

Victorian Desalination Project



D&C Marine Area Environmental Management Plan
 Attachment I1 – Coastal Processes and Activities Sub Plan

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Definitions and acronyms

The following Definitions and Acronyms are used in this document and relevant attachments:

145 dB re 1µPA	Root Mean Square acoustic pressure
A1MT	Area 1 Marine Team
CB radio	Citizens' Band radio
D&C	Design and Construct
DPs	Design Packages
DSE	Department of Sustainability and Environment
EES	Environmental Effects Statement
EIRP	Environmental Incident Response Plan
EMS	Environmental Management System
EMP	Environment Management Plan
EP Act	Environment Protection Act (1970)
EPA	Victorian Environment Protection Authority
HF radio	High Frequency radio
JSEA	Job Safety and Environmental Analysis
JUB	Jack-up barge
Marine Area	The marine component of the VDP. Includes the drilling of vertical holes in the seabed, installation of risers and marine structures, mobilisation and use of vessels for marine monitoring activities and construction.
Marine Works Area (onsite)	Refers to a locality where marine area activities take place. This includes all vessels when in use by TDJV, the area bounded by the temporary marine exclusion zone, the seabed where the marine structures are installed and monitoring locations where monitoring or devices are placed.
MEZ	Marine Exclusion Zone. Temporary gazetted area to ensure safety of project and non project vessels.
O&M	Operation and Maintenance Phase of the VDP
OSV	Offshore Support Vessel
PC	Performance Criteria
PR	Performance Requirement
SEI	Site Environment Inspection
SEPs	Site Environmental Plans
SEPP	State Environment Protection Policy
SEPP (WoV)	State Environment Protection Policy (Waters of Victoria)
TDJV	Thiess Degremont Joint Venture



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TSV	Transport Safety Victoria (previously Marine Safety Victoria)
VDP	Victorian Desalination Project
VHF radio	Very High Frequency radio
WAP	Work Area Packages
WP	Work Pack

1 Purpose and scope

This Coastal Processes and Activities Sub Plan describes the existing coastal integrity, processes and activities. The sub plan addresses associated issues in regards to commercial and non commercial access to, and use of, existing areas and resources affected by the design and construction (D&C) of the Victorian Desalination Project (VDP) Marine Area Works. It also describes the management measures required to ensure avoidance and mitigation of potential negative impacts to Coastal Processes and Activities. The land-based components relevant to Coastal Processes and Activities are managed through the D&C Plant and General Area EMP (as denoted in table 2-1).

This sub plan must be read in conjunction with the Environmental Management System (EMS) Manual, D&C Environmental Management Plan (D&C EMP), D&C Marine Area EMP and D&C Community Involvement Plan. This sub plan forms an attachment to the D&C Marine Area EMP and addresses requirements listed in the Environmental Compliance Tracker (TDV-0-EV-RP-0001-01), including licence conditions, performance requirements (PRs), performance criteria (PC) and other obligations which may impact marine operations.

Specific management measures from this and other environmental sub plans have been incorporated into Work Area Packages (WAP) and Work Packs (WPs), which are also referred to as management procedures, Site Environmental Plans (SEPs) and Job Safety and Environmental Analysis (JSEA's) where applicable.

Helicopter Management, Marine Pest and Pathogen Management and Underwater Noise have direct links to Coastal Processes and Activities and are each managed separately through specific sub plans (Attachments I5, I6 and I7 respectively).

2 Objectives and targets

The objective of this sub plan is to avoid and minimise harm to public health and the environment arising from coastal processes and activities during construction of the VDP Marine Area works to ensure project objectives, targets and obligations, including performance requirements and criteria (PC), are met.

Table 2-1 outlines the relevant coastal processes and activities objectives and targets nominated to be achieved during the D&C phase of the VDP. Numbered entries are applicable performance requirements taken from Schedule A of Appendix S3 of the Project Deed.

