

Environmental management of dewatering during construction activities

Issued August 2018

EPA 1093/18: This guideline advises on the environmental management of dewatering during construction activities under the Environment Protection Act 1993 and relevant environment protection policies. It is intended for all proponents who may dewater during construction activities including site owners, developers and their professional consultants and contractors.

1 Purpose of this guideline

This document guides proponents on their obligations under the *Environment Protection Act 1993* (EP Act) and the *Environment Protection (Water Quality) Policy 2015* (Water Quality Policy), with respect to environmental management of dewatering during construction activities. This guideline relates specifically to construction sites where earthworks will intersect groundwater or other non-groundwater related temporary dewatering activities. The guideline also highlights the intersection of dewatering with earthworks drainage which is a licensed activity under Schedule 1 of the EP Act. A decision-making flowchart (Figure 2) outlines the key considerations in preparing for and managing dewatering and earthworks drainage activities.

For the purpose of this guideline, dewatering is the process of removal of any water that accumulates in earthwork excavations or below ground structures, as a result of, for example:

- intersecting aquifers
- seepage of soil water/groundwater
- storm events or rainfall (including surface water runoff).

The water removed during dewatering activities is classified as wastewater.

Any responsible party must ensure that dewatering wastewater must not be discharged directly or indirectly to surface waters including the stormwater system, inland or marine waters, and are required to consider all reasonable and practicable alternatives to environmental discharge. The guideline emphasises the importance of the initial planning phase, and the need to carry out risk assessments, and, where necessary, hydrogeological assessments. Each dewatering project will require environmental management that is site and project specific.

This document should be read in conjunction with the EPA Guideline [Construction environmental management plans \(CEMP\)](#) which describes how activities undertaken during the construction phase of development will be managed to avoid or mitigate negative environmental impacts and how those environmental management requirements will be implemented. Effective planning for dewatering activities can inform site design and decrease costs associated with dewatering. This document aims to clarify the current regulatory requirements that already exist for proponents, site owners, developers and their professional consultants and contractors through the planning system or in general as part of their general environment duty under the EP Act and Water Quality Policy.

Mining dewatering is not covered in this guideline. All mine dewatering projects are processed by the Department of Energy and Mining. The dewatering of dredge spoil is also not covered and should be referred to the EPA for guidance.

2 Legislative requirements

The EP Act provides for the protection of the environment and promotes the principles of ecologically sustainable development. Section 25 of the Act imposes the general environmental duty on all persons undertaking an activity that may pollute, to take all reasonable and practicable measures to prevent or minimise any resulting environmental harm. Environmental harm is defined in section 5 and further specified for waters in clause 5 of the Water Quality Policy.

The EP Act and associated Water Quality Policy require dewatering to be carried out in a manner that does not cause environmental harm. The policy is subordinate legislation, developed to secure the objects of the Act with respect to water. It also makes clear via clauses 4 and 9 that the waste management hierarchy is an order of priority for the management of waste which includes dewatering wastewater.

The hierarchy is as follows:

- 1 avoidance of the production of waste
- 2 minimisation of the production of waste
- 3 reuse of waste
- 4 recycling of waste
- 5 recovery of energy and other resources from waste
- 6 treatment of waste to reduce potentially degrading impacts
- 7 disposal of waste in an environmentally sound manner.

