AGL Gas Import Jetty Project

AGL Wholesale Gas Limited

Hydrology Impact Assessment

IS210700-EP-RP-003 | Final

28 August 2018

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Project No:	IS210700
Document Title:	Hydrology Impact Assessment
Document No.:	IS2107100-EP-RP-003
Revision:	Final
Date:	28 August 2018
Client Name:	AGL Wholesale Gas Limited
Project Manager:	Shelley Ada
Author:	Tyrone Thomas
File Name:	IS210700-EP-RP-003-Hydrology-Final(v2)

Jacobs Group (Australia) Pty Limited
ABN 37 001 024 095
Floor 11, 452 Flinders Street
Melbourne VIC 3000
PO Box 312, Flinders Lane
Melbourne VIC 8009 Australia
T +61 3 8668 3000
F +61 3 8668 3001
www.jacobs.com

Document history and status

Revision	Date	Description	By	Review	Approved
1	17/07/2018	Final	T. Thomas	J McCrann	S. Ada
2	28/08/2018	Minor revisions	T. Thomas	J McCrann	S. Ada

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Glossary and Abbreviations

Abbreviation	Term	Definition
AEP	Annual Exceedance Probability	The probability that a flood event will be equalled or exceeded in any given year
AGL	AGL Wholesale Gas Limited	The Project proponent
Council	Mornington Peninsula Shire Council	
DELWP	Department of Environment, Land, Water and Planning	
DoEE	Department of the Environment and Energy (Commonwealth)	
FSRU	Floating Storage and Regasification Unit	An LNG carrier that is used for floating storage and also has regasification equipment on board that allows it to directly send out high pressure gas to the market.
LNG	Liquefied natural gas	LNG is natural gas (predominantly methane, CH_4, with some mixture of ethane C_2H_6) that has been converted to liquid form by chilling for ease of storage or transport.

Executive Summary

AGL Wholesale Gas Limited (AGL) is proposing to develop a Liquefied Natural Gas (LNG) import facility, utilising a Floating Storage and Regasification Unit (FSRU) to be located at Crib Point on Victoria's Mornington Peninsula. The project, known as the "AGL Gas Import Jetty Project" (the Project), comprises:

- The continuous mooring of a FSRU at the existing Crib Point Jetty, which will receive LNG carriers of approximately 300 m in length
- The construction of ancillary topside jetty infrastructure (Jetty Infrastructure), including high pressure gas unloading arms and a high pressure gas flowline mounted to the jetty and connecting to a flange on the landside component to allow connection to the Crib Point Pakenham Pipeline Project.

There are several other activities that are related to the Project, these include the Jetty Upgrade and the Crib Point Pakenham Gas Pipeline Project (Pipeline Project), which are the subject of separate assessment and approval processes carried out by separate entities.

The Project's permanent footprint within the landside area of the Project Site (landside component), will be limited to a gas flow line from the jetty to a flange, connecting to the natural gas transmission pipeline. As detailed design of the onshore infrastructure is yet to be developed, a conservative approach was taken, whereby this assessment covers the entire landside component (the study area). A temporary construction footprint comprising of a laydown area and staff facilities/amenities will be located within a small area of the landside component.

This report presents the findings of a hydrology impact assessment for the study area. The assessment included a review of available flood information as well as applicable legislation and associated approvals required for the Project.

It can be concluded through this assessment that:

1) There are no Flood Overlays affecting the study area under the Mornington Peninsula Shire Planning Scheme, and it is understood that a planning permit will not be required in relation to the Project.
2) It was confirmed that no waterways pass through the study area.
3) Sea level rise predictions as a result of climate change (2040), shows there are marginal fringe sea level risk impacts along the eastern boundary of the study area. As the layout of the landside component of the Project Site has yet to be confirmed, detailed design will require an assessment and determination of design mitigation options to ensure the landside facilities are not impacted by coastal flooding issues, storm surge and sea level rise impacts.
4) Much of the landside component has been cleared and levelled, therefore further development is unlikely to significantly change this feature of the local hydrology.
5) Given the limited Project footprint (consisting of a gas flow line from the jetty to a flange, connecting to the natural gas transmission pipeline and a temporary construction area including staff facilities/amenities and equipment laydown), it is anticipated that there would be a minimal change in the fraction of impervious area across the landside component and hence the impact would likely be minimal. This would be assessed during detailed design once site facility details are confirmed and any potential attenuation of flow would be provided on site.

