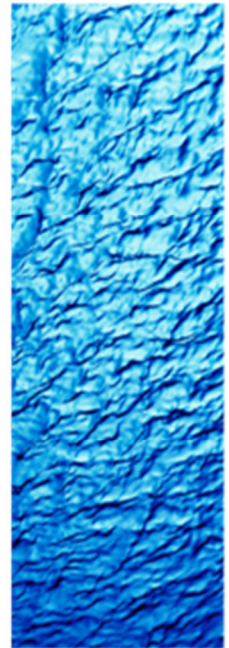
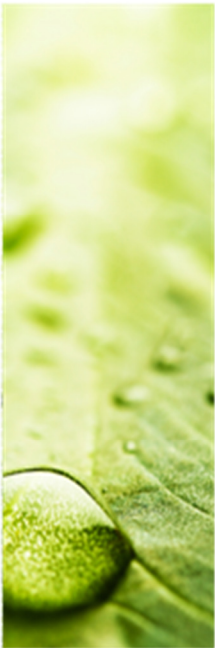


Victorian Desalination Project



D&C Utilities Environmental Management Plan
Attachment I6 – Resource Efficiency Sub Plan

DOCUMENT NUMBER

TDV	0	EV	SB	0012.16	03
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Definitions and acronyms

The following Definitions and Acronyms are used in this document:

CWMS	Construction Work Method Statements
D&C	Design and Construct Phase of the VDP
DSE	Department of Sustainability and Environment
DPI	Department of Primary Industries
EES	Environmental Effects Statement
EIRP	Environmental Incident Response Plan
EMP	Environmental Management Plan
EMR	Environmental Management Representative
EMS	Environmental Management System
EO	Environmental Officer
EPA	Victorian Environment Protection Authority
EP Act	<i>Environment Protection Act 1970</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i>
JHA	Job Hazard Analysis
JSEA	Job Safety and Environmental Analysis
NEPM	National Environment Protection Measure
PEM	Protocol for Environmental Management
O&M	Operation and Maintenance Phase of the VDP
OHS	Occupational Health and Safety
Performance Criteria	The Performance Criteria outline the overarching requirements based on the environmental objective for each Subject Area of Schedule A of Appendix S3 of the Project Scope and Project Requirements
Plant site	Victorian Desalination Project Wonthaggi Plant site
PR	Performance Requirement
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
SEWPAC	Department of the Sustainability, Environment, Water, Population and Communities *formally Department of Environment, Water, Heritage and the Arts (DEWHA)



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The State	The Minister for Water of the State of Victoria for and on behalf of the Crown in the Right of the State of Victoria
TDJV	Thiess Degremont Joint Venture
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 Resource Efficiency Sub Plan details the likely wastes to be produced, resources to be consumed and the management measures required to reduce resource consumption, waste and greenhouse gas emissions associated with 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 EMP. This sub plan forms an attachment to the D&C Utilities EMP and addresses requirements listed in the Environmental Compliance Tracker (TDV-0-EV-RP-0001-01), including licence conditions, performance requirements, performance criteria and other obligations which may impact resource efficiency.

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 management of spoil materials and contaminated soil are contained within the Soil Management Sub Plan and acid sulfate soil is covered by the Acid Sulfate Soil Sub Plan. The Hazardous Materials Sub Plan deals with materials on site (other than contaminated soil) that may also be deemed as waste, such as fuels, asbestos and solvents.

This sub plan forms the D&C Waste Management Plan, with waste-specific issues addressed further in Attachment I6.2 Waste Management. Contaminated land and asbestos are addressed in greater detail in the Soil Management Sub Plan, with management of contaminated soil, liquids and wastes (including asbestos) detailed in Attachment I7.2 Soil Management Procedure.

2 Objectives and targets

The objective of this sub plan is to minimise the use of resources, minimise the generation of waste and appropriately manage waste during construction to ensure project objectives, targets and obligations, including performance requirements and criteria, are met.

