Merimbula Sewage Treatment Plant Upgrade and Ocean Outfall

Appendix O

Socio-Economic Impact Assessment

Appendix O

Socio-Economic Impact Assessment

Client: Bega Valley Shire Council

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Prepared by

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Executive Summary

Bega Valley Shire Council (BVSC) is proposing an upgrade to the Merimbula Sewage Treatment Plant (STP) including a new ocean outfall in Merimbula Bay (the Project). The Project would be located between Merimbula and Pambula, within the Bega Valley Shire local government area (LGA). The Merimbula STP is bounded by the Pambula Merimbula Golf Club (PMGC) to the south, Merimbula Lake to the west, Merimbula Airport to the north and Arthur Kaine Drive to the east. The Merimbula STP is accessed via Arthur Kaine Drive, which links to Princes Highway to the west and providing direct access to Merimbula Airport in the north.

The Project would involve an upgrade of sewage treatment at the Merimbula STP and replacement of the existing beach face outfall and dunal exfiltration ponds with an ocean outfall in Merimbula Bay. Specifically, the Project would involve:

- upgrade of the STP to improve the quality of treated wastewater (including for beneficial re-use);
- decommissioning of the beach-face outfall, as well as an STP effluent pond;
- discontinuing the use of the dunal exfiltration ponds;
- installation of a secondary disposal mechanism - an ocean outfall pipeline about 3.5 km in length to convey treated wastewater to a submerged diffuser;
- installation of upgraded pumps; and
- continuation of the beneficial re-use irrigation scheme at the PMGC grounds and the Oaklands agricultural area, with treated wastewater of improved quality.

The Project area comprises the existing Merimbula STP site and ocean outfall alignment, as well as areas required for construction, including laydown areas within the adjacent PMGC grounds and on Merimbula Beach (with access via Pambula Beach).

The Project is aimed at reducing the environmental and health impacts of current operations, by providing a higher level of treatment and a superior mode of discharge/ dispersion of the treated wastewater via an ocean outfall in Merimbula Bay. The upgraded STP would be operated with the additional treatment processes which would improve the quality of the treated wastewater.

This Socio-Economic Impact Assessment (SEIA) is one of a number of technical documents that forms part of the Environmental Impact Statement (EIS) for the Project. This assessment addresses the relevant Secretary's Environmental Assessment Requirements (SEARs), aiming to identify potential impacts of the Project and to outline the performance outcomes and relevant mitigation and management measures for construction and operation of the Project.

This SEIA has been conducted in accordance with the *Socio-economic Assessment Guideline EIA-N05* (RMS, 2013). This document provides guidance on the steps to be undertaken when completing a SEIA, including the relevant reporting requirements and identification of the appropriate level of assessment. The assessment has also considered the *Social Impact Assessment Guidelines for State significant mining, petroleum production, and extractive industry development* (Department of Planning and Environment (DPE), 2017) and the principles and methods endorsed by the International Association for Impact Assessment (IAIA) (Vanclay, 2003 and Vanclay F, et al, 2015).

To facilitate preparation of the SEIA, the study area and the socio-economic baseline was established based on research into demographic profiles, community values, social infrastructure, business and industry, and transport services. Feedback received during Project consultation has been analysed, along with local community plans, to provide insights into community identity, values and goals. Technical reports prepared for the Project in relation to air quality, traffic and transport, noise and vibration, Aboriginal heritage, human health, marine ecology, terrestrial ecology and groundwater were used to analyse the potential impacts to the socio-economic environment.

The tourism industry, fishing industry and recreational amenity within Merimbula are heavily reliant on the quality of the natural environment and the productivity of the various marine, estuarine and forest ecosystems. The marine environment is therefore highly valued by the community and a key contributor to the local economy. The Project would improve the quality of treated wastewater from the upgraded STP and increase the distance of the discharge from sensitive environmental receptors. The Project would be predominantly low risk to the current socio-economic environment, would improve the marine environment from the baseline condition, and would provide the community with an essential piece of infrastructure. A number of mitigation and management measures have been recommended to address potential impacts identified.

1.0 Introduction

Bega Valley Shire Council (BVSC) is proposing an upgrade to the Merimbula Sewage Treatment Plant (STP) including a new ocean outfall in Merimbula Bay (the Project). The Project would be located between Merimbula and Pambula, within the Bega Valley Shire local government area (LGA) (refer **Figure 2-1**). BVSC is seeking approval for the Project under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The current assessment forms part of the Environmental Impact Statement (EIS) being prepared for the Project, which has been declared State Significant Infrastructure (SSI).

This Socio-Economic Impact Assessment (SEIA) has been prepared to accompany the EIS to support the application for approval of the Project and address the Secretary's Environmental Assessment Requirements (the SEARs), issued for the Project.

1.1 Project overview

The Project would involve an upgrade of sewage treatment processes at the Merimbula STP, decommissioning of an existing effluent storage pond, and replacement of the existing beach-face outfall and dunal exfiltration ponds with an ocean outfall pipeline in Merimbula Bay.

When operational, the Project would involve continuation of the beneficial re-use irrigation scheme at the Pambula Merimbula Golf Club (PMGC) grounds and the nearby Oaklands agricultural area, with improved treated wastewater quality from the upgraded STP.

The Project would reduce the environmental and health impacts of the current operations, by providing a higher level of treatment and a superior mode of discharge/dispersion of the treated wastewater via the ocean outfall offshore in Merimbula Bay.

The Project is described further in **Section 2.0** of this report, and an overview of the Project is provided in **Figure 2-1**. A full Project description is provided in **Chapter 2 Project description** of the EIS.

1.2 Purpose of this technical report

The purpose of this SEIA is to assess the potential social, economic and business impacts from the construction and operation of the Project to support the EIS.

This report considers the direct, indirect and cumulative social and economic impacts that may affect properties, businesses, recreational users and land and water users. In order to respond directly to the SEARs (outlined in **Section 1.2.1**), this report also assesses the potential benefits of the Project to recreational fishing off the coast of Merimbula Beach, within Merimbula Lake and Pambula Lake, and assesses potential benefits to the local oyster industry. These and other benefits from the operation of the Project are outlined in **Section 8.0**.

1.2.1 Secretary's environmental assessment requirements

The SEARs were issued for the Project on 4 February 2019. With respect to social and economic impacts, the SEARs include the following desired performance outcomes for the Project:

> *The project minimises adverse social and economic impacts and capitalises on opportunities potentially available to affected communities.*
>
> *The project minimises impacts to property and business and achieves appropriate integration with adjoining land uses, including maintenance of appropriate access to properties and community facilities, and minimisation of displacement of existing land use activities, dwellings and infrastructure.*

Table 1-1 sets out the specific SEARs relevant to social and economic impacts and identifies where the requirements have been addressed in this report. In responding to the Project SEARS, this SEIA relies on assessments and recommendations undertaken in various technical reports and chapters that form part of the EIS for the Project.

Table 1-1 SEARs – Socio-economic, land use and property

Ref	Secretary's environmental assessment requirements	Where it's addressed within this report
Socio Economic, Land Use and Property		
5.1	The Proponent must assess social and economic impacts in accordance with the current guidelines.	Refer to **Section 3.0** for discussion of the assessment approach in accordance with the current guidelines, and **Section 6.0** and **Section 7.0** for assessment of social and economic impacts.
5.2	The Proponent must assess impacts from construction and operation on potentially affected properties, businesses, recreational users and land and water users (for example, tourism, recreational and commercial fishers, aquaculture – existing and proposed), including property acquisitions/adjustments, access, amenity and relevant statutory rights.	Refer to **Section 6.0** and **Section 7.0** for the assessment of potential social and economic impacts during the construction and operational phase of the Project. Refer to **Chapter 19 Property and land use** of the EIS for assessment of property and land use impacts, and **Chapter 18 Traffic and transport** for assessment of access impacts.
5.3	The Proponent must provide an analysis of the potential benefits of the project to recreational fishing along Merimbula Beach, in Merimbula and Pambula Lakes and the oyster industry in both lakes.	Potential social and economic impacts (including benefits relating to recreational fishing and the oyster industry) are assessed in **Section 6.0** ,**Section 7.0** and **Section 8.0**.
Protected and sensitive lands		
6.1	The Proponent must assess the impacts of the project on environmentally sensitive land and processes (and the impact of processes on the project) including, but not limited to: (l) existing, safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability.	Public access is assessed in **Section 6.5** and **Section 7.5** (refer also **Chapter 18 Traffic and transport** of the EIS)
6.1	(n) use of the surf zone	Impacts on the use of the surf zone is assessed in **Section 6.5** and **Section 7.5.** Refer also to the EIS **Chapter 10 Marine and coastal processes**

1.2.2 Structure of this report

This report is structured as follows:

- **Section 1.0**: Introduction – overview of the Project and outlines the purpose of the report.
- **Section 2.0**: Project description – describes the key features of the Project.
- **Section 3.0**: Methodology – describes the methodology employed for the SEIA.
- **Section 4.0**: Strategic plans and policy – describes the strategic plans and policy within the Bega Valley LGA of relevance to the socio-economic environment.
- **Section 5.0**: Existing social baseline – provides an overview of the social and economic characteristics of the local study area with regard to demographic profiles, community values, social infrastructure, business and industry, and transport services.

- **Section 6.0**: Potential impacts – construction – assesses the potential socio-economic impacts associated with construction of the Project.
- **Section 7.0**: Potential impacts – operation – assesses the potential socio-economic impacts associated with operation of the Project.
- **Section 8.0**: Project Benefits – assesses the potential benefits of the Project to recreational fishing and the oyster industry within the local study area.
- **Section 9.0**: Cumulative impacts – assesses potential cumulative impacts upon the study area.
- **Section 10.0**: Mitigation and management measures – describes the mitigation and management approach for socio-economic factors during the construction and operation of the Project.
- **Section 11.0**: Conclusion.
- **Section 12.0**: References.

2.0 Project description

This chapter outlines the existing operations at the Merimbula STP and provides a summary of the Project description. A full Project description is provided in **Chapter 2 Project description** of the EIS.

The Project would be located between Merimbula and Pambula on Arthur Kaine Drive, within the Bega Valley LGA, approximately 3.5 kilometres (km) south of the Merimbula town centre and 2.5 km north of Pambula village, as shown on **Figure 2-1**. The Merimbula STP is bounded by the PMGC to the south, Merimbula Lake to the west, Merimbula Airport to the north and Arthur Kaine Drive to the east. The Merimbula STP is accessed via Arthur Kaine Drive, which links to Princes Highway to the west and provides direct access to Merimbula Airport in the north.

2.1 Existing operations

The existing operations at the Merimbula STP consist of:

- sewage treatment at the Merimbula STP; and
- disposal of treated wastewater via:
  - a beach-face outfall;
  - dunal exfiltration ponds; and
  - a beneficial re-use scheme at the adjacent PMGC grounds, and at Oaklands agricultural area.

The STP is an intermittently decanted extended aeration (IDEA) activated sludge plant designed to serve an equivalent population of 15,500. The STP has a capacity to accommodate an average dry weather flow of up to 3.72 megalitres per day (ML/day) and a peak wet weather flow of seven times the average dry weather flow, or 26 ML/day. It handles an average of 790 megalitres (ML) of treated wastewater per year.

The current strategy for managing treated wastewater from the Merimbula STP comprises a combination of:

- beneficial re-use (the preferred disposal option): use of treated wastewater to irrigate the adjacent PMGC grounds and ‘Oaklands’ agricultural area (approximately 25% of annual treated wastewater), located on the Pambula River flats at South Pambula; and
- disposal: discharge of excess treated wastewater to the environment, via dunal exfiltration ponds located within the sand dunes east of the STP between the ocean and Merimbula Lake (approximately 25% of annual treated wastewater), or via the existing beach-face outfall east of the STP at Merimbula Beach (approximately 50% of annual treated wastewater).

2.2 The Project

The Project would involve:

- upgrade of the STP to improve the quality of treated wastewater (including for beneficial re-use);
- decommissioning of the beach-face outfall, as well as an STP effluent storage pond;
- discontinuing the use of the dunal exfiltration ponds;
- installation of a secondary disposal mechanism - an ocean outfall pipeline about 3.5 km in length to convey treated wastewater to a submerged diffuser;
- installation of upgraded pumps; and
- continuation of the beneficial re-use irrigation scheme at the PMGC grounds and nearby Oaklands agricultural area with treated wastewater of improved quality.

Upgrades to the STP and the ocean outfall would reduce the environmental and health risks and impacts of the current operations, by providing a higher level of treatment and a superior mode of discharge/ dispersion of the treated wastewater via an ocean outfall offshore in Merimbula Bay.

A summary of the proposed Project elements is provided in **Table 2-1**.

The Project area comprises the existing Merimbula STP site and the proposed outfall pipeline alignment. The Project construction areas would include areas within the Merimbula STP, temporary laydown areas on the adjacent PMGC grounds and on Merimbula Beach (with associated access from Pambula), as shown in **Figure 2-1**.

This EIS is based on a concept design for the Project. It is noted that during subsequent design stages, and subsequent to a design and construction contractor(s) being engaged, details of the Project may change or be refined (e.g. specific locations of some elements or infrastructure within the existing STP site; materials to be used in plant construction and technology).

Table 2-1 Project elements

Project element	Summary
STP upgrade	The STP upgrade would involve additional treatment processes incorporated into the existing STP site, including two stage poly aluminium chloride (PAC) dosing, ultraviolet (UV) disinfection, chlorine dosing and tertiary filtration (if required). The indicative physical layout of the proposed STP upgrade is shown in **Figure 2-2**. The new treatment processes would be incorporated into the following existing STP phases (refer **Chapter 2 Project description** for further information): *Phase two: secondary treatment* Addition of: • two stage PAC dosing for phosphorous removal. *Phase three: disinfection* A change to the existing disinfection (chlorine dosing) treatment, involving: • addition of ultraviolet (UV) treatment; • chlorine dosing would continue to be applied to treated wastewater, however wastewater would be divided into two separate streams: - wastewater to be beneficially re-used would be dosed with chlorine; and - wastewater to be discharged via the ocean outfall would no longer be subject to chlorine dosing. • the chlorine dosing proposed would involve installation of a new chlorine dosing unit (including two 920 kg drum storage of chlorine, and a new pump system). The chlorine dosing unit would be stored at a dedicated storage facility within the STP (either the existing chlorine storage shed would be upgraded to house the increased volume of chlorine required for the Project, or a new shed would be built on or near to the site of the existing shed); and • tertiary filtration could also be installed (if required).

Project element	Summary
	The Project would also require the following within the existing STP site: • a new storage tank and new chlorine contact tank; • installation of up to four additional pump stations: - ocean outfall pump station – to pump treated wastewater through the outfall pipeline; - storage tank pump station – to pump treated wastewater to the new storage tank; - chemical sludge pump station (if tertiary filters required) – to pump sludge and treated wastewater; and - pump station – to pump from wet weather overflow back into the STP treatment train. • installation of ancillary infrastructure (including new sheds/structures to house new treatment processes, above-ground storage tanks, pipes, pits, power supply and additional low voltage (LV) connection (including transformer, cabling and distribution board), control kiosks, a retaining wall and internal access roads); and • relocation and upgrade of utilities to accommodate the additional features proposed.
Existing STP effluent storage pond	The existing 17 ML effluent storage pond within the STP site would be decommissioned, including dewatering and sediment/sludge removal.
New ocean outfall pipeline and effluent diffuser, and associated pump station	*Phase four: Disposal and beneficial re-use* New additions would involve: • installation of a 3.5 km outfall pipeline – the pipeline would travel from the STP in an east-south-easterly direction to a location approximately 2.7 km offshore in Merimbula Bay; • the pipeline would involve two construction methods for different sections of the pipeline as follows: - 'Section one' – STP to a location beyond surf zone: underground trenchless drilling method (refer **Figure 2-3**); and - 'Section two' – Location beyond surf zone to offshore pipeline termination point: laying of pipeline on sea floor and covering with rock or concrete mattresses (refer **Figure 2-4**). • Section one of the pipeline (the onshore component) would be about 0.8 km and below ground. installation of the underground section would be via a trenchless method (e.g. horizontal direction drilling or direct drive tunnelling), followed by pipeline insertion via pulling or pushing; • Section two (the above ground section of the pipeline) would be installed via direct placement on the sea floor in 600 m to 800 m pipe lengths. This would also involve progressive protection and stabilisation works for the pipeline (e.g. potentially using concrete or rock mattresses) held together with ropes/ slings/ cables; • the terrestrial component of the outfall pipeline would be laid between about -9.3 m and -19.5 m AHD, with greater depth largely depending on the nature of the overlying sand dunes; • a multi-port pipeline diffuser would be located at the end of the pipeline at a depth of approximately 30 m; the diffuser would be approximately 80 m in length; • the pipeline would have an outer diameter of up to 450 mm (366 mm internal diameter) and consist of pipeline lengths welded together; • a transition riser may be required to connect the underground pipeline with the above ground section of pipeline on the sea floor (if required, the riser would be located beyond the surf zone); and • the pipeline would contain valves along its length for mitigating against air entrapment.

Project element	Summary
Existing exfiltration ponds	The existing exfiltration ponds within the adjacent sand dunes (east of the STP site) would cease to be used under the Project.
Existing beach-face outfall	The existing public beach-face outfall pipeline would be decommissioned. The exposed end of the outfall pipeline would be removed, and the remainder of the pipeline would remain in-situ (i.e. would remain buried underground).
Water use	The STP would continue to use potable town water for kitchen and amenities on site. Apart from these water inputs, the Project would not require any other ongoing water source during operation.
Construction	
Construction footprint	The construction footprint includes temporary compound and laydown areas as shown in **Figure 2-5**. The location of laydown areas would be confirmed during detailed design and would depend on the method and location/s proposed to be used for directional drilling by the construction contractor. Temporary construction laydown areas would be located: • within the STP site; • within a portion of the adjacent PMGC grounds; and • on Merimbula Beach (if required, for pipe stringing and potentially an intermediate drill rig site for directional drilling). A total of approximately 2,800 square metres (m^2) (or 0.28 hectares) of vegetation removal / trimming would be required in the following locations: • approximately 217 m^2 at the Pambula Beach access track; • approximately 2,464 m^2 of regrowth scrub within the existing STP site and for construction access from the construction laydown area within the PMGC grounds; and • approximately 47 m^2 at the existing beach face outfall pipeline (to be decommissioned). Note that 0.28ha is a rounded up figure in accordance with the calculation of biodiversity offset credits contained in **Appendix H** (Biodiversity Assessment Report)).
Construction timing, hours and workforce	Pending Project approval, it is proposed to commence construction in early 2022, with construction anticipated to be undertaken over a period of 24 months. Construction would be staged and there would be times when some construction stages overlap. Works would typically be limited to standard daytime hours, which include: • 7:00 am to 6:00 pm Monday to Friday; • 8:00 am to 1:00 pm Saturday; and • no work on Sundays, public holidays. Certain works may need to occur outside standard construction hours for the safety of workers, in accordance with transport licence requirements, or for constructability reasons. Activities to be carried out during out of hours periods may include oversized load deliveries and pipeline pulling as part of the directional drilling (which would need to be undertaken continuously until completed, which may take up to 48 hours). Construction works in Merimbula Bay would occur seven days a week to maximise works during favourable offshore weather conditions. Approval from BVSC would be required for any out of hours work and the affected community would be notified. Construction of the Project would require a workforce of around 20 workers, with peak construction periods requiring up to 30 workers.