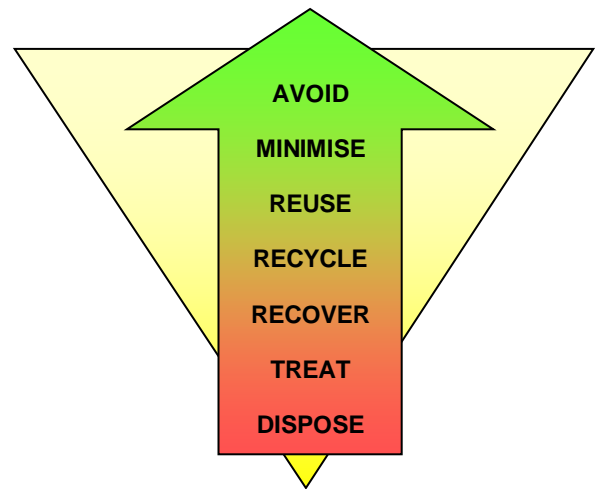


Figure 1 Waste hierarchy

These are pursued in order with first, avoidance of the production of waste; second, to the extent that avoidance is not reasonably practicable, minimisation of the production of waste; third, to the extent that minimisation is not reasonably practicable, reuse of waste, and so on. The hierarchy is regarded in [South Australia's Waste Strategy 2015–2020](#) as a key element for guiding waste management practices, while still recognising the need for flexibility based on local and regional economic, social and environmental conditions.

A person who pollutes or might pollute waters must follow this hierarchy, and it is applicable to all dewatering projects. The Water Quality Policy includes mandatory provisions to prevent negligent or deliberate acts of water pollution (clauses 10 and 11). Clause 10 is most relevant and makes clear that it is an offence to discharge a [Class 1 pollutant](#)¹ into any waters or onto land in a place from which it is reasonably likely to enter any waters. Clause 11 similarly states that it is an offence to discharge a [Class 2 pollutant](#)² into any waters.

Large earthworks activities that involve dewatering may require an authorisation in the form of a licence. The threshold for an 'earthworks drainage' licence is stated in Schedule 1 of the EP Act:

[the conduct of earthworks operations in the course of which more than 100 kL of waste water containing suspended solids in a concentration exceeding 25 mg/L is discharged directly or indirectly to marine waters or inland waters.](#)

