Western Sydney Airport

Soil and Water Construction Environmental Management Plan

December 2018

Western Sydney Airport

Document Control

File Name	Document Name	Revision
WSA00-BECHTEL-00400-EN-PLN-000004	WSA Co Soil and Water CEMP	1

Revision History

Revision	Date	Description	Author	Reviewer
0	24/09/2018	Approved	WSA Co	S Reynolds
0.1	09/11/2018	Draft updated to include Visitor Centre and Site Accommodation and Material Importation	WSA Co	S Reynolds
0.2	23/11/2018	Draft updated to address comments on the Visitor Centre and Site Accommodation phase and Material Importation phase	WSA Co	S Reynolds
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0.4	12/12/2018	For approval	WSA Co	S Reynolds
1	14/12/18	Revision update to include the Visitor Centre and Site Accommodation phase and Material Importation phase	WSA Co	S Reynolds

Plan Authorisation

Position	Name	Signature	Date
Environment Manager	S Reynolds		12/12/2018

Glossary and Definitions

Item	Definition
Airports Act	Airports Act 1996 (Cth)
Airport	The airport located at the Airport Site. Note: The Airport is referred to in the Act as Sydney West Airport and also commonly known as Western Sydney Airport
Airport Lease	An airport lease for the Airport granted under section 13 of the Act
Airport Lessee Company	The company that is granted a lease over the Airport Site
Airport Site	The site for Sydney West Airport as defined in the Act
ANZECC Guidelines	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000 Guidelines)
Approver	(a) for condition 30 of the Airport Plan (Biodiversity Offset Delivery Plan) and any matter relating to the Biodiversity Offset Delivery Plan – the Environment Minister or an SES employee in the Environment Department; and (b) for other matters – the Infrastructure Minister or an SES employee in the Infrastructure Department.
Apron	The part of an airport used for: a. the purposes of enabling passengers to embark/disembark an aircraft; b. loading cargo onto, or unloading cargo from, aircraft; and/or c. refuelling, parking or carrying out maintenance on aircraft
Associated Site	An 'associated site for Sydney West Airport' as set out in section 96L of the Act
Blue Book	*Managing Urban Stormwater: Soils and Construction* (Landcom 2004)
Condition	A condition set out in Part 3 of the Airport Plan in accordance with section 96C of the Act
Construction Impact Zone	The part or parts of the Airport Site or an Associated Site on which Main Construction Works are planned to occur, as detailed in the Construction Plan approved in accordance with Condition 1.
Construction Period	The period from the date of commencement of Main Construction Works in any part of the Airport Site until the date of commencement of Airport Operations.
EEW	The Phase of the Stage 1 Development that involves early earthworks as described in Section 6 of the Construction Plan
Environment Department	Commonwealth Department of the Environment and Energy

Item	Definition
Environment Minister	The Minister responsible for the EPBC Act
Environmental Impact Statement	The environmental impact statement prepared in relation to the Airport under the EPBC Act
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cth)
Groundwater	Water found below the surface, usually in porous rock, soil or in underground aquifers
Heavy metal	Any metal or metalloid of environmental concern
Infrastructure Department	The Department of the State administered by the Infrastructure Minister
Infrastructure Minister	The Minister responsible for the Act from time to time
Laws	Statutes, regulations, rules, bylaws and other subordinate legislation of the Commonwealth or a state or territory
Main Construction Works	Substantial physical works on a particular part of the Airport Site (including large scale vegetation clearance, bulk earthworks and the carrying out of other physical works, and the erection of buildings and structures) described in Part 3 of the Airport Plan, other than TransGrid Relocation Works or Preparatory Activities
Non-conformance	Failure to conform to the requirements of the Airport Plan (including the SEMF)
Preparatory Activities	The following: a. day-to-day site and property management activities; b. site investigations, surveys (including dilapidation surveys), monitoring, and related works (e.g. geotechnical or other investigative drilling, excavation, or salvage); c. establishing construction work sites, site offices, plant and equipment, and related site mobilisation activities including access points, access tracks and other minor access works, and safety and security measures such as fencing, but excluding bulk earthworks); d. enabling preparatory activities such as: (i) demolition or relocation of existing structures 0ncluding buildings, services, utilities and roads); (ii) the disinterment of human remains located in grave sites identified in the European and other heritage technical report in volume 4 of the EIS; and (iii) application of environmental impact mitigation measures; and

Item	Definition
	e. any other activities which an Approver determines are Preparatory Activities
the Project	Western Sydney Airport – Stage 1 development
Remediation Action Plan	The Western Sydney Airport Remediation Action Plan (RAP) provides a detailed summary of the nature and extent of known contamination on the Site. The RAP also documents the requirement for remediation of the identified contamination, the remediation approach and the implementation of the remediation that must be undertaken to ensure the suitability of the Site for its intended end-use as an airport.
SES Officer	An SES employee under the Public Service Act 1999 (Cth)
Sydney West Airport	The Airport. Note: this is the name used in the Act. The Airport is also commonly known as Western Sydney Airport
Western Sydney Airport (WSA)	The Airport. Note: Under the Act the Airport is referred to as Sydney West Airport

Acronyms and abbreviations

Item	Definition
ACM	Asbestos containing materials
AEPR	Airports (Environment Protection) Regulations 1997
ALC	Airport Lessee Company
ALER	Airfield lighting equipment room
ARFFS	Aviation Rescue and Firefighting Services
ATC	Air traffic control
ATCT	Air traffic control tower
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulations 1998
CEMP	Construction Environmental Management Plan
COPC	Contaminants of potential concern
DIPNR	NSW Department of Infrastructure, Planning and Natural Resources (now Department of Planning and Environment)
EIS	Environmental Impact Statement
EPA	NSW Environment Protection Authority
GSE	Ground support equipment
ha	Hectares
HIAL	High intensity approach lighting
HIL	Health investigation level
HSL	Health screening level
ISO 14001	AS/NZS ISO 14001:2015 – Environmental Management Systems
km	kilometres
m, m2 and m3	Metres, square metres and cubic metres
ML and ML/d	Megalitres and megalitres per day
OEH	NSW Office of Environment and Heritage
POEO Act	NSW Protection of the Environment Operations Act 1997
RAP	Remediation Action Plan
RMS	NSW Roads and Maritime Services
SES	Senior Executive Service
SEMF	Site Environmental Management Framework
TSP	Total suspended particulate matter
WTP	Water treatment plan

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1 Introduction

1.1 Background

In April 2014 the Australian Government announced that the Commonwealth-owned land at Badgerys Creek will be the site for a second Sydney Airport. The Badgerys Creek airport site was selected following extensive studies completed over a number of decades.

In December 2016 pursuant to the Airports Act, the Minister for Urban Infrastructure determined the Airport Plan which sets the environmental and planning authorisation for the development of Stage 1 of the Western Sydney Airport (WSA Stage 1). Part 3 of the Airport Plan outlines the conditions for the design, construction and operation of the Stage 1 development of the airport that must be complied with, regardless of who is delivering the works. These include strict environmental standards and implementation of mitigation measures identified in the Environmental Impact Statement (EIS).

The EIS was prepared in accordance with the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and was finalised under the EPBC Act in September 2016, following a public exhibition period during which almost 5,000 submissions were received. The EIS considered potential impacts during construction and operation of the Stage 1 and long-term development of the proposed airport. In determining the Airport Plan the Minister for Urban Infrastructure accepted environmental conditions proposed by the Environment Minister, taking into account the EIS.

In May 2017, the Government announced that it would establish WSA Co, to develop and operate the airport. WSA Co is responsible for constructing and operating Western Sydney Airport in accordance with the Airport Plan.

The Western Sydney Airport is expected to be developed in stages to match demand and include planning for services and amenities that are easily expandable over time, providing scalable capacity for aircraft, passengers, cargo and vehicle movements.

Stage 1 will include major site preparation, removing or relocating infrastructure from the site and earthworks to prepare the Airport Site, establishing the Airport with a single 3,700 metre runway located in the north-western portion of the Airport Site, a terminal and other support facilities to provide an operational anticipated capacity of approximately 10 million regional, domestic and international passengers per year, as well as freight traffic (the Stage 1 Development).

The scope of works for the Stage 1 Development is defined in the Airport Plan and will generally include the investigation, design, construction and commissioning of:

- Bulk earthworks to move and redistribute approximately 24 million cubic metres of material on the Airport Site
- A single 3.7-kilometre runway
- Aprons, taxiways and other airside pavements
- A multi-user terminal
- Appropriate airport and aviation support facilities
- Drainage and utilities infrastructure
- Car parking, on-site roads and other appropriate landside facilities.

Further details with regards to site activities specific to this Soil and Water CEMP is provided in Section 2.

1.2 Document context and scope

This WSA Co Soil and Water Construction Environmental Management Plan (Soil and Water CEMP) (this plan) has been prepared to satisfy the requirements of the Soil and Water CEMP set out in the Conditions for the Stage 1 Development of the Western Sydney Airport detailed in Section 3.10.2 of the Airport Plan. Specifically, Section 3.10.2 Condition 8(1) of the Airport Plan requires that a WSA Co Soil and Water CEMP be approved under the Airport Plan prior to the commencement of Main Construction Works under the Airport Plan.

This Soil and Water CEMP provides the management approach and requirements (including environmental mitigation measures, controls, monitoring and reporting) for soil and water during construction of the Stage 1 Development. This plan forms one of nine CEMPs which are collectively covered by the WSA Co Site Environmental Management Framework (SEMF). To ensure the environmental resources, responsibilities and management measures are implemented during the construction activities, the SEMF is contained within the Construction Plan (included as Appendix 2). The implementation of the Construction Plan and the SEMF are aligned with other Project level management plans including the Community and Stakeholder Engagement Plan and the Sustainability Plan as illustrated in Figure 1.

The Construction Plan including the SEMF and the nine CEMPs provide the environmental management approach and requirements and therefore should not be read in isolation to each other due to interconnecting management outcomes and objectives. Specifically, for the Soil and Water CEMP, it is considered that the following management plan linkages can be made:

- Aboriginal Cultural Heritage CEMP – The management of soil should be undertaken in alignment with the Aboriginal Cultural Heritage CEMP, in particular the Topsoil Management Protocol which has been developed to manage any areas with a high potential for surface artefacts.
- Air Quality CEMP – It is considered that the management of air quality, in particular dust control, is closely aligned with the outcomes and management objectives of this Soil and Water CEMP. Water application to the ground's surface for the purpose of dust suppression will need to be undertaken in accordance with this Soil and Water CEMP.
- Biodiversity CEMP – The management of surface water runoff is imperative to the management and protection of down-gradient receiving waters. The water quality monitoring program and set criteria has been designed to ensure the monitoring of any down-gradient water quality impacts which may have the potential to impact of aquatic fauna.
- Waste and Resources CEMP – Water storage for its application for soil compaction and dust suppression forms a major component of the Stage 1 Development construction. Water is considered a valuable resource and where possible, the project will strive to maximise the reuse captured / stored water as opposed to drawing on groundwater and potable water sources. In addition, any contaminated or unsuitable soil generated as a result of the works will need to be managed and disposed of in accordance with the Waste and Resources CEMP.
- Sustainability Plan (when approved) – Water is considered a valuable resource. Where possible, the project will maximise the reuse of stored water on site as opposed to drawing on groundwater and potable (municipal) supply sources. In addition, the project works will aim towards maximising the reuse and recycling of material / spoil on site and minimise the need for off-site disposal.

Where relevant, linkages to other CEMPs and management objectives have been included in the risk assessment and the environmental control measures, Section 6.5 and Section 7 respectively.

Table 1 highlights relationships and linkages of this Soil and Water CEMP with other CEMPs and management plans, including key cross-referencing to Airport Plan and EIS requirements.

Table 1 Soil and Water CEMP relationship with other CEMP documentation

CEMP or Plan	Airport Plan Condition (3.10.2)	EIS Chapter 28 Table: Management area	EIS Chapter 28 Table: Mitigation measures
Aboriginal Cultural Heritage	11	28-12	28-13
Air Quality	10	28-10	28-11
Biodiversity	7	28-04	28-05
Community and Stakeholder Engagement Plan	15	28-20	28-21
European and other Heritage	12	28-14	28-15
Noise and Vibration	6	28-02	28-03
Soil and Water (this plan)	8	28-06	28-07
Sustainability Plan	29	28-37	28-38
Traffic and Access	9	28-08	28-09
Visual and Landscape	14	28-18	28-19
Waste and Resources	13	28-16	28-17

Key
Moderate to high relevance to this CEMP
Some relevance to this CEMP

The review and document control process for this Plan are described further in Section 9 of the SEMF.

The context of this Plan in relation to the WSA Co environmental management system is presented in Figure 1.

1.3 Document purpose

The purpose of this plan is to provide the foundation for the management of soil and water quality impacts in accordance with best practice and legal requirements (including environmental mitigation measures, controls, monitoring and reporting) during the construction phase of the Stage 1 Development based on the assessment undertaken as part of the EIS.

This Plan details the soil and water quality management requirements that must be satisfied in order to demonstrate compliance with Condition 8 of Section 3.10.2 of the Airport Plan for the construction of the Stage 1 development of the Western Sydney Airport.

Legal and other requirements are identified and maintained in a register within the SEMF (refer SEMF Appendix C). Mitigation measures (specific to soil and water) required to satisfy these requirements are derived from the EIS and through risk assessment processes (refer Section 6.5) and included within this CEMP (refer Section 7).

Implementation of these measures is ensured through monitoring, training and competence, inspection, audit and report actions detailed in Sections 9 and 10, with the responsibilities for implementation identified in Section 8. Continual improvement processes in relation to compliance with regulatory requirements are detailed in Section 13.

In summary, this plan sets out to achieve the following:

- Provision of details for the management and mitigation measures to be implemented, including timing and responsibilities;
- Ensuring the commitments of the Conditions (as set out in the Airport Plan) are met and satisfied by both WSA Co and contractors;
- Provision of process for monitoring implementation, reporting, and auditing of soil and water quality related management and compliance related issues;
- Commitment to meeting the requirements of ISO 14001, including the need for continual improvement;
- Provision of a process to be implemented for the management of complaints, for stakeholder engagement, and for the management of emerging environmental issues as they arise; and
- Provision of a system including procedures, plans and documentation for implementation by WSA Co personnel and contractors to enable Project completion in accordance with the environmental requirements.

Effective implementation of this plan will assist WSA Co and relevant contractors to achieve compliance with necessary environmental regulatory and policy requirements in a systematic manner with an outcome of continual environmental management performance.

1.4 WSA Co environmental management system overview

WSA Co operates in general accordance with AS/NZS ISO 14001 – Environmental management systems. A copy of the WSA Co environmental policy is provided in Appendix E of the SEMF.

The Stage 1 Development will be undertaken in accordance with the Construction Plan including the SEMF and the associated CEMPs (including this Plan).

The SEMF forms an appendix to the Construction Plan and is the overarching environmental plan for the implementation of the nine CEMPs. It provides a structured and systematic approach to environmental management and provides an expectation and guidance with regards to environmental management for the overall construction of the Stage 1 Development.

The structure of the environmental management system for the Project is shown in Figure 1.

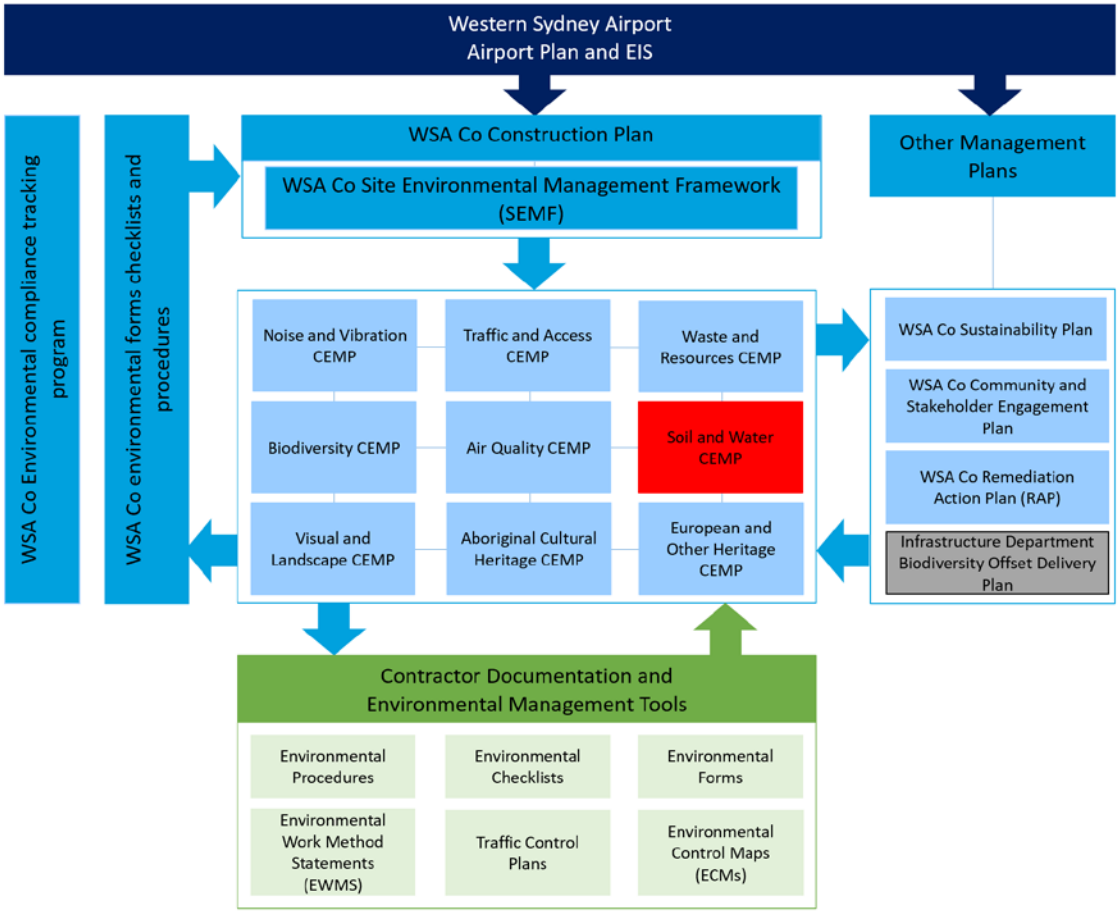


Figure 1 WSA Co Environmental Management System and CEMP context

1.5 Consultation requirements of this plan

Airport Plan Condition 35 outlines the consultation requirements during the preparation of this CEMP and requires consultation with any NSW Government agencies as specified by the NSW Department of Premier and Cabinet and consultation with the Commonwealth Department of the Environment and Energy (Environment Department) and NSW Office of Environment and Heritage. NSW Government agencies specified by Department of Premier and Cabinet for consultation for this Soil and Water CEMP, include the NSW Environment Protection Authority (EPA) and the NSW Department of Primary Industry - Water (DPI Water).

Further, Airport Plan Condition 8(3) requires that this Soil and Water CEMP take into account Table 28-6 of the EIS which states the CEMP should also be prepared in consultation with the NSW Environment Protection Authority (NSW EPA) and relevant local councils.

In addition to the above consultation requirements, the Soil and Water CEMP was also developed in consultation with the Airport Environment Officer (AEO). The focus of the consultation was primarily with regards to the water quality monitoring requirements and the applicable water quality criteria.

A summary of the stakeholder and government authority consultation completed to date which has informed the preparation of the Soil and Water CEMP is presented Table 2 details of consultation is included in Appendix A.

Consultation will continue with agencies, councils, the AEO and other relevant stakeholders throughout the Project where there is a change to a CEMP. The outcomes of this consultation will be documented in

subsequent revisions of the relevant CEMPs, with details of such consultation included in the applicable document.

To satisfy the above requirement this CEMP (Revision 0) has been provided to the relevant stakeholders for feedback on the Visitor Centre and Site Accommodation phase and Material Importation phase was described in the correspondence to provide context to the stakeholders on the level of impact that would result from the change. In addition, stakeholders were invited to attend a workshop on 13 November 2018 where an overview of the Visitor Centre and Site Accommodation phase and Material Importation phase was presented and feedback requested. A summary of the consultation is provided in Table 2 and details included in Appendix A.

Table 2 Soil and Water CEMP consultation summary

Government authority / stakeholder	Date	Summary
Consultation prior to Rev 0 approval		
Environment Department	July 2018	The Environment Department noted that they were broadly comfortable with the proposed content of the CEMPs and reiterate the need to ensure consistency with requirements of relevant conditions of the Airport Plan, particularly those related to protection and management of matters protected under the EPBC Act 1999 and the management of PFOS and PFAS.
NSW EPA	July 2018	The EPA notes the consultation requirements relating to the preparation of a CEMP, however, does not approve or endorse these documents. The EPA's role is to set environmental objectives for environmental management, rather than being directly involved in the development of strategies and management plans to achieve those objectives. The EPA provided advice in 2016 regarding environmental objectives during the exhibition of the Environmental Impact Statement.
		As a general recommendation, the CEMP should outline the measures that will be implemented to manage and mitigate all impacts assessed during the Environmental Impact Statement. All proposed mitigation and management measures in the CEMP should implement best practice to a level that is feasible and reasonable and clearly demonstrate how the proponent will meet the designated environmental objectives.
NSW Department of Industry, Lands and Water	July 2018	The Department of Industry, Lands and Water reviewed the provided brief for the Western Sydney Airport construction environmental management plan and understands that the CEMP will be prepared with considerations outlined in the provided brief. The DPIWL requested review of future revisions.
Office of Environment and Heritage	Sept 2018	Draft Soil and Water CEMP provided to OEH as required by Airport Plan Condition 35 (a) (ii). Any comments received will be addressed in subsequent iterations.
Liverpool City Council	July 2018	No comment provided regarding the preparation of the Soil and Water CEMP.
Penrith City Council	July 2018	The management plans should also address water quantity during construction, in addition to water quality management.
Airport Environment Officer (AEO)	September 2018	Additional physical parameters are to be included in the CEMP for sediment basin discharge, including dissolved oxygen (DO) and salinity.

Government authority / stakeholder	Date	Summary
		A requirement is to be included in the CEMP to ensure that regular reviews are undertaken of the discharge criteria and quality of the down-gradient receiving waters to ensure that the implemented criteria remains applicable and, where possible, explores options for continual improvement.
		The Australian *and New Zealand Environment Conservation Council* (ANZECC) water quality criteria is to be included in the criteria table to allow comparison where applicable in the monthly reports.
Consultation prior to Rev 1 approval		
Environment Department	Nov 2018	No comment provided regarding the preparation of the Soil and Water CEMP.
NSW EPA	Nov 2018	Requested that previous correspondence as per Revision 0 be used for consideration in the latest revision, inclusive of the Visitor Centre.
NSW Department of Industry, Lands and Water	Nov 2018	No comment provided regarding the preparation of the Soil and Water CEMP.
Office of Environment and Heritage	Nov 2018	Comments made with regards to flood management in the report, specifically requesting update of two dot points in Section 5.2.4.
Liverpool City Council	Nov 2018	No comment provided regarding the preparation of the Soil and Water CEMP.
Penrith City Council	Nov 2018	No comment provided regarding the preparation of the Soil and Water CEMP.
Airport Environment Officer (AEO)	Nov 2018	Consultation remains ongoing.
Stakeholder information workshop	13 November 2018	Workshop held on 13 Nov 2018. Attendees presented with a summary of the proposed works. Topics included: • Airport plan condition requirement for consultation • Land-use plan • Site location of works • Visitor Centre and Site Accommodation scope, including images of the concept design • Material importation, including location, distance to closest receiver and site access No comments received at workshop.
		Invitees: Liverpool City Council Western Area Health Penrith City Council NSW Department of Premier and Cabinet
		Attendees: NSW Aboriginal Affairs Liverpool City Council Western Area Health

Government authority / stakeholder	Date	Summary
		Roads and Maritime Services NSW Health NSW Department of Education NSW Aboriginal Affairs NSW Department of Planning and Environment Transport for NSW

1.6 Certification and approval

This Soil and Water CEMP has been reviewed and approved for issue by the WSA Co Environment Manager prior to submission to Western Sydney Unit, Australian Government Department of Infrastructure, Regional Development and Cities (Infrastructure Department).

1.7 Distribution

All WSA Co personnel and contractors will have access to this Soil and Water CEMP via the Project document control management system. The Approved Plan must be published on WSA Co's website within one month of being approved and be available until the end of the Construction Period. An electronic copy can be found on the Project website - http://wsaco.com.au/project/index.aspx

This document is uncontrolled when printed. One controlled hard copy will be maintained by the quality manager at the Project office.

2 Project details and scope of works

2.1 Project general features

The Project will be delivered through a packaging strategy with a wide variety of package sizes, risk profiles and contracting entities. Each package will have different levels of environmental risk and environmental obligations, depending on the scope of works, location of works and sensitivity of the receiving environment and relevant statutory requirements and obligations.

The Project is described in the Construction Plan. Stage 1 development of the Project comprises the following key features:

- Site preparation
- Airside precinct
- Terminal
- Utilities
- Ground transport
- Aviation support facilities
- Ancillary developments
- Other building activities

Further details of the overall Project construction activities, programming and methodologies are included in the Construction Plan.

2.2 Project site location and layout

The Western Sydney Airport will be developed on around 1,800 hectares of Commonwealth-owned land at Badgerys Creek in Western Sydney (Airport Site). The Airport Site is approximately 50 kilometres from Sydney's central business district.

The Airport Site is bounded by Elizabeth Drive to the north, Willowdene Avenue to the south, Luddenham and Adams Road to the west and Badgerys Creek to the east. The existing terrain is made up of undulating topography, and substantial earthworks are required to create a level surface to allow construction of the runway, taxiways and support services. The Airport Site location is provided in Figure 2 and the site layout is provided in Figure 3.

An Environmental Conservation Zone (ECZ), referred to as EC1 in Figure 3 is located within the Airport Site, mostly to the south and south east along with a small portion to the west. This is a protected land use due to the occurrence of natural habitats and water flows, including Badgerys Creek. ECZ also provides for an environmental preservation corridor which has a number of specific objectives and permissible uses in this land use zone as identified in the Airport Plan. Any construction work within ECZ must be managed appropriately and is to be carried out only with prior approval from the WSA Co Environmental Manger.

Figure 2 Western Sydney Airport site location

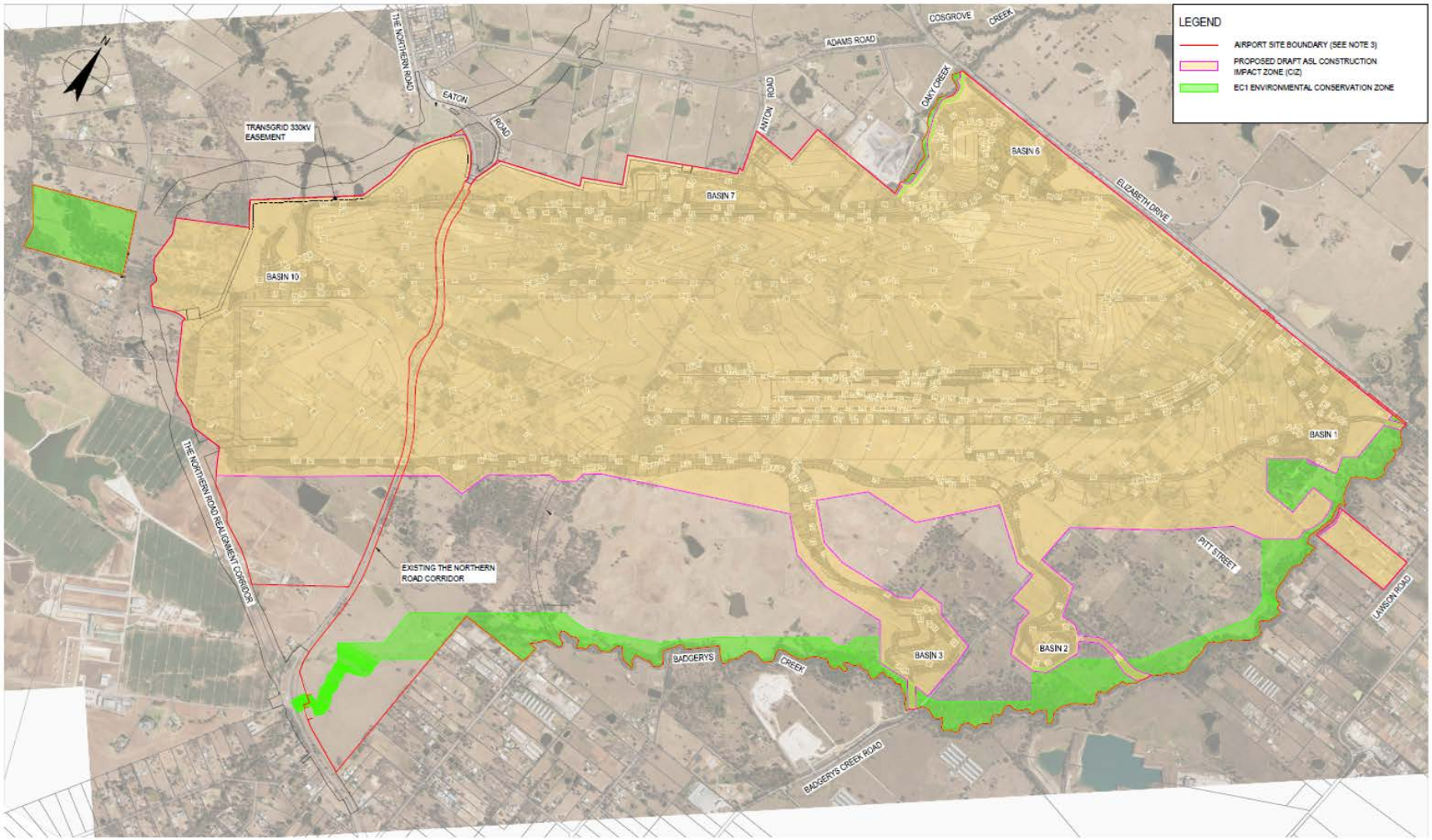


Figure 3 Stage 1 Development construction impact zones

2.3 Project staging and environmental management approach

Section 2 of the Construction Plan provides an overview of the total Project activities to be undertaken. As permitted by Condition 1(5), the Construction Plan identifies that the Stage 1 Development will be undertaken in the following phases:

- Preparatory Activities
- Early Earthworks (EEW)
- Visitor Centre and Site Accommodation
- Material importation
- Bulk Earthworks and Drainage Package (P1-A)
- Bulk Earthworks and Drainage Package (P1-B)
- Runway Pavement / Airside Civil (P1-C)
- Passenger Terminal Complex (P2)
- Landside Civil and Buildings (P3)

At the time of preparing this Soil and Water CEMP the current work phases, and therefore the work phases covered by this Soil and Water CEMP are included in Table 3.

