

Victorian Desalination Project



D&C Utilities Environmental Management Plan
 Attachment I9 – Water Quality and Erosion Management Sub Plan

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Definitions and Acronyms

The following Definitions and Acronyms are used in this document:

ANZECC	Australia and New Zealand Environment and Conservation Council
Class One Environmental Incident	Class One Environmental Incidents create permanent or long term damage to the environment. This damage will result in the environment taking 12 months or more to return to pre-existing conditions or costs in excess of \$50,000 to remediate. (See AEMP Attachment K).
Class Two Environmental Incident	Class Two Environmental Incidents create short to medium term damage to the environment. This damage will result in the environment taking up to 12 months to return to pre-existing conditions or costs in excess of \$10 000 but not exceeding \$50,000 to remediate. (See AEMP Attachment K).
Class Three Environmental Incident	Class Three Environmental Incidents typically cause short term or nuisance damage. The damage is easily rectified usually within one day. Class 3 incidents do not cause medium or long term damage or costs less than \$10 000 to remediate. (See AEMP Attachment K).
CMA	Catchment Management Authority
CWMS	Construction Work Method Statement
DEWHA	Department of the Environment, Water, Heritage and the Arts
D&C	Design and Construct Phase of the VDP
DPI	Department of Primary Industries
DSE	Department of Sustainability and Environment
EES	Environment Effects Statement
EIRP	Environmental Incident Response Plan
EMP	Environmental Management Plan
EPA	Victorian Environment Protection Authority
EP Act	<i>Environment Protection Act 1970</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EVC	Ecological Vegetation Class
FFG Act	<i>Flora and Fauna Guarantee Act 1988 (Vic.)</i>
JSEA	Job Safety Environmental Analysis
NVMF	Native Vegetation Management Framework
O&M	Operation and Maintenance Phase of the VDP
OHS	Occupational Health and Safety
Performance	The Performance Criteria outline the overarching requirements based on the



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 environmental objective for each Subject Area of Schedule A of Appendix S3 of the
 Project Scope and Project Requirements

Criteria	environmental objective for each Subject Area of Schedule A of Appendix S3 of the Project Scope and Project Requirements
Pollution of Waters	<p>A person shall not pollute any waters so that the condition of the waters is so changed as to make or be reasonably expected to make those waters—</p> <p>(a) noxious or poisonous;</p> <p>(b) harmful or potentially harmful to the health, welfare, safety or property of human beings;</p> <p>(c) poisonous, harmful or potentially harmful to animals, birds, wildlife, fish or other aquatic life;</p> <p>(d) poisonous, harmful or potentially harmful to plants or other vegetation; or</p> <p>(e) detrimental to any beneficial use made of those waters.</p> <p>(s.39, <i>Environment Protection Act 1970</i>)</p>
PR	Performance Requirements
Project Area	Refers to all areas designated for the project as defined in the Project Deed including both the plant area and the utilities corridor
PS&PR	Project Scope and Project Requirements
SEP	Site Environmental Plans
SEPP	State Environment Protection Policy
SEPP (GOV)	State Environment Protection Policy (Groundwaters of Victoria)
SEPP (WOV)	State Environment Protection Policy (Waters of Victoria)
TDJV	Thiess Degremont Joint Venture
TSS	Total Suspended Solids
Utilities corridor	Construction footprint of the Victoria Desalination Project transfer pipeline, power supply and associated utilities
VDP	Victorian Desalination Project
VDP Utilities	Collective term used to refer to the power supply, transfer pipeline and communications components of the VDP including compensations reaction stations, surge vessels and the booster pump station. Refer to Section 1.4 of the Utilities Area EMP for further description of these utilities.
WAP	Work Area Packages
WP	Work Packs



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1 Purpose and scope

This Water Quality and Erosion Management Sub Plan describes the existing surface water and groundwater conditions, including erosion and sediment control aspects, and the management measures required to mitigate the potential negative impacts to these aspects from the design and construction (D&C) of the Victorian Desalination Project (VDP) transfer pipeline and power supply (collectively referred to as the utilities corridor).

This sub plan must be read in conjunction with the Environmental Management System (EMS) Manual, D&C Environmental Management Plan (D&C EMP) and the D&C Utilities Area EMP. This Sub Plan forms an attachment to the D&C Utilities 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 influence water quality and erosion management.

Specific management measures from this and other environmental sub plans have been incorporated into Work Area Packages (WAP) and Work Packs (WP) which include Construction Work Method Statements (CWMS), Site Environmental Plans (SEP) and Job Safety and Environmental Analysis (JSEA's) where applicable.

The following sub-plans will be implemented in conjunction with this plan:

- ~ Acid Sulfate Soil Management Plan
- ~ Waterways and Wetlands Sub Plan

2 Objectives and Targets

The objective of this sub plan is to ensure appropriate controls are in place to minimise impacts to surface water and groundwater during construction of the VDP Utilities and to ensure project objectives, targets and obligations, including PRs and associated criteria, are met.

2.1 Performance and requirements

Table 1 outlines the relevant water quality and erosion management 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. Non-numbered entries in Table 1 have been identified through earlier rounds of agency consultation.

Table 1: Environmental objectives, targets and performance requirements

Issue	Objective/Performance Criteria	Target/Performance Requirements
Surface water quality	<p>Protect and maintain surface water quality:</p> <p>Minimise impacts on surface water quality. (PR#: 15103) D,C</p>	<p>Develop and implement construction methods and management systems that seek to maintain surface water quality consistent with State Environment Protection Policy (Waters of Victoria) and EPA Best Practice Environmental Management – Environmental Guidelines</p>

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Issue	Objective/Performance Criteria	Target/Performance Requirements
	<p>Comply with State Environment Protection Policy (Waters of Victoria) (PR#: 15103) D,C</p> <p>Achieve the Urban Stormwater Best Practice Environmental Management Guidelines performance objectives during construction and operation</p> <p>Comply with EPA Best Practice Environmental Management – Environmental Guidelines for Major Construction Sites (1996)</p> <p>Stormwater treatment system is to be fully integrated into the overall detail design of the Desalinated Water Supply System and its power supply and include spill management infrastructure to protect surface water quality</p> <p>(PR#: 15103) D,C</p>	<p>for Major Construction Sites (1996) (PR#:15105) C</p> <p>Design and construct Temporary Works to isolate construction runoff from catchment runoff and treat it prior to discharge to receiving waterways (PR#:15106) D,C</p> <p>Establish a surface water quality monitoring and reporting program in consultation with the EPA and West Gippsland Catchment Management Authority for all waterways that may be affected by the Project Activities (PR#:15107) C</p> <ul style="list-style-type: none"> - Avoid release of hazardous substances to soil or waterways C - Maximise surface water reuse where ever possible D,C <hr/> <ul style="list-style-type: none"> - Prevent the release of sediment laden water to waterways. Only discharge to construction water to waterways following authorisation from relevant waterway authority and EPA. Notify EPA and relevant waterway authority of uncontrolled release of construction water to waterway. C
Groundwater	<p>Protect the beneficial uses of groundwater:</p> <p>Minimise impact on groundwater</p> <p>Minimise impacts on the interaction between groundwater and flora and fauna habitats, including waterways, wetlands and dunes</p> <p>Comply with the Water Act 1989 and State Environment Protection Policy (Groundwaters of Victoria) requirements for groundwater quantity, quality, availability and flow including meeting any Government Agency or Water Authority licensing requirements</p> <p>(PR#:14098) D,C</p>	<p>Develop and implement methods and management systems which do not cause deterioration to groundwater systems including:</p> <ul style="list-style-type: none"> • Consideration of the interaction between surface water and groundwater • Recognition of the interaction with flora and fauna habitats, including wetlands and dune vegetation • Management of extracted groundwater seeking to maximise potential reuse and disposal • Limiting any impact on, or diminution of, the existing flow regime in waterways, wetlands or groundwater aquifers arising from the interception and/or drainage of groundwater • Minimise any reduction of existing groundwater recharge to wetlands resulting from the construction or operation of the Desalinated Water Supply System <p>(PR#:14100) D,C</p> <p>Monitor groundwater quality and levels during project construction in accordance with the requirements of the EPA and/or relevant Government Agency or Water Authorities (PR#:14102) C</p> <ul style="list-style-type: none"> - Zero incidents or release of contaminated groundwater

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Issue	Objective/Performance Criteria	Target/Performance Requirements
		to environment. C - Maximise groundwater reuse wherever possible D,C - No identifiable drawdown effect on groundwater past construction activities C
Erosion and sediment control	Minimise erosion and sediment movement: Comply with EPA Best Practice Environmental Management – Environmental Guidelines for Major Construction Sites (1996) and EPA Construction Techniques for Sediment Pollution Control (1991) (PR#:16109) C - Minimise vegetation removal C	Develop, implement and maintain construction methods and management systems consistent with EPA Best Practice Environmental Management – Environmental Guidelines for Major Construction Sites (1996) and EPA Construction Techniques for Sediment Pollution Control (1991) to limit erosion and sediment movement by: <ul style="list-style-type: none"> • Identifying highly erodible soil and avoiding activities involving disturbance of these areas where possible. Where avoidance is not possible, additional control measures to be implemented for these identified areas • Limiting clearance of vegetation, particularly along streams • Designing drainage outlets and diversion channels to limit flow velocities and erosion. (PR#:16111) C No increase in on site eroded features C

D = Design phase requirement; C= Construct phase requirement

All PRs from Project Deed Schedule A of Appendix S3 are contained within the D&C Utilities 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.