¹ Appendix 1 Schedule 2 – Class 1 pollutants

² Appendix 2 Schedule 3 – Class 2 pollutants

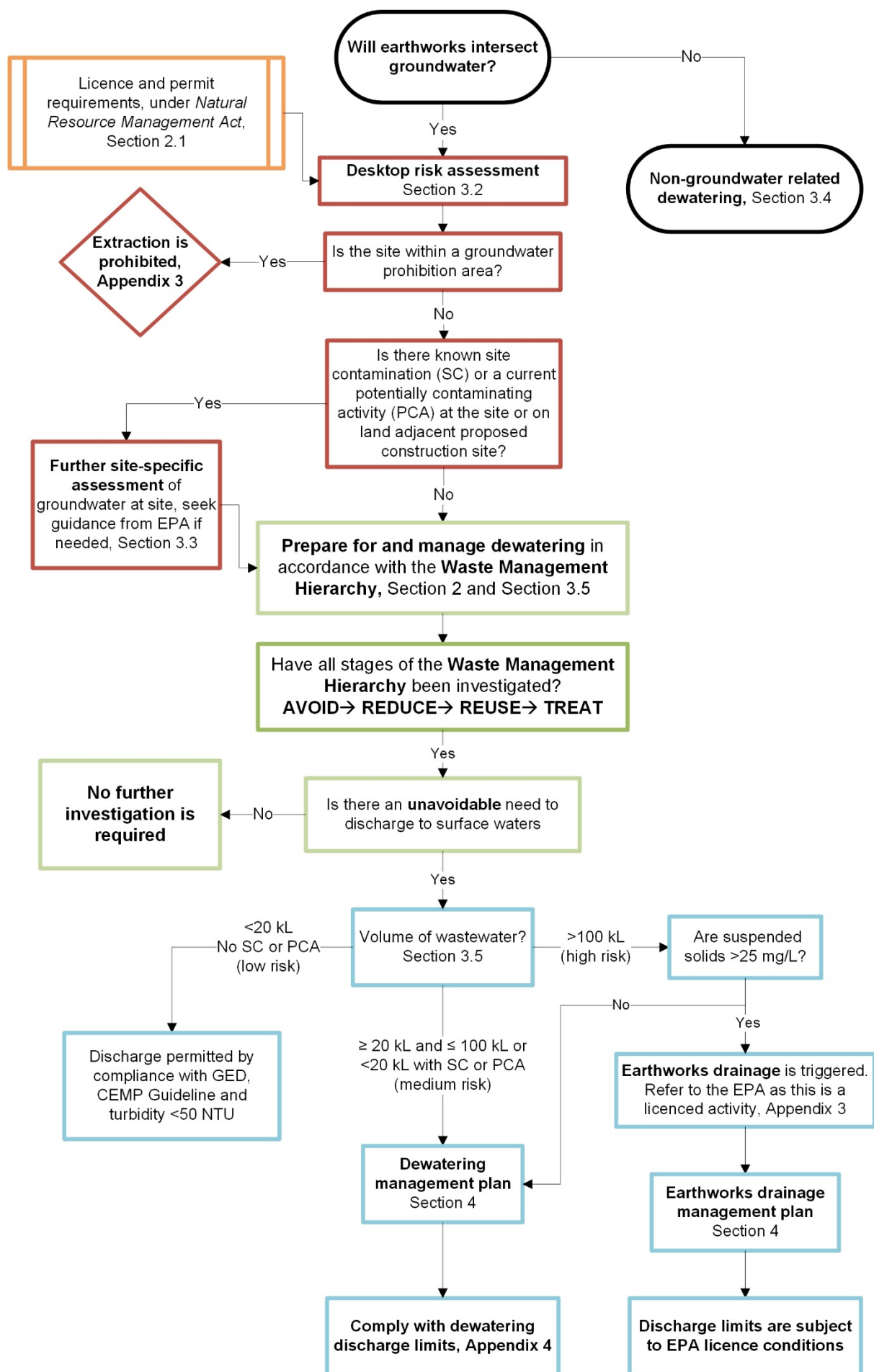


Figure 2 Decision-making flowchart for dewatering and earthworks drainage

If a project is likely to require an earthworks drainage licence, it is important to consult the EPA. Proponents will need to prepare an earthworks drainage management plan (EDMP) on how they will manage the activity in accordance with the waste management hierarchy. This is described in further detail on pages 6–7 of this guideline.

Some dewatering situations may encounter groundwater that has been contaminated³ by a previous activity. Appropriate preparation and planning should be done to prevent dewatering activities intersecting known or potential site contamination. If groundwater quality assessment confirms site contamination exists at a site, the owner/occupier, site contamination auditor or consultant engaged in the assessment of the site must notify the EPA as soon as reasonably practicable. This is a legal requirement under section 83A⁴ of the EP Act with an associated penalty of \$120,000 if the offender is a body corporate and a Division 1 fine for a natural person.

2.1 Consideration of the Natural Resource Management Act 2004⁵

In each instance where dewatering is proposed, an assessment would need to be made as to whether the requirement for a water licence is triggered. It is recommended that the proponents contact Department of Environment and Water (DEW) on (08) 8463 6876 regarding this issue. Please refer to the following links for additional guidance:

- 1 [Water affecting activities requirement](#)
- 2 [Water allocation plans](#).

This will ensure that all licence and permit requirements are dealt with prior to the start of works.

3 Planning to dewater

3.1 Development application process

The South Australian Planning System is regulated through the *Development Act 1993* and the *Development Regulations 2008* and development requires an approval before it is undertaken. Within this framework the EPA assesses referred development applications.

The EPA's involvement in assessment matters related to building construction is limited and much of the work is undertaken by the relevant planning authority (local government or State Commission Assessment Panel). The information in this guideline will assist developers and planning authorities when assessing development applications in which dewatering activities are likely to occur. In the case of earthworks drainage, as it is listed in Schedule 22 of the *Development Regulations 2008*, it is an activity that is to be referred to the EPA for assessment and direction. If the proposal does not meet this or other criteria for referral then assessment will be undertaken by the relevant planning authority.

When undertaking an assessment of a development application or major development, the EPA or a relevant authority may request a construction environmental management plan (CEMP) be provided as part of that assessment, or may recommend or impose a condition requiring a CEMP prior to construction commencing. Management of dewatering may form a component of the CEMP.