Table 2-1. Environmental objectives, targets and performance requirements

Issue	Objective/Performance Criteria	Target/Performance Requirements
Coastal Processes	<p>Protect coastal processes Minimise impacts on sand movements, wave patterns and currents (PR#28183) D, C.</p>	<p>Demonstrate through modelling of hydrodynamic processes such as tides, currents, winds and sand movements, that the Project will have no adverse effect on coastal processes (PR#28185) D.</p> <p>Monitor and report the effect of Project activities on coastal processes (PR#28186) C.</p>
Coastal Integrity	<p>Protect the physical integrity of the dune system, beach and intertidal zone No surface disturbance of the dune system, beach and intertidal zone. No measurable loss to the integrity of the coastal assets including the dune system, beach and intertidal zone (PR#29188) D, C.</p>	<p>Develop and implement methods and management systems designed to ensure no adverse effect on the dune system, beach and intertidal zone from Project activities including (PR#29190) D, C:</p> <p>Induction programs for project personnel.</p> <p>Minimise access outside public access pathways.</p> <p>Monitor and report the effect of Project Activities on the dune system, beach and intertidal zone (PR#29191) D, C.</p>
Coastal Flora and Fauna	<p>Protect the ecological values of coastal habitat No reduction in habitat values for significant species. Minimise loss of significant species' individuals. No removal of coastal vegetation (PR#30192) D, C.</p>	<p>Develop and implement methods and management systems designed to ensure no adverse effect on coastal flora and fauna from Project Activities including (PR#30194) D, C:</p> <ul style="list-style-type: none"> • Induction programs for project personnel. • Implement management measures to minimise access of construction personnel to Williamsons Beach and foreshore reserve, particularly during Hooded Plover breeding season (August to February).* • Collaborate with Parks Victoria and DSE to achieve additional protective measures such as fencing off portions of the beach used by nesting Hooded Plovers to exclude people, uncontrolled dogs and increased fox and cat control.* • Ensure that external lights are kept to a minimum, that they are positioned as low to the ground as is practicable and that they are shielded to avoid light spill upward and toward the foreshore, beach and sea.* • Implement a program of monitoring the locations and breeding success of resident Hooded Plovers along Williamsons Beach to measure the impact of Project Activities and inform opportunities for mitigation. This should continue at least monthly from prior to construction until the plant is in routine operation.* • Manage helicopter use to avoid low level flyovers of Williamsons Beach to minimise impacts on Hooded Plovers.

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Issue	Objective/Performance Criteria	Target/Performance Requirements
		<ul style="list-style-type: none"> Monitor human activity in the vicinity of the Hooded Plover nesting area on Williamsons Beach.* Implement a program of monitoring for the Orange-bellied Parrot from March to September prior to and during construction activities and inform opportunities for mitigation.*
Marine amenity – recreational	<p>Minimise disruption to marine recreational activities Outside any marine exclusion zone (for diving safety) no significant impact on diving, surfing, recreational fishing or marine boating activities (PR#34219) C.</p>	<p>Develop and implement methods and management and systems to minimise disruption to recreational activities (PR#34221) C. Turbidity or colouration impacts from the outlet should not be visible from the shoreline (PR#34222).</p>
Commercial fishing and marine tourism	<p>Minimise disruption to the commercial fishing industry and marine tourism Minimise restrictions on commercial fishing and marine tourism activities (PR#35223) C.</p>	<p>Develop and implement methods and management systems that seek to achieve effective consultation and communication with the commercial fishing and marine tourism industry in relation to potential restrictions and disruptions during construction (PR#35225) C.</p>
Underwater noise and vibration – marine diving activities	<p>Protect marine diving activities from underwater noise and vibration: no significant impact outside any marine exclusion zone on marine diving activities (PR#38232) D, C.</p>	<p>Outside any exclusion zone, minimise exposure of marine recreational users to underwater (continuous) noise levels greater than 145 dB re 1µPA (PR#38234) C. Develop, implement and maintain methods and management systems that ensure effective consultation and communication with marine divers in relation to marine noise and vibration (PR#38235) C.</p>
Marine – navigation	<p>Protect coastal access on marine waters for vessels: Minimise impact on safe passage of non-Project vessels along the coast (PR#39236) C.</p>	<p>Identify and implement any requirements for notifications for vessel movements by Transport Safety Victoria (PR#39238) C.</p>

D = Design phase requirement; C= Construct phase requirement

* Terrestrial PRs. These are addressed through the D&C Plant and General Area EMP.

All PRs from Project Deed Schedule A of Appendix S3 are contained within the D&C Marine Area EMP Attachment G – Environmental Obligations Register. The Environmental Compliance Tracker tracks conformance with these PRs and is updated regularly by the TDJV Environmental Coordinator and Area Environmental Managers.

