
Guideline

Construction Dewatering



Background

Building and construction activities undertaken on Adelaide and Parafield Airports are subject to the provisions of the Airport (Building Control) Regulations 1997 and Airport (Environment Protection) Regulations 1997 (AEPR 1997); under the *Airports Act 1996*. Where building and construction activities on airport land present potential off-site environmental risks, they are also subject to South Australian environmental legislation, including the Environment Protection (Water Quality) Policy 2015.

Occasionally, proposed excavations associated with development works extend below the depth of the shallow groundwater aquifer or into surface waters, and dewatering of the excavation is required to allow for the safe and effective completion of development works.

It is expected that management measures required to direct up-slope stormwater flow around worksites and excavations will limit the necessity for the dewatering of excavations due to inundation by stormwater. Dewatering should only be used in this scenario where other controls have failed.

Where dewatering of excavations is required, contractors are required to include a Dewatering Management Plan (DWMP) in Construction Environment Management Plans (CEMP) submitted to Adelaide Airport Limited and Parafield Airport Limited (AAL/PAL), as part of Building Approval Application.

Contractor DWMPs must document how construction dewatering is to be managed, in a manner that is compliant with the legislation referenced above and that minimises potential risks to human health and the environment.

This document is intended to provide guidance on:

- determining any potential requirement for dewatering as part of building and construction activities undertaken on Adelaide and Parafield Airports;
and where necessary,
- the development of dewatering management plans (DWMP), which include management measures directed at ensuring all dewatering on the two airports is compliant with the relevant State and Federal legislation and is undertaken in a manner consistent with the requirements set out in this document.

Assessing the potential need for dewatering

Groundwater Depth

Approximate groundwater elevation contours are indicated in Figure 1 (Adelaide Airport) and Figure 2 (Parafield Airport). The groundwater elevations and depths provided are indicative only and are subject to seasonal and long-term fluctuations. More recent data should be sought, particularly where excavation design levels are close to the assumed groundwater elevation. The most recent groundwater elevation data can be obtained from the AAL/PAL Environment Department (environment@aal.com.au).



Requirement for DWMP

Where excavation finished surface levels (design levels) extended below or to within 0.2m of assumed groundwater elevations, it will be assumed that groundwater will be intercepted and dewatering will be required. AAL/PAL will therefore require inclusion of a dewatering management plan in CEMPs submitted by contractors prior to the commencement of development works.

Where dewatering involves surface water or inundation of excavations where stormwater controls have failed a limited DWMP will be required.

DWMP Structure and Content

The primary determinants of DWMP complexity and content will be whether it is groundwater or surface water requiring removal or if contractors intend to dispose of dewatering effluent to on-site soils and waterbodies or transport effluent off-site for disposal. The proceeding guidance in this document is directed at the former scenario, on-site disposal.

DWMPs submitted to AAL/PAL must include:

- the purpose and method of dewatering (including effluent discharge method)
- the expected flow rate and total volume of dewatering
- methodology and criteria for water quality assessment and minimisation of environmental impacts
- dewatering effluent treatment and discharge controls (e.g. erosion)
- a dewatering effluent monitoring plan.

Where proposed excavations works fall within the Acid Sulfate Soil (ASS) risk zone (see Fig.3 and AAL/PAL 'Acid Sulfate Soil Guideline'), consideration of related soil testing results will also need to be included in the DWMP.

Further guidance on the essential elements of dewatering management are provided under the proceeding headings.



Water Quality Assessment

A principal objective of the DWMP is to provide a basis for assessing the potential impact of dewatering effluent on the receiving environment. Requirements for addressing this aspect of dewatering management are outlined below.

Where dewatering involves either surface water or inundation of excavations where stormwater controls have failed, water quality assessment will generally be limited to physio-chemical parameters and will not require laboratory analysis, unless there are other potential contaminants associated with the site activities.

Please note: it is a legislative requirement that all Water Quality (WQ) Assessment works are undertaken by a **suitably qualified environmental professional**, with all chemical analysis to be undertaken by a NATA accredited laboratory.

Analytes

The required analysis for groundwater will vary depending on the location of the development works and the nature of potential contamination risks in that area. AAL/PAL will advise contractors of the required analytical suite when assessing Building Approval applications or when advised of the requirement for dewatering during development works. As a minimum, field measurement of **physio-chemical parameters** must include:

- Electrical Conductivity (EC),
- Redox
- Temperature
- Dissolved Oxygen (DO)
- pH
- Turbidity.