A condition of development approval (under the *Development Act 1993* or *Development Regulations 2008*) may require the preparation of a CEMP to the satisfaction of the EPA. In this circumstance, it is the proponent's responsibility to seek EPA support for the development of the CEMP. Once a CEMP is finalised it can be endorsed by the relevant development approval authority. The relevant authority is also responsible for ensuring the CEMP is complied with, and the EPA will provide assistance as needed. This guideline provides further information regarding dewatering management so that it may be covered in the CEMP as an environmental issue relating to water quality.

³ Site contamination is defined in section 5B of the EP Act.

⁴ https://www.epa.sa.gov.au/files/13544_sc_groundwater_assessment.pdf

⁵ *Natural Resource Management Act 2004*

3.2 Desktop risk assessment

The desktop risk assessment is to be undertaken for any earthworks that will intersect groundwater. For other shallower earthworks that require dewatering as a result of only surface water runoff or storm events/rainfall, dewatering and any associated risks must still be planned for and managed through the waste management hierarchy. Page 6 of this guideline provides further clarification for non-groundwater related dewatering. For managing any other risks associated with water quality at construction sites the CEMP guideline must also be followed.

Underground waters may be contaminated by a wide range of pollutants (Appendices 1 and 2). Dewatering these contaminated waters and then discharging them to surface waters, such as inland and marine waters or a stormwater system, may result in environmental harm. Therefore, prior to any dewatering activities (where earthworks will intersect groundwater), a desktop risk assessment should be carried out to highlight potential environmental risks. As a minimum this will identify groundwater prohibition areas (GPA), known site contamination and existing potentially contaminating activities (PCAs) at the site and land directly adjacent the site⁶. PCAs are defined in the *Environment Protection Regulations 2009* under Schedule 3 – Site Contamination⁷. Refer to [Appendix 3](#) for further explanation regarding GPAs, site contamination and PCAs.

Options for dewatering (source), discharge procedures (pathway) and discharge-receiving environment (receptor) should also be investigated at this stage. If pollutants in the dewatering discharge have the potential to cause impacts to a receiving environment, for example, wastewater with elevated turbidity or suspended solids, management strategies should be designed to reduce those risks as far as reasonably practicable.

As a minimum, the EPA recommends searching the following resources which are publicly available via the EPA or other government websites:

- 1 [Public Register](#)
- 2 [Groundwater prohibition areas](#)
- 3 [Site contamination index](#)
- 4 [Groundwater information](#)
- 5 Other mapping systems: [Location SA](#) and [Environment Data](#).

The primary focus of this guideline and the associated desktop risk assessment is to identify the risks associated with contaminated groundwater or dewatering wastewater that *may be released to surface waters*. If a more detailed risk assessment is required with respect to site contamination, the EPA can advise on the appropriateness and level of detail required, and may request a preliminary or detailed site investigation be carried out in accordance with the *National Environment Protection Measure (Assessment Site Contamination) 1999* (ASC NEPM). Any site contamination issues should be addressed by a suitably qualified and experienced site contamination consultant. Further information on site contamination can be found on the [EPA website](#).

3.3 Further site-specific assessment

Hydrogeological characterisation of the site provides the necessary information to determine the volume, quality and duration of the dewatering discharge during construction. Relevant hydrogeological information is applicable when dewatering of groundwater is occurring and is used to decide upfront the expected duration of the dewatering project (short term and temporary) and, for a longer-term project, whether dewatering can be completed in a specified time or will be ongoing, for example, for the lifetime of a building (see [Appendix 3](#)).

Failure to anticipate dewatering requirements and subsequent intersection of groundwater during excavation can lead to costly construction delays, while approvals for dewatering are sought. This highlights the need for dewatering to be

⁶ This buffer zone can be negotiated based on level of risk presented by dewatering activities, in consultation with the EPA.

