

# Acceptance of the Crux Project Offshore Project Proposal

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The National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) provides the following statement of reasons for its decision to accept the Crux Project Offshore Project Proposal (OPP), in accordance with regulation 5D of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (the Environment Regulations).

## Relevant terms

1. In this statement, the words and phrases have the following meaning:
  - a. The *Offshore Petroleum and Greenhouse Gas Storage Act 2006* is referred to as the OPGGS Act.
  - b. The OPP is taken to mean the Crux Project Offshore Project Proposal (Revision 7, June 2020).
  - c. The offshore project is the Crux Project.
  - d. The *Environment Protection and Biodiversity Conservation Act 1999* is referred to as the EPBC Act.
  - e. Shell Australia Pty Ltd is referred to as the proponent.
  - f. Principles of ecological sustainable development (ESD) means the principles set out in section 3A of the EPBC Act.
  - g. Other terms used in this Statement of Reasons may be defined in the Environment Regulations and the OPGGS Act.

## Decision

2. On 3 August 2020, NOPSEMA made the decision pursuant to regulation 5D of the Environment Regulations to accept the OPP.
3. Acceptance of the OPP permits a titleholder to submit an environment plan (EP) for an activity that is, or is part of, the accepted OPP for assessment by NOPSEMA under the Environment Regulations.
4. Notice of the decision was provided to the titleholder on 3 August 2020.

## Authority

5. The decision maker for acceptance of an OPP under regulation 5D of the Environment Regulations is the 'Regulator'. Where the decision relates to a petroleum activity, as it does here, regulation 4 of the Environment Regulations defines the Regulator to be NOPSEMA.
6. I, Stuart Smith, was the decision maker responsible for this decision. I hold the position of Chief Executive Officer (CEO) within NOPSEMA. Pursuant to subsection 666(2) of the OPGGS Act, anything done by the CEO in the name of NOPSEMA is taken to have been done by NOPSEMA.

7. In this Statement of Reasons, when I refer to NOPSEMA having made a request, or having regard to a matter, or similar phrasing, I am referring to a step that I took in exercising my authority to make this decision. Where appropriate, in taking such steps I took into account advice from the assessment team within NOPSEMA.

## The assessment process

8. On 21 Sep 2018, in accordance with regulation 5A of the Environment Regulations, the proponent submitted an OPP (Revision 0, 21 September 2018) for assessment by NOPSEMA in relation to its suitability for publication in accordance with regulation 5C.
9. In accordance with regulation 5B of the Environment Regulations, NOPSEMA requested the proponent to provide further written information about matters required by regulation 5A on two occasions: 18 October 2018 and 18 December 2018. Having assessed Revision 3 of the OPP (dated 20 December 2018), which had been revised by the proponent in response to NOPSEMA's requests for further information referred to above, on 17 January 2019 NOPSEMA decided that Revision 3 of the OPP was suitable for publication in accordance with regulation 5C of the Environment Regulations.
10. Following publication of that version of the OPP and an eight week public comment period, and in accordance with regulation 5D of the Environment Regulations, the proponent submitted another copy of the OPP to NOPSEMA on 18 April 2019 (Revision 4, 18 April 2019). A NOPSEMA assessment team then completed an assessment of the OPP in relation to the criteria set out in subregulation 5D(6). The findings and conclusions of the general assessment and each topic assessment were considered together to form a view as to whether the OPP, as a whole, met the criteria in subregulation 5D(6).
11. The assessment team comprised an assessment manager, lead assessor and appropriately experienced NOPSEMA environment specialists with expert knowledge in environmental and marine science relevant to the OPP and its associated environmental impacts and risks. The assessment included an examination of higher order environmental impacts and risks, with the specialist NOPSEMA assessors paying particular attention to those matters. The assessment included a general assessment of the whole OPP and two detailed topic assessments of the OPP content, as follows:
  - a. Matters protected under Part 3 of the EPBC Act; and
  - b. Unplanned emissions and discharges.
12. At the conclusion of the assessment, the assessment team made a recommendation to me as the decision maker, that the OPP met the criteria in subregulation 5D(6). As set out below, I accept the assessment team's recommendation as part of my decision to accept the OPP.

## Background

13. On 18 April 2019, the proponent submitted an OPP (Revision 4, dated 18 April 2019) to NOPSEMA in accordance with subregulation 5D(1) of the Environment Regulations.
14. On 17 May 2019, under subregulation 5D(2)(a) of the Environment Regulations NOPSEMA requested the proponent to provide further written information, including in relation to the following environmental management themes:
  - a. The proponent's responses to public comments;

- b. The description of the project and the environment that may be affected by it;
  - c. The proposed environmental performance outcomes;
  - d. Feasible alternatives to the project; and
  - e. The evaluation of environmental impacts and risks from greenhouse gas emissions, operational discharges, underwater noise emissions, seabed disturbance, biosecurity risk and unplanned hydrocarbon spills, with a particular focus on impacts to listed threatened species under the EPBC Act, coral shoals and other values and sensitivities of the Commonwealth marine area (e.g. key ecological features, water and sediment quality).
15. On 28 August 2019, the proponent responded to NOPSEMA's request with further information which was incorporated into a resubmitted OPP (Revision 5, 28 August 2019), under subregulation 5D(4) of the Environment Regulations.
16. On 27 September 2019, under paragraph 5D(2)(a) of the Environment Regulations NOPSEMA again requested the proponent to provide further information, this time in relation to the following environmental management themes:
- a. The description of the project and the environment that may be affected by it;
  - b. The proposed environmental performance outcomes; and
  - c. The evaluation of environmental impacts and risks arising from the generation of greenhouse gas emissions and operational discharges with a focus on potential impacts to matters protected under Part 3 of the EPBC Act.
17. On 18 November 2019, the proponent responded to NOPSEMA's 27 September 2019 request with further information which was incorporated into the OPP (Revision 6, 18 November 2019), under subregulation 5D(4) of the Environment Regulations.
18. On 13 December 2019, under paragraph 5D(2)(a) of the Environment Regulations NOPSEMA again requested the proponent to provide further information, this time in relation to the following environmental management themes:
- a. The evaluation of environmental impacts and risks arising from the generation of greenhouse gas emissions; and
  - b. The proposed environmental performance outcomes.
19. On 26 June 2020, the proponent responded to NOPSEMA's request with further information which was incorporated into the OPP (Revision 7, dated 19 June 2020), under subregulation 5D(4) of the Environment Regulations.
20. On 3 August 2020, NOPSEMA accepted the OPP under paragraph 5D(5)(a) of the Environment Regulations. Notice of this decision was provided to the proponent on 3 August 2020.

