Stockdill 330/132kV Substation Construction and 330kV Transmission Line Connections

Zinfra Project No. TBA

[redacted]

Construction Environmental Management Plan

Document (Zinfra):	P810024-EN-PL-006
Document (TransGrid):	
Issue Date:	3/04/2019
Version Number:	Rev 0
Process Area:	**Environmental Management**

Contents

1 Introduction

This Construction Environmental Management Plan (CEMP) defines and outlines the mechanisms and systems of control that will be implemented by Zinfra for environmental management and compliance during the construction of the Stockdill 330/132kv substation & 330kv transmission line Project (project description is provided in Section 3).

The Plan has been developed in accordance with Zinfra's Values, Policies and Management Systems Framework that has been structured to conform to AS 14001:2004.

The Plan consists of two key sections:

A. Environmental Management System; and

B. Environmental Aspects and Impacts Controls.

This Plan has been developed and approved in accordance with G-HS-PR-50201 Develop HSEQ Management Plans.

The overall environmental performance goal for the Stockdill Project is to;

- Enable construction works to proceed as scheduled, while protecting the environmental resources and communities within the Project area in accordance with applicable Commonwealth and State/Territory legislation, policies and standards, recognised industry standards, and all associated approvals, authorisations, permits, and licences.

The objectives of this CEMP are to:

- Ensure compliance with approvals/permits;
- Provide the division of responsibilities for monitoring and environmental compliance requirements for the Project;
- Describe the communication and documentation of environmental compliance activities during the construction phase of the Project;
- Identify, develop and implement Procedures to manage environmental impacts against identified risk(s);
- Develop Site Environmental Control Plans (SECP – an example is attached in Appendix L) identifying the location of sensitive environmental features and control measures required to manage works where applicable or required;
- Develop Monitoring plans where site specific environmental aspects e.g. significant flora and fauna species require additional monitoring to ensure the Project meets the requirements of State/Territory and Commonwealth Permit conditions.
- Undertake inspections using checklists to ensure environmental controls and monitoring are being implemented and are effective.

This Plan is considered a living document, and will be reviewed at a minimum annually and updated periodically subject to Project Scope modifications and changes to regulatory requirements. All employees, subcontractors and visitors shall comply with this document at all times. Subcontractors will be provided with a copy of this CEMP and will be required to comply and/or align with its contents.

2 Purpose

The purpose of this CEMP is to provide direction to all Zinfra personnel including subcontractors in onsite environmental management requirements and mitigation strategies as they pertain to all locations within the scope of works.

3 Site location / Description

The ACT Government's electricity reliability criteria requires electrical providers (such as TransGrid and ActewAGL) to provide a secure electricity supply to the ACT .

Under the Electricity Transmission Supply Code, both TransGrid and ActewAGL have specific requirements to satisfy in order to meet their respective reliability criteria.

The parts of the Project to be delivered by TransGrid include the establishment of a 330/132 kV Stockdill Substation and associated transmission line and ancillary works proximate to Stockdill Drive in the ACT.

The parts of the Project to be delivered by ActewAGL include the connection between the proposed TransGrid 330/132 kV Stockdill Substation and the existing ActewAGL Canberra–Woden transmission line easement and associated ancillary works

3.1 Site Location

The Project is proposed to be located approximately 14 kilometres north-west of the centre of Canberra, immediately to the west and south-west of the suburbs of Holt and MacGregor, respectively, and to the southeast of the NSW ACT border.

The proposed substation component of the Project would be located near Stockdill Drive, West Belconnen, about three kilometres to the south-west of the of the existing TransGrid Canberra Substation which provides connections to Yass, Upper Tumut, Lower Tumut and Kangaroo Valley to the north and to Latham, Gold Creek, Woden, Queanbeyan and Williamsdale substations to the south.

3.2 Site Description

The proposed Project area currently consists of predominantly rural land uses. The surrounding lands is predominantly used for grazing and is interspersed with areas of woodland mainly in the steeper sections along the Murrumbidgee River. The Murrumbidgee River flows generally in a south to north direction, approximately 850 metres to the west of the Project study area. The confluence of the Murrumbidgee and Molonglo Rivers is located to the south-west of the Project study area. A tributary of the Murrumbidgee River, Ginninderra Creek, is also located to the north of the Project area.

The eastern section of the Project area is generally bordered by (and includes a section of) the Magpies Belconnen Golf Club (located adjacent to the existing TransGrid Canberra Substation). To the south east is the Pine Ridge Horse Agistment site, the Elvin Group vineyard and an additional private rural property.

The Ginninderra Estate residential development is currently under construction (on a former section of golf course lands) and would be located to the east and west of the transmission line easement running from the Canberra Substation in a southerly direction. The Ginninderry development is proposed to be developed on lands to the north of Stockdill Drive.

The suburb of Holt is located further to the east of the site, with the suburb of MacGregor located to the north-east of the site. A small community, Strathnairn, is located within the vicinity of the Project area. This community generally consists of a range of small art workshops and associated facilities.

The Bicentennial National Trail passes through portions of the eastern side of the Project. It is situated alongside the existing Canberra Substation and extends south to Stockdill Drive. In the vicinity of the Project, the Bicentennial National Trail follows the equestrian trail system through the ACT around Canberra's outer suburbs before heading into Namadgi National Park and crossing into Kosciuszko National Park.

Other land uses in the vicinity of the Project include:

- West Belconnen Resource Management Centre located to the north west of the existing TransGrid Canberra Substation
- Lower Molonglo Water Quality Control Centre (sewage treatment works) located to the west of the proposed Stockdill Substation location.

The Project area contains five key high voltage (330 kV) transmission line alignments which connect to the existing TransGrid Canberra Substation. These transmission lines provide connections between the Canberra Substation and the following locations:

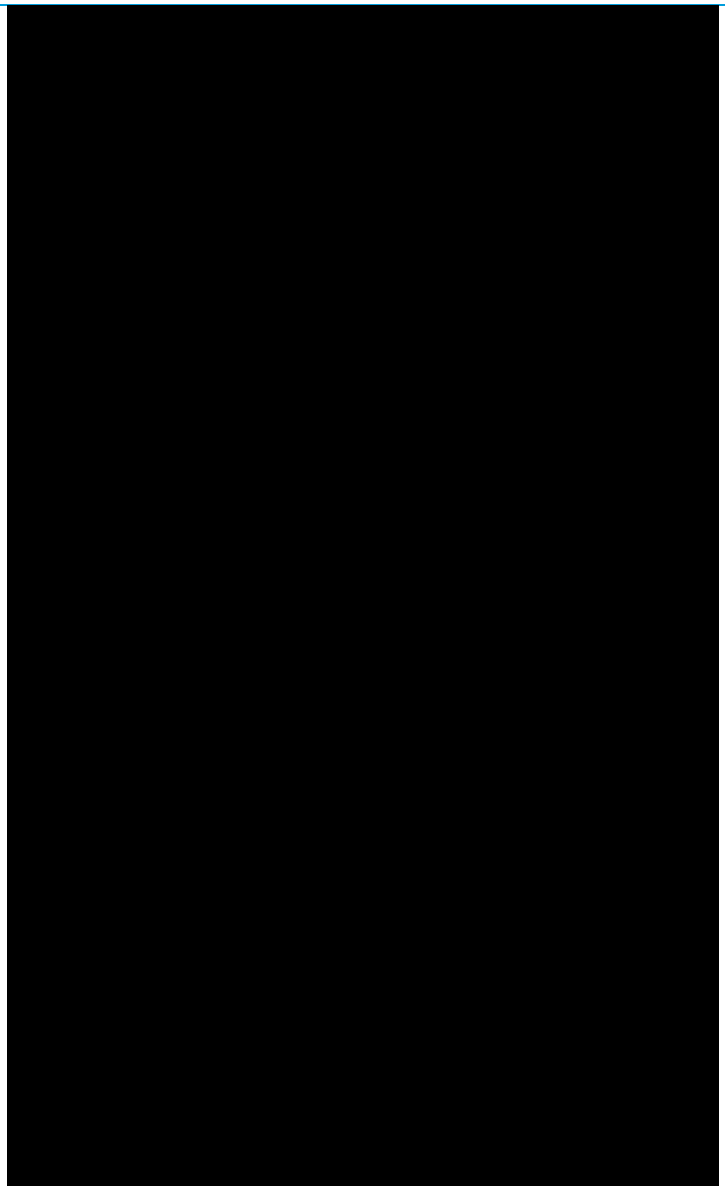
- Capital Wind Farm, travelling in a northerly direction from the Canberra Substation
- Yass, travelling in a westerly direction from the Canberra Substation
- Upper Tumut and Lower Tumut, both travelling in a south-westerly direction from the Canberra Substation — Williamsdale, travelling in a southerly direction from the Canberra Substation.

Three ActewAGL 132 kV transmission lines also connect into the Canberra Substation on its eastern side. The line which connects in from the south-eastern most point and which travels south is the Canberra-Woden 132 kV transmission line

3.3 Project Description

Project Details

Client:	TransGrid
Principal Contractor:	Zinfra Pty Ltd
Type of Work:	Transmission Line Construction; (SP1) includes all works to supply, erect and construct the new 330kV Transmission line Connections Greenfield Substation Construction; (SP2) includes all works to supply, erect and construct the new Stockdill 330/132kV Substation Construction Transformer Decommissioning; (SP3) includes all works to Canberra No 2 & No. 3 Transformer Decommissioning and Disposal
Project Address:	Stockdill Dr, ACT Figure 1: Project Regional Area



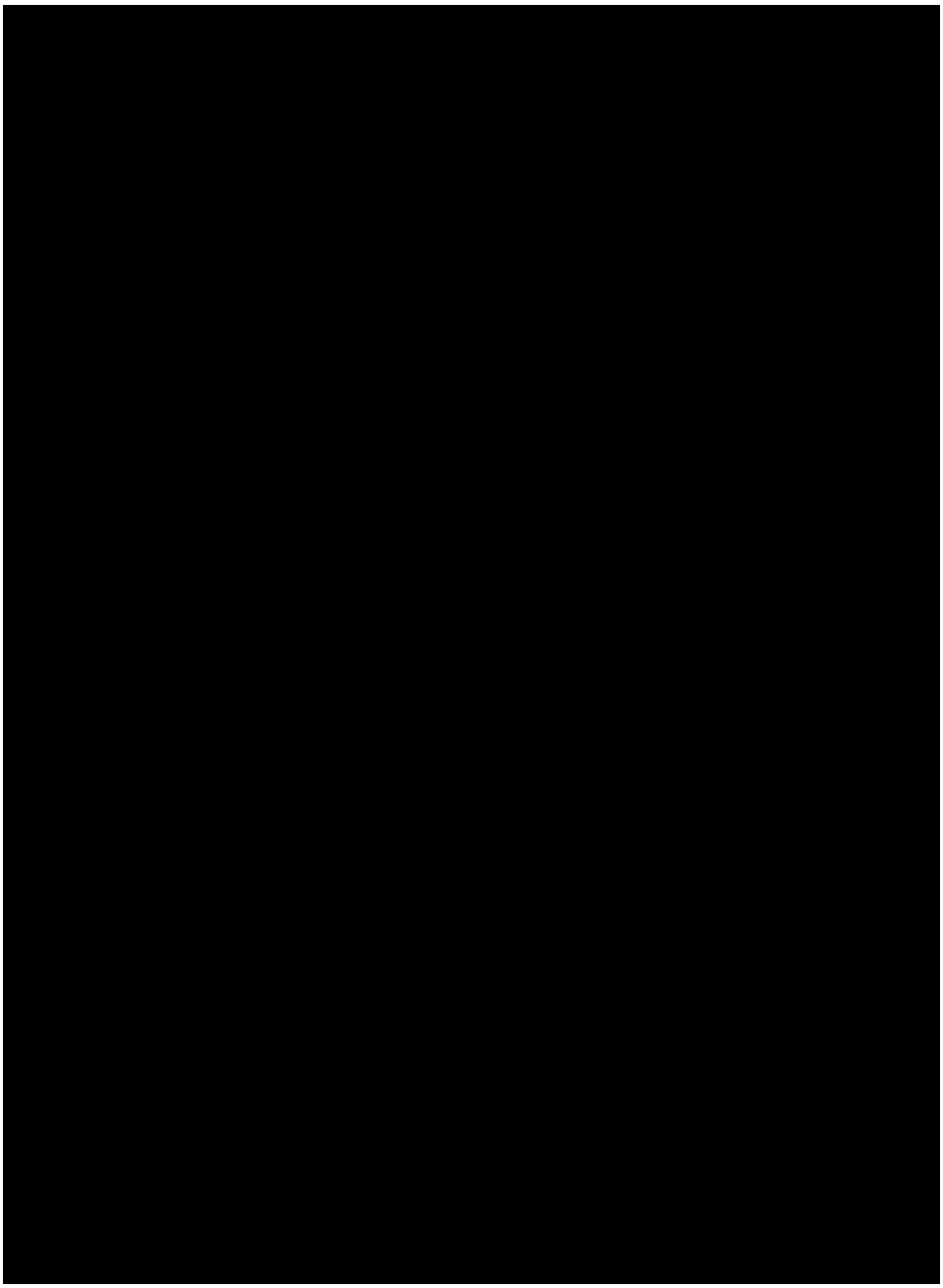
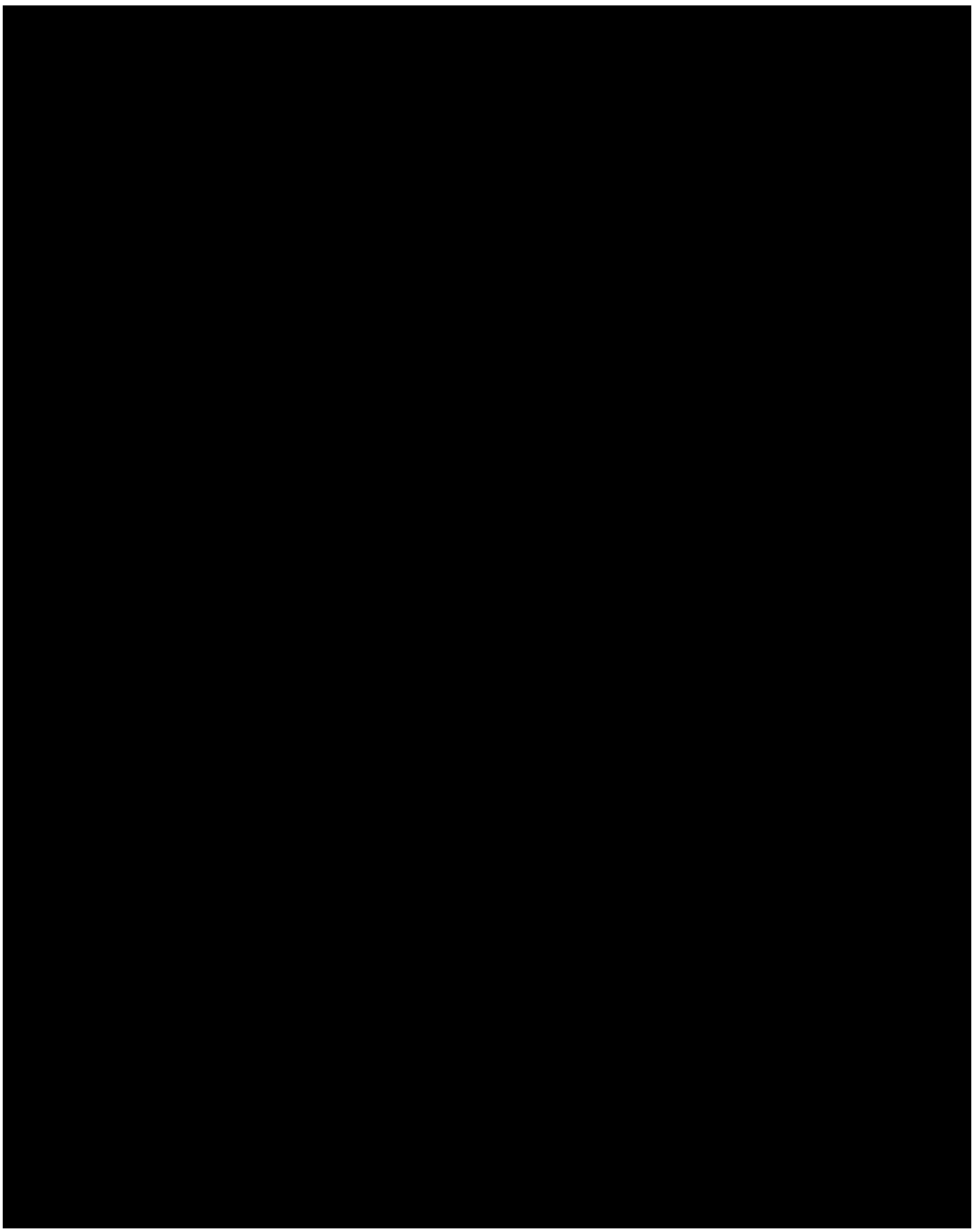
	

Figure 2 Substation Layout



3.4 *Key Project Dates (*from tender program – to be revised upon contract award)

Refer Construction Schedule

3.5 Key Project Personnel

Refer Project Organisation Structure

3.6 Key Client Contacts

Name	Company	Title	Mobile
TBA	TransGrid	Safety Advisor	
[redacted]	TransGrid	Environmental Advisor	[redacted]
[redacted]	TransGrid	Project Manager	[redacted]
TBA		Community Relations Manager	

4 Scope of Works

The scope of this CEMP is specific to Specification and [redacted] (TransGrid) and Zinfra.

The Scope of Works under the contract includes all works necessary to construct, test, commission, energise and train staff in the operation of a 330/132kV substation including the 375MVA transformer, and approximately 6km of 330kV transmission line construction and reconfiguration of lines connected to Upper Tumut, Canberra and Williamsdale 330/132kV Substations and connection of EvoEnergy 132kV distribution lines.

The works is divided into three (3) Separable Portions:

- Separable Portion 1 (SP1) includes all works to supply, erect and construct the 330kV Transmission line Connections
- Separable Portion 2 (SP2) includes all works to supply, erect and construct the new Stockdill 330/132kV Substation Construction
- Separable Portion 3 (SP3) includes all works to Canberra No 2 & No. 3 Transformer Decommissioning and Disposal

The parts of the Project to be delivered by TransGrid include the establishment of a 330/132 kV substation and associated 330 kV transmission line works proximate to Stockdill Drive in the ACT.

This development would enable the required level of electricity supply security for the ACT to be met.

The key features of the TransGrid's proposed components are summarised below:

- Construction and operation of the 330/132 kV Stockdill Substation, which includes:
    - 330 kV switchyard accommodating three 330 kV transmission lines
    - 330/132 kV transformer accommodating 132 kV feeders —
    - Substation communications systems
    - Substation protection systems
    - Supervisory control and data acquisition (SCADA) systems
    - Substation surveillance systems
    - Alternating current (AC) auxiliary supply systems
    - TransGrid Property boundary fence (around full acquired land parcel)
    - Transmission line works to connect the proposed substation to TransGrid's existing 330 kV transmission lines and the proposed 330 kV transmission line (refer below).
- Construction and operation of a 330 kV transmission line between the proposed Stockdill Substation and the existing Canberra 330/132 kV substation. A section of the proposed line would follow an alignment to the south of Stockdill Drive from the substation, while the remaining section would be located within the existing ActewAGL Canberra–Woden transmission line easement. The infrastructure to be constructed within this existing easement would be sufficient to allow for a double circuit arrangement for TransGrid transmission lines in the future, should this be required. The transmission line would be strung on one circuit, as a double circuit is currently not required to meet the needs of the Electricity Transmission Supply Code.
- Diversion of approximately 850 metres of existing TransGrid transmission lines to the west of the existing Canberra 330 kV substation. The redundant portion of these transmission lines beyond the diversion point would be decommissioned and removed including existing transmission line towers, conductors and associated foundations and other wiring.

- Removal of decommissioned sections of transmission lines on the southern side of the existing Canberra Substation as a result of the installation of new transmission line section at this location.

- Decommissioning and removal of existing transformers no. 2 and no. 3 from Canberra Substation.
- Line rearrangements, bypasses and connection of the new transmission line to the existing Canberra Substation.
- Installation of optical ground wire (OPGW) for the new sections of proposed transmission line.
- Installation of a new utility connections including water and 11 kV electrical connections from existing supplies along Stockdill Drive (for elements such as lighting and control building facilities).
- Vegetation clearing and earthworks for the above works, suitable for a 330 kV transmission line easement width of up to approximately 60 metres.
- Establishment of access tracks to all new infrastructure, including the proposed substation.
- Adjustment of the current alignment of the existing Telstra infrastructure near the Stockdill Substation.

The key construction management activities to be undertaken are expected to be as follows:

- Site mobilisation and the erection of temporary facilities
- Surveying the site; set-out points, project features and work areas
- Establishment of No-Go Zones
- Clearing, earthworks and excavations
- Fencing and signage
- Civil and building works
- Assembling and erecting high voltage equipment
- Pre-commissioning activities
- Testing and commissioning of equipment
- Decommissioning of existing structures
- Decommissioning of TransGrid plant and equipment within the existing Canberra Substation
- Clean-up and remediation of affected areas
- Site landscaping
- Site de-mobilisation

[redacted].

Project personnel are required to undertake construction in accordance with the planning and environmental approvals (listed in Section 5), this Plan, and the Environmental Subplans. This includes the preparation of Work Method Statements (WMSs), site specific risk assessments and Site Environment Control Plans (to be developed prior to works), specific to the work tasks which will identify environmental protection measures to be incorporated in the works, on-site responsibilities (organisational chart of management roles), identification of the relevant codes (e.g. EPA standards), site forms and checklists and other documents to guide construction activities and manage environmental risks. All sub-contractors are to also adhere to the Project WMSs and measures outlined in this CEMP.

The key environmental aspects and Project-specific environmental controls are addressed in Part B – Environmental Aspects and Impact Controls.

5 Reference Documents

- AS/NZS ISO 14001:2004 - Environmental Management System (EMS);
- Environmental Management Plan (G-EN-PL-50357)
- Commonwealth and State Environmental Legislation and Regulations (as relevant to aspects and impacts to be managed during construction works) and
- Planning and environmental approvals:
    - Planning approvals
        - DA No: 201732500, including endorsed documents.
    - ACT Environment Protection Act 1997
    - EPA approvals
    - The Territory Plan (ACT Government, 2014b)
    - Environmental Impact Statement (EIS)
        - Part A – Main Report
        - Part B – EIS Process
        - Part C – Assessment of Environmental Impacts
        - Part D – Mitigation and Recommendations
            - Technical paper 1 – Landscape and visual impact assessment
            - Technical paper 2 – Biodiversity impact assessment
            - Technical paper 3 – Traffic and transport impact assessment
            - Technical paper 4 – Noise and vibration impact assessment
            - Technical paper 5 – Cultural heritage impact assessment
            - Technical paper 6 – Bushfire risk assessment.
    - The National Capital Plan
    - AP2 – ACT Climate Change Strategy
    - ACT Planning Strategy
    - The Canberra Plan

This CEMP captures the environmental issues and mitigation measures associated with the construction works identified through the conditions of the DA approval and EIS conditions.

The proponent must prepare a Construction Environmental Management Plan (CEMP and obtain endorsement for the CEMP from the EPA. The CEMP must include the commitments made in part D of the EIS and DA approval and should be incorporated, as a minimum, into the following sub-management plans:

a) Biodiversity and rehabilitation management plan (including site maps) (Appendix A)
    - Tree management and revegetation plan
    - Rehabilitation Plan for the restoration of the Pink-tailed Worm-Lizard habitat at the Stockdill Substation
b) Weed management plan (Appendix B)
c) Construction Traffic management plan (Appendix C)
d) Construction noise and vibration management plan (Appendix D)
e) Heritage management plan (Appendix E)
f) Soil, water and contaminated land management plan (Appendix F)
g) Construction air quality management plan (Appendix G)
h) Waste and recycling management plan (Appendix H)
i) Construction emergency response plan (Appendix I)
j) Hazardous materials management plan (Appendix J)

5.1 Internal Zinfra Documents

Document Title	Document Number
Air Quality and Dust Control Procedure	G-EN-PR-00408
Bushfire Prevention Procedure	G-EN-PR-00047
Contaminated Soil Procedure	G-EN-PR-00048c
Controlled Waste Procedure	G-EN-PR-00027
Controlling Weeds and Diseases Procedure	G-EN-PR-00081
Environmental Inspection Checklist	G-EN-FM-50416
Environmental Noise Management Procedure	G-EN-PR-00055
Flora, Fauna and Vegetation Management Procedure	G-EN-PR-00053
Heritage Management Procedure	G-EN-PR-00049
HSEQ Fact Sheet - Dewatering a Trench	G-EN-FM-50386
HSEQ Fact Sheet - Oil Filled Equipment	G-EN-FM-00668
HSEQ Fact Sheet - Spills and Leaks	G-EN-FM-00667
HSEQ Fact Sheet - Waste Management	G-EN-FM-00666
HSEQ Factsheet - Saw cutting and Concrete Slurry	G-EN-FM-50387
HSEQ Factsheet - Silt and Sediment Controls	G-EN-FM-50388
Soil and Water Management on Sites Procedure	G-EN-PR-00238
Soil Assessment and Water Monitoring Form	G-EN-FM-50380
Spill Kit Inspection Checklist	G-EN-FM-50870
Spills and Leaks Management Procedure	G-EN-PR-00411
Unexpected Heritage, Flora or Fauna Item Form	G-EN-FM-50385
Vegetation Clearing and Site Establishment Checklist	G-EN-FM-50393
Waste Management Procedure	G-EN-PR-30143

6 Definitions

Acronym	Description
AS/NZS	Australian and New Zealand Standard
ASN	TransGrid Services
CEMP	Construction Environmental Management Plan
CHA	Cultural Heritage Assessment
EH&S	Environmental, Health and Safety
EMP	Environmental Management Plan
EMS	Environmental Management Systems
EPA	Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
E&SCP	Erosion and Sediment Control Plan
GIS	Geographic Information System
HSE	Health, Safety and Environment
ISO	International Standard Organisation
ITP	Inspection Test Plan
NCR	Non-conformance report
NGERS	National Greenhouse and Energy Reporting System
PM	Project Manager
RAO	Representative Aboriginal Organisation
SFAIRP	So Far As Is Reasonably Practicable
SECP	Site Environmental Control Plan
TBA	To be advised
VOC	Verification of Competency
WMS	Work Method Statement

Part A - Environmental Management System

7 Environmental Management System

Zinfra's Environmental Management System (EMS) is certified to the international environmental management specification AS/NZS ISO14001: 2004.
The EMS will be implemented through the following steps;

- Environmental and Sustainability Policy;
- Appointment of person(s) responsible for its coordination;
- Identification of interactions with the environment as a result of construction activities;
- Identification of actual and potential environmental impacts;
- Identification of relevant legal and regulatory requirements;
- Establishment of environmental objectives, targets and programs;
- Monitoring, inspection and measurement in achieving the objectives;
- Reviewing the system and environmental performance; and
- Continuous improvement of environmental performance.

The relationship between the EMS and hierarchy of documents is shown in Figure 1 below.

7.1 Hierarchy of Documents

An important principle of the hierarchy of documents is that documents must always be consistent with the level above them. For example, the Plans and Procedures must reflect the requirements of the Standards; the Standards must reflect the requirements of the Policies.

