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Planning Report to support an application for State Significant Infrastructure

Merimbula Sewage Treatment Plant Upgrade and Ocean Outfall

Prepared by Planning Law Solutions for
Bega Valley Shire Council

20 April 2016

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20 April 2016

1. Introduction

1.1. This planning report has been prepared to accompany an application by Bega Valley Shire Council ("BVSC") for planning approval of State Significant Infrastructure under Part 5.1 of the *Environmental Planning and Assessment Act 1979* ("EP&A Act"). The subject of the application is a deep water ocean outfall for effluent disposal and upgrade of the existing sewage treatment plant ("STP") at Merimbula on the NSW South Coast, within the Bega Valley Local Government Area. The proposed ocean outfall component of the project involves construction of a transfer pipeline approximately 5.5 km to up to 6km in length from the STP to a deep water discharge point in the Pacific Ocean. BVSC is the applicant and proponent.

1.2. The Merimbula STP services the localities of Merimbula, Pambula, South Pambula and Pambula Beach on the Far South Coast of NSW. The combined population of these centres have a current permanent population of approximately 7,044[1], and a seasonal population of 15,000 persons.

1.3. A portion of the treated effluent from the Merimbula STP is currently reused on the Pambula Merimbula Golf Course and a nearby farm at Oaklands. On average approximately 22% of the total existing yearly volume of effluent is reused in this manner. The remaining effluent that is unable to be reused is disposed to a beach face ocean outfall and two dunal exfiltration ponds located in the sand dunes east of the STP between Merimbula Beach and Arthur Kaine Drive.

1.4. These existing means of effluent disposal at the STP fail to meet NSW environmental objectives and community expectations. Effluent disposed to the beach face outfall flows across the beach and impacts on near shore water quality, recreational values, local aesthetics and perceptions of the area Effluent disposed to the exfiltration ponds impacts on groundwater quality and may influence water quality in the ocean and Merimbula Lake. Merimbula lake is identified in the South Coast Regional Strategy (DPE 2007) as a water body having significant aquatic habitat. An alternative, more acceptable and sustainable disposal system is needed for effluent disposal from the Merimbula STP.

1.5. The proposed STP upgrade and ocean outfall is the result of an effluent management strategy commenced by BVSC in 2009 and adopted at a meeting of the elected members of the Council on 25 June 2014. The strategy considered a number of effluent disposal and reuse options for Merimbula and district. It was developed by BVSC in consultation with community representatives and representatives from the Merimbula Lake Shellfish Quality Assurance Program, Pambula Lake Shellfish Quality Assurance Program, NSW Environment Protection Authority, NSW Office of Water and the Southern Rivers Catchment Management Authority. A number of issue, specific studies and impact assessments were commissioned by

[1] 2011 Census

BVSC to inform the strategy. These studies are discussed in section 5 of this report.

1.6. The final concept design for the STP upgrade and ocean outfall will be determined concurrently with the initial stages of the environmental impact assessment ("EIA") for the project, which will occur once the Secretary's Environmental Assessment Requirements are issued. This design phase of the EIA will inform the location of the discharge point which will, in turn, inform the level of treatment and hence modifications required at the upgraded STP. The full nature and extent of the impacts of the project will then be assessed as part of the continuing EIA process.

1.7. As well as the background studies underpinning the effluent management strategy discussed in section 5 of this report, BVSC has more recently commissioned Manly Hydraulics Laboratory to carry out a preliminary hydrodynamic assessment of ocean currents[2], and Elgin & Associates to carryout baseline water quality monitoring in Merimbula Bay and adjacent ocean locations. Both projects are ongoing and will inform the EIA. The background studies and MHL results to date have enabled BVSC to identify a broad area within which the discharge point is likely to be located.

1.8. Further detailed hydrodynamic investigations, modeling and analysis, together with an assessment of marine and terrestrial ecology impacts will be carried out by the EIA consultants, who will be appointed once the Secretary's Environmental Assessment Requirements are issued.

1.9. As at the date of this report, the declaration of the project as State Significant Infrastructure is yet to be made. The declaration will be made by way of an amendment to Schedule 4 of *State Environmental Planning Policy (State and Regional Development) 2011* by order made by the Minister for Planning under section 115U(4) of the EP&A Act. The amendment will take effect when published on the NSW Legislation website. This application for approval is made in anticipation of declaration being published.

[2] Manly Hydraulics Laboratory Report 2418 dated 17 November 2015.

2. Project Area

2.1. Bega Valley Shire Local Government Area is located on the south-eastern coastline of New South Wales. The area extends from Bermagui in the north, the Victorian border in the south and includes the towns of Bega, Tathra, Merimbula, Tura Beach, Wolumla, Cobargo, Bemboka, Pambula Beach, Towamba and Eden (see Figure 1 below).

Figure 1: Bega Valley LGA (Source: Bega Valley Shire Council)

2.2. The Merimbula STP is located between Merimbula and Pambula on Arthur Kaine Drive, approximately 3.5 km south of Merimbula town centre and 2.5 km north of Pambula village. To the north of the STP is Merimbula Lake and Merimbula Airport, to the west and south is Pambula-Merimbula Golf Course and to the east is vegetated dunes adjacent to Merimbula Beach. These localities are shown on the plan at Figure 2 below.

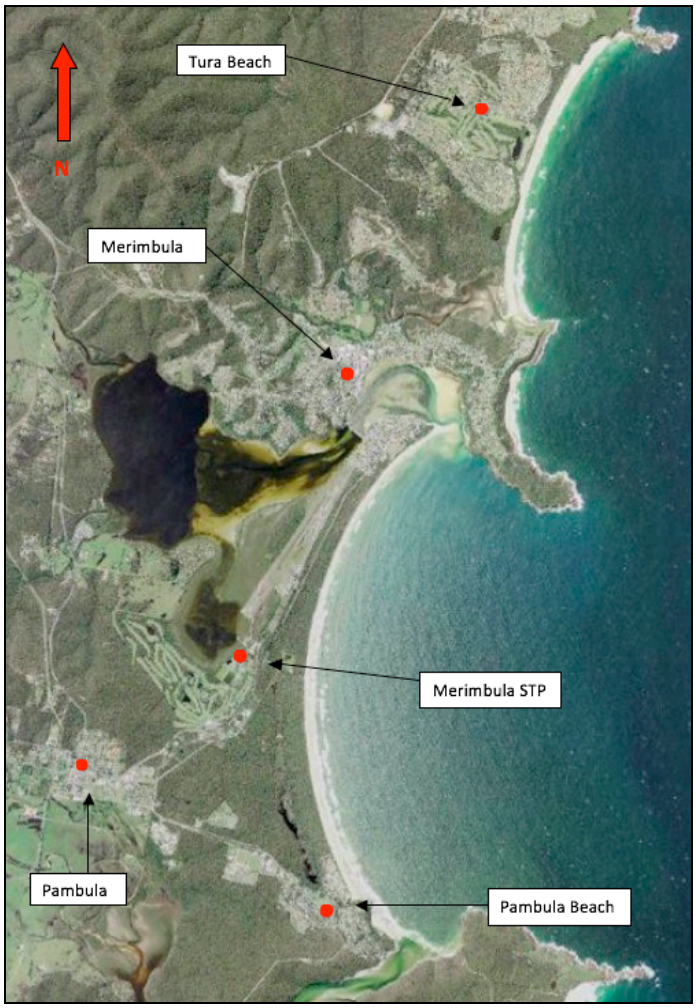

Figure 2: Locality Map (Source: www.six.nsw.gov.au)

2.3. The project comprises two components: modification/upgrade of the effluent treatment process at the STP and construction of an ocean outfall. A detailed description of the project is contained in section 3 below. That component of the project comprising the upgrade of the existing STP will occur wholly within the boundaries of the existing STP and exfiltration ponds.

2.4. The existing STP and exfiltration ponds are contained within the following allotments:

Lot 101 DP 1201186

Lots 1 and 2 DP 853245

Lots 1 and 2 DP 861737

2.5. The initial part of the proposed transfer pipe will be located underground from the existing STP to a point below mean high water mark ("MHWM") of Merimbula Bay, immediately beyond the wave zone. This section of the pipe will traverse below the surface of the following titles:

Lot 355 DP 41837

Lot 7308 DP 1167035

Lot 320 DP 750227

Lot 7307 DP 1167035

Section of Arthur Kaine Drive road reserve

Crown Land below MHWM

2.6. A construction compound to facilitate this section of the pipe is likely to be located near the existing exfiltration ponds. A temporary enclosure on Merimbula Beach approximately 850 metres long will be required for storage and assembly of sections of the transfer pipe. This area of Merimbula Beach is located with Lot 7307 DP 1167035. The totality of the project area above MHWM is shown on the cadastral plan at Figure 3 below.

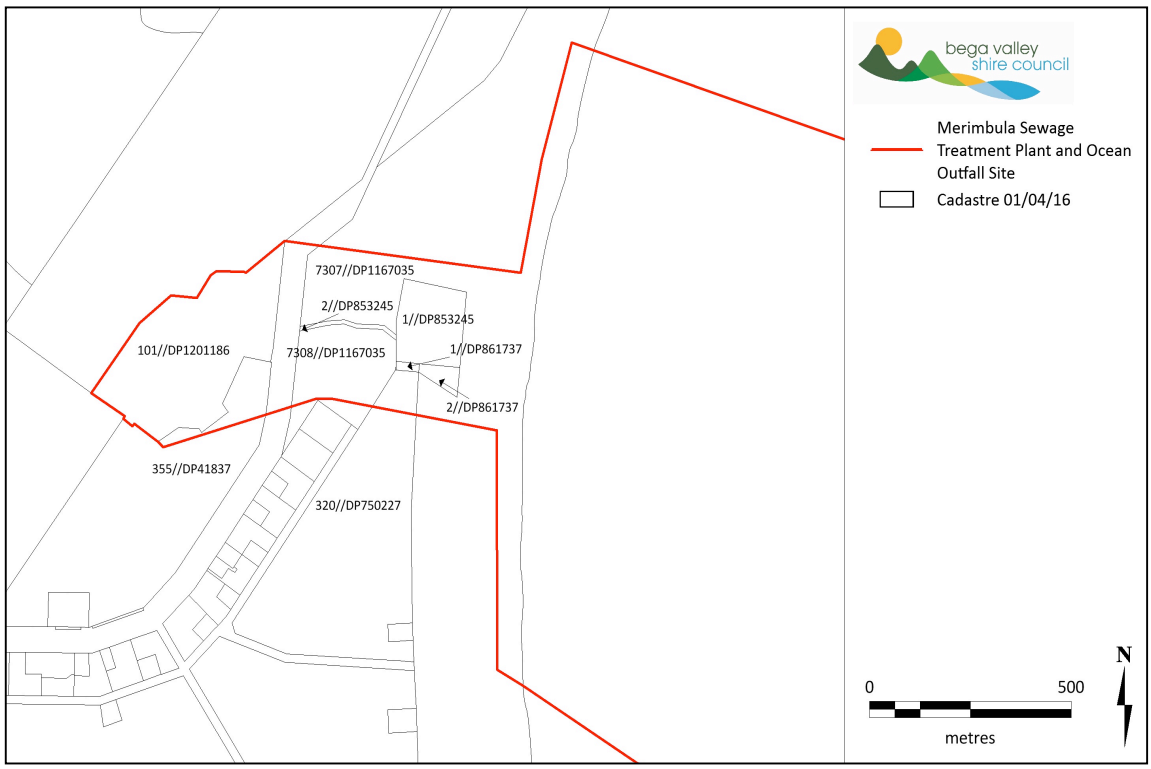

Figure 3: Merimbula STP & Ocean Outfall (Source: Bega Valley Shire Council)

2.7. Below MHWM the pipe will be located within a strip of sea bed running in a south easterly direction for a distance of approximately 5.5 to 6 kilometres. This area is shown on the plan at Figure 4 below.