3 Legal, regulatory, licence, permits and approval requirements

This sub plan has been developed in accordance with the following legislation and standards:

- *Environment Protection Act, (1970)*
 - State Environment Protection Policy (Waters of Victoria) (SEPP WoV)
- *Fisheries Act, (1995)*
- *Coastal Management Act, (1995)*
- *Marine Act, (1988)*
 - Marine Regulations 2009
 - Vessel Operating & Zoning Rules for Victorian Waters 2010
- *Port Services Act, (1995)*
 - Port Services (Local Ports) Regulations 2004
- *Pollution of Waters by Oil and Noxious Substances Act, (1986)*
 - Pollution of Waters by Oil and Noxious Substances Regulations 2002
- Bass Coast Shire Council bye-laws.

The legislative and contractual requirements for the D&C Marine Area works are summarised in:

- D&C Marine Area EMP – Attachment E – Environmental Legislation Register
- D&C Marine Area EMP – Attachment F – Environmental Licence, Permit and Approval Register
- D&C Marine Area EMP – Attachment G – Environmental Obligations Register.

The applicable PRs from Project Deed Schedule A of Appendix S3 are provided in Table 2-1.

Under the Project Deed the D&C EMP, all sub plans and any changes to these must be endorsed by the State, who may refer aspects to relevant agencies.

The EPA and any other relevant agencies will be consulted with regard to any specific approval requirements of this environmental sub plan. The requirements of any permits, licences or approvals obtained will be placed in the Environmental Licence, Permit and Approval Register on receipt and updated in the Environmental Compliance Tracker.

4 Existing conditions and issues

General location of activities in relation to the coast can be found in Attachment B – Project Components. A photograph of the coastal area applicable to this sub plan is given in Figure 4-1 below.



Figure 4-1. Coastline adjacent to the project area showing the plant site under construction in June 2010 and the Powlett River in the foreground.

4.1 Coastal processes and integrity

A variety of assessments and studies, included in the Environment Effects Statement (EES), have identified the following features of coastal processes and integrity in the VDP Marine Works Area:

- The project area encompasses sub-maximal, high energy coastline in the Central Victoria Bioregions which is exposed to prevailing westerly weather and swells. The shore consists of a surf beach, vegetated dunes and intertidal rocky platforms.
- Moderate to moderately high-relief rocky reefs are present in the subtidal zone, supporting productive kelp beds
- Low to medium profile reef covers much of the area between 10 and 25m depth, supporting a variety of seaweed and kelp communities and habitats.

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- Reef in deeper areas, 25-35m depth, is generally low profile reef interspersed by sand patches. Although reduced in area, these deeper reefs support ecologically important communities. There is considerable sand coverage in patches throughout the project area and more extensive sand beds occur at 30-40m depth.
- Wave action and ground surge frequently causes suspension of sediments and organic detritus.
- The water column generally has the properties of central Bass Strait waters: an influx of South Australian Current waters during the winter months, but are relatively stagnant with little influx during the summer months, leading to nutrient depletion.
- The local waters of the project area are also highly influenced by coastal discharges, such as the Powlett River and tidal outflows from Western Port. There are weak tidal currents and net westward water movements.

4.2 Local access and activities

A summary of the EES and other available background information has identified the following local access and activity requirements in the VDP Marine Works Area and adjacent to the project site:

- Marine recreation activities are anticipated to include sea kayaking, boating, surfing, fishing, scuba diving and other water based sports.
- Recreational boating occurs along the coastline between Phillip Island and Inverloch with Newhaven and San Remo boat ramps being popular launch sites.
- The Bass Coast Kayak Club uses the area off Williamsons Beach for sea kayaking, members meeting weekly Sept-May at the mouth of the Powlett River.
- Recreational surfers use the surf zone off Williamson's beach adjacent to the marine area site for surfing throughout the year.
- Game fishing, ocean angling and shore-based fishing occur on Williamsons beach and adjacent areas primarily on weekends and evenings throughout the year.
- Swimming at Williamson's beach is somewhat limited due to high energy surf and is generally confined to the summer months.
- Commercial uses of the marine environment adjacent the project site is understood to comprise marine tourism and fisheries including Abalone diving, Rock Lobster, Finfish, Scallops, Southern Squid Jig and King George Whiting.

5 Environmental risk

An environmental risk assessment has been carried out for the D&C Marine Area works. This assessment is contained in the Environmental Risk Register, Attachment C of the D&C Marine Area EMP. Table 5-1 summarises the potential hazards from project activities, potential impacts of these hazards and the risk of occurrence as rated by the environmental risk assessment.

