical consideration and consultation with landowners:

> As part of that process, the initially proposed alignment was relocated from within the O'Connor site to outside of it. APA's view is that the proposed alignment represents the best balance between the competing interests of the landowner to the south, which uses its land for agriculture, and O'Connor. The currently proposed alignment minimises impacts for agricultural uses and is unlikely to, in APA's view have any material impact on the use of the O'Connor site for a modest fuel depot, as seems to be proposed [269].

The Proponents relied on the evidence of Ms Filippin that the T1 pipeline location class is appropriate for light industrial, and this was the more appropriate classification for the O'Connor land. She commented on the risk of locating a fuel depot where proposed, noting that for a major escalation event to occur:

- Fuel tanks would need to be within the 50 metre 'credible threat zone' (which she noted meant within 20 metres of the site boundary).
- Tanks would need to be impacted by a fire event.
- Multiple pipeline controls would need to fail.
- Ignition of released gas would be required.
- Release would need to be oriented towards the tanks.

Her evidence was the likelihood of such a combination of events would be very low.

Ms Filippin concluded from a risk management perspective:

- If the pipeline alignment can be modified, this would be the most reliable mitigation.
- If the pipeline cannot be moved due to other constraints, it is recommended revision of the SMS be undertaken to confirm the risk is suitably low and assess whether additional controls are warranted [270].

The Proponents submitted the Master Plan had been considered in the pipeline SMS but the location of any fuel depot was not yet determined and would need further approval under the Cardinia Planning Scheme [271].

The Proponents noted an exchange of letters between G and K O'Connor and APA, through which APA sought to obtain details of any development proposals for the O'Connor land. G and K O'Connor acknowledged there are no detailed plans prepared for the location of a fuel depot but maintained the SMS ought to be revised to allow for such a future use.

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268 D376

269 D376 paragraph 29

270 D377

271 The Proponents cited Document 96 (Confidential SMS) Appendix H, CPT Property ID 121. The column 'Plans for future development / change in land use?' says 'Draft masterplan as described in Zone SUZ7',

20.2.3 Discussion

The IAC accepts the Proponents' position that the proposed location of a fuel depot is not specifically included in the Master Plan or otherwise in the Cardinia Planning Scheme. It is noted as a possible use in the Transport Precinct. A range of possible uses indicated in Master Plan precincts along the boundary include:

- Transport precinct
  - Transport terminal
  - Rural store/warehouse
  - Fuel depot/utilities
- Support/services Precinct
  - Warehouse/cold store
  - Rural industry – value add processing, service industries
  - Rural industry expansion – value add processing, service industries.

The IAC notes of all the uses proposed in the Master Plan in proximity to the southern or eastern boundaries of the O'Connor land, fuel depot is the only one likely to cause a level of risk that would conflict with the pipeline.

The IAC notes the Transport precinct (blue on the Master Plan) is approximately 250 metres deep from north to south. The IAC concludes there is sufficient space to locate any fuel storage in the Transport precinct well clear of the 50 metre consequence area. Bearing in mind the road reserve and landscaping strip, a 15 metre set back from the landscape reserve is the minimum that would be required to achieve this. The IAC concludes a design should be achievable for the Transport precinct that would achieve acceptable levels of risk by siting any fuel tanks with appropriate setbacks.

G and K O'Connor sought the flexibility to locate a fuel depot anywhere in the Transport precinct. Further, it sought the SMS be reviewed to assess the levels of risk to potential land uses and appropriate action be taken to relocate the pipeline, if necessary, to avoid risk. Ms Filippin supported the proposal to review the SMS.

The IAC notes the SMS provided on a confidential basis shows an awareness of possible future changes to land use on the O'Connor site. The SMS notes development of the land could disturb the profile of the land but does not identify a fuel depot specifically. It correctly notes a permit would be required for development, buildings or works on the land.

The IAC is of the view that a further safety assessment at this stage would not be useful. Until such time as a concept plan is formalised for development of the O'Connor land which shows the proposed location of land uses, including any fuel tanks, there is little that could be assessed in terms of risk.

The IAC accepts there is a balance to be achieved between the impacts on respective landowners by the Project and notes any relocation of the pipeline further into farming land to the south or east would likely adversely impact those landowners. The IAC is not convinced the theoretical risk of an as yet unplanned fuel depot is a more important consideration.

20.2.4 Findings

The IAC finds:

- The exhibited alignment of the pipeline in the vicinity of the G and K O'Connor Pty Ltd land is supported.

- No further safety or risk assessments are required for the G and K O'Connor Pty Ltd land at this time.

20.3 Evolution Rail Pty Ltd

20.3.1 Introduction

Evolution Rail Pty Ltd (S2322) made a written submission and presented at the Hearing in relation to the proposed pipeline works and PDF adjacent to the Pakenham East Rail Depot (the Depot). Evolution Rail has been contracted by the Victorian Government to finance, design, build and maintain 65 new high capacity trains for the metropolitan network. Evolution Rail operates the Train Maintenance Facility at the Depot, which is located on a 118 hectare site at 205 Oakview Lane, Pakenham East. The Depot was completed in July 2020 and the registered proprietor is the Head, Transport for Victoria.

The Project proposes the construction of the pipeline along the southern boundary of the Bairnsdale railway line (south of the Depot) and within the Oakview Lane road reserve to the east of the Deport. Construction will be by open cut trenching, except where it crosses the Bairnsdale railway line and the entrance to the Depot (off Oakview Lane) where it will be constructed by trenchless bore. The PDF is proposed be located to the northeast of the Deport and is within the area licensed to Evolution Rail.

The location of the pipeline, PDF and Depot are shown in Figure 18.

Figure 18 Pipeline and PDF works in proximity to the Pakenham East Rail Depot [272]

[272] Extract from EES Attachment VII Map book, Mapsheet 24

20.3.2 Evidence and submissions

Evolution Rail raised concerns related to:

- Safety impacts, including risks from gas leaks and explosions, maintenance failures at the PDF and access limitations to the Depot.
- Electrolysis impacts, including possible damage to the pipeline and an increased risk of pipeline failure resulting from Direct Current (DC) stray current.
- Operational impacts, including restrictions on vehicle and rail access to the Depot during construction and operation and potential impacts on existing utility infrastructure.
- Environmental impacts, including impacts on '*environmental no-go zones*' that were established as part of the Depot's approval and implementation of a Threatened Species Management Plan (TSMP) prepared under the *Environment Protection and Biodiversity Conservation Act.*
- Aboriginal cultural heritage impacts, including impacts on the '*cultural heritage no-go zones*' that were established as part of the existing CHMP prepared under the *Aboriginal Heritage Act*.

Evolution Rail submitted further analysis of these issues was required before the pipeline alignment and PDF location were approved. It provided a comprehensive set of *'potential solutions*' to these issues, the main elements of which were:

- Relocation of the PDF and realignment of the pipeline to provide greater separation from the Depot.
- Use of design and construction processes that would ensure vehicular access to the Depot via Oakview Lane at all times and maintain uninterrupted access to utility services.
- Further assessment of potential electrolysis impacts to the pipeline and associated mitigation measures, to the satisfaction of relevant regulatory authorities, including ESV.
- Use of a '*construction interface agreement*' between the pipeline operator and Evolution Rail to address safety, access and operational issues.
- Further assessment of environmental impacts in the context of the TSMP and inclusion of appropriate environmental conditions in the *Environment Protection and Biodiversity Conservation Act* approval and the *Pipeline Act* licence.
- Further assessment of Aboriginal cultural heritage impacts in the context of the existing CHMP to ensure the Project does not impact upon or compromise compliance with that CHMP.

Evolution Rail concluded:

> In summary, ER has significant and material concerns in relation to construction and operation of the Proponent's Pipeline and the chosen location of the Pipeline alignment and PDF as set out above in this submission but particularly in relation to unaddressed safety risks, the potential impact on the Victorian public transport network and disturbance of environmental and cultural heritage no-go zones which have been the subject of targeted protection measures on the Pakenham East Depot site, to date.

The Proponents noted APA and Evolution Rail have had extensive discussions about these matters, which are continuing. The Proponents supported the proposed pipeline alignment and PDF location and submitted alternative alignments and sites were not available because of various constraints and the need to link with the VTS.

In relation to safety risks, particularly gas release from the pipeline and PDF, the Proponents relied on Technical Report K, TN04 and Ms Filippin's evidence. They noted a QRA had been prepared and discussed with Evolution Rail and other Depot stakeholders and these discussions informed the design and operation of the facilities. The QRA found the hazard levels at the Depot would be acceptable for industrial land in accordance with HIPAP4 (Risk Criteria for Land Use Safety Planning).

The Proponents acknowledged the concerns about electrolysis and noted these risks were well understood by APA and had been the subject of extensive assessment. They noted APA had practical knowledge and understanding of pipeline and electrolysis issues associated with the Depot through its existing gas pipeline that traverses the area. They submitted several mitigation features were incorporated into the pipeline design, in addition to standard mitigation measures. They noted electrolysis risk was considered in the SMS and would be further assessed in the Safety Case required under the *Gas Safety Act*.

In relation to operational impacts on the Depot, including possible access constraints, the Proponents outlined various measures to manage this, including the need to implement the requirements of the road authority and TMPs that will need to be approved [273]. They indicated that Oakview Lane may need to be limited to one lane for limited times during pipeline construction, but there will be no ongoing impact or limitation on vehicles, including heavy vehicles crossing the pipeline easement.

The Proponents advised that environmental and Aboriginal cultural heritage issues will be addressed through the approvals required under the *Environment Protection and Biodiversity Conservation Act* and the *Aboriginal Heritage Act*. In relation to the existing CHMP and associated no-go zone, they relied on Ms Nicholson's evidence that CHMPs are specific to an activity and the Sponsor of that activity, and the Project would not be permitted to include works that are outside the approvals allowed in proposed CHMP 15384. Ms Nicholson advised '*If the no-go zone is required to be impacted by the pipeline Project, then the approved CHMP for the Project will address this and allow it*' [274]. Ms Nicholson noted there should be further consultation with Evolution Rail to ensure that each of the stakeholders understands their obligations in regard to their respective CHMPs.

20.3.3 Discussion

The IAC acknowledges the concerns raised by Evolution Rail and agrees the Pakenham East Rail Depot is State significant infrastructure that needs to be protected.

The general issues associated with hazard and risk are discussed in Chapter 14, in which the IAC noted the risk assessment done in Technical Report K, Appendix D on the PDF and the further work done on societal risk. The IAC noted the QRA risk criteria for current land uses including the Evolution Rail site are all met.

The IAC agrees that electrolysis impacts are potentially significant but notes this issue is well understood and addressed in pipeline legislation and regulation. As the Proponents noted, electrolysis issues influenced the design of the pipeline in this location and will be further addressed in the Safety Case required under the *Gas Safety Act*. The IAC accepts electrolysis impacts can be acceptably managed, subject to the further, more detailed assessments to be

273 POS A8 in CEMP
274 D381

undertaken by the Proponents. The IAC was not presented with any evidence that it would be necessary to realign the pipeline in order to address electrolysis issues.

In relation to the operation of the Depot, the IAC agrees maintaining vehicular access through the Oakview Lane entrance is critical, given the lack of alternative access points and the importance of the facility. The loss of this access, even on a temporary basis, must be avoided. Using trenchless boring opposite the Depot entrance would assist this, however the use of the open cut trenching along Oakview Lane would require careful planning to avoid disruption. It is important the implementation and staging of these works be discussed with Evolution Rail and other stakeholders in the area so access issues can be appropriately addressed. The IAC agrees with the Proponents this can be managed through the TMP and through the consultation processes that would be in place [275].

Environmental impacts, including MNES associated with Southern Brown Bandicoot and Growling Grass Frog habitat, and approval under the *Environment Protection and Biodiversity Conservation Act* are relevant to the concerns raised by Evolution Rail about the various environmental approvals that would be required.

In relation to the PDF, the IAC notes the Proponents' advice that it was sited to avoid the Growing Grass Frog habitat to the north of the site. This is consistent with the relevant plans provide by Evolution Rail and the Proponents. However, the IAC notes the evidence of Mr Lane whose response to Evolution Rail's concerns was that:

> … it is difficult to clearly identify if the proposed pipeline footprint will impact an environmental no-go zone as per Evolution Rail's TSMP. To do so requires GIS analysis with accurate CAD files. Impacts on this area will be subject to further analysis. It is recommended that a site-specific CEMP is designed to address all of Evolution Rail's concerns with the project (a-e) [276].

The IAC supports Mr Lane's recommendation for a site specific CEMP for the PDF and has included this as a recommendation.

The IAC has not reviewed the existing CHMP that applies to the Depot, although it notes that plans supplied by Evolution Rail identify a large '*cultural heritage no-go zone*' that overlaps a large part of the PDF site. Presumably, this was identified and implemented as part of that CHMP. As Ms Nicholson noted, CHMPs are specific to projects and sponsors, and a new CHMP (15384) is being prepared for the northern area of the Project, including the PDF site. This process will identify any Project specific constraints or requirements that need to be addressed. In the absence of that CHMP been approved, it is not possible to comment on the implications of where the two CHMPS might overlap or relate to each other.

The IAC agrees with Ms Nicholson there should be further discussions between the stakeholders so that their respective obligations are understood.

20.3.4 Findings

The IAC finds:

- The issues raised by Evolution Rail Pty Ltd are capable of being addressed through the recommended mitigation measures, the further assessments that

[275] CEMP POS A1

[276] Row 13A in Table 3 of D76.

will be undertaken and the detailed planning and approvals that would be required.

20.3.5 Recommendation

The IAC recommends:

Other recommendation

Prepare a site specific Construction Environmental Management Plan for the Pakenham Delivery Facility in response to environmental 'no-go' zones associated with Southern Brown Bandicoot and Growling Grass Frog habitat and addresses:

- **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**
- **dust impacts on flora and fauna as an ecosystem function.**

20.4 Other submissions

20.4.1 Introduction

Some submitters raised concerns about the impacts of the pipeline on their properties, the compensation and acquisition processes and the consultation with APA.

20.4.2 Submissions

S1303, S1305 and S1309 provided a common submission that indicated that their property was within the pipeline route. They opposed the pipeline and raised concerns about discussions held with APA about compensation issues, including adequacy of compensation.

S3777 opposed the pipeline and compulsory acquisition of the pipeline easement over his property.

These submitters did not attend the Hearing and the exact nature of their concerns is difficult to assess on the information provided in their written submissions.

The Proponents provided responses to each submission, as well as an overview of the consultation that had been undertaken and the relevant acquisition and compensation provisions, and submitted:

> APA is committed to providing fair, adequate and equitable compensation to impacted landowners and occupiers for disturbance and loss of production in accordance with the Pipelines Act 2005. APA's strong preference is to negotiate purchase of easements. Where this cannot be done and APA receives consent to compulsorily acquire easements, compensation for acquisition of property is dealt with in accordance with the section 151 of the Pipelines Act and Land Acquisition and Compensation Act 1986. Compensation takes into account the market value of the land/interest acquired and the depreciation in value of other adjoining land.
>
> The Pipelines Act 2005 and the Pipeline Regulations detail a process to ensure that landowners and occupiers are engaged in a structured and respectful process leading up to the negotiation of easement rights. It is a specific requirement of the Pipelines Act (Section 17) that the information to be provided to owners and occupiers of land

> must include details of the procedures that are to be followed under that Act and any other Act to permit the construction and operation of the pipeline, including the procedures for any compulsory acquisition of land [277].

20.4.3 Discussion

The IAC generally supports the pipeline criteria adopted by APA and the exhibited pipeline route, although it understands negotiations with various landowners are continuing and not all issues have been resolved. While the IAC acknowledges the concerns raised by these submitters, the various processes under the *Pipelines Act* provide the legal framework for addressing these matters. The IAC accepts that within this framework, APA's preference is to negotiate agreed outcomes rather than rely on compulsory easement acquisition.

Having reviewed these submissions, the IAC does not believe there are adequate grounds for recommending alternative pipeline alignments.

[277] D175

21 Matters of National Environmental Significance

21.1 Introduction

Chapter 22.2 sets out the process for referral of the Project under the *Environment Protection and Biodiversity Conservation Act*. The Project is a 'controlled action' as it is likely to have a significant impact on listed MNES.

Clause 39i. of the IAC's Terms of Reference requires it to prepare a written report that includes:

> Specific findings and recommendations about the predicted impacts on matters of national environmental significance and their acceptability, including appropriate controls and environmental management.

The MNES which the proposed action may have a significant impact on are known as the 'controlling provisions'. The relevant controlling provisions for the pipeline works are:

- Wetlands of international importance (Sections 16 and 17B of the Act).
- Listed threatened species and ecological communities (Sections 18 and 18A of the Act).

The relevant controlling provisions for the GIJW are:

- Wetlands of international importance (Sections 16 and 17B of the Act).
- Listed threatened species and ecological communities (Sections 18 and 18A of the Act).
- Listed migratory species (Section 20 and 20A of the Act).

Attachment I to the EES addresses MNES.

The EES reports a systematic risk-based approach was used to understand the existing environment and potential Project impacts on MNES. The assessment involved:

- a desktop assessment of relevant government curated biodiversity databases
- a desktop review of existing conditions reports, including previous field-based ecological investigations
- field investigations
- targeted threatened species surveys of flora and fauna
- assessment of potential impacts against the MNES Significant Impact Guidelines for the GIJW and the pipeline works.

An 'EPBC Act Protected Matters' search was undertaken for the both the GIJW and pipeline works using the DAWE online Protected Matters Search Tool (PMST) to determine the likely presence of any MNES.

The primary consideration relevant to the *Environment Protection and Biodiversity Conservation Act* is whether the Project will have a 'significant impact' to an MNES. Impact assessments to determine significant impacts on MNES were undertaken for the GIJW and pipeline works in accordance with the MNES Significant impact guidelines 1.1 *Environment Protection and Biodiversity Conservation Act* for wetlands of international significance, listed threatened species and communities, listed migratory species and to determine cumulative impacts.

The PDF is proposed to be located on a site for which the Department of Transport holds an existing approval under the Act (EPBC 2014/7263) and the conditions of that approval currently apply.

21.2 Key Issues

The key issues include:

- Impacts to wetlands of international importance from the GIJW and pipeline works, particularly operation of the FSRU and LNG carrier resulting in:
  - changes to marine water quality from seawater discharges containing CPO and colder water
  - entrainment of marine biota as part of the regasification process with the intake of seawater
  - spills and leaks
  - underwater noise and vibration
  - lighting.
- Impacts to threatened species and ecological communities from the pipeline works, specifically impacts of construction resulting in:
  - vegetation clearance and loss of habitat
  - changes to surface water quality
  - contaminated and acid sulfate soils
  - noise and vibration
  - changes to air quality
  - lighting.
- Impacts to migratory species
  - changes to water quality
  - spills and leaks
  - underwater noise and vibration
  - lighting.

21.3 Impacts to wetlands of international significance (Ramsar wetlands)

21.3.1 Background

The PMST search identified that the Western Port Wetland of International Significance was a MNES and a controlling provision for both the GIJW and Pipeline Projects.

EES Attachment I, Chapter 6 and Technical Report A described the potential impacts of the Project to wetlands of international significance.

Western Port Bay was designated as a wetland of international importance in 1982 and given special recognition as Waterfowl Habitat under the Ramsar Convention. Ecological character is the combination of the ecosystem components, processes, benefits and services that are critical to the ecological character of the Ramsar site and characterise the wetland at a given point in time.[278] The ECD compromises eight CPS:

- wetland bathymetry
- geomorphology and sedimentation
- flora - seagrass
- flora - mangrove and saltmarsh
- fauna - waterbirds
- fauna - marine invertebrates

[278] Ramsar Convention 2005a, Resolution IX.1 Annex A

- fauna - fish
- supports threatened species.

Attachment I reported that four of the eight components critical to the ecological character of the Ramsar site relate to fauna, with particular significance placed on waders and waterbirds. Seven fauna species listed under the *Environment Protection and Biodiversity Conservation Act* are regularly supported by the Ramsar site.

The Ramsar site satisfies seven of the nine criteria that determine if a wetland should be listed as internationally significant. At its original listing in 1982, four criteria were satisfied. Since 1982, the Ramsar site has been recognised for an additional three criteria.

The ECD for Ramsar wetlands provides the baseline description of the wetland at a given point in time and can be used to assess changes in the ecological character of these sites [279]. Changes to the ecological character outside natural variations may signal that uses of the site or externally derived impacts on the site are unsustainable. These may lead to degradation of natural processes, and the ultimate breakdown of the ecological, biological and hydrological functioning of the wetland [280].

The ECD explains 'limits of acceptable change':

> Limits of acceptable change acknowledge the natural variability exhibited by elements within the wetland ecosystem and establish guidelines that facilitate the assessment of change (either positive or negative) to the ecological character resulting from human activities.

21.3.2 Evidence and submissions

The Proponents presented the outcomes of the assessment on wetlands of international importance in EES Attachment I – MNES. As noted in Attachment I:

> A Ramsar wetland is an area designated under Article 2 of the Ramsar Convention or a wetland declared by the Federal Environment Minister to be a Ramsar wetland under the EPBC Act

The Proponents submitted the GIJW and pipeline works would not have an unacceptable environmental impact on the Ramsar wetland, with any impacts being localised within proximity to Berth 2 and the FSRU.

The Proponents determined the GIJW is expected to present the greater risk to the Ramsar site due to its location in proximity to six major habitats of the site, being:

- water column
- mud
- seagrasses
- mangrove
- saltmarshes
- rocky reefs.

The pipeline works were considered to have a low Ramsar impact, with the pipeline located in the vicinity of saltmarshes and mangroves habitats. The Proponents submitted the

279 https://www.environment.gov.au/water/wetlands/publications/national-framework-and-guidance-describing-ecological-character-australian-ramsar-wetlands#:~:text=Ecological%20character%20is%20the%20combination,1%20Annex%20A).

280 Ramsar Convention 1996, Resolution VI.1

pipeline alignment would not pass through or occur adjacent to any of the other four habitats.

The Proponents considered it unlikely the pipeline works would result in changes to wetland hydrology, diversity or structure that would lead to a decrease in Ramsar habitat quality. They reiterated the pipeline would be constructed using HDD to avoid surface impacts in four locations where Ramsar MNES attributes exist. The Proponents' closing submission referred to Mr Lane's evidence that:

> Technical Report B provides a detailed assessment of impacts on key components, processes and services (CPS) of the Western Port Ramsar site based on the framework in the site Ecological Character Description (Hale 2016) in Section 7.1.5, p. 177-181 and Table 34. It also assesses impacts against the EPBC Act Significant Impact Guidelines (Appendix A7.3). These are the accepted management and assessment frameworks for Australian Ramsar sites and are used by environmental decision-making bodies regularly to inform their decisions about projects that potentially affect these valuable wetlands. The assessment in Technical Report B is consistent with this approach and provides adequate information to inform a decision on whether the impacts of the Project on the site are acceptable or significant.
>
> …
>
> The requirements of Ramsar site impact assessment in Australia are founded on the EPBC Act Guidelines on Significance and the Limits of Acceptable Change to key components, processes and services in an Ecological Character Description. This is how impacts on the Ramsar site have been assessed in Technical Report B [281].

Many submitters opposed the Project because:

- it was inappropriately located in a Ramsar wetland
- critical CPS of Western Port Bay are intrinsically linked, each contributing to its ecological character
- the links within the marine environment are not well understood
- Project activities would result in unacceptable impacts to the wetland.

21.3.3 Discussion

The marine impacts of the Project are discussed in Chapter 4. The IAC found, in summary, the risks of the Project were not adequately assessed. The IAC concluded it was not established that significant impact will not occur, and it concluded the impact of the Project is unacceptable in a wetland of national and international importance.

The Proponents relied on the assessment of the Project against the LAC and CPS established for the entire Western Port Bay. The IAC appreciates the CPS approach to Ramsar site impact assessment is an Australia-wide, accepted framework for monitoring and assessing impacts on the ecological character of Ramsar sites. However, the IAC considers assessment of the Project's impacts against the recognised, bay-wide LAC and CPS is insufficient and does not provide a relevant representation of the potential impacts of the Project to the Ramsar wetland on a localised scale.

Localised impacts are expected to the CPS within the Ramsar wetland. The Proponent submitted impacts are confined within Port waters and the dredged channel. Irrespective of defined Port waters, the Project's impacts will occur within the wetland of international importance and the IAC has concluded the Project will likely result in a change to the

281 D589

ecological character of part of the Ramsar wetland. The IAC considers that ecological change will be certain within the proximity of the FSRU. The Proponents' marine experts suggested that impacts are likely beyond the FSRU. On balance, the IAC considers the impact will result in a significant change to the ecological character on a local scale and a change to the ecological character on a broader scale, but the extent of that change is unknown. The IAC considers this represents an issue under the significant impact guidelines of an action likely to have a significant impact on the ecological character of a declared Ramsar wetland where there is a real chance or possibility that it will result in areas of the wetland being destroyed or substantially modified [282].

The Proponent has not conclusively quantified that potential direct and indirect impacts of the Project to the Ramsar wetland are acceptable. They considered that as the Project is located within an established Port and within Port waters, the potential for adverse impacts should be considered insignificant.

The IAC acknowledges the emphasis placed by the Ramsar Convention on the wise use of listed wetlands. It considers Western Port should continue to be used wisely and potential risks should be well understood to ensure environmental values can be protected and enhanced. The IAC acknowledges submissions that emphasise governments, industries and the community have an obligation to protect and conserve the ecological character of the Western Port Ramsar wetland and ensure any threatening or potentially threatening processes do not result in ecological change.

At the same time, the IAC recognises the Port will continue to be of regional, State and national significance and its use and future operations should continue by balancing use and development of the Port and protection of the Western Port Ramsar wetland.

Based on its assessment of the marine biodiversity impacts in Chapter 4, the IAC believes cumulative impacts of the Project, particularly discharge of chlorinated and chilled seawater, and continual entrainment of plankton have the potential to result in the 'significant impacts'.

Table 20 summarises the findings of the IAC in relation to the Ramsar wetlands.

Table 20 Summary of findings in relation to Ramsar wetlands

Potential Risk	Implications for Ramsar Wetlands	Cross reference

[282] Page 13, Significant Impact Criteria for Wetlands of International Importance, MNES Significant impact guidelines 1.1, 2013.

Change in marine water quality	The FSRU will be permanently moored in the Ramsar wetland and regasification of LNG will require a constant supply of seawater. The FSRU will continuously discharge residual concentration of 100 μg/L chlorine produced oxidants (CPO) for the life of the Project. The seawater will be 7□C cooler at the point of discharge. This discharge will result in a change in chemical and physical properties of the water. Direct impacts are expected to be localised to waters immediately around Crib Point. Indirect impacts to the marine water quality and marine biodiversity are not well understood. Although it readily disperses in seawater, evidence indicates the spatial and temporal extent of CPO and its derivatives could persist within the Ramsar wetland well after discharge. There are no likely implications from the pipeline works to the Ramsar wetland.	Chapter 4.4
Entrainment of biota	The FSRU will draw an average 312,000 m^3 of seawater per day from the Ramsar wetland at a rate of 0.15 metres per second. The intake velocity will result in entrainment and impingement of pelagic marine biota from the Ramsar site up to minimum size of 100 mm. Entrainment will continue for the life of the Project, and it is expected the continual entrainment of phytoplankton, zooplankton, fish eggs and larvae will have localised impacts in the Ramsar wetland. The potential for long term impacts are not well understood. There are no likely implications from the pipeline works to the Ramsar wetland.	Chapter 4.5
Spills and leaks	In general, existing Port related activities present a risk of spills and leaks to the Ramsar wetlands. Historically, the risks within the Port appear to be effectively managed to avoid or minimise the risks. The additional vessels entering is unlikely to present additional risks beyond those already existing in the Ramsar wetland. Competent and effective systems and protocols are in place to both minimise the risk of oil spill and manage the effects in the unlikely event of a spill. There are no likely implications from the pipeline works to the Ramsar wetland.	Chapter 14.5.3
Noise	Noise during GIJW operations may cause localised impacts to the Ramsar wetland, particularly fish, waterbirds and threatened species, recognised as critical CPS. Air-borne noise and underwater noise may cause behavioural responses, which may result in marine fauna avoiding distances up to 2.09 kilometres from Berth 2 during periods of peak regasification. Long term and permanent adverse impacts are unlikely to result from noise generated at the GIJW.	Chapter 11
Light spill	Light spill may attract or detract some fish, waterbirds and threatened species, but adverse impact from artificial light to the Ramsar wetland is unlikely. There are no likely implications from the pipeline works to the Ramsar wetland.	Chapter 5.6

21.3.4 Findings

The IAC finds:

- The GIJW poses a threat to the Ramsar wetland due to its continual seawater intake entraining plankton, fish eggs and larvae, and discharge of chlorinated and cold seawater.
- The Project will result in unacceptable environmental impacts within a segment the Ramsar wetland.

21.4 Impacts to Listed threatened species and ecological communities

21.4.1 Background

EES Attachment I, and Technical Reports A and B described the potential impacts of the Project in relation to the controlling provision of listed threatened species and ecological communities (s18 and s18A of the *Environment Protection and Biodiversity Conservation Act*).

The Proponents advised that desktop assessments were conducted and, where deemed relevant, targeted surveys were undertaken to assess the presence of listed threatened species and ecological communities within the GIJW and pipeline project area to identify suitable habitat that threatened species are likely to occur in.

21.4.2 Evidence and submissions

Chapters 4 and 5 discuss the submissions and evidence relevant to the potential impacts of the GIJW and pipeline works on threatened species and ecological communities.

(i) Gas Import Jetty Works

The Proponents submitted that 65 threatened species with potential to occur within five kilometres of the study area were identified in the PMST search. Twelve listed threatened species were identified with a medium to high likely potential to occur within the GIJW area:

- Nine bird species (Fairy Tern, Lesser Sand Plover, Greater Sand Plover, Eastern Curlew, Bar-tailed Godwit, Curlew Sandpiper, Red Knot, Great Knot, White-throated Needletail).
- Two whale species (Southern Right Whale, Humpback Whale).
- One fish species (Australian grayling) [283].

The Proponents submitted that the Fairy Tern and Australian Grayling were the only listed threatened species identified that are not also listed migratory species. Migratory species are discussed in Chapter 21.5.

The EES found that impacts from construction of the GIJW to Fairy Terns were '*likely to be minor and associated with noise and contained within the vicinity of the GIJW*'. The impacts were considered to be short- term and unlikely to impact populations nor harm individuals.

The EES found that the Australian Grayling had the potential to be impacted by the uptake of seawater during operation of the FSRU. The EES indicated that Australian Grayling larvae '*drift downstream and enter Western Port from April to July with a peak in May. Larvae then*

[283] Under the *Environment Protection and Biodiversity Conservation Act*

undergo a period of marine residency before returning upstream as young juveniles from September to December' [284].

The Proponents noted that the Dense Leek-orchid was identified under the controlling provisions of the GIJW, but it was not considered further as it would not be impacted by the GIJWs.

Among other submitters, the Silverleaves Conservation Association Inc (S2569) submitted that the threat from the GIJW to Western Port Bay would be unacceptable. They noted the various threatened species in the Ramsar wetland, and that Western Port supports a number of threatened and critically endangered species such as white mangrove communities, high numbers of shorebirds and migratory species including the Fairy Tern, Orange-bellied Parrot and Swift Parrot, and marine megafauna.

The DAWE noted that the Hooded Plover and Australian Fairy Tern which are vulnerable MNES occur in Western Port Bay and suggested that they have not been adequately considered in the EES.

The Proponents submitted that the listed threatened ecological communities identified by the PMST search as likely to occur in the GIJW area were:

- Natural Damp Grassland of the Victorian Coastal Plains – critically endangered.
- Subtropical and Temperate Coastal Saltmarsh – vulnerable.

The Proponents noted the GIJW would not impact the Ramsar wetland ecological community of Subtropical and Temperate Coastal Saltmarsh and it was not considered a MNES for the purposes of the *Environment Protection and Biodiversity Conservation Act*. The MNES of Natural Damp Grassland of the Victorian Coastal Plains is not present within the GIJW project area.

A number of submissions including S2569 and DAWE expressed concern the EES lacked adequate consideration of the Orange-bellied Parrot and the critical habitat provided by the coastal saltmarsh. The EES found that:

> There is a significant distance between the areas above the temperature and chlorine Guideline Values and the various habitat types recognised under the Ramsar Convention. Due to the distance, the likelihood of there being any effect from the discharge on the subtidal reef or seagrass, estuarine areas, intertidal mud flats, intertidal forested wetlands, salt marshes, mangroves and waterbirds is low [285].

(ii) Pipeline works

The Proponents submitted that 68 threatened species were identified in the PMST search with potential to occur within five kilometres of the study area. These species included birds, fish, frogs, insects, marine and terrestrial mammals, plants, reptiles and sharks.

Of these species, the EES considered eight to have a medium or higher likelihood of occurring within the survey area (described in Chapter 3.0 of Attachment I). The following terrestrial and freshwater MNES species were further assessed in the EES:

- Growling Grass Frog – vulnerable
- Grey-headed Flying-fox – vulnerable

284 EES Attachment I

285 EES Chapter 3 Section 3.2.6

- Southern Brown Bandicoot – endangered and critically endangered
- Dwarf Galaxias – vulnerable
- Australian Grayling – vulnerable
- Swift Parrot – endangered and critically endangered
- Dense Leek-orchid – threatened
- River Swamp Wallaby-grass – vulnerable.

The Southern Brown Bandicoot, Growling Grass Frog and River Swamp Wallaby-grass were the only species of conservation significance under the *Environment Protection and Biodiversity Conservation Act* recorded during targeted field surveys.

The Proponents submitted the listed threatened ecological communities identified by the PMST search as likely to occur in the Pipeline works area were:

- Natural Damp Grassland of the Victorian Coastal Plains – critically endangered.
- Subtropical and Temperate Coastal Saltmarsh – vulnerable.
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – critically endangered.

The EES reported that:

> Only one threatened community was determined to have potential to be present within the pipeline alignment: Subtropical and Temperate Coastal Saltmarsh. Field investigations confirmed the presence of Subtropical and Temperate Coastal Saltmarsh within the pipeline alignment in one location at Watson Creek (KP19).

The Proponents advised the pipeline would be constructed using HDD to avoid surface impacts in four locations where Ramsar MNES attributes exist and would avoid impact to the coastal saltmarsh.

The PMST search noted 72 listed marine species and seven whales and cetaceans may also occur. The Proponents submitted that the Pipeline Works would not impact listed marine species.

21.4.3 Discussion

(i) Gas Import Jetty Works

The effects of the GIJW on listed species and ecological communities relate to construction and operational impacts.

The IAC considers construction impacts will be localised and generally acceptable. There are no ecological communities affected by the GIJW and the works for both the Jetty and the CPRF will have negligible impacts. The Jetty exists and will require upgrading, much of which has been approved through Marine and Coastal Consents obtained by PHDA. The CPRF site has been predominantly cleared of native vegetation and although some further additional vegetation removal may be required, the site has been substantially modified.

Listed species such as the Orange-bellied Parrot, Fairy Tern and White-throated Needletail would be unlikely to be affected by construction of the GIJW. These are all mobile species which would be unlikely to be within the impact area of the proposed works.

The operation of the GIJW has the possibility of affecting one listed vulnerable threatened species not identified as migratory in the EES, the Australian Grayling. The Proponents considered it was not expected to be significantly affected by entrainment or impingement, yet the impact of such effects remain relatively unknown. The EES identified in Technical

Report A – Annexure G, a juvenile specimen in September 2019, which had some level of uncertainty with respect to identification. This demonstrates uncertainty there may be a level of risk to this species from entrainment and impingement, but it is not known to what extent this may be the case. The EES relied on the small possibility of effect and the assumption that any migration of juveniles of the species may likely use the eastern arm of Western Port to otherwise dismiss the gravity of impact [286]. This demonstrates the uncertain impact of the Project on this species.

(ii) Pipeline Works

The Proponents submitted the likelihood of significant impact to the listed threatened species and ecological communities from the pipeline works were negligible to low as the pipeline works are short term and localised. They may result in a temporary degradation or fragmentation of particular habitats but would not lead to a decrease in population sizes and would be unlikely to create permanent alterations.

The IAC generally agrees impacts from construction of the pipeline are temporary and of a short duration, which, although significant at the time, allows the environment to recover. The effects from operation of the pipeline are minor as it will be underground. Effects on vegetation can be offset and the IAC has made recommendations that will assist in further avoiding impacts on those environments considered valuable, such as Warringine Park.

There will be impacts on habitat of threatened species such as the Southern Brown Bandicoot through vegetation removal. However, the IAC has recommended amendments to the CEMP POS that will assist in mitigating the more serious impacts of the works impacting on the species. The short duration of effects and lost habitat, and rapid revegetation of habitat areas post-construction should assist in providing refuge to allow for sustainability and movement of the species.

The pipeline construction will include HDD crossings for the majority of major waterways, which should reduce the significance of impacts on species such as the Growling Grass Frog and other aquatic species including the Australian Grayling and Dwarf Galaxias. The open trenching of those waterways is proposed to be undertaken during drier periods, minimising species impacts and the risk of sedimentation affecting water quality of Western Port Bay.

Flora species such as River Swamp Wallaby-grass have been safeguarded through detection and HDD works.

With respect to listed threatened ecological communities, there is a small area of coastal saltmarsh at KP20 proposed to be impacted by open trenching of the pipeline. In considered this impact, the IAC recommends removal of this community of coastal saltmarsh must be avoided through HDD. The IAC considers this will appropriately safeguard the community, particularly given its close location with extensive saltmarshes within the Western Port Ramsar site.

Table 21 summarises the findings of the IAC in relation to listed threatened species and ecological communities.

[286] Technical Report A, page 335

Table 21 Summary of findings on Listed species

Potential Risk	Implications for Listed threatened species and communities	Cross reference
Vegetation clearance and loss of habitat	Loss of vegetation is expected during the Pipeline Works to have an impact on listed threatened species primarily from removal and disruption of habitat. However, through recommended avoidance of areas of endangered vegetation communities and large scattered trees, together with proposed mitigation measures, impacts are considered to be acceptable. Vegetation clearance and loss of habitat is not expected during the GIJW to listed threatened species and communities.	Chapters 5.3 and 5.4
Changes to surface water quality	Impact from pipeline works to surface water quality should be avoided through waterways being either crossed by HDD or open trenched during periods of no water flow. Mitigation measures addressing stormwater runoff should reduce potential for sedimentation. Impacts are considered to be acceptable. Changes to surface water quality is expected around the GIJW and direct adverse impacts are not expected to listed threatened species and communities.	Chapter 6
Contaminated and acid sulfate soils	The short duration and temporary construction of the pipeline should minimise impacts on listed threatened species. Impacts are considered to be acceptable subject to the proposed mitigation measures. Contaminated sediment was measured proximal to the GIJW and impacts are not expected to listed threatened species and communities.	Chapter 8
Noise and vibration	Noise from construction of the pipeline is considered to be temporary and impacts acceptable. Air-borne noise and underwater noise from the GIJW may at times cause behavioural responses, which may result in marine fauna avoiding Berth 2 during periods of peak regasification. Long term and permanent adverse impacts are unlikely to result from noise generated at the GIJW.	Chapter 11
Air quality	Air quality impacts from the GIJW and pipeline works will not impact listed threatened species and communities.	Chapter 10
Lighting	Lighting may cause temporary behavioural changes, but adverse impact listed threatened species and communities is unlikely.	Chapter 5.6

21.4.4 Findings

The IAC finds:

- The likelihood of significant impacts to listed threatened species and ecological communities from both the GIJW and pipeline works are considered low providing the recommended mitigation measures are effectively implemented.

21.5 Listed migratory species

21.5.1 Background

EES Attachment I, and Technical Reports A and B described the potential impacts of the Project to the controlling provision of listed migratory species (s20 and s20A of the *Environment Protection and Biodiversity Conservation Act*).

Migratory species are those that migrate to Australia and its external territories or pass through or over Australian waters during annual migrations, including birds, mammals, sharks and reptiles.

21.5.2 Evidence and submissions

Chapter 5 provides further details on submissions and evidence relating to listed migratory species.

The Proponents submitted 54 listed migratory species with potential to occur within five kilometres of the GIJW area were identified in the PMST search. The EES reported that 25 listed migratory bird species were considered to have a medium or higher likelihood of occurring within this area, with eight of these species listed as threatened.

The Proponents described twelve migratory mammals, shark and reptile species as likely to occur in the GIJW area, seven of which are listed as threatened species. The Proponents noted the presence of the following:

- Humpback whales and Southern Right Whales frequent Western Port Bay on occasion, but visits to Western Port were considered the result of wandering from normal migration paths.
- White sharks are highly mobile and have been caught and observed in Western Port Bay, and it was anticipated this species could occasionally pass through the Western Port North Arm.
- Turtles are considered to have a low likelihood of occurring near the GIJW.

A significant number of submissions expressed concern with an increased risk of whale strikes from the additional movements of ships into the North Arm (See Chapter 14).

The GIJW and more broadly Crib Point provide foraging and roosting habitat for multiple migratory bird species, including species listed on one or more of several bilateral Migratory Birds Agreements Australia has with Japan, South Korea and China. Of the significant species recorded or predicted to occur within the GIJW area, 25 listed migratory bird species are considered to have a medium or higher likelihood of occurring within this area. Eight of these species are listed as threatened under the *Environment Protection and Biodiversity Conservation Act*.

The impacts of the GIJW on migratory birds was raised in several submissions. The Proponents submitted Crib Point is a secondary foraging habitat and does not provide important habitat for migratory shorebirds (see Chapter 5).

Submissions were concerned about lighting impacts on the listed migratory species residing within the GIJW and pipeline project area. Many questioned the adequacy of the Proponents' assessment of the Project impacts against the National Light Pollution Guidelines for Wildlife including Marine Turtles, Seabirds and Migratory Shorebirds. The Proponents submitted that light can be effectively managed and there will be no measurable change from GIJW and pipeline works (see Chapter 12.7).

The impact of noise, particularly underwater noise was considered in a number of submissions as a significant issue for migratory species. The Proponents submitted that listed migratory species will not be adversely impacted by air-borne noise from the GIJW and pipeline works. Listed marine species will likely exhibit behavioural responses and avoid underwater noise generated during some GIJW operational scenarios (see Chapter 11).

21.5.3 Discussion

The IAC has considered the potential impact pathways to listed migratory species across the GIJW and pipeline works area. A number of listed migratory species are within proximity to the GIJW, including migratory shorebirds, waterbirds, whales and dolphins. Listed migratory species are unlikely to be significantly impacted by the pipeline works.

Impacts to migratory species from the GIJW could potentially occur, with effects associated with water quality, spills and leaks, noise and vibration and lighting.

Table 22 summarises the findings of the IAC in relation to migratory species.

Table 22 Summary of findings in relation to migratory species

Potential Risk	Implications for migratory species	Cross reference
Changes to water quality	No impact from the GIJW and pipeline works, as any change to water quality will be localised.	Chapters 4, 5 and 6
Spills and leaks	The noted listed migratory species relevant to the GIJW are migratory in nature and would likely avoid an area impacted by spills and leaks until conditions become favourable. The risk of spills and leaks currently exist within PHDA. The pipeline works are localised and temporary impacts will be unlikely impact migratory birds.	Chapter 14.5.3
Noise and vibration	Underwater noise from the GIJW may cause temporary behavioural responses to marine listed migratory species. The extent of species impacts to underwater noise is not fully understood.	Chapter 11
Lighting	Lighting and sky glow may temporarily affect the behaviour of wildlife, particularly migratory birds, but permanent adverse impacts are not expected and species would not be prevented from undertaking critical behaviours such as foraging, reproduction and dispersal.	Chapter 12.7

21.5.4 Findings

The IAC finds:

- There is likely to be some impact from the GIJW on listed migratory species from lighting and noise. It is expected the adaptive behaviours of migratory species in the Project area may be temporarily altered but long term, permanent impacts are not expected.
- The effective implementation of the recommended mitigation measures will assist with managing impacts to Listed migratory species.

21.6 MNES conclusions

The IAC concludes that:

- Impacts to listed threatened species and listed migratory species are likely to be low.
- Impacts to the ecological character within a segment of the Western Port Ramsar wetland is unacceptable.

PART C: PROJECT IMPLEMENTATION/ASSESSMENT

22 Project implementation

22.1 Key approvals

22.1.1 *Environmental Protection and Biodiversity Conservation Act 1999*

The Project was referred to the Commonwealth Department of Environment and Energy under the Commonwealth *Environment Protection and Biodiversity Conservation Act* on 12 September 2018. The determining authority for the referral is now the DAWE.

The delegate for the Minister for the Environment and Energy determined the Project is a 'controlled action' as it is likely to have a significant impact on MNES:

> A 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts [287].

The Project was submitted as two separate referrals on the basis that the GIJW (EPBC Reference Number 2018/8298) and the Pipeline Works (EPBC Reference Number 2018/8297) were substantially different in the type of infrastructure and geographic footprint and would be operated by two separate proponents. The relevant controlling provisions for the pipeline works and GIJW are discussed in Chapter 21.

The EES process is accredited to assess impacts on MNES under the *Environment Protection and Biodiversity Conservation Act* through the Bilateral (Assessment) Agreement between the Commonwealth and the State of Victoria (Schedule 1 (part 5) of the Bilateral Agreement) [288].

The EES for the Project was undertaken in accordance with the Bilateral Agreement and there is no separate assessment by the Commonwealth. This avoids process duplication and enables alignment of mitigation and requirements under relevant State and Commonwealth legislation.

The Commonwealth Minister or delegate will receive the Minister for Planning's Assessment under the *Environment Effects Act* at the conclusion of the EES process and use it as the basis for deciding on approval of the Project under the *Environment Protection and Biodiversity Conservation Act,* including any conditions the Commonwealth Minister may deem appropriate.

The Project will require both Victorian and Commonwealth approvals in order to proceed.

The MNES are discussed in Chapter 21 where the IAC concluded that:

- Impacts to listed threatened species and listed migratory species are likely to be low.
- Impacts to the ecological character within a segment of the Western Port Ramsar wetland would be unacceptable.

[287] Commonwealth Significant Impact Guidelines 1.1

[288] What are generally termed 'effects' in the EES process correspond to 'impacts' under the *Environment Protection and Biodiversity Conservation Act*.

22.1.2 *Environment Protection Act 1970*

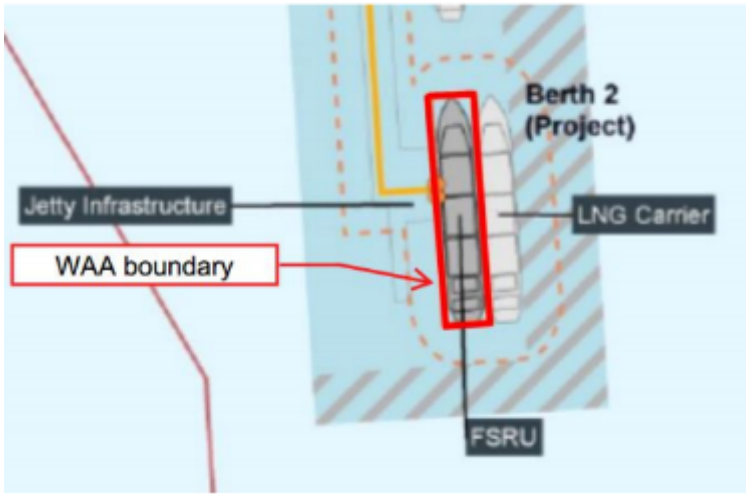
(i) Background

The Proponents made an application for a Works Approval under the *Environment Protection Act*, which was exhibited concurrently with the EES and attached as Attachment VIII to the EES.

The FSRU is a scheduled premises for the purposes of the *Environment Protection Act* that is '*likely to cause the discharge of waste to the enviro*nment' and therefore must obtain a Works Approval. The WAA relates exclusively to the continuous mooring of the FSRU at the Jetty, having regard to its likely emissions and discharges during operation.

The Boundary of WAA is shown in Figure 19.

Figure 19 Boundary of the Works Approval Application [289]



The WAA includes an assessment of the potential environmental impacts associated with the construction and operation of the FSRU including:

- FSRU processes
- energy use and greenhouse gas emissions
- water resource use
- air emissions
- noise emissions
- managing stormwater runoff discharges and discharge to Western Port waters
- land and ground water
- waste management
- risk assessment and environmental management
- operating requirements.

The Proponents advised the WAA was informed by the EES and the specialist studies exhibited as part of the EES.

289 EES Attachment VIII page 6

(ii) Terms of reference and approval process

The IAC Terms of Reference require the IAC to provide advice to inform the EPA's consideration of the WAA. The advice should recommend avoidance, mitigation or management measures the IAC considers necessary to ensure compliance with any relevant legislation and/or policy [290].

The IAC is required to make recommendations with respect to the WAA, including recommendations about conditions that might appropriately be attached to a Works Approval if issued [291].

The EPA participated in the TRG and provided advice about preparation of the EES. It made submissions to the IAC that outlined its preliminary observations and recommendations.

At the conclusion of the EES process, the EPA must consider the Minister's Assessment of the EES (as informed by the IAC's Report) before deciding the WAA.

The IAC notes that new laws will come into operation on 1 July 2021 under the amended *Environment Protection Act 2017*. The Proponents noted that:

> The WAA has been made under the current legislative framework but has had regard to concepts of risk assessment and risk minimisation that will be introduced under the New Environment Protection Act. It is anticipated that the New Environment Protection Act is likely to have commenced by the time that an operating licence is sought for the FSRU and that the operator will need to meet the requirements of the new legislative regime at that time [292].

The EPA noted applicable policies include the SEPPs, which are statutory instruments made under the *Environment Protection Act*. SEPP (Waters) SEPP (Air Quality Management) are of particular relevance to this Project [293].

A significant issue is that the Project proposes to discharge wastewater from the FSRU into the waters of Western Port Bay, which is designated as a wetland of international importance under the Ramsar Convention. The EPA submitted that Western Port Bay is therefore water of high conservation value under schedule 5 of SEPP (Waters).

The EPA submitted that SEPP (Waters) relevantly provides:

> (a) at clause 22(3), that the EPA must not approve an application for a new wastewater discharge to surface waters of high conservation value unless the EPA is satisfied that the waste water discharge will be consistent with the requirements of clause 25; and
>
> (b) clause 25 relevantly provides that the EPA may approve an application to discharge wastewater to surface waters to provide water for the environment or other uses if EPA is satisfied that the wastewater can be treated and managed to a level to protect beneficial uses.
>
> The EPA considers that the Proponent's Works Approval Application does not clearly explain how the FSRU would comply with the requirements of clause 25 of SEPP (Waters). EPA's records indicate this is the first application for permission to

290 IAC Terms of Reference Clause 21
291 IAC Terms of Reference Clause 39h
292 D162
293 D156

> discharge wastewaters into waters of high conservation value, under the current or past iterations of the waters policy [294].

The EPA has a number of matters to consider in relation to the relevance and applicability of SEPP (Waters). It noted this is the first application for permission to discharge wastewaters into waters of high conservation value, under the current past iterations of the waters policy. The IAC does not make any comments in relation to those matters.

On 19 November 2020, the EPA issued a notice to the Proponents under section 22(1) of the *Environment Protection Act* requesting further information [295]. The IAC makes no comments on the content of that request and has not seen any response.

(iii) IAC advice on the WAA

The IAC has assessed the potential environmental impacts of the proposed FSRU in Part B of the report. A summary of the assessment findings most relevant to the WAA are provided in Table 23.

Table 23 Summary of issues most relevant to the WAA

Chapter	Environmental impact	Comments relating to the WAA
4	Marine biodiversity	The marine biodiversity assessments considered potential impacts from the GIJW, primarily from operations of the FSRU and mooring of the LNG carrier when offloading the LNG. Biological and physico-chemical monitoring was conducted which included sampling plankton populations, seabed surveys and water quality monitoring. Physical modelling was performed to understand the hydrodynamic conditions of the marine waters of Western Port Bay and the localised Crib Point environment. Western Port Bay is an area of high conservation value as defined in SEPP (Waters). An objective of SEPP (Waters) is to achieve the level of environmental quality required to protect the beneficial uses of waters. SEPP (Waters) requires that EPA must not approve a new wastewater discharge in waters of high conservation value (Clause 22(3)) which include Ramsar listed wetlands (Schedule 5) unless discharges provide water for the environment or other uses and wastewater can be treated to protect beneficial uses (Clause 25). A mixing zone should not be approved if acute lethality results at the point of discharge. Under normal operation the Project would discharge 100 μg/L CPO. Based on the evidence presented to the IAC, the Project does not comply with the requirements of SEPP Waters. The discharge is considered by the IAC a new wastewater discharge which will be colder than ambient and contain CPO, a recognised toxicant. The GV of 6 μg/L and 0.5□C for CPO and temperature respectively, were nominated as the 99 per cent marine species protection criteria to protect beneficial uses.