2.2 Water quality standards

State Environment Protection Policy (Waters of Victoria) (SEPP WoV) sets the objectives for water quality in Victoria. Since many of the waterways relevant to the utilities corridor are heavily modified, background levels of water quality are often outside of these objectives. Part 5 of SEPP WoV Schedule F8 indicates that for cases where background water quality is outside the SEPP objective, maintenance of the background level becomes the objective.

The Dewatering Procedure PLV-3-EV-PR-0004, also included as Attachment I9.1 to this sub plan, contains details on target water quality for water discharge options off-site as well as for reuse options onsite.

3 Legal, regulatory, licence, permits and approval requirements

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



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~ *Environment Protection Act, (1970)*

- State Environment Protection Policy (Groundwaters of Victoria) (SEPP GOV)
- State Environment Protection Policy (Waters of Victoria) (SEPP WOV)

There are several guidelines that are used in Victoria to assist in determining the level of management necessary to meet SEPP requirements. These are:

- ~ Construction Techniques for Sediment Pollution Control Measures, EPA Victoria, 1991
- ~ Urban Stormwater Best Practice Environmental Guidelines, CSIRO, 1999
- ~ EPA Best Practice Environmental Management – Environmental Guidelines for Major Construction Sites (1996).

The legislative and contractual requirements for the D & C utilities corridor are summarised in:

- ~ D & C Utilities EMP – Attachment E – Environmental Legislation Register
- ~ D & C Utilities EMP – Attachment F – Environmental Licence, Permit and Approval Register
- ~ D & C Utilities EMP – Attachment G – Environmental Compliance Tracker.

The applicable PRs from Project Deed Schedule A of Appendix S3 are provided in Table 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 Environment Protection Authority (EPA) and any other relevant agencies and stakeholders (including Catchment Management Authorities (CMAs) will be consulted with regard to any specific approval requirements in relation to this environmental sub plan. The requirements of any permits, licences and 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

4.1 Surface water

There are many waterways ranging from rivers, streams and drains crossed by the utilities corridor. Many of these drains rarely contain water or are ephemeral and dry for several months of the year. The major waterways crossed by the utilities include the Powlett, Lang Lang and Bass Rivers and associated tributaries.

The utilities are within the low-lying elevation Eastern Plains, which consist of flat or gently undulating surfaces. The plains include the broad lowlands of the drained Koo Wee Rup swamp, the Bass River and Powlett floodplains. Several main waterway systems consist of constructed levees that are located above the banks to protect the adjacent farmland areas from flooding. The waterways that intercept the pipeline/cable that have constructed levees are Bunyip Main Drain, Yallock Creek/ Yallock Outfall, Yallock Cut and Levee, McDonald Catchment Drain, Cardinia Catch Drain, Lower Toomuc Creek, Deep Creek Catch Drain and Lower Gum Scrub.



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The health of the rivers crossed by the pipeline/cable have been classified in accordance with the *Regional River Health Strategies for Port Phillip, Western Port and West Gippsland (RRHS)*. In this strategy the regional importance and river health has been classified using five categories: hydrology, water quality, streamside zone, physical form and aquatic life. Data from rivers for each category are assessed to promote a rating for river conditions ranging from excellent, good, moderate, poor and very poor (EES, Volume 5, Chapter 6). This data has been summarised in Figure 1 to indicate the current river health of the region.

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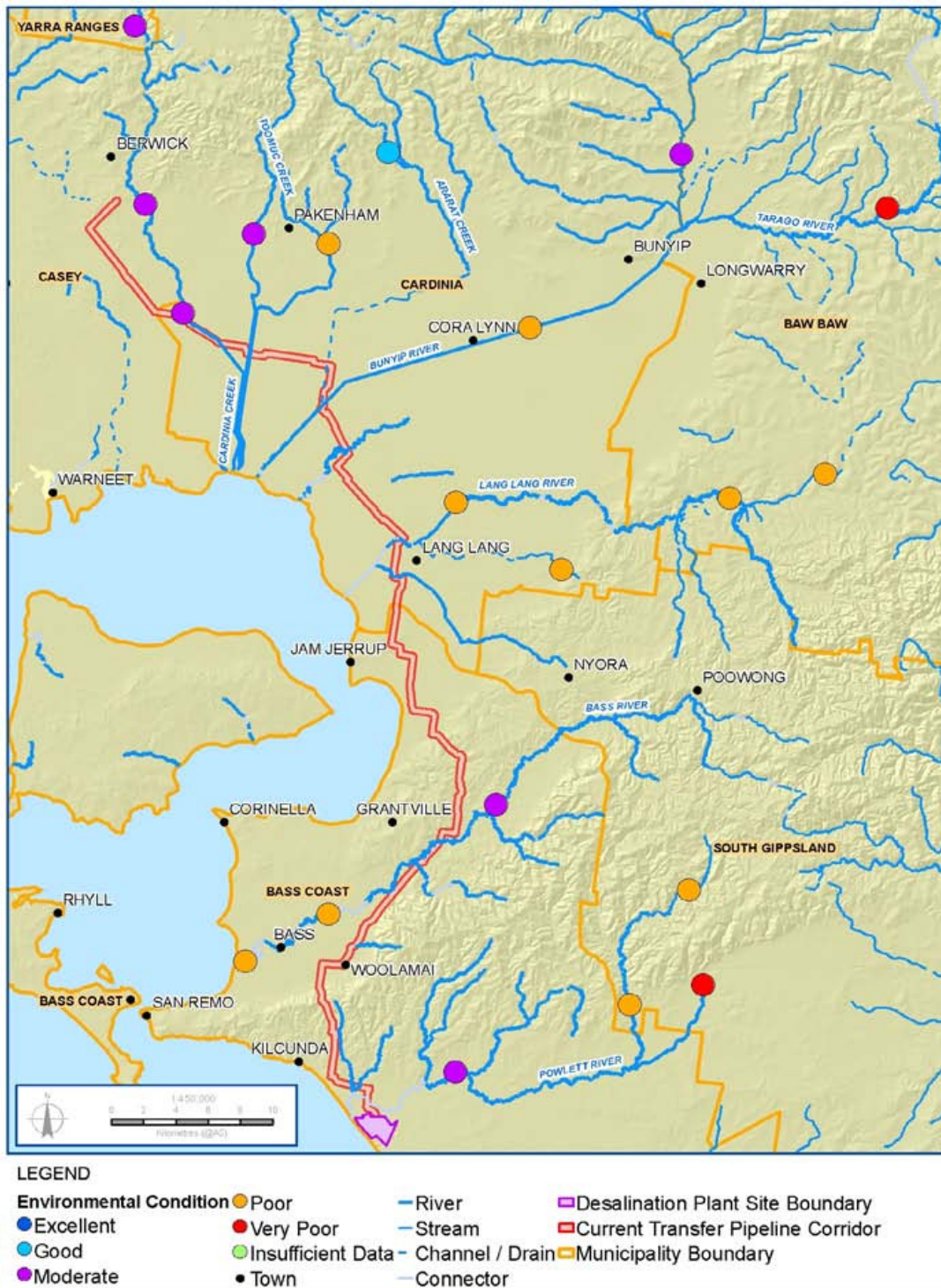


Figure 1 – River health in the region of the utilities corridor



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4.2 Groundwater

Groundwater along the utilities corridor falls within the Western Port and the Bass sedimentary basins with the majority of the corridor falling within the Western Port basin. The Koo Wee Rup Swamp was originally a groundwater discharge area that has been altered due to manmade drainage channels that discharge to Western Port and coastal sub marine discharge to the bay (EES, Volume 4, Chapter 6).

For all aquifers, the most common use of groundwater is for stock and domestic purposes with the greatest bore densities between 33 to 83 kilometres in the Western Port basin. There are no urban supply bores within the utilities corridor.

4.3 Western Port

The Western Port Ramsar site is a large bay to the west of the utilities alignment, connected to Bass Strait and draining an area of 3200 square kilometres. The Western Port Ramsar Site has four marine and coastal wetland types recognised under the classification system used by the Ramsar Convention. These are:

- Marine and sub tidal aquatic beds
- Intertidal mud and sand flats
- Intertidal marshes (including salt marsh)
- Intertidal forested wetlands (including mangroves).

All waterways north of Kilcunda ridge drain into Western point including Bass River, Lang Lang River, Yallock River System, Bunyip River Main Drain and Deep and Toomuc Creeks. These drain extensive dry land grazing and agricultural areas.

5 Environmental risk

An environmental risk assessment has been carried out for the D & C Utility works. This assessment is contained in the Environmental Risk Register, Attachment C of the D&C Utilities EMP. Table 2 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 2: Summary of utilities risk assessment for Water Quality and Soil Erosion.