A variation to this CEMP will be submitted before works other than Preparatory Activities are undertaken on any other phases of the Project.

Table 3 Works covered by this Soil and Water CEMP

Work package	Reference
Preparatory activities	Refer to section 2.4.1
Early Earthworks	Refer to Section 2.4.2
Visitors Centre and Site Accommodation	Refer to Section 2.4.3
Material importation	Refer to Section 2.4.4

As the Project develops, this table will be updated accordingly with further detail to be provided as required in the subsequent sections. Any preparatory activities will not be undertaken inconsistently with this CEMP. Section 2 of the SEMF provides a general overview of the total Project activities to be undertaken, with further specific detail targeting the current works (as indicated in Table 3) provided below in Section 2.4.

2.4 Scope of works

2.4.1 Preparatory activities (general)

Preparatory activities will be ongoing across the Airport Site throughout the Stage 1 Development. The works will be managed in accordance with the Overarching Preparatory Activities Plan which is prepared by the relevant Contractor and approved by WSA Co Environment Manager. The activities must be consistent with the Airport Plan definition for Preparatory Activities, refer to SEMF Section 3.9. Refer to Table 4 for details of proposed activities and indicative timing.

If an Approver determines an activity is a Preparatory Activity for paragraph (e) of the definition of 'Preparatory Activities' as per the Airport Plan and requires that a plan be prepared and submitted, WSA Co

will prepare the necessary plan for consideration and approval in accordance with Condition 5 (2) of the Airport Plan. Any Preparatory Activities must not be carried out inconsistently with the approved CEMPs.

A summary of the construction staging for the Preparatory Activities is provided below in Table 4.

Table 4 Construction Staging – Preparatory Activities

Construction staging	Indicative Timing
Preparatory Activities	
• Spatial Survey • Service Investigations • Pre-condition Surveys • Traffic Counting • Biological Pre-Clearance Surveys • Contamination Pre-Clearance Surveys • Aboriginal and European Cultural Heritage Survey and Salvage Works including Topsoil Protocol implementation • Site Security, including fencing • Removal of redundant infrastructure including farm fences, power poles, footings/slabs and rubbish • Site compound establishment and roundabout construction • Remediation works including establishment of stockpiles • Construction of temporary sediment basins and installation of erosion and sediment controls • Other activities which an Approver determines are Preparatory Activities.	Aug 2018 – 2026

2.4.2 Early Earthworks package

A breakdown of EEW construction activities are outlined below and are consistent with the activities described in the Airport Plan. The WSA EEW site comprises of 120 ha of the overall site and is bounded by Elizabeth Drive to the north and Badgerys Creek to the east.

The EEW will involve:

- Topsoil Protocol implementation
- Management of contamination in the Early Earthworks area
- Earthworks in Early Earthworks area
- Construction of a section of the new realigned Badgerys Creek Road within the Site
- Construction of a new intersection at Elizabeth Drive
- Utility relocations

In accordance with the Construction Plan Section 6, the early earthworks construction activities will be delivered in several stages. Table 5 outlines each stage and indicative timing for the proposed works and illustrated in Figure 4. This CEMP identifies the aspects and impacts for each key activity and required appropriate mitigation measures based on a risk assessment.

Table 5 Construction Staging – Early Earthworks

Construction staging	Indicative Timing
Stage 1	
Involves construction of permanent open drainage, swales and diversions into existing creeks and tributaries. This prevents clean water from outside the site, entering the construction site. Activities include: • Excavate northern end of the bypass channel from the existing Badgerys Creek Road culvert to the existing creek outfall on the north east of the Bio Retention Pond 1; • Construct a temporary channel crossing/culvert to suit the temporary side-track; • Divert overland flows to the partially constructed bypass channel; • Undertake cut to fill operation to develop import stockpile area west of Badgerys Creek road in parallel with stages 1-6; • Demolition of existing house; and • Implementation of the RAP	Sept 2018 – Jan 2019
Stage 2	
• Excavate Bio Retention Pond 1 for use as temporary erosion and sediment control.	Jan 2019
Stage 3	
Commencement of the cut to fill operation with a focus on getting the earthworks underlying Badgerys Creek Road completed. This enables the construction of new utilities routes, bridge construction and storm water drainage underneath Badgerys Creek road. Activities include: • Earthworks cut and fill to construct Badgerys Creek Road from the south tie-in to the new bridge location as well as fill required for the temporary side-track; • Construct a culvert beneath the temporary side-track to manage runoff from the main fill area; • Earthworks will include the water bypass channel between Badgerys Creek Road and the new bridge; • Drainage and roadworks to permanent and temporary alignments; • Construct bridge over stormwater channel; and • Endeavour Energy utility removal	Oct 2018 – April 2019
Stage 4	
Completion of drainage diversions and connections to the existing creek network will be undertaken after stabilisation of the new water channels and surrounding surface area to maintain water quality standards.	Nov 2018 – Dec 2018
Stage 5	
Completing the final portion of earthworks on the western side of Badgerys Creek Road and taking it across the road into the main fill. It is expected that Badgerys Creek Road re-alignment has reached the finishing works at this stage. Activities include: • Complete Main earthworks; • Complete south west leg of the bypass channel; • Complete Badgerys Creek Road north of the bridge; • Sydney water utility relocation and removal; and • Telstra relocation and removal.	Nov 2018 – Sept 2019
Stage 6	
Following RMS approval of the Works Authorisation Deed (WAD), works inside the Elizabeth Drive road corridor can commence to construct the new intersection of Elizabeth Drive and Badgerys Creek Road. Activities include: • Undertake Elizabeth Drive intersection works.	April 2019 – Dec 2019

Construction staging	Indicative Timing
• Divert traffic onto the full Badgerys Creek Road alignment; • Endeavour Energy Elizabeth drive works; and • Elizabeth Drive Upgrade works	

2.4.3 Visitor centre and site accommodation

WSA Co will engage a Contractor to complete the enabling works prior to the construction of the visitor centre and site accommodation (refer to Table 6). The site for the visitor centre is located in the north west section of the site at the intersection of The Northern Road and Eaton Road Luddenham. Refer to Figure 4.

The scope of the activities proposed to be undertaken in accordance with this CEMP are outlined in Table 6 and are consistent with the activities described in the Airport Plan.

Table 6 Construction staging – Visitor Centre and Site Accommodation

Construction staging	Indicative Timing
Stage 1	
Site access and preparation works • Removal of redundant infrastructure including farm fences, power poles, footings/slabs and rubbish; • Site compound establishment; • Site Security; • Construction of temporary sediment basins and installation of erosion and sediment controls; and • Implementation of the RAP.	Nov 2018 – Dec 2018
Earthworks to level the site • Earthworks – Cut and Fill (carting and disposal off-site); and • Site Grading and Benching.	Dec 2018 – Jan 2019
External roadworks* (Eaton Road – North and South from VC Entrance) • Earthworks – Cut and Fill (carting and disposal off-site); • Road pavement installation; • Permanent open drainage (swales formed as part of cut); • Line marking; • Utilities Diversion – relocation of existing light poles; and Signage – “No Right Turn” signs.	Dec 2018 – May 2019
Utilities* (Power, Water and Telecommunications) • Substation and connection to HV along The Northern Road; • Connection of water to Sydney Water Main; and • Conduit and pits for telecommunications lead-in cable.	Dec 2018 – May 2019
Stage 2	
Foundation Works and In-Ground Services • Slab on ground for the Visitor Centre; and • Screw Piles for the Site Accommodation.	Jan 2019 – Feb2019
Structure • VC structure shall be a combination of Laminated Veneer Lumber (LVL) columns and roof beams and Cross-Laminated Timber (CLT) ceiling panels solution; and • SA - modular timber framed panels lined with plasterboard internally and cladding externally.	Feb 2019 – Mar 2019

Construction staging	Indicative Timing
Finished and Internal Services • Utilities – provision and coordination of connections to external utilities such as potable water, electrical and telecommunications; • Services: - Fire-water and wastewater treatment systems; and - Heating, Ventilation, and Air-Conditioning (HVAC) • ITS (Information Technology Services) • Technical exhibition display and exhibition content • Furniture, Fit-out and Equipment for both VC and SA buildings.	Feb 2019 – May 2019
Testing and Commissioning • Comprehensive and systematic testing and commissioning of all utilities (below and above ground), internal services and systems: - Dry / Dead Testing - Wet / Live Testing • Integrated Testing & Commissioning	Mar 2019 to May 2019
Internal road, car parks and Landscaping • Landscaping; • Security Swipes / Cameras • Fencing / Gates to perimeter boundary and site interior; • Roadworks and carparking, including line marking, road furniture, and site lighting;	Jan 2019 – Mar 2019

*Note: may require approval from NSW government agencies and utility providers.

2.4.4 Material importation

Material will be imported to the site from other Sydney infrastructure sites as contemplated by the EIS starting in April 2019, this will ensure that valuable Sydney sandstone will be re-used in pavement construction potentially saving millions of tonnes of quarry won materials while diverting material from landfill sites in the Sydney area. The approximate stockpile location is shown in Figure 2. Initially 1.0 Million tonnes of sandstone material will be imported with the bulk being imported from April 2019 through to December 2020. It is expected that the stockpiled material will be used during pavement construction starting in mid 2022 and completing by December 2023.

To make the most of opportunities to obtain suitable material generated from other major infrastructure projects in Sydney, import will need to occur both during standard hours and also outside standard construction hours. As such, the processes outlined in the Noise and Vibration CEMP and the Traffic and Access CEMP for the ongoing assessment and environmental management of these works will be applied prior to commencement.

Table 7 Construction staging – Material importation

Construction staging – Material importation	Indicative Timing
Material importation	
• Haulage of sub-base and capping material to site	April 2019 – December 2020

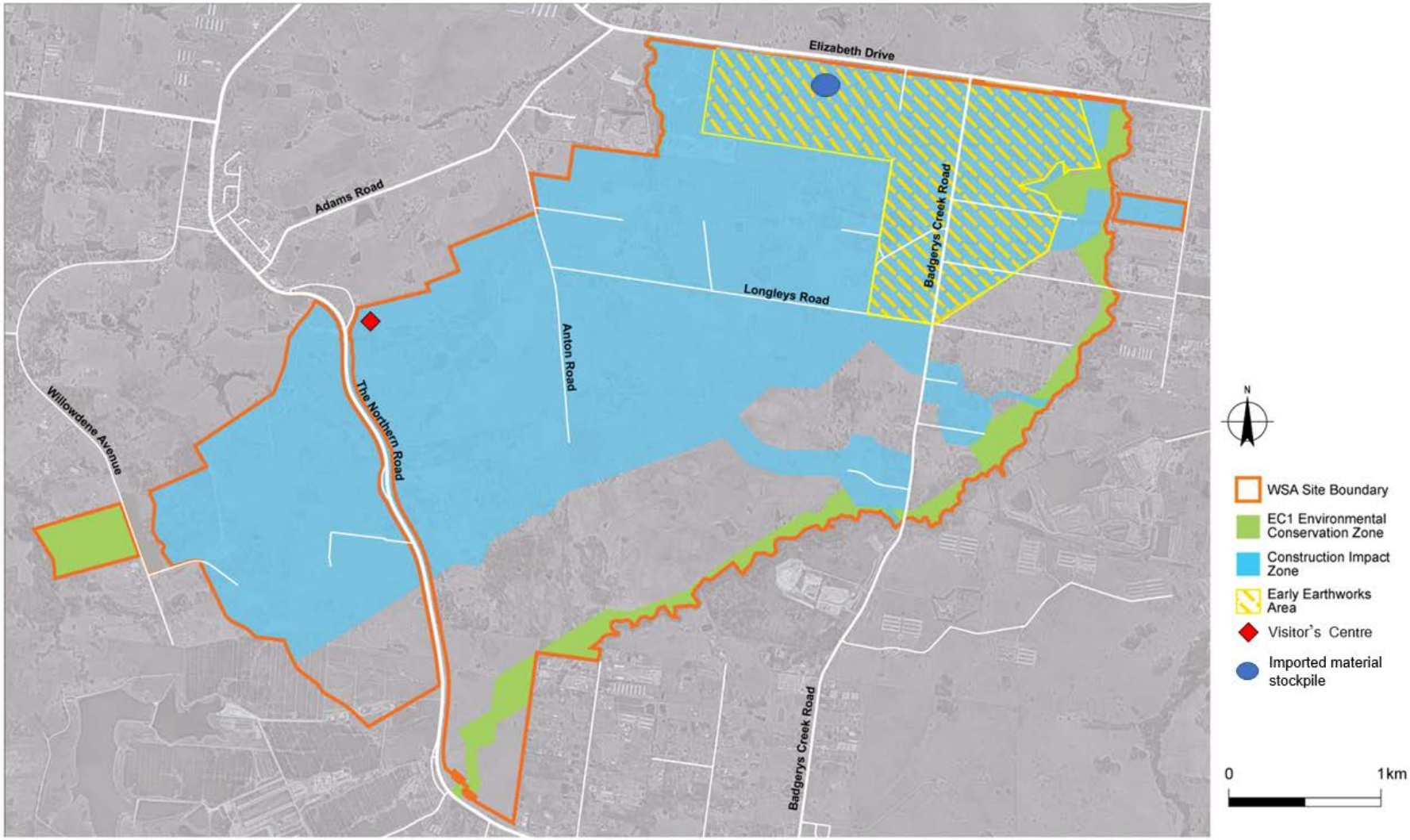


Figure 4 Site layout location plan

3 Objectives and targets

3.1 Objectives

The key objective of this Soil and Water CEMP is to ensure that impacts associated with soil and water quality are managed to within permitted criteria as far as practicable and to ensure that best practice controls and procedures are implemented.

To achieve this objective, the following will be undertaken:

- Ensure appropriate treatment of water prior to off-site discharge or disposal
- Minimise the risk of pollution incidents from the construction of the Stage 1 Development
- Minimise the export of sediment from the airport site
- Protect the quantity and quality of groundwater
- Minimise potable water use during construction
- Ensure appropriate treatment of any contaminants identified throughout construction
- Ensure appropriate measures are implemented to address the management and mitigation measures detailed in Table 28-6 and Table 28-7 in Chapter 28 of the EIS
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 3 of this Plan.

3.2 Targets and performance criteria

Performance criteria specific to soil and water have been established for the management of soil and water impacts during the construction phase of the works which have been, in part, derived from the performance criteria identified in the EIS, Table 28-6 are outlined in Table 8.

Table 8 Soil and water targets and performance criteria

Aspect	Target / Performance criteria	Document Reference
Environmental management compliance	Compliance with the requirements and mitigation measures set out in this Soil and Water CEMP	CEMP compliance audits (refer Section 9) Site environmental inspection checklist
Environmental management compliance	Compliance with the performance criteria in this CEMP which have been developed taking into account the general duty not to pollute under the AEPRs (Reg 4.01) and the related limits.	CEMP compliance audits (refer Section 9) Site environmental inspection checklist
Erosion and sedimentation	Establishment and maintenance of erosion and sedimentation controls in accordance with the NSW Blue Book (NSW Government, 2014)	Site environmental inspection checklist Contractor erosion and sedimentation control plans (as referenced / included in the EWMS and ECMs).
Water quality	Compliance with the water quality monitoring requirements of this Soil and Water CEMP, including the monitoring frequency and criteria.	Water quality monitoring records CEMP compliance audits (refer to Section 9)
Contamination disposal	Disposal of any material from site in accordance with the NSW EPA Waste Classification Guidelines (2014).	Soil testing / classification data Water testing / classification data Waste classification certificates

The above targets in Table 8 have been set to provide a benchmark performance objective to which WSA Co will endeavour to achieve. Failure to achieve the targets will not be considered a non-conformance, however, will prompt internal review of environmental management and assessment of potential improvement opportunities.

4 Legal and other requirements

Relevant environmental legislation and other requirements are identified below.

4.1 Relevant legislation and guidelines

As the Western Sydney Airport is to be developed under the Airport Plan determined under the Airports Act, some state laws will not be applicable to the Project (s112 of this Act). Where state law is applicable, this plan will set out the relevant applicable state legislation and requirements and demonstrate how compliance with those laws including obtaining relevant permits will be achieved. Where state laws are not applicable, there may nonetheless be a requirement to have regard to those laws, for example, through mitigation measures to be incorporated in CEMPs to satisfy conditions under the Airport Plan.

4.2 Legislation

Legislation and regulations and their relevance to soil and water quality and this Plan are summarised in Table 9.

Table 9 Principal legislation and relevance

Legislation or regulation	Relevance	CEMP compliance provisions
Commonwealth		
Airports Act 1996 (Airports Act)	The Airports Act and Airports Regulations set out the framework for the regulation and management of activities at airports that could have potential to cause environmental harm. This includes offences related to environmental harm, environmental management standards, monitoring and incident response requirements. The Airport Plan prepared under the Airports Act covers a number of environmental matters and, in particular, details specific measures to be carried out for the purposes of preventing, controlling or reducing the environmental impact associated with the airport. Criminal offences are applicable if these measures are not complied with.	This CEMP forms part of the overall WSA Co environmental management system which has as a target, full compliance with the Airport Plan. Relevant mechanisms within this CEMP that will contribute to this include but are not limited to: • Section 3.1 – Objectives • Section 4.3 – Airport Plan Conditions • Section 4.4 – Environmental Impact Statement Requirements • Section 6.5 – Risk Assessment • Section 7 – Environmental Control Measures • Section 8 – Environmental roles and responsibilities • Section 9 – Environmental inspection, monitoring and auditing • Section 12 – Environmental incidents, non-conformance and improvement opportunities • Section 13 – Review and improvement

Legislation or regulation	Relevance	CEMP compliance provisions
Airports (Environment Protection) Regulations 1997 (AEPR)	Imposes a general duty to prevent or minimise environmental pollution once an airport lease is granted. Promotes improved environmental management practices at airports. Includes provisions setting out definitions, acceptable limits and objectives for water (and air quality), as well as monitoring and reporting requirements.	Refer to commentary on Airport Plan above.
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Provides for the protection of matters of national environmental significance including species, populations, communities and their habitat that could be impacted by contamination or pollution.	Section 7 – Environmental Control Measures Biodiversity CEMP
Environment Protection and Biodiversity Conservation Regulation 2000 (as amended) (EPBC Regulation)	Provides for the protection of world heritage sites (including the Gondawana Rainforests) and wetlands of international importance (i.e. Ramsar sites).	Section 7 – Environmental Control Measures European and Other Heritage CEMP
Work Health and Safety Act 2011	Provides a general overview of how to make workplaces safe and healthy. The Act outlines WSA Co's legal responsibilities and duties as an employer and business owner with regards to work health and safety.	WSA Co WHS Management Plan Section 9 – auditing and reporting
Work Health and Safety Regulations 2011	The Regulations set out the standards that WSA Co need to meet for specific hazards and risks, such as noise, machinery, and manual handling. The Regulations also set out the licenses that may be required for specific activities, the records you need to keep, and the reports you need to make. Specific to this Soil and Water CEMP, Chapter 8 of the Regulations provide specific requirements with regards to the management of asbestos containing materials.	WSA Co WHS Management Plan Section 9 – auditing and reporting
NSW		
Water Act 1912 (Water Act)	Provides for the protection of groundwater in the few areas in NSW where water-sharing plans have not come into effect.	Section 7 – Environmental Control Measures

Legislation or regulation	Relevance	CEMP compliance provisions
Protection of the Environment Operations Act 1997 (POEO Act) and the Protection of the Environment Operations (General) Regulation 2009 (POEO (General) Regulations)	Establishes the process for issuing environmental protection licences (EPL) for certain scheduled activities - For the works covered by this CEMP (as detailed in Table 3), the need to obtain an EPL has not been identified, however, it may apply to future works. Places responsibility on the part of developers to prevent water pollution while also controlling waste during construction. Defines water and land pollution and the circumstances when pollution has been caused.	Section 7 – Environmental Control Measures
Protection of the Environment Operations (Waste) Regulation 2014	Establishes the process for issuing environmental protection licences (EPL) for certain scheduled activities - For the works covered by this CEMP (as detailed in Table 3), the need to obtain an EPL has not been identified, however, it may apply to future works. Places responsibility on the part of developers to prevent water pollution while also controlling waste during construction.	Section 7 – Environmental Control Measures
Soil Conservation Act 1938	Establishes controls to prevent soil erosion and land degradation.	Section 7 – Environmental Control Measures Air Quality CEMP (for the management of dust generation and associated soil erosion prevention measures)
Fisheries Management Act 1994	Provides for the conservation of fish stocks, habitat, threatened fish species, populations and communities. Promotes ecologically sustainable development. Promotes commercial and recreational fishing and aquaculture. Promotes the sharing of fishery resources. Provides for social and economic benefits for the wider community in terms of fish management.	Section 7 – Environmental Control Measures Biodiversity CEMP
Contaminated Land Management Act 1997	Provides for the investigation and remediation of contaminated land considered to pose a significant risk to human health or the environment.	Section 7 – Environmental Control Measures
Water Management Act 2000	Provides for the protection, enhancement and restoration of water sources and ecosystems, ecological processes and biological diversity.	Section 7 – Environmental Control Measures

Legislation or regulation	Relevance	CEMP compliance provisions
Aquifer Interference Regulation 2011	Defines the conditions where 'aquifer interference approval' is needed and clarifies the difference between 'minimal impacts' and major 'dewatering' activities.	Insert

4.3 Guidelines and standards

Guidelines and standards that are relevant to soil and water quality management and this plan are summarised in Table 10.

Table 10 Relevant guidelines and standards

Guidelines and standards
• Acid Sulfate Soil and Rock – Victorian EPA Publication 655.1 – July 2009
• Acid Sulfate Soil Manual (ASSMAC 1998)
• AS/NZS ISO 14001:2016 Environmental management systems – Requirements with guidance for use
• Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000 Guidelines)
• The Heads of EPAs Australia and New Zealand (HEPA), PFAS National Environmental Management Plan, January 2018.
• Commonwealth Environmental Management Guidance on Perfluorooctane Sulfonic Acid (PFOS) and Perfluorooctanoic Acic (PFOA), Draft - October 2016
• Contaminated Land Management - Guidelines for the NSW Site Auditor Scheme, 3rd edition (EPA 2017)
• DEC: Environmental Compliance Report Liquid Chemical Storage, Handling and Spill Management Part B Review of Best Practice and Regulation November 2005
• Department of Environment and Conservation (DEC): Storage and Handling Liquids: Environmental Protection Participant's Manual May 2007
• Department of Infrastructure, Planning and Natural Resources (DIPNR), 2003. Roads and Salinity Guideline
• Department of Land and Water Conservation (DLWC), 1998. Constructed Wetlands Manual
• Fairfull, S. and Witheridge, G. (2003) Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings. NSW Fisheries
• Guidelines for assessing former orchards and market gardens (DEC 2005)
• Guidelines for consultants reporting on contaminated sites (OEH 2011)
• Guidelines for the assessment and management of groundwater contamination (DEC 2007)
• Guidelines on the duty to report contamination under the Contaminated Land Management Act 1997 (EPA 2015)
• Liverpool Local Environmental Plan 2008 (NSW)
• Managing Urban Stormwater: Soils and Construction. Landcom, (4th Edition) March 2004 (reprinted 2006) (the "Blue Book"). Volume 1 and Volume 2
• National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended)
• National Environment Protection (National Pollution Inventory) Measure 1998 (as amended)
• National Water Quality Management Strategy

Guidelines and standards
• NSW EPA, 1995. Sampling design guidelines (EPA 1995)
• NSW EPA, 2003. Guidelines for the vertical mixing of soil on former broad-acre agricultural land
• NSW EPA, 2014. Waste classification guidelines.
• NSW EPA, 2016. Addendum to the Waste Classification Guidelines (2014) Part 1: Classifying Waste, October 2016 (PFAS solid waste criteria).
• NSW Fisheries, November 2003, Policy and Guidelines for Fish Friendly Waterway Crossings
• NSW Water Quality Objectives
• Penrith Local Environmental Plan 2010 (NSW)
• Safe Work Australia Model Code of Practice: How to Safely Remove Asbestos (April 2016)
• State Environmental Planning Policy No 52—Farm Dams and Other Works in Land and Water Management Plan Areas (NSW)
• State Environmental Planning Policy No 55—Remediation of Land (NSW)
• State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 (NSW)
• The Heads of EPAs Australia and New Zealand (HEPA), PFAS National Environmental Management Plan, January 2018.
• Volume 2A Installation of Services (DECCW 2008)
• Volume 2C Unsealed Roads (DECCW 2008)
• Volume 2D Main Roads Construction (DECCW 2008)
• WorkCover NSW Guidelines for managing asbestos in or on soil (March 2014)

4.4 Approvals and other specifications

- Functional Specifications;
- Western Sydney Airport Plan (2016);
- Western Sydney Airport Environmental Impact Statement;
- WSA Co Sustainability Plan;
- WSA Co Community and Stakeholder Engagement Plan; and
- WSA Co Construction Plan.

4.5 Airport Plan Conditions

Conditions relevant to soil and water quality management during construction are provided in Table 11.

Table 11 Conditions of Approval relevant to soil and water quality management

Condition No.	Condition	Timing	Responsibility	Document reference
1.4	The Site Occupier must ensure that no CEMP is inconsistent with the approved Construction Plan	Ongoing	WSA Co	This document (Soil and Water CEMP) and the WSA Co Construction Plan
1.5	The approved Construction Plan may provide for Main Construction Works to be carried out in phases that commence at different times for different parts of the Airport Site or an Associated Site. If it does, the Site Occupier may prepare a CEMP in relation to one or more phases, and the criteria for approval of such a CEMP are taken to exclude any matter irrelevant to the phases for which approval is sought. A variation of the CEMP must be submitted for approval in accordance with condition 41 (Variation of Approved Plans) prior to commencement of any new phase.	Ongoing	WSA Co	This document (Soil and Water CEMP) and the WSA Co Construction Plan
5.3	In carrying out a Preparatory Activity, the Site Occupier must not act inconsistently with any approved CEMP or the approved Construction Plan.	Ongoing	WSA Co	Section 2.4
8.1	The Site Occupier must not: Commence Main Construction Works until a *Soil and water CEMP* has been prepared and approved in accordance with this condition; or Carry out any development described in Part 3 of the Airport Plan inconsistently with the approved Soil and Water CEMP	Prior to Main Construction Works	WSA Co	This document (Soil and Water CEMP)
8.2	The Site Occupier must: Prepare, and Submit to an Approver for approval;	Prior to Main Construction Works	WSA Co	This document (Soil and Water CEMP)

Condition No.	Condition	Timing	Responsibility	Document reference
	a Soil and Water CEMP in relation to the carrying out of the developments described in Part 3 of the Airport Plan.			
8.3	The criteria for approval of the Soil and Water CEMP are that an Approver is satisfied that: a) in preparing the Soil and Water CEMP, the Site Occupier has taken into account Table 28-6 in Chapter 28 of the EIS; and b) the Soil and Water CEMP complies with Table 28-7 in Chapter 28 of the EIS and is otherwise appropriate.	Prior to Main Construction Works	Approver	Sections 4.4 and 7
8.4	The groundwater monitoring to be undertaken for the Soil and Water CEMP must include groundwater monitoring points adjacent to woodlands in areas outside the Construction Impact Zone (but within the Airport Site). Note: This measure is intended to implement a groundwater monitoring network in relation to likely groundwater dependent vegetation.	Prior to Main Construction Works	WSA Co	Section 9
8.5	The Soil and Water CEMP must include the following trigger-action-response measures in relation to groundwater levels in areas outside the Construction Impact Zone (but within the Airport Site): a) target criteria, set with reference to relevant standards and site-specific parameters; b) trigger values and corresponding corrective actions to prevent recurring or long-term exceedance of the target criteria described in (a); and c) corrective actions to compensate for any recurring or long-term exceedance of the target criteria described in (a). Note: Exceedance in this context should be understood to mean either elevated or depressed groundwater levels, with reference to an acceptable bandwidth.	Prior to Main Construction Works	WSA Co	Section 9.4.1 Section 9.4.2
8.6	The Soil and Water CEMP must include soil, groundwater and surface water PFAS contamination monitoring requirements, testing and disposal procedures appropriate to the risk posed by any contamination, and consistent with relevant Commonwealth environmental management guidance on PFOS and	Prior to Main Construction Works	WSA Co	Section 9

Condition No.	Condition	Timing	Responsibility	Document reference
	PFOA as prepared by the Environment Department.			
34.1	A person carrying out or operating an aspect of the Stage 1 Development must not act inconsistently with: a) National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended); b) Australian and New Zealand Guidelines for Fresh and Marine Water Quality (under the National Water Quality Management Strategy) including the draft default guideline values for perfluorooctanoic acid (PFOS) and perfluorooctane sulfonic acid (PFOA) in freshwater as applied by the state government; and c) relevant Commonwealth environmental management guidance on PFOS and PFOA.	During construction	WSA Co	This document (Soil and Water CEMP)
35	An Approver must not approve a plan referred to in Chapter 28 of the EIS unless he or she is satisfied that the Plan Owner: (a) in preparing the plan, has: i) consulted with any NSW Government agencies specified by the NSW Department of Premier and Cabinet; and ii) in the case of the … Soil and Water CEMP …, also consulted the Environment Department and OEH; and (b) has provided: i) the Approver; and ii) each consulted agency, with an explanation of how any responses have been addressed.	Ongoing	Approver	This document (Soil and Water CEMP)
37 to 42	Set out requirements in relation to informing other parties of conditions, keeping records, publishing reports, independent audits, variation to approved plans and publication of approved plans.	Ongoing	WSA Co and Approver	This document (Soil and Water CEMP)

4.6 Environmental Impact Statement requirements

The requirements of soil and water management to be considered and addressed during the construction phase of the Stage 1 Development are included in the EIS, specifically Table 28-6. A summary of these requirements and how they have been addressed in this Soil and Water CEMP is presented in Table 12.

