



**GAS IMPORT JETTY AND PIPELINE PROJECT  
ENVIRONMENT EFFECTS STATEMENT  
INQUIRY AND ADVISORY COMMITTEE**

**TECHNICAL NOTE**

**TECHNICAL NOTE NUMBER:** TN 029

**DATE:** 19 October 2020

**LOCATION:** Gas Import Jetty and Pipeline Works

**EES/MAP BOOK REFERENCE:** Chapter 6 – Marine biodiversity

Technical Report A – Marine biodiversity and Annexure A-B and Annexure A-C.

Technical Report B – Terrestrial and freshwater biodiversity.

**SUBJECT:** Response to RFIs 8, 9, 12, 13, 14, 15 - Section 2.4 Ramsar Values

**SUMMARY:** Responses relate to subsection: Ramsar values

**REQUEST:** This technical note has been prepared in response to the Request for Further Information 8, 9, 12, 13, 14 and 15 provided to the Proponents by the Crib Point Inquiry and Advisory Committee dated 16 September 2020.

**NOTE:**

**[RFI 008] Provide details on the information collected or relied on during EES compilation to inform baseline condition of seabirds, fish, migratory waders, marine mammals, and the extent of mangroves, seagrasses and saltmarsh communities (refer to Table 15 Technical Report B).**

1. To the extent that this question relates to marine biodiversity, it has been addressed in the Evidence in reply and response to IAC RFI prepared by Scott Chidgey (Document 164), at page 22 and in the Appendix.
2. To determine baseline ecological values present within the project study area for the Terrestrial and freshwater biodiversity impact assessment, an existing conditions assessment was undertaken which incorporated a background review of relevant biodiversity databases and existing assessment reports, as well as some site investigations. This included forming baseline conditions of seabirds and migratory waders.
3. Section 5.1 of Technical Report B: *Terrestrial and freshwater biodiversity impact assessment* provides the previous ecological assessment relevant to the Gas Import Jetty Works that helped form the existing baseline conditions of seabirds and migratory birds. Site investigations were undertaken by Biosis with particular attention for waders and waterbirds within the Gas Import Jetty Works study area, in order to complement existing information on species presence and habitat importance. Section 4.1.4.1 of Technical Report B: *Terrestrial*

and freshwater biodiversity impact assessment provides an overview of the wader and waterbird surveys undertaken.

**[RFI 009] Provide detail on the ongoing monitoring to assess potential impacts from the FSRU. Explain the triggers and mitigation actions if impact to Ramsar values is established.**

4. The marine monitoring program proposed for the Project is explained in Chapter 25 *Environmental Management Framework* (MM-ME16). The monitoring program will be prepared in consultation with the EPA and will be included in the OEMP for the Gas Import Jetty Works.
5. The aim of the monitoring program is to verify the assumptions in the EES and to ensure that actual environmental impacts are not greater than what was predicted. Unexpected circumstances can therefore be detected and responded to appropriately to meet the environmental responsibilities of the proponent.
6. The scope and detail of the monitoring program, including triggers and mitigation actions, would be determined in consultation with relevant environmental regulators, including EPA, DELWP and DAWE.
7. As identified in the evidence prepared by Dr I Wallis (Document 70, section 8.3.3), Technical Report A: *Marine biodiversity impact assessment* determined that Ramsar values and critical components, processes and services (CPS) are not at risk from the Project, and therefore remedial actions have not been proposed. The risk of the Project impacting on the Level of Acceptable change for each of the nine CPS is very low<sup>1</sup>.
8. In terms of monitoring requirements for Ramsar CPS, only two are considered to require monitoring. Dr I Wallis identified in section 8.3.9 of his witness statement (Document 70) the monitoring requirements of CPS are as follows:
  - (a) Wetland bathymetry – no loss in intertidal mudflat area = no action needed;
  - (b) Geomorphology – no change in sedimentation patterns = no action needed;
  - (c) Marine invertebrates – minor effect in 20 ha in Port seabed = monitoring task;
  - (d) Seagrass – no loss in seagrass = no action needed;
  - (e) Mangroves – no loss in mangrove area = no action needed;
  - (f) Saltmarsh – no loss in saltmarsh area = no action needed;
  - (g) Waterbirds – no affect due to FSRU = no action needed;
  - (h) Threatened bird species – no loss in bird populations = no action needed;
  - (i) Threatened fish species – very low risk to fish populations = monitoring task.
9. The Proponent's Day 1 EPRs (Document 174) provides for a plankton survival study and seabed biota monitoring at EPR-ME16, which requires:

*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. Plankton samples must be collected and analysed once per quarter for a period of three years (12 sampling events in total).*

*Seabed Biota Monitoring in Port Area. Baseline surveys 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.*

10. In addition, EPR-FF12 Migratory birds, states:

*The OEMP will include a monitoring program for waders and waterbirds at Woolleys Beach and Jacks Beach to allow for potential responses to the operation of the FSRU to be detected and, if appropriate, mitigated through an adaptive management response.*

11. Mr Brett Lane addresses EPR-FF12 in his evidence statement (at section 3.4.2, document 76):

*Mitigation measure MM-FF12 is an adaptive management strategy for detecting and responding to the potential indirect effects of works or project operation on migratory birds, rather than a specific mitigation or management activity. Given the technically strong assessment, founded on decades of waterbird monitoring data, and conclusions elsewhere in the report on the likelihood of impacts on this group from the Project, this mitigation measure is not considered necessary. The areas proposed for monitoring are not habitat of importance for migratory waterbird species and numbers are comparatively low, making the discernment of trends with any statistical precision challenging indeed. Small numbers of these birds may occur at Woolley's Beach and Jack's Beach but they are well screened from the pipeline works by native vegetation and works will not last long (several weeks in one place).*

*A better alternative would be to support the Western Port wide waterbird surveys to ensure they continue at the current effective level as these will be sufficient to discern any unlikely project impacts on waterbirds in areas that support meaningful numbers. In the unlikely event that were to occur leading to declines in waterbird numbers exclusively in the Hasting Bight and Hann's Inlet habitat areas (cf. the rest of Western Port) then further investigations of the causes of changes in waterbird use of habitats would be triggered, including investigation of possible impact pathways associated with the project.*

12. While Ramsar values and CPS are not considered to be at risk from the Project, specific objectives and remedial actions for Ramsar values should be considered for inclusion in the monitoring program.

13. Mr Chidgey recommends that (Section 9 of his evidence statement, Document 71):

- (a) The scope and detail of any monitoring and mitigation programs would be determined in consultation with relevant environmental regulators: EPA (State), DELWP (State) and DAWE (Commonwealth).
- (b) Monitoring programs should include specific environmental objectives and levels of remedial management response.
- (c) Program designs should consider potential spatial or temporal gradients of stressor effect on marine ecosystem values, the independence of reference locations and tiered management response triggers and corresponding remedial actions.

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<sup>1</sup> As outlined in Table 8-4 of Technical Report A.

- (d) In this case the programs should include specific objectives and remedial actions to address Western Port Ramsar Components, Processes and Services.

14. Dr Wallis further sets out the triggers and mitigation actions that he would expect if impact to Ramsar values is established, in his marine evidence in reply statement (Document 163, pdf pg. 32).

**[RFI 012] Explain potential effects on marine diving birds that utilise Crib Point Jetty and surrounds over a 24 hour period, with reference to survey data collected to inform the EES.**

15. Specific surveys for diving birds were not undertaken, but they were recorded wherever observed, including during the wader and waterbird surveys. Several diving bird species were recorded during field investigations and bird surveys, including Pacific Gull, Australian Pelican, Crested Tern as well as Cormorant species (Little Black Cormorant, Pied Cormorant and Little Pied Cormorant). These species were observed flying over, perching on or roosting on the existing pipe infrastructure on the Crib Point Jetty and have therefore adapted to the industrial setting of the area.