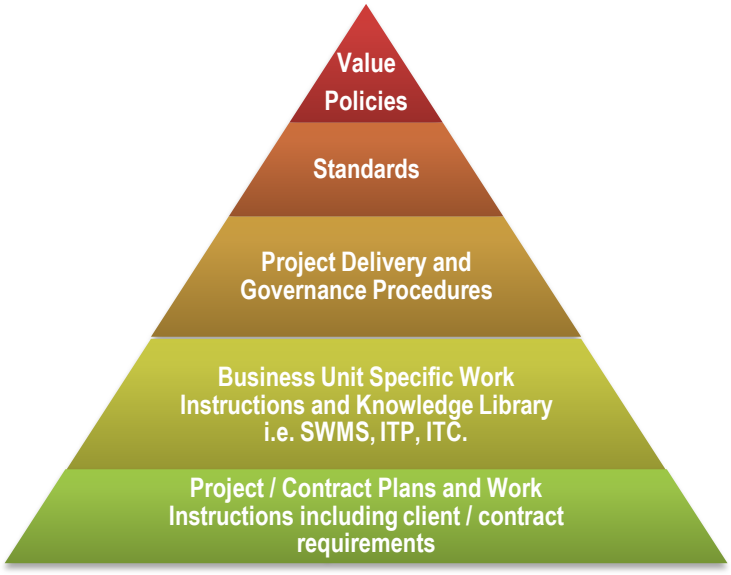
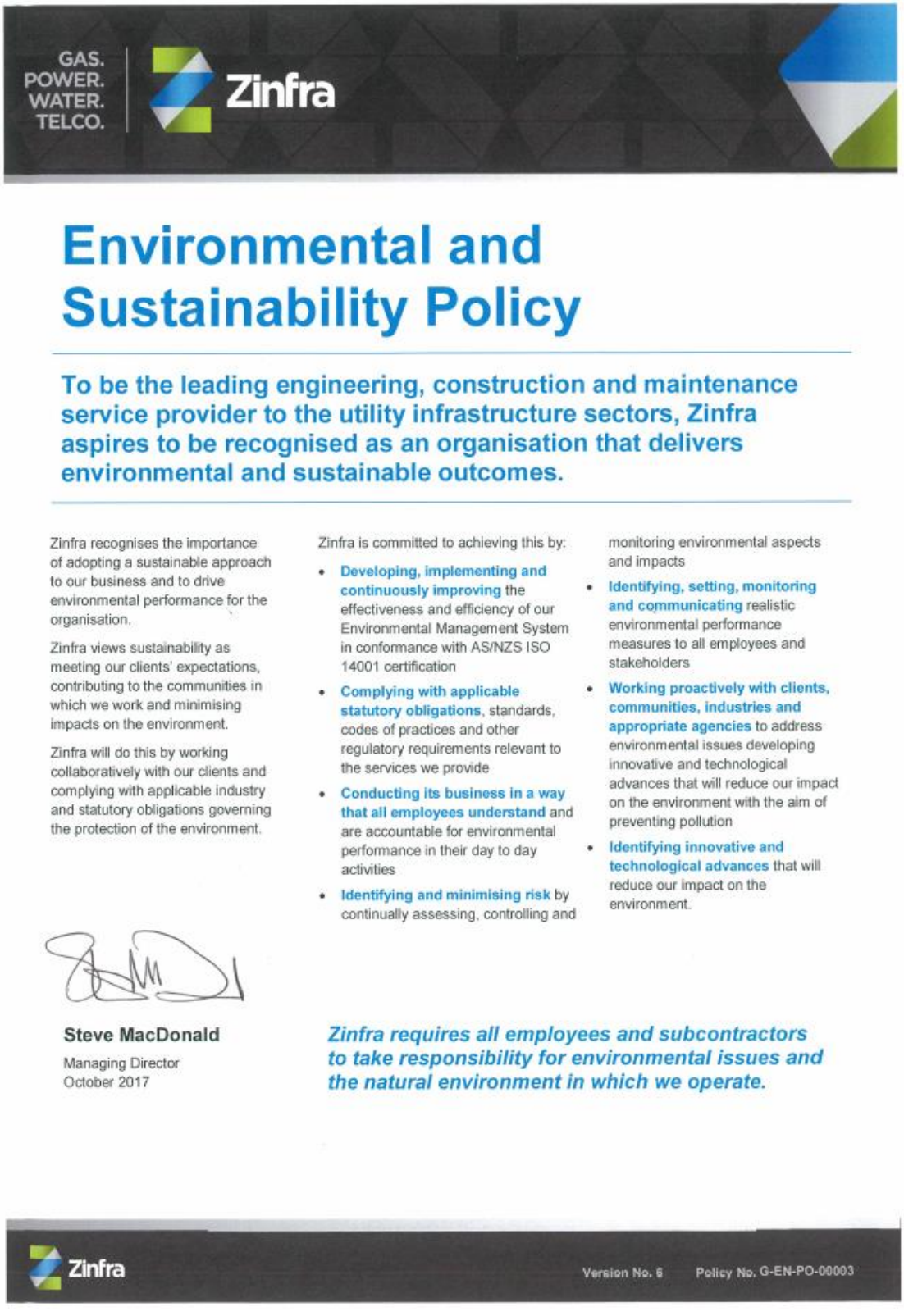


Figure 1 –Hierarchy of Documents

7.2 Environmental and Sustainability Policy

Zinfra Environmental and Sustainability Policy demonstrate its commitment to environmental protection and sustainability.

- G-EN-PO-00003 Environmental and Sustainability Policy



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Environmental and Sustainability Policy

To be the leading engineering, construction and maintenance service provider to the utility infrastructure sectors, Zinfra aspires to be recognised as an organisation that delivers environmental and sustainable outcomes.

Zinfra recognises the importance of adopting a sustainable approach to our business and to drive environmental performance for the organisation.

Zinfra views sustainability as meeting our clients' expectations, contributing to the communities in which we work and minimising impacts on the environment.

Zinfra will do this by working collaboratively with our clients and complying with applicable industry and statutory obligations governing the protection of the environment.

Zinfra is committed to achieving this by:

- **Developing, implementing and continuously improving** the effectiveness and efficiency of our Environmental Management System in conformance with AS/NZS ISO 14001 certification
- **Complying with applicable statutory obligations**, standards, codes of practices and other regulatory requirements relevant to the services we provide
- **Conducting its business in a way that all employees understand** and are accountable for environmental performance in their day to day activities
- **Identifying and minimising risk** by continually assessing, controlling and monitoring environmental aspects and impacts
- **Identifying, setting, monitoring and communicating** realistic environmental performance measures to all employees and stakeholders
- **Working proactively with clients, communities, industries and appropriate agencies** to address environmental issues developing innovative and technological advances that will reduce our impact on the environment with the aim of preventing pollution
- **Identifying innovative and technological advances** that will reduce our impact on the environment.

Steve MacDonald
Managing Director
October 2017

Zinfra requires all employees and subcontractors to take responsibility for environmental issues and the natural environment in which we operate.

Zinfra Version No. 6 Policy No. G-EN-PO-00003

8 HSE Management System

8.1.1 HSE Management System Standards

Zinfra's fourteen (14) HSEQ Management Standards contain the performance requirements to meet the intent of these standards.

Zinfra's Health, Safety and Environment Management Standards are:

Document Title	Document Number
G-HS-ST-00010	Management Commitment Standard
G-HS-ST-00011	Performance Monitoring, Reporting and Improvement
G-HS-ST-00012	Compliance
G-HS-ST-00013	Risk and Change Management
G-HS-ST-00014	Incident, Emergency and Crisis Management
G-HS-ST-00015	Communication, Consultation and Coordination
G-QM-ST-00016	Product Realisation and Control
G-HS-ST-00017	Supplier, Subcontractor and Service Provider Management
G-QM-ST-00019	Document, Content and Data Control
G-QM-ST-00019	Records Management
G-HS-ST-00020	Management of Plant, Equipment and Facilities
G-QM-ST-00021	Client Requirements and Satisfaction
G-HS-ST-00022	Learning and Development
G-QM-ST-00023	Design Management

8.1.2 HSE Management Procedures

These standards are supported by Zinfra procedures applicable to all operations within the business. These procedures are classified in two broad categories below:

- System Management Procedures; and
- Environmental Aspect and Impact Control Procedures.

8.2 Business Unit HSEQ Work Instructions

Zinfra Projects has developed a set of specific work instructions reflective of the industry in which it operates. These procedures are in line with both Commonwealth and State legislative requirements and industry practices, and they are also aligned with the Zinfra HSEQ Management System.

8.3 Project / Contract HSEQ Work Instructions

In addition to the above requirements, the Project / Contract Environmental Management Systems have been prepared to comply with a range of external requirements including contract requirements.

9 Legislative And Regulatory Framework

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

Construction activities will be planned, executed and implemented in accordance with all relevant Commonwealth legislation, State legislation and Regulatory requirements. These legislative requirements, policies, guidelines and standards may change over the duration of the contract. Any changes in legislation will be monitored through the Quarterly Enviro Review and amended as appropriate.

Specific environmental requirements from legislation, codes and standards are documented in Zinfra Procedures maintained by Zinfra Corporate HSEQ.

The key legislation and policy requirements that are relevant to the management of impacts on native flora and fauna applicable to the project are as follows:

The planning approvals process for the Project comprises a mix of both ACT (Territory) and Commonwealth requirements as the Project has been declared to be a controlled action under the Environment Protection Biodiversity Conservation Act 1999 (EPBC Act). As such, the Project has been assessed using the bilateral agreement process.

ACT Impact Tack Assessment Process

ACT Legislation

- *Planning and Development Act 2007 (P&D Act).*

  In accordance with section 123 of the P&D Act, the Project has been identified as requiring consideration under the impact track assessment process due to: — requirements associated with relevant development tables of the Territory Plan — being an identified project as identified in Section 4 of the P&D Act — the project being deemed to be a controlled action requiring approval under the EPBC Act.

Commonwealth legislation

- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*

Due to the potential for impacts on potential Pink-tailed Worm Lizard habitat, an EPBC Act referral and an EIS prepared.

Other legislative compliance requirements are listed in Appendix 22 of this Plan.

Environmental Authorisation Requirements

Under the ACT Environment Protection Act 1997, it is a requirement that certain activities that pose environmental risk consider the need for an environmental authorisation. There are three situations where an environmental authorisation for a project is required. These are:

- the conduct of Class A activities, found under Schedule 1 of the Environment Protection Act 1997
- the conduct of Class B activities, found under Schedule 1 of the Environment Protection Act 1997
- other situations determined by the Environment Protection Authority (EPA), as explained in Section 43 of the Environment Protection Act 1997.

The EPA requires an environmental authorisation on the grounds that the person conducting the activity has, is, or is likely to contravene the Act, and this contravention has caused, or is likely to cause, serious or material environmental harm.

The item identifies the need for an ACT Government environmental authorisation where a project results in the acceptance of more than 100 cubic metres of soil for placement on land.

Land development, or the construction of a commercial building, on a site of 0.3 ha or more and including the construction of associated public infrastructure. The Stockdill Substation site is approximately 2.7 hectares (greater than 0.3 hectares).

Zinfra currently holds an Environmental Protection Agreement under the Environment Protection Act 1997, Agreement No: LD 2016-035 expiring on 16/09/19.

9.1 Legal Subscriptions and Libraries

Zinfra's HSEQ Management System includes comprehensive references to Codes of Practice, Australian Standards and a wide range of guidance notes and publications issued by the various authorities and government departments.

Zinfra also utilises SAI Global and Workplace Enviro Australia Pty Ltd to access environmental legal documents to track changes to current legislation and regulations.

9.2 Legal Change Management

Zinfra Corporate HSEQ is responsible for maintaining the Management System, keeping it up to date with legislative changes, and ensuring that Quarterly HSE legislative updates are sent out to the Business Unit HSE Managers. Based on the updates, the Business Unit HSE Manager ensures these changes are communicated to Project HSE personnel.

It is the Project HSE personnel's responsibility to update the Project HSE Management System including this Plan, Project-specific procedures and risk assessments (including subcontractors). Any changes will be communicated to all Project personnel during pre-start or toolbox meetings.

9.3 Project Environmental Approvals

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

9.3.1 Planning Permits

This CEMP captures the environmental issues and mitigation measures associated with the scope of works identified through the conditions of the EIS and Development Application (DA) for the Project.

- DA No: 201732500
- Part D of the EIS

9.3.2 Cultural Heritage Assessment

Comprehensive Cultural Heritage Assessment has been undertaken by Navin Officer (Navin Officer, 2017) for the Project (refer Volume 2 –Technical paper 5 as part of the EIS).

Potential risks to Aboriginal heritage as identified for the Project is the loss or damage to Aboriginal archaeological potential or places with Aboriginal cultural values, in particular within the northern portion of the project. Mitigation measures are detailed in Part B of this Plan.

9.3.3 Other Approvals

TransGrid is to supply all existing planning permits and approval. Other permits, licenses, approvals and/or consents under relevant State/Territory and Federal legislation may be required to be obtained for the Project and will be obtained by TransGrid and/or Zinfra. Any specific approval conditions and reporting requirements outlined in permits will be incorporated into this Plan and any other relevant documentation.

The Zinfra Project Manager has the overall responsibility to ensure compliance with all applicable Project approvals, consents, licenses and/or permits.

9.4 Consultation

In the event additional/amended permits, approvals, licenses and/or consents are necessary, the Project team will consult with TransGrid along with any relevant regulatory agencies.

Applicable Procedure(s)

- G-HS-PR-00100 Legal and Other Requirements

10 Responsibilities and Accountability

10.1 Environmental Organisation and Responsibilities

The Project Manager is accountable for ensuring environmental protection by maintaining compliance with all legal and contractual requirements. Furthermore, the Project Manager is accountable for ensuring all environmental control measures are implemented and a suitable level of environmental resources as well as defining environmental responsibilities for all personnel is provided.

All persons involved in the Project have a responsibility to implement the relevant sections of this CEMP with assistance from their mangers or supervisors through the “support-role” of HSE personnel on environmental management including:

- The right and authority to stop work or refuse to work in a situation that may cause environmental harm
- Duties and responsibilities to prevent environmental harm

- Obligations to respond to environmental incidents, including their prevention, clean-up/ restoration and reporting.

In consultation with the Project HSEQ Manager, a project organisational chart has been developed for Stockdill as part of Project Management Plan (PMP)) depicting lines of responsibility, authority and accountability.

There are two types of responsibility and accountability involved in the implementation of processes in this CEMP - "Primary" and "Secondary".

"Primary" means the role is responsible for the implementation of a process in this CEMP and accountable for the overall performance outcome of the process.

"Secondary" means the role is responsible for providing technical guidance or execution of an element(s) of a process and responsible for the performance outcome of the element(s).

The definitions of the roles responsible for the implementation of this CEMP are in the table below.

PM	Project Manager	**PR**	Procurement
CM	Construction Manager	**SUB**	Subcontractors
SS	Site Supervisors	**PA**	Project Administration
HSEQ	HSEQ Personnel – Environmental Manager	**W**	Workers
ENG	Engineers		

Legend **P = Primary** **S = Secondary** XX = Not Applicable

Example:

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

This means Project Manager is "Primary", and Site Supervisor is "Secondary". The rest are not part of the implementation.

The responsibility for the implementation of this Plan is summarised in Appendix 11 Environmental Management Plan Implementation Matrix. This matrix will form part of the Project Training Matrix. Both "Primary" and "Secondary" must be trained on the sections of which they are responsible.

Applicable Procedure(s)

- G-HS-PR-50190 HSEQ Responsibilities

Role	Responsibilities
Zinfra Project Manager	• Ensure overall implementation of this CEMP • Ensure notifiable environmental incidents are reported to TransGrid and the appropriate authorities • May suspend work until adequate environmental safeguards implemented • Ensure environmental compliance reporting obligations are adequately met • Ensure Project personnel are trained in their environmental obligations and the content and responsibilities outlined in this CEMP • Ensure subcontractors comply with statutory, client, contractual and site specific environmental requirements • Ensure environmental inspections are undertaken and corrective actions are implemented satisfactorily

Role	Responsibilities
	• Ensure overall implementation of this CEMP during Project delivery • Ensure Zinfra Construction Manager adequately understands requirements of this CEMP • Liaise with Zinfra Environment Advisor and TransGrid on environmental issues
Zinfra Construction Manager	• Understand requirements of this CEMP • Ensure construction contractors comply with this CEMP • Provide on-site environmental direction to sub-contractors as required • Notify Zinfra Project Manager of any environmental incidents • May suspend work until adequate environmental safeguards have been implemented
Zinfra Environmental Advisor	• Develop the CEMP and review/amend as appropriate • Ensure environmental inductions are undertaken • Organise, facilitate and/or supervise environmental audits of the Project • Provide support to Zinfra Operations Manager and Project Manager on environmental issues • Undertake environmental compliance reporting in accordance with Project approvals and client requirements • Monitor contractor performance and compliance with this CEMP • Liaise with regulatory authorities/stakeholders • Provide support to construction personnel on all environmental issues
Project Field Engineers, and Supervisors	• Ensure environmental considerations are integral to decision making for all construction activities. • Ensure that the environmental controls and procedures contained in the CEMP are implemented. • Conduct regular checks of the site to ensure environmental controls such as sediment controls and dust suppression are functioning effectively. • Ensure subcontractors and all personnel onsite comply with the requirements of the CEMP; • Program daily work activities with regards to weather conditions; • Participate in environmental inspections, monitoring and audits as required; • Carry out maintenance on environmental controls as required.
All Project Personnel	• Responsible for environmental performance of their activities. • All persons associated with the Project have a duty of care under Environmental legislation. Specifically, all personnel must not carry out any activity that causes, or is likely to cause, environmental harm, unless the person takes all reasonable care to prevent and minimise environmental harm. • All persons associated with the project will be held accountable for compliance with their particular environmental responsibilities under this CEMP and Procedures.
Subcontractors	• Observe all legislative and statutory requirements relating to environmental protection; • Nominate site representatives to liaise with the HSE Representative with respect to, and take responsibility for, environmental requirements for all site activities; • Adhere to Zinfra's CEMP as it applies to their operations on the site; • Cooperate fully with site incident and reporting procedures.

11 Training and Competency

All personnel working on the Stockdill Project, including subcontractors shall be competent to conduct their work without harm to people, environment or assets. Competencies will be verified by a registered training organisation or by a site Subject Matter Expert (SME). All personnel shall complete all necessary site training and induction requirements as specified in the project training matrix, before commencing work on site. The Project Manager or nominee shall address all new employees and reinforce the project team's ongoing commitment towards project goals.

The Project Team shall be responsible for the maintenance and currency of all training material and training registers, encompassing records of all employees' qualifications (and training if occurring both on and off site). Each employee shall have copies of certificates of prior training retained on their personal / training file. All training will be supported by the use of attendance records to assist with auditing purposes.

11.1 Training Management

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

All site personnel will be appropriately trained and VOC'd as required prior to commencing works. All required licences/tickets and National and/or Industry recognised competencies skills must be identified for all project personnel.

A training schedule for each Project employee will be prepared at the commencement on the Project to identify training gaps and progressively close them out as early as possible. The training schedules will be reviewed and managed by the project HSEQ personnel.

Refresher training will be undertaken as required and corresponding records maintained.

Applicable Procedure(s)

- G-QM-PR-50217 Plan and Implement HSEQ Training

11.2 Environmental Management Plan Deployment

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

A review of the Project HSEQ Skill and Competency Matrix will be conducted for all personnel starting on the Project to determine the training requirements in order to competently fulfil their HSEQ responsibilities on this Project and deploy the relevant sections of this Plan.

Applicable Procedure(s)

- G-QM-PR-50217 Plan and Implement HSEQ Training
- G-HS-PR-50201 Develop HSEQ Management Plans

11.3 Project Induction

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

All personnel will receive orientation on the Project's environmental expectations upon hiring or project assignment. This orientation will include general and project specific environmental requirements with an emphasis on the importance of meeting the requirements, needs and environmental expectations of the Client and other stakeholders.

The PM shall ensure that all key personnel, including visitors and/or short-term workers, complete the necessary induction, training and that all records are maintained.

All Project personnel including subcontractors must successfully undertake the Project Induction and satisfactorily complete the induction assessment before they are granted access to the Project.

The induction will cover aspects including but not limited to the following:

- Project Environmental and Sustainability Policies, Procedures and Client Requirements

- Environmental permits/approvals and conditions
- Personnel Responsibilities
- Soil and Water Management
- Erosion and Sediment Control
- Waste Management
- Cultural Heritage Management
- Stakeholder Engagement
- Flora and Fauna Protection
- Weed Control and Wash-down Procedures
- Storage and Handling of Fuels, Oils and Chemicals
- Incident Management
- Bushfire Management
- Spill Prevention and Response
- Reporting Procedures

11.4 Site Establishment

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

Prior to the commencement of any works on site, a site/task specific risk assessment will be undertaken to ensure compliance with planning approvals and this CEMP in addition to the overall HSE risk register. Known sensitive environmental areas will be flagged/barricaded with 'No-Go Zone' signage in accordance with the planning approvals.

Zinfra will ensure all approvals are in place prior to commencing works.

Applicable Procedure(s)

- G-EN-PR-00053 Flora, Fauna and Vegetation Management
- G-EN-PR-00049 Heritage Management
- G-EN-FM-50393 Vegetation Clearing and Site Establishment Checklist
- Biodiversity and rehabilitation management sub plan

12 Managing Project and Operational Risk

12.1 Project Planning and Execution

Effective planning is vital to a successful project. Delays to construction can be avoided if effective construction sequencing and scheduling is addressed early in the planning process. It is important to plan for and manage timing conflicts that can occur between weather, scheduling heavy equipment and environmental concerns such as the presence of threatened or endangered flora, presence of nesting, migrating, or threatened or endangered fauna.

To ensure environmental constraints impacting on schedules and execution plans are appropriately managed and mitigated, an environmental hazard identification and control process will be conducted prior to the commencement of construction works. Project environmental planning will be integrated within the greater construction planning framework.

12.2 Environmental Objectives and Performance Criteria

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

The Project's environmental objectives, key performance indicators, targets and performance criteria are established, reviewed and agreed to as part of the Project business planning process. Project specific objectives, targets and key performance indicators must be consistent with TransGrid Services, Zinfra and Business Unit expectations.

12.2.1 Project Objectives and Targets

Objectives	Targets	Key Performance Indicators
Soil and Water Quality	• Zero externally reportable incidents relating to soil, sediment release and water quality • Zero externally reportable incidents relating to chemical, fuels and oil	• Number of externally reportable incidents
Erosion and Sediment Control	• Zero externally reportable incidents relating to soil, sediment release and water quality • Compliance with developed ES&CPs	• Number of externally reportable incidents
Flora and Fauna	• Zero damage to protected vegetation except in accordance with permit / approval conditions	• Number of incidents relating to vegetation damage outside of approved project area / scope
Weeds and Pests	• Zero incidences of weed spread between weed and weed free zone	• Number of incidents relating to weed spread
Noise and Vibration	• Zero complaints relating to noise and vibration outside approved Project hours	• Number of complaints relating to noise and vibration outside prescribed working hours
Air Quality and Dust Control	• No ongoing air quality and dust issues created as a result of Project activities	• Areas with dust and air quality issues observed during construction and post-construction will be mitigated
Cultural Heritage	• Zero interference of identified heritage items (other than in accordance with an approval) • Appropriate notification to relevant authorities of identification of any heritage items	• Number of known heritage items damaged • Number of appropriate authorities notified about heritage items uncovered
Waste and Energy	• Maximum recycling of Project wastes	• Evidence of recycling of materials where possible

	• Removal of contaminated soils and wastes in accordance to EPA requirements	• Evidence of correct EPA protocols being followed
Dangerous Goods and Hazardous Substances	• Zero externally reportable incidents relating to handling of dangerous goods and hazardous substances	• Evidence of appropriate handling of dangerous goods and hazardous substances
Reinstatement and Rehabilitation	• Effective restoration of all disturbed surfaces to pre-Project condition • No weed establishment in disturbed and rehabilitated areas	• Number of areas with insufficient re-vegetation success based on post-construction audit • Number of areas of weed infestation identified during post-construction audit
Legal and Regulatory Requirements	• Zero breaches of environmental legal or regulatory requirements	• Number of breaches of environmental legal or regulatory requirements
Permit Conditions	• Zero non-compliances with any permit conditions	• Number of non-compliances with permit conditions
Hazard Identification and Risk Assessment	• 100% compliance with Risk Assessment control measures	• Review and update of Risk Register periodically or change management
Project induction /training to include awareness of site-specific environmental aspects and impacts	• 100% of people inducted and trained (as relevant to their role) before performing site-based work activities.	• Number of personnel inducted and trained as per training matrix
Internal Audits of site	• Internal audits completed to measure compliance with the ESM and CEMP. • Regular (at least annual) internal auditing of the implementation of the complaints management plan will be conducted by the Client	• Number of audits undertaken as per Project Activity Plan

Applicable Procedure(s)

- G-HS-PR-50193 Develop HSEQ Targets and Objective

12.3 Environmental Aspect and Impact Controls

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

All construction activities carry an actual and potential risk of environmental harm. Environmental control measures will be implemented following a HAZID or ENVID process for all activities to avoid, minimise, and mitigate the risk of environmental harm to So Far As Is Reasonably Practicable (SFAIRP) utilising the hierarchy of controls.

The assigned risk level will stipulate the management tool that will be implemented. Further risk assessments may be required for site/activity specific works within or near environmentally sensitive areas.

The HAZID or ENVID process will involve the following;

- Identifying the activity and impact as a result of the activity
- Analysing the likelihood and consequence of risk
- Evaluating the likelihood and consequence of a risk prior to controls being implemented
- Treating the risk by implementing controls
- Assessing the risk after the controls have been implemented

Environmental risk management is an interactive process enabling continual improvement in rational and evidence-based decision-making.

Once suitable controls are selected, it is necessary to effectively implement these prescribed controls in a timely manner. The controls must be implemented at the right level of the organisation to treat the hazards and mitigate the associated risks to a forecast residual risk level.

The Project must apply a continual risk management process throughout the life of the Project starting from the initial tender stage and carrying out all-through the construction stage to handover to the client.

HSE risk reviews must be conducted at nominated stages of the Project or when there is a change to the scope of works. The outcomes of these workshops will provide information to prepare and/or update this Plan.

Project Stage	Risk Workshops / Review	Planned Date
On Award	HSE Risk Workshop	TBC
Mobilisation	Plan Review	TBC
Construction	Initial and Project Milestones	TBC
Commissioning	Initial and Project Milestones	TBC
Handover	Prior to handover	TBC

Applicable Procedure(s)

- G-HS-PR-00040 Health, Safety and Environment (HSE) Risk Management

Further prescription on application of Environmental Aspect and Impact Controls can be found in Part B of this Plan.

12.4 Emergency Management

12.4.1 Emergency Response Plan

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

An Emergency Response Plan (ERP) will be developed and maintained to minimise any potential and actual impacts on the environment arising from any work activities. The ERP will include communication and coordination protocols to allow the Project to access a broader level of support from the Project and Zinfra crisis management process. A similar coordination protocol will also be setup with the Client's crisis management process.

The development of the ERP will include a review of the risk register to identify situations where responses are required to mitigate the impact of emergencies.

Specific emergency plans to address the risks identified will be included within the ERP.

12.4.2 Site Plan

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

A Site plan will be developed and maintained if required depending on the scope of works. The plan will be communicated during the project induction and displayed on site noticeboards and other locations visible to site personnel. The location of items listed on the plan may include:

- Site Drainage
- Sensitive vegetation
- No Go Zones
- Details of plant/vehicle travel paths
- Firefighting equipment
- Spill kits/First Aid Kits
- Car parking locations
- Sediment Control Devices
- Emergency evacuation points

Applicable Procedure(s)

- G-HS-PR-50195 HSE Emergency Preparedness
- G-HS-PR-50191 Emergency Drills
- G-EN-PR-00411 Spills and Leaks Management

13 Implementation and Operation

13.1 HSEQ Subcontractor Management

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

Selection and retention of subcontractors will be undertaken in accordance with G-HS-PR-00634 HSEQ Subcontractor Management procedure. This is managed during the entire subcontractor management process commencing at Pre-Contract to Contract Closure. Effective alignment of the Project and subcontractors' HSEQ objectives and management processes with Zinfra is an integral part of the HSEQ Subcontractor Management Process.

During Pre-Contract and Contract Formation stages as part of the Purchase Approval (PAF) Process, subcontractor's HSEQ System is assessed against Zinfra's EMS and their ability to comply with all environmental and sustainability requirements.

Prior to mobilisation, a series of reviews will be conducted to ensure Subcontractors are ready to commence on the Project and have met all requirements. Upon mobilisation, subcontractors will be inducted, their licenses and competencies checked and their plant and equipment inspected. As per Condition 4 of the transmission line permits, before works start all persons undertaking vegetation removal will be advised of all relevant permit conditions.

A Subcontractor HSEQ Monitoring/ Inspection Plan will be implemented for each subcontractor to monitor their performance on the Project. Any non-conformance raised will be investigated and corrective actions closed out in a timely manner.

Plant/ Labour Hire, smaller subcontractors or sole traders that do not have their own Environmental Management Systems will work exclusively under the Zinfra EMS.

Applicable Procedure(s)

- G-HS-PR-00634 HSEQ Subcontractor Management

13.2 Plant and Equipment

Zinfra will ensure that prior to purchase, hire, or lease, the HSE specifications of equipment or materials that have potential health, safety and environmental impacts are reviewed and documented to verify suitability for the intended use and to prevent the introduction of significant risks.

Suppliers of services and goods including new plant and materials shall be subject to HSE risk assessments prior to use or operation. Purchasing decisions must consider environmental legislative requirements and/or Australian Standards that apply.