Table 12 Summary of soil and water quality management requirements

EIS Reference	Topic	Summary	Soil and Water CEMP Reference
Table 28-6	Performance criteria	The performance criteria for the Soil and Water CEMP would include: • Compliance with the approved Soil and Water CEMP; • Compliance with the water pollution and soil pollution accepted limits outlined in the AEPR, including any local standards approved under the AEPR; and • Establishment of erosion and sedimentation controls in line with 'NSW OEH Blue Book - Managing urban stormwater: soils and construction' at the start of construction and progressively as construction progresses.	Section 3 – Objectives and targets
Table 28-6	Implementation framework	A Soil and Water CEMP will be approved prior to commencement of Main Construction Works for the proposed airport. The Soil and Water CEMP will collate measures to mitigate and manage potential impacts to the receiving environment and will include cross-references to other environmental management plans where relevant. The Soil and Water CEMP will as a minimum: • Detail the management and mitigation measures to be implemented, including those outlined in Table 28-7	Section 7- Environmental control measures
		• Describe the process for managing complaints, stakeholder engagement, and emerging environmental management issues as they arise	Section 11 - Communication and complaints management
		• Specify the process for monitoring implementation reporting and auditing	Section 9 - Environmental inspection, monitoring and auditing

EIS Reference	Topic	Summary	Soil and Water CEMP Reference
		• Identify details of the party responsible for implementing the Soil and Water management CEMP.	Section 8 – Environmental roles and responsibilities
Table 28-6	Monitoring	General monitoring requirements are set out under the AEPR. These include that: • Monitoring must take place under direction of an appropriately qualified person; and • The results for the monitoring must be kept in a written record.	Section 9 - Environmental inspection, monitoring and auditing
		Additional monitoring requirements include that:	Note
		The most suitable surface and groundwater monitoring locations will be determined in consultation with NSW EPA and relevant local councils.	Section 9 - Environmental inspection, monitoring and auditing
		Regular site inspections will be conducted to monitor the effectiveness of the soil and water management controls. Inspection results will be recorded and the inspection log made available to the Department of Infrastructure and Regional Development upon request.	Section 9 - Environmental inspection, monitoring and auditing
		The frequency of site inspections will be increased during and immediately after wet weather when there is a higher potential for the off-site transport of sediment from the airport site.	Section 9.1 - Environmental inspections
		Groundwater elevation monitoring will be conducted to detect potential impacts to base flow in the vicinity of potentially sensitive creeks or groundwater dependent vegetation. Monitoring will be undertaken quarterly through construction up to a minimum period of three years after completion of the Stage 1 development and until any identified impacts stabilise.	Section 9 - Environmental inspection, monitoring and auditing

EIS Reference	Topic	Summary	Soil and Water CEMP Reference
		Groundwater quality monitoring of alluvial and Bringelly Shale aquifers will be conducted at major infrastructure locations, down gradient from those locations and in the vicinity of groundwater dependent vegetation or watercourses. Monitoring will initially be undertaken quarterly and adjusted as appropriate.	Section 9 - Environmental inspection, monitoring and auditing
		Monthly surface water quality monitoring will be conducted to monitor performance of the drainage system. The monitoring will occur once the surface water drainage system is in place and take place at basin outflow and during selected upstream and downstream conditions.	Section 9 - Environmental inspection, monitoring and auditing and Appendix E.
Table 28-6	Auditing and reporting	General reporting requirements are set out under AEPR. In addition, an annual report will be prepared and submitted to the Secretary of the Department of Infrastructure and Regional Development in relation to compliance with *Soil and water management CEMP* for the period until the airport commences operations.	Section 9.6 - Environmental reporting
		Additional auditing and reporting measures that will be implemented will include:	Note
		• Recording in a log book any exceptional incidents that cause excessive pollution of receiving waters and the action taken to resolve the situation; and	Section 12 – Environmental incidents, non-conformance and improvement opportunities
		• Reporting pollution incidents resulting in offsite impacts to the NSW Environment Protection Authority	Section 12 - Environmental incidents, non-conformance and improvement opportunities
		The Community and Stakeholder Engagement Plan provides for the development of a complaints log and includes specific measures for how complaints will be managed.	Section 11 - Communications and complaints management

EIS Reference	Topic	Summary	Soil and Water CEMP Reference
		Details regarding the required environmental management and mitigation controls associated with the management of soil and water. Including the following: • Surface water management system • Development of local standards • Erosion and sedimentation • Leaks and spills of fuel or other chemicals • Groundwater inflows • Land contamination	Section 7 - Environmental control measures
Table 28-6	Responsibility	Responsibilities include:	Note
		The Soil and Water CEMP will be prepared in consultation with the NSW Environment Protection Authority and relevant local councils	Section 1.5 - Consultation requirements of this plan
		The Soil and Water CEMP will be submitted for approval to the Infrastructure Minister or an SES Officer in the Infrastructure Department	Section 1.6 – Certification and approval
		The design and construct (D&C) contractor will be responsible for implementing site specific environmental procedures and work method statements applicable to the proposed woks in accordance with the requirements of the Soil and Water CEMP	Section 1.3 – Purpose Section 8.3 – WSA contractor roles and responsibilities
		The airport environment officer will be responsible for day to day regulatory oversight of the AEPR compliance at the airport after an airport lease is granted	Section 8 – Environmental Roles and responsibilities

5 Existing environment

The following information is primarily summarised from Chapter 17 -*Topography, geology and soils* and Chapter 18 - *Surface and groundwater* of the EIS Volume 2A. In addition, some background information has been obtained from two site contamination investigations completed in 2016 as follows:

- *Preliminary (Phase 1) Contaminated Assessment Report, Proposed Western Sydney Airport* (GHD 2016a)
- *Detailed Site Contaminated Investigation, Proposed Western Sydney Airport* (GHD 206b)

For the purpose of this CEMP, it is considered that any receiving water and soil are sensitive receivers and should be managed accordingly (refer to Sections 6 and 7 regarding environmental management).

For the purpose of the phase of Main Construction Works covered by this CEMP, the existing environment described herein is considered consistent and acceptable for consideration in the risk assessment process and the identification of suitable environmental mitigation measures and controls - for details with regards to environmental mitigation measures and controls for the management of impacts refer to Section 7.

5.1 Soil

5.1.1 Topography

The Airport Site is part of an elevated ridge system dividing the Nepean River and South Creek catchments. The site is characterised by rolling landscapes typical of Bringelly Shale. The site features a prominent ridge in the west, reaching an elevation of about 120 metres Australian Height Datum (AHD), and smaller ridge lines in the vicinity with elevations of about 100 metres AHD. The broad topography of the Airport Site generally slopes away from the ridges in the west, with elevations generally between 40 metres and 90 metres AHD, with the lower elevations toward Badgerys Creek.

5.1.2 Geology

The dominant geology formations beneath the Airport Site are Bringelly Shale, the Luddenham Dyke and alluvium.

Bringelly Shale is a Triassic geological unit mainly comprising claystone and siltstone, with some areas of sandstone. This unit underlies most of the Airport Site. Bringelly Shale is the top unit of the Wianamatta Group and is about 150 metres thick beneath the Airport Site, along with some overlying weathered material.

Luddenham Dyke is a Jurassic groundmass of olivine basalt, analcite, augite, feldspar and magnetite in the west of the Airport Site. The dyke outcrops towards the peak of the ridge in the west of the Airport Site.

Alluvium at the Airport Site comprises of Quaternary sedimentary deposits along Cosgroves Creek and Badgerys Creek. These sedimentary deposits can be up to five metres thick and are made up of fine sands, silts and clays with some areas of gravelly clay.

5.1.3 Soil attributes

Soil types

Geotechnical investigations at the Airport Site indicated surficial silt and/or clay topsoils overlying firm residual clays from the weathering of Bringelly Shale, with areas of alluvial gravels, sands, silt and clays associated with Badgerys Creek,

Soils at the Airport Site have also been classified as Kurosols, which occur over the majority of the Airport Site, and Hydrosols in the vicinity of Badgerys Creek. Kurosols are characterised by a strong texture contrast between their A horizons (topsoils) and their strongly acid B horizons (subsoils). Hydrosols are characterised by prolonged periods of saturation.

While parts of the Airport Site have been used for agricultural activities, the site is not mapped as biophysical strategic agricultural land.

Saline soils

Soil salinity mapping of Western Sydney indicates moderate salinity potential. Additionally, there are some localised areas of high salinity potential associated with Badgerys Creek and drainage lines to the south and west of the Airport Site. Soil samples from the geotechnical investigations returned relatively low salinity levels, between 120 and 384 mg/L. Any further soil salinity sampling will be considered further as part of the requirements for waste management, in particular the monitoring and analysis of waste materials to be taken off-site in accordance with the WSA CO Waste and Resources CEMP.

Acid sulfate soils

Acid sulfate soils are not expected at the Airport Site given that it is not a coastal location and has an elevation ranging between 40 and 120 metres AHD. Field testing during the geotechnical investigation indicated that isolated acid sulfate soil may be present, but not to an extent requiring measures for acid sulfate soil management.

5.1.4 Contaminated land

A range of contaminants associated with prior land uses may be present at the Airport Site. Previous and current land uses that may potentially result in contamination include agriculture, light commercial and building demolition works.

A review of the contamination register administered by the Infrastructure Department, historic aerial photos, and subsequent inspection of the Airport Site identified further evidence of potential contamination. Evidence included:

- Chemical storage tanks and drums;
- Rubbish dumping;
- Stockpiled demolition waste;
- Fibre cement sheeting;
- Hydrocarbon stains; and
- Stockpiled fill materials of unknown origin.

Contaminants associated with this evidence include fuels, lubricants, solvents, acids, asbestos, heavy metals, ash, herbicides, pesticides and pathogens. About half the properties were considered to present at least moderate risk of contamination. In particular, historic demolition sites, stockpiled demolition waste and fill material of unknown origin indicated potential for asbestos to be present. Elevated levels of copper, nickel and zinc were also identified across the Airport Site. In general, these levels were considered attributable to natural background conditions. Surface water and groundwater sampling also returned elevated concentrations of metals attributable to natural background conditions.

5.1.5 PFAS monitoring / testing requirements

Based on the findings of previous investigations (GHD 2016a, and 2016b), the key sources of potential contamination identified at the site were generally associated with agricultural land use, land filling, uncontrolled dumping of waste, fuel storage, market gardening storage of abandoned vehicles and demolition of rural/residential buildings. As per the RAP (GHD 2016b) soil samples collected from the site confirm presence of the following contamination:

- Asbestos fragments;
- Fibrous asbestos; and

- Localised hotspots of petroleum hydrocarbons and heavy metal contamination in in soils (generally near roadways).

The potential for per- and polyfluoroalkyl substances (PFAS) and PFOS (Perfluorooctyl Sulfonate) is considered to be relatively low given the prior use of the Airport Site. As per EIS mitigation measure SW14 the risk posed by PFAS has been assessed on this project, however, consistent with condition 8(6), ongoing monitoring of PFAS will be undertaken by:

- Testing for PFAS in groundwater, as per the Ground Water Monitoring program, Section 9
- Testing in surface water, as per Appendix E, and;
- Material to be removed from site, or to be used within the site, near roadways will be sampled for PFAS before reuse/export is authorised.

The PFAS monitoring and testing requirements in this Soil and Water CEMP will be updated if there is an increase in levels found in groundwater, soil or surface water onsite. PFAS testing will be undertaken as per the relative guidance levels in the PFAS National Environmental Management Plan, January 2018, as per the groundwater monitoring program detailed in Section 9 and Appendix E.

5.2 Surface water and groundwater

5.2.1 Climate and rainfall

The Airport Site hosts an automatic weather station operated by the Bureau of Meteorology. The weather station has recorded rainfall data at the Airport Site since 1998. Data is provided in Table 13. Average annual rainfall at the Airport Site is 676.6 millimetres (mm).

Table 13 Average monthly rainfall at the Airport Site*

Statistic	J	F	M	A	M	J	J	A	S	O	N	D
Mean monthly rainfall (mm) a	77	108	77	43	40	52	23	36	34	53	75	64
Highest monthly rainfall (mm) a	192	342	198	129	156	220	72	231	82	182	173	131
Lowest monthly rainfall (mm) a	14	13	21	2	2	2	3	1	6	0.4	8	14
Highest daily rainfall (mm) a	138	107	68	82	54	64	2	70	51	63	63	65
Evaporation (mm) b	173	128	116	76	50	38	38	56	75	120	146	154

Note: * All data has been rounded to the nearest decimal point (with the exception of October *Lowest monthly rainfall*).

a. Data from Bureau of Meteorology automatic weather station

b. Data from Bureau of Meteorology Parramatta weather station, as the nearest representative location with available evaporation data

Weather statistics continue to be monitored and recorded from the on-site weather station. All weather monitoring data is automatically recorded and stored electronically on a cloud-based system for future reference if required. The maintenance of weather station data will continue throughout the duration of the construction phase of the project.

5.2.2 Catchments

The Airport Site lies in the east of the Hawkesbury-Nepean catchment, which covers an area of 21,400 square kilometres. The Hawkesbury-Nepean catchment is characterised by meandering watercourses and is highly disturbed by clearing and urbanisation. All of the Airport Site subcatchments drain to the Hawkesbury-Nepean system downstream of Lake Burragorang.

The majority of the Airport Site drains to South Creek, which then flows to the Hawkesbury River. South Creek has a sub-catchment area of 414 square kilometres with headwaters located near Narellan to the south of the Airport Site. The south-western corner of the Airport Site drains to Duncans Creek, which then flows to the Nepean River.

Land uses within the Airport Site were predominantly agricultural (85 per cent), with smaller areas of rural residential (10 per cent), forest (four per cent) and horticulture (one per cent).

5.2.3 Watercourses

The Airport Site contains around 64 kilometres of watercourses and drainage lines. The major watercourses include Badgerys Creek, Oaky Creek and Cosgroves Creek in the South Creek Catchment and Duncans Creek, which is a tributary of the Nepean River. Bank erosion and head cut are evident at Badgerys Creek and Cosgroves Creek, despite these watercourses also having well vegetated riparian zones.

Badgerys Creek has its headwaters in the vicinity of Findley Road, Bringelly, approximately two kilometres south of the Airport Site and continues downstream until its confluence with South Creek. It flows in a north to north-east direction and forms the south-eastern boundary of the Airport Site as far as Elizabeth Drive. Ecologically sensitive riparian vegetation is located along sections of Badgerys Creek.

The key surface water catchments and their relationship to the Airport Site are provided in Figure 5.

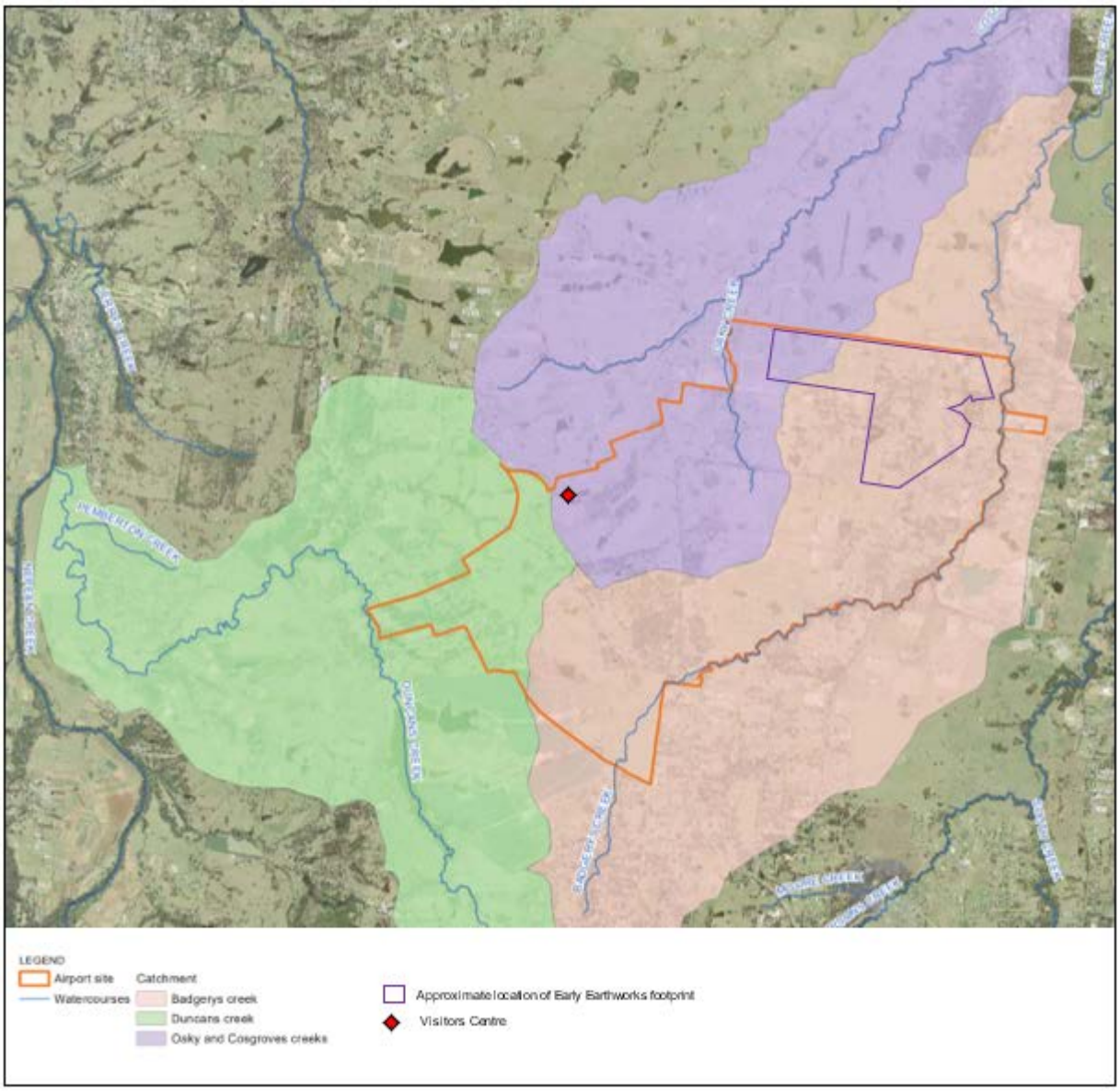


Figure 5 Local hydrological catchments

5.2.4 Flooding

The floodplain is more extensive on the western bank of Badgerys Creek than on the eastern bank due to the wider and flatter floodplain at the Airport Site. Existing surface water flows at the Airport Site during one-year average reoccurring interval (ARI) and 100-year ARI storms were simulated in hydrologic and hydraulic models. In the one-year ARI event, flooding is mostly confined to main watercourse channels and dams, while overbank flooding is expected in a 100-year ARI event. Refer to Figure 6 for the extent and degree of flooding in a 100-year ARI associated with Badgerys Creek and Cosgroves Creek, which indicates only a minor encroachment into the Early Earthworks footprint, restricted to a small area in the north-east of the site. Similarly, the Visitor Centre and Site Accommodation area, and the Material Importation area are not impacted by flooding as indicated in Figure 6.

Site-specific flood management measures will be implemented to avoid or control/mitigate risk and ensure that appropriate response procedures are in place. This will include minimising flood risk by storing flood-sensitive materials and infrastructure outside of the 100-year flood zone as shown in Figure 6 for example, locating stockpiles outside of areas of frequent inundation, for examples areas near waterways.

The project will monitor rainfall and weather forecasts with reference to conditions that will trigger high rain events for both preparation of site for erosion and sedimentation mitigation, and potential for flooding in high rainfall events.

Flood mitigation will include:

- Daily weather observations;
- Securing the site and materials;
- Safe procedures for moving flood-sensitive equipment and materials away from areas near creeks, and out of the 100-year ARI;
- Actions to mitigate any adverse impact of flooding on neighbouring properties of the site;
- Relocating moveable plant to higher ground; and
- Emergency Response Plan to manage flood risk for the full range of flooding up to the probable maximum flood, including an evacuation procedure for compound staff.

5.2.5 Surface water quality

Water quality modelling and monitoring of existing surface water quality was undertaken at upstream, downstream and major outflow locations in and around the Airport Site as part of the environmental assessment for the EIS and in subsequent monitoring. The results indicated that the water quality is generally poor and that the nutrient loads are generally well above both the AEPR accepted limits and the default values in the ANZECC guidelines. The data suggest that the surface water background concentrations were generally above the ANZECC freshwater criteria with exceedances detected for the following analytes / parameters:

- Cadmium
- Chromium
- Zinc
- Nitrate
- Iron
- Copper
- Total nitrogen
- Phosphorous

Turbidity and total suspended solids were found to be within acceptable levels, while dissolved oxygen levels were found to be relatively low. Conductivity levels were high and above those for typical lowland rivers. Some exceedances of chromium, copper and zinc were also detected.

Overall, both the Airport Site and downstream catchments are fairly degraded, particularly in terms of nutrients which is representative of a catchment that has been disturbed by agricultural and other rural development. The existing water quality does not typically satisfy the AEPR limits or default ANZECC guideline criteria for the protection of aquatic ecosystems, primary and secondary contact recreation, as well as irrigation water use for food and non-food crops.

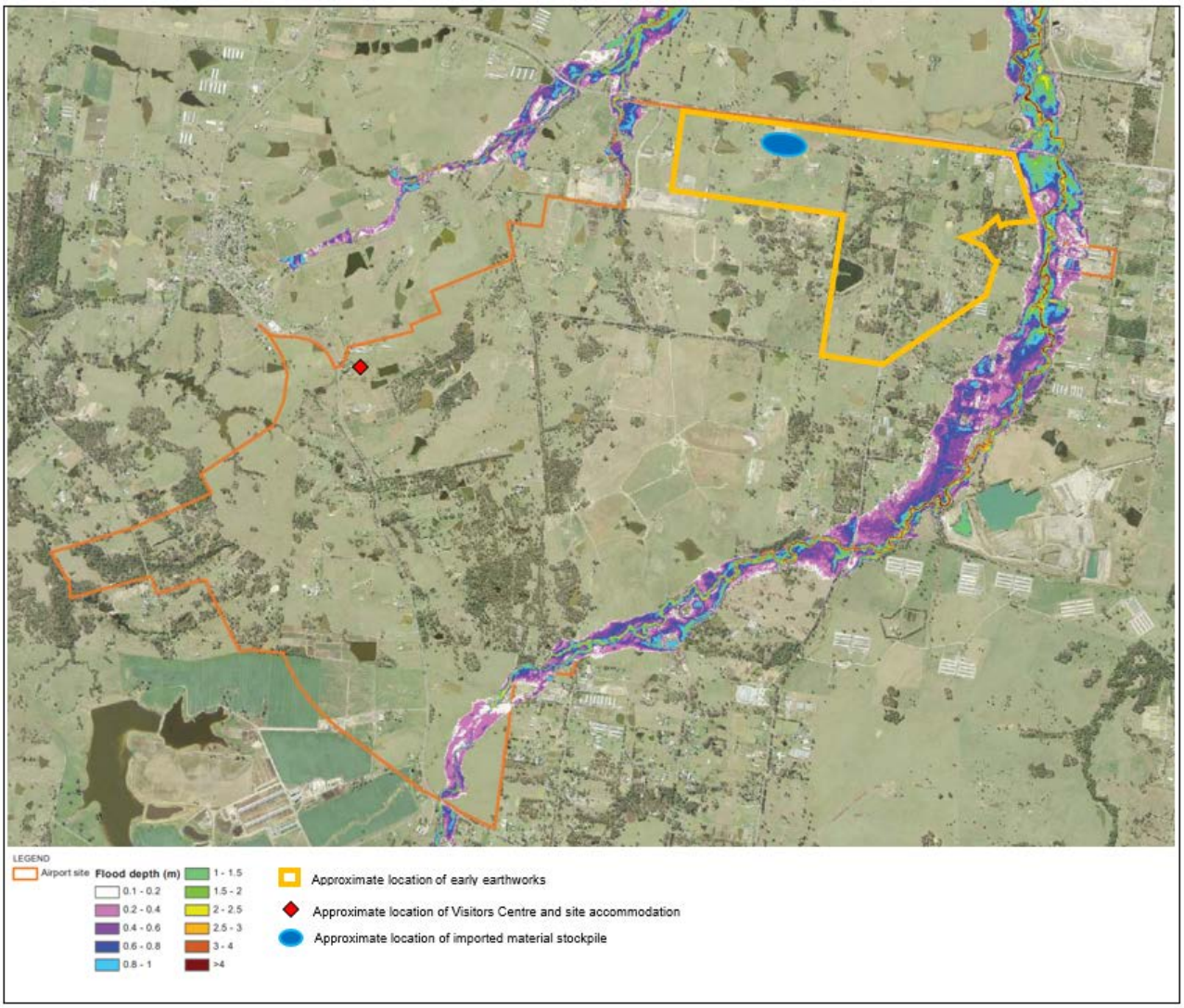


Figure 6 Existing flood depths – 100 year ARI, Badgerys and Cosgroves Creeks

5.2.6 Groundwater

Groundwater monitoring was undertaken as part of the environmental impact assessment completed for the EIS in addition to ongoing monitoring completed post-EIS up until the present. The obtained data indicates that groundwater at the Airport Site is generally of a relatively poor quality with limited beneficial use or environmental value. The aquifers at the Airport Site include:

- An unconfined aquifer in the shallow alluvium of the main watercourses at the Airport Site;
- An intermittent aquifer in weathered clays overlying the Bringelly Shale;
- A confined aquifer within the Bringelly Shale; and
- A confined aquifer within the Hawkesbury Sandstone.

The variations in depths to groundwater, described in Table 14, indicates low potential for connectivity between groundwater aquifers.

Table 14 Measured depths of the various aquifers at the Airport Site

Groundwater	Measured depths
Within the alluvium	0.7 metres – 4.7 metres
Within weathered clays overlying Bringelly Shale	2.4 metres – 4 metres
Within Bringelly Shale	3.0 metres – 11.7 metres
Within Hawkesbury Sandstone	100 metres below ground level

There are in excess of 42 registered groundwater bores within five kilometres of the site centre. The location of these groundwater receptors in Figure 7.

Overall, the available data suggest that groundwater is sparsely used, with only 12 bores for domestic, stock, industrial, farming and irrigation purposes. It is noted that all of these bores are generally screened at significant depth and are expected predominantly to intersect the underlying Hawkesbury Sandstone.

Historical groundwater monitoring data suggest that the groundwater quality has background concentrations of lead, zinc and copper consistently above the selected ANZECC (2000) freshwater criteria. Total nitrogen and phosphorous concentrations were all above freshwater criteria for lowland rivers with some exceedances of the irrigation criteria. Isolated samples had concentrations of nitrate above ANZECC (2000) freshwater criteria. Concentrations of sulphate above human health drinking criteria are present at a number of locations across the site.

This water quality data obtained suggests that only deeper groundwater in the Hawkesbury Sandstone is suitable for the uses outlined above and that shallow groundwater in the Bringelly Shale is unsuitable for beneficial domestic, stock, irrigation and industrial water use purposes.

Based on the available groundwater quality data, the groundwater assessment included as part of the EIS concluded that:

- The groundwater in the area of the Airport Site has low beneficial use potential for stock and potable purposes;
- The groundwater contributions to surface water are expected to represent a small part of the overall surface water flows in the area; and
- In terms of groundwater management during construction of the proposed airport, salinity, metals (particularly cadmium, copper, lead and zinc), sulphate, total nitrogen and phosphorous may require further consideration if discharge to surface water is being considered.

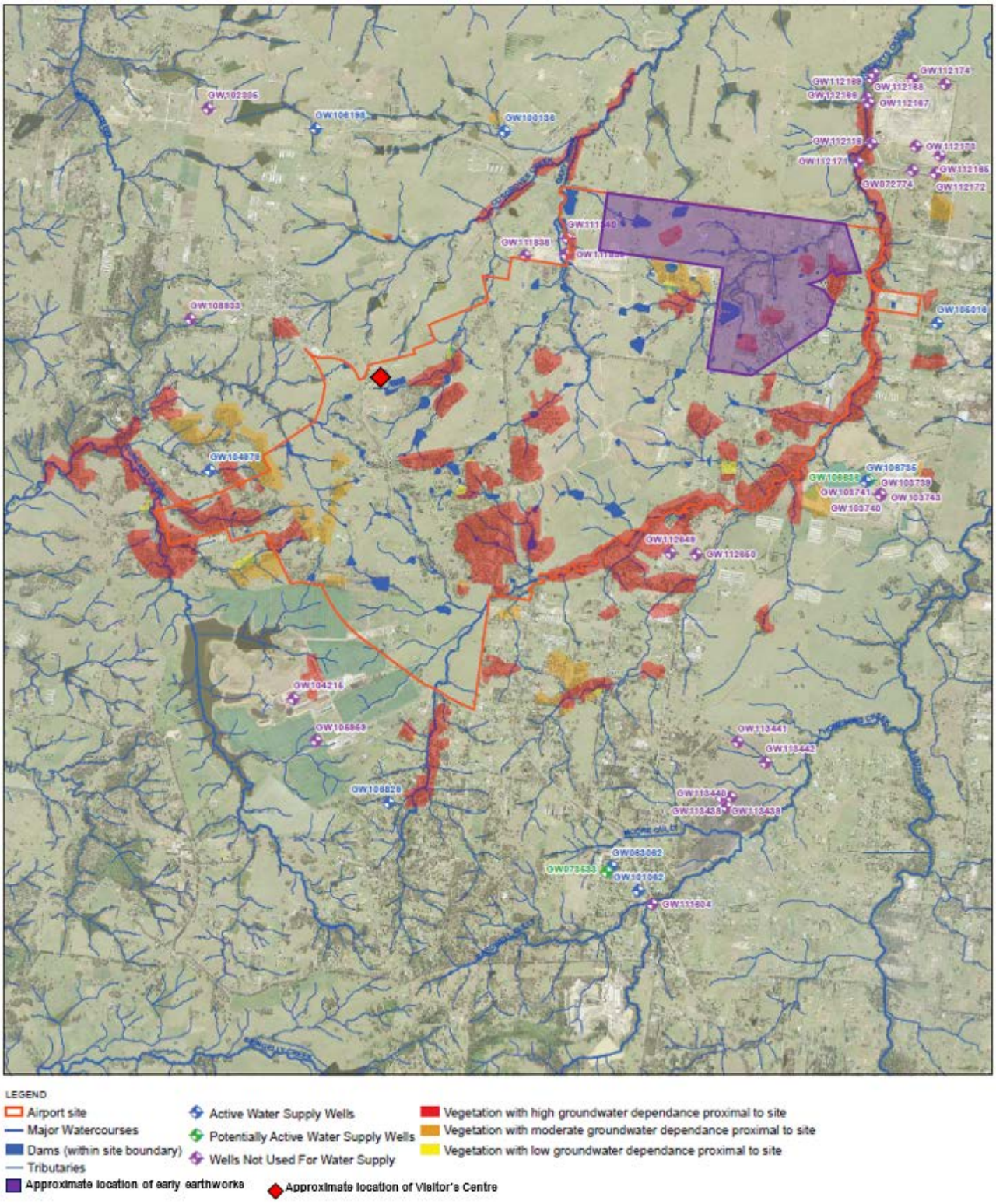


Figure 7 Groundwater receptors (Source: EIS Figure 5)

6 Soil and water aspects and impacts

6.1 Construction activities

Construction activities that may affect soil and water quality include:

- Topsoil stripping and soil disturbance;
- Vegetation clearing;
- Bulk earthworks;
- Road construction and other civil works;
- Storage of fuels and chemicals, refuelling;
- Stockpiling of materials;
- Water use;
- Use of vehicles, plant and machinery on site;
- Installation of the WTP for the visitors centre and site accommodation; and
- Site demobilisation and landscaping works.