Furthermore, the adjacent Western Port Ramsar wetland site must be considered during the detailed design phase as the site is a wetland of International Importance (listed under the Ramsar convention) and protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). However, due to the limited footprint of the Project on a previously cleared and levelled site, it is expected that the hydrological effects of the Project would not have a significant impact on the Western Port Ramsar wetland, and hence will not trigger the requirements for referral under the EPBC Act or the *Environment Effects Act 1978*.

1. Introduction

1.1 Project Overview

AGL Wholesale Gas Limited (AGL) is proposing to develop a Liquefied Natural Gas (LNG) import facility, utilising a Floating Storage and Regasification Unit (FSRU) to be located at Crib Point on Victoria's Mornington Peninsula. The project, known as the "AGL Gas Import Jetty Project" (the Project), comprises:

- The continuous mooring of a FSRU at the existing Crib Point Jetty, which will receive LNG carriers of approximately 300m in length
- The construction of ancillary topside jetty infrastructure (Jetty Infrastructure), including high pressure gas unloading arms and a high pressure gas flowline mounted to the jetty and connecting to a flange on the landside component to allow connection to the Crib Point Pakenham Pipeline Project.

There are several other activities that are related to the Project. These include the Jetty Upgrade and the Crib Point Pakenham Gas Pipeline Project (Pipeline Project) which are the subject of separate assessment and approval processes carried out by separate entities.

1.2 Purpose of this Report

Jacobs Group (Australia) Pty Ltd (Jacobs) was engaged by AGL to prepare this assessment of the hydrological impacts resulting from the Project. This report has been prepared in support of:

- A referral under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
- A referral under the Victorian *Environment Effects Act 1978.*

1.3 Study Area

The study area for the purposes of this assessment includes only the landside component of the Project Site, known as allotment 2040 The Esplanade, Crib Point.

The FSRU is a ship that will be moored at the jetty and will not impact the hydrology of the landside component. The Jetty Infrastructure will be mounted to an existing jetty and is not expected to have an impact on the hydrology of the landside component.

The Project's permanent footprint within the landside component comprises only of a gas flow line from the jetty to a flange, connecting it to the natural gas transmission pipeline. A temporary construction footprint comprising of a laydown area and staff facilities/amenities will be located within a small area of the landside component. As detailed design of the onshore infrastructure is yet to be developed, a conservative approach was taken, whereby this assessment covers the entire landside component.

1.4 Limitations

As the Project will occupy a very limited footprint within the landside component of the Project Site, a high level assessment was undertaken in order to produce an evaluation of the study area.

2. Legislation, Policy and Guidelines

This table provides for the legislation, policy and guidelines which are relevant to this assessment.

Table 2.1 : Applicable legislation, policy and guidelines

Legislation / Policy	Key Policies / Strategies	Implications for this project	Considerations	Timing/ interdependencies
Commonwealth				
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Subdivision B – Wetlands of international importance (Section 16)	An action that will, or is likely to, have a significant impact on a Ramsar wetland will be subject to a rigorous environmental assessment and approval regime under the EPBC Act.	A person proposing to take an action that is likely to have a significant impact on the ecological character of a declared Ramsar wetland should refer the action to the Environment Minister. The Minister will decide whether the action requires approval under the EPBC Act. If the Minister decides that the action requires approval under the EPBC Act, then an environmental assessment of the action will be carried out. Due to the limited footprint and fact that the landside component of the Project Site has been previously cleared and levelled, it is expected that the Project will not have a significant impact on the Ramsar Wetland.	Planning phase
State				
Environment Effects Act 1978	Section 8 – Advice of Minister as to whether statement required	The *Environment Effects Act 1978 (*EE Act*)* requires consideration to be given to projects which have significant impacts on the Victorian environment as described in the Act. Under section 8(3) and 8(4) of the Act, a proponent of works that could have a significant effect on the environment should seek advice of the Minister as to whether an Environment Effects Statement (EES) is required. This is done through a referral under the *Environment Effects Act 1978*. For this Project, there are two individual criteria that may warrant a referral. These are:	This assessment has determined that the hydrological effects associated with the Project do not trigger any of the criteria for referral under the *Environment Effects Act 1978*.	Planning phase