Activity posing hazard	Risk/ Potential Impact	Inherent Risk (before controls)
Clearing of ROW including removal of vegetation and topsoil	Increased sediment load to nearby surface waters. Erosion of land and loss of topsoil. Increase in sediment load to waterways. Non compliance under Water Act and SEPP (surface water and groundwater) requirements	High
Establishment of access roads, clearing of ROW and removal of vegetation	Reduction in flow regime in waterways, wetlands or groundwater aquifers. Reduction in groundwater quality and levels.	Extreme



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Activity posing hazard	Risk/ Potential Impact	Inherent Risk (before controls)
	<p>Reduction in surface water quality.</p> <p>Disturbance to waterways and impact to flood dependent ecosystems</p> <p>Works not designed in accordance with Authority requirements resulting in impact to agricultural or sensitive receivers</p>	
<p>Excavation, transfer of material and movement of stockpiles and soils</p>	<p>Non compliance under Water Act and SEPP (surface water and groundwater) requirements</p> <p>Increase in sediment to nearby surface waters and waterways</p> <p>Reduction of groundwater recharge to wetlands, disturbing or depleting existing groundwater tables may affect spring fed dams</p> <p>Reduction in groundwater quality and levels. Reduction in surface water quality</p> <p>Exposure of in situ PASS to oxidation and subsequent acidification of groundwater</p> <p>Disturbance to waterways and impact to flood dependent ecosystems</p> <p>Works not designed in accordance with Authority requirements resulting in impact to agricultural or sensitive receivers</p>	<p>High</p>
<p>Removal of access roads , replacement of topsoil, planting of vegetation</p>	<p>Reduction in flow regime in waterways, wetlands or groundwater aquifers.</p> <p>Reduction in groundwater quality and levels.</p> <p>Reduction in surface water quality.</p> <p>Disturbance to waterways and impact to flood dependent ecosystems</p> <p>Works not designed in accordance with Authority requirements resulting in impact to agricultural or sensitive receivers</p>	<p>High</p>
<p>Design of temporary sediment controls is insufficient for the maximum exposed area</p>	<p>Localised harm to soil and local water quality</p>	<p>High</p>
<p>Unforeseen water and soil contamination due to fuel or oil spill</p>	<p>Localised harm to soil and local water quality</p>	<p>High</p>
<p>Surface water exposed to sediment flow</p>	<p>Localised harm to soil and local water quality</p>	<p>Extreme</p>
<p>Road collapse over a waterway</p>	<p>This may lead to bank collapse, toxicant influx into the</p>	<p>Extreme</p>



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Activity posing hazard	Risk/ Potential Impact	Inherent Risk (before controls)
	waterway and mortality of significant fauna species.	
Storm, flooding	Immediate danger to people's safety, environment, damage to equipment	High

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

6 Control, management and mitigation measures

6.1 Control measures

The measures in Attachment I9.1 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 I9.1 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).

6.2 Dewatering

Dewatering or discharge of any sites will be carried out in accordance with the EPA Environmental Guidelines for Major Construction Sites (1996). The Dewatering Procedure PLV-3-EV-PR-0004, also included as Attachment I9.2 to this sub plan, contains details on the procedure for dewatering and discharge of water from the site in accordance with relevant project and legislative requirements.

The following techniques, in order of preference, are the options to be considered when discharging water from the VDP utilities corridor:

- Divert water off site using diversion banks to surrounding land via erosion and sediment controls
- Collect water for reuse on site (from within the utilities area) for dust suppression or irrigation of vegetation
- Pump water into nearby dams (with landowner consent) for reuse by landowners
- Pump water onto adjacent lands (pasture not within the utilities corridor) to allow infiltration and filtration by vegetated area (with landowner consent)
- Treat water and discharge into waterways with authorisation of EPA and waterway asset managers (Melbourne Water or West Gippsland CMA).



6.3 Waterway crossing

During the development of construction methods for sensitive waterway crossings, a risk assessment approach is used to develop site specific environmental mitigation measures. The measures are incorporated into waterway crossing specific construction work method statements and site environment plans for each waterway. The location specific WMS and SEPs are reviewed in consultation with the appropriate asset managers (e.g. Melbourne Water and WGCMA) prior to works and form part of the permit application process to ensure that location appropriate construction methods and environmental mitigation measures are implemented.

7 Site environmental plans

Site Environmental Plans (SEPs) have been developed for utilities corridor that detail environmental sensitive areas and general 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 water quality and erosion management controls set out in the SEPs are drawn from this sub plan. SEPs are held by Area Environment Managers. Additional practical management measures are picked up and covered by the Weekly Environmental Checklist.

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 for water quality and soil erosion are set out in the Monitoring, inspection, audit and reporting schedule - Attachment L of the D&C Utilities Area EMP.

Monitoring of surface water, groundwater, erosion, sediment during construction will be undertaken in accordance with the programme set out in the Monitoring, inspection, audit and reporting schedule - Attachment L of the D&C Utilities Area EMP.

This monitoring is undertaken by appropriately qualified personnel, in accordance with the appropriate standards and guidelines. The surface water quality monitoring and reporting program was established in consultation with the EPA and West Gippsland CMA for all waterways that may be affected by the project.

Samples of discharges will also be collected and analysed by a National Association of Testing Authorities (NATA) accredited laboratory as and when required. Testing frequency and parameters tested will be dependent on the consent requirements and as agreed with the regulatory body. Testing frequencies will be higher initially and then scaled down if results and parameters in the field remain consistent.

Where monitoring identifies levels exceeding the criteria outlined in Attachment I9.2 of this sub plan:

- No discharge will occur. Only waters that meet the relevant target water quality outlined in Attachment I9.2 are fit for discharge from site



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- Release waters will be treated according to the test/treat/retest regime provided in Figure 2 in Section 9 below.

A series of boreholes have been established along the utilities corridor. A total of 31 borehole locations have been identified and depth varies from 7.5 to 25m. The groundwater monitoring program was established to:

- Collect groundwater data to evaluate disposal/ collection dewatering requirements
- Collect baseline data to establish water quality conditions pre-construction.

Post construction monitoring of groundwater level and quality will be completed to establish if construction of the VDP Utilities had any adverse effects on water quality or level.



9 Contingency measures

Contingency measures have been developed and are summarised below. The control measures table (Attachment I9.1) focuses on preventative measures.

All environmental incidents will be responded to in accordance with the Utilities Environmental Incident Response Procedure (EIRP) (PR-PLV-PM-3-X-000-0001-00-00). The EIRP provides project specific details for the identification of and response to potential environmental related incidents along the utilities corridor during the D&C phase of the VDP. It provides guidance on strategies to manage potential and actual incidents, as well as follow-up and reporting requirements.

The environmental risk assessment has identified the following circumstances that could occur outside normal operating conditions, which may ultimately result in contamination of a waterway:

- ~ Unforeseen contamination of waterway due to fuel or oil spill
- ~ Large volumes of sediment laden water entering waterways such as design of temporary sediment controls is insufficient for the maximum exposed area or road collapse over a waterway
- ~ Accumulation of large amount of water trapped on site that requires discharge to waterway or wetland.