⁷ <https://www.legislation.sa.gov.au/LZ/C/R/ENVIRONMENT%20PROTECTION%20REGULATIONS%202009/CURRENT/2009.227.UN.PDF>

considered during the design stage. Proponents should be aware that dewatering wastewater that is highly contaminated and unsuitable to be discharged to surface waters can have costly disposal options, for example, liquid waste facility or SA Water trade waste.

If one or more significant risks were identified in the desktop risk assessment or it is anticipated that there will be an unavoidable discharge to stormwater system or surface waters (inland or marine), this indicates that further site-specific hydrogeological information will be required. For further guidance on other issues that trigger the need to seek guidance from the EPA because of the environmental risk they present, refer to [Appendix 3](#) for a summary. If the proponent of dewatering can confirm that there will be zero discharge to surface waters (including stormwater system, inland and marine waters) there will be no requirement to investigate further.

It is beneficial for proponents of dewatering to obtain the following further information:

- 1 Volume and quality of water to be discharged ([Appendix 4](#) for analytical suite). Proponents should be aware of their requirement to notify the EPA if site contamination of groundwater is identified (section 83A notification⁸). Further guidance is available from the EPA.
- 2 Details of dewatering volume, rate and duration.
- 3 If groundwater is to be sampled prior to construction commencing, seasonal changes in depth to groundwater at the site, caused by variability from the winter season or heavy rainfall, should be taken into account,
- 4 Effects on hydrogeology of the surrounding area – impact on coastal/estuarine and other groundwater users. This can be considered in greater detail if necessary in the dewatering management plan (DMP).

By following this guideline any significant hazards should be identified upfront, for example, highly contaminated groundwater that would need to be disposed of via a licensed hazardous liquid waste transporter on an ongoing basis. Such a situation along with its associated costs may trigger a re-design of the site, for example, reconsidering basement carparks.

3.4 Non-groundwater related dewatering and associated risks

For earthworks that will not require dewatering of groundwater, the desktop risk assessment and further site-specific assessment are not required as the associated risks are significantly reduced. However, there are potential risks associated with surface water runoff into earthwork excavations and the potential for the resultant accumulated water to be contaminated. Contamination can be dependent on the source and pathway of the surface water runoff. Examples of this include but are not limited to: surface water runoff over contaminated soils, industrial sites or sites with a PCA and runoff across construction sites (causing increased turbidity).

Proponents working on a known contaminated site or PCA must adequately plan for such risks upfront and before commencing dewatering activities. Management strategies must be designed to reduce risks as far as reasonably practicable. Proponents are still required to prepare for and manage their dewatering activities in accordance with the waste management hierarchy, taking all reasonable and practicable measures to avoid discharging to inland or marine waters or the stormwater system, and when a discharge occurs to meet the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000* (ANZECC and ARMCANZ). Proponents should still be aware that non-groundwater related dewatering still has the potential to trigger earthworks drainage, a licensed activity under Schedule 1 of the EP Act (See [Appendix 3](#)).

3.5 Management of dewatering

Any dewatering activities must be managed within the framework of the waste management hierarchy. With appropriate planning in place proponents will ensure their compliance with the EP Act and Water Quality Policy. The decision-making flowchart (Figure 2) shows the need for further considerations:

⁸ https://www.epa.sa.gov.au/files/13544_sc_groundwater_assessment.pdf

- 1 If proponents of dewatering have followed the hierarchy and all wastewater is suitable for reuse or have no requirement to discharge wastewater to any waters, then **no further action is required**.
- 2 If, upon following the waste management hierarchy, where all possible reuse/recycle, treatment and disposal options have been explored and there is an unavoidable need to discharge wastewater to stormwater system, inland or marine waters then the following applies based on the volume of water to be discharged:
 - a **Less than 20 kL (low risk)** – discharge is permitted with no further investigation required, unless the site or adjacent land was identified as having risks associated with site contamination or PCAs (see medium risk below). Proponents are still required to do all that is reasonable and practicable (under general environment duty) to decrease suspended solids in wastewater, ensuring turbidity is below 50 NTU prior to discharge. The CEMP guideline is applicable to address any other risks associated with water quality.
 - b **Between 20 kL to 100 kL (medium risk)** – discharge is subject to water quality testing and dewatering discharge limits must be met prior to any discharge ([Appendix 4](#)), this volume of wastewater triggers the need for a dewatering management plan (DMP). Any further requirements for managing identified risks should also be addressed and reflected in the water quality testing ([Appendix 5](#)).
 - c **Greater than 100 kL (high risk)** – discharge is subject to water quality testing and dewatering discharge limits must be met prior to any discharge. This volume of wastewater triggers the need for a DMP. If suspended solids are 25 mg/L or greater, earthworks drainage is triggered ([Appendix 3](#)) and an EPA licence is required. The conditions of the licence, when granted, will require an earthworks drainage management plan (EDMP). Any further requirements for managing identified risks should also be addressed and reflected in the water quality testing (Appendices 4 and 5).

The DMP and EDMP must clearly follow the principles of the waste management hierarchy and should be prepared by a suitably qualified professional, for the proponent responsible for the dewatering activity. The DMP or EDMP can be included as a component of the construction environmental management plan (CEMP).

The DMP is not required to be submitted to the EPA unless a significant risk to the environment has been identified ([Appendix 3](#)). However, the EPA may request that a DMP be provided for review. The DMP should highlight information obtained through the risk and further site-specific assessments. The DMP can be as simple or detailed as required depending on the complexity of the dewatering activity.

4 Suggested structure for a DMP or EDMP

4.1 Information collected from desktop risk assessment and/or further site-specific assessment

- 1 Purpose of dewatering (an explanation of why dewatering is necessary).
- 2 Description of dewatering technique to be employed.
- 3 Anticipated dewatering flow rate, duration and total volume.
- 4 Assessment of water quality (minimal or more extensive chemical analysis of groundwater may be required depending on presence of known site contamination or PCAs on site or on adjacent land, and to inform water reuse and disposal options). It is strongly recommended that some initial water testing be done prior but will also be required on any wastewater prior to its discharge to surface waters. Refer to Appendices 4 and 5 for analytes.
- 5 Water collection and storage options (if applicable).

4.2 Detailed investigation of the waste management hierarchy

- 1 Water reuse options which include but are not limited to irrigation of nearby grassed or vegetated areas including local ovals or parks, dust suppression on site, or re-injection to the aquifer that groundwater was originally sourced from.

- 2 Water treatment methods, for example, reducing suspended solids or turbidity of wastewater by water filtration systems including but not limited to silt socks, geobags, settling tanks or addition of flocculants. Proponents should also consider reuse options of any treated water.
- 3 Proposed disposal options dependent of water quality (dewatering discharge limits in [Appendix 4](#)) for wastewater pre- or post-treatment, which may include but are not limited to disposal to stormwater system, inland or marine surface waters, SA Water trade waste, liquid waste facility or re-injection to the aquifer with groundwater. If a surface water discharge is to occur, a description of the discharge location is to be included.

4.3 Other considerations (if applicable)

- 1 Noise (for example, pumping noise) and odour (for example, dewatering of sulfate soils) considerations.
- 2 People, property and water bodies that could be affected by the dewatering activity.
- 3 Contingency plans.
- 4 Maintenance plans for equipment, and mitigation plans if equipment fails.
- 5 Any requirements of the EPA licence for earthworks drainage

4.4 Monitoring and reporting (if applicable)

- 1 What is to be monitored (or analysed)?
- 2 How often will monitoring be done and over what timeframe?

Disclaimer

This publication is a guide only and does not necessarily provide adequate information in relation to every situation. This publication seeks to explain your possible obligations in a helpful and accessible way. In doing so, however, some detail may not be captured. It is important, therefore, that you seek information from the EPA itself regarding your possible obligations and, where appropriate, that you seek your own legal advice.