6.2 Soil impacts

6.2.1 Topography and geology

The earthwork activities will change the topography of the Airport Site from rolling landscapes to a built environment with some landscaping. The earthworks will affect the upper geological units of the Bringelly Shale, Luddenham Dyke and alluvium down to approximately 30 metres depth. The scope of work described in Section 2 will affect the upper units of the Bringelly Shale only.

6.2.2 Soil erosion and degradation

The Early Earthworks and the Visitors Centre and Site Accommodation will involve the excavation of approximately 1.8 million cubic metres of material including about 190,000 cubic metres of topsoil within the Early Earthworks construction impact zone (and the immediate area of the Visitor's Centre).

Topsoil will be stockpiled while the remaining excavated material will be distributed within the construction impact zone. As cut and fill requirements are expected to be equal, most soil material will remain at the Airport Site and will not generally be moved further than two kilometres. Note, for details for the management and implementation of the Topsoil Protocol, refer to the Aboriginal Cultural Heritage CEMP.

Clearing and bulk earthworks will temporarily increase the area of exposed soil at the Airport Site, ultimately increasing the risk of erosion. The majority of Early Earthworks and the Visitors Centre and Site Accommodation works will occur in the Blacktown and South Creek soil landscapes. The Blacktown soil landscapes have a slight to moderate erosion potential for non-concentrated flows. The South Creek soil landscapes, and some subsoils in the Blacktown soil landscape, have higher erosion potential.

If improperly managed, topsoil stockpiles will not only present an erosion hazard but will also potentially lose their chemical and physical fertility over time.

6.2.3 Land contamination

Construction of the Stage 1 Development has the potential to interact with existing sources of potential contamination. Construction will also involve the storage, treatment and/or handling of fuel, sewage and other potential contaminants.

Although unlikely, the accidental release or mobilisation of contaminants has the potential to affect human health and the environment through contact with pathogens (such as sewage), inhalation (such as asbestos or chemical vapours), or mobilisation to surface waters and bioaccumulation. These events will be managed in the first instance through implementation of applicable Australian Standards for the storage and handling of hazardous materials. In the unlikely event of a significant leak of spill or contaminants, remediation will be implemented as soon as practicable.

The work will involve the stockpiling of approximately 24,000 cubic metres of known asbestos contamination across the site. The management of 50 cubic metres of hydrocarbon contamination will also form part of the earth works activities. These activities will be undertaken in accordance with the RAP. The RAP outlines the material tracking requirements for the movement of material on site. Asbestos containing material that meets the RAP requirements will be placed in a temporary stockpile as part of the Early Earthworks phase. The asbestos material will be transferred to a permanent onsite containment cell as the Stage 1 Development continues.

In addition to this there may be unexpected finds of contamination encountered during construction activities. The unexpected finds procedure is outlined further in Appendix D. The assessment criteria for onsite reuse and validation is outlined in detail in the Remediation Action Plan (GHD 2016c).

6.3 Surface water and groundwater impacts

Site preparation and construction will transform approximately 60 per cent of the Airport Site from a rolling grassy and vegetated landscape to essentially a built landscape with some landscaping. These changes will alter the catchment areas within the Airport Site and the permeability of the ground surface, altering the duration, volume and velocity of surface water flow from this site. The Early Earthworks will fall largely within the Badgerys Creek catchment.

6.3.1 Watercourse

The bulk earthworks program will involve the removal of one kilometre of minor watercourses within the construction impact zone, the majority being drainage lines and valley fills with less defined channels. In addition, 12 farm dams of varying sizes will be removed as part of the Early Earthworks project. Construction will also change the topography and permeability of sub-catchment areas at the Airport Site, affecting flows in receiving watercourses upstream and downstream of the Airport Site. These changes will occur progressively during construction.

6.3.2 Flooding

Construction of the Stage 1 Development will modify drainage direction and overland flow paths, changing the nature of flooding on the Airport Site. As construction progresses and the impervious area expands, the volume of runoff from the Airport Site will also increase.

There is a high likelihood of large rainfall events during construction. This has the potential to disrupt construction activities due to flooding and waterlogged soils, as well as the potential for downstream flooding. Detention basins will be established at the commencement of the construction program to mitigate the increase in runoff, reducing offsite impacts of surface water flows.

6.3.3 Surface water quality

These conditions will present a risk of erosion and associated surface water quality impacts. Bulk earthworks will not occur within 300 metres of Cosgroves Creek or 880 metres of Duncans Creek. Works will be required to occur adjacent to Badgerys Creek. Refer to Section 7 for details of the management measures.

The design capacity and placement of detention basins will ensure that all drainage water from disturbed areas will be captured prior to discharge. The water management system will include the main detention basins supplemented by a series of interim sediment basins and control measures within the immediate work

area. The water management system will have the effect of improving the quality of the surface water prior to release to receiving waters by allowing sediment to settle within the basins.

Construction will also involve the use of a range of fuels and chemicals. These substances may be released to the environmental in the event of a mishap during refuelling, maintenance or general storage or handling.

6.4 Groundwater

6.4.1 Groundwater recharge

As stated in the EIS, groundwater recharge may be affected by compaction and the establishment of impermeable surfaces across the Airport Site during construction. Re-profiling the land may lead to a temporary increase in rainfall recharge during bulk earthworks, as the fill is expected to have a higher overall permeability than the existing site conditions. However, as construction progresses, the proportion of paved surfaces will have increased, reducing recharge to below existing conditions.

Overall, minimal change to local groundwater recharge will be expected as the existing shale derived clay soils have low permeability resulting in the majority of rainfall at the site being released as stormwater runoff rather than infiltrating to groundwater. As stated in the EIS it is not expected that a reduction in recharge will affect any sensitive ecological receptors or beneficial uses of the groundwater system.

6.4.2 Groundwater drawdown

The EIS considered the potential for groundwater drawdown at the Airport Site. The EIS stated that drawdown is anticipated as a result of Airport Site re-profiling and dewatering of excavation beneath the water table. The extensive re-profiling will result in a lowering of groundwater elevations in areas that currently have higher topographic elevation. It is also expected to result in reduced groundwater flow rates and reduced discharge to surrounding surface features. However, the re-profiling will not result in dewatering of the groundwater system below the level of the surrounding creeks and there will be no potential for creeks to dry up due to groundwater drawdown.

Establishment of basements in the terminal complex as part of the Stage 1 Development will likely intercept the underlying shale aquifers and require dewatering and management throughout construction. As per Section 18.5.4.2 of the EIS due to low inherent hydraulic conductivities of the geology in these areas, it can be expected that seepage volumes will be relatively small.

6.4.3 Groundwater quality

Potential groundwater quality risks include isolated spills and incidents occurring during construction, and diffuse impacts associated with general construction activities such as the use of machinery. Contaminants of primary concern are usually hydrocarbons; however, other chemicals such as herbicides, pesticides and fertiliser may also be used during construction. Impacts may result from the infiltration of pollutants through the ground surface or through dirty water retention facilities (such as temporary sediment basins) to the underlying groundwater systems.

Groundwater seepage into excavations for building basements will need to be managed by pumping seepage to stormwater management facilities or other suitable treatment systems. Chemicals of concern in groundwater seepage include:

- Total dissolved solids;
- Metals;
- Total nitrogen;
- Phosphorus; and
- Sulphate.

Groundwater present in the shallow geology has been identified to have high salinity values. The excavation and sue of this material for infilling could permit the release of additional salts into groundwater. This will only occur where increased recharge occurs to fill areas, and where a shallow groundwater table develops in the fill material.

6.4.4 Water usage

Water will be utilised during construction for soil conditioning, dust suppression and other construction activities.

An estimated 0.422 ML of water will be required per day for site preparation works (based on EIS predictions). It has been assumed that non-potable water sources will be used to meet this requirement. However, potable water may be required to be supplied from existing assets operated by Sydney Water. Non-potable water sources will include stormwater runoff captured in sediment dams or existing farm dams.

To meet water demand, it may be necessary to access water from other sources such as groundwater or surface water sources within the catchment. However, water extraction from such alternative sources will be subject to a new assessment and consideration of necessary approvals if and when required.

6.5 Risk Assessment

A Preliminary Risk Assessment has been undertaken as part of the CEMP. The parts of the overall risk assessment relevant to Soil and Water have been extracted and summarised in Table 18.

The identification of construction activities and associated impacts that could eventuate during construction of the Project is central to the selection of appropriate environmental safeguards.

The risk management process involved an assessment of all specific Project activities/aspects in or near environmentally sensitive areas and resulted in the development of a list of environmental risks (effects and impacts) and a corresponding risk mitigation strategy and risk ranking. Each environmental risk was categorised, based on the following:

- The environmental aspect;
- Relative scale of the potential impact;
- Type of potential impact; and
- Likelihood of occurrence.

The identification of risks included a review of the works, and review of the environmental risks identified by the EIS. The mitigation measures in the risk assessment are in-line with the EIS mitigation measures in Section 7 of this CEMP, Table 19.

The following risk assessment process has been implemented, together with a review of proposed activities and known risks based on past project experience.

6.5.1 Risk Assessment Process

The following tables outline the risk assessment process using three steps to identify the appropriate management measures required.

Table 15 is used to determine the likelihood that the aspect will have an impact on the environment.

Table 16 is used to determine the potential consequence rating of the risk identified

From these two tables, a risk rating can then be assigned using Figure 8 to determine the potential severity of the risk and the appropriate management response as per Table 17.

Table 15 Likelihood descriptor

	Likelihood	Description
A	Rare / improbable	The event may only occur in exceptional circumstances.
B	Unlikely / remote	The event may occur at some time (about once every five years).
C	Possible	The event is likely to occur at some time (about once every year).
D	Likely	The event will probably occur in most circumstances (at least once every six months).
E	Almost certain	The event is expected to occur in most circumstances (at least once every month).

Table 16 Consequence descriptor

	Consequence (impact)	Description
1	Insignificant/negligible	• Short-term disturbance with minor environmental release or damage that is non-reportable. • No impact outside site boundary. • No community complaints or media reports.
2	Minor/low	• Minor violation of regulation or guideline with minimal damage to the environment and small clean-up. • Immediately contained on site. • Local government action, minor community complaints. • Potential or actual breach of legislation.
3	Moderate	• Violation of regulation or guideline with moderate temporary damage to the environment and significant clean-up costs. • Release of pollution off site. • Detrimental media reports, community concerns and complaints.
4	Major	• Major environmental damage with potentially permanent. • Release of pollution off site. Significant loss of environmental resources. • Detrimental media reports in the national or state media, organised community concern. • High likelihood of fine or court action.
5	Catastrophic	• Long-term environmental harm. • Permanent irreparable damage to the environment. • Sustained detrimental state and national media reports. Sustained community outrage. • Penalty Infringement Notice/court action.

Figure 8 Risk severity ranking

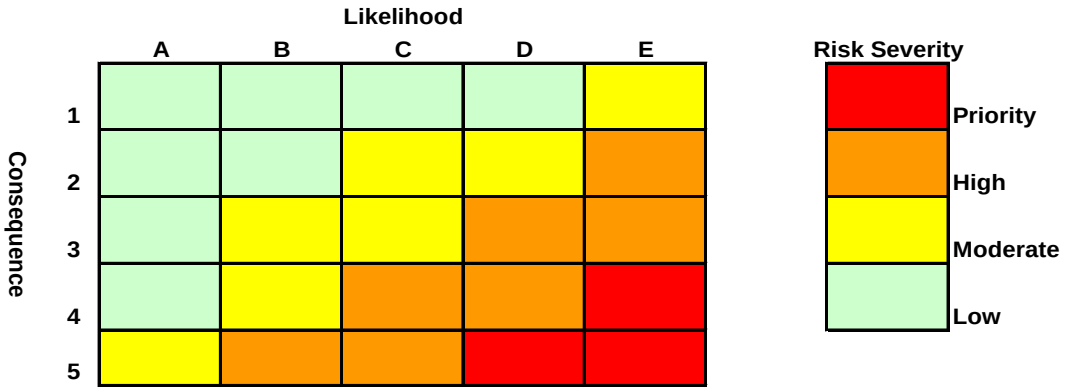


Table 17 Risk severity and management response

Risk severity	Management response
Priority	Immediate and detailed management action required. (e.g. stop or change activity)
High	Priority management action warranted
Moderate	Management action warranted
Low	Management action should be considered, particularly for low-level impacts that nevertheless occur on a continual basis

Table 18 Soil and water risk assessment

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
01	Site establishment	Site and delivery vehicles travelling on unsealed roads	Sedimentation	Offsite sediment discharge/pollution to waterways, ecological areas, local drainage	C2 (Mod)	SW_29 SW_30 SW_31 SW_32 SW_33 SW_34	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • Environmental Control Map (ECM)
02			Sedimentation	Offsite sediment discharge/pollution to waterways, ecological areas, local drainage	C2 (Mod)	SW_29 SW_30 SW_31 SW_32 SW_33 SW_34	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
03		Erosion and sedimentation of site compound areas	Erosion and sedimentation	Offsite sediment discharge/pollution to waterways,	C2 (Mod)	SW_29 SW_30 SW_31	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
				ecological areas, local drainage		SW_32 SW_33 SW_34		• Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
04	Site establishment (continued)	Erosion and sedimentation of project areas	Ground disturbance	Unnecessary disturbance of areas not requiring construction causing erosion and sedimentation issues to waterways, ecological areas, local drainage	C2 (Mod)	SW_38	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
05	Utility works	Potholing and trenching	Sedimentation	Offsite sediment discharge/pollution to waterways, ecological areas, local drainage	B2 (Low)	SW_29 SW_30 SW_31 SW_32 SW_33 SW_34	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
06	Earthworks and Bridge Construction	Topsoil stripping / clearing and grubbing	Sedimentation	Offsite sediment discharge/pollution to waterways, ecological areas, local drainage	C2 (Mod)	SW_29 SW_30 SW_31 SW_32 SW_33 SW_34	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Aboriginal Cultural Heritage CEMP (in particular, the Topsoil Management Protocol) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
07	Earthworks and Bridge Construction (continued)	Excavation	Sedimentation	Build up of water in excavations causing runoff to site / offsite areas	B2 (Low)	Ground water MM (SW_15-23) SW_29 SW_30 SW_31 SW_32 SW_33 SW_34	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
08		Excavation (Cont.)	Ground water	Intercepting ground water causing sediment runoff to waterways,	C2 (Mod)	Ground water MM (SW_15-23)	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
				ecological areas, local drainage				• Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
09	Earthworks and Bridge Construction (continued)	Stockpiling materials	Erosion and sedimentation	Offsite sediment discharge/pollution to waterways, ecological areas, local drainage	C3 (Mod)	SW_29 SW_30 SW_31 SW_32 SW_33 SW_34 SW_35 SW_36	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
10		Constructing waterway crossings	Sedimentation	Sediment discharge to creeks / erosion of crossing platform	C2 (Mod)	SW_29 SW_30 SW_31 SW_32 SW_33 SW_34	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
11		Piling	Groundwater	Intercepting ground water leading to offsite sediment discharge	C2 (Mod)	Ground water MM (SW_15-23)	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
12	Culvert construction	Culvert excavation	Sedimentation	Sediment discharge to creeks / offsite	C4 (High)	Ground water MM (SW_15-23) SW_29 SW_30 SW_31 SW_32 SW_33 SW_34	B4 (Mod)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
13	Concrete works	Drainage	Pollution to waterways / ecological areas	Offsite concrete runoff /Ph rise to waterways, ecological areas, local drainage	C2 (Mod)	SW_29 SW_30 SW_31 SW_32 SW_33 SW_34	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
					C2 (Mod)		B2 (Low)	• Traffic and Access CEMP • Complaints Procedure • Induction • ECM
14		Concrete pours	Pollution to waterways / ecological areas	Offsite concrete runoff /pH rise to waterways, ecological areas, local drainage		SW_29 SW_30 SW_31 SW_32 SW_33 SW_34		• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • Environmental Control Map (ECM)
15	Waste storage	Concrete washouts	Pollution to waterways / ecological areas	Offsite concrete runoff /pH rise to waterways, ecological areas, local drainage		SW_29 SW_30 SW_32 SW_33 SW_34		• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
16		Temporary waste storage	Excess waste generation	Improper storage of waste concrete causing excess material waste (cross contamination of soils)	B2 (Low)	SW_26 SW_27 SW_29 SW_30 SW_32 SW_33 SW_34	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
17	Contaminated material works (Remediation)	Excavation	Asbestos	Cross contamination of surrounding areas	C4 (High)	SW_24 SW_25	B4 (Mod)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
18				Improper validation of contaminated/remediated areas	C2 (Mod)	SW_24 SW_25	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
								• Traffic and Access CEMP • Complaints Procedure • Induction • ECM
19		Excavation (continued)	Acid Sulphate Soils	Cross contamination of surrounding areas	B2 (Low)	SW_24 SW_25	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
20	Contaminated material works (Remediation) (continued)			Improper validation of contaminated/remediated areas	B2 (Low)	SW_24 SW_25	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
21			PFOS/PFAS	Cross contamination of surrounding areas	B2 (Low))	SW_14 SW_24 SW_25	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
22		Excavation (continued)		Improper validation of contaminated/remediated areas	B2 (Low)	SW_14 SW_24 Testing as per Appendix E and this Soil and Water CEMP	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
23	Site water management	Dewatering	Sedimentation	Incorrect treatment and discharge of sediment basins	C2 (Mod)	SW_33	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
								• Traffic and Access CEMP • Complaints Procedure • Induction • ECM
24			Sedimentation	Incorrect treatment and discharge of sediment traps and excavations throughout site	C2 (Mod)	SW_29 SW_30 SW_31 SW_32	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
25	Road paving activities	Milling and excavation of road surfaces	Erosion and sedimentation	Offsite sediment discharge/pollution to waterways, ecological areas, local drainage	C2 (Mod)	SW_29 SW_30 SW_31 SW_32	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
26	Road paving activities	Asphalt works	Contamination	PCB runoff to surrounding areas from asphalt if laid in intermittent weather	B2 (Low)	SW_13	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
27	Chemical use	Storage of chemicals	Contamination	Site and surrounding area contamination due to chemical runoff	C2 (Mod)	SW_13 Chemical storage MM (SW_40-SW_46)	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS • Traffic and Access CEMP • Complaints Procedure • Induction • ECM
28	Chemical use (continued)	General use of chemicals onsite	Contamination	Site and surrounding area contamination due to chemical runoff	C2 (Mod)	SW_13 Chemical storage MM (SW_40-SW_46)	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • Waste and Resources CEMP • Air Quality CEMP • EWMS

Ref	Activity	Construction Aspect	Environmental Aspect	Potential Impact	Risk level [2] pre-mitigation	Mitigation measure [1]	Risk level [2] post-mitigation	Management tools
								• Traffic and Access CEMP • Complaints Procedure • Induction • ECM
29	General	Plant and machinery	Flooding	Construction activities are inundated with flood waters resulting in isolation of plant and machinery and potential for chemical release into waters	C2 (Mod)	SW_47 SW_48 SW_49 SW_50	B2 (Low)	• Soil and Water CEMP (in particular GWMP, CPSWMP, ESCPs) • WSA Co Emergency and Incident Response Procedure
30	Water treatment facility operation	Operation of facility	Sewage discharge/ overflow	Soil pollution	C2 (Mod)	SW_51	B2 (Low)	• Soil and Water CEMP • ECM • WSA Co Emergency and Incident Response Procedure

[1] Refer to Table 19 for mitigation measures and controls

[2] Derived from risk assessment process detailed in Section 6.5.1

7 Environmental control measures

Mitigation and management measures that will be implemented during construction are detailed in Table 19 and are consistent with those provided in Tables 28-6 and 28-7 in Chapter 28 of the EIS, as per Condition 10 (Section 3.10.2) of the Airport Plan. Operational mitigation and management measures relevant to the construction phase from Table 28-29 and 28-30 of Chapter 28 of the EIS have also been provided below. The relevant control measures will be included in the site-specific Environmental Work Method Statement (EWMS) and Environmental Control Map (ECM) – refer to Section 4.4.2 of the SEMF for further detail.

Table 19 Soil and water environmental control measures

Ref	Mitigation measure	When to implement	How to implement	Responsibility	Reference
SURFACE WATER MANAGEMENT					
SW_01	As part of the detailed design process for the Stage 1 Development, a surface water management system will be developed. Development of a surface water management system for the Airport Site may involve a progressive process of design and implementation covering both the construction and operational phases. This may include the implementation of temporary system elements specifically for the construction phase. The system will include:	Pre-construction / Construction	To be implemented as per SW_01 under the supervision of the construction and environmental management teams and will include SW_02, SW_03, SW_04, SW_05, SW_06, SW_07, SW_08, SW_09, SW_10.	▪ WSA Co Construction Manager ▪ WSA Co Design team	EIS Table 28-7
SW_02	A detailed design of basins and channels to capture the majority of runoff, including during construction;	Pre-construction / Construction	Refer to SW_01.	▪ WSA Co Design team ▪ WSA Co Construction Manager ▪ WSA Co Environment Manager	EIS Table 28-7

Ref	Mitigation measure	When to implement	How to implement	Responsibility	Reference
SW_03	Refined drainage system design performance standards to optimise capacity and release timing, mimicking natural flows as far as practicable. This is to be undertaken during the design refinement process, from concept to detailed design.	Pre-construction / Construction	Refer to SW_01.	▪ WSA Co Design team ▪ WSA Co Construction Manager ▪ WSA Co Environment Manager	EIS Table 28-7
SW_04	Separate bio-retention basins to provide additional treatment for low flows and separation of these features from the drainage system to protect contained water during flood events;	Pre-construction / Construction	Refer to SW_01.	▪ WSA Co Design team ▪ WSA Co Construction Manager ▪ WSA Co Environment Manager	EIS Table 28-7
SW_05	Pollutant traps to prevent debris and other coarse material entering the drainage system;	Pre-construction / Construction	Refer to SW_01.	▪ WSA Co Design team ▪ WSA Co Construction Manager ▪ WSA Co Environment Manager	EIS Table 28-7
SW_06	Stabilisation structures at outlets to include rock check dams at regular intervals along channels and energy dissipaters at basin outlets;	Pre-construction / Construction	Refer to SW_01.	▪ WSA Co Design team ▪ WSA Co Construction Manager ▪ WSA Co Environment Manager	EIS Table 28-7

Ref	Mitigation measure	When to implement	How to implement	Responsibility	Reference
SW_07	Capacity for containment of accidental leaks or spills in the drainage system at maintenance areas, fuel farms or other areas where fuels or chemicals are stored or handled in accordance with Australian standards;	Pre-construction / Construction	Refer to SW_01.	▪ WSA Co Design team ▪ WSA Co Construction Manager ▪ WSA Co Environment Manager	EIS Table 28-7
SW_08	Measures to address impacts on downstream and upstream uses, including sensitive environmental values;	Pre-construction / Construction	Refer to SW_01.	▪ WSA Co Design team ▪ WSA Co Construction Manager ▪ WSA Co Environment Manager	EIS Table 28-7
SW_09	Volumes and sources of construction water; and	Pre-construction / Construction	Refer to SW_01.	▪ WSA Co Construction Manager ▪ WSA Co Environment Manager	Good practice
SW_10	Processes for treatment and discharge of any water from site and associated monitoring, reporting and regulatory approval requirements	Pre-construction / Construction	Refer to SW_01.	▪ WSA Co Construction Manager ▪ WSA Co Environment Manager	Good practice

Ref	Mitigation measure	When to implement	How to implement	Responsibility	Reference
DEVELOPMENT OF LOCAL STANDARDS					
SW_11	Local standards for water quality may be developed under the AEPR, with due consideration to the Australia and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000) and the results of baseline water quality monitoring taking place for a minimum of 24 months prior to the commencement of Main Construction Works.	Pre-construction/ Construction	May be undertaken as per SW_11 but will not be undertaken if AEPR duty in Reg 4.01 can be satisfied based on the measures in this plan.	▪ WSA Co Environment Manager	N/A
EROSION AND SEDIMENTATION					
SW_12	ESCPs will be prepared by a Certified Professional in Erosion and Sediment Control for all works involving soil disturbance unless the Airport Environment Officer agrees that soil and water risks do not warrant this. ESCPs will be prepared in accordance with the 'NSW OEH Blue Book – Managing urban stormwater: soils and construction'.	Prior to works involving soil disturbance	Will be undertaken as per SW_12.	▪ WSA Co Environment Manager ▪ Contractor	Good practice EIS Table 28-7
SPILL RESPONSE					

Ref	Mitigation measure	When to implement	How to implement	Responsibility	Reference
SW_13	An emergency spill response procedure will be prepared to minimise the impact of any accidental spills, and include details on the requirements for managing spills, disposing of any contaminated waste, and reporting of any such incidents.	Pre-construction	Emergency spill response procedure (Appendix C) has been prepared and will be discussed during the compulsory induction undertaken by all staff, workers and visitors before attending the site.	▪ WSA Co Construction Manager ▪ Contractor	Good practice
PFAS					
SW_14	The risk posed by PFAS contamination will be identified and if necessary, the Contractor environmental management plan is to include soil, groundwater and surface water PFAS contamination monitoring requirements, testing and disposal procedures consistent with relevant Commonwealth environmental management guidance on PFOS and PFOA as prepared by the Environment Department.	Pre-construction	Will be undertaken as SW_14.	▪ WSA Co Environment Manager ▪ Contractor	Condition 8(6) and 34
GROUNDWATER MANAGEMENT					
SW_15	A groundwater management plan is to be developed and implemented identifying:	Prior to Main Construction Works	Will be undertaken as per SW_15, SW_16, SW_17, SW_18 and SW_19.	▪ WSA Co Environment Manager ▪ Contractor	Condition 8(4) and 8(5)
SW_16	Details of work that intercepts groundwater or requires groundwater extraction;		Refer to SW_15.		