Project element	Summary
Traffic, construction vehicle types and workforce	Construction traffic would indicatively comprise: • 5 to 10 heavy vehicles per day (e.g. truck and dogs); and • 10 to 20 light vehicles per day. Vehicles transporting machinery or oversized materials such as prefabricated units may be required from time to time, and oversized vehicles would require escort to and from site. The largest truck expected as part of construction is the directional drilling rig truck (the exact size would be confirmed by the construction contractor). The construction phase of the Project would require construction vehicles to transport materials and equipment along the existing road network to the construction compound/laydown areas at the Merimbula STP and PMGC grounds and, if required, at the Merimbula Beach laydown area via Pambula Beach. In facilitating these construction activities, various plant and equipment would be required, including: • small, medium and large excavators (3 to 25 tonne) (tracked and wheeled); • compaction plant (e.g. roller/s, plate compactor); • grader; • bulldozer; • directional drilling rig truck and associated infrastructure (i.e. drilling fluid recovery and recovery unit); • pumps for dewatering (if required); • vacuum truck; • bobcat; • concrete trucks and pumps; • mobile cranes (e.g. franna crane, scissor lift, forklift); • semi-trailers and tipper truck; • telehandlers; • micro-piling rig (on barge); • water carts; • hand tools and welding equipment; • barges (e.g. 55 m and 73 m barges, jack-up barge) and tugs; • small, self-propelled vessel; • demolition saw, jackhammer, grinder; • generator/s, lighting tower; • forklift; • light vehicles and light trucks; and • heavy vehicles. The size of vehicles used for haulage would be consistent with the access route constraints, safety and any worksite constraints. Some construction activities (such as the delivery of precast sections) may require truck and trailer combinations or semi-trailers.

Project element	Summary
Access	Construction vehicles would access/egress the STP site via the following accesses: • Arthur Kane Drive, via either the northern end of the STP site, and/or the existing main STP entrance. Construction of the outfall pipeline would also utilise the following accesses: • Coraki Drive, Pambula (construction vehicles would enter the temporary beach access track from the end of Coraki Drive, before traversing the beach access track to the laydown area on Merimbula Beach); and • Port of Eden, Twofold Bay (barge/s would transport materials and equipment northward to the location of the proposed outfall pipeline alignment). Construction site accesses at Arthur Kaine Drive and Pambula Beach are shown in **Figure 2-5**. Construction materials and equipment could also be delivered to the Port of Eden using shipping containers, with construction vehicles expected to haul these containers to the construction sites via the Princes Highway.

2.3 Operational stage

The upgraded STP would be operated with the additional treatment processes which would improve the quality of the treated wastewater. Levels of total phosphorus, total suspended solids, biological oxygen demand, virus, bacteria and other pathogens would be managed to be within discharge limits. Treated wastewater would be tested for quality prior to discharge via the ocean outfall pipeline or via beneficial re-use offsite (to existing land application areas at the Oaklands agricultural area or the adjacent PMGC grounds). Maintenance activities for the STP and ocean outfall would also be undertaken and would continue until the STP is decommissioned or further upgraded in the future.

FIGURE 2-1: PROJECT AREA

Legend

- Project area
- Project area (temporary construction area)

N

0 500 1,000 m

AECOM

Source: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

FIGURE 2-2: PROPOSED STP LAYOUT (INDICATIVE)

N 0 50 100 m

AECOM

Legend

- Project area
- Project area (temporary construction area)

Proposed Project Upgrades

- PAC dosing, UV disinfection, tertiary treatment
- Pump stations, storage, chlorine disinfection
- PAC dosing (second unit)
- Effluent storage pond to be decommissioned

Source: Nearmap, 2019

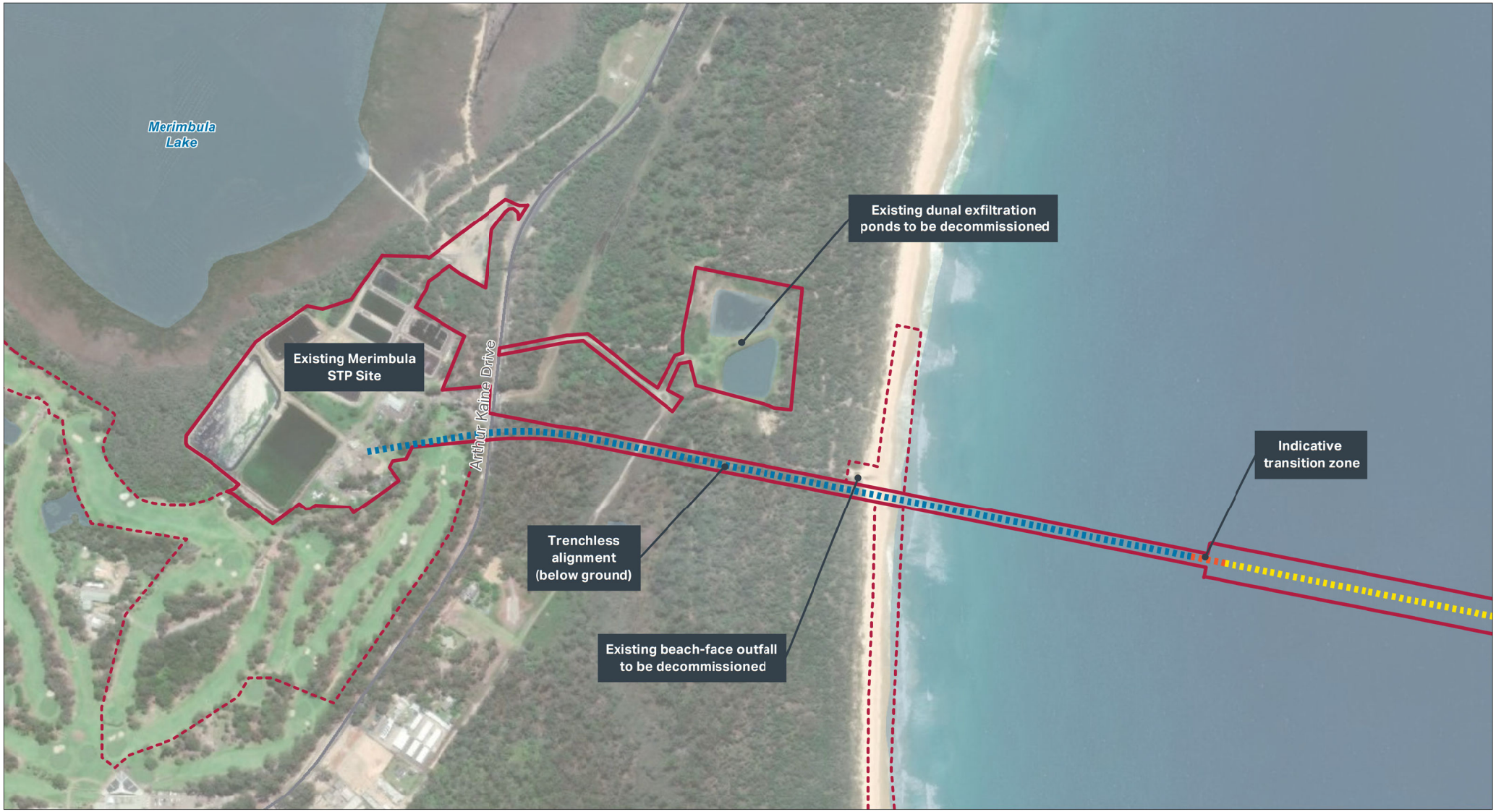

FIGURE 2-3: OCEAN OUTFALL PIPELINE - SECTION 1 (BELOW GROUND)

N

0 100 200 m

AECOM

Legend

- Project area
- Project area (temporary construction area)
- Outfall pipeline – Section 1 (below ground)
- Transition Zone
- Outfall pipeline – Section 2 (above seafloor)

Source: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

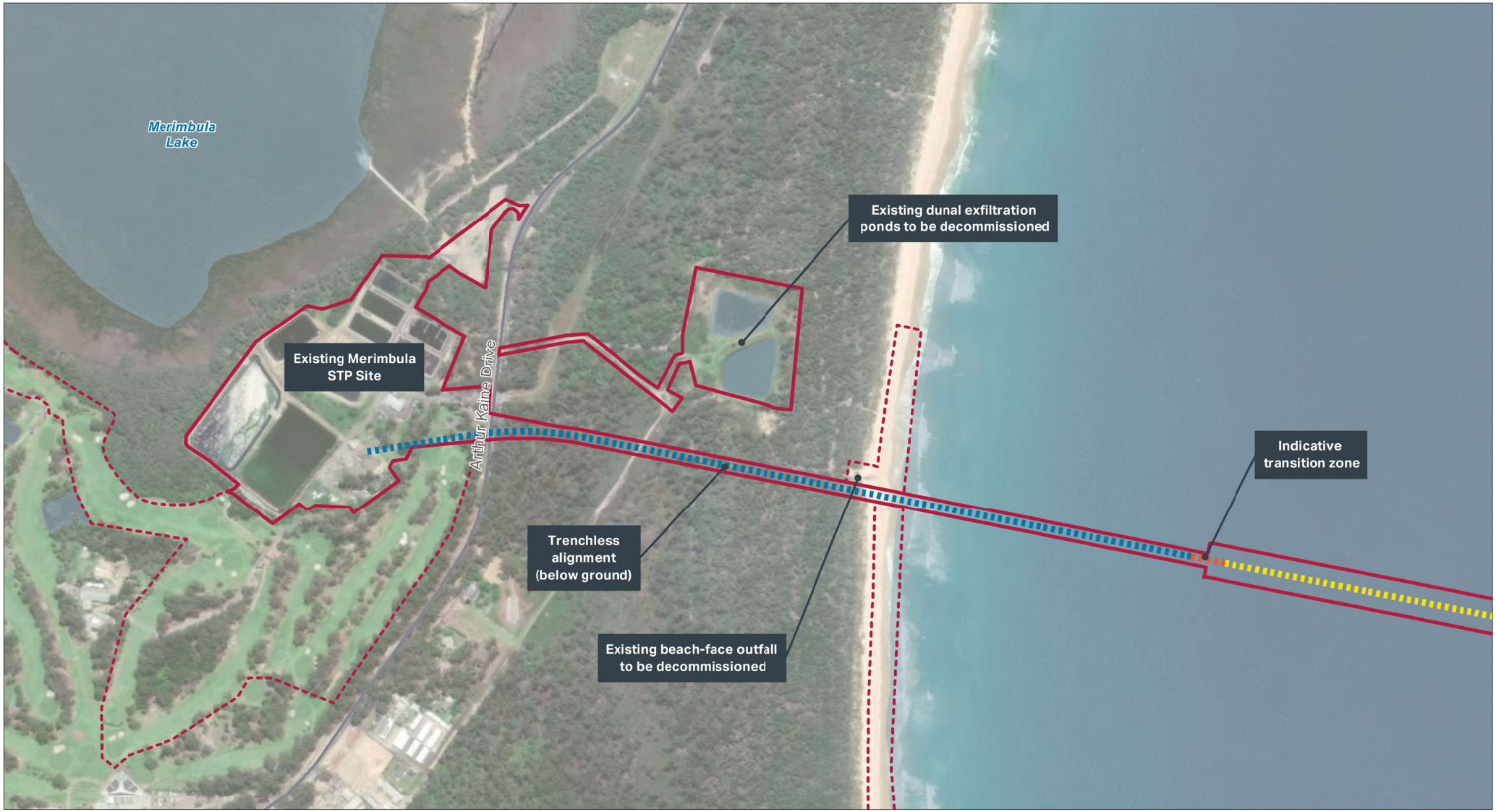

FIGURE 2-3: OCEAN OUTFALL PIPELINE - SECTION 1 (BELOW GROUND)

N

0 100 200 m

AECOM

Legend

- Project area
- Project area (temporary construction area)
- Outfall pipeline – Section 1 (below ground)
- Transition Zone
- Outfall pipeline – Section 2 (above seafloor)

Source: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

FIGURE 2-5: CONSTRUCTION COMPOUND/LAYDOWN AREAS

N

0 300 600 m

AECOM

Legend

- Project area
- Temporary project area for construction
- Construction access
- Construction compound/laydown area
- Construction laydown area and potential intermediate drilling site
- Construction laydown area at Pambula-Merimbula Golf Club grounds

Source: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

3.0 Methodology

This section describes the methodology used to establish the social baseline and undertake the assessment of potential socio-economic impacts as a result of the construction and operation of the Project.

3.1 Overview

The SEIA methodology has been developed according to the SEARs and the *Socio-economic Assessment Guideline - EIA-N05* (RMS, 2013) (herein referred to as the 'Practice Note').

In addition, the following guidance has been referred to during the preparation of this SEIA:

- *Social Impact Assessment Guidelines for State significant mining, petroleum production, and extractive industry development* (Department of Planning and Environment (DPE), 2017) (the Social Impact Assessment Guidelines) (herein referred to as the '2017 guidance').
- *Social Impact Assessment principles and methods endorsed by the International Association for Impact Assessment (IAIA)* (Vanclay, 2003 and Vanclay F, et al, 2015) (herein referred to as the 'IAIA guidelines').

This SEIA is informed by the outcomes of the various technical reports that have been prepared for the Project. Of particular relevance to this SEIA are the air quality, traffic and transport, noise and vibration, Aboriginal heritage, human health, biodiversity, marine ecology, terrestrial ecology and groundwater technical reports. This assessment has been informed by the results of technical reports and the outcomes of consultation undertaken for the Project, in accordance with the *Socio-economic Assessment Guideline* (RMS, 2013).

3.2 Environmental Impact Assessment Practice Note – Socio-economic assessment - EIA-N05

The Practice Note provides guidance on the steps to be undertaken when completing a SEIA, including the relevant reporting requirements. This includes identification of the level of assessment appropriate for a particular project.

For a project of this scale, the Practice Note requires a moderate assessment. The Practice Note indicates a moderate level of assessment applies to projects with several impacts or impacts to groups of people, and impacts of a moderate nature. A moderate assessment was chosen because:

- The Project would generally be an improvement to the baseline situation. It, however, still has the potential to result in a number of perceived and actual adverse impacts on the environment.
- The surrounding environment is highly valued by the community due its biodiversity values, and the range of recreational and economic opportunities it provides. The Project therefore has the potential to result in impacts to a large variety of people for an extended duration.
- The Project does not require any permanent property acquisition or severance to individuals within the community.

The Project warrants a moderate socio-economic assessment to determine the significance (or risk level) of the impacts, and the identification of measures to manage and mitigate those impacts to an acceptable level.

Table 3-1 outlines the rationale for the level of assessment (scale and magnitude of impact) and the expectations around a moderate SEIA.

Table 3-1 Moderate assessment level SEIA (RMS, 2013)

Scale of impacts	Magnitude of impacts	Information expectations	Socio economic baseline content
• several impacts or • two or more medium or high impacts or • impacts on groups of people	• impacts of a moderate nature or • impacts of moderate duration or • impacts that require specific mitigation measure	• desktop research • quantitative information from secondary sources • limited primary research • targeted consultation with some key community and government stakeholders to identify specific impacts and mitigation measures	• Australian Bureau of Statistics (ABS) Census data, describing key population characteristics • local community structure and patterns • relevant business and economic data • outcomes of targeted consultation

3.3 Defining socio-economic impacts

The Practice Note states that a socio-economic assessment involves '*identifying and evaluating changes to or impacts on, communities, business and industry that are likely to occur as a result of a proposed development, in order to mitigate or manage impacts and maximise benefits'*. These impacts have been assessed and summarised in various chapters the make up the EIS for the Project.

A socio-economic impact assessment, as outlined in Section 1.1 of the Practice Note, is concerned with changes to:

- how people live, work, play and interact with one another on a daily basis;
- how people move about their area for personal or business purposes, including by vehicle, walking, cycling or public transport;
- people's culture, including shared beliefs, customs and values, attachment to land and places, and sense of belonging;
- people's community, including the level of community cohesion, local character and sense of place;
- people's access to and use of community services, facilities and social networks;
- people's physical and psychological health and well-being, including stress levels, happiness and sense of security;
- people's fears and aspirations, including perceptions about safety and their fears about, and aspirations for, the future of their community;
- people's assets, such as property, housing or business;
- people's personal or business income and expenses;
- employment, including location, availability and types of employment and labour force availability; and
- people's environment, including the quality of the air and water people use, the level of hazard or risk, dust and noise they are exposed to and their physical safety.

Given socio-economic impacts are interrelated with a range of other impacts, including those associated with amenity, the natural environment and traffic and transport, a socio-economic impact assessment is informed by a range of studies, environmental investigations and community engagement. These assessments have been referred to and informed this SEIA.

3.4 Socio-economic impact assessment steps

To determine the socio-economic impacts assessed in this report, the following steps were undertaken:

- review of the Project description, as detailed in **Chapter 2 Project description** of the EIS;
- determination of the study area for SEIA;
- development of a profile of existing geographic areas, social infrastructure and businesses that may be influenced by the project (using information from the ABS Census 2016 and various online sources);
- review of **Chapter 6 Consultation** of the EIS to understand community sentiment towards the Project and issues of importance;
- review of relevant strategic plans and policy relevant to the socio-economic environment and potential impacts;
- identification and assessment of socio-economic impacts based on the following:
  - identification of those environmental issues with potential for socio-economic impacts; and
  - review of relevant environmental assessments undertaken for the EIS;
- identification of likely changes/impacts that may occur as a result of the Project, including specific effects on stakeholders, general community, businesses, social infrastructure and other receivers;
- assessment of the significance of socio-economic and business impacts during construction and operation;
- assessment of the cumulative impacts;
- assessment of the Project benefits; and
- identification of mitigation strategies for monitoring and managing the impacts during both construction and operation of the Project.

Further information on these steps is provided in the following sections of this report.

3.5 Study area

The Project area and its surrounds were analysed to identify the study area (or area of social influence) for the SEIA. The study area is identified as follows:

- **Project area** – The proposed location of the Project, including the construction footprint and operational footprint (refer **Figure 2-1**). The communities that live, work and visit this area are considered most likely to be impacted by the Project.
- **Local study area** – This consists of one Statistical Local Area Level 2 (SA2) area, defined by the ABS as “Merimbula – Tura Beach SA2” (refer **Figure 3-1**); and
- **Bega Valley Local Government Area** – The LGA relevant to the Project (refer **Figure 3-2**).

The Merimbula – Tura Beach SA2 area (herein referred to as the ‘local study area’ extends as far south as Pambula Lake, as far west as the Bald Hills, as far north as Bournda and occupies the townships of Pambula and Merimbula, including Pambula and Merimbula Beach.

The baseline profile for the local study area has been compared with data for the Bega Valley LGA.