Further information

Legislation

[Online legislation](#) is freely available. Copies of legislation are available for purchase from:

Service SA Government Legislation Outlet
Adelaide Service SA Centre
108 North Terrace
Adelaide SA 5000

Telephone: 13 23 24
Facsimile: (08) 8204 1909
Website: shop.service.sa.gov.au
Email: ServiceSAcustomerservice@sa.gov.au

General information

Environment Protection Authority
GPO Box 2607
Adelaide SA 5001

Telephone: (08) 8204 2004
Facsimile: (08) 8124 4670

Freecall: 1800 623 445 (country)
Website: <https://www.epa.sa.gov.au>
Email: epainfo@sa.gov.au

Appendix 1 Schedule 2 – Class 1 pollutants extracted from the Water Quality Policy

Agricultural chemicals

Asbestos

Biosolids and wastewater treatment sludge

Brick, bitumen or concrete cutting wastewater

Building washwater

Carpet or upholstery cleaning waste

Chemicals designed for human or animal therapeutic use

Chemicals listed in Schedule A of the *National Strategy for the Management of Scheduled Wastes 1992*, prepared by ANZECC, as in force from time to time

Cleaning agents

Concrete waste

Condensate from compressors

Construction and demolition waste (whether or not inert)

Detergents and their byproducts

Domestic waste (being waste produced in the course of a domestic activity)

Engine coolant

Food or beverage waste

Fuel dispensing area washwater

Hard waste (for example, vehicles, tyres, batteries, metal parts, piping, electronic equipment and municipal solid waste)

Hazardous waste

Human waste

High pressure water blasting waste

Liquid waste

Medical waste

Motor vehicle servicing or repairs waste

Oil, grease or lubricants

Paint and paint scrapings

Painting washwater

Paint stripping waste

Petroleum products

Photographic chemicals

Plaster, plaster waste and plaster wastewater

Pool backwash water

Pool chemicals

Putrescible waste (for example, food scraps and dead animals that are putrid or likely to become putrid)

Quarantine waste (waste that is subject to quarantine under the *Quarantine Act 1908* of the Commonwealth)

Radioactive waste (being waste, the management or disposal of which is regulated under the *Radiation Protection and Control Act 1982* or a law of the Commonwealth)

Roof cleaning waste

Rubbish and litter (for example, bottles, cans, cartons, cigarette butts, food scraps, packaging and paper, glass or plastic items or materials)

Sawdust

Sewage

Solvents

Stain or varnish

Steam cleaning waste

Street cleaning waste

Timber preservatives

Trade waste

Washdown water from cleaning animals or animal enclosures

Washdown water from cleaning vehicles, plant or equipment

Washdown water from commercial or industrial premises or wharves

Waste from grease traps

Appendix 2 Schedule 3 – Class 2 pollutants extracted from the Water Quality Policy

Air conditioning or cooling system wastewater

Animal faeces

Fertilisers

Green waste (for example, lawn clippings, leaves and prunings)

Soil, clay, gravel or sand

Appendix 3 Summary of when to refer to EPA for further guidance

Groundwater prohibition and/or restriction areas (GPA)

The EPA, through the provisions of section 103S of the EP Act, can establish a prohibition and/or restriction on taking water affected by site contamination. If it is satisfied that there is site contamination that affects or threatens water; and action is necessary under this section to prevent actual or potential harm to human health or safety, the EPA may, by notice in the Gazette, prohibit or restrict the taking of the water. If the site of dewatering is in an established GPA then the proponent should contact the EPA.

Known or suspected site contamination

Dewatering activities on a site, or on adjacent land to the site, with known site contamination or a potentially contaminating activity (PCA) should have their risks adequately addressed through a DMP. In the case of a PCA or the indication of site contamination on or adjacent land to the site, proponents may be required by the EPA to test groundwater before dewatering activities commence.