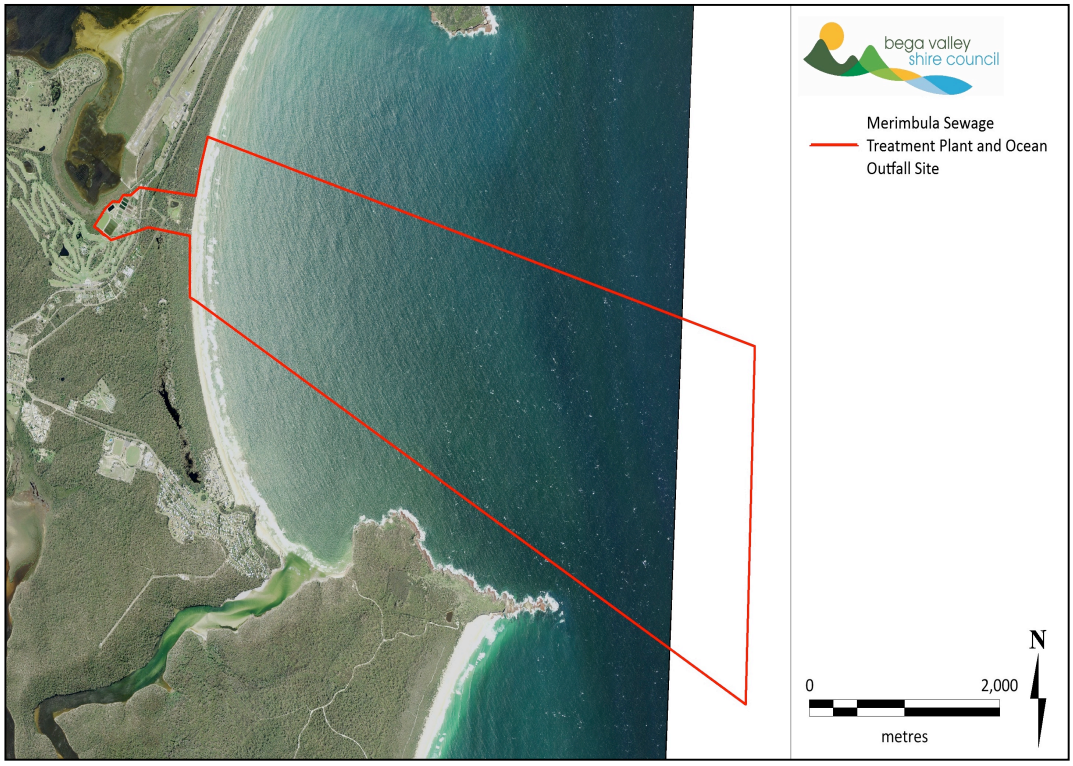

Figure 4: Merimbula STP & ocean outfall project area (Source: Bega Valley Shire Council)

2.8. Ownership of the land affected by the project is as follows:

Lot	**Owner**
Lot 101 DP 1201186	BVSC
Lots 1 and 2 DP 853245	BVSC
Lots 1 and 2 DP 861737	BVSC
Lot 355 DP 41837	State of NSW (Leased to Pambula-Merimbula Golf Club Ltd)
Lot 7308 DP 1167035	State of NSW
Lot 320 DP 750227	State of NSW
Lot 7307 DP 1167035	State of NSW
Section of Arthur Kaine Drive road reserve	BVSC
Land below MHWM	Crown in the Right of NSW

2.9. Land owner's consent to lodgement of the application is not required, as the proponent of the project, BVSC, is a public authority.[3] However, written notice must be either served on the owner before, or no later than 14 days after, the application is made, or published in a local newspaper at least 14 days prior to notification of the Environmental Impact Statement.[4]

[3] EP&A Reg, clause 193(1)(a).
[4] EP&A Reg, clause 193(4).

3. Project Description

STP Upgrade

3.1. The existing Merimbula STP will be upgraded so as to ensure that effluent discharge to ocean will not cause water quality at the boundary of a defined mixing zone to exceed the marine water quality trigger values for south-east Australia stipulated in the ANZECC *Guidelines for Fresh and Marine Waters, 2000*.[5] This component of the project will be fully operational before the ocean outfall is commissioned. Upgrades will also include those required to further reduce public health risks associated with recycled water use as recommended in the *Australian Guidelines for Water Recycling 2006*.

3.2. The nature and extent of the modifications to the STP will be determined as part of the design phase of the EIA. Modifications and potential options to be considered may include:

- A pump station for ocean outfall with a building structure for pumps and switchboard.
- Modification of the existing STP effluent ponds to provide flow balancing to:
    - cater for peak wet weather flows
    - optimise size of pumps and pipeline,
    - improve disinfection and
    - split effluent flows for disposal and reuse discharge locations.
- Modification of chlorine disinfection and potential de-chlorination equipment for effluent disposed to ocean.
- A UV disinfection system for effluent reuse.
- A phosphorous removal chemical dosing system with a shelter for equipment and chemical storage.
- Biologically active filters designed to reduce concentration of nitrogen in the effluent if required.

3.3. The level of treatment of effluent at the upgraded STP will in part be dependent on the location of the ocean discharge point. A higher level of treatment may be required if the discharge point is located in shallower waters and/or in an area less influenced by ocean currents. The project area below MHWM identified on Figure 4 above provides a broad area with the

[5] The trigger values to be applied are those for the protection of aquatic ecosystems, recreational water quality and aesthetics.

greatest potential to accommodate a transfer pipeline and discharge diffuser based on ocean current surveys and hydrodynamic modelling undertaken by Manly Hydraulics Laboratory to date. Further analysis on depth of water, sea bed conditions and constraints, and water quality modelling will need to be undertaken as part of the design phase of the EIA to determine the exact location of the discharge point within this broad area.

3.4. The upgrade component of the project will also involve decommissioning of the existing exfiltration ponds and removal of associated above ground infrastructure. Future discussions between BVSC, NPWS and the Eden Local Aboriginal Land Council and other agencies will determine the nature of future rehabilitation, future land ownership and management of the exfiltration ponds area.

Ocean Outfall - Construction of Transfer Pipeline

3.5. The ocean outfall component of the project involves construction of a transfer pipe from the existing STP to a deep water discharge point up to 6km south east of the MHWM of Merimbula Beach. The distance between the discharge point and MHWM at its closest point will be less than 6 km due to the location of Haycock Point and the configuration of the coastline in this area.

3.6. The transfer pipeline might be constructed and laid in the following two sections:

- section one will be located underground from the STP to a point beyond the wave zone; and
- section two will be located in a trench on the sea bed from the end of section one to the outfall discharge point.

Potential construction methodology – Pipeline section one

3.7. The construction methodology for the entire length of the pipe will be developed concurrently with the concept design, which is to occur in the initial stages of the EIA. Subject to a detailed construction plan, section one of the pipe from the STP is likely to be installed by underground horizontal directional drilling. There will likely be two drilling rig staging locations, one within the existing STP and the other within a cleared area adjacent to the exfiltration ponds east of Arthur Kaine Drive.

3.8. The following activities may occur in connection with construction of section one of the transfer pipe:

- Geotechnical investigations using a vehicle mounted auger to define subsurface ground conditions.
- Individual lengths of pipe (typically 12m long) will be transported to the area (probably by barge) and stored ready for joining. The only flat open ground where this can readily occur is Merimbula Beach in the vicinity of the existing exfiltration ponds. An area of beach approximately 600 metres

to 800 metres in length may be required. This storage and assembly area will need to be temporarily fenced.

- Works sites/compounds may need to be established for the storage and welding of the HDPE pipe; directional drilling; and work within the sewage treatment plant site.

- Individual pipe lengths will be welded at the storage compound so that the pipe can be installed as a continuous length. If HDPE pipe is used, an electro welding process will be used, which requires a petrol/diesel generator. This activity is likely to occur within the storage and assembly compound on Merimbula Beach. The exact area of beach needed for this activity will be determined as part of the design phase of the EIA process.

- Once all individual lengths for section one are joined, the pipeline will be towed out to sea. One end of the pipe will be towed to shore and dragged over the beach, through the dunes along an upgrade access track and fed into the directional bore hole located in the cleared area adjacent to the exfiltration ponds. The pipe will then be dragged from the other end of the directional drilling bore hole through the bore hole to the STP.

- The same method will be used to install that section of the pipe between the start of the proposed sea trench and the compound located adjacent to the exfiltration ponds. The difference being that the pipe will be towed further out to sea so that it may be dragged through the bore hole from the end of section one back to the compound located adjacent to the exfiltration ponds.

- There is likely to be a permanent structure, in the nature of a low profile structure on the sea bed fitted to the seaward end of the underground section of the pipe. This structure will be designed so as to allow the section one pipe to be connected to the section two pipe.

3.9. The existing access tracks from Arthur Kaine Drive to the exfiltration ponds and from the exfiltration ponds to Merimbula Beach may need to be widened and regarded in order to accommodate:

- transport of directional drilling and welding equipment from Arthur Kaine Drive to the beach; and

- heavy vehicles necessary to drag the continuous length of pipe from the beach to the bore hole, as described above.

3.10. The existing cleared area adjacent to the exfiltration pond may be used to establish the directional drilling compound (see Figure 5 below). It is expected that minimal vegetation will need to be cleared to create the compound. Similarly, an existing vacant area within the STP compound adjacent to the eastern boundary may be used to setup the directional drilling rig at the STP end of the bore. The nature and extent of vegetation proposed to be cleared

will be the subject of a detailed site survey prepared once the concept design is finalised.

Figure 5: Aerial showing location of existing exfiltration ponds and access tracks between Arthur Kaine Drive and Merimbula Beach, as well as cleared areas for potential compounds (Source: www.six.nsw.gov.au).

Potential construction methodology – Pipeline section two

3.11. The length of the pipeline on the sea bed from the end of section one to the discharge point is dependent upon the precise location of the discharge point. The location of the discharge point is also a factor in determining the level of treatment at the upgraded STP, as discussed earlier in this report.

3.12. Preliminary analysis undertaken on behalf of BVSC[6] in the development of the Merimbula effluent management strategy suggested that the optimum depth of the discharge point is around 40 metres. The final location and depth of the discharge point will be determined as part of the design phase of the EIA having regard to a combination of hydrodynamic effects (such as ocean current), sea bed characteristics; the presence of sensitive ecosystems; the use of the bay by recreational and commercial fishers and divers; the presence of fish and aquatic mammals and construction feasibility.