## Key materials considered in making the decision

21. In making this decision, NOPSEMA assessed the OPP in accordance with legislative requirements and NOPSEMA policy and procedure. The material that NOPSEMA took into account in making this decision included:

- a. The OPP, comprising:
  - i. Crux Project OPP (Revision 7, dated 19 June 2020); and
  - ii. Supporting OPP documentation (Appendices A, B, C, D, E, F, G, H I, J K).
- b. The legislative framework relevant to OPP assessments:
  - i. The OPGGS Act;
  - ii. The Environment Regulations;
  - iii. The Endorsed EPBC Program<sup>1</sup>.
- c. Policies and guidelines:
  - i. NOPSEMA, *PL1650 – Offshore Project Proposal assessment*, Revision 1, (September 2018);
  - ii. Department of Sustainability, Environment, Water, Population and Communities, *Environment Protection and Biodiversity Conservation Act 1999 (Cth) Policy Statement ‘Indirect consequences’ of an action: Section 527E of the EPBC Act*, BIO274.0613 (2013);
  - iii. Department of the Environment, Water, Heritage and the Arts, *EPBC Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales: Industry Guidelines*, (September 2008);
  - iv. Department of the Environment, Water, Heritage and the Arts, *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance*, EPBC Act Policy Statement (2013).
- d. Guidance:
  - i. NOPSEMA, *N-04790-GN1663 – Offshore project proposal content requirements*, Revision 4, (November 2019);
  - ii. NOPSEMA, *GN1488 - Oil pollution risk management*, Revision 2, (February 2018); and
  - iii. NOPSEMA, *N-04790- IP1664 – Information paper – Making public comment on offshore project proposals*, Revision 3, (September 2018);
  - iv. NOPSEMA, *N-04750-IP1765 – Information Paper - Acoustic impact evaluation and management*, Revision 2 (December 2018);
  - v. NOPSEMA, *Environmental Bulletin – Oil Spill Modelling*, (April 2019); and
  - vi. Department of the Environment and Energy, *National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds*, (2020).
- e. Procedures:
  - i. NOPSEMA, *N-04790 – SOP1678 - Offshore project proposal assessment standard operating procedure* (Revision 3, May 2020).
- f. Other relevant documents and records:
  - i. Recorded findings of NOPSEMA’s assessment team regarding assessment of how the OPP was considered to meet the requirements of the Environment Regulations.

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<sup>1</sup> <https://www.environment.gov.au/protection/assessments/strategic/offshore-petroleum-greenhouse-gas>

- ii. Department of the Environment, *Recovery Plan for Marine Turtles in Australia*, (2017).
- iii. Department of the Environment, *Conservation Management Plan for the Blue Whale—A Recovery Plan under the Environment Protection and Biodiversity Conservation Act 1999*, (2015).
- iv. Director of National Parks, *North West Marine Parks Network Management Plan 2018*.
- v. Director of National Parks, *North Marine Parks Network Management Plan 2018*.
- vi. Department of Sustainability, Environment, Water, Population and Communities, *Marine Bioregional Plan for the North-west Marine Region*, (2012).
- vii. Threatened Species Scientific Committee, *Conservation Advice for Rhincodon typus (whale Shark)*, (approved on 01/10/2015).
- viii. Threatened Species Scientific Committee, *Conservation Advice for Megaptera novaeangliae (humpback whale)*, (approved on 01/10/2015).
- ix. Other documents including policies, plans of management, recovery plans, conservation advice and, guidance and information relevant to matters protected under the EPBC Act published on the Department of Agriculture, Water and Environment (DAWE) website.
- x. Relevant scientific literature
- xi. Relevant publications of the International Energy Agency including the World Energy Outlook 2019.
- xii. Comments received from the public on the OPP during the statutory public comment period, 4/02/2019 - 18/03/2019.

## Legislative framework

22. The Environment Regulations relevantly provide that:

- a. before commencing an offshore project, a person must submit an offshore project proposal to the Regulator (subregulation 5A(1)); and
- b. the proposal must be in writing (subregulation 5A(4)); and
- c. the proposal must (subregulation 5A(5)):
  - i. include the proponent's name and contact details; and
  - ii. include a summary of the project, including the following:
    - A. a description of each activity that is part of the project;
    - B. the location or locations of each activity;
    - C. a proposed timetable for carrying out the project;
    - D. a description of the facilities that are proposed to be used to undertake each activity;
    - E. a description of the actions proposed to be taken, following completion of the project, in relation to those facilities; and
  - iii. describe the existing environment that may be affected by the project; and

- iv. include details of the particular relevant values and sensitivities (if any) of that environment; and
- v. set out the environmental performance outcomes for the project; and
- vi. describe any feasible alternative to the project, or an activity that is part of the project, including:
  - A. a comparison of the environmental impacts and risks arising from the project or activity and the alternative; and
  - B. an explanation, in adequate detail, of why the alternative was not preferred; and
- d. particular relevant values and sensitivities may include, but are not limited to any of the following (subregulation 5A(6)):
  - i. the world heritage values of a declared World Heritage property within the meaning of the EPBC Act;
  - ii. the national heritage values of a National Heritage place within the meaning of the EPBC Act;
  - iii. the ecological character of a declared Ramsar wetland within the meaning of the EPBC Act;
  - iv. the presence of a listed threatened species or listed threatened ecological community within the meaning of the EPBC Act;
  - v. the presence of a listed migratory species within the meaning of the EPBC Act;
  - vi. any values and sensitivities that exist in, or in relation to, part or all of:
    - A. a Commonwealth marine area within the meaning of the EPBC Act; or
    - B. Commonwealth land within the meaning of the EPBC Act; and
- e. the proposal must (subregulation 5A(7)):
  - i. describe the requirements, including legislative requirements, that apply to the project and are relevant to the environmental management of the project; and
  - ii. describe how those requirements will be met; and
- f. the proposal must include (subregulation 5A(8)):
  - i. Details of the environmental impacts and risks for the project; and
  - ii. An evaluation of all the impacts and risks, appropriate to the nature and scale of each impact or risk; and
- g. within 30 days after the proponent gives the Regulator a copy of the proposal (subregulation 5D(5)):
  - i. if the Regulator is reasonably satisfied that the proposal meets the criteria set out in subregulation (6), the Regulator must accept the proposal; or
  - ii. if the Regulator is not reasonably satisfied that the proposal meets the criteria set out in subregulation (6), the Regulator must refuse to accept the proposal; or

- iii. if the Regulator is unable to make a decision on the proposal within the 30 day period, the Regulator must give the proponent notice in writing and set out a proposed timetable for consideration of the proposal; and
- h. The criteria are that the proposal (subregulation 5D(6)):
  - i. adequately addresses comments given during the period for public comment; and
  - ii. is appropriate for the nature and scale of the project; and
  - iii. appropriately identifies and evaluates the environmental impacts and risks of the project; and
  - iv. sets out appropriate environmental performance outcomes that:
    - A. are consistent with the principles of ecologically sustainable development; and
    - B. demonstrate that the environmental impacts and risks of the project will be managed to an acceptable level; and
  - v. does not involve an activity or part of an activity being undertaken in any part of a declared World Heritage property within the meaning of the EPBC Act.