Ref	Mitigation measure	When to implement	How to implement	Responsibility	Reference
SW_17	An assessment of aquifer impacts resulting from groundwater interception or extraction;		Refer to SW_15.		
SW_18	Extraction methodology and management measures for discharge; and		Refer to SW_15.		
SW_19	Groundwater monitoring and inspection programs.		Refer to SW_15.		
GROUNDWATER INFLOWS					
SW_20	To mitigate the impacts associated with groundwater inflows the following measures will be implemented:	N/A	Note.	▪ WSA Co Environment Manager ▪ Contractor	EIS Table 28-7
SW_21	Groundwater inflows will be reused or released with appropriate treatment;	Construction	Will be undertaken as per SW_21 under supervision of the construction and environmental management teams.		EIS Table 28-7
SW_22	Where groundwater is released to surface waters, treatment will be undertaken to bring water pollution below the accepted limits set out in the AEPR or any local standards; and	Construction	Will be undertaken as per SW_22 under supervision of the construction and environmental management teams.		EIS Table 28-7
SW_23	Corrective measures will be developed and implemented to supplement groundwater supplies in the unlikely event of impacts to dependent vegetation or watercourses.	Construction	Will be undertaken as per SW_23 under supervision of the construction and environmental management teams.		EIS Table 28-7

Ref	Mitigation measure	When to implement	How to implement	Responsibility	Reference
LAND CONTAMINATION					
SW_24	A remedial action plan and unexpected finds protocol will be established to facilitate the quarantining, isolation and remediation of contamination identified throughout the construction program.	Prior to Main Construction Works and implemented during construction	A remedial action plan and unexpected finds protocol (Appendix D) have been established. These should be discussed during the compulsory induction undertaken by all staff, workers and visitors before attending the site.	▪ WSA Co Environment Manager ▪ Contractor	EIS Table 28-7
SW_25	Any asbestos identified on site will be managed in accordance with applicable regulatory requirements.	Construction	The unexpected finds protocol (Appendix D) outlines the process of dealing with unexpected asbestos finds. This will be followed and reported upon occurrence in accordance with applicable regulatory requirements.	▪ WSA Co Environment Manager ▪ Contractor	-
SW_26	Any material requiring off-site disposal shall be done in accordance with the Waste and Resources CEMP.	Construction	Will be undertaken as per WR_05 of Waste and Resources CEMP.	▪ WSA Co Environment Manager ▪ Contractor	Waste and resources CEMP (EIS Table 28-17) - Good practice
SW_27	Waste classification details for any waste material removed from site shall be documented and maintained on project records (in accordance with the NSW Waste Classification Guidelines, 2014).	Construction	Will be undertaken as per SW_27.	▪ WSA Co Environment Manager ▪ Contractor	Waste and resources CEMP (EIS Table 28-17) Good practice

Ref	Mitigation measure	When to implement	How to implement	Responsibility	Reference
EROSION AND SEDIMENTATION					
SW_28	Impacts associated with erosion and sediment will be mitigated through:	Note	NA	NA	NA
SW_29	Implementation of ESCPs;	Construction	ESCPs will be implemented by the contractor. Environmental site inspections would be undertaken by the WSA Co Environment Manager (or delegate) on a monthly basis to evaluate the effectiveness of environmental controls implemented by the contractor (Refer to Section 9 of Soil and Water CEMP).	▪ Contractor ▪ WSA Co Environment Manager ▪ WSA Co Construction Manager	Good practice
SW_30	Installing a site drainage system prior to commencement of bulk earthworks;	Construction	Will be undertaken as per SW_30.	▪ Contractor ▪ WSA Co Environment Manager ▪ WSA Co Construction Manager	EIS Table 28-7
SW_31	Minimising the surface area disturbed at any one time by, where practical, staging construction works and stabilising soils with vegetation or appropriate cover materials;	Construction	Will be undertaken as per SW_31. Mitigation measure WR_06 of Waste and Resources CEMP notes that mulch will be utilised onsite for environmental controls and ground stabilisation.	▪ Contractor ▪ WSA Co Environment Manager ▪ WSA Co Construction Manager	EIS Table 28-7
SW_32	Establishing erosion and sediment controls in accordance with the 'NSW OEH Blue Book – Managing urban stormwater: soils and construction';	Construction	Also covered in SW_12	▪ WSA Co Environment Manager ▪ Contractor	EIS Table 28-7

Ref	Mitigation measure	When to implement	How to implement	Responsibility	Reference
SW_33	Providing intermediate sediment retention basins within the construction impact zone to provide additional treatment prior to completion of the airport's site drainage system. Specific erosion control measures will be developed for the management of highly erodible soils such as those anticipated in the Luddenham and South Creek soil landscapes;	Pre-construction/ Construction	Will be undertaken as per SW_33.	▪ Contractor ▪ WSA Co Environment Manager ▪ WSA Co Construction Manager	EIS Table 28-7
SW_34	Mulching cleared vegetation for use in erosion control at construction sites;	Construction	Will be undertaken as per SW_34. Mitigation measure WR_06 of Waste and Resources CEMP also notes that mulch will be utilised onsite for environmental controls and ground stabilisation.	▪ Contractor ▪ WSA Co Environment manager ▪ WSA Co Construction Manager	EIS Table 28-7
SW_35	Covering and stabilising soil stockpiles with vegetation or mulch;	Construction	Will be undertaken as per SW_35. Mitigation measure WR_06 of Waste and Resources CEMP also notes that mulch will be utilised onsite for environmental controls and ground stabilisation.	▪ Contractor ▪ WSA Co Environment manager ▪ WSA Co Construction Manager	EIS Table 28-7

Ref	Mitigation measure	When to implement	How to implement	Responsibility	Reference
SW_36	Stockpiling topsoil at a maximum height of two metres, where practicable; and	Construction	Will be undertaken as per SW_36. Environmental site inspections will be undertaken by the WSA Co Environment Manager (or delegate) on a monthly basis to evaluate the effectiveness of environmental controls implemented by the contractor (Refer to Section 9 of Soil and Water CEMP).	▪ Contractor ▪ WSA Co Environment manager ▪ WSA Co Construction Manager	EIS Table 28-7
SW_37	Distributing and seeding topsoil over landscaped areas at the completion of bulk earthworks.	Construction	Will be undertaken as per SW_37 under supervision of the construction and environmental management teams.	▪ Contractor ▪ WSA Co Environment manager	EIS Table 28-7
PROGRAMMING					
SW_38	Construction programming will allow for progressive rehabilitation of disturbed areas will be undertaken to minimise soils exposure and the potential for dust generation, erosion and sedimentation, and visual impacts.	Pre-construction/ construction	Will be undertaken as per SW_38.	▪ WSA Co Construction Manager ▪ Contractor	Good practice
LEAKS OR SPILLS OF FUEL OR OTHER CHEMICALS					
SW_39	To minimise the risk of leaks or spills the following mitigation measures will be put in place:	Note	NA	NA	EIS Table 28-7

Ref	Mitigation measure	When to implement	How to implement	Responsibility	Reference
SW_40	Maintenance areas, fuel farms and other areas where fuels or chemicals are stored or handled will be bunded to contain any accidental spills or leaks;	Construction	Will be undertaken as per SW_40. Environmental site inspections will be undertaken by the WSA Co Environment Manager (or delegate) on a monthly basis to evaluate the effectiveness of environmental controls implemented by the contractor	▪ Contractor ▪ WSA Co Environment Manager	EIS Table 28-7
SW_41	Fuel and other chemicals will be stored and handled in accordance with relevant Australian standards such as:	Construction	Australian standards listed will be taken into account when storing fuel and other chemicals. Environmental site inspections will be undertaken by the WSA Co Environment Manager (or delegate) on a monthly basis to evaluate the effectiveness of environmental controls implemented by the contractor	▪ Contractor ▪ WSA Co Environment Manager	EIS Table 28-7
SW_42	AS 1940-2004 The storage and handling of flammable and combustible liquids;	Construction	Refer to SW_41.	▪ Contractor ▪ WSA Co Environment Manager ▪ WSA Co Construction Manager	EIS Table 28-7

Ref	Mitigation measure	When to implement	How to implement	Responsibility	Reference
SW_43	AS/NSZ 4452:1997 The storage and handling of toxic substances;	Construction	Refer to SW_41.	▪ Contractor ▪ WSA Co Environment Manager ▪ WSA Co Construction Manager	EIS Table 28-7
SW_44	AS/NZS 5026:2012 The storage and handling of Class 4 dangerous goods; and	Construction	Refer to SW_41.	▪ Contractor ▪ WSA Co Environment Manager ▪ WSA Co Construction Manager	EIS Table 28-7
SW_45	AS/NZS 1547:2012 On-site domestic wastewater management.	Construction	Refer to SW_41.	▪ Contractor ▪ WSA Co Environment Manager ▪ WSA Co Construction Manager	EIS Table 28-7
SW_46	A protocol will be developed and implemented to respond to and remedy leaks or spills.	Construction	Protocol has been developed (refer to Appendix C) and will be implemented and should be discussed during the compulsory induction undertaken by all staff, workers and visitors before attending the site.	▪ Contractor ▪ WSA Co Environment Manager ▪ WSA Co Construction Manager	EIS Table 28-7
FLOOD MANAGEMENT					
SW_47	Weather forecast and monitoring is to be undertaken daily as part of the pre-start meeting and the day's activities are to be modified if and as required.	Construction	Will be undertaken as per SW_47.	▪ WSA Co Environment Manager ▪ Contractor	Good practice

Ref	Mitigation measure	When to implement	How to implement	Responsibility	Reference
SW_48	In the event that rain forecast is likely to exceed 20mm in any 24-hour period, work activities are to be re-assessed and if deemed necessary (i.e. in the event of prolonged rainfall and actual or potential for rising creek levels), any plant and machinery (and moveable items) are to be relocated to an area outside of the 100-year ARI area (refer to Section 6.3.2) and away from any watercourse.	Construction	Will be undertaken as per SW_48 under the supervision of the construction and environmental management teams.	▪ WSA Co Environment Manager ▪ Contractor	Good practice
SW_49	Where possible, temporary stockpiles and plant and equipment storage are to remain outside of the area identified as being within the 100-year ARI (refer to Figure 6). If required, a flood marker is to be installed on site to indicate the 100-year ARI extent.	Construction	Will be undertaken as per SW_49 under the supervision of the construction and environmental management teams.	▪ WSA Co Environment Manager ▪ Contractor	Good practice
SW_50	In the event that flooding occurs on the site, the WSA Co Emergency and Incident Response Plan is to be implemented.	Construction	Will be undertaken as per SW_50. The WSA CO Emergency and Incident Response plan will be discussed during the compulsory induction undertaken by all staff, workers and visitors before attending the site.	▪ WSA Co Environment Manager ▪ Contractor	Good practice

Ref	Mitigation measure	When to implement	How to implement	Responsibility	Reference
WATER TREATMENT FACILITY OPERATION					
SW_51	The treated water irrigation scheme will be designed and operated in accordance with the risk framework and management principles contained in the National Guidelines on Water Recycling (EPHC 2006) and Environmental guidelines: Use of effluent by irrigation (DEC 2004).	Construction Operation	Will be undertaken as per SW_51.	▪ WSA Co Environment Manager ▪ Contractor ▪ Designer	Table 28-30

8 Environmental roles and responsibilities

The key environmental management roles and responsibilities for the construction phase of the work are detailed in Section 4.5 of the SEMF.

WSA Co will ensure sufficient resources are allocated on an ongoing basis to ensure effective implementation by both WSA Co and the responsible contractors.

Specific responsibilities for the implementation of this Soil and Water CEMP are detailed below.

8.1 External roles and responsibilities

Environment Minister (or an SES employee in the Environment Department)

- The Approver for the Biodiversity Offset Delivery Plan.
- On 24 August 2018 the Approver approved the Biodiversity Offset Delivery Plan in accordance with Condition 30 of the Airport Plan.
- The Environment Department is to be included in the consultation process for the Biodiversity CEMP and the Soil and Water CEMP (in accordance with Condition 35 of the Airport Plan).
- The Environment Department receives notification regarding publication of annual reports under condition 39 of the Airport Plan, in addition to evidence of publication of annual reports.

Infrastructure Minister (or an SES employee in the Infrastructure Department)

- The Approver for the Construction Plan, CEMPs, the Community and Stakeholder Engagement Plan and the Sustainability Plan;
- Approval for variation of an Approved Plan; and
- Review and approve other matters (excluding Biodiversity Offset Delivery Plan).
- The Infrastructure Department is responsible for administering and enforcing the Airports Act.

Airport Environment Officer

The responsibilities of the Airport Environment Officer (AEO) include the following:

- Monitoring compliance with the AEPRs;
- Facilitate an understanding of the obligations of the AEPRs;
- Ensure the best possible outcomes are achieved;
- Complete site inspections to review monitoring requirements and completion of works;
- Review and comment on CEMPs, incidents, and remedial activities;
- Issue an environmental protection order in accordance with Part 7 of the AEPR; and
- Issue an infringement notice in response to an offence against the AEPR.

8.2 WSA Co roles and responsibilities

WSA Co Executive General Manager

Environmental responsibilities of the WSA Co Executive General Manager include (but are not limited to):

- Provide resources to ensure compliance with SEMF and CEMPs is achieved;
- Mandate and ensure that environmental protection remains an integral element of all Project activities; and
- Authorise resourcing with regards to soil and water quality management.

WSA Co Environment Manager

The WSA Co Environment Manager is responsible for leading the planning, approvals and environmental function and is responsible for the ongoing requirements associated with the management of soil and water quality as follows:

- Coordinate and manage the preparation of the Soil and Water CEMP (this Plan) and associated documents / plans / procedures;
- Liaise regularly with the stakeholders and contractors on environmental matters routinely and as required;
- Coordinate ongoing training in environmental awareness for all levels of WSA Co staff as required to implement this Soil and Water CEMP;
- Ensure that an appropriate environmental induction and training program is developed such that personnel are aware of their environmental responsibilities under relevant legislation and the contract, including the requirements associated with soil and water quality management;
- Ensure compliance of Stage 1 Development activities with this Soil and Water CEMP;
- Implement, maintain, monitor, report and advise the Executive General Manager on all environmental matters including those associated with soil and water quality management;
- Liaise with the Infrastructure Department Environment Manager on environmental issues, including the written notification of non-conformances;
- Monitor the implementation of all environmental management requirements as detailed in this Soil and Water CEMP;
- Provide direction and guidance on implementation of this Soil and Water CEMP to all levels of the Project, including to the contractors as required;
- Ensure Project contractors comply with all relevant statutes, regulations, rules, procedures, standards and policies as detailed in this Soil and Water CEMP; and
- Ensure the timely review and assessment of environmental monitoring, auditing and inspection outcomes to ensure identification and implementation of continual improvement with regards to environmental management; and
- Overall reporting of the environmental performance of the Project.

WSA Co Site Environment Officer

The environmental responsibilities of the WSA Site Environmental Officer include (but are not limited to):

- Daily interaction and coordination with Project contractor representatives to ensure their environmental management requirements are discharged; and
- Work collaboratively with the WSA Co Environment Manager to ensure desired environmental outcomes are achieved.

8.3 Western Sydney Airport Delivery Partner roles and responsibilities

The Western Sydney Airport Delivery Partner is responsible for the coordination and management of contractors ensuring all necessary planning approvals and environmental management activities and documentation are undertaken in accordance with WSA Co requirements.

In summary, the environmental requirements of the Western Sydney Airport Delivery Partner in relation to soil and water quality impact management are as follows:

- Ensure that this Soil and Water CEMP is effectively implemented by the contractor as required;

- Ensure that the required soil and water monitoring and reporting, including environmental auditing, is undertaken and reported to WSA Co as required;
- Ensure that all necessary planning approvals, licenses and permits are obtained, as required by this Soil and Water CEMP, prior to commencement of applicable works;
- Liaise with the WSA Co Environment Manager on soil and water quality related issues, including the written notification of non-conformances;
- Participate in regular workplace inspections to ensure compliance;
- Provide direction and guidance on implementation of the Soil and Water CEMP; and
- Liaise between contractors and relevant government stakeholders as required and provide notification / information where environmental incidents / events have occurred.

8.4 WSA Co contractor roles and responsibilities

Construction contractor(s)

The responsibilities of the relevant contractor with regards to the management of impacts associated with soil and water quality are:

- Ensure that the relevant contractor requirements under the Soil and Water CEMP, including the relevant environmental procedures and work method statements, are effectively implemented;
- Identify resources required for implementation of the Soil and Water CEMP;
- Report to the WSA Co Environment Manager as required to inform community and stakeholder notifications and to provide information where environmental incidents / events have occurred;
- Report to WSA Co Environment Manager (or delegate) on environmental performance monthly or at other times as necessary;
- Ensure that all personnel receive appropriate induction training, including details of the environmental obligations associated with soil and water quality management;
- Responsible for the implementing of site specific environmental procedures and work method statements applicable to the proposed works in accordance with Section 7 of this CEMP and also in accordance with Section 4.4. of the SEMF;
- Ensure suppliers and subcontractors comply with requirements regarding soil and water quality management;
- Undertake weekly inspections, ensuring all works comply with relevant regulatory and project requirements, including soil and water quality management objectives;
- Provide other information as required from time to time, in order to demonstrate to WSA Co that environmental management requirements are being met by the contractor;
- Program toolbox talks and daily pre-start meetings to include any relevant soil and water quality management requirements;
- Report any activity that has resulted, or has the potential to result, in an environmental incident immediately to WSA Co Environment Manager;
- Stop activities where there is an actual or immediate risk of harm to the environment and advise WSA Co Environment Manager;
- Ensure steps are taken to rectify and prevent future incidents from occurring;
- Ensure that soil and water quality management controls are properly maintained and effective; and
- Carefully select suppliers and subcontractors based upon their ability to meet stated requirements.

9 Environmental inspection, monitoring and auditing

Monitoring, inspection and auditing will be undertaken to measure effectiveness and facilitate continuous improvement of soil and water quality management.

General environmental monitoring, inspection and auditing requirements are summarised in Table 14 of the SEMF.

A summary of the environmental inspection, monitoring and auditing requirements is provided below, with details of how they apply to soil and water management where applicable.

9.1 Environmental inspections

WSA Co environmental inspections

Environmental site inspections will be undertaken by the WSA Co Environment Manager (or delegate) on a monthly basis to evaluate the effectiveness of environmental controls implemented by the contractor.

The monthly site inspection is to include a visual check of general construction activities and any soil and water quality mitigation measures and or controls including but not limited to the following:

- Observation of dust generation from specific construction activities including those from vehicle tracking and excavation works;
- Observation of excessive visible exhaust emission from plant and machinery under normal operational loads;
- The presence / generation of any odours associated with the work activities; and
- Plant and machinery left idling whilst unused for extended periods of time (considered to be 10 minutes or greater).

The findings of the WSA Co site environmental inspection will be recorded on a WSA Co Site Environmental Inspection Checklist with an accompanying photographic style inspection report.

Refer to Section 4 of the SEMF for further details with regards to completing *the Site Environmental Inspection Checklist.*

AEO environmental inspections

Environmental site inspections will be undertaken by the AEO as required by the AEPR to evaluate the effectiveness of environmental controls implemented on site during the construction activities.

Generally the inspections will be coordinated with the WSA Co environmental site inspections and will include a visual inspection of general construction activities and any soil and water quality mitigation measures and or controls. The AEO may choose to complete ad hoc inspections in addition to the routine inspections.

Contractor environmental inspections

Regular site inspections will be undertaken to monitor compliance with this plan. Inspection results will be recorded, and the inspection log made available to Infrastructure Department upon request. Any exceedance of soil and water quality criteria will be reported in the monthly report and discussed at the Environmental Coordination meeting and appropriate remedial action will be taken.

More frequent site inspections by the person accountable for soil and water quality issues will be conducted onsite when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. The duration of the increased inspection regime is to commence at daily and be re-assessed daily for continuation of the increased inspections.

Pre-start inspection

Prior to the commencement of works on each shift, an inspection will be carried out by the relevant contractor and will include a check of relevant environmental controls and resources required to ensure effective operation and maintenance. This is to include an inspection of relevant soil and water quality management mitigation measures and controls where applicable. Works are not to commence unless inspections are found to be satisfactory.

9.2 Soil and water monitoring

General environmental monitoring requirements are set out in the AEPR (and also within Table 28-6 of the EIS) and include the following:

- Monitoring must take place under the direction of an appropriately qualified person; and
- The results of the monitoring must be kept in a written record.

Specific soil and water quality monitoring requirements, including timing and responsibilities, are included in Table 20.

Table 20 Soil and water quality monitoring requirements

Reference	Requirement	Timing	Responsibility
SW_M_01	The most suitable surface and groundwater monitoring locations have been determined in consultation with the NSW EPA and relevant local councils, including monitoring locations adjacent to woodland areas and outside of the construction impact zone (but within the Airport Site);	Pre-construction and during construction	WSA Co Environment Manager and Contractor Environment Manager
SW_M_02	Regular site inspections will be conducted to monitor the effectiveness of the soil and water management controls. Inspection results will be recorded, and the inspection log made available to the Infrastructure Department upon request;	During construction	WSA Co Environment Manager and Contractor Environment Manager
SW_M_03	The frequency of site inspections will be increased during and immediately after wet weather (considered >20mm in any 24 hour period) when there is a higher potential for the off-site transport of sediment from the Airport Site;	During construction	WSA Co Environment Manager and Contractor Environment Manager
SW_M_04	Groundwater elevation monitoring will be conducted to detect potential impacts to base flow in the vicinity of potentially sensitive creeks or groundwater dependent vegetation. Monitoring will be undertaken quarterly through	During construction	WSA Co Environment Manager and Contractor Environment Manager

Reference	Requirement	Timing	Responsibility
	construction up to a minimum period of three years after the completion of the Stage 1 development and until any identified impacts stabilise;		
SW_M_05	Groundwater quality monitoring of alluvial and Bringelly Shale aquifers will be conducted at major infrastructure locations, down gradient from those locations and in the vicinity of groundwater dependent vegetation or watercourses. Monitoring will initially be undertaken quarterly and adjusted as appropriate; and	During construction	WSA Co Environment Manager and Contractor Environment Manager
SW_M_06	Monthly surface water quality monitoring will be conducted to monitor performance of the drainage system. This monitoring will occur once the surface water drainage system is in place and take place at basin outflows and during selected upstream and downstream conditions.	During construction	WSA Co Environment Manager and Contractor Environment Manager

Where a non-conformance is detected, or monitoring results are outside of the expected range, the non-conformance process described in Section 12 will be implemented.

9.3 Surface water quality monitoring program

The following sections detail both a Project-wide surface monitoring program (Stage 1 Development surface monitoring program) in addition to targeted water quality monitoring program associated with specific construction activities, including those covered by this CEMP (Refer to Table 3).

Calibration of all monitoring equipment will be undertaken in accordance with the relevant manufacturer's specification prior to first usage. All calibration records will be retained on site, including calibration certification (where undertaken by a third-party) and any other pre and post calibration records.

9.3.1 Stage 1 Development surface water quality monitoring

Stage 1 Development monitoring locations

The Stage 1 Development surface water monitoring program will utilise a series of ten pre-selected surface water monitoring location points as detailed in Table 21 and presented in Figure 9. These locations are based off the previously used monitoring locations for the background / baseline monitoring undertaken for the Airport Site and enable a consistent approach moving forward, allowing for ease of comparison and interpretation against historical data.

Table 21 Surface water quality monitoring locations

Name	Receiving water	Latitude (°N)	Longitude (°E)	Street address	Description
D/S Basin 1	Badgerys Creek	-33.873794	150.754716	1727-1447 Elizabeth Drive	This site is located off Elizabeth Drive with a road bridge at the sampling site. The surrounding area is mainly pasture.
D/S Basin 2	Badgerys Creek	-33.893885	150.747222	76 Fuller Street.	To access this site, park at the end of Fuller Street (the road gate needs to be unlocked) and walk through a paddock to reach the creek.
D/S Basin 3 New	Badgerys Creek	-33.898961	150.738342	679 Badgerys Creek Road	This site is located off Badgerys Creek Road with a road bridge running over the Creek. The surrounding area is pasture/ mixed native-exotic forest.
D/S Basin 6	Oaky Creek	-33.869251	150.721278	2111 Elizabeth Drive	This site is located off Elizabeth Drive with a road bridge at the sampling site. The surrounding area is mainly pasture with a few homes.
D/S Basin 7	Cosgrove Creek Tributary	-33.872049	150.713461	223 Adams Road.	D/S Basin 7 is located off Adams Road, with a small road bridge at site. Access is off road bridge.
D/S Basin 8	Tributary	-33.887897	150.675722	336 Willowdene Avenue	This site is located off Willowdene Ave, access from road bridge at site.
D/S Basin 9	Duncan's Creek	-33.898923	150.683626	Lot 32 392 Willowdene Avenue	This site is located off Willowdene Ave.
D/S Residual	Duncan's Creek	-33.900330	150.645150	527 Greendale Road	The site is located off Greendale Road with a road bridge present at site. Access down to the creek is difficult; the alternative is to stand on the roadside on a narrow bridge, which is unsafe in a 70-80 km speed zone with blind corners in both directions.
U/S Airport New	Badgerys Creek	-33.912333	150.704744	1675 The Northern Road	The site is located off The Northern Road.
U/S Airport 2	Badgerys Creek anabranch	-33.914444	150.705994	1655 The Northern Road	The site is located off The Northern Road opposite a fertiliser company.

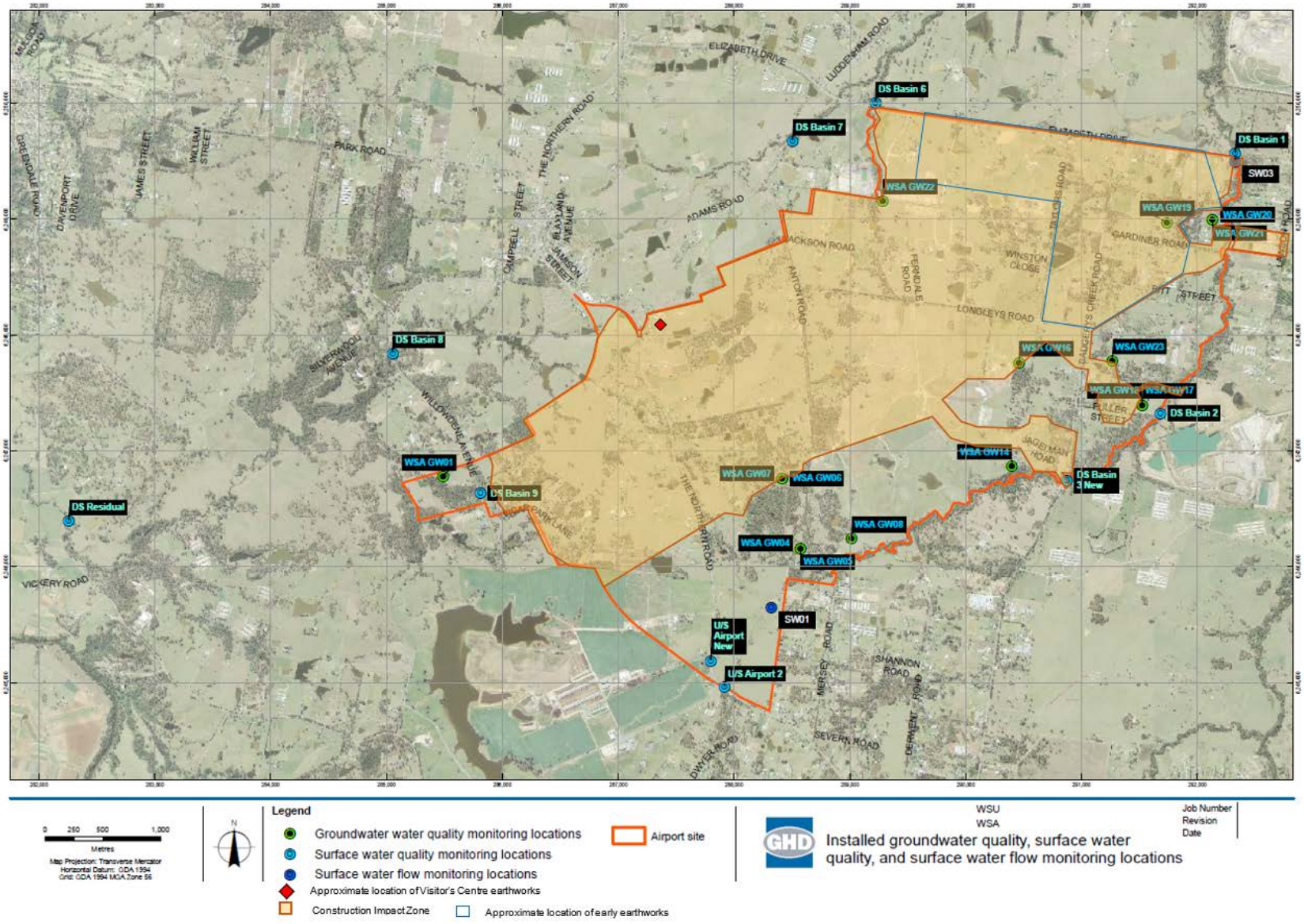


Figure 9 Stage 1 Development surface water and groundwater monitoring locations

9.3.2 Stage 1 Development monitoring, sampling and reporting

Surface water quality monitoring

Monitoring and sampling will be undertaken on a monthly basis by WSA Co environmental team. Both in situ sampling and 'ex situ' sampling (collecting 'grab' samples) for laboratory analyses, will be conducted. Observations on visual assessments will be recorded on a water quality monitoring form at the time of the sampling event.

In situ sampling - In situ measurements of water quality parameters are essential to determine site conditions that can vary dramatically, or frequently, in waterbodies. In situ monitoring will be conducted (where possible) from locations away from the water's edge, and in areas where water is sufficiently deep.

Using a calibrated portable water quality monitoring probe / meter the following parameters will be recorded:

- Temperature (°C);
- Conductivity (µS/cm);
- pH (pH units);
- Dissolved Oxygen (mg/L and % saturation); and
- Turbidity (NTU).

Grab samples - Samples will be collected from discrete locations at each site as detailed in Table 21 in appropriate bottles as provided by the relevant NATA accredited laboratory. All sampling equipment will be decontaminated between each site as required. The collected samples will be transported to the NATA accredited laboratory as soon as possible with adequate ice supplies included in the transportation container to ensure the samples remain cool. All sample batches submitted to the laboratory will be accompanied by a Chain-of-Custody form, a copy of which will be saved and maintained on project records. All analysis will be undertaken as per the instruction on the Chain-of-custody form in accordance with the required standards and procedures as per NATA requirements.

All sampling and preservation techniques will be in accordance with the Australian Standards for water quality sampling (AS/NZS 5667.1:1998).

Monthly reporting – The WSA Co monthly report will include details of monitoring completed during the month. The detail included in the monthly report will be the following as a minimum:

- Date and time of the sampling event;
- Description of the weather and any potential influencing conditions;
- Description of the monitoring location of the sampling event at the time of the sampling, in particular, observations regarding the condition of the waterway and associated water levels and water flow (if any);
- A summary of all monitoring and sampling results; and
- Interpretation of the results and comparison against the relevant criteria (refer to Section 9.3.3), including identification of any water quality exceedances and potential sources of the exceedance.

An Early Earthworks Water Monitoring and Inspection Procedure is included in Appendix E of this CEMP. The Early Earthworks monitoring plans will be appropriate to the level of risk associated with the scope of activities and be prepared in accordance with the legislation and guidelines identified in Section 4.

Monitoring and inspections will include, but not be limited to:

- Up and downstream of the work site water quality monitoring at nominated locations;
- Where relevant monitor adjacent to woodlands at representative locations to the work,
- Groundwater monitoring, both level and quality at nominated locations;
- Construction water quality prior to discharge (e.g. sediment basin, excavation etc); and

- Weekly and post rainfall inspections to evaluate the effectiveness of erosion and sediment controls measures.

The type, timing, frequency, assessment criteria and associated reporting requirements are detailed in the plan. The plan includes detailed inspection criteria such as:

- Monitoring locations;
- What is to be monitored;
- Type of monitoring; and
- Frequency of monitoring.

Site waters, including sediment basins, will not be discharged until the relevant criteria as detailed in Table 24 have been reached, observed by the Contractors Environmental Manager, and a discharge permit is issued verifying the water quality (refer to Appendix E for further detail regarding surface water discharge).

Surface water quality reporting

The Contractor will be responsible for reporting monthly to WSA Co on the results of the water quality monitoring undertaken during the reporting period.

The monthly contractor's water quality monitoring report will include the following as a minimum:

- Date and time of the sampling event;
- Description of the weather and any potential influencing conditions;
- Description of the monitoring location of the sampling event at the time of the sampling, in particular, observations regarding the condition of the waterway and associated water levels and water flow (if any);
- A summary of all monitoring and sampling results; and
- Interpretation of the results and comparison against the relevant criteria (refer to Section 9.6).

WSA Co will utilise the relevant information from the any water quality monitoring and reporting undertaken by the contractor to inform the monthly report compiled for the Stage 1 Development surface water quality monitoring and reporting.

9.3.3 Surface water quality limits

AEPR Construction water quality limits

The Airports Act specifies offences relating to environmental harm, environmental management standards, and monitoring and incident response requirements, including in relation to water pollution. Standards in relation to water pollution include water quality criteria such as oxygen content, pH, salinity and turbidity.

Part 4 of the AEPR imposes a duty on the operator of an undertaking to at an airport to take all reasonable and practicable measures:

(a) to prevent the generation of pollution from the undertaking; or

(b) if prevention is not reasonable or practicable—to minimise the generation of pollution from the undertaking.

Both the Airport Plan conditions and Part 6 of the AEPR address monitoring of pollution levels. The AEPR requires that testing be undertaken by laboratory analysis accredited by the NATA.

Schedule 2 of AEPR sets out acceptable limits for water pollution which are assumed to satisfy the general duty not to pollute. Key parameters from these acceptable limits, considered applicable to the construction phase of the Stage 1 development have been extracted and provided in Table 22. A complete list of the acceptable limits for water quality under the AEPR is provided in Appendix F.

Table 22 Key water quality parameters under the AEPR

Parameter	Accepted limit of contamination
Total Phosphorous	< 0.01 mg/L*
Total nitrogen (TN)	< 0.1 mg/L*
Dissolved oxygen (DO)	80% of average level for a normal 24 hr period or < 6 mg/L
Total suspended solids (TSS)	Change not more than 10% from seasonal mean
Turbidity	Reduction of 10% clarity in the euphotic zone from the seasonal mean
pH	6.5 – 9.0
Salinity	> 1000 mg/L or an increase of > 5%

*It should be noted that these regulations are approximately five times more stringent than the current Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000) (ANZECC guidelines) for total phosphorus and total nitrogen (EIS, 2016).