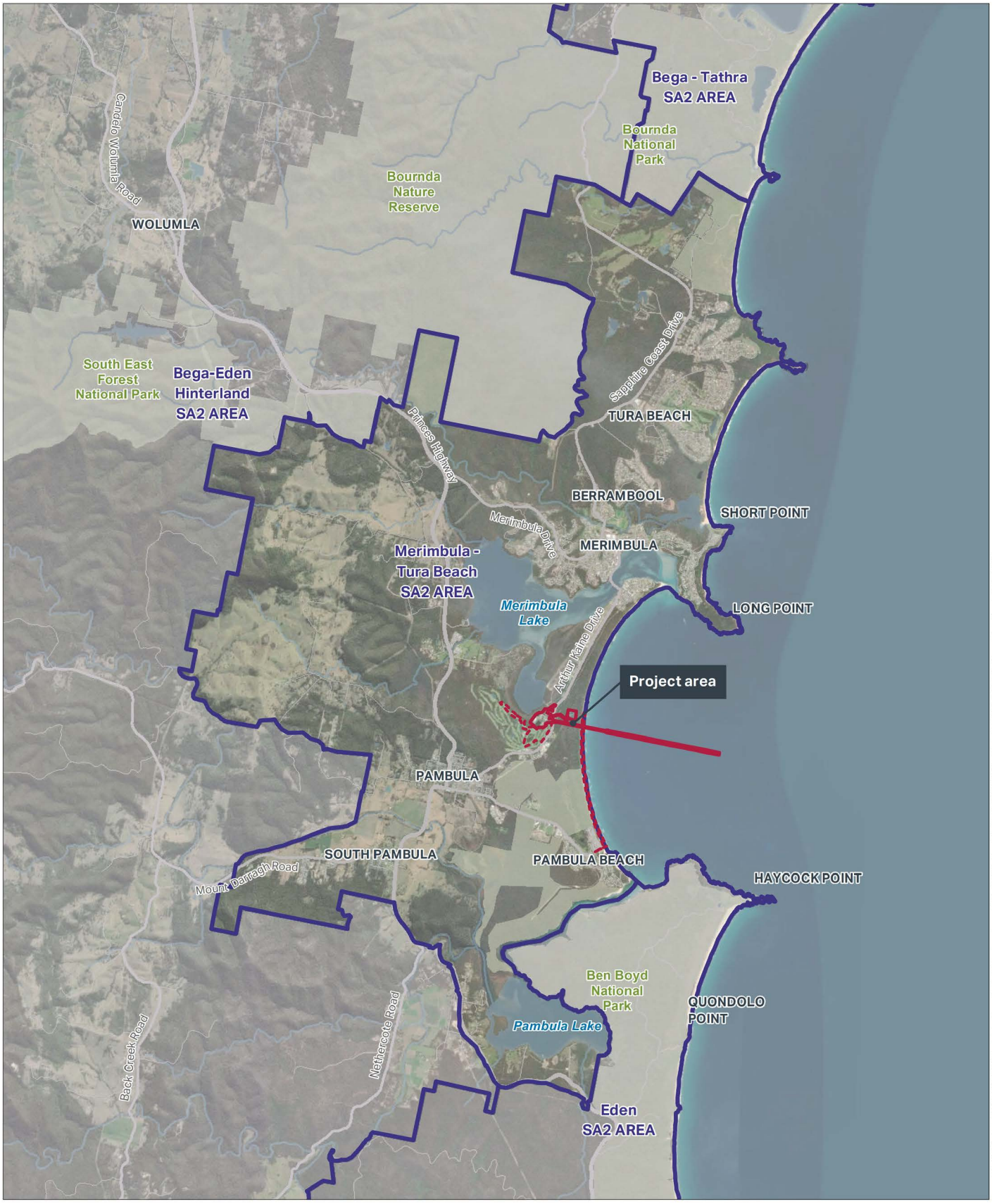

FIGURE 3-1: THE LOCAL STUDY AREA AS DEFINED BY THE MERIMBULA-TURA BEACH STATISTICAL AREA LEVEL 2

N

0 2 4 km

AECOM

Legend

- Project area
- Project area (temporary construction area)
- Statistical Area Level 2 (SA2) boundary

Source: Department of Customer Service, 2020; Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

\\ausyd1fp001\Projects\605X\60541653 Merimbula Ocean Outfall\4. Tech work area\4.99_GIS\02_Maps_TECH_REPORT\TR084_02_A4P_F23-2_SA2_210121.mxd Date Saved: 21/01/2021

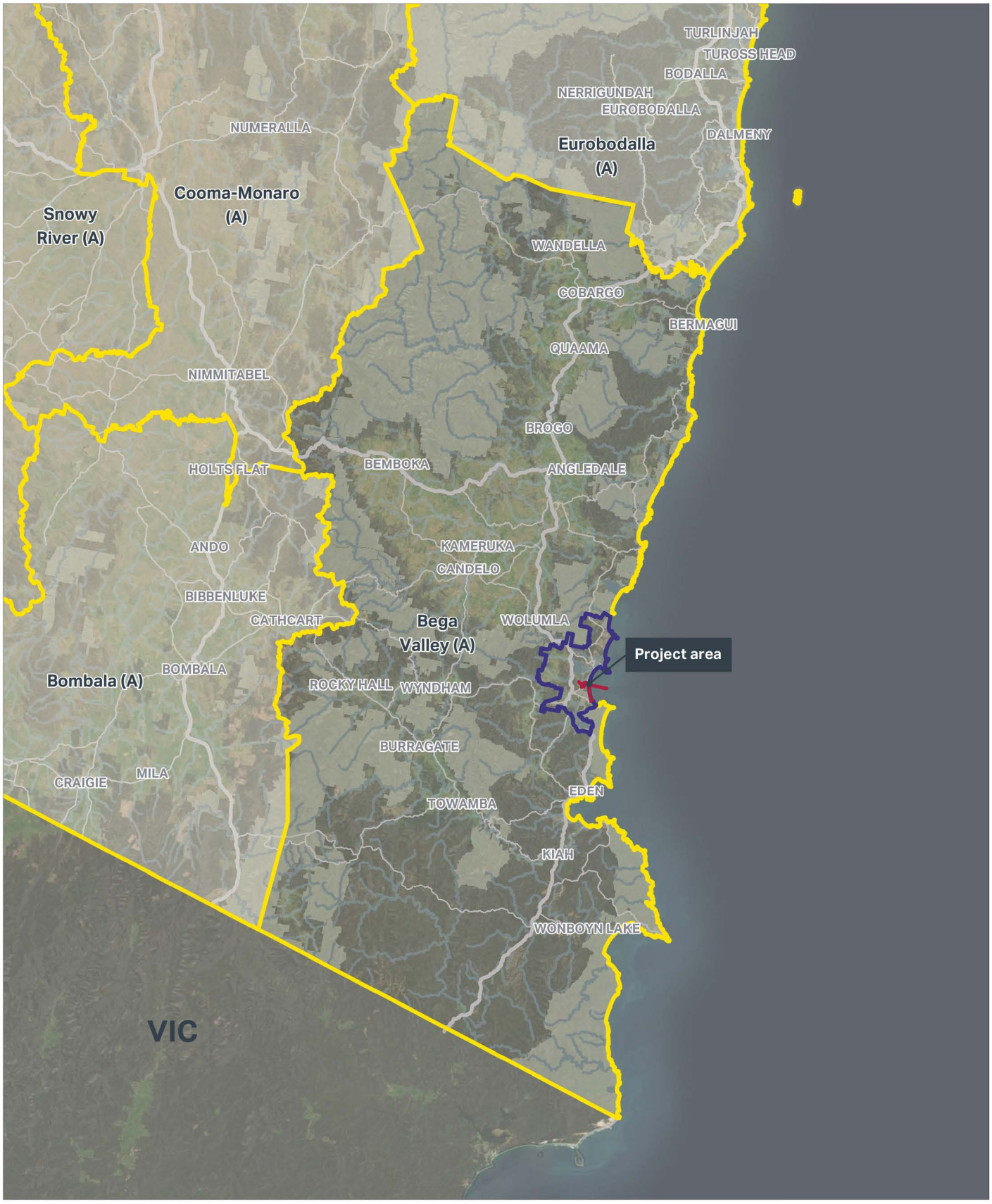

FIGURE 3-2: BEGA VALLEY SHIRE LOCAL GOVERNMENT AREA

N

0 10 20 km

AECOM

Legend

- Project area
- Local Government Area boundaries*
- Merimbula-Tura Beach SA2 Area

**Note that the Cooma-Monaro LGA and Bombala LGA merged to form the Snowy Monaro LGA*

Source: Department of Customer Service, 2020; Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

3.5.1 Social baseline study

The social baseline for the Project, outlined in **Section 5.0**, includes the following information:

- The demographic profile of the study area including indicators of population, age profile, cultural diversity, levels of income and employment, levels of socio-economic disadvantage, household composition, vehicle ownership and how people travel to work. Demographic data has been sourced from the ABS Census websites focusing on 2016 Census data (ABS, 2016).
- Key business and retail areas that would attract visitors to the area, identified through desktop research.
- Information on local the tourism, recreational and commercial fishing, abalone and oyster industry.
- Community values related to local amenity, character, lifestyle, recreation, community cohesion, access and connectivity. These values have been identified based on a review of community strategic plans, and community consultation outcomes.
- Social infrastructure facilities within the vicinity of the Project area. Social infrastructure has been identified through a search of online sources including council websites and Google Maps.

The demographics, business and retail areas, social infrastructure and social characteristics of the communities in the local study area have been collated and analysed to understand community functions and interactions with the Project. Mitigation and management measures in response to the socio-economic impacts were then identified.

3.5.2 Plan and policy review

Strategic planning documents and policy within the Bega Valley LGA of relevance to the socio-economic environment have been reviewed. This was undertaken to determine goals, outcomes and opportunities within the BVSC, and to identify values of importance to the local community (refer **Section 0**).

3.6 Community and stakeholder consultation

This SEIA has been informed by stakeholder and community consultation undertaken for the Project (detailed in **Chapter 6 Consultation)**, which included:

- consultation undertaken during the Project using a range of communication tools;
- consultation with 13 different stakeholder groups and over 70 different stakeholders; and
- formation of a ‘Community Working Group’ (CWG) in September 2017, which developed assessment criteria used to analyse and assess a preferred option for the Project and provide recommendations to BVSC. Nine meetings were held between 4 December 2017 to 7 August 2019.

Feedback received during Project consultation has been analysed, along with local community plans, to provide insights into community identity, values and goals. A summary of these outcomes is provided in **Section 5.7**.

BVSC would continue community and stakeholder consultation during further design development, construction and operation. This is so that stakeholders and the community are informed about the Project and have opportunities to provide feedback to the Project team during detailed design and construction.

3.7 Impact assessment framework

3.7.1 Overview

The impact assessment section of this SEIA (**Section 6.0** and **Section 7.0**) identifies and describes changes to existing socio-economic conditions which may potentially arise from the construction and/or operation of the Project in accordance with the Practice Note. This includes the assessment of direct and indirect impacts[1] and benefits, as well as consideration of cumulative impacts.

The impact assessment considers:

- the socio-economic impacts from construction and operation of the Project on potentially affected properties, businesses (including tourism, recreational and commercial fishing and aquaculture industries) and recreational users, including recreation fishers; and
- Project benefits arising from the operation of the Project, including those to recreational fishing along Merimbula Beach, in Merimbula and Pambula Lakes and the oyster industry in both lakes.

Note that impacts to property and land use are assessed in the EIS in **Chapter 19 Property and land use**.

3.7.2 Environmental scoping and environmental assessments

Chapter 7 Environmental scoping assessment of the EIS was reviewed to determine the preliminary environmental risk rating of environmental issues associated with the Project without mitigation (both 'construction' and 'operational' phase). Those environmental issues initially found to have an unmitigated risk rating of medium and/or high, as outlined in **Chapter 7** of the EIS, include:

- water quality, hydrology and flooding
- groundwater
- marine and coastal processes
- marine ecology
- terrestrial ecology
- hazards and risk
- landform, geology and soils
- human health
- Aboriginal heritage
- non-Aboriginal heritage
- traffic and transport
- property and land use
- noise and vibration
- sustainability
- social and economic
- air quality
- climate change related impacts
- waste.

All of the environmental issues outlined in the preliminary environmental scoping assessment have the potential to result in socio-economic impacts. The following technical reports and EIS chapters prepared for the EIS were reviewed to inform this SEIA:

- Aboriginal Cultural Heritage Assessment
- terrestrial ecology report
- marine ecology report
- human health risk assessment report
- climate change risk assessment report
- hazards and risk
- traffic and transport assessment report
- noise and vibration impact assessment
- air quality impact assessment
- groundwater
- water quality, hydrology and flooding
- non-Aboriginal heritage.

[1] As defined in page 4 of Practice Note EIA-N05 (RMS, 2013)

3.7.3 Consequence, likelihood and significance of socio-economic impact

Once potential impacts were identified and described, they were assessed against a range of criteria to obtain an overall significance of socio-economic impact. The key terms are described below:

Consequence

Consequence refers to the degree of benefit or detriment associated with the impact. Duration, spatial extent and severity of change are the underlying criteria that contribute to the determination of the overall consequence level (and are described below).

Duration

Potential duration that an impact or impacts may affect a household, business or community. Duration criteria are described in **Table 3-2**.

Table 3-2 Duration criteria

Duration	Description
Short term	Less than six months
Short-medium term	Between six months and two years
Medium term	Between two and five years
Medium-long term	Between five and ten years
Long term	More than ten years (effect likely to be irreversible)

Extent

The extent of area that the impacts are likely to affect. The extent criteria are described in **Table 3-3**.

Table 3-3 Extent criteria

Extent	Description
Project area	Impacts felt within the Project area only
Local study area	Impacts felt within the Project area and beyond into the local study area
Bega Valley LGA	Impacts felt within the Project area, local study area and beyond into the Bega Valley LGA
Further afield	Impacts felt further afield

Severity

Severity is based on the intensity of a potential impact and the potential change to the existing socio-economic environment (baseline condition). The severity criteria are described in **Table 3-4**.

Table 3-4 Severity criteria

Severity	Description
Neutral	No discernible change to baseline condition
Small	Small change to baseline condition
Medium	Medium change to baseline condition
Large	Large change to baseline condition

Level of consequence

The level of consequence is based on the extent, duration and severity of the socio-economic impact. The consequence criteria are described in **Table 3-5**.

Table 3-5 Consequence criteria

Consequence levels	Consequence descriptors
Catastrophic	Irreversible, wide-spread and long-term, with limited response to mitigation.
Major	Large change to baseline condition usually resulting in medium to long-term effects. Spatial extent is generally at an LGA or regional level with the potential for substantial effects on the social or economic environment. Negative impacts would require extensive mitigation.
Moderate	Medium change to baseline condition that may be short, medium, or long term. The spatial extent may vary; however impacts would usually respond to mitigation or enhancement.
Minor	Small change to baseline condition, generally short-medium term, confined to a locality or suburb and are able to be mitigated or enhanced.
Insignificant	No discernible positive or negative changes to baseline condition.

Likelihood

Likelihood the impact would occur, based on the criteria described in **Table 3-6**.

Table 3-6 Likelihood criteria

Likelihood	Description	Probability of occurrence (for operational phase of the Project)
Almost certain	Expected to occur in most circumstances	Within 1 year
Likely	Would probably occur in most circumstances	Within 2 years
Possible	Might occur at some time	Within 3-5 years
Unlikely	Could occur at some time	Within 10-20 years
Rare	May occur in exceptional circumstances	More than 20 years

Significance of socio-economic impact

The assessment matrix for determining the overall significance of impact is provided in **Table 3-7**. The impact is determined with consideration of the following:

- consequence of the impact, based on the extent, duration and severity of the impact; and
- likelihood of the impact occurring.

Table 3-7 Assessment matrix for determining the significance of socio-economic impacts

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	Medium	High	High	Very High	Very High
Likely	Medium	Medium	High	High	Very High
Possible	Low	Medium	Medium	High	High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Medium	Medium

Socio-economic impacts may be experienced by individuals and communities as **positive**, **neutral** or **negative**, depending on individual circumstances, vulnerabilities and attitudes in relation to particular changes (RMS, 2013). For example, the overall significance of impact upon the socio-economic environment for a particular issue could be neutral (if no positive or negative impacts are anticipated), 'low-negative' (if minor impacts are anticipated) or 'low-positive' (if minor benefits are anticipated). This is outlined in **Table 3-8**, below:

Table 3-8 Nature of impact

Nature	Definition
Positive	Impacts that result in net benefits for the community (properties, businesses, recreational users and land and water users).
Negative	Impacts that result in detriments for the community (properties, businesses, recreational users and land and water users)
Neutral	A change that does not result in a positive or negative impact but allows continuation of the usual function.

4.0 Strategic plans and policy

Strategic plans and policy of relevance to the socio-economic environment and the Project are outlined below.

4.1 Local Government Area plans and policies

Given the scale and location of the Project (as described in **Section 2.0** above), this section focuses on the planning and policy documents relevant to socio-economic impacts within the Bega Valley LGA.

4.1.1 Local Government Plans

The *Bega Valley Local Environmental Plan 2013* (LEP) is the principal planning document for controlling development at the local level. The zoning provisions of the LEP typically establish the permissibility of uses and standards to regulate the extent of development. One of the aims of the LEP, as set out in Section 1.2(2)(a), is "*to provide employment opportunities and strengthen the local economic base by encouraging a range of enterprises, including tourism, that respond to lifestyle choices, emerging markets and changes in technology*". It is noted that Section 5.22(2) of the EP&A Act excludes the application of environmental planning instruments to State Significant Infrastructure Projects (except as those instruments apply to the declaration of SSI or critical SSI). Notwithstanding this, the provisions of the LEP have been considered consistent with good environmental assessment practice. The LEP and other local plans and policies are addressed in **Table 4-1**.

Table 4-1 BVSC strategic plans relevant to the Project

Overview	Relevance to the Project
Bega Valley Local Environmental Plan 2013 (LEP)	
The Bega Valley LEP 2013 provides the framework by which BVSC's development decisions are made. It sets out BVSC's vision and seeks to implement this by way of objectives, policies, zoning tables and zoning and heritage conservation maps[2].	The LEP outlines the intended use and objectives for land within the Bega Valley LGA, enabling analysis of whether the Project is impacting on use of land. Note that the LEP is also considered in the EIS in **Chapter 5 Statutory context**.
Bega Valley Development Control Plan 2013 (DCP)	
The Bega Valley Development Control Plan 2013 Supplements the LEP by providing reasoning, guidelines, requirements and general information relating to the decision-making process. The DCP ensures that future development is consistent with the desired future character and community vision for the Bega Valley's towns, villages, urban settlements and rural areas.	Section 5.4 of the DCP sets out the requirements for assessment of social and economic impacts. The overriding objective of the DCP in terms of social and economic impacts is to '*ensure the impacts of certain developments on social and economic factors are considered*' and applies to any development proposal deemed by BVSC to have likely significant social or economic impacts.

[2] The LEP is also considered in **Chapter 5 Statutory context** of the EIS.