## Consideration and findings of material facts

23. NOPSEMA provides the following considerations and findings of material fact which contributed to the decision to accept the OPP.

## Consideration of the principles of ecological sustainable development (ESD)

24. The principles of ESD were relevant to the assessment of the proposal, with aspects of ESD inherent in the OPP content requirements and criteria for acceptance in the Environment Regulations. An overview of how NOPSEMA has considered these principles is provided below:

- a. *Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations* (the 'integration principle').

NOPSEMA has considered the proponent's evaluation of the socio-economic and ecological matters that may potentially be affected by the project. The OPP has demonstrated an integrated approach to considering all environmental features, including relevant social, cultural and economic features that make up the environment as defined under Regulation 4 of the Environment Regulations. Specifically, the OPP includes an evaluation of the potential impacts and risks of the project on Commonwealth and WA State managed fisheries, tourism and recreation, commercial shipping and other oil and gas exploration and operational activities, and has demonstrated that impacts and risks to these socio-economic values will be of an acceptable level.

- b. *If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation* (the 'precautionary principle').

NOPSEMA has considered the proponent's evaluation of impacts and risks to the environment as well as its case for why these impacts and risks will be of an acceptable level. This includes consideration given to measures committed to by the proponent to manage residual scientific uncertainty associated with evaluation of environmental impacts and risks, particularly in relation

to impacts to the Commonwealth marine area from drilling discharges and potential impacts arising from the generation of greenhouse gas emissions.

- c. *That the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations (the 'intergenerational principle').*

NOPSEMA has considered the measures the proponent has committed to apply, including measures to avoid and minimise environmental impacts and risks to an acceptable level for the duration of the project and through setting out appropriate environmental performance outcomes (EPOs).

- d. *The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making (the 'biodiversity principle').*

NOPSEMA has considered the proponent's evaluation of environmental impacts to the biodiversity and ecological values of the Commonwealth marine area, including listed threatened and migratory species under the EPBC Act, and the EPOs defined in the OPP. The evaluation and EPOs collectively demonstrate that the project can be managed so that impacts to biodiversity values and the ecological integrity of the Commonwealth marine area will be of an acceptable level.

- e. *Improved valuation, pricing and incentive mechanisms should be promoted (the 'valuation principle').*

NOPSEMA notes that the proponent will bear the costs relating to management of environmental aspects of the project and its activities to ensure that environmental impacts and risks will be of an acceptable level.

## **Consideration and findings of material facts in relation to the proponent's assessment of public comments received [regulation 5D(1)(c)]**

25. Following publication of the OPP and receipt of public comments, a summary of all the comments received during the public comment period, as well as an assessment of the merits of each objection or claim about the project and a statement of the proponent's response to these was included with a copy of the OPP provided to NOPSEMA.
26. The assessment of the merits of each objection or claim about the project or any activity that is part of the project is found in Appendix K of the OPP.
27. Changes made to the OPP in response to public comments include (though were not limited to) an evaluation of scope 3 greenhouse gas (GHG) emissions as environmental impacts of the project, further information on the feasibility of options for carbon capture and storage, and clarifications in relation to the preferred option for a not normally manned (NNM) platform. Further evaluation of alternatives such as carbon capture and storage (CCS) and the impacts of GHG emissions was provided in Sections 8.4.5 and 5.8.3 respectively. An additional engineering definition regarding the Crux NNM platform design and concept was provided in Section 5.5.1.2 of the OPP.
28. The OPP adequately addresses comments given during the period for public comment.



## Consideration and findings of material facts in relation to the content

### [Regulation 5A]

29. Following an assessment of the OPP undertaken in accordance with the Environment Regulations and NOPSEMA's assessment policies and procedures, NOPSEMA provides the following findings of material facts in relation to the content of the OPP which led me to be reasonably satisfied that the OPP meets the criteria under subregulation 5D(6) and must be accepted under subregulation 5D(5).

#### *Proponent's name and contact details*

30. NOPSEMA considered the information provided in the OPP and found that:

- a. The OPP identified the proponent and included its contact details including an address, phone number and email, as well as a web link to a dedicated project website.

#### *Project summary - Description of each activity part of the project*

31. NOPSEMA considered the description provided of each activity that is part of the project in the OPP and found that:

- a. The summary of the project provided details key characteristics of the project, including geographic locations of infrastructure and project activities as well as their scale, duration and timing. The project description also informed the understanding of the extent of the environment that may be affected and was appropriate to the nature and scale of the project.
- b. It was clear that the project involves the production of the Crux field as a primary source of backfill gas to the Prelude Floating Liquefied Natural gas (FLNG) facility and potential future development of other fields within the Crux in-field development area. A comprehensive description of the project activities, as identified by the proponent, was provided.
- c. The description of the project is provided in both a local and regional environmental context, including timing relative to seasonal features of the environment, which is relevant for the evaluation of environmental impacts and risks of the project. It was clear that all activities that are part of the project are located in Commonwealth waters.
- d. The description of the project and the activities that make up the project provide a basis for the proponent to evaluate all environmental impacts and risks, including potential for cumulative impacts. Key aspects of the project description include:
  - i. The production of the Crux field as a primary source of backfill gas to the Prelude Floating Liquefied Natural gas (FLNG) facility and potential future development of other fields within the Crux in-field development area (Figure 5-3).
  - ii. The initial stage of the project consists of the construction of a NNM platform, which includes dry trees, processing facilities and associated utility systems, five production wells (drilled with a semi-submersible drilling rig), subsea wellhead system tied back to the NNM platform, a subsea integration system and an approximately 165 km long 26-inch export pipeline, approximately 165 km long, which ties the platform back to the Prelude FLNG facility.
  - iii. The initial five Crux production wells are proposed to be drilled with a semi-submersible drilling rig and later completed from the platform using a temporary completions unit.

- iv. The platform jacket and Crux rigid riser will be constructed off-site and transported to the Crux location by an offshore installation vessel(s). On arrival, the platform jacket will then be installed and fixed to the seabed by piled foundations using a construction vessel. Drilling is likely to be undertaken to assist in the installation of the piled foundations. The platform topsides will be installed via a floatover.
- v. A rigid tie-in spool connects the rigid riser on the platform to the export pipeline end termination (Crux PLET). The export pipeline will terminate into a Crux dedicated PLET (Prelude PLET), which is proposed to be located approximately 550m from the Prelude FLNG turret centre.
- vi. The rigid export pipeline and associated Crux PLET and Prelude PLET will be installed utilising specialised large bore rigid pipeline vessels with heavy lift capability.
- vii. The installation of the pipeline will include several phased campaigns, including Prelude FLNG facility integration, export pipeline installation and Crux platform integration. The pipeline will be installed using a pipelay vessel and an S-lay method of installation.
- viii. Potential future subsea developments limited to within the Crux infield development area (Figure 5-7), tied back to the Crux platform and consisting of a maximum of 10 wells drilled with a semi-submersible drilling rig, subsea integration systems and flow line stabilisations and supports.
- ix. Other activities described as part of the project include: installation and hook up of the subsea integration system; commissioning and operation of the wells, platform and pipeline; inspection maintenance and repair activities; support operations, installation and commissioning of subsea facilities to support future subsea tie-backs, installation and commissioning of a future compression module, and decommissioning and well abandonment at the end of the project.