Where a renewable energy source can be used to power plant and equipment they will be sourced where possible and practicable (e.g. solar powered lighting towers).

13.3 Communication and Consultation

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

Effective Communication and Consultation will be to be used to establish a Project culture that reflects a positive, inclusive approach to environmental protection that encourages the full involvement of all personnel to achieve a safe working environment that is aligned to Zinfra's expectations. It is also paramount to ensure a positive environment in which employees are motivated to openly suggest opportunities, report incidents, drive innovation and continuously improvement.

13.3.1 Customer Complaints Management

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

Zinfra Project management will be notified immediately of any issues or complaints raised by any relevant stakeholder, so that the most consistent and up to date information is provided and a suitable resolution is reached. All complaints will be recorded in ASIPRE.

The complaint investigation process will include notification to TransGrid as soon as practical, within 24 hours and responses / resolutions to the complaint is to be communicated by Zinfra Project management as soon as practical.

13.3.2 Client's Meetings

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

The Project Manager, Construction Manager, and HSE Representative will be the central point of contact for all client-related information and communication as required. This includes requests for information and/or clarification of any environmental issues.

Zinfra will prepare for, attend and participate in Project Management Meetings (PMM) to report on environmental issues associated with the Project as agreed/directed by the Contract Administrator. Any relevant information from the PMM will be flowed down to site personnel and Subcontractor.

13.3.3 Toolbox Talks

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

Toolbox talks will include relevant environmental management awareness training as well as site-specific environmental information that may be required to undertake a particular construction activity or task. Toolbox talks will also be delivered to continuously improve performance and in response to an environmental incident or non-conformance observed on the project or similar projects.

Toolbox will be scheduled as per the Project Activity Plan. Attendance Record sheet will be used to record attendance at Toolbox Talks.

Minutes of the meetings will be maintained and any actions raised are recorded and tracked to their completion. Feedback on progress will be provided to managers, client, employees / subcontractors at subsequent toolbox meetings or as required dependent on the urgency of the issue.

13.3.4 Daily Pre-start Meetings

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

Daily pre-start meetings will be held prior to commencing works each shift. This meeting itemises the work that will be undertaken during the day and where applicable the following environmental related components:

- Weather observations / forecast
- Work area restrictions, activities that may affect the works
- Environmental focus for the day (e.g. Housekeeping/ litter clean-up, water management, dust control, etc.)
- Feedback on environmental issues that have recently occurred within the area or other areas of the project
- Notices about up and coming events such as environment and community meetings, audits, environmental inspections
- Feedback on previous day's work practices
- Feedback from environment, community and stakeholder meetings.

All personnel undertaking work within the construction crew will sign onto the pre-start attendance record form.

Applicable Procedure(s)

- G-HS-PR-00507 Pre Start Worksite Health Safety Environment (HSE) Risk Assessment

13.3.5 External Communication

External communication will ensure that stakeholders are kept informed of planned works. Key Environmental Stakeholders include, but not limited to:

- Regulatory Authorities/ Government Departments
- Other Asset Owners/ Operators
- Community Groups/ Landowners/ General Public
- Local Council
- Local Emergency Services

All communication with stakeholders liaison and engagement with be recorded in a register.

14 Monitoring and Evaluation

All monitoring will be conducted by suitably qualified persons and where laboratory results are required, samples will be sent to NATA accredited laboratories.

Suspected contaminated land, if discovered on the Project site, will be sampled in accordance with;

- AS/NZA 4482.1:2005 *Guide to the investigation and sampling of site with potentially contaminated soil*

Monitoring activities, locations, frequency and compliant criteria will be addressed in depth within the relevant Project environmental procedure (i.e. Water Management Procedure).

14.1 Environmental Inspections

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

14.1.1 Environmental Inspection Schedule

To ensure compliance with both the regulatory and environmental requirements stated in this Plan, physical inspections will be conducted to ensure effective implementation of control measures and timely remedial actions are undertaken. Weekly Environmental Inspections will be conducted on active work sites during the Project. Pre and Post rainfall checks will be undertaken as required and when runoff producing rainfall is forecast. Inspections will be undertaken on checklist templates (Appendix 4) developed from the Project Environmental Requirements and the Project HSE Risk Register.

Any corrective actions identified during inspections and observations will be communicated to relevant personnel and recorded in the incident management database (ASPiRE) or Actions Tracking Register (ATR) until they are successfully completed or closed-out.

14.1.2 Inspections

Formal Environmental inspections will be undertaken at least weekly and may involve project management, workers, subcontractors, client and external personnel such as Zinfra senior managers and/or subject matter experts/professionals. It is the Project Construction Manager's responsibility to ensure these inspections are carried out. These inspections will be conducted in accordance with the project Activity Plan.

Routine inspections of work areas including subcontractor operations will be conducted to monitor work practices and identify nonconforming areas and activities or work practices which could lead to environmental harm.

The purpose of the inspections is to:

- Provide a surveillance tool to ensure that safeguards are being implemented
- Identify where problems might be occurring (or have the potential to occur)
- Identify where ineffective environmental practices are being implemented
- Facilitate the identification and early resolution of issues/concerns.

It is noted that inspections also provide an opportunity to address issues raised by the Supervisor, Leading Hand, Project Engineer or Project Manager and assist in the implementation of environmental controls. Often this continued support leads to better ownership of environmental management and becomes a coaching exercise for field personnel to improve their skills in this specialised and complex discipline.

On completion of the inspection all environmental hazards identified will have been recorded on the relevant checklist with corrective actions, responsibilities, and timeframes detailed.

Corrective actions must be entered into, and managed in, the incident and inspection management database, ASPiRE.

> Note: In addition to the formal weekly inspection, informal daily observations will be undertaken to ensure environmental controls are being implemented correctly and remedied as soon as possible.

Applicable Procedure(s)

- G-HS-PR-50196 HSE Inspections and Task Observations

15 Events Management and Notification

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

15.1 Complaints Management and Response

Complaints are considered an opportunity for continuous improvement and to enhance project environmental performance.

Complaints will be dealt with and resolved as soon as possible to prevent harm to people, the environment and local amenity and to minimise potential for prosecution by regulators. All complaints will be recorded in the Complaints Management System.

As required, complaint details (including type and preventative/corrective actions) will be communicated to site personnel via Pre-start Meetings, Environmental Alerts or Toolbox Talks as appropriate.

Information recorded for each complaint will include (but not be limited to) the following items:

- The date and time of complaint
- The means by which the complaint was lodged
- Personal details of the enquirer or complainant or members of group.
- Nature of the enquiry or issue of concern
- Any actions taken to address the enquiry or complaint or members of group
- Any documentation relating to the enquiry or complaint or event.

All complaints will be actioned within an appropriate or agreed timeframe of receiving the complaint.

Applicable Procedure(s)

- G-QM-PR-00179 Customer Satisfaction and Complaint Management Procedure

15.2 Incident Reporting and Investigation

All project and subcontractor personnel shall report all environment incidents and near misses regardless of size and severity to their Supervisor immediately. An Environment Incident Report and Investigation will be completed for every incident and near miss.

For this project an Environmental Incident is considered to include the following but not limited to;

- A pollution incident (i.e. dust, noise, hydrocarbon spill, water pollution) that results in a complaint from a regulator or community member
- There is the potential for a legal breach
- Significant impact on people or the environment (flora and fauna) has been/ may be caused by the incident
- Native vegetation is accidentally or unintentionally damaged or removed
- Impacts on indigenous or non-indigenous heritage aspects
- Injury or fatality to a native fauna species (including listed species).

An environmental investigation may include the following basic elements depending on the size and severity of the incident:

- Identifying the cause, extent and responsibility of the incident;

- Identifying and implementing the necessary corrective action;
- Identifying the personnel responsible for carrying out the corrective action;
- Implementing or modifying controls necessary to avoid a repeat occurrence of the incident;
- Recording any changes in written procedures required;
- Advising the relevant stakeholders, if any substantial pollution has occurred (reporting of incidents to regulatory authorities).

The Project must ensure all incidents are documented and entered into the incident management database (ASPiRE) to allow incident actions to be monitored implemented within the specified timeframes. All incidents must be reported and investigated to prevent further incidents from occurring as per G-HS-PR-000153 Incident Management.

Investigations will take place as soon as possible after the incident has occurred. All incident investigations will focus on identifying the causes of the incident so that appropriate remedial and preventative control measures can be identified and implemented.

The Root Cause Analysis process will be used in incident investigation to determine the cause(s) of an incident or near miss, so that a repeat of the incident can be avoided. The “root” causes of an incident are system level causes that can reasonably be identified and that we have control to fix or rectify.

The Zinfra prescribed incident investigation method is ICAM (Incident Causation Analysis Method) and an alignment to ensure the Client’s investigation method requirements are complied with must occur.

The level of investigation and reporting required shall be in accordance with Zinfra requirements. The depth of the investigation, the composition of the investigation team and the reporting requirements will vary subject to an assessment of the actual and the potential severity of consequences. Final investigation reports will be completed with a time-frame appropriate for complexity of the incident or as per project contractual requirements.

Upon the completion of the investigation, the findings and recommendations must be distributed to the relevant work groups for discussion at a toolbox meeting. All incidents and the results of the subsequent investigation will be tabled and reviewed at the next Project management review meeting.

15.3 Incident Notification

All incidents must be reported immediately to the Site Supervisor, who will then notify the Cosntruction Manager and Project Manager accordingly.

Notification timeframes in line with WHS notifications are listed below:

- Notification - 1 hour
- Initial incident report - 24 hours
- Draft for comment - 5 working days from the date of the incident
- Final version - 10 working days from the date of the incident

A completed Environment Incident Register must be submitted to TransGrid within 3 working days of the incident taking place. Where relevant this may need to be updated in response to any protracted investigation.

The Project has a specific G-HS-FM-00678 HSEQ Incident Management Matrix that indicates the response required and whom to contact if an incident occurs.

15.4 Notifiable Incident Reporting

In accordance with Commonwealth and State Legislation, the Regulator will be notified of incidents where material harm to the environment is caused or threatened. Zinfra will report notifiable incidents to TransGrid in a timely fashion to allow them to notify the appropriate authorities.

15.5 Significant Incident Alert and Lessons Learnt

In line with Zinfra's culture of being a learning organisation, Significant Incident Alerts and Lessons Learnt will be shared in order to encourage a high level of awareness across all Zinfra's Projects and workplaces and to improve the Projects' Environmental Management.. The Project must comply with Zinfra's procedures on development and dissemination of alerts and lessons learnt.

For Potential and Actual Level 4 and 5 incidents, the Project must prepare a Significant Incident Alert and submit it to the Business HSEQ Manager to record and raise awareness of the incidents occurrence. This also aids in eliminating the potential of a similar scenarios arising in another part of the organisation. Upon receiving a Significant Incident Alert, the Project will review the alert, determine its relevancy and take any preventative actions deemed necessary.

Lessons Learnt issued from Zinfra's Corporate division as a result of significant environmental incident investigations will be reviewed along with the required actions. The level of relevancy to the Project is to be determined and communicated to the Project.

Applicable Procedure(s)

- G-HS-PR-000153 Incident Management

15.6 Non-Conformance, Preventative and Corrective Actions

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

A non-conformance occurs when an operation or system does not comply with control standards or limits specified. For the Project, non-conformances relate to any departure from a requirement of this CEMP, or any activity that has the potential to breach a regulatory requirement or have an adverse impact on the environment.

Non-conformances may be identified by anyone involved with the site construction and operation including the public, construction management personnel, employees, visitors, sub-contractors and external auditors. Where a non-conformance is identified through monitoring or otherwise reported it will be documented in the Zinfra incident management database.

Non-conformances can be either potential or actual and are identified and raised through such processes such as monitoring, inspections/ audits, incidents and complaints. This mechanism also allows for opportunities for improvement to be identified and acted upon.

There are two types of non-conformances; Minor and Major. Minor non-conformances occur when isolated discrepancies are found between what has/is required and what has/is occurring. A minor non-conformance does not have the potential to cause significant adverse environmental effects. A Major non-conformance occurs when the ability to control the process or product has been significantly reduced.

Corrective and preventative actions raised in relation to incidents and near misses will be entered, tracked and closed out through ASPiRE.

In the event that the client issues a non-conformance to the Project, it will be managed as per the Contract and closed out within the agreed timeframe.

Applicable Procedure(s)

- G-QM-PR-00574 Corrective, Preventative and Improvement Action

16 Records And Reporting

In accordance with Zinfra's Document Management procedure project records will be maintained to provide evidence of conformity to contractual requirements, regulatory requirements and to demonstrate the effective implementation of the EMS.

Such records may include, but are not limited to the following:

- Correspondence to/ from the Client and interested parties
- Permits To Work, Licenses and Approvals
- Induction and Training Records
- Inspection and test documentation, including daily/weekly inspection checklists and monitoring results
- Environmental Action Tracking Register (ATR)
- Meeting Records
- Non-conformance & Corrective Action Registers / Reports
- Public complaints and responses
- Environmental Incidents
- National Greenhouse and Energy Reporting Scheme records (NGERS)
- Waste Management and recyclable content data
- Monthly environmental reports
- Internal and external reviews and Audit Reports

Records shall be legible, identifiable and accessible to those persons required to maintain records to show conformance to meeting contractual and legislative requirements

16.1 Documentation and Records

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

The Project Manager shall maintain records to demonstrate conformance with the CEMP.

Records can be in the form of hard copy media or they can be in electronic or other media. Records to be retained include Training Certificates and Records, Project Inductions, Toolbox Meeting, HSEQ meeting Minutes, Incident Investigations and Reports, Site Inspections, Project Plans, Safety Data Sheets and Certificates supplied by subcontractors.

Applicable Procedure(s)

- G-QM-PR-00103 Records Management

16.2 Monthly Environmental Reporting

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

Monthly reports will be prepared covering all aspects of the project including, procurement, commissioning and completion.

The Environmental Representative shall prepare a summary report on the status of design and construction activities in relation to environmental activity and supply relevant documentation on environmental matters on a

monthly basis or as required by the Client or the contract. This report may also be provided to the Client and Stakeholders.

The monthly report will also be useful in identifying any recurring issues or impacts, to develop environmental training programs and identify areas of the EMS that may require review.

The report may include details on but not limited to:

- Updates on key design and construction activities in relation to environmental activity;
- All cases of non-compliance with environmental obligations;
- Inspections by agencies and actions resulting from the inspection;
- Actioning and reporting of all incidents;
- Frequency of environmental checklists and actioning of concerns;
- Any Client issues not addressed;
- Monitoring results;
- NGERS Reporting;
- Waste Management and recyclable content data;
- Complaints;
- Audits conducted (internal and external).

The Project must report its environmental performance information to its Business Unit by COB first working day of each month and the Client according to a predetermined schedule.

Applicable Procedure(s)

- G-HS-PR-00305 HSEQ Performance Monitoring and Reporting
- G-HS-PR-50206 Project HSEQ Reporting

17 Continuous Improvement

17.1 Management Review

Management Review ensures that environmental performance is monitored, measured, analysed and reported appropriately to internal and external stakeholders, to both benchmark current performance and provide the basis for continuous improvement.

The review will consider (but not be limited to) the following:

- Site personnel comments
- State or independent reviewer comments
- Audit findings
- Environmental monitoring records
- Complaints and feedback
- Details of corrective and preventative actions taken
- Environmental non-conformances, environmental inspection notices, inspection reports, and non-conformance register

- Incident reports
- Changes in organisation structures and responsibilities
- The extent of compliance with objectives and targets
- The effect of changes in standards and legislation
- Co-ordination of environmental management of subcontractors.

The framework for the EMS improvement in Zinfra is based on the 'Plan-Do-Check-Act' methodology.

17.2 Document Review

In addition to the EMS review, all related system documentation will be reviewed to ensure compliance with project objectives, targets and performance criteria.

Environmental documentation will be revised if:

- There are relevant changes to environmental conditions or generally accepted environmental management practices
- Previous unforeseen environmental risks are identified
- Previously unidentified areas of contamination are discovered
- There is a change in relevant legislation that impacts on either the design outputs or construction activities
- There is a formal request made by the Client and/ or Regulator to make modifications
- There is a non-conformance relevant to the CEMP (not of minor nature).

17.3 HSEQ Management System Audit

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

A schedule of internal and external audits that focuses on the effective application of this Plan and the EMS will be developed, implemented and maintained accordingly. This may include Client or third party audits. In addition, this CEMP will be reviewed to reflect improvements or modifications as they occur throughout the duration of the Project and after consultation with stakeholders. Any changes will be approved by the Project Manager.

Additionally, the Zinfra Business Unit will periodically assess the effectiveness of the application of this CEMP. The first audit (Project Start up Audit) is scheduled for three (3) months after the commencement of work on Site. The close outs of any Corrective Actions (CARs) arising from these audits will be monitored by the Business Unit HSEQ Managers and implemented by the PM.

All Corrective Actions will be entered into the incident and inspection management database to track responses and progress until they are successfully completed and closed-out.

The outcomes of any audit will be documented and noted (including any non-conformances, 'opportunities for improvement') within an HSEQ Audit Report. Adverse or non-conforming activities requiring corrective action will be noted in the format given below

- Major NCR - A total absence of the criteria for conformance with the nominated standard; or a situation that raises significant doubt as to the effectiveness of the management system to achieve its intended outputs.
- Minor NCR - Departure from a particular system requirement, or failure to consistently implement a requirement.
- Objective evidence - Qualitative or quantitative information, records or statements of fact pertaining to the quality of an item or service or to the existence and implementation of a management system element, which is based on observation, measurement or test.
- Observation - An area of concern which if not addressed, may lead to a system deficiency which may result in a non-conformance.

Applicable Procedure(s)

- G-HS-PR-50208 Project HSEQ Auditing

Part B – Environmental Aspect and Impact Controls

18 Environmental Aspect and Impact Controls

18.1 Environmental Aspect and Impact Framework

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

Zinfra's vision for environmental management on projects is to protect the environment through the mitigation of impacts that could lead to damage.

The Zinfra HSE Risk Management Framework is applied during the planning, implementation and review of all work activities on the project.

It outlines the hierarchy of risk assessment applied throughout Zinfra as seen in the diagram on the right.

Applicable Procedure(s)

- G-HS-PR-00004 Health, Safety and Environment (HSE) Risk Management

18.2 Key Project Environmental Aspects

There are significant environmental risks and hazards associated with construction activities. This section identifies and addresses the key environmental aspects that form part of the environment management process for the Project. The mitigation and management measures for each aspect are addressed in detail in Section 19.

All environmental management and mitigation measures will be established in accordance with this CEMP, DA Permit , EIS conditions Part D and the following sub plans.

- Biodiversity and rehabilitation management plan
- Weed management plan
- Tree management and revegetation plan
- Construction Traffic management plan
- Construction noise and vibration management plan
- Heritage management plan
- Soil, water and contaminated land management plan
- Construction air quality management plan
- Waste and recycling management plan
- Construction emergency response plan

- Hazardous materials management plan
- Emergency response plan
- Flora and Fauna management

18.2.1 Climate Risk

Potential climate change impacts on the construction and operation of the proposed Stockdill Substation and associated transmission infrastructure have been considered in the EIS.

Potential mitigation measures during the construction and operation of the include;

- monitoring weather forecasts and specific weather warnings
- positioning fire extinguishers at site offices and within construction vehicles (in case of bushfires)
- being alert to fire warnings and notices
- keeping the construction site clear of debris wherever possible (in case of severe winds)
- considering specific measures for wet season as part of the broader ESCP
- ensuring major earthworks are planned to reasonably not coincide with periods of expected rainfall or high winds.

The ACT Emergency Services Agency (ESA) has declared that bushfire season will begin one month early – on 1 September 2018 – due to forecast dry conditions.

Traditionally, the bushfire season commences on 1 October and runs through until 31 March, unless conditions warrant a variation. After assessment of the current conditions and consideration of forecast weather, the ESA Commissioner has made the decision to start the ACT bushfire season early.

The Bureau of Meteorology has advised a predicted El Niño event may produce hotter and drier conditions as we head into summer and unless the future outlook starts to suggest a different situation, predicted elevated risks to the ACT from heatwave, wildfire and dust storms are likely.

Bush fire prevention will be undertaken in accordance with G-EN-PR-00047 Bushfire Prevention Procedure and G-EN-FM-50243 Bushfire Prevention Inspection Checklist. Total fire bans will be monitored and observed at all times.

18.3 Consultation with landowners

Consultation will continue throughout the entire project from planning and design through to construction and completion of the new substation and associated transmission lines, providing opportunities for stakeholders to comment on the project at various stages.

The key stakeholders for the Project include:
Primary stakeholder;

- Land/lease holders and land managers potentially impacted directly by the Project
- ACT Government and Riverview Group as developers of the West Belconnen land release area
- Representative Aboriginal Organisations (RAOs)
- Community and recreational groups affected by the Project including:
- Conservation Council
- Ginninderra Catchment
- ACT Equestrian Association
- Belconnen Community Council.

Secondary stakeholders:

- Land/lease holders and land managers potentially impacted indirectly by the Project (i.e. adjacent to the Project or which may have distant visual impacts etc.)
- Local business

- Community and environmental groups/organisations
- Federal Government agencies and representatives
- Internal ACT Government
- Utility providers, including Icon Water.

Landowners will be consulted regarding the schedule of works prior to the commencement of works at their property and ongoing through the construction program. At least seven days' notice will be provided before commencement at new work areas to allow landowners to plan any stock movements or other activities on their land which may conflict with the construction works.

18.3.1 Communications Approach

The principles of this are to implement a number of controls to minimise impacts to the community:

- Minimisation of Impacts – Potential impacts on the community will be controlled through construction scheduling and compliance with this CEMP
- During construction, Zinfra will engage with stakeholders on day-to-day construction activities and report to TransGrid any significant communication with Stakeholders
- Complaints, Enquiries Feedback and Actions Management – a number of mediums such as phone calls, email and letters will be utilised to communicate, document and maintain any complaints ,enquiries and feedback. Actions arising from these complaints and enquiries will follow the process as outlined in Section 15 to ensure actions are closed out in a timely manner.
- Notifications and Awareness –notifications will be undertaken to inform BCG, community and key stakeholders of any potential impacts in relation to project activities.

The substation site and the new transmission line alignments are on rural leases (greenfield areas) and are therefore anticipated to have limited impacts on the wider local community (i.e. the suburbs of Holt and MacGregor).

A Project newsletter was sent out by TransGrid to affected properties on 28 July 2015 to inform all property owners of the Project and provide them with an overview of the Project. An additional newsletter was also distributed to affected land owners and other key stakeholders in June 2017.

Discussions with affected land owners regarding leasing agreements for transmission line easements have been undertaken by TransGrid.

18.3.2 Air Emissions

As a result of land disturbance required for the development and construction of the transmission line and substation there is a potential to create nuisance dust effects on surrounding areas/neighbours. There is also potential for further air emissions from diesel exhaust emissions from vehicles and machinery. These impacts and the proposed mitigation measures are considered in the Air Quality Sub plan.

18.3.3 Waste

Multiple waste streams will be generated throughout the construction phase of the Project as follows;

- General industrial waste;
- Steel;
- Soil and rock from excavations, after maximum beneficial use elsewhere onsite or as agreed with the Client, at potential offsite locations;
- Putrescible waste;
- Glass and aluminium form;

- Paper and cardboard;
- Sewage and effluent;
- Contaminated soil;
- Contaminated absorbent materials; and
- Hydrocarbon waste.

All waste will be managed in accordance with the waste management hierarchy which states that waste should be managed in accordance with the following order;

1. Avoidance
2. Reduce
3. Re-use
4. Recycling
5. Recovery
6. Disposal

Mismanagement of waste can result in pollution of land and waters in the surrounding landscapes and increases in pest populations. An appropriately licensed contractor will be engaged for waste management and the Waste Management Procedure (G-EN-PR-30143) and Waste Management Sub Plan will be implemented for the duration of the Project.

18.3.4 Dangerous Goods and Hazardous Substances

Hazardous substances will be appropriately managed to reduce the potential risk of environmental/ human harm during construction of the Project. Hazardous substances used and generated during construction will include, but are not limited to, petroleum products and chemical materials. Hazardous material may broadly be defined as any substance or article (solid, liquid, gas) that poses a threat to human health and/or the environment. Typically, hazardous materials are toxic, corrosive, flammable, explosive or radioactive. When misused or mismanaged, they can adversely affect the environment and our health and safety. Typical hazardous materials that may be used or generated onsite during the course of construction include, but are not limited to;

- Gasoline/diesel fuel and oils;
- Oil/lubricants;
- Solvents and thinners;
- Paints/coatings;
- Glues/adhesives;
- Batteries; and
- Oil contaminated soil and used oil

Dangerous goods and hazardous substances will be stored in accordance with AS1940-2004 and Safety Data Sheets (SDS) will be available at the storage location and at the site office. All hazardous substances will be contained within a bunded area, protected from stormwater incursion and located away from drainage lines and at least 50m from waterways. Regular spill response training toolboxes will be conducted.

18.4 Project Health, Safety and Environment Risk Register

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

The Project HSE risk register forms the basis of environmental aspect and impact management. The intention of this register is to identify aspects and impacts that apply across the entire Project. The mitigation measures/controls are described in broad terms and often refer to information and checks that must be completed prior to work commencing.

The Project HSE risk register will be developed by the Project team prior to commencement of works. The aspects and impacts recorded in the register will be dependent on the design risk assessments, scope of work, client requirements as well as relevant environmental protection requirements such as permits and approvals. Appropriate controls will be documented and residual risk assessed.

The Project HSE risk register will be reviewed on an annual basis and following significant events.

The Project HSE risk register will be communicated to subcontractors as applicable to their scope of work and contract requirements. The aim is to ensure Subcontractors have equal to and/or better controls in their risk management methodologies.

Applicable Procedure(s)

- G-HS-PR-00733 Project Contract HSE Risk Management (HSE Risk Register)

18.5 Pre-Start Site Risk Assessment

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

The Pre-Start Site Risk Assessment is designed to complement the Project HSE Risk Register, whereby time is taken prior to the start of an activity to review the work specific environmental aspects and impacts.

The work crew must be included in the process to ensure critical environmental information is communicated and also use their knowledge to identify any additional aspects.

The Pre-Start Site Risk Assessment must be conducted on a daily basis at the start of field work and repeated when there is a change in work scope or conditions. The process aims to:

- Communicate site requirements and HSE controls (e.g. Permits, plans/studies and drawings)
- Identify job site specific aspects not captured and managed in the HSE Risk Register

Applicable Procedure(s)

- G-HS-PR-00507 Pre-Start Site Risk Assessment

19 Project-Specific Control Measures

PM	CM	SS	HSEQ	ENG	PR	SUB	PA	W

Zinfra Environmental Procedures have been established to manage “Extreme” and “High” impacts. These procedures are in addition to the sub plans.

These documents are fundamental to Zinfra demonstrating its environmental due diligence and legal compliance to include minimum requirements to manage identified aspects and impacts. Project-specific environment control measures are listed in the sections below.