Overview	Relevance to the Project
Bega Valley Shire Community Strategic Plan 2040 (CSP)	
The *Bega Valley Shire Community Strategic Plan 2040* defines the community's priorities and aspirations for the future.	The CSP is reviewed and referred to within this SEIA to provide an understanding of what the communities perceive as important contributors to their quality of life and wellbeing. This is used as a benchmark for how the Project impacts (or benefits) these important community values. One of the CSP's goals is to develop a prosperous and diverse economy supported by innovative and creative businesses, where the development of adventure tourism and investment in tourism infrastructure has been identified as a mechanism to achieve this.
Bega Valley Shire Aboriginal Cultural Heritage Study 2010 (BVS Aboriginal Cultural Heritage Study)	
The *Bega Valley Shire Aboriginal Cultural Heritage Study 2010* identifies places valued by the Aboriginal community within the Bega Valley LGA.	Land between the Merimbula STP site and Merimbula Beach contains burial grounds and other items of cultural significance. Construction activities are proposed to be undertaken in a manner which avoids impacts on these sites.
Local Strategic Planning Statement 2040 (LSPS)	
The LSPS is a planning tool that provides direction for land use in the Bega Valley LGA through to 2040. In summary, the LSPS documents future land use intentions and provides clarity on the types of development that are likely to be supported by BVSC in certain areas and those that may not.	The LSPS indicates maintaining the balance between development and environmental protection is of high importance to residents. Looking forward to 2040, the plan indicates the following planning priorities that are of particular relevance to the Project: • Natural environment: *The exceptional quality of our natural environment and sustainable development practices set us apart and underpin our way of life and economy.* • Agriculture, forestry and aquaculture: *Innovation within the agriculture, forestry and aquaculture sectors continues as operators diversify to capitalise on new economic opportunities and are profitable and sustainable.* • Tourism: *The natural and cultural assets of the Shire have been enhanced to create a flourishing year-round tourism industry supporting local employment in a wide range of associated businesses.* The LSPS indicates tourism to be a planning priority for the future, where natural and cultural assets of the area can be enhanced to create a year-round tourism industry to support the local economy.

Overview	Relevance to the Project
Commercial Land Strategy 2040 (CLS)	
The strategy sets the direction for future development based on existing natural advantages. It includes recommendations for changes to land use zones, and other planning controls to help promote economic growth opportunities.	The CLS identified agriculture and tourism as important contributors to the economy and highlights the development of a strategy which focuses on the provision of high-quality organic food products (such as oysters and mussels) as a key opportunity for the future. The CLS indicates the tourism industry as being a major contributor to the Bega Valley Shire economy, where in 2018, there were approximately 522 businesses directly associated with tourism which contributed $380 million to the local economy.
Bega Valley Shire Climate Resilience Strategy 2050 (Climate Strategy)	
The Climate Strategy aims to highlight the activities, projects and programs contributing to the Bega Valley LGA's resilience and identify the positive steps the community can take to create a climate resilient future.	The BVSC highlights priorities for climate resilience strategies. The following areas are of direct relevance to the Project: **Coast and marine** • Changes in ocean temperatures and ocean currents will affect specifies diversity as well as ecology and ecosystem health. • Healthy estuaries have a number of recreational benefits such as swimming, snorkelling boating and fishing. • Economic benefits of healthy estuaries include commercial fishing, aquaculture, real-estate ventures and business opportunities. **Tourism** • The various components of the BVSC's tourism industry are heavily reliant on the quality of the natural environment and the productivity of the various marine, estuarine and forest ecosystems. • Potential impacts on these environments have a direct relationship to the tourist and visitor economies, including estuarine health, changes in fish stocks, beach recession and loss of tourism focused recreational assets. • Modelled predictions of coastal inundation, where the majority of the BVSC's tourism is focused, is a major land use planning challenge. **Aquaculture forestry and fishing** • The oyster industry has a unique dependency on the ecological health of estuaries. • Predicted changes in rainfall intensities and distribution, increasing average temperatures will place significant pressures on oyster aquaculture. • Commercial and recreational fishing industries are reliant on the health of estuaries and the offshore marine environment. Any changes to these environments would have direct impacts to local economies.

Overview	Relevance to the Project
Bega Valley Shire Merimbula Sustainability Strategy	
The draft *Merimbula Sustainability Strategy* is a Project-specific document that sets out how sustainability would be embedded into the Project during design, construction and operation. The Sustainability Strategy defines the vision for the Project and the supporting Project objectives, which align with BVSC's Corporate Sustainability Policy and relevant aspects of the *Bega Valley Shire Climate Resilience Strategy 2050*. It seeks to provide overarching direction on how the Project can achieve sustainability outcomes and meet the requirements of the *Environmental Planning and Assessment Act 1979* (EP&A Act).	The strategy is directly relevant to the Project, and states that for the Project, sustainability means considering impacts and providing benefits across environmental, social and economic drivers to deliver an outcome that addresses both present and future requirements of the Bega Valley Shire. In order to achieve this vision, the strategy identifies draft sustainability objectives, which the Project would aim to meet. The Sustainability Strategy and sustainability for the Project are considered further in in the EIS in **Chapter 24 Sustainability**.

4.1.2 Local Government Policy

Policy[3] adopted by the BVSC which are of relevance to the Project are described in **Table 4-2**.

Table 4-2 BVSC policy relevant to the Project

Overview	Relevance to Project
Policy 1.01 Community Wellbeing	
States that BVSC will address the matter of 'Community Wellbeing' by creating and managing an environment which supports the health of the local community and strengthens the capacity of the community and individuals to achieve better health and wellbeing.	The health of the marine and coastal environment is of particular importance to the community, and has the potential be degraded by the Project. The community rely on this environment for their health and wellbeing.
Policy 2.05 Tourism	
To provide or facilitate transport and recreational infrastructure, facilities, and amenities to support visitations and tourism operations within the Bega Valley LGA. This is to ensure tourism is promoted as an industry which enables employment, economic, cultural, social and recreational opportunities for the community, whilst also maintaining the lifestyle of residents and protecting the natural environment.	Tourism is a significant contributor to the local economy, is largely dependent on the preservation of a pristine natural environment, and this environment has the potential to be degraded by the Project.

[3] https://begavalley.nsw.gov.au/cp_themes/default/page.asp?p=DOC-LDX-33-26-08

Overview	Relevance to Project
Policy 3.02 Environmental Management	
Sets out a commitment to protect the BVSC's natural environment through best practice planning processes, internal activities, land and asset management, and public education. States that BVSC will actively and responsibly undertake 'Environmental Management' in a systematic manner by: • Supporting action for sustainability by reducing the use of resources. • Managing for clean and healthy waterways, beaches and wetlands with healthy marine life and cleaner stormwater run-off through integrated cycle management, that recognises the interrelationships between water, wastewater and the receiving natural systems.	The health of the marine and coastal environment is of particular importance to the community, and has the potential be degraded by the Project. BVSC have a responsibility to manage potential environmental effects.
Policy 4.07 Water and Sewerage Services	
Relates to water supply and sewerage service delivery to communities in the Bega Valley LGA. The scope covers the extraction, treatment and supply of drinking water, the collection and treatment of sewage, the disposal of effluent and the use of recycled water. In terms of environment and sustainable development, the policy seeks to: • conserve available water resources whilst meeting water demand needs; • enable water recycling from sewer where it is beneficial and financially feasible to do so; • be efficient with energy use; and • support shire development.	Policy is directly relevant. Water recycling and future proofed infrastructure are key issues raised by the community (refer to **Chapter 6 Consultation**[4] of the EIS).
Policy 4.12 Environmental and Public Health	
To promote effective environmental and public health outcomes to the local community and visitors to the Bega Valley LGA.	Water quality could be adversely affected by the Project (without mitigation), therefore potentially affecting human health, tourism and recreational/commercial fishing and aquaculture, all dependant in some manner on the marine environment.
Policy 6.16 Community Engagement	
To outline the BVSC's commitment to engage with the community in a respectful, effective and transparent manner. To better understand, value and include the views of the community in Council's decision making.	Community and stakeholder consultation has been undertaken throughout preparation of the EIS. A summary of this consultation and feedback received is provided in **Section 5.6**.

[4] **Chapter 6 Consultation** summarises consultation undertaken in accordance with the *Community and Stakeholder Engagement Plan* (CSEP) (AECOM, 2017) prepared for the Project.

5.0 Existing social baseline

This section provides an overview of the social and economic characteristics of the local study area with regard to demographic profiles, community values, social infrastructure, business and industry, and transport services.

Social infrastructure and land use zoning within 400 metres (and further afield) of the Project area are shown in **Figure 5-1** and **Section 5.3**.

5.1 Project context

The Project is located within the local study area; the existing Merimbula STP is located off Arthur Kaine Drive between the townships of Merimbula and Pambula, approximately 3.5 km south of the Merimbula town centre and 2.5 km north of Pambula village.

The Project area encompasses the existing Merimbula STP site, the proposed ocean outfall pipeline route and the areas required for construction of the Project, which include a temporary laydown area on Merimbula Beach and associated temporary access via Pambula Beach, and a temporary laydown area within a portion of the Pambula Merimbula Golf Club (PMGC) grounds.as shown in **Figure 2-1** and **Figure 2-5**.

5.2 Demographic profile

The demographic profile, relating to the socio-economic characteristics of the study area as defined in **Section 3.5**, is informed by statistics sourced from the ABS Census 2016. This demographic profile forms the socio-economic baseline against which potential impacts are assessed. **Table 5-1** summarises the demographic profile of the local study area with comparisons to the Bega Valley LGA.

Table 5-1 Demographic information for the local study area and Bega Valley LGA (ABS, 2016)

Characteristics	Merimbula Tura Beach SA2 (i.e. "Local study area")	Bega Valley LGA
Population and age distribution	• Population of 10,618 • Median age of 54 • 14% of residents under the age of 15 • 32% of residents over the age of 65 • 24% of residents within the young working family demographic of 15-44 years	• Population of 33,253 • Median Age of 51 • 16% of residents under the age of 15 • 26% of residents over the age of 65 • 26% of residents within the young working family demographic of 15-44 years
Unemployment and household conditions	• The unemployment level was 4.6% in 2016 • An IRSD[5] index of 3, indicating the study area has an average number of residents with low income, no qualifications or are in low skill positions	• The unemployment level was 5.4% in 2016 • An IRSD index of 3, indicating the Bega Valley LGA has an average number of residents with low income, no qualifications or are in low skill positions
Cultural diversity	• 21.6% of residents born overseas • 89.5% of residents only spoke English at home • 1.8% of residents are Aboriginal and Torres Strait Islander people	• 20.5% of residents born overseas • 89.5% of residents only spoke English at home • 3.6% of residents are Aboriginal and Torres Strait Islander people

[5] The Index of Relative Socio-economic Disadvantage (IRSD) is a general socio-economic index that summarises a range of information about the economic and social conditions of people and households within an area. Unlike the other indexes, this index includes only measures of relative disadvantage.

Characteristics	Merimbula Tura Beach SA2 (i.e. "Local study area")	Bega Valley LGA
Dwellings and household composition	• In 2016, there were around 5,492 private dwellings. • 69.3% were separate houses • 27.4% were apartment or townhouse style dwellings	• In 2016, there were around 16,263 private dwellings • 82.7% were separate houses • 14.2% were apartment or townhouse style dwellings
Household composition, tenure and income	• Total 4,347 households: - 66.2% are family households - 31.4% are single person households • 46.7% of residents owned their home outright • 25.4% of residents had a mortgage • 23.2% of residents rented. • The median weekly household income was $1,014	• Total 13,214 households: - 67.2% are family households - 30.4% are single person households • 45.5% of residents owned their home outright • 27.5% of residents had a mortgage • 22.7% of residents rented • The median weekly household income was $986
Employment	• In 2016, 50.1% of residents aged over 15 were employed fulltime, and 38.5 % were employed part time • The top four employment industries were: - Technicians and trades workers (16.4%) - Professionals (15.7%) - Mangers (13.3%); and - Community and personal service workers (13.3%)	• In 2016, 50.1% of residents aged over 15 were employed fulltime, and 38.1 % were employed part time • The top four employment industries were: - Professionals (16.0%) - Technicians and trades workers (15.4%) - Labourers (13.8%) - Mangers (13.6%)
Business and Industry	• At the end of the 2018-2019 financial year, there were 1,014 registered businesses. The top four industries for business were: - construction (213 businesses); - rental hiring and real-estate services (101 businesses) - accommodation and food services (95 businesses) - retail and trade (90 businesses)	• At the end of the 2018-2019 financial year, there were 3,106 registered businesses. The top four industries for business were: - construction (604 businesses); - agriculture, forestry and fishing 550 businesses) - professional, scientific and technical services 254 businesses) - rental hiring and real-estate services (247 businesses)
Journey to work	• For employed residents within the study area: - 71.3% drove to work in a car as either driver or passenger - 0.7% used public transport to get to work - 11.3% walked or worked from home	• For employed residents within the Bega Valley LGA: - 69.9% drove to work in a car as either driver or passenger - 0.7% used public transport to get to work - 12.3% walked or worked from home

Characteristics	Merimbula Tura Beach SA2 (i.e. "Local study area")	Bega Valley LGA
Vehicle ownership	• Of occupied private dwellings: - Around 40.9% had one registered motor vehicle garaged or parked at their address - Around 36.3% had two registered motor vehicles and 18.2% had three or more registered motor vehicles - Around 4.6% per cent did not have a vehicle	• Of occupied private dwellings: - Around 36.8% had one registered motor vehicle garaged or parked at their address - Around 37.7% had two registered motor vehicles and 21.1% had three or more registered motor vehicles - Around 4.4% per cent did not have a vehicle
Population and employment forecast	The New South Wales 2016 State and Local Government Area Population Projections[6] estimate a population of 33,200 in the Bega Valley LGA by 2036, resulting in a 0.2% net decrease compared to the 2016 census population data.	

5.3 Social infrastructure

Social infrastructure refers to the "*community facilities, services and networks which help individuals, families, groups and communities meet their social needs, maximise their potential for development, and enhance community wellbeing*"[7].

The Project area is generally coastal, surrounded by conservation land and national parks. There are limited populated areas within its immediate vicinity.

The range of social infrastructure located within the vicinity of the Project area (refer **Figure 5-1** below for spatial extent) is listed in **Table 5-2** and **Table 5-3**. This represents the social infrastructure that has the potential to be most affected by the Project (e.g. indirect impacts from construction activities such as amenity impacts). The beaches and lakes of Merimbula and Pambula form an important (and natural) social infrastructure function, supporting opportunities for recreation and leisure for residents and visitors and so has been included in the table of social infrastructure, below.

Table 5-2 Social infrastructure in proximity to the Project area.

Facility	Address	Type	Approximate distance from Project area
Pambula Merimbula Golf Club	173 Arthur Kaine Dr, Merimbula	Sporting / Recreation	Immediately south and west of Merimbula STP site.
Merimbula Airport	371 Arthur Kaine Dr, Merimbula	Airport	550 m north
Merimbula Lake and public boat ramps	Lake	Recreation (natural feature), and recreation (boat ramps)	500 m north

[6] https://www.planning.nsw.gov.au/-/media/Files/DPE/Factsheets-and-faqs/Research-and-demography/Population-projections/2019-Bega.pdf
[7] *Environmental Impact Assessment Practice Note: Socio-economic assessment – EIA-N05* (Roads and Maritime Services, 2013)

Facility	Address	Type	Approximate distance from Project area
Merimbula Main Beach recreation reserve	Beach	Recreation (natural feature) *Middle of the beach (adjacent to the Project area) undeveloped; natural environment largely intact. Southern and northern ends include coastal residential and commercial development.*	Adjacent to the temporary construction access and laydown on Merimbula Beach
Pambula Surf Life Saving Club	Pambula Beach Road, Pambula Beach	Community service and sporting / recreation	Adjacent to Pambula Beach construction access
Pambula Beach	Pambula Beach	Recreation (natural feature)	Adjacent to the temporary construction access at Pambula Beach
Pambula Lake	Pambula Lake (Lake entrance is approximately 600 m south of Project area)	Recreation (natural feature)	800 m south
Noonameena Scout Camp	Arthur Kaine Dr, Merimbula	Recreation	400 m west of the temporary construction access along Merimbula Beach
Various parks and reserves	South and west of Arthur Kaine Drive	Recreation	Immediately adjacent
Ben Boyd National Park	South Coast	Recreation	900 m south of STP site and extends to the location of the temporary construction access along Merimbula Beach

The town of Pambula is located approximately 1.5 km southwest of the STP site, and represents some of the closest social infrastructure to the Project area, which extends to Pambula Beach. It contains a range of social and community infrastructure facilities typical of a small town, listed in **Table 5-3**, below.

Table 5-3 Social infrastructure in Pambula, over 1 km from the Project area

Facility	Address	Type of facility
Pambula District Hospital	Merimbola St, Pambula	Health
Imlay House	Merigan St, Pambula NSW	Aged care
Pambula cemetery	Munje Street, Pambula	Cemetery
Bendigo bank	55a Toallo St, Pambula	Bank
Pambula Public School	25 Oregon St, Pambula	Education
Shorebreakers Kindergarten	3 Monari St, Pambula	Education
Pambula Denture Clinic	24 Quondola St, Pambula	Health
Pambula Medical Centre	17 Quondola St, Pambula	Health
Pambula Village preschool	37 Taollo St, Pambula	Education
St Peters Catholic Church	16 Monaro St, Pambula	Place of worship
Christ Church, Sapphire Coast Anglican Parish	32 Quondola St, Pambula	Place of worship
Pambula Tennis Club	Toallo St, Pambula	Recreation / Community
Pambula Beach skatepark	153 Pambula Beach Rd, Pambula	Community
Pambula Sporting Complex	LOT 354 Pambula Beach Rd, Pambula	Community
Sapphire Aquatic Centre	190 Pambula Beach Rd, Pambula Beach	Community
Pambula Baptist Church	169 Pambula Beach Rd, Pambula NSW	Place of worship

FIGURE 5-1: SOCIAL INFRASTRUCTURE

N

0 500 1,000 m

AECOM

Legend

- Project area
- Project area (temporary construction area)
- Social Infrastructure

Source: Department of Customer Service, 2020; Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

5.4 Land use zoning and employment centres

The LEP is the planning document for controlling development at the local level. The zoning of the existing Merimbula STP site is Special Purpose Infrastructure (SP2) for Sewerage System purposes. The location of the Project's dunal exfiltration ponds is surrounded by land zoned Environmental Conservation (E2), the location of the Merimbula STP is surrounded by land zoned SP2 for Air Transport Facility purposes to the west and land zoned Public Recreation (RE1) to the south.

Approximately 200 m southeast of the existing dunal exfiltration ponds (along Arthur Kaine Drive) is an area of land zoned Business Development (B5). Further south of the Project area (south of B5 and E2 zoned land) is land zoned National Park and Nature Reserves (E1).

The objective each land use zone[8] is set out in **Appendix A** and a spatial plan indicating the location of the land use zoning in relation to the Project is shown in **Figure 5-1**.

5.4.1 Businesses

The closest cluster of businesses to the STP site are located in the B5 zoned land along Arthur Kaine Drive which consists of a range of small to medium sized businesses including:

- a boat washing business (350 m southeast);
- a packaging and bulky goods retail business;
- building equipment hire (400 m southeast);
- accommodation (Fairway Motor Inn) (500 m south); and
- a seafood eatery (600 m south).

The Pambula Merimbula Golf Club is also located immediately south of the STP site and contains a club house with restaurant and café.

Approximately 1.5 km southwest of the STP site is the town of Pambula which includes a mixture of small to medium commercial, retail, and industrial land uses.

The town of Pambula Beach is also located near the proposed temporary construction beach access, and contains a number of businesses including holiday houses, holiday units and camping grounds, the Pambula Surf Life Saving Club, general store and café.

A number of oyster farming businesses operate within the Merimbula and Pambula area through oyster leases within Merimbula Lake, Pambula Lake and nearby estuaries. Further information on business associated with the oyster industry is provided in **Section 5.4.2.** The oyster aquaculture industry is described in **Appendix G** (Marine Ecology Assessment)[9], and is summarised in **Chapter 11 Marine ecology** of the EIS.