Generally, **laboratory testing** of groundwater samples should be for a broad analytical suite, including but not limited to:

- Total Suspended Solids (TSS)
- Total Dissolved Solids (TDS)
- heavy metals
- nutrients.

In some circumstances AAL/PAL may elect to allow the use of historical analytical results for AAL/PAL groundwater monitoring well/s located near the proposed development site. This will depend primarily on how recently the groundwater sampling was undertaken and the proximity of the monitoring well/s to the development site.

Assessment Criteria

To satisfy regulatory obligations under both State and Federal legislation, the AEPR 1997 and the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000) are to be used in assessing the potential impacts of dewatering effluent on the receiving environment.

Discharge to 'Turkey's Nest' dam

Where dewatering effluent is to be discharged to a 'Turkey's Nest' dam (or detention basin) groundwater analyte concentrations and physio-chemical parameters must be below the AEPR 1997, Schedule 2 criteria (fresh water) for dewatering effluent discharge to be permitted.

Discharge to waterbody

If contractors intend to discharge dewatering effluent to drains or other waterbodies, groundwater physio-chemical parameters and analyte concentrations can be compared to either the ANZECC criteria for freshwater aquatic ecosystems (Table 3.4.1) or the results for receiving environment samples collected at the time groundwater sampling is undertaken. In both cases physio-chemical parameters and chemical concentrations in groundwater must be below lower than the adopted comparison criteria for effluent discharge to be permitted.

Dewatering Effluent Treatment and Control

Procedures for any required control and treatment of dewatering effluent discharge must also be included in DWMPs. AAL/PAL will undertake site inspections to ensure that the documented procedures are implemented and operating effectively.

Sedimentation Tanks

Unacceptable turbidity (or TSS) often restricts the permissible discharge of dewatering effluent to the receiving environment. Where this occurs, contractors are encourage to utilise a sedimentation tank to reduce turbidity to acceptable levels.

Where a sedimentation tank is used to reduce turbidity, contractors will need to demonstrate via field testing of the tank outflow, that turbidity meets the adopted WQ criteria prior to discharge. AAL/PAL also expects regular on-going testing of tank outflows to ensure acceptable turbidity levels are maintained.



Discharge Erosion Control

All dewatering outflows must be managed in such a way that soil erosion, the disturbance of sediments and consequently, the turbidity of discharged effluent entering waterways is kept to a minimum. This can be achieved by a range of measures including but not limited to:

- discharge flow restriction
- gravel beds
- slit fences and socks
- geotextile/material soil coverings.

Reporting

Approval for dewatering will not be provided by AAL/PAL until appropriate WQ assessment reports have been received and reviewed by the AAL/PAL Environment Department.

Consistent with the requirements for WQ assessment works, the reporting of any WQ assessments must be undertaken by a **suitably qualified environmental professional**.

As a minimum WQ assessment reports must include:

- the scope, methodology and date/s of WQ assessment works
- tabulated WQ assessment results, including comparison to the relevant assessment criteria and QA/QC results
- map/s indicating WQ sampling locations
- all relevant laboratory chain of custody documents and certificates of analysis.

Consultants

Water Quality assessments for dewatering on airport land must be undertaken by a **suitably qualified environmental professional** with adequate environmental experience and training. There are a number of specialist consultancy companies who offer services for undertaking such works that meet the general requirements of under the National Environment (Assessment of Site Contamination) Protection Measure 1999.

The following options are available for choosing a suitably qualified consultant:

- Contact a company that employs a Site Contamination Auditor accredited by the SA EPA. The auditor register is available on the EPA website.
- Contact the South Australian branch of the Australian Contaminated Land Consultants Association (ACLCA) for a list of current members on 08 8243 2505 or available at www.aclca-sa.org.au
- Seek advice from a trusted person who has previously engaged a consultant that successfully demonstrated acceptable

standards of competency and completed similar projects successfully.

Further Guidance and References

The AAL/PAL Environment Department can assist in clarifying requirements under this guideline and/or the applicable legislation.