Table 1 outlines the relevant resource efficiency 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 1: Environmental objectives, targets and performance requirements

Issue	Objective/Performance Criteria	Target/Performance Requirements
Resource efficiency	<p>Minimise resource use including energy and water during Project Activities.</p> <p>Comply with the Environment and Resource Efficiency Plans reporting and management requirements (PR#11085) D.</p> <p>Design to provide a holistic, best practice solution encompassing minimal resource usage and emissions to the receiving environment. D</p>	<p>Develop and implement construction and operation methods and management systems (including monitoring and reporting) to ensure the efficient use of water resources during Project Activities, including:</p> <ul style="list-style-type: none"> • Minimising water use. Designing offices and associated facilities to achieve a minimum water conservation target of 2A (i.e. less than, or equal to, 18 litres per day per person) • Reusing or recycling water, where possible. Where practical, harvesting rainwater and stormwater as a supplementary supply for various non-potable uses such as toilet flushing, cooling tower, irrigation and various in-plant uses where appropriate • Treating and/or returning surplus water for other non-Project uses or benefits • Using recycled water where practical, including during construction (PR#11087) D, C. <p>Develop and implement construction and operation methods and management systems (including monitoring and reporting) to ensure energy efficiency during Project Activities including:</p> <ul style="list-style-type: none"> • Achieving a specific energy consumption for the desalination process that is less than 4.6kWh/kL (calculated using a method agreed with EPA) on an annual average basis and as low as reasonably practicable and to the satisfaction of EPA • Installing variable speed drives (VSD) on pumps and motors, where practical • Ensuring all pumps are selected to run at their best efficiency point under normal operating conditions (PR#11088) D, C.

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Issue	Objective/Performance Criteria	Target/Performance Requirements
Greenhouse Gas	<p>Minimise greenhouse gas emissions.</p> <p>Adopt energy efficient design in accordance with Protocol for Environmental Management - Greenhouse Gas Emissions and Energy Efficiency in Industry (EPA Victoria), 2006 (PR#27179) D.</p> <p>Comply with the Environment and Resource Efficiency Plans reporting and management requirements (PR#27179) D.</p>	<p>Monitor and report in accordance with the National Greenhouse and Energy Reporting (Measurement) Systems and Technical Guidelines 2008 v1.0 (Department of Water Climate Change, 2008) (PR#27181) C.</p> <p>Demonstrate design, selection of project components and consumables minimises greenhouse gas emissions to the extent reasonably practicable (PR#27182) D.</p>
Waste – general	<p>Manage waste from the construction and operation phases of the Project consistent with the requirements of the Government/ EPA Waste Management Policies</p> <p>Minimise waste through the adoption of best practice waste reduction and disposal procedures consistent with the EPA waste hierarchy (PR#20130) D, C.</p>	<p>Develop and implement a long term waste minimisation and management plan for the construction¹ and operational phases of the Project, incorporating best practice measures to reduce the quantities of particular waste streams and minimise associated environmental impacts – including landfill requirements and greenhouse gas emissions – to the extent practicable, to the satisfaction of the EPA (PR#20132) C.</p> <p>In assessing waste management options, adopt the following order of preference:</p> <ul style="list-style-type: none"> - Waste avoidance and/or reduction - Waste reuse, recycling and reclamation - Waste treatment - Waste disposal (PR#20133) D, C. <p>Remove and otherwise handle any materials containing asbestos in accordance with the requirement of all Laws and Approvals, including the Occupational Health and Safety (Asbestos) Regulations 2003 (Victoria) (PR#20134) C.</p> <p>Promote the efficient use and conservation of resources as part of the training program for all Associates including contractors, subcontractors and operators (PR#20135) C.</p>

D = Design phase requirement; C= Construct phase requirement

¹ This sub plan serves as the Waste Minimisation and Management Plan for the construction phase of Utilities, as required by PR#20132.



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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 Manager 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*
 - o Environment Protection (Environment and Resource Efficiency Plans) Regulations 2007
 - o Environment Protection (Industrial Waste Resource) Regulations 2009
- ~ National Environment Protection Measure (Movement of Controlled Waste Between States and Territories) 2004
- ~ National Environment Protection Measure (Used Packaging Materials) 1998
- ~ Waste Management Policy (Used Packaging Materials)
- ~ EPA Publication 448.3 – Classification of Wastes
- ~ EPA Publication 996 – Guidelines for hazard classification of solid prescribed industrial wastes
- ~ EPA Best Practice Environmental Management – Environmental Guidelines for Major Construction Sites (1996)
- ~ Protocol for Environmental Management - Greenhouse Gas Emissions and Energy Efficiency in Industry (EPA Victoria), 2006
- ~ National Greenhouse and Energy Reporting (Measurement) Systems and Technical Guidelines 2008 v1.0 (Department of Climate Change, 2008).