Legislation / Policy	Key Policies / Strategies	Implications for this project	Considerations	Timing/ interdependencies
		· Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia' · Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term		
Planning and Environment Act 1987	Section 8A - Municipal council as planning authority for its municipal district	The municipal council is a planning authority for any planning scheme in force in its municipal district. Planning approvals go through Council.	The wharf is an existing structure and is currently used to provide facilities for bulk liquids. It is currently used by United Petroleum to transfer liquid fuel via a pipeline along the wharf to its onshore storage facility. The FSRU will similarly be a ship discharging cargo at the wharf, albeit on a more continuous basis. The new flowline will constitute a utility installation land use, which is ancillary to the use of the land as a wharf. At this stage AGL understands that the Project will not require planning permission for use of the land, nor for the works to install the Jetty Infrastructure.	Planning phase
Building Act and *Building Interim Regulations 2017*	Regulations 802 and 806	Regulation 802 provides that the report and consent of the relevant council must be obtained for an application for a building permit if the site is on an allotment that is in an area liable to flooding. The relevant council must not give its consent under sub regulation (3) if it is of the opinion that there is likely to be a danger to the life, health or safety of the occupants of the building due to flooding of the site. A council may specify a level for the surface of the lowest floor of a building on the site. But must first consult with the floodplain management authority for the site, and must specify a level at least 300mm above any declared flood levels unless the authority consents to a lower level. Regulation 806 requires that the report and consent of the relevant council must be obtained for an application for a building permit for the construction of a building on designated land or works.	The landside component lies within a designated 'Flood Prone Area' as defined by the Shire of Mornington Peninsula, as a result of coastal flooding projections. However, given that this Project only involves construction of topside jetty infrastructure and structures that will be classified as Class 10 buildings (e.g. a non-habitable shed) under the Building Code of Australia (BCA), it is understood that consent and referral will not be required. Regulation 806 of the Building Interim Regulation 2017 is also not applicable, given that there will be no designated land or works affected by the building permit application.	Planning Phase

Legislation / Policy	Key Policies / Strategies	Implications for this project	Considerations	Timing/ interdependencies
Local				
Mornington Peninsula Planning Scheme	Clause 12.02 – Coastal Areas The Victorian Coastal Strategy Clause 13.01 – Climate Change Impacts Clause 13.02 – Floodplains Clause 44.03 – Floodway Overlay	If proposed works are deemed to impact coastal areas, planning will need to incorporate the Coastal Management Act 1995 and the Victorian Coastal Strategy as part of the planning process. If proposed works are deemed to be subjected to climate change impacts, planning scheme outlines strategies to incorporate in planning phase. If proposed works are deemed to impact the natural flooding regime of the area or may be at risk of flooding via existing inundation areas, planning scheme outlines strategies to incorporate in planning phase.	It is understood that no planning permit will be required for the Project, and so these policies will not be engaged or applicable.	Planning phase

3. Method

3.1 Desktop Assessment

A review of available flood information was undertaken. This included the following relevant sources:

- Mornington Peninsula Shire: Integrated Local Flood Management and Drainage Strategy (2009)
- Mornington Peninsula Shire: Flood Emergency Plan (2013)
- Mornington Peninsula Shire: Flood Prone Mapping – Designated Flood Prone Areas (2016)
- Victorian Department of Environment, Land, Water and Planning (DELWP): Planning Scheme Overlays and 1: 25,000 Contours
- Victorian Department of Environment, Land, Water and Planning (DELWP): Victorian Coastal Inundation Extents
- Victorian Department of Environment, Land, Water and Planning (DELWP): VicPlan Online Mapping (Zones and Overlays).

3.2 Assumptions

This assessment relates only to the landside component of the Project Site and excludes the marine assessment, and Jetty Infrastructure.

Coastal flooding issues, storm surge and climate change have not been considered. A separate climate change risk assessment has been conducted and is included in the Greenhouse Gas Emissions Assessment (including Climate Change) by Jacobs 2018.

3.3 Stakeholder Engagement

To obtain required flood information, the following stakeholders were engaged during this assessment:

- Melbourne Water
- Mornington Peninsula Shire Council (Council).

Information from the Department of Environment, Land, Water and Planning's (DELWP) databases was reviewed without direct engagement.

4. Assessment

4.1 Existing Conditions

4.1.1 Flood overlays

To determine whether flooding may be an issue for this site, flood overlays have been overlain over the existing aerial imagery to identify any potential flooding impacts within the study area. The overlays of interest are:

- Floodway Overlays (FO)
- Land Subject to Inundation Overlays (LSIO)
- Special Buildings Overlays (SBO).

There are no identified flood overlays (FO, LSIO, SBO) in or around the study area in the Mornington Peninsula Planning Scheme as illustrated in Figure 4.1 below, and it is understood that a planning permit will not be required in relation to the Project. However, Figure 4.2 illustrates that the landside component is within a 'Designated Flood Prone Area' as identified by Mornington Peninsula Shire Council for the purposes of assessing building permit requirements.