### ***Project summary - Description of the location of each activity***

32. NOPSEMA considered the location or locations of each activity proposed in the OPP and found that:
- a. The locations of the project activities in Commonwealth waters are set out by diagrams, figures and coordinates depicting the locations / geographic areas within which:
    - i. the proposed wells will be drilled and the platform will be installed in offshore areas (the infield development area (Figure 5-3));
    - ii. the export pipeline, subsea integration system and associated installation activities will be constructed and operated (pipeline corridor (Figure 5-4 and 5-6)) ; and
    - iii. the environment may be affected by planned and unplanned (hydrocarbon spill) aspects of the project (area of influence (Figure 6-1)).
  - b. The exact locations of proposed wells are not defined at this stage but they will be located within the in-field development area identified in Figure 5-3.
  - c. The pipeline from the Crux platform to Prelude FLNG Facility traverses Commonwealth waters in depths that range from 170 m to 250 m across a distance of 165 km.
  - d. The pipeline does not traverse Australian Marine Parks (AMPs).

- e. It is clear from the project description and description of the environment within which the project is proposed to take place, that the project does not involve any planned activity or part of an activity within any part of a declared World Heritage property.

#### ***Project summary – Proposed timetable***

33. NOPSEMA considered the proposed timetable in the OPP for carrying out the project and found that:
  - a. The project timetable is being driven by factors including front-end engineering and design and the timing of the proponent's final investment decision (FID), anticipated for 2020, with the final design, construction and commissioning of the platform (offsite) taking approximately 4-5 years from the FID.
  - b. The project is anticipated to have a design life of 20 years.
  - c. The development of any potential future tie-backs from other gas fields within the in-field development area may take place during operations and may extend the operating life of the Crux project by an additional 20 years.

#### ***Project summary – Description of facilities proposed for each activity***

34. NOPSEMA considered the description of the facilities that are proposed to be used to undertake each activity in the OPP and found that:
  - a. The facilities that will be used to undertake the activities include: MODUs that may be moored, semi-moored, dynamically positioned or a semi-submersible drill rig; wellheads, dry trees, subsea infrastructure including manifolds, flowlines and umbilicals, export pipeline, communications lines, tiebacks; subsea integration system comprising risers, subsea isolation facilities, pipeline inspection gauge receiver and associated control systems; a NNM Platform for which utilities are described in the OPP; cable lay vessel, line pipe supply vessel, pipelay barge, offshore construction vessel, supply vessels, pipelay and support vessels; ROVs and helicopters; air guns for vertical seismic profiling (VSP) and sound receivers; and piling facilities.

#### ***Project summary – Description of actions proposed following project completion***

35. NOPSEMA considered the description in the OPP of the actions proposed to be taken following completion of the project, in relation to the facilities proposed to be used to undertake each activity and found that:
  - a. The OPP states that the project will be decommissioned in accordance with the prevailing legislation at the time.
  - b. The OPP recognises that the complete removal of infrastructure and the plugging and abandonment of wells is the default decommissioning requirement under the OPGGS Act and is consistent with Australia's international obligations to remove disused installations and structures.

#### ***Description of existing environment***

36. NOPSEMA considered the description in the OPP of the existing environment that may be affected by the project and found that:

- a. The description of the existing environment is appropriate to the nature and scale of the project and has a well-founded basis in the review and analysis of scientific evidence and benthic habitat studies.
- b. An overview of the features of the existing environment is provided that encompasses the in-field development area, pipeline corridor and area of influence which represents the areas that may be affected directly or indirectly by the project, including under potential emergency conditions or by emergency response arrangements.
- c. The description of the environment includes physical environmental features, such as climate, oceanography, bathymetry and seabed features, water and sediment quality, air quality and ambient underwater noise typical of the region.
- d. The description of the environment addresses ecosystems, habitats, listed threatened and migratory species, biodiversity values and their constituent parts in the area that may be affected by the project including planktonic assemblages, benthic habitats and communities (such as epifauna and infauna), banks, reefs and shoals, coastal habitats and, demersal and pelagic biota.
- e. Socio-economic features of the environment that may be affected by the project including commercial shipping, tourism and recreation, military/defence activities, Commonwealth and WA State managed commercial fisheries, traditional/ indigenous fishing, and petroleum industry activities have been identified and described.
- f. Known cultural and heritage environment features and values that may be affected have been identified and described.

***Values and sensitivities – including Part 3 protected matters***

37. NOPSEMA considered the details of the particular relevant values and sensitivities of the existing environment contained in the OPP and found that:
- a. A combination of physical, ecological and biological data and information has been used to describe the environment in both a local and regional context. This includes water and sediment quality, bathymetry, seabed features in the Commonwealth marine area and habitats for species protected under the EPBC Act.
  - b. Protected matters search reports for each of the defined project areas and area of influence are included in Appendix J.
    - a. The OPP recognises the regionally significant shoals and banks within the Crux project area and adequately describes their environmental value acknowledging that these benthic habitats and associated fauna assemblages are highly diverse relative to the surrounding environment.
    - b. With the exception of banks and shoals, the benthic habitats and communities within the Crux project area broadly comprise soft sediment benthic habitats, which are widely represented in the Timor Sea region.
    - c. Biologically important habitats and ecological features have been described in sufficient detail to inform the detailing and evaluation of environmental impacts and risks, including by using information from the Marine Bioregional Plan for the North-west.

- d. Where relevant, in describing matters protected under Part 3 of the EPBC Act, the OPP has considered information found in relevant plans of management, recovery plans, conservation advice, and other relevant guidance and information published on the DAWE website.
- e. The project areas (planned impacts) associated with the in-field development area overlaps with a biologically important area (BIA) for whale sharks. Planned aspects of the project do not overlap with any other BIAs or habitats critical to survival for EPBC Act listed threatened species.
- f. The OPP recognises the overlap of the project area of influence (area potentially affected by an unplanned hydrocarbon spill) with a number of BIAs and habitats critical for survival for a listed threatened species and these are identified and described.
- g. Species of fauna that may, are likely to, or are known to occur in the project area including seabirds, fish, marine mammals and reptiles are described in a manner appropriate to the nature of overlap between the project and knowledge of the species' presence and distribution in the area.
- h. A description of the key ecological features (KEFs) overlapped by the project is included. The continental slope demersal fish communities KEF is intersected by the pipeline corridor from the Crux platform to the Prelude facility. Planned aspects of the project do not overlap with any other KEFs.
- i. Ecological features of the Commonwealth marine area, including their biodiversity and ecological values, are adequately described including shoals/banks located within the Crux project in-field development area. Examples of shoals include, Goeree, Eugene McDermott and Vulcan shoals.
- j. Protected areas and places that are within the project's potential area of influence from oil spills are described in sections 6.6.5 – 6.8 of the OPP. The OPP describes the values, including the representative values, of the AMPs that may be affected by unplanned hydrocarbon spills, utilising the information provided in the North-west Marine Park Network Management Plan.