The following issues are the key potential environmental risks relating to the Project:

- Soil management - Deposits of soil/sediment and other substances to watercourses, impacting upon water and land quality
- Potential damage to flora and fauna
- Impact on visual amenity values of the area

- The potential spread of weeds and pests as a result of works
- Impact of works on Aboriginal and cultural heritage values
- Waste management - Appropriate management of waste streams during and post construction
- Management of hazardous materials on site
- Bushfire Management
- Concrete washout
- Potable water/ stormwater harvesting and energy related impacts
- Dewatering
- Spoil Management
- Flora and Fauna management

19.1 Construction and Site Works Management

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.1.1	All construction and site works will be undertaken such that activities and processes comply fully with Zinfra, TransGrid and all regulatory authority requirements.	Pre-Construction / During/ Post Construction	As required	**PM**	**All**
19.1.2	All soil subject to disposal from the site must be assessed in accordance with EPA Information Sheet 4 - Requirements for the reuse and disposal of contaminated soil in the ACT.	During	As required	**HSEQ**	**PE**
19.1.3	Consultation will occur with EPA prior to soil disposal from site.	During	As required	**HSEQ**	**PE**

Reference(s)

- Project Management Plan

19.2 Hydrocarbon, Hazardous Substance and Refuelling Management

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.2.1	Prior to the commencement of site activities, HSE personnel are to be advised of all hydrocarbons and chemicals considered likely to be used during project activities and stored on site. These must be approved and entered in the ChemAlert database before use.	Pre-Construction	As required	**CM**	**HSEQ, SS**
19.2.2	All hazardous materials bought to site must be accompanied by the relevant Safety Data Sheets (SDS), a copy of which is to be kept by the HSE personnel.	During	As required	**CM**	**HSEQ, SS**

19.2.3	Ensure the SDS are available on site and easily accessible at all times during the course of the project	During	During, post-construction works	**HSEQ**	**SS**
19.2.4	Fuel, oil and other chemicals that are stored on site will be stored within a bund(s), capable of retaining at least 110% of the largest container within it, with an impervious floor, in an area that is not subject to flooding in accordance with current Australian Standard 1940 and this CEMP	During	As required	**CM**	**SS, PM, HSEQ**
19.2.5	Onsite refuelling is to be minimised, with drip trays to be used at all times. Spill control equipment is also to be nearby during any refuelling activity and near any plant/equipment	Pre/ During Construction	As required	**CM**	**SS, PM, HSEQ**
19.2.6	All storage containers and areas shall be appropriately labelled	During	As required	**CM**	**SS, PM, HSEQ**
19.2.7	In the event of a leak of Fuel, oil and hydraulic fluids from machinery, the leak and contaminated area shall be immediately cleaned up. Disposal of the affected material to the nearest licensed waste depot and reported immediately.	During	As required	**PM**	**SS, PM, HSEQ**
19.2.8	Waste oil or chemical will be stored in sealed containers in bunded areas for collection and disposal by a licenced waste disposal contractor.	During	Daily, Weekly	**SS**	**HSEQ, PM**
19.2.9	Material used in spill clean-up must be removed once product is absorbed and stored in sealed container for disposal off-site by a licensed contractor.	During	As required	**SS**	**HSEQ**
19.2.10	Store and handle fuels and hazardous materials in accordance with applicable legislative requirements and relevant guidelines.	During	Daily, Weekly	**SS**	**HSEQ, PM**

Reference(s)

- G-EN-PR-50244 Hazardous Substance Management Procedure
- Hazardous Substance Management Plan

19.3 Fire Prevention and Emergency Response Management

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.3.1	Site Risk Assessment must consider bushfire risk with the use of any plant or equipment in any area with dry/combustible vegetation or Total Fire Bans	Pre-Construction	As required	**PM**	**CM**

19.3.2	Ensure no construction activities on or near to vegetation occur on days with a fire danger rating of extreme or Code Red.	Pre-Construction/ During	As required	**CM**	**CM, SS**
19.3.3	Avoid using heavy plant/slashing/mulching in weather with strong dry wind, and warm to hot temperatures	During	As required	**CM**	**HSEQ, SS**
19.3.4	Monitor Alerts from Rural fire service for total fire ban warnings	During	As required	**HSEQ**	**CM, SS,**
19.3.5	Hot work to be suspended during Total Fire Bans until approval provided by the CFA	During	As required	**CM**	**PM, SS, HSEQ**
19.3.6	Smoking only permitted in designated 'Smoking Areas' on Site. All cigarette butts must be appropriately disposed of in the waste facilities provided.	During	As required	**CM**	**SS**
19.3.7	Demarcate emergency assembly areas on site plans by using signage throughout the site.	Pre-Construction	As required	**PM**	**CM, SS**
19.3.8	Ensure the emergency egress route is communicated and not affected by the project works.	During	As required	**CM**	**SS**
19.3.9	Provide fire suppression equipment in accordance with appropriate guidelines for construction activities.	During	As required	**PM**	**SS**
19.3.10	Provide induction training for all personnel that includes the emergency procedure to be followed in case of a fire event and roles and responsibilities.	During	As required	**HSEQ**	**CM, SS**

Reference(s)

- G-EN-FM-50243 Bushfire Prevention Inspection Checklist
- G-EN-PR-00047 Bushfire Prevention Procedure
- Emergency Response Management Plan

19.4 Native Vegetation Management

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.4.1	Site Induction shall include any native vegetation information / requirements	Pre-Construction	N/A	**PM**	**HSEQ**
19.4.2	Vegetation will be clearly delineated to be retained and protected as no-go zones where applicable. Suitable visual and/or physical barriers will be used to ensure no unauthorised intrusion into these areas.	Pre-Construction	As required	**CM**	**HSEQ, PM**
19.4.3	Vegetation to be removed will be clearly delineated and surveyed pre and post removal to	Pre & Post Construction	As required	**CM**	**HSEQ, PM**

	ensure compliance with the Planning Permits. A register will be kept to track removal.				
19.4.4	Construction vehicles and equipment will be required to use designated tracks and work areas wherever practicable.	During	As required	**CM**	**HSEQ**
19.4.5	Spoil from the building work and materials needing to be stockpiled, is to be stored on land free of native vegetation, with a minimum buffer distance of 5m from any vegetation.	During	As required	**SS**	**HSEQ, CM**
19.4.6	Significant trees/vegetation in close proximity to works must be protected by temporary fencing/barricading at/beyond the drip line	During	During clearing works	**CM**	**HSEQ, SS**
19.4.7	Plant/equipment received onsite must be free of soil/organic matter to prevent introduction of weeds, inspected and documented in a site diary (or similar) as being clean on arrival	During	On entry to site	**CM**	**HSEQ, SS**
19.4.8	Materials/equipment lay-down areas established and clearly marked at each work site to prevent damage to surrounding trees/vegetation	Pre-Construction	Prior to works commencing	**CM**	**HSEQ, SS**
19.4.9	All vehicles shall observe and follow the designated site speed limit, and remain to the designated roads to avoid collisions with fauna or damage to flora	During	As required	**CM**	**PM**

Reference(s)

- Biodiversity and rehabilitation management subplan
- G-EN-FM-50393 Vegetation Clearing and Site Establishment Checklist
- G-EN-FM-50385 Unexpected Heritage, Flora or Fauna Item Form

19.5 Weed Management

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.5.1	Site Induction shall include any vehicle hygiene and weed control requirements.	Pre-Construction	N/A	**PM**	**HSEQ**
19.5.2	Construction vehicles and equipment will be required to use designated tracks only.	During	As required	**CM**	**HSEQ, SS**
19.5.3	Plant/equipment received onsite must be free of soil/organic matter to prevent introduction of weeds, inspected and documented in a site diary (or similar) as being clean on arrival	During	On entry to site	**CM**	**HSEQ, SS**
19.5.4	Implement measures to prevent the spread of weeds and pathogens procedures for all vehicles, equipment and footwear.	During and Post Construction	As required	**CM**	**HSEQ, SS**

19.5.5	Weed disposal protocols in accordance with EPA requirements	During	As required	**CM**	**HSEQ, SS**
19.5.6	Prior to entry to properties, crews will attend a toolbox talk on landholder weed and access requirements.	Pre-construction, During	Prior to entry	**CM**	**HSEQ, PM**

Reference(s)

- Weed Management subplan
- G-EN-PR-00081 Weed and Diseases Procedure
- G-EN-FM-00077 Vehicle Clean-Down Checklist

19.6 Fauna Management

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.6.1	Wildlife will not be handled wherever possible. Construction staff will only handle wildlife in an emergency situation. Uninjured wildlife would be gently encouraged to leave the site by the ecologist/ wildlife specialist. Injured wildlife would be taken to a local WIRES carer or veterinarian for treatment and care if necessary.	During	As required	**CM**	**HSEQ, SS**
19.6.2	No-go zones will be established and clearly delineated by suitable visual and/or physical barriers to ensure no unauthorised access to fauna sensitive habitats and areas.	Pre-Construction	As required	**PM**	**SS, HSEQ**
19.6.3	Communication with construction personnel of the conservation value of surrounding habitats and their responsibilities with regards to protecting these habitats during construction. All personnel shall be made aware of the proper response to wildlife encounters via the induction process.	Pre-Construction	As required	**HSEQ**	**HSEQ, SS,CM**
19.6.4	Fill any trenches and excavations as quickly as possible. Inspect prior to backfilling.	During	As required	**SS**	**HSEQ, CM**
19.6.5	Where trenches or excavated holes are to be left overnight, a ramp is to be placed to ensure native fauna can egress the excavation. Where this is not practical e.g. bored pier, the excavation shall be covered or fenced.	During	As required	**SS**	**HSEQ, CM**
19.6.7	All vehicles shall observe and follow the designated site speed limit, and remain to the designated roads to avoid collisions with fauna,	Pre-Construction, During, Post-Construction	N/A	**SS**	**HSEQ, CM**
19.6.8	Drivers shall conduct a visual inspection for fauna in and around vehicles, truck and heavy machinery prior to moving equipment	During	As required	**SS**	**HSEQ, CM**

19.6.9	Complete inspections, including indirect observations (tracks, scats etc.) of the open trench will be conducted each day prior to the commencement of each sections' construction activities	During	Daily	**SS**	**CM, HSEQ**
19.6.10	Dust suppression trucks are to be utilised where feasible to minimise emissions impacting adjacent flora and fauna	During	Daily, Weekly	**SS**	**PM, CM**

Reference(s)

- G-EN-FM-50393 Vegetation Clearing and Site Establishment Checklist
- G-EN-FM-50385 Unexpected Heritage, Flora or Fauna Item Form
- Biodiversity and rehabilitation management subplan

19.7 Traffic Management (including Haul Roads and Upgrades)

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.7.1	Traffic management plan will be developed and implemented to cover all Project work areas to avoid local traffic disruptions and maintain safe conditions for Project personnel and public road users.	Pre-construction	As required	**PE**	**CM, PM, HSEQ**
19.7.2	Management of parking of construction machinery and workers vehicles to avoid causing adverse impact on nearby properties.	During	As required	**SS**	**CM, PM, HSEQ**
19.7.3	The condition of roads and road infrastructure in the vicinity of site access points will be assessed prior to site establishment	During	As required	**PM**	**HSEQ, CM, SS**
19.7.4	Delivery of materials will be undertaken in accordance with the TMP. Transport logistics manifestos will be provided to Councils where required to inform the local community of increased traffic movements.	Pre and during construction	As required	**PM**	**HSEQ, CM, SS**

Reference(s)

- G-HS-PR-00746 Working In Or Near Traffic HCP
- G-HS-PR-50171 Driving Vehicles
- Traffic Management Plan

19.8 Cultural Heritage Management

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.8.1	Prior to commencement of works, items of heritage significance shall be located and identified, construction practices modified to	Pre-Construction	As required	**PM**	**CM**

	minimise disturbance. Protect known sites of Aboriginal significance where impacts can be avoided.				
19.8.2	Heritage site areas identified in close proximity to construction activities are to be pegged and flagged off and marked as no-go zones prior to construction activities commencing	Pre-Construction	Prior to, during, post-construction works	**PM**	**SS, HSEQ**
19.8.3	All Project personnel to have completed Cultural Heritage Induction	Pre-Construction	As required	**PM**	**ALL**
19.8.4	In the event an item of potential Cultural heritage is suspected, all work in the vicinity must stop and the Zinfra Site Supervisor and TransGrid Representative be contacted immediately.	Pre-Construction During	As required	**PM**	**ALL**
19.8.5	Consultation with traditional owners/heritage groups undertaken where required, agreement on monitoring prior to commencement of works.	Pre-Construction	As required	**TG**	**HSEQ**
19.8.6	If previously unknown Aboriginal or European heritage items/areas identified during construction, cease works immediately. Site Supervisor, Project Manager, HSEQ Advisor notified immediately, notify TransGrid to enable them to contact relevant authorities	During	Immediately	**W**	**SS, PM, HSEQ**
19.8.8	All construction activities will be undertaken in accordance with the relevant Cultural Heritage Management Subplan	During	Ongoing	**SS**	**CM, PM**
19.8.9	Heritage site areas identified in close proximity to construction activities are to be pegged and flagged off and marked as no-go zones prior to construction activities commencing	Pre-construction, During	As required	**Tardis**	**SS, PM, HSEQ**
19.8.10	If a find is discovered during the conduct of activities; • Works will cease immediately in the vicinity and the Field Officer (if in attendance) or appropriate heritage contact will be notified as well as TransGrid Services • Barricading or flagging will be erected • Works may skip or go around the find if advice from the relevant persons is provided to do so If human remains are uncovered, the Human Remains protocol must be followed.	During	As required	**SS**	**HSEQ, PM, CM**

Reference(s)

- G-EN-PR-00049 Heritage Management Procedure

- G-EN-FM-50393 Vegetation Clearing and Site Establishment Checklist
- G-EN-FM-50385 Unexpected Heritage, Flora or Fauna Item Form
- Heritage Management Subplan

19.9 Landscape Management

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.9.1	Any contract conditions on site rehabilitation will be followed, ensuring that disturbed areas are free of litter and debris, rehabilitated as required, all temporary infrastructure removed from site and that all necessary records are recorded in the Project's document management system.	Post-Construction	As required	**PM**	**HSEQ**
19.9.2	Temporary fencing should ensure that vehicles and materials are not parked or stored within the drip line of the mature trees that are being retained on site	Pre-Construction	As required	**SS**	**HSEQ, CM**
19.9.3	Landscaping should include a number of *Eucalyptus blakleyi* replacement plants – in the vicinity of where the original tree is felled, however tree or shrub planting should not occur within the rocky native grassland which is the PTWL habitat	During	As required	**PM**	**HSEQ, CM**

Reference(s)

- Landscape Management Subplan

19.10 Clearing and Grubbing

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.10.1	Establishment and demarcation of no-go zones, sensitive work area sand designated access tracks.	Pre-Construction	As required	**PM**	**SS, HSEQ**
19.10.2	No removal and/or pruning of trees/vegetation unless an approval/condition issued by appropriate authority	During	Ongoing	**PM**	**SS, HSEQ**
19.10.3	If tree/vegetation clearing approved, clearing kept to absolute minimum (understory vegetation retained where possible)	During	During clearing works	**SS**	**HSEQ**
19.10.4	There is a need for the removal of one non-hollow bearing, *Eucalyptus blakleyi* tree, to allow for installation of the sediment basin, with the trunk and main branches of the felled tree to be left on site as a habitat feature	During	During clearing works	**SS**	**HSEQ**

Reference(s)

- G-EN-PR-00053 Flora, Fauna and Vegetation Management

- G-EN-FM-50393 Vegetation Clearing and Site Establishment Checklist
- G-EN-FM-50385 Unexpected Heritage, Flora or Fauna Item Form

19.11 Community Consultation Management

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.11.1	Consultation to the local community and all other relevant stakeholders will be undertaken to ensure that continued compliance to all requirements of this CEMP are met.	Pre-construction During	As required	**PM**	**CM, HSEQ**

19.12 Operational and Maintenance Management

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.12.1	No operations or maintenance of the infrastructure constructed by Zinfra is to occur by Zinfra, at this stage. Any changes to this will require an amendment to this section of the CEMP.	N/A	N/A	**PM**	PM

19.13 Waste and Energy

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.13.1	SDSs obtained and kept on site for all waste chemicals (information on SDSs communicated to affected staff)	Pre-Construction	Weekly	**HSEQ**	**SS, CM**
19.13.2	Controlled/Regulated Wastes disposed of at licensed EPA facilities and removed from site by EPA licensed sub-contractors	During	As required	**SS**	**HSEQ**
19.13.3	Establish concrete wash down areas and appropriate treatment systems to ensure no contamination of soil or waterways	During	Weekly	**SS**	**HSEQ**
19.13.4	All reasonable steps shall be taken to: • Avoid waste generation • Reduce waste and to keep waste to a minimum • Recover, re-use and recycle waste • Use recycled products where appropriate and where technical – specifications allow	During	As required	**W**	**SS**

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
	• Dispose of waste/s that cannot be reduced/ re-used/ recycled, to an appropriately designed and licensed waste facility				
19.13.5	All project areas will be well maintained and cleared of any litter. Housekeeping will be a component of daily prestart meetings as required and awareness programs will be conducted in the form of toolboxes and educational posters	During	Daily, Weekly	**SS**	**CM**
19.13.6	Where feasible, procurement processes will prioritise bulk orders to minimise packaging waste where possible unused materials and chemical containers are to be returned to the supplier for reuse	Pre-construction, During	During procurement process	**PR**	**PM**

Reference(s)

- G-EN-PR-30143 Waste Management
- G-EN-PR-00027 Controlled Waste
- Waste Management Subplan

19.14 Noise and Vibration

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.14.1	Except in unavoidable works and emergency situations, construction shall be undertaken during the following hours: Normal Working Hours: 7:00am – 6:00pm Monday to Friday 7:00am – 1:00pm Saturday	During	During noise-generating works	**HSEQ**	**SS**
19.14.2	Community consultation and notification shall be undertaken prior to the commencement of works. Affected communities will be kept informed of the nature of works and progress during the Project.	Pre-Construction	N/A	**PM**	**HSEQ**
19.14.3	Works scheduling shall be used to minimise noise to adjacent residents where practicable	Pre-Construction	During noise-generating works	**PM**	**CM**
19.14.4	Designated respite periods implemented at locations involving excessively noisy activities (e.g. rock breaking) for extended lengths of time	Pre-Construction	During noise-generating works	**PM**	**CM**

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.14.5	Plant/equipment appropriately silenced and maintained in accordance with manufacturer's requirements	Pre / During, Construction	Prior to operating plant/equipment	SS	HSEQ
19.14.6	Noisy machinery and equipment shall be switched off when not in use	During	As required	SS	W
19.14.7	Complaints relating to noise/vibration shall be directed to Site Supervisor and reported to TransGrid Services, addressed and resolved as soon as possible	During	As required	SS	PM
19.14.8	Local council, police and if applicable affected residents notified of intention to perform night works	Pre-Construction	During noise-generating works	SS	HSEQ

Reference(s)

- G-EN-PR-00055 Construction Noise & Vibration Management Procedure
- Construction Noise & Vibration Management Subplan

19.15 Air Quality

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.15.1	Stockpiling of soil shall be kept to a minimum practical level to minimise dust. Planning undertaken to ensure that a practical minimum amount of spoil and materials are stored on site at designated locations. Stockpiles to be covered or hydrseeded if required to be in location for 28 days or longer.	Pre-Construction	Daily	CM	SS
19.15.2	Period of time between excavating and backfilling minimised where possible.	Pre/During-Construction	As required	SS	CM
19.15.3	Vegetation clearing activities staged to minimise exposure to bare soil.	Pre/ During Construction	As required	PM	SS
19.15.4	Groundcover maintained particularly surrounding access tracks.	During	As required	SS	W
19.15.5	Stockpiles covered or watered down if dust is a risk.	During	Daily	SS	HSEQ
19.15.6	Disturbed areas and access roads visually monitored for dust generation.	During	During dry/windy conditions	SS	HSEQ

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.15.7	Dust suppression as required in dry/windy conditions.	During	During dry/windy conditions	SS	HSEQ
19.15.8	Complaints received relating to air quality/dust reported to Site Supervisor, TransGrid Services, addressed and resolved as soon as possible.	During	As required	SS	HSEQ
19.15.9	Appropriate speed limits will be established and enforced on site for all vehicles to reduce wheel generated dust, and dust from moving materials.	During	As required	SS	PM
19.15.10	Vehicular and machinery movements will be limited to designated roads and access track. Appropriate speed limits will be implemented on unsealed roads near sensitive receptors	Pre-construction, During, Post construction	Weekly report	SS	PM, HSEQ

Reference(s)

- G-EN-PR-00408 Air Quality and Dust Control
- Construction air quality management subplan

19.16 Demobilisation

	Project-Specific Environmental Controls	Construction Timing	Inspection	Responsibility	
19.16.1	Demobilisation activities will be planned and undertaken to ensure that continued compliance to all requirements of this CEMP are met	Pre-construction	As required	SS	CM, PM, HSEQ
19.16.2	All temporary structures, works and staging areas will be removed from site at the completion of the construction phase, or at an earlier time if they are deemed no longer necessary.	During, Post construction	As required	SS	CM, PM, HSEQ
19.16.3	The decommissioning of each construction area will include a general site clean-up and removal of all construction equipment and residual items.	During, Post construction	As required	SS	CM, PM, HSEQ

20 Document Control

Approval

The following table lists personnel who are responsible for authorising the document:

	Title	Name	Signature	Date
Owner:	Project Manager	Craig Gosney		19/02/19
Approver:	Environmental Manager	Dean Lal		19/02/19

Document History

The following table lists the changes made to this document:

Version	Date	Amended by	Comments
A	21/12/2018	[redacted]	Issued for Review/Comments to TransGrid
B	17/01/2019	[redacted]	Incorporation of TransGrid comments
C	20/02/2019	[redacted]	Issued for Review/Comments to TransGrid
D	05/03/2019	[redacted]	Issued for Review/Comments to TransGrid
E	21/03/2019	[redacted]	Incorporation of ACT Govt. comments
F	03/04/2019	[redacted]	Incorporation of ACT Govt. comments
0	05/04/2019	[redacted]	Approved for use by Client

Appendix 1 Environmental Management Plan Implementation Matrix

Environmental Management Plan Implementation Matrix Legends: P (Primary) S (Secondary)	Project Manager	Construction Manager	Site Supervisor	HSEQ	Engineer	Procurement	Subcontractors	Project Administration	Worker
9 Legislative and Regulatory Framework									
9.3 Project Environmental Approvals	P	S	S	S					
11 Training and Competency									
11.1 Training Management	S	S	S	P					
11.2 Environmental Management Plan Deployment	P	S	S	S	S				
11.3 Project Induction			P	S					
11.4 Site Establishment	S	S	P	S					
12 Managing Project and Operational Risk									
12.2 Environmental Objectives and Performance Criteria	P			S					
12.3 Environmental Aspect and Impact Controls	P	S	S	S	S		S		S
12.4 Emergency Management									
12.4.1 Emergency Response Plan	P	S		S					
12.4.2 Erosion and Sediment Control Plan		S		P					
13 Implementation and Operation									
13.1 HSEQ Subcontractor Management	S	S		S		P			
13.3 Communication and Consultation	P	S	S	S					
13.3.2 Client Meetings	P	S	S	S					
13.3.3 Tool Box Talks		P	S	S					
13.3.4 Daily Pre-Start Meetings	S	S	P	S	S		S		
14 Monitoring and Evaluation									
14.1 Environmental Inspections	S	P	S	S	S		S		
15 Events Management and Notification									
15.6 Non-Conformance, Preventative, Corrective Actions	P	S	S	S	S	S	S	S	S

Environmental Management Plan Implementation Matrix Legends: **P (Primary) S (Secondary)**	Project Manager	Construction Manager	Site Supervisor	HSEQ	Engineer	Procurement	Subcontractors	Project Administration	Worker
16 Records and Reporting									
16.1 Documentation and Records	P			S					
16.2 Monthly Environmental Reporting	P			S					
17 Continuous Improvement									
17.3 HSEQ Management System Audit	S			P					
18 Environmental Aspect and Impact Controls									
18.1 Environmental Aspect and Impact Framework	P	S	S	S	S		S		S
18.3 Project HSE Risk Register	P	S	S	S	S		S		
18.4 Pre-Start Site Risk Assessment		S	P	S			S		S
19 Project-Specific Control Measures	P	S	S	S	S	S	S	S	S

Appendix 2 Environmental Legislation

State	Legislation, Regulations and Guidelines
Cwlth	• *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* • *Environment Protection and Biodiversity Conservation Act 1999* • *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy 2012 • *Native Title Act 1993* • *National Environment Protection (Ambient Air Quality) Measure 1998* • *National Environment Protection (Movement of Controlled Waste between States and Territories) Measure 1998* • *National Environment Protection (Assessment of Site Contamination) Measure 1999*
ACT	• *Environment Protection Act 1997* • *Environment Protection Regulation 2005* • *General Environment Protection Policy 2016* • *Air Protection Policy* • *Contaminated Sites Protection Policy 2017* • *Hazardous Materials Protection Policy* • *Noise Protection Policy 2012* • *Water Quality Protection Policy* • *Water Resources Act 2007* • *Water Resources Regulation 2007* • *Nature Conservation Amendment Act 2016* • *Heritage Act 2004* • *Waste Management Strategy 2011-2025* • *Planning and Development Act 2007*

Appendix 3 Environmental Inspection Checklist

Form Name: **Environmental Inspection Checklist**
Document ID.: G-EN-FM-50416
Process Area: Environmental Management

Project / Workplace:		**Project No.:**	
Inspection Completed by :		**Inspection Date:**	

	Items Inspected	Satisfactory N/A	Satisfactory Yes	Satisfactory No	Action Closed (Initials)	Action / Comments
	Risk Management					
1.	CEMP readily available at worksite, signed off by appropriate personnel	☐	☐	☐		
	Hazardous Substances					
2.	Hazardous substances register/SDS available	☐	☐	☐		
3.	Hazardous substances bunded/locked storage cabinet, stored away from drainage lines/waterways	☐	☐	☐		
4.	Refuelling machinery onsite minimised, away from waterbodies	☐	☐	☐		
5.	Concrete disposal and/or Vehicle wash down facility contained/drainage protection in place	☐	☐	☐		
6.	Spill procedure/kit available with appropriate contents for chemicals/fuels stored	☐	☐	☐		
	Soil Management					
7.	Nearby waterways/stormwater drains identified	☐	☐	☐		
8.	Erosion and Sediment Control Plan for site (if required)	☐	☐	☐		
9.	Silt and sediment controls in place (silt socks/sediment fencing), in correct locations (downstream of works, between drainage lines, around stockpiles)	☐	☐	☐		
10.	Silt fencing clean, maintained and free of build up	☐	☐	☐		
11.	Topsoil and spoil stockpiled separately	☐	☐	☐		
12.	Disturbance to total area of ground surface minimised	☐	☐	☐		
13.	Disturbed soils and stockpiles protected against wind/rain (covered/contained if unworked > 20 days)	☐	☐	☐		
	Water Management					
14.	Dewatering of trenches adequate for site conditions (filter bags/grassed areas)	☐	☐	☐		
15.	No discharge of sediment-laden water to drains/waterways/offsite	☐	☐	☐		
	Traffic and Access					
16.	Traffic Control Plan available	☐	☐	☐		
17.	Site set up according to Plan, appropriate signage	☐	☐	☐		
18.	No restrictions to property access	☐	☐	☐		
19.	Site vehicle movements adhering to restrictions (hours/speed/only on approved access roads)	☐	☐	☐		
20.	Roads free from spillage (oil/soil)	☐	☐	☐		
	Noise and Vibration					
21.	Machinery/equipment noise and vibration levels controlled (mufflers etc.)	☐	☐	☐		

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Form Name: **Environmental Inspection Checklist**
Document ID.: G-EN-FM-50416
Process Area: Environmental Management

	Items Inspected	Satisfactory			Action Closed (Initials)	Action / Comments
		N/A	Yes	No		
22.	Work scheduling for noisy activities to minimise noise	☐	☐	☐		
23.	Nearby residents notified of noise-producing works/hours of operation managed	☐	☐	☐		
24.	Noise complaints reported to supervisor/client, managed appropriately	☐	☐	☐		
25.	Machinery/equipment switched off when not in use	☐	☐	☐		
	Air Quality and Dust Control					
26.	Site road surface adequate	☐	☐	☐		
27.	Dust suppression in place (roads/work areas watered down if required)	☐	☐	☐		
28.	Air emissions controlled at source	☐	☐	☐		
29.	Vehicle exhaust controls adequate (<10 second rule)	☐	☐	☐		
	Fire Management					
30.	Permit used for hot works in hazardous areas	☐	☐	☐		
31.	Hot works conducted away from sensitive environmental receptors (vegetation/waterways)	☐	☐	☐		
32.	Firefighting equipment in place	☐	☐	☐		
	Waste and Energy					
33.	Site clean and tidy, free from rubbish	☐	☐	☐		
34.	Skips/bins provided on site and not overflowing	☐	☐	☐		
35.	Separation of recyclable material	☐	☐	☐		
36.	Separate bins for potentially hazardous wastes (i.e. oils, chemicals)	☐	☐	☐		
37.	Contaminated waste managed appropriately (use of EPA Waste Transport Certificates if required)	☐	☐	☐		
38.	Waste and energy data collected (if required)	☐	☐	☐		
	Heritage					
39.	Permits and approvals obtained if known heritage items on site	☐	☐	☐		
40.	Identified heritage items (indigenous and non-indigenous) protected with flagging tape, 'no-go zone' signage	☐	☐	☐		
41.	Procedures for unexpected heritage item find	☐	☐	☐		
	Flora and Fauna					
42.	Permits and approvals obtained if known protected flora/fauna on site	☐	☐	☐		
43.	Protected areas of vegetation protected with flagging tape, 'no-go zone' signage	☐	☐	☐		
44.	No unauthorised tree/vegetation removal	☐	☐	☐		
45.	No materials laydown/site sheds/stockpiles within tree protection zones	☐	☐	☐		
46.	No mechanical trenching within tree protection zones	☐	☐	☐		

Form Name: **Environmental Inspection Checklist**
Document ID.: G-EN-FM-50416
Process Area: Environmental Management

	Items Inspected	Satisfactory N/A	Satisfactory Yes	Satisfactory No	Action Closed (Initials)	Action / Comments
	Weeds and Pathogens					
47.	All weeds identified and control measures in place (spraying/fencing)	☐	☐	☐		
48.	Vehicle and equipment wash-down area set up if travelling between properties	☐	☐	☐		
	Revegetation and Site Restoration					
49.	All disturbed areas restored to original condition	☐	☐	☐		
50.	Verges/driveways/roads free of any soil/debris	☐	☐	☐		
51.	Temporary access tracks restored	☐	☐	☐		
52.	Revegetation (if required) in accordance with CEMP	☐	☐	☐		
53.	Sediment controls remain in place in un-stabilised areas (in good working order)	☐	☐	☐		

To score an inspection checklist as part of an HSEQ Management Plan audit:

- Yes or N/A responses: score 1 point
- No responses: score 0 points

Total score= [53- (number of NO responses)]/53

Item	Findings and Recommendations for Improvement	Action For	By When	Date Rectified

Comments:

Appendix A Biodiversity and rehabilitation management subplan and Tree management and revegetation subplan

Appendix B Weed management subplan

Appendix C Construction Traffic management subplan

Appendix D Construction noise and vibration management subplan

Appendix E Heritage management subplan

Appendix F Soil, water and contaminated land management subplan

Appendix G Construction air quality management subplan

Appendix H Waste and recycling management subplan

Appendix I Construction emergency response subplan

Appendix J Hazardous materials management subplan

Appendix K Site Environment Control Plan – Example

Contents

1 Purpose

The purpose of this Plan is to minimise the potential for and impacts to, flora and fauna from physical interactions between plant and equipment and construction personnel during construction, operational and maintenance activities.