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 License, Permit and Approval Register
- ~ D&C Utilities EMP – Attachment G – Environmental Obligations Register.

The applicable Performance Requirements from Project Deed Schedule A of Appendix S3 are provided in Table1.

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.

EPA and any other relevant agencies and stakeholders will be consulted with regard to any specific approval requirements in relation to this sub plan. The requirements of any permits, licence and approval 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

There are significant resource efficiency opportunities and waste issues during construction activities along the utilities corridor. These involve project office activities, transport and machinery, fit for purpose use and reuse practices and recycling activities.

Types of waste likely to be generated on site and their management requirements are detailed in Attachment I6.2. In Victoria, wastes are classified using *EPA Publication 448.3 – Classification of Wastes*.

5 Environmental risk

An environmental risk assessment has been carried out for the D & C Utilities works. This assessment is contained in the Environmental Risk Register, Attachment C of the D&C Utilities EMP. Table 2 summarises the potential resource efficiency 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 corridor risk assessment for Resource Efficiency

Activity posing hazard	Risk/ Potential Impact	Inherent Risk (before controls)	Control Measure Reference (Att I06.1)
Excessive use of energy including for lights, air conditioning	Use of resources, increase in greenhouse gases gas production	Moderate	#18, 24-25
Excessive use of water	Depletion of resources	Moderate	#19-23
Generation of office waste	Increased waste to landfill.	Moderate	#2-4
Unforeseen contamination due to inappropriate or illegal disposal of waste	Localised harm to soil and local water quality	Extreme	#2-10, 12, 26
Unexpected discovery of suspected contaminated soil, ASS, liquid or waste material during construction	Localised harm to soil and local water quality	High	Refer to Att. I07.1 Soil Management
Inappropriate handing of waste (eg packaging etc) not in accordance with the EPA Waste Management Policies	Contamination of soil and waterways	Moderate	#2-12, 26

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



6 Control, management and mitigation measures

Attachment I6.1 describes a range of mitigation and control measures that will be used to minimise wastage and manage resource efficiency.

The measures in Attachment I6.1 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 I6.1 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).

The scale of the project provides an opportunity to drive more efficient resource use through the supply chain. Major purchases of resources are managed during the D&C phase with resource efficiency aspects in mind. Supplier evaluations consider the best value offer to TDJV and take into account how the supplier manages its resources and cost to produce a product or supply a service. Contracts detail expectations and obligations regarding contract deliverables.

Bulk purchase agreements (e.g. concrete) are used to minimise cost and minimise resource, packaging and transport wastage. Procurement procedures have specific environmental requirements, as outlined in the Procurement Management Plan (TDV-0-PR-PL-0004-00).

Quality Systems and assurance processes adopted throughout the D&C phase of the project are aimed at avoiding rework and therefore minimising waste and using resources more efficiently.

7 Site environmental plans

Site Environmental Plans (SEPs) have been developed for the Utilities corridor 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 resource efficiency related management controls set out in the SEPs are drawn from this sub plan.

SEPs are held by Area Environment Managers.

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 waste management and resource efficiency are set out in the Monitoring, inspection, audit and reporting schedule – Attachment L of the D&C Utilities EMP.

This 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 Utilities EMP.



9 Contingency measures

Contingency measures have been developed and are summarised below. The control measures table (Attachment I6.1) focuses on preventative measures.

All environmental incidents will be responded to in accordance with the plant site Environmental Incident Response Procedure (EIRP). 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:

- ~ Unforeseen contamination due to the inappropriate or illegal disposal of waste
- ~ Unexpected discovery of contaminated soil, liquid or waste

Excessive use of water and energy in site offices, generators, and other equipment was also identified as a moderate risk. These are managed through the control measures and monitoring requirements outlined in sections 6 and 8 respectively.

In the case of unexpected discovery of contaminated soil, liquid or waste (including materials containing asbestos), the contingency measures as described in the Soil Management Sub Plan, Attachment I7.2 Contaminated Land Procedure, will be followed. Management of contaminated soil, liquid and wastes will be undertaken in consultation with the Project Health and Safety Manager or their representative.