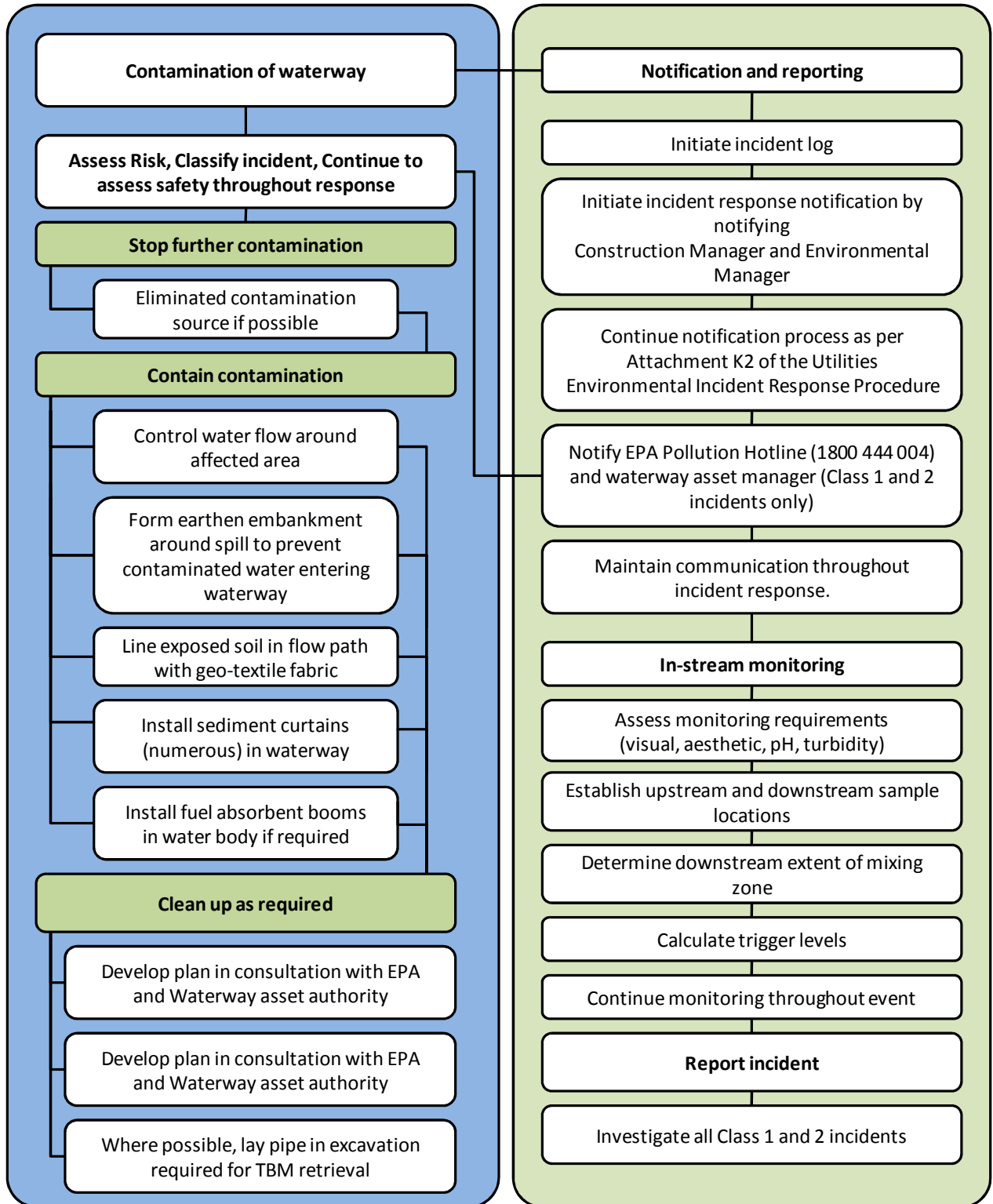
Contingency measures for a contamination of a waterway or wetland will be implemented in accordance with the procedure outlined in Figure 2. Discharge of large amount of water trapped on site would be in accordance with the Dewatering Procedure PLV-3-EV-PR-0004, also included as Attachment I9.2 to this sub plan.

The environmental risk assessment has also identified the following circumstances that could occur outside normal operating conditions, which may ultimately result in contamination of groundwater:

- ~ Contamination of groundwater as a result of oxidation of in situ Acid Sulfate Soils or significant fuel or chemical spill.

In the event of identified contamination of groundwater, DSE, EPA and Southern Rural Water would be notified as soon as practical and a response plan would be formulated.

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ATTACHMENT I9.1 WATER QUALITY AND EROSION MANAGEMENT – CONTROL MEASURES TABLE