Depending on the nature of the works, a building permit application in relation to land liable to flooding would ordinarily require Council consent and referral to the floodplain management authority. Given that the Project involves construction of topside jetty infrastructure and structures that will be classified as Class 10 buildings (non-habitable buildings), it is understood that consent and referral will not be required.

Regulation 806 of the Building Interim Regulation 2017 is also not applicable, given that there will be no designated land or works affected by the building permit application.

4.1.2 Waterways

Figure 4.2 confirms that no waterways pass through the study area with the topography of the region resulting in a small upstream catchment. There are also no inland waterbodies within a reasonable distance of the site that may be impacted (excluding the Ramsar area).

Though the area is not affected by 1% AEP flood extents, the consideration of sea level rise impacts on the study area as a result of climate change is required. As the Project is intended to operate for approximately 20 years, the sea level rise predictions for 2040 have been selected as the most relevant. Based upon current predictions from the Victorian Coastal Inundation Dataset[1] (2040), sea level is predicted to rise by 0.2 m by 2040. Figure 4.3 illustrates the resultant extent of inundation, which shows there are marginal fringe sea level risk impacts along the eastern boundary of the study area. This does not include a 2040 Storm Tide extent as this information is not currently available.

As the layout of the landside area of the Project Site has yet to be confirmed, detailed design will require an assessment and determination of design mitigation options to ensure the landside facilities are not impacted by coastal flooding issues, storm surge and sea level rise impacts.

4.1.3 Wetlands

The study area is adjacent to the coastal wetlands of Western Port. These include intertidal flats, which are located between the site and the bay. A large portion of Western Port is a wetland of International Importance (listed under the Ramsar convention) and protected under the EPBC Act 1999, as indicated in Section 4.4.1.