2 Scope

This Plan defines management strategies to minimise the potential for, and impacts to, native flora and terrestrial fauna (including seasonal or migratory fauna) from construction activities.

Native Flora and Fauna is protected under Commonwealth and State/Territory legislation, any removal of flora and fauna will require approval from the various Regulatory Authorities.

Some operations may also involve maintenance activities around established assets such as electrical and gas networks and pipelines and may require vegetation management. This is usually directed toward regrowth of vegetation and may involve thinning, lopping or clearance. Maintenance operations are generally focussed on ensuring the asset easements previously cleared remain cleared so that a 'line of sight' may be preserved and ready access is available for surveys and emergencies.

3 Responsibilities

Role	Responsibility
Group Manager Environment & Sustainability	• Provide Zinfra with advice in relation to flora, fauna and vegetation management and support the business units in complying with regulations.
Environmental Managers/ Advisors	• Provide training in this Plan, monitoring and reporting on the day-to-day operation of the Plan, regular auditing and updating this Plan.
Project Managers / Team Leaders	• Ensure all measures are implemented as per requirements detailed in this Plan and included in the project risk register, plans and induction. • Where there is an unexpected find of a flora or fauna item ensure that the procedure is followed including any notification.
Construction / Site Supervisors	• Coordinate implementation of this Plan on site.
All Employees and Contractors	• Ensure awareness of any sites adjacent to the works, minimise risk and report issues to their immediate supervisor.

4 Definitions

Term	Definition
Clearing and Grubbing	The removal, via any method, of surface material (e.g. vegetation and topsoil). This can include the removal/destruction of one single plant
EPBC Listed Flora	Flora listed as threatened species (extinct, extinct in the wild, critically endangered, endangered, vulnerable, conservation dependent) under the Environmental Protection and Biodiversity Conservation Act 1999
Interaction	Contact between vertebrate, invertebrate and subterranean fauna and the workforce

Invertebrate fauna	Spiders, scorpions, land snails, millipedes (and some subterranean fauna)
Non-indigenous Flora	Any flora species that have been introduced non-native flora to Australia, identified as environmental weeds
Native Vegetation	Plants that are indigenous to that area including trees, shrubs, herbs and grasses
Remnant Native Vegetation	Native vegetation that has not previously been cleared (i.e. not re-growth) and includes forest, woodland, native grasslands, mallee, coastal heathland, rainforest
Stockpile	A mound of organic material (either topsoil or vegetation) that has been set aside for use in rehabilitation
Threatened Flora and Fauna	Those species that have been defined as Critically Endangered, Endangered or Vulnerable in the various Commonwealth and State/Territory legislation
Vegetation	Any plant including: grass, shrubs, trees, tree stumps, tree roots, logs, seeds, brush
Vertebrate fauna	Mammals, reptiles, amphibians and birds

5 Legislative Requirements

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**) is the primary legislation for categorising and protecting endangered or threatened species in Australia. The EPBC Act has six categories:

- Extinct – no reasonable double that the last member of the species has died
- Extinct in the Wild – known only to survive in cultivation and despite exhaustive surveys has not been seen in the wild
- Critically Endangered – extremely high risk of extinction in the wild in the immediate future
- Endangered – very high risk of extinction in the wild in the near future
- Vulnerable – high risk of extinction in the wild in medium-term future; and
- Conservation dependent – focus of a specific conservation program without which the species would enter one of the above categories.

The EPBC Act also recognises and protects threatened ecosystems such as plant communities, wetlands and migratory birds.

Each State and Territory has additional legislation giving further protection to certain species which may or may not be listed nationally. State/Territory government departments/agencies have also developed fact sheets which list the threatened flora and fauna species in that State/Territory.

The fact sheets provide information on the characteristics (including photographs and/or drawings) to assist in identification, their likely distribution/habitat, and threats to their existence.

Where protected species are identified or likely on a project or work area, the Environmental Manager must be consulted to determine whether permits or approvals are required.

A consultant may need to be engaged if a flora or fauna assessment is needed. Time and resources must be factored into project planning and no works can commence until necessary appropriate permits and/or approvals are in place.

Ref	Document Title
ACT	*Nature Conservation Act 1980* ACT Government Environment and Planning Directorate, http://www.environment.act.gov.au/cpr/conservation_and_ecological_communities/information_on_action_plans
Cth	*Environment Protection and Biodiversity Conservation Act 1999*

6 Environmental Impacts

Disturbance to threatened flora, fauna and native vegetation has the potential to cause:

- Loss of biodiversity
- Loss of visual amenity
- Species extinction
- Disruption to parenting, reproductive and feeding behaviour;
- Reduction to numbers of protected fauna; and
- Corporate and personal fines from State/Territory and Commonwealth authorities

Construction activities that have the potential to impact on flora and fauna include, but not limited to:

- Vehicle movements;
- Clearing and earthworks,
- Trenching/excavating;
- Direct human contact;
- Waste and chemical storage;
- Waste disposal;
- Noise and light emissions;
- The spread of non-indigenous species (including weeds);
- Removal of fauna habitat;
- Accidental death or injury to fauna;

7 Project Overview

7.1 Existing Conditions

Potential biodiversity impacts of the Project is informed by the Biodiversity Impact Assessment report prepared by WSP (WSP, 2017) for the Project (refer Volume 2 – Technical paper 3).

The Biodiversity Impact Assessment report identifies the following flora and fauna impacts as a result of construction works.

Three threatened fauna species have been recorded within the Project area;

- Pink-tailed Worm-Lizard – two individuals recorded. This species is listed as Vulnerable under the Nature Conservation Act 2014 (NC Act) and the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).
- Scarlet Robin – one individual recorded. This species is listed as Vulnerable under the NC Act.
- Little Eagle – listed as Vulnerable under the NC Act.

In addition to the three recorded species, six threatened fauna species listed under the NC Act are considered to have a moderate or higher likelihood of occurrence in the Project area, based on availability of potential habitat (Appendices B and C). A total of nine threatened species of fauna have been recorded (3) or have potential habitat (6), including:

- eight species of bird (three of which are also listed under the EPBC Act)
- one species of reptile.

Clearing and grubbing is required for construction works resulting in loss of habitat, new edge effects, fragmentation and loss of connectivity. The Project requires clearing of up to 25.91 hectares of vegetation of which only 1.1 hectares is a native vegetation community. Impacts to threatened ecological communities and habitat patches have been avoided through early identification and preliminary design.

In addition, hollow-bearing trees surveys were undertaken and 19 trees containing hollows potentially suitable for Superb Parrot nesting were identified. Of these 19 Superb Parrot hollow bearing trees, two would be removed at the proposed substation site and up to eight along the easement. Where possible, hollow-bearing trees within the easement will be retained depending on safety requirements. This would be determined on the ground during construction and operation and could include the retention of a up to four addition trees with hollows suitable for the Superb Parrot.

Since the preparation of the referral, the Project design has also been refined based on the constraints mapping. As a result of the additional surveys and refined design, the likelihood of occurrence and impact significance assessments under the EPBC Act have been updated and concluded that the Project is not likely to have a significant impact on threatened biodiversity listed under the EPBC Act.

This refined design included siting of the proposed substation to minimise ecological impacts. However, at this site there is a conflict between retaining hollow-bearing trees and minimising the impact on Pink-tailed Worm-lizard habitat. While hollow-bearing trees are a limited resource and their clearing has been nominated as a Key Threatening Process, only common species were observed utilising trees within this area. As such, in siting the substation, priority was given to the protection of the Commonwealth listed Pink-tailed Worm Lizard and its habitat. This approach was supported by the ACT Government who stated that in this case, “the aim should be to retain at least some of the trees, while not exceeding greatly the area of Pink-tailed Worm Lizard impact”. This has been achieved with the retention of 11 trees in this area including eight hollow-bearing trees, four of which are suitable for Superb Parrot.

Overall, the Project is considered unlikely to have a significant impact to threatened biodiversity. The avoidance of impacts and minimisation of impacts, where feasible, was undertaken through the planning process. This included:

- avoidance of impacts to Box Gum Woodland listed as Endangered under the NC Act and Critically Endangered under the EPBC Act. This community was recorded in the north west and south west of the Project area
- minimising impacts to woodland habitat and habitat patches to the south of Stockdill Drive including habitat of Scarlet Robin
- minimising impacts to Pink-tailed Worm-Lizard habitat at the Stockdill substation site
- minimising clearing of trees at Stockdill substation site to ensure that some hollow-bearing trees are retained.

7.2 DA and EIS Conditions

The Biodiversity and Rehabilitation Management Plan is a sub-plan that forms part of the overarching Construction Environmental Management Plan (CEMP)

It has been developed in accordance to the relevant conditions of the DA and EIS Conditions (see Table 1).

Table 1

DA Condition Ref	EIS Condition Ref	Condition
B5		Prior to commencement of construction, the proponent must submit as part of the CEMP:
		a) a Rehabilitation Plan for the restoration of the Pink-tailed Worm-Lizard habitat to be prepared to the satisfaction of the Parks and Conservation Service

	C-B1	Induct workers on environmental sensitivities, legislative requirements and penalties prior to commencement of work.
	C-B2	Prior to commencement of construction a Construction Environment Management Plan would be developed for approval by EPSDD (the Planning and Land Authority). This must include:
		Clear site maps identifying areas of Pink-tailed Worm Lizard habitat and significant vegetation.
		A weed management plan that containing ongoing commitment to the control of African Love grass within the proposed substation location
		measures to prevent the spread of invasive species and pathogens, including into areas of potential habitat for threatened species:
		monitor areas of potential new outbreaks for weed control including soil stockpiles, roadsides and any other disturbed areas and undertaking weed control when outbreaks are identified in and adjacent to the Project study area to ensure the requirements of the Pest Plants and Animals Act 2005 are met
		ensure all vehicles, machinery and equipment are washed down prior to entering the Project study area. Clean vehicle tyres, undersides and radiator grills and footwear before leaving a property (as appropriate), to minimise soil movement and weed spread between properties within the Project study area
		ensure any imported fill is certified at the source location as pathogen and weed free.
	C-B3	A tree management plan would be developed which would include: Pre-clearing surveys for:
		Black Cypress (Callitris endlecheri) plants within the footprint and the presence of Callitris mistletoe (Muellerina bidwillii), a regionally rare species. Loss of mistletoe bearing Callitris trees would be identified as part of preparation of the CEMP and should be avoided where possible.
		Any Red Gum hollow-bearing trees, located within the APZ, which could be retained would be identified as part of preparation of the CEMP. The retention of a single smooth-barked tree would be permissible with an APZ.
	C-B4	Maps to clearly show the trees that are to be removed and which trees are hollow bearing.
	C-B5	Measures to recover hollows that are felled. These are to be recovered and reinstalled within the property where possible. Re-use of hollows is preferred to the construction of artificial nest boxes as compensatory nesting offsets. Felled hollows that are not able to be mounted should be retained on ground.
	C-B6	Provision of hollows or nest boxes for hollow-bearing trees to be removed at a minimum ratio of 1:1. Fifty percent of these should be installed prior to clearing of hollow-bearing trees. Locate these on trees retained within the proposed substation property with a maximum of one nest box on each tree. Any nest boxes that cannot be accommodated within this property could be located in nearby Woodstock Nature Reserve in consultation with ACT Government. Any timber from tree removal which is not used within the site as part of the hollow re-use is to be utilised as course woody debris in nearby reserves. An appropriate location will be determined in consultation with the Acting Area Manager of the Murrumbidgee River Corridor.
	C-B7	Provision of an ecologist spotter/catcher onsite during habitat removal/disturbance of hollow bearing trees. Translocate any animals to suitable habitat in close proximity but outside Project impact area.
	C-B8	Avoid vegetation clearing within 800 metres of Little Eagle nest at Strathnairn during breeding (spring to early summer).
	C-B9	Avoid removal of logs and woody debris, unless necessary as this provides habitat for Little Eagle prey species.
	C-B10	During construction phase – lower speed limits around southern portions of the Project study area (substation and Stockdill Drive) preferably to 50 km per hour or less to reduce potential road mortality to fauna including Rosenberg's Goanna. Incorporate into the CEMP and CTMP.
	C-B11	Prior to commencing clearing works a rehabilitation plan would be developed for the restoration of the Pink-tailed Worm-lizard habitat in consultation with the Parks and Conservation Service. This would include:
		restoration of vegetation within the recipient site for translocation of Pink-tailed Worm Lizard in preparation for placement of rocks. This should include scraping the topsoil of the site and reseeding with native grasses and forbs characteristic of natural temperate grasslands in the locality including Kangaroo Grass (Themeda australis), Red-leg Grass
		(Bothriochloa macra) and Lomandra filiformis. stockpiling suitable rock (225–625 cm3, corresponding with the preferred rock size) uncovered during construction within the Project work areas, and as soon as practical lay out rock in rock poor areas within the TransGrid property in areas immediately adjacent to mapped areas of Pink-tailed Worm Lizard habitat.

	C-B12	Prior to commencing clearing works at the proposed substation site, erect frog/reptile proof fencing around areas of Pink-tailed Worm-Lizard habitat that are outside the construction footprint and are to be retained (as identified in Figure 4.4 of Volume 2 – Technical paper 2) to:
		prevent the lizards entering the construction area to minimise likelihood of injury or mortality
		prevent unauthorised entry of construction workers or vehicles to habitat areas.
	C-B13	Avoid clearing of rocks within Pink-tailed Worm-Lizard habitat when temperatures above 25 degrees and the species is likely to retreat below ground (generally December to February).
	C-B14	An ecologist is to be onsite to supervise clearing and moving of rocks within Pink-tailed Worm-Lizard habitat. If a Pink-tailed Worm-Lizard is found during clearing, the ecologist is to capture it and relocate it under a 400 x 400 mm terracotta tile placed on the ground within the retained and fenced habitat area.
	C-B15	A Revegetation plan which includes:
		Revegetation of the proposed substation site with local native grasses, specifically Themeda triandra and Poa sieberiana. Any screening vegetation should be limited to avoid shading of Pink-tailed Worm-Lizard habitat.
		Discuss with landowner the potential of tree planting outside the easement corridor at key wildlife linkage points to maintain vegetation gap of less than 100m (Rural Block 1634 Belconnen).

8 Mitigation Measures

The proposed mitigation measures will be undertaken to manage biodiversity impacts during construction works;

Pre-construction;

- Provide clear site maps identifying areas of Pink-tailed Worm Lizard habitat or significant vegetation within this Plan, SECP and Project Induction
- Induct workers on environmental sensitivities, legislative requirements and penalties prior to commencement of work via Project induction, SCEP, pre-starts and toolboxes.
- Prepare a Rehabilitation Plan for the restoration of the Pink-tailed Worm-Lizard habitat to the satisfaction of the Parks and Conservation Service.
- Develop a Tree Management Plan that clearly shows the trees that are to be removed and which trees are hollow bearing including detailing the recovery and re-use of the hollows.

During Construction;

General vegetation and habitat clearing measures

- Engage an ecologist spotter/ fauna catcher onsite during habitat removal/disturbance of hollow bearing trees and around areas of Pink-tailed Worm-Lizard habitat.
- Translocate any animals to suitable habitat in close proximity but outside Project impact area.
- Where hollows are felled, they will be recovered and reinstalled where possible. Re-use of hollows is preferred to the construction of artificial nest boxes as compensatory nesting offsets. Felled hollows that are not able to be mounted should be retained on ground.
- Provide reused hollows or nest boxes for hollow-bearing trees to be removed at a minimum ratio of 1:1. Install 50% of these prior to clearing of hollow-bearing trees. Locate these on trees retained within the proposed substation property with a maximum of one nest box or reused hollow on each tree. Any that cannot be accommodated within this property to be located in nearby (for example within Woodstock Nature Reserve) in consultation with ACT Government.
- Undertake the following to prevent the spread of invasive species and pathogens, including into areas of potential habitat for threatened species:
  - monitor areas of potential new outbreaks for weed control including soil stockpiles, roadsides and any other disturbed areas and undertaking weed control when outbreaks are identified in and adjacent to the Project study area to ensure the requirements of the Pest Plants and Animals Act 2005 are met

- clean vehicle tyres, undersides and radiator grills before leaving a property (as appropriate), cleaning of footwear and minimising soil movement between locations
- ensure any imported fill is certified at the source location as pathogen and weed free.

- Monitor clearing areas to ensure impacts are no greater than assessed than permitted
- Designated lower speed limits around southern portions of the Project area (substation and Stockdill Drive) to reduce potential road mortality to fauna including Rosenberg's Goanna.

Little eagle

- Avoid vegetation clearing within 800 metres of Little Eagle nest at Strathnairn during breeding (spring to early summer).
- Avoid removal of logs and woody debris, unless necessary as this provides habitat for Little Eagle prey species.

Pink tailed worm lizard

- Prior to commencing clearing works at proposed substation site, erect frog/reptile proof fencing around areas of Pink-tailed Worm Lizard habitat that are outside the construction footprint and are to be retained to:
  - prevent the lizards entering the construction area to minimise likelihood of injury or mortality
  - prevent unauthorised entry of construction workers or vehicles to habitat areas.
- Where practical avoid clearing of rocks within Pink-tailed Worm-Lizard habitat when temperatures above 25 degrees and the species is likely to retreat below ground (generally December to February).
- An ecologist is to be onsite to supervise clearing and moving of rocks within Pink-tailed Worm Lizard habitat. If a Pink-tailed Worm Lizard is found during clearing, the ecologist is to capture it and relocate it under a 400 x 400 mm terracotta tile placed on the ground within the retained and fenced habitat area.
- Restore Pink Tailed Worm-Lizard habitat, by stockpiling suitable rock (225–625 cm3, corresponding with the preferred rock size) uncovered during construction within the Project work areas, and as soon as practical lay out rock in rock poor areas within the TransGrid property in areas immediately adjacent to mapped areas of Pink-tailed Worm Lizard habitat.
- Revegetate substation site with local native grasses, specifically Themeda triandra and Poa sieberiana. Any screening vegetation should be limited to avoid shading of Pink-tailed Worm Lizard habitat.

Management and Mitigation measure including the establishment of No-go zones will be established prior to construction works in accordance with;

- Biodiversity Impact Assessment report prepared by WSP (WSP, 2017) for the Project (refer Volume 2 – Technical paper 3).
- Part C – Assessment of Potential Impacts
- Part D – Mitigation and Recommendations.

No.	Control measure	Responsibility	Timing
General			
1	Construction activities shall be designed to minimise vegetation clearance and fauna disturbance where practicable or possible.	Construction Manager/ Environmental Advisor	Prior to disturbance
2	No Person shall intentionally remove or damage native flora or injure fauna.	All personnel	Ongoing
3	No disturbance to any vegetation (native and non-native) shall occur without explicit approval.	All personnel	Ongoing
4	Relevant permits or approvals shall be obtained and the required conditions of those permits shall be communicated to all relevant personnel.	All personnel	Ongoing
5	No Go Zones shall be set up prior to works around known protected or sensitive areas.	Supervisor/ Environmental Advisor	Prior to works
6	No person shall cut down, dig out, burn or in any way disturb vegetation or flora outside of the defined areas without written approval from the relevant authorities or the Environmental Advisor.	All personnel	Ongoing
7	All personnel shall be made aware of the proper response to wildlife encounters via the induction process.	All personnel	Ongoing
8	Field operations personnel must be trained in the identification of threatened flora and fauna in the project area	Supervisor/ Environmental Advisor	Prior to works
9	All vehicles shall observe and follow the designated site speed limit, and remain to the designated roads to avoid collisions with fauna or damage to flora.	All personnel	Ongoing
10	When safe to do so, drivers shall give way to fauna at all times within the construction areas and on site roads.	All personnel	Ongoing
11	Drivers shall conduct a visual inspection for fauna in and around vehicles, trucks and heavy machinery prior to moving equipment.	All personnel	Ongoing
12	Lighting on construction equipment shall only be used during construction activities and all efforts shall be made to reduce impacts on nocturnal fauna during night works.	Supervisor/ Environmental Advisor	Ongoing

13	Fauna shall only be handled by appropriately trained personnel.	All personnel	Ongoing
Manage Unexpected Find Protocol			
14	Works must stop immediately and the Supervisor notified.	All personnel	Ongoing
15	The discovered item should be protected, delineated and clearly marked with communication to all personnel to preserve the site.	Supervisor/ Environmental Advisor	Ongoing
16	The supervisor must notify the Environmental Advisor and Project Manager who will determine what regulatory authorities need to be alerted (these may include a state department for protected flora and fauna and/or local council)	Supervisor	As required
17	Complete G-EN-FM-50385 - Unexpected Heritage, Flora or Fauna Item Form	Supervisor/ Environmental Advisor	As required
18	A suitably qualified ecologist should be engaged to investigate and prepare a report	Environmental Advisor	As required
19	Works may not commence again until a management strategy has been approved and additional mitigation measures implemented including any permits or approvals	Supervisor/ Environmental Advisor	As required
Clearing Activities			
20	G-EN-FM-50393 Vegetation Clearing and Site Establishment Checklist must be completed prior to any vegetation clearing being undertaken.	Supervisor/ Environmental Advisor	Prior to disturbance
21	Clearing activities shall be undertaken in accordance with the relevant Client, State and Commonwealth approval requirements. The Environmental Advisor shall proactively communicate the project requirements for any clearing on site to all relevant personnel prior to clearing.	Supervisor/ Environmental Advisor	Prior to disturbance
22	Any additional clearing of native vegetation outside the approved area of disturbance shall only be carried out if the necessary approvals have been obtained.	Supervisor/ Environmental Advisor	Prior to disturbance
23	Ensure clearing or disturbance area is positively identified and clearly demarcated in the field including limits of clearance and access tracks	Supervisor/ Environmental Advisor	Prior to disturbance
24	Prior to clearing, relevant drawings shall be issued defining the following but not limited to; • construction boundary • vegetation clearance boundary • environmental sensitive areas • weeds zones	Supervisor/ Environmental Advisor	Prior to disturbance

	• heritage sites • No Go Zones		
25	Ensure the work methodology includes the following; • Clearing methodology • Fauna management • Topsoil handling • Weed management • Dust management	Supervisor/ Environmental Advisor	Prior to disturbance
26	Monitoring shall be undertaken during native vegetation clearance activities by an Environmental Professional	Environmental Advisor	Prior to/during disturbance
27	Ensure a fauna survey is undertaken prior to and during clearing by a suitably qualified person.	Supervisor/ Environmental Advisor	Prior to/during disturbance
28	Ensure clearing process is systematic and deliberate so as not to isolate or trap evacuating fauna	Supervisor/ Environmental Advisor	During clearing
29	Avoid the creation of “habitat islands” (un-cleared areas in the middle of cleared areas within which fauna can hide	Supervisor/ Environmental Advisor	During clearing
30	A qualified surveyor (or equivalent) shall review post disturbance area to ensure no disturbance has occurred outside area approved by the Clearing and Grubbing area	Supervisor/ Environmental Advisor	Post clearing
31	A GIS drawing shall be generated following clearance activities showing clearing limits	Supervisor/ Environmental Advisor	Post clearing
32	Regular inspections during clearing shall be undertaken and recorded to ensure that clearing and grubbing remain restricted to pre-designated, surveyed areas. All records shall be maintained	Supervisor/ Environmental Advisor	Post clearing
Fauna Interaction			
33	Fauna shall be protected from work sites by: • Providing a suitable barrier via fencing or alternative strategy around areas where larger terrestrial fauna may come into contact with hazardous conditions. • Investigating options to exclude fauna from work areas and where appropriate implementing exclusion measures. • As far as is practicable, scheduling works to avoid peak breeding months	Supervisor/ Environmental Advisor	Prior to disturbance
34	Fauna egress structures (e.g. matting, ramps) shall be provided at regular intervals in excavations and trenches where required.	Supervisor/ Environmental Advisor	Ongoing

35	The period of time that a trench/excavation is left open shall be minimised where practicable.	Supervisor/ Environmental Advisor	Ongoing
36	Open trenches and excavations shall be inspected at the start and finish of each shift. They shall also be inspected prior to backfilling.	Supervisor/ Environmental Advisor	Ongoing
37	Following heavy rainfalls, trenches and excavations shall be inspected and assessed for water pooling as soon as practical.	Supervisor/ Environmental Advisor	Ongoing
Fauna Incidents			
38	In the event of a vehicle collision with fauna, the following shall be implemented: • Vehicle collisions with fauna shall be reported immediately. • Deceased fauna shall be moved off the road that is far enough from the road to prevent other fauna (e.g. scavengers) from being injured by vehicles. • Deceased fauna shall be checked to see if they are carrying any young.	All Personnel	Ongoing
39	Injured or orphaned fauna shall be assessed and handled by specialist personnel that are accredited fauna handlers or registered wildlife carers.	All Personnel	Ongoing
Monitoring			
40	Where there are known protected items within the work site, weekly inspections shall be conducted to ensure that “No-Go Areas” Flagging and Signage remains in good working order and that the items have remained undamaged. This monitoring shall continue until the works have been completed and the site is restored/rehabilitated.	Supervisor/ Environmental Advisor	Ongoing

Appendix A Tree Management Plan

1. Introduction

a. Plan Requirements

This Tree Management Plan is to address the following EIS conditions:

- CB3: A tree management plan including surveys for Black Cypress and Callitris mistletoe, and hollow bearing Red Gums
- CB4: Maps showing trees to be removed and those with hollows.
- CB5: Methods to recover hollows that are felled.
- CB6: Provision of hollows (nest boxes or hollow-bearing trees) for hollow-bearing trees to be removed.
- CB7: Provision of a wildlife catcher on site during removal of hollow-bearing trees.

b. Objectives

To implement the recommendations outlined in the EIS and Biodiversity Impact Assessment (WSP 2018); to minimise and mitigate impacts to wildlife utilising hollow-bearing trees; and to provide a 1:1 provision of hollows for those hollow-bearing trees being removed.

2. Identification of Black Cypress and Callitris Mistletoe

- Trees within the impact area will be identified to species level in order determine the presence of Black Cypress (*Callitris endlecheri*).
- Any Black Cypress found will be assessed for the presence of Callitris mistletoe (*Muellerina bidwillii*).
- Tree mapping initially recorded in Figure 4.5 of WSP (2018) will be updated to include any recorded Black Cypress and those that also have Callitris mistletoe present.
- Those recorded Black Cypress will be avoided where possible as part of the CEMP.

3. Identification of hollow-bearing trees

- Figure 4.5 of WSP (2018) will be updated with the latest information regarding what trees are to be removed or retained, and which of those trees contain hollows.
- The number of trees to be removed with hollows will determine the number of nesting boxes and hollow bearing trees to be retained – see point 4 below. Initial mapping indicates 22 hollow bearing trees will be removed.
- Trees containing hollows that will be removed shall be inspected for native fauna by a wildlife catcher prior to removal using the procedure in point 6 below.