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10 References

10.1 VDP documents

- ~ Environmental Effects Statement, Volume 3, Chapter 9

10.2 Technical / legislative documents

- ~ Sustainability Victoria, 2008, <http://www.sustainability.vic.gov.au>
- ~ Environment Protection (Industrial Waste Resource) Regulations 2009
- ~ Industrial Waste Management Policy (Prescribed Industrial Waste)
- ~ EPA Publication 448.3 – Classification of Wastes and the Guidelines
- ~ Australian Code for the Transport of Dangerous Goods
- ~ *Road Transport (Dangerous Goods) Act 1995*
- ~ *Road Transport Reform (Dangerous Goods) Regulations 1997*
- ~ *Environment Protection Act 1970*
- ~ *Environment Protection (Environment and Resource Efficiency Plans) Regulations 2007*



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ATTACHMENT I6.1 Utilities Resource Efficiency – Control measures table

ATTACHMENT I6.1 RESOURCE EFFICIENCY – CONTROL MEASURES TABLE

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
1	Induction	20135	Promote the efficient use and conservation of resources as part of the training program for all personnel including contractors, subcontractors and operators. Include the waste management hierarchy in the induction with an emphasis on avoidance and minimisation.	Area Environment manager All employees	Design, Construct	Training records	
2	Waste Management	11085, 20132	This sub plan forms part of a Project Waste Minimisation and Management Plan, with schedule(s) to be added as appropriate through the construction phase. The project plan will incorporate best practice measures to reduce the quantities of the waste streams identified and minimise the associated impacts for such things as; landfill requirements and greenhouse gas emissions, to the extent practicable. The Project plan will be developed in consultation with the EPA.	Area Environment manager	Construct	Sub plan & associated waste schedule(s)	
3	Waste Separation	20130, 20133	Prescribed wastes to be separated from non-prescribed waste.	Site Supervisors All employees	Construct	Inspection & monitoring records	
4	Waste Storage	20130	All storage containers and locations for the various waste streams shall be clearly labelled to ensure that mixing of wastes is avoided.	Site Supervisors	Construct	Inspection records	
5	Waste Storage	20130	The storage of prescribed waste shall be in accordance EPA Bunding Guidelines (Publication 347 or its most recent amendment) and the relevant Material Safety Data Sheet (MSDS) for the product shall be available at site of use. The storage of fuel, oil or chemicals on site will be undertaken in a designated area specifically designed to contain chemical, fuel, or other hazardous materials.	Site Supervisors	Construct	Inspection records	
6	Waste Storage	20130	Waste will not be stored adjacent to potentially sensitive areas such as natural vegetation, stormwater drains, residences or waterways.	Site Supervisors	Construct	SEP and SEIs	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
7	Storage	-	Spares waste storage receptacles will be maintained on site for use as required.	Site Supervisors	Construct	Inventory records	
8	Storage	-	All bins to have a securable lid.	Site Supervisors	Construct	SEI	
9	Waste classification and transport	-	All waste to be classified and transported offsite in accordance with EPA Waste Management policies and a Waste Transport Certificate completed and retained where wastes are classified as Prescribed Waste. Consult the Area Environmental Manager on the nature or classification of a waste if it is unknown.	Site Supervisors	Construct	Waste transport certificate copies	
10	Waste transport	18125	Use appropriately licensed (EPA) waste transporters for the transportation of prescribed waste to off-site locations	Site Manager	Construct	Waste transport certificate copies	
11	Litter	-	Keep the site free of litter	Site Manager	Construct	Inspection records	
12	Sewage	-	Manage sewage in accordance with Water Authority requirements	Site Manager	Construct	Compliance records	
13	Construction spoil reuse	11085, 20133	<p>Uncontaminated construction spoil shall be reused as general structural or non-structural fill, including general backfilling, rehabilitation works, general landscaping and construction of embankments and barriers as much as possible. Particles with durable physical and mechanical properties may be used as a road base, drainage or concrete aggregate in line with regulatory requirements.</p> <p>Excess construction spoil is to be managed in accordance with the Spoil Management Plan (PLV-3-CN-PR-0002).</p>	Construction Manager	Construct	Spoil management records	
14	Construction spoil reuse	11085, 20133	<p>Off site reuse of uncontaminated construction spoil shall be considered, including use in the civil sector, agricultural sector and landfill sector (eg material for new landfill cells).</p> <p>Where off site reuse of uncontaminated spoil is not feasible, the excess spoil will</p>	Construction Manager	Construct	Spoil management records	