[1] https://www.data.vic.gov.au/

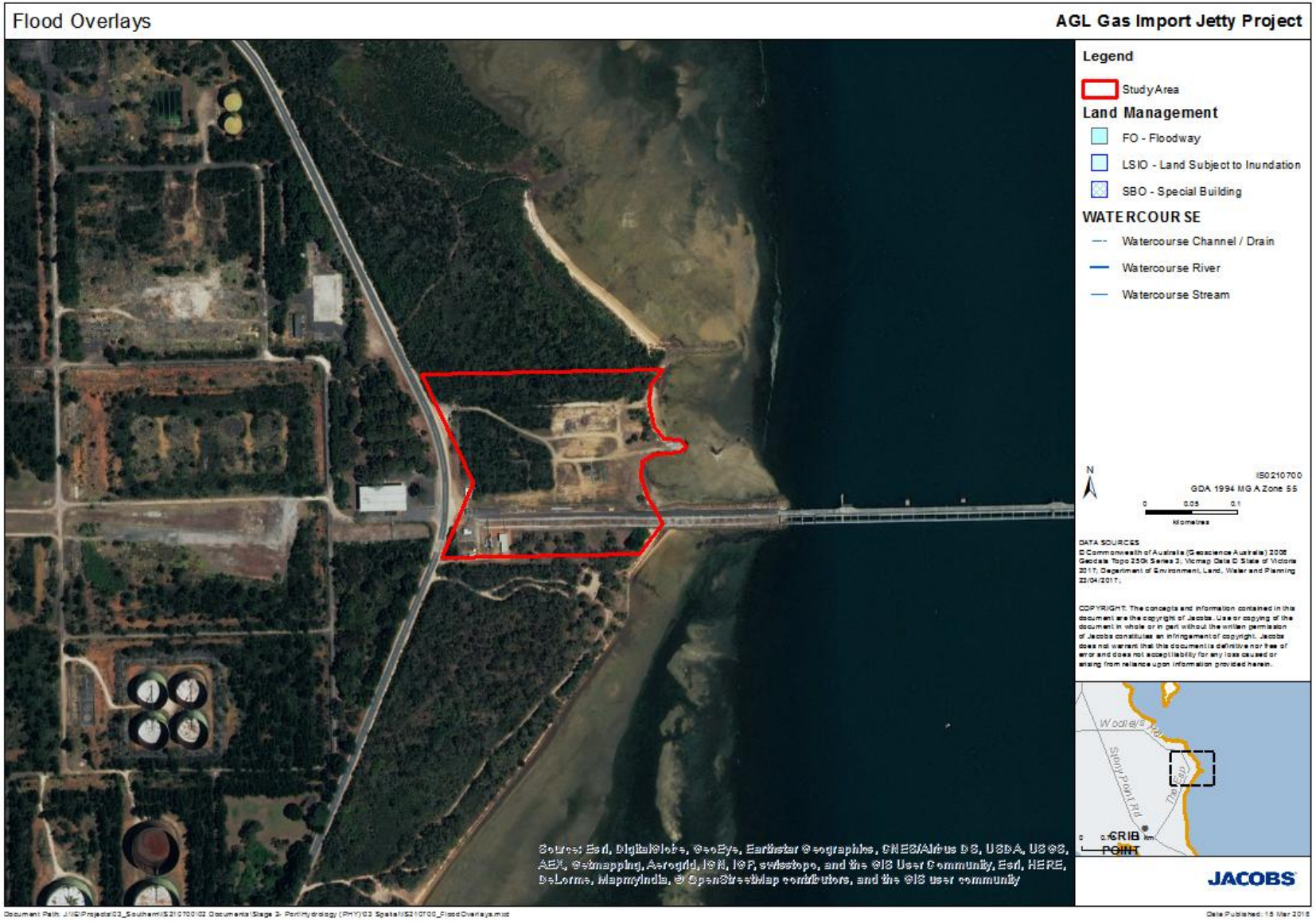

Figure 4.1 : Study area showing Flooding Overlays and Watercourses

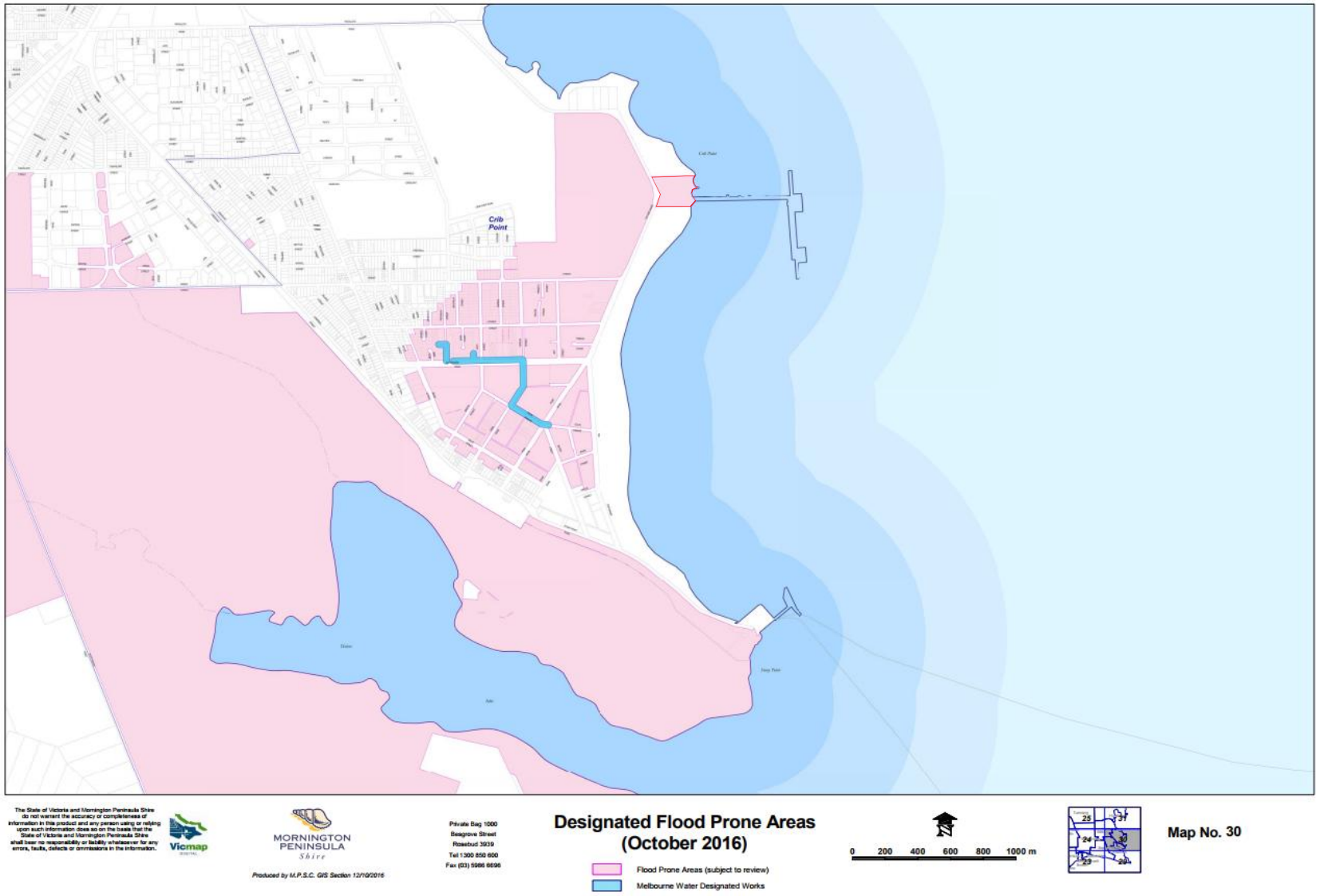

Figure 4.2 : Designated Flood Prone Areas - Map 30 (MPS, 2016). Study area outlined in red.

Figure 4.3 : Indicative Port Zone showing 2040 climate change scenario overlays