3.13. BVSC has engaged Manly Hydraulics Laboratory (MHL) to carry out further hydrodynamic investigations within Merimbula Bay and the adjacent open ocean. Based on preliminary results of the MHL investigation, the optimal discharge point from an ocean current perspective is north-east of Haycock Point.[7] The MHL report was used to determine the eastern end on the project

[6] AECOM 2013
[7] Manly Hydraulics Laboratory Report 2418 dated 17 November 2015.

area (see map at Figure 4 above). MHL has recommended further analysis of dye dispersion field tests and other hydrodynamic investigations to confirm its preliminary conclusion.

3.14. Section two of the pipeline will potentially be constructed by dredging a trench in the sea floor in which the pipe will be laid, and refilling the trench once the pipe is in place. Preliminary hydrosurvey investigation suggest that the sea bed in Merimbula Bay is mostly sand, which is conducive to a trenching approach.

3.15. The pipe will be sized to meet current and long term loadings on the STP, assuming there will be periods when no land effluent reuse can occur. The only permanent structure above the sea floor in section two of the pipeline is a diffuser attached to a concrete pad at the discharge point. The diffuser structure will be constructed on shore and barged to discharged site and lowered into position.

4. Permissibility and Strategic Planning

4.1. In November 2014 BVSC made an application to the Minister for Planning and Environment requesting declaration of the project as State Significant Infrastructure under section 115U(4) of the EP&A Act. It is anticipated that the declaration will be made before preparation of the EIA commences. Once the declaration is made Part 5.1 of the EP&A Act will apply to the assessment and determination of the project. Other legal and practical effects of the declaration are that:

a) the Minister responsible for administering the EP&A Act is the sole consent authority;[8]

b) Part 3 of the EP&A Act and environmental planning instruments have limited application to the project;[9]

c) Parts 4 and 5 of the EP&A Act do not apply;[10]

d) numerous approvals under other legislation are not required;[11]

e) an Environmental Impact Statement is prepared during the course of the application (that is after the application is made to the Minister);[12] and

f) subsequent approvals required for the project under other legislation cannot be refused and must be substantially consistent with the Minister's approval under Part 5.1.[13]

4.2. The Department requirements for the preparation of applications for State Significant Infrastructure require the supporting planning report to identify the environmental planning instruments and key development standards applying to the project. Although environmental planning instruments largely do not apply to the assessment of the project, the following part of this report is included in response to the Department's requirements. The following environmental planning instruments would apply to the project had the declaration not been made:

Bega Valley Local Environmental Plan 2013
State Environmental Planning Policy (Infrastructure) 2007
State Environmental Planning Policy No. 14 – Coastal Wetlands
State Environmental Planning Policy No. 71 – Coastal Protection

An outline of the key controls contained in those instruments is set out below.

[8] Section 115W of the EP&A Act
[9] Section 115ZF(2) of the EP&A Act
[10] Section 115ZF(1) of the EP&A Act
[11] Section 115ZG(1) of the EP&A Act
[12] Section 115Y and 115Z of the EP&A Act
[13] Section 115ZH of the EP&A Act

Bega Valley Local Environmental Plan 2013

4.3. The STP is located on land within zone SP2 Infrastructure under *Bega Valley Local Environmental Plan 2013* ("BVLEP 2013"). The proposed transfer pipe is located on land within zone E2 Environmental Conservation and RE1 Public Recreation under BVLEP 2013. That part of the pipe that is located on the seaward side of MHWM is on land that is outside the Bega Valley LGA and hence not affected by BVLEP 2013. An extract of BVLEP 2013 zoning map showing the zoning of land affected by the project above MHWM is reproduced at Figure 6 below.

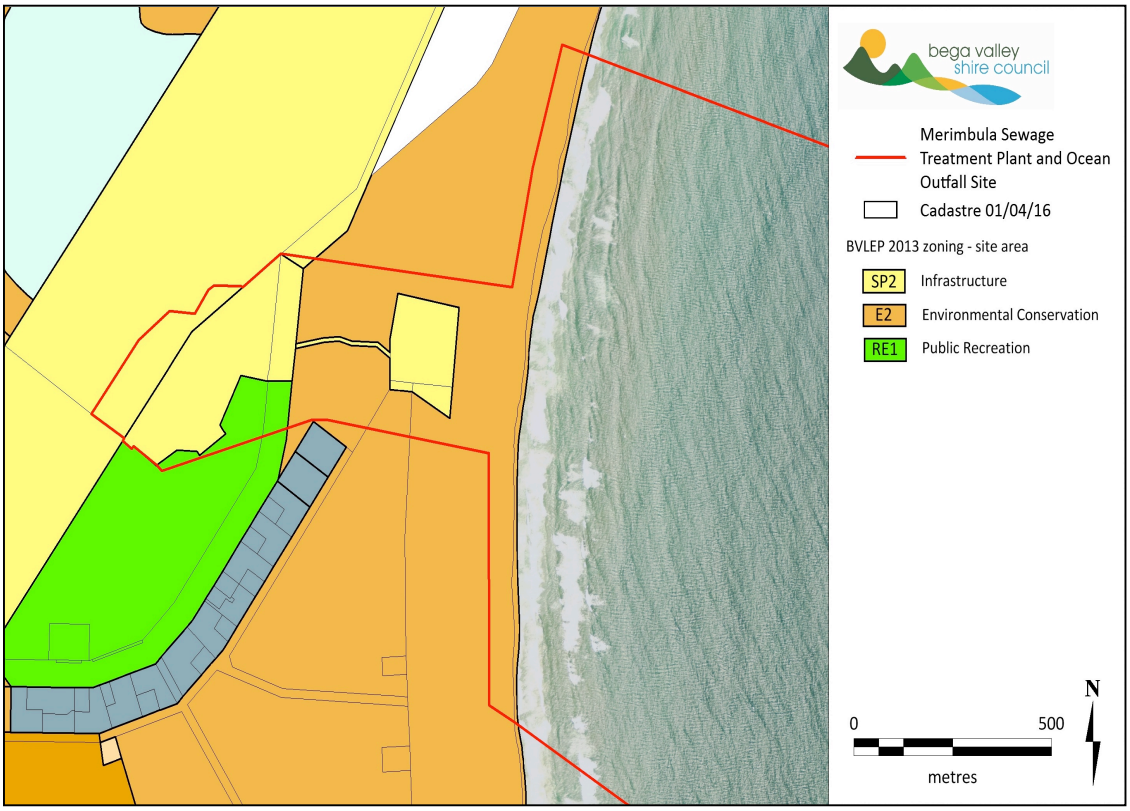

Figure 6: Merimbula STP & Ocean Outfall Zoning map (Source: Bega Valley Shire Council)

4.4. Development may be carried out with development consent in the SP2 zone for "the purpose shown on the Land Zoning Map, including any development that is ordinarily incidental or ancillary to development for that purpose." The purpose indicated on the Land Zoning Map for the existing STP is "sewerage system". A "sewerage system" is defined in the dictionary to BVLEP 2013 as:

"… any of the following:

(a) biosolids treatment facility,

(b) sewage reticulation system,

(c) sewage treatment plant,

(d) water recycling facility,

(e) a building or place that is a combination of any of the things referred to in paragraphs (a)–(d)."

4.5. The expression "sewage treatment plant" is also defined in the dictionary to BVLEP 2013 as "a building or place used for the treatment and disposal of sewage, whether or not the facility supplies recycled water for use as an alternative water supply." That component of the proposed infrastructure that comprises the upgrading of the existing STP is defined as a sewage treatment plant, which in turn is a "sewerage system", which is **permissible with development consent** in the SP2 zone.

4.6. On land within zone E2 under BVLEP 2013 "environmental protection works" are permissible without development consent, and the following types of development are permissible with development consent:

"Boat launching ramps; Boat sheds; Building identification signs; Community facilities; Environmental facilities; Jetties; Roads; Water recreation structures"

4.7. The proposed transfer pipe, regardless of how it may be defined, is not a type of development that is permissible either with or without development consent in the E2 zone. Accordingly, the proposed transfer pipe would be prohibited on that part of the project site that is within zone E2 under BVLEP 2013 but for ISEPP and the State Significant Infrastructure declaration.

4.8. On land within zone RE1 "environmental protection works" are permissible without development consent, and the following types of development are permissible with development consent:

"Boat launching ramps; Boat sheds; Building identification signs; Business identification signs; Caravan parks; Child care centres; Community facilities; Environmental facilities; Flood mitigation works; Information and education facilities; Jetties; Kiosks; Markets; Recreation areas; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Respite day care centres; Roads; Sewage treatment plants; Water recreation structures"

4.9. The proposed transfer pipe, regardless of how it may be defined, is not a type of development that is permissible either with or without development consent in the RE1 zone. Accordingly, the proposed transfer pipe would be prohibited on that part of the project site that is within zone RE1 under BVLEP 2013 but for ISEPP and the State Significant Infrastructure declaration.

State Environmental Planning Policy (Infrastructure) 2007 ("ISEPP")

4.10. The *State Environmental Planning Policy (Infrastructure) 2007* ("ISEPP") expressly prevails over any other environmental planning instruments made

before or after the ISEPP, to the extent of any inconsistency, except for the following instruments:[14]

State Environmental Planning Policy No 14—Coastal Wetlands ("SEPP 14"),
State Environmental Planning Policy No 26—Littoral Rainforests ("SEPP 26")
State Environmental Planning Policy (Major Projects) 2005 ("SEPP MP").

4.11. If ISEPP applied to the project, it would prevail over BVLEP 2013 to the extent of any inconsistency between ISEPP and BVLEP 2013.

Application of Planning Laws below MHWM

4.12. ISEPP applies to all land within the State of NSW.[15] The word "land" is defined in section 4(1) of the EP&A Act as including the "sea or an arm of the sea". The ordinary English meaning of the word land is the "surface of the Earth and the soil beneath it, to the centre of the Earth."[16] Accordingly, ISEPP applies to the surface of the Earth (including the sea bed) and the subsoil beneath **within the State of NSW**.

4.13. The jurisdiction of the State of NSW extends into the territorial waters of Australia. Section 59 of the *Interpretation Act 1987* provides that:

"The laws of the State apply in and in relation to:

(a) the coastal waters of the State, and

(b) the sea-bed and subsoil beneath, and the airspace above, the coastal waters of the State,

as if the coastal waters of the State, as extending from time to time, were within the limits of the State."

4.14. The coastal waters of the State of NSW extend approximately **8.96 km** seaward of the low water mark in Merimbula Bay.

4.15. That Commonwealth *Coastal Waters (State Powers) Act 1980* conveys jurisdiction to the NSW Parliament to make any law in respect of the coastal waters of the State, being laws that the NSW Parliament is otherwise entitled to make on the land. The project will take place wholly within coastal waters of the State of NSW as defined by the Cth *Coastal Waters (State Powers) Act 1980*. The NSW Application *of Laws (Coastal Sea) Act 1980* operates to apply planning law in NSW to the coastal waters (and sea bed) of the State of NSW.