9.3.4 Airport Site water quality

The EIS referenced water quality criteria that was based on the existing water quality developed during the study period from 2015 to 2016. In addition, further water quality assessment has continued since the development of the EIS between 2016 - 2018. The results of the water quality monitoring has provided information about the existing background levels. The water quality is considered in the EIS as being fairly degraded due to the previous land uses. This has particularly resulted in elevated levels of Total Nitrogen and Total Phosphorous.

Table 23 provides a summary of the background water quality at the Airport site

Table 23 Airport Site Background water quality criteria

Guideline / source	Total suspended Solids (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)
Background water quality criteria[1]	23.2	0.92	6.2
ANZECC Guidelines Default Trigger Levels	40	0.05	0.5
AEPR Limits	Change not more than 10% from seasonal mean	0.01	0.1

1 Based on monthly water quality monitoring data obtained during 2015 and 2016 at various locations around the airport site, consisting of more than 80 samples for each parameter.

9.3.5 Receiving water quality targets

The criteria that was used to assess the condition of the water quality during the EIS and subsequent monitoring is provided in Table 24. The targets were based on the AEPR and ANZECC guidelines and will continue to be referenced during the Stage 1 Development monthly water quality program to determine potential construction impacts. The WSA Co monthly report will include a comparison of the receiving water quality against the target provided in Table 24 and any exceedance will be discussed further in the report with regards to consideration of upstream and downstream water quality and the likely source of any exceedances. Appropriate action will be taken to mitigate against future exceedances where appropriate.

Following twelve months of implementation and monitoring against the water quality targets of receiving waters (as presented in Table 24), and every twelve months thereafter, WSA Co will undertake a review process of the criteria to refine the criteria to accurately reflect actual conditions and in an effort to demonstrate a process of continual improvement.

Table 24 Receiving water quality target

Analyte	Assessment Guideline	Assessment guideline source*
pH (in situ)	**6.5-9.0**	AEPR
Conductivity (µS/cm)	**125-2,200**	ANZECC
DO (%sat)	80% of average level for a normal 24 hr period or < 6 mg/L	AEPR
DO (mg/L)		
Turbidity (NTU)[1]	**6-50**	ANZECC
Faecal Coliforms (CFU/100mL)	**150**	AEPR
SS (mg/L)	**6**	ANZECC
NOx (mg/L)	**0.04**	
TKN (mg/L)	**N/A**	-
TN (mg/L)	**0.1**	AEPR
TP (mg/L)	**0.01**	
Chlorophyll-a (mg/m³)	**2**	
Arsenic (mg/L)	**0.05**	
Cadmium (mg/L)	**0.0002**	
Chromium (mg/L)	**0.01**	AEPR
Copper (mg/L)	**0.002**	
Lead (mg/L)	**0.001**	
Nickel (mg/L)	**0.015**	
Zinc (mg/L)	**0.005**	
Mercury (mg/L)	**0.0001**	
TPH C6 – C9 fraction (µg/L)	**150**	
TPH > C9 fraction (µg/L)	**600**	
PFAS/PFOS	**TBC**	NEMP

*In the absence of criteria from the Airports (Environmental Protection) Regulations 1997, criteria was sourced from the ANZECC (2000) Freshwater Guidelines

1 Note: Turbidity in lowland rivers can be extremely variable. Values at the low end of the range would be found in rivers flowing through well vegetated catchments and at low flows. Values at the high end of the range would be found in rivers draining slightly disturbed catchments and in many rivers at high flows.

9.3.6 Construction water quality discharge criteria

In consideration of the AEPR, the background water quality as presented in the EIS (refer to Table 23) and the existing water quality at the Airport Site (as presented in Table 24), WSA Co, following consultation with the AEO, has adopted the following construction water discharge criteria as presented in Table 25 during the construction phase of the Stage 1 Development. The criteria selected are representative of the potential contaminants that may result from construction activities.

Table 25 Construction water quality discharge criteria

Parameter	Criteria	Sampling method	Analytical method
Receiving water within the Airport Site (AEPR)			
pH	6.5 –9.0	Probe or Grab Sample	Field analysis and confirmed as required with laboratory assessment
Total Suspended Solids (TSS)	Change not more than 10% from seasonal mean	Grab Sample	Field analysis and confirmed as required with laboratory assessment
DO (%sat)	80% of average level for a normal 24 hr period or < 6 mg/L	Grab sample (probe)	Field analysis and confirmed as required with laboratory assessment
DO (mg/L)		Grab sample (probe)	Field analysis and confirmed as required with laboratory assessment
Oil and Grease	No visible	Visual assessment for oil sheen	Field analysis and confirmed as required with laboratory assessment
Receiving water outside the Airport Site (ANZECC)			
pH	6.5 –8.5	Probe or Grab Sample	Field analysis and confirmed as required with laboratory assessment
Turbidity[1]	6- 50 NTU	Probe or Grab Sample	Field analysis and confirmed as required with laboratory assessment
DO (%sat)	**>80**	Grab sample (probe)	Field analysis and confirmed as required with laboratory assessment
DO (mg/L)	**<6**	Grab sample (probe)	Field analysis and confirmed as required with laboratory assessment
Oil and Grease	No visible	Visual assessment for oil sheen	Field analysis and confirmed as required with laboratory assessment

1 Turbidity in lowland rivers can be extremely variable. Values at the low end of the range would be found in rivers flowing through well vegetated catchments and at low flows. Values at the high end of the range would be found in rivers draining slightly disturbed catchments and in many rivers at high flows.

9.4 Groundwater monitoring program

The groundwater monitoring program will utilise the existing network of 15 groundwater monitoring wells that were installed during the baseline groundwater monitoring program. The location of the groundwater monitoring locations are shown in Figure 9 and are summarised in Table 26.

Calibration of all monitoring equipment will be undertaken in accordance with the relevant manufacturer's specification prior to first usage. All calibration records will be retained on site, including calibration certification (where undertaken by a third-party) and any other pre and post calibration records.

Table 26 Groundwater monitoring locations and well details

Well ID (Refer to Figure 9)	Installation date	Location Easting	Northing	Well Depth (mbtoc)	Well screen (mbgl)
GW01*	21/12/2016	285489	6246780	10.80	7 – 10
GW04	14/12/2016	288574	6246161	20.87	17 – 20
GW05*	14/12/2016	288574	6246161	10.76	7 – 10
GW06*	13/12/2016	288413	6246761	20.35	17 – 20
GW07*	13/12/2016	288413	6246761	10.27	7 – 10
GW08*	15/12/2016	289013	6246245	10.67	7 – 10
GW14*	15/12/2016	290400	6246870	10.75	7 – 10
GW 16*	15/12/2016	290461	6247764	10.77	7 – 10
GW 17*	19/12/2016	291523	6247399	21.85	17 – 20
GW18*	19/12/2016	291523	6247399	10.81	7 – 10
GW19*	21/12/2016	291738	6248976	10.81	7 – 10
GW20	20/12/2016	292130	6249000	20.83	17 – 20
GW21	20/12/2016	292130	6249000	10.84	7 – 10
GW22	21/12/2016	289283	6249162	10.65	7 – 10
GW23	16/12/2016	291265	6247780	10.82	7 – 10

*Indicates the groundwater well which have been installed with electronic logging instrumentation

9.4.1 Groundwater monitoring

Manual monitoring

Manual monitoring and sampling of the groundwater wells will be undertaken on a quarterly basis (i.e. every three months).

A groundwater grab sample will be obtained every quarter for the purposes of laboratory analysis including the following analytes:

- Nitrogen (speciated) and total phosphorus;
- Dissolved metals (field filtered As, Cd, Cr, Cu, Ni, Pb, Zn and Hg);
- Total recoverable hydrocarbons (TRH);
- Trace phenols and polycyclic aromatic hydrocarbons (PAHs);
- Benzene, toluene, ethylbenzene, xylene (BTEX);
- Volatile organic compounds (VOCs); and
- PFAS

In-situ groundwater field parameters will be checked and recorded including the following:

- pH;
- Temperature (^{o}C);
- Electrical conductivity (uS/cm);
- Dissolved oxygen (mg/L); and

- Oxidation reduction potential (mV)

Electronic logging

Electronic high frequency groundwater elevation monitoring equipment has been installed in eight of the fifteen groundwater wells and will be utilised to remotely access and record groundwater elevations at 15 minute intervals. A barometric gauge was also installed above the standing water level in monitoring well WSA GW19. The barometric logger will be used to correct for barometric effects from the logger data. Table 26 above includes indication of which groundwater wells have electronic logging instrumentation installed.

9.4.2 Groundwater criteria

The assessment criteria adopted for the monitoring program was derived from the potential receptors identified in the EIS groundwater assessment. These include:

- Beneficial use capacity of groundwater and surface water quality;
- Potential recreational users of groundwater and surface water (farm dams and creeks);
- Use of groundwater and surface water for stock watering;
- Aquatic ecosystems located in creeks and farm dams; and
- Groundwater in and around groundwater dependent vegetation.

The adopted assessment criteria to assess impacts to these potential receptors is presented in Appendix G.

Analytical trigger values

The adopted groundwater quality criteria will be utilised as the trigger values for the purpose of this CEMP and associated soil and water management. Where background concentrations exceed adopted criteria, laboratory concentrations should be assessed in the context of those background concentrations. Exceedances will be assessed using statistical interrogation utilising the Mann-Kendall Statistic.

Groundwater trigger-action-response measures

The Airport Plan Condition 8(5) is satisfied through simple compliance arrangements that are suitable for specific activities required for this phase of works. More detailed trigger-action-response measures will be implemented for subsequent phases of works that have the potential to alter groundwater conditions.

The proposed trigger value for standing groundwater shall be a trend over a continuous three-month period, and overall change by 20% when compared to baseline data accounting for seasonal fluctuations to groundwater levels. Site specific parameters will be considered by Contractors in accordance with Section 7 of this CEMP and Section 4.4 in the SEMF.

Given the limited nature of the works proposed for this CEMP, the proposed approach is considered appropriate. However, for more extensive works, future iterations of the Soil and Water CEMP would refine these trigger values such that they specifically nominate seasonal upper and lower boundaries for the key groundwater monitoring points as nominated in Table 25.

Corrective actions to compensate for any reoccurring or long-term exceedances of the above target criteria will be managed through discussions with the Environment Department and the Infrastructure Department. After agreement on corrective actions, implementation of control measures will be undertaken. Refer to Section 9.4.3 for more details.

9.4.3 Corrective actions

Where groundwater monitoring results exceed the adopted criteria (refer Appendix G) and/or are above the results established during the baseline assessment, the following actions would occur:

- Interrogation of dataset by WSA Co in consultation with the site Contractor and a review of construction activities that are likely to cause impact to groundwater;

- Review of sample collection and QA/QC procedures to assess data quality to confirm the data is representative of site conditions;
- Re-sampling of groundwater if required to confirm results;
- WSA Co to notify Infrastructure Department if considered a notifiable event (in accordance with Section 9.6);
- Review of on-site activities by the Contractor(s) which may have contributed to exceedance.;
- Assess the need for corrective measures or options to mitigate impacts in consultation with Infrastructure Department and groundwater consultant (if required); and
- Implementation of control measures.

9.4.4 Groundwater reporting

A quarterly groundwater monitoring report will be compiled based on the above groundwater monitoring activities. The reports will be reviewed by the WSA Co Environment Manager and any potential exceedances (as noted in the report) will be reported to Infrastructure Department and managed accordingly. As a minimum, the quarterly monthly groundwater monitoring report will include the following:

- Date, location (well) and time of the sampling event;
- Description of the weather and any potential influencing conditions;
- Factual reporting including lab results and groundwater elevation plots; and
- Interpretation of the results and comparison against the relevant criteria (refer to Section 9.4.2), including identification of any water quality exceedances and potential sources of the exceedance.

9.5 Environmental auditing

Refer to Section 8 of the SEMF for environmental auditing requirements, including internal WSA Co audits, independent audits and audits to be undertaken by contractors.

9.6 Environmental reporting

General environmental reporting requirements are detailed in Section 8.3 the SEMF. In addition, a summary of reporting requirements required under this Soil and Water CEMP (including environmental reporting requirements under the Airport Plan specific to this Soil and Water CEMP) is provided in Table 27.

Table 27 Soil and water quality reporting

Action	Scope	Timing / Frequency	Responsibility
Annual reporting	Unless otherwise agreed by an Approver, an annual report will be prepared in relation to compliance with the Soil and Water CEMP. In accordance with Condition 39 (2), WSA Co will publish each of the annual reports on its website within three months of the end of the period in respect of which the report was prepared, with evidence providing proof of the date of publication to the Infrastructure Department with a copy to the Environment Department. The report must remain on	Annually	WSA Co

Action	Scope	Timing / Frequency	Responsibility
	the website for a period of at least 12 months.		
Monthly compliance reporting	Undertaking monitoring as required by the relevant contractor CEMP. Provide WSA Co with a monthly summary of all soil and water monitoring undertaken and advise of compliance with criteria	Monthly	Contractor
Complaints reporting	Recording of complaints and stakeholder interactions	As required	WSA Co and Contractor
Recording in a log book any exceptional incidents (required under the 6.02(3) of the AEPR)	Record any exceptional incidents that cause excessive pollution of receiving waters and the action taken to resolve the situation	As required	All
Shut-down inspections	Inspection of contractor works including status of environmental controls prior to shut-down of site for an extended period (i.e. more than 2 days)	Prior to site shut-down	Contractor
General environmental inspection	Inspection of environmental management controls on site and sighting of site documentation as required by the contractor's CEMP	At least monthly	WSA Co
General environmental inspection	Inspection of environmental management controls and site documentation for contractor works (as required by the contractor's CEMP).	As per Contractor environmental management system (at least weekly)	Contractor
Post-rainfall inspection	Inspection of environmental controls following a rainfall event exceeding 10 mm in any 24 hour period.	Within 24 hours of the rainfall event (excluding Sunday's and Public Holidays)	Contractor
Reporting pollution incidents (required under the Airport Act)	Report pollution incidents resulting in offsite impacts to the NSW Environment Protection Authority – refer to WSA Co Environmental Non-conformance Classification and Reporting Procedure	As required	All
Pollution and or excessive noise reporting	In accordance with the AEPR, WSA Co must give an airport environment officer for the airport, within 14 days, a written report in the event that monitoring results indicate pollution, or excessive noise, occurring as a result of the undertaking of the works associated with the Stage 1 development. The trigger for a 'pollution event' as per the Airports	As required	WSA Co

Action	Scope	Timing / Frequency	Responsibility
	(Environment Protection) Regulations 1997 is provided in the relevant schedules of the AEPR (refer to Appendix F for a copy of the AEPR acceptable limits for water quality).		
Reporting of non-conformances and improvement opportunities	The management and reporting requirements of environmental non-conformances and improvement opportunities will be in accordance with Section 9 of the WSA Co SEMF.	As required	WSA Co and Contractor

9.7 Environmental compliance tracking

In accordance with Condition 38 of the Airport Plan, a Compliance Tracking Program has been developed for the Project and is included in Appendix K of the SEMF. The Compliance Tracking Program will WSA Co to track compliance status with the conditions of the Airport Plan (and any other approval requirements) and will allow WSA Co to demonstrate measures taken to implement the Approved Plan. The Compliance Tracking Program will be used as a tool to inform the annual report (as detailed above in Table 27 and will be made available to Infrastructure Department upon request as required. Refer to Section 8.3.2 of the SEMF for further details regarding the maintenance and implementation of the Compliance Tracking Program.

10 Competence, training and awareness

To ensure this Soil and Water CEMP is effectively implemented, each level of management is responsible for ensuring that all personnel reporting to them are aware of the requirements within. The WSA Co Environment Manager will coordinate the necessary and relevant environmental training in conjunction with other training and development activities.

All competence, training and awareness requirements will be implemented as detailed in Section 5 of the SEMF. A summary of these requirements is provided in the sections below.

10.1 Environmental Project induction

All project personnel working on the Stage 1 Development (including sub-contractors) are required to attend a compulsory Project induction that includes an environmental component prior to commencement of works on site, which will include:

- Soil and water impacts of the works;
- Soil and water management on site; and
- Contaminated material.

Short-term visitors to site for purposes such as deliveries will be required to be accompanied by inducted personnel at all times. A visitors' induction will also be undertaken for visitors onsite for short periods as agreed with the WSA Co Safety Manager.

The WSA Co Environment Manager (or delegate) will be responsible for providing the environmental component of the Project inductions, ensuring that the environmental management requirements of this plan are incorporated.

A WSA Co Induction and Training Register will be maintained at all times including the details of all personnel who have completed the WSA Co project induction and any other pertinent environmental training and or awareness forums (workshops, presentations etc.).

10.2 Contractor specific site inductions

In addition to the WSA Co Project induction, contractors will develop and implement their own environmental training and induction program relevant to their scope of works. A record of all environment inductions is to be maintained by the contractor and provided weekly to WSA Co.

10.3 Toolbox talks, training and awareness

Toolbox talks or similar will be one method of raising awareness and educating personnel on issues related to aspects of construction including environmental issues. The toolbox talks are used to ensure environmental awareness continues throughout construction.

Toolbox attendance is mandatory and attendees of toolbox talks are required to sign an attendance form and the records maintained as part of the Induction and Training Register.

Environmental issues associated with soil and water quality management to be considered for toolbox talks may include (but are not limited to):

- Erosion and sedimentation control;
- Implementation and usage of spill response materials for both aquatic and terrestrial environments;
- Implementation and awareness of the unexpected contamination finds procedure;
- Management of spills, drips and leaks or chemicals (including hydrocarbons);
- Incidents and spill response; and
- Storage and handling of chemicals.

For activities with high environmental risk (as identified through the risk assessment process undertaken as part of the CEMP), targeted environmental awareness training is to be provided.

The WSA Co Environment Manager will establish a schedule of environmental training.

10.4 Daily pre-start meetings

The pre-start meeting is a tool for informing the workforce of the day's activities, safe work practices, environmental protection practices, work area restrictions, activities that may affect the works, coordination issues with other trades, hazards and other information that may be relevant to the day's work.

Specifically with regards to this Soil and Water CEMP, the daily pre-start forum can be used as an opportunity to discuss the following:

- Forecast inclement weather that may impact on soil and water quality;
- Recent site observations / learnings with regards to soil and water quality management; and
- Daily activities that may have impact on soil and water quality.

11 Communications and complaints management

All communications and complaints management will be implemented and managed in accordance with Section 7 of the SEMF.

11.1 Complaints management

A Complaints and Enquiries Procedure, consistent with AS 4269: *Complaints Handling*, has been developed for the work, in accordance with the requirements of Condition No. 15 (Airport Plan, Section 3.10.2). Refer to Section 7.3 of the SEMF for further details regards the Complaints and Enquiries Procedure.

All community inquiries and complaints related to the construction activities will be referred to the 24-hour community information line (1800 972 972). A postal address (PO Box 397, Liverpool NSW 2170) and email address (info@wsaco.com.au) has been provided for receipt of complaints and enquiries. The telephone number, the postal address and the email address will be published in newspapers circulating in the local area prior to the commencement of construction and is provided on the Project website.

The community and stakeholder engagement team will take the lead in responding to complainants. Attempts will be made to resolve all complaints in accordance with the Community and Stakeholder Engagement Plan. Timeframes for initial responses to complaints are outlined below.

- Telephone complaints received during work hours will be provided a response within two hours. Complaints received outside of works hours will be provided a response within two hours of the next working day; and
- Email and postal complaints will be responded to within two (2) business days of receipt.

The aim is to resolve the complaint at the first point of contact, by providing a solution or negotiating an agreed course of action. The complainant will be provided updates on the progress of their complaint and a written response will be provided within 10 working days if the complaint cannot be resolved by the initial or follow up verbal response.

The community contacts database will be used as a complaints register. The database will be used to record, track and respond to complaints efficiently. Information on all complaints received, the means by which they were addressed and whether resolution was reached with or without mediation shall be included in the construction compliance reports.

The WSA Co Environment Manager in consultation with the relevant contractor where required, will apply an adaptive approach to ensure that corrective actions are applied in consultation with the appropriate construction staff to allow modifications and improvements in the management of any environmental issues resulting in community complaints.

11.2 Community and stakeholder communication

Construction of the Stage 1 Development will involve a number of interactions with local residents, local councils and NSW Government agencies, among others. To ensure a consistent approach with regards to community and stakeholder management, WSA Co have developed a Community and Stakeholder Engagement Plan to address broader stakeholder engagement objectives during construction and to coordinate engagement activities for all environmental management issues during construction. For further detail with regards to community and stakeholder engagement, refer to Section 7.3 of the SEMF.

12 Environmental incidents, non-conformance and improvement opportunities

The management and reporting requirements of environmental non-conformances and improvement opportunities will be in accordance with Section 8 of the SEMF. The management and reporting of environmental incidents shall be undertaken by the appropriate person as detailed in Section 6 of the SEMF.

It should be noted that the management and reporting requirements associated with major accidents and emergency situations (for example a major chemical or hydrocarbon spill, fuel storage tank failure, surface fires, sediment basin failure) should be undertaken in accordance with the WSA Co Emergency Preparedness and Response Procedure.

13 Review and improvement

13.1 Continuous improvement

Continuous improvement of this plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement. This process is detailed further in the SEMF.

The continuous improvement process is designed to:

- Identify areas of opportunity for improvement of environmental management and performance;
- Determine the cause or causes of non-conformances and deficiencies;
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies;
- Verify the effectiveness of the corrective and preventative actions;
- Document any changes in procedures resulting from process improvement; and
- Make comparisons with objectives and targets.

13.2 Change management

Further refinements to the Stage 1 Development may result from detailed design refinement or changes identified during the construction phase of the works. Any design changes or changes in scope of works will be communicated to the WSA Co Environmental Manager.

WSA Co would be responsible for assessing any potential inconsistencies with the Airport Plan and formally seeking approval from the Infrastructure Minister for any project modifications as required, prior to commencement of the scope of works in question.

13.3 Variation of approved Plans

WSA Co will seek approval for variation of an Approved Plan from the Infrastructure Minister or an SES Officer (SES employee under the *Public Service Act 1999*) in the Infrastructure Department by submitting a version of the plan with the proposed variation clearly marked. All variations to an Approved Plan must be approved in accordance with Condition 41 of the Airport Plan. As each package of work is developed the SEMF and associated CEMPs documents will be reviewed and where applicable updated to ensure the environmental aspects of the work package are managed. Where necessary the document will be updated and submitted for approval in accordance with the Airport Plan prior to the work commencing. A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure, including update of the publicly available copy of the document on the Project website.

The Infrastructure Minister or an SES Officer in the Infrastructure Department may vary an Approved Plan or request WSA Co prepare and seek approval for a specified variation if the Infrastructure Minister or an SES Officer in the Infrastructure Department believes on reasonable grounds that:

- A Condition of Approval has been contravened and the nature of the contravention is relevant to the subject matter of the Approved Plan;
- The variation will address the contravention; and
- WSA Co will comply with any such request within three months.

13.4 Review of approved plans

WSA Co will review each approved plan at least every five years (from the date of approval) as required by the Airport Plan. A review will also be completed annually to ensure that it continues to meet the approval criteria. Details of the review will be included in the annual report (refer to Section 8.3 of the SEMF). If the review identifies areas where the plan does not continue to meet the approval criteria for that plan, a variation to the approved plan will be prepared and submitted for approval.

WSA Co may initiate reviews of Approved Plans at other times in response to improvement opportunities, non-conformances changes to scope of work or construction methodology; or alterations to legal or contractual requirements.

Any changes identified and implemented through the variation and review process identified above will be communicated to Relevant Contractors through re-issue of the revised WSA Co Approved Plan and subsequent training and awareness (refer to Section 5 of the SEMF).

14 References

Department of Infrastructure and Transport (2013). *A Study of Wilton and RAAF Base Richmond for Civil Aviation Operations,* http://westernsydneyairport.gov.au/scopingstudy/index.aspx

Commonwealth Department of Infrastructure and Regional Development, 2016. *Airport Plan* (*December 2016)*

Commonwealth Department of Infrastructure and Regional Development, 2016. *Western Sydney Airport Environmental Impact Statement, 2016*

GHD (2016a*), Preliminary (Phase 1) Contaminated Assessment Report, Proposed Western Sydney Airport*, ref. 2124265.208989, February 2016

GHD (2016b), *Detailed Site Contaminated Investigation, Proposed Western Sydney Airport*, ref. 2124265.212332, February 2016GHD (2016c), *Western Sydney Airport Remediation Action Plan*, ref. 2126850, February 2016.

NSW Government, 2004. *Managing Urban Stormwater: Soils and Construction Volume 1* (Blue Book).

Standards Australia 2001. *Australian and New Zealand environmental management international standard* (AS/NZS ISO 14001)

Appendix A

WSA Co Soil and Water CEMP Consultation

A1 Stakeholder consultation – Commonwealth Department of the Environment and Energy

Table A1 Commonwealth Department of the Environment and Energy CEMP consultation summary

Input	Response / where addressed
Consultation prior to Rev 0 approval	
A response to an invite for comment on the Soil and Water CEMP was received from the Commonwealth Department of Environment and Energy (Environment Department) on 27 July 2018 via email correspondence. The relevant comments were addressed and considered in the preparation of the CEMP. Details with regards to how the Environment Department comments were addressed are provided below. A letter acknowledging receipt of the review comments from Environment Department and how the comments (if applicable) were addressed was prepared and issued from WSA Co to Environment Department in September 2018.	
Environment Department expressed appreciation for the opportunity to provide input into the development of the CEMPs.	Noted
Environment Department were broadly comfortable with the proposed content of the CEMP and reiterate the need to ensure consistency with requirements of relevant conditions of the Airport Plan, particularly those related to protection and management of matters protected under the EPBC Act 1999 and the management of PFOS and PFAS.	Relevant conditions of the Airport Plan (and other requirements under the EIS) are addressed in Section 4 of the CEMP. Specifically, PFOS / PFAS management and monitoring have been addressed in various sections throughout the CEMP including the following: • Section 4 – Legal and other requirements • Section 5 – Existing environment • Section 6 – Environmental risk assessment • Section 7 – Environmental control measures • Section 9 – Environmental inspection, monitoring and auditing • Appendix E - Soil and Water Monitoring and Inspection Procedure
Consultation prior to Rev 1 approval	
A request to provide comments on the CEMPs (Revision 0) was submitted to the Commonwealth Department of Environment and Energy (DoEE) on 30th October 2018. The request included an outline of the Visitor Centre and Site Accommodation phase and Material Importation phase. No response to the invitation for comment on the Soil and Water CEMP was received from DoEE as noted below.	
No comments received from DoEE regarding the update of this Soil and Water CEMP.	Ongoing consultation to be undertaken in accordance with Section 1.5 of the Soil and Water CEMP and the Community and Stakeholder Engagement Plan.

A2 Stakeholder consultation – NSW Department of Industry, Lands and Water

Table A2 NSW Department of Industry, Lands and Water CEMP consultation summary

Input	Response / where addressed
Consultation prior to Rev 0 approval	
A response to an invite for comment on the Soil and Water CEMP was received from NSW Department of Industry, Lands and Water (NSW DPILW) on 2 August 2018. The relevant comments were addressed and considered in the preparation of the CEMP. Details with regards to how the NSW DPILW comments were addressed are provided below. A letter acknowledging receipt of the review comments from NSW DPILW and how the comments (if applicable) were addressed was prepared and issued from WSA Co in September.	
The DPILW reviewed the provided brief and understands the CEMP will be prepared with considerations outlined in the provided brief. The DPILW has no recommendations at this stage and advises that it will undertake a full assessment of the draft CEMP once that has been submitted	Noted. The approved CEMP will be provided to DPI and any further comments addressed in subsequent iterations of the plan
Consultation prior to Rev 1 approval	
A request to provide comments on the CEMPs (Revision 0) was submitted to the NSW Department of Premier and Cabinet (DPC) on 30th October 2018. The request included an outline of the Visitor Centre and Site Accommodation phase and Material Importation phase. No response to the invitation for comment on the Soil and Water CEMP was received from DPILW as noted below.	
No comments received from DPILW regarding the update of this Soil and Water CEMP.	Ongoing consultation to be undertaken in accordance with Section 1.5 of the Soil and Water CEMP and the Community and Stakeholder Engagement Plan.

A3 Stakeholder consultation – NSW Environment Protection Authority

Table A3 NSW Environment Protection Authority CEMP consultation summary

Input	Response / where addressed
Consultation prior to Rev 0 approval	
A response to an invite for comment on the Soil and Water CEMP was received from NSW Environment Protection Authority (NSW EPA) on 26 July 2018. The relevant comments were addressed and considered in the preparation of the CEMP. Details with regards to how the NSW EPA comments were addressed are provided below. A letter acknowledging receipt of the review comments from NSW EPA and how the comments (if applicable) were addressed was prepared and issued from WSA Co to NSW EPA in September.	
The EPA notes the consultation requirements relating to the preparation of a CEMP, however does not approve or endorse these documents. The EPA's role is to set environmental objectives for environmental management, rather than being directly involved in the development of strategies and management plans to achieve those objectives.	Noted
The EPA provided advice in 2016 regarding environmental objectives during the exhibition of the Environmental Impact Statement.	All CEMP documentation includes measures that will be implemented to manage and mitigate identified impacts assessed during the Environmental Impact Statement.

Input	Response / where addressed
As a general recommendation, the CEMP should outline the measures that will be implemented to manage and mitigate all impacts assessed during the Environmental Impact Statement. All proposed mitigation and management measures in the CEMP should implement best practice to a level that is feasible and reasonable and clearly demonstrate how the proponent will meet the designated environmental objectives.	Risk assessment approach has been adopted for the implementation of the CEMP documentation, with linked reference to applicable mitigation measures and controls as required under the Airport Plan (and EIS) in addition to known implementation of a 'best-practice' approach.
Consultation prior to Rev 1 approval	
A request to provide comments on the CEMPs (Revision 0) was submitted to the NSW Department of Premier and Cabinet (DPC) on 30th October 2018. The request included an outline of the Visitor Centre and Site Accommodation phase and Material Importation phase. A response to the invitation for comment on the Soil and Water CEMP was received from NSW EPA and is summarised below. A letter acknowledging receipt of the review comments from NSW EPA and how the comments (if applicable) were addressed was prepared and issued from WSA Co to NSW EPA in December 2018.	
The NSW Government provided a detailed submission on the Western Sydney Airport (WSA) EIS that included advice on the environmental aspects of the proposal. The EPA also provided a response to a request from WSA for comments on monitoring locations in the CEMPs and on the illegal dumping strategy, dated 13 September 2018. This information should be considered for the VSA.	Noted.