Att I6 D&C Utilities – Resource Efficiency Sub Plan

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
			be managed in accordance with the Spoil Management Plan.				
15	Temporary roads	11085, 20133	Temporary haul roads during construction to be made using non-descript natural excavated material that will be removed during site reinstatement and reused for quarry backfill.	Site Supervisors	Construct	Haul Road Design Plans	
16	Waste recycling	11085, 20133	Where practically possible, the following (but not limited to) waste types shall be separated on site and sent to a facility for either reuse or recycling: <ul style="list-style-type: none"> - Asphalt - Cable - Cardboard and paper - Concrete/brick/tile (accepted for reprocessing) - Drums - Landscape materials - Oil Pallets - Pallets - Plastic and polystyrene - Scrap metal - Spoil/ rubble - Virgin excavated natural material 	Site Supervisors	Construct	SEP, SEI's	
17	Purchasing	11085, 20130	The procurement of products that have a recycled content (or have been purchased from a reprocessing facility) will take precedence for the following: <ul style="list-style-type: none"> - Office-based supplies - Landscaping materials - Construction materials 	Area Environment Manager	Construct	Procurement records	
18	Purchasing	20130	Major purchases of resources are managed during the D&C phase with resource efficiency aspects in mind. Supplier evaluations consider the best value offer to TDJV and take into account how the supplier manages its resources and cost to produce a product or supply a service. Contracts detail expectations and	Procurement Manager	Construct	Procurement records	

#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
			obligations regarding contract deliverables.				
19	Embedded energy in consumables and project components	27182	<p>Ensure the following designs incorporate selection of project components and consumables that minimise greenhouse gas emissions to the extent reasonably practicable:</p> <p>DP 2-0013 DMPF - Electrical</p> <p>DP 2-0225 - Electrical after 22 kV Transformer</p> <p>DP 3-0100 - Pipeline Overview Report -</p> <p>DP 3-0116 - Pipesection 16</p> <p>DP 3-0117 - Pipesection 17 incl 3 crossings</p> <p>DP 3-0131 Pipe Section 01A</p> <p>DP 3-0132 Pipe Sections 1-10 Stage 1</p> <p>DP 3-0133 Pipe Section 15-13 incl crossings Stage 2</p> <p>DP 3-0134 Pipe Section 12 incl crossings Stage 2</p> <p>DP 3-0135 Pipe Section 11-09 incl crossings Stage 2</p> <p>DP 3-0136 Pipe Section 08-06 incl crossings Stage 2</p> <p>DP 3-0137 Pipe Section 05-04 incl crossings Stage 2</p> <p>DP 3-0138 Pipe Section 03-01 incl crossings Stage 2</p> <p>DP 3-0566 Surge Station kp10.3 and kp29.1 - Process, Mechanical, Electrical, I&C, HVAC</p> <p>DP 3-0559 Transfer Pump Station Electrical</p>	Design Package Manager	Design	Verified designs	
20	Water minimisation	11085, 11087	<p>Ensure the following designs provide minimal water usage and maximum water reuse and recycling: Site office and other facilities will achieve a minimum water conservation target of less or equal to 18 litres per person per day.</p> <p>DP 3-0552 Transfer Pump Station Building Services</p> <p>DP 3-0556 Booster Pump Station Building Services</p> <p>DP 3-0565 Surge Station km 10.300 Building Services</p>	Design Package Manager	Design	Verified designs	