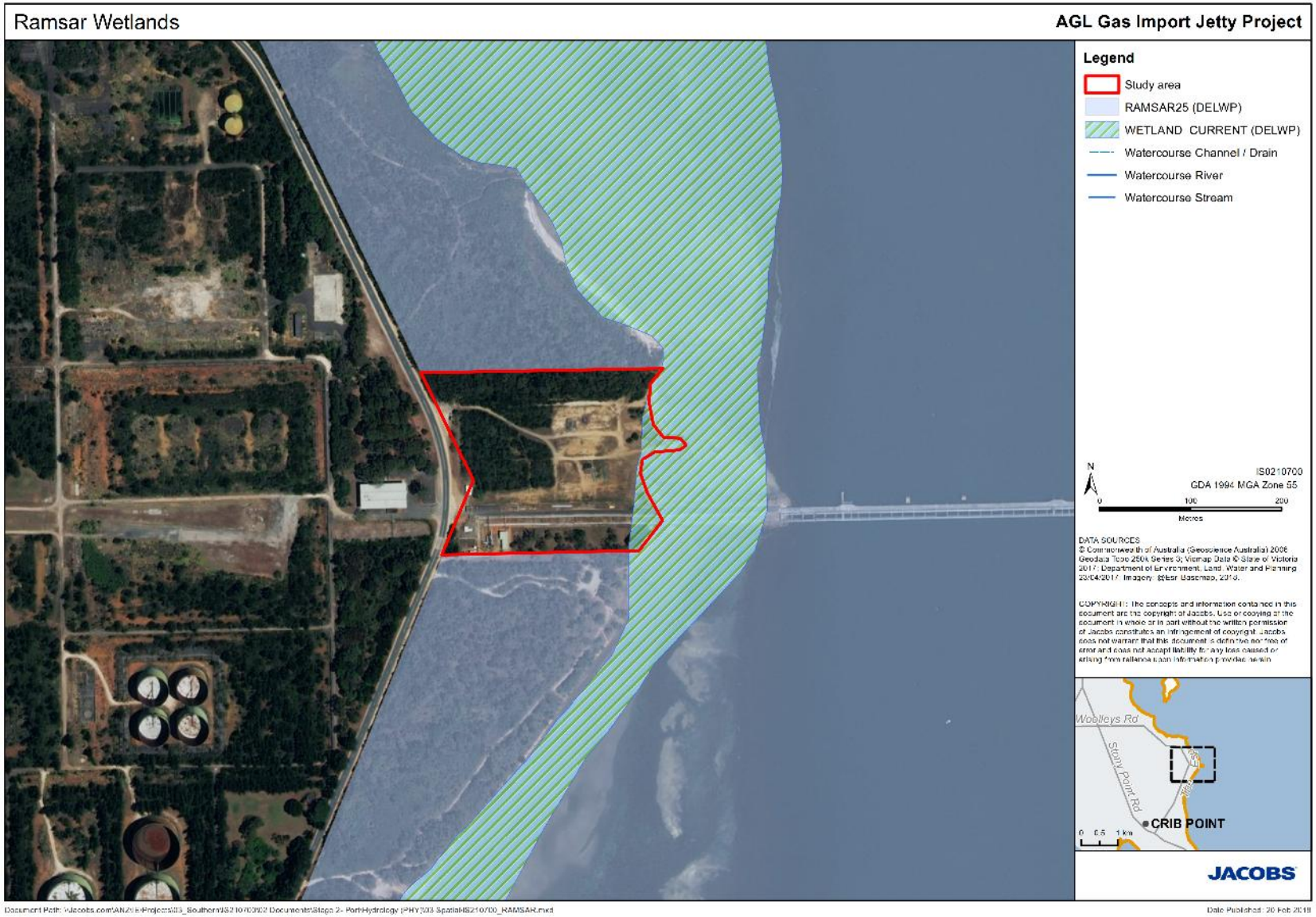

Figure 4.4 : Indicative Port Zone showing adjacent wetland and Ramsar region

4.2 Key Issues

Given that much of the study area has been cleared and levelled, further development is unlikely to significantly impact the local hydrology. It is worth noting, however that there will need to be mitigation measures in place if further development does occur.