### ***Environmental performance outcomes***

38. NOPSEMA considered the EPOs for the project in the OPP and found that:

- a. The OPP sets out EPOs, including those for higher order impacts and risks such as drilling cuttings and disposal, underwater noise, seabed disturbance, greenhouse gas emissions and spill risk, which:
  - i. are relevant to identified environmental impacts and risks for the project;
  - ii. establish measurable levels for management of environmental aspects of activities that are part of the project;
  - iii. when read in conjunction with the relevant environmental impact/risk evaluation content and proposed management measures in the OPP, demonstrate that impacts and risks will be managed to acceptable levels, which are defined through a process that takes into account ESD; and
  - iv. are considered consistent with the principles of ESD considering items i-iii above.

39. In relation to matters protected under Part 3 of EPBC Act, the EPOs in combination with the proponent's evaluation of environmental impacts and risks demonstrate that:

- a. The environmental impacts and risk to the values of the Commonwealth marine area will be managed to acceptable levels as these levels are set below significant impact levels where 'significant' is understood by having regard to the *Matters of National Environmental Significance - Significant impact guidelines 1.1*.
- b. The project will not be inconsistent with the Department of the Environment Recovery Plan for Marine Turtles in Australia, (2017) and the Department of the Environment, Conservation Management Plan for the Blue Whale—A Recovery Plan under the Environment Protection and Biodiversity Conservation Act 1999, (2015).
- c. Relevant policy, background and guidance documents have been used by the proponent to support the evaluations of environmental impacts and risks that underpin the demonstration that the project is able to be managed to ensure environmental impacts and risks will be of acceptable levels. Relevant information considered includes the Marine Bioregional Plan for the North-west, EPBC Policy Statement 2.1, Threatened Species Scientific Committee, Conservation Advice for *Rhincodon typus* (whale Shark), (approved on 01/10/2015) and Threatened Species Scientific Committee, Conservation Advice for *Megaptera novaeangliae* (humpback whale), (approved on 01/10/2015).
- d. The oil spill risk will be of an acceptable level with an EPO that sets the level of performance of "No emergency events associated with the unplanned release of Crux condensate or vessel fuel to the marine environment during the Crux project". In addition, the OPP includes the commitment that as the design of the Crux project progresses through activity-specific EPs, these will contain detailed EPOs that will maintain an equivalent, or better, level of environmental performance. Further, NOPSEMA's EP assessment process will require specific control measures and environmental performance standards (EPS) specific to the activity risks, to demonstrate that EPOs can be achieved.

#### ***Description of feasible alternatives – comparison of impacts and risks and explanation***

40. NOPSEMA considered the feasible alternatives to the project, or activity that is part of the project, provided in the OPP, including a comparison of the impacts and risks arising from the project or activity and the alternative, as well as a detailed explanation of why the alternative was not preferred, and found that:
- a. Feasible alternatives to the project are described, including four different project concepts:
    - i. Subsea tieback to Prelude FLNG facility;
    - ii. Greenfield FLNG facility;
    - iii. Fixed host types including platform and Tension Leg Platform (TLP/Spar); and
    - iv. Floating host types including Floating Production Storage and Offloading (FPSO) and semi-submersible.
  - b. An assessment of these options is provided including economic, technical, environmental and social drivers resulting in the third project concept option (iii) above being selected.
  - c. Alternatives within the preferred overall project design are also described. Such alternatives included consideration of options energy efficiency enhancement, power generation, GHG

management, export pipeline configuration, mooring of construction vessels, manning of Crux platform, use of different drilling fluids, piling techniques and produced water treatment. The OPP also provides a comparison of environmental impacts from these alternatives with reasons given as to why the selected options for project elements and activities were preferred.

- d. The OPP describes an alternatives analysis that was undertaken for the project and sets out the findings and conclusions of this analysis.
- e. The OPP provides an overview of the feasible alternatives and a comparison of environmental impact aspects associated with each option.
- f. An explanation as to why each feasible option has not been selected is provided in the OPP.

### **Description of requirements**

41. NOPSEMA considered the description of requirements in the OPP, including legislative requirements that apply to the project and are relevant to the environmental management of the project and found that the OPP has presented a case that relevant legislative requirements will be met. These requirements include, but are not limited to:
  - a. OPGGS Act and Environment Regulations;
  - b. EPBC Act and Regulations;
  - c. *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (MARPOL) *Protection of the Sea (Prevention of Pollution from Ships) (Orders) Regulations 1994*;
  - d. *Biosecurity Act 2015* and *Australian Ballast Water Management Requirements 2017 Quarantine Regulations 2000*;
  - e. *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 (Cth) (SGM)* made under the *National Greenhouse and Energy Reporting Act 2007 (Cth) (NGERS)*;
  - f. *Listed Threatened Species Management/Recovery Plans and Conservation Advices*;
  - g. Management plans for places and areas; and other approvals required under the OPGGS Act besides the OPP, relevant Commonwealth legislation, and relevant international agreements.

### **Environmental impacts and risks – details and evaluation**

42. The environmental impacts and risks resulting from the project are appropriately identified, given the description of the project and environment that may be affected by the project. These include environmental impacts and risks associated with:
  - a. Physical presence;
  - b. Vessel movements;
  - c. Light emissions;
  - d. Underwater noise from sources including pile driving, drilling, vertical seismic profiling and vessel noise;
  - e. Atmospheric emissions;
  - f. Greenhouse gas emissions;