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#	Issue	PR # addressed	Control Measure	Responsibility *	Project Phase	Evidence	Audit Check
			DP 3-0569 Monitoring points - Building Services DP 3-0551 Transfer Pump Station STR - Superstructure DP 3-0572 - Transfer Pump Station Envelope - Architecture - DP 3-0579 - Booster Pump Station Envelope - Architecture -				
21	Water minimisation	11085, 11087	Recycled water will be used for dust suppression spraying over potable water where possible.	Site Manager	Construct	SEP and SEIs	
22	Water minimisation	11085, 11087	Minimise the use of potable water. This will include use of recycled water for activities such as dust control. -	Site Manager	Construct	SEP and SEIs	
23	Water minimisation	11085, 11087	Apply water during periods of least evaporation (early morning and late evening) where practical.	Site Manager	Construct	Site inspection records	
24	Water minimisation	11085, 11087	Monitor water usage as per and assess obligation report to EPA's EREP program. Thresholds for reporting are 120ML/year water usage or 100TJ/year energy usage.	Area Environmental Manager	Construct	Monitoring records	
25	Energy efficiency in construction	27179	Ensure the following designs adopt energy efficient design during construction: DP 3-0566 Surge Station kp10.3 and kp29.1 - Process, Mechanical, Electrical, I&C, HVAC DP 3-0559 Transfer Pump Station Electrical	Design Package Managers	Design	Verified designs	
26	Energy	11088, 27181	Monitor energy usage and assess obligation report to EPA's EREP program (see #23 above) and the Commonwealth Government's NGERS program. NGERS facility threshold is 100TJ/year energy use – identical to EREP.	Area Environment Manager	Construct	Monitoring records	
27	Asbestos	20134	Ensure that removal or handling of any material containing asbestos is done in accordance with the requirement of all Laws and Approvals, including the Occupational Health and Safety (Asbestos) Regulations 2003 (Victoria). Refer to Soil Management Sub Plan, Attachment I7.2 Contaminated Soil Procedure for the details of the management measures for asbestos.	Area Environment Manager / Health and Safety Officer	Construct	Daily logs	



* The *Responsibility* 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.



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ATTACHMENT I6.2 Utilities Resource Efficiency – Waste Management

ATTACHMENT I6.2 RESOURCE EFFICIENCY – WASTE MANAGEMENT

1. Introduction

This attachment describes waste aspects of the Utilities Resource Efficiency Sub Plan in further detail. Control measures for the minimisation and management of wastes are described in Attachment I6.1 Control Measures Table. Contingency measures relating to waste are described in the Resource Efficiency Sub Plan, section 9.

2. Waste Hierarchy

The objectives and targets detailed in the Resource Efficiency Sub Plan Table 1 will be achieved through the implementation of the Victorian EPA waste management hierarchy displayed graphically in Figure 1.

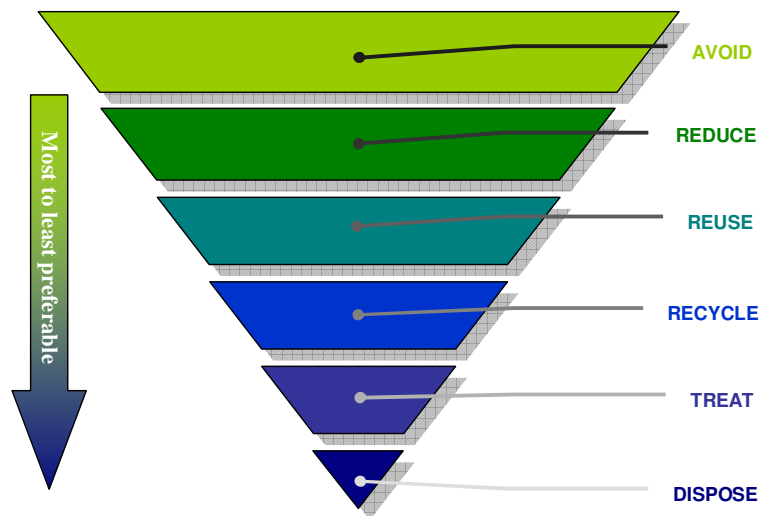


Figure 1: Waste Hierarchy

This waste hierarchy aims to achieve the following:

- AVOID:** Do not produce the waste in the first place.
- REDUCE:** Reduce the amount of pollution or waste by changing the way the activity is carried out.
- REUSE:** Some products and materials can be reused with minimal processing, for example, use durable alternatives to disposables, or use waste materials from one process as the raw material for another.
- RECYCLE:** Break down products into their constituent materials and reprocess this into new articles.

TREAT: Treat products to make them less harmful to the environment.

DISPOSE: Transfer waste to another location under controlled conditions for long-term storage (no further use).