Sewerage Systems under ISEPP

4.16. Part 3 Division 18 of ISEPP applies to the following four types of sewerage systems, each of which is defined in the dictionary to ISEPP:

bio-solids treatment facility

[14] Clause 8(2) ISEPP
[15] ISEPP clause 4, (SRD) SEPP clause 6
[16] Butterworths Concise Australian Legal Dictionary 2nd Ed.

sewage reticulation system

sewage treatment plant

water recycling facility

4.17. Development controls applying to *sewage treatment plants* and *sewage reticulation systems* are set out, respectively, at clauses 106(1) and 106(3) of ISEPP. The expression "sewage reticulation system" is defined in clause 105 of the ISEPP as follows:

> *"sewage reticulation system means a facility for the collection and transfer of sewage to a sewage treatment plant or water recycling facility for treatment, or transfer of the treated water for use or disposal, including associated:*
>
> *(a) pipelines and tunnels, and*
>
> *(b) pumping stations, and*
>
> *(c) dosing facilities, and*
>
> *(d) odour control works, and*
>
> *(e) sewage overflow structures, and*
>
> *(f) vent stacks."*

Permissibility of transfer pipe under ISEPP

4.18. That component of the project that comprises the transfer pipe and submerged diffuser is a sewage reticulation system for the purposes of ISEPP.

4.19. Clause 106(3) of the ISEPP provides that development for the purposes of a sewage reticulation system may be carried out without development consent if it is carried out "by or on behalf of a public authority".[17] An exception applies to land reserved under the *National Parks and Wildlife Act 1974*, which is not the case here.

4.20. BVSC is a public authority for the purposes of the ISEPP, being an authority constituted under the *Local Government Act 1993,* and the underground transfer pipe and submerged diffuser is a form of sewage reticulation system for the purposes of ISEPP. Accordingly, the underground transfer pipe and submerged diffuser are **permissible without development consent** under ISEPP. The categorisation of the project as permissible without development consent under ISEPP prevails over any contrary categorisation under BVLEP 2013.[18]

[17] The expression "public authority" is defined in section 4(1) of the EP&A Act as "a public or local authority constituted by or under an Act"
[18] Clause 8(1) ISEPP

Permissibility of STP Upgrade under ISEPP

4.21. That component of the project that involves the upgrading of the existing STP falls within the meaning of the expression "sewage treatment plant" in clause 105 of the ISEPP, namely:

> *"sewage treatment plant means a facility for the treatment and disposal of sewage, whether or not the facility supplies recycled water for use as an alternative water supply."*

4.22. Clause 106(1) of the ISEPP provides that development for the purposes of a sewage treatment plant may be carried out without development consent if it is carried out "by or on behalf of a public authority" and is located on land within a "prescribed" zone.[19] Council is a public authority for the purposes of the ISEPP as identified earlier. A prescribed zone is a type of zone listed in clause 105 of the ISEPP, and includes zone SP2 Infrastructure. The Merimbula STP, and the upgrade works proposed as part of the project, is located within zone SP2 Infrastructure under BVLEP2013.

4.23. Accordingly, that part the project comprising the upgrade to the existing sewage treatment plant is **permissible without development consent** under ISEPP. As discussed above, the categorisation of the project as permissible without development consent under ISEPP prevails over any contrary categorisation under BVLEP 2013.[20]

State Environmental Planning Policy No. 14 – Coastal Wetlands ("SEPP14")

4.24. As identified at the start of this analysis, subject to exceptions not relevant to the project,[21] the ISEPP does not prevail over SEPP 14.[22] Therefore if SEPP 14 applies to the project, the controls contained in SEPP 14, and not ISEPP, would apply to the impact assessment and determination of the project had the State significant declaration not been made.

4.25. To determine whether there is any inconsistency between ISEPP and SEPP 14, it is necessary to examine the controls contained in both instruments. The project area is close to a wetland identified under SEPP 14 ("the SEPP 14 wetland" as indicated in Figure 7 below.

[19] Clause 106(1) ISEPP
[20] Clause 8(1) ISEPP
[21] Clause 8(2) ISEPP
[22] Clause 8(2) ISEPP

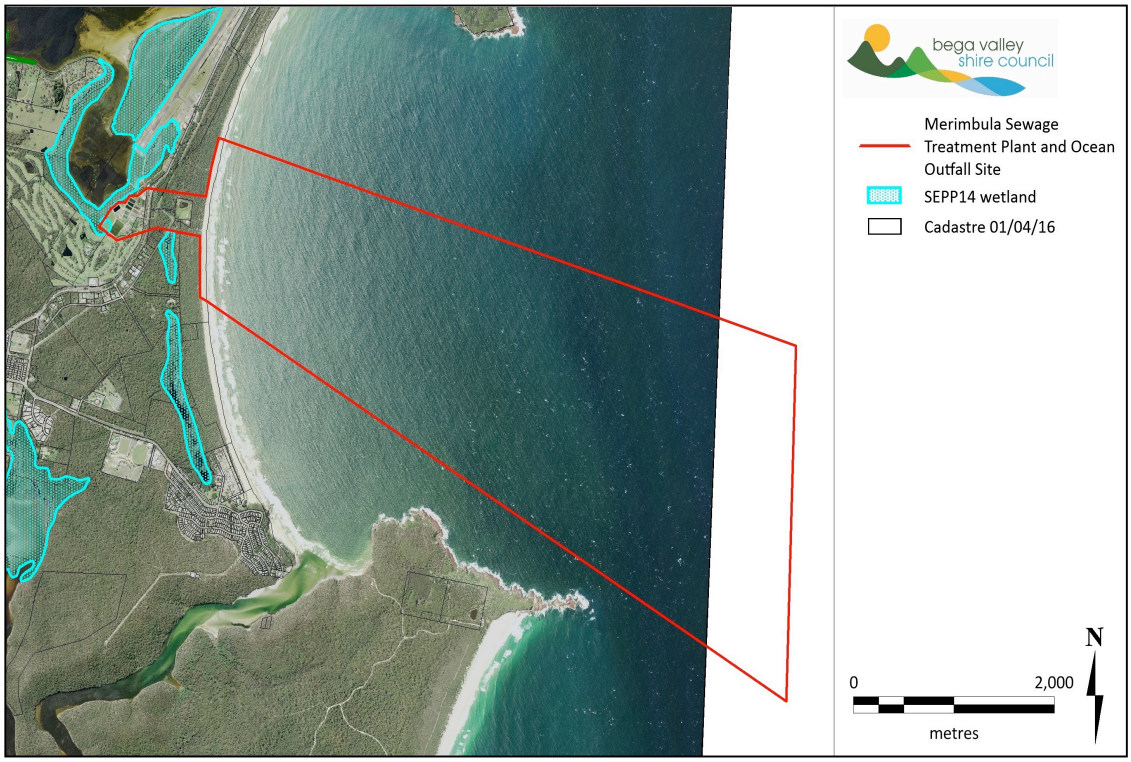

Figure 7: Land affected by SEPP 14 (Source: Bega Valley Shire Council)

4.26. Clause 7(1) of SEPP 14 provides that:

"In respect of land to which this policy applies, a person shall not:

(a) clear that land,

(b) construct a levee on that land,

(c) drain that land, or

(d) fill that land,

except with the consent of the council and the concurrence of the Director."

4.27. The land to which SEPP 14 applies is the land identified on the map that accompanies SEPP 14, an extract of which appears at Figure 7 above. Whether the project is likely to impact on the SEPP 14 wetland will depend on the exact location of the underground pipe and the risk of subsidence or draining of surface water during directional drilling of the bore hole. The nature and extent of this impact will be assessed once the concept design of the project is completed and the detailed EIA of the project is undertaken.

4.28. Had the project not been declared State Significant Infrastructure, there were a number of legal scenarios that may eventuate depending on whether the SEPP 14 wetland is affected by the project. If there is no impact on the SEPP 14 wetland, SEPP 14 does not apply to the project and ISEPP prevails. If there is an impact on the SEPP 14 wetland by reason of the project resulting in draining of the wetland, the controls in SEPP 14 will prevail over ISEPP. In

that case, the project would be permissible with development consent under Part 4 of the EP&A Act and would be designated development for the purposes of the EP&A Act.

4.29. If ISEPP applied to the assessment of the project, the project could be carried out without development consent and the assessment procedures under Part 5 of the EP&A Act, rather than Part 4 of the EP&A Act, would apply to the project, but for the SSI declaration.

State Environmental Planning Policy No. 71 – Coastal Protection (SEPP71)

4.30. SEPP 71 applies to land the whole or any part of which is within the "coastal zone". The coastal zone is defined in the *Coastal Protection Act 1979* as:

(a) the area within the coastal waters of the State as defined in Part 10 of the Interpretation Act 1987 (including any land within those waters), and

(b) the area of land and the waters that lie between the western boundary of the coastal zone (as shown on the maps outlining the coastal zone) and the landward boundary of the coastal waters of the State, and

(c) the seabed (if any) and the subsoil beneath, and the airspace above, the areas referred to in paragraphs (a) and (b).

4.31. The whole of the project falls within the coastal zone. Therefore, SEPP 71 would apply if the project had not been declared State Significant Infrastructure.

4.32. Under clause 7(b) of SEPP 71 a consent authority must take into account the matters specified in clause 8 of SEPP 71 when it determines a development application to carry out development on land to which SEPP 71 applies. The matters specified in clause 8 are, in summary:

- impact on public access to and along the coastal foreshore
- opportunities to provide new public access to and along the coastal foreshore
- impact on the amenity of the coastal foreshore and on scenic qualities of the New South Wales coast
- impact on animals (within the meaning of the Threatened Species Conservation Act 1995) and plants (within the meaning of that Act), and their habitats,
- impact on fish (within the meaning of Part 7A of the Fisheries Management Act 1994) and marine vegetation (within the meaning of that Part), and their habitats
- impact on wildlife corridors

- impact of coastal processes and coastal hazards on the project
- potential conflict between land-based and water-based coastal activities,
- impact on cultural places, values, customs, beliefs and traditional knowledge of Aboriginals,
- impacts on the water quality of coastal waterbodies,
- impact on items of heritage, archaeological or historic significance,
- cumulative impacts and measures to ensure that water and energy usage by the proposed development is efficient.

4.33. All of the matters set out in clause 8 are highly relevant to the project. Although SEPP 71 does not apply to the assessment of the project, the matters set out at clause 8 are a useful check list of coastal zone specific matters for consideration and will be considered in the EIA.

4.34. Clause 14 of SEPP 71 concerns the public's right of access to the foreshore. It prevents the consent authority from granting consent to a development within the coastal zone if, in the opinion of the consent authority, the development will, or is likely to, result in the impeding or diminishing, to any extent, of the physical, land-based right of access of the public to or along the coastal foreshore. Although clause 14 of SEPP 71 does not apply to the project, the principle of maintaining public access along Merimbula Beach will be a consideration in the design of the work compound likely to be located on the beach.