16. As identified in the evidence of Mr B Lane (Document 76, Table 3, item 5F), the Project is being developed in the context of an existing working port, and therefore the activities associated with the Project are already part of the current environment in which a number of marine bird species live. All species of diving birds that were recorded are listed in Table A2.1 of Technical Report B: *Terrestrial and freshwater biodiversity impact assessment*. Any threatened diving birds recorded are listed in Table A2.2.

17. Potential impacts on marine birds, including diving birds, associated with the operation of the Project at the Crib Point Jetty have been identified in section 7.2 of Technical Report B: *Terrestrial and freshwater biodiversity impact assessment*. Potential impacts may occur from noise and lighting generated during FSRU operation.

18. As identified in the evidence of Mr B Lane (Document 76, Table 3, item 3E), the extent of marine and intertidal habitat used by migrating intertidal and marine birds affected by artificial light is very limited. The areas most affected are confirmed not to be important habitat for migratory species, based on decades of bird survey work. Due to the limited use of the most affected area by these birds and the very small proportion of available habitat affected, the impacts of artificial lighting associated with the Project are highly unlikely to result in significant disruptions to the breeding, survival and migratory habits of birds. The assessment undertaken is consistent with the *National Light Pollution Guidelines for Wildlife, including marine turtles, seabirds and migratory shorebirds* (Commonwealth of Australia, 2020).

19. It is not expected that predicted noise levels from operational activities at the Crib Point Jetty would have measurable effects on marine and waterbird species that use the jetty and surrounding area, including the use of foraging or roosting habitat by any waterbird species that use Western Port. As identified in the evidence of Mr B Lane, the impact of noise on birds has been adequately assessed in Section 7.2.1.2 of Technical Report B. Predicted noise levels in primary foraging habitats for significant bird populations are the same as or less than current ambient noise levels. Significant impacts on birds from noise and vibration are therefore not anticipated.

20. Furthermore, discharges associated with the operation of the FSRU would not impact on adjacent secondary wader and waterbird foraging habitats of Woolleys Beach or nearby

seagrass beds and mangroves. Impacts would not occur to the food chain such that effects would be felt to any of these nearby receptors or habitats.

**[RFI 013] Explain the potential attractants for marine life around the FSRU and likely risks.**

21. There are three attractants for marine life around the FSRU:

- (a) The high velocity jets, which disturb the water surface and will attract large fish, as fish are naturally attracted to interfaces in the ocean
- (b) The dead plankton in the discharge jets, which will attract fish that feed on plankton (mostly smaller fish, but they may not be able to stay in position in the strong tidal currents)
- (c) The surface of the FSRU, which will be colonized by macroalgae (in the photic zone near the water surface) and encrusting invertebrates (ascidians, bryozoans, sponges and hydroids) at lower depths (as on jetty piles).

22. It is doubtful that the temperature variations will have any negative effects, as temperature variations occur naturally each tide cycle and from day to night.

23. The locally elevated chlorine concentration may be a minor deterrent although observations at power stations show fish are attracted to the discharge (by the food availability) even if there is a high chlorine concentration.

24. We do not know if the encrusting invertebrate community is affected by chlorine, but we do know that outlets from power stations and desalination plants (and other outfalls containing chlorine) are covered with growth in a few months.

25. As the FSRU would be in a fishing-exclusion zone, there is no direct route for any residual chlorine (or bromine) to enter the human food supply.

**[RFI 14] Explain the basis for monitoring the Ramsar area for a period of three years when the FSRU has a design life of 20 years.**

26. The rationale for a three year monitoring period is that it is expected that this will be sufficient to establish what, if any, impacts occur. If there are unanticipated and unacceptable impacts after three years, it would be expected that the relevant authorities would impose a requirement for both additional mitigation measures and ongoing monitoring. If there are no impacts or acceptable impacts, there is no basis to continue monitoring.