3. Type of wastes

3.1 Waste generation

The major waste-generating aspects of the works include but are not restricted to:

- Project office activities
- Materials for construction of the utilities associated with the desalination plant
- Ancillary works related to the desalination plant utilities
- Site preparation and development, including clearing and grubbing of the site and vegetation removal
- Pavement and road works
- Storm water runoff.

Potential waste types generated from the above work activities are detailed in Table 1. In Victoria wastes are classified utilising the *EPA publication IWRG631 – Solid Industrial Waste Hazard Categorisation and Management, 2009*.

Table 1: Potential waste products generated during construction

Waste types*	State**	Classification
Project office activities		
Glass	S	Solid Inert ***
Aluminium cans	S	Solid Inert***
Paper and cardboard*	S	Solid Inert *** (if separated from other waste streams)
PET plastic bottles	S	Solid Inert***
Toner cartridges	S	Solid Inert
Putrescible wastes (non recyclables)*	S	Putrescible
Paint wastes and sludges	L	Prescribed
Office fit-out wastes*	S	Solid Inert
Sanitary waste	S	Not Applicable
Batteries	S	Prescribed
Sewage	L	Prescribed
Site Preparation and Development		
Metals*	S	Inert***
Cables	S	Inert***
Bitumen seal	S	Inert***

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Waste types*	State**	Classification
Vegetation removal*	S	Putrescible
Topsoil*	S	Inert
Fill material	S	Inert
Masonry materials (e.g. concrete rubble)	S	Inert***
Construction Works		
Bitumen seal	S	Inert***
Sub base and base course materials	S	Inert
Utilities Works Construction		
Concrete Slurries*	L	Inert when allowed to cure***
Timber (formwork, off-cuts, packaging, packing crates)*	S	Inert *** (provided separated from other waste streams)
Ferrous materials (e.g. steel frame, drums, piping, cables, sheeting, strapping)*	S	Inert***
Non-ferrous materials (e.g. electrical cable off-cuts, aluminium profile off-cuts)	S	Inert***
Rigid and film plastics (e.g. PVC piping off-cuts, drums, packaging film)	S	Inert***
Oils	L	Prescribed
Oily waste water	L	Prescribed
Batteries	S	Prescribed
Fuels	L	Prescribed
Engine coolant	L	Prescribed
Paint wastes and sludges	L	Prescribed
Sewage	L	Prescribed
Topsoil	S	Inert
Any other waste material that meets the criteria for dangerous goods under the Australian Code for the Transport of Dangerous Goods by Road and Rail (chemical waste from painting, maintenance, spill cleanup).	S and L	Prescribed
Ancillary works		
Concrete slurries*	L	Inert***
Ferrous materials (e.g. steel frame, drums, piping, cables, sheeting, strapping)*	S	Inert***
Non-ferrous materials (e.g. electrical cable off-cuts, aluminium profile off-cuts)	S	Inert***

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Waste types*	State**	Classification
Rigid and film plastics (e.g. PVC piping off-cuts, drums, packaging film)	S	Inert***
Oils	L	Prescribed
Batteries	S	Prescribed
Fuels	L	Prescribed
Used tyres	S	Inert
Engine coolant	L	Prescribed
Paint wastes and sludges	L	Prescribed
Any other waste material that meets the criteria for dangerous goods under the Australian Code for the Transport of Dangerous Goods by Road and Rail	S and L	Prescribed

* Waste type anticipated to be generated in large quantities (in relation to other waste types and construction activity).

** L= liquid; S= non-liquid (solid)

*** Schedule 1 of the *Environment Protection (Industrial Waste Resource) Regulations 2009* also classifies these wastes as "industrial waste"

3.2 Management requirements for waste disposal

Table 2 details the waste categories, description and management requirements that apply in Victoria for off site disposal of waste in accordance with EPA publication IWRG631 – Solid Industrial Waste Hazard Categorisation and Management, 2009. Categories in Table 3 can be matched to the classification of potential wastes listed above in Table 1 to assist in the selection of appropriate management options.