Earthworks drainage

Schedule 1 of the EP Act states earthworks operations is a prescribed activity of environmental significance when more than 100 kL of waste water containing suspended solids in concentration exceeding 25 mg/L is discharged directly or indirectly to marine waters or inland waters. An authorisation in the form of a licence is required. Earthworks drainage is also listed in Schedule 22 of the Development Regulations 2008 as an activity that is to be referred to the EPA for assessment and direction. If the proposal does not meet the criteria for referral then assessment will be undertaken by the relevant planning authority.

Potential for disturbance of acid sulfate soils (ASS)

It is not within the scope of this guideline to provide advice on the environmental management of ASS. [Further guidance](#) can be obtained from the EPA⁹.

Activation of trigger values

If pollutants in dewatering wastewater exceed (activate) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000* trigger values¹⁰ (ANZECC and ARMCANZ), there is an increased level of risk to a receiving water environment. That is, there is potential for environmental harm if the dewatering wastewater is discharged to an aquatic ecosystem and is a breach of the Water Quality Policy. Trigger value exceedence does not, in and of itself, preclude dewatering, and all dewatering activities will be considered on a case-by-case basis. This guideline has been supplemented with a list of discharge limits (Appendix 4) to assist proponents where following the waste management hierarchy has resulted in an unavoidable need to dispose of wastewater, these discharge limits must be met prior to any discharge to stormwater system, inland or marine surface waters.

Foreseen ongoing dewatering

If dewatering is foreseen to be ongoing (post-construction or required for the lifetime of the building), then this should be brought to the EPA's attention. Any proposal that incorporates ongoing discharge must be presented to the EPA with evidence demonstrating no potential for environmental harm. If discharge has to be ongoing, disposal costs may be prohibitive especially if specialised disposal is required. This situation needs special early consideration at the design stage for the site.

⁹ https://www.epa.sa.gov.au/environmental_info/water_quality/programs/acid_sulfate_soils

¹⁰ Water quality values that 'trigger' the potential for environmental harm require more detailed evaluation. Trigger values are protective of aquatic ecosystem and primary industry environmental values, as declared in the Water Quality Policy. They are not used as mandatory compliance criteria.

Appendix 4 Water quality trigger values for (i) inland surface waters and (ii) marine waters and Dewatering Discharge Limits

Notes:

- All inland surface waters and marine waters are aquatic ecosystems as declared by the Water Quality Policy
- The freshwater (inland) and marine water quality trigger values are from the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000* (ANZECC and ARMCANZ).
- > means greater than
- < means less than
- LOR means the laboratory limit of reporting

Trigger	Units	Freshwater (inland) (i)	Marine (ii)	Dewatering discharge limits
Turbidity	NTU	1-50	0.5–10	50
pH	mg/L	>6.5 and <9	>8.0 and <8.5	>6.5 and <9
Ammonia (total)	mg/L	0.1	0.05	0.5
Dissolved oxygen	% saturation	90	90	70
Total nitrogen	mg/L	0.1	1	5
Nitrate	mg/L	0.1	0.05	10
Total phosphorous	mg/L	0.1	0.1	0.5
Salinity	mg/L	1,000	n/a	1,000
Total petroleum hydrocarbons (TPH)	–	>LOR	>LOR	>LOR
Copper	mg/L	0.0014	0.0013	0.01
Lead	mg/L	0.0034	0.0044	0.005
Zinc	mg/L	0.008	0.015	0.05
Chromium (VI)	mg/L	0.001	0.0044	0.0044

Appendix 5 Additional chemicals

Additional chemicals that can be **considered** for screening of dewatering discharge if there is a clear reason (for example, if in the vicinity of an industrialised area, a specific PCA, known site contamination or an agricultural setting).

- Volatile chemicals – including monocyclic aromatic hydrocarbons, oxygenated compounds, sulfonated compounds, fumigants, halogenated aliphatic compounds, halogenated aromatic compounds, trihalomethanes and naphthalene.
- Semi-volatile chemicals – including phenolic compounds, polycyclic aromatic hydrocarbons, phthalate esters, nitrosamines, nitroaromatics and ketones, haloethers, chlorinated hydrocarbons, analines and benzidines, organochlorine pesticides and organophosphorus pesticides.