Table 5-1. Summary of marine area risk assessment for Coastal Processes and Activities

Activity posing hazard	Risk/ Potential Impact	Inherent Risk (before controls)	Control Measures Reference (Att I1.1)
Marine Structures: <ul style="list-style-type: none"> Siting design Intake and Outlet design 	<ul style="list-style-type: none"> Intake of sand Adverse effects on coastal processes (sand movements, wave patterns and currents) Loss to the integrity of the coastal assets Reduced habitat quality 	Extreme	#1,2, 4, 5, 6, 7, 8
General shipping, vessel movements	<ul style="list-style-type: none"> Interference of local and commercial users by project vessels Impacts on diving, surfing, recreational fishing or marine boating activities Restrictions on commercial fishing and marine tourism activities 	Moderate	#3, 5, 7, 9 10-14
General shipping, vessel movements	<ul style="list-style-type: none"> Interference of local and commercial users by project vessels Impacts on the safe passage of non-Project vessels along the coast 	Moderate	#3, 11, 12, 14
General activities (offshore)	<ul style="list-style-type: none"> Impact to physical integrity of the dune system, beach and intertidal zone 	Moderate	#4-8

Attachment C of the D&C Marine Area EMP should be consulted for a comprehensive assessment of these risks.

6 Control, management and mitigation measures

Attachment I1.1 describes a range of mitigation and control measures that will be used to minimise and manage potential impacts to coastal processes and activities.

The measures in Attachment I1.1 are designed to address potential impacts from the risks outlined in Section 5 as well as deliver on the objectives, targets and in particular the PRs listed in Section 2. They include requirements and responsibilities for design, construction, evaluating performance and reporting.

Attachment I1.1 also references Design Packages (DPs) in design-related control measures. PRs that relate to design are addressed in accordance with the Design Management Plan (PL-TDV-PM-0-X-000-0011-0-00).

Attachment I1 – Coastal Processes and Activities Sub Plan

Changes to coastal processes are likely to be observed over a significant temporal period. Any changes will be observed through a component of an operational marine monitoring program. Based on this, minimising impacts to coastal processes is largely focussed on the design phase while managing potential impacts will largely occur throughout Operation and Maintenance (O&M).

Conversely, potential impacts to coastal activities are most likely to occur during construction and are therefore managed accordingly.

6.1 Associated sub plans

Numerous objectives, targets and in particular PRs, as listed in Section 2, are relevant to multiple D&C Marine Area EMP Sub Plans. This has occurred in many cases in order to allow key PRs to be managed in more specific detail. In the case of Coastal Processes and Activities a number of objectives, targets and PRs are also managed outside of this sub plan as follows:

Attachment I5 – Helicopter Management Sub Plan (TDV-0-EN-SV-0013.I5):

- Helicopter operations, for personnel transfer to the JUB and aerial photography of the project site, present a risk of disturbance to sensitive fauna (hooded plovers and marine mammals) in the Marine Works Area. The Helicopter Management sub plan and its attachments provide management measures to mitigate the potential impacts of TDJV helicopter operations on both the ecological values of coastal habitat and neighbourhood amenity.

Attachment I6 – Marine Pest and Pathogen Management Sub Plan (TDV-0-EN-SV-0013.I6):

- VDP Marine Area construction works will involve significant vessel and equipment movements into the project area from outside the project bioregion. If such vessels and equipment (including divers/dive gear) have been exposed to marine pests, i.e. through docking at infested ports, this provides a pathway for the translocation of marine pests and pathogens to the marine works area (site). Combined with the fact that the project will result in some disturbed habitat and artificial structures, which are easily colonised, the risk of marine pest translocation is significantly increased. The Marine Pest and Pathogen management sub plan contains control measures with a primary emphasis on prevention, reinforced by response measures in the form of ongoing monitoring and contingency planning to adequately mitigate the potential negative impacts of marine pests and pathogens. This will protect marine flora and fauna as well as recreational and commercial diving and fishing activities in the area.

Attachment I7 – Underwater Noise Management Sub Plan (TDV-0-EN-SV-0013.I7):

- The riser drilling process may generate low frequency noise. While this is not anticipated to adversely impact recreational divers, this sub plan provides measures including noise monitoring in order to protect marine divers and recreational users alike. The sub plan also details management measures to ensure the protection of marine mammals such as whales.