294 D156

295 A draft was provided to the IAC (D431)

		The Project will impact biodiversity of Western Port Bay by entraining plankton, fish eggs and larvae during intake of an average 312,000 m^2 per day of seawater. Impingement of marine biota is expected although intake velocities are proposed at 0.15 metres per second to reduce entrainment and impingement. The extent of the discharge plume and the mixing zone will be reduced by avoiding discharge during slack tides. The IAC has recommended a GV of 2 μg/L as the 99 per cent marine species protection criteria and the discharge concentration from the high velocity discharge ports of the FSRU. The discharge concentration consistent with the 99 per cent marine protection species GV is considered to protect the beneficial uses at the point of discharge, should avoid acute lethality at the point of discharge and will minimise impact to waters of high conservation value. The final decision of the Project's compliance with SEPP (Waters) is a matter for the EPA. In the event the Project is approved, the recommended EPRs should be adopted.
9	Energy use and Greenhouse gas emissions	For operation, the Project would contribute the equivalent of 0.23 per cent of Victoria's annual Scope 1 and Scope 2 emissions under a closed loop scenario or 0.06 per cent under an open loop scenario. The Project will contribute additional Scope 1 and 2 GHG emissions which, when compared to those at the State level, are relatively low. GHG emissions produced from the Project are unlikely to run the risk of undermining or preventing the development, implementation, or achievement of net zero reduction of GHG emissions by 2050. The FSRU can adjust its gas outputs depending on policy and/or consumer demand or it can relocate elsewhere if need for the facility dissipates. Greenhouse gas impacts can be acceptably managed through the recommended EPRs.
10	Air quality	Air emission assessments were conducted to assess the potential air quality impacts due to construction and operation of the FSRU at Crib Point in accordance with relevant federal and state policies. Air emissions during construction of the GIJW can be effectively managed through the recommended EPRs. The assessment of the GIJW considered potential air emissions during operation of the FSRU and dispersion modelling of likely emissions under a range of worst case operating scenarios. The air emission modelling was considered conservative as it applied higher than expected background concentrations and operating scenarios that would occur for no more than 10 per cent of the year. Predicted emissions of carbon monoxide (CO), particulate matter (PM_{10} and $PM_{2.5}$) and sulphur dioxide (SO2) during worst case scenarios were modelled below SEPP (AQM) design criteria. Under worst case operating scenarios formaldehyde and NO_2 were both modelled to exceed SEPP (AQM) design criteria over water. Formaldehyde was modelled exceeding SEPP (AQM) design criteria

		over a small area of the Crib Point foreshore. Modelled dispersal plumes for assessed air pollutants did not intersect with sensitive uses, nor the Victorian Maritime Centre or Woolleys Beach Reserve. Odour is not expected from the GIJW. A HHRA determined that formaldehyde and NO_2 emissions from the FSRU would be at significantly lower concentrations than concentrations that cause adverse human health impacts. Air quality impacts can be acceptably managed through the recommended mitigation measures.
11	Noise and vibration	Noise and vibration impact assessments were conducted for a range of operational scenarios at the GIJW. Construction impacts at the GIJW can be effectively managed by implementing recommended EPRs. The FSRU operating at peak regasification was assumed as the worst case scenario at the Jetty. Noise modelling was conducted on five operating scenarios under peak regasification with an LNG carrier unloading LNG. The individual operations of the GIJW are likely to meet the NIRV Recommended Maximum Levels during gas import operations. However, the combined operations at Berth 1 and 2 are likely to result in exceedances of Recommended Maximum Levels at the nearest residence at 103 The Esplanade, particularly when the landside pump is offloading petroleum from a vessel docked at Berth 1. Additional background noise assessments should be conducted over an extended period during a range meteorological conditions to confirm noise emissions at the nearest sensitive receptor operations. Background noise should be measured during operations at Berth 1. This will assist in developing targeted noise amelioration measures to minimise cumulative noise exceedances particularly at night during concurrent operations at Berths 1 and 2. Operational noise from the GIJW requires further consideration to confirm cumulative noise during activities at Crib Point Jetty can be effectively managed to comply with Recommended Maximum Levels between 10pm and 7 am at the nearest sensitive receptor.
14	Safety, Hazard and Risk	The risk identification and assessment work done to date for the Jetty, FSRU and CPRF has been done to a standard appropriate to the current stage of the Project. The proposed operation of Jetty, including berthing and unloading of the LPG tankers are well covered by existing Port operating practices. Existing regulations combined with the identified Project EPRs will properly control and mitigate risks associated with the Jetty works, FSRU and CPRF.

Most relevantly, the IAC found in Chapter 4.4.6 that:

- Based on the evidence presented to the IAC, the Project does not meet the requirements of SEPP Waters Clause 23(2) (a) and (b) and Clause 22(3).
- The seawater discharged from the FSRU is considered a waste stream.

- Discharge from the FSRU would not have a net benefit to the receiving environment, nor are additional water flows required in Western Port Bay.

The IAC recommends that any WA conditions (should the Project proceed) incorporate the IAC's recommended mitigation measures.

22.1.3 *Planning and Environment Act 1987*

(i) Background

As noted in Appendix E, the pipeline elements of the Project are exempt from approval under the *Planning and Environment Act* where a pipeline licence is required under the *Pipelines Act*. The components of the Project within the Port of Hastings (the GIJW and FSRU) would require approval under the *Planning and Environment Act* and the Mornington Peninsula Planning Scheme. To facilitate this, the Proponents prepared draft Planning Scheme Amendment C272morn (the PSA) that proposes to:

- amend the schedule to Clause 45.12 Specific Controls Overlay by inserting incorporated document 'Crib Point Gas Import Jetty Works Incorporated Document, December 2020'
- amend the Schedule to Clause 72.01 (Responsible Authority for this Planning Scheme) to make the Minister for Planning the Responsible Authority for the purpose of the Project
- amend the schedule to Clause 72.03 (What Does this Scheme Consist of?) to insert Planning Scheme Map No 33SCO
- amend the schedule to Clause 72.04 (Documents Incorporated in this Planning Scheme) by inserting the incorporated document
- rezone the northern portion of CA 2040 from the Public Conservation and Resource Zone to the Port Zone
- extend the Port Zone to apply to all of CA 2085
- rezone the small western portion of CA 2085 from Public Use Zone 7 to Port Zone.

The Incorporated Document (prepared under the Specific Controls Overlay) would be the key instrument for approving those elements of the Project within the Port. It would exempt the Project from the need to obtain any further planning approval, subject to satisfying various conditions, including the preparation of various plans.

The Incorporated Document would require preparation of the following plans:

- Development Plan/s (an overarching description of the proposed works)
- Environmental Management Plan (the principal means of implementing the EPRs), including:
  - Construction Environment Management Plan
  - Operations Environment Management Plan
- Bushfire Management Plan.

(ii) Evidence and submissions

The Proponents outlined the proposed suite of planning controls and submitted the Specific Controls Overlay (and the associated Incorporated Document) was the appropriate planning tool to implement the Project. They noted the Specific Controls Overlay had been used to implement other large projects and relied on the evidence of Mr Biacsi who supported its

use for the Project. Mr Biacsi reviewed the exhibited Incorporated Document and recommended four changes that the Proponents subsequently included in the Day 1 version (D172).

As the Hearing progressed, the Proponents proposed further changes that were included in the Day 4 version (D587) that forms the basis of the IAC's recommended Incorporated Document at Appendix F.

The Proponent's key changes included:

- requiring the Development Plan and EMP to give effect to the EPRs
- requiring the Development Plan to address access and car parking
- requiring the EMP to be accompanied by a statement explaining any differences in the applied and approved EPRs
- requiring the CEMP to address acid sulfate soil
- requiring that the OEMP include a '*statement of anticipated LNG cargoes, not exceeding 40 cargoes or 160 PJ per annum (whichever is the greater)*'
- requiring further consultation with Mornington Peninsula and relevant authorities
- making various plans available on a Project website.

There were few substantive issues raised in submissions about the draft Amendment or the Incorporated Document.

Mornington Peninsula noted the visual impact of existing abandoned infrastructure from previous industrial uses in the Crib Point area and submitted:

> … it would be prudent to amend clause 6.0 of the Incorporated Document to make clear that the rehabilitation and decommissioning contemplated by that clause includes the removal of all aboveground infrastructure (noting that clause 6 allows the Minister and the Port of Hastings Development Authority to allow the retention of infrastructure in some circumstances) [296].

The EPA noted the Incorporated Document makes provision for the EMP to be amended to make it consistent with the new *Environment Protection Act*. The EPA supported the inclusion of this provision and noted a similar provision was included in the Incorporated Document for the North East Link approval.

The CEG submitted the Incorporated Document:

- should provide for a community representative to be involved in development of the EMP
- should require that the '*statement of anticipated LNG cargoes'* should be expressed as 'an enforceable cap'
- should not provide for the Minister to approve a Project extension beyond 20 years
- should require the various plans approved under the Incorporated Document be publicly available '*for the life of the Project'*[297].

Some submitters opposed the extent of the proposed Port Zone and removal of the Public Conservation and Resource Zone along the northern boundary of the CPRF site. Some were

296 D564
297 D549

concerned about the extent of the Port Zone and the Specific Controls Overlay to the offshore area, south of the Jetty. These submitters were concerned whether these controls (and the Project) would restrict access to the picnic area and associated beach. The Victorian Sea Kayak Club (S995) and Save Westernport were among those who had these concerns.

The Proponents advised the foreshore north of the Jetty would still be publicly accessible along the waterfront, but not through the CPRF site that would be fenced off for the Project. They advised the picnic and beach areas south of the Jetty would still be accessible from along the waterfront, within the Woolleys Beach Reserve and The Esplanade. However, they agreed with the Victorian Sea Kayak Club that the extent of the proposed Port Zone south of the Jetty be reduced to coincide with the existing Port boundary, subject to the views of relevant agencies including DELWP, PHDA and Mornington Peninsula[298].

Mornington Peninsula supported a review of the extent of the Port Zone in this area in order to minimise any restriction on beach access.

(iii) Discussion

The IAC supports the use of the Specific Controls Overlay and the revised Incorporated Document, noting this approach was generally supported in evidence and submissions.

Incorporated Document

Clause 4.5.3 requires various stakeholders, including Mornington Peninsula, be consulted during the preparation of the required plans. The IAC is satisfied that Mornington Peninsula can represent community interests and does not agree with the CEG that a '*community representative'* be nominated.

Clause 4.5.5 requires the OEMP include '*A statement of anticipated annual LNG cargoes, not exceeding 40 cargoes or 160 PJ per annum (whichever is the greater)*'. The IAC agrees with the CEG that this is a statement of intent, rather than an enforceable cap, and has included a revised requirement in Appendix F to address this.

Clause 7.0 (Expiry) allows the Minister for Planning to extend the expiry of the approval. This was opposed by the CEG, but the IAC is satisfied this is an acceptable provision and consistent with similar approvals. It does not follow that the Minister would automatically approve any extensions to the specified expiry dates.

Clause 4.11 (Other conditions) requires that various approvals be publicly available '*until the commencement'* or '*during the operation'* of the GIJW. This satisfies the concerns raised by the CEG, but unnecessarily distinguishes between documents being available until commencement or during operation. The IAC believes this should be simplified and all relevant approvals should be available for the life of the Project. The IAC believes this should include a document that lists the relevant EPRs approved by the Minister. Given that the various approvals under the Incorporated Document have their basis in the EPRs, including a copy of them would improve the transparency of those processes and approvals. These matters are addressed in the recommended Incorporated Document at Appendix F.

298 D175

The extent of the Port Zone

In relation to the extent of the Port Zone, the IAC accepts that its northern boundary represents the northern extent of the CPRF and the removal of a small area of the Public Conservation and Resource Zone is necessary to facilitate the Project. This area is within the Port, and access along the waterfront will still be possible.

To the south of the Jetty, the draft Amendment proposes a minor expansion of the Port Zone along the waterfront. The purpose of this expansion is not clear and submitters were concerned about its possible implications for access to the picnic area and beach. Although the rezoning would not, by itself, affect access to this area, the IAC agrees with the Proponents that the proposed change to the Port Zone should be reviewed so that it coincides with the Port Boundary. The IAC has included a recommendation to that effect.

Other issues

Clause 4.6 (Bushfire Management) requires the preparation of a Bushfire Management Plan. Bushfire risks were raised in submissions and are discussed in Chapter 14.

The IAC believes the Bushfire Management Plan should be prepared in consultation with the relevant fire authority and has included this in the recommended Incorporated Document at Appendix F.

(iv) Recommendations

The IAC recommends:

Incorporated Document

Include the following changes:

- **Revised Clause 4.4 (Development Plan)**
- **Revised Clause 4.5 (Environmental Management Plan)**
- **Revised Clause 4.6 (Bushfire Management)**
- **Revised Clause 4.1 (Other conditions)**

These changes are included at Appendix F.

Other recommendations

Review the extent of the proposed Port Zone south of the Jetty to coincide with the existing Port boundary.

22.1.4 Pipeline Licence Application

(i) Background

The IAC was appointed by an authorised delegate of the Minister for Energy, Environment and Climate Change as a Panel on 11 September 2020 to consider and prepare a report for the Minister in relation to the Pipeline Licence Application under s 40 of the *Pipelines Act 2005*.

The IAC acting as the Panel must, in accordance with s 47(1) of the *Pipelines Act:*

- report to the Minister for Energy, Environment and Climate Change on the submissions; and

- make a recommendation to the Minister for Energy, Environment and Climate Change as to the action that it believes should be taken with respect to the Pipeline Licence Application.

The Minister must consider the following in determining the application under section 49 of *the Pipelines Act*:

- the potential environmental, social, economic and safety impacts of the proposed pipeline
- the potential impact of the proposed pipeline on cultural heritage (including Indigenous cultural heritage)
- the benefit of the proposed pipeline to Victoria relative to its potential impacts.

The Proponents set out the statutory process for the Pipeline Licence Application in its opening submissions [299]. The stages for obtaining a licence were summarised including:

- the requirement for a consultation plan to be approved by the Minister as a precondition to any application
- pre-licence surveys that includes notification of affected landowners
- formal notification of the pipeline corridor
- submission of the licence application.

All of these steps were completed prior to the exhibition of the EES.

The Proponents advised the IAC that notice of the Pipeline Licence Application was given in accordance with the requirements of the *Pipeline Act* in conjunction with the notice of the EES for the proposed pipeline. The Pipeline Licence Application formed Attachment IX to the EES.

All submissions received in relation to the EES are deemed to be submissions in relation to the Pipeline Licence Application.

(ii) EES assessment of pipeline impacts

The IAC has assessed the potential environmental, social, economic, safety and cultural heritage (including Aboriginal cultural heritage) impacts of the proposed pipeline in the Part B of the report. A summary of the assessment findings in relation to the pipeline are shown in Table 24.

Table 24 Summary of assessment of impacts of the pipeline

Chapter	Environmental impact	Findings relating to the pipeline
5	Terrestrial and freshwater biodiversity	The impacts on native vegetation can be managed through the recommended CEMP POS subject to the addition of further sites for avoidance from removal. Impacts on threatened species have been appropriately avoided and minimised, will not be significant and can readily be managed to within acceptable limits. The proposed mitigation measures should be implemented subject to modifications relating to rapid revegetation for Southern Brown Bandicoot habitat along the length of the

[299] D162 paragraphs 221 to 225

		pipeline alignment and an appropriate protocol for managing clearing of Swamp Skink habitat. Biosecurity risk can be appropriately managed.
6	Surface Water	The surface water impacts are consistent with the draft evaluation objective. Surface water impacts can be acceptably managed through the recommended CEMP POS.
7	Groundwater	The groundwater impacts are consistent with the draft evaluation objective. Groundwater impacts can be acceptably managed through the recommended CEMP POS.
8	Contamination and acid sulfate soils	Soil and groundwater contamination impacts can be adequately managed by the recommended mitigation measures. Impacts from acid sulfate soils will not be significant and subject to additional sampling in medium to high risk locations and appropriate management guided by the Acid Sulfate Soils Management Plan and Acid Sulfate Soils Management Protocol should be acceptable.
10	Air quality	The CEMP POS (as modified) is adequate to manage potential air emissions impacts predicted during construction.
11	Noise and vibration	The noise and vibration impacts of the pipeline are mainly associated with construction. Impacts can be managed through the CEMP POS.
12	Landscape and visual	The landscape and visual impacts of the pipeline and associated works will mainly be confined to the construction phase of the Project, while the impacts associated with its operation will be negligible. Visual impacts of the pipeline and associated works can be managed through the recommended CEMP POS and are acceptable.
13	Transport	The traffic impacts of the pipeline are mainly associated with construction. Impacts can be managed through the CEMP POS.
14	Safety, Hazard and Risk	The risk identification and assessment work done to date for the pipeline and associated infrastructure (including the SMS) has been undertaken to a standard appropriate to the current stage of the Project. Further, more detailed risk assessments should be undertaken if and when the Project proceeds. The next versions of the risk assessment for the PDF should act on the further work recommendations of Ms Filippin. Existing regulations combined with the CEMP POS (as amended) will properly control and mitigate risks associated with the pipeline and associated infrastructure.

15	Land Use	Potential land use impacts associated with the pipeline would be predominantly confined to the pipeline notification area and are considered to be acceptable. Land use impacts are consistent with the draft evaluation objective. Land use impacts of the pipeline can be acceptably managed through the recommended CEMP POS.
16	Social	Social impacts can be adequately managed through the recommended mitigation measures.
17	Business	Business impacts during the construction and operation of the Project will be limited and can be appropriately managed. The Project will generate local employment and opportunities for local businesses, although this will be focussed on the Project's construction rather than its operation. The business impacts of the Project would be consistent with the social, economic, amenity and land use draft evaluation objective. The construction and operation of the Project are not expected to have any discernible impacts on local and regional tourism, including nature-based tourism. The tourism impacts of the Project would be consistent the social, economic, amenity and land use draft evaluation objective.
18	Agriculture	The impacts on agriculture would not be significant, subject to ongoing collaboration and liaison with landholders. The impacts on agriculture are acceptable subject to the recommended CEMP POS as amended.
19	Heritage (including Indigenous cultural heritage)	Heritage impacts are consistent with the draft evaluation objective/s, subject to the approval of the three CHMPs. Heritage impacts can be acceptably managed through the recommended mitigation measures.
20	Pipeline route options and site specific submissions	The IAC notes that discussions are continuing between APA and landowners regarding detailed pipeline alignment. The IAC encourages all parties to continue to work towards negotiated outcomes. The IAC has no basis to support realignment of the pipeline on any of the specific properties listed in the report. The IAC recommends that negotiations between APA and affected landowners about pipeline options in farming areas should have regard to minimising any impacts on the agricultural productivity and viability of the property.

There are no environmental, social, economic, safety or heritage impacts of the proposed pipeline component of the Project that preclude the Pipeline Licence Application from being approved.

(iii) Benefits relative to impacts

In assessing the benefit of the proposed pipeline to Victoria relative to its potential impacts, benefits need to be viewed in terms of how the pipeline supports the overall Project.

The EES Executive Summary summarised the benefits of the Project and concluded it would:

- provide gas supply certainty and security for Victorian gas customers in a climate where gas shortfalls are projected for south-eastern Australia
- place downward pressure on gas prices for residential customers as well as vulnerable industrial and commercial customers
- provide a flexible source of gas for gas-powered generation so that customers have secure and stable electricity supply as the National Energy Market transitions to accommodate more renewables
- employ in excess of 500 workers at the peak of its construction and 40 permanent positions at Crib Point during operations
- provide for a local community fund of $7.5 million.

The IAC has not quantified these benefits and it received numerous submissions challenging the value of some of the claimed benefits. The IAC concludes that, if the Project were to proceed, the above benefits would accrue at least to some measurable degree.

Taking the pipeline in isolation, the IAC concludes the overall impacts of its construction and operation are manageable if the recommended mitigation measures are adopted.

Having regard to the EES assessment, submissions and other material presented to it, the IAC concludes that the impacts of the pipeline relative to the benefits of the Project, if the entire Project proceeds, are manageable and sees no reason to preclude the Pipeline Licence Application being granted.

22.2 Other approvals

22.2.1 *Aboriginal Heritage Act 2006*

The *Aboriginal Heritage Act* requires the approval of CHMPs for the Project before it can proceed. The operation of the Act is discussed in Appendix E.

Three CHMPs are in preparation but have not been finalised:

- CHMP 15383 (Pipeline works - Crib Point to Tooradin)
- CHMP 15384 (Pipeline works - Tooradin to Pakenham)
- CHMP 16300 (Gas Import Jetty Works - Crib Point Jetty).

The BLCAC is the RAP for CHMPs 15383 and 16300. There is no RAP for CHMP 15384, so Aboriginal Victoria is the evaluating body.

The IAC heard submissions and evidence about adequacy of the work undertaken on the CHMPs to date, including the need to review the accuracy of some background information and address intangible heritage issues.

On the basis of the material presented to it, the IAC concludes there are no Aboriginal cultural heritage issues that preclude the Project proceeding, subject to the CHMPs being approved. In Chapter 19, the IAC recommends further actions so that Aboriginal cultural heritage issues are better managed.

22.2.2 *Marine and Coastal Act 2018*

The *Marine and Coastal Act* provides for the protection of Victoria's marine and coastal environment and requires consent for any use or development of coastal Crown land within 200 metres inland of the high-water mark.

The elements of the Project that require consent include the mooring of the FSRU, CPRF and Jetty pipeline. Consent has been granted to PHDA to upgrade Berth 2 to accommodate the FSRU. Consent will be required for construction of the CPRF and sections of the pipeline within 200 metres of the high tide mark.

22.2.3 *Flora and Fauna Guarantee Act 1988*

The *Flora and Fauna Guarantee Act* lists threatened flora and fauna species and communities. The Act works synergistically with the *Wildlife Act* (which covers threatened fauna) by triggering requirements for authorisation only for removing species of flora that are listed under the *Flora and Fauna Guarantee Act* as protected and for species of fish protected under this Act.

A licence or permit is required under section 48 for the removal of flora species protected under the *Flora and Fauna Guarantee Act*. Section 47 limits the need for authorisation under this Act to areas of public land. Section 52 requires authorisation to take species of fish listed as protected under this Act. This may be required for entrainment of fish species by the FSRU.

A range of listed species are present in the Project area and within the pipeline alignment and their removal from public land will require approval under the *Flora and Fauna Guarantee Act*. The operation of this Act is discussed in Appendix E.

The IAC discusses issues relating to the *Flora and Fauna Guarantee Act* in Chapters 5 and 11, where it provides relevant findings. The IAC finds there are no impediments to approval under this Act associated with the pipeline, subject to compliance with relevant mitigation measures. However, the effects of entrainment on fish species may be a matter where the effects of the Project are not acceptable and will require consideration by the decision maker.

22.2.4 *Wildlife Act 1975*

Section 28A(1)(a) of the *Wildlife Act* provides for authorisation to hunt, take or destroy wildlife (referred to as an authorisation to control wildlife), while section 28A(1)(f) enables for the care, treatment or rehabilitation of sick, injured or orphaned wildlife.

The IAC discusses matters associated with translocation of wildlife in Chapter 5, where it notes translocation of threatened species is considered an important conservation technique and can offer, for some species, the only method to prevent their extinction or to establish new populations.

On the basis of the material presented to it, the IAC concludes there are no wildlife management issues that preclude the Project proceeding, subject to the proposed mitigation measures.

22.2.5 *Water Act 1989*

Under the *Water Act*, Melbourne Water is responsible for managing waterways in the Western Port Bay catchment and administers *By-law No. 2 - Waterways, Land and Works*

Protection and Management, which prohibits certain activities without authorisation from Melbourne Water. The operation of the *Water Act* is discussed in Appendix E.

Approval from Melbourne Water would be required for any works on, over or under a designated waterway, or for the GIJW on the land which is subject to the Land Subject to Inundation Overlay. Approval is required before the commencement of construction. Consent for minor waterway work would be required for each crossing of a waterway by the Pipeline.

The IAC discusses Surface Water and Groundwater in Chapters 6 and 7, where it provides relevant findings. The IAC finds there are no impediments to approval under the *Water Act*, subject to implementing the proposed mitigation measures.

23 Integrated assessment

This chapter on integrated assessment brings together the IAC's considerations in relation to:

- Net community benefit
- EES draft evaluation objectives
- response to Terms of Reference
- response to draft Evaluation Objectives.

23.1 Net Community Benefit

A Project such as this invariably will have competing policy objectives and analysis of these assists to determine whether the Project will result in acceptable outcome that achieves a net community benefit.

Clause 72.02-3 of the Victoria Planning Provisions 'Integrated decision making' provides that:

> Society has various needs and expectations such as land for settlement, protection of the environment, economic wellbeing, various social needs, proper management of resources and infrastructure.
>
> Planning aims to meet these needs and expectations by addressing aspects of economic, environmental and social wellbeing affected by land use and development. Planning and responsible authorities should endeavour to integrate the range of planning policies relevant to the issues to be determined and balance conflicting objectives in favour of net community benefit and sustainable development for the benefit of present and future generations. However, in bushfire affected areas, planning and responsible authorities must prioritise the protection of human life over all other policy considerations. (IAC underlining)

In considering net community benefit, the 'community' which might be positively or negatively impacted must be acknowledged. It is well recognised that planning is not about maintaining the status quo but, in accordance with section 4(1)g of the *Planning and Environment Act,* planning is to balance the present and future interests of all Victorians. All Victorians includes not just an immediate local community.

The community in this case includes Crib Point, Hastings and Western Port Bay, French Island, the wider Mornington Peninsula, and Victoria in general. The Proponents urged the IAC to recognise the Project would be an asset for all of Victoria in terms of an ongoing and secure energy supply.

Clause 72.02-3 further notes the importance of sustainable development and effective and efficient use of resources.

Disappointingly for a project of this scope, the SIA did not undertake a net community benefit assessment, nor did the relevant witnesses.

This was raised in cross examination by the IAC to Mr Boushel and Ms Rosen, both of whom were questioned about principles of integrated decision making, net community benefit and the value of undertaking such assessments. Neither responded particularly well to the issues and questions put and both noted such an assessment could have been undertaken.

The Proponents addressed net community benefit in their closing submissions. In relation to the 'community' that might be impacted by the Project, they said:

> The identification of affected communities requires careful filtering in the context of this Project. Many submitters who live some distance from the Project and Crib Point

> argued that the implications of the Project aroused a sense of fear and anger because it proposes to import gas, a fossil fuel, despite climate change concerns. The difficulty with this argument is that it applies to any similar project anywhere in the state. The fear or anger would not be lessened if the Project was shifted elsewhere in Victoria, or Australia. To this extent this impact is not a direct impact of the Project but is more correctly understood as an impact of policy, and climate change concerns.[300]

To a certain extent, that is true. But the matter before this IAC is this Project at Western Port Bay which must be considered by this IAC.

The Proponents argued there should be more targeted consideration of local or nearby community impacts, and *'Fears and concerns for the activity in the Bay must be reconciled with knowledge of, or perhaps ignorance of, industrial port activities at Crib Point and Long Island Point'*. The Proponents noted various factors such as distance of the Jetty from Crib Point township, the long life of the Port, the proposed community fund and the objective analysis of factors such as current policy, traffic, risk and safety all must be taken into consideration in this context.

In relation to the tests to determine net community benefit, the Proponents addressed this in the context of acceptability and highlighted relevant case law. They noted '*The broader community impacts asserted by many submitters, while not central to the EES, in any case must be weighed against the broader implications of the energy supply for the State*'.

The IAC notes many tangible impacts can be mitigated through the EPRs and when considered in isolation, seem acceptable.

The intangible impacts of change and overall impact on lifestyle is more difficult to address. While there are five houses in closer proximity to the Jetty site, Crib Point township is 1.5 to two kilometres away from the Jetty. However, Crib Point and its surrounds (Woolleys and Jacks Beaches) are community assets used by residents and visitors to Crib Point, Western Port Bay and Mornington Peninsula locals, as well those from places beyond. Locals will experience varying levels of disruption as a result of the Project, both during the construction and ongoing operational phases. Others may decide to stay away from the area as a result of the Project.

The IAC accepts the primary starting point for its integrated assessment is that the Port of Hastings and Crib Point Jetty are long standing and legitimate land uses. Local and State planning policy is clear about the role of the Port, yet it comes with a caution that new development be assessed in the context of the designated Ramsar wetland, the UNESCO Biosphere designation (the only such designation in Victoria) and the complex marine environment. The nature of this Project, in that it will realise a permanently operating moored industrial FSRU for a 20 year period, introduces a new type of offshore use that will have potentially significant implications for the immediate marine environment.

The IAC has found there would be unacceptable impacts on the marine environment at Crib Point and potentially within the broader Western Port Bay. There is also the risk of further marine impacts that are not able to be quantified based on the available information.

Taking an evidentiary approach, the IAC has systematically reviewed and assessed each of the key impacts of the Project. Most impacts can be mitigated. In this context and in considering net community benefit, the IAC considers that local benefits include the

[300] D589, paragraph 450

community fund and some employment opportunities for local residents. Regional and State benefits include increased use of the Port of Hastings and a more secure gas supply.

Local disbenefits include intrusion into the Ramsar wetlands/UNESCO Biosphere Reserve, unacceptable impacts to the marine environment, highly negative community perceptions, and some unknown cumulative impacts. Regional or State disbenefits include intrusion into the Ramsar wetlands/UNESCO Biosphere Reserve and unacceptable impacts to the marine environment.

For these reasons, the IAC considers the Project will not result in a net community benefit.

23.2 Response to Terms of Reference

This chapter provides the IACs response to its Terms of Reference.

(i) Clause 39

Clause 39 specifies the matters the IAC's report must contain. The IAC's response is included in Table 25.

Table 25 Summary of IAC response to Terms of Reference Clause 39

Terms of Reference	IAC response and findings	Relevant report reference
a. Conclusions with respect to the environmental effects of the Project and their significance and acceptability;	The IAC finds the environmental effects of the Project are generally acceptable, except for environmental effects on marine biodiversity. The adverse effects on marine biodiversity would potentially be significant.	Chapter 4: Marine Biodiversity Chapters 5 to 21: various other effects Chapter 23: Integrated assessment
b. Findings on whether acceptable environmental outcomes can be achieved, having regard to legislation, policy, best practice, and the principles and objectives of ecologically sustainable development;	The IAC finds impacts on marine biodiversity would be unacceptable having regard to the *Environment Biodiversity and Conservation Act,* the *Environment Protection Act* and obligations associated with the Western Port Ramsar designation.	Chapter 4: Marine Biodiversity Chapters 5 to 21: various other effects Chapter 22: various approvals the Project would require
c. Recommendations and/or specific measures that it considers necessary and appropriate to prevent, mitigate or offset adverse environmental effects having regard to legislation, policy, best practice, and the principles and objectives of	If the Project proceeds, the IAC recommends revised and additional mitigation measures, and additional actions that would assist the Project better address environmental effects.	Chapters 4 to 21: Where appropriate, these chapters recommend new or revised mitigation measures, and further actions.

ecologically sustainable development;		
d. Recommendations as to any feasible modifications to the design or management of the project that would offer beneficial outcomes;	The IAC recommends revised and additional mitigation measures, and additional actions relating to the design and management of the Project. These include the need for additional investigations and monitoring.	Chapters 4 to 21.
e. Recommendations for any appropriate conditions that may be lawfully imposed on any approval for the project, or changes that should be made to the draft PSA in order to ensure that the environmental effects of the project are acceptable having regard to legislation, policy, best practice, and the principles and objectives of ecologically sustainable development	If the Project proceeds, the IAC recommends revised and additional mitigation measures, and additional actions that would better address environmental effects. The IAC discusses the various approvals the Project would require, including the draft Amendment.	Chapters 4 to 21: Where appropriate, these chapters recommend new or revised mitigation measures, and further actions. Chapter 22: Draft Planning Scheme Amendment
f. Recommendations as to the structure and content of the proposed environmental management framework, including with respect to monitoring of environmental effects, contingency plans and site rehabilitation	The IAC generally supports the structure of the environmental management framework, but recommends revised and additional mitigation measures, and additional actions. Some of these recommendations relate to additional monitoring, contingencies and site rehabilitation.	Chapters 4 to 21: Where appropriate, these chapters recommend new or revised mitigation measures, and further actions.
g. Recommendations with respect to the structure and content of the draft PSA	The IAC recommends changes to the Incorporated Document included in the draft PSA and a review of the proposed Port Zone boundary.	Chapter 22: Draft Planning Scheme Amendment
h. Recommendations with respect to the WAA, including recommendations about conditions that might appropriately be attached to a works approval if issued	The IAC finds the Project would have unacceptable environmental effects on marine biodiversity. This should inform the EPA's assessment of the WAA. If the Project proceeds, the IAC recommends revised and additional mitigation measures, and additional actions relevant to the WAA. This should inform the EPA's assessment of Works Approval conditions.	Chapter 22: Works Approval Application
i. Specific findings and	The IAC finds that impacts on the	Chapter 21: MNES

recommendations about the predicted impacts on MNES and their acceptability, including appropriate controls and environmental management.	Ramsar wetland (MNES) would be unacceptable. Impacts on other MNES are likely to be low and can be managed with the recommended mitigation measures.	

(ii) Clause 40

Clause 40 specifies the matters the IAC's report should include. The IAC's response is included in Table 26.

Table 26 IAC's responses to Clause 40

Relevant clause	Terms of reference requirement	Relevant report reference
40a	Information and analysis in support of the IAC's findings and recommendations.	Parts B and C
40b	A list of all recommendations, including cross references to relevant discussions in the report.	Table 27
40c	A description of the public Hearing conducted by the IAC, and a list of those persons consulted with or heard by the IAC.	Chapter 1 and Appendices B and C
40d	A list of all submitters in response to the exhibited EES.	Appendix B
40e	A list of the documents tabled during the public Hearing.	Appendix D

Table 27 Cross references between recommendations and discussions

Recommendation	Relevant report reference
Environmental Performance Requirements	
Revised EPR-ME16 (Monitoring Program)	Chapter 4
Revised EPR-C03 (Contaminated groundwater)	Chapter 8
Revised EPR-C04 (Unknown contamination)	Chapter 8
Revised EPR-C02 (Acid Sulfate Soil Management Plan)	Chapter 8
New EPR-GG07 (Certified carbon offsets)	Chapter 9
Revised EPR-NV06 (Managing cumulative noise impacts)	Chapter 11
Revised EPR-NV09 (Operations Noise Management Plan)	Chapter 11
Revised EPR-NV11 (Operational noise cumulative controls)	Chapter 11
Revised EPR-NV13 (Post-commissioning measurements)	Chapter 11
Revised EPR-NV14 (Underwater Noise: Detailed Design)	Chapter 11
Revised EPR-NV15 (Underwater Noise: Ambient Noise Study)	Chapter 11
Revised EPR-NV16 (Underwater Noise: Post Construction Monitoring and Assessment).	Chapter 11

Revised EPR-NV01 (Construction noise and vibration management plan)	Chapter 11
Revised EPR-NV02 (Managing noise and vibration from construction activities)	Chapter 11
Revised EPR-NV03 (Construction noise criteria)	Chapter 11
Revised EPR-NV05 (Noise and vibration monitoring).	Chapter 11
Revised EPR-LV01 (Landscape screening)	Chapter 12
New EPR-LV07 (FSRU lighting)	Chapter 12
Revised EPR-TP01 (Traffic Management Plan)	Chapter 13
Revised EPR-TP06 (Nitrogen Transport Plan)	Chapter 13
New EPR-SO07 (Woolleys Beach North)	Chapter 16
Revised EPR-SO03 (Community fund)	Chapter 16
Revised EPR-SO02 (Source local workers)	Chapter 16
Revised EPR-SO04 (Stakeholder Engagement Management Strategy)	Chapter 16
Revised EPR-AH03 (Project Working Group)	Chapter 19
Construction Environment Management Plan	
Additional native vegetation and large scattered trees is to be avoided. CEMP Attachment G (Environmental Line List)	Chapter 5
New POS B14 (Predator control management)	Chapter 5
Revised POS R14 (Southern Brown Bandicoot habitat)	Chapter 5
Revised POS B14 (Swamp Skink)	Chapter 5
Revised POS T13	Chapter 8
Revised POS E5	Chapter 11
Revised POS E6: Managing noise from construction activities	Chapter 11
Revised POS E7: Offsite noise management measures	Chapter 11
Revised POS HH3	Chapter 19
Incorporated Document	
Revised Clause 4.4.2 f) (Development plans)	Chapter 12
Revised Clause 4.4 (Development Plan)	Chapter 22
Revised Clause 4.5 (Environmental Management Plan)	Chapter 22
Revised Clause 4.6 (Bushfire Management)	Chapter 22
Revised Clause 4.1 (Other conditions)	Chapter 22

23.3 Response to draft evaluation objectives

Clause 5a of the Terms of Reference requires the IAC to have regard to the draft evaluation objectives in the Scoping Requirements Report. Table 28 summarises the IAC's findings about the Project's consistency with the objectives and indicates where the relevant discussion can be found in its Report.

Table 28 Response to EES draft evaluation objectives

Draft evaluation objective	Response
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.	The Project is consistent with this draft evaluation objective (Chapters 3.1, 9, 13 and 14).
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.	The Project is inconsistent with this draft evaluation objective in relation to Marine Biodiversity (Chapter 4) and MNES (Chapter 21). The Project is consistent with this draft evaluation objective in relation to Terrestrial and Freshwater Biodiversity (Chapter 5).
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.	The Project is inconsistent with this draft evaluation objective in relation to Marine Biodiversity (Chapter 4) and MNES (Chapter 21). The Project is consistent with this draft evaluation objective in relation to Terrestrial and Freshwater Biodiversity (Chapter 5), Surface Water (Chapter 6), Groundwater (Chapter 7) and Contamination and Acid Sulfate Soil (Chapter 8).
Cultural heritage: To avoid or minimise adverse effects on Aboriginal and historic cultural heritage.	The Project is consistent with this draft evaluation objective (Chapter 19).
Social, economic, amenity and land use: To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.	The Project is consistent with this draft evaluation objective (Chapters 10, 11, 12, 13, 15, 16, 17, 18 and 20).
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.	The Project is inconsistent with this draft evaluation objective in relation to discharge of wastewater from the FSRU (Chapter 4). The Project is consistent with this draft evaluation objective in relation to Contamination and Acid Sulfate Soils (Chapter 8), Greenhouse gas (Chapter 9) and Air quality Chapter 10).

Environment Effects Act 1978

Pipelines Act 2005

Planning and Environment Act 1987

Inquiry, Advisory Committee and Panel Report No. 2

Crib Point Gas Import Jetty and Crib Point – Pakenham Gas Pipeline

Report No. 2: Appendices

22 February 2021

Environment Effects Act 1978

Inquiry report pursuant to section 9(1)

Pipelines Act 2005

Panel report pursuant to section 40

Planning and Environment Act 1987

Advisory Committee report pursuant to section 151

Crib Point Gas Import Jetty and Crib Point – Pakenham Gas Pipeline

22 February 2021

Kathy Mitchell, Chair

Michael Kirsch, Deputy Chair

Jacquelle Gorski, Member

Chris Harty, Member

Trevor McCullough

Contents

Appendix A Terms of Reference

Terms of Reference

Crib Point Gas Import Jetty and Crib Point-Pakenham Gas Pipeline Inquiry and Advisory Committee

The Crib Point Gas Import Jetty and Crib Point-Pakenham Gas Pipeline Project Inquiry and Advisory Committee (the IAC) is appointed to inquire into, and report on, the proposed Crib Point Gas Import Jetty and Crib Point-Pakenham Gas Pipeline Project in accordance with these terms of reference.

The IAC is appointed pursuant to:

- section 9(1) of the *Environment Effects Act 1978* (EE Act) as an inquiry; and
- part 7, section 151 of the *Planning and Environment Act 1987* (P&E Act) as an advisory committee.

Name

1. The IAC is to be known as the 'Crib Point Gas Import Jetty and Crib Point-Pakenham Gas Pipeline Project Inquiry and Advisory Committee'.

Skills

2. The IAC members should have the following skills:
    a. gas industry engineering and management, including safety;
    b. marine and terrestrial ecological assessment;
    c. statutory planning.

3. The IAC may seek additional specialist expert advice to assist it in undertaking its role, in particular with respect to:
    a. air quality assessment
    b. landscape and visual impacts;
    c. social impact assessment
    d. agriculture and rural land use; and
    e. greenhouse gas emissions; and
    f. noise assessment.

4. The IAC will comprise an appointed chair (IAC Chair), a deputy chair and other members.

Purpose of the IAC

5. The IAC is appointed by the Minister for Planning under section 9(1) of the EE Act to hold an inquiry into the environmental effects of the project. The IAC is to:
    a. review and consider the environment effects statement (EES) and public submissions received in relation to the environmental effects of the project;
    b. draw conclusions on the potential environmental effects of the project, their significance and acceptability, having regard to the draft evaluation objectives in the EES scoping requirements and relevant policy and legislation;
    c. identify any measures it considers necessary and effective to avoid, mitigate or manage the environmental effects of the project within acceptable limits; and
    d. report its findings and recommendations to the Minister for Planning so he can assess the project's environmental effects.

6. The IAC is appointed as an advisory committee under section 151 of the P&E Act to:

a. review draft planning scheme amendment (PSA) C272morn, which has been prepared to facilitate the project, along with any public submissions received in relation to the draft PSA;
b. provide a report to the Minister for Planning as to whether the draft PSA contains provisions and controls that are appropriate for the project; and
c. recommend any changes to the draft PSA that it considers necessary.

7. The IAC will also provide advice that can be used to inform the Environment Protection Authority's consideration of the WAA prepared by the proponent for the project.

8. The IAC might also separately be appointed by the Minister for Energy, Environment and Climate Change as a panel under s. 40 of the Pipelines Act.

Background

Project outline

9. The project proposes the permanent mooring of a floating storage and regasification unit (FSRU) at Crib Point Jetty (The Esplanade, Crib Point), the installation of gas handling infrastructure on the jetty, construction of a gas receiving facility at Crib Point and construction of a gas pipeline from Crib Point to Pakenham, including a delivery facility at Pakenham East. The project comprises the following works elements:
    a. mooring and operation of the FSRU, including transfer of liquified natural gas (LNG) cargoes from visiting tankers and storage and regasification of LNG to natural gas;
    b. construction and operation of facilities for processing of gas at Crib Point and Pakenham East, including correction of gas to transmission system specifications, addition of odorant and adjustment of temperature and pressure;
    c. construction and operation of a high-pressure gas pipeline from Crib Point to Pakenham East, including ancillary facilities such as main line valves and pipeline inspection equipment;
    d. removal of native vegetation (and the provision of offsets) as required to enable the project to proceed; and
    e. ancillary and temporary works to support construction and operation of the project.

10. The project's proponents are AGL Wholesale Gas Limited (AGL) for the FSRU, jetty works and Crib Point receiving facility and APA Transmission Pty. Limited (APA) for the pipeline and other components of the project.

11. AGL and APA, acting jointly as the proponent, are responsible for preparing technical studies, consulting with the public and stakeholders and preparing an EES.

EES assessment process

12. In response to a referral under the EE Act from the proponent, the Minister for Planning determined on 8 October 2018 that an EES is required for the project and issued his decision with procedures and requirements for the preparation of the EES as specified in **Attachment 1**.

13. In response to the coronavirus pandemic emergency, the Minister issued amended procedures and requirements on 1 June 2020, as specified in **Attachment 2**.

14. The EES has been prepared by the proponent in response to the EES scoping requirements issued by the Minister for Planning in January 2019.

15. The EES is to be placed on public exhibition for forty (40) business days, together with the WAA, draft PSA and pipeline licence application.

Commonwealth assessment process

16. Because of its potential impacts on matters of national environmental significance, the project was determined to be a controlled action for the purposes of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) on 28 November 2018. The relevant controlling provisions

under the EPBC Act relate to listed threatened species and communities (sections 18 and 18A) and listed migratory species (sections 20 and 20A). Separate controlled action decisions apply to AGL's and APA's respective components of the project.

17. Under the bilateral agreement between the Australian and Victorian Governments, the Victorian EES process is serving as the accredited process for the assessment purposes of the EPBC Act. The assessment of environmental effects to be made by the Victorian Minister for Planning will be provided to the Commonwealth Minister for the Environment to inform the approvals decision under the EPBC Act. To assist the Minister in making his assessment, the IAC should specifically identify its advice relevant to matters of national environmental significance that may be affected respectively by either the AGL or the APA elements of the project.

Planning approval process

18. The IAC is to consider and provide advice on draft PSA C272morn that proposes planning controls and provisions for the Crib Point mooring site, jetty and receiving facility. The PSA, in conjunction with other required approvals will regulate the use and development of the project in accordance with an incorporated document which is proposed to be included in the Mornington Peninsula Planning Scheme.

Works approval process

19. A WAA for the project has been prepared in accordance with the provisions of the *Environment Protection Act 1970* (EP Act). The works approval application will be jointly advertised with the EES, in accordance with section 20AA of the EP Act.

20. Section 19B(3)(b) of the EP Act provides that: *if an application for a works approval is to be jointly advertised under section 20AA with a notice relating to the same proposal under the Environment Effects Act 1978… comments by any person or body interested in the application must be made as a submission on the environment effects statement or be included in any submission on the environment effects statement*. In addition, the Environment Protection Authority can no longer decide under section 19B(6) to hold a section 20B conference.

21. The IAC is to provide advice that can be used to inform the Environment Protection Authority's consideration of the WAA prepared by the proponent. The IAC may request any further information from the proponent that it considers necessary to assist it to provide that advice. The advice should recommend avoidance, mitigation or management measures that the IAC considers are necessary to ensure compliance with any relevant legislation and/or policy.

Pipeline licence application process

22. The IAC might also separately be appointed by the Minister for Energy, Environment and Climate Change as a panel under s. 40 of the Pipelines Act. If so, it must act in accordance with the requirements of the Pipelines Act and any specifications in its instrument of appointment.

Other approvals

23. The Project may require several other statutory approvals and/or consents, as outlined in the EES, including:
    a. approved cultural heritage management plans under the *Aboriginal Heritage Act 2006* to manage works in areas of cultural heritage sensitivity;
    b. consent for the use of Crown land under the *Marine and Coastal Act 2018* for the mooring and operation of the FSRU and for other project elements located on coastal Crown land;
    c. a permit to remove listed flora and fauna under the *Flora and Fauna Guarantee Act 1988*;
    d. an authority to take or disturb wildlife under the *Wildlife Act 1975*; and
    e. consents for works on, over or under waterways under the *Water Act 1989*.

Process

Stage 1 – Submissions

24. Submissions on the EES, draft PSA, WAA and pipeline licence application will be collected by Planning Panels Victoria (PPV) in accordance with the 'Guide to Privacy at PPV' through the Engage Victoria Website. All written submissions or other supporting documentation should be published on-line, unless submitters request that their submission not be publicly available, or where the IAC specifically directs that the submission or part of it is to remain confidential.

25. Electronic copies of submissions on the EES, draft PSA, pipeline licence application and WAA should be provided to the proponent, Mornington Peninsula Shire Council, Casey City Council, Cardinia Shire Council, the Department of Environment, Land, Water and Planning and the Environment Protection Authority.

26. Petitions will be treated as a single submission, and only the first name to appear on the first page of the submission should receive correspondence in relation to the IAC.

27. Any written material or evidence provided to the IAC during the public hearing should be published on-line, unless the IAC specifically directs that the material is to remain confidential.

28. Planning Panels Victoria will retain any written submissions and other documentation provided to the IAC for a period of five years after the time of the appointment of the IAC.

Stage 2 – Public hearing

29. The IAC must hold a public hearing and may make other such enquiries as are relevant to undertaking its role.

30. When it conducts a public hearing, the IAC has all the powers of an advisory committee that are specified in section 152(2) of the P&E Act.

31. Prior to the commencement of the public hearing, the IAC must hold a directions hearing in order to make any directions it considers necessary or appropriate as to the conduct, scope or scheduling of the public hearing.

32. The IAC may inform itself in any way it sees fit, but must review and consider:
    a. the exhibited EES, draft PSA and WAA;
    b. all public submissions, and all submissions and evidence provided to the IAC by the proponent, state agencies, local councils and the public;
    c. any information provided by the proponent that responds to submissions; and
    d. any other relevant information that is provided to, or obtained by, the IAC.

33. The IAC must conduct its public hearing in accordance with the following principles:
    a. the public hearing will be conducted in an open, orderly and equitable manner, in accordance with the principles of natural justice, with a minimum of formality and without the necessity for legal representation; and
    b. the IAC process is to be exploratory and constructive with adversarial behaviour minimised and with cross-examination controlled by the IAC Chair.

34. The IAC may limit the time of parties appearing before it.

35. The IAC Chair may direct that a submission or evidence is confidential in nature and the hearing be closed to the public for the purposes of receiving that submission or evidence.

36. The IAC may only conduct a public hearing when there is a quorum of at least two of its members present or participating through electronic means in line with Attachment 2, one of whom must be the IAC Chair or Deputy Chair.

37. Recording of the hearing will be undertaken by the proponent, in accordance with any directions made by the IAC Chair. The audio recording of any hearing sessions should be provided to Planning Panels Victoria as a weblink. The link to the recording will be made publicly available as soon as practicable after the conclusion of each day of the hearing, or otherwise as directed by the IAC Chair.

38. Any other audio or video recording of the hearing by any other person or organisation may only occur with the prior consent of, and strictly in accordance with, the directions of the IAC Chair.

Stage 3 – Report

39. The IAC must produce a written report for the Minister for Planning containing the IAC's:
    a. conclusions with respect to the environmental effects of the project and their significance and acceptability;
    b. findings on whether acceptable environmental outcomes can be achieved, having regard to legislation, policy, best practice, and the principles and objectives of ecologically sustainable development;
    c. recommendations and/or specific measures that it considers necessary and appropriate to prevent, mitigate or offset adverse environmental effects having regard to legislation, policy, best practice, and the principles and objectives of ecologically sustainable development;
    d. recommendations as to any feasible modifications to the design or management of the project that would offer beneficial outcomes;
    e. recommendations for any appropriate conditions that may be lawfully imposed on any approval for the project, or changes that should be made to the draft PSA in order to ensure that the environmental effects of the project are acceptable having regard to legislation, policy, best practice, and the principles and objectives of ecologically sustainable development;
    f. recommendations as to the structure and content of the proposed environmental management framework, including with respect to monitoring of environmental effects, contingency plans and site rehabilitation;
    g. recommendations with respect to the structure and content of the draft PSA;
    h. recommendations with respect to the WAA, including recommendations about conditions that might appropriately be attached to a works approval if issued; and
    i. specific findings and recommendations about the predicted impacts on matters of national environmental significance and their acceptability, including appropriate controls and environmental management.

40. The report should include:
    a. information and analysis in support of the IAC's findings and recommendations;
    b. a list of all recommendations, including cross-references to relevant discussions in the report;
    c. a description of the public hearing conducted by the IAC, and a list of those persons consulted with or heard by the IAC;
    d. a list of all submitters in response to the exhibited EES; and
    e. a list of the documents tabled during the public hearing.

Timing

41. The IAC should begin its formal public hearing no later than 40 business days from the final date of the exhibition period, or as otherwise agreed by the Minister for Planning.

42. The IAC must submit its report in writing to the Minister for Planning within 30 business days from its last hearing date or within 30 business days from 11 January 2021, whichever is the later.

Minister's assessment

43. The Minister for Planning will make his assessment of the environmental effects of the project after considering the IAC's report as well as the EES, submissions and any other relevant matters.

44. Planning Panels Victoria will notify submitters of the release of the Minister for Planning's assessment and IAC report.

Fee

45. The fees for the members of the IAC will be set at the current rate for a panel appointed under part 8 of the P&E Act 1987.

46. All costs of the IAC, including the costs of obtaining any expert advice, technical administration and legal support, venue hire, accommodation, recording proceedings and other costs must be met by the proponent.

Miscellaneous

47. The IAC may apply to the Minister for Planning to vary these terms of reference in writing, at any time prior to submission of its report.

48. Planning Panels Victoria is to provide any necessary administrative support to the IAC.

49. The IAC may engage additional technical and administrative support as required.

HON RICHARD WYNNE MP
Minister for Planning

Date: 18 / 10 / 2020

Appendix B List of Submitters

No.	Submitter	No.	Submitter	No.	Submitter
1	Michael Pickford	26	Marg D'Arcy	51	Edward Neff
2	Trudy-Ann King	27	Meg Paul	52	Jane Leitinger
3	Lucy Chesser	28	Matt Sykes	53	John Neve
4	Hayley Malloy	29	Branca McFarlane	54	Janet Davey
5	Damien Griffiths	30	Jane SeArle	55	Jordan Valentine
6	Megan Kimber	31	Jane Brownrigg	56	Ben Peck
7	Elizabeth Dodd	32	Kay Schroer	57	Miles Guggenheimer
8	Janina King	33	Anthony Dillon	58	Maureen Donelly
9	Jesse Wurt	34	David McCowan	59	Joanna Ferguson
10	Daniel Box	35	Tony Bates	60	Rupert Hazel
11	Gemma van Cuylenburg	36	Penelope Swales	61	Linda McLeish
12	Amy Henson	37	David McCowan	62	Tom Hayes
13	Eliot Davenport	38	Dorith Freeman	63	Dave Archer
14	Jessica Gleeson	39	Bernard Rowley	64	Jackson Connellan
15	Ben Davey	40	Kenneth Hailey	65	James Conquest
16	Pamela Marshall	41	Ann and Peter Robb	66	Paul Guggenheimer
17	Christopher Fowler	42	Sarah Mercuri	67	Tas Roussos
18	Cathie Coleman	43	Samantha Vullers	68	Michael Rings
19	David Wilson	44	Julie Bowden	69	Australian Wildlife Society
20	Breyten Storm	45	Brett Whiteoak	70	Confidential
21	Heidi Trudinger	46	Rachel Bucknall	71	Western Port Action Group
22	Peter Lole and Gloria McFarlane	47	Darebin Climate Action Now	72	Bryden Banks
23	Arthur O'Bryan	48	Mary Daley	73	Ian Haywood
24	Trevor Atkins	49	Lindsey Duffield	74	Marcus Henderson
25	Lynette Rings	50	Andrew Browne	75	Leyton Bowen

76	Liam McMahon	101	Sylvia Simons	126	Genevieve Droppert
77	Ben Hughes	102	Jack Knobel	127	Mia Dunphy
78	Danielle Devlin	103	Brent Morgan	128	Marcus Mason
79	Petrina Wetzel	104	Clea Morgan	129	Lucy Tulloh
80	Roderick Dixon	105	Bryce Kennedy	130	Peta Newbound
81	Jocelyn Watson	106	Theologia Keramaris	131	Remy Pilot
82	Mark Galliennne	107	Anne Paul	132	Jamie Stackpole
83	William Chandler	108	Anna Lycett	133	Jyhanna Saba
84	Leyla Bulmer	109	Clair Weekley	134	Bruna Amaral
85	Patricia Commerford	110	Kate Culmsee	135	Christine Gregory
86	Christa Whelan	111	Alice Saveneh-Murray	136	Matilda Hiscock
87	Jill Stanszus	112	Bre Rodwell	137	Marie-Louise Drew
88	Margaret Hiney	113	Offshore & Specialist Ships Australia Ltd	138	Amanda Lee
89	Elizabeth Fenwick	114	Bruce Missen	139	Anne Tillig
90	Sue Leitinger	115	Laurel Heisman	140	Jo Whitehead
91	Genevieve Arter-Luen	116	Australasian Native Orchid Society – Victoria	141	Caitlin Ramsay
92	Sue Whelan	117	Cathy Thesing	142	Amanda Peyton
93	Simon Luen	118	Christine Mackintosh	143	Medine Simmons
94	Oscar Arter-Luen	119	Alexander McKelvie	144	Jemma Caddell
95	Scarlet Arter-Luen	120	Samuel Fyfield	145	Jennifer Christopherson
96	Madeleine Neff	121	Monique Scalzo	146	Richard Kelly
97	Hine-Te-Ra	122	Suzanne Cockle	147	Carol Goudie
98	Helen Wolfe	123	Thomas Hoelzer	148	Emma Hopkins
99	Elaine Smith	124	Celeste de Vis	149	Helmut Loersch
100	Sun butter	125	Peter Deerson	150	BEAM Mitchell Environment Group Inc.