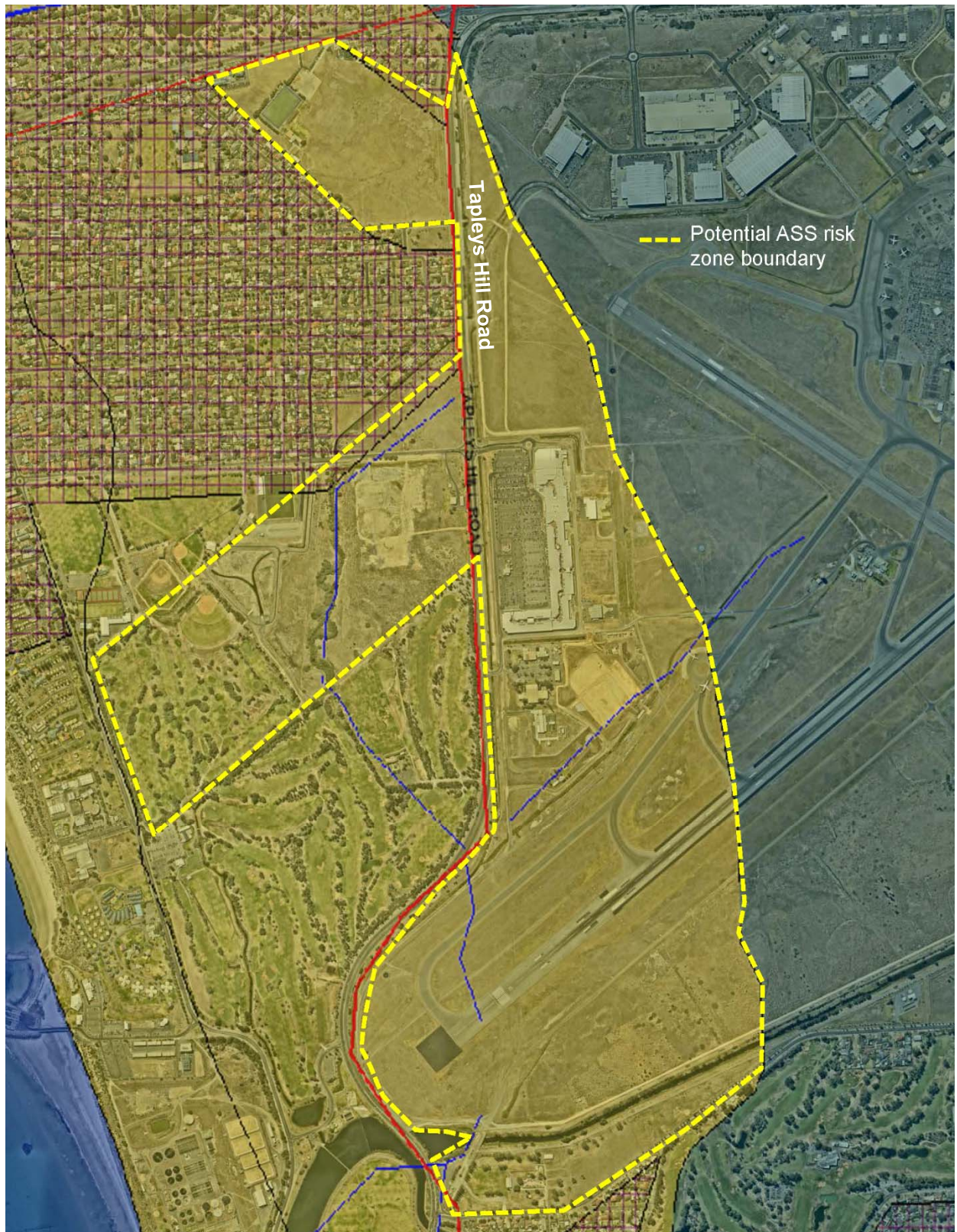
Published documentation which may provide further assistance includes:

- Airport (Environment Protection) Regulations 1997
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000)
- National Environment Protection (Assessment of Site Contamination) Measure 1999, National Environment Protection Council
- Guidance provided by South Australian Environment Protection Authority (EPA), www.epa.gov.au
- AS/NZS 5667.11:1998, Water quality - Sampling - Guidance on sampling of groundwaters

Figure 1. Adelaide Airport groundwater contour map

Figure 2. Parafield Airport groundwater contour map

Figure 3. Acid Sulfate Soil Risk Zone.



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