Whale watching charters operate out of Merimbula, as well as a number of recreational fishing charters which operate out of Merimbula, Pambula and Eden. Recreational fishing is also enjoyed within Merimbula Lake and Pambula Lake. Commercial fishing vessels also operate throughout the South Coast, including off the coast of Merimbula and Pambula. Commercial trawling vessels are prohibited from operating within Merimbula Bay however, as it is an exclusion zone. Further information on business associated with the fishing industry is provided below in **Section 5.4.2**.

A list of key stakeholders, including businesses, tourism stakeholders, community groups and recreation and commercial fishing groups, is provided in **Chapter 6 Consultation**.

[8] Including land use zoning located within the local study area (but outside the Project area) which provides business and employment opportunities.
[9] **Marine Ecology Assessment** prepared for the EIS to assess potential impacts and benefits to marine ecology from the construction and operation of the Project (Elgin, 2020). This assessment is summarised in **Chapter 11 Marine ecology** of the EIS (AECOM, 2020).

5.4.2 Employment and industry

In the 2016 census year, the local study area had a population of 10,618, of which 4,296 people were recorded as being in the labour force. In 2019, BVSC released a Labour Force Capabilities Report[10] relating to the Bega Valley LGA, outlining the occupation, skills and employment environment within the Bega Valley LGA, as well as outlining key challenges and opportunities to sustain and grow jobs.

The Labour Force Capabilities Report reported (between the 2011 and 2016 Census periods) a growth in jobs in the following industries in the Bega Valley LGA:

- Administrative and support services – total of 428 jobs, up by 89 jobs (26%);
- Arts and recreation services – total of 218 jobs, up by 25 jobs (13%);
- Health care and social assistance – total of 1,895 jobs, up by 187 jobs (11%);
- Agriculture, forestry and fishing – total of 924 jobs, up by 66 jobs (8%);
- Information media and telecommunications – total of 113 jobs, up by 5 jobs (5%); and
- Construction – total of 1,202 jobs, up by 61 jobs (5%).

The top four employment industries for both the local study area and Bega Valley LGA are indicated in **Table 5-1**).

The Agriculture, Forestry and Fishing Industry was outlined as an existing area of strength for the BVSC economy (up 8% between 2011 and 2016) with further growth expected over the next decade, however, this growth may be impacted given the summer 2019-2020 bushfires and COVID-19 pandemic (refer **Section 5.4.3**).

Tourism

Tourism is a key economic driver for the local study area. Merimbula is a tourist destination for domestic and international travellers, being an approximate six hours drive from Sydney, seven and a half hours drive from Melbourne and three hours' drive from Canberra. It is also accessible by air (Merimbula Airport) or by cruise ship (Port of Eden). People choose to visit Merimbula and Pambula due to the areas natural beauty offering a range of recreational opportunities.

Merimbula Bay, and Merimbula and Pambula Lake and surrounding estuaries are important assets to the coastal township because of their natural amenity and ecological values, including clear waters, high tidal flows and extensive saltmarsh, mangrove and seagrass communities. They are among the most popular estuaries within the Bega Valley LGA for recreational use. Some of the recreational activities popular within the vicinity of the Project area are listed below. It is noted there are a number of marine protected areas within the local study area, which prohibit/restrict some of these activities in certain locations:

- swimming, boating, kayaking, paddle-boarding, diving and snorkelling;
- recreational fishing opportunities, fishing charters, whale-watching cruises, and oyster farming tours;
- numerous walking tracks, including the lakeside Merimbula Boardwalk, and hiking within the nearby Bournda National Park;
- birdwatching along the Goodenia Rainforest Walking Track; and
- the enjoyment of high-quality seafood, including oysters which are farmed within Merimbula Lake, Pambula Lake and nearby estuaries, and abalone which is retrieved off various locations along the South Coast.

[10] Jobs & Skills Bega Valley, Labour Force Capabilities Report & Practical Resources Guide (BVSC, 2019)

The *Bega Valley Economic Development Strategy 2016-2021* recognises tourism as being critical for the local economy, and provides some key statistics related to tourism / visitation:

- the local Visitor Economy is worth approximately $223 million per annum;
- visitors to the Bega Valley LGA stay an average of 4.3 nights;
- there are about 797,000 domestic visitors per annum;
- there are about 22,000 international visitors per annum; and
- most visits (approximately 61%) are for holiday purposes.

A 'Tourism Economic Impact Assessment[11]' was prepared for BVSC in 2018, indicating the tourism industry is 'undoubtedly critical' to the local economy. In the year ending March 2018, the Bega Valley region recorded:

- over 1 million visitors;
- spending of approximately $437 million;
- with about 460,000 domestic visitors contributing over $355 million to the local economy; and
- the total gross regional product for the Bega Valley LGA from tourism was $1.53 billion.

There are two key Projects within the Bega Valley LGA which are aimed at boosting tourism. The Eden Wharf extension Project (completed in 2019), enables large cruise ships to be able to berth alongside the wharf. Port of Eden is located an approx. 20-minute drive south of Merimbula. The 'Tourism Economic Impact Assessment' projected the wharf extension would increase visitation of cruise ship travellers, drive regional economic growth, and create jobs[12] in the tourism, hospitality and stevedoring industry[13].

The Merimbula Airport Terminal Upgrade project was completed in December 2019. An estimated 60,000 travellers are anticipated to use the upgraded terminal every year, making Merimbula Airport a gateway for business and recreational related visitors to the South Coast[14].

It is noted that the bushfires that occurred in the area in early 2020 and the COVID-19 pandemic may adversely affect tourism in the region, and the projections provided above. These impacts may continue into the future, particularly in regards to the COVID-19 pandemic.

Recreational fishing

Recreational fishing has economic and social benefits and offers participation that spans a lifetime. Within the South Coast of NSW, the recreational fishing sector generates approximately 1800 full-time jobs and contributes approximately $395 million to the economy each year.

Appendix G (Marine ecology assessment) of the EIS provides information on the recreational fishing industry within the vicinity of the Project. Numerous businesses offer charter fishing options within and around Merimbula due to the wide variety of areas and fish habitat accessible including estuarine, coastal and offshore environments. Recreational fishing opportunities were enhanced in September 2018 when an artificial reef was deployed off the coast of Merimbula Bay (approximately 1 km north of the proposed Merimbula STP site). This artificial reef supports species such as Kingfish, Snapper, Morwong, Trevally, Nannygai, Gummy Shark, Leatherjackets and Salmon, and is enjoyed by recreational fishers.

A number of recreational fishing groups have been consulted. Feedback from these groups are outlined in the EIS in **Chapter 6 Consultation**.

[11] *Merimbula Town Centre Streetscape Revitalisation Tourism Economic Impact Assessment* (BigOZ Agency, 2018).
[12] These figures are likely to be adversely impacted from the bushfires and COVID-19 pandemic restrictions.
[13] https://www.portauthoritynsw.com.au/port-of-eden/port-services-facilities/eden-cruise-wharf/
[14] https://minister.infrastructure.gov.au/mccormack/media-release/merimbula-airport-new-crown-jewel-sapphire-coast

Commercial fishing

Commercial fisheries operate off the coast of the local study area. These include the abalone fishery, lobster fishery, sea urchin and turban shell fishery, ocean haul fishery, ocean trawl fishery, ocean trap and line fishery and estuary general fishery. Further details are provided in the EIS in **Appendix G** (Marine ecology assessment).

The ocean haul fishery is the most productive for the region. Species such as the Australian salmon and Australian sardine are targeted with annual catches of 40 tonne and 34.6 tonne respectively. The abalone fishery also is a significant fishery within the region, producing the third highest mean annual catch of 5.6 tonne.

The ocean trawl fishery operates within the Merimbula/Pambula region (however Merimbula Bay is an exclusion zone for trawling), and catches a range of species including snapper, yellow tail, silver trevally and tuna. Various other commercial fishing vessels also operate throughout the South Coast.

Fishing charters also operate in the area, targeting species such as Kingfish and Snapper found within the various reef formations off the coastline. Marlin, Yellowfin Tuna and Bluefin Tuna are also targeted in the deeper waters further off the coast.

A number of commercial fishing groups have been consulted with during the preparation of this EIS and matters raised are outlined in **Chapter 6 Consultation**.

Oyster industry

Oyster farming has occurred in Merimbula Lake since the 1920's and Pambula Lake for over 100 years. It is based primarily around the farming of the Sydney rock oyster.

Approximately 125.8 hectares of Merimbula Lake and approximately 97.3 hectares of the Pambula estuary is designated as a priority oyster aquaculture area. In 2005/2006, Merimbula Lake produced over 3% of the total NSW production of Sydney rock oyster worth in excess of $1 million (OISAS 2006). It is therefore a significant contributor to the local economy with a positive impact on employment, economic growth and tourism. Within NSW, the oyster aquaculture industry is the largest aquaculture industry by production value and accounts for approximately 32% of the State's total commercial fisheries production (OISAS, 2016).

Merimbula Lake supports approximately 17 locally owned oyster businesses valued at over $2.4 million. Oysters are extremely vulnerable to poor estuarine water quality. Oyster production requires water quality that supports healthy oyster growth in order to result in a product that is safe for human consumption. If water quality declines, strict and costly food safety measures are imposed. The main causes of water quality decline are as a result of development along the coastline, discharge of wastewater and sedimentation, and are mostly beyond the control of the oyster industry.

Abalone

Abalone is commercially fished and predominantly sold as a seafood delicacy. The abalone fishery (for the whole of Australia) harvested an annual wild catch of 3,176 tonnes in 2017/18 worth approximately $151.5 million (ABARES, 2020).

The abalone fishery within NSW targets the blacklip abalone**.** The blacklip abalone is predominantly found in two rocky reef systems located in the vicinity of the Project; Long Point reef (located off the headland bounding Merimbula Bay to the north) and Haycock Point reef (located off the headland bounding the bay to the south). These reefs are commercially harvested for blacklip abalone.

Abalone are most common from the inter-tidal area to depths of up to 40 m. These shallow waters are particularly susceptible to adverse changes in water quality. If the water quality is poor, then abalone become stressed and grow slowly, which increases the cost of production and can prevent abalone from growing and reproducing[15].

5.4.3 COVID-19 pandemic and bushfire impacts

The 2019-2020 bushfires engulfed much of the South Coast resulting in many businesses and homes being destroyed. Following the bushfires, the global pandemic of COVID-19 emerged resulting in lockdown restrictions with significant economic consequences for the local study area, particularly those associated with the tourism industry. These impacts represent a data gap regarding the projections and statistics outlined within this SEIA. In the short term, it can be expected that forecasted economic growth in the local study area would be halted, and tourism would be primarily from domestic travellers.

Economic data produced for BVSC outlined the potential economic impacts for the Bega Valley LGA as a result of the bushfires and pandemic restrictions[16]. This indicated that COVID-19 will have a significant impact on the Bega Valley LGA's economy, and includes the following predictions:

- Gross Regional Product (GRP) in the Bega Valley LGA is forecast to fall by up to $52m in the June quarter 2020, representing a 13.9% fall compared to the 2018/2019 June quarter;
- the Bega Valley LGA is forecast to be sixth worst impacted among regional NSW LGAs;
- local jobs are expected to fall by 8.1% (1139 jobs) in the June quarter 2020 compared to the previous year. This figure is higher that the regional NSW average at 6.7%;
- Bega Valley LGA is forecast to be fourth worst impacted among 95 regional NSW LGAs in terms of percentage of jobs lost and jobs compensated;
- food services and retail are forecasted to be the hardest hit sectors, due to being susceptible from reliance on tourism and hospitably sectors; and
- Bega Valley LGA as a whole has experienced an 85% uplift in people accessing unemployment benefits from December 2019 to June 2020[17].

Business, employment and industry, as described in **Section 5.4.1, 5.4.2** and **5.4.3** of this report, are already being impacted by COVID-19 restrictions and the bushfires, with the potential for further impacts if additional lockdowns or similar disruptions are required, or if there is a substantial delay in a vaccine solution.

5.5 Access and connectivity

A technical report in relation to the traffic and transport environment has been prepared for the Project and is provided in the EIS in **Appendix D** (Traffic and transport). A summary of the traffic and transport environment is provided in **Chapter 18 Traffic and transport** and is outlined in **Table 5-4.** Details of access arrangements for construction activities are detailed in **Section 2.0**.

[15] https://www.frdc.com.au/Archived-Reports/FRDC%20Projects/1997-323-DLD.pdf
[16] https://www.merimbulanewsweekly.com.au/story/6915551/bushfires-and-covid-take-their-toll-report-paints-a-picture-of-a-shire-in-need/
[17] http://economy.id.com.au/bega-valley/covid19-extended-forecasts

Table 5-4 Traffic and transport facilities around the Merimbula STP

Surrounding facilities	Description
Car parking	• 14 car parking spaces are currently provided for workers and visitors to the existing STP site.
Coach services	Two coach services operate in the area including: • Eden to Canberra Civic via Merimbula, stopping in Merimbula town centre along Merimbula Drive, approximately 3.6 km from the Merimbula STP; and • Eden to Bomaderry via Merimbula, stopping in Merimbula town centre at Park Street, approximately 3.6 km from the Merimbula STP. Both services travel along Arthur Kaine Drive, bypassing the Merimbula STP. The V/line is a public transport operator which is also relevant to the regional area. The operator provides regional services between Batemans Bay, Merimbula and Melbourne via Mallacoota and Genoa in Victoria. Services depart from Batemans Bay once during weekdays on Tuesday and Friday and once during the weekend on Sundays.
Regional and local bus services	Sapphire Coast Buslines operates regular bus routes in the area including: • route 790/890: Bega to Eden via Wolumla and Merimbula; • route 790/890: Bega to Eden via Kalaru and Tura Beach; and • route 790/890: Merimbula to Pambula Beach via Pambula (Loop Service). The closest bus stops to the Merimbula STP include: • Pambula Merimbula Golf Club, approximately 900 m south; and • Merimbula airport, approximately 1.2 km north. The closest bus stop to the Port of Eden access is: • Eden Wharf, located approximately 50 m north west along Imlay Street. The closest bus stop to the Pambula Beach access include Pambula Beach Bus Shelter, located approximately 300 m west along Pambula Beach Road.
On demand bus services	One on demand bus service, Flexibus, runs three services including: • Bega service; • Tura Beach/Merimbula/Pambula service; and • Eden service. In Merimbula, the service operates between 9:30 am to 2:45 pm Monday to Friday, 9:30 am to 3:35 pm on Saturday with no services on Sunday or Public holidays. The Tura Beach/Merimbula/Pambula service includes bus routes along key roads for the Project including Arthur Kaine Drive, the Princes Highway and Pambula Beach Road. The Eden service includes bus routes along key roads for the haulage routes, including Princes Highway and Imlay Street.

Surrounding facilities	Description
Cycling routes and facilities	On-road and off-road cycle routes in the area include: • the Bike Way – off-road shared path that traverses through Merimbula, providing links between Merimbula Airport, Merimbula Beach and Merimbula town centre; • the cycleway – located along Arthur Kaine Drive providing links to Pambula town centre in the south, to South Pambula and links to the Bega Valley Cycleway in Merimbula in the north (this cycleway passes through the Project area); and • Lake Street Shared Path – located adjacent to Lake Street in Merimbula, from Rotary Park to Merimbula Wharf via Bar Beach.
Pedestrian	Pedestrian access is provided via off-road shared paths, located along the western side of Arthur Kaine Drive, linking to Merimbula town centre in the north and Pambula town centre in the south.

5.6 Community consultation

Community and stakeholder consultation has been undertaken throughout preparation of the EIS, in accordance with the *Community and Stakeholder Engagement Plan* (CSEP) (AECOM, 2017) prepared for the Project. **Chapter 6 Consultation** provides a list of stakeholders engaged with and summarises the feedback received. The consultation activities for the Project were undertaken in the following three phases:

- consultation before public exhibition of the EIS, including consultation during design development; and
- consultation during public exhibition of the EIS, including subsequent preparation of a submissions report and a preferred infrastructure report (if required).

Note, additional consultation would be undertaken after the public exhibition of the EIS and post determination (should the Project be approved), including proposed consultation activities during construction of the Project.

5.6.1 Stakeholders and Community Working Group

Consultation on the Project commenced in May 2017, and was carried out with the community, as well as:

- relevant government agencies;
- infrastructure and service providers;
- special interest groups;
- affected landowners and businesses; and
- recreational fishers, commercial fishers and the aquaculture industry.

A CWG was formed, consisting of 12 members which aimed to closely match the ABS (2016) profile of the region. CWG members were consulted over nine separate meetings, developed key criteria for the Project, and this assisted in the development of the preferred option for the Project. The CWG wanted a system which offered higher wastewater quality treatment, and which took advantage of oceanographic conditions to minimise impacts upon the environment of Merimbula Bay.

5.6.2 Themes identified

Key issues and/or themes identified as a result of consultation activities (refer **Chapter 6 Consultation** and relevant to the assessment of socio-economic impacts are summarised in **Table 5-5**. These key issues predominantly relate to potential environmental impacts on the marine and coastal environment, particularly impacts upon the recreational amenity value, tourism, fishing and aquaculture industries.

Table 5-5 Summary of feedback provided by community and key stakeholders relevant to socio-economic impacts

Issue	Summary of feedback
Property	Will the potential extension of the airport runway have an impact?
	What will be the impacts to the National Park/other areas outside of the study area?
Amenity	Would construction be done in stages? Would the upgrade all be done at once?
	Is the effluent going to come back onto the beach?
Human health	What will be the resulting impact of pathogens around the dispersal point?
	Is the effluent of the same quality during periods of heavy rain?
	How might chemical use in wastewater treatment impact human health?
Environmental	Will this Project impact the artificial reef in Merimbula Bay? Will treated effluent enter estuaries?
	What is the potential for marine ecology to become contaminated and prevent human consumption?
	Will this work decrease the number of sewage spills?
	What is the correlation between wastewater and algae blooms?
	How might wastewater and chemical use in wastewater treatment impact marine ecology?
	How does wastewater impact beach worms and other creatures?
	Will this Project impact the dunes?
	What are the impacts of dredging on the seabed?
	Will this Project impact on the rocky reef near Haycock Point? Is there potential risk of microplastic pollution from ocean outfall wastewater disposal?
Business impacts	What will the impacts to commercial fishing be?
	What is the potential for damage/loss to abalone and other commercial fishing industries? What will BVSC do if these industries are adversely affected? Will there be compensation?
Cultural	impacts to Aboriginal heritage artefacts and sites during construction.

A number of other questions were raised and are detailed in **Chapter 6 Consultation**. These include questions on Project cost, level of community engagement provided, effects on the coastal, marine and terrestrial environments, and the long-term outlook of the Project (i.e. future capacity). The general socio-economic impacts of importance to stakeholders within the community (summarised in **Table 5-5** above) are assessed in **Section 6.0** and **Section 7.0** of this report.

5.7 Community values

The identification of community values and goals assists in the assessment of potential socio-economic impacts by providing an insight into how the community may perceive these impacts.

Community values[18] are those that are shared by residents and visitors about a particular area, contributing to quality of life or sense of place, and relate to things such as:

- the amenity and character of a place based on the physical and natural environment (including heritage and cultural features, air quality, noise levels);
- health and safety;
- access to employment and community services;
- environmental values and natural features enjoyed by local communities; and
- view of the future.