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
1	Planning - Soil analysis	16111	Prior to the commencement of construction, soil types will be analysed within the project area and tested for erosion and revegetation parameters. This will assist in determining the appropriate erosion and sediment controls to be implemented onsite and soil ameliorants for revegetation purposes. This includes the use of the March Chart (Time Chainage chart) which identifies soil types.	Construction Manager	Construct	Geotechnical factual reports, Rehabilitation Consultant recommendations for rehabilitation	
2	Induction		All personnel are appropriately inducted in general water quality and erosion and sediment control practices	Site Manager	Construct	Training records	
3	Site access	16111	Site access roads will be established utilising existing tracks where possible. If new tracks are required they will be located along drainage divides where possible, to avoid water course crossings and to minimise cut and fill. Drainage and erosion control measures such as trafficable inclined diversion banks and turnouts will be used to minimise erosion.	Site Manager	Construct	Inspection records	
4	Vegetation clearance / reinstatement	16111	Vegetation clearance and soil disturbance will be confined to those areas required for construction within the construction corridor or identified extra works spaces. The limits of disturbance will be flagged prior to disturbance.	Site Manager and Environmental Officer	Construct	Site inspection records	
5	Vegetation clearance / reinstatement	16111	Vegetation clearance will be minimised where possible.	Site Manager and Environmental Officer	Construct	Site inspection records	
6	Vegetation clearance / reinstatement	16111	Progressive reinstatement of disturbed areas will be undertaken following completion of all works (transfer pipeline, power, fibre optics, joint pits and valves). Temporary reinstatement of waterway crossing will be completed as soon as practicable where final reinstatement is not possible immediately.	Construction Manager	Construct	Site inspection records	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
7	Weather watch	16111	Where possible, works near waterways will be performed in dry season and using Bureau of Meteorology weather forecasting information.	Site Manager and Environmental Officer	Construct	Site inspection records	
8	Weather watch	13096	Implement a flood warning system including daily check of weather forecasts (Bureau of Meteorology) and information distribution to key site personnel and installation of real time water level monitor.	Site Manager and Environmental Officer	Construct	Prestart records, monitoring data	
9	Stockpiles	15106	Sediment fences and / or bunds will be built, as appropriate, around stockpiles to contain stockpile material and direct clean water flow away from stockpiles.	Construction Manager	Construct	Site Environmental Plans	
10	Stockpiles	15106	Stockpiles will be located away from natural flow paths including minimum 10m setback from all waterways.	Construction Manager	Construct	Site Environmental Plans	
11	Stockpiles	16109 16111	Temporary erosion and sediments control structures will be placed around stockpiles where required to minimise erosion.	Construction Manager	Construct	Site Environmental Plans	
12	Stockpiles	16109 16111	Long terms stockpiles (over 6 months) will not be located within the dripline of any tree that is to be retained	Construction Manager	Construct	Site inspection records	
13	Stockpiles	16111	If stockpiling is required outside of the construction area it will be subject to a separate environmental assessment to ensure that the stockpile will not block waterway or floodways.	Construction Manager	Construct	Site inspection records	
14	Stockpiles	13092 16109 16111	Plan and manage stockpiles to minimise the potential for 'wash-out' and the generation of sediment-laden runoff during periods of rainfall.	Construction Manager	Construct	Site inspection records	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
15	Stockpiles	16111	If contaminated stockpiles are created, these will be covered or bunded in order to prevent further spread of contamination through contaminated run-off.	Construction Manager	Construct	Contaminated soil record	
16	Storage and handling of fuels	19126	All oils, fuels and other potentially polluting chemicals will be stored away from drains and at least 10 m from any surface water bodies in a bunded area in accordance with EPA Bunding Guidelines.	Construction Manager	Construct	Site Environmental Plans	
17	Storage and handling of fuels	19128	The gross capacity of a bunded area should be sufficient to hold at least the volume of 25% of the (maximum design number of) drums to be stored up to 10kL, plus 10% of any volume in excess thereof. If used empty drums are stored with other drums, then the bund should be provided with a height which assumes all drums to be full.	Construction Manager	Construct	Site inspection records	
18	Storage and handling of fuels	19128	<p>Refuelling and servicing of plant and equipment (including pumps and generators) will be undertaken, as far as is practicable, away from watercourses. This may not always be possible with static plant when refuelling from a mobile fuel tanker.</p> <p>All staff responsible for refuelling will have specific training and will be aware of the relevant precautions and what is required of them.</p> <p>All fuel trucks will have fuel nozzles with automatic cut-off switches. Where there is potential for spillage, drip trays will be used when refueling.</p>	Construction Manager	Construct	Site Environmental Plans	
19	Storage and handling of fuels	19128	Spills of fuel, oil or chemicals will be cleaned up immediately and any leaking containers will be replaced. Spill kits/booms are to be provided in site compound areas where potentially polluting substances are stored and are also to be provided in areas of re-fuelling. All static compressors, generators, and pumps that require regular refuelling will be provided with a drip tray.	Construction Manager and Environmental Officer	Construct	Site inspection records	
20	Storage and handling of fuels	19128	Any surplus effluent from biosecurity wash down containing harmful detergents will be captured and disposed of offsite.	Construction Manager	Construct	Site inspection records	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
21	Excavation and dewatering	14098	Avoid excessive dewatering (i.e. undertake only what is required to ensure works can proceed).	Construction Manager	Construct	Site Environmental Plan	
22	Excavation and dewatering	16100	If necessary alternative water sources will be provided to groundwater users.	Construction Manager	Construct	Site inspection records	
23	Excavation and dewatering	14100	Maximise potential reuse of groundwater including for dust suppression or groundwater recharge.	Construction Manager	Construct	Site inspection records	
24	Excavation and dewatering	6045, 14100, 14102	<p>All dewatering activities will require a water discharge permit issued by an Environmental Officer before commencement (e.g. groundwater, trench water, surface water, waterbody water etc). Permit will be issued to ensure that water is discharged in accordance with Utilities Dewatering / Discharge Procedure (PLV-3-EV-PR-0004), Attachment I9.2 to this sub plan. The water will be tested and dealt with in the following ways:</p> <ul style="list-style-type: none"> - Use on site or along other sections of the utilities corridor i.e. for dust suppression or watering of revegetated areas. - Discharge onto adjacent farming land or dams, subject to landowner approval. Water quality must be equal to or better than the water within the dam. Appropriate energy dissipaters (e.g. rock rip-rap, geotextile fabric) must be used at discharge outlet. - Discharge into waterways. No discharge will be made without agreement from the EPA. The water quality will be monitored to ensure it complies with the SEPP (WoV) guidelines. 	Construction Manager and Environmental Officer	Construct	Monitoring records	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
25	Excavation and dewatering	14101	<p>Discharge with permit issued by Environmental Officers. Discharge must be carried out in a manner that doesn't cause flooding or erosion of receiving areas.</p> <p>Landowner or land manager consent must be given for any discharge off the site. Where possible water will be direct to landowner dams (with their consent) for beneficial reuse.</p> <p>EPA and waterway asset manager must be notified of any discharge to waterways or any event when turbid water from the site enters waterways.</p>	Environmental Officer	Construct	Inspection & monitoring records	
26	Excavation and dewatering	14101	If water quality does not comply, treatment may be required e.g. flocculant, sediment separation tank, addition of Gypsum (Calcium sulphate) to improve turbidity or Agricultural Lime (Calcium carbonate) or Soda Ash Solution (Sodium carbonate), to improve the pH of the water.	Environmental Manager	Construct	Inspection & monitoring records	
27	Discharge of water	14100	<p>Where discharging water for reuse on site:</p> <ul style="list-style-type: none"> - Discharge water, where possible, onto construction easement for dust suppression (e.g. Right of Way, haul road, topsoil stockpiles). - Discharge via water tanker side sprays or dribble bars to prevent waterlogging of RoW, soil loss from stockpiles and erosion. <p>(Refer to PLV-3-EV-PR-0004, Attachment I9.2 to this sub plan)</p>	Environmental Officer	Construct	Inspection & monitoring records	
28	Discharge of water	14100	<p>Where discharging water off site into nearby dams or onto adjacent lands,:</p> <ul style="list-style-type: none"> - Discharge water, where practical, onto vegetated area or directly into dam; - Where vegetated areas are no available, ensure water is discharged / directed on to appropriate energy dissipaters (e.g. geotextile fabric or further sediment controls structures). - Precautions should be made to ensure discharge area does not become waterlogged i.e. discharge outlet point may require regular relocation. - Discharge will be supervised and monitored. <p>(Refer to PLV-3-EV-PR-0004, Attachment I9.2 to this sub plan)</p>	Environmental Officer	Construct	Inspection & monitoring records	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
29	Discharge of water	6045, 14100	<p>Where discharging into waterways:</p> <ul style="list-style-type: none"> - Discharge water, where practical, onto vegetated area. - Where vegetated areas are not available, ensure water is discharged / directed on to appropriate energy dissipaters (e.g. geotextile fabric or further sediment controls structures). - Discharge will be supervised and monitored. If target water quality exceeds listed objectives or trigger values, discharge is to cease, EPA notified immediately, and further investigation and treatment carried out. If target water quality can not be met, alternative options will need to be considered (e.g. tanker off site) - On completion of discharge, a report outlining quality of water discharged, how it was calculated, and the results of water quality monitoring will be submitted to the EPA <p>(Refer to PLV-3-EV-PR-0004, Attachment I9.2 to this sub plan)</p>	Environmental Officer	Construct	Inspection & monitoring records	
30	Excavation and dewatering	14101	Reinstate ground to pre-construction conditions or temporary reinstatement as soon as practicable to control post construction surface water flow. Temporary reinstatement will be undertaken where there is a delay between phases of works.	Construction Manager	Construct	Inspection records	
31	Excavation and dewatering	14102	<p>Conducting ongoing monitoring ensuring minimisation of impacts on groundwater. Monitoring programme to include as required:</p> <ul style="list-style-type: none"> - Establishment of groundwater monitoring bore sites and obtaining monitoring bore licences - Collection of groundwater data to evaluate disposal/ collection dewatering requirements - Baseline monitoring to establish water quality conditions pre-construction - Investigation of potential impacts to flora and fauna. 	Construction Manager and Environmental Officer	Construct	Inspection & monitoring records	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
32	Excavation and dewatering	14101	No discharge to waterways will be made without agreement from the EPA and the relevant waterway asset manager (Melbourne Water or West Gippsland CMA). Discharge to waterways, with relevant approval, must be done in a manner that maintains beneficial uses of water. As such, target discharge water objectives are based on SEPP (Waters of Victoria) Schedule F8 environmental quality indicators and objectives. Where a background level of an indicator falls outside the objective, maintenance of the background level (trigger value) becomes the objective.	Environmental Manager	Construct	Inspection & monitoring records	
33	Excavation and dewatering	14102	Inspection of ground discharges will be incorporated into the daily environmental inspection programme.	Environmental Officer	Construct	Inspection records	
34	Surface Water	13092 15105	Divert clean surface water runoff around and/or away from disturbed areas and construction activities, where feasible.	Construction Manager	Construct	Site Environmental Plans	
35	General measures	13092 15105	Minimise slope gradient and length, where feasible.	Construction Manager	Construct	Site Environmental Plans	
36	General measures	13092 15105	Maintain run-off at non-erodible velocities.	Construction Manager	Construct	Site Environmental Plans	
37	Vehicle Washing	15105	Any effluent from vehicle washing containing harmful detergents will be disposed to a sealed tank for disposal off site.	Construction Manager	Construct	Inspection records	
38	Drainage	16111	Appropriate drainage, erosion and sediment control from the changing profile to ensure turbid run-off does not enter surface watercourses or drains without treatment.	Construction Manager	Construct	Inspection records	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
39	General measures	14100	Any encountered boreholes will be protected or decommissioned.	Construction Manager	Construct	Daily logs	
40	Inspections and Maintenance	16111	Conduct regular inspections and maintenance of erosion and sediment controls to ensure they are functioning correctly and efficiently.	Environmental Officer	Construct	Inspection records	
41	Monitoring	14101 15107	Monitor quality of discharge water in accordance with SEPP objectives and EPA requirements.	Environmental Officer	Construct	Monitoring records	
42	Monitoring	14102	Monitor groundwater quality and levels during project construction in accordance with the requirements of the EPA and/or relevant Government Agency or Water Authorities.	Environmental Officer	Construct	Monitoring records	
43	General measures	15105	Appropriate signage of creeks adjacent to working areas to ensure proper placement of stockpiles, storage areas and activities.	Environmental Officer	Construct	Inspection records	
44	General measures	15103	Any contaminated water on site will be identified and labelled accordingly.	Environmental Officer	Construct	Inspection records	
45	General measures	15103	Erosion and sediment control measures will be installed in accordance with the Victorian <i>Urban Stormwater Best Practice Environmental Guidelines</i> and EPA <i>Best Practice Environmental Management – Environmental Guidelines for Major Construction Sites (1996)</i> .	Construction Manager and Environmental Officer	Construct	Inspection records	
46	Stormwater collection	15106	Where possible, water collected on site will utilised on site for uses such as dust suppression where possible.	Environmental Officer	Construct	Inspection & monitoring records	
47	Catch/ diversion drains	15106	Prior to commencement of construction and site clearance, diversion drains will be constructed across slopes to direct runoff at a non erosive velocity. These will divert clean runoff away from and/or around disturbed areas. Diversion drains will also be used where long cut or fill slopes need to be broken into a number of shorter non-erodible sections. Intercepted sheet runoff will be directed across the slopes to discharge onto designated stabilised areas.	Site Manager and Environmental Officer	Construct	Site Environmental Plans and Inspection records	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
48	Catch/diversion drains	15106	Perimeter catch drains will be installed along site boundaries, where feasible, to catch and drain surface water runoff generated on site and direct to the detention basin or other suitable collection point.	Construction Manager	Construct	Site Environmental Plans and Inspection records	
49	Catch/diversion drains	15106	Diversion Banks will be used to reduce or eliminate the catchment to the heads of gullies. They need to be located such that they spill water to stable areas - away from the rehabilitation area.	Construction Manager	Construct	Site Environmental Plans and Inspection records	
50	Absorption and Pondage Banks	15106	Absorption and Pondage Banks will apply only on low slopes (less than 1%) and will be avoided in materials which become dispersive when saturated. They will not be used on spoil dumps containing toxic materials.	Construction Manager	Construct	Site Environmental Plans and Inspection records	
51	Revegetation	21138	Reinstate ground to pre-construction conditions or temporary reinstatement as soon as practicable to control post construction surface water flow. Temporary reinstatement will be undertaken where there is a delay between phases of works.	Site Manager and Environmental Officer	Construct	Inspection records	
52	Revegetation	21138	Geofabric may be used to line channels of modest grade (up to 10%) where flow velocities do not consistently exceed 2.5 metres per second. This is laid after a channel has been shaped to an even cross-section and seeded with a stabilising cover which will grow up through the mesh. It is held in place by staples pushed into the underlying soil. Bitumen emulsion may also be sprayed over it to secure it more firmly and to provide added soil protection. Revegetation of disturbed areas will be undertaken as soon as practicable following completion of all construction works and will be progressively fenced off from areas of active works.	Site Manager and Environmental Officer	Construct	Inspection records	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
53	Revegetation	21136	Revegetation will also form part of the site rehabilitation and is covered in greater detail in the Site Reinstatement and Rehabilitation Sub Plan.	Construction Manager and Environmental Officer	Construct	Inspection & Monitoring records	
54	Revegetation	21138	Where possible vegetated buffers will be used to intercept sediment laden flows.	Construction Manager and Environmental Officer	Construct	Inspection records	
55	Revegetation		<p>Contour Deep Ripping or 'Contour Furrowing' will be used to relieve soil compaction and improve water infiltration only where the soil or spoil material is of low permeability.</p> <p>It is common to use these procedures where gypsum or lime soil amendments are being incorporated. The methods may also be used to increase infiltration in most soils.</p> <p>Liquid lime and liquid gypsum shall not be used.</p>	Construction Manager	Construct	Site Environmental Plans and Inspection records	
56	Revegetation		Disturbed areas shall be contour scarified prior to the application of topsoil and hydro-mulch.	Construction Manager	Construct	Site Environmental Plans and Inspection records	
57	Revegetation		<p>Where poor vegetation establishment/ growth or soil is found to have caused sediment contamination into a waterway, new vegetation will be planted, bonded fibre matrix hydro-mulch and/or mulching will be undertaken, as required.</p> <p>Newly planted and previously planted areas may require supplementary watering and replanting to ensure adequate growth and minimize a re-event.</p>	Construction Manager and Environmental Officer	Construct	Site Environmental Plans and Inspection records	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
58	Hay bale barriers		Hay bales will be used as temporary sediment control devices. All hay bales will be wrapped in a geotextile membrane, staked in place and used in multiples. All bales will be butted tightly at adjoining surfaces and will be embedded into the ground surface to ensure that sediment laden runoff is forced to pass through the bales. Hay bales will be sourced from reputable suppliers to ensure that no pest plant species are inadvertently introduced to the site.	Construction Manager	Construct	Site Environmental Plans and Inspection records	
59	Hay bale barriers		Hay bales will be used to aid filtration of runoff from small catchments (up to 0.5ha) and may also be used to create temporary perimeter banks around disturbed areas to prevent runoff from leaving the area without being filtered.	Construction Manager	Construct	Site Environmental Plans and Inspection records	
60	Hay bale barriers		All hay bales will be regularly inspected for signs of damage and will be replaced as and when required but no less frequently than every three months. Following rain events hay bales will be checked to ensure they remain in position and that undercutting or overtopping has not occurred.	Construction Manager	Construct	Site Environmental Plans and Inspection records	
61	Silt fences	15105 16111	Silt fences will be used where sediment control of sheet flow is required, particularly exposed areas. Silt fences will be installed prior to site clearance and construction works and will be located so as not to impede the movement of construction traffic. These measures will be installed along the downstream perimeters of construction areas to provide an additional link in the treatment train of erosion and sediment control. They may also be utilised around the base of stockpiles to prevent any potential escape of sediment laden runoff. In either case the catchment area will not exceed 0.5ha.	Construction Manager and Environmental Officer	Construct	Site Environmental Plans and Inspection records	
62	Sediment traps	15105 16111	Prior to construction and site clearance sediment traps will be installed in areas where high or concentrated sediment laden flows are expected (silt fences). These will consist of small basins that will allow the settlement of sediment and silts and will be located on drainage lines downstream of catchments no larger than 0.5ha.	Construction Manager and Environmental Officer	Construct	Site Environmental Plans and Inspection records	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
63	Sediment traps	15105 16111	Sediment traps will be regularly inspected and maintained to ensure continued efficiency and capacity. Their effectiveness may be aided through the use of sediment filters on the uphill face of the embankment.	Environmental Officer	Construct	Inspection records	
64	Temporary construction exits	15105 16111	Where mud-tracking is being tracked off site cannot be adequately controlled by street sweepers, wheel cleaning facilities, rumble grids or an area of washed ballast rock will be installed to minimise mud tracked off site.	Construction Manager and Environmental Officer	Construct	Site Environmental Plans and Inspection records	
65	Temporary construction exits	15105 16111	A street sweeper unit will also be employed to maintain paved road surfaces around site access points.	Construction Manager	Construct	Inspection records	
66	Sedimentation basins and water treatment	15106	Sedimentation basins will be used where all other methods are deemed insufficient to control sediment laden flows.	Construction Manager	Construct	Site Environmental Plans and Inspection records	
67	Sedimentation basins and water treatment	15106	The basins will be designed to allow the water to remain captured, treated if required and released. The water will either be used on site in dust suppression activities and other activities as required, or discharges in accordance with the dewatering procedure.	Environmental Officer	Construct	Site Environmental Plans	
68	Sedimentation basins and water treatment	15106	Collected and treated water will be regularly tested prior in ensure it is being discharged accordance with the Utilities Dewatering / Discharge Procedure (PLV-3-EV-PR-0004). Should the treated water quality not achieve the discharge requirements, water will either be discharged to a retention tank and retreated or discharged to sewer.	Environmental Officer	Construct	Inspection & monitoring records	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
69	Sedimentation basins and water treatment	15106	The above measures will be used in combination to provide the most practical and environmentally beneficial outcome.	Construction Manager and Environmental Officer	Construct	Inspection 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.