Other Policy and Local Strategic Plans

NSW Coastal Policy

4.35. The NSW Coastal Policy 1997 is not an environmental planning instrument, however is a relevant matter for consideration in the assessment of a project under Part 5.1 of the EP&A Act. In summary, the Coastal Policy:

- requires that the principles of ecologically sustainable development (ESD) should be used to guide decision making in all areas and activities affecting the NSW coast;
- promotes the reservation from development of critical habitat;
- adopts an overriding vision of ecological sustainability of the NSW coast and gives expression to that vision by the promotion of nine goals relating to the three key areas of conservation, human activities and implementation; and
- establishes operational targets and strategic actions, which, when met will ensure that the nine goals are achieved.

4.36. Two of the key actions in the Coastal Policy relevant to the project contained are:

- to maintain and, where inadequate, improve water quality in coastal waters, estuaries and rivers; and

- to impose an embargo on new ocean outfalls until a full investigation of alternative wastewater strategies has been undertaken and considered by the Government.

4.37. The consistency or otherwise of the project with the Coastal Policy will be addressed in detailed in the EIA that will be prepared for the project. The project is not inconsistent with the embargo on new ocean outfalls, because it involves upgrading of an existing near shore ocean outfall. If the coastal policy intended to prohibit the project, the proponent argues that a concession to Coastal Policy is warranted for the project given the constraints on other effluent management options and the findings of the Merimbula effluent disposal strategy. It is clear that Council, in its development of an effluent management strategy for Merimbula and district has fully investigated alternative effluent disposal strategies, and the ocean outfall is the preferred means of disposal. The ocean outfall also has the support of the NSW EPA.

NSW 2021 South East Regional Action Plan

4.38. The South East NSW Regional Action Plan was published in December 2012 and is part of the current NSW Government's commitment to deliver a whole of Government, integrated strategic plan for land use, transport and infrastructure investment, supported by financial management. The South East NSW Regional Action Plan identifies the Government's immediate priorities for the region. These will complement both the existing long term strategies for the Region including the South Coast Regional Strategy and the Community Strategic Plans of individual Local Government Authorities in the region.

4.39. The South East NSW Regional Action Plan supports the development of Coastal Zone Management Plans and Emergency Action Sub-Plans. It encourages local councils to prepare Coastal Zone Management Plans by 2014. The Plans will relate to the coastline of Eurobodalla and Bega Valley LGAs and include an Emergency Action Sub-Plan for coastal erosion hazards at Wharf Road, Batemans Bay. Coastal Zone Management Plans for estuaries will also be prepared, which will aim to improve estuary health and access to estuary foreshores, reduce the risk from coastal hazards of estuary entrance instability, tidal inundation and estuary foreshore erosion and protect cultural and heritage values.

Coastal Processes and Hazard Definition Study

4.40. BVSC has prepared a Coastal Processes and Hazard Definition Study. The study provides a regional assessment of the coastal hazards impacting on the Bega Valley Shire LGA coastline. It outlines the key coastal processes and interactions operating on the coastline and presents the projected extent of the coastal hazards arising from these processes. BVSC intends to use the findings of the study to develop a Coastal Management Plan.

4.41. In respect of the Merimbula Beach the Coastal Processes and Hazard Definition Study concludes that:

"The photogrammetric data indicates that the beaches of Merimbula Bay are exhibiting a moderate ongoing loss of beach sand and therefore a future long term retreat of this section of coast is likely. The 'best estimate' long term recession rate for Merimbula Beach, Pambula Beach and Jiguma Beach is 0.1m/yr, with upper and lower limits of zero and 0.2m/yr, respectively."

4.42. The recommendations of the study will be taken into account the design of the project and EIA.

Bega Valley Community Strategic Plan 2013/2014

4.43. The "Community Strategic Plan - Bega Valley 2030" was prepared in response to the Integrated Planning and Reporting Framework legislation enacted by the State Government in 2010. It was adopted by Council in 2013 and sets the direction for the Bega Valley for the next 20 years.

4.44. Bega Valley 2030 has been prepared to complement key directions established in NSW strategic documents such as the South Coast Regional Strategy, South East Regional Action Plan, South Coast Regional Development Australia Strategic Plan and has been influenced by the principles of the NSW State Plan.

4.45. The Community Strategic Plan records that in 2012 a community satisfaction survey was conducted by Council to assess the communities' priorities and any changes in these priorities over time. The priorities identified by the community for the future of the LGA include:

- adequacy and cleanliness of public amenities;
- the adequacy and standard of infrastructure;
- the promotion of tourism and brand, employment and commercial opportunities.

4.46. The Plan establishes five key themes, or strategic priorities, for the Bega Valley community: a liveable place; an enterprising place; a sustainable place; an accessible place; and a leading organisation. Community ambitions in respect of each theme are captured through key directions. The Plan establishes directions for each strategic priority key direction. For the sustainability priority the directions are:

- Valued natural environments: The natural environment and ecosystems are appropriately protected and enhanced.
- Sustainable communities: Our community has the services, opportunities and support to live sustainably.
- Character and amenity: The character and amenity of our towns and villages is protected and enhanced.

- Proactive support and planning: There is proactive planning with the community for the protection of our built and natural environment.

4.47. The community strategic plan recognises that population concentration on the coast, together with seasonal tourist and local visitor usage, places pressure on the LGA's coastal environment. The Plan recognises that growth will need to be carefully managed into the future to ensure the LGA's "natural advantages" are protected.

4.48. BVSC is pursuing the proposed ocean outfall as an infrastructure project designed to meet all of the key directions for sustainability adopted by BVSC in the Community Strategic Plan.[23]

South Coast Regional Strategy

4.49. In 2007 the then Department of Planning published a regional planning strategy, known as the South Coast Regional Strategy, for the local government areas of Shoalhaven, Eurobodalla and Bega Valley. This Strategy remains in force and represents current planning policy of the State Government in the region.

4.50. The Strategy identifies challenges facing the Region including the management of groundwater resources, climate change/sea level rise, population growth and management of water and waste services. The vision for the Region in terms of sustainability is that development and growth achieves economic and social goals, whilst protecting the Region's sensitive natural environment. The aims of the Strategy relevant to the project include:

- protect high value environments including pristine coastal lakes, estuaries, aquifers, threatened species, vegetation communities and habitat corridors by ensuring that no new urban development occurs in these important areas or their catchments; and

- increase the amount of housing in existing centres to ensure the needs of future households are better met, in particular the needs of smaller households and an ageing population.

4.51. The Strategy identifies outcomes and actions for the natural environment, natural hazards, housing and settlement, economic development and employment growth, rural landscape and rural communities, water, energy and waste resources, cultural heritage. Merimbula Lake is identified in the Strategy as a water body having significant aquatic habitat.

4.52. The Strategy notes that the Bega Valley LGA has an oversupply of vacant urban land, particularly around Bega, but recognises a continued demand for housing in existing coastal centres such as Merimbula over the next 25 years. The Strategy also recognises that peak demand periods could increase the risk of localised pollution of sensitive ecosystems (as a result of sewage overflow) if the carrying capacity of infrastructure is exceeded. The Strategy

[23] BVSC Annual Report 2012/2013

states that concentrating growth in the major regional centres and towns provides an opportunity to more efficiently use existing and augmented water, energy and waste infrastructure.

4.53. Actions identified in the strategy in relation to waste resources include:

- encouraging councils to reduce the demand on town water supplies through water conservation, including replacing the use of potable water with harvested stormwater and/or highly treated wastewater for non-potable uses;
- supporting suitable, locally generated and/or renewable energy projects such as wind, solar by bio-waste and wave power.

4.54. The project will support the over-arching objective of the strategy, which is to locate additional population in existing urban areas by increasing the capacity of existing sewage treatment works. The project will also support the sustainability aim of the strategy by adding a long term, sustainable effluent disposal scheme for the Merimbula Pambula urban areas. The reuse components of the broader project are also consistent with the objective of reduce the demand on town water supplies through water conservation.

4.55. The following natural resource policies are relevant to the project and will need to be considered in the EIA:

- NSW Oyster Industry Sustainable Aquaculture Strategy (DPI, 2006),
- Fish Habitat Protection Plan No.2 Seagrasses (DPI,1997).

5. Preliminary Environmental Impact Assessment

Operation of Existing STP

5.1. In order to properly assess the net impact of the project it is necessary to identify the negative impacts arising from the existing STP that will be avoided as a result of the project. The existing STP receives sewage mainly from residential uses, with a small component of commercial and industrial sewage. The existing treatment plant is licenced by the NSW EPA under the *Protection of the Environment Operations Act 1997*. The licence permits the disposal of up to 4 ML of treated effluent per day to the ocean outfall and/or dunal exfiltration ponds.[24] Effluent supplied and used as recycled water on the Pambula Merimbula Golf Course and Oaklands Farm has no daily volumetric licence limit. During warmer holiday months, the current STP operates at near full capacity. Total reuse and disposal volumes in mega litres over the last 6 years are indicated in table 1 below.

	Merimbula STP effluent discharge points Volume (ML/y)	9/10 ML	10/11 ML	11/12 ML	12/13 ML	13/14 ML	14/15 ML
Disposal	Ocean Outfall	348	403	542	286	435	500
	Dunal Exfiltration Ponds	157	166	149	152	50	112
Reuse	Pambula Merimbula Golf Course	182	90	93	146	142	101
	Oaklands Farm				40	96	32
Total		**687**	**659**	**785**	**624**	**722**	**745**

Table 1: Total volumes reused and disposed

5.2. Sewage at the STP is treated to an advanced secondary standard. The treatment process involves the following phases: [25]

5.3. Sewage is pumped to the STP from pump stations in Merimbula, Pambula and Pambula Beach. The sewage flows into the inlet works and is screened by mechanical step-screens to remove non-organic macro solids such as plastics, rags etc.

5.4. The screened sewage is processed to a secondary treatment level by aeration and biochemical degradation followed by a settlement phase. Secondary treated effluent is then decanted to a catch pond and then to a chlorine contact pipe, where it is dosed with chlorine (sodium hypochlorite) to reduce the number of microorganisms in the effluent.

5.5. Chlorinated effluent then flows from the chlorine contact pipe to the STP effluent pond. Effluent in the storage pond is supplied and used as recycled water on the Pambula Merimbula Golf Course and pumped to a dam at Oaklands Farm as required by the users. Effluent surplus to reuse

[24] EPA licence 1741 (as amended in June 2009).
[25] Merimbula Effluent Options Investigation Project, www.begavalley.nsw.gov.au

requirements is pumped and disposed to the shore-based ocean outfall or dunal exfiltration ponds located within the sand dunes east of the STP between Arthur Kaine Drive and the Pacific Ocean.

5.6. Between 18% and 33% of effluent is supplied and used as recycled water on the Pambula Merimbula Golf Course and Oaklands Farm in a year, more in dry years, less in wet. The remaining effluent is discharged to the shore based ocean outfall or the exfiltration ponds for disposal. The percentage of effluent sent for reuse and disposal over the last 6 years is indicated in table 2 below.