- g. Invasive marine species;
  - h. Waste management;
  - i. Liquid discharges;
  - j. Cumulative impacts; and
  - k. Health impacts.
43. The environmental impacts and risks associated with unplanned events and potential emergency conditions are appropriately identified. These include impacts and risks associated with:
- a. Introduction of invasive marine species (IMS);
  - b. Collision with marine fauna;
  - c. Unplanned hydrocarbon releases; and
  - d. Accidental release of hazardous or non-hazardous solid waste to marine environment.
44. The statements and conclusions drawn by the proponent regarding environmental impacts and risks have been sufficiently supported with scientific literature, with greater emphasis placed on supporting the evaluation where there is a higher degree of uncertainty and/or higher potential consequences. Appropriate additional studies are provided in the OPP to support the evaluation of impacts and risks, including but not limited to:
- a. Benthic habitat assessment (Appendix C), to provide information to enable the proponent to adequately describe the benthic habitats including benthic species and habitats of biodiversity significance;
  - b. Drill cuttings and drilling muds dispersion modelling study (Appendix D);
  - c. Oil spill modelling study (Appendix G) to provide sufficient information for preparation and planning of oil spill response and monitoring for all possible oil spill scenarios in the unlikely event of a spill;
  - d. EPBC Act protected matters reports (Appendix J) that identify matters of national environmental significance and other matters protected by the EPBC Act in the vicinity of the project area and the area that may be affected under oil spill scenarios;
  - e. Underwater noise modelling study (Appendix I) that involves modelling of underwater acoustic emissions from pile driving, drilling and operations associated with the project;
  - f. Discharge modelling (Appendices E and F) to predict the dispersion of proposed cooling water, hydrotest water and produced formation water discharges; and
  - g. Light modelling (Appendix H) to characterise the sources of light emissions from the Crux project and assess the predicted impact of light emissions in the context of the nearest key habitats that support light-sensitive receptors.
45. NOPSEMA considered the details and evaluation of all environmental impacts and risks for the project in the OPP in the context of whether these are appropriate to the nature and scale of each environmental impact or risk and found that:



- a. A sufficiently robust method has been applied for the identification and evaluation of environmental impacts and risks of the project. This included describing aspects of the project and the environment that may be impacted and at risk, defining acceptable levels of impact and risk and an evaluation to demonstrate that the defined acceptable level of impact and risk can be met. Following this method provides for the establishment of environmental performance outcomes (EPOs) that are consistent with the principles of ESD and reflect the previously defined acceptable levels of impact and risk.
- b. Impacts and risks to the environment resulting from all aspects of the project are identified and described in sufficient detail to set the foundation for an appropriate evaluation of those impacts and risks. The proponent has utilised an appropriate methodology to identify impact and risk pathways which then establishes the basis for the evaluation needed to demonstrate that the project's environmental aspects are able to be managed to ensure its environmental impacts and risks will be of an acceptable level.
- c. An appropriate process has been applied by the proponent to demonstrate that each environmental impact and risk of the activity will be of an acceptable level. This process takes into account:
  - i. Significance, sensitivity and conservation status of receptors and levels of protection for the environment that may be affected including species and their habitats, KEFs and designated protected areas within the project's area of influence;
  - ii. relevant external context such as relevant international and national standards, laws, policies, statutory instruments (e.g. plans of management and recovery plans relevant to matters protected under Part 3 of the EPBC Act) and relevant published scientific literature;
  - iii. The principles of ESD considered, including by:
    - A. Identifying the levels of uncertainty in conclusions arising from the evaluation of environmental impacts and risks, and accounting for this uncertainty (precautionary principle). Specific examples of measures to address uncertainty include:
      - For the impacts of underwater noise, an EPO that requires '*No mortality or injury of threatened and migratory MNES species as a result of underwater noise from the Crux project*'. The specific management measures required to achieve this outcome will be subject to EP assessment processes that will require an evidence base to demonstrate that this outcome can be achieved.
      - For the uncertainty in relation to the project's contribution to global GHG emissions and climate change, an EPO that requires that '*Programs are developed and implemented, in conjunction with the wider Shell Group and others, to actively support the global transition to a lower carbon future by net displacement of higher carbon intensity energy sources relating to third party GHG emissions*'. NOPSEMA is reasonably satisfied that this EPO establishes that the proponent is committed to developing programs that support the global transition to lower carbon intensive fuels by monitoring the role that gas plays in displacing coal / oil and adapting management strategies in response to World Energy Outlooks, therefore addressing uncertainty.

- For uncertainty in relation to drilling discharge impacts on regionally significant shoal and bank features, committing to further site-specific modelling of drilling discharge dispersion and deposition in the event that drill locations are proposed at or within 2km of a shoal feature. This modelling will be undertaken once more detail for the drilling campaign is available and will allow the proponent to validate its predictions of environmental impacts in light of higher certainty around the specific drilling circumstances. This in turn influences the selection of specific control measures needed to ensure the drilling is managed consistent with performance established by the EPO of *'No direct loss of coral communities (coral colony) at Goeree Shoal, Eugene McDermott Shoal and Vulcan Shoal will occur as a result of liquid discharges from the Crux project'*.
  - B. Acceptable levels of impact and risk for biodiversity and ecological values and sensitivities are defined at levels that are below the significant impact criteria (defined in Policy Statement 1.1 – Significant impact guidelines) for matters protected under Part 3 of the EPBC Act including: ecological values and sensitivities of the Commonwealth marine area and listed threatened and migratory species (biodiversity principle).
  - C. Undertaking robust evaluations of higher order environmental impacts and risks using appropriate impact prediction tools and taking these predictions into account when demonstrating that these impacts and risks will be managed to ensure they will be acceptable (biodiversity and intergenerational equity principles). This includes using liquid waste, light emissions and underwater sound modelling to predict the impacts of the project of matters protected under the EPBC Act.
  - D. Where applicable, undertaking an assessment of predicted impacts in the context of requirements of relevant statutory instruments for biodiversity conservation to support demonstration that the project would not be inconsistent with these instruments, including recovery plans for listed threatened species.
  - iv. applying the mitigation hierarchy in the evaluation of environmental impacts and risks to identify where management measures, further site specific evaluation and/or monitoring are required to provide confidence that the environmental impacts or risks of the project will be managed to acceptable levels.
  - v. comparing predicted environmental impacts and risks with the defined acceptable levels which includes an evaluation of how each impact and risk aspect of the project is consistent with principles of ESD (section 8.4); and
  - vi. Setting out EPOs that reflect the defined acceptable levels of environmental impacts and risks and are in turn consistent with the principles of ESD (also refer to clauses 39 and 39).
46. NOPSEMA's assessment of the OPP placed greater attention on the higher order impacts and risks of the project, including seabed disturbance impacting values of Commonwealth marine area, greenhouse gas emissions, underwater noise emissions, light emissions and unplanned hydrocarbon discharges.
47. The OPP has provided an evaluation of environmental impacts and risks in a manner appropriate to the nature and scale of each impact and risk, and demonstrated that these will be reduced to an acceptable level. Reasons relating to higher order impacts and risks are outlined in clauses 48 to 52.