A4 Stakeholder consultation – Liverpool City Council

Table A4 Liverpool City Council consultation summary

Input	Response / where addressed
Consultation prior to Rev 0 approval	
A response to an invite for comment on the Soil and Water CEMP was received from Liverpool City Council on 27 July 2018 which did not contain any specific comments relating to the preparation of the Soil and Water CEMP. This is reflected below. A letter acknowledging receipt of the review comments from Liverpool City Council for the overall CEMP documentation and how the comments (if applicable) were addressed was prepared and issued from WSA Co to Liverpool City Council on 21 September, 2018.	
No comments related to soil and water were provided.	Ongoing consultation to be undertaken in accordance with Section 1.5 of the Soil and Water CEMP.
Consultation prior to Rev 1 approval	
A request to provide comments on the CEMPs (Revision 0) was submitted to Liverpool City Council including an outline of the Visitor Centre and Site Accommodation phase and Material Importation phase. A response was received from Liverpool City Council via email, with no issues related to this Soil and Water CEMP (all comments received were relating to traffic and access – refer to the Traffic and Access CEMP for further details).	
No comments related to the Soil and Water CEMP were provided.	Ongoing consultation to be undertaken in accordance with Section 1.5 of the Soil and Water CEMP and the Community and Stakeholder Engagement Plan.

A5 Stakeholder consultation – Penrith City Council

Table A5 Penrith City Council consultation summary

Input	Response / where addressed
Consultation prior to Rev 0 approval	
A response to an invite for comment on the CEMP documentation was received from Penrith City Council on 24 July 2018 which did not contain any specific comments relating to the preparation of the Soil and Water CEMP. This is reflected below. A letter acknowledging receipt of the review comments from Penrith City Council for the overall CEMP documentation and how the comments were addressed was prepared and issued from WSA Co to Penrith City Council on 21 September, 2018.	
No comments related to soil and water were provided.	Ongoing consultation to be undertaken in accordance with Section 1.5 of the Soil and Water CEMP.
Consultation prior to Rev 1 approval	
A request to provide comments on the CEMPs (Revision 0) was submitted to the NSW Department of Premier and Cabinet (DPC) on 30th October 2018. The request included an outline of the Visitor Centre and Site Accommodation phase and Material Importation phase. There were no responses received from Penrith City Council as noted below.	

No comments related to the Soil and Water CEMP were provided.	Ongoing consultation to be undertaken in accordance with Section 1.5 of the Soil and Water CEMP and the Community and Stakeholder Engagement Plan.

A6 Airport Environment Officer - consultation

Table A6 Airport Environment Officer Soil and Water CEMP consultation summary

Input	Response / where addressed
Consultation prior to Rev 0 approval	
During the development of the CEMP, WSA Co has undertaken consultation with the Airport Environment Officer (AEO). With regards to the Soil and Water CEMP, consultation has been particularly focused on the water quality monitoring requirements and the applicable water quality criteria. A meeting was held between the WSA Co Environment Manager and the AEO on Thursday 6 September 2018. The key discussion points regarding the CEMP and how they have been addressed are included Table A6.	
Additional physical parameters are to be included in the CEMP for sediment basin discharge, including dissolved oxygen (DO) and salinity.	Noted. Section 9.3 of the CEMP has been updated accordingly.
A requirement is to be included in the CEMP to ensure that regular reviews are undertaken of the discharge criteria and quality of the down-gradient receiving waters to ensure that the implemented criteria remains applicable and where possible, explores options for continual improvement.	Noted. Section 9.3 of the CEMP has been updated accordingly.
The Australian and New Zealand Environment Conservation Council (ANZECC) water quality criteria is to be included in the criteria table to allow comparison where applicable in the monthly reports.	Noted. As noted in Section 9.3.3.3 o the Soil and Water CEMP, the WSA Co monthly report will include a comparison of the receiving water quality against the criteria provided in Table 22. Any exceedance will be discussed further in the report with regards to consideration of upstream and downstream water quality and the likely source of any exceedances and also comparison against ANZECC criteria (where AERP criteria has been adopted).
Consultation prior to Rev 1 approval	
Regular / routine consultation undertaken with Airport Environment Officer with all matters regarding environmental management.	Ongoing

Table A7 Office of Environment and Heritage consultation summary

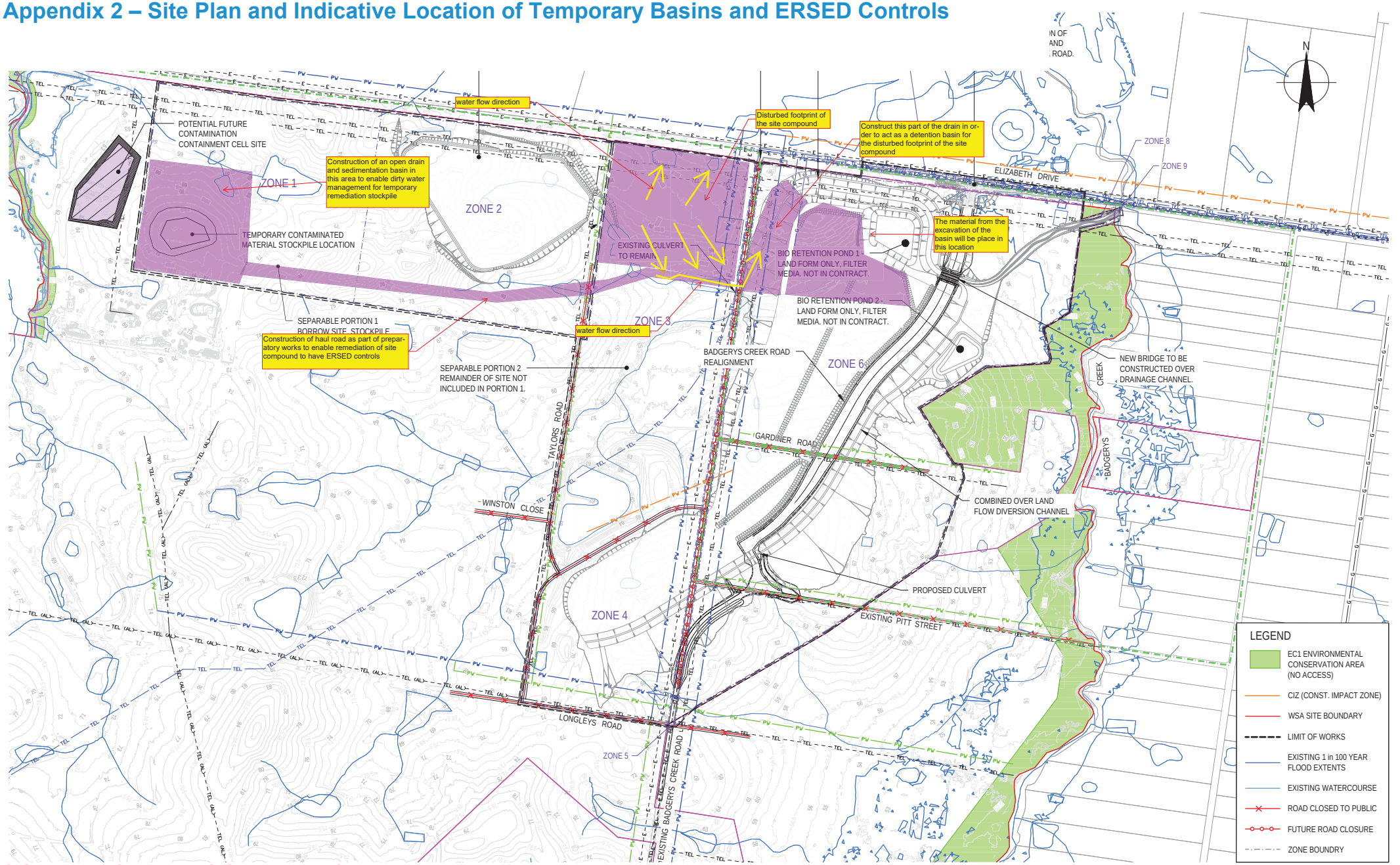
Input	Response / where addressed
Consultation prior to Rev 0 approval	
A response to an invite for comment on the relevant WSA Co CEMPs was received from NSW Office of Environment and Heritage (NSW OEH) on 26 July 2018. There were no specific comments provided in relation to the preparation of this Soil and Water CEMP as reflected below. A letter acknowledging receipt of their overall CEMP review comments from NSW OEH and how the comments were addressed was prepared and issued from WSA Co to NSW OEH in September 2018.	
No comments related to the Soil and Water CEMP were provided.	Ongoing consultation to be undertaken in accordance with Section 1.5 of the Soil and Water CEMP and the Community and Stakeholder Engagement Plan.

Input	Response / where addressed
Consultation prior to Rev 1 approval	
A request to provide comments on the CEMPs (Revision 0) was submitted to the NSW Department of Premier and Cabinet (DPC) on 30th October 2018. The request included an outline of the Visitor Centre and Site Accommodation phase and Material Importation phase. A response to the invitation for comment on the Soil and Water CEMP was received from NSW OEH and is summarised below. The relevant comments were addressed and considered in the preparation of this revision of the CEMP. A letter acknowledging receipt of the review comments from NSW OEH and how the comments were addressed was prepared and issued from WSA Co to NSW OEH in December 2018.	
Section 5.2.4 identifies flood mitigation in six dot points *Comments on the flood mitigation dot points:* *Dot point 4 states:* *Actions to mitigate the effects on neighbouring properties of flooding of the site* *Amend to: Actions to mitigate any adverse impact of flooding on neighbouring properties of the site.*	Section 5.2.4 updated accordingly
Dot point 6 states: *Evacuation procedures for compound staff* *Amend to: Emergency Response Plan to manage flood risk for the full range of flooding up to the probable maximum flood, including an evacuation procedure for compound staff.*	Section 5.2.4 updated accordingly
Section 6.3.2 indicates potential use of detention basins to deal with increasing runoff due to construction, which is supported.	Noted
Flood Management Mitigation Measures SW_47 to SW_50 are supported.	Noted.

Appendix B

Example erosion and sediment control plans

Appendix 2 – Site Plan and Indicative Location of Temporary Basins and ERSED Controls



COMMERCIAL IN CONFIDENCE

No	Revision	Drawn	Job Manager	Project Director	Date
0	ISSUED FOR CONSTRUCTION	PB	DB	GW	15.06.18

Note: * indicates signatures on original issue of drawing or last revision of drawing

0 50 100 150 200 250m
SCALE 1:5000 AT ORIGINAL SIZE

WSACo

GHD
Level 6, 20 Smith Street
Parramatta NSW 2150 Australia
T 61 2 8898 8800 F 61 2 8898 8810
E sydmail@ghd.com.au
W www.ghd.com.au

DO NOT SCALE

Drawn	S.PATTESON	Designer	S.PATTESON
Drafting Check	A.FRENCH	Design Check	D.BEACROFT
Approved (Project Director)	G. WOOD		
Date	15.06.2018		
Scale	AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	

Client WSA Co
Project WSA - EARLY EARTHWORKS PACKAGE
Title SITE PLAN

Original Size A1 Drawing No. WSA-GHD-0100-GEN-DRG-0010 Rev: 0

Plot Date: 15 June 2018 - 7:15 PM Plotted by: Allan French Cad File No: G:\21\26850\10_CAD-GIS\10.02_Controlled DRAWINGS\WSA-GHD-0100-GEN-DRG-0010.dwg

Appendix C

Emergency spill response procedure

Emergency Spill Response Procedure

Background

This Emergency Spill Response Procedure (ESRP) has been prepared to identify and manage the risk of pollution incidents and facilitate a coordinated management response to pollution incidents during the construction of the Western Sydney Airport Stage 1 Development (the Project).

Purpose

The primary purpose of the plan is to identify and manage the risk of pollution incidents, plan the project response to pollution incidents and to facilitate coordination with the relevant response agencies.

The objectives of the plan are to:

- minimise and control the risk of a pollution incident at the premises through the early identification of risks and the development of planned actions to minimise and manage those risks; and
- ensure timely communication about pollution incidents by WSA Co Environment Manager to the AEO construction personnel, Infrastructure Department, and relevant response agencies/authorities.

Scope

This ESRP for the Project covers pollution incidents that cause actual or potential material harm to the environment and/or human health.

The specific work activities covered by this ESPR is included in Table 3 of this CEMP and the location of the work area is included in Figure 4. As required under the SEMF (Section 4.4), prior to commencement of works on site, the contractor is required to prepare and implement appropriate environmental management plans including *Environmental Work Method Statement* (EWMS) and *Environmental Control Maps* (ECMs) which include as a minimum the following details:

- the project office (which will be the Incident Control Centre with regards to the implementation of this ESPR);
- the location of potential pollutant storage (bunded chemical storage); and
- emergency access routes.

Legislation

Key environmental legislation relating to pollution incident response management includes:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- *Protection of the Environment Operations Act 1997* (POEO Act);
- *Protection of the Environment Operations (General) Regulation 2009*; and
- *Protection of the Environment Operations (General) Amendment (Pollution Incident Response Management Plans) Regulation 2012*.

The WSA Co approach is to carry out construction activities in a planned and controlled manner, taking into account potential environmental risks, to prevent pollution incidents from occurring on the project. This is achieved through the use of preventive measures including:

- Construction planning including environmental risk assessments,
- Implementation and maintenance of identified control measures,
- Compliance with legislative and regulatory requirements,
- Implementation of, and compliance with, requirements of the project CEMP and associated sub-plans; and
- Implementation and compliance with the requirements of this plan.

Control Measures

Pre-emptive control measures rest with thorough planning of construction activities and the involvement of key personnel in that planning process. The project SEMF requires that and Environmental Control Map is developed for all activities/location and an Environmental Work Method Statement prepared for all activities that carry an inherent level of environmental risk or community interest. All method statements will be prepared to identify risks, ensure sound environmental practices are implemented, and to minimise the risk of environmental incidents or system failures. They will specify actions to be undertaken to ensure compliance with the project approval and CEMP and will draw on the mitigation measures detailed in the specific sub plans detailed in appendices of the CEMP.

Preparedness

It is considered that the key to effective incident prevention on site is via ongoing monitoring, surveillance and training. During the course of construction, the following preventative strategies will be implemented onsite:

- daily inspections of active work sites;
- completion of Environmental Inspection Checklist;
- issue and quick close-out of non-compliance notices (as required);
- prompt maintenance and repairs;
- ongoing environmental training;
- environmental audits of worksites, sub-contractors and general compliance; and
- environmental and safety information on hazardous substances (e.g. SDS) will be available at the main site office and where such substances are to be stored.

Testing of environmental response procedures will be conducted annually to confirm appropriateness of management measures. Additional testing will be carried out in areas where a pollution risk is present, such as in workshops and work areas in close proximity to water courses. Personnel involved in emergency response activities will be provided with specific training.

An up-to-date list of emergency response personnel and relevant organisations (emergency services, Department of the Environment and Energy, NSW EPA, etc) will be maintained at the main office and site compounds.

Spill kits are located in compound areas, site vehicles and on the Project at the location of high-risk activities. Spill kits will be monitored as part of weekly inspections and will be replenished as required. These kits are designed for immediate containment and management of pollution incidents and, as a minimum, are stocked with the following material;

- Absorbent mats;
- Absorbent floor sweep material;
- Floating booms to control spills in water; and
- Disposal bags.

Incident Procedure

1. Immediate Response

Personnel in the vicinity must stop works. Consider any safety hazards created by the incident and if safe to do so, apply immediate controls to attempt to minimize further harm to the environment. This could include use of spill kit material.

2. Immediate Notification

Personnel onsite to immediately contact their supervisor who then will notify the WSA Co Environmental Manager and WSA Co Construction Manager.

3. Classify Incident

Using the classifications listed above, the WSA Co Environmental Manager will assess the incident to determine if it has or is threatening to cause material environmental harm.

4. Notify Incident

The WSA Co Environment Manager will notify relevant stakeholders if the incident causes or threatens to cause material harm to the environment immediately to the following as appropriate:

- Commonwealth Department of the Environment and Energy and Commonwealth Department of Infrastructure, Regional Development and Cities;
- Airport Environment Officer
- Other government agencies that may include:
- NSW EPA;
- Ministry of Health (via the Public Health Unit)
- Work Cover Authority and Comcare;
- Local Authority (i.e. council) if the EPA is not the appropriate authority; and
- Fire and Rescue NSW

5. Clean-up Incident

Ensure all components of the incident have been addressed and corrective actions implemented

6. Report Incident

The WSA Co Environmental Manager must report the incident through the internal systems, requiring an incident report form to be completed with a copy provided to the WSA Co Construction Manager and any relevant Contractors.

7. Investigate Incident

The WSA Co Environmental Manager shall undertake an incident investigation assisted by the WSA Co Construction Manager and relevant Contractors.

Environmental Incident / Emergency Response Protocol

Step	Action	Responsibility
1	Incident Occurs – Contractor personnel to contact the relevant Foreman / Supervisor (or similar) immediately and advise	All
2	STOP WORKS in the vicinity of the incident	Contractor (Foreman or similar)
3a	If the incident is of a routine nature such as a minor spill, follow spill response procedure detailed below and advise the WSA Co Environmental Manager OR	Contractor (Foreman or similar)
3b	If the incident is significant (e.g. over clearing, large spills, waterway impact, Flora/fauna impact, heritage impact etc.) contact the WSA Co Environmental Manager and WSA Co Construction Manager immediately and advise	Contractor (Foreman or similar)
4	If safe to do so, implement measures to contain incident or prevent any / further environmental harm	All Contractor (Foreman or similar)
6	Notify regulatory agencies if legally required.	WSA Co Environment Manager
7	Implement further containment or protection strategies as directed by the WSA Co Environment Manager (assisted by the SA Co Construction Manager)	All Contractor
8	Environmental incident response procedure to be implemented as per Section 6 of the SEMF	WSA Co Environment Manager
9	The Contractor is to implement any additional measures if directed by WSA Co or government stakeholders / authorities	Contractor
10	Undertake incident investigation and reporting as per process detailed in the Section 6 of the SEMF	WSA Co Environment Manager WSA Co Construction Manager
11	Toolbox relevant personnel on incident to ensure similar incidents are prevented in future	WSA Co Construction Manager Contractor
12	Update CEMP, EWMSs or relevant procedures if required to reflect lessons learnt and a process of continual improvement	WSA Co Environment Manager

Protocol for Minor Spills

Step	Action	Responsibilities	Comments
1	Make safe and stop further pollution	Person causing / finding leak	If leak from oil drum roll drum so that leak area is uppermost. If leak from pipe close valve.
2	Inform Superintendent / Supervisor	Person causing / finding leak	Stop human and vehicular traffic and isolate area.
3	Determine the source of the leak or issue	Supervisor	For major leaks inform Superintendent. If spill has escaped offsite / into waterway contact Environmental Manager immediately.
4	Form barrier around leak / spill to contain leak / spill	Foreman / Superintendent	Use foam barrier material in kit. Use soil / sand if kit not available.
5	Stop the spreading of the leak / spill	Foreman / Superintendent	Transfer fuel / oil from leaking drum into another drum etc.
6	Put barriers around drains / outlets	Foreman / Superintendent	Seal drain grates by putting sand bags etc. around them.
7	Obtain hydrocarbon spill kit and apply absorbent on spill	Foreman / Superintendent	Use 'absorbent' or equivalent.
8	Clean up / remove absorbent material to appropriate bin	Foreman / Superintendent	Use 'Chem-Oil-A-Way' or equivalent for clean-up of area. Use brush / pan provided in kit.
9	Clean up soft surface by excavating contaminated soil	Foreman / Superintendent	Stockpile contaminated material in designated area.
10	Appropriately remove and dispose contaminated material from site	Foreman / Superintendent	Ensure transported and waste facility are appropriately licenced and material tracked.
11	Inform Environmental Manager and complete incident form	Foreman / Superintendent	Record incident and investigate.
12	Report incidents as per incident reporting procedure	Environmental Manager	Ensure appropriate reporting procedures are followed.

Incident Notification

The Contractor Environmental Manager (or equivalent) will notify the WSA Co Environment Manager who will notify the relevant stakeholders/authorities including the AEO. The following organisations maybe notified if the incident 'causes or threatens to cause material harm to the environment':

- Commonwealth Department of the Environment and Energy and Commonwealth Department of Infrastructure Regional Development and Cities;
- NSW EPA;
- Ministry of Health (via the Public Health Unit)
- Work Cover Authority and Comcare;
- Local Authority (i.e. council) if the EPA is not the appropriate authority; and
- Fire and Rescue NSW

The information that will be reported is:

- time, date, location and likely duration of incident;

- location of place where incident is occurring or likely to occur;
- type of incident (e.g. chemical spill, water pollution etc.);
- extent of incident (e.g. magnitude of spill, area covered etc.); and
- action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution.

Notifications to authorities must be verbal communication (i.e. – via telephone call.)

Incident Notification Details

Position	Responsibility	Contact	Contact Details
Contractor Environmental Manager	24hr availability for activating Emergency Spill Response Procedure (ESRP). Notifying WSA Co. Environment Manager	TBA	TBA
Contractor Community Relations Manager	Notifying community, key stakeholders, coordinating media communications.	TBA	TBA
Contractor Project Director	Notifying WSA Co. and JV partners.	TBA	TBA
Contractor Construction Manager	Notifying Project Director. Managing Incident as per ESRP.	TBA	TBA
Contractor General Superintendent (or – Early Earthworks	Notifying Construction Manager. Notifying Area Manager. Coordinating incident response Liaising with emergency response organisations. Provision of labour, equipment or support to the Environmental Staff and emergency response organisations as requested.	TBA	TBA
WSA Co. Environment Manager	Notify the AEO and Infrastructure Department	TBA	TBA
Agency	**Role**	**Contact**	**Contact Details**
Commonwealth Department of the Environment and Energy	-	-	1800 803 772
NSW EPA	-	-	131 555
Fire and Rescue NSW	-	-	1300 729 579
NSW Health	-	-	9391 9000
Work Cover NSW	-	-	131 050
Liverpool City Council	-	-	1300 362 170

Appendix D

Unexpected contamination find protocol

Unexpected contamination find protocol

Purpose and Scope

This Procedure details the actions to be taken when unexpected contaminated soil/material or water is encountered during construction activities. Other areas of known contamination on the site are to be managed in accordance with the Remediation Action Plan, GHD 2016.

This Procedure is applicable to all activities conducted by construction personnel that have the potential to uncover or encounter contaminated soil/material or water which may be identified due to suspected contaminating odours, visual staining (unusual discolouration) or other foreign material which may indicate the potential for contamination.

Process

Potential contamination encountered during construction

If any potential contaminated soil/material or water is encountered during construction (e.g. strange soil colours or odours), the following must occur:

- STOP ALL WORK in the immediate / affected area and cordon off the surrounding area to prevent any inadvertent access;
- Immediately notify the Environment Manager (EM);
- The EM will take the lead in relation to the management of the find and notify the Safety Manager (SM) accordingly;
- Wash self or other persons if contact is made with contaminated materials; and
- Recommence works in an alternate area where practicable

Potential asbestos encountered during construction

Should potential asbestos be uncovered the following actions must be implemented:

- STOP ALL WORK in the immediate / affected area and cordon off the surrounding area to prevent any inadvertent access;
- Contact the project Occupational Hygienist to investigate the find and provide preliminary identification; and
- If the material is confirmed as asbestos through preliminary identification, the Occupational Hygienist will direct the implementation of specific controls based on the nature and the quantity of the find, this may include:
  - In the case of larger discrete units of bonded asbestos, remove the asbestos and immediately surrounding contaminated material and dispose offsite.
  - In the case of non-bonded asbestos, the material and surrounding soil matrix (to a distance as directed by the Occupational Hygienist) will be removed and disposed offsite.
  - In the case of multiple small asbestos fragments, the material may be tested (either in situ, or as part of a stockpile of material from the area which has been identified to be potentially contaminated, as directed by the Occupational Hygienist) for waste classification purposes and/or potential re-use onsite.

Personal Protective Equipment

Prior to any contamination investigation / management, appropriate personal protective equipment (PPE) is to be worn as per the relevant Safety Data Sheet(s) (SDS).

This may include, but not be limited to:

- Eye goggles;
- Face mask;

- Rubber boots;
- Rubber gloves; and
- Tyvec Suits.

Undertake a site/area contamination investigation

The EM is to assess the situation. Samples will be collected (where safe to do so) and analysed to determine if contamination is present. Advice from a suitably qualified contamination specialist may be requested based on the level and extent of the contamination in the area of the find.

The AEO (in consultation with specialists) will determine the appropriate management measures to be implemented. This may include treatment with onsite reuse / capping, or offsite disposal.

Works will be completed following the guidance of the Contamination Specialist.

Both options will require laboratory analysis of the contamination and reference against the relevant guidelines (NEPM for onsite management and NSW EPA 2014 and NSW 2016 Addendum.

Offsite disposal will be tracked by the Environmental Team with details recorded in the Waste Register.

The contamination specialist is to provide a validation report following the removal or remediation of the contamination discovered.

Notification and Reporting

The EM is to notify of all contamination immediately via phone (or other) to the Airport Environment Officer (AEO) in the first instance and additionally complete incident reporting in accordance with the SEMF. Any other (i.e. external) notification must be undertaken by the EM in accordance with the SEMF and other applicable legislation. Emergency Services will be contacted in the event of safety concerns in accordance with the Project Safety Management Plan.

Recommence Works

The EM (for all contamination other than asbestos) will advise when works can commence again in that area once it is determined that no further action is required, i.e. the contamination has been removed or a management process has been established. In the case of asbestos contamination, the appointed Occupational Hygienist will provide an Onsite Inspection Clearance Certificate (where asbestos remains but has been 'made safe' so that adjacent works can continue) or An Asbestos Materials Clearance Report (when all asbestos has been removed and has been verified by the Occupational Hygienist) when works may recommence, as described in the *Asbestos Management Plan.*

Documentation

- Contamination Validation Report/ Testing Results;
- Waste Disposal Records (as applicable);
- Onsite Asbestos Clearance Inspection Report;
- Asbestos Materials Inspection Report;
- Asbestos Materials Clearance Report;
- Waste Analysis and Classification Report;
- Analytical Soil Test Report; and
- Analytical Asbestos Report

Appendix E

Soil and Water Monitoring and Inspection

Introduction

As per the EIS soil and water Mitigation measure, SW_01, a Surface Water Management Plan is required to involve a progressive process of design and implementation covering both the construction and operational phases. This Construction Phase Soil and Water Monitoring and Inspection Procedure (CPSWMP) details the methodology for soil and water quality monitoring on the Stage 1 Development.

There are interrelationships with this CPSWMP and the project CEMPs and sub-plans that provide additional information on environmental management relating to soil and water monitoring and inspections. These plans and procedures include:

Soil and Water Construction Environment Management Plan: Overarching methodology describing soil and water risks and management on the project.

Erosion and Sedimentation Control Plans – Appendix B of the Soil and Water CEMP – These plans specify the surface water controls and site methodology to manage erosion and sedimentation on the Project. These plans are updated throughout construction to remain relevant for specific site circumstances.

Emergency Spill Response Procedure – Appendix C of the Soil and Water CEMP. This procedure details how spills on the project are responded too, reported and prevented from reoccurring.

Objectives

The key objectives of the CPSWMP are to ensure that impacts associated with soil and water quality are managed to within permitted criteria as far as practicable and to ensure that best practice controls and procedures are implemented.

To achieve this, the following will be undertaken:

- Ensure appropriate treatment of water prior to off-site discharge or disposal;
- Minimise the risk of pollution incidents from construction;
- Minimise the export of sediment from the airport site; and
- Sample site surface water to detect effectiveness of controls.

Legal and other Requirements

This CPSWMP has been prepared to satisfy the requirements of the Soil and Water CEMP for the Early Earthworks and Visitor Centre and Site Accommodation phase (as detailed in Table 3 of this CEMP) set out in the Conditions for the Stage 1 Development of the Western Sydney Airport (Section 3.10.2 of the Airport Plan). This CPSWMP specifically addresses EIS mitigation measures SW01 – SW10 as listed in the EIS and outlined in Table 1. It should be noted that all required mitigation measures and controls required by the Airport Plan and EIS have been included in Table 1 below, with applicable timing detailed in the last column.

Table 1 EIS Mitigation measures relevant to this procedure

Ref	Topic	Mitigation measure	Where addressed	Timing
SW01	Surface water management plan	As part of the detailed design process for the Stage 1 development, a surface water management system will be developed. Development of a surface water management system for the Airport Site may involve a progressive process of design and implementation covering both the construction and operational phases. This may include the	Appendix B of the Soil and Water CEMP (Erosion and Sedimentation Control Plans).	preconstruction / construction

Ref	Topic	Mitigation measure	Where addressed	Timing
		implementation of temporary system elements specifically for the construction phase. The system will include:		
SW02		A detailed design of basins and channels to capture the majority of runoff, including during construction;	Appendix B of the Soil and Water CEMP (Erosion and Sedimentation Control Plans).	preconstruction / construction
SW03		Refined drainage system design performance standards to optimise capacity and release timing, mimicking natural flows as far as practicable;	N/A	Stage 1 planning/ construction
SW04		Separate bio-retention basins to provide additional treatment for low flows and separation of these features from the drainage system to protect contained water during flood events;	N/A	Stage 1 planning/ construction
SW05		Pollutant traps to prevent debris and other coarse material entering the drainage system;	Example provided in Appendix B of the Soil and Water CEMP (Erosion and Sedimentation Control Plans).	preconstruction / construction
SW06		Stabilisation structures at outlets to include rock check dams at regular intervals along channels and energy dissipaters at basin outlets;	Appendix C of the SWCEMP (Erosion and Sedimentation Control Plans).	preconstruction / construction
SW07		Capacity for containment of accidental leaks or spills in the drainage system at maintenance areas, fuel farms or other areas where fuels or chemicals are stored or handled in accordance with Australian standards;	N/A	Stage 1 planning/ construction
SW08		Measures to address impacts on downstream and upstream uses, including sensitive environmental values;	Appendix C of the SWCEMP outlines controls to be implemented including progressive stabilisation	construction
SW09		Volumes and sources of construction water; and	This CPSWPMP, section 5.1.	construction
SW10		Processes for treatment and discharge of any water from site and associated monitoring,	This CPSWPMP, section 5.	construction

Ref	Topic	Mitigation measure	Where addressed	Timing
		reporting and regulatory approval requirements		

Potential Construction Impacts

Construction activities that may affect water quality include:

- Removal of vegetation adjacent to waterways and ephemeral drainage lines;
- Clearing of vegetation;
- Concreting works;
- Exposure and mobilisation of exposed soils during construction such as from cleared areas and stockpiles;
- Fuel, chemicals, oils, grease and petroleum hydrocarbon spills from construction machinery directly polluting waterways and soils;
- Earthworks and associated inadequate management of runoff, improper sediment controls from the construction site;
- Excavation and exposure of Acid Sulphate Soils (ASS) to the air (oxidising conditions) resulting in potential for acidic runoff to receiving waterways; and
- Exposure of per- and polyfluoroalkyl substances (PFAS) resulting in mobilisation to waterways.