6.2 Marine Exclusion Zone

A temporary Marine Exclusion Zone (MEZ) will be set up and maintained during Area 1 Marine Team (A1MT) construction works (from just prior to the laying of moorings in late September 2010 until the Jack Up Barge (JUB) and Offshore Support Vehicle (OSV) demobilise immediately post Marine Area Works completion in May 2011). The MEZ will help protect and maintain the safety of A1MT staff working offshore and marine recreational users alike by providing an area, isolated from the public, for the manoeuvring of project vessels and equipment in the vicinity of the marine intake and outlet riser installation locations.

The proposed MEZ will be identified by six lit buoys configured as per the General Marine Area SEP (TDV-0-EV-PL-0015). The buoys are not proposed to be remotely monitored as VDP operations will occur on a 24 hour a day basis and thus the MEZ can be easily monitored from the raised deck of the JUB. The MEZ will meet PS & PR requirements as follows:

- Be minimised to limit impact upon marine recreational users and commercial fishing and marine tourism;
- Meet the requirements of Appendix S3 (Environmental Requirements); and
- Be at least 500 metres away from the beach or shore.

Upon approval by Transport Safety Victoria (TSV), the marine exclusion zone will be communicated through the following methods:

Transport Safety Victoria:

- Formally gazette the MEZ with a Notice to Mariners.

Stakeholder and Community Relations Team:

- Specific consultation with key affected individuals and groups;
- Notices in local newspapers;
- Notices posted at local boat launching facilities;
- Notices provided to local fishing supplies shops/ dive shops, or similar; and
- Works Notifications which will be provided to AquaSure to be uploaded onto the AquaSure website.

Finally the MEZ will be enforced, in the event that non-project vessels/persons enter the MEZ, through the following (as outlined in Section 9 Contingency Measures):

- Liaise with the vessel by marine radio (CB, VHF or HF).
- Approach the vessel/person using a guard boat if applicable.
- Consult with affected persons in order to ensure exclusion zone requirements are understood.
- If vessels/persons are unresponsive to requests to vacate the exclusion zone contact the Victorian Water Police and Transport Safety Victoria.

Remediation: If vessels/persons were found to be unaware of the Marine Exclusion Zone requirements ensure follow up communication/consultation is completed to reduce the likelihood of reoccurrence.



7 Site environmental plans

Site Environmental Plans (SEPs) have been developed for Marine Area Works that detail practical environmental management measures implemented to minimise potential impacts of construction activity on the environment and community.

The information contained in the SEPs is presented in pictorial and tabular drawing format. This is to make them easy to use by all site personnel, consultants and subcontractors. SEPs are updated to reflect operating practices on a regular basis.

The coastal processes and activities controls set out in the General Marine Area SEP (TDV-0-EV-PL-0015) are drawn from this sub plan.

SEPs are held by the Marine Area Environment Manager and are provided on site (onboard TDJV and subcontractor vessels) as applicable. The General Marine Area SEP (TDV-0-EV-PL-0015) will be held onboard all TDJV and subcontractor vessels at all times.

8 Evaluating performance and reporting

Environmental audits and site environmental inspections (SEIs) are scheduled to detect where PRs are not being met with appropriate corrective actions developed to address these issues as they arise. Schedules, responsibilities and reporting procedures are set out in the Monitoring, inspection, audit and reporting schedule - Attachment L of the D&C Marine Area EMP.

Monitoring will be undertaken by appropriately qualified personnel, in accordance with the appropriate standards and guidelines as specified in Attachment L of the D&C Marine Area EMP.

9 Contingency measures

Contingency measures have been developed and are detailed below. The control measures table (Attachment I1.1) focuses on preventative measures.

All environmental incidents will be responded to in accordance with the Marine Area Environmental Incident Response Procedure (EIRP). The EIRP provides project specific details for the identification of and response to potential environmental related incidents for Marina Area Works during the D&C phase of the VDP. It provides guidance on strategies to manage potential and actual incidents as well as classification, notification, follow-up and reporting requirements.

The environmental risk assessment has identified the following circumstances that could occur outside normal operating conditions:

- Disruption of marine recreational activities (both within and outside the exclusion zone).
- Failure to adhere to vessel protocols resulting in potential safety impacts to recreational boat users.
- Unforeseen contamination of the marine environment due to an incident such as a collision at sea, resulting in a spill – Managed through Attachment I2 – Hazardous Materials.

If these circumstances occur, the contingency measures outlined in Figure 9-1 will be implemented.