The primary factor influencing the local hydrology will be the change in overall imperviousness of the site area and changes to the local overland flow paths due to the proposed development. Given that the Project only involves construction of topside jetty infrastructure and the end of the gas flow line connecting to the flange on shore, it will not significantly change the impervious area or rate of runoff generation and does not require further consideration.

The adjacent Western Port Ramsar wetlands must be considered during the design phase as the site is a wetland of International Importance (listed under the Ramsar convention) and protected under the *Environment Protection and Biodiversity Conservation Act 1999.* However, due to the limited footprint and fact that the landside component has been previously cleared and levelled, it is not expected that the Ramsar wetland will be adversely impacted by the Project.

4.3 Benefits and Opportunities

As the study area has been previously cleared and levelled, it is assumed that the impact to local hydrology resulting from the site re-development will be minimal.

Any future further development of the site may provide an opportunity to reduce the increased runoff resulting from development of the site, including capture of rainwater in tanks

4.4 Impact Assessment

4.4.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) promotes the conservation of biodiversity by providing for the protection of threatened species and ecological communities, migratory and marine species and other matters of national environmental significance. The Act is administered by the Commonwealth Department of the Environment and Energy (DoEE).

Under the EPBC Act 1999, if the Project has the potential to have a significant impact on any matters of national environmental significance, a referral should be made to the Minister to determine whether the Project is a 'controlled action'.

From a hydrological perspective, the following sections/questions from the EPBC referral form (online submission) will be relevant during the referral process:

Question 2.3 - Is the proposed action likely to have ANY direct or indirect impact on the ecological character of a Ramsar wetland?

> As the Project Site sits within and adjacent to a declared Ramsar wetland, the development could potentially result in either a direct or indirect impact upon the ecological character of this adjacent wetland through the generation of increased runoff if the impervious area of the site increases from existing conditions. However, under the proposed changes this should be very small, as described in Section 4.2 above.

Question 3.2 - Describe the hydrology relevant to the project area (including water flows)

> Section 4.1 above outlines the existing hydrology relevant to the Project Site. Due to the fact that there are no identified flood overlays (FO, LSIO, SBO) affecting the study area in the Mornington Peninsula Planning Scheme as illustrated in Figure 4.1, it is inferred that there would be minimal risk of flooding associated with

runoff. The study area does however sit within a 'Designated Flood Prone Area' as identified by Council in Figure 4.2; though this is indicative of coastal flooding which is outside the scope of this document.

Figure 4.1 also confirms that no waterways pass through the study area providing only in a small upstream catchment. There are also no inland waterbodies within a significant distance of the site that may be impacted (excluding Ramsar areas).

Although part of the Project Site sits within a declared Ramsar wetland (as identified in Section 4.1.3), at this stage no significant hydrological impacts have been identified. Any potential impacts would be identified and mitigated during the detailed design phase. It will be possible to optimize the site layout such that works are located away from sensitive areas and impacts are managed so as to avoid these sensitive areas.

4.4.2 Environment Effects Act 1978

The *Environment Effects Act 1978* requires consideration to be given to projects which have significant impacts on the Victorian environment as described in the Act.

A project with potential adverse environmental effects that, individually or in combination, could be significant in a regional or State context should be referred. The criteria for referral are provided in the *Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978*.

For this proposed development, there are two individual criteria that may warrant a referral. These are:

- Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'
- Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term

This assessment has determined that hydrological effects associated with the Project do not trigger any of the criteria for referral. The following provides a response to the referral criteria identified above:

- For the proposed development, it is unlikely that the Project will require significant volumes (e.g. > 1GL/year) of fresh water, discharge waste water runoff to water environments, impact the beneficial use of water environments or cause extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems over the long-term.
- The site is adjacent to the coastal wetlands of Western Port. These include intertidal flats, which are located between the site and the bay. Parts of Western Port are a wetland of International Importance (listed under the Ramsar convention) and protected under the EPBC Act. Due to the limited footprint and the fact that the landside component has been previously cleared and levelled, it is not expected that the wetlands will be adversely impacted by the Project.
- No waterways pass through the area of interest with the topography of the region providing only a small upstream catchment. An appropriate stormwater management strategy will be required to appropriately manage incidental rainfall.
- There are no waterways or waterbodies near the site that may be impacted (excluding Ramsar areas).