151	Barbara Hogarth	176	Dylan Candy	201	William Fenner
152	Gina McKenna	177	Philippa Harrison	202	Shirley Wallace
153	Elliot Condous	178	Mornington Peninsula Marine Alliance	203	Catherine John
154	Mary French	179	Karen Hopkins	204	Jason Tranter
155	Rupert Steiner	180	Louise Kyle	205	Michael Upston
156	Veronica Sive	181	Margaret Spence	206	Robin Massey
157	Rebecca Davis	182	Trina Hipwell	207	Colin Smith
158	Rosemary Birney	183	Tania Kaye	208	Ann-Marie McLean
159	Nicholas Jans	184	Bruce Beddoe	209	Sally Holdsworth
160	Nicole Humphreys	185	Jan Parker	210	Kevin Holt
161	Deborah Punton	186	Sue O'Brien	211	Patricia England
162	Barbara Denham	187	Danny Blay	212	Antonietta Gentile
163	Joshua Warren	188	Hayley Rings	213	Peter Renkin
164	Deborah Malesa	189	Felicity Crombach	214	Monique Parkes
165	Ido Fridberg	190	Ron attard	215	Phillip Slattery
166	Anne Tardif	191	Gemma Dickson	216	Kevin Marks
167	Janet Eyles	192	Warwick Sprawson	217	Jeanette Davidson
168	Michelle Mason	193	Heather Stephens	218	José Palazzo, Jr.
169	Loryn Worthy	194	Lea Jellinek	219	Pasquale Lazzaro
170	Heather Chapman	195	Bronwyn Elmore	220	Bruce Jeffery
171	Richard Whitehead	196	Jason Macquarrie	221	Elise Slattery
172	Judith Smart	197	Michael Sydney	222	Maureen Elmore
173	Nicola Venditozzi	198	Simon Duncan	223	Louise Riley
174	Melody Chittenden	199	Geoffrey Poynter	224	Darcy Regan
175	Surfrider Foundation Mornington Peninsula Branch	200	Rosalind Steel	225	Holly Regan

226	Beverley Middleton	251	Nicholas Peyton	276	Molly Van Berkel
227	Jeff Davies	252	Gabrielle Nolan	277	Jasmine Treppo
228	David Regan	253	Mark Mackie	278	Rhonda Attwood
229	Lisa Whiston	254	Yung En Chee	279	Mark Nienaber
230	Sue Boggan	255	Martine Holberton	280	Sam Imberger
231	Matthew Benjamin	256	Melanie Attard	281	Kate Butler
232	Jacek Mambort	257	Jackson Freeman	282	Verity Campbell
233	Callum Rogers	258	Kate Dalton	283	Robyn Tyson
234	Victorian Planning Authority	259	Susan Dwyer	284	Linda Clarke
235	Sally-Ann Baxter	260	Hannah Mckelvie	285	Louise Taylor
236	Edith Coventry	261	Nicholas Elmore	286	Peter Fellows
237	Ann Renkin	262	Ian Cuzens	287	Rosemary Vernon
238	Victor Perez	263	Claudia Terstappen	288	Robert Thornhill
239	Douglas Evenden & H Evenden	264	Liam Plumb	289	J Johns
240	Bette Mitchell	265	Travis Turner	290	Ruby Lewis
241	Bonnie Gelman	266	Kathryn Shain	291	Amelia Glass
242	Cheryl McDonald	267	Joan Spittle	292	Henk Van Leeuwen
243	Amy Heson	268	Gabrielle Hermans	293	Marlo Reyneke
244	Marianne Sherry	269	Verity McLucas	294	Gil Hopkins
245	Jananta Dwipa	270	Janet Elizabeth Morgan	295	Lorna Wyatt
246	Alexander Price	271	Kate Perman	296	Sonya Burrill
247	Rupert Simmons	272	Lucy Anderson	297	Tessa Mitchell
248	Teresa Hicks	273	Kendall Monk	298	Sasha Taylor
249	Hannah Lewis	274	Erin Howard	299	Graeme Garrett
250	Elizabeth Nolan	275	Peter Davis	300	Robert Power

301	Kirsty Graham	326	Jemma Jolly-Bordonaro	351	Sean Willmore
302	Jessica McAllister	327	Jane Touzeau	352	Kim Adair
303	Sandy Richards	328	Marie Wannan	353	Terese Dalman
304	Nicole Creaser	329	Joanne Lane	354	Rhonda Juniper
305	Joelle Stoelwinder	330	Anne Kotzman	355	Adam Reincke
306	Aaron Brereton	331	Keith Lawrence	356	Pierre Quaglino
307	Alexander Campbell	332	Melanie Thewlis	357	Australian Energy Council
308	Kaye Blum	333	Linda Bester	358	David Robinson
309	Ailsa Cowan	334	Margaret Bryant	359	Elisabeth Wauchope
310	John Blogg	335	Mila Milenkovich	360	Joshua Logan
311	Cassy Laird	336	Helen Kent	361	Heather Gee
312	Ceri Pritchard	337	Susan Taylor	362	Stephen Wauchope
313	Danielle Grant	338	Valerie Davis	363	Doug Varey
314	Rosemary Vernon	339	Pam French	364	Gavin McKelvie
315	Joan Smith	340	Jane Vandeth	365	Australian Industry Group
316	Duplicate Submission	341	Penny Roberts	366	Elisabeth Perraud
317	Rachel Riordan	342	Grace Roberts	367	Lucy Moray
318	Lisa How	343	Annie Wwenham-Flatt	368	Anna Nervegna
319	Caleb Grimes	344	Cheryl Ribeiro	369	James Hewitt
320	Jannine Blogg	345	Jon Clarke	370	Dion Belfrage
321	Ashley Dawes	346	Gerard Drew	371	Suzanne Riordan
322	Susan Varey	347	Matthew Gilbert	372	Emily Kemp
323	Jarryd Minahan	348	Anoush Witsel	373	Joanne Harrison
324	Marco Setiawan	349	Tess Lehman	374	Nick Gleeson
325	Rodney Novak	350	Stephen Espenschied	375	Angus Robb

376	Polly Morton	401	Oscar Aliotta	426	Adam Rubenis
377	Elizabeth Fraser	402	Jared Denton	427	Susan Jenkins
378	Felicity Warren	403	Raf Heale	428	Annabelle Townsend
379	Michelle Pretty	404	Kiana Jordan	429	Daniel Tester
380	Olivia Jones	405	Fiona Hammond	430	Timothy Schneider
381	Emma Gates	406	Sally Mckittrick	431	Chris Howlett
382	Paul Hopkins	407	Robin Anderson	432	Benjamin George
383	Robyn Hansen	408	Susan Tospell	433	Nikki Mathews
384	Crispin Hiney	409	Mark Adams	434	Sharyn Belcher
385	Sam Holland	410	Majell Backhausen	435	Cristie Wilson
386	Claire Osman	411	Sally Vivian	436	Dawn Markowitsch
387	Serena Cabello	412	Andrew Tarlinton	437	Bruce Robertson
388	Alasdair Ross	413	Katie Wells	438	Nicole Fawcett
389	Carole Anne Emslie	414	Ben Rawling	439	Kaye Brooks
390	Jeff Fortuyn	415	Judy Newman	440	Lisa Jordan
391	Mark Lording	416	Ella Walker	441	Tamsin Neff
392	Vicki Hester	417	Jarrah van Stekelenburg	442	Aidan Sujecki
393	Jessica Brebner	418	Drew Cooper	443	Linda Dougall
394	Noriel Williams	419	Tim Watson	444	Adam Hodgson
395	Michelle Lannan	420	Jacqui Perrey	445	Kate Coverdale
396	Sally Foran	421	lachlan Hughes	446	Robyn Knobel
397	Wendy Van Cuylenburg	422	Jari Cooper	447	Kerwan Peck
398	Elaine Wmart	423	Jan Calaby	448	Rupert Steiner
399	Alice Blanch	424	Christine Besson	449	Nic Sujecki
400	Chiara Finnigan	425	Ian George	450	Laura Sujecki

451	Elizabeth Bolitho	476	Graham Gregson	501	Anne Mennell
452	Stephen Molloy	477	Brigette Snell	502	Ben Katona-Staindl
453	Mark Coverdale	478	Natalie Carter	503	Jane Hall
454	William Atkinson	479	Hamish Payne	504	Jane Ryrie
455	Linda Palmer	480	Dominic Holden	505	Alisha Fulton
456	Jennifer Francis	481	Elaine Harper	506	Eliza Buckley
457	John O'Brien	482	Penny Underwood	507	Patrick Wilson
458	Roxana McMillan	483	Jessica Kafcaloudes	508	Todd Scatchard
459	Thomas Williams	484	Heather Goddard	509	Shari Barmos
460	Kate Wilson	485	Gracie Forshaw	510	Vicki Scotland
461	Svea Nord-D'Alton	486	Julie McKay	511	Scott Brennand
462	Mary Thackeray	487	Tasma Walton	512	Madelene McNeill
463	Kate Ryan	488	Hamish Donaldson	513	Bodhi woods
464	Antony Ransome	489	Harrison Storm	514	Callum Edwards
465	April Chaplin	490	Adair Lander	515	Hannerose Falkiner
466	Jessica Davies	491	Jessica Holding	516	Michaela Poncell
467	XR Grey Power Victoria	492	Julie-Ann Rofe	517	Christine Kirkpatrick and David Green
468	Michelle Wright	493	Jodie King	518	Benjamin Racz
469	Andrew and Linda Marston	494	Sarah Mills	519	Andrea Babon
470	Bruce McCallum	495	Eddie Perfect	520	Kim Harley
471	Erena Lawrence	496	Madeleine Moore	521	Barbara Fraser
472	Amy Campbell	497	Amanda Clarke	522	Nick White
473	Nikky Saitta	498	Jodi Boadle	523	Elliot Henkel
474	Geoffrey Linnell	499	Justin Hams	524	Gillian Adam
475	J Thillaimuthu	500	Helen Evans	525	Melissa Trudinger

526	Mairi Stewart	551	Amy Finerty	576	Donna Foster-Travers
527	William Loft	552	Jacqueline Winstanley	577	Annie McCallum
528	James Woods	553	Julia Coffey	578	Sophie McCabe
529	Anna Whitehead	554	Lucinda Healey	579	Michelle Hardie
530	Rebecca Robinson	555	Fred Butcher	580	Sarah Treacy
531	Kaye Duffy	556	Aaron Kosub	581	Laura Brearley
532	Hilda McLeod	557	Kenneth Blackman	582	Helen Lawrence
533	Leah Brown	558	Jocelyn O'Neil	583	Lisa Hodgson
534	Chelsea Riviere	559	Jan Farrell	584	Margot Rottem
535	Graeme Smith	560	Jeremy Oleksyn	585	Jai Marchinton
536	Luke Hunter	561	Lucy Fahey	586	Elizabeth Mackie
537	Nat Chatfield	562	Bron Ives	587	Carrieann Wells-Macey
538	Yohanna Gardener	563	Sally Baillieu	588	Karin Till
539	John Hughes	564	Roger Richards	589	Jennifer Bashford
540	Leigh McLeod	565	Susan Keeble	590	Geoff Spillane
541	Melanie McLean	566	Ben Russell	591	Sarah Rostron
542	Kathleen Howe	567	Ian Fraser	592	Elesha Burkart
543	Shae Anastasia	568	Mark Dewhurst	593	John Mitchell
544	Joanne Thompson	569	Ray Peck	594	Bailey Thomas
545	David Arnold	570	Meghan Streiff	595	Pamela Engelander
546	Trevor Vreekamp	571	Brett Hemphill	596	Sean Ori
547	Fiona Rawson	572	Simon Scott	597	Vicky Ellmore
548	Graeme Levey	573	Erin Jones	598	Joy Herring
549	Christopher Russell	574	Brenda Tucker	599	Geraldine McFaul
550	Amanda Kelly	575	Barry Peachey	600	Joshua Neilsen

601	Nelly Shaw	626	Belinda Pearson	651	Merrilyn Newnham
602	Dani Mcintyre	627	Esther Grimes	652	Pamela Green
603	Christine Irvine	628	Sarah Bell	653	Nerida Melsmith
604	Jock Perry	629	Anne Wagner	654	Madeleine Grimes
605	Bruno Chene	630	Benjamin Armstrong	655	Andrea Dunkley
606	Belinda Rodman	631	Genine Hook	656	Jonathan Webster
607	Anthony bult	632	Christian Cairns	657	Claire Thorn
608	Jemma Heritage	633	Roger Anderson	658	Emily Langdon
609	Kate Smyth	634	Bree Colcott	659	Clare Armstrong
610	Joanne Caligiuri	635	Jorja Pendlebury	660	Helen Foster
611	Sean Jones	636	Caitlin Coleman	661	Jessica Dinan
612	Kathryn Hannan	637	Leona Twist	662	Camilla Lazzar
613	Richard Mathews	638	Anna Linehan	663	Bek Thompson
614	Susan Thompson	639	Dave Colcott	664	Paul Thompson
615	Jason Gardner	640	India Flint	665	Kate Cogger
616	Murrindindi Climate Network Inc.	641	Diane Karitinos	666	Leigh Dowell
617	Stephanie Malane	642	Laura Moso	667	Carmel Mcinneny-Mcare
618	Elizabeth Moore	643	Carolyn Ingvarson	668	Fiona
619	Keith Moore	644	Emilie Alciato	669	Daisy Slade
620	Telisa Gardner	645	Maddison Cain	670	Adam Brian Levey
621	Wendy Nieuwenhuizen	646	Linda Dean	671	Susan Ratcliffe
622	Lynn Frankes	647	Friends of Bradshaw Bushland Reserve Inc	672	Mara Saunders
623	Julia Merrington	648	Gayle Ebery	673	Timothy Stout
624	Carolyn Woods	649	Angela Hodgkiss	674	Brian Forward
625	Jannica Cleary	650	Pat Macwhirter	675	Ingrid Hornung

676	Joel Grist	701	Alex McLean	726	Courtney Campbell
677	Sarah Thomson	702	Glen Mackie	727	Steve Bursill
678	Amelia Vague	703	Martin Dobson	728	John Reynoldson
679	Christine Charles	704	Amanda Palmer	729	Andrea Earle
680	Siobhan Morris	705	Stewart Macgowan	730	Lina Libroaperto
681	Esther Smyth	706	Lara Bickford	731	Rebecca Schwerdfeger
682	Theresa Dyer	707	Lucinda Francis	732	Gabriella Beaumont
683	William Mitchell	708	John Chadderton	733	Ann Thomas
684	Jill Mathers	709	Sarah Catchlove	734	Philip Crohn
685	Mary Edwards	710	Jack Lazzaro	735	John Wright
686	Michelle Thomas	711	Jennifer Lenard	736	Melba Farnbach
687	Ruth Clifford	712	Michele Ford	737	Lee Carmody
688	Anthony Grimes	713	Stephanie Campbell	738	James Graham
689	Sue Pratt	714	Claire Coulson	739	Peter and Shelagh Goodey
690	Anne-Marie Spagnolo	715	Larissa Andrusiak	740	Eileen Khoo
691	Stephen Munro	716	Jasmine Campbell	741	Jodi Nissen
692	Sophie Adsett	717	Jesse Cardamone	742	Noel Loft
693	Robert Mattingly	718	William Campbell	743	Leah Earle
694	Gregory Hardisty	719	Lou Curtis-Smith	744	Eric Cross
695	Peter Adsett	720	Owen Morris	745	Bella Ford
696	Alice Hayes	721	David Tracy	746	Mornington Peninsula Koala Conservation Landcare group
697	William Webster	722	Janet Limb	747	Alicia Kristow
698	Lydia Hedley	723	Jan Earls	748	Tria Manley
699	Suzanne Adsett	724	Patricia Menzies	749	Emmanuel Coulaud
700	Suzanne Grimes	725	Morgan Coventry	750	Brenda Larsson

751	Poul Grage	776	Kristen Seps-Moffat	801	Tom Hide
752	Maree Kratzer	777	Karen Johnson	802	Rachel Coffey
753	Phillip Nahed	778	Julie Crawford	803	Carol Shelton
754	Dina Listmangof	779	Deb barke	804	Janine Bugg
755	Jennifer Hattingh	780	Mandy Varcoe-Cocks	805	Douglas Murchison
756	Sophie Freeman	781	Louise Hempel	806	Wendy Coad
757	Claire McNamara	782	Sandra Kane	807	John Bailey
758	Bronwen Gibbs	783	Kevin Armstrong	808	MK Francis
759	Janelle Phillips	784	Ratna Pradhan	809	Andrew Parsons
760	Sarah Pyman	785	Friends of the Glenfern Green Wedge inc	810	Michelle Baxter
761	Ross Headifen	786	Christine Kendall	811	May Williams
762	Josette Bowden	787	Anne Murphy	812	Darryl McKean
763	Ramona Headifen	788	Wilga Kottek	813	Jennifer Thorn
764	Christa Momot	789	Liz Walker	814	Jackie Tritt
765	Rhiannon Morgan	790	Cameron Olsen	815	Carolyn Briggs
766	Ian Coffey	791	Andrew Cox	816	Kelly Stevens
767	Alex Eggleston	792	Georgina Cripps	817	Ross Edward Lloyd
768	Anna Burstall	793	Emma Libbis	818	Monica Rivera
769	Peter Kratzer	794	David Laing	819	Vicky Karitinos
770	Graeme Shrapnel	795	Heather Armstrong	820	Jeremy
771	Dan Burstall	796	Peter Balka	821	Susan Keil
772	Sally Ferber	797	Leigh Houliston	822	Maddison Butler
773	Holly Wignall	798	Norm Mortlock	823	Meredith Kefford
774	Diane Tymms	799	Amanda Blake	824	Michael Braden
775	Jonathan Morris	800	Christine Puebla	825	Robin Baillie

826	Rosemary Brooks	851	Tristan Maclean	876	Hamish Kebbell
827	Carol Bate	852	Mick Fischer-Brunkow	877	Sheree Krass
828	Caroline Bernardo	853	Judy Nutter	878	Miranda Bonwick
829	Sonia Hartley	854	Madeleine Austin	879	Flinders Oyster Company P/L
830	Catherine Loel	855	Evie Atkins	880	Tiahn
831	Jamie Kristow	856	Gina Tritt-Buntine	881	Michelle gregson
832	Lighter Footprints	857	Daniel Kabel	882	Gerd Kurz
833	Emma Lewis	858	Jarrod Kangisser	883	Manon Keur
834	Wayne Spicer	859	Abbie Newman	884	Jacqueline Bates
835	Kerryn Jory	860	Marcus Thorntovina	885	Jane Myers
836	Tan Somkiat	861	Greer Hellier knox	886	Kate Reid
837	Tess Huntley	862	Australian Conservation Foundation Macnamara Community Group	887	Kate Skinner
838	Lena Anne Berryman	863	Chelsea Haynes	888	Michael Spiteri
839	Louise Simmons	864	Tess and John Synot	889	Marcus Maginness
840	Shannon Garrett	865	Paul Morris	890	Sherie Connors
841	Susanne Jackson	866	Fantazia Nelson	891	Barbara Tipper
842	Lighter Footprints	867	Susan Mitchell	892	Kerry Delaney
843	Spiro Pittas	868	Meredith Lynch	893	Emils Baumanis
844	Peter Richardson	869	Stevie Butler	894	Marlee Durdin
845	Will Brownlee	870	Andrew Mason	895	Leanne Hyatt
846	Hollie Hick	871	Dean Lynch	896	Mitchell Norris
847	Julie Busch	872	Sarah Toose	897	Eunika Burger
848	Isabelle Howes	873	Bryn Mason	898	Kirsty Cortese
849	Tim Nlan	874	Philip Bock	899	Mayra Cuming
850	Jen Cunningham	875	Audrey Zerbe	900	Felix Metz

901	Simone Cull	926	Jade vigilante	951	Jenny Thomas
902	Michael Johnson	927	Karina Armstrong	952	Jasminka Ward-Matievic
903	Balnarring Beach Community Association	928	Sarah Clisby	953	Andrew McInnes
904	Justin Tomlins	929	Cory Saunders	954	Eve Wilson
905	Lesley Walker	930	Mary Lukis	955	Prom Country Climate Action
906	Ashlyn Van Den Broek	931	Harvey Roche	956	Matthew Crouch
907	Philippa Ransome	932	David John Day	957	Linda Drewitt
908	Louise Westle	933	Kellie Saunders	958	Brenda Karnowski
909	Andrew William Giles	934	Marilyn Bakker	959	Caragh Robinson
910	Henry Carus	935	Kathleen Davies	960	Marcus Laugier
911	Monica Hearn	936	Lynne Curtin	961	James Round
912	Knox Environment Society	937	Jillian Alibertini	962	Liz Brooks
913	Rosella Battaglia	938	ClimActs	963	Corinella Foreshore Reserve Committee of Management
914	Leonard Jackson	939	Ruth Luckock	964	Romy Lipszyc
915	David Paonetti	940	Western Port Seagrass Partnership Ltd.	965	The Corinella Foreshore Reserve Committee of Management
916	Maia Ronchi-Banay	941	Luisa McMartin	966	Frederick Mills
917	Tennille Hallam	942	Neil Adams	967	Patricia Stewart
918	Else Fitzgerald	943	Demeter Mock	968	Wendy Doube
919	Michael Bower	944	Jesse Aldenhoven	969	Julie Mills
920	Kellie McNamara	945	Andrea Gallant	970	Marion Cincotta
921	Mark Palmer	946	Marcia Lewis	971	Richard Clarke
922	Lois Logan	947	Jane McDonell	972	Sergei Plishka
923	Louise Seymour	948	John McMahon	973	Betsy Dunne
924	Tonianne Delaney	949	Lori Curran	974	Sally Mantell
925	Anne Lukis	950	Oliver Lukis	975	Jim Shnookal

976	Carrie Van Der Weyden	1001	Mary OBrien	1026	Suzanne Taylor
977	Anne Wardrop	1002	Jayne McSwiney	1027	Catherine Mitchell
978	John Allnutt	1003	Lily Enders	1028	Patricia Buoncristiani
979	Tim Forcey	1004	Megan Trevaskis	1029	Gwyneth Missen
980	Wildlife Coast Cruises	1005	Jeremy Beckett	1030	Ashleigh Gledhill
981	Kent Thomas	1006	Theodore Mallia	1031	Eliza Rowe
982	Kimberley Brooke	1007	Greg Hunt	1032	Viola McMahon
983	Stephen Wood	1008	Meagan Dalton	1033	Thomas Danese
984	Robert Fry	1009	Barbara King	1034	Karen Scatchard
985	Ian Pascoe	1010	Judith Graley	1035	Michael Gordon
986	Jasmine Wigley	1011	Russell Barrett	1036	Rachel Dafner
987	Sarah Toose	1012	Leigh Borley	1037	Stephanie Loveday
988	Tony Hacking	1013	Morgan Price	1038	North Morris
989	Eloi Grace	1014	Peter Balfe	1039	Steven Oates
990	Tanzy Owen	1015	Katie Fisher	1040	Ethan O'Neill
991	Kelsey Geurds	1016	Romy Lipszyc	1041	David Morris
992	Rebecca Kenward	1017	Briony Hutton	1042	Andree Austin
993	Matari Grace	1018	Donna Mahon	1043	Sophie Jackson
994	Mitzi Tuke	1019	Michael Mann	1044	Glenda Message
995	Victorian Sea Kayak Club	1020	Andrew Evans	1045	Janet Oliver
996	Barbara Shalit	1021	Lauren Simmonds	1046	Annabel Richards
997	Catherine O'Byrne	1022	Abigail Benham-Bannon	1047	Nance Gooderham
998	Adam McInerney	1023	Warwick MacAvoy	1048	Ceridwen Owen
999	John Lorkin	1024	Denise Dillon	1049	Benjamin O'Connor
1000	Maarten Koster	1025	Michael Whelan	1050	Gregory Williams

1051	Eileen Donaldson	1076	Jo-Anne Standaar	1101	Isabella Ryan
1052	Nina Phillips	1077	Surfrider Foundation Australia	1102	Felix curry
1053	Pauline Braumann	1078	Anne Phefley	1103	Lachlan Macready
1054	Verity Ducos	1079	Scott Blight	1104	Lucas Farnbach
1055	Vicki Dodd	1080	Philip Perkins	1105	Jillian Sokol
1056	Jennifer Gielb	1081	Erin Farquharson	1106	Jane Whitelock
1057	Markus Tschech	1082	Joel wright	1107	Ewan Greenfield
1058	Ewen Gellie	1083	Sue McAdam	1108	Elaine Hopper
1059	Geoff Gowers	1084	Janet & John Stanley	1109	Alithia Andrianakis
1060	Jo Laver	1085	Megan Shannon	1110	Stephen Case
1061	Sam Borley	1086	Jasmine Wigley	1111	Darren Livings
1062	Cam Parker	1087	Elly Johnson	1112	Haydn Liddell
1063	Jillian Trinca	1088	Coralie Davies	1113	Roy Francis
1064	Caroline White	1089	Kerry Macdonald	1114	James Hay
1065	Michael Hall	1090	Julian Balthazaar	1115	Steven Harris
1066	Kirra Minton	1091	Henry Seldon	1116	Michael Muskens
1067	Prudence Trinca	1092	Stephen Clifford	1117	Seamus Billings
1068	Stuart McKenzie	1093	Jack Peterson	1118	Chloe Farmer
1069	Erin Funnell	1094	Robert Stallard	1119	Daniel Gerlach
1070	Svenja Murray	1095	Carmen Hibbins	1120	Joanne Richards
1071	Darren Major	1096	Ian Wilkinson	1121	Geoffrey LCoggins
1072	Lynette Milner	1097	Lynda Tredwell	1122	Lauren
1073	Michele Damschke	1098	Maggie Dick	1123	Kathy Heffernan
1074	Julie Simpkin	1099	Dean Patton	1124	Lachlan Martin
1075	Debra Mar	1100	Sharon Rogers	1125	Kat Bottone

1126	Lesley Irvine	1151	Sachi Rowe	1176	Christopher Densham
1127	Crystal Boothby	1152	David McCallum	1177	Jaimee Iles
1128	Sasha baker	1153	Stephanie Lewis	1178	Phil Boyd
1129	Harriette Richards	1154	Trudy Litt	1179	Michael McCarron
1130	Emily Dickinson	1155	Christopher Ramsay	1180	Fiona Macdonell
1131	Will Morgan	1156	Lilly Harris	1181	Paul Palmer
1132	Bruna Ballan	1157	Wendy Fleetwood	1182	Mathew Simpson
1133	Mark little	1158	Annabelle Dureau	1183	Joel Amos
1134	Ben McMahon	1159	Clair Hirschausen	1184	Olivia Brock
1135	Julie Paterson	1160	Claudia Jagger	1185	Jake Ryan
1136	Amanda Robertson	1161	Shelley Iles	1186	Jess Brear
1137	Jennifer Francis	1162	Peter Blaney	1187	Chloe Lines
1138	Jasmine Alexandra	1163	Louise Lechte	1188	Christopher Kendall-Sanders
1139	Christabel Wigley	1164	Adam Crosby	1189	Jeremy Light
1140	Friends of French Island National Park	1165	Josie Kent	1190	Aaron Maxwell
1141	Angus McDiarmid	1166	Travis Wright	1191	Benjamin Berry
1142	Michael McInnes	1167	Sharon Little	1192	Carly Nugent
1143	Annie Zawada	1168	Eliza Feely	1193	Simon Healey
1144	Abbey Lindner	1169	Jessica Vigilante	1194	Bronte Basil
1145	James Cooper	1170	Kai Busch	1195	Patrick Shanahan
1146	Taariq Hassan	1171	Laura Packham	1196	Jack Wesolowski
1147	Natalie Nana	1172	Jordan Hunt	1197	Mitchell brown
1148	Bray Rowley	1173	Lachlan Gill-Renouf	1198	Brayden Clothier
1149	Luca Twist	1174	Barney Carberry	1199	Dominic Kersch
1150	Jason Cotter	1175	Katie McCallum	1200	Jayda Hunt

1201	Glenys Sharma	1226	Nathan Rayner	1251	Natell Young
1202	Mmberta Salvarani	1227	Catherine Stewart	1252	Natalie Scollo
1203	Andrew Maglio	1228	Mike Hegarty	1253	Libby Goldingay
1204	Ashley Brown	1229	Rachel Dean	1254	Kathryn Burke
1205	Tim Newton	1230	Sue Leening	1255	Hopper Fagan
1206	Kate Mussett	1231	Sam Sheppard	1256	William Hayes
1207	Jasmine Mansbridge	1232	Cassandra Pinney	1257	Lyndon Coulson
1208	Jasmin Collins	1233	Sam Proudley	1258	James Kemp
1209	Sarah Negri	1234	Sarah Rickard	1259	Virginia Pilcher
1210	Erin Brown	1235	Hilary McAllister	1260	Lisa Williams
1211	Dane Jama	1236	Liam Wiemann	1261	Katherine O'Brien
1212	Alex Gersch	1237	Craig Hardman	1262	Biomimicry Australia
1213	Jessica Turnbull	1238	Samuel Forster	1263	Victoria Beirne
1214	Alan Pentland	1239	Rachel Anderson	1264	Millie Spargo
1215	Max Galbraith	1240	Simone Gruca	1265	Mathew Starr
1216	Brett King	1241	Felix Ratcliff	1266	Samantha Sherlock
1217	Steve Rodgie	1242	Riley Foster	1267	Ron VanBeek
1218	Brett Allain	1243	Lorinda Hartley	1268	Oliver MacLatchy
1219	Ashleigh Young	1244	Teresa Branca	1269	Michele Sabto
1220	Zoe Trilsbach	1245	Alicia Miran-Khan	1270	Belinda Haydon
1221	Melanie Daymond	1246	Catalina Lonie-Richardson	1271	Denham Joseph
1222	Ayten Ahmet	1247	Cameron Taylor	1272	Ben Ashby
1223	Vanessa Ferriman	1248	Jesse Lee	1273	Marion Hemopo
1224	Thomas Mitchell	1249	Tarryn Tracey	1274	Byron Meyer
1225	Christian Graham	1250	Janet Rae Opie	1275	David Perry

1276	Travis Best	1301	Marieka Jacobs	1326	Gerald Abela
1277	Tyler Lloyd	1302	Tim Hillier	1327	Nathan Harris-Dent
1278	Erin Farnbach	1303	Shanmuka Rayapudi	1328	La-nee Isherwood
1279	Erin Maclatchy	1304	Susan Chan	1329	Brad Stone
1280	Charlie Edis	1305	Kalyana Suravarapu	1330	Holly Sweeney
1281	Jake White	1306	Robert Box	1331	Matthew Knowles
1282	Rhubie Morin	1307	Shell-Sea Ellem	1332	Kelsey Tong
1283	Ruby McMaster	1308	Elise Kratzer	1333	Arcadia Callow
1284	Jasmin Shazad	1309	Rajasekhar Kondapavuloori	1334	Libby Imrie
1285	Matthew Zerbe	1310	Jan Ungerer	1335	Jess Picton-Warlow
1286	Lynda Sainsbury	1311	Andrew Kramer	1336	Heidi Andrews
1287	Ben McGregor	1312	Jackson Lane	1337	Anton McMurray
1288	Andrew Rogerson	1313	Jim Mason	1338	Whitney Klonsky
1289	Anthony McInerney	1314	Henry Vine	1339	Lake Bovell
1290	Stephen Lapin	1315	Abbie Cruickshank	1340	Merricks Beach Residents Association
1291	Sarah Reid	1316	Alicia Clyne	1341	Alexandra McCombe
1292	Brascha Nicholas	1317	Daniel Pike	1342	David Girardin
1293	Barry West	1318	Matt Lugg	1343	Dustin Price
1294	Matthew Benjamin	1319	Ryan Brock	1344	Fran Dargaville
1295	Alex Lawless	1320	Stephanie Poon	1345	Anousone Rattanasinh
1296	Ashley Davis	1321	Bobbie Ryan	1346	Dakota Carter
1297	Natalie Turner	1322	Bryony Callander	1347	Melanie-Jane Turner
1298	Chris Ross	1323	Briana O'Hehir	1348	Charlotte Westaway
1299	Fiona Scott	1324	Meike Suggars	1349	Tim Henry
1300	Matthew Henry	1325	Matthew Knowles	1350	Laura Barrand

1351	Nicholas Hayes	1376	Rachael Richardson	1401	Mathew McBain
1352	Piers Bird	1377	Joshua Kousal	1402	Christopher Copeland
1353	Paul Leitinger	1378	Eleanor Adams	1403	Betty Wardrop
1354	Caitlin Delosa	1379	Elizabeth Byrne	1404	Lauren Elson
1355	Annie Buntine	1380	Thomas Keck	1405	Daniel OConnell
1356	Abbey Cook	1381	Patrick Hutchinson	1406	Giovanni Pagliuso
1357	Department of Transport	1382	Robert Brewer	1407	Gwynedd Davies
1358	David Kloeber	1383	Joel Nankervis	1408	Will Gregory
1359	Kiefer Casamore	1384	Jay Gargaro	1409	Abbey Mitchell
1360	Catherine Graham	1385	Glenn Barry	1410	Philippa Anne Sorel
1361	Ella Warren	1386	Sheena Waterhouse	1411	Nicola Clyne
1362	John Tully	1387	Brittany Kirkman	1412	Christopher Honey
1363	Bettine Hartley	1388	Leisa Wharington	1413	Marion Roller
1364	Francine Buckley	1389	Ehren Hudson	1414	Anssi Pitkanen
1365	Taylor Poon	1390	Michel Lazzaro	1415	Tegan White
1366	Thomas Brown	1391	Elizabeth Wardrop	1416	Elizabeth Wright
1367	Patrick Horan	1392	Daina Anderson	1417	Matthew White
1368	Lachlan Anderson	1393	Tyler Slaven	1418	Gina Goble
1369	Lily Warren	1394	Sophie Fletcher	1419	Darcy Wright
1370	Allister Payne	1395	Marcus Harwood	1420	Samantha Bright
1371	Georgia Robinson	1396	Melanie Edwards	1421	Michael Hinch
1372	Michael Zippel	1397	Sarah Holmes	1422	Kirsty Harris
1373	Jane Gee	1398	Lush Evers	1423	Lord Somers Camp and Powerhouse.
1374	Harry Gibson	1399	Luke Carrick	1424	Anna Eggleton
1375	Brian Tew	1400	Elijuh Mustapha	1425	Georgina Maxwell

1426	Paul Fallon	1451	Sandy Monkhouse	1476	Jeffrey Bond
1427	Carl Wright	1452	Caitie Philpott	1477	Carly Robertson
1428	Anne McMillan	1453	Jessica Kaczmarek	1478	Anthony Lunken
1429	Mietta Fleay	1454	Christin Wachter	1479	Mornington Peninsula Vignerons Association
1430	Klara Mcmurray	1455	Jacob Millman	1480	Joe van Dijk
1431	Curtis Hill	1456	Joshua Ryan	1481	Marion Harper
1432	Jack Salau	1457	Peter Roller	1482	Matt Davies
1433	Ryan Nix	1458	Isabella Aitkenhead	1483	Byron Leeworthy
1434	Will Griffiths	1459	Jenna Eagles	1484	Jessica Bhardwaj
1435	Emily Commerford	1460	Michael Palmer	1485	Seb Brennan
1436	Stephen Cousins	1461	Major Road Projects Victoria	1486	Daniel Lannan
1437	Sam Weston	1462	Jonathan Collins	1487	Jess Laing
1438	Celina Mahoney	1463	Angus Crook	1488	Dylan Henry
1439	Stephanie Wehner	1464	Alison Normanton	1489	Ingrid Tadich
1440	Max Smiles-Schmidt	1465	Amy	1490	Colin Gardner
1441	Barbara Salzmann	1466	Jesse Caulfield	1491	Dylan Teuma
1442	Peter Avery	1467	Selim Dalvean	1492	Helmy Cook
1443	Namoi Hodgson	1468	Charli Ross	1493	Clare Wilson
1444	Taj McEntee	1469	Kara Ashton-Fox	1494	Sean Kelly
1445	Brent Wright	1470	River Moore	1495	Annabel Mason
1446	Dean Ratten	1471	Erin Martin	1496	Lachlan Wright
1447	Elliot Del Greco	1472	BirdLife Australia Mornington Peninsula	1497	Adrienne Smith
1448	Margaret Kosub	1473	Rosie Westbrook	1498	Emma Leitinger
1449	Imogen Armstrong	1474	Alex Pokrassen	1499	Kerri Wellman
1450	Annabel Dick	1475	Rodney Knowles	1500	Magdalene Shapter

1501	Frances Walpole	1526	Jemma Howard	1551	William Clarkson
1502	Janice Gardner	1527	Joshua Cannon	1552	Tom Broadbent
1503	Jade Hutchinson	1528	Lilibeth Hall	1553	Madison O'Brien
1504	Jack Dowson	1529	Owen Casey	1554	Deline Skinner
1505	Jon Luu	1530	Stanley Carr	1555	Maureen Ashton
1506	Georgia Robinson	1531	Annthea Hick	1556	Joshua Sinclair
1507	Andrew Lee	1532	Michael Taylor	1557	Anthony Papalia
1508	Liam Wolters	1533	Joe Pardy	1558	Zachery Fortuyn
1509	Suzanne Barmos	1534	Lily Jessulat	1559	Lily Bond
1510	Matthew Harris	1535	Tony Gilchrist	1560	Anne-Marie Bell
1511	Annie Dickson	1536	William Hawke	1561	Jason Webb
1512	Paul Fleer	1537	Micaela Paddon-Row	1562	Daniel Armstrong
1513	Gareth Kennedy	1538	Darren Cairns	1563	Jayden Eddy
1514	Anthony Bosca	1539	Myles Carew	1564	Clair Klopper
1515	Susanne Forge	1540	Kurt Rutter	1565	Maria Miranda
1516	Rebecca Hempel	1541	Jenny Stidston	1566	Lulu Crowhurst
1517	Darby Schembri	1542	Sam Portman	1567	Carolyn Rushford
1518	Barbara Rimington	1543	Taylor Rubinstein	1568	Patrick Livesey
1519	Keeley Reynolds	1544	Luke Russo	1569	Riley Aickin
1520	Miriam Chidam	1545	Thom Neal	1570	Patricia Cortese
1521	Mollie Sanderson	1546	Tara Broderick	1571	Lachlan Bulman
1522	Gabrielle Low	1547	Trent Rogers	1572	Hannah Kotzman
1523	Melanie Pope	1548	Moscow Roller	1573	Laura Waters
1524	Marguerite Marshall	1549	Siobhan Cook	1574	Amy McGibbony
1525	Liam Alexander-Quinn	1550	Edwina Austin	1575	Sebastian Beck

1576	Courtney Castles	1601	Rory McGinley	1626	Paige England
1577	Dashiell Roller	1602	Emily Childs	1627	Molly Wescott
1578	Eleanor Moller	1603	Kimberly Noy	1628	Michelle Tkalcevic
1579	Karl Bromelow	1604	Jack Duncan	1629	Michael Quigley
1580	Amy McKernan	1605	Chelsea Broeren	1630	George Hedley
1581	Michael Adams	1606	James Brine	1631	Helen Nguyen
1582	Russell Cohen	1607	Rob Kent	1632	Sally-Anne Melke
1583	Christie O'Neill	1608	Czarina Madayag	1633	Kira Antonucci
1584	Ruby Randles	1609	Jack Winter	1634	Zoe Matthews
1585	Sean McManus	1610	Matthew Kerr	1635	Cecelia Hedditch
1586	Victoria Kerr	1611	Laresa Kosloff	1636	Marijne Vogel
1587	Ashlee Scicluna	1612	Liz O'Brien	1637	Carol Reason
1588	Louise Laing	1613	Maggie Francis	1638	Harrison West
1589	Jillian Warner	1614	Elissa Schembri	1639	Harry Hedley
1590	Saaskia Dickson	1615	Arunothat Ponyeim	1640	Laura Herriott
1591	Jack Hayes	1616	Jarrod Luxton	1641	Nicolo Bianchino
1592	Kaneisha Tancredi	1617	John Bolger	1642	Natalie Van Der Heyden
1593	Matteo Meirelles	1618	Belinda Black	1643	Michael Franklin
1594	Pamela Taverniti	1619	Talia Burlovic	1644	Martin Lenard
1595	Mary Whiteside	1620	Daniel OBrien	1645	Sarah Mason
1596	Jack Hannan	1621	Nicholas Ford	1646	Matthew Roberts
1597	Brayden Vallance	1622	Amy Dettmann	1647	Shona Izenberg
1598	Stephanie Pepprell	1623	James Spithill	1648	Jess Cooper
1599	Rory Gollow	1624	Rob Nigro	1649	Jonathan Watcham
1600	Susan Muller	1625	Emma Tkalcevic	1650	Somers Residents Association Incorporated

1651	Marcus Tarrant	1676	Rory Philpott	1701	Abbey Kirk
1652	Joshua Doherty	1677	Daniel Flynn	1702	Tony Roche
1653	Rose Childe	1678	Peter Bennett	1703	Ian Gray
1654	Kristy Arthurson	1679	Andrea Huser	1704	Helen Fallaw
1655	Zsuzsa Mihaly	1680	Janet Heald	1705	John Teague
1656	Simone C	1681	Amanda Nelson	1706	Mitch Bagley
1657	Nicole Cowan	1682	Mark Fisher	1707	Sam Gaudion
1658	Nathan Fejes	1683	Gemma Foster	1708	Taylah Paton
1659	Michael Barrett	1684	Simon Bicknell	1709	Katherine Hamilton
1660	Daene Gallagher	1685	Travis Boltong	1710	Ruth De Souza
1661	Sharon Clerke	1686	Angus Christie	1711	Blue Wedges Inc.
1662	Peter Sampson	1687	Barbara Flynn	1712	Juliet Le Feuvre
1663	Daniel Woodstock	1688	Hannah Eisen	1713	Narelle Huxley
1664	Nicholas Wilkins	1689	Naomi Juniper	1714	Josh Sorati
1665	Jessica O'Callaghan	1690	Nichola Quinn	1715	Sacha Guggenheimer
1666	Harris Zervakis	1691	Ruby Hotchin	1716	Maree Goozee
1667	Mark Savage	1692	Anna Papij	1717	Tess Plowman
1668	Susan Kerr	1693	Olivia Floate	1718	Joy Molina
1669	Hamish McShane	1694	The Southern Peninsula Indigenous Flora & Fauna Association	1719	Molly Williams
1670	Colin Smith	1694	Gidja Walker	1720	Jess Cole
1671	Kelli Simmons	1695	Christopher Fernando	1721	James Latham
1672	Michael Crommelin	1696	Paul Roche	1722	Aliana Tabone
1673	Lisa Chalk	1697	Margaret Seldon	1723	Fiona Haasz
1674	Mark Bluett	1698	Eliza Shannon	1724	Neralie Thorp
1675	Joseph Duck	1699	Susie Kirk	1725	Luke Murchie

1726	Elly Wingfield	1751	Hannah Brown	1776	Jacinta Morahan
1727	Luke Barron	1752	Vicki Black	1777	Hayley Perry
1728	Ruby Broomhall	1753	Diana Carr	1778	Debbie Carruthers
1729	Philippa Armstrong	1754	Mikayla Gersch	1779	Julia Carpenter
1730	Grace Cockman	1755	Alice Hamilton	1780	Aaron Slater
1731	William Skerrett	1756	Ellen Freeman	1781	Toby Silke
1732	Peter Kinchington	1757	Marnie Kruyer	1782	Penelope Underwood
1733	Jacqui Brosnan	1758	Iris Egan	1783	Geoff Webster
1734	Jess Keepence	1759	Lucy Simpson	1784	Alexander Wilkinson
1735	James McCormick	1760	Naomi Hatton	1785	Elise Rodwell
1736	Michelle W	1761	Joyce and Simon Welsh	1786	Matt Krumins
1737	Atholie Harden	1762	Max Walter	1787	Nicholas Dion
1738	Save Westernport	1763	Ainsley Paton	1788	Briony Kent
1739	Marion Wood	1764	Judy Brokenshire	1789	Hamish Keane
1740	Jake Watson	1765	John Trinca	1790	Klaus Ahlhaus
1741	Georgia Venn	1766	Taylah Langdon	1791	Jake Kepper
1742	Julian Stow	1767	Sally Croker	1792	Heather Tervit
1743	Charlie Grant	1768	Christina Bennett	1793	Ben Bycroft
1744	Zion Abraham	1769	Cathie Coates	1794	Clare Goodwin
1745	Eugenie Knox	1770	Anne Myers	1795	Connor Thorn
1746	Maggie Cowling	1771	Flinders Coastal Advisory Group	1796	Yossi Admon
1747	Peter Lee	1772	Sarah Smith	1797	Michael Jones
1748	Maddie Felder	1773	Anthony Fennell	1798	Margaret Howden
1749	Paul Le Fevre	1774	Kim Wilson	1799	Peter Houghton
1750	Marjorie Johnston	1775	Matthew stacey	1800	Ellen Coaes

1801	Denise McDonough	1826	Simon Copeland	1851	Ben Fox
1802	Wendy Bajraszewski	1827	Sophie Evans	1852	Sara Elizabeth
1803	Robyn Gillespie	1828	Camilla Myers	1853	Andrew Lindsey
1804	Mark Stanford	1829	Ben Heenan	1854	Greta Webster
1805	Robyn Dempster	1830	David Holyoake	1855	Callum Powell
1806	Kaila Paarlberg	1831	Cara Macri	1856	Eliziane Oliveira
1807	Tracey Robinson	1832	Beverley Armstrong	1857	Lawrence Reddaway
1808	Benjamin Keys	1833	John Collins	1858	Brett Robinson
1809	Sam Boughton	1834	Jennine Hewett	1859	Kat Oakley
1810	Jay Austin	1835	Robert Fogden	1860	Geoff Robinson
1811	William Clancy	1836	Margaret Gibson	1861	Bryce Norman
1812	Mr Brian Harper	1837	Leticia Nieuwenhuizen	1862	Luke Apthorpe
1813	Penny Woodward	1838	Hamish McWilliam	1863	Rebecca Cannon
1814	Thomas field	1839	Tom Sullivan	1864	Eve Marden
1815	Helen Wellman	1840	Kristen Pearson	1865	Jamie Van Egmond
1816	Holley Freeman	1841	David Corsar	1866	Brayden Murrihy
1817	Annabel Blur	1842	Jim Crosthwaite	1867	Monique Machin
1818	Liam Head	1843	Marvin barker	1868	Valerie McGibbony
1819	Jeremy Clark	1844	Louise Williams	1869	Philip Sisson
1820	Burt Blackburne	1845	Rex Radley	1870	Lucinda Kitney
1821	M Roffey	1846	Kathryn Woods	1871	Michelle Joseph
1822	Josie Browne	1847	Simon Boucher	1872	Naomi Lazzaro
1823	Anne Balfe	1848	Debra lea justice	1873	Mary Simpson
1824	Troy Wilkinson	1849	Zöe Kenna	1874	Warren Goodrich
1825	Janice Halliday	1850	Robert and Allison Walker	1875	Lachie Robinson

1876	Jonathan Reid	1901	Zac Pearton	1926	Catherine Ingham
1877	Jack Malzinskas	1902	Simon Hawking	1927	Jennifer Petinatos
1878	Annie Hughes	1903	Natalie Lawrance	1928	Nicholas Krstic
1879	Nicole Hoddinott	1904	Owen O'Reilly	1929	Max Patton
1880	Amy Adeney	1905	Thea Lang	1930	Katherine Gorton
1881	Cheryl Walshe	1906	Paul van der Ploeg	1931	Luke Shoppee
1882	Natalie Visser	1907	Alexander Caetano	1932	Remi Hudson
1883	Nikkola Mikocki-Bleeker	1908	Dylan	1933	Cathy Sansom
1884	Huw Richardson	1909	Narelle Dahlenburg	1934	Brendan Scanlan
1885	David Gazzo	1910	Chloe John	1935	Frazer Saunders
1886	Hayden Cameron	1911	Jen Scott	1936	Jack Millen
1887	Estelle Kefford	1912	Joe Rogers	1937	Laura smith
1888	Mornington Peninsula Branch of the Australian Greens Victoria	1913	Nick Garnham	1938	Christopher Vitartas
1889	Francine Machin	1914	Tom McFarlane	1939	Emeshe Remete
1890	Adam Turner	1915	Simon Mulvany	1940	Danielle Vitartas
1891	Simon Walker	1916	Emily Hamilton	1941	Suede Croad
1892	Michael Hurst	1917	Serena Trezise	1942	Catherine McInnes
1893	Geordie Birkett	1918	Sarah Miller	1943	Daniel Ross
1894	Christopher Bailey	1919	Simone Tanner	1944	Carolin Savage
1895	Anna Brown	1920	Peter Keillar	1945	Indianna Croad
1896	Alan Pears	1921	Travis Winder	1946	Anna McIldowie
1897	Josie Reichelt	1922	Lachie Sanford	1947	Tony Graham
1898	Richard Woodall	1923	Madison Forbes	1948	Jackson Lee
1899	Lily Jones	1924	Brooke Walton	1949	Isabella Henderson
1900	Mark Horton	1925	Pete Venticich	1950	Bridget Groves

1951	Justine Peacock	1976	Debra Archibald	2001	James Ingram
1952	Lachy McDonald	1977	Lachlan Keith	2002	Louise knight
1953	Jonathon Keane	1978	Katrina Knight	2003	Kajeera Jenkins
1954	Annie Lane	1979	Katherine Ayrton	2004	Victorian Wader Study Group
1955	Nick Cowan	1980	Imogen Yusko	2005	Jacqueline Salter
1956	Rachel Swain	1981	Anthony Davenport	2006	Ashleigh Krievans
1957	Georgia McGrath	1982	Joy Mettam	2007	Verity Kimpton
1958	Sophie McCracken-Evans	1983	Sophia	2008	Erin Tidball
1959	Joyce Lawrence	1984	Isabel Allen	2009	Seamus Allan
1960	Georgina Foot	1985	Hilary Bray	2010	Sharnell Lawrence
1961	Max Tulen	1986	Kelly Tytherleigh-Laity	2011	Ben Purdie
1962	Joe Hocking	1987	Ido Monk	2012	Lynda Burns
1963	Penelope Flint	1988	Siobhan Neyland	2013	Graham Evans
1964	Lorena Marquez	1989	Georgia Bisset	2014	Jake Forsyth-Turner
1965	Otto Mudigdo	1990	Felicity Fox	2015	Peter Murray
1966	Jarrod Cooper	1991	Ben Estchling	2016	Ellie McGrath
1967	Luke Featherston	1992	Christina Aitken	2017	Siusan Findlay
1968	Bart Vaughan	1993	Sharyn Hamey	2018	Campbell Robbins
1969	Valerie Curtis	1994	Erin Power	2019	Shaharna McDonald
1970	Kelly brawn	1995	Jacqueline Phelps	2020	Ashley Scott
1971	Ruby Haynes	1996	John Clark	2021	Zak Mills-Goodwin
1972	Josh Reimers	1997	Sally Pickford	2022	Kate Malzinskas
1973	Victor Eke	1998	Julia Hurst	2023	Tony Mott
1974	Vivien Bird	1999	Simon MacGregor	2024	Yuko Arafuka
1975	Mich Schepers	2000	Melanie Clark	2025	Jonathan Thomson