4. Installation of nest boxes prior to felling

- Nesting boxes will be required to meet the condition of having fifty percent of artificial hollows in place prior to any hollow bearing tree removed. The remaining fifty percent will utilise reclaimed/natural hollows from felled trees.
- To aid preplanning for hollow or nest box installation the following assumptions are made:
    - 22 trees with hollows are estimated to be removed.
    - 22 hollows or nest boxes will be required based on that estimate.

- 11 hollows or nest boxes need to be in place prior to any hollow bearing tree being removed.
- The Stockdill Substation contains a further seven hollow bearing trees that will be retained.
- A further 3 nest boxes will be installed in the Stockdill Substation prior to any hollow bearing tree removal. Note that the Stockdill Substation study area contains many more trees for installation of nest boxes.
- A further 11 of the 22 hollow bearing trees that will be removed will be utilised as the final number of hollows to meet the 1:1 hollow replacement condition. These 11 additional natural hollows will also be installed at the Stockdill Substation.

- The three Nesting boxes to meet the 50% preinstalled condition shall be installed in trees without hollows within the Stockdill Substation at least 3 days prior to tree removal to accommodate displaced fauna.

- Nesting boxes will be made suitable for the fauna that is being removed (predominantly Swift Parrot and possums).

- Nesting boxes will be in trees with a maximum of one nest box per tree, installed facing east where possible.

5. Relocation of remaining wildlife

- Any wildlife found upon identification of hollow-bearing trees will be removed and translocated by a suitably qualified zoologist/wildlife handler to the hollow bearing trees or nest boxes within the Stockdill Substation prior to felling. Capture and release will follow the standard operating procedure and ethics approval conditions of the wildlife catcher.

6. Removal of hollow-bearing trees

- Where hollow-bearing trees are felled, before felling the branches with hollows should be gently ‘knocked’ with an excavator bucket to encourage any remaining wildlife to leave.

- Hollow-bearing trees to be removed carefully by qualified arborists under the direction of an appropriately qualified zoologist/wildlife handler.

- Once tree has been felled, all hollows are checked again. Any that can be removed are removed for reinstatement in the conservation reserve.

- Excess natural hollows will be prepared as per specifications in section 7 of this Tree Management Plan, with TransGrid to direct any transportation to an agreed site(s) for restoration works within the Molonglo River Reserve.

- Trunks and main branches of trees felled in the vicinity of the sub-station site should be left on site.

7. Natural Hollow Creation

- Eleven natural hollows will be harvested from the removed hollow bearing trees. All suitable hollows will be trimmed to approximately 0.5-1 metre either side of the hollow by an appropriately qualified arborist. These shall be relocated and mounted with a metal strap or pins to suitable trees in a similar outward facing aspect as the tree it was removed from.

- Care will be taken to trim the hollow so that solid timber is above and below the internal cavity to provide adequate shelter for animals.
- When trimming the hollow or installing the hollow, provision will be made to allow for arboreal animal access to the hollows. For example, a suitable amount of tree will be left under the trimmed hollow to allow wildlife to climb into and out of the hollow.

8. Monitoring, Review and Updating

Monitoring, review and updating of this rehabilitation plan will be undertaken as described in the Construction Environmental Management Plan and any subsequent Operational Environmental Management Plan for the Stockdill Substation Environmental Values.

9. References

WSP, 2018. ACT Second Electrical Supply Project Biodiversity Impact Assessment. Report to TransGrid and ActewAGL by WSP.

Appendix B: Rehabilitation Plan for the restoration of the Pink-tailed Worm-Lizard habitat at the Stockdill Substation

1. Introduction

a. Plan Requirement's

This Rehabilitation plan for the restoration of Pink-tailed Worm-lizard (PtWl) habitat is to address the following EIS conditions:

- CB12: A plan for reptile proof fencing
- CB13: Actions regarding clearing of rocks
- CB14: A plan for salvage and relocation of PtWl
- CB15: A revegetation plan for within the Stockdill Substation

b. Objectives

To implement the recommendations outlined in the EIS and Biodiversity Impact Assessment (WSP 2018); to minimise and avoid impacts to the PtWl; and to rehabilitate suitable habitat for the PtWl within the Stockdill Substation.

2. Species Details

c. Characteristics

The Pink-tailed Worm-lizard (*Aprasia parapulchella*) is a small legless lizard that lacks forelimbs and with hind limbs are vestigial flaps (Cogger 2014). The head and nape is dark brown and blends to a pale grey and then grey brown along the length of the body, terminating in a pinkish or reddish-brown tail (Gogger 2014).

PtWl is a diurnal species with peak activity during the day in late Spring and early Summer during ambient temperatures of greater than 25^{o}C. As with most legless lizards, extreme hot dry periods are thought to be unfavourable to the species being active and resulting in individuals seeking refuge (taken from WSP 2018)

The PtWl is listed at Vulnerable under the ACT *Nature Conservation Act 2014* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

d. Habitat

The PtWl can be found in native grassland and grassy woodland habitats dominated by the native Kangaroo Grass (*Themeda triandra*) within the Australian Capital Territory and New South Wales among weather granite rocks and logs (Cogger 2014; OEH 2018). The PtWl is also found in Box-Ironbark country around the Bendigo Region of Victoria, also among weather rocks and logs.

e. Records at the Stockdill Substation

The Biodiversity Impact Assessment for the ACT Second Electrical Supply Project for TransGrid and ActewAGL by WSP in 2017 recorded 2 PtWl within the project study area south of Stockdill drive (WSP 2018). WSP noted that these records were outside the new proposed easement and project impact area.

A total of 3.28ha of potential habitat for PtWl was recorded in the impact area based on the cover of Kangaroo Grass (*Themeda triandra*, sometimes referred to as *T. australis* [ANH 2018]) (WSP 2018). Within these areas the construction, salvage and translocation protocol outlined in Section 4 below shall be implemented.

3. Threats to PTWL recovery

Direct threats to the PtWl as part of this project will include habitat loss and degradation through rock removal. Indirect threats may arise with invasion of habitat with weeds and an increase in predator number. More generally, poor management of retained habitat may lead to further habitat degradation by other factors such as inappropriate fire regimes. WSP 2018 and the PtWl Action Statement (ACT 2017) contain further information on threats to the PtWl.

4. Construction, Salvage, Translocation and Recipient Sites

This Section outlines the actions that will be implemented to minimise impacts from the project on the PtWl.

Impacts on PtWl during construction will be minimised through installing barriers to PtWl movement into the construction zone, the minimisation of disturbance within and construction related runoff through PtWl habitat areas (through sediment and erosion control devices) and through planned movement of habitat rocks. Any PtWl that are found during construction will be salvaged from the construction area, assessed for injury, and then translocated to suitable habitat within the Stockdill Substation if uninjured. These steps are provided below.

a. Barriers to PtWl movement

Barriers to PtWl movement will be installed around PtWl habitat (See Figure 4.4 of WSP 2018) to be retained outside of the construction footprint but within the study area. Suitable barriers include those that mimic drift fences used in the capture and marking of reptiles and amphibians or those used as frog barriers along roadsides (Figure 1).

Each PtWl habitat will be fenced (no-go-zone fence) with either a standard farm fence or chain wire fence that is suitable to attach a fine weave netting or fabric. It is the fine weave fabric that restricts movement of the reptiles and amphibians. Suitable fine weave materials include:

- Fly screen netting
- Sediment fencing material
- Thick shade cloth.

Installation of the fine weave fabric shall follow the following principles:

- Each fine weave fabric will extend 40cm vertically up the no-go-zone fence.
- The fine weave fabric is to be buried into the soil in a skirt pattern.
- The skirt is to be at least 10cm buried into the ground directly down.
- Vegetation will be maintained at less than 5cm in height either side of the fence.
- The fine weave fabric is to be fixed by wire ties, or similar, to the no-go-zone fence.
- Weekly checks of the integrity of the fine weave material is required and sections that have been damaged will be repaired.
- No-go-zone and reptile barrier fencing will be installed prior to construction works commencing.

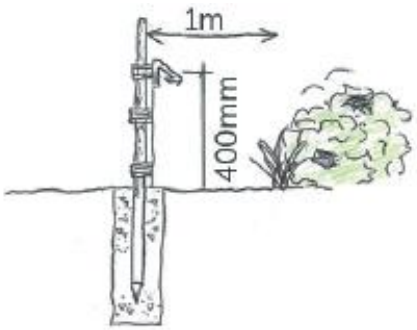

Figure 25: Free standing frog fence (adapted from 3003181 -BFF-020-6003) (PacificLink Alliance 2006d).

Figure 1: Frog resistant fencing from VicRoads Fauna Sensitive Road Design Guidelines (VicRoads 2012)

b. Relocation of habitat rocks

Rocks suitable for recreation of PtWl habitat will be recovered from the construction impact zone and moved to PtWl habitat to be retained within the Stockdill Substation. The following principles will apply to this action:

- Rock removal will only occur within areas that are to be impacted by construction activity.
- Rock removal will only occur on days that are predicted to reach an ambient temperature of less than 25ºC.
- A wildlife catcher will be present during rock removal to capture and treat injured PtWl or to relocate snakes or other reptiles and amphibians that may be disturbed by the rock removal.
- Injured animals will be treated in accordance with the wildlife catcher's permit and ethics approval
- A grid of at least 5-10 terracotta tiles (min size 400mm x 400mm) will be placed within the PtWl habitat to be retained within the Stockdill Substation prior to rock disturbance. The purpose of the tiles is to provide a relocation point for any PtWl that are found during disturbance activities. These terracotta tiles are to be recorded spatially and assigned a number that will be referenced against translocated PtWl.
- An estimate of the spread of rocks in the retained PtWl habitat shall be calculated based on

The process to relocate habitat rocks is as follows:

i. A wildlife catcher with the relevant permits will be identified and contracted to the project.
ii. The no-go-zones and reptile barriers will be installed around PtWl habitat to be retained prior to any rock relocation.
iii. Once the no-go-zone fencing is installed, terracotta tiles will be placed in the habitat to receive any PtWl caught within the impact area.
iv. Suitable rocks for relation will be identified within the impact area based on a minimum size of 10-30cm diameter. These rocks will be marked in the field with yellow marker paint so they can be found upon return.
v. Rocks previously marked for relocation will be moved on suitable days with temperatures predicted not to exceed 25ºC ambient temperature.
vi. Relocation and transport of rocks by machinery will be required. Relocation actions shall not occur on days of heavy rainfall of enough intensity to make the retained PtWl habitat boggy and subject to disturbance from vehicle tracks.
vii. Rocks will be relocated into the retained PtWl habitat in clusters of no more than 2 rocks to avoid the potential of creating rabbit harbour.

viii. The spread of relocated rocks across the retained PtWl habitat will be such as to not hinder vegetation management activities in the habitat. Spaces between the rocks that allow a 4WD vehicle to traverse the habitat shall be retained.

ix. The rock density across the restoration site should be 10 – 20%.

c. Salvage and Translocation

Two methods will be employed for PtWl salvage and translocation operations. The first is a targeted salvage for PtWl in areas marked as High potential habitat in Figure 4.4 (WSP 2018). The second is incidental salvage of PtWl in areas of Moderate and Low potential habitat for PtWl in Figure 4.4 (WSP 2018).

Targeted Salvage and Translocation for PtWl

Any salvage action will only occur once the no-go-zones and reptile barriers are installed around PtWl habitat that will receive the salvaged PtWl. Targeted salvage will only occur in those areas of high potential habitat (WSP 2018) that have been approved for disturbance. The following outlines the targeted salvage approach:

i. A wildlife catcher with the relevant permits will be identified and contracted to the project.

ii. The no-go-zones and reptile barriers will be installed around PtWl habitat to be retained prior to any rock relocation.

iii. Once the no-go-zone fencing is installed, terracotta tiles will be placed in the habitat to receive any PtWl caught within the impact area that require translocation.

iv. A grader equipped with rear rippers will rip the soil to a minimum depth of 300mm through the high potential habitat.

v. Two suitably qualified observers will follow on foot at a safe working distance and search for PtWl dislodged with the soil material.

vi. If a PtWl is found the animal will be collected and inspected for injury. If uninjured, the animal will have its details such as length and weight recorded along with a detailed photograph of the animals head scales. The animal will then be moved to the recipient site and placed under a terracotta tile or rock where the temperature under that structure does not exceed 25^{o}C.

vii. Any injured animals will be treated in accordance with the wildlife carers ethics approval for such instances.

Incidental Salvage for PtWl

Incidental salvage for PtWl will follow the below approach:

i. A wildlife catcher with the relevant permits will be identified and contracted to the project.

ii. The no-go-zones and reptile barriers will be installed around PtWl habitat to be retained prior to any rock relocation.

iii. Once the no-go-zone fencing is installed, terracotta tiles will be placed in the habitat to receive any PtWl caught within the impact area.

iv. As habitat marked as Moderate or Low potential habitat type in Figure 4.4 of WSP (2018) is encountered for disturbance, the wildlife catcher will be present.

v. If PtWl are observed during the soil disturbance component of the construction activity the targeted salvage protocol will be implemented for the remainder of that habitat type.

If excess rock is produced onsite, TransGrid will consult with the ACT Government to have excess rock of the appropriate size transported to an agreed site(s) for restoration works within the Molonglo Reserve. The outcome of this consultation will be advised to Zinfra, as necessary.

5. Rehabilitation of habitat within the Stockdill Substation

The suitable habitat for PtWl to be retained and managed within the Stockdill Substation site was identified in Figure 4.4 of WSP (2018). These areas are dominated by exotic grassland with scattered rocky outcrops. Rehabilitation of such a grassland back to one that represents a native grassland is the identified objective.

Native grassland can be restored though mechanical and passive methods. Mechanical methods include where the top soil, soil structure and exposed rock are completely removed (scalped or scraped), disposed of, and combined with direct drill seeding to establish native grassland (Greening Australia 2017). Passive methods include the manipulation of the exotic to native plant cover balance combined with reseeding to establish native grassland (Mason 2005). The first method is not considered suitable in this instance as it will result in the removal of PtWl habitat (Rocks and cracking soil) and may directly impact on any PtWl that may be present in the restoration site. Both methods will take 1-3 years to establish a grassy sward on the site. The second method will not alter structural PtWl habitat elements so will be more suited for use in restoration of the translocation recipient site and can be undertaken during translocation of PtWl to the site.

A specific Native grassland restoration action plan will be developed by the site operator to detail the actions required to restore native grassland in the Stockdill Substation area and retain and improve PtWl habitat. Such an action plan shall include:

i. A timeline for actions.

ii. Identification in the field and on a map of the specific areas to be restored back to native grassland. The area (hectares) of required restoration is required to:

   a. Calculate the amount of native grass seed needed to introduce back to the site. Mason (2005) provides a guide on how to calculate the volume of seed needed to account for natural seed dormancy, viability and survival of germinant through to seedlings and mature plants.

   b. Calculate the labour required to control weeds.

iii. An indication of vegetation species and abundance. The restoration site will have the ratio of native to weedy grasses and herbs determined on the Braun Blanquet scale and mapped using basic quadrat assessments. This ratio will be used to develop a specific weed control strategy. For example, where can suitable control measures such as fire or herbicide be used to knock down weeds, allow spaces for native grasses to germinate and grow, and at the same time as not impacting on the life cycle of the PtWl population.

iv. Identification of native grass see source or supplier. Suitable native grass seed harvesting sites or suppliers will be identified. The key will be to purchase or harvest enough suitable seed for the restoration exercise. Given the sparse distribution of native grasslands, a staged restoration of the area may be needed as native seed is likely to also be sparse. Timelines may also be interrupted by dry or drought conditions that can cause native grasses to abort seed production, in a given year.

v. Introduction of native grass seed to the site. The scalp and seed method requires all seeds to be processed so that awns are removed. However, the proposed passive restoration method relies on the native grass to have the awns remain intact and attached to the seed in a chaffy form. These awns are essential for the seed to self drill into suitable microhabitats in the soil. Leaving awns attached also reduces double handling of seed and reduces the risk of damage to seed during processing. Chaffy seed will be introduced to the weed controlled area in late autumn by hand or hay spreader. Weed invasion will be controlled through applying a straw mulch to the site and chemical control where needed. The mulch retains soil moisture and suppresses weeds over the winter period. The mulch is then removed (by hand or controlled burn) in early spring allowing for native seed germination.

vi. Indicators of success. In this instance success will be a transfer of the dominance (>70% cover) of exotic grasses to a dominance (>70% combined cover of Kangaroo grass, spear and wallaby grasses, and native herbs).

   If restoration works do not achieve the criteria ‘a transfer of the dominance (>70% cover) of exotic grasses to a dominance (>70% combined cover of Kangaroo grass, spear and wallaby grasses, and native herbs), within three years it is recommended that the operator of the site trigger the following contingency actions :

a. An assessment of the percentage cover of the dominant grasses and weeds will be undertaken in spring of the third year. Signs of soil disturbance that may hinder regeneration of native flora will be identified. For example, such factors include intensive grazing, invasive weed establishment, poor soil moisture, increases soil salinity, underlying bedrock and red legged earth mites.

b. The native grass with the greatest dominance across the site resulting from the restoration program will be identified from the assessment. This grass will then be used as the key grass for a supplementary seeding program.

c. The supplementary seeding program will see the areas requiring reestablishment reseeded at sufficient densities to enable densities of native grass emergence and survival. This may require the weed control program to be adapted to control any particular weeds that may have established.

d. If soil moisture is determined to be an issue, a supplementary watering program will be developed and implemented over the summer establishment period.

e. It is recommednec that following practical completion, TransGrid monitor monthly over the summer-autumn period and then annually for 5 years.

g. If at the five year period native grass establishment is still patchy, a suitable pasture species will be sown across the site in the bare areas. Such pasture species that are susceptible to invasion by native grasses will be selected as a preference, such as Cocksfoot and Annual Rye grass. This strategy aims to allow for long term natural establishment and invasion of native grass species into the bare or pasture species.

vii. A monitoring schedule linked to annual action planning to direct on ground efforts.

viii. A proforma for annual reporting of actions and outcomes back to TransGrid.

6. Fire Management

Fire is essential for improving grassland vigour and diversity and to stimulate life cycles of insects. In the ACT controlled ecological burns are undertaken in autumn and winter in key habitats for PtWI. The objective with such timing is to keep the burn cool and to coincide when PtWI are in torpor within soil burrows (ACT 2017).

Once the native grassland (point 5) has been established it will require periodic burning to maintain its vigour.

7. Monitoring, Review and Updating

Monitoring, review and updating of this rehabilitation plan will be undertaken as described in the Construction Environmental Management Plan and any subsequent Operational Environmental Management Plan for the Stockdill Substation Environmental Values.

8. References

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Contents

1 Purpose

To maintain ecological and conservation values during construction activities.

This Plan ensures that construction, maintenance and operational activities are managed in accordance with relevant legislation to prevent the spread of plant and pathogens to minimise adverse environmental impacts. This Plan ensures that vehicle and equipment clean down practices on are implemented appropriately in order to minimise adverse environmental impacts from construction activities.

2 Scope

To ensure that the spread of diseases, weeds or non-indigenous flora on and off the site by project vehicles, construction works and equipment is minimised so far as is reasonably practicable (SFAIRP), through vehicle and equipment inspections, and thorough cleaning practices.

3 Responsibilities

Role	Responsibility
Group Manager Environment & Sustainability	• Provide advice in relation to weeds, plant and animal diseases and clean down procedures and support business units in complying with State/Territory regulations
HSEQ Managers/ Advisors	• Implement and maintain specific measures for vehicle and equipment clean down, monitor the adequacy and effectiveness of these measures, provide training, monitoring and reporting, regular auditing of operations
Project Managers / Team Leaders	• Ensure adequate measures for prevention of spread of weeds and diseases, ensure clean down procedures are maintained for the duration of works and implemented in accordance with this Plan • Ensure all measures are included in risk registers, plans and induction
Construction / Site Supervisors	• Coordinate implementation of this Plan on sites
All Employees and Contractors	• Ensure awareness of any weeds or diseases on site, responsible for minimising spread of weeds, complying with clean down procedures and reporting any issues to their immediate supervisor

4 Definitions

Term	Definition
SFAIRP	So far as is reasonably practicable
Clearing and Grubbing	The removal, via any method, of surface material (e.g. vegetation and topsoil). This can include the removal/destruction of one single plant.
Non-indigenous Flora	Any flora species that have been introduced and non-native flora to Australia, identified as environmental weeds
Topsoil	The top layer of soil that stores seed and acts as the growth medium in which vegetation can establish itself.
Stockpile	A mound of organic material (either topsoil or vegetation) that has been set aside for use in rehabilitation.
Vegetation	Any plant including: grass, shrubs, trees, tree stumps, tree roots, logs, seeds, brush.

5 Legislative Requirements

Ref	Document Title
ACT	Pest Plants and Animal Act 2005

6 Environmental Impacts

Environmental Impact

- Weeds outcompete native plants;
- Weeds do not provide the 'right' food and habitat for native animals;
- Invade ecosystems;
- Outgrow native vegetation;
- Are a nuisance;
- Reproduce aggressively.

Weeds can be introduced by;

- People;
- Machinery & equipment;
- Poor machinery hygiene practices;
- Land disturbance (e.g. clearing and grubbing, grading, earthworks).

7 Project Overview

7.1 Existing Conditions

The existing vegetation has been extensively disturbed in the past due to clearing and grazing and no longer represents a remnant native vegetation community.

This community is dominated by exotic grasses and weeds including Eragrostis curvula (African love grass), Bromus driandrus, Briza minor, Aira elgantissima, Vulpia sp., Lolium perenne, Acetosella vulgaris, Petrohagia nanteuilii, Hyphochaeris radicata, Phalaris aquatic, Holcus lanatus, Trifolium spp. and Carthamus lanatus.

Native species included grazing tolerant species such as Bothriochloa macra and Austrostipa scabra. Small areas dominated by these native species, consistent with low condition native pasture, south of Stockdill Drive.

Due to past and ongoing disturbance the vegetation is no longer considered to be consistent with this native vegetation community.

The weed density in the existing native vegetation varies from very low to high. The most problematic weeds being various species of exotic perennial grasses in dry areas. At present, agriculture appears to be one the main causes of weed invasion, in conjunction with soil disturbance.

The Project has the potential to further disperse weeds into adjacent areas of native vegetation. The greatest potential for weed dispersal and establishment associated with the Project would include earthworks, movement of soil and attachment of seed (and other propagules) to vehicles and machinery where these are utilised within or adjacent to retained vegetation.

Due to the majority of the easement and access tracks occurring within exotic agricultural grasslands and the implementation of mitigation measures it is unlikely that dispersal of weeds into unaffected areas will occur and be of significant detriment to native vegetation.

African love grass is considered the dominant species within the Project. African lovegrass takes over pastures and disturbed areas. It degrades pastures because it's not very nutritious for livestock. African lovegrass thrives on acidic, sandy soils with low fertility. It is heat and drought tolerant. Frost can damage it, but it regrows in warmer weather.

African lovegrass is a perennial grass that grows in clumps up to 1.2 m tall. Leaves are:

- dark green to blue-green
- 3 mm wide
- with rolled edges.

African lovegrass has a small, thin structure at the base of the leaf blade called a ligule. The ligule has a ring of white hairs.

Stems are:

- slender
- erect
- sometimes bent at the nodes.

African lovegrass looks like other perennial pasture tussock grasses. It is difficult to tell native and introduced Eragrostis species from each other.

Mitigation measures for controlling African love grass is detailed in Section 8.

7.2 Post Construction

It is recommended for the site operator to continue weed control for a minimum of three years, to include spraying to maintain the extent of African Love Grass to less than 5% cover within the PtWl habitat area, and the total weed cover to less than 10% of the ground cover.

7.3 DA and EIS Conditions

The Weed Management Plan is a sub-plan that forms part of the overarching Construction Environmental Management Plan (CEMP)

It has been developed in accordance to the relevant conditions of the DA and EIS Conditions (see Table 1).

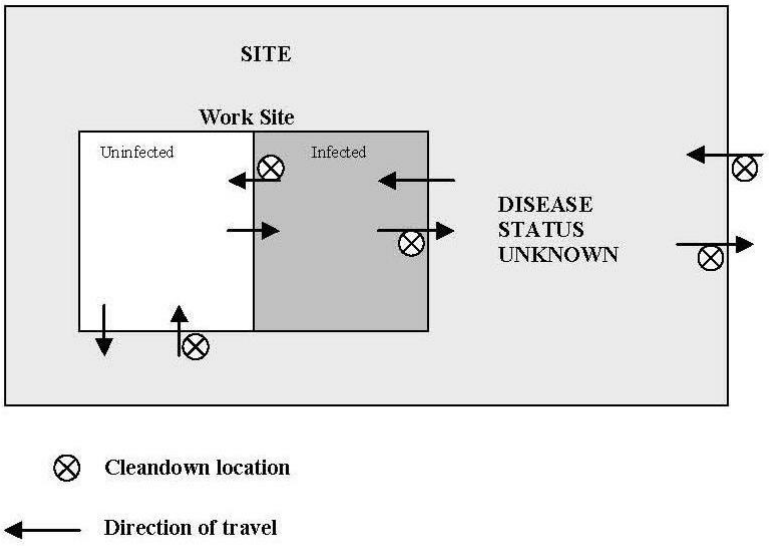
Table 1

DA Condition Ref	EIS Condition Ref	Condition
B5		Prior to commencement of construction, the proponent must submit as part of the CEMP:
		b) A weed management plan that also contains an ongoing commitment to the control of African Love Grass within the proposed substation locations, including the retained and restored Pink-tailed Worm-lizard habitat.
C5		All vehicles, machinery and equipment must be washed down prior to entering the site to reduce the risk of weed spread.
	C-B2	Prior to commencement of construction a Construction Environment Management Plan would be developed for approval by EPSDD (the Planning and Land Authority). This must include:
		A weed management plan containing ongoing commitment to the control of African Love grass within the proposed substation location
		measures to prevent the spread of invasive species and pathogens, including into areas of potential habitat for threatened species:
		monitor areas of potential new outbreaks for weed control including soil stockpiles, roadsides and any other disturbed areas and undertaking weed control when outbreaks are identified in and adjacent to the Project study area to ensure the requirements of the Pest Plants and Animals Act 2005 are met
		ensure all vehicles, machinery and equipment are washed down prior to entering the Project study area. Clean vehicle tyres, undersides and radiator grills and footwear before leaving a property (as appropriate), to minimise soil movement and weed spread between properties within the Project study area
		ensure any imported fill is certified at the source location as pathogen and weed free.
	C-SC2	As part of the overarching CEMP for the Project, soil, water and contaminated land management plans would be prepared prior to construction works commencing. It would include the following measures:
		Any imported fill shall be certified at source location (e.g. Quarrymaster or property owner) as pathogen and weed free Excavated Natural Material (ENM) or Virgin Excavated Natural Material (VENM).