D&C Utilities EMP Attachment I9 – Water Quality and Erosion Management Sub Plan

ATTACHMENT I9.2 WATER QUALITY AND EROSION MANAGEMENT – DEWATERING PROCEDURE



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1 Project Overview

The Victorian Desalination Plant (VDP) is a project commissioned by the Victorian Government to help provide a rain independent clean drinking water source for the Victorian people. The desalination plant is located on the Bass Coast approximately three kilometres from Wonthaggi. The VDP comprise a desalination plant with the capacity to produce 150 to 200 GL of drinking water per year, marine structures for the seawater intake and the saline concentrate outlet associated with the plant, a pipeline to transfer water from the plant to Melbourne's water supply network in Berwick, and a power supply infrastructure to supply electricity for the plant and the Booster Pump Station as well as ancillary infrastructure. It is the Government's intention that the plant and associated infrastructure will be operational by the end of 2011.

2 Purpose and Scope

The purpose of this procedure is to direct dewatering and discharge of water from the site in accordance with relevant project and legislative requirements. That is, to prevent any adverse environmental impacts resulting from dewatering or discharges of water (surface or groundwater) and protect the beneficial uses within the schedule areas listed within SEPP (Waters of Victoria) Schedule F8 (South Eastern Rural and Lowland and Phillip Island) intersected during the construction of the VDP pipeline and powers supply. Moreover, dewatering and discharge options and procedure will be provided for each water disposal technique.

3 Descriptions of Actions

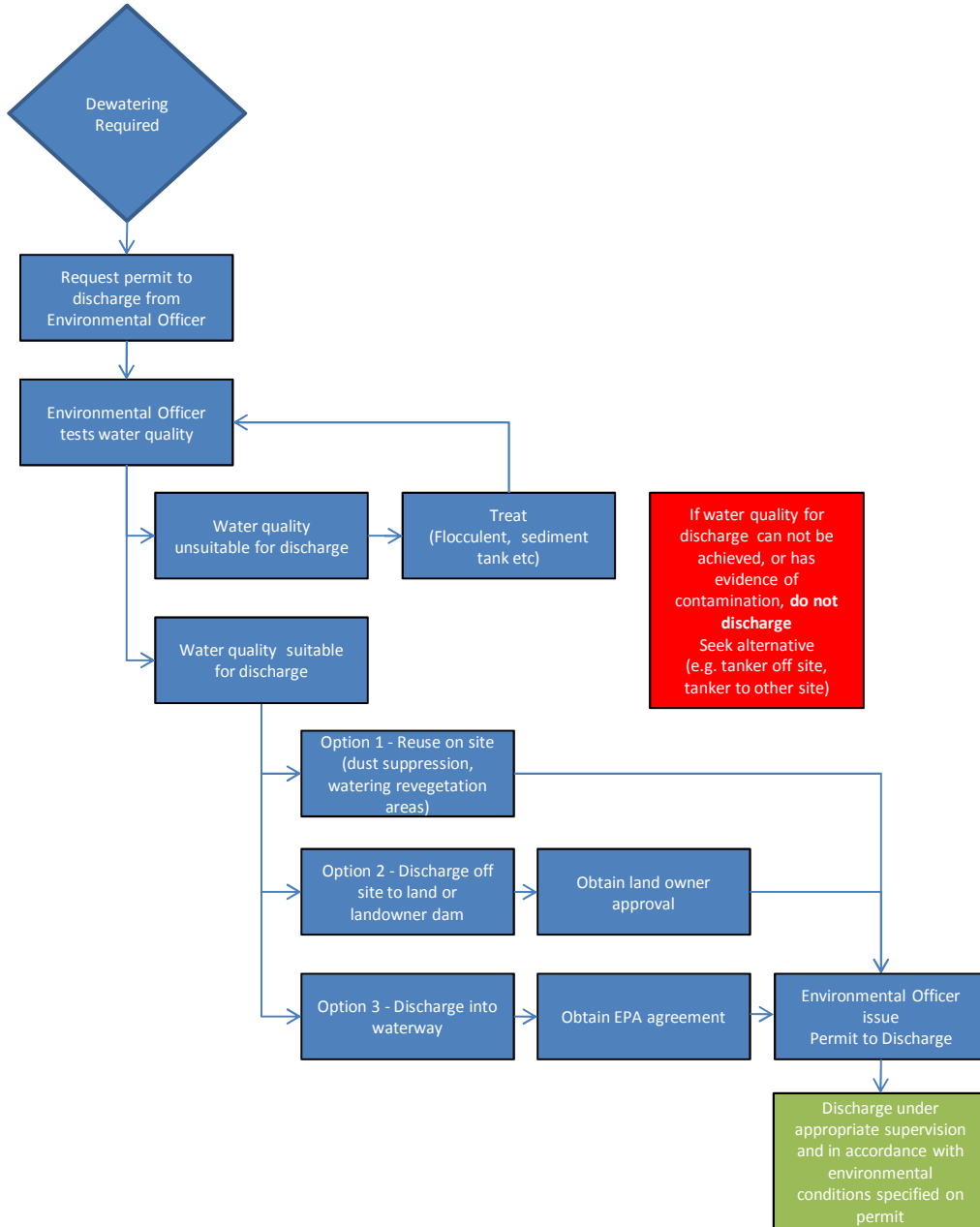
Dewatering or discharge of any sites will be carried out in accordance with the EPA Environmental Guidelines for Major Construction Sites (1996).