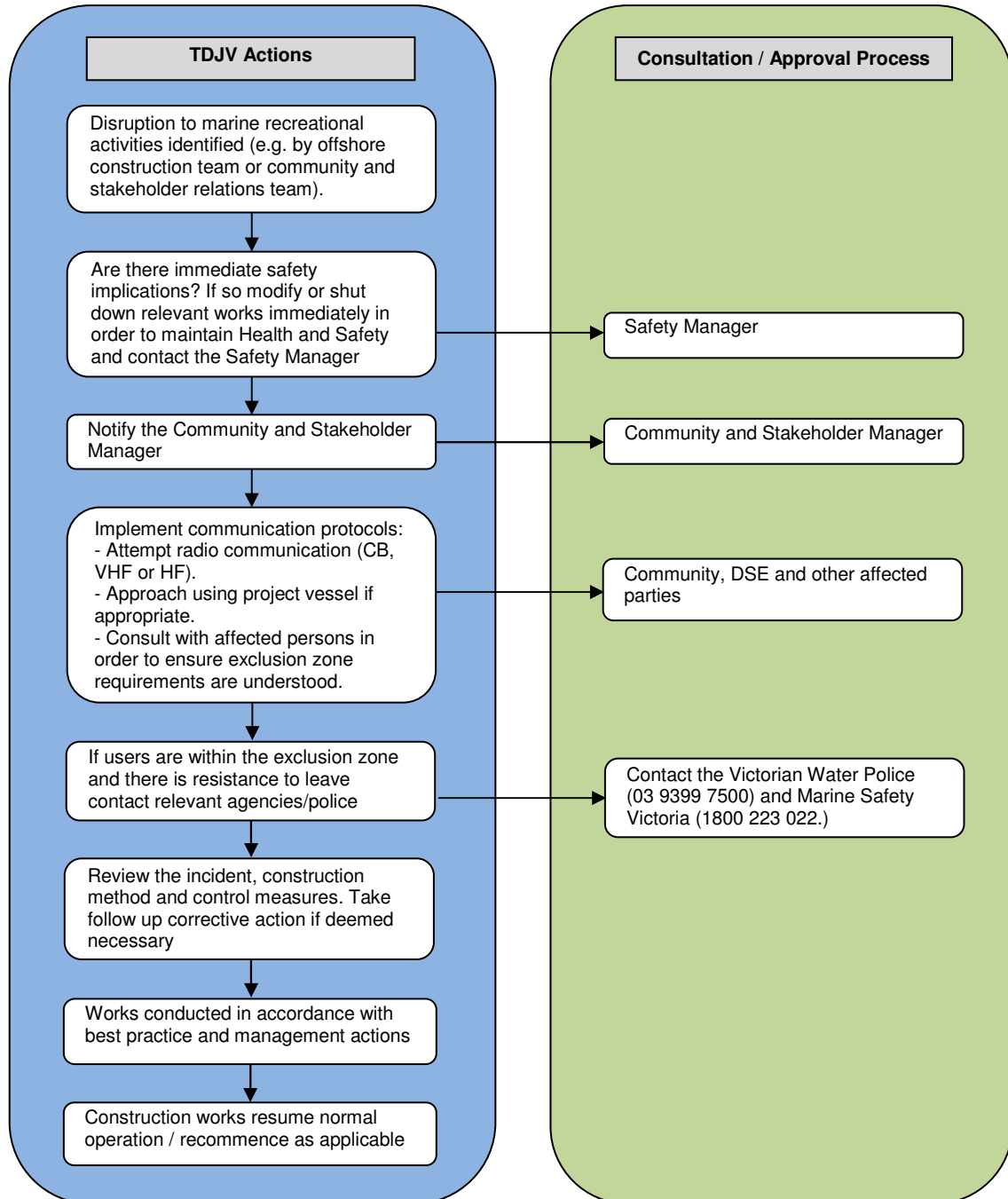


Figure 9-1. Contingency Measures



Attachment I1 – Coastal Processes and Activities Sub Plan

10 **References**

- Mitchell K, Wimbush N, Harty C, Lampe G, Sharpley G (2008) Victorian Desalination Project Environmental Effects Statement. Report of the Inquiry. Report to Minister for Planning, Victoria



Attachment I1 – Coastal Processes and Activities Sub Plan

**ATTACHMENT I1.1 Coastal Processes and Activities
– Control Measures Table**



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ATTACHMENT I1.1 COASTAL PROCESSES AND ACTIVITIES – CONTROL MEASURES TABLE