48. Potential impacts to the Commonwealth marine area

- a. Quantitative estimates have been included in the OPP for the potential extent of seabed that will be disturbed for both the foundation project and future tie-backs (Table 5-4).
- b. Particle and fluid dispersion modelling predicts that drilling fluids and cuttings discharges will be limited to approximately 326 m from the drilling location and will not exceed impact for coral if drilling is located 1km or more from coral shoals within the in-field development area.
- c. Recognising that some degree of uncertainty is inherent in predictions of this nature, the proponent has committed to undertaking further site and drilling campaign specific drilling fluid and cuttings modelling in the event that a drilling location is identified within 2km of a shoal so as to determine whether additional management controls will be required to ensure that the defined acceptable level of *'No loss of coral communities at named banks or shoals as a result of indirect/offsite impacts associated with the Crux project'* will be met. This commitment represents an action that will be taken to address scientific uncertainty and therefore the precautionary principle of ESD (refer to sub-clause 45(c)(iii)).
- d. The environmental impacts from the installation of the pipeline have been evaluated according to the values and sensitivities on the seabed that will be disturbed.
- e. The installation of the pipeline does not overlap with any known shoals or banks.
- f. The continental slope demersal fish communities KEF is partially overlapped by the export pipeline corridor. The corridor, covering approximately 14 km<sup>2</sup>, is equivalent to less than 0.05% of the KEF. No other components of the project overlap this KEF.
- g. Environmental surveys of the export pipeline corridor did not observe particularly high or diverse fish assemblages within the overlap, although isolated areas of hard substrates and associated communities were observed.
- h. Impacts to the continental slope demersal fish communities KEF will be limited to <1% of the total area of the KEF.
- i. The OPP presents an evaluation that is supported by benthic habitat surveys and scientific literature concluding that the physical presence of the export pipeline is not expected to have any impact on the fish habitat value and ecological integrity of the KEF, and therefore will not result in an unacceptable impact to the values of the Commonwealth marine area.
- j. The defined acceptable levels for impacts to the Commonwealth marine area and associated EPOs are appropriate and demonstrate that the project can be managed consistent with ESD and to an acceptable level.

49. Greenhouse gas emissions (GHG)

- a. In assessing this OPP, NOPSEMA has had regard to the Department of Sustainability, Environment, Water, Population and Communities' Policy Statement 'Indirect consequences of an action: Section 527E of the EPBC Act', in particular in relation to GHG emissions, including scope 3 emissions.
- b. The OPP estimates the volumes of total lifecycle GHG emissions (including scope 3 emissions) and evaluates the potential impacts of project GHG emissions from domestic and global perspectives, including potential implications for the Australian environment as a result of global climate change.

The evaluation recognises the project's contribution to the global scale of GHG emissions and acknowledges the cumulative nature of global GHG emissions and associated impacts.

- c. The OPP explains that Australia's commitments under the Paris Agreement are delivered through the primary domestic legislation for emissions management; the National Greenhouse and Energy Reporting Act 2007 (Cth) (NGER Act). Under the legislative framework the Safeguard Mechanism requires Australia's largest emitters to measure, report and manage their emissions. The OPP concludes that the Safeguard Mechanism requires abatement and offset of Scope 1 emissions from the Crux project.
- d. The OPP clarifies that the emissions generated through the processing of Crux gas at the Prelude facility will be managed as part of the Prelude facility. The OPP also explains the relationship between the Crux project and the Prelude FLNG project, acknowledging that emissions generated by the processing of Crux gas beyond what was accepted and approved under the Prelude FLNG project approval (EPBC 2008/4146) are part of the OPP assessment. The Prelude facility Greenhouse Gas Environmental Management Plan (GHGEMP) will be in place to manage GHG emissions generated through processing Crux gas to an acceptable level. In addition, the GHG emissions generated through processing Crux gas are also subject to the Safeguard Mechanism under the NGER Act. GHG emissions at the Prelude facility will also be subject to EP assessment processes.
- e. The OPP makes a case that natural gas investments are identified in the World Energy Outlook 2019 as part of the International Energy Agency's Sustainable Development Scenario (SDS) and that gas investment is integrated into strategies for global decarbonisation and resource development. The OPP claims that fuel switching in industrial applications contributes to 28% of CO<sub>2</sub> emissions reductions needed to meet the SDS. The OPP concludes there is, and will continue to be, a critical role for gas, even in the SDS and that gas has a key role to play in the transition to a lower carbon global energy system by displacing demand for higher emitting products (e.g. coal).
- f. To manage scope 1 emissions at the Crux facility, the OPP has selected the development concept with the lowest technical and economic GHG emissions profile and commits to adopting all economically viable opportunities to further reduce GHG emissions during the design phase. In addition, the OPP describes implementation of ongoing GHGEMP processes and the legislative arrangements that apply to the Crux project, in particular, the Safeguard Mechanism under the NGER Act.
- g. The OPP recognises the inherent uncertainty associated with climate projections and claims that it is not possible to isolate the influence of Crux emissions to any conclusive impact on the Australian environment. The proponent proposes to address this uncertainty by establishing and managing GHG emissions from the project consistent with EPOs that reflect an acceptable level of impact. These EPOs are:
  - i. Emissions at the Crux facility will not exceed 0.5 Mt CO<sub>2</sub>-e in any single operating year.
  - ii. Emissions at the Crux facility will not exceed an average of 0.4 Mtpa CO<sub>2</sub>-e over a 5-year period.
  - iii. Emissions at the Crux facility will comply with the Australian government Safeguard Mechanism baseline.

- iv. Shell Australia Pty Ltd will ensure that programs are developed and implemented, in conjunction with the wider Shell Group and others, to actively support the global transition to a lower carbon future by net displacement of higher carbon intensity energy sources relating to third party GHG emissions.
- h. To demonstrate how these EPOs are able to be met, the proponent has committed to implementing programs of management that could include the following measures (or equivalent / similar measures):
  - i. Working with the natural gas value chain to reduce methane emissions in third party systems;
  - ii. Promote and market the role of LNG in displacing higher carbon intensity fuels;
  - iii. Continue to develop and deploy new technologies to substitute for higher carbon intensive fuels;
  - iv. Continue to advocate for stable policy frameworks that reduce carbon emissions; and
  - v. Continue to monitor, report, and adapt to the global energy outlook.
- i. The OPP refers to future regulatory approval processes required before activities can commence. The EP approval process is one such process and requires titleholders to identify and evaluate environmental impacts and risks, detail control measures and provide specific details of environmental performance, and for these to be reviewed and amended over time to account for changes in external and internal context.
- j. The arguments made by the proponent in the OPP are based on consideration of current published and reputable literature (e.g. International Energy Agency reports and scientifically peer-reviewed literature) regarding global GHG emissions and global climate change.
- k. With the environmental performance outcomes in place and commitments to programs of management to address GHG emissions, including those associated with third party emissions outside of the proponent's direct operational control, the OPP demonstrates that the GHG emissions associated with the Crux project will be managed to an acceptable level. This conclusion is supported when considering the cumulative global nature of GHG emissions and subsequent net global atmospheric GHG concentrations associated with global energy use. Further to this, the International Energy Agency highlights a role for gas in displacing higher carbon intensive energy sources and supporting the transition to renewable energy sources to reduce global greenhouse gas emissions over time.
- l. Further to the management commitments made in the OPP, the Environment Regulations provide a future legislative mechanism for EP assessments that:
  - i. Require a detailed evaluation of all activity-specific environmental risks and impacts, including those associated with GHG emissions and global climate change, and will also require demonstration that GHG emissions will be reduced to 'as low as reasonably practicable (ALARP);
  - ii. Provides for NOPSEMA to further assess measures the proponent proposes in order to meet the established EPOs, which will be subject to regular review and compliance monitoring;

- iii. Will address specific monitoring and management actions that would need to be taken by the proponent to address uncertainties in the role of natural gas in displacing higher emission insensitive fuels, to ensure the EPO is achieved for the life of the project.
- m. The future EP assessment and compliance monitoring processes are the appropriate mechanisms for NOPSEMA to provide regulatory oversight and verification of the case made that impacts and risks arising from petroleum activities that are part of the project will be of an acceptable level and managed in accordance with the principles of ESD.