Prior to dewatering/discharge of water from site an Environmental Officer must be notified so as the water quality can be tested and the most suitable discharge option determined (Refer Figure 1). All dewatering must be approved by the Environmental Officer and a Discharge/Dewatering Permit must be issued prior to discharge (PLV-3-EN-FM-001-00-00).

The following techniques, in order of preference, are the options to be considered when discharging water from the VDP utilities corridor:

- Divert water off site using diversion banks to surrounding land via erosion and sediment controls
- Collect water for reuse on site for dust suppression or irrigation of vegetation
- Pump water into nearby dams (with landowner consent) for reuse by landowners
- Pump water onto adjacent lands to allow infiltration and filtration by vegetated area (with landowner consent)
- Treat water and discharge into waterways with authorisation of EPA and waterway asset managers (Melbourne Water or West Gippsland CMA).

Figure 1. Dewatering/Discharge Procedure Flowchart



4 Control, Mitigation and Management Measures

4.1 Reuse on Site

4.1.1 Assess Source Water Quality

Prior to reuse of water on site, the source water will be assessed to determine quality to ensure that its reuse will not result in adverse effects to the receiving environment. When assessing water for reuse on site, parameters including electrical conductivity, pH and aesthetics will be considered.

4.1.2 Determination of Target Discharge Water Quality Values

The target discharge water qualities for reuse of discharge water onsite are based on the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000) and SEPP (Waters of Victoria) Schedule F8 as summarised in Table 1.

Table 1 Target Discharge Water Quality Requirements for Reuse Onsite

Water Quality Parameters	Target Discharge Quality
Electrical Conductivity ($\mu\text{S}/\text{cm}$)	800 - 7300
pH	4.0 - 9.0
Aesthetics	No visible floating oil, grease, scum, litter or other objectionable matter, or odours or colours in water

If source water quality is not of target discharge quality:

- This water will not be discharged/reused onsite and treatment may be required
- If target quality cannot be met then alternative options will be considered (e.g. tanker off site or tanker to other site storage).

4.1.3 Treatment of Water

The treatment of water prior to discharge for reuse onsite where required may involve:

- The addition of Agricultural Lime (Calcium carbonate) or Soda Ash Solution (Sodium carbonate), to tank, may be required to improve the pH of the water at a rate to be determined on a case by case basis.
- Dilution of water with high electrical conductivity with fresh water to reduce the salinity.

Water treatment may be completed in an environmental settlement tank (13,000 litre capacity) or poly water tanks.

4.1.4 Collection of Water

If target discharge water quality is achieved, dewatering will commence and the following measures will be carried out when a pump is use:

PLJV – Dewatering/Discharge Procedure

- Extract water from relatively high in the water column to minimise sediment uptake;
- Where necessary, install filter at the intake point to prevent unnecessary sediment, organic matter or fauna being drawn into the pumps;
- Ensure dewatering pumps are bunded appropriately, to prevent any spills, and they are installed as far as practicable from waterways;
- Store bulk fuel greater than 100 metres from waterways;
- Ensure spill kits are available, in close proximity and that personnel are aware of the spill response.

4.1.5 Discharge of Water

The following measures will be followed when discharging water for reuse on site:

- Discharge water, where possible, onto construction easement for dust suppression (e.g. Right of Way, haul road, topsoil stockpiles).
- Discharge via water tanker side sprays or dribble bars to prevent waterlogging of RoW, soil loss from stockpiles and erosion.

4.2 Discharge onto Adjoining Land (Pasture/Crops)

4.2.1 Assess Source Water Quality

Prior to dewatering/ discharge onto adjoining land, the source water will be assessed to determine quality to ensure that its discharge will not result in adverse effects to the receiving environment. When assessing water for discharge to adjoining land, parameters including electrical conductivity, pH and aesthetics should be considered.

Landowner consent must be obtained prior to discharging any water to adjoining land.

4.2.2 Determination of Target Discharge Water Quality Values

The target discharge water qualities for discharge off site onto pasture or crops are based on the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000) and SEPP (Waters of Victoria) Schedule F8 as summarised in Table 3.

Table 2 Target Discharge Water Quality Requirements for Discharge to adjoining land

Water Quality Parameters	Target Discharge Quality
Electrical Conductivity ($\mu\text{S}/\text{cm}$) ¹	800 – 7300
pH	4.0 - 9.0
Aesthetics	No visible floating oil, grease, scum, litter or other objectionable matter, or odours or colours in water

The Electrical Conductivity (EC) range for this discharge option is dependent on plant/crop sensitivity. For more accurate EC target values refer to Table 3 sourced from Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

Table 3 Target Electrical Conductivity for Discharge to various crops and soil types

Crop type	Maximum recommended Electrical Conductivity ($\mu\text{S}/\text{cm}$)		
	Sand	Loam	Clay
Phalaris	5300	3000	1800
Fescue	7300	4200	2400
Strawberry Clover	3300	1900	1100
White Clover	2500	1400	800
Lucerne	4700	2700	1600

4.2.3 Target Discharge Water Quality Not Achieved

If source water quality is not of target discharge quality:

- This water will not be discharged/reused onsite and treatment may be required
- If target quality cannot be met then alternative options will be considered (e.g. tanker off site or tanker to other site storage).

4.2.4 Treatment of Water

The treatment of water prior to discharge for reuse onsite where required may involve:

- The addition of Agricultural Lime (Calcium carbonate) or Soda Ash Solution (Sodium carbonate), to tank, may be required to improve the pH of the water at a rate to be determined on a case by case basis.
- Dilution of water with high electrical conductivity with fresh water to reduce the salinity.

Water treatment may be completed in an environmental settlement tank (13,000 litre capacity) or poly water tanks.

4.2.5 Collection of Water

If target discharge water quality is achieved, dewatering will commence and the following measures will be carried out when a pump is use:

- Extract water from relatively high in the water column to minimise sediment uptake.
- Where necessary, install filter at the intake point to prevent unnecessary sediment, organic matter or fauna being drawn into the pumps.
- Ensure dewatering pumps are bunded appropriately, to prevent any spills, and they are installed as far as practicable from waterways.
- Store bulk fuel greater than 100 metres from waterways.
- Ensure spill kits are available, in close proximity and that personnel are aware of the spill response.

4.2.6 Discharge of Water

The following measures will be followed when discharging water off site onto adjacent lands:

- Discharge water, where practical, onto vegetated area.
- Where vegetated areas are no available, ensure water is discharged/directed on to appropriate energy dissipaters (e.g. geotextile fabric or further sediment controls structures).
- Precautions should be made to ensure discharge area does not become waterlogged i.e. discharge outlet point may require regular relocation.
- Discharge will be supervised and monitored.

4.3 Discharge into Nearby Dams

4.3.1 Assess Source Water Quality

Prior to dewatering/ discharge into nearby dams, the source water will be assessed to determine quality to ensure that its discharge will not result in adverse effects to the receiving environment. When assessing water for discharge into nearby dams, parameters including Total Dissolved Solids (TDS), pH, turbidity and aesthetics should be considered.

Landowner consent must be obtained prior to discharging any water to dams.

4.3.2 Determine Extent of Fauna Habitat

Prior to discharge into dams the Environmental Officer will determine the extent of the fauna habitat of the dam for significant species, not limited to, Dwarf Galaxis, Australian Mudfish and Growling Grass Frog prior to discharge. If the dam potential habitat for a significant species, then monitoring trigger levels will be determined and maintained for the dam in accordance with the procedure for discharge to waterway and the values in Table 6.

4.3.3 Determination of Target Discharge Water Quality Values

The target discharge water qualities for discharge off site into nearby dams are based on the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000) and SEPP (Waters of Victoria) Schedule F8 as summarised in Table 4. Source water that is not within the Target Discharge Range may be discharged to a dam so long as the background quality of the dam can be maintained (refer Table 4).