2026	Christine Morris	2051	Celia Hirsh	2076	Lachlan Smethurst
2027	Mark Keehn	2052	Jack Myers	2077	Doone Wyborn
2028	Patricia Olsen	2053	Richard Phillips	2078	Jordyn Dickson
2029	Nathan Wainwright	2054	James Bail	2079	Sarcha Braund
2030	Ethan Reeves	2055	Peter Dunn	2080	Marcellus Shiell
2031	Nicole Busby	2056	Lee O'Keefe	2081	Joshua Carey
2032	David Tuke	2057	Daniel Ware	2082	Madison Rowswell
2033	Aaron Jackson	2058	Ruby Wright	2083	Nicholas Giuliani
2034	The Green Wedge Coalition	2059	Marty Chan	2084	Wendy Matthews
2035	Olivia Rose	2060	James Laird	2085	Sammy-Jo Hand
2036	Bianca Felix	2061	Daniel Yusko	2086	Victoria Hemming
2037	Richard Campbell	2062	Madeleine Serong	2087	Oscar Peddle
2038	Warwick Sadler	2063	Claire Betteridge	2088	James campbell
2039	Helen Pritchard	2064	Eve Williams	2089	Phillip Zachariah
2040	Barbara Gregson	2065	Terence and Brigitte Nott	2090	Haydn Clynick
2041	Eve Stocker	2066	Emily Nash	2091	Helen Cameron
2042	Jed Knaggs	2067	Jean Knowles	2092	Samuel Grose
2043	Brett Collins	2068	Anthony Fisk	2093	Bronnie Walsh
2044	Fiona Sheppard	2069	Janet Wheeler	2094	Nathan Blencowe
2045	Caroline Naughton	2070	Harry Smith	2095	Irene Christy
2046	Kerry French	2071	Gaston Freddi	2096	Josephine Carter
2047	Cat Martin	2072	AWARE	2097	Peter Julian
2048	Darcy Norman	2073	Cathy O'Callaghan	2098	Darcy Scott
2049	Claire Sadler	2074	Susan Ginnivan	2099	Joshua Stainer
2050	Andrea Gowers	2075	Zoe Robinson	2100	Kara Summerfield

2101	Camilla Druce	2126	Julie Hocking	2151	Protectors of Public Lands Victoria Inc.
2102	Lucinda Cowden	2127	Katherine Hocking	2152	Fiona Clarke
2103	Thomas Murchie	2128	Albina Mackiewicz	2153	Jane Tracy
2104	Phill English	2129	Yvette Brindle	2154	Jamie Russell-Mudge
2105	Breanna Sykes	2130	Tess	2155	Liz Shuter
2106	Cherie Seeto	2131	William Sherriff	2156	Crib Point Stony Point Foreshore Committee of Management
2107	John Boulton	2132	Liam Murphy	2157	Jacqui Campbell
2108	Elinor Devenish-Meares	2133	Sarah Stiles	2158	Allie Imlach
2109	Tuscani Closter	2134	Kerry Ungerer	2159	Paul Ryan
2110	Jesse Kennedy	2135	Stephanie Everett	2160	Mel Wight
2111	Ian Campbell	2136	Doctors for the Environment Australia	2161	Judith Brooks
2112	Sophie Shanahan	2137	Peta Coward	2162	Natalie Schwabegger
2113	Adam Shaw	2138	Jennifer Sebire	2163	Anna Cuttriss
2114	Sophie Cuttriss	2139	Suzanne Suggars	2164	Paul Mckie
2115	David Pardoe	2140	Kelly Irvine	2165	Mariusz Kendra
2116	Jourdan Keillor	2141	Eva Eden	2166	Desley Tunstall
2117	Pam Owen	2142	Lauren Grusauskas	2167	Gail Noble
2118	Anna T	2143	Susan Stolz	2168	Sally Barrett
2119	Cory White	2144	Catherine Goode	2169	Lachlan Gridley
2120	Marcus Wright	2145	Jade De La Haye	2170	Kimberley Kliska
2121	John Pye	2146	Leeanne Toneman	2171	Megan Jacob
2122	Guy Stanaway	2147	David Colmanet	2172	Jo Vautier
2123	Lauren McLoughlin	2148	Carly Dober	2173	Chris Sutcliffe
2124	Kathryn	2149	Cameron Browne	2174	Melissa Duggan
2125	Millie Nankivell	2150	Jayde Morris	2175	Isabelle Mildenhall

2176	Vicki Hosking	2201	Peter Elgar	2226	James Wierzbowski
2177	James Kristian Davies	2202	Jessica MacLeish	2227	Philip Rose
2178	Caroline Durre	2203	Cheryl McDonald	2228	Michelle Shawcross
2179	Joanna Hunt	2204	Lauren Barker	2229	Julia Rogerson
2180	Malcolm Twist	2205	Tanya Tankard	2230	Mark Garland
2181	Susan Ball	2206	Erinne McGinley	2231	Alexander Nicolson
2182	Leesa Nicholls	2207	Nicole Fidge	2232	Jordan Ryan
2183	Merl Crawley	2208	Sonia De Rose	2233	Joel Hodgson
2184	Ken Charpentier	2209	Sarah Oxford	2234	Samantha Brewin
2185	Lena Piekarski	2210	Ian Campbell	2235	Andrew Satchwell
2186	Jennifer Jones	2211	Asitha Samarawickrama	2236	Ben Kampschoer
2187	Shannon Creasey	2212	Paul Anderson	2237	Frederick Warren
2188	Bronwyn Orr	2213	Kirstin Clements	2238	John Nairn
2189	Thomas Wright	2214	Charlotte Kininmonth	2239	Philip Thomas
2190	Jeffrey Lim	2215	Jennifer Fisher	2240	Haydn Jones
2191	Nikki Hill	2216	Brendan Henderson	2241	Silvia Di Domenicantonio
2192	Andrew Kelly	2217	Ricci Swart	2242	Jacqueline Hood
2193	Charlotte Fleming	2218	Tony Liatos	2243	Nicole Creaser
2194	Emily Williams	2219	Simon Griffiths	2244	Heather Safstrom
2195	David Scolyer	2220	Diane John	2245	Helen Graham
2196	Kate Perry	2221	Ceri Bryant	2246	Laura Patchell
2197	Anthony Jones	2222	Kaye Blum	2247	Alastair Jones
2198	Amelia Abdulnour	2223	Jessica Graham	2248	Dusty Bursill
2199	Hudson Messenger	2224	Glenn Pyman	2249	Caitlin Taylor
2200	Margaret Fried	2225	Sue Wilkins	2250	Andrew Read

2251	Tash Hughes	2276	Mornington Peninsula Shire Council	2301	Pamela Wakefield
2252	Helen	2277	Rosemary Cummings	2302	Serrin McCallum
2253	Janette Pickersgill	2278	No Gas Hub at Crib Point	2303	Joanne Brockwell
2254	Merran Williams	2279	Ian Hundley	2304	Alison Taylor
2255	Mandy Downward	2280	Naomi Wells	2305	Cathy Freemantle
2256	Patricia Taranto	2281	Bev Cowan	2306	Thomas Waltrich
2257	Merve Davraz	2282	Ross Cummings	2307	G & K O'Connor Pty Ltd.
2258	Marion Manifold	2283	Crib Point Advisory Group Inc (CPAG)	2308	Danielle Galley
2259	Cynthia Alexander	2284	Geoffrey Bricknell	2309	Bayside Climate Crisis Action Group and Associates
2260	Julian Jones	2285	Jo Rushbrook	2310	Christine Lawrance
2261	Glenn Dawson	2286	Sharon Green	2311	Deborah Coffey
2262	Hugh Sheehan	2287	Rebecca Casey	2312	Clive Gould
2263	Lorraine Watt	2288	Austin Craig	2313	Madeline Scott
2264	Paul Janovskis	2289	Alan Webster	2314	Sarah Sharp
2265	James Ryan	2290	Susan Humphries	2315	Deirdre Boeyen-Carmichael
2266	Marylu Lloyd	2291	Duplicate Submission	2316	Alice young
2267	Hayley Davis	2292	Virginia Bowe	2317	Daniel Hayes
2268	Hayden O'Neill	2293	Lisa Dixon	2318	Louis Horne
2269	Edward Merrison	2294	Julius Meltzer	2319	William Ahern
2270	Pedro R Ramos	2295	Wendy Fornaro	2320	Kristiahne Read
2271	Kate Gazzard	2296	Maria Liatos	2321	Don Serle
2272	Andre Tristan Fazio	2297	Tom Saunders	2322	Evolution Rail Pty Ltd
2273	Kristina Belleville	2298	Friends of the Koalas Inc.	2323	Ann Taket
2274	Jan Clarke	2299	Amanda Breidahl	2324	Presentation Family Centre
2275	Thomas Kinsey	2300	Maria Liatos	2325	Meredith Ramadan

2326	Oliver Alexander	2351	Alarna Twight	2376	Belinda Eden
2327	Rachel Connor	2352	Sue Saliba	2377	Shae Dingle
2328	Szczepan Grebosz	2353	Stuart Irvine-Brown	2378	Summer Smyth
2329	Peter Jack	2354	Jackson	2379	Virginia Wallace
2330	Peter Wilkinson	2355	Phillip Argus	2380	Kate Gorringe-Smith
2331	Sara Hyde	2356	Monty Wright	2381	Jeanette Birtles
2332	Samantha Bouchier	2357	David Williams	2382	Ian Wigg
2333	Margaret Bolitho	2358	Trent Mead	2383	Nancy Otis
2334	Lily Van Berkel	2359	Jacinta Le	2384	Lyndall Francis
2335	Jennifer Murdoch	2360	Samuel Marcus	2385	Don Juniper
2336	Jillian Byrne	2361	Jake Vos	2386	Meredith Kidby
2337	Matt Moran	2362	Alice Brandli	2387	Ella Gasowski
2338	Claire Stephenson	2363	Chris Johnson	2388	Linda Marshall
2339	Warren Cooke	2364	Bayside Climate Crisis Action Group	2389	Kimberley Miter
2340	Jamia Hemphill	2365	Miles Teller	2390	Deepa Ramakrishnan
2341	Eideann McCann	2366	Troy Bryant	2391	Erin Andrusiw
2342	James Kilby	2367	David Strang	2392	Amy Hunt
2343	Emma Hardy	2368	Tori Stones	2393	Thomas McNish
2344	Corinne Boston	2369	David Kenneth Evans	2394	Peter Monie
2345	Emma Morris	2370	Daryl Gordon	2395	David Smith
2346	Paul Nuttney	2371	Simon Ransome	2396	Christian Turner
2347	Tessa Mazor	2372	Malcolm Ellenport	2397	Janet Hall
2348	Joan Pittendrigh	2373	Nicholas Bail	2398	Bridget McArthur
2349	Jo Selleck	2374	Kate Phillipson	2399	Gillian Tolley
2350	Geraldine Gorringe	2375	Celeste Mabarrack	2400	Jutta Beher

2401	Jillian Dixon	2426	Ellie Collins	2451	Roger East
2402	Pamela Ford	2427	Andrew Collins	2452	Joanna Monie
2403	Daniel Mason	2428	Jasmin Little	2453	John Berry
2404	Jonathan MacDonald	2429	Peter Moore	2454	Deborah Ostrow
2405	Jesse Butland	2430	Montanna Macdonald	2455	Elizabeth Russell
2406	Angela Freeman	2431	Kendall Ingram	2456	Carol Head
2407	Cheryl Gebhart	2432	Anne Somerville	2457	Anna Cosgrove
2408	Hayley Kruse	2433	Christina Flann	2458	Madelyn Hellyer
2409	Haley stafford	2434	Alex Kydd	2459	George Giann
2410	Cecelia Witton	2435	Madelin craig	2460	Elizabeth Perkins
2411	Gerhard Grasser	2436	Jenny Jones	2461	Zachary Millard
2412	Lee-Anne Wigg	2437	David Smythe	2462	Bree-Anna Cummins
2413	Mark Gage	2438	Jessica Nailon	2463	Hayley Singer
2414	Lesley Walsh	2439	Tegan Kop	2464	Laura Bulmer
2415	Louisa Bujor	2440	Mary Ferguson	2465	Ian Tredinnick
2416	Claire Stafford	2441	Emily Cassano	2466	Kelly-Anne Twist
2417	Alice Land	2442	Devilbend Foundation	2467	Manton & Stony Creeks Landcare Group
2418	Kooper Walker	2443	Lily Neal	2468	Lighter Footprints
2419	Tony Bannister	2444	Minna Loft	2469	Fergus Pilgrim
2420	Matthew Teston	2445	Shaun Flynn	2470	Samantha Thomson
2421	Mechelle Cheers	2446	Olga Novikova	2471	Leigh Rabl
2422	Louise O'Shea	2447	Lenny Stepjan Willmore	2472	Ross Freeman
2423	Austen Venville	2448	Felix Smalley	2473	Robin Harper
2424	Jack Miers	2449	Helen Kirkby	2474	Laura Le Busque
2425	Genevieve Fitzgerald	2450	Sophie Foyster	2475	Cecilia Cairns

2476	Elizabeth Clancy	2501	Margaret Dalli	2526	Christine Cook
2477	George Dowling	2502	Heather Macauley	2527	Julia Symons
2478	Philip Jackson	2503	Jessica Tong	2528	Marcus OReilly
2479	Virginia Staggs	2504	Sam Gibbard	2529	Charlie Fortuyn
2480	Patricia Lynne Curran	2505	Alan Tyers	2530	Belinda Lewis and Jeff Lewis
2481	Elisa Bentley	2506	Matthew Skinner	2531	Lynne Oliver
2482	Manton & Stony Creeks Landcare Group	2507	Paula Rivera	2532	Don Smith
2483	Angela Bloomfield	2508	Bill Hicks	2533	Kaye Trainor
2484	Rob Hillman	2509	Emma Morris	2534	Olivia Buxton
2485	Janine McCarthy	2510	Amity Hunter	2535	Sueanne Lewis
2486	Sheila Rose Buckley	2511	Steve Butler	2536	Lucinda Connelley
2487	Alex Ferguson	2512	Max Collett	2537	Regina Bos
2488	Samuel Thompson	2513	Suzanne L Walker	2538	Samuel Riley
2489	Sue Lawrence	2514	Western Smith	2539	Samuel Bryant
2490	William Murray	2515	Jennifer McHenry	2540	Campbell Opie
2491	Malcolm Finlay	2516	Zoe Morris	2541	Duncan Buchanan
2492	Kia Matley	2517	Fiona Dann	2542	Penelope Manning
2493	Kyle Simpson	2518	Josh Pelletti	2543	William Nicholson
2494	Melanie Ahkin	2519	Michael Mullerworth	2544	Elizabeth Varkulevicius
2495	Carney Hick	2520	Ian Breadon	2545	Jamey McIntyre
2496	Emma Robinson	2521	Jonathan Storey	2546	Victorian Chamber of Commerce and Industry
2497	Callum Henderson-Miller	2522	Andrew Nicholson	2547	Thea Adamson
2498	Teresa Hicks	2523	Lauren Rowley	2548	Caroline Mahoney
2499	Amy Scott	2524	Bess Kelly-Norris	2549	Barbara Long
2500	Tom Pengelly	2525	Debbie Woods	2550	Jennifer Langridge

2551	Rebecca Honner	2576	Rohan Cuming	2601	Minerva Lamorgese
2552	Narelle Sheehan	2577	Julie Tenace	2602	Andrea Falk
2553	Anna Clark	2578	Phillip McGibbony	2603	Alisha Dabonde
2554	Pamela French	2579	Peter Floyd	2604	Chris Fetterplace
2555	Nina Killham	2580	Leila Musakka	2605	Cate Hoyle
2556	David Davenport	2581	Felicity Stewart	2606	Sharron Shalekoff
2557	Lucy Marks	2582	Lachy Henry	2607	Isabella Ferrieri
2558	Trust for Nature (Vic)	2583	Andrei Trickovic	2608	John Glover
2559	Kara van Der Heyde	2584	Jennifer Skewes	2609	Ineka Soetens
2560	Edmund Griffith	2585	Francesca Gaspar	2610	On the go
2561	Matthias Brandl	2586	Jair Town	2611	Suzie Rush
2562	Lynette Blom	2587	Nell Sexton	2612	Robert Briggs
2563	Danny Butt	2588	Riley Nigro	2613	Ben Hughes
2564	Margot Hinge	2589	Adele Howitt	2614	Lesley Adena
2565	Paul Reiner	2590	Jessica McIntosh	2615	Cicily Svikart
2566	James Massey	2591	Claire Harden	2616	Terrence Bulmer
2567	Laraine Proctor	2592	Robert Kilcullen	2617	Sea Shepherd
2568	Ailsa Cowan	2593	Joanne Livermore	2618	Dolphin Research Institute
2569	Silverleaves Conservation Association	2594	Sali Hayes	2619	Meg Anderson
2570	Elaine Larsson	2595	Philip Kemp	2620	Edward Pawlik
2571	Paul Fetterplace	2596	Romina Scarlato	2621	Candida van Rood
2572	Dan Sandiford	2597	James Longson	2622	Kate Campbell
2573	Dillon Hobbs	2598	Nicole Glover	2623	Penelope Gebhardt
2574	Angus Thompson	2599	Lindsay Gust	2624	Catherine Paulzen
2575	Labor Environment Action Network	2600	Catherine Lee	2625	Matthew Tetteroo

2626	Justine Beck	2651	Andrew McFee	2676	Russell Brown
2627	Julie Hart	2652	Amy Humphrey	2677	Patricia Wright
2628	Margaret Alexevich	2653	Heath Mathias	2678	Martin Oliver
2629	Alexander Holt	2654	Jack Hibbins	2679	Blue Wedges Inc.
2630	Georgia Monsell-Butler	2655	Sophie Phillips	2680	John Bailey
2631	Eliza Lawrence	2656	Giulio Catena	2681	Libby Langford
2632	Thomas Farmer	2657	Mary-Ann Skidmore	2682	Margot Kilcullen
2633	Heather Orlando	2658	Karly Roolker	2683	Penelope Takenaga
2634	Susan Mathews	2659	Jeremy Farrington	2684	Amanda Swanson
2635	Cassandra Milana	2660	Cheryl Evans	2685	Rachel Barbosa
2636	Meg Pawlik	2661	Raymond Bannister	2686	Alister Stohr
2637	Brigette Sigley	2662	James Skidmore	2687	Liam Jury
2638	Alison Durant	2663	City of Casey	2688	Jane Miller
2639	Izabella Woinarski	2664	Madeline McGarvey	2689	Rachael Hart
2640	Freddie Holt	2665	Bass Coast Shire Council	2690	Alexis Smith
2641	Lyndall Rowley	2666	Josh Tebbutt	2691	Susan Burne
2642	Peter Flanagan	2667	Marianne Conn	2692	Diana Scambler
2643	Hayley Koster	2668	Molly Franzke	2693	Ella Gleeson
2644	Jennifer-Leigh Petkovic	2669	Catherine Stirling	2694	Christopher White
2645	Neil Hallam	2670	Jayden Mitchell	2695	Sam Kohne
2646	Skye Mcfee	2671	EPA Victoria	2696	A Rivera
2647	Abhikash Sivabalan	2672	Simon Black	2697	Olivia Girardin
2648	Jacob Lawrence	2673	Claudia Lyons	2698	Marcelle Holdaway
2649	Michael Delaney	2674	Cheryl Wilkinson	2699	Phil Wright
2650	Kara Freedman	2675	Patrick Hockey	2700	Port of Hastings Development Authority

2701	Lysette Ashford	2726	Elizabeth Gofton	2751	Charles Risbey
2702	Dashel Tran	2727	Elke Emerald	2752	Peter Lovell
2703	Peter Vadiveloo	2728	Thalia Collard	2753	Peter Bosland
2704	Georgia Arranga	2729	Catherine Weiss	2754	Russell Jones
2705	Caitlin Rivera	2730	Christine Mofardin	2755	Andrew McKinnon
2706	Clifford Hayes	2731	Miguel Gallego	2756	Anda Banikos
2707	Dixon Hayes	2732	Su-Hsien Kuan	2757	Ann Paul
2708	Riley Goodwin	2733	Jan Aitcheson	2758	Mayra Cuming
2709	Jessica Brady	2734	Yoav Lev	2759	Andrea Bunyevich
2710	Cheryl Clark	2735	Kai Brach	2760	Susan Lovell
2711	Elizabeth Woodside	2736	Russell Curr	2761	Jonathan Mark
2712	Martine Middendorp	2737	Kasia Fabijanska	2762	Mitchell Bready
2713	Marija Ivkovic	2738	Philippa Morrison	2763	Bree Lovell
2714	Jenny Le Boeuf	2739	Rachel Affas	2764	Julie Pittle
2715	Kaitlin Rust	2740	Mylene Pentland	2765	Kathryn Hart
2716	Ben Loaring	2741	Abigail Browne	2766	Michelle Gibson
2717	Kate Babic	2742	Meryle Findlay	2767	Lily Sharples
2718	Christine de Wit	2743	Mascha McKernin	2768	Greg Hunt
2719	Mark Burfoird	2744	Judy Jack	2769	Diana Williamson
2720	Claire Weiss	2745	Michael Timlin	2770	Dina Charpentier
2721	Patricia Ritman	2746	Glenda Holmes	2771	Stacey Ferrando
2722	Bob Walshe-Howling	2747	Patrick	2772	Alex Neil Streich
2723	Hannah Opaluch	2748	Shaun McKernin	2773	Annette Bunyevich
2724	Mornington Environment Association	2749	Sophie Paterson	2774	Duguild Durant
2725	Marnie Fitzsimons	2750	Clinton Scott	2775	Matthew Dearling

2776	Celia Sexton	2801	Lloyd Steele	2826	Daniel Tilbrook
2777	Philip Balcombe	2802	Les Mumford	2827	Mornington Peninsula Climate Action Network
2778	Flinders Community Association	2803	Christopher Monie	2828	Wendy Lee Haines
2779	Margaret Tilleard	2804	Robyn Aldrick	2829	Andrew Taylor
2780	Benjamin Vasic	2805	Cardinia Shire Council	2830	Claire Greenhill
2781	Michael oylan	2806	Samantha Phelps	2831	Diane Keane
2782	Marie Ferguson	2807	John Owens	2832	Margaret Reichelt
2783	Andrew McFarlane	2808	William De-La-Warr	2833	Ciara Gardiner
2784	Lauren Burns	2809	Angela Tucker	2834	Diana Zulicki
2785	Errol Croll	2810	Nathan Jones	2835	Victoria Arena
2786	Kristen Lindesay	2811	Miranda Brash Brenan	2836	Meredith Drew
2787	Kate Monk	2812	Amanda Pearce	2837	Janus Karnowski
2788	Suzanne D'Ombrain-Allain	2813	Caroline Lipinski	2838	John Neve
2789	John Merory	2814	CLIMARTE: Arts for a Safe Climate	2839	Jesse Linkins
2790	Keith Williamson	2815	Kerryn Reichelt	2840	Millers Kitchen
2791	Helen Fischer	2816	ACF Sunbury	2841	Danielle Gibson
2792	Annie Stephenson	2817	Lochie Scott	2842	Stephanie Presser
2793	Jacob Hinds	2818	Pam Bell	2843	Sylvie Walker
2794	Peter Cook	2819	Ella McIlvena	2844	Patrick Mooney
2795	Dove Wilson	2820	Bailey White	2845	Yvonne Smith
2796	John Cashion	2821	Lorris Jones	2846	Gemma Davenport
2797	Meredith Stone	2822	Fiona Stitfold	2847	Simon White
2798	David Pope	2823	Sophie Cant	2848	Noelene Carr
2799	David McCormack	2824	Rachael Ferguson	2849	S Bakewell
2800	Zander Morris	2825	Shirley Mitchell	2850	Melbourne Scuba Dive Reports

2851	Aliya Murray	2876	Jamie Mita	2901	Jessica Schuller
2852	John Daras	2877	Greg Dudgeon	2902	Amelia Hardy
2853	Eva Merta	2878	Annie Jeffery	2903	Jeannine Wilson
2854	Sophie Isbister	2879	Kerry McGennisken	2904	Luke Marburg
2855	Lindsey Mathews	2880	Brendan Anderson	2905	Sam Miller
2856	Tess Weller	2881	Alexander Knox	2906	Vee Thompson
2857	Andrew Powis	2882	Geoffrey Heyes	2907	Anthea Mackernzie
2858	Paul Round	2883	Callum Powell	2908	Martine Seccull
2859	Georgina Stubbs	2884	Peter Sack	2909	Freya Woodland
2860	Dianna McKellar	2885	Sue Carolane	2910	George Forster
2861	John Tilleard	2886	Liezl Shnookal	2911	Grazyna Mackiewicz
2862	Jack Paul-Drevensek	2887	Rosemary McDonald	2912	Dale Stohr
2863	Wendy Bryceland	2888	Richard Spencer	2913	Nicole Kepert
2864	Nina Buxton	2889	Caitlin Duryea	2914	Catherine Mclennan
2865	Lucy Robertson	2890	Diane Garnham	2915	Phillip Island Conservation Society
2866	Christina Saladino	2891	Wade Cochrane	2916	Mark Schneider
2867	Todd Watts	2892	Stan Maine	2917	Stuart Wilson
2868	Charlotte Jagusch	2893	Georgia Siddall	2918	Gilllian Blair
2869	Thomas Hiney	2894	Aurora Shmith	2919	Lucy a'Beckett
2870	Bunurong Land Council Aboriginal Corporation	2895	Olivia Flavell	2920	Lillie Thompson
2871	Department of Agriculture, Water and the Environment	2896	Deborah Bohm	2921	Jaimee White
2872	Stacey Chilcott	2897	Danaa Faulken	2922	Noel Goldsworthy
2873	Kirk Siddall	2898	Paddle People	2923	Jo-Anne Bulmer
2874	Stuart Redman	2899	Pamela Stewart	2924	Timothy Henderson
2875	Malcolm Shore	2900	Peter Leslie	2925	Lara Appudurai

2926	Cameron Barrett	2951	Eve Brady	2976	Janette Watson
2927	Leanne Walker	2952	Brian Thomas	2977	Joanne Dalton
2928	Louise O'Gorman	2953	Mike Cleeland	2978	Marion van Rooden
2929	James Young	2954	Christopher Gurney	2979	Mark Christie
2930	Alecia Wolan	2955	Natasha Wolan	2980	Jo Minto
2931	Paul Skerrett	2956	Thomas Hulse	2981	Jasper Fleming
2932	Harrison Jones	2957	Harry Hayes	2982	Luke Skehan
2933	Peter Simonsen	2958	Catherine Hamilton	2983	Paulina Valdes
2934	Ashley Martin	2959	William Terry	2984	Brenden Fejes
2935	Alison Laird	2960	Australian Parents for Climate Action)	2985	Nicole Bond
2936	Sasha King	2961	William Lord	2986	Lucy Keller
2937	Bron Gwyther	2962	Oscar van Stekelenburg	2987	Lucinda Flynn
2938	Rosemary Rothstadt	2963	Deidre Holicka	2988	Tasmin Lewis
2939	Jack Bridges	2964	Jonathan Wilson	2989	Piper Iles
2940	Kye Espenschied	2965	Barbara Oates	2990	Cara Richardson
2941	Jo Gibson	2966	Laura Alfrey	2991	Claire Cordwell
2942	Georgina Sack	2967	Margaret Quinn	2992	Melinda Venticich
2943	Zachary Joan	2968	Janenne Willis	2993	Ruby Campbell
2944	Margaret Arnott	2969	Stephen McMurray	2994	Jemma van Loenen
2945	Sean Doherty	2970	Jemma Shakespeare	2995	Montanna Gerber-Corn
2946	Louise Rawlings	2971	Jeanette Miller	2996	Emma Brace
2947	Melinda Gustus	2972	Nicole Lotscher	2997	Brent Ham
2948	Zoe Adams	2973	Shane Simms	2998	Aaron Petty
2949	Susan Stoppa	2974	Amber Skehan	2999	Isabel Bailey
2950	Merit Tabak	2975	Tim Burford	3000	Johnny Carr

3001	Ashika Kanhai	3026	Kimberley Prince	3051	Jo-Anne Hook
3002	Lauren Leyden	3027	Paul Dicintio	3052	Ross Fullerton
3003	James Morgan	3028	Thomas Herriott	3053	Julie McInnes
3004	Victorian National Parks Association	3029	Keith Old	3054	Rafael Heale
3005	Rita Coffey	3030	Ruth Honan	3055	Wilman Rivera
3006	Ishani Clegg	3031	Sue Busbridge	3056	Cynthia R Gibbs
3007	Felicity Waddell	3032	Grace Mills	3057	Glenn Heil
3008	Anton Middendorp	3033	Penelope Gilbert	3058	Jack Trickey
3009	Kelly-Ann Thompson	3034	Caren Heilberg	3059	Jonathon Fetterplace
3010	Timothy Gordon	3035	Ashlee Cahir	3060	Isaac Hura
3011	Eleanor Pearson	3036	Johnny Carr	3061	Damien Moylan
3012	James Coffey	3037	Warwick Smith	3062	Fiona Gray
3013	Patrick Barnewall	3038	Timothy Shannon	3063	Christopher Naylor
3014	Tom Keddie	3039	Sophie Nettlefold	3064	Hugh Boulton
3015	Peta Campbell	3040	Nicola Campbell	3065	Susan Bartholomaeus
3016	Mike Ufer	3041	Robin Hick	3066	Carla Tadich
3017	Brandon Fredericks	3042	Jenny Dixon	3067	Louise Page
3018	Amy Leeworthy	3043	Felicity Barclay	3068	Louise Goff
3019	Maurice Schinkel	3044	Florence Townshend	3069	Robert Harrison
3020	Stephanie Larcombe	3045	Heather Cullen	3070	Elena Mujkic
3021	Tim Brace	3046	Lucie Burns-Warr	3071	Marty Nelson-Williams
3022	Stephen Dodd	3047	Melissa Geyer	3072	Kane Bourke
3023	Lilian Hutcheson	3048	Florence Townshend	3073	Cheryl Madden
3024	Cameron Stops	3049	Dayne Jeffery-Warren	3074	Rachael Ferguson
3025	Ann Lazzaro	3050	Michael Binney	3075	Kathleen Denny

3076	Paige Busbridge	3101	Laura Alexander	3126	John Wilkins
3077	Kenneth Hudson	3102	Bryannah Downward	3127	Michelle Thomas
3078	Ted Tilbrook	3103	Latika Hick	3128	Grant Godbold
3079	Thomas Nixon	3104	Steph Miller	3129	Save Westernport Inc
3080	Judith Parslow	3105	Bron Gwyther	3130	Sarah Raine and Simon Chaffey
3081	Sophie Winter	3106	Rahne Widarsito	3131	Stephen Swan
3082	Greg Dedman	3107	Bianca Otto	3132	Irene Morgan
3083	Patrick Shannon	3108	Erin Gardner	3133	Conan Peterson
3084	Joanne Swain	3109	Australian Animal Rescue	3134	Stuart Miller
3085	Extinction Rebellion - Western Port and Mornington Peninsula	3110	Shannon Jarman	3135	Rosslyn Chandler
3086	Paula Ercole	3111	Georgia Ehrlich	3136	Charlotte Noall
3087	Christopher Ferguson	3112	Kathy MacKendrick	3137	Jesse Stapleton
3088	Environment Victoria	3113	Jason Schilling	3138	Jennifer McKeachie
3089	Katherine Wilkins	3114	Jack Braun	3139	Monica Barrow
3090	Jordan Lawson	3115	Lucinda Koch	3140	Anthony Ladson
3091	Jardin Hick	3116	Louie Marshall	3141	David Fabiny
3092	Peter Hartley	3117	Debra Le Cerf	3142	Ryan Tobin
3093	Kate Ross	3118	Attika Kaylah Stahl	3143	Kerri McCafferty
3094	Ian McKerrow	3119	Jo Roszkowski	3144	Renee Kostiuk
3095	Dan Milne	3120	Caigan Meade	3145	Alan Wallace
3096	Jason Goldingay	3121	Ripley Everett	3146	Elizabeth Dennis
3097	Geoffrey White	3122	Michelle Hanslow	3147	Lisa Garland
3098	Amity Alexander	3123	Terry Vernon	3148	Jemma Jones
3099	Natalia Hick	3124	Bill Young	3149	Westernport and Peninsula Protection Council
3100	Lisa Hunter	3125	Jessica Adams	3150	Liam Frampton

3151	Danny Clarke	3176	Kate Foley	3201	Amelia Perkins
3152	Paul Wainwright	3177	Lucinda Strong	3202	Owen Missen
3153	Michael Johnston	3178	Michael Jaboor	3203	Ellen Barabas
3154	Jane Baillieu	3179	Sarah Stops	3204	Brittany Myers
3155	Tahlia Christie	3180	Martin Stringer	3205	Leigh Naunton
3156	Annie Nihill	3181	Heidi Williams	3206	Sarah Carter
3157	Virginia MacPherson	3182	Bronwyn Dowler	3207	Lisa Justin
3158	Annabel Wilson	3183	Luke Milgate	3208	Kristina Alexander
3159	Merryn Staley	3184	Sonia Edwards	3209	Richard Clarkson
3160	Angus Cormick	3185	Kate Roper	3210	Robyn Nixon
3161	Sianna Lee	3186	Jason Furness	3211	Lynne Imlach
3162	Michael Gielb	3187	Lynette Mackenzie	3212	Red Hill South Landcare Group
3163	Darcy Neave	3188	Matthew Tardif	3213	Lynne Alexandra
3164	Elyse Profenna	3189	Eliza Hutchison	3214	Kellie Lee
3165	Mary Hanly	3190	Jane Clarkson	3215	Eliza Kelly
3166	Christopher Coulthursy	3191	William Lombard	3216	Yi Mei Tan
3167	Adrienne Teague	3192	Michael Levy	3217	Sara Leitch
3168	Guillemette Perrin	3193	Kahlil Rogers-Perazzo	3218	Peter Nixon
3169	Scott Harris	3194	Julie Kleverlaan	3219	Julia Croatto
3170	Johanna Le	3195	Harold Bolitho	3220	Jackson Dahlenburg
3171	Sarah Merrett	3196	Jesse O'Mara	3221	Lynne Henson
3172	Patrick Deveney	3197	Linda Bowden	3222	Sarah Jaboor
3173	Andrew Watson	3198	Piers Morgan	3223	Christopher Bailey
3174	Rick Rogers	3199	Neville Imlach	3224	Sandra Milne
3175	Ying Zhi Gu	3200	Jack Ottaway	3225	Jay Lewis

3226	Emily Lee	3251	Alan Machin	3276	Jill Moore
3227	Alison Hoelzer	3252	Janette Nibaldi	3277	Michelle Maes
3228	Raelene Morey	3253	Michael Moore	3278	Rebecca Davey
3229	Darren Cristina	3254	Jonathan Amos	3279	Declan Logan
3230	Jessica Osburn	3255	Rebecca Hengemuhle	3280	Anika Potter
3231	June Godfree	3256	Malcolm Adams	3281	Gabriella Hont
3232	John Counsell	3257	Brodie Pope	3282	Caroline Carter
3233	Amy Tobin	3258	Emily Burke	3283	Professor Mazza
3234	Kathryn Woods	3259	Georgia Fennessy	3284	Angela Szeitli
3235	Tanya Essing	3260	Jason Kleinitz	3285	Nicholas Bebbington
3236	BirdLife Australia	3261	Lucy Dewhurst	3286	Greg Wallis
3237	Lisa Hansen	3262	Tom Moore	3287	Bronwen Coleman
3238	Chris Hannah	3263	Ralf Thesing	3288	Peter Mulherin
3239	Tanisha Wookey	3264	Krista Minzenmay	3289	Leanne Craven
3240	Cally Greene	3265	Hamish Martin	3290	Jessica Obersby
3241	Mirielle Schreuders	3266	Sarah Bell	3291	Cameron Matters
3242	Bec Smith	3267	Henri Pryde	3292	Keely Boyd
3243	Jacinta Quattrocchi	3268	Ewen Coates	3293	Kristin Campbell
3244	Sally Prideaux	3269	Jenna Clarke	3294	Alana Ford
3245	Suzanne Kepert	3270	Shav Goonewardena	3295	Nicholas Boyd
3246	Maxam MCCafferty	3271	Pam Bannister	3296	Bill Genat
3247	Victor Komarovsky	3272	Sue King	3297	Stephen Ginnivan
3248	Zoe Champion	3273	Fiona Ames	3298	Jacqueline Forster
3249	Leah Slater	3274	David Rawlings	3299	Soraya Burrows
3250	Rebecca McIntosh	3275	Peter Whittle	3300	James Naylor

3301	Jantina Forecast	3326	Angela Gioffre	3351	Joanna Johnson
3302	Patricia Low	3327	Janet Davidson	3352	Diane Price
3303	Rick Coleman	3328	Stuart Mitchell	3353	Ilma Hackett
3304	Richard Hook	3329	Jane White	3354	Graeme Brownfield
3305	Robert Babb	3330	Sarah Hudson	3355	Cameron Williams
3306	Imogen Koh	3331	Leon Peterson	3356	Jorja Hodgson
3307	Liz Reen	3332	Dominic Al-Mudaris	3357	Caroline Dynon
3308	Oliver Le Clerc	3333	Yvonne Clarnette	3358	Rhys Ripper
3309	Judy Pile	3334	Karla Laidlaw	3359	Julie O'Brien
3310	Mark Aarons	3335	Sarah Oliveira	3360	Julie Billett
3311	John Cherry	3336	Alexandra Mullis	3361	David Neal
3312	Ross Whitehead	3337	Timothy Beattie	3362	Nathan McGuire
3313	Susan Beveridge	3338	Kathie Sampson	3363	Julia Stockigt
3314	Nicola Tragear	3339	Dominic Noonan	3364	Rhyanon Lane
3315	Victorian Recreational Fishing Peak Body	3340	Sarah Tolson	3365	Jackson Anderson
3316	Morgan Henson	3341	Laura Cuttriss	3366	Josh Clark
3317	Amy King	3342	Jessica Hobbs	3367	Jocelyn Adams
3318	Naomi Nicholas	3343	Catherine Rogerson	3368	Harry Patchett
3319	Julie Thomas	3344	Alice Forrest	3369	Marc O'Carroll
3320	Karen Anderson	3345	Sarah Nicholas	3370	Vivien Rutter
3321	Neale Burgess	3346	Ella Hayes	3371	Don Lazzaro
3322	Sophie Morse	3347	Richard Hutchinson	3372	Michael Heenan
3323	Terryl Donaldson	3348	Luca Calabrese	3373	Ebony Prescott
3324	Sian Hughes	3349	Tom Milledge	3374	Allan McCasker
3325	Eli Schwedes	3350	Emily Guy	3375	Trevor Blatchford

3376	Barbara Burstall	3401	Jessie Tucker	3426	Katrina Newman
3377	Rachel Unicomb	3402	Helen Gentry	3427	Keith Valentine
3378	John Adlam	3403	Lauren Lee	3428	Felicity Rahaus
3379	Michael Skomina	3404	Lauren Hunt	3429	Sarah Seddon
3380	Liz Needham	3405	Nancy Sugarman	3430	Karsten Poll
3381	Priyadharshini Raveendran	3406	Meagan Bursa	3431	Melissa Poll
3382	Sophie Kershaw	3407	Lindy Flatz	3432	Kalika Miliankos-King
3383	Adam Kershaw	3408	Jamie Reichelt	3433	Kiera Corby
3384	Kezia Brett	3409	Andre Barrand	3434	Robert Marston
3385	Fiona Curl	3410	Michael	3435	Dave Pauli
3386	Diana Langmead	3411	Kerryn Lee Scanlan	3436	Margaret Lognsn
3387	Aaron Tully	3412	Amanda Day	3437	Joel Vanderuit
3388	Etan Scott	3413	Jennifer Armstrong	3438	Damien Cole
3389	Rachel Davis	3414	David King	3439	John Merakovsky
3390	Robyn Stephens	3415	Greta Webster	3440	Patrick Sloan
3391	Julia Pickwick	3416	Tom Thornton	3441	Joy Hudson
3392	Carlie Watson	3417	Richard Lipp	3442	Rhiannon Morgan
3393	Sherry Wilson	3418	Alison Cooke	3443	James Young
3394	Ian Brett	3419	Sonja Leon	3444	Emma Bentley
3395	Matt Hornby	3420	Anna Henderson	3445	Jeanette Swain
3396	Marc O'Carroll	3421	Kylie Meakins	3446	Lynne Ruthven
3397	Daniel Wilson	3422	Tiffany Sandell	3447	Emily Clarke
3398	Marnie Berry	3423	Louise Watkins	3448	Eleonore Rich
3399	Vanessa Church	3424	Enrico Gazzurra	3449	Laura Ruaux
3400	Sasha Taylor	3425	Kim Manning	3450	Andrew Thomas

3451	Laura Mansell	3476	Tony Messenger	3501	Belinda
3452	Joan Sarda	3477	Julie Morgan	3502	Lee May
3453	Sarah McMahon	3478	Gail Lynch	3503	Alexander Sherriff
3454	Pippa Howes	3479	Jo Roszkowski	3504	Abby Lethlean
3455	Yvonne Lynch	3480	Karen Fitzgerald	3505	Kate Mabin
3456	Samantha Harrison	3481	Andrew Berrill	3506	Maaike Watson
3457	Emily Grant	3482	Margot de Deugd	3507	Noreen Nicholson
3458	Ilias Grivas	3483	Ursula Chandler	3508	Martin Paulo
3459	Susan Johnson	3484	Bethany Batchelor	3509	Greg Thompson
3460	Philip Eyles	3485	David Pincus	3510	Christine McKenzie
3461	Catherine Watson	3486	Hayley Wainwright	3511	David Podhaczky
3462	Janelle Magee	3487	Vayda Dainney	3512	Kathy Mclaren
3463	Norman Arena	3488	Lachlan Mollica	3513	Sondrine Kehoe
3464	John Slavin	3489	Iesha Delune	3514	Elaine Alexander
3465	Eva Welch	3490	Trevor Hunt	3515	Maurice Perry
3466	Tammy Alner	3491	David Simpson	3516	Jane Brook
3467	Bronwyn Francis	3492	Hayley Franklin	3517	Sarah Albright
3468	Kat Lavers	3493	Nick Yates	3518	Kath Alford
3469	Tilly Riches	3494	Dave Maxted	3519	Vera Moeller
3470	Jacinta Newton	3495	Cheryl Lee	3520	Jeni Jobe
3471	Linda-Sue Simpson	3496	Maureen Plunkett	3521	Levinia Olsen
3472	Catherine Buxton	3497	Kim Morris	3522	Kerry Whatley
3473	Nicky Leitch	3498	Anneliese Twigg	3523	Valerie Barrington
3474	David Bonighton	3499	Sharon Berry	3524	Alyssa Tabone
3475	Beth Dunham	3500	Tanya Nolan	3525	Pamela Lawson

3526	Peter Mossop	3551	Pat Pringle	3576	Hunter Shen
3527	Rain White	3552	Jeremy Sallmann	3577	Elizabeth Cox
3528	Rodney Beale	3553	Donald Munro	3578	Eamon OBryan
3529	Timothy Cleaver	3554	Ryan Wright	3579	David Williams
3530	Jac Nolan	3555	Jess Laing	3580	Daniel Horstra
3531	Victoria Johnson	3556	Jane Sellenger	3581	Darcy Stafford
3532	Mitchell Connolly	3557	Sheila Bardon	3582	Sandra Schoffer
3533	Dim Kostaras	3558	Caitlin Brownlee	3583	Amy Motherwell
3534	Daamon Parker	3559	Lynne-Maree Congiusta	3584	Jean Leeson
3535	Garry Green	3560	Samuela Sirilo	3585	Elizabeth Sarda
3536	Fiona White	3561	Ingrid Barrington	3586	Carolyn Hatherly
3537	Belinda Baggs	3562	Rod Lawrence	3587	Alan Baker
3538	Damian McLindon	3563	Eliza Knox	3588	Jeff Giddings
3539	Phill Northwood	3564	Kate Mcintosh	3589	Russel Baader
3540	Fiona Edginton	3565	Susan McCulloch	3590	Diana Harris
3541	Patrick Schwarz	3566	Ally Valerio	3591	Marnee Wills
3542	Dorthe Jantzen	3567	Kerry Echberg	3592	Marylou Scally
3543	Alex McLean	3568	Margaret Timmer-Arends	3593	Alexander Livissianos
3544	Peter Steele	3569	John Neve	3594	Helen Harris
3545	John Taylor	3570	Andrew Thomas	3595	Paul Dempsey
3546	Charlotte Henson	3571	Jan Mitchell	3596	Natalie Raye
3547	Billie Sallmann	3572	Euan Belcher	3597	Anneli Dyall
3548	Joshua Wright	3573	Gen Rawling	3598	Caroline Thomas
3549	Jane Tyrrell	3574	Nina deVreeze	3599	Jocelyn Hansen
3550	Susan Laukens	3575	Stephen Shelley	3600	Cassandra Sinclair

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3607	Dale Martin	3632	Melissa Burrage	3657	Michelle Rawlings
3608	Alison Gadd	3633	Amy King	3658	Donna Foster-Travels
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3611	Nicholas White	3636	Tim James	3661	Garry Disher
3612	Anne Algar	3637	Elizabeth Ross	3662	Georgia McGhee
3613	Karen Dodd	3638	Philip Riley	3663	Valerie Newman
3614	Carolyn Harbeck	3639	Oli Anderson	3664	Helen Isaacs
3615	Peter Malesa	3640	Deborah Pach	3665	Abigail Boucher
3616	Geordie Tancheff	3641	Huon Smith	3666	Mitchell Skvor
3617	Kristine Bedford	3642	Patrik Marsh	3667	Benjamin Kemp
3618	Jemma Hannan	3643	Jillian Rose	3668	Natalie Greenfield
3619	Maria Tsangaris	3644	Mark Bourke	3669	Christine Larsen
3620	Annabelle Clarkson	3645	Max Webb	3670	S Findlay
3621	Alison Haitana	3646	Jodie Cousins	3671	Pamela Abell
3622	Timothy Bardon	3647	Helen Fallaw	3672	June, Geoff Fischer
3623	Peter Allsop	3648	Anna Grieve	3673	Patricia Elmore
3624	Crina Virgona	3649	Jordan Stout	3674	Tayah Carr
3625	Claire Magee	3650	Post & Beam Pty Ltd	3675	Rhondda Booth

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3680	Marianne Dalton	3705	Nicholas Stone	3730	Katharine Gentry
3681	Rhonda Whitehead	3706	Angela Matkovic	3731	Andrew Mather
3682	Prue Gill	3707	Jason Ford	3732	Peter Dynes
3683	Natasha Sasse	3708	Roslyn Webster	3733	Kym Stout
3684	Diane Hook	3709	Lisa Magnusson	3734	Amber Ferraro
3685	Anne Kennedy	3710	Therese Stone	3735	Belinda Ruzicka
3686	Mark McCallum	3711	Duncan Reid	3736	Leith Marshall
3687	Jenny McCallum	3712	Lindsay Agnew	3737	Jennifer Smith
3688	Catherine Paul	3713	Margaret Moorhouse	3738	Regina Boulton
3689	Stephen Paul	3714	Barbara Kay Moss	3739	Robyn Lansdowne
3690	Philip Gentry	3715	Jean Phillips	3740	Merelle Du Ve
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3692	Ellie Caldwell	3717	Fiona Dundas	3742	Maria Del Core
3693	John Tucker	3718	Jacqueline Mucha	3743	Jeffrey Sellenger
3694	Kerrie Tucker	3719	Anthony Holden	3744	Margaret Hook
3695	Shane Ellis	3720	Sarah Adolph	3745	Kenneth Hook
3696	Andrew Molloy	3721	Geoffrey Adolph	3746	Lissa Board
3697	Jennifer Detez	3722	Daniel Stuart	3747	Tomas Scerbo
3698	Sarah Woods	3723	Sarah Foley	3748	Kylie Hosking
3699	Janet Groves	3724	Michelle Egan	3749	Antony Muir
3700	Astrid Werner	3725	Gillian Upton	3750	Kate Coverdale

3751	Jim Sansom	3776	Bryan Loft	3801	Cathy Gledhill
3752	Mark Coverdale	3777	John Di Petta	3802	Peter Conlon
3753	Frank Smith	3778	Joanna Moloney	3803	Merilyn Anderson
3754	Richard Anderson	3779	Freya Headlam	3804	Elliot Hook
3755	Christian Cairns	3780	Margaret Morrissey	3805	Toby Hook
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3757	Tabitha Hocking	3782	Heather Rankin	3807	Ruth Schoenheimer
3758	Judith Hanan	3783	Hayden Richardson	3808	Chelsey Swanson
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3760	Lucy Kyriacou	3785	John Shortridge	3810	Linda Hodges
3761	Ann Fuller	3786	Fiona Bodsworth	3811	Rosie Ganino
3762	Adam Kyriacou	3787	Anthea Swann	3812	Tam Jones
3763	Lachlan Williams	3788	Andrew Breaden	3813	Emily Oulton
3764	Angela Gill	3789	Gregory Whatley	3814	Mandy Swaney
3765	Leon Sweeney	3790	Anda Petrapsch	3815	Michelle Laucius
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3835	Mallory Blackmore	3860	Adele Papon	3885	Alecia Duke
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3842	Andrea Schloetzer	3867	Anne Fitzpatrick	3892	Alex Hill
3843	Angela Myzzin	3868	Bryan Jeffrey	3893	Alex Lotric
3844	Aaron Bickery	3869	Agneta Carroll	3894	Alex Merory
3845	Aaron Densham	3870	Rick Hallin	3895	Alexandra Thorsen
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3908	Anita Smith	3933	Andrea Coleman	3958	Anna Battese
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3910	Gamani Goonetilleka	3935	Kate Wheeler	3960	Annette Culley
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3913	Amanda Jacobs	3938	Andrew Dewhurst	3963	Margaret Learmonth
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3915	Amanda Christie	3940	Andrew Westle	3965	Annelize Vullers
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3917	Amanda Woolley	3942	Andrea Morgan	3967	Annett Finger
3918	Amber Parsons	3943	Annie Whitlocke	3968	Anne Jones
3919	Ana McLiesh	3944	Ang McLeod	3969	Annie Fenner
3920	Alexandra Miles	3945	Marina Giampietri	3970	Annie Guillaume
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3924	Amy ratel	3949	Marion Campbell	3974	Ann Nevill
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3979	Anthea Sinclair	4004	Attalia Everton	4029	Brandon Dowling
3980	Anthony Woolley	4005	Virginia Shering	4030	Blythe Dwyer
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3984	April Stroud	4009	Chris Matthews	4034	Rebecca Stuart
3985	Archie Bowers	4010	Ayeesha Puveendran	4035	Rebecca Gray
3986	Anthony Roberts	4011	Anne Young	4036	Rebecca Harrington
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3990	Michelle Crozier	4015	Bailey Ianson	4040	Bee Barker
3991	Ashleigh Marlow	4016	Enes Bajrektar	4041	Bek Hampshire
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3993	Ashleigh Lappin	4018	Dennis Ball	4043	Belinda Carey
3994	Ashlea Heffernan	4019	Georgia Balme	4044	Belinda Urbans
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3996	Ashley Maher	4021	Barbie Wilson	4046	Michael Bell
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4000	Asti Fletcher	4025	Bernadette Broersen	4050	Ben Graham

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4053	Ben Matthews	4078	Bianca Cottle	4103	Lyndal Hoad
4054	Benjamin Nuttney	4079	Angus Martin	4104	Brad Cook
4055	Ben Taylor	4080	Ian Birdwheel	4105	Brandon Mahoney
4056	Tess Bergin	4081	Belinda Jack	4106	Brandy Ball-Mahony
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4058	Bernadette Young	4083	Bronwyn Hooper	4108	Braydon Davies
4059	Bernard Abadie	4084	Jill Stewart	4109	Barb Lasky
4060	Bernie Stute	4085	Brigid Magner	4110	Brei Meek
4061	Beth Ramsay	4086	Ben Phibbs	4111	Brett Champion
4062	Bethany Perry	4087	Bailey Mereszko	4112	Brianna Horne
4063	Bethany de Bruyn	4088	Bernadette Greenwood	4113	Brian Thompson
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4136	Ben Walta	4161	Caroline McLeod	4186	Colin Brewster
4137	Catherine Ahkin	4162	Caroline Shaw	4187	Craig Barker
4138	Christopher Eastman-Nagle	4163	Carol O'Rourke	4188	Claire Bruce-Gardner
4139	Christina Pollard	4164	Carolyn Jeffrey	4189	Colton Carner
4140	Clive Gould	4165	Carolyn Goldberg	4190	Celeste Farrell
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4145	Cameron Davey	4170	Casey Clarkson	4195	Carla Gardner
4146	Camilla Cohen	4171	Cassie Mills	4196	Christina Gledhill
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4204	Charlie Plant	4229	Chris Clarke	4254	Clare Baldwin
4205	Charlotte Fisher	4230	Chris Porter	4255	Clare Le Serve
4206	Charlotte Wall	4231	Chris Doe	4256	Clare Jones
4207	Charlotte O'Donnell-Young	4232	Chris Weaver	4257	Clare Brady
4208	Charmaine Farrell	4233	Christine Biro	4258	Catherine Clark
4209	Caroline Hedkey	4234	Chris Macqueen	4259	Brent Clark
4210	Chelsea McGhee	4235	Chris O'Donnell	4260	Julie Clarke
4211	Chelsea Taylor	4236	Christian Tucker	4261	Claudia Alberico
4212	Darcy Chene	4237	Christie Glennan	4262	Claudia Cepin
4213	Cheryl Turner	4238	Christine Bateman	4263	Clea McKeown
4214	Cheryl Gardner	4239	Christine Down	4264	Anne Maxwell
4215	Cheryl Dyer	4240	Christine Morgan	4265	Charlie Nairn
4216	Cheryl Oliver	4241	Christine Jansen	4266	Christine Newnham
4217	Siobhan Taylor	4242	Christopher Watt	4267	Chris Nieuwesteeg
4218	Chiara Bold	4243	Christine Villiers	4268	Charles O’Hara
4219	Lizz Heyes	4244	Chrystal Marinos	4269	Brett Williams
4220	Chloe Cervi	4245	Charlie Seymour	4270	Chloe Guss
4221	Chloe Jones	4246	Siobhan Nolan	4271	Cohen Walkerden
4222	Chloe Johnstone	4247	Marilia Cipolloni	4272	Colin Mckelvie
4223	Chloe Rings	4248	Caroline Jessop	4273	Hugh Coldwell-Ross
4224	Chloe Corrigan	4249	Cameron Miller	4274	Andrew Cole
4225	Chloe Mace	4250	Chloe Hooper	4275	Frank Coletta