The community values the natural attributes of the local study area (being the coastal and marine environment), and also values how people perceive their community, how safe the areas is, and their ability to provide for the physical, social and economic wellbeing.

5.7.1 Community plans

This section highlights the values of importance to the community, as outlined in the CSP, and how they relate to the issues raised in **Section 5.6** of this report (and **Chapter 6 Consultation**). Extensive engagement undertaken to inform the CSP (involving around 2,000 members of the community), highlighted key opportunities; those opportunities of relevance to the Project are outlined in **Table 5-6** below;

Table 5-6 Opportunities highlighted within the CSP 2040, and relevance to the Project

Opportunities highlighted in the CSP 2040	Relevance to the Project
The natural environment and relaxed lifestyle	The community highlighted the natural environment is a primary issue of concern during engagement.
Strong community support for sustainability initiatives and innovation	Re-use of wastewater for irrigation purposes was preferred over discharge into the ocean.
The expansion of infrastructure in the Port of Eden	Tourism is an important industry within the local study area. Expansion of the wharf would further support this.
Merimbula Airport and links to Canberra Airport	The airport expansion would enhance accessibility to the area and encourage visitation and spending.
The expansion of existing agriculture and aquaculture industries	Aquaculture is a significant industry within the local study area, with oysters farmed in both Merimbula and Pambula lakes.
Coastline, marine and adventure-based tourism opportunities	Tourism is an important industry within the local study area and can be further expanded on to support the local economy.
Indigenous heritage and cultural activities	Culturally sensitive land is located within the vicinity of the Project. Understanding heritage and history of a site enhances community ties and belonging to a place.

From community engagement, community priorities and aspirations for the future were identified and have been categorised into outcomes and goals. Those outcomes and goals of relevance to the Project are highlighted in **Table 5-7** below.

[18] As defined in Environmental Impact Assessment Practice Note: Socio-economic assessment – EIA-N05 (Roads and Maritime Services, 2013)

Table 5-7 Outcomes and goals from the Bega Valley Community Strategic Plan (CSP) 2040 and relevance to the Project

Community Strategic Plan 2040		Relevance to the Project
Outcomes	**Goals**	
Active and healthy communities	Are an active, healthy community with access to good quality recreation and sporting facilities, and medical health care	The beaches and lakes within the study area form an important recreational function for the community and is vital to their wellbeing. Maintaining the quality of these environments is important.
Employment and learning opportunities	Our economy is prosperous, diverse and supported by innovative and creative businesses.	Many businesses and industry within the study area is reliant on the natural environment. Maintaining the quality of these environments are vital in the retention of a prosperous economy.
	We have meaningful employment and learning opportunities for people in all stages in life.	The marine environment provides for many employment opportunities for the local community.
Sustainable living	Our air and water is pristine, and our natural environment and rural landscapes are protected.	Natural environment is inextricably linked to values of importance to the community. The Project must maintain the quality of these environments.
	We are leaders in sustainable living and support innovative approaches to resource recovery and the production of renewable energy and food.	Renewable production of food (fisheries and aquaculture) is a significant employment, economic driver and industry within the local study area. The Project must not impact on this.
Liveable places	Our places retain their character and scale, development is well planned, and a range of goods and services are available with our Shire that meet local needs.	This infrastructure is vital to the Merimbula community, and needs to be constructed in a way that maintains community values.
Strong, consultative leadership	Our Council is financially sustainable, and services and facilities meet community need.	The Project provides infrastructure that would enable population growth and visitation to the region.

6.0 Potential impacts – construction

This section assesses the potential socio-economic impacts associated with construction of the Project. The matters considered within this assessment respond to the SEARS outlined in **Section 1.2.1** of this report and includes impacts on:

- population and demography;
- property and land use;
- business and industry;
- economy;
- access and connectivity;
- environmental values; and
- local character, identity and amenity.

Outcomes of the assessments are discussed according to the assessment matrix provided in **Section 3.7**. A number of technical studies prepared as part of this EIS (refer **Section 3.7**) have been reviewed and referred to, in order to determine the overall significance of impact upon the socio-economic environment.

6.1 Population and demography

The existing demographic profile within the study area is outlined in **Section 5.0** of this report.

Construction of the Project would require a workforce of around 20 workers, with peak construction periods requiring up to 30 workers. This workforce would represent a negligible change to the local population and demographics profile. Workers may be sourced from the local area, however this would be confirmed during the detailed design stage of the Project.

The severity of impact of the Project on the population and demography of the study area is expected to be neutral to small, and therefore the consequence would be insignificant. The likelihood of impacts occurring is rare. Considering this, the overall significance of impact is low-neutral or low-positive (where construction workers can be sourced from the local area, therefore increasing employment).

6.2 Property and land use

Property impacts are detailed in **Chapter 19 Property and land use** of the EIS. The socio-economic impacts related to property and land use are outlined below.

Most of the STP-related construction activities would be contained within the existing STP site. This minimises the need for property acquisition or temporarily lease arrangements. The Project would not impact access to private properties.

The temporary use of a portion of the PMGC grounds would be required for the proposed construction laydown area at this location. BVSC would negotiate terms of agreement with the PMGC for the temporary use of this land and would work directly with PMGC to minimise impact on the activities and operation of the golf club, before returning the land for use as a golf course following construction.

Section one of the ocean outfall pipeline construction would be undertaken using an underground trenchless drilling method launching from within the STP property to a location beyond the surf zone in Merimbula Bay. Construction impacts to property and land use would therefore largely be avoided. However, a portion of Merimbula Beach may be required for the temporary construction laydown area/intermediate directional drilling site, and the temporary access from Pambula Beach via Jiguma Beach would also be required. A section of Jiguma Beach forms part of the Ben Boyd National Park and therefore, BVSC requires separate approval from the NSW National Parks and Wildlife Service for construction access along Jiguma Beach (refer to the EIS **Chapter 19 Property and Land use** and **Chapter 5 Statutory context**).

Note that some of the Project area also contains Crown Land, and an approval from Crown Lands would be required for construction and operation of the Project (refer **Chapter 19 Property and Land Use** of the EIS for further information).

Effects upon property and land use would be of a short-medium duration, limited to duration of construction, during which there would be small changes to the baseline conditions. While temporary impacts are likely, the consequence would be minor. The overall significance of impact would therefore be medium-negative.

6.3 Business and industry

Construction activities have the potential to impact upon businesses and industry within the local study area as a result of the presence of construction sites, construction vehicles accessing the Project area,, impacts to the normal enjoyment of parts of Pambula Beach and Merimbula Beach (due to temporary construction laydown and vehicle access), and changes to delivery arrangements. Some local businesses such as takeaway shops/cafes may also experience positive benefits from construction workers visiting them. There is also potential for construction equipment and materials to be sourced from local businesses, however this would be confirmed during detailed design of the Project. The extent of impact on individual businesses would vary depending on the proximity to construction works and would be subject to the duration of construction activities. Additionally, impacts to the marine environment could also impact tourism, fishing and aquaculture industries within the local study area, which are reliant on the marine environment. The significance of impact upon business and industry from construction of the Project, is outlined below.

As previously outlined in this report, the Project would predominantly occupy the existing STP site, which is located in a largely unpopulated / low density area. Construction compound and laydown areas would require temporary use of a portion of the PMGC grounds, whilst a temporary laydown area is also required at Merimbula Beach, with a vehicle access from Pambula Beach.

Impacts on the PMGC would be temporary, with land returned to its pre-construction use following completion of construction. Negotiations would be undertaken with the PMGC to confirm terms of agreement and to minimise impacts upon the operations of the PMGC as far as practicable. There may be temporary and minor disruptions to the Pambula Surf Life Saving Club and the Pambula Beach Caravan Park, given their close proximity to the proposed access from Pambula Beach.

As assessed in **Chapter 18 Traffic and Transport** of the EIS and highlighted in **Section 6.5** above, impacts on the traffic and transport environment would be minimal, and there would be largely indiscernible impacts within the local study area upon people's ability to move freely and access businesses.

Background noise and air emissions (e.g. dust emissions) from construction activities can potentially impact on employee productivity. As previously indicated, the majority of the Project area is largely isolated from populated development, although the beach access at Pambula would be located close to local businesses. With noise and air emissions mitigated and managed, impact upon employee productivity is expected to be negligible to minor. Similarly, given the location of the Project area relative to businesses, any impact upon business visibility or viability (which may influence visitation numbers) would be negligible to minor.

Construction of the Project would not impact upon activities within Merimbula Lake or Pambula Lake, therefore aquaculture or fishing opportunities within these environments would be unaffected. As outlined in **Section 6.6.1**, marine ecology would not be significantly impacted within Merimbula Bay (from underwater noise, reduction in water quality or introduction of invasive marine pests, etc.) with the implementation of appropriate mitigation. Recreational and commercial fishing, and/or tourism activities associated with the marine environment, would not be impacted significantly by the Project's construction.

6.3.1 Significance of socio-economic impact – Business and industry

The duration of construction effects on businesses and industry would be for a short-medium term with the severity of change from the existing baseline condition neutral to small. Effects on businesses are generally confined to the PMGC, Pambula Beach Surf Life Saving Club and Pambula Beach Caravan Park, in which negotiations undertaken with these businesses would aim to minimise impacts on these businesses as far as practicable. Impacts on the marine environment are also not expected to be significant provided appropriate mitigation and management measures are in place. The likelihood of construction effecting business operations is likely. The consequence of this impact is considered to be minor given negotiations would be undertaken with the affected parties, and mitigation and management measures (as outlined in the above sections) would be implemented throughout construction. Considering this, the overall significance of impact upon the socio-economic environment is medium-negative at the most affected businesses. Other businesses in the study area would be less affected.

6.4 Economy

Construction activity associated with a project can potentially inject economic stimulus benefits into the local economy. This is through direct employment, associated workforce spending, provision of goods and services required for construction.

Given the low number of workers required to deliver the Project, there is anticipated to be a minimal impact upon the local economy from direct stimulus from construction workers and supplies.

The overall significance of impact upon the socio-economic environment from construction activities is low-positive, given the small contribution made to the local economy.

6.5 Access and connectivity

Construction related impacts to access and connectivity are summarised in **Chapter 18 Traffic and transport** of the EIS. The impacts identified would be experienced at various times during the construction phase of the Project as works progress and would depend on the construction activity being undertaken. The indicative construction activities and working hours are summarised in **Section 2.0** and described further in **Chapter 2 Project Description** of the EIS.

Construction activities, work sites and construction traffic can impact on people's ability to freely travel. This can cause delays on roads, impacting on pedestrian and traffic environments and accessibility to transport and community services. Impacts relating to each component of access and connectivity are outlined below.

6.5.1 Traffic

Construction traffic would consist of up to 20 light vehicles and 10 heavy vehicles per day during peak periods. The frequency of these vehicles would vary and be as required. Traffic would be predominantly associated with the delivery of machinery, equipment and materials to the STP site and may last for the duration of construction (approximately 24 months).

Heavy vehicles would generally follow established heavy vehicle routes including local roads when required. Access to the construction laydown/compound areas (refer **Chapter 2 Project Description)** requires vehicles to drive along Arthur Kaine Drive, Princes Highway and Imlay Street. Coraki Drive (via Pambula Beach Road and Bullara Street) would be used to access the Pambula Beach access for construction of the ocean outfall pipeline.

Construction vehicles would be required to traverse local roads in order to access Pambula Beach. Impacts to travel time are not expected to be significant as these roads generally provide local access rather than a key through route for general traffic.

The assessment in **Chapter 18 Traffic and transport** found that traffic impacts along key local and regional access routes would be minor, even in the worst-case scenario. A Construction Traffic Management Plan (CTMP) would be prepared by the contractor undertaking the works, which would include provision for traffic access routes that are appropriate for the size of vehicles proposed to be used, where possible, and include mitigation and management measures applicable for the Project.

The CTMP would provide details of construction vehicle activity, accredited site personnel, traffic, pedestrian and cyclist management and any required signage.

Overall, the effect of construction impacts on traffic would be experienced for a short-medium term and would be highly localised. The severity of change from the existing baseline environment would be small. The consequence of the change would be insignificant with likelihood of impacts possible. The overall significance of impact would be low-negative.

6.5.2 Parking

There would be no loss of any car parking spaces to private residences or the public. Direct impacts to parking provision associated with construction activities are not anticipated.

Construction worker parking would be provided for construction workers within the Project area. Construction of the Project would require a workforce of around 20 workers, with peak construction periods requiring up to 30 workers. Construction workers would be encouraged to car-pool or drive to the STP and car-pool to construction locations outside of the STP. A small number of construction workers would require access to the Port of Eden, with no car parking facilities provided specifically for the Project at this location. Parking impacts associated with construction worker parking are anticipated to be limited, due to the low number of construction workers expected at any one time, and the number of offsite parking spaces required would be low (as parking would be provided within construction sites also). In addition, the CTMP would contain provisions to manage construction worker parking and minimise parking impacts in the wider area. Construction workers would also be encouraged to park away from residential areas where possible.

Given the limited impacts anticipated, the overall significance of impact would be low-negative.

6.5.3 Public transport

Public transport users are not expected to be impacted by construction of the Project, except for minimal impacts from a small (insignificant) increase in traffic on local roads which may result in short delays. There would be no changes to bus stop locations or bus services as a result of construction of the Project.

Given there is potential for these impacts over the course of the construction period (approximately 24 months), the effects would reflect a short-medium term change from the baseline public transport environment. The consequence of these changes would be insignificant with the likelihood of impacts occurring possible. The overall significance of impact would therefore be low-negative.

6.5.1 Pedestrians and cyclists

Pedestrian and cyclist routes surrounding the Project area would be maintained during construction. However pedestrian or cyclist access impacts have the potential to occur, including temporary delays/disruptions from construction vehicles accessing construction sites (e.g. construction vehicles entering and exiting the STP site, causing delays at the cycle path along Arthur Kaine Drive, and also along the beach). An increase in construction activities would also increase the safety risk for pedestrians and cyclists.

As detailed in **Chapter 18 Traffic and transport** of the EIS, traffic management would be implemented (including signs and/or traffic controllers) to control traffic and notify pedestrians and cyclists of the temporary arrangements. Impacts during construction would be managed through the CTMP. Additionally, the community would be notified in advanced of any planned works that would potentially impact on pedestrian and cyclists' routes within the study area.

Given there is potential for impacts to last the duration of construction (approximately 24 months), the effects would reflect a short-medium change from the baseline pedestrian and cyclist environment. With mitigation in place, the consequence of these changes would be minor with the likelihood of impacts occurring unlikely. The overall significance of impact would therefore be low-negative.

6.5.2 Beach and surf zone access

Beach access would remain available to the public throughout construction, however, if the Merimbula Beach laydown area is used (e.g. for pipe stringing in this location), sections of the beach occupied by construction related activities would be unavailable to the public. At Pambula Beach, construction vehicles would travel along Coraki Drive and down a temporary access track onto Pambula Beach.

Construction vehicles would then travel north along the beach to the construction laydown near the existing beach-face outfall at Merimbula Beach. The temporary laydown area on Merimbula Beach may prevent pedestrian/beach-goer access from one side of the laydown to the other at times.

Access to some parts of the surf zone in front of the laydown area on Merimbula Beach is also likely to be impacted at times, if barges are operating in this area (e.g. transporting pipe strings).

Existing public access to other surrounding parts of the foreshore and beach would be maintained, and public access would not be impacted to nearby headlands or rock platforms.

There would be a minor and temporary disruption to the community's access to sections of Pambula Beach and Merimbula Beach given the presence of construction related vehicles, which may also disrupt people's (and tourists) normal enjoyment of the beach. These impacts would be temporary, of limited magnitude (i.e. construction vehicles are expected to be low in number - refer **Section 6.5.1**), and experienced intermittently, however would disrupt the amenity of beach users. Public access to the beach and car park would be maintained during construction. The effects would reflect a short-medium change from the baseline environment. The consequence of these changes is minor with likelihood of impacts occurring possible. The overall significance of socio-economic impact would therefore be medium-negative, localised to the Pambula Beach access and laydown on Merimbula Beach, and would be experienced intermittently.

6.5.3 Significance of socio-economic impact – access and connectivity

In summary, the greatest impacts to access and connectivity would be medium-negative, brought about by the construction laydown on Merimbula Beach and associated beach access from Pambula. Other potential impacts would either be avoided or have a low (negative) impact.

6.6 Environmental values

Issues raised by stakeholders, as described in **Chapter 6 Consultation** of the EIS, were predominately associated with environmental values. Impacts to environmental values could lead to socio-economic impacts including impacts to tourism, marine-based commercial and recreational activities and amenity. The risk in relation to construction activities is explained below, and is predominantly associated with poorly maintained vessels, accidental spillages of chemicals/fuels or other materials, accidental release of sediment/or dirty stormwater runoff, noise and air emissions, or inadequate implementation of mitigation and management measures. Potential impacts to environmental values are assessed below, for both the marine environment and terrestrial environment.

6.6.1 Marine environment

Potential impacts to marine ecology are assessed in detail in the EIS in **Appendix G** (Marine ecology assessment) and summarised in **Chapter 11 Marine ecology**. This assessment indicates impacts to marine ecology are primarily associated with Section two of the pipeline installation (i.e. the offshore section). This requires laying of a 2.7 km long and 450 mm diameter pipeline on the seabed and covering with concrete / rock mattresses.

Potential impacts to marine habitats and communities associated with the construction of Section two of the outfall pipeline include:

- introduction of an invasive marine pests via construction vessels and equipment;
- disturbance to, and loss of sandy seabed habitat as a result of establishing the pipeline and diffuser infrastructure;
- underwater construction noise from vessels and equipment which impacts on marine life;
- vessel or anchor cable strike, resulting in injury or mortality of marine life, including protected species;
- accidental spills from construction vessels and equipment causing a reduction in water quality; and
- reduced opportunities for future marine waters aquaculture.

Introduction of invasive marine pests

Invasive marine pests can potentially be introduced by vessels or machinery which have not been thoroughly cleaned, or by ballast water discharge. Such species could impact upon the rocky reef habitat within Merimbula Bay and pose a threat to abalone populations.

Chapter 11 Marine Ecology indicates that the overall potential risk of introducing an invasive marine pest during construction phase activities is a medium risk that can be reduced to a low risk with adoption of standard environmental mitigation and management measures[19]. Given this, it is considered changes to the marine environment which would impact upon the commercial fishing industry and the assemblage of marine species within Merimbula Bay is low risk, provided the proper mitigation and management measures are in place.

Underwater construction noise

Underwater construction noise from vessel movements and equipment used to establish the pipeline and diffuser infrastructure on the seabed and anchoring the outfall pipeline with protective concrete/rock mattresses could potentially impact upon marine fauna within Merimbula Bay.

The marine fauna that may be affected include a number of listed threatened and protected marine mammals. An assessment of the impacts from underwater noise is detailed in **Appendix M** (Underwater noise assessment) and summarised in **Chapter 21 Underwater Noise** of the EIS. This assessment considers that noise levels from the proposed construction methods are expected to be similar to the range of noise that already occurs in Merimbula Bay from recreational, charter and commercial vessels. Any noise effects would be short-term and localised. It is anticipated that mobile species such as fish would avoid or move away from the area if noise is experienced, and noise upon any marine mammals would be mitigated with mitigation and management measures, including implementation of safety zones and exclusion zones. With the implementation of appropriate mitigation and management measures, the risk is anticipated to be low.