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
1	Marine Construction and Operation Footprint	28183	DP 1-0035 Marine Intake Structures and Risers Design Package: Minimising the size and footprint of permanent structures on the seabed by using risers from subterranean tunnels, no surface pipes and small number of risers (two each for the intake and outlet).	Design Package Manager	Design	Design Package	
2	Marine Construction and Operation Footprint	28183	DP 1-0015 Intake Tunnel Alignment Design Package; and DP 1-0036 Outlet Tunnel Alignment Design Package: No disturbance or trenching of seabed and coastal structures. Achieved by tunnelling from well behind the shore habitats.	Design Package Manager	Design	Design Packages	
3	Safe Vessel Operation	28183	All vessels to be operated in accordance with Transport Safety Victoria (TSV) and International Ship Management (ISM) Code requirements as applicable. JUB Towing and Positioning Procedure. NB. All procedures include measures to minimise incidents and vessel collisions. A marine exclusion zone shall be established and gazetted. The marine exclusion zone is detailed in The General Marine Area SEP (TDV-0-EV-PL-0015).	Offshore Construction Manager	Construct	Inspections & Checklists	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check												
4	Assessing the effect of Project activities on coastal processes	28183, 28186 & 28187	<p>The following monitoring programs will monitor and assess the status of coastal processes through any changes to coastal structures (beach formations, etc.). Monitoring will be conducted before, during and after construction.</p> <p>Coastal Processes and Integrity Monitoring:</p> <table border="1"> <thead> <tr> <th>Purpose</th> <th>Components</th> <th>Design</th> </tr> </thead> <tbody> <tr> <td colspan="3">Protection of Coastal Processes and the Physical Integrity of the Dune System, Beach and Intertidal Zone</td> </tr> <tr> <td>Monitor status of coastal processes through any changes to coastal structures.</td> <td> <p>Mapping of geomorphology: Aerial mapping of coastal features (dune, beach, intertidal reef, etc) to detect impacts on coastal structures through changes to coastal processes Ground truthing through site visitation and georeferenced observations.</p> </td> <td>Three aerial surveys, one before construction of the marine structures, one just after construction and one two years after construction.</td> </tr> <tr> <td>Monitor status of coastal integrity and quality of key and sensitive features.</td> <td> <p>Integrity of coastal features: Repeated standardised observations and photographic records of fixed points on sensitive features (<i>e.g.</i> vegetation, track blowouts) Mapping of observations, this may be in conjunction with mapping of geomorphology.</p> </td> <td>Once before, once during construction of the marine structures and first year of operation.</td> </tr> </tbody> </table>	Purpose	Components	Design	Protection of Coastal Processes and the Physical Integrity of the Dune System, Beach and Intertidal Zone			Monitor status of coastal processes through any changes to coastal structures.	<p>Mapping of geomorphology: Aerial mapping of coastal features (dune, beach, intertidal reef, etc) to detect impacts on coastal structures through changes to coastal processes Ground truthing through site visitation and georeferenced observations.</p>	Three aerial surveys, one before construction of the marine structures, one just after construction and one two years after construction.	Monitor status of coastal integrity and quality of key and sensitive features.	<p>Integrity of coastal features: Repeated standardised observations and photographic records of fixed points on sensitive features (<i>e.g.</i> vegetation, track blowouts) Mapping of observations, this may be in conjunction with mapping of geomorphology.</p>	Once before, once during construction of the marine structures and first year of operation.	Marine Area Environment Manager	Design, Construct & Operation	Monitoring Records and Assessment	
Purpose	Components	Design																	
Protection of Coastal Processes and the Physical Integrity of the Dune System, Beach and Intertidal Zone																			
Monitor status of coastal processes through any changes to coastal structures.	<p>Mapping of geomorphology: Aerial mapping of coastal features (dune, beach, intertidal reef, etc) to detect impacts on coastal structures through changes to coastal processes Ground truthing through site visitation and georeferenced observations.</p>	Three aerial surveys, one before construction of the marine structures, one just after construction and one two years after construction.																	
Monitor status of coastal integrity and quality of key and sensitive features.	<p>Integrity of coastal features: Repeated standardised observations and photographic records of fixed points on sensitive features (<i>e.g.</i> vegetation, track blowouts) Mapping of observations, this may be in conjunction with mapping of geomorphology.</p>	Once before, once during construction of the marine structures and first year of operation.																	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