Table 2: Management requirements by category

Category	Description	Management option	EPA requirements for offsite disposal
Solid Inert***	Building/demolition material, e.g. concrete, bricks, dry timber, plastic, glass, metals, bitumen; and shredded tyres	Reuse Recycling Landfill	Receiving facility must be licensed (Non-municipal landfills) and when disposing to municipal landfill serving >5000 persons the receiving facility must be licensed. ¹
Putrescible	Food or garden wastes from commercial or industrial sources, e.g. vegetable processing, butchers and domestic garbage	Composting Stockfood ² Recovery of energy Landfill	As above

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Category	Description	Management option	EPA requirements for offsite disposal
Prescribed waste	<p>Prescribed industrial waste means any industrial waste or mixture containing industrial waste other than industrial waste or a mixture containing industrial waste that—</p> <p>(a) is a Schedule 1 industrial waste; or</p> <p>(b) has a direct beneficial reuse and has been consigned for use; or</p> <p>(c) is exempt material; or</p> <p>(d) is not category A waste, category B waste or category C waste;</p> <p>As defined as:</p> <p>Environment Protection (Industrial Waste Resource) Regulations 2009</p>	Various treatment and disposal methods depending on waste type and hazard category	<p>No disposal of Category A waste to landfill.</p> <p>Disposal of hazard category B or C waste to a licensed site.¹</p> <p>EPA transport certificates must be used (Attachment I6.1).</p> <p>Vehicles must hold EPA permit (unless exemption issued).</p>
SOIL – dealt with directly in Soil Management Sub Plan			
Fill Material	Soil where: the site assessment demonstrates the soil is not contaminated or contamination concentrations do not exceed those specified in Table 2* and without potential amenity effects, e.g. highly odorous or any elevated levels of metals or other constituents can be demonstrated to be of natural origin	Use as fill material, e.g. site filling/levelling	No licence required. However, reuse must not give rise to environmental or health impacts.
Category A Contaminated soil	Contaminated soil with any contaminant concentration or leachable concentration greater than those specified in Table 4* or soil that displays any hazard characteristic listed in Table 6*	<p>On-site remediation</p> <p>Off-site remediation</p> <p>Storage pending availability of treatment</p>	<p>No disposal to landfill.</p> <p>EPA transport certificates must be used (Attachment I6.1).</p> <p>Vehicles must hold EPA permit (unless exemption issued).</p>
Category B Contaminated soil	Contaminated soil with any contaminant concentration or leachable concentration greater than those specified in Table 3*, but not exceeding both the contaminant and leachable concentrations specified in Table 4*	<p>On-site remediation</p> <p>Off-site remediation</p> <p>Licensed facility</p>	<p>Disposal to licensed facility.¹</p> <p>EPA Transport certificate system must be used (Attachment I6.1).</p> <p>Vehicles must hold EPA permit (unless exemption issued)</p>

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Category	Description	Management option	EPA requirements for offsite disposal
Category C Contaminated soil	Contaminated soil with any contaminant concentration greater than those specified in Table 2*, but not exceeding both the contaminant and leachable concentrations specified in Table 3*	On-site remediation Off-site remediation Licensed landfill	Disposal to licensed landfill. ¹ EPA Transport certificate system must be used (Attachment I6.1). Vehicles must hold EPA permit (unless exemption issued).

* EPA Publication 448.3 – Classification of Wastes

*** Schedule 1 of the *Environment Protection (Industrial Waste Resource) Regulations 2009* also classifies these wastes as “industrial waste”

- 1 Receiving facility must be licensed to receive the specific waste type, and for prescribed industrial waste, the specific hazard category
- 2 The Victorian Department of Primary Industries can provide advice on the suitability of commercial waste as stockfeed

3.3 Waste recycle and reuse

Table 3 details the waste categories and reuse/recycle targets for the Utilities Corridor.

Table 3: Waste recycle and reuse targets

Waste Stream	Target
Recyclable Waste	60% recycling of comingled waste
	80% recycling of waste metal
	80% recycling of waste concrete
Prescribed waste	100% separation of prescribed wastes from general waste streams
Spoil	100% beneficial reuse (clean) fill material
	100% of contaminated soil disposed of to landfill and with EPA transport certificate, or remediated on site
	100% disposal of contaminated soil in accordance with EPA Guidelines
ASS	0% disposal waste ASS to non-licensed landfill
	>90% reuse of waste ASS on site
	Identification and disposal of all contaminated soil in accordance with EPA Soil Hazard Categorisation and Management Guidelines
	100% transportation and disposal of asbestos in accordance with EPA guidelines