Potential construction related water quality impacts could include:

- Degraded water quality including lower Dissolved Oxygen (DO) levels, increased nutrients (Nitrogen, Phosphorous), increased turbidity, and altered pH;
- Increased sedimentation smothering aquatic life and affecting aquatic ecosystems;
- Increased levels of nutrients, metals and other pollutants, transported via sediment and runoff to receiving waterways;
- Spills of concrete during concrete pours directly or indirectly polluting receiving waterways;
- Contamination from site compounds, chemical storage areas and wash-down locations;
- Increased levels of litter from construction activities polluting receiving waterways;
- Contamination of receiving waterways as a result of disturbance of contaminated land;
- Acid runoff from disturbance of acid sulfate soil during construction;
- Tannin leachate from cleared/mulched vegetation;
- Scour around pipe outlets; and
- Increase in creek bank instability due to removal of vegetation or excavation.

Surface Water and Sediment Basin Water Sampling Methodology

Sampling locations

Surface water sampling sites have been determined to monitor potential impacts from construction activities based on presence of water ways, ephemeral drainage lines and nearby construction works to be undertaken. These locations, where they remain accessible throughout construction will be sampled and analysed for water quality parameters on a monthly basis. Where potential impact from construction activities may occur following a storm event (i.e. >20mm), water sampling will be undertaken for comparison against baseline data. The drainage lines shown in Figure 1 have been adapted from EIS Figure 18-2. As these drainage lines are ephemeral in nature, surface water sampling locations will be focused on waterways downstream of site at SP2 and SP3.

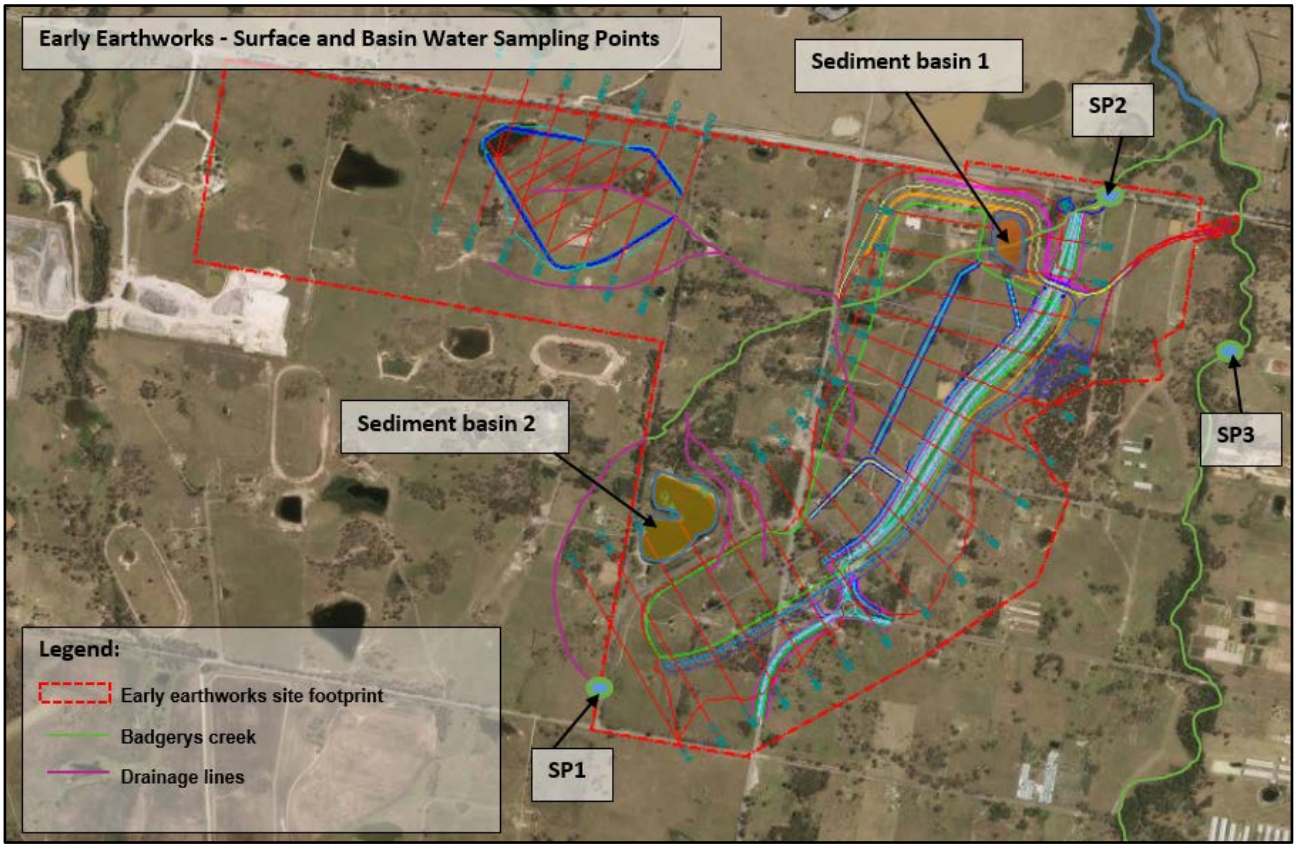


Figure 1 Site footprint with ephemeral waterways

Sampling frequency

Surface and Sediment Basin water parameters will be recorded on the Water Quality Monitoring Record Form (Figure 4-3) and entered into the Water Quality Monitoring register. Monitoring will be undertaken routinely as described in Table 4-2 and in response to construction activities or incidents. In the event that sampling cannot be undertaken safely at any given waterway reference to this will be made in the Water Quality Monitoring Register.

Table 2 Environmental Surface water and Sediment Basin Sampling and Inspection Frequency

Action	Scope	Timing	Responsibility
Surface water sampling of SP1-3	As per surface water criteria in Section 9 of this CEMP.	Monthly	Contractors Environmental Manager
Surface water sampling of SP1-3	As per surface water criteria in Section 9 of this CEMP.	During, or as soon as feasible after >20mm rain	Contractors Environmental Manager

Action	Scope	Timing	Responsibility
		event (within a 24 hour period).	
Water sampling of SB1-2	As per discharge water criteria in Section 9 of the CEMP.	Before authorised discharge	Contractors Environmental Manager

Wet Weather and Additional Monitoring

Monitoring would be undertaken for wet weather events in excess of 20 mm (within a 24 hour period) as described in Table 2. Additional water quality monitoring may be undertaken during high risk construction activities, such as installation or removal of temporary waterway crossings or in response to an incident, enquiry or complaint.

In the case of wet weather or additional monitoring, where there is a variance greater than 20% between upstream and downstream further analysis and/or investigation will be performed to determine if the changes in water quality relate to construction activities. Monitoring parameters and subsequent trigger levels for incident response monitoring may differ depending on the incident type, and guidance will be obtained from an appropriately qualified independent industry professional.

Reporting

All surface water and groundwater sampling will be recorded on the Water Quality Monitoring Record Form (Figure 3). A summary of the water quality monitoring results will be reported within the Project's Monthly Environment Reports, and the quarterly compliance reports.

Date	Site ID	Total Suspended Solids (TSS)	pH (6.5-8.5)	Oil and Grease (Visual)	Discharge Permit Number	Comments
DATE		0.0	0.00			
Date		0.0	0.00			
DATE		0.0	0.00			
Date		0.0	0.00			
DATE		0.0	0.00			
Date		0.0	0.00			
DATE		0.0	0.00			
DATE		0.0	0.00			
Date		0.0	0.00			
DATE		0.0	0.00			
Date		0.0	0.00			

Figure 3 Example of Surface Water Quality Register

Sediment Basin Water Discharge Procedure

Purpose

Successful water management is critical to demonstrating our capacity to manage environmental impacts and our overall commitment to the environment. Poor management of water can cause pollution of land and waterways and may result in project penalties, reputational damage and even prosecution.

In the first instance sediment basin water will be reused for site purposes such as dust suppression of haul roads, excavations, stockpiling and construction purposes such as compaction. As per the sediment basins in Figure 1, the approximate volume of sediment Basin 1 is 6000 m^3, sediment basin 2 is approximately 9000m3. The discharge volumes are determined by rainfall, however a significant amount of water collected onsite will be reused as above.

This procedure has been prepared to ensure all water discharged from site meets acceptable water quality standards, and shall be tool-boxed to all site personnel involved in dewatering activities.

Testing

Calibrate Monitoring Equipment

Accountability: Environmental Coordinator / Officer

Calibrate all monitoring equipment prior to first usage and in accordance with the manufacturer's specifications.

Pre-calibration results should be taken and recorded as part of the equipment calibration. Include date and time of calibration, equipment calibrated and the serial number of equipment calibrated.

Obtain calibration solutions from an appropriate supplier and store them in accordance with manufacturer's specifications.

A test following calibration should be carried out in the calibration solution following the calibration. This should also be recorded.

Retain calibration records onsite in accordance with project requirements.

Determine Water Quality

Test the quality of the water to be discharged to determine if treatment is required before it is removed from the site.

Assess water quality against Project Requirements

- Total Suspended Solids: ≤23.2 mg/L
- pH: 6.5 – 9.0
- Oil and Grease: no visible trace

External Testing (PFAS / PFOA)

Testing for PFAS/PFOA presence in sediment basins is to occur once a month to determine any potential increases in contaminated runoff from the site into the sediment basins. If after 6 months of testing PFAS/PFOA is not present, testing will cease.

If testing is to be undertaken by an external party, create the Deliverable: Chain of Custody Form using Tool: Chain of Custody Form template. Ensure that this form is attached to the sample when forwarding to the external party for testing. PFAS/PFOA testing will be undertaken by a NATA accredited lab by an independent consultant.

PFAS Criteria:

Aquatic ecosystems: freshwater and marine water guideline values (NEMP, 2018)

Exposure scenario	PFOS	PFOA	Exposure scenario	Comments and source
Freshwater	0.00023 µg/L	19 µg/L	99% species protection – high conservation value systems	Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft default guideline values. Note 1: The 99% species protection level for PFOS is close to the level of detection. Agencies may wish to apply a 'detect' threshold in such circumstances rather than a quantified measurement. Note 2: The draft guidelines do not account for effects which result from the biomagnification of toxicants in air-breathing animals or in animals which prey on aquatic organisms. Note 3: The WQG advise that the 99% level of protection be used for ...slightly to moderately disturbed systems'. This approach is generally adopted for chemicals that bioaccumulate and biomagnify in wildlife.
	0.13 µg/L	220 µg/L	95% species protection – slightly to moderately disturbed systems	
	2 µg/L	632 µg/L	90% species protection – highly disturbed systems	
	31 µg/L	1824 µg/L	80% species protection – highly disturbed systems	
Interim marine	0.00023 µg/L	19 µg/L	99% species protection – high conservation value systems	As above Freshwater values are to be used on an interim basis until final marine guideline values can be set using the nationally-agreed process under the Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Note 1: The WQG advise that in the case of estuaries, the most stringent of freshwater and marine criteria apply, taking account of any available salinity correction.
	0.13 µg/L	220 µg/L	95% species protection – slightly to moderately disturbed systems	
	2 µg/L	632 µg/L	90% species protection – highly disturbed systems	
	31 µg/L	1824 µg/L	80% species protection – highly disturbed systems	

Water Treatment

Treat water based upon testing outcomes:

1. Test water with appropriately calibrated pH meter.
2. No action if pH reading between 6.5 and 9.
3. Lime to be added if pH below 6.5.
4. Hydrochloric Acid (32% Muriatic) or Sulfuric Acid to be added if pH above 8.5.
5. Determine volume of water in basin or excavation.
6. Bucket Test. Determine percentage of lime or acid required by taking a 10 litre sample of basin or excavation water and adding a known amount of lime or acid (initially 0.004%). If the pH is still not acceptable, vary the amount of lime or acid until within the limits.
7. Once the required percentage has been determined, calculate the actual amount of lime or acid to be added by multiplying the volume of water in the basin or excavation by the determined percentage.
8. Add the required amount of lime or acid to the basin.
9. Mix the water in the sediment basin well.
10. Treat for pH prior to Total Suspended Solids.

NB: Refer to SDS for Hydraulic or Sulfuric Acid prior to handling. The following PPE must be worn at all times when handling Hydrochloric or Sulfuric Acid:

- Safety glasses with side shields, chemical goggles or full-face shields;
- Impervious PVC or butyl rubber gloves;

- PVC overalls/jacket/apron and butyl rubber Wellington boots; and
- If handling indoors, approved respirator with replaceable vapour/mist filter.

NB: Refer to SDS for Lime **prior** to handling. The following PPE **must** be worn at all times when handling Lime:

- Safety glasses; and
- If handling indoors, approved P2 face mask.

Turbidity (Suspended Solids)

1. Test basin or excavation water using appropriately calibrated water quality probe.
2. If turbidity (NTU) reading indicates Total Suspended Solids (TSS) ≤23.2mg/l dewatering can commence, if turbidity reading indicates TSS >23.3 water samples to lab for TSS verification is required or the water should treated with a flocculent.

   Note: In the absence of a NTU / TSS correlation, a 1:1 ratio for NTU:TSS is adopted as conservative relationship.
3. If basin or excavation require flocculation (e.g. T.S.S. >23.2mg/l), gypsum is to be immediately applied evenly across the top of the water at a rate of 30kg per 100 cubic metres of water. Allow 36 – 48 hours for flocculation to occur.

Methods of application to include:

- Broadcast by shovels recommended dosage is 30kg – 50kg/100 cubic meters. Spreading powder evenly and thinly (i.e. “dusting”) is recommend. Refer to table at the back of this document for base line gypsum application rates/basin capacity;
- Mixing in a drum with water and pumping through a hose on large basins or excavations (i.e. >200m3);
- When spraying flocculants the mixture must hit the water at between 10 to 20 degrees to increase surface areas exposure to the water column; and
- When using liquid gypsum or Liquid flocculants the solution must be mixed before use to ensure the product is evenly suspended throughout mixture. To be applied as per manufactures instructions.

Basins or excavations should be monitored & recorded daily after flocculation until desired turbidity is achieved and to assist in determination of optimal dosage levels.

NB: Refer to SDS for Gypsum **prior** to handling. The following PPE **must** be worn at all times when handling Gypsum:

- Safety glasses with side shields, chemical goggles; and
- If handling indoors, approved P2 face mask.

Oil and grease

1. Examine surface of water for evidence (e.g. sheen, discoloration).
2. No action if no visual contamination.
3. Oil absorbent material to be removed if there is contamination with absorbent materials (e.g. Xtrasorb, floating booms, pads and socks) and/or an oil/water separator. Leave basins to compensate for 24 to 48 hours.

Discharging Water

Identify Discharge Location

Select discharge locations that are stable and are effective in preventing impacts to the receiving waters. On site discharge locations must be selected to avoid the potential for scouring, prevent water from flowing back onto site and avoid sensitive areas.

Energy dissipation must be provided at all dewatering discharge points. This may include the use of surface protection such as concrete aprons, geofabric, shade cloth, gabions or form ply depending on the condition of the receiving environment.

Ensure that the water is tested and a Permit to Pump is approved and issued by the Contractors Environmental Manager prior to discharge to ensure that water quality criteria have been achieved. Retain the approved Permit to Pump and Checklist on site in accordance with project document management requirements.

Confirm the characteristics of the location of the water (e.g. deep excavation or elevated sediment basin) and determine a suitable method for discharge (e.g. pumping, decanting, siphon).

Ensure that any water discharge activities, whether offsite or onsite, are under constant supervision to prevent unacceptable environmental impacts.

Monitor discharge and record observations on the Water Release Approval (Permit to Pump) and keep on file.

Record post treatment results on the Permit to Pump.

Note: (1) An Offsite Discharge Permit must be signed by the Contractors Environmental Manager prior to discharge.

Non-compliance and incidents

If non-compliances arise, ensure that site processes are reviewed and corrective actions implemented to prevent recurrence.

Consult with the Supervisor or Construction Manager, if applicable.

Notify the Environmental Manager immediately if any incidents occur.

WSA Water Release Approval (Permit to Pump) and Checklist

Permit No:	Site:	Location :
Expiry Date:	Approx. Vol. to be released:	Notes:
Date inspected:	Discharge location (circle applicable): • Reused on site: grassed area/ water cart/ landscaping • Off-site: stormwater	

CONTROL MEASURE	YES	NO
Pump intake sited to avoid discharge of silty water		
Outlet sited to avoid scouring or environmental damage at discharge point		
Float or similar device installed to prevent inlet from sinking into mud		
Spill Kit in place		
Pumping equipment checked and operational		
Water Testing Equipment Calibrated		

COMMENTS	

Water Quality Criteria (relevant to site location)	ENTER THE FIELD TEST INFORMATION HERE
pH: **6.5 to 9** Total Suspended Solids **23.2 mg/L** Oil/Grease: **No visible oil or grease.** Other:	DATE: pH: TIME: Turbidity: METER: Visible Oil:

SAMPLED BY:	DISCHARGE DATE:	DISCHARGED BY:	TIME OF DISCHARGE:

Flocculent added? YES/NO Type: Dose: Kg/L	SUPERVISORS NOTES Check Every .....mins. Pump Is Running OK: YES/NO Suction Hose is Clear of Silt: YES/NO Discharge into correct location? YES/NO No discolouration/oil film from discharge? YES/NO Other:
pH regulator added? YES/NO Type: Dose: Kg/L	
Comments:	
Approved by:	Discharged by:

Figure 4 Example Permit to Pump

Appendix F

AEPR acceptable limits for water and soil

Schedule 2—Water pollution—accepted limits

(subregulation 2.02(3) and paragraph 4.02(a))

1.01 Interpretation

In this schedule:

fresh water means water containing total dissolved solids of less than 1000 mg/l, and includes any water of that quality in a pipe, drain or man-made channel delivering water for use by humans or animals.

MPN/100ml means most probable number of coliform count per 100 millilitres.

marine water means ocean, sea, coastal or estuarine water, and includes river water affected by the tide.

seasonal mean TSS means the mean total of suspended solids for a climatic season, calculated in accordance with methodology acceptable to an airport environment officer for the airport concerned, taking into account the climatic and topographic conditions of the locality in which the airport is located.

waters has the same meaning as it has in regulation 2.02.

1.02 Indicators of adverse chemical effect

(1) Without limiting subregulation 2.02(1), the chemical condition of water is adversely affected if an event mentioned in this clause occurs.

Dissolved oxygen

(2) There is an adverse effect if, because of the entry of a substance into waters, the dissolved-oxygen content of the waters falls:
  (a) below 6 mg/l; or
  (b) to 80% of the average saturation level for a normal 24 hour period.

pH

(3) There is an adverse effect if, because of the entry of a substance into waters, the pH of the waters:
  (a) for fresh water—falls below 6.5, or rises above 9.0; or
  (b) for marine water—rises by more than 0.2 pH unit.

Salinity

(4) There is an adverse effect if, because of the entry of a substance into waters:
  (a) the salinity of the water rises above 1000 mg/l; or
  (b) the salinity rises by more than 5%.

Turbidity

(5) There is an adverse effect if, because of the entry of a substance into waters:
  (a) the TSS (total suspended solids) of the waters changes by more than 10% from the seasonal mean TSS; or
  (b) visual clarity within the euphotic zone is reduced by more than 10% from the seasonal mean clarity.

Faecal coliforms

(6) There is an adverse effect if, because of the entry of a substance into waters:
  (a) the median faecal coliform count of test samples of the waters exceeds 150 faecal coliform organisms/100 ml; and
  (b) the faecal coliform count of more than 20% of at least 5 test samples of the waters, taken at regular intervals during a period no longer than 1 month, exceeds 600 faecal coliform organisms/100ml.

Temperature

(7) There is an adverse effect if, because of the entry of a substance into waters, the temperature of the waters rises by more than 2º C above the seasonal mean temperature.

1.03 Table—accepted limits of contamination

This table sets out, for paragraph 4.02(a) of the regulations, the accepted limit for contamination of fresh water or marine water by a substance mentioned in column 2.

Column 1 Item no.	Column 2 Substance	Column 3 Accepted limit for fresh water (µg/1)	Column 4 Accepted limit for marine water (µg/l)
	Inorganic toxicants:		
1	Aluminium	100.0	
2	Ammonia	20.0	
3	Antimony	30.0	500.0
4	Arsenic	50.0	50.0
5	Beryllium*	4.0	
6	Cadmium	0.2	2.0
7	Chromium	10.0	50.0
8	Copper*	2.0	5.0
9	Cyanide	5.0	5.0
10	Iron	1000.0	

Clause 1.03

Column 1 Item no.	Column 2 Substance	Column 3 Accepted limit for fresh water (µg/1)	Column 4 Accepted limit for marine water (µg/l)
11	Lead	1.0	5.0
12	Mercury (except as provided in item 13)	0.1	0.1
13	Mercury, occurring as methylmercury	0.012	0.025
14	Nickel*	15.0	15.0
15	Selenium	5.0	70.0
16	Silver	0.1	1.0
17	Sulphide	2.0	2.0
18	Thallium	4.0	20.0
19	Tin (tributyltin)	0.008	0.002
20	Zinc*	5.0	50.0
	Organic toxicants:		
21	Surfactants and oil dispersants	<0.05 for a 96 hour period	<0.05 for a 96 hour period
	Total petroleum hydrocarbon		
21A	Fuel (C_6–C_9 fractions)	150.0	
21B	Mineral oil (>C_9 fractions)	600.0	
	Halogenated aliphatic compounds:		
22	Hexachlorobutadiene	0.1	0.3
	Monocyclic aromatic compounds:		
23	Benzene	300.0	300.0
24	Ethylbenzene	140.0	
25	Phenol	50.0	50.0
26	Toluene	300.0	
	Chlorinated benzenes		
27	Monochlorobenzene	15.0	
28	1,2 dichlorobenzene	2.5	
29	1,3 dichlorobenzene	2.5	
30	1,4 dichlorobenzene	4.0	
31	1,2,3 trichlorobenzene	0.9	
32	1,2,4 trichlorobenzene	0.5	
33	1,3,5 trichlorobenzene	0.7	
34	1,2,3,4 tetra-chlorobenzene	0.1	
35	1,2,3,5 tetra-chlorobenzene	0.1	
36	1,2,4.5 tetra-chlorobenzene	0.2	
37	Pentachlorobenzene	0.03	

Clause 1.03

Column 1 Item no.	Column 2 Substance	Column 3 Accepted limit for fresh water (µg/1)	Column 4 Accepted limit for marine water (µg/l)
38	Hexachlorobenzene	0.007	
	Chlorinated phenols		
39	Monochlorophenol	7.0	
40	2,4 dichlorophenol	0.2	
41	Trichlorophenol (total)	18.0	
42	2,4,5 trichlorophenol	1.0	8.0
43	2,4,6 trichlorophenol	10.0	
44	Tetrachlorophenol	1.0	
45	2,3,4,6 tetra-chlorophenol	1.0	
46	Pentachlorophenol	0.05	0.2
	Nutrients (in river or stream waters)		
47	Phosphorus	10.0	
48	Nitrogen	100.0	
	Nutrients (in lake or reservoir waters)		
49	Phosphorus	5.0	
50	Nitrogen	100.0	
51	Chlorophyll-a	2.0	
	Nutrients (in estuarine or embayment waters)		
52	Phosphates, expressed as P		5.0
53	Nitrates, expressed as N		10.0
54	Ammonium, expressed as N		5.0
55	Chlorophyll-a		1.0
	Nutrients (in coastal waters)		
56	Phosphates, expressed as P		1.0
57	Nitrates, expressed as N		10.0
58	Ammonium, expressed as N		5.0
59	Chlorophyll-a		1.0
	Pesticides:		
	Organochlorines		
60	Aldrin	0.01	0.01
61	Chlordane	0.004	0.004
62	DDE	0.014	0.014
63	DDT	0.001	0.001

Column 1 Item no.	Column 2 Substance	Column 3 Accepted limit for fresh water (µg/1)	Column 4 Accepted limit for marine water (µg/l)
64	Dieldrin	0.002	0.002
65	Endosulfan	0.01	0.01
66	Endrin	0.003	0.003
67	Heptachlor	0.01	0.01
68	Lindane	0.003	0.003
69	Methoxychlor	0.04	0.04
70	Mirex	0.001	0.001
71	Toxaphene	0.008	0.008
	Organophosphate		
72	Chlorpyrifos	0.001	0.001
73	Demeton	0.1	0.1
74	Guthion	0.01	0.01
75	Malathion	0.07	0.1
76	Parathion	0.004	0.004
77	Acrolein	0.2	0.2
	Phthalate esters:		
78	di-n-butylphthalate	4.0	4.0
79	di(2-ethylhexy) phthalate	0.6	0.6
80	other phthalate esters	0.2	0.2
	Polyaromatic hydro-carbons:		
81	Polychlorinated biphenyls	0.001	0.001
82	Polycyclic aromatic hydrocarbons	3.0	3.0

Clause 1.01

Schedule 3—Soil pollution—accepted limits

(subregulation 2.03(1), paragraph 4.02(a) and regulations 6.07 and 6.08)

1.01 Table 1—areas of an airport generally

(1) Table 1 mentions in column 3, for paragraph 4.02(a) of the Regulations, the accepted limits of the pollutant substances mentioned in column 2.

(2) The table mentions in column 2, for paragraph 6.07(1)(a) of the Regulations, certain pollutant substances that could cause an effect described in subregulation 2.03(1).

(3) The table mentions in column 3, for each substance mentioned in column 2, the trigger level for subregulation 6.08(2).

Column 1 **Item no.**	**Column 2** **Substance**	**Column 3** **Accepted limit/trigger Level (mg/kg)**
1	Aldrin (including aldrin and dieldrin in combination)	50
2	Arsenic (total)	500
3	Benzo (a) pyrene	5
4	Beryllium	100
5	Cadmium	100
6	Chlordane	250
7	Chromium (III)	600,000
8	Chromium (VI)	500
9	Copper	5,000
10	Cyanides (complexed)	2,500
11	Dieldrin (including dieldrin and aldrin in combination)	20
12	DDT	1,000
13	Heptachlor	50
14	Lead	1,500
15	Manganese	7,500
16	Methyl mercury	50
17	Mercury (inorganic)	75
18	Nickel	3,000
19	Polycyclic aromatic hydrocarbon	100
20	PCB (total)	50

Column 1 Item no.	Column 2 Substance	Column 3 Accepted limit/trigger Level (mg/kg)
21	Phenol	42,500
22	Zinc	35,000
23	Total petroleum hydrocarbon—fuel (C_6–C_9 fractions)	800
24	Total petroleum hydrocarbon—mineral oil (>C_9 fractions)	5,000
25	Benzene	1
26	Ethylbenzene	50
27	Toluene	130
28	Xylene	25

1.02 Table 2—areas of environmental significance

(1) Table 2 mentions in column 3, for paragraph 4.02(a) of the Regulations, the accepted limits of the pollutant substances mentioned in column 2.

(2) The table mentions in column 2, for paragraph 6.07(1)(b) of the Regulations, certain pollutant substances that could cause an effect described in subregulation 2.03(1).

(3) The table mentions in column 3, for each substance mentioned in column 2, the trigger level for subregulation 6.08(2).

Note: A soil pH outside the range pH6 to pH8 is a ***trigger level*** for the purpose of subregulation 6.08(2)—see paragraph 6.08(2)(b).

Column 1 item no.	Column 2 Substance	Column 3 Accepted limit/trigger Level (mg/kg)
	Heavy Metals	
1	Antimony	20
2	Arsenic	20
3	Barium	200
4	Cadmium	3
5	Chromium	50
6	Cobalt	170
7	Copper	60
8	Lead	300
9	Manganese	500
10	Mercury	1

Clause 1.02

Column 1 item no.	Column 2 Substance	Column 3 Accepted limit/trigger Level (mg/kg)
11	Molybdenum	20
12	Nickel	60
13	Tin	50
14	Zinc	200
	Mineral pollutants	
15	Boron	75
	Phenolic compounds	
16	Phenols (total)	0.5
	Aromatic hydrocarbons	
17	Benzene	0.5
18	Toluene	3
18A	Ethylbenzene	5
18B	Xylene	5
	Total petroleum hydrocarbon	
18C	Fuel (C_6–C_9 fractions)	100
18D	Mineral oil (>C_9 fractions)	1,000
	Polyaromatic hydrocarbons	
19	PAH (total)	5
	Chlorinated hydrocarbons	
20	PCB (total)	1
	Pesticides	
21	Aldrin	0.05
22	Dieldrin	0.2
23	DDT	0.97
	Other chemicals	
24	Sulphate	2,000

Appendix G

Groundwater quality criteria

Analyte	Criteria		
	ANCECC 2000 – Lowland Rivers (NSW Rivers)	ANCECC 2000 FW 95%	Airports (1997) Fresh Water
Nitrogen (Total)	0.6 mg/L	-	0.1 mg/L
Ammonia as N	0.03 mg/L	0.9 mg/L	-
Nitrate as N	-	7.2 mg/L	-
Dissolved Metals (filtered):			
Arsenic	-	0.013 mg/L	0.05 mg/L
Cadmium	-	0.0002 mg/L	0.0002 mg/L
Chromium (III + IV)	-	0.001 mg/L	0.01 mg/L
Copper	-	0.0014 mg/L	0.002 mg/L
Nickel	-	0.011 mg/L	0.015 mg/L
Lead	-	0.0034 mg/L	0.001 mg/L
Zinc	-	0.008 mg/L	0.005 mg/L
Mercury	-	0.0006 mg/L	0.0001 mg/L
Total recoverable hydrocarbons (TRH) - C10-C36	-	-	600 ug/L
Phenols	-	320 ug/L	50 ug/L
polycyclic aromatic hydrocarbons (PAHs)	-	-	3 ug/L
BTEX			
Benzene	-	950 ug/L	300 ug/L
Toluene	-	-	300 ug/L
Ethylbenzene	-	-	140 ug/L
Xylene (o)	-	350 ug/L	-