Table 4 Target Discharge Water Quality Requirements for Discharge to Dams

Water Quality Parameters	Target Discharge Quality	Target Discharge Quality calculated from background
Total Dissolved Solids	0-5000 mg/L	≤ background + 20%
pH	4.0 - 9.0	Maintain background at ±0.5
Turbidity	≤ background	≤ background + 20%
Aesthetics	No visible floating oil, grease, scum, litter or other objectionable matter, or odours or colours in water	No visible floating oil, grease, scum, litter or other objectionable matter, or odours or colours in water

The Total Dissolved Solids (TDS) range for this discharge option is dependent on livestock salt sensitivity. For more accurate TDS target values refer to Table 2 sourced from Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

Table 5 Target TDS levels for Discharge into Dams

Stock type	Target TDS level (mg/L)
Beef Cattle	< 4000
Dairy Cattle	< 2500
Sheep	< 5000
Horses	< 4000

4.3.4 Target Discharge Water Quality Not Achieved

If treated water is not of target discharge quality:

- Quality of the receiving waters will be monitored to ensure receiving waters do not exceed the water quality objective values;
- If water quality objectives are exceeded, discharge into the dam will cease and alternative options for discharge will be considered.

4.3.5 Treatment of Water

The treatment of water prior to off-site discharge into nearby dam's may involve:

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- The use of an environmental settlement tank (13,200 litre capacity) may be used to settle out suspended sediment from the source water as it flows through the internal weir system of the tank.
- Additional flocculent agents may be required to assist in binding sediment particles and further removal of sediment out of suspension. The additional flocculent will include:
 - Floccblocks: Suppliers recommend dosage of one 3kg block to 100,000 to 300,000 litres of water. The block must be positioned at a point of turbulence that will ensure contact with most of the water flow.
- The addition of Gypsum (Calcium sulfate) may be required to improve turbidity.
- The addition of Agricultural Lime (Calcium Carbonate) or Soda Ash Solution (Sodium Carbonate) may be required to improve the pH of the water at a rate to be determined on a case by case basis. A point of turbulence may have to be created if one does not exist.

4.3.6 Collection of Water

If target discharge water quality is achieved, dewatering will commence and the following measures will be carried out when a pump is in use:

- Extract water from relatively high in the water column to minimise sediment uptake;
- Where necessary, install filter at the intake point to prevent unnecessary sediment or organic matter being drawn into the pumps;
- Ensure dewatering pumps are bunded appropriately, to prevent any spills, and they are installed as far as practicable from waterways;
- Store bulk fuel greater than 100 metres from waterways;
- Ensure spill kits are available, in close proximity and that personnel are aware of the spill response.

4.3.7 Discharge of Water

The following measures will be carried out when discharging water off site into nearby dams:

- Discharge water, where practical, onto vegetated area or directly into dam;
- Where vegetated areas are no available, ensure water is discharged/directed on to appropriate energy dissipaters (e.g. geotextile fabric or further sediment controls structures).
- Precautions should be made to ensure discharge area does not become waterlogged i.e. discharge outlet point may require regular relocation.
- Discharge will be supervised and monitored.

4.4 Discharge to Waterway

Prior to discharge into waterways the following stakeholders must be notified:

- EPA Victoria
- Waterway asset managers (Melbourne Water/WGCMA)

- Directly affected landowners.

4.4.1 Assess Source Water Quality

Prior to dewatering/ discharge into waterways, the source water will be assessed to determine quality to ensure that its discharge will not result in adverse effects to the receiving environment. Source water that meets the water quality values outlined in the SEPP (Waters of Victoria) Schedule F8 is considered suitable for discharge (Refer Appendix A).

4.4.2 Determination of Target Discharge Water Quality Objective's and Trigger Values

Target discharge water objectives are based on SEPP (Waters of Victoria) Schedule F8 environmental quality indicators and objectives. Where a background level of an indicator falls outside the objective, maintenance of the background level (trigger value) becomes the objective.

Table 6 Target TDS levels for Discharge into Waterways or wetlands

Water Quality Parameter	SEPP(WoV) Objective Schedule F8		Trigger Value
	Lowland & Phillip Island Schedule Area	South Eastern Rural	
Turbidity (NTU)	<25 (75 th percentile)	<15 (75 th percentile)	N ±20%
Electrical Conductivity (µs/cm)	≤500	≤500	N ±20%
Dissolved Oxygen (%Sat)	≥85	≥85	N ±20%
pH	6.5 - 9.0	6.5 - 9.0	N± 0.5
Temp(0C)	N± 2 0C	N± 2 0C	N± 2 °C
Aesthetics	No visible floating oil, grease, scum, litter or other objectionable matter, or odours or colours in water.		

"N" is the background level. Where background discharge objectives cannot be achieved, the mixing zones will need to be considered in achieving discharge water quality values and approval obtained from EPA.

When discharging to a waterway the listed background objectives will be assessed at the boundary of the mixing zone. Mixing zones will be defined by the water quality and/or ecological objectives and must be kept as small as possible via the application of best practice management. SEPP (WoV) water quality objectives do not apply within a mixing zone, although the beneficial uses specified must not be adversely affected. No discharges to a waterway are to occur without EPA consent/approval.

4.4.3 Collection of Water

The following measures will be carried out when a pump is used for dewatering:

- Extract water from relatively high in the water column to minimise sediment uptake;
- Where necessary, install filter at the intake point to prevent unnecessary sediment or organic matter being drawn into the pumps;

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- Ensure dewatering pumps are bunded appropriately, to prevent any spills, and they are installed as far as practicable from waterways;
- Store bulk fuel greater than 100 metres from waterways;
- Ensure spill kits are available, in close proximity and that personnel are aware of the spill response.

4.4.4 Treatment of Water

The treatment of water prior to discharge for reuse onsite may involve:

- The use of an environmental settlement tank (13,200 litre capacity) may be used to settle out suspended sediment from the source water as it flows through the internal weir system of the tank.
- Additional flocculent agents may be required to assist in binding sediment particles and further removal of sediment out of suspension. The additional flocculent will include:
 - Floccblocks: Suppliers recommend one 3kg block to 100,000 to 300,000 litres of water. The block must be positioned at a point of turbulence that will ensure contact with most of the water flow
- The addition of Gypsum (Calcium sulfate) may be required to improve turbidity of the water at a rate determined on a case by case basis.
- The addition of Agricultural Lime (Calcium Carbonate) or Soda Ash Solution (Sodium Carbonate) may be required to improve the pH of the water at a rate to be determined on a case by case basis. A point of turbulence may have to be created if one does not exist.

4.4.5 Target Discharge Quality Not Achieved

If treated water is not of target discharge quality:

- This water will not be discharged and further treatment may be required
- If target quality cannot be met then alternative options will be considered (e.g. tanker off site or tanker to other site storage).

4.4.6 Discharge of Water

The following measures will be followed when discharging water:

- Discharge water, where practical, onto vegetated area.
- Where vegetated areas are not available, ensure water is discharged/directed on to appropriate energy dissipaters (e.g. geotextile fabric or further sediment controls structures).
- Discharge will be supervised and monitored. If target water quality exceeds listed objectives or trigger values, discharge is to cease, EPA notified immediately, and further investigation and treatment carried out. If target water quality can not be met, alternative options will need to be considered (eg.tanker off site)
- On completion of discharge, a report outlining quantity of water discharged, how it was calculated, and the results of water quality monitoring will be submitted to the EPA.

5 Stakeholder Participation

5.1 Discharge onto Adjoining Land and into Dams

Prior to discharge off site onto land or into neighbouring dams, landowner approval must be received.

5.2 Discharge into Waterways

Prior to discharge into any waterways EPA Victoria and waterway asset managers (Melbourne Water/WGCMA) must be notified and consulted.

6 Monitoring and Reporting

Table 7 Monitoring associated with the discharge of the water from the VDP Utilities Corridor

Discharge Options	Type	Scope	Frequency	Reporting procedure
Reuse on Site	Source water quality assessment	Assess quality of source water	Prior to discharge onto construction site	Water Quality Monitoring Permit for Controlled Discharge Form
Discharge onto Adjoining Land	Source water quality assessment	Assess quality of source water	Prior to discharge of site to adjacent pasture, crops or native vegetation.	Water Quality Monitoring Permit for Controlled Discharge Form
Discharge into Dams	Source water quality assessment Receiving water quality assessment	Assess quality of receiving water	Prior to initial discharge into dams. Post discharge when target discharge values exceeded.	Water Quality Monitoring Form
Discharge into Waterways	Source water quality assessment	Assess quality of source water	Prior to treatment (at least daily)	Water Quality Monitoring Permit for Controlled Discharge Form
	Treated water assessment	Assess quality of water to be discharged	Post treatment, prior to discharge (ongoing hourly or at frequency determined by supervising Environmental Officer ¹)	Water Quality Monitoring Permit for Controlled Discharge Form
	In situ water quality monitoring of receiving waters	To assess impact of discharge to receiving waters.	2 upstream sites, 4 downstream sites, daily during discharge and following day or continuous turbidity monitoring up and down stream during prolonged discharge	Water Quality Monitoring Form

¹. Any change from the hourly monitoring will be done based on consultation with and provision of data to EPA.



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