27. The monitoring program will be prepared in consultation with the EPA. The aim of the monitoring program is to verify the assumptions in the EES and to ensure that actual environmental impacts are not greater than what was predicted. Unexpected circumstances can therefore be detected and responded to appropriately to meet the environmental responsibilities of the proponent. As identified in the evidence of S Chidgey (Section 6.3, Document 71), the scope and detail of the monitoring program, including timeframes, would be determined in consultation with relevant environmental regulators, including EPA, DELWP and DAWE, and would need to include consideration of forthcoming regulatory changes.

28. Mr Chidgey (as section 9, Document 71) recommends that the monitoring program design consider potential spatial or temporal gradients of stressor effect on marine ecosystem values, the independence of reference locations and tiered management response triggers and corresponding remedial actions.

29. EPA has recommended the proponent consult with EPA about the exact nature of the monitoring programs, as part of the discharge licencing conditions. As identified in section 10 of the evidence of S Chidgey (Document 71), this recommendation is consistent with usual practice that monitoring programs in relation to discharges and other impacts associated with marine, freshwater, and terrestrial aspects of a project would be conditions of any DAWE/DELWP Environmental Approval, EPA Works Approval and Licence to discharge.

**[RFI 015] Describe and assess overall cumulative impacts to marine flora and fauna from the FSRU over 20 years having regard to the following individual effects:**

- **noise, vibration, underwater acoustics**
- **vessel movement and frequency**
- **air emissions**
- **water quality impacts from chlorine, temperature, sediment disturbance**
- **night lighting**
- **spills and leaks.**

30. Significant cumulative impacts to marine flora and fauna from the FSRU operating at the proposed location at Crib Point for the nominated project period of 20 years are not expected to occur as a result of the individual effects identified in RFI 015. The risk of significant impacts on marine flora and fauna from these individual effects are low with the implementation of mitigation and are therefore unlikely to result in cumulative impacts over the operational period. Impacts on marine flora and fauna from these effects are assessed in Technical Report A: *Marine biodiversity impact assessment* and Technical Report B: *Terrestrial and freshwater biodiversity impact assessment*.

31. Technical Report B: *Terrestrial and freshwater biodiversity impact assessment* has assessed the potential noise and vibration and lighting impacts of the FSRU on waders and waterbirds. The assessment concluded that light spill is unlikely to impact on foraging success of birds and other fauna in Western Port due to the distance from existing roost sites and foraging habitat. The secondary foraging habitat for waders and waterbirds along Woolleys Beach being located at least 500 metres from the proposed FSRU location and sitting outside of the area effected by light spill.

32. Predicted noise levels from operational activities at the Crib Point Jetty are not expected to have measurable effects on marine and waterbird species that use the jetty and surrounding area, including the use of foraging or roosting habitat by any waterbird species that use Western Port.

33. Mr B Lane identified in his evidence statement (Document 76) that the Project is being developed in the context of an existing working port, and therefore the activities associated with the Project are already part of the current environment in which waders and waterbird species live. The Project is not expected to result in significant impacts to waders and waterbirds and is therefore not likely to have a long-term cumulative effect. A variety of mitigation measures will be implemented to minimise impacts and further limit the capacity of the Project to have negative residual effects over the life of the Project.

34. Technical Report A: *Marine biodiversity impact assessment* has assessed the potential impacts on marine flora and fauna as a result of FSRU operation. Underwater noise generated by the Project may impact on individual marine fauna within the vicinity of the jetty, however, the

noise emitted will not cause significant changes to the soundscape in a pre-existing operational port.