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4277	Conor Mullan	4302	Chris Syratt	4327	Darcy Malesa
4278	Conor Mullan	4303	Cynthia Smith	4328	Darius Kedros
4279	Chris Frey	4304	Denise Bryant	4329	Darren McClelland
4280	Nadine Hermann	4305	Adrian Goodwin	4330	Daryl Hutchins
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4282	Brooke Spencer-Pitts	4307	Linda Dal Castello	4332	David Eastick
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4284	Cora Thomas	4309	Dale Knight	4334	David Treanor
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4291	Thomas Coy	4316	Daniel Schulz	4341	David Shutler
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4299	Caroline Langer	4324	Daniel Ryan	4349	Dean Greenall
4300	Catherine Smith	4325	Darcy DuMont	4350	Dean Campbell

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4354	Debbie Mackenzie	4379	Daniel Mangano	4404	Lachlan Dunne
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4356	Debra Marks	4381	Dawn Kneen	4406	Dylan Neal
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4359	Debra Johnston	4384	Dominique Garrard	4409	Edward James
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4361	Dee O'Mara	4386	Don Newgreen	4411	Ellen Rankin
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4431	Eleisa Wilson	4456	Ernst Merkenich	4481	Danuta Bieber
4432	Elektra Banikos	4457	Emiliano Avendano	4482	Erica Sherlock
4433	Eli Curry	4458	Emilie Fincher	4483	Eric Almon
4434	Elisabeth Agren	4459	Emilie Baird	4484	Erica Corr
4435	Elisa Jane	4460	Emily Barrow	4485	Susan James
4436	Elissa Grossi	4461	Emily Blaak	4486	Estelle Taylor
4437	Jess Kamperman	4462	Emily Coad	4487	Ed Hamlin
4438	Eliza Kidder	4463	Emily Okeefe	4488	Dominic White
4439	Eliza Godkin	4464	Emily Dow	4489	Ethan Jenkins
4440	Liz Lee	4465	Emily Jordan	4490	Euan Thomas
4441	Elizabeth Leslie	4466	Emily Brett	4491	Evan Kalathenos
4442	Elizabeth Wade	4467	Emily Boyd	4492	Patrice Evans
4443	Eliza Bartram	4468	Emily Holsman	4493	Evelyn Hamel-Green
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4448	Ella Johnson	4473	Emma Clark	4498	Faye Woodward
4449	Gabrielle Arnold	4474	Emma Jones	4499	Carolyn Eastick
4450	Ellen Cottingham	4475	Emma Acocks	4500	Felicity Sammut

4501	Sue Caldwell	4526	Flynn Gregory	4551	Gerard Egan
4502	Stephanie Pollock	4527	Joe Mama	4552	Gemma Falk
4503	Ferida Felstead	4528	Phinny Fortuyn	4553	Gemma Stewart
4504	Fiona Gilfillan	4529	Kerry Firtuyn	4554	Gemma Westle
4505	Fiona Bradley	4530	Siobhan Foster	4555	Genevieve Star
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4509	Fiorella Glavich	4534	Frederique Robert	4559	George Lucas
4510	Fiona Henderson	4535	Fred Nijffels	4560	Georgia Coy
4511	Fiona Mason	4536	Freya Rastall	4561	Georgia Green
4512	Fiona Healy	4537	Freya Bennett-Overstall	4562	Georgia Murphy
4513	Fiona Colin	4538	Jill Friedman	4563	Georgia Wood-Freeman
4514	Fiona Gardner	4539	Judith Venables	4564	Georgie Cummings
4515	Fiona Powell	4540	Felicity Sturgiss	4565	Georgina Minton
4516	Fiona Jettner	4541	Greg Dudgeon	4566	Georgie Puschner
4517	Chris H	4542	Gabi Seth	4567	Georgie Dunn
4518	Robyn Day	4543	Gabrielle Doolan	4568	Gerard Khoo
4519	Caitlin Shiell	4544	Maria Sonntag	4569	Grant Smith
4520	Geraldine Fitzgerald	4545	Gail Hall	4570	Gabriele Frenkel
4521	Josephine Moore	4546	Gareth Wilson	4571	Giana Bevinetto
4522	Jill Clayton	4547	Gawaine Blake	4572	Gideon Segal
4523	Fleur Gaylard	4548	Hayden Cronin	4573	Sharrie Grocock
4524	Flossy Sperring	4549	Greg Cleaver	4574	Jasmin Thomas
4525	Fiona Whitehouse	4550	Geoff Clements	4575	Gillian Ray

4576	Gillian Trahair	4601	Catherine O'Donoghue	4626	Harry Evans
4577	Gillian Senior	4602	Georgia Spring-Brown	4627	Hayley CH
4578	Giselle Rosman	4603	George Thomas	4628	Leanne Adams
4579	giselle lazarus	4604	Gus Stott	4629	Brittany Heath
4580	Glen Dalton	4605	Guy Abrahams	4630	Heather Cooke
4581	Glenn Cameron	4606	Gaye Welford	4631	Heather Welch
4582	Glenys Malkin	4607	Helen Alberico	4632	Heather Livingstone
4583	Gael McLeod	4608	Johanna Whatley	4633	Heather Barrett
4584	Margaret Clarkson	4609	Daniel Haack	4634	Heather Walker
4585	Amanda Morony	4610	Hailey Malberg	4635	Heath Wallace
4586	Gordana Simovic	4611	Hamish Korvin	4636	Helen Drinoczky
4587	Grace Watson	4612	Erika Hamilton	4637	Helen Kearton
4588	Grace Carty	4613	Hannah Young	4638	Helen Mountfort
4589	Grace Barnes	4614	Pauline Hannan	4639	Helen Shepherd
4590	Grace Calnin	4615	Yvette Gordon	4640	Samuel Wines
4591	Gary Grace	4616	Hugh Hardy	4641	Uma Spender
4592	Graeme Walters	4617	Jan Willis	4642	Henry Mckay
4593	Grant Fletcher	4618	Harriet Smith	4643	Henry Rushford
4594	Dylan Grayden	4619	Harrison Cattell	4644	Christine Henty
4595	Van Greenland	4620	Harrison Ede	4645	Hermina Vos
4596	Gregory Arnold	4621	Mark Harrison	4646	Henrietta Rodda
4597	Gregory Conductier	4622	Harry Hedley	4647	Alfred Heuperman
4598	Greta Hendry	4623	Harry Clyne	4648	Judy McCormack
4599	Margherita Grmek	4624	Hatem Ahmed	4649	Helen Farthing
4600	Pete Chandler	4625	Hayley Morris	4650	Anita Norris

4651	Michelle McCarthy	4676	Ian Crawford	4701	Isabella Torriero
4652	Duncan Hillier	4677	Ian Hester	4702	Indianna Trickey
4653	Ian Brown	4678	Ian Malkin	4703	Irene Vanderhelm
4654	Hilary Probyn-Smith	4679	Ian Macdonald	4704	Isabel Tyrrell
4655	Heather Step	4680	Ian Mccarthy	4705	Isabel Macpherson
4656	Holly McNeill	4681	Ikram Alfayadh	4706	Judith Brett
4657	Temay Honey	4682	Ilya Fridman	4707	Jason Furness
4658	sean hooper	4683	Imke Pansegrouw	4708	Jaclyn Trevillian
4659	Hopi Rodwell	4684	Imo Jackson	4709	Jack Hibbins
4660	Miranda Deylen	4685	Gail Gailey	4710	Jack Turner
4661	Helen Sakkas	4686	Amy Alexander	4711	Jack Nugent
4662	Bernadette Systa	4687	India Nicholson	4712	Jacki Brown
4663	Carol Hughes	4688	Andy White	4713	Jacqueline Younger
4664	Hugh Russell	4689	Colin Clarke	4714	Jade Radnor
4665	Brydie Bullard	4690	Jennifer Berridge	4715	Jai Forster-Saunders
4666	Abigail Humphreys	4691	Paul Andrews	4716	Jaimi Meyer
4667	Hunter Shen	4692	Marylou Scally	4717	Jacob Reilly
4668	Valda Soliman	4693	Josephine Jones	4718	Jacob Griffiths
4669	Heather Whitaker	4694	Randall Joseph	4719	Jalila Slaouti
4670	Heather Patterson	4695	Inga Jackowska	4720	Jane Allsop
4671	Emily Clarke	4696	Irvin Kaye	4721	James Edwards
4672	Sam Fullarton	4697	Isabella Zerella	4722	James Puls-Welsh
4673	Ian Edwards	4698	Joanne Kuhlmann	4723	James Whelan
4674	Ian McKerrow	4699	Ishani Gunasekara	4724	James Sexton
4675	Ian Allen	4700	Lois Sharp	4725	James Nuttney

4726	James Peverelle	4751	Jarrah Lynch	4776	Jayne Elrick
4727	Jamie Jones	4752	Jasmine Mcjames	4777	Jemma Hastings
4728	Jan Roach	4753	Jason McNamara	4778	Jemma Newcombe
4729	Jane Alder	4754	Jason Coles	4779	Jen de Longville
4730	Jane Rikard-Bell	4755	Jacqueline Kerr	4780	Jen Menz
4731	Jane Taylor	4756	Jason Reading	4781	Jennifer Bennett
4732	Jane Seymour	4757	Jayde Spears	4782	Jenny Brown
4733	Jane Smith	4758	Jay Sunderland	4783	Jennah Henry
4734	Amanda Harper	4759	Jaynee Bristow	4784	Jenn Clark
4735	Janelle Oldfield	4760	Jaynelle Lording	4785	Jennifer Candy
4736	Janelle Langley-Dunn	4761	Jenny Taylor	4786	Jennifer Bourke
4737	Jane Webster	4762	Jazmin Langenberg	4787	Jennifer Guilfoyle
4738	Rod Oaten	4763	Jasmine Kennedy	4788	Jennifer St. John
4739	Jane Tilley	4764	Jascinta De fazio	4789	Jenny Hutchinson
4740	Jan Harrison	4765	James Barry	4790	Jenny Lindley
4741	Janine Hutt	4766	Jasmyn Bendel	4791	Jenny Hatton-Mahon
4742	Janice Crockford	4767	Jess Bowles	4792	Jenny White
4743	Jan Ratcliff	4768	Jennifer Brockman	4793	Jenny Jagic
4744	Jan Turner	4769	John Bruynen	4794	Jenny Waters
4745	Marie Stoller	4770	Jenny Dewhurst	4795	Jennifer Orkisz
4746	J Taylor	4771	Jeanette Stapleton	4796	Jennifer Pearson
4747	Jaquelina Ferreira	4772	Jeanette Woods	4797	Jenny Tatchell
4748	Jarah Dennis	4773	Jeanine Zijerveld	4798	Jenny Tilleard
4749	Jaron Fisher	4774	Jean Leeson	4799	Jennifer Olsen
4750	Jarrah Simao	4775	Jeff Lyell	4800	Jeremy Fultheim

4801	Jerome Mcgaw	4826	Juneen Schulz	4851	Jodie Lloyd
4802	Jerrie Liberati	4827	Joanne Davis	4852	Jodie Armitage
4803	Jesper Levinsen	4828	Jake Fraser	4853	Jodie Winnell
4804	Jessica Garvin	4829	Margaret Knott	4854	Joe Boin
4805	Jess Kost	4830	James Brown	4855	Clare Thomspon
4806	Jess Goodman	4831	Lois Doeven	4856	Joel Ellis
4807	Jessica Seidel	4832	Jeff Lord	4857	Joel Kilgour
4808	Jess Hodson	4833	Jarrod Pittoni	4858	Joel Sharpe
4809	Jessie Tang	4834	Matthew Jagger	4859	Joel Benetti
4810	Janice Monroe	4835	James Legg	4860	Joel O'Brien
4811	David Jones	4836	Jan Bates	4861	Joseph Pascuzzi
4812	Julie Stevens	4837	Jo Shoppee	4862	Joey De Backer
4813	Jenny Mante	4838	Jo Wright	4863	John Harrington
4814	Steven Coverdale	4839	Jo Kidder	4864	John Malvestuto
4815	Jason D'Ortenzio	4840	Joanne Edwards	4865	John Reynolds
4816	Jamie Dyason	4841	Jo Loughran	4866	John de Figueiredo
4817	Jhanene Carmody	4842	Joan Nelson	4867	John Lippmann
4818	Jack Hibbins	4843	Jo Burns	4868	Margaret Bennett
4819	Joy Sayers	4844	Joanne Zions	4869	Michael Dalton
4820	Jill Redwood	4845	Joanne Bell	4870	Jo Ingram
4821	Jill Anderson	4846	Jock Pryse Jones	4871	Johanna Millward
4822	James Grantham	4847	Jo Cooke	4872	Jo-Anne Kelder
4823	Jinesh Wilmot	4848	Jodee Dewhurst	4873	Jo Kuropatoff
4824	Jordan Alves	4849	Jody Simmons	4874	Jocelyn Lawry
4825	Jenny Ellis	4850	Jodie Donnellan	4875	Linda Mainwaring

4876	Jolie Baird	4901	Julian Sharp	4926	Justine Puschner
4877	Jo Mcbride	4902	Jac Crowle	4927	Jutta Chatto
4878	Jon Christie	4903	Judith McCombe	4928	Wendy Bartlett
4879	Jon Poole	4904	Jude Barley	4929	Kirk Irvin
4880	Jonathan Keren-Black	4905	Judith North	4930	Kailani Johnson
4881	Jordan Byrne	4906	Judith Baldwin	4931	Kaisha Thomson
4882	Jordan Roberts	4907	Judith Scurfield	4932	Kaitie New
4883	Jordan Strom	4908	Judy Andrews	4933	Kaitlyn Waldie
4884	Jordan Van Tienen	4909	Judy O'Donnell	4934	Kaiya Skurnik
4885	Josie Edmonds	4910	Judith Martin	4935	Subramaniam Sivasubramaniam
4886	Josephine Rich	4911	Julia Benkert	4936	Karen Campbell
4887	Josh Hill	4912	Julia Collin	4937	Karen Phillips
4888	Josh Forster	4913	Julia Lewis	4938	Karen George
4889	Josie Howells	4914	Julia Lee	4939	Karen Lindsay
4890	Josie Muller	4915	Julian Woods	4940	Karen Moore
4891	Jo Tanner	4916	Julie Kolges	4941	Karl Fitzgerald
4892	Jo Walton	4917	Julie Hayes	4942	Karl Dunham
4893	Jo Williams	4918	Julie Angliss	4943	Katherine Masiulanis
4894	Joy Stapleton	4919	Julie DAlberto	4944	Kasia Wrzesinski
4895	Jenny Pilgrim	4920	Julie Webster	4945	Rhianna Wilson
4896	Robyn Crawley	4921	Julien Ashby	4946	Karina Smith
4897	Julie Ronaldson	4922	Julia Castillo	4947	Katarina Landerstedt
4898	Justin Rowe	4923	Julie Minichiello	4948	Kate Curtis
4899	Jack Strom	4924	June Govet	4949	Kathryn Southon
4900	James Stewart	4925	Justin Church	4950	Kate Mullan

4951	Kate Purcell	4976	Katrina Brooks	5001	Kerrie Scull
4952	Kate Hiney	4977	Katy Morrison	5002	Kate Farrell
4953	Kate Rennie	4978	Kay Toussaint	5003	Rebecca Newman
4954	Kate Edwick	4979	Kay Bull	5004	Carmen Bulmer
4955	Kate Murray	4980	Kaylah Gawne	5005	Kim Riddle
4956	Kathryn Langford	4981	Kayla Nagy	5006	Kim Blackmore
4957	Katrina Larsen	4982	Caitlin Keating	5007	Kimberly Stewart
4958	Kate Lynch	4983	Nikki Shelton	5008	Kim Wormald
4959	Katerina Van Dijk	4984	Amanda Keilar	5009	Kirra Lane
4960	Kate Tucker	4985	Kelly McMeeken	5010	Kirsty Idczak
4961	Kate Walsh	4986	KEL Gellie	5011	Kirsty Coulter
4962	Kath Green	4987	Karen Ellis	5012	Kirsty Kay
4963	Katherine Beare	4988	Kelly Franks	5013	Roslyn Browning
4964	Katherine Harris	4989	Kel Buckley	5014	Christopher James
4965	Kathie Ward	4990	Kelvin Fleming	5015	Kathryn Maxwell
4966	Kathryn Gor	4991	Kelvin Wicks	5016	Kieran Johnson
4967	Kathryn Mccallum	4992	Kerrie Mcleod	5017	Keith Adamson
4968	Kathy Anderson	4993	Kerry Thurrowgood	5018	Katie Dean
4969	Katie Stokes	4994	Kerry Lording	5019	Kobi Lachmund
4970	Katie Finnigan-Long	4995	Kerry Reid	5020	Tim Koerner
4971	Katrina Dean	4996	Kerry Rainer	5021	Keith Sutton
4972	Katie Alsop	4997	Kerry Spokes	5022	Krista Saunders
4973	Katina H8	4998	Kevin Gaynor	5023	Kristie Oates
4974	Katja Stone	4999	Kevin Wright	5024	Kim Sampson
4975	Katrina Stevens	5000	Kevin Devers	5025	Julie Thomas

5026	Kylie Luttrell	5051	Lauren Merrington	5076	Jennifer Kenna
5027	Kylie Blake	5052	Lauren Broad	5077	Leonore Carmichael
5028	Kylie warren	5053	Lauren Chiu	5078	Leon Pelling
5029	Kylie Durant	5054	Lauren Moolenaar	5079	Lesley McMillan
5030	Kym Bridgford	5055	Lauren Kovacevic	5080	Leslie Bowker
5031	Kim Taylor	5056	Mark Lawrence	5081	Lewis Bolitho
5032	Kylie Head	5057	Layla Vardo	5082	Erica Lewis
5033	Kym O'Shannassy	5058	Layla CW	5083	Liam Downie
5034	Kerrie Murray	5059	Lauren Bailey	5084	Liam Johnston
5035	Lynn Ashbolt	5060	Lance Collins	5085	Ligia Prado
5036	Louise Bloxham	5061	Liam Brosnahan	5086	Lilith Gelinas
5037	Lachlan McKeeman	5062	Luke Smith	5087	Lilli Dubs
5038	Lachlan Avery	5063	Leah Roach	5088	Lily O'Rourke
5039	Laila Nelson-Williams	5064	Leanne Webb	5089	Sascha Taylor
5040	Lana Wolstencroft	5065	Leanne Costello	5090	Linda Hamilton
5041	Lance Hamilton	5066	Leanne Jack	5091	Linda Rogan
5042	Stephanie Langman	5067	Leanne Corey	5092	Linda Wilson
5043	Lance Sheppard	5068	Leanne Clooney	5093	Linda Dillon
5044	Louise Arnaud	5069	Lee Cath	5094	Linda Marshall
5045	Lauchlan Cox	5070	Lee Boniface	5095	Linda George
5046	Laura Kola	5071	Leigh White	5096	Lisa Hall
5047	Laura Barsby	5072	Leigh Rogan	5097	Lisa Sherif
5048	Laura Dunlop	5073	Leilou Nache	5098	Tania Lee
5049	Lauren Hunt	5074	Alicia Martin	5099	Jasmine Mace
5050	Lauren Curson	5075	Ben Leith	5100	Liz Barraclough

5101	Liz Teague	5126	Louise Smith	5151	Lynne van Schilfgaarde
5102	Liz Conder	5127	Laurence Balmer	5152	Lin Craig
5103	Lauren Foster	5128	Lucette Brown	5153	Matilda Coppard
5104	Leonie Smith	5129	Lucille Warwick	5154	Michael Gaynor
5105	Lesley Jones	5130	Lucy Bracey	5155	Miriam Rotstein
5106	Chris Huggins	5131	Lucy Doran	5156	Riley Paul
5107	Heather Huggins	5132	Lucy Buxton	5157	Maaike Watson
5108	Lou Gerardi	5133	Lucy Moran	5158	Anne Bolitho
5109	Lachlan Cleeland	5134	Luke Andersen	5159	Maddison Sirianni
5110	Lochie Greig-Moore	5135	Luke Borkowski	5160	Madeline Cassano
5111	Lindsay Lockhart	5136	Luke Wilkinson	5161	Madeline Whitty
5112	Lois O'Connor	5137	Luke Dunstan	5162	Madi Wynne
5113	Anthony Longley	5138	Luke Huels	5163	Maeve Scannell
5114	Luke Xavier	5139	Lucy Filor	5164	Fernanda Guevara
5115	Loretta Leary	5140	Rob Dawson	5165	Mandy Fletcher
5116	Lorin Clarke	5141	Lorraine Wolstencroft	5166	Ross Robarts
5117	Lorna Hendry	5142	Laura Tan	5167	Maggie Gerrand
5118	Lorni Landrigan	5143	Lydia Syme	5168	Maggie Dawson
5119	Lorraine Elsass	5144	Lyn Wilks	5169	Mahalay Gore
5120	Louise Blosfelde-Hayes	5145	Lynley Stewart	5170	Mai Geisner
5121	Louise Angwin	5146	Lyndell Parker	5171	Jacob Plant
5122	Leo Harrison	5147	Lynette Mitchell	5172	Malcolm Robins
5123	Leah Harrison	5148	Lynette Oswald-Jacobs	5173	Marilyn Gibson
5124	Louis Durand	5149	Lyn Watson	5174	Diane Otto
5125	Louise Emblin	5150	Lynne Siejka	5175	Nikki Kelly

5176	Darren Smart	5201	Marita Egan	5226	Matthew Dodge
5177	Michael Halls	5202	Mark Howlett	5227	Matthew Tardif
5178	Amand King	5203	Mark Cramond	5228	Matt Beesley
5179	Mandy Collins	5204	Mark Landrigan	5229	Matt Grantham
5180	Manny Paterakis	5205	Mark Simnett	5230	Matthew wickert
5181	Mara Salievski	5206	Mark Smith	5231	Matthew Gardner
5182	Marigold Hayler	5207	Susanne Chalmers	5232	Matthew Hawthorne
5183	Marcell Marjee	5208	Georgie Markulia	5233	Matt Prouten
5184	Marcelle Kirby	5209	Mark Williams	5234	Maureen Bell
5185	Marcille Cameron	5210	Mark Quinn	5235	Maureen Cudmore
5186	Mark Roberts	5211	Marlow Perrott	5236	Maureen Webb
5187	Margaret Tamblyn	5212	Patricia Bell	5237	Mauro Geminian
5188	Margaret Brauer	5213	Ella Martin	5238	Max Gettler
5189	Margaret Brumley	5214	Martin Lockett	5239	Martyn Brogan
5190	Margerie Linton	5215	Martin Koval	5240	Marilyn Larkin
5191	Margaret Morrissey	5216	Caitlin Gregory	5241	Michael Mazzanti
5192	Margaret Young	5217	Mary Maher	5242	Mark Babbage
5193	Mariah Brown	5218	Mary Harnan	5243	Michael Blair
5194	Marianne Ellis	5219	Mary Albert	5244	Michelle Buckle
5195	Melissa Hughes	5220	Mary Hartwig	5245	Margaret Byron
5196	Marie Bliss	5221	Mary Wade	5246	Christine Barnett
5197	Marie Caruso	5222	Michele Speck	5247	Madeleine Callas
5198	Marion Gray	5223	Malcolm Stewart	5248	David McCallum
5199	Marion Harttig	5224	Mathilde Tjepkema	5249	Elizabeth McDonald
5200	Sauaga Pritchard	5225	Alison Ray	5250	Michael Turner

5251	Bruce McKelvie	5276	Jennifer Knop	5301	Michaela Young
5252	Margaret Counsel	5277	Merle Cornell	5302	Michelle Marshall
5253	David Wright	5278	Merran Wilde	5303	Mihail Galabov
5254	Monique Crundall	5279	Ian Sharpe	5304	Mikael Morgan
5255	Lachlan McSevich	5280	Helen Messer	5305	Michael Bailey
5256	Michael Hurwood	5281	Kim K	5306	Anja Dent
5257	Ian R	5282	M Woods	5307	Mike Beach
5258	John Myers	5283	Michele Finey	5308	Michael Greenfield
5259	Meegan Blackney	5284	Georgina Gower	5309	Jan Muller
5260	Meg Ryan	5285	Marlene Hargreaves	5310	Mikhayla Burstin
5261	Megan Ridgway	5286	Morgan Hopkins	5311	Jacques Miller
5262	Megan Peterson	5287	Mia Grunden	5312	Mimosa Henderson
5263	Megan Rogers	5288	Mia Trujillo	5313	Melinda Power
5264	Megan Grigarius	5289	Micah Mills	5314	Martine Spencer
5265	Meghann Lilley	5290	Michael Carpenter	5315	Caterina Misale
5266	Megan Wilson	5291	Michael Grose	5316	Melissa Abrahams
5267	M Symes	5292	Michael Beeston	5317	Fleur Bound
5268	Melanie Sakkeus	5293	Michael Johannesen	5318	Melissa Gallagher
5269	Mel Mcgeoch	5294	Michael Kenny	5319	Mitchell Rafferty
5270	Melinda Adams	5295	Michael Sanger	5320	Margaret Chilcott
5271	Malisa Taylor	5296	Michelle Leber	5321	Merril Bolton
5272	Melissa Weideman	5297	Michelle Vallinga	5322	Matthew Ferrari
5273	Melissa Wellham	5298	Michelle MacEwan	5323	Melissa Reaburn-Jenkin
5274	John Bailey	5299	Michelle Jones	5324	William Kirkey
5275	Regina Mendes-Joachim	5300	Mick Grogan	5325	Michael Lewin

5326	Mark Renouf	5351	Kyme Farley	5376	Nat Davies
5327	Mick Williams	5352	Diane Byrne	5377	Natalie Muir
5328	Maggie Allmand	5353	Alice Knowles	5378	Natalia Milosz
5329	Mairead OBrien	5354	Matt Smith	5379	Natalie Semmel
5330	Maureen Gudeika	5355	Rachael Dubois	5380	Nat Dittman
5331	Mollie Morgan	5356	Merran Williams	5381	Natasha Ballard
5332	Maureen Tarnok	5357	Janet Clark	5382	Natasha Williams
5333	Mary Wiseman	5358	Eddy Aarons	5383	Nathan Wright
5334	Kristie Molnar	5359	Sari Poletti	5384	Nathan Alfrey
5335	Monica Pease	5360	Murray Wannan	5385	Natalie Rentzis
5336	Monique Morey	5361	Martin Watts	5386	Natalie Smith
5337	Michaela Brown	5362	Nicm Hyde	5387	Nat Diconza
5338	Maria Sola	5363	Nadine Stirrip	5388	Fiona Stevens
5339	John Mooney	5364	Nadene Boyd	5389	Natalie Wisken
5340	Morag McKinnon	5365	Bronwyn Neubecker	5390	Namoi Gillard
5341	Jane Morrow	5366	Joan Lynn	5391	Natalie Wright
5342	Mostafa Kamal	5367	Nancy Lee-James	5392	Neil Harvey
5343	David Parsons	5368	Naomi Egan	5393	Nerida Lowndes
5344	Tracey MOGFORD	5369	Naomi Taylor	5394	Danielle Turner
5345	Michael Arnould	5370	Imogen Taylor	5395	Lynda Newton
5346	Maxine Gibson	5371	Naomi Nienaber	5396	Vivienne Newman
5347	Michael Trueman	5372	Naomi Taylor	5397	Hugh Nicoll
5348	Malcolm Hooper	5373	Narelle Lewis	5398	Nick Rose
5349	Mark Riddell	5374	Mark McCallum	5399	Nick Yates
5350	Matthew Ray	5375	Natalia Lamb	5400	Nicholas Handley

5401	Nick Allan	5426	Rosalie White	5451	Thomas Wright
5402	Nick Brodribb	5427	Natasha Perkins	5452	Robyn Vincent
5403	Nick Foley	5428	Nicholas Portelli	5453	Tim Whistlecroft
5404	Nicholas Temby	5429	Nicky Brodie	5454	C Batalha
5405	Nick Crawford	5430	Nathan Garrison	5455	Oscar Morrison
5406	Nicholas Volachec	5431	Neal Salan	5456	Ottalei Martin
5407	Nicola Amos	5432	Nicholas Bateman	5457	Philippa Taylor
5408	Nicola Gee	5433	Norm Tillack	5458	Issy Overhill
5409	Nicola Pavlich	5434	Jackie Mucha	5459	Olivia Hamilton
5410	Nicole O'Brien	5435	Nyree Davis	5460	Owen Sharkey
5411	Nicole FERRIS	5436	Olivia Hughes	5461	Pamela Gray
5412	Nicole Ferrinda	5437	Stephen Oâ€™ Brien	5462	Paul Carter
5413	Nicole Lord	5438	Dan O'Brien	5463	Paige Harkin
5414	Nikki Cranston	5439	Jessica O’Brien	5464	Pam Connell
5415	Nikki Noordennen	5440	Tim Mackay	5465	Pamela Sun
5416	Nikki White	5441	Wendy Fornaro	5466	peter moylan
5417	Nina H	5442	Oliver Mossop	5467	Sandra Parker
5418	Ninelle Salem	5443	Oliver Stone	5468	John Pitman
5419	Mohamed Nizar	5444	Oliver Mellmann	5469	Samuel Parsons
5420	Nadine Joy	5445	Liv Crowder	5470	Patricia Wilson
5421	Mark Minett	5446	Olivia Twining	5471	Patricia Miller
5422	Saraa Phoenix	5447	Olivia Baumann	5472	P Carden
5423	Noreen Nicholson	5448	Olivia MacKinnon	5473	Patrick Dalton
5424	Stella Northeast	5449	Olivia Vos	5474	Huibert Schroor
5425	Greg Savage	5450	Olly Wilson	5475	Patricia Crase

5476	Patricia Dempsey	5501	John Tato	5526	Phil Anderson
5477	Patsy Waters	5502	Pete Floyd	5527	Philip Johnson
5478	Paul Size	5503	Peter Temby	5528	Phillippa Adgemis
5479	Paul Hellard	5504	Peter Cleaver	5529	Philip Hinz
5480	Paul Moodie	5505	Peter Lynch	5530	Helen Morris
5481	Paula Clarke	5506	Peter McCaw	5531	Phoebe Roberts
5482	Paul Geddes	5507	Peter Thompson	5532	Phoebe Rouse
5483	Pauline Carroll	5508	Peter Birtles	5533	Pia Om
5484	Pav Sidhu	5509	Peter Epi	5534	Melinda Chan
5485	Patricia Scales	5510	Peterbio Logan	5535	Andrew Pickering
5486	Pauline Cleaver	5511	Peter Cassano	5536	Pete Malone
5487	Debra Biancon	5512	Peter Dewez	5537	Paul Harford
5488	Colin Pearce	5513	Peter Howe	5538	Paul Ransom
5489	Jules Hansford	5514	P Howe	5539	Peter Robb
5490	Philip Eyles	5515	Peter Smith	5540	Peter Murnane
5491	Peggy Willing	5516	Peter Kuestler	5541	Phill Young
5492	Jenifer Winterbine	5517	Peter Mollica	5542	A Polack
5493	Glen McClay	5518	Peter Nienaber	5543	Stewart Dwyer
5494	Penelope Peters	5519	Peter Wainwright	5544	Joe Howes
5495	Julie Bennett	5520	Petrana Nikolov	5545	Susan McLeod
5496	Sean Thomas	5521	Pete Fletcher	5546	Peter Spence
5497	Penni Somers	5522	Patricia Green	5547	Russell McNaught
5498	Penny Crossman	5523	Philippa Grounds	5548	Peter Treby
5499	Rachel Clarke	5524	Johnny Pham	5549	Andrew Lyngcoln
5500	Effie Solomos	5525	Philip Rowlands	5550	Andrew Collins

5551	Angela Anderson	5576	Richard Cooke	5601	Geoff Swanson
5552	Alex Quirk	5577	Verlie Walker	5602	Rhiannon Cross
5553	Ryan Barnaby	5578	Robyn Beesley	5603	Rhonda McIntosh
5554	Ruth Dimond	5579	Rosalind Burns	5604	Rhonda Shannon
5555	Rachel Scott	5580	Robbie Connell	5605	Roslyn Hunter
5556	Michael Bunney	5581	Rachel DeSumma	5606	Rhys Grunden
5557	Rachael McNamara	5582	Rebecca Moses	5607	Richard Harrison
5558	Rachael Wilmot	5583	Tebecca Foote	5608	Richard Smart
5559	Rachana Evans	5584	Rebecca Honner	5609	Tanja Richter
5560	Rachel Rowe	5585	Rebecca Sweeney	5610	Tiffany Riggs
5561	Rachel POTTER	5586	Rebecca Heath	5611	Rikki Morris
5562	Rachael Booth	5587	Robert Brown	5612	Rebecca Schischka
5563	Radha Russell	5588	Laura Jenkins	5613	Rosemary McDonald
5564	Raewyn Leithhead	5589	Joanne Fraser	5614	Ross Moresi
5565	Antonina Madafferi	5590	Ryan Egan	5615	Rob Cross
5566	Rae Bond	5591	Maree McCormack	5616	Robert Cooper
5567	Ralf Weber	5592	Kylie Rees	5617	Roberto D'Andrea
5568	Rebecca Gillies	5593	Reilly Gaynor	5618	Robert Stringer
5569	Ramon Blandford	5594	Robert Murray	5619	Rob Hosking
5570	Karen Lee	5595	Luke Buckley	5620	Robin Bowen
5571	Ranjith Soysa	5596	Renuka Potter	5621	Robin Tregenza
5572	Tara Kinniburgh	5597	Alistair Mills	5622	Robert Patterson
5573	Raphael Kilpatrick	5598	Faye Poll	5623	Robyn McLachlan
5574	Rohini Ratnakaf	5599	Kendall Chadwick	5624	Robyn Congreve
5575	Ravi Witt	5600	Robert Bell	5625	Robyn Colls

5626	Rodney Burns	5651	Ruth Adams	5676	Samantha Menzies
5627	Gill Lee	5652	R Wirtz	5677	Samantha Hafey-Bagg
5628	Rodney Boyle	5653	Robin Wilson	5678	Sam Jennens
5629	Rodney Waterman	5654	Ryan Coleman	5679	Sandra Cerrato
5630	Roger Summers	5655	Ryan Jacobsen	5680	Sandra Graham
5631	Marie Rogers	5656	Ryan Kearney	5681	Sandra Marks
5632	Rolene London	5657	Rebecca Yuen	5682	Sandra Morin
5633	Ruth Romei	5658	Sawsan Alfayadh	5683	Sandra Walsh
5634	Ryan Sanders	5659	Sean Bay	5684	Sandy Russo
5635	Rosemary McGinley	5660	Vishal S	5685	Sandra Webb
5636	Rose Ovenden	5661	Susan Rissinich-Samson	5686	Sandy Hale
5637	Rose Wintergreen	5662	Scott Barnes	5687	Sandy Matthews
5638	Rosie Brown	5663	Sage Butler	5688	Andrew Williams
5639	Roslyn Semler	5664	Shayn Ainsworth	5689	Sunny Kandula
5640	Ross McDonald	5665	Grant Clarke	5690	Sarah Fairweather
5641	David Rothstadt	5666	Sally Fisher	5691	Sarah Wiegard
5642	Rachael Sanderson	5667	Sally Wilson	5692	Sarah Pilgrim
5643	Richard Barlow	5668	Sally Jeffery	5693	Sarah Spencer
5644	Rachael Shaw	5669	Sally Genser	5694	Sarah Lang
5645	Ruby Mcbride	5670	Sally Di Martino	5695	Sarah McLennan
5646	Ronald Rumbelow	5671	Sally Rochlin	5696	Sarah Buckley
5647	Michael Russell	5672	Sam Chalmers	5697	Sarah Jackson
5648	Anne Hadley	5673	Sama Hugo	5698	Camilla Babington
5649	Russell Lovell	5674	Samantha Alexander	5699	Sarah Brown
5650	Ruth de Gille	5675	Sam Barnes	5700	Sarah Reid

5701	William Sargood	5726	Shakira Van Vugt	5751	Simon Meyer
5702	Steve Jones	5727	Shane Ellis	5752	Simone Kingston
5703	Saskia Ashby	5728	Shane Wright	5753	Simon Jones
5704	Amelia Hardy	5729	Shannon Hudspith	5754	Siobhan O'Brien
5705	Sandra Baguley	5730	Shannon Regan	5755	Susan Cairney
5706	Shirley Bare	5731	Holly Shannon	5756	Sue Moore
5707	Sue Anderson	5732	Sharon Linsel	5757	Steven Jones
5708	Scott Krasauskas	5733	Alanna Sharp	5758	Jill Winterburn
5709	Scott Lang	5734	Suzanne Barrell	5759	Steph Skerrett
5710	Scott Werner	5735	Shaun Price	5760	Skye Aldie
5711	Scott Brierley	5736	Sharon Summerhayes	5761	Megan Pritchard
5712	Scott Milligan	5737	Sheila Aylward	5762	Sue Jackel
5713	David Scotte	5738	Michelle Hines	5763	Shae Willson
5714	Scott Fullarton	5739	Shelley Stanek	5764	Matthew Smith
5715	Charles White	5740	Michelle McNamee	5765	Stu Baird
5716	Andrea Ellery	5741	Steven Greatorex	5766	Melissa Morris
5717	Sophia Connolly	5742	Sholem B	5767	Sally Missing
5718	Suzanne Lake	5743	Shona Peni	5768	Dylan Smith
5719	Sebastian Holding	5744	Guy Eastaugh	5769	Heidi Smith
5720	Rosemary Brooks	5745	Susan Bollard	5770	Sue Moores
5721	Natasha Colchester	5746	Siobhan Hudson	5771	Sue Brabender
5722	Matt Price	5747	Sienna McFarlane	5772	Sofie Hutchinson
5723	Sam Cox	5748	Sienna Nussbaum	5773	Sonia Briggs
5724	Serena Buckley	5749	Simon Murray	5774	Sonjx Searle
5725	Serena Ho	5750	Simon Gillham	5775	Sonja Morrison

5776	Sonya Crest	5801	Stan Simnett	5826	Frances Stow
5777	Sonya Starnes	5802	Geraldine Chapman	5827	Steve Stretton
5778	Sophie Cole	5803	Stede Clifford	5828	Jane Strickland
5779	Susan Wilson	5804	John Muscat	5829	Gayle Cowan
5780	Sophie Storm	5805	Stella Clifford	5830	Stuart Chipperfield
5781	Sophia Westphal	5806	Steph Thornborrow	5831	Jo Stubbs
5782	Sophia Petropoulos	5807	Stephanie O'Kane	5832	Gen Kay
5783	Sophie Camenzuli	5808	Steph Harcher	5833	Stuart Owen
5784	Sophie Fletcher	5809	Steph Bubnich	5834	Andrew Stump
5785	Sophie Griffiths	5810	Stephanie Muller-Leydig	5835	Sue Collins
5786	Sophie Doherty	5811	Stephanie Patchell	5836	Sue Adams
5787	Sophia Kelso	5812	Stephanie Spurr	5837	Suzanne Genziuk
5788	Sophia Kay	5813	Stephen Oakley	5838	Susan Cook
5789	Soul Kramkimel	5814	Stephen Shelley	5839	Sue Moorhen
5790	Ron Thomas	5815	Thomas Spender	5840	Sue Rintoul
5791	Spencer Newman	5816	Steve Morvell	5841	Sue Taylor
5792	Simone Gribble	5817	Steve Friedman	5842	Deni Sevenoaks
5793	Louise Jorritsma	5818	Steve Milton	5843	Debra Noseda
5794	Sean Creaser	5819	Steven bell	5844	Susan Borg
5795	Shane Smith	5820	Steve Yuen	5845	Susan and Andrew Farr
5796	Subramanian Sangameswaran	5821	Steve Young	5846	Susan Linley
5797	Susan Shore	5822	Stevie Thomas	5847	Susan Andrews
5798	Michael Hamilton	5823	Stephen Stewart	5848	Susan Morse
5799	Susan Sutherland	5824	Angus Stirling	5849	Susannah Kenny
5800	Stevo Dugec	5825	Bonnie Storm	5850	Susanne Cooper

5851	Susan Khoo	5876	Natasha Nero	5901	Beau Campbell
5852	Suzie Taylor-Watts	5877	Natasha Stapleton	5902	Sarah Amberton
5853	Suzanne James	5878	Natasha Armstrong	5903	Trudy Hellier
5854	Liz Clark	5879	Natasha Lucas	5904	Vanessa Hollo
5855	Sam Swift	5880	Taya Fairfoul	5905	Luke Thompson
5856	Tahlia Williams	5881	Tayla Duncan	5906	Gillian Rose
5857	Bronwyn Taylor	5882	Taylah Wynen	5907	Thomas Mail
5858	Tait Bonito	5883	Saul Taylor	5908	Tom Gurnett
5859	Talia Duell	5884	Terry Blanch	5909	Thomas Smith
5860	Talia Barrett	5885	Travis Brewster	5910	Thomas Hamilton-Gilligan
5861	Greg O'Callaghan	5886	Teagan Atkinson	5911	Sarah Thompson
5862	Tristan Clarke	5887	Teagan Bau	5912	Claire Thorn
5863	Tamara Faigh	5888	Elaine Tebbutt	5913	Thorsten Padeffke
5864	Tam Faiman	5889	Rachel Herbert	5914	Tilly Hopkins
5865	Tamsin Yorston	5890	Tegan Ryan	5915	Tim Gannon
5866	Tamara Wakeman	5891	John-Paul Teggart	5916	Tim Patkin
5867	Tania Barat	5892	Tempe Davis	5917	Tim Poyser
5868	Tania Ennor	5893	Teresa Ruddell	5918	Tim Mitchell
5869	Tania G	5894	Terry Watt	5919	Timothy Koren
5870	Tanyia Gillon	5895	Theresa Vanderwyk	5920	Tim Myles
5871	Tanys Boschma	5896	Tess Sanders	5921	Timothy Price
5872	Tara Rogers	5897	Theresa Elliott	5922	Paul McConville
5873	Tara Kate	5898	Trevor Hunt	5923	Tim Mintern
5874	Tara Byrne	5899	Shane Edmonds	5924	Rowyn Day
5875	Natasha Molent	5900	George Theodore	5925	Thomas McGrath

5926	Tom Golding	5951	Trish Peach	5976	Vanessa Field
5927	Thomas Midgley-Mather	5952	Trish Bourke	5977	Kirsten Van Haaster
5928	Therese Neal	5953	Patricia Brown	5978	Victoria Goddard
5929	Tobias Ahern	5954	Patricia Mccormack	5979	Vicki Hosking
5930	Toby Lea	5955	Troy Kenyon	5980	Vicki Walker
5931	Fiona Clifford	5956	Timothy Alner	5981	Vicky Stassos
5932	Antoine Van Cleemput	5957	Melissa Turnbull	5982	Victor Hoisington
5933	Dane Toleman	5958	Therese van Maanen	5983	Vince Cafici
5934	Tom Harkin	5959	John Jackson	5984	Viola Stahl
5935	Tom Glover	5960	Brendan Holman	5985	Violette Flint
5936	Tom Bell	5961	Tyger Baise	5986	Virginia Carey
5937	Tom Davis	5962	Janette Wilson	5987	Vivien Sharpe
5938	Tom Cordier	5963	Caroline Rowenal	5988	Vivian Harris
5939	Tom Rawlings	5964	Mark Ashby	5989	Vivian Murphy
5940	Thomas Reid	5965	Nat Wells	5990	Dawn Shirley
5941	Toby Eccles	5966	Vicki Mitchell	5991	Robert McKenzie
5942	Luciano Prisco	5967	Vanessa Church	5992	Jenni Wadsworth
5943	Tracey Stroker	5968	Robyn Valoppi	5993	Daniel Waffler
5944	Tracey Coad	5969	Vanessa Thomas	5994	Lou Dickson
5945	Michael Oxer	5970	Julie Van Vugt	5995	Darby Walker
5946	Trent Mead	5971	Graeme Hooper	5996	Wanda Napier
5947	Trevor Hunt	5972	Vayda Dainney	5997	Leslie Rosenblatt
5948	Jane Trikojus	5973	Garda Kroes	5998	Harry Wang
5949	Kat Steward	5974	Vera Schomers-MacAlpine	5999	Sam Waring
5950	Trish Miller	5975	Yvette Southgate	6000	Warren Finger

6001	Wendy Avery	6026	Wendy Wilson	6051	Zane Bannister
6002	Wayne Ashdown	6027	Diane Anderson	6052	Michelle Zintschenko
6003	Wayne Paterson	6028	Winnie Turner	6053	Patrik Klages
6004	Wendy Burkwood	6029	Will Abbott	6054	Zoe Anderson
6005	Wendy Duncan	6030	Graham Lovegrove	6055	Zoe Proctor
6006	Wendy Johnson	6031	Janet McNeill	6056	Zoe Paradise
6007	Wendy Sumpton	6032	William McIntosh	6057	Gail Lewis
6008	Wendy Morriss	6033	Paul Smith	6058	Zach Wellman
6009	Wendy Percy	6034	Hannah Womersley		
6010	Kim Morton	6035	Silas Woodrup		
6011	Vern and Lorna White	6036	James Norman		
6012	Kat Wihongi	6037	Cr Geoff Ellis		
6013	Debra Rollings	6038	Owen Thomas		
6014	Andrea Buckley	6039	Alexander Sanbrook		
6015	Barb Wilkinson	6040	Xanthe Rivett		
6016	Will Brownlee	6041	Yasemin Bekirofski		
6017	Will Eerhard	6042	Yasmine Mercuri		
6018	Will Andrews	6043	Chris Yates		
6019	Will Stevenson	6044	Yvonne Lynch		
6020	Wil Crawford	6045	Grace Cohen		
6021	Will Fisher	6046	Valerie Rickard		
6022	William Budds	6047	Zac Macciocca		
6023	William Webb	6048	Sally Vogel		
6024	Jo Williams	6049	Zach Hart		
6025	Will Butler	6050	Zarabelle Coles		

Appendix C Parties to the Hearing

Submitter	Represented by
Proponents - AGL and APA	Christopher Townshend QC, Barnaby Chessell and Alexandra Guild of Counsel instructed by Meg Lee of Hall and Wilcox and Sophie Osborn of Ashurst who called evidence from: - Richard Bolt of Nous Group on energy market policy - Owen Kelp and Jerome Fahrer of Acil Allen Consulting on energy market economics - Andrew Biacsi of Contour Town Planning on strategic planning - Ian Wallis and Scott Chidgey of CEE Pty Ltd on marine ecology - Captain Chris Noon of Port Operation Management Services Pty Ltd on maritime and port operations/safety - Mark Cook of AECOM on lighting - Hayden Burge of Jacobs on landscape and visual impact - Ben Sichlau of Point Advisory on greenhouse - Graeme Ross of CAMM on air quality - Roger Drew of Drew Toxicology on human health and ecotoxicology - Brett Lane of Nature Advisory on terrestrial ecology - Owen Boushel of Jacobs on social impacts - Tim Marks of Marshall Day Acoustics on noise - Charmaine Dunstan of Traffix Group on traffic - Chris McNeill of Ethos Urban on business impacts - Jonathon Medd of Golder Associates on groundwater - Mark Davidson of AECOM on contamination - Andrew McCowan of Water Technology on surface water - Kate Filippin of R4Risk on safety - Oona Nicolson of Ecology Heritage Partners on cultural heritage - Tim McBride-Burgess of Contour Consultants on planning (pipeline) Craig McPherson of Jasco Applied Sciences did not provide evidence but was called upon by the Proponents to assist Mr Marks with underwater noise.
Minister for Planning	Jack Krohn of DELWP

Minister for Energy, Environment and Climate Change	Don Hough of DELWP
Port of Hastings Development Authority	Peter O'Farrell of Counsel, instructed by Sarah Raso of Corrs Chambers Westgarth
Mornington Peninsula Shire Council and Bass Coast Shire Council	Rupert Watters of Counsel, instructed by Kate Morris and Allison Tansley of Harwood Andrews who called evidence from: - Ed Smith of Northmore Gordon on greenhouse gas emissions (for Mornington Peninsula Shire Council and Bass Coast Shire Council) - Chris Smitt of EHS Support on groundwater (for Mornington Peninsula Shire Council and Cardinia Shire Council) - Marcus Lincoln-Smith and Craig Blount of Cardno on marine ecology and water birds/shorebirds (for Mornington Peninsula Shire Council and Bass Coast Shire Council) - Stuart Moore of Earthcheck on tourism and economics (for Bass Coast Shire Council) - Hilary Marshall of Ratio on traffic and transport (for Mornington Peninsula Shire Council) - Jim Antonopoulos of SLR Consulting on noise and vibration (for Mornington Peninsula Shire Council) - Graeme Lorimer of Biosphere Pty Ltd on terrestrial ecology and Merran's Sun-orchid (for Mornington Peninsula Shire Council) - Jake Urlus of Tactecol Consulting on terrestrial ecology and Southern Brown Bandicoot (for Mornington Peninsula Shire Council)
Cardinia Shire Council	Maria Marshall of Maddocks Lawyers (Chris Smitt of EHS Support gave evidence in conjunction with Mornington Peninsula Shire Council)
City of Casey	Hayley Brunel
EPA Victoria	Edwina Smith of Counsel, instructed by Indra Soysa and Matt Carrazzo of the EPA
Bunurong Land Council Aboriginal Corporation (BLCAC)	Sean Sexton who called evidence from: - Bradley Wards of BLCAC on Archaeology - David Tutchener of BLCAC on Ethnocultural matters - Robert Ogden of BLCAC on 'Speaking for Country'
Westernport and Peninsula Protection Council Incorporated	Karri Giles, Sandy Milne and Gidja Walker who called evidence from: - Mary Cole in Phytophthera cinnamon, *Amphiboulus Chytrid* Fungus
Don Juniper	

G & K O'Connor Pty Ltd	Stuart Morris QC of Counsel, instructed by Ellie Mason of Arnold Bloch Leibler who called evidence from: - Peter Ramsey of Peter J Ramsey and Associates in engineering
Environment Victoria, Save Westernport Inc and Victorian National Parks Association	Jane Sharp, Sean McArdle, Robert Forrester and Suganya Pathan of Counsel who called evidence from: - Bruce Robertson of the Institute for Energy Economics and Financial Analysis on energy finance - Perran Cook of Monash University on environmental chemistry - Matt Edmunds of Australian Marine Ecology on marine ecology and ecological assessments - Tom Baldock of the University of Queensland on hydrodynamics - John Wardrop of Safety, Environment and Emergency Response (SEER) Associates on environmental science (oil spills) - Vanessa Wong of Monash University on soil science (acid sulfate soils) - Bonnie Rosen of Symplan Consulting on social impacts
Save Westernport Inc	Chris Atmore
Bill Genat	… who called evidence from: - Rhonda Small of La Trobe University on social research
Sue King	… who called evidence from: - Michelle Thomas of Animalia Wildlife Shelter and Rescue Frankston on Wildlife and disaster management training - Frank Hanson of TBC on urban design, landscape architecture and visual and shadow impacts - Maurice Beinat of Eco-Master Green Retrofit
French Island Community Association	Bronwyn Gwyther
Surfrider Foundation Mornington Peninsula Branch	Arthur O'Bryan
The Australian Industry Group	Tennant Reed
Victorian Sea Kayak Club	Bill Zombor
Mornington Peninsula & Western Port Biosphere Reserve Foundation Ltd	Greg Hunt
Somers Residents Association Incorporated	Millens Lawyers
Surfrider Foundation Australia	Damien Cole

Victorian Fishing Charter Association	Robert Harrison
Mornington Peninsula Koala Conservation Landcare Group	Dirk Jansen
Friends of the Glenfern Green Wedge Inc.	Johanna Selleck
ClimActs	Deborah Hart
Mornington Peninsula Vignerons Association Inc.	Geraldine McFaul
Southern Peninsula Indigenous Flora & Fauna Association Inc (SPIFFA)	Gidja Walker
Blue Wedges Inc.	Jennifer Warfe
Green Wedge Coalition	Rosalie Counsell
Doctors for the Environment Australia	Elizabeth Bashford
Crib Point Stony Point Foreshore Committee of Management Inc.	Cecelia Witton
Silverleaves Conservation Association Phillip Island Victoria Australia	M A Johnston
Sea Shepherd	Haans Siver
Mornington Environment Association Inc.	Margaret Howden
Flinders Community Association	Neil Hallam
Mornington Peninsula Climate Action Network	Rachel Coffey
Phillip Island Conservation Society Inc.	Jane Jobe and Jeff Nottle
Devilbend-Hastings Landcare Group	Keith Old
Extinction Rebellion - Western Port and Mornington Peninsula Local Group	John Lorkin
Isaacs Climate Action Network	Damien Williams
Evolution Rail Pty Ltd	Phillip Walker
Lighter Footprints	Michael Nolan
Balnarring Beach Community Association	Bruce Beddoe
Individuals	**Individuals**
Arthur O'Bryan	Simon Scott
Elizabeth Nolan	Hamish Kebbell
Sheree Krass	Lisa Hodgson
Philippa Ransome	Elizabeth Moore