	Merimbula STP effluent discharge points Percentage (%/y)	9/10 %	10/11 %	11/12 %	12/13 %	13/14 %	14/15 %
Disposal	Ocean Outfall	51%	61%	69%	46%	60%	67%
	Dunal Exfiltration Ponds	23%	25%	19%	24%	7%	15%
Reuse	Pambula Merimbula Golf Course	26%	14%	12%	23%	20%	14%
	Oaklands Farm	0%	0%	0%	6%	13%	4%
Total		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table 2: Volumes as a percentage of total discharge

5.7. The location of the STP, dune exfiltration ponds and shore based ocean outfall are shown in the aerial photograph at Figure 9 below. Further details of current discharge arrangements by shore based ocean outfall, dunal exfiltration and re-use are described below.

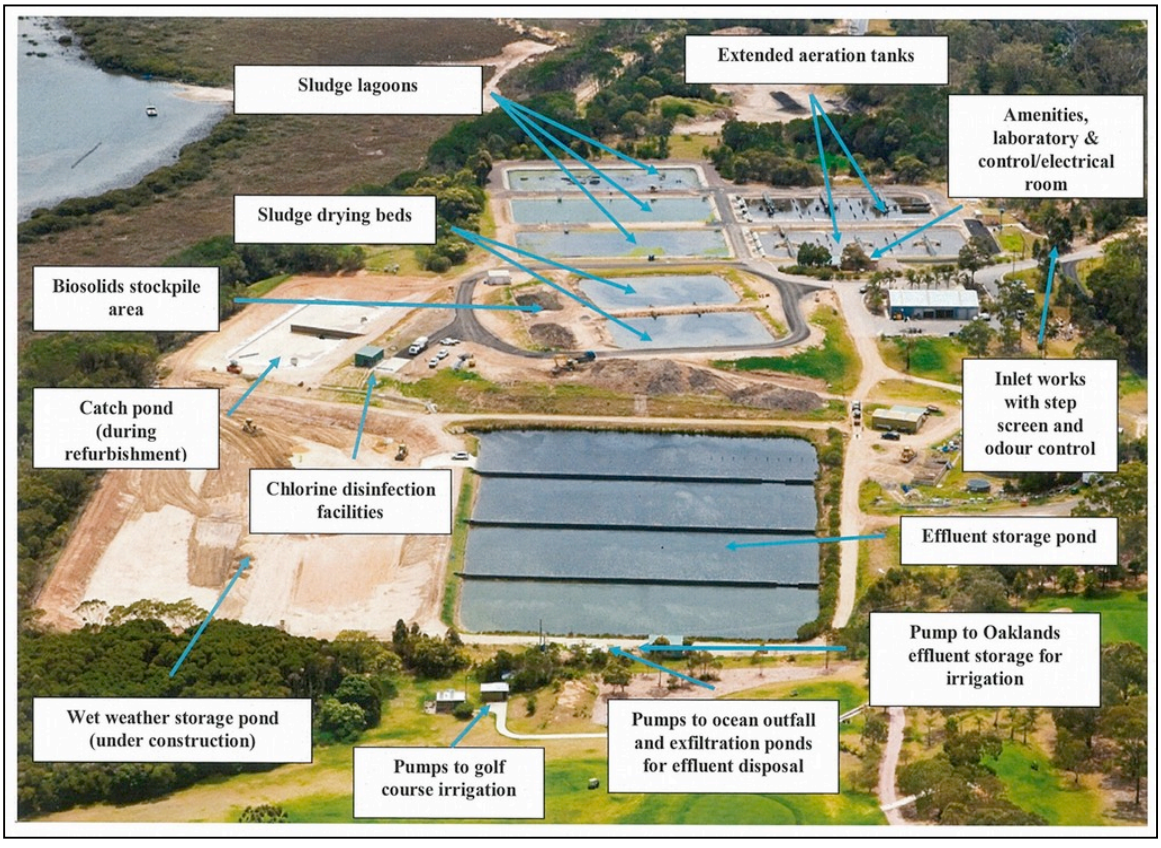

Figure 9: Aerial showing existing STP site layout (Source: Bega Valley Shire Council)

Existing shore-based ocean outfall

5.8. The existing shore-based ocean outfall consists of a 1 km long, 250 mm pipeline from the STP effluent pumping station to a pipe head structure located in the hind dunes east of the exfiltration pond (see photograph at Figure 10). Effluent is discharged just above the MHWM and flows across the beach and into the ocean waters of Merimbula Bay. The pipeline originally extended into the surf zone, but was damaged in a large storm event in the 1970s and has not been reinstated.[26]

Figure 10: Existing shore based ocean outfall

Existing exfiltration ponds

5.9. Two exfiltration ponds are located in a disused quarry in the sand dunes east of the STP (see photograph at Figure 11 below). Effluent is pumped from the STP to the ponds and drains (exfiltrates) into the underlying groundwater aquifer. The ponds are used preferentially during summer to minimise effluent disposal via the outfall when beach use is highest. In 2014/15, total effluent disposal to the ponds accounted for approximately 18% of the total effluent discharged from the STP.[27]

5.10. Groundwater level monitoring near the ponds is undertaken to ensure that the induced groundwater level rise remains below acceptable levels. Groundwater level monitoring determines the timing to switch disposal from the ponds to the ocean outfall and vice-versa. The groundwater level near the ponds is allowed to fall leading up to the summer peak tourist season to enable the ponds to be used instead of the outfall during this time. Once the groundwater level rises towards 1.5 m AHD, as a result of dunal exfiltration and/or rainfall, the ponds are taken off-line and the groundwater level allowed to fall away again.[28]

[26] Facts Sheet No. 2, www.begavalley.nsw.gov.au
[27] BVSC 2016
[28] AECOM/Elgin 2013 p 1

Figure 11: Aerial showing existing exfiltration ponds

Existing Re-use Schemes

5.11. Treated effluent is pumped off-site for beneficial reuse at two locations: the Pambula Merimbula Golf Club, located immediately south of the Merimbula STP and the Oaklands agricultural irrigation area located on the Pambula River flats at South Pambula.

5.12. The Pambula Merimbula Golf Club land comprises a 27-hole golf course over an area of approximately 37 hectares. The treated effluent is used for irrigation of the tees, greens and fairways on the course. The Golf Club has received effluent in varying quantities from the Merimbula STP for over 20 years. In the 2009/2010 financial year, the Golf Club used 182 ML of effluent, the equivalent of 26% of the effluent discharged from the STP in the year. The 2010/11 financial year was significantly wetter, with only 90 ML used. This was equivalent to 13% of the effluent discharged from the STP in that year. Average annual reuse at the golf course over the last 6 years is approximately 125.6 ML/year, equivalent to about 18% (yearly average) of the total existing volume of effluent discharged from the STP per annum.[29]

5.13. The second beneficial reuse site is known as the Oaklands agricultural irrigation area. This is a privately owned rural land holding located on the Pambula River flats at South Pambula. The scheme was commissioned on 14 February 2013 and comprises an area of approximately 40 ha which is available for irrigation of either fodder crops or pasture. Treated effluent is pumped from the Merimbula STP to the property through a 4 km pipeline to a 20 ML storage dam on the property. Reuse at Oaklands has ranged from 96ML/year in 2013/2014 to 32 ML/year in 2014/2015.

5.14. Beneficial reuse of treated effluent at Pambula Merimbula Golf Course and Oaklands is proposed to continue once the project is commissioned. No

[29] BVSC 2016

expansion of the reuse scheme is proposed until such time as funding for the ocean outfall infrastructure has been secured and allocated.

5.15. The importance of increasing effluent reuse quantities and reducing disposal volumes is considered greater for a shallow dunal exfiltration disposal system than a deep water ocean outfall disposal system. This is because there are phosphorous sorption capacity, nitrogen mobilisation and Merimbula Lake nutrient loading issues that would be lessened by reducing the volume of effluent disposed to the dunes (by increased effluent reuse). Such issues do not apply for the deep water ocean outfall option.

Impacts of the Existing STP

5.16. During the course of preparation of the effluent management strategy for the Merimbula and district BVSC commissioned a number of reports investigating the current and likely future impacts of the existing STP. These reports are listed below (URL links are provided at Annexure A):

- Ecological Assessment of the Potential Impacts on Merimbula Lake from Shallow Dunal Exfiltration of Effluent (AECOM and Elgin 2013)
- Pilot Water Quality Model Final report Merimbula Effluent Outfall, AECOM September 2010
- Disposal of Effluent from Merimbula Sewage Treatment Plant by Dunal Exfiltration – Investigation and Assessment of Impacts on Groundwater Levels and Water Quality of Merimbula Lake, IGGC Pty Ltd March 2013
- Merimbula Bay Algal Bloom Study, Elgin Associates January 2013

5.17. The existing near shore outfall has been linked, anecdotally and scientifically, to the occurrence of algal blooms in Merimbula Bay and associated beaches. Elgin and Associates (2013) concluded that the Merimbula STP was one of a number of sources of available nutrients feeding algal blooms in Merimbula Bay. Other sources include diffuse source inputs from the catchments of Merimbula and Pambula Lakes, periodic upwelling of deep water from the continental shelf and the release of nutrients from the bay sediments. However the STP provided a relatively continuous supply of inorganic nutrients at high concentrations compared to diffuse sources.[30]

5.18. The existing discharge of effluent to groundwater via exfiltration ponds has the potential to impact on water quality in Merimbula Lake. Since 2004 Council has monitored groundwater quality in a number of bores in the vicinity of the existing exfiltration ponds to assess the impact of the selective use of dune exfiltration as a disposal method. While results for total phosphorous have remained relatively steady at most locations, two boreholes in the vicinity of the existing exfiltration ponds indicates a gradual increase. On the ocean side of the existing ponds there has been an increase over the period

[30] Elgin & Assoc 2013 p 49, 50

2004 to 2014 from 1 mg/L in 2004 to 7 mg/L in 2014, and on the lake side an increase from 0.2 mg/l to 0.8mg/l.

5.19. The ANZECC guidelines for phosphorus in ocean waters are 0.25mg/l, and in estuaries 0.3mg/l. The increase in levels on the lake side, while less in magnitude, is of greater concern as Merimbula Lake has limited flushing and dispersion capacity when compared to the ocean. Merimbula Lake is listed in the Directory of Important Wetlands in Australia,[31] and supports extensive seagrass meadows and the lake foreshores and tributary streams also support fringing mangrove, saltmarsh and freshwater wetland areas. The ecological values of Merimbula Lake are documented by AECOM and Elgin 2013, including the presence of saltmarsh, which is listed as an endangered ecological community under the NSW *Threatened Species Conservation Act 1995.*

5.20. In 2000 a dieback of a number of large trees in the vicinity of the ponds was attributed to elevated ground water levels.[32] An assessment of the health of trees in the vicinity of the exfiltration ponds carried out in 2007 observed that some trees to the north of the ponds showed symptoms of stress with signs of crown dieback, together with high levels of foliar diseases and leaf pest damage.[33] Other trees more tolerant of wetter soils were in a good state of vigour. The assessment concluded that a sustained high water table and increased nutrient levels in ground water was likely to be one of a number of factors contributing to the impact on existing vegetation. A further assessment by the same company in 2014 found that the condition of the trees in the dunes to the north of the ponds is again very similar to that found in 2007, however the frontal and dune vegetation had grown significantly.[34]

5.21. BVSC is concerned that in the long term, relying solely on dunal exfiltration in combination with limited reuse will further exacerbate nutrient concentrations in the groundwater on both the ocean and lake sides of an exfiltration system. To date the increased phosphorus levels in groundwater have not resulted in any measurable impacts in Merimbula Lake or the Ocean. However given the modelling undertaken by IGGS Pty Ltd in 2013 for a new exfiltration "trench" system located in the dunes north of the existing exfiltration ponds, there is the potential for nutrient enriched groundwater to make its way to the Lake at some future time. The longer an exfiltration system operates, the greater the risk of nutrient enriched groundwater discharging to Merimbula Lake and impacting on the lake ecosystem.