Vessel or cable strike to marine mammals

The risk of vessel strike during vessel mobilisation is most likely to involve slow moving marine mammals such as whales and has the potential to cause injury and death.

The risk of vessel or cable strike is considered low with the risk further reduced by adopting routine mitigation and management measures during construction activities.

Accidental spill from construction vessels

There is the potential for substances such as fuels and oils from construction vessels to accidentally enter the water through spills or leaks which is considered a medium risk to marine fauna that occur or forage near surface waters (such as marine mammals and birds).

The potential risk would be reduced by implementing a range of routine mitigation measures to protect water quality.

Disturbance and loss of soft sediment habitat

The offshore pipeline construction would involve laying the pipeline directly on the seafloor and anchoring along its length, resulting in an insignificant loss of soft sediment habitat. The concrete/rock mattresses would effectively provide an artificial reef formation and provide opportunity for colonising sessile invertebrates such as ascidians, barnacles, oysters and mussels. This would potentially result in a positive impact to species diversity and abundance within Merimbula Bay. **Future marine waters aquaculture.**

Construction activities would not impact on the potential for future aquaculture opportunities given the short-term nature of activities and the low risk with effective mitigation and management in place.

[19] Mitigation and management in accordance with the *National Marine Pest Plan 2018-2023* and other measures described in **Chapter 11 Marine ecology** of the EIS.

Conclusion – marine environment

With mitigation and management measures in place, socio-economic impacts related to impacts to the marine environment are unlikely, and the consequence minor. The overall the risk would be low-negative.

6.6.2 Terrestrial environment

Chapter 12 Terrestrial Ecology (and Appendix H Biodiversity Assessment Report) of the EIS provides an assessment of the potential impacts to terrestrial ecology as a result of construction activities.

As indicated in **Chapter 2 Project description**, construction would predominantly be confined to the existing STP site, and therefore is expected to have minimal impact on the surrounding terrestrial environment. Loss of approximately 0.28 hectares of native vegetation is required to facilitate construction, however due to the construction methodology chosen (trenchless drilling for the outfall pipeline), largely avoids impacts to important biodiversity values. Impacts on associated fauna within those environments would therefore largely be avoided.

Chapter 12 Terrestrial Ecology also assesses indirect impacts, such as those from potential introduction of invasive species and pathogens, fauna injury and mortality, and increase in noise, vibration and light, from construction related vehicles and equipment. These impacts have been assessed as being low risk, with potential for impacts to be further mitigated through measures outlined in **Chapter 12 Terrestrial Ecology**.

An assessment of groundwater dependant ecosystems (GDEs) as a result of the construction of the Project has been undertaken and detailed within **Appendix D** (Groundwater Dependant Ecosystems) of the EIS. This indicates that the proposed ocean outfall pipeline would be constructed beneath the groundwater table and would have small effects on groundwater flow, quality, or level. The risks of significant changes to the water table elevation and quality of groundwater that supports the wetlands and GDEs due to drilling are therefore considered to be low.

With mitigation and management measures in place, socio-economic impacts related to impacts to the terrestrial environment are unlikely, and the consequence minor. The overall the risk would be low-negative.

6.6.3 Significance of socio-economic impact – Environmental values

A review of assessments prepared for the Project EIS has been undertaken in relation to potential impacts upon environmental values of particular interest to the local community[20]. It is considered impacts on environmental values during construction activities would be low risk with mitigation and management in place. Any potential impacts would be over a short period of time representing a small to medium change from the baseline environment. The potential severity of this change would be low to medium. With effective mitigation in place, it is unlikely that impacts would occur, and the consequence would be minor. The overall socio-economic impacts related to impacts on environmental values (of either the marine and/or the terrestrial environment) would therefore be low-negative.

6.7 Local character, identity and amenity

The preservation of local character and identity is of high importance to the community and is linked with the preservation of a high-quality natural environment. The protection of Aboriginal and non-Aboriginal heritage is also of value to the community, as well as the protection of the amenity and accessibility of open space and recreation areas.

Amenity can be impacted by proximity to infrastructure and services enjoyed by the community, introduction of noise and vibration, as well as unsightliness or offensive odours.

The potential impacts upon local character, identity and amenity during construction of the Project are outlined below. The significance of the impact upon the socio-economic environment is summarised in **Section 6.7.7.**

[20] This includes **Chapter 11 Marine Ecology**, **Chapter 12 Terrestrial Ecology** and **Chapter 21 Underwater Noise**.

6.7.1 Natural environment

The Project has been designed to avoid the important biodiversity values recorded nearby within the area, with the proposed loss of vegetation considered relatively small given the abundance of vegetation surrounding the Project area. As such, socio-economic impacts related to the natural environment were assessed to be unlikely and insignificant, giving a low-negative impact overall.

6.7.2 Landscape and visual amenity

Visual amenity is an important part of an area's character and can offer a wide variety of benefits to communities in terms of quality of life and wellbeing, whilst also being positive for economic activity (i.e. tourism).

The construction of the Project would result in temporary changes to landscape and visual amenity through loss of vegetation required for the Project and from the presence of construction sites, vehicles and equipment. The Project has been designed to avoid the important biodiversity values recorded nearby within the area with the proposed loss of vegetation considered relatively small given the abundance of vegetation surrounding the Project area. Vegetation in Ben Boyd National Park, which is enjoyed by the community, would not be impacted. It is considered impacts to visual amenity as a result of the construction phase of the Project would be insignificant to minor, with the most noticeable change being the presence of the construction laydown area on Merimbula Beach (and associated access track from Pambula Beach), and the laydown area on the PMGC grounds. Impacts are likely and the overall impact would be medium-negative.

6.7.3 Noise and vibration

Noise and vibration arising from construction activities has the potential to affect a community's ability to enjoy a place and can impact upon human health and wellbeing. It is noted that the STP site is largely isolated from populated areas, therefore limiting potential to create adverse amenity impacts from construction activities. Noise and vibration related to the construction access required through Pambula Beach and the laydown area at Merimbula Beach have the potential to impact upon the amenity enjoyment of these beach areas. **Appendix L** (Noise and Vibration Technical Report) details the potential noise and vibration impacts during the construction phase of the Project and is summarised in **Chapter 20 Noise and Vibration**. This assessment indicates there would be a small noise exceedance of applicable criteria of up to 6 dB(A) (at times) at the Pambula Beach Caravan Park due to heavy vehicle movements into the Project area.

The assessment also indicates that provided recommended safe working distances are complied with, there would be no adverse impacts from vibration intensive works.

Overall noise impacts would be minor and unlikely for most receptors, and therefore low-negative; however for the caravan park at Pambula Beach, impacts would be possible, and therefore the worst case impact would be medium-negative.

6.7.4 Air quality

Dust and odour have the potential to affect human health, reduce the amenity of an area and generate nuisance potentially deterring people from using spaces, visiting businesses or enjoying residential amenity.

Appendix N (Air Quality Impact Assessment) details the potential air quality impacts during the construction (and operation) phase of the Project and is summarised in **Chapter 22 Air Quality**. The assessment found that while there is the potential for some minor odour impacts to occur, the removal of the effluent storage pond, cessation of use of the dunal exfiltration ponds and the relocation of the ocean outfall would result in an overall reduction of odour concentrations from the STP once operational.

Potential dust and odour impacts have been assessed as temporary and insignificant during construction in **Chapter 22 Air quality**. Impacts are unlikely, and the consequence would be insignificant. Overall the impact would be low-negative.

6.7.5 Changes to access and connectivity

Impacts upon access and connectivity have been summarised in **Section 6.5** of this report and indicate that temporary use of the PMGC and temporary access along Pambula Beach and Merimbula

Beach are required to facilitate construction activities. The majority of the beach would remain available for the public to enjoy, albeit with the temporary presence of construction vehicles, which would affect the amenity value compared to the baseline environment. With mitigation measures implemented as per the CEMP, it is considered that impact upon access and people's ability to enjoy social infrastructure and access businesses within the study area would be temporary and mostly low, or medium in the case of the use of a portion of the beach area for construction.

6.7.6 Heritage

Heritage reveals the history of a place and safeguards and enriches community ties and belonging to an environment. The loss of heritage items can potentially diminish the sense of place and identity valued by the community.

Aboriginal heritage

Appendix I (Aboriginal Cultural Heritage Assessment Report) for the Project EIS identified six Aboriginal archaeological sites within the Project area. Earthworks within the Project area (existing fenced STP complex and the installation of the underground section of the ocean outfall pipeline) are not anticipated to result in any physical impacts to identified Aboriginal sites. Vehicle movements are assessed as carrying a low to moderate impact risk for identified Aboriginal sites within and immediately adjacent the Project area.

Overall, given the construction methods proposed for the Project (e.g. directional drilling), it is considered that there would be a low risk to Aboriginal heritage as a result of construction activities with the implementation of mitigation and management measures described in **Chapter 14 Aboriginal heritage**. The overall impact to local character and identity with respect to Aboriginal heritage values would be neutral (no impacts expected).

Non-Aboriginal heritage

Chapter 15 Non-Aboriginal heritage indicates that earthworks activities are not anticipated to result in any physical impacts to survey reference trees identified within and adjacent to the Project area. The proposed pipeline would be directionally bored underneath these trees at depth and would not have any direct impacts. Similarly, vehicle movements are not anticipated to result in any impacts. Chapter 15 Non-Aboriginal heritage also indicates there would be no impact to marine heritage sites from the Project (including ship wrecks). The overall impact to local character and identity with respect to non-Aboriginal heritage values would be neutral (no impacts expected).

6.7.7 Significance of socio-economic impact – Local character, identity and amenity

A review of assessments prepared for the Project EIS has been undertaken in relation to potential local character, identity and amenity impacts[21].

Overall it is considered impacts upon local character, identity and amenity during construction activities would represent a short to medium term change from the baseline environment. The potential severity of this change would be small, and the consequence level would be minor. The likelihood of impacts occurring is mostly possible, with amenity impacts near the beach construction areas likely. The overall impact to local character, identity and amenity of the socio-economic environment would therefore be low to medium-negative with mitigation and management measures in place.

[21] This includes **Chapter 19 Property and Land Use**, **Chapter 20 Noise and Vibration, Chapter 22 Air Quality, Chapter 18 Traffic and Transport, Chapter 14 Aboriginal heritage** and **Chapter 15 Non-Aboriginal heritage**.

7.0 Potential impacts - operation

This section addresses the potential socio-economic impacts likely to occur during the operation of the Project. The matters considered respond to the SEARS outlined in **Section 1.2.1** of this report. Potential benefits of the Project to recreational fishing along Merimbula Beach, in Merimbula Lake and Pambula Lake and the oyster industry in both lakes have been assessed in **Section 8.0**.

This assessment considers operational impacts on:

- Population and demography;
- property and land use;
- business and industry;
- economy;
- access and connectivity;
- community values; and
- local character, identity and amenity.

Similarly to **Section 6.0**, outcomes of the assessments are discussed according to the assessment matrix described in **Section 3.7** of this report. A number of technical studies prepared as part of this EIS have been reviewed and referred to, in order to determine the overall significance of impact upon the socio-economic environment.

7.1 Population and demography

Operation of the Project would not require new employees and is not likely to affect population or the demographic profile of the area. Impacts would therefore be neutral (no impacts).

7.2 Property and land use

As detailed in **Chapter 19 Property and land use**, the Project when operating would not change the existing land use or impact on properties in the Project area, with the exception of the land currently used for access and operation of the dunal exfiltration ponds. The Project proposes to cease the use of the existing dunal exfiltration ponds (however this site would continue to be maintained by BVSC in the short term). The location of the onshore, underground section of the ocean outfall pipeline would be signposted onshore to notify the community in relation to its location. It is noted that access arrangements are required with Crown Land for ongoing access during operation (e.g. for maintenance).

Socio-economic impacts on property and land use would be neutral with no discernible effect given the Project would occupy the existing STP site only, with no permanent acquisition of additional land required. The change from the existing baseline environment would be neutral, the consequence of change would be insignificant, and it is unlikely impacts would occur. The overall significance of impact upon the socio-economic environment would therefore be low-neutral.

7.3 Business and industry

The Project SEARS specifically requires an assessment of impacts from the operation of the Project on potentially affected properties[22], businesses, recreational users and land and water users (notably tourism, recreational and commercial fishers, aquaculture – existing and proposed). As highlighted in **Section 5.4.1** and **5.4.2** of this report, tourism is a major contributor to the local economy, with recreational fishing, commercial fishing and aquaculture being a significant contributor. The marine environment is therefore not only of importance to the community for their well-being but is also highly valuable to the community as a source of employment and income.

[22] Also assessed in **Chapter 19 Property and land use**

Impacts on marine ecology and human health have been assessed to be have a medium socio-economic rating. Impacts upon marine ecology has been assessed as an improvement compared to the baseline. Therefore, business and industry operating in the local study area, namely recreational fishing, commercial fishing, aquaculture and abalone (which are dependent on the quality of the marine environment) would not be adversely impacted by the Project.

The ocean outfall pipeline and diffuser may have a positive effect on species diversity and abundance. The pipeline infrastructure would constitute a change from sandy seabed habitat to hard substrate habitat for a wide range of colonising sessile invertebrates, effectively resulting in the creation of an artificial reef. This may result in a net positive effect on species diversity and/or abundance in the central region of Merimbula Bay, which may also equate to improved recreational fishing opportunities.

In terms of impacts to future aquaculture opportunities, **Chapter 11 Marine Ecology** has assessed that Merimbula Bay would be suitable for most forms of aquaculture. Construction of the pipeline and outfall diffuser would reduce the area of Merimbula Bay potentially available for future marine aquaculture by approximately 50%, (as the *NSW Marine Waters Sustainable Aquaculture Strategy* (DPI, 2018) requires that aquaculture must not occur within 1 km of sewage outfall pipelines). Given that aquaculture has been focused around oysters for the last 100 years within the lake and estuarine environments (considered optimal for oyster aquaculture), it is unlikely that aquaculture would extend into Merimbula Bay in the short or medium term.

Chapter 11 Marine ecology indicates that the Project would not jeopardise future recreational and commercial fishing opportunities within the local study area. The biggest impact to these industries is expected to be from climatic changes, which influence marine ecology. It is also noted that the Project would result in improved wastewater quality and the potential formation of a rocky habitat along the pipeline, and so may benefit species diversity and abundance within Merimbula Bay (discussed further in **Section 8.0**).

The Project provides the local study area with needed infrastructure, which is a significant improvement to the existing STP infrastructure, and which has a lifespan of approximately 100 years. The Project therefore has the capacity to serve the residents and visitors to the region for years to come, whilst also maintaining water quality and the integrity of the natural environment.

Given the assessments undertaken within this SEIA, it is considered the consequence of impact upon business and industry within the local study area would be minor, given the improvement of wastewater quality, and the increased distance of the discharge from the surf zone in Merimbula Bay. This would result in an improvement in water quality and marine ecology. Impacts to business and industry would be unlikely (i.e. could occur at some time within the timeframe of decades, refer **Table 3-7**) and minor, however would be positive. This would result in an low -positive impact for business and industry within the local study area.

7.4 Economy

Operation of the Project and the benefits it would bring (specifically from the removal of the beach-face outfall) may bring about a positive effect to how the Merimbula Beach area is viewed by the community and tourists alike (relative to the current situation), resulting in a longer term, indirect and positive impact to tourism and the local economy. The Project is also a vital upgrade to an essential piece of infrastructure required for the communities in the area, which may also have a positive effect to the profile of the region as a place for people to stay, move to or invest in.

The likelihood of these impacts is assessed as unlikely, and the consequence would be insignificant. The overall significance of impact from operation on the Project on the local economy would be low-neutral or low-positive.

7.5 Access and connectivity

The operational phase of a project can impact on a community's ability to freely travel by causing delays on roads, impacting on pedestrian and traffic environments and impacting on accessibility to community services.

A summary of operational traffic impacts for the Project is outlined in the EIS in **Chapter 18 Traffic and Transport**. Operation of the Project is not anticipated to generate significant traffic volumes, and the road network and road users within the vicinity of the Project are not expected to be impacted. The Project does not impact on the provision of parking spaces. The Project does not include changes to bus or coach services and there is no forecasted increase to workforce numbers utilising this service, therefore, increased bus patronage is not expected. The Project would retain the existing shared path facilities along Arthur Kaine Drive. No changes to private property access would be required as part of the operation of the Project. Access to Crown land would be required with approval (from Crown lands) to access project elements (e.g. ocean outfall pipeline) during operation for maintenance activities.

As the ocean outfall would be installed underground to out beyond the surf zone, the pipeline would not be visible or affect public access to the beach or surf zone. Public access would also not be impacted to nearby headlands or rock platforms.

The severity of the associated socio-economic impacts would be neutral and the consequence insignificant. As it is rare that impacts would occur, the overall impact would be low-neutral.

7.6 Community values

The marine environment within the local study area supports tourism, recreational and commercial fishing opportunities and supports oyster aquaculture. The marine environment is therefore highly valued by the community. As detailed in **Chapter 6 Consultation** of the EIS, potential water quality impacts from the discharge of treated wastewater into the marine environment has been highlighted by the community as an issue of primary concern, due to its potential to impact on activities valued by the community, as well as impact on their health and safety. Potential impacts to environmental values and health and safety, and therefore community values, are discussed below.

7.6.1 Environmental values

Potential operational related impacts and risk level to marine ecological receptors and values have been summarised in **Chapter 11 Marine Ecology**.

It is noted that discharge of treated wastewater into Merimbula Bay, via beach-face outfall, has occurred since 1974. The replacement of the beach-face outfall to ocean outfall and the upgrades at the STP would result in improvements in the quality of the wastewater being discharged into the environment and would also increase the distance of this discharge to approximately 2.7 km into the bay. This substantially increases the point of discharge from beach-goers compared to the existing beach-face outfall. An ocean outfall would result in improved dispersion of wastewater and reduces the risk of entrapment in the surf zone and therefore reduces the risk of nutrients (associated with the wastewater) to enter Merimbula or Pambula estuaries. Adverse water quality impacts to these environments would therefore be reduced. Conversely, some sensitive ecological receptors within Merimbula Bay would be closer to the proposed ocean outfall discharge than previously. This includes Merimbula Offshore Artificial Reef approximately 1,000 m to the north-east, followed by Hunter Reef, Haycock Point, Long Point.

However **Chapter 11 Marine Ecology** finds that the wastewater discharge under normal conditions (expected for the majority of time) would have a mixing zone of approximately 25 m, meaning that Marine Water Quality Objectives would be met outside of this zone (and would extend to 200 m under a worst case scenario). The sensitive ecological receptors are all beyond these mixing zones.

Water quality is assessed further in **Chapter 8 Water quality, hydrology and flooding**, and marine ecological receptors and values likely to experience operational impacts are discussed in **Chapter 11 Marine ecology**.

Table 11-10 of **Chapter 11 Marine Ecology** highlights the risk level to marine ecological receptors as a result of the operation of the Project. Those of relevance to socio-economic impacts valued by the community are highlighted in **Table 7-1**, below.

Table 7-1 Potential impacts to marine ecological receptors during the operation of the Project (AECOM, 2020).