Maarten Koster	Vicky Karitinos
Gaston Freddi	Amanda Nelson
Sacha Guggenheimer	Janenne Willis
Sarah Miller	Alan Webster
Mark Keehn	Celia Sexton
Eva Eden	Sasha King
Rachel Coffey	Melinda Gustus
Julia Symons	Bron Gwyther
Ann Lazzaro	Lynne Alexandra
Cameron James Matters	Joe Rogers
Elke Emerald	Lenny Stepjan- Willmore
Kerri McCafferty	Szczepan Grebosz
Phil Wright	Kristen Pearson
David Pope	John Cherry
Georgina Stubbs	Pippa Howes
Ann and Peter Robb	Michael Gielb
Tim Forcey	Rodney Knowles
Mary Daley	Eliza Hutchison
David Day	Dave Archer
David Strang	William Chandler
Peta Newbound	Jack Knobel
Kathryn Hannan	Bruce Missen
Candida van Rood	Peter Renkin
Eve Stocker	Hannah Lewis
Michele Sabto	Mark Mackie
Rebecca Hengemuhle	Melanie Attard
Clea Morgan	Anne Mennell
Laurel Heisman	Helen Lawrence
Bruna Amaral	Julia Merrington
Andrew Kelly	Lara Bickford
Sean Willmore	Cameron Olsen
Adam Hodgson	Laura Brearley
Ian Wilkinson	Georgia Siddall
Laresa Kosloff	Louise Taylor

Martin Lenard	Mary Jo Hanly
Tasma Walton – In confidence	Martin Stringer
Penelope Flint	Linda Bowden
Lawrence Reddaway	Richard Clarke
Caroline Naughton	Brett King
Stacey Chilcott	Elaine Hopper
Peter Kinchington	Andrew Parsons
Monica Rivera	Michelle Maes
Jim Crosthwaite	Philippa Harrison
Sara Elizabeth	Jan Parker
Christine Morris	Michael Upston
Nathan Wainwright	Ian Henry Coffey
Liezl Shnookal	Deborah Coffey
Angela Freeman	Victor Komarovsky
Dale Stohr	Lisa Whiston
Harrison Jones	Julia Stockigt
Marion van Rooden	Kevin Armstrong
Marty Nelson-Williams	Helen Pritchard
Peter Mulherin	Debra Mar
Yohanna Gardener	Beverley Armstrong
Rosemary Vernon	Genevieve Fitzgerald
Claire Weekley	Carly Dober
Alison Hoelzer	Jason Gardner
Deline Skinner	Mitzi Tuke
Silvia Di Domenicantonio	Ingrid Tadich
Louise Page	Alison Durant
Peter Allsop	John Lorkin
Lisa Hunter	Sally Vivian
Terence and Brigitte Nott	John Tilleard
Suzanne D'Ombrain-Allain	Thomas Hiney

Appendix D Document list

No.	Date	Description	Presented by
1	02/06/20	Terms of Reference	Minister for Planning
2	24/07/20	Letter to the Proponent, DELWP, Municipal Councils and EPA regarding submissions	Ms Mitchell, IAC Chair
3	29/07/20	Letter to the Proponent, DELWP, Municipal Councils and EPA regarding submissions regarding key dates	"
4	31/07/20	Letter of response regarding key hearing dates	The Proponents
5	07/08/20	Google Earth file and instructions – Pipeline footprint	The Proponents
6	10/08/20	Email to Clause 24 parties regarding site inspection locations	Ms Thomas, PPV
7	13/08/20	Letter to Clause 24 parties requesting outline of hearing time and evidence request	Ms Mitchell
8	14/08/20	Letter outlining hearing case	Pipeline Regulation Unit, DELWP
9	"	Letter of response regarding site inspection locations	Pipeline Regulation Unit, DELWP
10	17/08/20	Letter of response and maps regarding site inspection locations	EPA Victoria
11	"	Letter of response and maps regarding site inspection locations, 11b. Map of Site Inspections Attachment	Mornington Peninsula Shire Council
12	18/08/20	Letter of response and maps regarding site inspection locations	Cardinia Shire Council
13	19/08/20	Letter outlining hearing case	EPA Victoria
14	"	Letter outlining hearing case	Mornington Peninsula
15	"	Letter outlining hearing case	Environment Assessment Unit, DELWP
16	20/08/20	Letter outlining hearing case	The Proponents
17	25/08/20	Letter outlining hearing case	Cardinia
18	04/09/20	Hearing Notification Letter	Ms Mitchell
19	11/09/20	Summary of unaccompanied site inspection itineraries and map	"
20	07/09/20	Request for welcome to country and procedural matters	BLCAC

No.	Date	Description	Presented by
21	08/09/20	Confirmation of expert witness details	Cardinia
22	31/08/20	Technical Advice Noise and Vibration	Ms Hui
23	"	Technical Advice Pipelines	Ms Auld
24	"	Technical Advice Air Quality	Mr McIntosh
25	09/09/20	Suggested site inspection locations	Bass Coast
26	11/09/20	Email to Environment Victoria submitters advising of submissions, hearing details and privacy matters	Ms Thomas
27	"	Suggested site inspection locations	Mornington Peninsula
28	"	Suggested site inspection locations	Environment Victoria and Save Westernport
29	14/09/20	Email foreshadowing procedural matters at the Directions Hearing	PHDA
30	"	Confirmation of witness details	BLCAC
31	"	Confirmation of witness details	S3296
32	"	Confirmation of witness details	G&K O'Connor
33	"	Confirmation of witness details and procedural matters to be raised at the Directions Hearing	The Proponents
34	"	Letter outlining procedural matters to be raised at the Directions Hearing	Save Westernport
35	"	Letter outlining procedural matters regarding hearings	Environmental Justice Australia
36	"	Merits based submission to the Directions Hearing	S3291
37		Email outlining questions to be asked at the Directions Hearing	S106
38		Confirmation of witness details	S3272
39	"	Letter regarding procedural matters	"
40		Merits based submission to the Directions Hearing	S2932
41	"	Confirmation of witness details	Westernport and Peninsula Protection Council
42	"	Request to make confidential submission	S487
43	"	Confirmation of Experts and outline of Procedural Matters	Mornington Peninsula/Bass Coast
44	15/09/20	Merits based submission to the Directions Hearing	S3296
45	16/09/20	IAC Request for Information	Ms Mitchell

No.	Date	Description	Presented by
46	"	Request for Information	Mornington Peninsula
47	"	Further Request for Information	"
48	"	Email raising procedural matters	Cardinia
49	"	Updated expert witness list	The Proponents
50	18/09/20	Preliminary Directions	Ms Mitchell
51	"	Email and PPV response	S106
52	22/09/20	Letter responding to Directions Hearing matters	The Proponents
53	14/09/20	Merits-based submission to the Directions Hearing	S932
54	22/09/20	Confirmation of Expert Witness details	Environmental Justice Australia
55	22/09/20	Confirmation of Expert Witness details	Mornington Peninsula
56	23/09/20	Letter to the Proponents regarding Western Port Bryozoan Reefs reports	"
57	"	Confirmation of Expert Witness details	Cardinia
58	"	Directions and Timetable – Version 1	Ms Mitchell
59	"	Response to letter of Harwood Andrews regarding Western Port Bryozoan Reefs reports	The Proponents
60	"	Suggested Site Inspection Locations	French Island Community Association
61	24/09/20	Suggested Site Inspection Locations	S3296
62	"	Confirmation of Expert Witness Details	"
63	25/09/20	Suggested Site Inspection Locations	S3149
64	"	Suggested Site Inspection Locations	Environmental Justice Australia
65	"	Evidence filing letter	The Proponents
66	"	Evidence statement of Mr Bolt on energy policy	"
67	"	Evidence statement of Mr Fahrer on energy markets	"
68	"	Evidence statement of Mr Biacsi on Strategic Planning	"
69	"	Evidence statement of Captain Noon on Port and Maritime Operations and Safety	"
70	"	Evidence statement of Dr Wallis on Marine Ecology	"
71	"	Evidence statement of Mr Chidgey on Marine	"

No.	Date	Description	Presented by
		Ecology	
72	"	Evidence statement of Dr Ross on Air Quality	"
73	"	Evidence statement of Dr Drew on Human Health and Ecotoxicity	"
74	"	Evidence statement of Mr M Cook on Lighting	"
75	"	Evidence statement of Mr Sichlau on Greenhouse Gas	"
76	"	Evidence statement of Mr Lane on Terrestrial Ecology	"
77	"	Evidence statement of Mr Burge on Visual Impact	"
78	"	Evidence statement of Mr McNeill on Business Impacts	"
79	"	Evidence statement of Ms Dunstan on Traffic	"
80	"	Evidence statement of Ms Nicolson on Cultural Heritage	"
81	"	Evidence statement of Ms Filippin on Safety	"
82	"	Evidence statement of Mr Boushel on Social	"
83	"	Evidence statement of Mr Marks on Noise	"
84	"	Evidence statement of Mr Medd on Groundwater	"
85	"	Evidence statement of Mr Davidson on Contamination	"
86	"	Evidence statement of Mr McBride-Burgess on Planning (Pipeline)	"
87		Evidence statement of Mr Kelp on energy markets	
88	"	Letter filing - Response to Request for Further Information	"
89	"	Annexure A - Response to Request for Further Information	"
90	"	Technical Note 001 – Response to RFI 037 – 038 – Offset strategy	"
91	"	Technical Note 002 – Response to RFI 058 – Section 7.1 Greenhouse gas	"
92	"	Technical Note 003 – Response to RFI 076 – Section 9.1 Background noise levels	"
93	"	Technical Note 004 – Response to RFI 095 - 126 – 130 – Land use impacts	"
94	"	Technical Note 005 – Response to RFI 097 – Section 11 Transport	"
95	"	Technical Note 006 – Response to RFI 112 – 114 –	"

No.	Date	Description	Presented by
		Section 12.7 FSRU	
96	"	Safety Management Study provided to the IAC in confidence	"
97	28/09/20	Evidence statement of Dr McCowan on surface water	"
98	30/09/20	Evidence Statement of Dr Cole on Phytophthera Cinnamon Amphiboulous Chytrid fungus	S3149
99	02/09/20	Evidence Statement of Mr Hanson on Urban Design	S3272
100	"	Evidence Statement of Ms Thomas on Wildlife and Disaster Management Training	"
101	"	Evidence Statement of Mr Ward on Archaeology	BLCAC
102	"	Evidence Statement of Dr Tutchener on Ethnocultural Matters	"
103	"	Evidence Statement of Mr Ogden speaking for Country	"
104	"	Letter filing evidence statements	Environmental Justice Australia
105	"	Evidence Statement of Ms Rosen on Social Impacts	"
106	"	Evidence Statement of Mr Robertson on Energy Finance	"
107	"	Evidence Statement of Mr Wardrop on Environmental Science	"
108	"	Evidence Statement of Dr Edmunds on Marine Ecology	"
109	"	Evidence Statement of Professor P Cook on Environmental Chemistry	"
110	"	Evidence Statement of Professor Baldock on Hydrodynamics	"
111	"	Evidence Statement of Associate Professor Wong on Soil Science	"
112	"	Letter to IAC advising evidence will no longer be filed	Isaacs Climate Action Network
113	"	Evidence Statement of Professor Small on Social Research	S3296
114	"	Letter filing evidence statements	Mornington Peninsula/Bass Coast
115	"	Evidence Statement of Dr Lorimer on Terrestrial Ecology and Merran's Sun Orchid	"
116	"	Evidence Statement of Mr Smith on Greenhouse	"

No.	Date	Description	Presented by
		Gas	
117	"	Evidence Statement of Mr Smitt on Groundwater	Mornington Peninsula/Cardinia
118	"	Evidence Statement of Mr Moore on Tourism and Economics	Mornington Peninsula/Bass Coast
119	"	Evidence Statement of Mr Antonopoulos on Noise and Vibration	"
120	"	Evidence Statement of Ms Marshall on Traffic	"
121	05/10/20	Evidence Statement of Mr Beinat on Green Retrofit	S3272
122	06/10/20	Email correspondence to the IAC from Mr Carino	Peter Carino
123	07/10/20	Pipeline alignment video	The Proponents
124	"	Combined habitat loss area referenced in EES Technical Report B - Terrestrial Biodiversity Table 31	"
125	"	Terrestrial report referenced in EES Section 10 - Technical Report B – Southern Brown Bandicoot Targeted Survey Report	"
125a	"	Terrestrial report referenced in EES Section 10 - Technical Report B – Growling Grass Frog Targeted Survey Report	"
125b	"	Terrestrial report referenced in EES Section 10 - Technical Report B – Aquatic Survey Report	"
125c	"	Terrestrial report referenced in EES Section 10 - Technical Report B – Swamp Skink Targeted Survey Report	"
125d	"	Terrestrial report referenced in EES Section 10 - Technical Report B – Southern Toadlet Targeted Survey Report	"
125e	"	Terrestrial report referenced in EES Section 10 - Technical Report B - Dwarf Galaxias Targeted Survey Report	"
125f	"	Terrestrial report referenced in EES Section 10 - Technical Report B – Flora Survey Report (draft)	"
125g	"	Terrestrial report referenced in EES Section 10 - Technical Report B - Flora Survey Report – River Swamp Wallaby – grass (draft)	"
126	"	Desktop geotechnical and hydrology study referenced in EES - Section 10 - Technical Report B	"
127	"	Peer review of Terrestrial and freshwater biodiversity impact assessment referenced in EES - Section 10 - Technical Report B	"

No.	Date	Description	Presented by
128	"	Initial QRA – Gas Import Jetty Works referenced in EES - Section 10 - Technical Report B	"
129	"	Initial QRA – Pakenham End of Line Facility referenced in EES - Section 10 - Technical Report B	"
130	"	Pipeline alignment option BJ-11 (Warringine Park/Reid Parade)	
131	"	Pipeline alignment option BH-11 (Bloomfield Lane)	"
132	08/10/20	Letter in regard to the provision of pipeline mapping tool	"
133	"	Letter filing response to request for information TN 007 - 017	"
134	"	Annexure A	"
135	"	Technical Note 007 Response to RFI 021 - Section 2.5 Chlorine and temperature	"
136	"	Technical Note 008 - Response to RFI 133 - Section 14.1 Social and Business	"
137	"	Technical Note 009 - Response to RFI 052 - Section 5.1 condition of bore water	"
138	"	Technical Note 010 - Response to RFI 053 - Section 5.2 CPRF piles	"
139	"	Technical Note 011 - Response to RFI 138-139 - Section 15.3 Soil profile re-instatement	"
140	"	Technical Note 012 - Response to RFI 45-47- Section 4.1 Waterway pipeline crossing	"
141	"	Technical Note 013 - Response to Mornington Peninsula Shire Council RFI	"
142	"	Technical Note 014 - Response to RFI 092 - Section 10.4 Properties proximate to Crib Point Jetty	"
143	"	Technical Note 015 - Response to IAC RFI 007 - Section 2.3 Re-gasification when LNG tanker is present	"
144	"	Technical Note 016 - FSRU Safety International classification and regulation	"
145	"	Technical Note 017 - Response to RFI 123-124 - Section 13.3 Pipeline alignment	"
146	09/10/20	Timetable Version 2	Ms Mitchell
147	"	Further Directions	"
148	"	Expert Advice Noise and Vibration – EH02	"
149	"	Expert Advice Air Quality – CM02	"

No.	Date	Description	Presented by
150	"	Submission	EAU, DELWP
151	"	Submission	Pipeline Regulation Unit, DELWP
152	"	Response to like evidence of Professor Smalls	S3296
153	"	Opening submission	Cardinia
154	"	Opening submission	Save Westernport
155	"	Opening submissions	Environmental Justice Australia
156		Opening submission	EPA Victoria
157	"	Letter filing response to marine evidence	Mornington Peninsula/Bass Coast
158	"	Cardno review of marine evidence	"
159	"	Letter filing opening submission	"
160	"	Opening submissions	"
161	"	Letter filing response evidence, opening submission and day 1 controls	The Proponents
162	"	Part A Submission	"
163	"	Dr Wallis – Marine evidence in reply	"
164	"	Mr Chidgey - Evidence in reply and response to IAC RFI - Marine	"
165	"	Mr Marks – Acoustic evidence in reply	"
166	"	Mr Medd – Groundwater evidence in reply	"
167	"	Mr Fahrer - Evidence in reply to Bruce Robertson	"
168	"	Mr Davidson – Contamination evidence in reply	"
169	"	Mr Boushel – Social evidence in reply	"
170	"	Ms Nicolson - Aboriginal cultural heritage evidence in reply	"
171	"	Technical Note 018 - 170. Response to RFI 115-117, 119-120,131 - Section 12.8, 12.96 and 13.5	"
172	"	Incorporated Document – Day one version	"
173	"	Slide of useful terms (gas import jetty works)	"
174	"	Day one – Crib Point Jetty works EPR's	"
175	"	Response to key issues	"
176	"	Appendix to statement of Mr Biacsi	"
177	"	Appendix D to Pipeline CEMP (marked up with Day 1 amendments) MS Word	"

No.	Date	Description	Presented by
178	"	Appendix J to Pipeline CEMP (marked up with Day 1 amendments) MS Word	"
179	"	Appendix K to Pipeline CEMP (marked up with Day 1 amendments) MS Word	"
180	"	Reconciliation of Chapter 25 MMs with Pipeline CEMP MS Word	"
181	"	Letter to Harwood Andrews advising Proponent will not be relying on Fathom Pacific Reports	Proponents
182	11/10/20	Opening presentation slides - Hoegh LNG FSRU	"
183	"	Opening presentation slides - AGL	"
184	"	Opening presentation slides - APA	"
185	12/10/20	Opening submissions	BLCAC
186	"	Australian Energy Market Operator (AEMO) – Gas Statement of Opportunities (March 2020)	Environmental Justice Australia
187	"	AEMO – Victorian Gas Planning Report Update (March 2020)	"
188	13/10/20	Expert advice on pipeline matters – SA02	Ms Auld
189	"	Presentation of Mr Bolt	Proponents
190	"	Presentation of Mr Fahrer and Mr Kelp	"
191	"	Instructions to Mr Biacsi (Planning) - Direction 40	"
192	"	Instructions to Dr McCowan - Direction 40	"
193	"	Instructions to Mr Sichlau - Direction 40	"
194	"	Instructions to Mr Lane - Direction 40	"
195	"	Instructions to Mr McNeill - Direction 40	"
196	"	Instructions to Captain Noon - Direction 40	"
197	"	Instructions to Dr Ross - Direction 40	"
198	"	Instructions to Ms Nicolson - Direction 40	"
199	"	Instructions to Mr Boushel - Direction 40	"
200	"	Instructions to Mr Bolt - Direction 40	"
201	"	Instructions to Mr Chidgey - Direction 40	"
202	"	Instructions to Mr Burge - Direction 40	"
203	"	Instructions to Dr Wallis - Direction 40	"
204	"	Instructions to Ms Filippin - Direction 40	"
205	"	Instructions to Mr M Cook - Direction 40	"

No.	Date	Description	Presented by
206	"	Instructions to Mr Davidson - Direction 40	"
207	"	Instructions to Mr Marks - Direction 40	"
208	"	Instructions to Mr McBride-Burgess - Direction 40	"
209	09/10/20	Evidence in reply – Mr Sichlau on Greenhouse	Proponents
210	"	Evidence in reply – Mr Lane on Ecology	"
211	"	Evidence in reply – Ms Dunstan on Traffic	"
212	"	Evidence in reply- Mr McNeill on Business	"
213	13/10/20	Opening submissions with hyperlinks included	Mornington Peninsula/Bass Coast
214	"	Crib Point Township Structure Plan Refresh (Draft)	"
215	14/10/20	COAG - Measures to improve transparency in Gas Market	"
216	"	Cth Department of Industry - ADGSM RIS	"
217	"	Cth Department of Industry - Review of ADGSM	"
218	"	DELWP - Consultation Factsheet - Gas in VEU	"
219	"	DELWP - VEU Final RIS	"
220	"	DEWLP - VEU - Appendix 11 Energy Market Modelling	"
221	"	Independent Expert Panel - Final Report Interim Emissions Reduction Targets.	"
222	"	Northmore Gordon - Victorian Demand Side Management	"
223	"	Prime Minister - Gas-fired recovery Media Release	"
224	"	ACIL Allen Chemical Industry 2019	"
225	"	AEMO - 2017 Gas Statement of Opportunities	"
226	"	AEMO - 2020 Gas Statement of Opportunities	"
227	"	AEMO - 2020 Victorian Gas Planning Report	"
228	"	AEMO - Gas Demand Forecasting Methodology	"
229	"	AEMO – Strategy Policy Research 2019 Energy Efficiency Forecasts	"
230	"	Presentation by Mr Biacsi	Proponents
231	"	Submissions of Port of Hastings Development Authority	PHDA
232	02/10/20	Evidence Statement of Dr Lincoln-Smith and Dr	Mornington

No.	Date	Description	Presented by
		Blount on Marine Ecology and Shorebirds	Peninsula/Bass Coast
233	15/10/20	Questions of Mr Fahrer and Mr Kelp	S3272
234	"	Request for Further Information	Ms Mitchell
235	"	Port of Hastings Development Strategy 2018	PHDA
236	"	Questions of Mr Fahrer and Mr Kelp	S2912
237	16/10/20	Letter filing TN 019 - 027	Proponents
238	"	Annexure A of letter filing TN 019 – 027	"
239	"	TN 019 - Societal risk assessment	"
240	"	TN 020 - Response to IAC RFI 93-94 & 96 - Section 11.1 Use of rail line right of way	"
241	"	TN 021 - Response to IAC RFI 39-40 - Section 3.3 Threatened species	"
242	"	TN 022 - Responses to RFIs 048-051 - Section 4.2 Coastal inundation	"
243	"	TN 023 - Responses to IAC RFIs 140 -145 - Sections 16.1 - 16.4 Aboriginal cultural heritage	"
244	"	TN 024 - Response to RFIs 85 to 89 - Section 10.1 Landscaping and Section 10.2 Landscape Character	"
245	"	TN 025 - Response to RFIs 147 and 149 - Section 17.1 SCO and 17.2 Incorporated Document	"
246	"	TN 026 - Response to RFI 75, 77, 84 - Section 9.1 Background noise levels & 9.4 Mitigation Measures	"
247	"	TN 027 - Response to evidence of Dr Lorimer	"
248	19/10/20	Email filing material referenced in cross-examination	Mornington Peninsula/Bass Coast
249	"	Melbourne Industrial and Commercial Land Use Plan (MICLUP) Part B	"
250	"	Ministerial Direction 11 Strategic Assessment of Amendments	"
251	"	Mornington Peninsula Localised Planning Statement	"
252	"	Plan Melbourne 2017 Implementation Actions	"
253	"	Victorian Coastal Strategy 2014	"
254	"	Plan Melbourne 2017-2050 Strategy	"
255	"	46 Strategic Assessment Guidelines May 2017	"

No.	Date	Description	Presented by
256	"	Clause 12 02-3S MPPS	"
257	"	Clause 19 01-01S MPPS	"
258	"	Clause 19 01-002S MPPS	"
259	"	Map-12-gis284 11 Existing and Future Industrial Land Southern	"
260	"	Letter filing TN 028 - 032	Proponents
261	"	Annexure A of letter filing TN 028 to 032	"
262	"	TN 028 - Response to RFIs 1 and 3 - Section 2.1 Seawater use	"
263	"	TN 029 - Response to RFIs 8, 9, 12, 13, 14 and 15 - Section 2.4 Ramsar values	"
264	"	TN 030 - Response to RFIs 155, 156 & 157 - Sections 19.1 & 19.2	"
265	"	TN 031 - Response to RFI 164 - Section 20.2 Clarification of risk register	"
266	"	TN 032 - Response to RFI 104 - Section 12.1 Risk methodology - assessment of spills	"
267	"	Response to Ms King questions from Mr Fahrer and Mr Kelp	"
268	"	Marine Presentation (Wallis and Chidgey)	"
269	"	Proponent – Opening remarks – Marine Ecology (Dr Wallis and Mr Chidgey)	"
270	"	TN 033 – Response to IAC further RFI (document 234) FSRU operation	"
271	16/10/20	Timetable V3	Ms Mitchell
272	19/10/20	TN 034 - Response to RFI 002 - Section 2.1 Seawater use	Proponents
273	"	TN 035 - Response to RFIs 16, 17, 18 and 19 - Section 2.5 Chlorine and temperature discharge conditions	"
274	"	TN 036 - Response to RFIs 161 162 and 163 - Section 20.1 Consequence Criteria	"
275	20/10/20	Letter filing Terrestrial Ecology evidence on terrestrial ecology	Mornington Peninsula/Bass Coast
276	"	Evidence Statement of Mr Urlus on Terrestrial Ecology	"

No.	Date	Description	Presented by
277	"	Suggested underwater site inspection locations	S3272
278	"	Revised Method for Deriving Australian and New Zealand Water Quality Guideline Values for Toxicants (Oct 2018)	Environmental Justice Australia
279	"	ANZECC Guidelines: Australian and New Zealand Guidelines for Fresh and Marine Water Quality	"
280	"	Email correspondence from Professor P Cook	Environmental Justice Australia
281	"	Letter in response to Direction 6	DELWP Pipeline Regulation Unit
282	"	Summary of submissions	"
283	"	Letter from the Minister	Minister for Planning
284	"	Amended Terms of Reference	"
285	21/10/20	Science of the Total Environment Journal – Chlorination by-product concentration levels in seawater, Boudjellaba et al	EPA Victoria
286	"	Email filing witness presentations and opening remarks	Proponents
287	"	Witness presentation for Mr M Cook	"
288	"	Witness presentation for Captain Noon	"
289	"	Opening remarks for lighting	"
290	"	Technical Note 37 responding to RFIs 90 and 91	"
291	"	Questions from various submitters	S3272, S3162 and S3363
292	"	Environmental Health and Safety Guidelines Liquified Natural Gas Facilities – April 2017	S3363
293	"	Questions for Captain Noon	S2915
294	22/10/20	Email tabling documents 294- 296	Proponents
295	"	Technical Note 40 responding to RFIs 59-63	"
296	"	Witness presentation for Mr Sichlau	"
297	"	Opening remarks for Greenhouse gas	"
298	"	Email proposing new EPR re lighting standards	"
299	"	Opening remarks Visual Impact	"
300	"	Witness presentation for Mr Burge	"
301	"	Draft questions for supplementary response from	"

No.	Date	Description	Presented by
		Dr Wallis and Mr Chidgey	
302	"	Letter addressing questions from the IAC	EPA Victoria
303	"	RFI Response table	Proponents
304	"	Technical Note 38 response to Mr Smitt	"
305	"	Technical Note 39 Compliance with Incorporated Document	"
306	"	Technical Note 41 Response to RFI'S 29, 25 & 36	"
307	26/10/20	Submitter guide to asking questions of witnesses	Ms Mitchell
308	"	Questions for Mr Burge	S3272
309	"	Questions for Mr Burge	S2937
310	"	Questions for Mr Burge	S3296
311	"	Questions for supplementary response from Dr Wallis and Mr Chidgey	Ms Mitchell
312	"	Opening remarks for Air Quality	Proponents
313	"	Witness presentation for Dr Ross	"
314	"	Witness presentation for Dr Drew	"
315	"	Victorian GHG Emissions Report (2019)	Environmental Justice Australia
316	"	Independent Expert Panel's Interim Emissions Reduction Targets for Victoria (2021-2030)	"
317	"	Email forwarding Technical Note 43 and providing advice on underwater noise evidence	Proponents
318	"	Technical Note 043, in response to the IAC RFIs about underwater noise modelling	"
319	"	Questions for Mr Burge	S2912
320	"	Questions for Mr Burge	S3363
321	"	Questions for Mr Sichlau	S3272
322	"	Technical Note 42 addressing RFIs 64-74	Proponents
323	"	Questions for Mr Sichlau	S2912
324	"	Technical Note 44 – Response to RFI 28, 30, 31, 32 & 33 – Section 3.1 Native Vegetation Removal	Proponents
325	27/10/20	Email filing documents 326 - 328	"
326	"	Opening Remarks Terrestrial and freshwater ecology	"

No.	Date	Description	Presented by
327	"	Technical Note 045 – Response to RFI 098 – 101 – Section 11.1 - 11	"
328	"	Technical Note 046 – Response to RFI 41 and 43 – Section 3.3	"
329	"	Questions for Dr Drew	S2912
330	"	Evidence in reply of Mr Lane to Mr Urlus	Proponents
331	"	Witness presentation of Mr Lane	"
332	"	Email relating to asking questions of witnesses	S3363
333	"	Questions for Dr Drew	"
334	28/10/20	Email regarding independence of GHD	S3272
335	"	Questions for Mr Lane	Casey
336	"	Questions for Mr Lane	S3149
337	"	Questions for Mr Lane	S2915
338	"	Opening remarks on noise	Proponents
339	"	Witness presentation of Mr Marks	"
340	"	Opening remarks on social impact	"
341	"	Witness presentation of Mr Boushel	"
342	"	Email providing link to underwater tow footage and attached details of underwater tow camera	"
343	"	Questions for Mr Lane	S3363
344	"	Underwater tow footage and photos	Proponents
345	"	Mark-up of the Acoustic EPRs	"
346	29/10/20	Memo from Mr Lane responding to questions on notice	"
347	"	Questions for Mr Marks	S3272
348	"	Questions for Mr Marks	S3241
349	"	Questions for Mr Boushel	S3296
350	"	Response to questions taken on notice	PHDA
351	"	Questions for Mr Boushel	S2912
352	"	Questions for Mr Boushel	S3363
353	"	Questions for Mr Marks	S2912
354	"	Technical Note 47 - Response to the IACs expert advice SA02	Proponents

No.	Date	Description	Presented by
355	"	Technical Note 048 – Response to RFI 110 and recommendation from Ms Fillipin	"
356	30/10/20	Opening remarks Traffic	Proponents
357	"	Presentation of Ms Dunstan	"
358	"	Pipeline CEMP - Bookmarked Day 1 version	"
359	"	Opening remarks Business	"
360	"	Presentation of Mr McNeill	"
361	"	Timetable – version 4	Ms Mitchell
362	4/11/20	Email tabling Technical Notes 49 to 52	Proponents
363	"	Annexure A – Updated table of responses to RFIs	"
364	"	Technical Note 049 – Response to RFI 109 - Section 12.4: Risk criteria	"
365	"	Confidential Technical Note 050 – Response to RFI 105 and 111: Safety Studies	"
366	"	Technical Note 051 – Response to RFI 102-103 - Section 12.1: Risk methodology	"
367	"	Technical Note 052 – Response to RFI 106-108 – Section 12.3: Cumulative impacts	"
368	"	Letter relating to Confidential Technical Note 50	"
369	"	Submitter questions for Mr Marks	S2785 and S3363
370	"	Email regarding Week 4 appearance	Environmental Justice Australia
371	"	Submitter questions for Ms Dunstan	S2912, S3363 and S2785
372	"	Opening remarks Groundwater, Surface Water and Contamination	Proponents
373	"	Presentation of Dr McCowan	"
374	"	Presentation of Mr Medd	"
375	"	Presentation of Mr Davidson	"
376	"	Opening remarks – Gas Safety	"
377	"	Presentation of Ms Filippin	"
378	"	Questions for Mr McNeill	S3363
379	"	Timetable - Version 5	Ms Mitchell
380	5/11/20	Email regarding Confidential Technical Note 50	EPA Victoria

No.	Date	Description	Presented by
381	"		
382	"	Opening Remarks on Cultural Heritage	"
383	"	Map A - existing pipelines and utility connections to and from Crib Point	PHDA
384	"	Map B - existing pipelines and utility connections to and from Crib Point	"
385	"	Questions for Mr Medd	S3363
386	"	Presentation of Mr McBride-Burgess	Proponents
387	"	Evidence statement of Mr Ramsey	G&K O'Connor
388	"	Site Selection and Design for LNG Ports and Jetties with views on risk limitation during port navigation and cargo operations: Information Paper No. 14	Save Westernport
389	6/11/20	APA 'Day 2' Version Appendix D to Pipeline CEMP	Proponents
390	"	APA 'Day 2' Version Appendix J to Pipeline CEMP	"
391	"	APA 'Day 2' Version Appendix K to Pipeline CEMP	"
392	"	Presentation of Mr Smith on greenhouse gas emissions	Mornington Peninsula/Bass Coast
393	"	Email responding to IAC request for information about approvals required	EAU, DELWP
394	"	Environmental Performance Requirements version 2 (corrected version 9/11/2020)	Proponents
395	"	Response of Dr Wallis and Mr Chidgey - chlorine impact assessment	"
396	7/11/20	Email with questions on EPR's and EMM's	S3272
397	8/11/20	Letter to the IAC regarding comments made on 5/11/20	"
398	9/11/20	Instructions from Harwood Andrews to Mr Smith	Mornington Peninsula/Bass Coast
399	"	Guidance note on presenting at the Hearing	Ms Mitchell
400	"	Presentation of Mr Smitt on Groundwater	Mornington Peninsula/Cardinia
401	"	Further Instructions to Mr Smitt	"
402	"	Further instructions to Mr Smitt regarding new documents for review	"
403	"	Presentation of Dr Lincoln Smith and Dr Blount	"

No.	Date	Description	Presented by
404	"	Supplementary remarks on CHMP requirements	Proponents
405	"	Instructions to Dr Smith and Dr Blount	Mornington Peninsula/Bass Coast
406	"	Email regarding questions for Mr Boushel	FICA
407	10/11/20	Instructions to Mr Moore	Mornington Peninsula/Bass Coast
408	"	Email regarding site inspection to French Island	S3272
409	"	Presentation of Mr Moore	Mornington Peninsula/Bass Coast
410	"	Presentation referred to when questioning Mr Marks	S3272
411	11/11/20	Withdrawn	S3272
412	"	Questions for Mr Moore	S2912
413	"	Presentation of Ms Marshall	Mornington Peninsula/Bass Coast
414	"	Instructions of Harwood Andrews to Ms Marshall	"
415	"	Presentation of Mr Antonopoulos	"
416	"	Instruction of Harwood Andrews to Mr Antonopoulos	"
417	"	Letter to the Proponent regarding risk issues associated with the pipeline	G&K O'Connor
418	12/11/20	Further Directions to Dr Blount and Dr Lincoln-Smith	Ms Mitchell
419	"	Day 2 EPR's with proposed changes from Mr Antonopoulos	Mornington Peninsula/Bass Coast
420	"	Timetable Version 6	Ms Mitchell
421	"	Response to letter circulated by G & J O'Connor	The Proponents
422	13/11/20	Presentation of Dr Lorimer	Mornington Peninsula/Bass Coast
423	"	Presentation of Mr Urlus	"
424	"	Consolidated instructions from Harwood Andrews to Mr Urlus	"
425	16/11/20	Supplementary evidence statement of Mr Sichlau	Proponents
426	"	Submission	Mornington Peninsula/Bass Coast

No.	Date	Description	Presented by
427	17/11/20	Dr Lorimer's marked-up recommended changes to Day 2 version of Appendix J of the CEMP	"
428	"	Dr Lorimer's marked-up recommended changes to Attachment IX to the Pipeline licence application	"
429	"	Presentation	Casey
430	"	Letter to the IAC concerning notice requiring further information from AGL re the WAA	EPA Victoria
431	"	Proposed Environment Protection Act section 22 notice to supply further information	"
432	"	Copy of Gloucester Resources v Minister for Planning (2019) 234 LGERA 257. Footnote 1	Mornington Peninsula/Bass Coast
433	"	Submission	Casey
434	"	Marked up corrections to Document 424	Mornington Peninsula/Bass Coast
435	"	Further Direction re Version 3 EPRs and CEMP	Ms Mitchell
436	"	Evidence summary of Mr Ward	BLCAC
437	"	Evidence summary of Dr Tutchener	"
438	"	Submission	EPA Victoria
439	"	Submissions in response to IAC Document 418	Mornington Peninsula
440	"	Letter to Harwood Andrews re recommended changes to CEMP Appendix J from Mr Urlus	Mornington Peninsula/Bass Coast
441	"	CEMP Appendix J (Document 390) with marked-up suggested changes from Mr Urlus	"
442	"	Presentation notes	Cardinia
443	"	Response from Dr Blount to IAC Document 418	Mornington Peninsula
444	"	Response from Dr Lincoln-Smith to IAC Document 418	"
445	"	Presentation	S2385
446	"	Presentation of Ms Milne	Westernport and Peninsula Protection Council
447	"	Speaking Notes of Ms Milne	"
448	"	Presentation of Dr Cole	"

No.	Date	Description	Presented by
449		Speaking Notes of Dr Cole	"
450	"	Presentation of Ms Walker	"
451	"	Speaking Notes of Ms Walker	"
452	"	Presentation of Ms Giles	"
453	"	Summary of Submission	"
454	"	Answers to questions of clarification sought by IAC	Casey
455	19/11/20	Presentation	G&K O'Connor
456	"	Letter to G&K O'Connor 7 August 2019 from APA	"
457	"	Email with questions for Dr Cole	S3363
458	"	Submissions in relation to the Port of Hastings	Mornington Peninsula
459	"	Marked up version 2 Appendix J to Pipeline CEMP from Mr Antonopoulos	"
460	20/11/20	Revised EPR ME01A	The Proponents
461	"	Presentation of Mr Robertson	Environmental Justice Australia
462	"	Presentation of Professor P Cook	"
463	"	Letter in response to the Proponent	G&K O'Connor
464	23/11/20	Email regarding advocate attendance for the remainder of the hearing	Mornington Peninsula/Bass Coast
465	"	Instructions to Mr Robertson	CEG
466	"	Instructions to Professor P Cook	"
467	"	Curriculum Vitae of Professor P Cook	"
468	24/11/20	Instructions to Dr Edmunds	"
469	"	Presentation of Dr Edmunds	"
470	"	Curriculum Vitae of Mr Robertson	"
471	"	Instructions to Mr Wardrop	"
472	"	Presentation of Mr Wardrop	"
473	"	Instructions to Professor Baldock	"
474	"	Presentation of Professor Baldock	"
475	25/11/20	Further instructions to Ms Rosen	"
476	"	Presentation of Ms Rosen	"
477	"	Further instructions to Associate Professor Wong	"

No.	Date	Description	Presented by
478	"	Presentation of Associate Professor Wong	"
479	26/11/20	Environment Victoria guide on how to write a submission opposing AGL gas import terminal	The Proponents
480	"	Save Western Port brochure opposing AGL gas import terminal	"
481	"	Environment Victoria Survey to submission tool and webpage link	"
482		Environment Victoria 'Stop AGL's dirty gas plan for our Bay' webpage	"
483	27/11/20	Submissions	CEG
484	30/11/20	Presentation slides	Save Westernport
485	"	Submission	"
486	"	Supplementary Expert Report of Dr Cole	WPPC
487	1/12/20	Without prejudice suggested changes to EPRs	S2912
488	"	Suggested changes to EPRs	S3272
489	"	Without prejudice comments on Day 2 EPRs	CEG
490	"	Without prejudice comments on Day 2 CEMP	"
491	"	Comments on Day 2 EPRs from Dr Edmunds	"
492	"	Proposed changes to Day 2 EPRs	Mornington Peninsula
493	"	Proposed changes to Day 2 CEMP	Mornington Peninsula/Bass Coast
494	"	Supplementary statement following site visits - Mr Biacsi	The Proponents
495	"	Supplementary statement following site visits - Dr Ross	"
496	"	Supplementary statement following site visits - Mr McNeill	"
497	"	Supplementary statement following site visits - Mr McBride-Burgess	"
498	"	Response to IAC questions regarding pollution and waste arising from moorings and ships at the Port of Hastings	EPA Victoria
499	"	Comments on Day 2 CEMP (D390)	"
500	"	Comments on Day 2 EPRs (D394)	"

No.	Date	Description	Presented by
501		Email filing suggested changes to D390, D394	"
502	2/12/20	Accompanied site inspection itinerary	Ms Mitchell
503	"	Map book and information to accompany site inspection	The Proponents
504	"	Westernport Bay Environmental Study 1973-1974 – M. A Shapiro	Save Westernport
505	"	Presentation	French Island Community Association
506	"	Presentation of Professor Small	S3296
507	"	Submission	"
508	"	Instructions to Professor Small	"
509	"	Presentation of Ms Thomas	S3272
510	"	Instructions to Ms Thomas	"
511	"	Correspondence with APA	"
512	"	Written witness statement of Ms Thomas	"
513	"	Written statement of Mr Beinat	"
514	"	Presentation of Mr Beinat	"
515	"	Written statement of Mr Hanson	"
516	"	Presentation of Mr Hanson	"
517	3/12/20	Declaration of Professor Small	S3296
518	"	Declaration of Mr Beinat	S3272
519	"	Declaration of Mr Hanson	"
520	"	Clarification on paragraph [18] of the Expert Witness Statement of Professor Baldock	CEG
521	"	Further details on entrainment methodology Professor Baldock	"
522	"	Submission on Port Kembla	S3272
523	"	Presentation slides	"
524	"	Version 7 Timetable	Ms Mitchell
525	"	Additional slides to Ms Thomas presentation	S3272
526	4/12/20	Marked up day 3 version of the CEMP	The Proponents
527	"	Day 3 version of CEMP Attachment J	"

No.	Date	Description	Presented by
528	"	Day 3 version of CEMP Attachment K	"
529	"	Day 3 version of CEMP Attachment G	"
530	"	Response of Mr Lane to presentation of Mr Smitt relating to GDE	"
531	"	Marked up day 3 version of EPR's	"
532	"	Email filing documents 533 & 534	Save Westernport
533	"	Summary of ship collisions	"
534	"	Marine Safety Report on Collision between 'KINNA' & 'CHALLENGER'	"
535	"	Technical Note 53 – Operation of the FSRU	The Proponents
536	08/12/20	Letter to the IAC regarding submitters contacting EPA representatives	EPA Victoria
537	09/12/20	Supplementary evidence statement of Mr Burge	The Proponents
538	"	Supplementary evidence statement of Mr M Cook	"
539	"	Further Directions regarding EPRs and CEMP	Ms Mitchell
540	14/12/20	Response from Dr Wallis to Professor Baldock on entrainment	The Proponents
541	"	Response from Dr Wallis to Professor Baldock on connection	"
542	"	Comments from Dr Genat on EPRs	S3296
543	"	Recommended changes to EPRs	Phillip Island Conservation Society
544	"	Comments on EPRs, CEMP and Incorporated Document	Cardinia
545	"	Comments on EPRs	S3272
546	"	Email regarding Day 36 proceedings	S2768
547	"	Email to the EPA	S3272
548	"	Email regarding past application to discharge wastewater in Westernport Bay	EPA Victoria
549	"	Comments on EPR's	CEG
550	"	Comments on EPR's	S2947
551	"	Suggested changes to the Day 3 Version Controls	The Proponents
552	"	Letter to the IAC regarding correspondence with	G&K O'Connor

No.	Date	Description	Presented by
		the Proponents	
553	"	Approved Master Plan dated 1 October 2019	"
554	15/12/20	Email filing proposed controls	CEG
555	"	New proposed controls	"
556	"	Closing submissions	EPA Victoria
557	"	Closing submissions	CEG
558	"	Email regarding whale risk issues	Phillip Island Conservation Society
559	"	Closing submissions	BLCAC
560	"	Procedure Statement for the Translocation of Threatened Native Fauna in Victoria – April 2019	S2947
561	"	Amended Timetable - Day 37	Ms Mitchell
562	"	Closing Submissions	PHDA
563	"	Comments on the EPR's	S3296
564	"	Closing Submissions	Mornington Peninsula/Bass Coast
565	"	Final report – EH03 – Noise technical advice to IAC	Ms Hui
566	16/12/20	Final report – SA03 - Pipeline technical advice to IAC	Ms Auld
567	14/12/20	Supplementary statement of Mr Lane on Offset Calculations	The Proponents
568	16/12/20	Email attaching documents 569 and 570 and link to a third document referred to in closing submissions	Mornington Peninsula/Bass Coast
569	"	Statements of Planning Policy No 1 & 2 - Western Port (as gazetted 1970)	"
570	"	Statement of Planning Policy No 1 - Western Port (as varied 1976)	"
571	"	Liquefied Natural Gas Safety Research Report to US Congress May 2012 (referred to in submissions)	Save Westernport
572	"	Breach and Safety Analysis of Spills Over Water from Large LNG Carriers, Sandia 2008	"
573	"	Report on the Effects of Fire on LNG Carrier Containment Systems, SIGTTO 2009	"
574	"	Crib Point Jetty Upgrade - Coastal Management Act	PHDA

No.	Date	Description	Presented by
		Consent	
575	"	Crib Point Jetty Upgrade – Condition 2 Consent	"
576	"	Crib Point Bitumen Storage Facility Call in VCAT Ref P2758/2007 Advisory Committee Report	Ms Mitchell
577	"	Crib Point Bitumen Storage Facility Call in Media Release	"
578	"	Crib Point Bitumen Storage Facility Call in Ministers Assessment July 2009	"
579	"	Email regarding CEMP Attachment G reference to swamp skinks	S2947
580	"	Letter clarifying closing submission comments regarding notifying submitters of WAA outcome	EPA Victoria
581	"	Day 4 Version of the CEMP - Clean	The Proponents
582	"	Day 4 Version of Attachment J to the CEMP – Mark up from Day 3 Version	"
583	"	Day 4 Version of Attachment J to the CEMP – Clean	"
584	"	Day 4 Version of CEMP – Consultation Plan Extract	"
585	"	Day 4 Version of the EPRs - Clean	"
586	"	Day 4 Version of the EPR's - Tracked	"
587	"	Day 4 Version of the Incorporated Document – Clean	"
588	"	Day 4 Version of the Incorporated Document - Tracked	"
589	"	Closing Submissions	The Proponents
590	16/12/20	Email and article on AGL receiving penalty re coal-ash spill in Bayswater Creek	S3272
591	17/12/20	Flora and Fauna Management Plan – Port Kembla	"
592	"	Electro chlorination in the Chamber	"
593	"	Infigen submission to AEMO on innovation prediction and forecasting	"
594	"	Effects on moonlight on the vertical migration of demersal plankton	"
595	"	Imso plankton news	"
596	"	Near surface enrichment of zooplankton	"
597	"	Submission addendum and attachment	S3363

No.	Date	Description	Presented by
598	"	Submission	"
599	"	Email discussing further amendments to E5 to the CEMP	EPA Victoria

POST HEARING

No.	Date	Description	Presented by
600	21/12/20	Letter outlining errors in clean Day 4 Version of the EPR's (document 585) and filing corrected version	The Proponents
601	"	Updated 'tracked' Day 4 Version of the EPR's (D585)	"
602	"	Updated 'clean' Day 4 Version of the EPR's (D585)	"
603	21/01/21	Letter from the Chair including: - Att 1 DELWP email attaching MPSC letter - Att 2 Letter from MPSC to DELWP - Att 3 IAC Chair request for legal opinion - Att 4 Advice of Counsel Assisting	Ms Mitchell
604	21/01/21	Response to IAC correspondence	BLCAC
605	28/01/21	Response to IAC correspondence	The Proponents
606	29/01/21	Response to IAC correspondence	Save Westernport

Document List – Concurrent sessions

Zoom Room 1

No.	Date	Description	Presented by
R1 - 1	07/12/20	Photo at Woolley's Beach	Victorian Sea Kayak Club (S995)
R1 – 2	"	Google Earth Image	"
R1 – 3	"	Extracts from Appendix B to EES Attachment VI	"
R1 – 4	"	Extracts from Attachment VII to EES – Works Approval Application	"
R1 – 5	"	Amended Port Zone and SCO9 to MPSC Planning Scheme at Crib Point Jetty	"
R1 – 6	"	Presentation	Southern Peninsula Indigenous Flora & Fauna Association (S1694)
R1 – 7	"	Presentation notes	"
R1 – 8	"	Presentation	Western Port Biosphere Foundation (S2768)
R1 – 9	"	Presentation	Australian Industry Group (S365)
R1–10	"	Presentation	Mornington Peninsula Koala Conservation Landcare Group (S1479)
R1–11	"	Presentation	Mornington Peninsula Vignerons Association Inc. (S1479)
R1-12	"	Submission notes	Victorian Fishing Charter Association (S3069)
R1- 13	"	Additional notes	Victorian Sea Kayak Club (S995)
R1-14	"	Challenges and benefits for the transition to renewable energy in Australia	S2071
R1-15	"	Decarbonization of Australia's energy system	"

No.	Date	Description	Presented by
R1-16	"	Solar industrial process heating systems in operation	"
R1-17	"	Co-benefits of large-scale renewables in remote Australia	"
R1-18	"	Trials and tribulations of market responses to climate change	"
R1-19	"	Submission	S907
R1-20	"	Presentation	S3291
R1-21	"	Submission	S1000
R1-22	"	Submission	Blue Wedges (S1711)
R1-23	08/12/20	Submission	S2041
R1-24	"	Presentation	S23
R1-25	"	Additional notes	S3025
R1-26	"	Presentation	S3105
R1-27	"	Presentation	S134
R1-28	"	Submission	S2947
R1-29	"	Submission	S2776
R1-30	"	Curriculum Vitae	"
R1-31	"	Comments on Victorian Budget 2021	"
R1-32	"	Solar Renewal Payback	"
R1-33	"	Presentation	S3213
R1-34	"	Submission	"
R1-35	9/12/20	Presentation	S2947
R1-36	"	Photos	S104 and S105
R1-37	"	Summary of verbs used in EES	S351
R1-38	"	Dolphin video	S314
R1-39	"	Submission	"
R1-40	"	Submission	S1852
R1-41	"	Submission	S2406
R1-42	"	Presentation	S2912
R1-43	"	Submission	"
R1-44	"	Video of noise Crib Point Jetty	"

No.	Date	Description	Presented by
R1-45	"	1966 BP Westernport brochure	
R1-46	"	Submission	s818
R1-47	"	Video link	s2872
R1-48	"	Topographical map of the Mornington district	s2776
R1-49	"	Submission	s2936
R1-50	"	Map of Hastings circa 1978	s2912
R1-51	10/12/20	Presentation	s1842
R1-52	14/12/20	Information Sheet on Ramsar Wetlands	s185
R1-53	"	Light Pollution Journal Article	"
R1-54	"	Submission	s177
R1-55	"	Presentation	s2045
R1-56	"	Image of Dolphins	s783
R1-57	"	Submission	s185
R1-58	"	Presentation	s177
R1-59	"	Submission	s938
R1-60	"	Presentation	s2289
R1-61	7/12/20	Presentation with additional comments	s1000
R1-62	"	Presentation	s2468
R1-63	"	Submission	s2311
R1-64	9/12/20	1999 Western port Information Sheet on Ramsar Wetlands	s2912
R1-65	"	Meeting obligations to protect Ramsar Wetlands	"
R1-66	14/12/20	Presentation	s2468
R1-67	11/12/20	Submission	s938 ClimActs
R1-68	16/12/20	EPBC Act Referral - 2020/8838 - Viva Energy Gas Terminal Project	s3162
R1-69	"	EPBC Act Referral - 2020/8298 – AGL Gas Import Jetty Project	"
R1-70	"	EPBC Act Referral 2020/8297 – APA Crib Point Pakenham Pipeline	"

Document List – Concurrent sessions

Zoom Room 2

No.	Date	Description	Presented by
R2-1	7/12/20	Presentation	Phillip Island Conservation Society (s2915)
R2-2	"	Submission	"
R2-3	"	Aerial photograph of Crib Point	Crib Point and Stony Point Foreshore Committee of Management (s2156)
R2-4	"	Submission	"
R2-5	"	Submission	Green Wedges Coalition (s2034)
R2-6	"	Email with links to references of management measures of vessel strikes with Right Whales	Phillip Island Conservation Society (s2915)
R2-7	"	Presentation	s2699
R2-8	"	'Circle' by Jeannie Baker	s2859
R2-9	"	Presentation	s2621
R2-10	8/12/20	Submission	s2798
R2-11	"	Presentation	s41
R2-12	"	Video log	s106
R2-13	"	Submission	s1475
R2-14	"	Woolley's Road Bushland Reserve Long Term Master Plan 2013	s3189
R2-15	"	Various news articles	"
R2-16	"	LNG Properties and Hazards – G.A Melhem, Ph.D et al	"
R2-17	"	Hazards within LNG Floating Facilities Topside Design – Symposium series No 161	"
R2-18	"	Submission	"
R2-19	"	Submission and whale photos	s3454
R2-20	"	Submission	s3162
R2-21	"	Submission	s979

No.	Date	Description	Presented by
R2-22	"	Presentation	s2367
R2-23	"	Submission	s501
R2-24	"	Submission	s3311
R2-25	"	Presentation	"
R2-26	9/12/20	Submission - photographs	s256
R2-27	"	Submission	s979
R2-28	"	Video	s581
R2-29	"	Various Photos	s809
R2-30	"	Presentation	s2893
R2-31	"	Various Articles	s2788
R2-32	"	Photo	"
R2-33	"	Presentation	s3197
R2-34	"	Submission	s256
R2-35	"	Submission	s971
R2-36	"	Submission	s3067
R2-37	"	Email and Premier release	s1108
R2-38	10/12/20	Submission	s2065
R2-39	"	Figure referred to in submission	"
R2-40	"	Submission	s3623
R2-41	"	Images	"
R2-42	"	Presentation	s2861
R2-43	"	Australian Marine Conservation Society Booklet	s2788
R2-44	"	Presentation	s3100
R2-45	14/12/20	Submission	s3227
R2-46	"	Submission	s994
R2-47	"	Submission	s3165
R2-48	"	Submission	s2425

Appendix E Legislative and policy context

Legislative approval framework

This section outlines the key elements of the legislative approval context and should be read in conjunction with the relevant elements of the EES, including EES Chapter 5.

***Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)**

The *Environment Protection and Biodiversity Conservation Act* is the Commonwealth government's principal environmental protection and biodiversity conservation legislation. It provides the legal framework for the conservation of biodiversity and the protection of the environment, particularly the Matters of National Environmental Significance (MNES), Ramsar wetlands, listed nationally threatened species and listed native migratory species.

The Project was referred to the Commonwealth under the Act as two separate projects were subsequently deemed to be controlled actions and therefore required assessment and approval. Following the EES process and the assessment by the Victorian Minister for Planning, the Commonwealth Minister for the Environment (or delegate) will decide whether the action is approved, approved with conditions or refused under the Act.

***National Greenhouse and Energy Reporting Act 2007* (Commonwealth)**

The first object of the Act is to provide a single national reporting framework for the reporting and dissemination of information related to greenhouse gas emissions, greenhouse gas projects, energy consumption and energy production of corporations to:

- inform government policy formulation and the Australian public
- meet Australia's international reporting obligations
- assist Commonwealth, State and Territory government programs and activities
- avoid the duplication of similar reporting requirements in the States and Territories.

The second object of the Act is to ensure that net covered emissions of greenhouse gases from operation of a designated large facility do not exceed the baseline applicable to the facility.

***Climate Change Act 2017* (Victoria)**

The *Climate Change Act* establishes a long-term emissions reduction target of net zero by 2050 and requires five yearly interim targets to keep Victoria on track to meet this overarching target. It includes policy objectives and guiding principles that embed climate change in government decision making. The Act requires the government to develop a Climate Change Strategy every five years, which sets out how Victoria will meet its targets and adapt to the impacts of climate change (from 2020).

The Act sits alongside other key Victorian government energy and climate change initiatives including Victoria's Climate Change Framework, Victoria's Climate Change Adaptation Plan 2017-2020 and Victoria's Renewable Energy Action Plan.

***Environment Protection Act 1970* (Victoria)**

The *Environment Protection Act* provides the legal framework to protect Victorian air, land and water from pollution. The Act, and any regulations and orders made under the Act, is administered by the EPA, including State Environment Protection Policies (SEPPs).

The FSRU requires a works approval to be granted by the EPA under the Act because it is a scheduled premises under the Environment Protection (Scheduled Premises and Exemptions) Regulations 2017. The EPA cannot decide whether or not to approve the works approval application until the Minister for Planning has assessed the environmental effects of the Project and issued his assessment report.

The *Environment Protection Act* has been replaced by the *Environment Protection Act 2017* as amended by the *Environment Protection (Amendment) Act 2018*. The EPA provided an overview of this change and the implications for the Project in its initial written submission.

State Environment Protection Policies

The *Environment Protection Act* provides for State Environment Protection Policies (SEPPs). The two SEPPS of particular relevance to the Project are:

- SEPP (Waters)
- SEPP (Air Quality Management)
- SEPP (Ambient Air Quality)
- SEPP (Prevention and Management of Contamination of Land).

SEPP (Waters) applies, among other things, to the discharge of wastes into the receiving environment and includes the following clauses relating to surface waters of high conservation value, which includes Western Port Bay:

Clause 22(3)

> The Authority must not approve an application for a new wastewater discharge to surface waters in the following areas unless the Authority is satisfied that the wastewater discharge will be consistent with the requirements of clause 25 –
>
> (a) aquatic reserves;
>
> (b) waters of high conservation value as set out in Schedule 5;
>
> (c) wetlands or estuaries segments.

Clause 25 states:

> The Authority may approve an application to discharge wastewater to surface waters to provide water for the environment or other uses, if –
>
> (a) the Authority is satisfied that the wastewater can be treated and managed to a level to protect beneficial uses, and
>
> (b) the waterway manager (if applicable) is satisfied that the discharge is consistent with environmental flow requirements.

***Planning and Environment Act 1987* (Victoria)**

The *Planning and Environment Act* provides the framework for land use planning and development in Victoria, including the preparation of planning schemes and planning scheme amendments.

The *Pipelines Act* 2005 exempts pipelines from approval under the *Planning and Environment Act* where a pipeline licence is issued (including the proposed pipeline from

Crib Point to Pakenham), but requires the works to be considered in the context of the Act and relevant planning scheme provisions. The relevant planning schemes are the Mornington Peninsula, Cardinia and Casey Planning Schemes.

The *Pipelines Act* does not apply to land within a port, so the components of the Project that are within the Port of Hastings (the GIJW and FSRU) require approval under the *Planning and Environment Act* and the Mornington Peninsula Planning Scheme. To facilitate this, the Project proposes a planning scheme amendment that would, among other things, apply the Specific Controls Overlay to the Crib Point Jetty, surrounding berth area and CPRF, and introduce the Crib Point Gas Import Jetty Works Incorporated Document.

***Pipelines Act 2005* (Victoria)**

The *Pipelines Act* is the primary legislation governing the construction and operation of pipelines in Victoria and is administered by DELWP and Energy Safe Victoria. The Act requires licensed pipelines to be constructed and operated in accordance with Australian Standard 2885: Pipelines—Gas and liquid petroleum.

The construction and operation of the pipeline element of the Project will require a Pipeline Licence under the Act. The Act requires that a licensee prepare a Safety Management Plan and Construction Environmental Management Plan to be approved by Energy Safe Victoria and the relevant Minister before operations commence.

The Act removes the requirement for approval under the *Planning and Environment Act*, although regard must be had for planning matters in the areas traversed by the pipeline.

As previously noted, the Act does not apply to pipelines within a port.

***Gas Safety Act 1997* (Victoria)**

The main purpose of the *Gas Safety Act* is to make provision for the safe conveyance, sale, supply, measurement, control and use of gas and to generally regulate gas safety. It requires, among other things, that the gas company must submit a safety case to Energy Safe Victoria for each of its facilities. In the case of this Project, the Act requires a safety case for the gas transmission infrastructure for the GIJW (excluding the FSRU) and the gas pipeline.

***Occupational Health and Safety Act 2004* (Victoria)**

The *Occupational Health and Safety Act* is the primary workplace health and safety law in Victoria and is supported the Occupational Health and Safety Regulations 2017. In concert they provide for the regulation of Major Hazard Facilities (MHFs).

The FSRU is not currently classified as an MHF for the purposes of the Act, although the Proponents indicated that the safety case for the Project would be consistent with the MHF requirements of the Act.

***Aboriginal Heritage Act 2006* (Victoria)**

The *Aboriginal Heritage Act* provides for the protection of Aboriginal cultural heritage in Victoria.

Section 49 of the Act requires that a CHMP be prepared for an area where an EES is required and that it be prepared before any works commence. Part 4 of the Act describes the processes associated with the preparation and approval of CHMPs.

Three CHMPs are proposed for the Project, two for the pipeline works (CHMP 15383 and 15384) and one for the GIJW (CHMP 16300).

***Flora and Fauna Guarantee Act 1988* (Victoria)**

The *Flora and Fauna Guarantee Act* provides for the conservation of Victoria's native flora and fauna, including processes for the conservation, management or control of flora and fauna and the management of potentially threatening processes.

The Act lists threatened flora and fauna threatened species and communities and requires a permit for their removal on public land. A range of listed species are present in the Project area and within the pipeline alignment and their removal from public land will require approval under the Act.

The IAC understands that the Act has been reviewed and the *Flora and Fauna Guarantee Amendment Act 2019* came into effect on 1 June 2020. The new Act seeks to modernise and strengthen the framework for protecting Victoria's biodiversity. The new Act introduces principles to guide consideration of the rights and interests of Traditional Owners and the impacts of climate change, improve the consideration of biodiversity across government and improve the process of listing threatened species.

***Marine and Coastal Act 2018* (Victoria)**

The *Marine and Coastal Act* provides for the protection of Victoria's marine and coastal environment and requires consent for any use or development of coastal Crown land within 200 metres inland of the high-water mark.

The elements of the Project that require consent include the mooring of the FSRU, CPRF and Jetty pipeline. Consent has been granted to PHDA to upgrade Berth 2 to accommodate the FSRU. Consent will be required for construction of the CPRF and sections of the pipeline within 200 metres of the high tide mark.

***Wildlife Act 1975* (Victoria)**

The *Wildlife Act* establishes procedures to promote the protection and conservation of wildlife, prevention of species from becoming extinct, sustainable use of and access to wildlife and to prohibit and regulate the conduct of persons engaged in activities concerning or related to wildlife such as duck hunting or caring for sick or injured wildlife.

The *Wildlife Act* works in conjunction with the *Flora and Fauna Guarantee Act* to protect threatened species. It contains extensive provisions not directly related to threatened species, such as protection of whales and seals, the management of wildlife and nature reserves and the regulation of the keeping and trading of wildlife. The *Flora and Fauna Guarantee Act* lists all threatened species (flora, fauna and fish) and the *Wildlife Act* provides regulatory protection to threatened wildlife.

***Water Act 1989* (Victoria)**

The *Water Act* provides the legal framework for the integrated management of Victoria's water resources. The main purpose of the Act is to promote the efficient and equitable use of water resources and ensure water resources are conserved and appropriately managed for sustainable use. The Act provides a formal means of protecting and enhancing waterway flow, water quality and catchment conditions.

High-level policy framework

This section outlines the key high-level elements of the policy framework that are relevant to the Project. It should be read in conjunction with the relevant elements of the EES, including EES Chapter 5.

Planning Policy Framework

The State elements of the Planning Policy Framework are included in all Victorian planning schemes, including those within the Project area. The key state policies relevant to the Project include the following themes:

- settlement, including green wedges, coastal settlement, distinctive areas and landscapes
- environment and landscape values, including protection of biodiversity, native vegetation management, protection of coastal areas, coastal Crown land and bays
- environmental risks and amenity, including bushfire planning, noise, air quality, amenity and safety, land use compatibility and major hazard facilities
- natural resource management, including protection of agricultural land, sustainable agricultural land use, agricultural productivity and water quality
- built environment and heritage, including heritage conservation and Aboriginal cultural heritage
- economic development, including business, industry and tourism
- transport, including land use and transport planning, freight links and planning for ports and port environs
- infrastructure, including energy supply and pipeline infrastructure.

These State policies are supported by regional and local policies in the Mornington Peninsula, Bass, Casey and Cardinia Planning Schemes.

Plan Melbourne 2017-2050

Plan Melbourne is the overarching planning strategy for metropolitan Melbourne, including the broader Mornington Peninsula and all of the Project area. It is a policy document in the Planning Policy Framework.

Plan Melbourne:

- identifies the Port of Hastings as a '*state significant transport gateway*' (seaport) and the northern area of the Port (around the Long Island Point and BlueScope wharves) as a '*state significant industrial precinct*'
- identifies Hastings as a '*major activity centre*'

- includes policies for protecting the environmental and biodiversity values of Western Port Bay, Ramsar sites and the UNESCO Mornington Peninsula and Western Port Biosphere Reserve
- includes policies for protecting distinctive areas and landscapes, including the Mornington Peninsula
- includes policies for protecting agricultural land including '*key agricultural areas*' such as the Mornington Peninsula and Cardinia
- includes policies for promoting tourism
- supports the productive use of land and resources in Melbourne's non-urban areas, including green wedge and peri-urban areas.

Victorian Freight Plan – Delivering the Goods 2018

The Victorian Freight Plan (VFP) sets out short, medium and long-term priorities to support Victoria's freight and logistics system.

The VFP notes the Port of Hastings is one of four commercial ports (in addition to Melbourne, Geelong and Portland) and is on the Principal Freight Network (rail).

The VPF discusses options for Melbourne's second container port, once the Port of Melbourne is at capacity, and promotes the Bay West option in Port Phillip Bay in preference to the Port of Hastings. It notes the Port of Hastings has various limitations and constraints compared to Bay West, noting '*Plan for Bay West as Victoria's second container port whilst retaining the Port of Hastings as an option in reserve*'.[301]

2018 Port Development Strategy, Port of Hastings Development Authority

The Port Development Strategy (PDS) was prepared in accordance with Section 91K of the *Port Management Act 1995* that requires relevant port authorities to prepare a PDS every 5 years. A PDS must address matters specified in the Act and any associated guidelines, including:

- projections of commercial trade
- current and projected land use, infrastructure and transport requirements.

The PDS replaces the Port of Hastings Port Land Use and Transport Strategy 2009 and describes the overarching role and function of the Port, including the Long Island Precinct, Crib Point and Stony Point. It notes the Port's ongoing role in movement of oil and gas, and steel products from BlueScope Steel. It foreshadowed the Crib Point gas import project and noted that although Bay West has been identified as the preferred location for Victoria's second container port, Hastings is retained as an option in reserve.

The PDS outlines various growth scenarios in terms of goods, types of shipping and ship tonnage, and describes various port infrastructure works necessary to accommodate future growth, including rehabilitation works on Crib Point Berth 2.

Victorian Coastal Strategy 2014

The Victorian Coastal Strategy was prepared under the *Coastal Management Act 1995* to set the long-term vision and framework for planning and managing the Victorian coast,

[301] Victorian Freight Plan – Delivering the Goods, page 47

guided by a Hierarchy of Principles, policies and actions. It is supported by a 2017 Implementation Plan.

The Marine and Coastal Policy 2020

The Marine and Coastal Policy came into operation in March 2020 and supersedes the 'policy for decision making' parts of the Victorian Coastal Strategy. It applies to all private and public land and waters between the outer limit of Victorian coastal water and five kilometres inland of the high-water mark of the sea.

The Marine and Coastal Policy guides decision makers in planning, management and sustainable use of Victoria's coastal and marine environment. It provides direction to decision makers including local councils and land managers on a range of issues such as dealing with the impacts of climate change, population growth and ageing coastal structures.

The Victorian Biodiversity Plan – Protecting Victoria's Environment – Biodiversity 2037

The Victorian Biodiversity Plan – *Protecting Victoria's Environment – Biodiversity 2037* is Victoria's biodiversity strategy required under section 17 of the *Flora and Fauna Guarantee Act*. It seeks to stop the decline of biodiversity and to achieve an overall improvement of biodiversity over the next 20 years. This includes stopping the overall decline of threatened species and improving the overall extent and condition of native habitats across the land, waterways, coasts and seas.

Victorian Waterway Management Strategy 2013

The *Victorian Waterway Management Strategy – Improving Our Waterways* provides a detailed policy for managing Victoria's waterways. It aims to maintain and improve the condition of wetlands, rivers and estuaries so they can continue to provide environmental, social, cultural and economic value for all Victorians and address waterway management obligations expressed under the *Water Act* and the *Catchment and Land Protection Act 1994.*

Western Port Ramsar site

Western Port was designated as a wetland of international significance under the international Ramsar Convention in 1982. It is one of 12 Ramsar sites in Victoria.

The site's values were defined in the Western Port Ramsar Wetland Ecological Character Description 2010[302] that:

- described the site's essential elements, critical ecosystem components, processes, benefits and services
- set limits of acceptable change for critical ecosystem components and processes, where practical, to establish a benchmark from which change could be detected
- described threats to the ecological character of the site

[302] Western Port Ramsar Wetland Ecological Character Description Ramsar Wetland, Commonwealth Department of Sustainability, Environment, Water, Population and Communities, 2010

- described the current status and any evident change to critical components and processes within the site
- described knowledge gaps and monitoring requirements to adequately assess and detect change.

There are national and State guidelines for managing Ramsar sites, while the *Environment Protection and Biodiversity Conservation Act* includes various requirements in relation to the actions that impact on a site.

Specifically, at the State level, the Western Port Ramsar site is supported by the *Western Port Ramsar Site Management Plan 2017*, which has the primary purposes of maintaining ecological character and promoting wise use of the site.

Western Port Biosphere

The Western Port Biosphere Reserve is one of nine reserves recognised under the United Nations Educational, Scientific and Cultural Organization's (UNESCO) Man and the Biosphere Programme in Australia, the only one in Victoria and one of 701 reserves world-wide. The reserve includes an area of approximately 2,150 square kilometres and was chosen because of its natural values, including the Western Port Ramsar site, on the fringe of the expanding city of Melbourne.

Healthy Waterways Strategy 2018-2028

The Healthy Waterways Strategy is a shared strategy between Melbourne Water, State and local government, water corporations and the community. It provides direction towards a regional vision for the health of rivers, estuaries and wetlands in the Port Phillip and Westernport region. The Strategy is required to be considered when seeking approval under the *Water Act* or *the Catchment and Land Protection Act.*

Mornington Peninsula Localised Planning Statement 2014

The Mornington Peninsula Localised Planning Statement (MPLPS) applies to the Mornington Peninsula Shire Council area and recognises it has '*a special character and importance with a role clearly distinct from and complementary to metropolitan Melbourne and designated growth areas*'.

The MPLPS includes objectives and strategies in support of:

- an integrated approach to planning
- the conservation of natural systems and biodiversity
- protecting the role and character of settlements, towns and villages
- protecting landscape and cultural values
- protecting the value of agriculture and encouraging sustainable agricultural land use
- protecting the recreational role of the area and providing for appropriate tourism based use and development
- ensuring the appropriate use and development of the Port of Hastings and hinterland.

Other key policy documents

Other key policy documents the IAC has had regard to include:

- The Planning Policy Frameworks in the relevant planning schemes.

- Statement of Planning Policy No 1 - Western Port (1970-varied 1976) (a policy document in the MPPS).
- Protecting Victoria's Environment - Biodiversity 2037.
- Hastings Port Industrial Area Land Use Structure Plan 1996, referred to in the MPPS as an Incorporated Document.
- Port of Hastings Land Use and Transport Strategy, Port of Hastings Corporation, 2009, a policy document at Clause 18.03-1S (Planning for ports) of the MPPS.

Appendix F Recommended Incorporated Document

NOTE: The IAC has provided its recommended changes to the final version of the Incorporated Document (Document 587) using:

Tracked Added

~~Tracked Deleted~~

Crib Point Gas Import Jetty Works

Incorporated Document
December 2020

1.0 INTRODUCTION

This document is an incorporated document in the Mornington Peninsula Planning Scheme (planning scheme) pursuant to section 6(2)(j) of the Planning and Environment Act 1987.

The land identified in Clause 3 of this document may be used and developed in accordance with the specific controls in Clause 4 of this document.

The control in Clause 4 prevails over any contrary or inconsistent provision in the planning scheme.

2.0 PURPOSE

The purpose of the control in Clause 4 is to permit and facilitate the use and development of land described in Clause 3 for the purposes of the Crib Point Gas Import Jetty Works (Project), in accordance with the requirements specified in Clause 4.

The Project includes, but is not limited to, use and development of a Liquified Natural Gas Import Facility (LNG Import Facility), including continuous mooring of a floating storage and regasification unit (FSRU), jetty infrastructure including marine loading arms and gas piping on the jetty, and a gas receiving facility.

3.0 LAND

The control in Clause 4 applies to the land shown as SCO9 on the planning scheme map in the planning scheme (Project Land).

4.0 CONTROL

Exemption from planning scheme requirements

4.1 Despite any provision to the contrary or any inconsistent provision in the planning scheme, no planning permit is required for, and no provision in the planning scheme operates to prohibit, restrict or regulate the use or development of the Project Land for the purposes of, constructing, maintaining or operating the Project, including any ancillary activities.

4.2 The use and development of the Project Land for the purposes of, or related to, the Project includes, but is not limited to:

a) a LNG Import Facility, including:
   i) continuous mooring of a FSRU at a berth adjacent to the Crib Point Jetty and the operation of the FSRU to store LNG and to regasify LNG into natural gas;
   ii) jetty infrastructure including marine loading arms and gas piping to transfer gas from the FSRU to the Gas Receiving Facility; and
   iii) a Gas Receiving Facility, including gas metering, odorant storage and injection, and liquid nitrogen storage and injection.

b) Buildings and works or associated infrastructure or activities for the Project.

c) Utility installation including substations, the transmission and distribution of gas and gas infrastructure including piping, the pigging facility (which will allow for in-line inspections of the pipeline with a pipeline inspection gauge, integration with the Crib Point to Pakenham gas transmission pipeline, integration with the pigging facility, and associated gas infrastructure including piping and power upgrades.

d) Wharf including facilities for LNG ships and the FSRU.

e) Creation and alteration of access to roads.

f) Other buildings or works or associated infrastructure or activities associated with the use for an LNG Import Facility.

g) Ancillary activities, to the use and development of the Project Land for the purposes of, or related to, the Project, including but not limited to:
   i) Undertaking any preparatory works as defined in Clause 5
   ii) Creating and using lay down areas and depots for construction purposes
   iii) Stockpiling of excavation material.
   iv) Constructing and using temporary site workshops and storage, staff car parking, administration and amenities buildings.
   v) Removing, destroying and lopping of trees and removing vegetation, including native vegetation and dead native vegetation.
   vi) Demolishing and removing buildings, structures, infrastructure and works.
   vii) Relocating, modifying and upgrading services and utilities.
   viii) Constructing fences, temporary site barriers and site security.
   ix) Constructing or carrying out works to create or alter roads, car parking areas, bunds, mounds, landscaping, excavate land, salvage artefacts and alter drainage.

x) Constructing and using temporary access roads, diversion roads and vehicle parking areas, loading and unloading areas, access paths and pedestrian walkways.

xi) Earthworks including cutting, stockpiling and removal of spoil, and formation of drainage works.

xii) Displaying construction, directional and identification signs.

xiii) Mooring and use of barges for construction purposes.

4.3 CONDITIONS

The use and development permitted by this document is subject to the following conditions, with the exception of preparatory buildings and works outlined at Clause 5.0. In these conditions, reference to 'a stage' includes any stage or part of the Project, whether for construction or operation or both.

4.4 Development Plans

4.4.1 Prior to the commencement of use and development (excluding preparatory buildings and works under Clause 5), a Development Plan must be prepared to the satisfaction of the Minister for Planning.

4.4.2 A Development Plan must include:

a) Site layout plan/s;

b) A plan showing a designated area within which the FSRU will be moored;

c) Site levels showing the full extent of any proposed cut and fill;

d) Architectural plans including elevations, and a schedule of materials generally in accordance with the landscape and visual EPRs of the Minister's Assessment; and

e) On-site landscaping details including a planting schedule, having regard to the management of bushfire risk and visual amenity generally in accordance with the landscape and visual EPRs of the Minister's Assessment.

f) ~~Lighting details for the Project.~~ A lighting plan that describes the key lighting details of the Project (including the CPRF, associated Crib Point Jetty infrastructure and FSRU) and demonstrates how it implements and complies with relevant standards, guidelines and EPRs

g) Access and car parking details.

h) An explanation demonstrating how the Development Pan is in accordance with the approved EPRs included within the Environment Management Plan.

4.4.3 A Development Plan may be prepared and approved in stages or parts to the satisfaction of the Minister for Planning.

4.5 Environmental Management Plan

4.5.1 Prior to the commencement of use and development (excluding preparatory buildings and works under Clause 5), an Environmental Management Plan (EMP) must be prepared to the satisfaction of the Minister for Planning. The EMP must

be prepared in consultation with Mornington Peninsula Shire Council (the Council).

4.5.2 The EMP must include Environmental Performance Requirements (EPRS) generally in accordance with the Minister's Assessment dated [day month 2020] made pursuant to the Environment Effects Act 1978 (EE Act) as applicable to the LNG Import Facility unless otherwise approved by the Minister for Planning. The EPRs must address the following areas and any other relevant matters:

a) Aboriginal cultural heritage
b) Air quality
c) Contamination and acid sulfate soils
d) Greenhouse gas
e) Groundwater
f) Historic heritage
g) Landscape and visual
h) Noise and vibration
i) Marine biodiversity
j) Safety, hazard and risk
k) Social
l) Surface water
m) Terrestrial and freshwater biodiversity
n) Traffic and transport

4.5.3 The EMP must:

a) set out the process (including approval) and timing for development of a Construction Environmental Management Plan (CEMP), Operations Environmental Management Plan (OEMP) and other plans and procedures required by the EPRs including the process and timing for consultation with relevant stakeholders, including Council, the Department of Environment Land, Water and Planning, Energy Safe Victoria, the Roads Corporation, Melbourne Water, Heritage Victoria, Aboriginal Victoria, the Registered Aboriginal Party for Mornington Peninsula and Westernport (Bunurong Land Council Aboriginal Corporation), WorkSafe Victoria, Environment Protection Authority and the Port of Hastings Development Authority as relevant;
b) be accompanied by a statement explaining any difference between the EPRs included in the EMP and the EPRs set out in the Minister's Assessment dated [insert date] made pursuant to the EE Act.

4.5.4 The CEMP must include:

a) A summary of key construction methodologies.
b) An overarching framework for site works or specific measures to reduce and manage environmental and amenity effects during construction of the Project, including management plans in respect of:
    i) Air quality
    ii) Hazardous substances management

iii) Noise and vibration
iv) Sediment, erosion and water quality (including surface water and groundwater)
v) Traffic and transport
vi) Contamination and Acid Sulfate Soil

c) A summary of the consultation that informed the preparation of the CEMP and a summary of the proposed ongoing engagement activities with Council, the community and other stakeholders during construction of the Project and enquiries and complaints management.

d) A summary of performance monitoring and reporting processes, including auditing, to ensure environmental and amenity effects are reduced and managed during construction of the Project.

4.5.5 The OEMP must include:

a) An overarching framework for managing environmental and amenity effects during operation of the Project, including management plans in respect of:
i) Air quality
ii) Hazardous substances management
iii) Noise and vibration
iv) Sediment, erosion and water quality (including surface water and groundwater)
v) Marine monitoring
vi) Native vegetation offset management
vii) Traffic and transport

b) A statement of ~~anticipated~~ maximum annual LNG cargoes, not exceeding 40 cargoes or 160 PJ per annum (whichever is the greater).

c) A summary of the consultation that informed the preparation of the OEMP and a summary of the proposed ongoing engagement activities with Council, the community and other stakeholders during operation of the Project and enquiries and complaints management.

d) A summary of performance monitoring and reporting processes, including auditing, to ensure environmental and amenity effects are reduced and managed during operation of the Project. The summary of performance monitoring and reporting processes will include the monitoring and reporting frequencies and will identify the relevant agencies to which monitoring reports will be provided.

4.5.6 The EMP must be generally consistent with any works approval approved by the Environment Protection Authority under the *Environment Protection Act 1970* and any consent granted under the *Marine and Coastal Act 2018* in relation to the use and development of the Project Land.

4.5.7 The EMP may be amended from time to time, to the satisfaction of the Minister for Planning.

4.5.8 The EMP must be amended to update references and requirements to be consistent with the *Environment Protection Act 2017* as amended by the

Environment Protection (Amendment) Act 2018 (New Environment Protection Act), to the satisfaction of the Minister for Planning. The amended EMP must be prepared in consultation with Environment Protection Authority and must be submitted to the Minister for Planning within 12 months of the commencement of the New Environment Protection Act.

4.5.9 The use and development of the Project must be carried out in accordance with the approved EMP including the EPRs and all plans and procedures required by them.

4.6 Bushfire Management

4.6.1 Prior to the commencement of use and development (excluding preparatory buildings and works under Clause 5), a Bushfire Management Plan must be prepared to the satisfaction of the Minister for Planning and in consultation with the relevant fire authority. The Bushfire Management Plan must include EPRs generally in accordance with the Minister's Assessment dated [day month 2020] made pursuant to the Environment Effects Act 1978 (EE Act) as applicable to the LNG Import Facility unless otherwise approved by the Minister for Planning.

4.7 Native Vegetation

4.7.1 Prior to removal, destruction or lopping of native vegetation:

a) Information about that native vegetation, including an avoid and minimize statement, in accordance with application requirements 1, 5 and 9 in Table 4 of the Guidelines for removal, destruction or lopping of native vegetation (DELWP, December 2017) must be provided to the satisfaction of the Secretary to DELWP.

b) The biodiversity impacts from the removal, destruction or lopping of that native vegetation must be offset in accordance with the Guidelines for removal, destruction or lopping of native vegetation (DELWP, December 2017).

c) Evidence that the required offset/s has been secured must be provided to the satisfaction of the Secretary to DELWP.

4.7.2 The requirements of Clause 4.10.1 may be satisfied in stages, however, each requirement must be satisfied prior to the removal, destruction or lopping of native vegetation for that stage.

4.7.3 The secured offset/s for the Project may be reconciled at the completion of the Project in accordance with the Assessor's handbook – Applications to remove, destroy or lop native vegetation (DELWP, October 2018).

4.8 Flood Management

4.8.1 Where, but for this document, a planning permit would be required for buildings and works on land within the Land Subject to Inundation Overlay, the buildings and works must be undertaken to the satisfaction of the relevant floodplain management authority.

4.9 Creating or altering access to roads

4.9.1 Where, but for this document, a planning permit would be required to create or alter access to a road in a Road Zone, the creation or alteration of access must be undertaken in consultation with the Roads Corporation.

4.10 Works where a planning permit would not usually be required under the provisions of the Planning Scheme

4.10.1 Buildings and works, including vegetation removal, that would not require a permit under the provisions of the relevant planning scheme may be undertaken on the land as required.

4.11 Other conditions

4.11.1 Unless otherwise stated, the plans and other documents listed in Clause 4 must be approved prior to the commencement of works. Plans and other documents may be prepared and approved for separate components or stages of the Project but each plan or other document must be approved before commencement of works for that component or stage.

4.11.2 The plans and other documents may be amended from time to time to the satisfaction of the Minister for Planning or relevant approving authority. In deciding whether a plan or other document is satisfactory or whether to consent to an amendment to a plan or other document, the Minister for Planning must seek the views of Council if satisfied that the amendment will have a significant impact on the municipal district and may otherwise seek the views of Council or any other relevant authority.

4.11.3 The use and development of the Project Land must be undertaken generally in accordance with the approved plans and documents, with the exception of preparatory buildings and works outlined at Clause 5.0.

4.11.4 A current version of each of the following approved plans and documents must be available on a clearly identifiable Project website ~~until commencement of~~ during the construction and operation of the Gas Import Jetty Works:

a) Each Development Plan approved under Clause 4.4;

b) Each Environmental Management Plan (including each CEMP and OEMP) approved under Clause 4.5;

c) Other plans required by EPRs applicable to the construction and operation of the Gas Import Jetty Works;

d) The EPRs relevant to the Gas Import Jetty Works approved by the Minister for Planning.

~~4.11.5 A current version of each of the following approved plans must be available on a clearly identifiable Project website during operation of the Gas Import Jetty Works:~~

~~a) Each Environmental Management Plan (including each OEMP) approved under Clause 4.5;~~

~~b) Other plans required by EPRs applicable to the operation of the Gas Import Jetty Works.~~

5.0 PREPARATORY BUILDINGS AND WORKS

The following buildings and works may be undertaken and the Project Land may be used in the following manner before the plans and other documents listed in Clause 4.2 are approved:

a) Preparatory buildings and works for the Project including, but not limited to:

i) Works, including vegetation removal, where but for this document a planning permit would not be required under the provisions of the planning scheme.

ii) Investigating, testing and preparatory works to determine the suitability of land, and property condition surveys.

iii) Creation and use of construction access points and working platforms.

iv) Site establishment works including temporary site fencing and hoarding, site offices, and hardstand and laydown areas.

v) Construction, protection, modification, removal or relocation of utility services.

vi) Establishment of environment and traffic controls, including designation of 'no-go' zones.

vii) Establishment of temporary car parking.

viii) Demolition to the minimum extent necessary, to enable preparatory works.

ix) Salvage and relocation of aboriginal cultural heritage material and other management actions required to be undertaken in compliance with a cultural heritage management plan approved under the *Aboriginal Heritage Act 2006* or otherwise in compliance with that Act.

b) The removal, destruction or lopping of native vegetation to the minimum extent necessary to enable preparatory works, to the satisfaction of the Minister for Planning. Any native vegetation removed to enable preparatory works forms part of the total extent of native vegetation removal necessary for the construction of the Project and native vegetation offsets must be provided in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation* (Department of Environment, Land, Water and Planning, December 2017) except as otherwise agreed by the Secretary to DELWP.

6.0 DECOMMISSIONING AND REHABILITATION

Within 18 months of the cessation of operations, unless the Minister for Planning and the Port of Hastings Development Authority agree otherwise, the Project Land must be rehabilitated and gas infrastructure decommissioned and removed in consultation with the Port of Hastings Development Authority and to the satisfaction of the Minister for Planning.

7.0 EXPIRY

The controls in this document expire if any of the following circumstances apply:

- The development allowed by the control is not started by 31 January 2023.
- The development allowed by the control is not completed by 31 January 2025.
- The use allowed by the control is not started by 31 January 2025.
- The use allowed by the control will expire 20 years from the date of commencement of operation of the Project.

The Minister for Planning may extend these periods if a request is made in writing before the expiry date or within three months afterwards.

Appendix G Recommended Environmental Performance Requirements

NOTE:

The IAC normalised all EPRs prior to making changes, that is, various grammatical and style changes were made, but no content change was made.

The IAC has then provided its recommended changes to the final version of the EPRs (Document 602) using:

Tracked Added

~~Tracked Deleted~~

This work has mainly focussed on the EPRs and there may be consequential changes to EPR numbering and the Timing, Associated Risk ID and Statutory Implementation columns.

The IAC acknowledges the work of the Proponents in seeking to amend the EPRs in relation to evidence and submissions during the Hearing and its own further work. Further, many parties and submitters made various recommendations to the EPRS, which the IAC appreciates and has taken into account.

Version 4 EPR – IAC RECOMMENDED CHANGES 22 FEBRUARY 2021

ENVIRONMENTAL PERFORMANCE REQUIREMENTS – GAS IMPORT JETTY WORKS

CONTENTS

TOPIC PAGE

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
Aboriginal cultural heritage **EES evaluation objective: To avoid or minimise adverse effects on Aboriginal and historic cultural heritage.**				
EPR-AH01	**Cultural Heritage Management Plan** Implement and comply with the management conditions of Cultural Heritage Management Plan 16300	Construction	ACH1, ACH2, ACH3, ACH4, ACH5, ACH6	Incorporated Document, CHMP
EPR-AH02	**Construction demarcation** Demarcate construction areas with survey pegs, fencing or other means, to ensure works are limited to the approved CHMP Activity Areas.	Construction	ACH4	Incorporated Document, CHMP
EPR-AH03	**Project Working Group** Develop a project working group that incorporates input from stakeholders relevant to CHMP 15383, 15384, 16300 including the Traditional Owners and Aboriginal Victoria.	Design and Construction		Incorporated Document, CHMP

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
AIR QUALITY EES evaluation objective: To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.				
EPR-AQ01	**Dust suppression** Suppress dust at construction areas as required using water sprays, water carts or other devices: • on unpaved work areas • on sand, spoil and aggregate stockpiles • during the loading and unloading of dust generating materials.	Construction	AQ1, AQ2, AQ3, B2, TP4, C10	Incorporated Document, Consent under the Marine and Coastal Act 2918 (MAC Act)
EPR-AQ02	**Restricted vehicle movements** Ensure vehicles, plant and equipment remain within the construction footprint of the Project site and on public roads and designated tracks to the extent practicable, unless undertaking survey and property management activities as agreed with the landholder.	Construction	AQ1, AQ2,	Incorporated Document, Consent under the MAC Act
EPR-AQ03	**Covering vehicle loads** Cover construction vehicles with potential for loss of loads (such as dust or litter) when using public roads.	Construction	AQ4, TP4, C10	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
EPR-AQ04	**Weather monitoring** Monitor weather conditions for extreme heat and/or wind events using systems such as the Bureau of Meteorology forecasts. Modify works and implement EPR-AQ01 if conditions are likely to result in air quality impacts at sensitive receptors.	Construction	AQ3	Incorporated Document, Consent under the MAC Act
EPR-AQ05	**Dust monitoring** Undertake observational monitoring of dust at the Gas Import Jetty Works site Implement EPR-AQ01 if fine particulates or dust is observed causing a hazard. Modify or stop works until the dust hazard is reduced to a manageable level if fine particulate or dust levels cannot be contained.	Construction	AQ1, AQ2, AQ3, AQ4	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
EPR-AQ06	**Odorous soils management** Undertake the following mandatory measures if odorous soils (other than acid sulfate soils) are uncovered during construction: a) Cease ground disturbance at the location and within the immediate vicinity. b) Assess site contamination and ~~determine~~ implement appropriate management actions in consultation with suitably qualified personnel. c) Notify EPA as soon as reasonably possible if odorous material is found to be contaminated. Manage acid sulfate soils in accordance with EPR-C02.	Construction	AQ6, C10	Incorporated Document, Consent under the MAC Act
EPR-AQ07	**Equipment maintenance** Maintain plant and equipment in good condition.	Construction	AQ5, AQ8	Incorporated Document, Consent under the MAC Act
EPR-AQ08	**Maintenance of the FSRU burners** Undertake regular maintenance of the FSRU burners in the boilers and engines as per manufacturer's specifications and the requirements of any Works Approval.	Operation	AQ7	Incorporated Document, EPA licence for the operation of the FSRU

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
EPR-AQ09	**Monitoring FSRU air emissions** Design and implement an air quality monitoring programme that must: a) Confirm FSRU emission rates, including formaldehyde, comply within tolerances of the design specifications. b) Be carried out initially over 12 months, and then subject to a review of the results to confirm whether the results are acceptable or whether any further monitoring or mitigation is required. c) Be consistent with the requirements of any Works Approval.	Design and Operation	AQ7	Incorporated Document, EPA licence for the operation of the FSRU
EPR-AQ10	Odour Take all reasonable steps to ensure mercaptan odour will not be detectable outside the Crib Point Receiving Facility property boundary.	Construction and Operation	AQ4, AQ5, AQ06	Incorporated Document, EPA licence for the operation of the FSRU

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
CONTAMINATION AND ACID SULFATE SOILS EES evaluation objectives: • 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.				
EPR-C01	**Contaminated Soils** a) Manage contaminated soil in accordance with the SEPP (Prevention and Management of Contaminated Land) and EPA Victoria interim Position Statement on PFAS. b) Notify all Project personnel of the presence of contaminated soils at the following locations during the site(s) induction: • the Crib Point Receiving Facility • the Esplanade adjacent to the former BP refinery • the former BP refinery. c) Avoid construction works during wet weather unless conditions are such that property damage, contaminated soils, and surface water issues can be managed.	Construction	C1	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	d) Sample and categorise excess soils that are required to be disposed off-site in accordance with EPA Victoria Publications IWRG702 – Soil Sampling and IWRG621 – Soil Hazard Categorisation and Management. e) Handle and transport contaminated soil for off-site treatment/disposal in accordance with Environment Protection (Industrial Waste Resource) Regulations 2009. Ensure any material imported for use as backfill complies with the EPA Victoria Publication IWRG621 – Soil Hazard Categorisation and Management for 'Fill Material' and is accompanied by relevant documentation confirming its compliance to the 'Fill Material' criteria.			
EPR-C02	**Acid Sulfate Soil Management Plan** Develop an Acid Sulfate Soil Management Plan (ASSMP) ~~generally~~ in accordance with the Industrial Waste Management Policy (Waste Acid Sulfate Soils) 1999 and EPA Victoria Publication IWRG655.1 – Acid Sulfate Soil and Rock, and the Victorian Best Practice Guidelines for Assessing and Managing Coastal Acid Sulfate Soils (CASS BPMG, 2010). The ASSMP must be prepared in consultation with the EPA prior to commencing construction and will include requirements to: a) Sample soils in accordance with CASS BPMG (2010) prior to construction commencing in areas deemed as medium to high risk of CASS, in consultation with the EPA.	Construction	C2	Incorporated Document, EPA licence for the operation of the FSRU Consent under the MAC Act, Approval under the EPBC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	b) Train relevant site-based personnel on the requirements of the acid sulfate materials management procedure including the recommended time period over which soils may be temporarily stockpiled before treatment commences as recommended by the CASS BPMG (2010). c) Minimise the duration of stockpiling of untreated ASS by taking into consideration the constraints on stockpile duration where treatment of ASS may not be required, as per the CASS BPMG (2010). d) Manage an unexpected discovery of ASS/PASS. e) Manage the potential generation of acidic leachate, by treating the stockpile and or spreading a guard layer before stockpiling and/or covering the stockpile if ASSs are to be stockpiled for an extended time period (exceeding the CASS BPMG (2010) recommended short-term stockpiling durations). f) Capture (where practicable) and manage run-off that has the potential to be impacted by stockpile material, in accordance with the CASS BPMG (2010). g) Implement a monitoring program in accordance with the CASS BPMG (2010) to measure the effectiveness of the management strategy and to provide an early warning of any environmental degradation or impact to surface water, groundwater and soils.			

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
EPR-C03	**Contaminated groundwater** a) Manage contaminated groundwater in accordance with: • SEPP (Waters) • PFAS National Environmental Management Plan. b) Do not discharge groundwater from areas that have been identified as contaminated to the environment (land, waterways, sewer). c) Ensure contaminated groundwater is contained and: • treated onsite, depending on contaminant encountered (this may require approval from the EPA Victoria) or • disposed offsite to an EPA Victoria licensed facility or • left in-situ but not abstracted or disturbed. d) Ensure backfill materials has similar or lower hydraulic conductivity than the surrounding soils in areas where the potential for soil or groundwater contamination has been identified and imported backfill materials are used.	Construction	C4, C5, C6	Incorporated Document, EPA licence for the operation of the FSRU Consent under the MAC Act
EPR-C04	**Unknown contamination** Undertake the following measures if unknown contamination	Construction	C9	Incorporated Document

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	(including asbestos containing material) is encountered during construction: a) Cease ground disturbance at the unknown contamination location and within the immediate vicinity. b) Assess site contamination in accordance with EPA IWRG 702 and IWRG 621 to categorise soils prior to developing ~~and identify~~ appropriate remedial action.			
EPR-C05	**Fuel and chemical leaks/spills** a) Bund diesel generators. b) Undertake routine and scheduled maintenance of vehicles and plant/machinery/equipment to avoid ~~minimise the~~ potential for leaks/spills to occur.	Construction and operation	C11, C13	Incorporated Document, EPA licence for the operation of the FSRU Consent under the MAC Act
EPR-C06	**Construction waste management** a) Manage waste in accordance with Environment Protection (Industrial Waste Resource) Regulations 2009, including establishment of appropriate and secured waste storage locations on-site, as required. b) Develop and implement waste management procedures. c) Identify suitable waste disposal locations in consultation with a	Construction	C12	Incorporated Document, EPA licence for the operation of the FSRU Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	licenced waste contractor prior to construction commencing. d) Ensure waste materials are reused or recycled where practicable or collected and transported by licenced waste contractors for disposal at appropriately licenced facilities. e) Ensure portable toilet facilities are available for work construction crews at designated locations. f) Ensure waste containers are available for different types of waste generated onsite. g) Ensure waste containers are located at each worksite to enable collection of waste, with regular removal from worksites to designated storage areas. h) Ensure refuse containers are lidded to mitigate fauna access.			
EPR-C07	**Operation waste management** a) Manage waste in accordance with Environment Protection (Industrial Waste Resource) Regulations 2009, including establishment of appropriate and secured waste storage locations on-site, as required. b) Develop and implement waste management procedures. c) Ensure waste materials are stored appropriately, reused or recycled where practicable, or collected and transported by	Operation	C14	Incorporated Document, Consent under the MAC Act, EPA licence for the operation of the FSRU

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	licenced contractors for disposal at appropriately licenced facilities. d) Ensure waste containers are available for different types of waste generated onsite. e) Ensure waste containers are lidded to mitigate fauna access.			
EPR-CO8	Develop a strategy in consultation with the EPA which outlines the methods for disturbing and disposing soils contaminated with PFAS	Design and Construction	C1	Incorporated Document EPA licence for the operation of the FSRU
GREENHOUSE GAS EES evaluation objective: To minimise generation of wastes by or resulting from the Project during construction and operation, including accounting for direct and indirect greenhouse gas emissions.				
EPR-GG01	**Equipment specification - fuel efficiency** Include environmental principles in contracts to encourage fuel efficiency to reduce the consumption of fossil fuels and therefore enable a reduction in greenhouse gas emissions from the construction and operation of the Project.	Construction and Operation	GG2, GG6	Incorporated Document
EPR-GG02	**Source local materials**	Construction	GG2	Incorporated Document

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	Use locally sourced materials, including those provided by suppliers where they are of comparable quality and utility if possible.			
EPR-GG03	**Low embodied energy materials** Use where possible, low embodied energy materials (e.g. substituting concrete mixes) where they are of comparable quality and utility.	Construction	GG2	Incorporated Document
EPR-GG04	**Managing the quality of materials** Inspect the quality of key materials (i.e. pipe and pipe fittings) before supplying to site for installation to avoid additional transport and handling of materials.	Construction	GG3	Incorporated Document
EPR-GG05	**Sustainable resource management practices** Use sustainable resource management practices to avoid the inefficient use of materials, fossil fuels, and electricity.	Construction	GG5	Incorporated Document
EPR-GG06	**Implementation of the PEM** Implement the Protocol for Environmental Management (GHG emissions and energy efficiency in industry) (PEM) for the operation of the FSRU, which must include: • conducting a minimum level 2 audit on the FSRU operation	Operation	GG6	Incorporated Document, EPA licence for the operation of the FSRU

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	annually to identify inefficiencies • preparing an action plan for implementing greenhouse gas emissions reduction measures • annual reporting of measures to the EPA for the life of the Project. Update the action plan every five years and include ongoing examination of options to: • maximise open loop mode operation of the FSRU • identify and minimise fugitive emissions from LNG transfer, storage and transmission infrastructure.			
EPR-GG07	**Certified carbon offsets** Consider purchasing certified carbon offsets to compensate for the long-term impacts of the Project's greenhouse gas emissions.	Construction and operation	GG02 and GG06	Incorporated Document, EPA licence for the operation of the FSRU
GROUNDWATER EES evaluation objective: 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.				
EPR-HG01	**Suitably qualified contractors**	Construction	HG4, HG10, C7	Incorporated Document

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	Use contractor(s) that are suitably qualified and experienced in piling installation for piling work.			
HISTORIC HERITAGE EES evaluation objective: To avoid or minimise adverse effects on Aboriginal and historic cultural heritage.				
EPR-HH01	**Unexpected cultural heritage finds procedure** Incorporate procedures in the EMP and CEMP to implement if an unknown historic heritage site, value or object is discovered during construction. This procedure must: • include guidelines on collection or salvage of historic heritage objects • be discussed in the site induction(s).	Construction	HH2	Incorporated Document, Consent under the MAC Act
EPR-HH02	**Condition surveys and monitoring (former BP refinery administration building H1016)** Undertake a condition survey of the Victorian Heritage Register site (Former BP refinery administration building H1016) prior to commencing construction activities at Crib Point and following completion of construction activities at Crib Point. Any damage deemed to have resulted from the Project must be rectified by the proponent.	Construction	HH3	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
LANDSCAPE AND VISUAL EES evaluation objective: To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.				
EPR-LV01	**Landscape screening** Retain and introduce, to the maximum practicable extent, appropriate indigenous vegetation to screen facilities within the viewshed of roads (such as The Esplanade), other public places (such as the Victorian Maritime Centre and the Woolleys Beach Reserve) and residences (if ~~reasonably~~ requested by affected landholders) ~~and with any necessary approvals granted where practicable~~.	Design, construction and operation	A risk assessment was not undertaken as part of this impact assessment	Incorporated Document, Consent under the MAC Act
EPR-LV02	**Materials and finishes** Select materials and finishes which appropriately respond to the environment and are complementary to the setting.	Design and Operation	A risk assessment was not undertaken as part of this impact assessment	Incorporated Document, Works Approval, EPA licence for the operation of the FSRU
EPR-LV03	**Preventative maintenance** Maintain exterior materials and finishes according to a schedule for cleaning, painting and general maintenance to prevent aesthetic deterioration.	Operation	A risk assessment was not undertaken as part of this impact assessment	Incorporated Document, Works Approval, EPA licence for the operation of the FSRU
EPR-LV04	**Reflective surfaces** Minimise reflective surfaces on infrastructure to reduce reflection of	Design and Operation	A risk assessment was not undertaken as part of this impact	Incorporated Document, Works Approval, EPA licence for the operation of the

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	artificial light where practicable.		assessment	FSRU
EPR-LV05	**Design of lighting for land-based works** Design the land-based components of the Gas Import Jetty Works to comply with Australian Standard AS 4282:2019 Control of the Obtrusive Effects of Outdoor Lighting.	Construction		Incorporated Document
EPR-LV06	**Vegetation outside construction footprint** Replace any trees or shrubs lost due to construction outside the approved construction footprint with appropriately selected small trees or large shrubs, in consultation with the affected landholder	Construction and Operation	A risk assessment was not undertaken as part of this impact assessment	Incorporated Document
EPR-LV07	FSRU lighting Configure the number, intensity and direction of lights, and the reflectivity of surfaces on the FSRU in order to minimise its landscape and visual impact, subject to meeting navigation and vessel safety standards.			

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
NOISE AND VIBRATION EES evaluation objective: To minimise potential adverse social, economic, amenity and land use effects at local and regional scales				
EPR-NV01	**Construction Noise and Vibration Management Plans** Prepare ~~a~~ site-specific Construction Noise and Vibration Management Plans (CNVMPs) in consultation with the EPA and Mornington Peninsula Shire Council, to be approved by the responsible authority, prior to the commencement of construction. Inform the CNVMPs by modelling and monitoring undertaken by a suitably qualified noise and vibration consultant prior to the construction activities occurring. Ensure the CVNMPs are consistent with NSW CVNG and EPA Publication 1834 to assist in managing impacts of construction noise. Ensure the CNVMPs ~~is~~ are consistent with and gives effect to EPR-NV02 – EPR-NV08, which must include (where relevant): • identification and assessment of noise and vibration sensitive receptors, including habitat for listed threatened fauna, likely to be impacted by the Crib Point Jetty Works • details of construction activities and an indicative schedule for construction works, including identification of key noise and/or vibration generating construction activities that have the potential to generate airborne noise and/or surface vibration impacts on	Construction		Incorporated Document, EPA licence for the operation of the FSRU Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	surrounding sensitive receivers • construction noise and vibration targets as specified in EPR-NV02 – EPR-NV08 • how predictive modelling, active monitoring, and compliance reporting will be undertaken to specifically address how it informs any out of hours works permit process and scheduling of works in general • measures to ensure that construction noise and vibration must be minimised and managed in accordance with the methods specified in EPR-NV02 – EPR-NV08; • the specification of any unavoidable works to be undertaken in respect of the Crib Point Jetty Works; • measures to ensure effective monitoring of noise associated with construction with consideration to the construction noise and vibration targets. • noise and vibration monitoring commitments and response protocols for managing complaints and exceedances above nominated noise criteria; and • details of communication processes to be adopted in accordance with EPR SO01 relating to noise and vibration management actions and complaints. • detail the Project relocation and respite program. Ensure the site-specific CNVMPs are approved by an independent			

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	auditor prior to submission to the EPA and relevant Council.			
EPR-NV02	**Managing noise and vibration from construction activities** Manage construction noise and vibration in accordance with EPA Publication 1834 Civil Construction, building and demolition guide and NSW Construction Noise and Vibration Guideline (NSW CVNG). ~~Implement the following 'general good practice' measures during construction of the Crib Point Jetty Works:~~ Undertake all reasonable and feasible mitigation actions to minimise the impact on sensitive receptor locations during construction of the Crib Point Jetty Works. Measures may include (but are not limited to) the following onsite mitigation measures: • use the lowest-noise work practices and equipment that meet the requirements of the job • locate site buildings, access roads and positioning plant such that the minimum disturbance occurs to the locality • install broadband reversing alarms on construction vehicles and machinery in preference to 'beeper' reversing alarms – • plan the site to minimise the need for reversing of vehicles • turn off plant and vehicles when not being used • take care not to drop spoil and construction materials that cause	Construction	B2, NV1, NV2, NV3, NV4, NV5, NV6, NV7	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	peak noise events • limit works to the arrival of staff on site and toolbox meetings between 6.00am and 7.00am • minimise the use of loud equipment, generation of unnecessary noise and movement of vehicles on the construction footprint • undertake all reasonable and feasible mitigation actions to minimise the impact on sensitive receptor locations. Measures may include (but are not limited to) to following onsite mitigation measures: ○ scheduling noisier works during less sensitive hours ○ adopting engineering noise controls at the source (e.g. silencer, mufflers, enclosures) by all practical means using current technology ○ selecting quieter equipment ○ installing onsite barriers such as hoardings or temporary screens to provide a noise barrier between any particularly noisy construction works and the residences ○ implementing respite periods by restricting the hours that the very noisy activities can occur.			