4.4.3 Mornington Peninsula Planning Scheme

Council is the responsible authority for the preparation and administration of its Planning Scheme under the *Planning and Environment Act 1987*. There are no Flood Overlays affecting the proposed Project Site under the Mornington Peninsula Shire Planning Scheme, and it is understood that a planning permit will not be required in relation to the Project.

4.4.4 Building Act and Building Interim Regulations

Whilst, the study area has been identified as being within a 'Designated Flood Prone Area' by Council (see Figure 4.2), a building permit for the construction of this infrastructure is not required under the Building Code of

Australia (BCA). Regulation 806 of the Building Interim Regulation 2017 is also not applicable, given that the Project does not involve any impacts on designated land or designated works.

5. Management and Mitigation

Generally, the construction of any on-site infrastructure (above-ground) may require a detailed hydrological assessment to be undertaken to determine:

- Alterations to overland flow paths that may result in flooding of adjoining land
- Management of generated stormwater
- Mitigation measures of any potential impacts to surrounding property.

However, as outlined above, the Project infrastructure will have minimal impact on the impervious area. Due to the small footprint and the fact that the study area has been previously cleared and levelled, no additional mitigation measures are recommended for this Project.

6. Conclusion

Following a desktop review of available flood information, it can be concluded through this assessment that:

1) There are no Flood Overlays affecting the study area under the Mornington Peninsula Shire Planning Scheme, and it is understood that a planning permit will not be required in relation to the Project.
2) It was confirmed that no waterways pass through the study area.
3) Sea level rise predictions as a result of climate change (2040), shows there are marginal fringe sea level risk impacts along the eastern boundary of the study area. As the layout of the landside area of the Project Site has yet to be confirmed, detailed design will require an assessment and determination of design mitigation options to ensure the landside facilities are not impacted by coastal flooding issues, storm surge and sea level rise impacts.
4) Much of the landside component has been cleared and levelled, therefore further development is unlikely to significantly change this feature of the local hydrology.
5) Given the limited Project footprint (consisting of a gas flow line from the jetty to a flange, connecting to the natural gas transmission pipeline and a temporary construction area including staff facilities/amenities, and equipment laydown), it is anticipated that there would be a minimal change in the fraction of impervious area across the landside component and hence the impact would likely be minimal. This would be assessed during detailed design once site facility details are confirmed and any potential attenuation of flow would be provided on site.

Furthermore, the adjacent Western Port Ramsar wetland site must be considered during the detailed design phase as the site is a wetland of International Importance (listed under the Ramsar convention) and protected under the *Environment Protection and Biodiversity Conservation Act 1999*. However, due to the limited footprint of the Project on a previously cleared and levelled site, it is expected that the hydrological effects of the Project would not have a significant impact on the Western Port Ramsar wetland, and hence will not trigger the requirements for referral under the EPBC Act or the EE Act.

7. References

Department of Environment, Land, Water and Planning (DELWP) 2017. *Referral of a Project for a decision on the need for assessment under the Environment Effects Act 1978 – Referral Form.* Accessed Sep 2017 at: https://www.planning.vic.gov.au/__data/assets/word_doc/0023/9446/EES-REFERRAL-FORM-revised-2015.doc

Department of Sustainability and Environment (DSE) 2006. *Ministerial Guidelines for Assessment of Environmental Effects under the Environment Effects Act 1978.* Accessed October 2017 at: https://www.planning.vic.gov.au/__data/assets/pdf_file/0020/9443/DSE097_EES_FA.pdf

Jacobs 2018. Greenhouse Gas Emissions Assessment (including Climate Change). Report prepared for AGL.

Mornington Peninsula Shire (MPS) 2017. *Mornington Peninsula Planning Scheme*. Accessed Sep 2017 at http://planning-schemes.delwp.vic.gov.au/schemes/combined-ordinances/MorningtonPeninsula_PS_Ordinance.pdf

Mornington Peninsula Shire (MPS) 2016. *Flood Prone Mapping: Map 30*. Accessed Sep 2017 at https://www.mornpen.vic.gov.au/files/assets/public/new-website-documents/building-amp-planning/building/docs/building-flood-prone_30.pdf