5.22. In addition to likely ecological impacts if the existing discharge arrangements are permitted to continue, in the medium to long-term they may result in economic and social impacts on the significant oyster industry in Merimbula Lake and tourism in the Merimbula-Pambula area. Merimbula Lake supports a small but significant oyster farming industry. In 2005/2006, it was estimated

[31] Environment Australia (2001). "A Directory of Important Wetlands in Australia", Third Edition.
[32] Ian Grey Groundwater Consulting Pty Ltd, Merimbula STP Assessment of Potential Impacts Jan 2004.
[33] South Coast Arbor & Eco Pty Ltd, Condition Assessment Merimbula STP Exfiltration Ponds 2007
[34] South Coast Arbor & Eco Pty Ltd, Condition Assessment Merimbula STP Exfiltration Ponds 2014

that Merimbula Lake produced over 6.7% of the total NSW production of Sydney Rock Oyster (total value in excess of $2.02 million). Saccostrea glomerata (Sydney rock oyster) and Crassostrea gigas (Pacific oyster) are farmed in the Lake and the area also produces Angasi oysters. Areas in the lake that have been leased for oyster aquaculture cover 142.5 ha, with areas currently mapped as priority oyster aquaculture areas covering 125.8 ha.[35]

5.23. The impacts and potential impacts of the existing STP described above will be entirely eliminated once the ocean outfall becomes operational, because the project involves decommissioning the existing exfiltration ponds and near shore outfall. Effluent from the plant will continue to be reused after the ocean outfall becomes operational.

Outline of potential adverse impacts of the Project

5.24. The project may have potential negative impacts during the construction stage and ongoing. The following discussion outlines the **nature** of potential impacts result from construction and operation of the project. The **extent** of the impacts and the means of mitigating them will be determined as part of the EIA and design process. The potential impacts of the project include impact on:

Water quality
Marine Ecology
Native Vegetation/Terrestrial Ecology
Aboriginal cultural heritage
Economic and Social Impacts

However, when these potential impacts are balanced against the reduction in adverse impacts from the existing STP, the project is expected to deliver a long term net environmental improvement both to ecosystems and water quality in Merimbula Lake and Merimbula Bay and vegetation in the Merimbula Beach dunes.

Water quality

5.25. Ocean water quality within Merimbula Bay may be affected in the short-term as a consequence of disturbance of the sea floor during dredging to create the trench in which the pipeline will be placed, and the subsequent backfilling of that trench. Increased turbidity, and potential release of nutrients stored in sediment on the sea floor, may occur.

5.26. Ocean water quality in the immediate vicinity of the effluent discharge point may also be adversely affected once the Ocean outfall is operational. In 2014 BVSC, through its consultants Elgin Associates, commenced baseline water quality monitoring at the proposed discharge point in Merimbula Bay. As mentioned earlier in this report, BVSC is also commissioned MHL to undertake hydrodynamic surveys within Merimbula Bay and adjacent open

[35] ACOM and Elgin 2013

ocean purposes of identifying the optimum location, from an ocean current perspective, for the effluent discharge point. The Elgin and MHL monitoring programs are continuing.

5.27. Long-term impacts on ocean water quality in the immediate vicinity of the discharge point will be mitigated by selecting a discharge location and depth that will facilitate rapid dispersion, together with modification of chlorine disinfection and potentially new de-chlorination equipment as part of the upgrade of the existing STP.

5.28. The combination of discharge point selection and increased treatment at the STP will be designed to ensure compliance with marine water quality trigger values for south-east Australia in ANZECC *Guidelines for Fresh and Marine Waters 2000* at the edge of the defined mixing zone at the discharge location. Water quality parameters to be assessed in the context of the ANZECC guideline trigger values for phosphorous and nitrogen species for protection of aquatic ecosystems and faecal coliforms, enterococci and metals for recreational water quality and aesthetics.

Marine Ecology

5.29. It is anticipated that construction of the pipeline below MHWM, in the manner described in section 3 above, will disturb existing sea floor ecology. The siting of the pipeline trench and discharge point will be chosen to minimise, as far as possible, disturbance of marine ecosystems within Merimbula Bay and offshore from Haycock Point. The nature and extent of marine ecosystems and fisheries will be mapped and quantified as part of the EIA.

5.30. Operation of the outfall will have a localised impact on ecology immediately surrounding the discharge point, but will eliminate the long-term threats to the ecosystem within Merimbula Lake and diverse plant communities along its fringes and eliminate the concentration of nutrients within the Merimbula embayment.

Native Vegetation/Ecology

5.31. Native vegetation between the existing STP and the beach in the vicinity of the exfiltration ponds comprises Banksia intergrifolia, Eucalyptus tereticornis, Eucalyptus globoidea, Eucalyptus pilularis and Eucalyptus longifolia.[36] Other species include scattered thickets of sapling Hickory Wattle (Acacia implexa), shrubs Monotoca scoparia and Hibbertia spp., and a dense groundcover of the scrambling succulent shrub Rhagodia candolleana, sedges Lepidosperma concavum and L. gladiatum, Spiny Mat- rush (Lomandra longifolia) and various grasses, including Microlaena stipoides and Poa poiformis.[37]

5.32. No plant or fauna species listed on Schedules 1 or 2 of the *Threatened Species Conservation Act 1995* or listed as nationally threatened under the *Environment Protection and Biodiversity Conservation Act 1999* were found

[36] South Coast Arbor & Eco Pty Ltd, Condition Assessment Merimbula STP Exfiltration Ponds 2007
[37] NGH Environmental, REF for Groundwater Investigations, Oct 2009

when the land surrounding the exfiltration ponds was surveyed in 2009. However the area contains potential habitat for the Eastern Pygmy-possum and the White-footed Dunnart (both listed (as at 2009 as Vulnerable under the TSC Act, and not listed under the EPBC Act). The Koala is unlikely to occur in the area.[38]

5.33. The following endangered and migratory bird species protected under the *Environment Protection and Biodiversity Act 1999* are highly likely to be present in the vicinity of the sand dunes east of the STP:[39]

Botaurus poiciloptilus, Australasian Bittern (Endangered)
Ardea ibis, Cattle Egret (Migratory)
Gallinago hardwickii, Latham's Snipe (Migratory)
Haliaeetus leucogaster, White-bellied Sea-Eagle (Migratory)
Numenius madagascariensis, Eastern Curlew (Migratory)
Numenius phaeopus, Whimbrel (Migratory)

5.34. Additionally, the Rufous Fantail, Black- faced Monarch, White- throated Needletail are considered likely to occur in the vicinity of the exfiltration ponds.[40]

5.35. Within Merimbula Lake, coastal saltmarsh, an Endangered Ecological Community (EEC) listed in Part 3 of Schedule 1 of the NSW *Threatened Species Conservation Act* 2005. Four endangered or vulnerable bird species (Australasian Bittern, Sooty Oystercatcher, Pied Oystercatcher and Hooded Plover) have been recorded within the Lake and dunes near the STP and exfiltration ponds.[41] In addition, BVSC's mapping database indicates that the Powerful Owl, Masked Owl, Yellow Bellied Glider and Green and Golden Bell Frog have been sighted in the sand dunes near the existing exfiltration ponds.

5.36. The works and activities associated with the project as described in section 3 above will involve some clearing of native vegetation adjacent to the existing access tracks between Arthur Kaine Drive and Merimbula Beach in the vicinity of the exfiltration ponds. It is not expected that the storage and welding compound on Merimbula beach will necessitate clearing of native vegetation. Whether or not these activities are likely to have a significant adverse impact on any native vegetation animals will be assessed when the concept design is prepared and its impacts are assessed as part of the EIA process.

Aboriginal Cultural Heritage

5.37. In 2009 NSW Archeology Pty Ltd carried out and Aboriginal archaeological assessment of 2 sites located in the sand dunes between the exfiltration ponds and Merimbula urban area. The assessment report records that the Merimbula area belonged to the Katungal, or 'sea coast people' of the Thaua people. The sand dunes between Merimbula Beach and Merimbula Lake

[38] NGH Environmental, REF for Groundwater Investigations, Oct 2009
[39] AECOM and Elgin 2013
[40] NGH Environmental, REF for Groundwater Investigations, Oct 2009
[41] AECOM and Elgin 2013

have a high potential to contain items and areas of Aboriginal archaeological significance, being situated between three major resource zones, the estuary, coast (littoral zone) and its forested hinterland.[42]

5.38. A search of the NSW DECC Aboriginal Heritage Management Information System conducted by NSW Archeology Pty Ltd in 2009 found five Aboriginal object recorded as being present within the Merimbula barrier search area. These included a burial site (#62-6-0173), two scarred trees (#62-6-0193 and #62-6-0475), an artefact scatter (#62-6-0133) and a midden (#62-6-0192).

5.39. The archaeological significance of the dunes was raised as an important issue in the consultation that occurred in the preparation of the Merimbula effluent treatment strategy and was a contributing factor as to why the option of developing a new dunal exfiltration system north of the existing ponds was ruled out. Further consultation will be required with Aboriginal groups and National Parks and Wildlife Service as part of the concept design phase and EIA to identify particular aspects of significance and means of mitigating that impact.

5.40. As with impact on native vegetation/terrestrial ecology, impact of the project on Aboriginal archaeology and values might potentially arise from the widening and regrading of the existing access tracks between Arthur Kaine Drive and Merimbula Beach. The extent of disturbance arising from those works is not expected be significant, but will be identified as part of the concept design stage. One of the benefits of directional drilling is that it is a trenchless technology and causes minimal disturbance at the surface. For the majority of the pipeline length, the depth will be greater than 3m and the surface disturbance due to the pipeline will be limited to the immediate area in the dunes where the pipe surfaces at the drilling compound. Conventional pipe laying would require surface disturbance for the entire length of the pipeline through the dunes.

Economic and Social Impacts

5.41. Potential adverse economic and social impacts of the project include:

- impact on commercial and recreational fishers who may not be able to access a defined section of Merimbula Bay during construction of the project;
- temporary changes to recreational use of Merimbula Beach and dune area while the pipeline is being assembled and installed, including alienation of an area of beach approximately 600m long required for the storage and assembly compound;
- restriction on commercial fishing (trawling) in the immediate vicinity of the diffuser structure to prevent nets being snagged on the structure and interfering with the diffuser operation.