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
EPR-NV03	**Construction noise criteria** Implement additional onsite noise mitigation measures if construction noise is predicted to or exceeds the specified construction noise criteria. Implement additional noise mitigation measures including respite periods or rescheduling of noise works (in particular works generating noise that is tonal, impulsive or intermittent or low frequency noise) or offsite noise management measures. Establish background noise levels representing ~~having regard to~~ the time at which the construction works will take place. Appoint an independent ~~and qualified~~ environmental auditor ~~assessor~~ to review and verify unavoidable night work (10.00pm to 7.00am). Ensure out of hours works comply with EPA publication 1254 and must be 'Unavoidable Works' or approved 'Low Noise or Managed Impact Works', which must be approved by an independent environmental auditor. Notify affected residents at least 24 hours before the out of hours work commences. Include the details of works notification for unavoidable night works of the specified tasks that cannot be done during normal working hours.	Construction	NV1, NV2, NV3, NV4, NV5	Incorporated Document, Consent under the MAC Act

<table>
<tr><th>EPR ID</th><th>ENVIRONMENTAL PERFORMANCE REQUIREMENT</th><th>TIMING</th><th>ASSOCIATED RISK ID</th><th>STATUTORY IMPLEMENTATION</th></tr>
<tr><td></td><td>
<table>
<tr><th>TARGET AREA</th><th>TIME OF DAY</th><th>CONSTRUCTION NOISE CRITERIA [LAEQ(15-MIN) DB] AND MANAGEMENT MEASURE</th></tr>
<tr><td colspan="3">EPA normal working hours</td></tr>
<tr><td>Residential</td><td rowspan="4">Mon-Fri: 7.00am – 6.00pm

Sat: 7.00am – 1.00pm</td><td>65</td></tr>
<tr><td>Educational institutions</td><td>60</td></tr>
<tr><td>Parks and recreational areas</td><td>65</td></tr>
<tr><td>Community and commercial buildings</td><td>70</td></tr>
<tr><td colspan="3">Outside of EPA normal working hours</td></tr>
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EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT			TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	Residential - Evening and weekend	Mon-Fri: 6.00pm - 10.00pm Sat: 1.00pm – 10.00pm Sun/Public Holiday: 7.00am – 10.00pm	Noise level at any residential premises not to exceed background (LA90, dB) noise by: • 10 dBA or more for up to 18 months after project commencement Works notification Individual briefings Specific notification Respite offer			
	Residential – Night	Mon-Sun: 10.00pm – 7.00am	Noise inaudible within a habitable room of any residential premises except for unavoidable night works or night period low-noise or			

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT			TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
			managed-impact works approved by an independent and qualified environmental ~~assessor~~ auditor. Noise level at any residential premises not to exceed background (LA90, dB) noise by 0 dB.			
	Residential – Unavoidable night works	Mon-Sun: 10.00pm – 7.00am	Application of all feasible and reasonable work practices to minimise noise and its impacts Works notification Individual briefings Specific notification Respite offer when external construction noise level: LAeq(15min) >			

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT			TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
			LA90, night + 5 dB Additional noise mitigation measures measures) when external noise construction noise level: will be predicted above 50 dBA on any night or measured above 50 dBA for two or more nights Additional noise mitigation measures may include but not limited to respite periods or rescheduling of noisy works (in particular works generating noise that is tonal, impulsive or intermittent or low frequency noise) or offsite noise mitigation measures,			

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	such as Targeted engagement with impacted landholders to discuss individual mitigation options. Residents with special requirements will be consulted with on a case by case basis.			
EPR-NV04	**Vibration safe working distances** Implement additional management measures where occupancies, structures and assets are within the safe working distances derived using the values in the following standards: • British Standard BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting – Table 1 Vibration dose value ranges which might result in various probabilities of adverse comment within residential buildings • German Standard DIN4150-3:2016-12: Table 1 – Guideline values for vibration velocity for evaluating the effects of short-term vibration on structures • German Standard DIN4150-3:2016-12: Table 3 – Guideline values for vibration velocity for evaluating the effects of short-	Construction	NV6, NV7	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	term vibration on buried pipework • An asset owner's utility standards.			
EPR-NV05	**Noise and vibration monitoring** Undertake noise and vibration monitoring during construction when: • noise sensitive residential property or properties are predicted (pursuant to the CNVMP) to be impacted by out-of-hours works to confirm compliance with the construction noise criteria and to confirm modelling outputs • buildings or assets are within derived set back distances for structural damage • an asset owner's utility standards are at risk of being exceeded. • a complaint is received regarding noise in relation to an activity. Develop and implement a response plan to manage potential impacts if nominated criteria in the CNVMP are exceeded, including: • actions taken to rectify the exceedance • actions to minimise risk of reoccurrence • name of person(s) responsible for undertaking the required actions.	Construction	NV4, NV7	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	• The type and duration of any further monitoring to be undertaken. Make available the noise monitoring results and the response plan on a clearly identifiable Project website. Determine the duration of the monitoring by a suitably qualified acoustic consultant.			
EPR-NV06	**Managing cumulative noise impacts** Consult the EPA, Port of Hastings Development Authority and United Petroleum during detailed design and the construction planning phase for the purpose of managing cumulative noise impacts associated: • Crib Point Jetty upgrade construction works • Crib Point Jetty operation. The Project must: ~~(construction only):~~ • avoid overlap of sensitive works at night and other periods where excessive noise and vibration is likely • incorporate a requirement within the Stakeholder Engagement Management Strategy to notify residents of any unavoidable project overlaps and the potential impact to the community. • Conduct further noise assessments at 103 The Esplanade under a	Design, Operation and Construction	NV5, NV10, NV12	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	range of meteorological conditions to confirm compliance with Recommended Maximum Noise Levels: a) during operations at Berth 2 in isolation; and b) combined with activities at Berth 1.			
EPR-NV07	**Managing impacts from ground vibration** Apply the following management measures when the setback distances derived using EPR-NV04 are encroached: • consult with above and below ground utility asset owners to establish construction vibration limits to maintain asset integrity • monitor vibration of sensitive buildings/structures inside safe working distances • undertake condition survey of properties within safe working distances.	Construction	NV6, NV7,	Incorporated Document, Consent under the MAC Act
EPR-NV08	**Condition surveys** Undertake condition surveys for sensitive buildings and assets that are within the derived set back distances for structural damage.	Construction	NV7	Incorporated Document
EPR-NV09	**Operations Noise Management Plan** Prepare an Operations Noise Management Plan (ONMP) to be	Operation		Incorporated Document, Consent under the MAC Act, Works Approval, EPA licence

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	approved by ~~in consultation with~~ the EPA that is consistent with the requirements of any Works Approval, prior to commencement of operation. The ~~Operations Noise Management Plan~~ (ONMP) must be consistent with and give effect to EPR-NV10 – EPR-NV13 and must include: • Identification and assessment of noise sensitive receptors, including habitat for listed threatened fauna, and areas of the Woolleys Beach Reserve likely to be impacted by the project • a noise monitoring program to be implemented prior to the commencement of operations, to establish existing ambient conditions at identified sensitive receptors, including during operation of the United Petroleum facilities • Recommended Maximum Noise Levels (RMNLs) determined in accordance with EPR-NV10 that apply to nearby noise sensitive receptors, including but not limited to: ○ 103 The Esplanade ○ 132 The Esplanade ○ 43 Disney Street. • an explanation how the selected noise sensitive receptors can be used to assess noise against the Recommended Maximum Noise Levels for all noise sensitive areas			for the operation of the FSRU

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	• any mitigation or operational limitations necessary to achieve compliance with the Recommended Maximum Noise Levels determined in accordance with EPR-NV10 • any cumulative impact management strategy developed in accordance with EPR-NV11 • a post commissioning noise monitoring program in accordance with EPR-NV13. The ONMP must be approved by an independent auditor prior to submission to the EPA.			
EPR-NV10	**Operational noise controls** Identify and specify practical measures from the Gas Import Jetty Works for minimising noise in accordance with EPA Publication 1411 - Noise from Industry in Regional Victoria in consultation with the EPA. Specify recommended Maximum Noise Levels determined in accordance with Part 3 of EPA Publication 1411 in respect of nearby noise sensitive receptors, including but not limited to: • 103 The Esplanade • 132 The Esplanade • 43 Disney Street.	Operation	NV8, NV11	Incorporated Document, Consent under the MAC Act, Works Approval, EPA licence for the operation of the FSRU

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	(Specified Noise Sensitive Receptors) Ensure the specified noise sensitive receptors are suitable for assessing compliance with the Recommended Maximum Noise Levels for all sensitive areas. Consider the specified noise sensitive receptors as derived points and assess effective noise levels against the relevant derived noise limits (as defined in SEPP N-1).			
EPR-NV11	**Operational noise cumulative controls** Manage noise from the Project when operating near existing industry in accordance with Section 5 - Managing Noise from Multiple Premises within the EPA Publication 1413 - Applying NIRV to Proposed and Existing Industry where relevant. Establish a working group including the Port of Hastings Development Authority and commercial operators at the Crib Point Jetty and residents located within 1.5km from the Crib Point Jetty to develop a cumulative noise impact strategy in consultation with the EPA, including: • implementing appropriate noise amelioration measures if required, including specification of the party responsible for implementing those measures • coordinating operations at the Jetty. • A Compliance Plan developed in collaboration with United Petroleum to minimise cumulative noise impacts at Crib Point	Operation	NV10, NV12	Incorporated Document, Consent under the MAC Act, EPA licence for the operation of the FSRU

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	Jetty. The cumulative noise from the combined activities at Crib Point must not exceed EPA criteria at the nearest sensitive receptor.			
EPR-NV12	**Notification for mooring LNG carriers** Notify residents within 1.5 kilometres of the FSRU at least 24 hours before the planned arrival of an LNG carrier between 10.00pm and 7.00am if the verification noise monitoring demonstrates that the night time Recommended Maximum Levels have not been met. Include a link to the Port of Hastings Development Authority Weekly Shipping List (which provides a forecast about expected ships in the Port each week) about the Project communication resources and website.	Operation	NV9	Incorporated Document, EPA licence for the operation of the FSRU
EPR-NV13	**Post-commissioning measurements** Measure noise produced by the Gas Import Facility and other commercial operations at Crib Point within 10 business days ~~six months~~ of the beginning of commercial operation to confirm compliance with the Recommended Maximum Levels. Undertake noise measurements every 10 business days for the first 12 month of commissioning the FSRU in accordance with current Victorian EPA requirements to verify compliance with the Recommended Maximum Levels applied at 132 The Esplanade Crib Point, 43 Disney Street Crib Point, ~~and~~ 103 The Esplanade Crib Point and any other Specified Noise	Operation	NV9	Incorporated Document, EPA licence for the operation of the FSRU

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	Sensitive Receptor in the Operations Noise Management Plan. The monitoring program will be developed in consultation with the EPA as per NV09. Undertake onsite noise mitigation (administrative, operating or engineering controls) ~~as soon as practicable~~ within 48 hours if the measured noise levels demonstrate that the Recommended Maximum Levels are exceeded. Report any exceedance to EPA within 48 hours, and submit a report outlining further mitigation measures to the EPA within 20 business days. Offer and implement offsite noise mitigation to affected landowners (noise screening or architectural acoustic treatment to the exterior of rooms used for sleeping) if onsite noise mitigation cannot be feasibly implemented to reduce external noise to below the Recommended Maximum Levels. Offsite mitigation measures must be completed as soon as practicable.			
EPR- NV14	**Underwater Noise: Detailed Design** ~~Consider~~ Implement measures to reduce underwater noise associated with best practice operational requirements of ~~the operation~~ of the FSRU in the detailed design of the discharge ports in consultation with the EPA.	Design and construction		Incorporated Document, Consent under the MAC Act, Works Approval

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
EPR-NV15	**Underwater Noise: Ambient Noise Study** Conduct an ambient noise study in consultation with the EPA, which must: • be conducted for a period of ~~1 month~~ six months using a moored autonomous recorder at a ~~fixed location~~ number of fixed locations around Crib Point and the North Arm, including a reference site. • determine the Power Spectral Density (PSD) percentiles for the acoustic environment for the monitoring period • include the arrival, and departure of a petroleum tanker, representing current port operations. • assess the sensitivities of individual marine species to underwater noise, including fish, penguins, seals, dolphins and whales.	Design and construction		Incorporated Document, Consent under the MAC Act, Works Approval
EPR-NV16	**Underwater Noise: Post-Construction Monitoring and Assessment** Conduct a post-construction monitoring program in consultation with the EPA that must characterise the typical soundscape of the Port, for at least 12 months from the Project commencing. ~~along with a full cycle of operation of the FSRU and LNG cargo delivery. Conduct the monitoring program for a period of one month~~ Monitoring will occur using a moored autonomous recorder at a fixed location. Prepare an updated Underwater Noise Impact Assessment if the post-	Operation		Incorporated Document, EPA licence for the operation of the FSRU

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	construction monitoring program records higher noise levels than modelled in the Underwater Acoustic Modelling Report (Jasco Applied Sciences, 11 June 2020) which: • has regard to the results of the ambient noise study • assesses the impact of the measured underwater noise from the operation of the FSRU on marine ecology; particularly FFG listed species or species considered as MNES expected to frequent the North Arm, including penguins, seals, dolphins and whales. • ~~and~~ identifies any mitigation or operational measures necessary to ensure acceptable outcomes.			
MARINE BIODIVERSITY EES evaluation objectives: • To avoid, minimise or offset potential adverse effects on native flora and fauna and their habitats, especially listed threatened 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.				
EPR-ME01	**Design of intake, velocity and screening grilles** Design the intake of the FSRU in consultation with the EPA to be	Operation	ME1 ME2 ME3 ME4 ME5A ME5B ME6NNE ME6NA ME6EPB ME7 ME8	Incorporated Document, Consent under the MAC Act, Works Approval, EPA licence for the operation of the

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	consistent with the requirements of any Works Approval, as follows • provide the screening grille with spaces not exceeding 100 millimetres by 100 millimetres in the vertical dimension to prevent larger organisms such as penguins and large fish from entering the intake and becoming trapped, injured or killed • ensure water is taken in horizontally, to allow fish and other free-swimming marine biota to sense the intake current and swim away from the intake • limit the intake velocity to 0.15 m/s at peak production so that fish and other biota can swim away from the intake without becoming impinged or entrained • be at least 2 metres below the water surface level and at least 3 metres above the seabed, taking account of tides and different loading levels of the FSRU.		ME9	FSRU, Approval under the EPBC Act
EPR-ME02	**Seawater discharge** ~~Option 1 –~~ **Varying chlorination rate at point of discharge** Except as approved or required by the EPA, the OEMP must include requirements that seawater discharges from the regasification system must: a. have a chlorine residual concentration of up to 0.1mg/L other than	Operation		Incorporated Document, Consent under the MAC Act, EPA licence for the operation of the FSRU, Approval under the EPBC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	at Slack Tide b. have a chlorine residual concentration of 0mg/L during Slack Tide c. not exceed a tidally averaged chlorine residual concentration of 0.0022mg/L beyond a distance of 100 metres from the FSRU d. not exceed a temperature variation of 7°C from ambient Note: As a conservative approach, the time of Slack Tide is ~~half an hour~~ considered two hours either side of high tide or low tide at Crib Point. High tide and low tide at Crib Point are to be calculated by reference to the BOM Victorian Tide Tables or other source to the satisfaction of the EPA. Each tide is to be recorded by the FSRU operator against measured discharged chlorine concentrations and temperature. Results are to be submitted to the EPA monthly. ~~Option 2 – Constant chlorination rate at point of discharge~~ ~~Except as approved or required by the EPA, the OEMP must include requirements that seawater discharges from the regasification system must:~~ ~~a. have a chlorine residual concentration of 0.02mg/L~~ ~~b. not exceed a tidally averaged chlorine residual concentration of 0.0022 mg/L beyond a distance of 100 metres from the FSRU;~~ ~~c. not exceed a temperature variation of 7°C from ambient.~~			

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EPR-ME03	**Limit seawater regasification flows between August and February** Minimise potential entrainment impacts and operate the FSRU at a 14-day moving average (mean) regasification seawater flow not exceeding 312,000 m^3 per day between August and February (inclusive), except as otherwise required by the EPA, and subject to further marine studies demonstrating acceptable impacts during August to the satisfaction of the responsible authority, following consultation with the EPA.	Operation	ME5A, ME25, ME35	Incorporated Document, Consent under the MAC Act, EPA licence for the operation of the FSRU, Approval under the EPBC Act
EPR-ME04	**Use 6 port design to increase mixing** Design the FSRU with a six discharge port configuration to optimise dilution and minimise thermal differences. Locate the discharge ports above the seawater inlets which must be spaced at a minimum distance of 10 metres. Discharge of wastewater from the six high velocity discharge ports must not occur when an LNG carrier is moored adjacent to the FSRU and for one hour before or after slack tide.	Operation	ME10, ME11, ME12, ME13, ME14, ME15, ME16, ME17, ME18, ME19, ME30, ME31, ME32, ME33, ME34, ME35, ME36, ME37, ME38, ME39, ME40	Incorporated Document, Consent under the MAC Act, EPA licence for the operation of the FSRU, Approval under the EPBC Act, Safety case for a Major Hazard Facility (MHF) (subject to amendment of OHS Regulations)
EPR-ME05	**High velocity discharge to increase dilution** Discharge seawater from the FSRU at high velocity no less than 5 m/s to facilitate mixing and increase dilution.	Operation	ME20, ME21, ME22, ME23, ME24, ME25, ME26, ME27, ME28, ME29	Incorporated Document, Consent under the MAC Act, EPA licence for the operation of the FSRU, Approval under the EPBC Act

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EPR-ME06	**Port of Hastings Handbook** Ensure all vessels comply with the Port of Hastings Development Authority Safety and Environmental Management Plan and Port Operating Handbook.	Operation	ME41, ME42, ME43, ME44, ME47,	Incorporated Document, Consent under the MAC Act, PoHDA approval of the SEMP and SMS for the port operations aspects of the FSRU, and integration of these requirements into the PoHDA whole of Port of Hastings SEMP
EPR-ME07	**Compliance with the Port of Hastings environment management plan, regulations and policies** Ensure the operation of the FSRU and LNG carriers proposed to enter, moor and depart the Port of Hastings are consistent with present and past operations within the Port. Operation must comply with all Port and State environmental guidelines, regulations and environmental management plans.	Construction and Operation	ME45, ME46, ME49, ME50	Incorporated Document, Consent under the MAC Act, PoHDA approval of the SEMP and SMS for the port operations aspects of the FSRU, and integration of these requirements into the PoHDA whole of Port of Hastings SEMP
EPR-ME08	**No unauthorised cleaning** Undertake hull cleaning and propeller polishing in accordance with the PoHDA and Harbour Master requirements.	Operation	ME44	Incorporated Document, Consent under the MAC Act, EPA licence for the operation of the FSRU
EPR-ME09	**FSRU mooring and operation within dredged area**	Operation	ME45, ME46,	Incorporated Document, Consent under the MAC Act,

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	Moor and operate the FSRU within an area that has been dredged in the past to create and develop the Port.			EPA licence for the operation of the FSRU
EPR-ME10	**Class and IMO standards** Design and construct the FSRU and LNG carriers to be compliant with shipping class and International Marine Organisation standards.	Design and construction	ME47	Incorporated Document, Safety case for a MHF
EPR-ME11	**LNG carriers pilotage** Operate vessels by experienced captains only and at speeds less than the maximum allowed vessel speed.	Operation	ME47	Incorporated Document,
EPR-ME12	**Limiting lights to the number for safe operations** Limit lights to the number for safe operations. Reduce direct light spill where possible, subject to meeting navigation and vessel safety standards.	Operation	ME48,	Incorporated Document, Consent under the MAC Act, Safety Case for a MHF
EPR-ME13	**Appropriate antifoul, cleaning and inspection** Ensure FSRU and LNG carriers are protected with approved use antifoul and inspected by biofouling/IMS inspectors. Clean vessels at appropriate intervals.	Operation	ME49, ME50	Incorporated Document, Consent under the MAC Act, EPA licence for the operation of the FSRU

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
EPR-ME14	**Exclusion zone around FSRU** Establish a vessel exclusion zone that extends for 100 metres from the FSRU and any moored LNG carriers.	Operation	ME51	Incorporated Document, Consent under the MAC Act, approval of the exclusion zone under the Marine Transport and Offshore Facilities Act
EPR-ME15	**Speed restrictions and Master watches for whales** Ensure FSRU and LNG carriers comply with the maximum allowed vessel speeds and operational instruction if a marine mammal is encountered.	Operation	ME52	Incorporated Document, Consent under the MAC Act, PoHDA approval of the SEMP and SMS for the port operations aspects of the FSRU, and integration of these requirements into the PoHDA whole of Port of Hastings SEMP
EPR-ME16	~~Monitoring program~~ ~~Prepare a marine monitoring program in consultation with the EPA and include it in the Gas Import Jetty Works Operational Environmental Management Plan. Design the monitoring program in collaboration with a statistician and marine ecologist.~~ ~~Include the following measures in the monitoring program, having regard to the relevant objectives for each measure, consistent the requirements of any EPA works approval or licence:~~	Operation	ME5A	Incorporated Document, Consent under the MAC Act, EPA licence for the operation of the FSRU

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	~~1. Monitor Rates and Characteristics of all discharges. Require monitoring and recording of the flow rate, temperature and residual chlorine concentration of all major discharges, excluding minor discharges such as fire water, water curtain and ballast water.~~ ~~2. Plankton Survival Study. Collect plankton samples on the seawater intake and discharge of the FSRU and analyse the samples to determine the percentage of zooplankton and fish larvae survival. Collect and analyse Plankton samples once every quarter for a period of three years (12 sampling events in total).~~ ~~3. Seabed Biota Monitoring in Port Area. Undertake baseline and post-commissioning surveys every six months for three years of benthic fauna abundance, diversity and composition to detect if there are any significant changes to infauna communities in the Port area and within North Arm.~~ ~~4. Water Quality Sampling. Monitor seawater at six sites down-current of the FSRU and at reference sites to accurately determine chlorine produced oxidants (CPO) concentration and temperature change as a result of FSRU operation every quarter for three years. Collect replicate samples for quality control.~~ ~~5. Transplanted Mussel Monitoring. Deploy 10 sets of mussels at different sites, for example, at 100 metres, 200 metres, 400 metres, 800 metres and 1,500 metres to the north and south of the FSRU twice a year for three years for 21 days for each monitoring period. Retrieve mussels and analyse for chlorinated~~			

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	~~organics at the end of each 21 day period.~~ Monitoring program Prepare a marine monitoring and adaptive management plan in consultation with the EPA and include it in the Gas Import Jetty Works Operational Environmental Management Plan. Design the monitoring and adaptive management program in collaboration with a statistician. Include the collection of scientifically rigorous baseline data against which change will be measured in the plan. The plan will outline triggers and responses to mitigate impact from the operation of the FSRU. The plan will include the following measures in the monitoring and adaptive management plan, having regard to the relevant objectives for each measure, and subject to any additional requirements of any EPA works approval or licence: 1. Monitor Rates and Characteristics of all discharges. Require monitoring and recording of the flow rate, temperature and residual chlorine concentration of all major discharges, excluding minor discharges such as fire water, water curtain and ballast water. Conduct monitoring routinely within the FSRU immediately prior to discharge into the marine environment. Regularly analyse the defined mixing zone for temperature, chlorine and TBP. Keep a record of all discharges to confirm the discharge rate and			

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	chlorine concentration are within the limits licenced by EPA. (The objectives are to keep a record of all discharges, confirm that the discharge rate and chlorine concentration are within the values set out in EPA licences and, if not, provide the trigger for remedial action.) 2. Plankton Survival Study Repeat the baseline phytoplankton, zooplankton and ichthyoplankton surveys in line with the methodologies in the EES, with increased temporal and spatial sampling to understand intra-diurnal and intra monthly variability. Post commissioning: Collect samples of plankton, including phytoplankton, zooplankton and fish larvae monthly from the seawater intake and discharge of the FSRU and analyse the samples to determine the intake numbers and percentage of zooplankton and fish larvae survival. Assess the morphological condition of plankton sampled from the discharge. Collect Plankton samples at the intake and discharge ports and analysed monthly for a period of no less than three years. Sample phytoplankton, zooplankton and fish larvae and analyse at a distance of 200 metres, 500 metres and 1000 metres north and south of the FSRU at nominated reference sites. (The EES risk assessment is based on the conservative assumption of 100 per cent loss of small biota that is entrained in the FSRU. The			

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	objective of this task is to establish whether a smaller loss might actually occur in practice, so the effect of the Project on primary productivity in North Arm is less than calculated.) 3. Jetty and Seabed Biota Monitoring in Port Area Conduct monthly baseline surveys of the Jetty and seabed biota for twelve months prior to commissioning the FSRU. Undertake post-commissioning surveys every three months for three years of benthic biota abundance, diversity and composition to detect if there are any significant changes to Jetty biota, seabed epibiotic and infauna communities in the Port area and within North Arm. Ensure the EPA reviews and advises on any need for ongoing monitoring following the initial three years. Conduct surveys every 100 metres from the FSRU extending one kilometre from the Jetty. Commence locations at the seabed immediately below the FSRU and at each cardinal point based on benthic habitat. Select two reference sites based on similar benthic habitat remote from Crib Point, to be sampled at the same frequency. ~~(The objective is to check whether the impact on infauna is less or more than the impact predicted in the EES from the combined area of chlorine and temperature change on the seabed near Berth 2.)~~ (The objective is to understand the Jetty biota, and check whether the predicted impacts to the seabed and infauna assemblages are less or more than the impact predicted in the EES from the combined area of			

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	chlorine and temperature change on the seabed near Berth 2.) 4. Water and Sediment Quality Sampling Conduct a baseline assessment of CPO residual by-products in waters around Crib Point. Monitor seawater every month for a period of three years to accurately determine chlorine produced oxidants (CPO) and reactive by-products and temperature change due to the FSRU operation at nominated distances from the FSRU, or otherwise agreed by the EPA. Collect and analyse sediment for residual chlorine and residual by-products, particularly tribromophenol to a detection limit of 0.01 mg/kg sediment, unless a lower detection limit can be achieved. Collect water and sediment samples at distances: • 0m, 40m, 100m and 500m east and west of the FSRU • 0m, 40m, 200 m, 500m and 1000m north and south of the FSRU. Apply appropriate quality control sampling in accordance with the EPA requirements. (The objective is to check whether the predicted extent of chlorine concentration and the temperature anomaly matches the EES predictions and, if a greater extent, what corrective action should be taken to limit the extent. The distribution of CPO can be calculated			

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	from the measured extent of temperature.) 5. Transplanted Mussel Monitoring Deploy mussels at different sites, (100, 200, 400, 800 and 1,500 metres to the north and south of the FSRU and 200 and 500 metres west). Subsample ten mussels every month from each location and analyse these for chlorine by-products, including brominated and chlorinated organics. Continue sampling at all locations if chlorine is measured in mussel tissue. (The objective is to check whether there is measurable or significant accumulation of chlorinated or brominated organics in biota. Mussels are recognised as an appropriate method to accumulate any collect chlorinated organics (if present) for analysis. If there are elevated levels (e.g. exceeding background levels at reference sites) then a review of chlorination rates and procedures must be undertaken.) 6. Ecotoxicology testing to determine chronic exposure Conduct ecotoxicity testing exposing endemic marine invertebrate and fish species (eg. sea urchins, gastropods, polychaete worms) to chlorine under chronic conditions prior to commissioning the FSRU. Develop tests in consultation with the EPA and a laboratory accredited to conduct toxicity tests. Perform the tests targeting lethal and sublethal impacts exposing early stage and juvenile life forms to chlorine and cold water, consistent with worst case exposure scenarios likely from the FSRU discharge. Ecotoxicity testing must be conducted for a			

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	minimum of seven days. (The objective is to validate the GV of 2 mg/L derived by Batley and Simpson (2019), confirm impacts of CPO under chronic exposure and determine the relevant time averaged concentration at the edge of the mixing zone.) 7. Intertidal surveys Survey seagrass and intertidal mudflats along transects extending 500m north and south of Crib Point Jetty at 100m intervals. Commence surveys at the high tide mark and cease at the furthest extent of seagrass. Conduct surveys every two months for 12 months before the FSRU commences operation and continue for the life of the Project once commissioned. (The objective is to develop a baseline dataset of intertidal ecological conditions at Crib Point prior to the Gas Import Jetty Works commencing. The baseline dataset will be used as a benchmark to assess changes in the condition of intertidal ecology that may occur from the Gas Import Jetty Works.) 8. Marine mammals and fish surveys Survey the distribution and diversity of pelagic and demersal fish species using Crib Point every month for twelve months, with particular focus on recreational and commercial fish. Conduct targeted surveys of marine megafauna species over 24			

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	months to better understand temporal and spatial distribution and likely habitat use of the North Arm and Crib Point. (The objective is to develop a baseline dataset of marine mammals and fish in the vicinity of Crib Point. The baseline will be used as a benchmark to assess for changes in the behaviour, distribution and abundance of marine fauna resulting from the Gas Import Jetty Works.) 9. Marine pest monitoring Conduct marine pest and invasive species monitoring twice a year at the beginning of winter and summer each year for the life of the Project at the Crib Point Jetty, HMAS Otama, and Stony Point Jetty. (The objective is to assess the presence or otherwise of exotic marine organisms around the Gas Import Jetty Works area and understand baseline conditions. Ongoing monitoring for the life of the Gas Import Jetty Works can assist with proactive management and mitigation to avoid infestation of marine pests and invasive species from Crib Point.)			

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SAFETY, HAZARD AND RISK EES evaluation objective: **TO PROVIDE FOR SAFE AND COST-EFFECTIVE AUGMENTATION OF VICTORIA'S NATURAL GAS SUPPLY SOCIAL** • EES evaluation objective: To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.in the medium to longer term. • To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.				
EPR-HR01	**Gas Import Jetty Works safety standards** Design, construct and operate the Gas Import Jetty Works to meet relevant safety standards. Design, operate and maintain the FSRU to comply with and retain an appropriate Class Notation.	Design, Construction and Operation	No environmental risk assessment was undertaken as part of this study. In the context of the safety, hazard and risk assessments, risk is distinct from the environmental risks assessed in the other EES technical studies.	Incorporated Document, Consent under the MAC Act, Safety Case for FSRU as a MHF and Safety Case for Gas Import Jetty Works (exc FSRU)
EPR-HR02	**Process control system and automated emergency shutdown systems** Monitor the operation of the Gas Import Jetty Works using high integrity process automation and shutdown systems in accordance	Design and Operation	No environmental risk assessment was undertaken as part of this study. In the context of the	Incorporated Document, Consent under the MAC Act, Safety Case for FSRU as a MHF and Safety Case for Gas Import Jetty Works (exc

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	with safety requirements.		safety, hazard and risk assessments, risk is distinct from the environmental risks assessed in the other EES technical studies.	FSRU)
EPR-HR03	**Fire Protection** Provide the FSRU and LNG carriers with onboard fire protection and suppression systems, in accordance with the relevant class notation. Provide active fire protection and suppression for liquid fires and gas fires on the Jetty in compliance with Australian Standards. Design the diesel fuel supply for six hours of firewater per pump, with two x 100% firewater pumps. Design the system as a dry pipe (i.e. no requirement for a jockey pump to maintain pressure), and for saltwater service, providing an unlimited supply of water. Provide fire and gas detection along the gas piping on the Jetty.	Design and Operation	No environmental risk assessment was undertaken as part of this study. In the context of the safety, hazard and risk assessments, risk is distinct from the environmental risks assessed in the other EES technical studies.	Incorporated Document, Consent under the MAC Act, Safety Case for FSRU as a MHF and Safety Case for Gas Import Jetty Works (exc FSRU)
EPR-HR04	**Dangerous goods** Store and handle dangerous goods at the Crib Point Receiving Facility and on the Jetty, as defined by the Australian Dangerous Goods Code, and flammable and combustible liquids in accordance with the	Construction and Operation	No environmental risk assessment was undertaken as part of this study. In the context of the	Incorporated Document, Consent under the MAC Act, Safety Case for FSRU as a MHF and Safety Case for Gas Import Jetty Works (exc

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	Dangerous Goods Act 1985, Dangerous Goods (Storage and Handling) Regulations 2012, EPA Victoria Publication 1698 – Liquid Storage and Handling Guidelines and all relevant Australian Standards including but not limited to the requirements of: • AS1940 – The storage and handling of flammable and combustible liquids • AS1210 – Pressure vessels • AS4343 – Pressure equipment – hazard levels • AS3846 – The handling and transport of dangerous cargoes in port areas • AS2941 – Fixed fire protection installations – pumpset systems • AS/NZS60079 – Explosive atmospheres. Store and handle Dangerous Goods on the FSRU in accordance with international maritime requirements including the **Det Norske Veritas** (DNV) classification and all relevant certifications.		safety, hazard and risk assessments, risk is distinct from the environmental risks assessed in the other EES technical studies.	FSRU)
EPR-HR05	**Monitoring of chemical and fuel storage facilities** Undertake routine visual monitoring and recording of chemicals and fuel storage facilities.	Construction and Operation	No environmental risk assessment was undertaken as part of this study. In the context of the safety, hazard and	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
			risk assessments, risk is distinct from the environmental risks assessed in the other EES technical studies.	
EPR-HR06	**Emergency response plans** Develop and implement emergency response plans, including for spills, for both the construction and operations phases of the Project.	Construction and Operation	No environmental risk assessment was undertaken as part of this study. In the context of the safety, hazard and risk assessments, risk is distinct from the environmental risks assessed in the other EES technical studies.	Incorporated Document, Consent under the MAC Act, PoHDA approval of the SEMP and SMS for the port operations aspects of the FSRU, and integration of these requirements into the PoHDA whole of Port of Hastings SEMP
EPR-HR07	**Site Safety Advisor** Appoint a suitably competent and qualified person as Site Safety Advisor during construction. Maintain and have available a set of the relevant safety data sheets (SDS) for hazardous and dangerous materials on site at all times.	Construction	No environmental risk assessment was undertaken as part of this study. In the context of the safety, hazard and risk assessments,	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
			risk is distinct from the environmental risks assessed in the other EES technical studies.	
SOCIAL EES evaluation objective: To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.				
EPR-SO01	**Consultative mechanism for information and enquiries** Develop a consultative mechanism to: • make the results of environmental monitoring available to the community • allow for contemporaneous updates to communication of noise monitoring during out of hours construction activities • make information relating to potential risks to human health and safety available to the public as required ~~(see EPR-SO04)~~ • enable residents and the community (including relevant Councils, government authorities, adjoining affected landowners and businesses and other community groups directly impacted by the Project) to make enquires, lodge complaints etc. during	Construction and Operation	A risk assessment was not undertaken as part of this impact assessment	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	construction ~~(see EPR SO05).~~			
EPR-SO02	**Woolleys Beach North** Consult with the Crib Point Stony Point Committee of Management Inc, stakeholders and the community to identify a suitable foreshore location and provide appropriate recreational infrastructure that accommodates activity displaced from Woolleys Beach North (immediately south of the Jetty). All costs are to be borne by the Proponent and are to be funded separately from the Community Fund.	Construction and operation	A risk assessment was not undertaken as part of this impact assessment	
EPR-SO03	**Source local workers** Develop a local procurement plan that focuses on Mornington Peninsula Shire, with targets for local employment and social procurement for the Project and its contractors. ~~Report back on the plan targets and performance through one of the reporting mechanisms already proposed for the Project.~~ Provide a status report on the employment of local workers to Council and in the Stakeholder Engagement Management Strategy on an annual basis for the construction phase of the Project and then annually for its first five years of operation.	Construction and Operation	A risk assessment was not undertaken as part of this impact assessment	Incorporated Document, Consent under the MAC Act
EPR-SO04	**Community fund**	Construction and	A risk assessment	Incorporated Document

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	Resolve detailed arrangements for the community fund to the value of $7.5 million in partnership with Mornington Peninsula Shire Council and relevant community stakeholders. In particular, there must be community led involvement in: • identifying a Committee of Management drawn from the Crib Point and Hasting areas. • selecting which communities will benefit from the programs and projects to be funded. • selecting appropriate projects and activities. • identifying how the fund will be established, managed and governed. • devising and implementing processes to monitor and evaluate the fund's effectiveness in addressing socio-economic disadvantage and offsetting adverse social impacts. Appoint an independent facilitator to assist the establishment of the community fund and its governance. The operation of the fund should commence as soon as all relevant permissions are finalised to commence construction of the Project and should conclude within ten years from commencement. (The costs of administering the community fund, including the funding of the independent facilitator must be borne by the Project	Operation	was not undertaken as part of this impact assessment	

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	proponent, separate to the $7.5 million.)			
EPR-SO05	**Stakeholder Engagement Management Strategy** Prepare a Stakeholder Engagement Management Strategy to facilitate ongoing consultation between the proponent and the community (including relevant Councils, government authorities, adjoining affected landowners and businesses and other community groups directly impacted by the Project). The Stakeholder Engagement Management Strategy will be a requirement of the EMP for the Gas Import Jetty Works. The Stakeholder Engagement Management Strategy must: • be coordinated with the Consultation Plan being prepared for the Pipeline Licence • identify people and stakeholders to be engaged during the design and construction phases • set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the Project • identify opportunities to provide information regularly about construction activities, schedules and milestones • detail the measures for advising the community and stakeholders in advance of upcoming works (where necessary)	Design, Construction and Operation	B1, B2	Incorporated Document

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	• set out procedures and mechanisms for engaging with relevant council(s) and government authorities/agencies • set out procedures and mechanisms: ○ through which the community can discuss or provide feedback to the Proponent ○ through which the Proponent must respond to complaints, enquiries or feedback from the community ○ to resolve any issues and mediate any disputes that may arise in relation to environmental management and delivery of the Project ○ include commentary about the Complaints management system and provide a hyper-link to that document. Implement the Stakeholder Engagement Management Strategy for the duration of the construction works and for 12 months following completion of construction.			
EPR-SO06	**Complaints management system** Establish a complaints management system consistent with Australian Standard AS/NZS 10002: 2014 Guidelines for Complaint Management in Organisations that documents:	Construction and Operation		Incorporated Document

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	• name of persons receiving complaint • name of person or stakeholder making the complaint • location, date and time of complaint. • nature of the complaint • actions taken to rectify • actions to avoid and minimise risk of reoccurrence • name of person(s) responsible for undertaking the required actions • communication of response to the complaint. Report details on the performance of the complaints management system through both the channels used for EPR-SO01 and the Project website. Reporting must include the number of complaints received within the reporting period, how the complaints were reconciled and closed out, why complaints could not be reconciled and broad themes for the complaint categories (for example, noise, environment, traffic).			

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SURFACE WATER EES evaluation objective: 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.				
EPR-SW01	**Managing runoff** a) Place flow diversion banks upstream of the spoil material if required. b) Construct an overflow spillway to allow runoff from external catchments to pass over the spoil material at a controlled location without causing erosion. c) Divert stormwater from the upstream catchment around construction activities associated with the Receiving Facility and manage any potential sediment laden runoff from the site in accordance with EPA Publication 1834 *Civil construction, building and demolition guide* and the International Erosion Control Association's *Best Practice Erosion and Sediment Control.*	Construction	HD2, HD4	Incorporated Document, Consent under the MAC Act, Approval under the EPBC Act
EPR-SW02	**Fuel and chemical storage** Implement the following measures to ensure that fuel and chemical	Construction and Operation	HD5, HD8	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	storage is safe and spilt liquids do not cause environmental harm: a) Minimise fuels and chemicals stored on site. b) Ensure fuels and chemicals are not stored close to surface waters. c) Install bunds or other appropriate containment methods for stored liquids. d) Store and handle dangerous goods, and monitor storage facilities to comply with EPR-HR04, EPR-HR05.			
EPR-SW03	**Spills prevention and management** Ensure spill kits are available at locations where machinery/plant are operating, refuelling points and fuel and chemical storage locations. Render spills of hazardous materials safe, and where required, ensure they are collected and transported by licenced waste contractors for disposal at appropriately licenced facilities, including cleaning materials, absorbents and contaminated soils. Ensure staff training includes spill management procedures. Develop emergency response plans for spills to comply with EPR-HR06.	Construction and Operation	HD5, HD8, C11, C13	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
EPR-SW04	**Refuelling of vehicles and mobile machinery** Refuelling of vehicles and machinery (excluding handheld machines) must: a) Be undertaken with appropriate measures to contain spills. b) Utilise auto shut off valves. c) Not occur within 50m of a watercourse.	Construction	HD5, HD8, C11, C13	Incorporated Document, Consent under the MAC Act
EPR-SW05	**Facilities design** Design permanent surface structures, including the Crib Point Receiving Facility to maintain existing overland flow paths and not result in increased flood levels upstream of the site.	Design	HD7	Incorporated Document, Consent under the MAC Act
EPR-SW06	**Water Sensitive Urban Design (WSUD) treatments** Incorporate WSUD treatments into the site design for the Crib Point Receiving Facility to capture surface runoff and reduce pollutants in accordance with the *Best Practice Environmental Management Guidelines* (CSIRO 1999).	Design	HD9	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
TERRESTRIAL AND FRESHWATER BIODIVERSITY EES evaluation objectives: • To avoid, minimise or offset potential adverse effects on native flora and fauna and their habitats, especially listed threatened 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.				
EPR-FF01	**Unplanned vegetation loss** Clearly demarcate and identify the approved vegetation clearing extent, including retained environmental features within the construction footprint, during the construction stage as follows: a) Erect para-webbing, bunting and signage, construction fencing or fauna-specific temporary fencing in any areas of special concern noted during pre-clearance inspections. b) Erect bunting in any areas of native vegetation, as well as habitat features to be retained within the construction footprint. c) Install survey pegs in remaining areas of cleared or non- native vegetation.	Construction	FF1, FF2, FF3, FF4, FF5, FF6, FF7, FF15, FF18, FF19, FF20, FFO5, FFO8	Incorporated Document, Consent under the MAC Act
EPR-FF02	**Invasive weeds, pests, pathogens and waste**	Construction and	FF2, FF3, FF11, FF12,	

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	Implement the following measures to manage biosecurity risks: a) Satisfy Australian Quarantine and Inspection Service (AQIS) regulatory requirements for any vehicles and equipment sourced from overseas. b) Inspect and certify all vehicles and construction machinery upon arrival at site. Vehicles and construction machinery cannot access the construction area until certified as clean. c) Ensure vehicles and construction machinery must not go outside of the construction footprint or approved roads and tracks unless undertaking survey or property management activities as agreed with the landowner. d) Manage waste in accordance with EPR-C06 (construction waste management) and ERP-C07 (operation waste management), which will require provision of lidded refuse containers to prevent fauna access, and their appropriate monitoring and removal. e) Ensure any topsoil imported for maintenance is of an appropriate quality.	operation	FF16, FF17, F19, FF20, FFO5	
EPR-FF03	**Contractor awareness** Ensure all Project personnel attend an induction that outlines environmental management requirements. This must include information on the biodiversity values of the Project study area,	Construction and Operation	FF2, FF3, FF5, FF10, FF11, FF12, FF15, FF16, FF17, FF18, FF19, FF20, FFO5, FFO6	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	specifically areas of threatened flora and fauna habitat.			
EPR-FF04	**Topsoil management** Implement the following mitigation measures to manage topsoil: a) Clear vegetation prior to stripping of topsoil. b) Strip topsoil across the construction footprint to maximum depths determined during pre-construction surveys. c) Ensure topsoil is not stripped when saturated. d) Stockpile stripped topsoil separately from woody material and subsoil stockpiles. e) Ensure topsoil stockpile heights do not exceed two metres. f) Leave appropriate intervals in the linear topsoil stockpiles for drainage and for the movement of vehicles and fauna through the site. g) Clearly signpost topsoil stockpiles. h) Ensure topsoil is not used as a padding material. i) Respread stockpiled topsoil over the construction footprint to a minimum depth of 100mm, or to the depth that topsoil was stripped if this was less than 100mm to areas which have not	Construction	FF4, FF6, FF13, FF16, FF17	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	been converted to hardstand. j) Ensure topsoil is not respread for rehabilitation when saturated.			
EPR-FF05	**Injury and/or disturbance to fauna** Ensure a suitably qualified wildlife handler is present for clearing woody vegetation and stockpiles to: a) Inspect habitat in advance of clearing. This must include a walk-through/visual inspection of the habitat to be removed immediately prior to clearance to flush out fauna and capture and relocate. b) Advise on clearing techniques that minimise fauna impact. c) Keep records of important fauna interactions, listing the species concerned, the nature of the interaction and GPS coordinates. Include fauna management standards in the Gas Import Jetty Works EMP. Develop a specific protocol in consultation with Mornington Peninsula Shire for clearing Swamp Skink and Glossy Grass Skink habitat, which refers to the management activity guidelines developed by Robertson and Clemann (2015) for Swamp Skink. This protocol must be included as a management standard in the Gas	Construction and Operation	FF8, FF19, FF20, FF21, FFO1, FFO6	Incorporated Document, Consent under the MAC Act, Approval under the EPBC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	Import Jetty Works EMP. Manage noise impacts to fauna in accordance with EPR-NV02 (managing noise from construction activities). Manage noise produced by the operational Gas Import Jetty and FSRU in accordance with EPR-NV13 (post- commissioning measurements), to confirm compliance with Recommended Maximum Levels.			
EPR-FF06	**Migratory birds** ~~and marine fauna~~ Develop an adaptive management framework for inclusion in the OEMP with methods to detect and respond to any documented impacts on migratory birds and/or Ecological Character of the Ramsar site. The framework will include triggers for implementing adaptive management to reduce impacts in the event data collected from the surveys indicates a change in the numbers of birds post-operations compared with baseline data collected for the first two years in areas closest to the Project. ~~Prepare and implement~~ Include an artificial light management plan in the OEMP in accordance with the National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds (Commonwealth of Australia, 2020) including applying Best Practice Lighting Design Principles (as described in the Guidelines). Ensure the artificial light management plan includes the following	Operation	FF19, FF20, FFO6	Incorporated Document, Consent under the MAC Act, Approval under the EPBC Act, EPA licence for the operation of the FSRU

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	requirements: a) Complete additional surveys ~~per year~~ in November, December, January and February (consistent with existing surveys), for a period of at least ~~one~~ two years prior to and at least ~~two~~ four years after operation of the FSRU commences, ~~of~~ at Crib Point and nominated locations throughout the whole of Western Port in spring-summer (in addition to the survey that is already completed in early summer). b) Analyse and publish the data collected from the surveys on the project website. c) Further investigate the impact to the Project and mitigation measures to be established and implemented where the data collected from the surveys indicates a negative (statistically significant) change in the numbers of birds post-operations in areas closest to the Project compared with more distant areas.			
EPR-FF07	**Surface water sedimentation and runoff** Include erosion and sediment controls in the Gas Import Jetty Works EMP and ensure they will follow EPA Victoria publication 1834 – Civil construction, building and demolition guide.	Construction and Operation	FF19, FF20	Incorporated Document, Consent under the MAC Act, Approval under the EPBC Act
EPR-FF08	**Surface water contamination** Store and handle dangerous goods at the Crib Point Receiving	Construction and operation	FF19, FF20, FF24, FFO4	Incorporated Document, Consent under the MAC Act,

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	Facility and on the Crib Point Jetty, as defined by the Australian Dangerous Goods Code, and flammable and combustible liquids in accordance with all relevant Australian Standards and in accordance with EPR-SW02 (fuel and chemical storage). Undertake the following additional measures: a) Undertake routine visual monitoring and recording of chemicals and fuel storage facilities. b) Undertake refuelling and maintenance of vehicles and machinery in accordance with EPR-SW04 (refuelling of vehicles and mobile machinery) and EPR-C05 (fuel and chemical leaks/spills) to minimise the potential for leaks or spills to occur. c) Ensure spill kits are available at locations where machinery/plant are operating, refuelling points and fuel and chemical storage locations and managed in accordance with EPR-SW03 (spills). d) Manage waste in accordance with EPR - C06 (construction waste management) and EPR- C07 (operation waste management). Store and handle Dangerous Goods on the FSRU in accordance with international maritime requirements including the DNV classification and all relevant certifications.			Approval under the EPBC Act
EPR-FF09	**Lighting impacts to fauna**	Construction	FF4, FF19, FF20, FF23,	Incorporated Document, Consent under the MAC Act,

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	Manage light generated during construction and operation in general accordance with the guidance measures described in the *National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds*. Include an artificial light management plan in the OEMP which contains monitoring requirements and an adaptive management framework to ensure proposed lighting continues to be managed to avoid significant impacts to fauna, particularly threatened and migratory species.		FFO1, FFO6	Approval under the EPBC Act
EPR-FF10	**Dust impacts to flora/fauna** Undertake management of construction activities in accordance with EPA Victoria publication 1834 – Civil construction, building and demolition guide in respect to dust, odour and construction vehicle emissions to minimise amenity impacts during construction. In accordance with EPR-AQ01, suppress dust at construction sites using water sprays, water carts or other devices on unpaved work areas, sand, spoil and aggregate stockpiles and during the loading and unloading of dust generating materials. Restrict vehicle movements to within designated access paths, turning circles and the construction footprint, in accordance with EPR-AQ02 (restricted vehicle movements). Monitor weather conditions and dust in accordance with EPR-AQ04	Construction	FF19, FF20, FF25	Incorporated Document, Consent under the MAC Act

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	(weather monitoring) and EPR-AQ05 (dust monitoring).			
TRAFFIC AND TRANSPORT EES evaluation objective: • 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.				
EPR-TP01	**Traffic Management Plan (TMP)** Prepare and implement a Traffic Management Plan for construction by an appointed contractor for approval by the relevant local government authorities and VicRoads. Inform the TMP by the Road Safety Audit required by TP03. Include specific measures in the TMP for discrete components or stages of the works having the potential to impact on roads, shared use paths, bicycle paths, footpaths or public transport infrastructure. Coordinate the TMP with the TMP for the construction of the Crib Point to Pakenham gas pipeline. Include a number of sub-plans in the TMP, including: • Public Transport Disruption Management sub- plan	Construction	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, B1	Incorporated Document

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	• Car Parking Management sub-plan • pedestrian and cyclist connectivity.			
EPR-TP02	**Stakeholder and consultation on transport changes** Carry out stakeholder consultation and give advance notice, by letter, to affected residents, business or industries, prior to commencement of works and any temporary road closures. Coordinate this consultation with consultation for the construction of the Crib Point to Pakenham gas pipeline. Establish stakeholder engagement and communications strategies in the TMP and the Stakeholder Engagement Management Strategy for the Project. Stakeholders may include local councils, road authorities, business operators and residents, among others.	Construction and Operation	TP2, TP4, TP5, TP6, TP7, TP10	Incorporated Document
EPR-TP03	**Road Safety Audit** Design and construct intersections to provide safe vehicle movements to the satisfaction of the responsible road management authority. Undertake a Road Safety Audit (RSA) upon finalisation of the proposed routes and access tracks to confirm mitigation measures. This must consider investigating existing warning signage, lighting, turning movement lane provision and sight clearance and access track alignment modifications to improve safe intersection sight	Construction and Operation	TP8	Incorporated Document

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	distance (SISD) for those that are non-conforming. This includes management measures such as advanced warning signage and flag lighting. Coordinate the RSA with the RSA to be conducted for the construction of the Crib Point to Pakenham gas pipeline. The RSA must include review of the following key intersections as a minimum (unless otherwise agreed with the relevant authorities): • Tyabb-Tooradin Road / Bungower Road • Western Port Highway / Bungower Road • Western Port Highway / Tyabb-Tooradin Road • Frankston Flinders Road / Western Port Highway / Denham Road (Peak Hour analysis by Aecom) • Frankston Flinders Road / Marine Parade (Peak Hour analysis by Aecom) • Woolleys Road / Stony Point Road. Consider signage improvements and speed reduction measures at Hunts Road to minimise the likelihood of collision with other vehicles at the black spot identified at the intersection between Hunts Road and the Coolart Road in order to provide a safe route for the operation stage.			

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	Undertake the RSA in consultation with local councils.			
EPR-TP04	**Pavement strength survey** Undertake a pavement strength survey for: a) Woolleys Road and the Esplanade prior to construction to determine suitability to accommodate projected heavy vehicles for construction and operation phases. b) the preferred delivery route for heavy vehicles delivering liquid nitrogen to the Crib Point Receiving Facility (excluding any approved B-Double routes). Implement road upgrades identified as necessary by the pavement strength survey.	Design, Construction and Operation	TP3, TP10	Incorporated Document
EPR-TP05	**Public Transport Disruption Management sub-plan** Develop and implement a plan to minimise disruption to public transport services (including school buses) resulting from Project construction activities, prior to commencement of works affecting public transport services. Develop the plan in consultation with relevant authorities such as Public Transport Victoria and the Department of Transport, following which it must be included as a sub-plan to the TMP.	Construction	TP6	Incorporated Document

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
EPR-TP06	**Nitrogen Transport Plan** Develop a Nitrogen Transport plan. Identify the preferred route(s) (unless audited in preparing the Traffic Management Plan under TP03), management measures at key intersections and permit requirements for access to roads that are not approved B-Double routes. Use alternative roads to bypass the Hastings and Somerville town centres where possible. Conduct a road safety audit to determine if any further mitigation measures are required once a preferred route is identified.	Operation	TP10, TP 11	Incorporated Document
INDEPENDENT ENVIRONMENTAL AUDITOR				
EPR-IEA01	Appoint an independent environmental auditor prior to commencement of construction, who will: a) assess the CEMP and OEMP for adequacy in compliance with statutory approvals and b) conduct audits of the contractors' construction works, processes and systems and the operation of the FSRU ~~operations~~ to: • assess compliance with statutory approval conditions issued	Construction		Incorporated Document

EPR ID	ENVIRONMENTAL PERFORMANCE REQUIREMENT	TIMING	ASSOCIATED RISK ID	STATUTORY IMPLEMENTATION
	for the Gas Import Jetty Works • assess conformance with any other relevant environmental management documentation • assess responses to non-conformances, complaints and incidents. • assess conformance and compliance through a range of inspections, observations of Project works, consultations with AGL, operators and contractors, reviews of records and meeting minutes as agreed between AGL and the auditor • provide audit reports that must include recommendations for corrective and preventative actions, if required • conduct audits within three months of the commencement of construction, and at six monthly intervals thereafter, to the end of construction, • conduct audits during operation of the Gas Import Jetty Works at six monthly intervals for the first five years. The frequency of ongoing audits will be determined by the EPA following review of the first five years of data. Make the summary audit reports publicly available 30 days after completion.			