5	Protection of the physical integrity of the dune system, beach and intertidal zone	29188, 29190, 30192 & 30194	Induction programs for project personnel: Includes education regarding sensitive areas, conservation exclusion zones, transport methods, monitoring and the detection of integrity status and reporting of events.	Marine Area Environment Manager	Construct	Induction Records	
6	Assessing the effect of Project activities on the dune system, beach and intertidal zone	29188, 29190 & 29191	Coastal Processes and Integrity (as per control measure #5) <ul style="list-style-type: none"> Monitor status of dune system, beach and intertidal zone before, during and after construction of the marine structures. Monitoring of integrity status. 	Marine Area Environment Manager	Construct and Operation	Monitoring Records	
7	Outlet Plume	34222	DP 1-0003 Hydrodynamic Model Design Package: Design of diffusers to avoid surface strike, without compromising risks of poor dilution and seabed strike (causing greater biological impacts).	Design Package Manager	Design	Design Package	
8	Outlet Plume	34222	DP 2-0001 Plant Process Design Concept Design Package: <ul style="list-style-type: none"> Avoid additives and processes in the Plant that cause effluent colouration. DP 1-0003 Hydrodynamic Model Design Package: <ul style="list-style-type: none"> Turbidity and/or colouration impacts from the outlet should not be visible from the shoreline. 	Design Package Manager	Design	Design Packages	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
9	Construction Impacts on recreation sectors	34221	<p>Consultation with recreation sectors will occur to ensure that they are informed regarding exclusion zone requirements, potential underwater noise impacts and any other relevant information. Communication Protocols will include.</p> <p><u>Transport Safety Victoria:</u></p> <ul style="list-style-type: none"> Formally gazette the MEZ with a Notice to Mariners. <p><u>Stakeholder and Community Relations Manager:</u></p> <ul style="list-style-type: none"> Specific consultation with key affected individuals and groups; Notices in local newspapers; Notices posted at local boat launching facilities; Notices provided to local fishing supplies shops/ dive shops, or similar; and Works notifications provided to AquaSure to be displayed on their website. <p><u>A1MT:</u></p> <ul style="list-style-type: none"> Contact using radio (CB, VHF or HF); and Use of project vessels as required (by A1MT). 	Stakeholder and Community Relations Manager; and Offshore Construction Manager	Construct	Community Involvement Plan Consultation Manager database	
10	Construction Impacts on the commercial fishing industry and marine tourism	35223 & 35225	<p>Consultation with fishing, commercial and tourism sectors and advising them of the nature of construction activities and timing; possible exclusion zones and potential risks to their fishing gear and catches; and modifications to accommodate operators wherever practical.</p>	Stakeholder and Community Relations Manager	Construct	Community Involvement Plan Consultation Manager Database	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
11	Extent of temporary construction exclusion zone	34219, 34221, 35223 & 35225	In consultation with Transport Safety Victoria, minimise, to the extent possible, the size of construction exclusion zone. <ul style="list-style-type: none"> Minimum distance of 500 m from the high tide line The marine exclusion zone is detailed in The General Marine Area SEP (TDV-0-EV-PL-0015).	Offshore Construction Manager	Construct	Marine Exclusion Zone SEP Transport Safety Victoria Correspondence Works Notifications Inspections & Checklists	
12	Period of temporary construction exclusion zone	34219, 34221, 35223 & 35225	Minimise the period of exclusion during construction: <ul style="list-style-type: none"> Implement just prior to anchor laying (scheduled for September 2010) Demobilise immediately post Marine Area Works completion (scheduled May 2011) 	Offshore Construction Manager	Construct	Marine Exclusion Zone Transport Safety Victoria Correspondence Works Notifications	
13	Construction Impacts on marine recreational divers	38232, 38234 & 38235.	The Community Involvement Plan will ensure effective consultation and communication with marine divers in relation to marine noise and vibration through: <ul style="list-style-type: none"> Works notifications The AIMT will aid with consultation though the implementation of the following as required: <ul style="list-style-type: none"> Radio communication; The use of project vessels boats; and Potential modification of the exclusion zone and/or Work Packs as required. 	Offshore Construction Manager; and Stakeholder and Community Relations Manager	Construct	Community Involvement Plan Works Notifications	



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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
14	Protect coastal access	39236 & 39238	Identifying and implementing any requirements for notifications of vessel movements by Transport Safety Victoria in developing and approving relevant Work Packs.	Offshore Construction Manager	Construct	Tow Permit Transport Safety Victoria Correspondence / Meeting Records	

* The *Responsibilities* column refers in many cases to senior positions within the project organisation, due to the changing nature of project teams. In practice some responsibilities may be delegated by the person nominated.