8 Mitigation Strategies

No.	Control measure	Responsibility	Timing
Pre-clearance			
1	Ensure weeds are positively identified and clearly demarcated in the field.	Supervisor/Environmental Advisor	Prior to clearing
2	Identified stockpile locations for weeds, non-weed vegetation, weed topsoil, and weed-free topsoil.	Supervisor/Environmental Advisor	Prior to clearing
3	Ensure the work methodology includes the following; • Clearing methodology (see below) • Fauna management • Weed and pathogen management • Dust management	Supervisor/Environmental Advisor	Prior to clearing
4	Complete Pre-clearance Checklist	Supervisor/Environmental Advisor	Prior to clearing
5	Clearing and stripping should be avoided in wet and windy condition	Supervisor/Environmental Advisor	Prior to clearing
6	Control access and egress onto sites, set-up dedicated washdown/brushdown areas at allocated entry/egress points as required.	Supervisor/Environmental Advisor	Prior to clearing
7	Ensure vehicles, machinery, equipment and footwear are cleaned and free of mud, soil and plant material.	All	Prior to clearing
8	Set up “No Go Zones”	Supervisor/Environmental Advisor	Prior to clearing
9	If identified weeds need to be eradicated, this should be done by an approved weed contractor Only employees or contractors holding current licences/approvals shall apply herbicides and pesticides	Supervisor/Environmental Advisor	Prior to clearing
10	Herbicide and pesticides must be applied based on the manufacturer’s recommendation and label specifications at the most appropriate time of year for that weed species	Supervisor/Environmental Advisor	Prior to clearing
During Clearing			
11	Clear non weed-infested/non disease areas first. Clear weed-infested/ non disease areas last	All Personnel	During clearing
12	Watch for new plants and control African lovegrass as soon as it appears. Minimise soil disturbance when clearing. Spot spraying may be better than disturbing a large patch of African lovegrass	All Personnel	During clearing
13	Ensure that all vehicle and equipment movement is kept within designated disturbance areas. Do not enter ‘No-go’ zones	All Personnel	During clearing
14	Undertake visual inspections to confirm that vehicles, plant and equipment and footwear are free of clods of soil, slurry (water and soil mixture) and plant material.	All Personnel	During/post clearing

No.	Control measure	Responsibility	Timing
15	Use facilities specifically designed for cleaning vehicles, plant and equipment or footwear at washdown/brushdown locations.	All Personnel	During/post clearing
16	The transfer of weeds and diseases along easements, private land holdings and access tracks must be avoided wherever possible by visually inspecting, cleaning or washing down vehicles, plant and equipment.	All Personnel	At all times
Training			
17	Employees and subcontractors must trained in the identification of weeds specifically the African love grass relevant to their work sites and appropriate clean down procedures	Environmental Advisor	Ongoing
18	Raise awareness of the importance of controlling weeds and their role in preventing its spread.	Environmental Advisor	Ongoing
Clean Down Requirements			
19	All vehicles, plant and machinery entering and leaving sites with weed infestations must be cleaned and free of weeds and pathogens Particular attention should be paid to the radiator, wheel wells, tyres, bumpers and undercarriage on the exterior and the carpets, floor mats and seats within the cab.	All Personnel	Post clearing
20	All soil and organic matter from tyres and undercarriages is removed (for example, with a bristle brush or spraying with a bio-degradable disinfectant such as Phytoclean, Biogram, Stericide or Trigene)	All Personnel	Post clearing
21	The soil and seeds from vehicle/equipment cleaning must be collected in the area, bagged and disposed of appropriately.	All Personnel	Post clearing
22	All machinery and equipment must be inspected and cleaned prior to leaving the infected area.	All Personnel	Post clearing
23	All cleaning implements (i.e. brushes) must be double bagged and disposed of appropriately.	All Personnel	Post clearing
24	Old cleaning equipment is to be double bagged and disposed of appropriately.	All Personnel	Post clearing
25	Grass seeds shall be removed from trousers, socks, boots and boot laces	All Personnel	Post clearing
26	Cleaning only to occur in Approved Wash/brush down areas close to infected areas to reduce spreading infected material	All Personnel	Post clearing
27	If a vehicle re-enters an infected area it must be cleaned again prior to leaving the site	All Personnel	Post clearing
28	Where possible, a blow-down using air compressor is also desirable	All Personnel	Post clearing

No.	Control measure	Responsibility	Timing
29	In dry conditions, equipment is cleaned of soil and organic matter using compressed air or a high pressure hose in replacement of wash downs (thereby reducing water use)	All Personnel	Post clearing
30	Waste water is not be discharged into watercourses or unaffected areas	All Personnel	Post clearing
31	Complete Weed/disease Inspection and clean down checklist	All Personnel	Post clearing
32	The figure below shows a graphical depiction of when vehicles/equipment requires an inspection. Needed inspections are depicted with a circled “x”. 		
Visual Inspection			
33	A visual inspection of vehicles, plant and equipment shall be undertaken and shall include the following; The radiator, wheel wells, tyres, bumpers and undercarriage on the exterior and the carpets, floor mats and seats within the cab	All Personnel	Ongoing
35	Any vegetation and/or seeds are removed and disposed of appropriately.	All Personnel	Ongoing
Vehicle Clean Down Checklist			

No.	Control measure	Responsibility	Timing
36	Vehicles travelling within areas of known or suspected plant/animal disease and/or weed infestations must complete a Vehicle Clean Down Checklist to record all cleaning episodes using **G-EN-FM-00077 Vehicle Clean Down Checklist**. The Vehicle Clean Down Checklist should be completed after each clean down. The following information should be recorded: • Date • Property or Location • Vehicle make, model and registration • Previous Location (if known) • Drivers Name and Signature • Type of Clean Down (visual inspection, clean down, full clean, onsite or offsite, car wash)	All Personnel	Ongoing
Records			
37	Records shall be kept and maintained for the following; • Any pesticides/herbicides used • Vehicle Clean Down Checklists • Properties with significant weed infestations and/or plant/animal diseases • Any requirements of landowners regarding access or weed/disease control techniques	All Personnel	Ongoing

8.1 Clean Down Techniques

The matrix below can be used to assess the appropriate type of vehicle clean down required - for example, a full clean, a wash down or a visual inspection. These requirements can be applied where there is no project or client guidance on clean down techniques.

		Dense infestations – contact with weeds unavoidable	Large number of scattered plants or clumps of weeds that can be driven or walked around – contact probable	Small patches of weeds or individual plants – easily avoided – contact with weeds feasible
Operator Actions	RISK	HIGH	MEDIUM	LOW
Drove off-road through vegetation, worked in muddy/ wet conditions / worked among plants where seeds visibly present	HIGH	FULL CLEAN	FULL CLEAN	WASH DOWN
Drove on un-improved roads, pulled onto shoulder, had contact with vegetation either on-foot or with vehicle	MED	FULL CLEAN	WASH DOWN	WASH DOWN
Travelled on improved roads only, did not walk off designated path	LOW	VISUAL INSPECTION	VISUAL INSPECTION	VISUAL INSPECTION

The following techniques should be performed at a designated vehicle clean down station prior to entering a protected site for the first time or when moving from one infested area to another.

9 Related Documents

9.1 Internal References

Ref	Document Title
G-EN-FM-00077	Vehicle Clean Down Checklist

Clearing Methodology

1. Prior to any clearing, grubbing or ground disturbance ensure permit or approvals are place.
2. Ensure clearing or disturbance area is positively identified and clearly demarcated in the field including limits of clearance and access tracks.
3. Ensure weeds are positively identified and clearly demarcated in the field.
4. A qualified surveyor (or equivalent) shall mark out the area approved for Clearing and Grubbing,

5. Identify stockpile locations for weeds, non-weed vegetation, weed topsoil, and weed-free topsoil.
6. Ensure all services are located, verified and marked prior to clearing
7. Ensure all relevant drawings including clearing boundaries are clearly defined.
8. Ensure appropriate erosion and sediment controls area in place
9. Ensure sensitive areas are clearly demarcated and signposted in the field.
10. Ensure a pre-clearance checklist is completed
11. Ensure that all vehicle and equipment movement is kept within designated land disturbance areas.
12. Ensure the clearing area is surveyed post- clearing.
13. Clearing and stripping should be avoided in wet and windy condition
14. Minimise the area of exposed soil
15. Clear non weed areas first
16. Clear weed-infested areas last
17. Avoid the creation of “habitat islands” (un-cleared areas in the middle of cleared areas within which fauna can hide
18. Stockpile weed-free vegetation separately to weed-infested vegetation
19. Stockpile weeds separately from other vegetation and place
20. Complete post disturbance inspection to ensure no unauthorised disturbance
21. Maintain complete vegetation clearing and stockpile records
22. Regular inspections shall be undertaken and recorded to ensure that clearing and grubbing remain restricted to pre-designated, surveyed areas. All records to be maintained

Topsoil stripping Activities

23. Topsoil from weed affected areas should be stripped and stockpiled separately from topsoil from non-weed affected areas
24. Strip topsoil to a target depth of 75 mm and maximum of 100 mm

Topsoil Storage Activities

25. Stockpile topsoil in areas that will not be disturbed by future construction or operations activities
26. Stockpile topsoil such that surface water flow is not impeded
27. Construct topsoil stockpiles by paddock-dumping of topsoil, to a maximum height of 2m. The stockpiles should be created by placing successive truckloads of soil sufficiently far apart to create depressions between loads
28. Stockpile topsoil such that it is not placed within a 10m inside limit of tenure or disturbance boundary
29. Topsoil stored more than 24 months should be stored for sufficient length of time to allow establishment and seed production by vegetation on the stockpile itself
30. Control weed populations that establish in stockpiles as they emerge using approved methods or chemicals
31. Appropriate weatherproof signage should be used to clearly identify stockpiles, and the locations should be recorded on site maps. The signs should discourage vehicle access
32. Topsoil stockpiles should be left undisturbed until required for rehabilitation works
33. Double handling of vegetation stockpiles and windrows should be avoided
34. Monitor topsoil stockpiles on an fortnightly basis for erosion, vegetation development and weed infestation

General

35. Weeds shall be managed in accordance with Weed Hygiene procedure
36. Vehicles and equipment shall be cleaned in designated wash down areas.

Contents

1 Purpose

The purpose of this Plan is to minimise the potential for, and impacts from, noise and vibration resulting from construction activities.

2 Scope

This Plan defines management strategies to minimise the potential for, and impacts from, noise and vibration resulting from construction activities.

This Plan does not intend to mitigate or address Health and Safety risks; these will be managed through Health and Safety Plans and Procedures.

3 Responsibilities

Role	Responsibility
Group Manager Environment & Sustainability	Provide Zinfra with advice in relation to environmental noise management and support the Project in complying with State/Territory regulations
Construction Mangers/HSE Managers/ Advisors	Implement and maintain specific measures for noise and vibration for the duration of works, monitor the adequacy and effectiveness of these measures, provide training, monitoring and reporting, regular auditing of operations
Project/ Delivery/ Operations Managers	Ensure adequate measures for noise and vibration are maintained for the duration of works and implemented in accordance with this Plan.
Site Supervisors	Coordinate implementation of this Plan
All Employees / Contractors	Responsible for minimising noise emissions and vibrations, reporting any noise complaints to their immediate supervisor.

4 Definitions

Term	Definition
EPA	Environment Protection Authority
EPR	Environment Protection Regulation 2005
Noise	Unwanted or offending or nuisance sound to which humans and fauna are involuntarily exposed to.
SECP	Site Environmental Control Plan
Vibration	Felt when ‘shock’ waves pass through a medium (e.g. soil, metal, water, plastic, concrete etc.).

5 Legislative Requirements

Zinfra is required to minimise noise disruption as a result of any construction, operation and maintenance activities in accordance with relevant legislation (see the Legislation Table below).

All plant, equipment and facilities should be designed and operated to comply with relevant noise regulations and ***Australian Standard AS 1055.1-1997: Acoustics – Description and Measurement of Environmental Noise – General Procedures***.

All construction, maintenance and demolition activities should comply with the Australian Standard ***AS 2436-2010 (R2016) Guide to noise and vibration control on construction, demolition and maintenance sites.***

Ref	Document Title
ACT	*Environment Protection Act 1997* *Environment Protection Regulation 2005* Noise Environment Protection Policy 2010 Noise Measurement Manual (ACT) (NMM). ACT Territory Plan. World Health Organization - Guidelines for Community Noise (WHO Guidelines). Department of Environment, Climate Change, Energy and Water's 'Environment Protection Guidelines for Construction and Land Development in the ACT, EPA, March 2011
Aust Stand.	AS 1055.1-1997: Acoustics – Description and Measurement of Environmental Noise – General Procedures AS 61672.1-2004 Electroacoustics – Sound level meters – Specifications AS 2436-2010 (R2016) Guide to noise and vibration control on construction, demolition and maintenance sites.

6 Project Overview

6.1 Existing Conditions

The Project is located approximately 14 kilometres north-west of the centre of Canberra, immediately to the west and south-west of the suburbs of Holt and MacGregor, respectively, and to the south-east of the NSW ACT border. The Project area currently consists of predominately rural land uses. The area to the north of Stockdill Drive, is a future residential development referred to as Ginninderry and the east of this is an additional residential development Ginninderra Estate.

The eastern boundary of the Project includes, and is bordered by, the Magpies Belconnen Golf Club (located adjacent to the existing TransGrid Canberra Substation), further south -east is the Pine Ridge Horse Agistment site, another private rural property and the Elvin Group vineyard.

A small arts community, Strathnairn, is also located to the north of Stockdill Drive of the Project which is accessed from Stockdill Drive. This community generally consists of a range of small art workshops and associated facilities.

The Bicentennial National Trail passes through portions of the eastern side of the Project. It is situated alongside the existing Canberra Substation and extends south to Stockdill Drive.

In the ACT, noise associated with both construction activities and ongoing operation of a facility are governed by the same noise standards. The Environment Protection Regulation 2005 (EPR) however contains certain clauses that provide exemptions (with conditions) for construction noise during the daytime periods.

Based on the Territory Plan land zoning, the Project is located on and mostly surrounded by land blocks classified as Zone G, which carries the most onerous noise standards under the EPR. There are also two areas where the applicable zoning is Zone E (Broadacre). The relevant noise standards for these zones are outlined below in Table 1.

Noise Impact	ACT Land	**EPR NOISE STANDARD**	
		MON – SAT 7 AM – 10 PM SUN AND PUB. HOLS 8 AM – 10 PM	**MON – SAT 10 PM – 7 AM SUN AND PUB. HOLS 10 PM – 8 AM**
Zone E	Land (other than land in the city centre, town centres and group centres) in: • a restricted access recreation zone • a broadacre zone.	50 dBA	40 dBA
Zone G	All other land, other than land in the Central National Area (Fairbairn).	45 dBA	35 dBA
Noise emitted in the course of development [(1)].	The noise is emitted from a place other than a place in noise zone A or B; and The development will not be finished within 2 weeks after the day it started; and All relevant noise reduction measures mentioned in AS2436, as in force from time to time, are implemented; and The noise is emitted between 7 am and 6 pm on Monday to Saturday, excluding public holidays	**MON – SAT 7 AM – 6 PM** Excluding public holidays	Applicable to most the Project (e.g. Stockdill Substation, new transmission lines), associated noise is exempt from meeting the noise standards as determined by the EPR.

[(1)] In accordance to the ACT Territory Plan, the definitions of 'development' encompasses major utility installation (including a major electrical substation) and major service conduits (including transmission lines having a voltage greater than 66 kV).

If the listed conditions are met when carrying out the relevant activities, the associated noise is exempt from meeting the noise standards as determined by the EPR.

Once a noise zone has been identified according to the Territory Plan, the noise standard for that zone is applicable as an upper limit. Section 8.2 of the Noise Environmental Protection Policy, ACT (the Policy) states that the limits shown in Table 1 are to be measured as LA10 T, where 'T' is not less than 5 minutes or greater than 15 minutes.

According to Section 24(2) (c) of the Regulation, it is stated that "the noise standard on the boundary between 2 or more noise zones is the average of the noise standards for the noise zones for the time when the noise is emitted, rounded up to the nearest dB(A)."

In assessing the noise impact at sensitive receivers, the Regulation describes the compliance point as any point as near as practicable to the property boundary from the proposed development as opposed to specifically the location of a residence on that property.

Noise impact is expected to be limited as most works will be conducted during the standard hours prescribed by the Environment Protection Regulation 2005 (EPR) when exemption to meeting noise standards would apply.

For all daytime works conducted during standard construction hours (between 7 am and 6 pm on Monday to Saturday, excluding public holidays), exemptions to comply with the normal noise standards apply. This implies that the EPR does not require consideration of mitigation for exceedances of the day time noise standards. This is however subject to the condition that noise reduction measures mentioned in AS2436 (Guide to Noise Control on Construction, Maintenance and Demolition Sites), are implemented.

Additional consideration of noise mitigation is required for all out-of-hours construction works except for works at the Stockdill Substation site (as these works have been assessed to comply with the most stringent noise standard). These out-of-hours works are currently identified as:

- transmission line cutover and commissioning
- substation assembly (oil filling of the transformer) and commissioning
- the delivery of materials outside standard hours requested by police or other authorities for safety reasons
- emergency work to avoid the loss of lives and/or property
- work timed to correlate with system planning outages.

Construction vibration; The use of rollers has the potential to induce human discomfort and building cosmetic damage if operated within 100 metres from a sensitive human receiver or an establishment.

Some potentially sensitive noise receivers have been identified along the construction route that would be potentially be impacted slightly during construction.

Land owners will be consulted and notified in advance in relation to the construction program and staging of proposed land access restrictions to minimise impacts.

The Pine Ridge Horse Agistment has also been identified within the immediate vicinity of the proposed transmission line alignment which may be impacted by construction related noise and vibration.

Specific mitigation measures will be determined in consultation with sensitive land uses (such as the Pine Ridge Horse Agistment) to minimise potential impacts on these land uses (i.e. noise and vibration impacts to horses located on this property).

6.2 DA and EIS Conditions

The Construction Noise & Vibration Management Plan is a sub-plan that forms part of the overarching Construction Environmental Management Plan (CEMP)

It has been developed in accordance to the relevant conditions of the DA and EIS Conditions (see Table 1).

Table 1

DA Condition Ref	EIS Condition Ref	Condition
	C-NV1	Prior to the commencement of works a construction noise and vibration management plan (CNVMP) would be developed for the Project. The CNVMP would identify management strategies for works required outside of the standard construction hours and protocols for community consultation and complaints handling.
	C-NV2	All workers shall be inducted on the CNVMP, site environmental conditions and sensitivities identified in the EIS and receive training as appropriate. The primary emphasis should focus on ensuring that workers understand the implemented noise management measures and locations of the sensitive receivers. Records shall be kept of this induction and training.
	C-NV3	Noise affected neighbouring properties shall be notified as to the timing and duration of the construction works at least seven days prior to commencing work.
	C-NV4	Construction works would be planned and carried out during standard construction hours wherever possible (i.e. Monday to Saturday 7 am to 6 pm). Where out-of-hours works are required as per identified in this report, a further assessment should be undertaken specific to the proposed activities. This assessment should consider factors such as the level of occupancy at any identified new residential estates and the locations of the proposed out-of-hours works to confirm the predicted impacts and appropriateness of mitigation measures.
	C-NV5	In relation to vibration, restrictions to the use of roller would be required for all transmission lines works within the easement. It is recommended that the safe working distance as noted in Table 10.6 be referred to when working close (≤100 metres) to a building structure. This is expected to primarily impact on future residents within the Ginninderry and the Ginninderra Estate.
	C-NV6	No specific mitigation consideration was found to be required in relation to construction traffic noise.

	C-SE2	Mitigation measures for minimising noise and vibration amenity impacts are as per section 10.4 of this Revised EIS).
	C-SE4	Specific mitigation measures would also be determined in consultation with sensitive land uses (such as the Pine Ridge Horse Agistment) to minimise potential construction impacts on these land uses (i.e. noise and vibration impacts to horses located on this property).

7 Environmental Impacts

Noise and vibration are transmitted through air, water or ground. Noise and/or vibration emitted can be of varying frequency and intensity.

Construction activities that have the potential to emit noise and vibrations include, but are not limited to:

- Fixed plant (generator sets, etc.);
- Mobile equipment (light vehicles, trucks, heavy equipment, drill rigs, etc.);
- Warning devices (sirens, reversing alarms etc.); and

Noise and vibration has the potential to impact the environment by:

- Disturbing habitat (e.g. birds may avoid the site during periods of excessive noise);
- Altering soil structure (e.g. vibrations from blasting may alter fauna warrens); and
- Interfering with existing feeding and breeding behaviour (e.g. Noise at night will disturb nocturnal feeders).

Fauna can be alarmed by sudden loud noises and may temporarily vacate the immediate area, returning to normal behaviour when the noise has ceased. Irregular loud noise is expected to have a short-term behavioural impact on fauna.

Noise emissions, in particular those with tonality, modulation or impulsiveness may lead to adverse nuisance impacts to local community, landowners and businesses.

8 Mitigation Measures

No.	Control measure	Responsibility	Timing
General			
1	Sensitive receptors to noise and vibration (e.g. affected communities, fauna habitat, shall be identified on SECP.	Environmental Advisor	Pre – construction
2	All personnel shall be inducted on the CNVMP, site environmental conditions and sensitivities identified in the EIS via Project induction, daily prestart, toolboxes and SECP. Records shall be kept of this induction and training.	Environmental Advisor	Pre – construction
3	All plant and machinery shall be fitted with sound insulation and/or silencers/mufflers, smart reversing alarms, noise barriers etc. to reduce noise.	Construction Manager/ Supervisor	Pre – construction
5	Limits shall be applied to the load rating of roller when used near any buildings / receivers (within 100 metres).	Construction Manager/ Supervisor	Ongoing
6	All potentially affected parties/communities shall be notified in writing as to the timing and duration of the construction works at least seven days prior to commencing works.	Construction Manager/ Environmental Advisor	Pre – construction
7	Prior to works commencing in the vicinity of the Pine Ridge Horse Agistment, the Pine Ridge Horse Agistment shall be notified and consulted with to ensure specific control measures are implemented to minimise noise and vibration impacts to horses located on this property.	Construction Manager/ Environmental Advisor	Pre – construction

No.	Control measure	Responsibility	Timing
8	Construction works would be planned and carried out during standard construction hours wherever possible (i.e. Monday to Saturday 7 am to 6 pm).	Construction Manager/ Environmental Advisor	Ongoing
9	Approval may be required to work outside designated hours. The following shall be considered; • Justification for the work to be done out of hours; • Types of activity which could be noisy; • Predictions of noise levels; • Control measures for noise and vibration; and • Monitoring of noise and vibration. • Sensitive receptors	Construction Manager/ Environmental Advisor	Prior to out of hours work
10	Noise risk assessments must be performed daily in accordance with the risk assessment processes in place at that site. G-HS-PR-00040 Health Safety and Environment (HSE) Risk Management Procedure for more details.	Construction Manager/ Supervisor	Daily
11	Noise levels for individual items of plant and equipment brought to a site must be checked for compliance with noise regulations prior to delivery on site.	Construction Manager/ Supervisor	Pre-mobilisation
Plant and Equipment			
12	Select equipment that is likely to result in the lowest noise impact whilst still completing the task (i.e. electric rather than diesel/air-powered)	Procurement/ Project Manager	Pre-mobilisation
13	All plant and equipment shall be regularly maintained to ensure noise control equipment is correctly fitted and operating as per design performance requirements.	Workshop/ Maintenance Equipment Owner	Ongoing
14	Repair, modify or replace any unduly noisy item with a quieter item.	Workshop/ Maintenance/ Equipment Owner	Ongoing
15	Records of compliance/maintenance checks shall be maintained.	Workshop/ Maintenance/ Equipment Owner	Ongoing
16	Where applicable, ensure vibration transmission to ground from fixed plant is minimised.	Construction Manager/ Supervisor	Ongoing
17	Where practical, shut down heavy equipment when not in active use, rather than letting it idle for long periods	All Personnel	Ongoing
18	Minimize or eliminate the use of back-up beepers during night shift construction activities providing there is compliance with Operational Health and Safety requirements.	Construction Manager/ Supervisor	Ongoing

No.	Control measure	Responsibility	Timing
19	Where noise emissions from a particular piece of equipment cannot practically achieve compliance with noise emission guidelines, restrict its use to daytime hours only and/or to locations remote from sensitive receptors.	Construction Manager/ Supervisor	Ongoing
20	Monitor sources of noise and vibration as required.	Construction Manager/ Supervisor	As required
Complaints			
21	Noise complaints must be recorded, reported and investigated in accordance with Zinfra's G-HS-PR-00153 Incident Management Procedure, and any client reporting procedures.	Construction Manager/ Supervisor	As required
22	All concerns/complaints shall be resolved in a timely manner, by considering all practicable means to mitigate noise/vibration impacts, either through changes of work schedule, use of alternative construction techniques, quieting and/or relocation of key equipment or the construction of effective temporary noise barriers.	Construction Manager/ Supervisor	Ongoing

Contents

1 Purpose

The purpose of this Plan is to adopt best practice in the management of both Aboriginal and Non-Aboriginal Heritage, ensuring any item, site or relic of heritage significance is protected and recorded. Compliance with all relevant legislation and mitigation measures is outlined in Section 8.

The objectives of this Plan are to:

- Avoid and/or minimise impacts on Aboriginal and Non-Aboriginal Heritage sites;
- Ensure best management procedures are followed;
- Comply with the approved Cultural Heritage Assessment (CHA) and any other heritage approvals;
- Manage impacts on known and previously unrecorded sites where impacts are unavoidable;
- Obtain all necessary approvals and adhere to permit conditions, where disturbance is unavoidable;
- Protect, educate and promote environmental awareness; and
- Leave a positive environmental legacy post-construction.

2 Scope

This Plan applies to all work associated with the construction phase of the project. There is potential for Aboriginal and Non-Aboriginal (European) heritage sites to be discovered during construction works (both Identified and unidentified sites).

Any cultural values or heritage material encountered during ground disturbance works shall be managed in accordance with this Plan.

3 Responsibilities

Role	Responsibility
Group Manager Environment & Sustainability	• Provide Zinfra with advice in relation to heritage management and support the Project in complying with State/Territory regulations.
HSE Managers/ Advisors	• Provide training in this Plan, monitoring and reporting on the day-to-day operation of this Plan, regular auditing and updating the Plan.
Project Managers / Team Leaders	• Ensure all measures are implemented as per requirements detailed in this Plan and included in the project risk register, plans and induction. • Where there is an unexpected find of a heritage item ensure that the Plan is followed including any notification.
Construction / Site Supervisors	• Coordinate implementation of this Plan on site.
All Employees and Contractors	• Ensure awareness of any sites adjacent to the works, minimise risk and report issues to their immediate supervisor.

4 Definitions

Term	Definition
Artefact Scatters	Means material remains of past Aboriginal people's activities and usually contain stone artefacts used for tasks such as cutting, charcoal, animal bone, shell or ochre.
CHA	Cultural Heritage Assessment
Cultural Heritage	Means a way of understanding and living in the world. Cultural Heritage encompasses the environment, objects and places that we inherit from the past and pass on to future generations to use, learn from and be inspired by.
SECP	Site Environmental Control Plan
Aboriginal	Means for the purpose of this Plan, the term to encompass all Aboriginal and Torres Strait Islander people, communities and items.
Middens	Means a mound or deposit of shells, animal bones or other refuse that indicates the site of an Aboriginal settlement, often including shellfish remains, bones of fish, birds and land and sea mammals used for food, charcoal from campfires and tools made from stone, shell and bone.
Non-Aboriginal	Means for the purpose of this Plan, to encompass all people and communities and items that are not Aboriginal or Torres Strait Islander in origin.
RAOs	Representative Aboriginal Organisations
Relic	Means any artefact, object or material evidence which relates to the settlement of the area, not being Aboriginal settlement, and which is of State or Local heritage significance.
Rock Engraving	Means Rock Art or Rock Paintings.
Rock Shelter	Means a shallow cave-like opening at the base of a bluff or cliff.
Scarred Trees	Means trees which have had bark removed by Aboriginal people for the creation of canoes, shelters, shields or containers.
Torres Strait Islander	Means the Aboriginal people of the Torres Strait Islands in Queensland

5 Legislative Requirements

Heritage items are protected by State/Territory and Federal legislation. It is an offence to damage Aboriginal places or objects except where a permit or approval has been granted. Penalties apply for breaches and all staff and contractors can be personally liable.

Where heritage items are known to occur, all reasonable steps must be taken to avoid impacts.

Any permit, approval or environmental assessment must be incorporated into the project risk assessment.

State	Legislation	Applicable Authority	Aboriginal	Non Aboriginal
ACT	*Heritage Act 2004*	Department of Environment and Sustainable Development	Aboriginal heritage is defined as Aboriginal places and objects protected under the Heritage Act 2004 and recorded in a centralised database maintained by the ACT Heritage Unit.	Non-Aboriginal heritage includes: • Natural heritage - objects recognised as having heritage significance as a rare or unique example of their kind, demonstrating the evolution of natural landscapes, significant ecological communities

				or habitats, or with an unusual richness or diversity of flora, fauna or natural landscapes. • Historic heritage - includes social, aesthetic, archaeological and architectural significance. The Heritage Register contains information on heritage places and objects that have been nominated, provisionally registered and registered. Information is available on the ACTMAPi website. Proposed changes which negatively impact on heritage significance will only be permitted where it is proven that there is no feasible alternative. For greenfield sites, a Cultural Heritage Assessment is required. This should detail the works to take place, the likely impact on any heritage sites, mitigation measures, and a protocol for unanticipated discovery of heritage items, and is submitted as part of the development approval.

6 Environmental Impacts

Disturbance can lead to a loss of cultural heritage, loss of visual amenity, community outrage and fines from regulators.

Aboriginal heritage items may include stone artefact scatters, rock shelters, scarred trees, rock engravings, carvings and rubbing grooves as found on rocks. They may also include material deposited on land such as middens and ancestral remains of Aboriginal people.

Non-Aboriginal heritage items may include ruins, historic settlement areas, road markers, bridges or buildings that have aesthetic, archaeological, architectural, cultural, historical, scientific or social significance.

While the development of an area may destroy the scientific values of the cultural heritage values of an area, the historic and social significance may remain as those values may relate to place rather than just the objects that are there. Indirect impacts and the context of cultural heritage values within a landscape must also be considered.