Potential hazard / threat	Marine ecological receptors and values								
	Threatened and migratory marine mammals	Threatened and protected fish	Type 3 soft sediment marine habitat	Abalone and abalone fishery	Fish assemblage	Benthic infauna communities	Estuaries	Aquaculture	Recreational and commercial fishing
Discharge of levels of metals that exceed MWQOs within mixing zone with potential to bioaccumulate in fish greater than natural background levels	Low	Low	Medium	Minimal	Low	Medium	Minimal	N/A	Low
Discharge of wastewater resulting in marine waters with reduced salinity within the mixing zone	Low	Minimal	Medium	Minimal	Minimal	Medium	Minimal	N/A	Minimal
Increased suspended sediment load, organic particulate material, nutrients and toxicants settling to the seabed around the diffuser and within the mixing zone	Low	Low	Medium	Minimal	Low	Medium	Minimal	Low	Low
Reduction in available nutrients as a result of moving the existing beach-face outfall	Low	N/A	N/A	Low	N/A	N/A	Low	Low	Minimal

The above summation of the risk level to marine ecological receptors and values from operational related impacts of the Project indicates there may be a medium risk to:

- the soft sandy habitat beneath the proposed pipeline; and
- the benthic infauna communities which inhabit that soft sandy habitat.

All other impacts are considered low or minimal risk or were not considered applicable. Of particular relevance to the SEARS are risks to the abalone fishery, oyster aquaculture, the assemblage of fish and to recreational and commercial fishing, where the risk level has been assessed as being low or minimal.

Medium risk of impacts to benthic infauna communities are primarily associated with the location of these species being within the mixing zone of the proposed treated wastewater discharge. It is noted that the benthic fauna community exposed is minimal in comparison to the habitat available within Merimbula Bay. The quality of the wastewater being discharged is improved compared to the baseline. Therefore, it is considered that impacts to this community would be not be significant, and an improvement compared to the existing beach-face outfall pipeline.

In addition, **Chapter 9 Groundwater**, indicates seepage from the existing exfiltration ponds has resulted in higher recordings of pathogenic bacteria beneath these ponds. Ceasing the use of these exfiltration ponds would likely have a net benefit to the receiving environment over time as treated wastewater would cease to be released from this location into the environment (and subsequently into groundwater).

Conclusion – Environmental values

Overall, socio-economic impacts upon environmental values of importance to the community, particularly recreational fishing, commercial fishing, abalone fishery, aquaculture and the recreational value of the marine environment would be an improvement compared to the baseline condition given that the quality of the wastewater being discharged would be improved and ongoing seepage from the exfiltration ponds would cease. The duration of operational effects on environmental values would be for a long term, with the severity of change from the existing baseline condition, small to medium. The likelihood of the impacts on environmental values from the operation of the project is possible, with the consequence moderate. Considering this, the overall significance of impact upon the socio-economic environment relating to environmental values, from the operation of the Project, is medium-positive.

7.6.2 Health and safety

The community highlighted the risk to human health from the operation of the Project as a primary concern[23]. This is because the discharge of treated wastewater into the marine environment could potentially render seafood unsuitable for human consumption. Additionally, the community considered that treated wastewater discharged near the surf zone of Merimbula Bay could adversely impact on the health of recreational beach users. These impacts simultaneously impact upon the community's ability to enjoy the natural amenity of the marine environment.

Chapter 17 Human Health indicates that the Project would result in improved wastewater quality, with a substantial improvement in dispersion compared with the existing beach-face outfall. The possibility of direct contact with treated wastewater by recreational users of the beach is low. The human health risk associated with re-use of treated wastewater would be lower in post-upgrade conditions when compared with current (pre-upgrade) conditions.

Chapter 16 Hazard and risk indicates that the STP would require minor quantities of hazardous chemicals. The storage of minor quantities of hazardous chemicals is not a significant contributor to the overall risk profile of the Project from a land use safety planning perspective. A standard safety management system would be in place to mitigate any health risk associated with the storage and use of these hazardous substances.

Conclusion – Health and safety

Overall, health and safety would be improved compared to the baseline condition given that wastewater is no longer discharged directly on the beach (instead it would be discharged 2.7 km offshore) and so is unlikely to come into contact with recreational beach users. The quality of the wastewater being discharged would also be improved by the STP upgrades. The duration of operational effects on environmental values would be for the long term, and the consequence would be moderate (positive). The likelihood of the impacts is possible. The overall significance of socio-economic impact relating to health and safety, from the operation of the Project would be medium-positive.

7.6.3 Significance of socio-economic impact - community values

In consideration of community values overall, of relevance is that the beach-face outfall would no longer be associated with Merimbula Beach and the exfiltration ponds would also be removed. These elements would effectively be replaced with the ocean outfall pipeline, which is expected to have a limited environmental impact, with Marine Water Quality Objectives being met outside of the modelled mixing zones. Overall, operation of the Project is expected to have a medium-positive impact on community values.

7.7 Local character, identity and amenity

The preservation of local character and identity is of high importance to the community and is inextricably linked with the preservation of a high-quality natural environment. The community within the study area are likely to take pride in their coastal towns, and highly value their natural environment, which is also likely to contribute to their wellbeing. Preservation of the natural environment is therefore intimately linked with the community's sense of pride and identity.

Amenity can be impacted by noise, air quality and access impediments. Of particular relevance to the Project is the potential for unsightliness or offensive odours, which can be actual or perceived by the community.

The significance of potential socio-economic impacts relating to components which comprise local character, identity and amenity during operation of the Project are outlined below.

7.7.1 Natural environment

Degradation of the environment would adversely impact upon the community's sense of pride and belonging, and would also impact on the population's ability to make a living, and their enjoyment of the place they live in.

Chapter 8 Water quality hydrology and flooding assesses the impacts to water quality from operation of the Project, finding that the quality of treated wastewater discharging into Merimbula Bay would be improved, and also that Marine Water Quality Objectives would be met at the boundary of a 25 m mixing zone from the pipeline diffuser under typical conditions (increasing to a 200 m mixing zone under a worst case scenario) (noting that these results are based on modelling undertaken using existing treated wastewater quality values, and therefore would be improved under the improved treated wastewater quality as a result Project).

Section 6.6.1 outlines that the marine ecology assessment undertaken shows that the significance of potential impacts to marine ecology when mitigated would be low, given the improvement in the quality of the discharge, and the increased distance of the discharge to sensitive ecological receptors. Operation of the STP would not impact other surrounding land uses including extensive natural environments of Ben Boyd National Park and Merimbula Beach.

The natural environment is primarily expected to be improved from the current situation, with an increase in quality of treated wastewater discharged from the STP, and removal of the beach-face outfall from Merimbula Beach.

The duration of operational effects on the natural environment would be long term, the severity of change from the existing baseline condition would be small to medium. The likelihood of the impacts is possible, with the consequence moderate. Considering this, the overall significance of impact on local character, identify and amenity from operation of the Project is medium-positive.

7.7.2 Noise and vibration

Chapter 20 Noise and Vibration (airbourne) indicates the likely maximum increase in noise emissions from operation of the Project would be 0.5 dB(A). This is a minor increase with the impacts of the noise exhibited from the upgraded STP site operations anticipated to be indiscernible. Furthermore, operational noise from the Project would be well under the applicable noise criteria for operation of the Project.

Given the above, any socio-economic impact resulting from operational noise and vibration would be insignificant. The duration would be long term, the consequence would be insignificant, and the likelihood of impacts rare. The overall significance of socio-economic impact upon local character, identify and amenity from operational noise and vibration is considered low-negative.

7.7.3 Air quality

Chapter 22 Air Quality details the potential operational air quality impacts from the Project. Based on a realistic worst-case scenario modelling results, there were no predicted exceedances of the relevant air quality criterion for existing or proposed operations from the Merimbula STP. Predicted offsite odour concentrations are expected to decrease as a result of the STP upgrade due to the removal of odour inducing sources (i.e. the STP effluent pond and exfiltration ponds). Given the compliance with the odour criterion, no adverse impacts in relation to ground level odour concentrations are anticipated under the realistic scenario.

The duration would be long term, the consequence would be insignificant, and the likelihood of impacts rare. The overall impact on local character, identify and amenity as a result of air quality impacts, is considered low-positive.

7.7.4 Significance of socio-economic impact – Local character, identity and amenity

Overall it is considered that impacts to local character, identity and amenity during operation would represent a long term change from the baseline environment. The potential severity of this change would be small to medium, and the consequence level would range up to minor. Impacts are possible, and overall the impact to local character, identity and amenity is expected to be low to medium, and positive.

8.0 Project benefits

This section assesses the potential benefits of the Project, including potential benefits to recreational fishing and the oyster industry within the local study area.

The Project would cease the disposal of wastewater at the current beach-face outfall and to dunal ex-filtration ponds. Water quality risks associated with those methods of disposal would be eliminated, potentially benefitting recreational and commercial fishing and estuarine aquaculture. The recreational and amenity benefits associated with improved water quality would also indirectly benefit the tourism sector. There would also be a reduced potential for recreational beach users to come into contact with wastewater discharge, which at present, is periodically discharged directly onto Merimbula Beach. The improved treatment of wastewater also provides additional opportunities for beneficial reuse options into the future.

The benefits are summarised below:

- The Project would result in improved wastewater quality. The reduction in risk associated with this means there are potential benefits to the health and values of both estuaries, including recreational use and fishing.
- The quality of treated wastewater discharge is improved and the distance of this discharge to sensitive receivers, notably Merimbula and Pambula Lake where aquaculture is located, is increased. The ocean outfall pipeline would allow treated wastewater to disperse away from Merimbula Beach. This eliminates the risk of wastewater being entrained in the surf zone where it would generally have more potential to disperse parallel to the beach and towards the estuary entrances. This also means there is less potential for poor quality water to enter Merimbula Lake, which contains oyster aquaculture (which is particularly susceptible to changes in water quality).
- Ceasing disposal of treated wastewater to the dunal exfiltration ponds is likely to improve groundwater quality beneath the ponds over time, including the component of groundwater that flows westwards and discharges to Merimbula Lake. This again would be beneficial to water quality within Merimbula Lake and its associated uses. The exfiltration ponds are found in an area containing Aboriginal heritage values, and so ceasing their use may also carry benefits in protecting these values due to their proximity.

The ocean outfall pipeline and diffuser structure may have a positive effect on species diversity and abundance. The pipeline infrastructure would constitute a change from sandy seabed habitat to hard substrate habitat for a wide range of colonising sessile invertebrates, effectively resulting in the creation of an artificial reef. Some sections of the structure may also be potentially suitable for natural colonisation by blacklip abalone. If colonisation of the structure by blacklip abalone is a possibility, this could potentially produce benefits for the Merimbula Bay reefs habitat and/or the local abalone fishery by increasing the pool of Merimbula Bay reefs contributing to local larval supply. Snapper may also be attracted to the pipeline and diffuser infrastructure and in doing so, the Project may have a positive effect on local snapper population. This may result in a net positive effect on species diversity and/or abundance in the central region of Merimbula Bay, which may also equate to improved recreational fishing opportunities.

9.0 Cumulative impacts

Impacts from a project when considered in isolation, may be minor, however, when multiple developments/activities result in impacts to the same receivers, the impacts may be more substantial. These are what are referred to as cumulative impacts.

The potential for cumulative impacts with other projects is set out in **Chapter 27 Cumulative Impacts** of the EIS. The assessment indicates that there would be no developments undertaken simultaneously in the area that have the potential to contribute to cumulative impacts (i.e. potential effects from other developments would not be experienced at the same time as the effects experienced from the Project). Therefore it is considered unlikely that there would be any significant cumulative socio-economic impacts with other developments in the vicinity of the Project.

10.0 Mitigation and management measures

10.1 Overview

This chapter describes the mitigation and management approach for socio-economic impacts from the construction and operation of the Project, as outlined in **Section 6** and **Section 7**. This chapter also details the desired performance outcomes as indicated within the Project SEARS.

The mitigation and management measures described in this section would also be included in the CEMP for the Project and also implemented by BVSC during operation where relevant.

As discussed throughout this report, the assessment of social and economic impacts considers a range of inputs from other technical environmental assessments undertaken for the EIS, as other environmental impacts can bring about socio-economic impacts. Mitigation and management measures in other chapters that are relevant to the management of related potential social and economic impacts include those contained in Chapters 8 to 27 of the EIS.

Consultation would also be undertaken with the community and stakeholders in accordance with the *Community and Stakeholder Engagement Plan* (CSEP) (AECOM, 2017) prepared for the Project, to provide information about the Project and feedback channels, and assist in minimising impacts.

10.2 Performance outcomes

Socio-economic performance outcomes for the Project are outlined below:

- construction impacts on businesses and industry are minimised through adequate mitigation and consultation; and
- environmental and cultural values of importance to the community, tourists and commercial operators (commercial fishing) and the recreational value of the marine environment (for recreational fishing, swimming) are improved.

The Project would be designed, constructed and operated to achieve these performance outcomes.

10.3 Mitigation and management measures

Table 10-1 outlines the mitigation and management measures that would be implemented to address the potential socio-economic impacts of the Project.

Table 10-1 Mitigation and management measures

ID	Mitigation and management measure	Timing
SE1	Continued consultation with the community throughout the assessment, approval and construction phases (and post construction) of the Project in accordance with the *Community and Stakeholder Engagement Plan* (CSEP) (AECOM, 2017). Using a variety of engagement tools and methods, the aims of ongoing communications and consultation are to provide the community with: • accurate and accessible information regarding the processes and activities associated with the Project; • appropriate avenues for the community to provide comment or raise concerns; and • responsiveness to issues and concerns raised.	Construction and Operation

ID	Mitigation and management measure	Timing
SE2	In conjunction with mitigation measure SE1, a socio-economic impact monitoring framework would apply throughout the construction phase of the Project (and three months post construction) to: • monitor the communities experience and perception of impacts; • monitor the effectiveness of the identified mitigation and management measures outlined in **Chapter 28 Project synthesis** of the EIS; and • monitor complaints and public enquiries.	Construction and Operation
SE3	The construction laydown area on Merimbula Beach and associated access would be planned to minimise impacts on beach users. Public access to Pambula beach would be maintained at all times. Establishment and use of the laydown area would consider public safety and maintaining safe access around the site. Signage would be erected at the access to, and along the length of, Pambula Beach with the purpose of informing the public of the location of construction activities.	Construction
SE4	All construction sites would be maintained to minimise visual amenity impacts, including keeping sites tidy, litter-free, and with well-maintained fences/bunting, signage, erosion and sediment controls, and entrances and access tracks. Hoarding may also be used (where appropriate).	Construction
SE5	BVSC would investigate opportunities to source construction workers, equipment and materials from the local community.	Construction

11.0 Conclusion

This SEIA has been prepared to support the EIS. It assesses the potential socio-economic impacts from the construction and operation of the Project and recommends mitigation and management measures.

As summarised in **Section 5.6** of this report, the community places significant value on the marine environment. Potential impacts from the discharge of treated wastewater into the marine environment has been highlighted by the community as an issue of primary concern.

The Project would improve the marine environment from the baseline condition (existing beach-face outfall). As summarised in **Chapter 11 Marine ecology**, and highlighted in **Section 8.0** of this report, the Project would provide the local study area with an essential piece of infrastructure, resulting in improved wastewater quality and benefits to the marine environment enjoyed by the community. As a result of the Project's operation, environmental values would be improved. Health and safety would be improved given risk associated with the beach-face outfall is eliminated and local fishing, aquaculture and tourism industries are also likely to benefit from an improvement in water quality.

Mitigation and management measures have been outlined within **Chapter 11 Marine ecology** to minimise any risk to the marine environment during construction (and operation) of the Project. The key socio-economic impacts associated with the Project are related to construction. These impacts are associated with the temporary use of the PMGC grounds and Merimbula Beach for temporary laydown areas and impacts to the Pambula Surf Life Saving Club and the Pambula Beach Caravan Park, given their close proximity to the proposed beach access route. The requirement for construction access along Pambula Beach, Jiguma Beach and Merimbula Beach would likely temporarily disrupt public access and normal enjoyment of those beaches. As outlined in **Chapter 19 Property and land use**, agreements would be negotiated with relevant landowners (PMGC) for the temporary use of property during construction and land would be returned to their original use and a similar pre-construction condition following construction (or as otherwise agreed to with the relevant landholder).

Other potential socio-economic impacts associated with the construction and operation of the Project have been assessed as either positive or low-negative. **Section 8.0** describes the benefits of the Project.

This SEIA recommends that an ongoing consultation and socio-economic impact monitoring framework be implemented throughout construction, and three months post construction of the Project, to keep the community informed, respond to any concerns, and analyse the effectiveness of the identified mitigation and management measures outlined in the EIS prepared for the Project.

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Appendix A

Objectives of Land Use Zoning within the Project area and Local Study Area

Appendix A Objectives of Land Use Zoning within the Project area and Local Study Area

Table A-1: Land use zoning (LEP)

Zone	Location relative to STP site	Zone objective
STP site land use zoning		
SP2	Land use zoning for the Project	• To provide for infrastructure and related uses. • To prevent development that is not compatible with or that may detract from the provision of infrastructure.
Surrounding Land use zoning		
E2	Surrounds Project area	• To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values. • To prevent development that could destroy, damage or otherwise have an adverse effect on those values.
RE1	Adjoining southern boundary	• To enable land to be used for public open space or recreational purposes. • To provide a range of recreational settings and activities and compatible land uses. • To protect and enhance the natural environment for recreational purposes.
B5	200 m southwest	• To enable a mix of business and warehouse uses, and specialised retail premises that require a large floor area, in locations that are close to, and that support the viability of, centres. • To cater specifically for uses that require a high degree of visibility and accessibility to passing traffic and that generate a high proportion of single purpose vehicle trips. • To enable the establishment of an aquaculture, agricultural produce and tourist precinct at Arthur Kaine Drive, Merimbula.
E1	900 m south	• To enable the management and appropriate use of land that is reserved under the *National Parks and Wildlife Act 1974* or that is acquired under Part 11 of that Act. • To enable uses authorised under the *National Parks and Wildlife Act 1974*. • To identify land that is to be reserved under the *National Parks and Wildlife Act 1974* and to protect the environmental significance of that land.

Table A-2: LEP zoning objectives relevant to employment within the local study area

Zone	Location	Objective
B1	Pambula Beach and Tura Beach	• To provide a range of small-scale retail, business and community uses that serve the needs of people who live or work in the surrounding neighbourhood. • To minimise conflict between land uses on land in the zone and land uses on land in adjoining zones.
B2	Pambula Town and Merimbula Town	• To provide a range of retail, business, entertainment and community uses that serve the needs of people who live in, work in and visit the local area. • To encourage employment opportunities in accessible locations. • To maximise public transport patronage and encourage walking and cycling. • To enable other land uses that are complementary to, and do not detract from, the viability of commercial uses within the zone. • To minimise conflict between land uses on land in the zone and land uses on land in adjoining zones. • To strengthen the viability of existing business centres as places for investment, employment and cultural activity.
B4	Pambula Town and Merimbula Town	• To provide a mixture of compatible land uses. • To integrate suitable business, office, residential, retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling.
SP3	Various locations	• To provide for a variety of tourist-oriented development and related uses.
IN1	Pambula Town, Tura Beach	• To provide a wide range of industrial and warehouse land uses. • To encourage employment opportunities. • To minimise any adverse effect of industry on other land uses. • To support and protect industrial land for industrial uses. • To allow a range of support services that do not have an adverse impact on the viability of business and commercial zones.