50. Underwater noise emissions impacts on fauna

- a. The OPP includes results of underwater noise modelling, including predictions of received levels of underwater noise in relation to biologically relevant thresholds for marine fauna. Using this modelling, the evaluation process indicated that without mitigation there was potential for unacceptable impacts on low frequency cetaceans from piling activities should they be present in the project area over the duration of piling activities.
- b. The OPP provides a comprehensive evaluation of the potential for impacts from underwater noise emissions. The Crux project location does not overlap any biologically important areas (BIA) for noise sensitive marine fauna, with the nearest documented important cetacean habitat being the pygmy blue whale migratory BIA, 268 km north-west of the Crux platform.
- c. To address the predicted impacts of underwater noise and ensure that the project will be managed so that it is not inconsistent with the Conservation Management Plan for Blue Whales 2015, and will not result in unacceptable impacts to cetaceans, the OPP commits to applying EPBC Policy Statement 2.1 controls with night time and low visibility procedures. In addition, the OPP has included an EPO to demonstrate that underwater noise impacts associated with the project will be managed to an acceptable level: *'No mortality or injury of threatened or migratory MNES fauna from the Crux project'*.
- d. The OPP demonstrates that based on the location of the project and the implementation of proposed management measures, the project is unlikely to injure cetaceans or interfere with migration behaviours when whales are in BIAs and is therefore is considered not inconsistent with the Conservation Management Plan for Blue Whales 2015.
- e. To ensure that the EPOs for underwater noise impacts on cetaceans are achieved, NOPSEMA's EP assessment process will require demonstration that the impacts and risks from underwater noise will be managed to an acceptable level and reduced to ALARP.

51. Light emissions

- a. The OPP does not overlap with any BIAs for light sensitive fauna.
- b. The OPP recognises that light from vessels may result in temporary attraction of listed threatened and migratory birds and presents an evaluation which concludes that this attraction will be of short duration and will not result in significant impacts or mortality to these species.
- c. The results of the Crux light assessment show that light from the Crux platform is not expected to reach any of the emergent receptors which represent nearest turtle nesting beaches (nearest being Cartier Island, approximately 105 km from the Crux platform). The OPP concludes no potential for

adverse disturbance to hatchling turtles arising from the project and demonstrates that the project will not be inconsistent with the National Recovery Plan for Marine Turtles in Australia (2017).

- d. During the implementation of the project, the OPP commits to managing light impacts consistent with policies, strategies, guidelines, conservation advice, and recovery plans for threatened species. This will include further consideration and application of the *National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds, (2020)* through the EP assessment process, when more specific activity-specific details are available.

## 52. Unplanned hydrocarbon discharges

- a. The OPP evaluation applied a systematic process to assess potential consequences of unplanned hydrocarbon releases by considering receptor sensitivity and predicted extent, duration, frequency and scale of impacts of hydrocarbons at the surface and in the water column from worst case spill scenarios utilising outputs of stochastic spill modelling.
- b. The OPP defined a potential 'area of influence' associated with possible hydrocarbon spill scenarios for the project. The boundary of this area was informed by the maximum predicted extent of hydrocarbon exposure at low threshold values in the marine environment from the maximum credible spill scenarios that may occur throughout the life of the project. This is considered a conservative outer estimate, based on a low probability potential for unplanned discharge.
- c. The OPP identified, defined and analysed the existing environment within the potential area of influence associated with the project.
- d. The risk evaluation found a number of emergent and submerged oceanic reefs, islands, shoals and banks within the potential area of influence associated with the project. Informed by the EPBC Protected Matters Database Search, the OPP identified listed threatened and migratory species, BIAs, Australian marine parks and protected heritage places within the project area of influence.
- e. The OPP identified the potential for hydrocarbon pollution, and potential consequential habitat degradation, from largescale hydrocarbon releases as a significant environmental risk. The most significant risks to the environment associated with unplanned hydrocarbon spill scenarios presented in the OPP were due to the distribution and concentration of entrained hydrocarbons. The OPP details a range of controls that are intended to reduce the likelihood of such a release occurring.
- f. The OPP refers to future regulatory approval processes required before activities can commence.
- g. The Environment Regulations provide the mechanism for EP assessments that:
  - i. Require a detailed evaluation of all activity-specific environmental risks and impacts, including those associated with unplanned hydrocarbon discharges, and a demonstration that those risks and impacts will be reduced to ALARP;
  - ii. Provides for NOPSEMA to further assess measures the proponent proposes in order to meet the established EPOs, which will be subject to regular review and compliance monitoring.
- h. The future EP assessment and compliance monitoring processes are the appropriate mechanisms for NOPSEMA to provide regulatory oversight and verification of the case made that impacts and risks arising from petroleum activities that are part of the project will be of an acceptable level and managed in accordance with the principles of ESD.

- i. Based on the outcomes of the evaluation of impacts and risks, the residual environmental risks of the unplanned hydrocarbon spill aspect of the Crux project are acceptable.

### Findings on subregulation 5D(6) criteria

53. NOPSEMA was reasonably satisfied that the OPP:

- a. Adequately addresses comments given during the period for public comment;
- b. Is appropriate for the nature and scale of the project;
- c. Appropriately identifies and evaluates the environmental impacts and risks of a project;
- d. Sets out appropriate environmental performance outcomes that:
  - i. Are consistent with the principles of ecologically sustainable development;
  - ii. Demonstrate that the environmental impacts and risks of the project will be managed to an acceptable level; and
- e. Does not involve an activity or part of an activity being undertaken any part of a declared World Heritage property within the meaning of the EPBC Act.

54. As NOPSEMA was reasonably satisfied that the OPP meets the criteria set out in subregulation 5D(6) of the Environmental Regulations, NOPSEMA accepted the OPP pursuant to subregulation 5D(5)(a) of the Environment Regulations.

Signed



Stuart Smith

Chief Executive Officer

6 August 2020