35. The additional noise from the Project would not affect marine fauna species on a population level and is therefore not expected to result in long-term cumulative impacts. Mitigation measures will be implemented to manage potential underwater noise impacts.
36. The additional port activity and shipping movements associated with the visiting LNG carriers is not expected to significantly impact on marine fauna. The Project is being developed in the context of an existing working port and the shipping activities associated with the Project are already part of the current environment, and are properly categorised as impacts associated with the existing, ongoing, policy-supported use of the Port for port activities. .
37. Water quality impacts from FSRU operation are unlikely to significantly impact on marine flora and fauna, with potential impacts restricted to the 20 hectares area around the Crib Point Jetty in the case of temperature change predicted above the guideline value under the modelled 'worst-case' operational mode (peak gas production, with an LNG carrier adjacent). Dr I Wallis explains in section 8.3.11 of his evidence statement (Document 70) that the areas where chlorine and temperature guideline values would be exceeded extend only over a small part of a working port area, where the seabed has been modified by dredging. These areas are well away from any intertidal mudflats, seagrass, mangroves or saltmarsh in Western Port.
38. The operational 'worst case' can be distinguished from the modelled 'worst case', resulting in further lowering of the impact areas. This is described in more detail in Technical Note 033.
39. There are strong tidal currents in Western Port which flow along the main axis of North Arm. Chlorine and cold water from the port area is dispersed by these tidal currents, which inevitably involves dilution. Because of the continued dilution over time, there is no long-term accumulation of chlorine in Western Port, even in the vicinity of the FSRU. The chlorine produced oxidants discharged from the FSRU would decay in seawater, with the total loss of CPO from the initial production occurring over a period of one to two days in well-mixed aerobic seawater, as occurs in Western Port.
40. The risk of bioaccumulation of chlorine by products has been discussed by Mr Chidgey in his evidence statement (Document 71, page 15). Mr Chidgey concludes that the risk is low given the tidally influenced and well-mixed conditions in Western Port. The cumulative effects of the FSRU on chlorine concentrations in the project area and more broadly over the remainder of the bay are expected to be negligible. It is therefore considered unlikely that water quality impacts associated with chlorine and temperature would result in long-term cumulative impacts.
41. The disturbance of sediments from the FSRU and tugboat operations is not considered to result in significant impacts. Western Port is characterised by high turbidity, which arises from the daily reworking and resuspension of fine sediment by tidal, wind and wave action. As outlined in Section 7.10.2 and 7.10.3 of Technical Report A, the local seabed scour expected to occur from the FSRU and tug boat operations has been assessed as having a negligible consequence, as very small quantities of sediment are involved compared to the natural suspension of sediment and the input of sediment from the catchment.
42. The sediment re-suspended by tugboats would settle back down to the seabed within the defined port area. There would be a brief local increase in turbidity but no large scale or long-term increase. Therefore, long term cumulative impacts from the disturbance of sediments is unlikely to occur.

43. The risk of increased disturbance of sediment is further addressed in the evidence statement of Dr Wallis (Document 70), at section 8.6.2.
44. The potential impacts associated with a spill or contamination during FSRU operation has been assessed in Section 7.9 of Technical Report A. The risk of contamination by spills / leaks from the FSRU and LNG carriers would be the same as any similar vessels visiting Australian ports, but considerably less than oil and fuel tankers. The likelihood of a spill occurring is considered rare.
45. Dr Wallis (Document 70, section 8.5.7), further addresses the risk of spills from the FSRU or LNG carriers and states:

*The FSRU and LNG vessels are double-hull vessels, the fuel storage tanks are separated from the hull by either ballast tanks or cofferdams (void spaces). There is no point on the vessel where tanks (or the LNG cargo) are in direct contact with the outer hull of the vessel. For a significant loss of diesel to occur, the outer and inner hull of the vessel would have to be breached at the point where a storage tank is located on the vessel. In the unlikely event of this happening, there are also multiple bunker tanks meaning that fuel can be transferred to intact tanks and it would be improbable that a large complement of diesel fuel would be lost. Overall, the potential risk for a large spill of diesel is considered to be very unlikely.*

46. The risk of spills and leaks during FSRU operation would be managed with documented standard operation procedures (SOPs) and by ensuring compliance with the Port of Hastings Development Authority Safety and Environmental Management Plan and Port Operating Handbook. With the implementation of mitigation measures, the risk of a spill impacting on the surrounding Western Port environment is low.

**CORRESPONDENCE:** N/A

**ATTACHMENTS:** N/A