[42] NSW Archaeology Pty Ltd Aboriginal Archaeological Assessment for Geotechnical Investigations June 2009

5.42. It is anticipated that pedestrian access along the beach will be maintained to the east of this assembly area. It is also anticipated that the location of the pipeline will not interfere with a shipwreck known to be located in the vicinity of Haycock Point, which is presently used by recreational divers.

6. Justification for the project

6.1. As identified in the introduction this report, BVSC has adopted a strategy for the future long-term management of effluent from the Merimbula sewage treatment plant. The strategy recognizes that the current means of effluent management at Merimbula is unsustainable. The strategy considered a number of effluent disposal options for Merimbula and district, and was developed by BVSC in consultation with community representatives and representative from the Merimbula Lake Shellfish Quality Assurance Program, Pambula Lake Shellfish Quality Assurance Program, NSW Environmental Protection Authority, NSW Office of Water and Southern Rivers Catchment Management Authority. This strategy is the genesis for projects subject of this application.

6.2. The focus group established to oversee the Merimbula sewage management strategy considered a number of other options for effluent management treatment. Three effluent disposal, five STP treatment and eight reuse options were evaluated. These options were described as:

Effluent disposal options:

- Deep water ocean outfall
- An expanded shallow dunal exfiltration
- Deep alluvial aquifer injection

STP upgrade options:

- Phosphorous reduction
- Improved chlorine disinfection
- Ultraviolet light (UV) disinfection
- Nitrogen reduction via a constructed wetland
- Nitrogen reduction via biologically active filters and de-nitrifying filters with methanol dosing

Reuse options:

- Existing Pambula-Merimbula Golf Course (“PMGC”) and Oaklands Agricultural Irrigation
- PMGC Expansion and Oaklands Agricultural Irrigation
- Pambula Open Space, PMGC and Oaklands Agricultural Irrigation
- South Pambula Agricultural, PMGC and Oaklands Agricultural Irrigation

Lochiel Agricultural, PMGC and Oaklands Agricultural Irrigation

Millingandi Agricultural, PMGC and Oaklands Agricultural Irrigation

Wolumla Agricultural, PMGC and Oaklands Agricultural Irrigation

Yellow Pinch Dam Indirect Potable Reuse, PMGC and Oaklands Agricultural Irrigation

6.3. With the assistance of consultants AECOM, the focus group undertook a multi-criteria analysis of the shortlisted disposal and reuse options, taking into account the expert reports referred to earlier and listed at Annexure A. This was done in a series of focus group workshops in March, April and May 2013.

6.4. The multi-criteria analysis undertaken by the focus group considered the benefits and costs of all treatment, disposal and re-use options. The environmental impact factors against which the options were ranked included public health, potable water substitution and improved drought security, aesthetics and recreational amenity, Aboriginal heritage, substitution of natural water resources, construction impact, greenhouse gas emissions, receiving water quality and aquatic ecology.

6.5. Ultimately, the focus group preferred the deep water ocean outfall means of disposal as it offers the greatest relative environmental and public health benefits in terms of:

- improvements to receiving water quality and ecology;
- enhancements to the aesthetic and recreational amenity of the Merimbula Bay locality;
- provision of the least construction impacts;
- provision of the greatest preservation of aboriginal heritage; and
- the least risk to public health.

6.6. The deep water ocean outfall disposal option also offered greater relative benefit in terms of system reliability and enhancing the regional economy.

6.7. The NSW EPA supports BVSC's adopted effluent management strategy. The EPA has imposed a legal obligation on BVSC, through its environment protection licence to operate the Merimbula STP under the *Protection of the Environment Operations Act 1997* to obtain the necessary approvals, construct and commission a deep water ocean outfall and upgraded STP by 30 June 2017.[43]

6.8. The longer the exfiltration ponds and near shore outfall operate, the greater the risk of nutrient enriched groundwater discharging to Merimbula Lake, Merimbula Bay and the SEPP 14 wetlands located in the vicinity of the exfiltration ponds and in Merimbula Lake, potentially resulting in adverse impacts on the ecology of those areas. As described above, Merimbula Lake contains an endangered ecological community, a SEPP 14 wetland and

[43] Licence 1741, Amended 9 December 2013, condition 8 U1.1

supports an important oyster industry and tourism. These attributes are described in more detail in the report prepared by AECOM and Elgin 2013 commissioned on behalf BVSC.

6.9. The impacts and potential impacts of the existing STP on Merimbula Bay and Merimbula Lake, as described in this section of the report will be entirely eliminated once the ocean outfall is commissioned.

7. Consultation

7.1. The proponent has consulted with community groups and Government Agencies as part of its adoption of the Merimbula effluent management strategy, and the formation of a focus group to prepare that strategy. The role of the focus group was to consult, guide, review and discuss the available project information and to recommend a preferred effluent management strategy to the elected representatives of BVSC. The focus group included representatives from the following industry organisations and State Agencies:

Merimbula Lake Shellfish Quality Assurance Program

Pambula Lake Shellfish Quality Assurance Program

NSW Environment Protection Authority

NSW Office of Water

Southern Rivers Catchment Management Authority

BVSC Councillors and staff and 2 community representatives.

7.2. As explained in section 6 above, the focus group preferred the deep water ocean outfall means of disposal as it is predicted to offer the greatest relative environmental and public health benefits.

7.3. More recently, BVSC consulted with the EPA and the Office of Water in the collection of the baseline water quality data by consultants Elgin and Associates within Merimbula Bay.

8. Capital Investment Value

8.1. The current cost estimate for the project and STP upgrade determined by consultants AECOM in 2013, is $25.1m. This is a preliminary estimate that will be revised and independently costed when a field investigation of subsurface soil conditions is undertaken and the concept design is developed. There are no similar projects that could be used to generate expected costs. Accordingly, a capital investment value cannot be determined at this stage.

8.2. The development of the concept design and preparation of the EIA will be carried out concurrently as they have significant impact on each other. The concept design will highlight potential impacts and the environmental assessment will be used to modify the concept design, if and where required to minimise or avoid impacts. This iterative process will affect the final scope and cost of the project.

8.3. It should be noted that the estimated capital cost of the ocean outfall has been based on an alignment directly east of the existing near shore discharge point (i.e. from STP directly eastwards to Merimbula Bay); modelling of existing effluent quality and the need to convey through a 5.5 km to up to 6km pipeline offshore to a depth of 40m in order to be subject to sufficient hydrodynamic effects and meet the relevant water quality objectives.

8.4. The likely capital cost estimate of $25.1 million for the ocean outfall means of disposal compares with estimated capital costs for Deep Aquifer Injection of $17.5 million and Shallow Dunal Exfiltration of $7.5 million.

9. Annexure

ANNEXURE A – List of background documents and web addresses

Environment Protection Licence 1741 (current)	http://www.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=17%2041&id=1741&option=licence&searchrange=licence&range=PO%20EO%20licence&prp=no&status=Issued
Notice of variation, Environment Protection Licence 1741 (dated 29 June 2009)	http://www.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=17%2041&id=1741&option=licence&searchrange=licence&range=PO%20EO%20licence&prp=no&status=Issued
Notice of variation 1513381, Environment Protection Licence 1741 (dated 9 December 2013)	http://www.epa.nsw.gov.au/prpoeoapp/Detail.aspx?instid=17%2041&id=1741&option=licence&searchrange=licence&range=PO%20EO%20licence&prp=no&status=Issued
Facts Sheets Nos. 1 to 14, Merimbula Effluent Options Investigation (BVSC)	http://www.begavalley.nsw.gov.au/attachments/Merimbula_Outfall/Fact%20Sheets%201%20-%2016%20Merimbula%20Effluent%20Options%20Investigation%20(BVSC).pdf
Ecological Assessment of the Potential Impacts on Merimbula Lake from Shallow Dunal Exfiltration of Effluent (AECOM and ELGIN 2013)	http://www.begavalley.nsw.gov.au/attachments/Merimbula_Outfall/Ecological%20Assessment%20of%20the%20Potential%20Impacts%20on%20Merimbula%20Lake%20from%20Shallow%20Dunal%20Exfiltration%20of%20Effluent%20(AECOM%20and%20ELGIN%202013).pdf
Pilot Water Quality Model Final report Merimbula Effluent Outfall (AECOM Sept 2010)	http://www.begavalley.nsw.gov.au/attachments/Merimbula_Outfall/Pilot%20Water%20Quality%20Model%20Report%20Merimbula%20Effluent%20Outfall%20(AECOM%20Sept%202010).pdf
Investigation and Assessment of Impacts on Groundwater Levels and Water Quality of Merimbula Lake (IGGC Pty Ltd March 2013)	http://www.begavalley.nsw.gov.au/attachments/Merimbula_Outfall/Investigation%20and%20Assessment%20of%20of%20Impacts%20on%20Groundwater%20Levels%20and%20Water%20Quality%20of%20Merimbula%20Lake%20(IGGC%202013).pdf

Merimbula Bay Algal Bloom Study (Elgin Associates January 2013)	http://www.begavalley.nsw.gov.au/attachments/Merimbula_Outfall/Merimbula%20Bay%20Algal%20Bloom%20Study%20(ELGIN%20Jan%202013).pdf
Memorandum to Councillors of Bega Valley Shire Council (AECOM 24 May 2013)	http://www.begavalley.nsw.gov.au/attachments/Merimbula_Outfall/Memorandum%20to%20Councillors%20of%20Bega%20Valley%20Shire%20Council%20(AECOM%2024%20May%202013).pdf
BVSC Sewer Asset Management Plan 2011 (v1/11)	http://www.begavalley.nsw.gov.au/attachments/Merimbula_Outfall/BVSC%20Sewer%20Asset%20Management%20Plan%20Version%206%20adopted%20June%202015.pdf
NSW Archaeology Pty Ltd Aboriginal Archaeological Assessment for Geotechnical Investigations June 2009	http://www.begavalley.nsw.gov.au/attachments/Merimbula_Outfall/Aboriginal%20Archaeological%20Assessment%20DRAFT%20Merimbula%20Test%20Bores%20Dunal%20Exfiltration.pdf
Manly Hydraulics Laboratory Report 2418 dated 17 November 2015.	http://www.begavalley.nsw.gov.au/attachments/Merimbula_Outfall/Manly%20Hydraulics%20Laboratory%20Report%202418%20Draft_v1_part1.pdf http://www.begavalley.nsw.gov.au/attachments/Merimbula_Outfall/Manly%20Hydraulics%20Laboratory%20Report%202418%20Draft_v1_part2.pdf http://www.begavalley.nsw.gov.au/attachments/Merimbula_Outfall/Manly%20Hydraulics%20Laboratory%20Report%202418%20Draft_v1_part3.pdf
NGH Environmental, REF for Groundwater Investigations, Oct 2009	http://www.begavalley.nsw.gov.au/attachments/Merimbula_Outfall/REF%20for%20Dunal%20Exfiltration%20Investigations%20Merimbula%20(NGH%20Environmental%20Oct%202009).pdf