7 Project Overview

7.1 Existing Conditions

Four local Aboriginal organisations have stated an objective to represent traditional Aboriginal cultural values and interests within the ACT. These groups have been recognised by the Minister as Representative Aboriginal Organisations (RAOs) as defined under the ACT Heritage Act 2004. These groups are the;

- Buru Ngunawal Aboriginal Corporation (Buru Ngunawal)
- King Brown's Tribal Group Pty Ltd (KBTG)
- Little Gudgenby River Tribal Council (LGRTC)
- Ngarigu Currawong Clan (Ngarigu).

All Aboriginal sites within the ACT are regarded by the RAOs as having cultural significance as locations that have direct evidence of the past Aboriginal occupation of the area. Aboriginal heritage sites within the ACT are generally larger and more frequent if they are close to major permanent water sources. Stone artefact scatters are the most frequently occurring residue of Aboriginal activity in the ACT region.

The Cultural Heritage Assessment (Volume 2 – Technical paper 5) revealed that there are (Navin Officer, 2017);

- 57 Aboriginal sites recorded within two kilometres of (and including) the Project area
- two previously recorded Aboriginal sites, both artefact scatters, within the Project area: RC1 and RD3.
- three new Aboriginal sites, all artefact scatters within drainage lines, which were recorded in the Project area during the field survey for this Project: SDRA1, SDRA2 and SDRA3.

The following Aboriginal heritage listed sites are found within the Project area.

Table 1. Aboriginal sites

SITE NAME	SITE TYPE	DESCRIPTION	OBSERVATION DURING FIELD STUDY
RC1	Artefact scatter	A small artefact scatter containing four artefacts: a silcrete blade, a quartz flake and two chert flakes	Only one artefact was recorded at this location
RD3	Artefact scatter	A small scatter of artefacts	One artefact, a quartz flaked piece, was recorded at this location
SDRA1	Artefact scatter	A scatter of four artefacts including a quartz core, a quartz flaked piece, a quartz proximal flake fragment and a quartzite complete flake	This site was discovered during the field survey
SDRA2	Artefact scatter	A scatter of two artefacts including a quartz flake fragment and a quartz flake piece	This site was discovered during the field survey
SDRA3	Artefact scatter	A scatter of two artefacts including a quartzite complete flake and a quartzite flake with 50% pebble cortex and possible retouch	This site was discovered during the field survey

RC1 and RD3 have been identified as artefact scatter sites. Both of these sites are located in the north west portion of the Project area proximate to the transmission line deviation works outside Canberra substation. SDRA1 is located in the North west portion of the Project area proximate to the transmission line deviation. SDRA2 is located in the South west portion of the Project study area proximate to the new proposed Stockdill Substation. SDRA3 is located in the Southern portion of the Project area proximate to the new transmission lines.

Collectively, a total of five Aboriginal sites (RC1, RD3, SDRA1, SDRA2 and SDRA3), all artefact scatters, have been recorded to currently be in existence within the Project area.

Given that Aboriginal sites have been identified within and surrounding the Project area there is a potential that further unexpected Aboriginal sites are present, though considered unlikely within the Project impact area. Additionally, there is potential for the sites to be indirectly impacted during construction activities.

No non-Aboriginal heritage sites have been identified within the Project area. The project does not directly impact any Aboriginal heritage site and does not impact any non-Aboriginal heritage site

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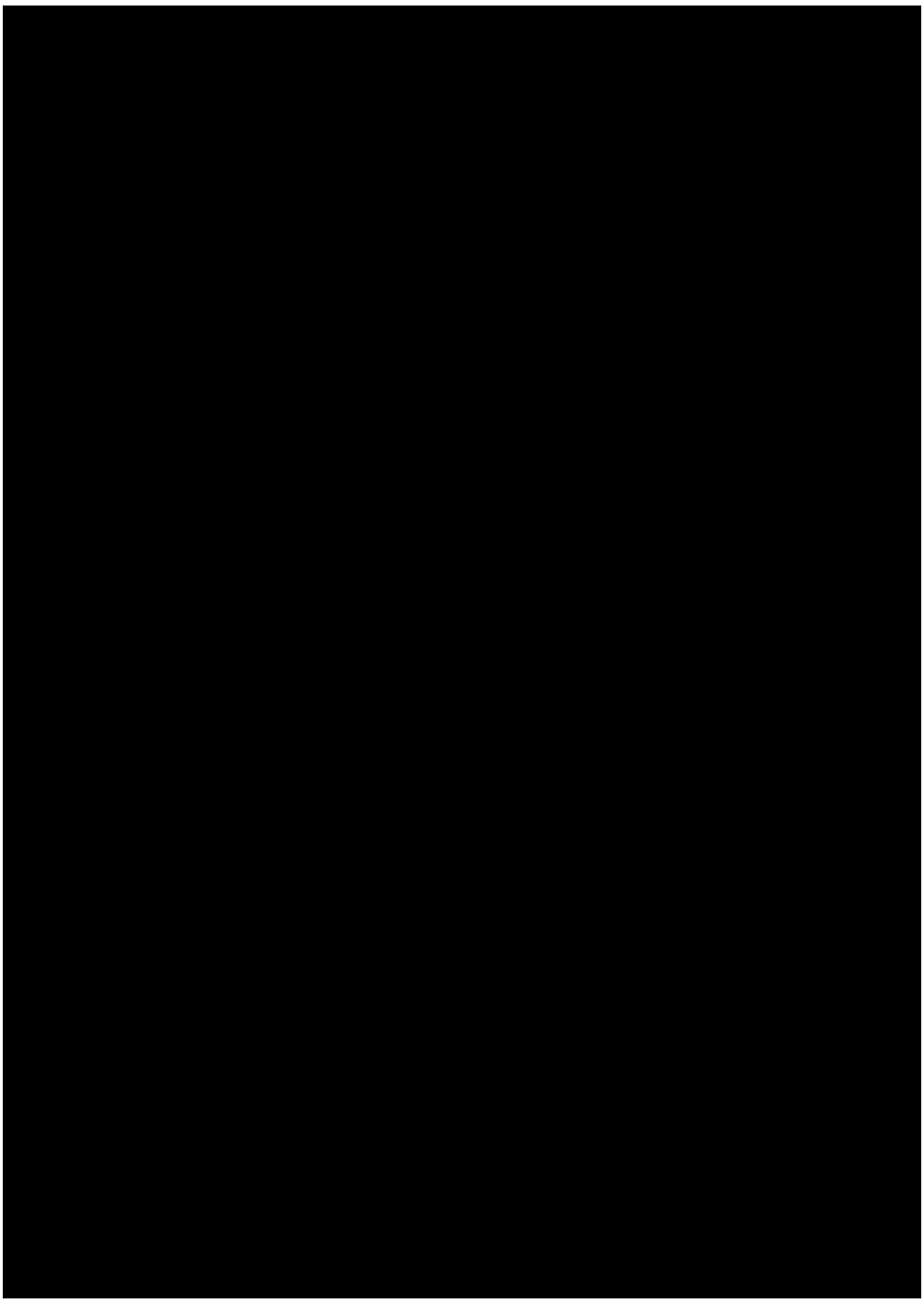


7.2 DA and EIS Conditions

The Heritage Management Plan is a sub-plan that forms part of the overarching Construction Environmental Management Plan (CEMP)

It has been developed in accordance to the relevant conditions of the DA and EIS Conditions (see Table 2).

Table 2

DA Condition Ref	EIS Condition Ref	Condition
B2		Prior to the commencement of works:
		a) Protective fencing is to be installed around Aboriginal places recorded as 'RC 1', 'RD 3', 'SD RA 1', 'SD RA2' and 'SA RA3', following demarcation of heritage boundaries by a qualified archaeologist and Representative Aboriginal Organisations (RAOs); and
		b) Written notification of fence installation is to be provided to ACT Heritage.
B3		The CEMP must identify the above Aboriginal places and management controls for their protection; and must also include the Unanticipated Discovery Protocols described in Navin Officer Heritage Consultants (June 2018)
		All project personnel are to be made aware of CEMP heritage content through the induction process
C3		In the event that additional Aboriginal places and objects are encountered during construction works, the Unanticipated Discovery Protocols described in Navin Officer Heritage Consultants (June 2018) are to be implemented.
C4		Following completion of works, protective fencing is to be removed and written notification of this is to be provided to ACT Heritage.
	C-AH1	Identification of Sites RC1, RD3 and SDRA2 on relevant construction maps (and identified in the CEMP) and worker induction on these to raise awareness of sensitivities and requirements to avoid impact.
	C-AH2	Sites SDRA1 and SDRA3 would be fenced off during construction and their location included on all relevant construction maps.
	C-AH3	In the event that an Aboriginal heritage site or artefact is identified during construction works, all ground surface disturbance works in the area would cease immediately. The unanticipated discovery protocol (CHA Appendix 2) would be implemented.

8 Mitigation Measures

No.	Control measure	Responsibility	Timing
Planning			
1	All employees and subcontractors must undertake a Heritage Induction (part of the Project Induction) prior to the commencement of works. The project induction must detail the contingency measures for the discovery of Aboriginal and non-Aboriginal heritage sites as described in the CHA	All	Prior to work commencing on site
2	The location of known known Aboriginal heritage sites within the project area are made known to all site personnel through project induction and detailed on the SECP. Sites RC 1', 'RD 3', 'SD RA 1', 'SD RA2' and 'SA RA3',	Construction Manager/Environmental Advisor	Prior to work commencing on site
3	Protective fencing shall be installed around Aboriginal places recorded as 'RC 1', 'RD 3', 'SD RA 1', 'SD RA2' and 'SA RA3', following demarcation of heritage boundaries by a qualified archaeologist and Representative Aboriginal Organisations (RAOs);	Construction Manager/Environmental Advisor	Prior to work commencing on site
4	Written notification of fence installation to be provided to ACT Heritage.	Construction Manager/Environmental Advisor	Prior to work commencing on site
5	Work crew induction, prestart and toolbox on these to raise awareness of sensitivities and requirements to avoid impact.	Construction Manager/Environmental Advisor	Prior to work commencing on site
6	In the event that an unidentified Aboriginal heritage site or artefact is discovered or identified during construction works, all ground surface disturbance works in the area will cease immediately. The unanticipated discovery protocol (Appendix 2 of Volume 2 – Technical paper 5) and Zinfra Procedure will be implemented.	Construction Manager/Environmental Advisor	At all times
7	Ensure clearing of soil and vegetation is kept to a minimum where possible.	Construction Manager/Environmental Advisor	During construction
8	Ensure that all vehicle and equipment movement is kept within approved designated land disturbance areas.	Construction Manager/Environmental Advisor	During construction
Inspections			
9	Where there are known heritage items within the work site, weekly inspections should be conducted to ensure that “No Go Zones/Areas” are not disturbed.	Supervisor/Environmental Advisor	Weekly
10	Flagging and Signage shall remain in good working order and remedied immediately. Daily and weekly inspections shall continue until the permit or approval has been closed.	Supervisor/Environmental Advisor	Daily and Weekly

No.	Control measure	Responsibility	Timing
Protocol to be followed in the event that previously unrecorded or unanticipated Aboriginal or non-Aboriginal archaeological material (objects, artefacts, deposits or relics) are encountered			
1	All ground surface disturbance in the area of the finds should cease immediately the finds are uncovered. a) The discoverer of the find(s) will notify machinery operators in the immediate vicinity of the find(s) so that work can be halted; and b) The site supervisor and the development proponent will be informed of the find(s).	All Personnel	At all times
2	If there is substantial doubt regarding a human or Aboriginal or historical European origin for the finds, then consider if it is possible to gain a qualified opinion (such as from the project archaeologist) within a short period of time. If feasible, gain a qualified opinion (this can circumvent proceeding further along the protocol for remains which turn out not to be archaeological). If a quick opinion cannot be gained, or the identification is positive, then proceed to the next step.	Construction Manager/Environmental Advisor	At all times
3	Immediately notify the following authorities or personnel of the discovery: a) The ACT Heritage; b) Representatives from the Representative Aboriginal Organisations (RAOs) (where appropriate); and c) The project archaeologist (if not already present).	Construction Manager/Environmental Advisor	As required
4	Facilitate, in co-operation with the appropriate authorities and stakeholders: a) The recording and assessment of the finds by a suitably qualified heritage professional b) (either the project archaeologist or a member of the ACT Heritage). This will include c) determining if the find(s) are from a new or previously recorded site, and lodgment of d) site information for all new recordings with the Heritage Unit; e) Fulfilling any legal constraints arising from the finds. This will include complying with f) Heritage Council advice, any Conservation Management Plan (CMP) requirements in the g) case of a previously recorded site; and h) The development and conduct of appropriate management strategies. Strategies will i) depend on stakeholder requirements and the assessed significance of the find(s).	Construction Manager/Environmental Advisor	As required
5	Where the management of find(s) involves the salvage excavation or collection of artefacts, this material will be curated according to the provisions of any relevant CMP, or as directed by the Heritage Council.	Construction Manager/Environmental Advisor	As required

No.	Control measure	Responsibility	Timing
6	Where the find(s) are determined to have cultural heritage value according to the criteria specified in the Heritage Act 2004, any re-commencement of construction related ground surface disturbance may only resume in the area of the find(s) following compliance with any consequential legal requirements and gaining written approval from the ACT Heritage Council.	Construction Manager/Environmental Advisor	As required
Protocol to be followed in the event that suspected human remains are encountered			
1	All ground surface disturbance in the area of the finds should cease immediately the finds are uncovered. a) The discoverer of the find(s) will notify machinery operators in the immediate vicinity of the find(s) so that work can be temporarily halted; and b) The site supervisor and the development proponent will be informed of the find(s).	All	At all times
2	If there is substantial doubt regarding a human origin for the remains, then consider if it is possible to gain a qualified opinion within a short period of time. If feasible, gain a qualified opinion (this can circumvent proceeding further along the protocol for remains which turn out to be non-human). If conducted, this opinion must be gained without further disturbance to any remaining skeletal material and its context as possible (Be aware that the site may be considered a crime scene containing forensic). If a quick opinion cannot be gained, or the identification is positive, then proceed to the next step.	Construction Manager/Environmental Advisor	As required
	Immediately notify the following people of the discovery: a) The local Police (this is required by law); b) The ACT Heritage; c) Representatives from the Representative Aboriginal Organisations (RAOs) (where appropriate); and d) The project archaeologist (if not already present).	Construction Manager/Environmental Advisor	As required
4	Facilitate the evaluation of the find(s) by the statutory authorities and comply with any stated requirements. Depending on the evaluation of the find(s), the management of the find(s) and their location may become a matter for the Police and/or Coroner.	Construction Manager/Environmental Advisor	As required
5	Construction related works in the area of the find(s) may not resume until the development proponent receives written approval from the relevant statutory authority: from the Police or Coroner in the event of an investigation; and from the ACT Heritage Council in the case of human remains outside of the jurisdiction of the Police or Coroner.	Construction Manager/Environmental Advisor	As required
6	In the event that the proponent continues an active role in the evaluation and/or management of the find(s), via a direction or advice from the Police, Coroner and/or Heritage Council, then all or some of the following steps may be conducted:	Construction Manager/Environmental Advisor	As required

No.	Control measure	Responsibility	Timing
7	Facilitate, in co-operation with the appropriate authorities, the definitive identification of the skeletal material by a specialist (if not already completed). This must be done with as little further disturbance to any remaining skeletal material and its context as possible.	Construction Manager/Environmental Advisor	As required
8	If the specialist identifies the bone as non-human then, where appropriate, the protocol for the discovery of historical or Aboriginal artefacts (above) should be followed.	Construction Manager/Environmental Advisor	As required

9	If the specialist determines that the bone material is human, then the proceeding course of action may be of three types: a) The bone(s) are of an Aboriginal and non-Aboriginal person who died less than 100 years ago and where traumatic death is suspected. Such remains come under the jurisdiction of the 1997. All further decisions and responsibilities regarding the remains and find location rest with the ACT Police, and/or the ACT Coroner. b) The bone(s) are of a non-Aboriginal person who died more than 100 years ago. In this case, and where the Police have indicated that they have no interest in the find(s), the following steps may be followed: i. Ascertain the requirements of the ACT Heritage Council, the development proponent, the project archaeologist, and the views of any relevant community stakeholders; ii. Based on the above, determine and conduct an appropriate course of action. Possible strategies could include one or more of the following: 1. Avoiding further disturbance to the find and conserving the remains *in situ* (this option may require relocating the development and this may not be possible in some contexts); 2. Conducting (or continuing) archaeological salvage of the finds following receipt of any required statutory approvals; 3. Scientific description (including excavation where necessary), and possibly also analysis of the remains prior to reburial; 4. Recovering samples for dating and other analyses; and/or 5. Subsequent reburial at another place and in an appropriate manner determined by the Heritage Council and in consultation with other relevant stakeholders c) The bone(s) are of an Aboriginal person who died more than 100 years ago. In this case the following steps may be followed: i. Ascertain the requirements of the local RAOs, the ACT Heritage Council, the development proponent, and the project archaeologist; ii. Based on the above, determine and conduct an appropriate course of action. Possible strategies could include one or more of the following: 1. Avoiding further disturbance to the find and conserving the remains in situ, (this option may require relocating the development and this may not be possible in some contexts);	Construction Manager/Environmental Advisor	As required

No.	Control measure	Responsibility	Timing
	2. Conducting (or continuing) archaeological salvage of the finds following receipt of any required statutory approvals; 3. Scientific description (including excavation where necessary), and possibly also analysis of the remains prior to reburial; 4. Recovering samples for dating and other analyses; and/or 5. Subsequent reburial at another place and in an appropriate manner determined by the RAOs and the Heritage Council.		

Contents

1 Purpose

The purpose of this Plan is to ensure that any erosion and off-site sedimentation from construction works is avoided, minimised, and mitigated through effective and appropriate erosion and sediment control measures.

2 Scope

This Plan applies to Zinfra employees and subcontractors

The objectives of this Plan are to:

- Ensure best management procedures are followed and appropriate soil conservation practices (management of erosion and sedimentation) are planned/implemented and that stormwater runoff is effectively controlled;
- To minimise the potential for sediment loss from the project site;
- To minimise turbidity, sediment movement and overall disturbance of stream bed and banks as a consequence of construction;
- To prevent the decline in water quality in comparison to pre-construction background levels;
- To comply with best practice environmental management guidelines for the management of stormwater;
- To minimise the possibility of contamination to site drainage systems;
- To remove suspended sediments from runoff water prior to discharge from construction sites;
- To minimise the risk of increased erosion and/or sediment deposition on the surrounding environment;
- Protect, educate and promote environmental awareness during construction and

- Leave a positive environmental legacy post-construction.

3 Responsibilities

Role	Responsibility
Group Manager Environment & Sustainability	Provide advice on surface water and site drainage management, soil erosion and sediment control techniques and support business units in complying with regulations
HSE Managers/ Advisors	Assist with any risk assessments as required. Responsible for training, monitoring, regular inspections in accordance with the Plan.
Team Leaders/ Managers	Ensure that all employees adhere to the requirements outlined in this Plan. Ensure surface water, drainage, erosion, sediment control measures implemented.
All Employees/ Contractors	Adhere to the requirements as outlined in this Plan.

4 Definitions

Term	Definition
SECP	Site Environmental Control Plans
E&SC	Erosion and Sediment Control
Flumes	An artificial waterway to conduct surface water over broken ground to prevent its entering the workings
Rip Rap	Cobblestone or coarsely broken rock used for protection against erosion of embankment or gully
Sediment	Soil, sand and minerals at the bottom of surface waters, such as streams, lakes and rivers

5 Legislative Requirements

Doc Ref	Document Title
ACT	*Environment Protection Act 1997; Water and Sewerage Act 2000*
	Environment Protection Regulations 2005; Land (Planning and Environment) Act 1991; Land (Planning and Environment) Regulation 1992

6 Environmental Impacts

- Soil erosion and increased sedimentation due to ground disturbance;
- Degradation of flora and fauna habitat as a result of sediment loss or accumulation in existing habitats;
- Localised changes to the subterranean fauna habitat due to changes in the hydrology and hydrogeology of the area;
- Impacts to aquatic habitat as a result of sediment-laden runoff;
- Impacts to community recreational resources, as a result of sediment-laden run-off; and
- Impacts to surface water quality due to release of sediment laden run-off.

7 Project Overview

7.1 Existing Conditions

The 330/132 kV Stockdill Substation and associated transmission line and ancillary works project area is located in western Canberra, ACT, in an area of gently undulating small hills, with variations in elevation from approximately 545 metres Australian Height Datum (m AHD) to 630 mAHD (WSP, 2017). The regional topography drains westward towards the Molonglo River.

Soil Landscapes of the Canberra (Jenkins 2000) indicates that the site is likely to be located on the Burra Soil Landscape, which consist of well drained Rudosols and Tenosols, which are moderately acidic, with low potential to hold water, and a potential for sheet erosion (WSP, 2017).

A substantial amount of material, up to 27,000 cubic metres, is required to be excavated to allow for construction of the Stockdill Substation, access tracks and foundation works for the transmission line structures. This soil disturbance generates a potential for erosion and sediment transfer offsite, which may result in potential sedimentation of surrounding land and drainage lines. Where possible, spoil generated will be used on site to provide the required levels. Some excavated material may also be suitable for reuse for elements such as access tracks and backfilling trenches for drainage, earthing and conduits.

Depending on site levels and detailed design, some fill material may need to be imported to site for new access tracks and trench backfilling. Excess spoil which is not suitable for reuse will be disposed of offsite. The exact earthworks balance and export volumes will be determined during construction based on the suitability of the excavated materials. Based on current constructability assessment it is anticipated that there could be approximately 5,500 cubic metres to be exported off-site. No significant modification of the existing landform of the Project study area is anticipated to be required for the Project.

The current design has two (2) sediment basins to be positioned on the eastern and southern edges of the site area, to capture sediment-laden runoff from construction activities. These basins are expected to stay insitu once construction is completed, having been constructed for use as permanent site structures.

7.2 DA and EIS Conditions

The Soil, Water and Contaminated Land Management Plan is a sub-plan that forms part of the overarching Construction Environmental Management Plan (CEMP)

It has been developed in accordance to the relevant conditions of the DA and EIS Conditions (see Table 1).

Table 1

DA Condition Ref	EIS Condition Ref	Condition
B1		Develop Soil, water and contaminated land management plan
B7		Prior to works commencing, an erosion and sediment control plan must be submitted to, and be endorsed by, the EPA.
B8		A site-specific unexpected finds protocol (UFP) must be prepared by a suitably qualified environmental consultant and implemented during site development works. The UFP must include, amongst other things, appropriate procedures for the identification, assessment, management, validation and disposal of potential contamination at the site and contractor induction procedures into the use of the UFP.
	C-SC1	Confirm requirement for an environmental authorisation from the EPA in relation to volume of earthworks and likely import material volume (refer to Table 3.3 for volume triggers).
	C-SC2	As part of the overarching CEMP for the Project, soil, water and contaminated land management plans would be prepared prior to construction works commencing. It would include the following measures:
		Erosion and Sediment Control Plan (ESCP) requirements – these would be prepared in accordance with ACT requirements to manage erosion and endorsed by the EPA prior to works commencing.
		Requirements for progressive reinstatement of construction work areas, including disturbed tower/pole installation sites, to minimise erosion potential.

		Construction plant and vehicles shall be cleaned of any mud or soils prior to access onto public roads. Vehicles and equipment shall remain on existing roads and defined site access tracks.
		Any imported fill shall be certified at source location (e.g. Quarrymaster or property owner) as pathogen and weed free Excavated Natural Material (ENM) or Virgin Excavated Natural Material (VENM).
	C-SC3	Environmental spill kits containing spill response materials suitable for the works being undertaken shall be kept on site at all times and be used in the event of a spill.
	C-SC4	All chemicals or other hazardous substances shall be stored in bunded and weatherproof facilities away from drainage lines. The capacity of the bunded area shall be at least 130% of the largest chemical volume contained within the bunded area. The location of the bunded enclosure/s shall be shown on the Site Plans.
	C-SC5	Protocols for management of spoil including:
		any specific conditions associated with the environmental authorisation
		stockpile management
		testing and classification requirements prior to export offsite
		any material excavated during construction within the area of the Canberra Substation to be assessed for contaminants of potential concern, prior to reuse, or disposal off-site.
	C-SC6	An Unexpected Finds Procedure (UFP) to manage any unexpected contamination identified during site works. The UFP should:
		identify potential contaminated land characteristics (visual, odours, etc.) to be aware of during works
		identify measures to mitigate potential risks to sensitive receptors from exposure to contamination associated with the unexpected finds
		provide procedure for sampling and analysis of material or soil suspected of showing evidence of contamination and required disposal protocols in accordance with regulatory requirements.
	C-SC7	Identification of contamination risk management measures related to excavation activities on previous Blocks 15 and 16, Section 99 for all excavation and construction activities on the site. Adherence to any Contamination Management Plans (CMP) that exist for these properties, and control measures identified therein.
	C-SC8	Copies of the Preliminary Site Investigation (as outlined in section 14.2.1 of the Revised EIS) would be made available to the ACT EPA prior to commencement of works for endorsement.
	C-HF1	Spoil shall be stockpiled in a manner so as to avoid the possibility of sediments entering waterways (including stormwater drains) or migrating off-site.
	C-HF2	Any bulk fuel/herbicide or hazardous material transport vehicles shall be parked on level ground a minimum of 40m away from waterways (including drainage and irrigation channels). No refuelling or bulk herbicide preparation shall occur within 40 metres of a waterway or open site drains.
	C-HF3	Any spills of oil, fuel and other liquids shall be cleaned up promptly and immediately reported to the TransGrid/ Evoenergy (as relevant) site representative.
	C-HF4	If minor dewatering is required, the management of discharge water would be documented in the CEMP. Discharge water would be limited to vegetated, grassed areas, away from creek lines and sensitive ecological habitats, and within the transmission line easement. If the discharge water is highly turbid, dewatering through a filter sock (or similar) would be considered, where appropriate, to minimise sedimentation.

8 Mitigation Measures

No.	Control measure	Responsibility	Timing
Design and Planning			
1	Confirm requirement for an environmental authorisation from the EPA in relation to volume of earthworks and likely import material volume (refer to Table 3.3 for volume triggers).	Project Manager / Environmental Advisor	Prior to start of works
2	Prepare Erosion and Sediment Control Plan (ESCP) in accordance with ACT requirements and the Blue Book to manage erosion and endorsed by the EPA prior to works commencing.	Environmental Advisor / E&SC Specialist	Prior to start of works
3	Undertake progressive reinstatement of construction work areas, including disturbed tower/pole installation sites, to minimise erosion potential.	Construction Manager / Environmental Advisor	Ongoing
4	Clean construction plant and vehicles any mud or soils prior to access onto public roads. Vehicles and equipment shall remain on existing roads and defined site access tracks.	All	Ongoing
5	Any imported fill shall be certified at source location (e.g. Quarrymaster or property owner) as pathogen and weed free Excavated Natural Material (ENM) or Virgin Excavated Natural Material (VENM) where possible.	All	Ongoing
6	Environmental spill kits containing spill response materials suitable for the works being undertaken will be kept on site at all times and be used in the event of a spill.	All	Ongoing
7	All chemicals or other hazardous substances will be stored in bunded and weatherproof facilities away from drainage lines. The capacity of the bunded area shall be at least 130% of the largest chemical volume contained within the bunded area. The location of the bunded enclosure/s will be shown on the Site Environmental Control Plans.	All	Ongoing
8	Spoil will be managed in accordance with the following; • any specific conditions associated with the environmental authorisation • stockpile will be away from drainage lines • spoil will be tested and classified as required prior to export offsite • any material excavated during construction within the area of the Canberra Substation will be assessed for contaminants of potential concern, prior to reuse, or disposal off-site.	Construction Manager / Environmental Advisor	Ongoing
9	Delineate clearing & grubbing/earthworks/excavation area prior to commencing work.	Environmental Advisor / Project Engineer	Prior to start of works

No.	Control measure	Responsibility	Timing
10	Install and maintain erosion and sediment controls in accordance with manufacturer's specifications and E&SC Plan	Environmental Advisor / Project Engineer	Prior to start of works
11	Provide training and promote awareness of construction soil and water quality issues to all personnel and subcontractors.	Environmental Advisor / Supervisor	At all times
12	Control measures for E&SC should be determined by considering: • Local climatic conditions and seasonal variations; • Soil types, particularly dispersive, sodic and saline soils; • Local hydrology affecting the construction zone; • Local drainage, including temporary and overland flow paths.	Environmental Advisor / Project Engineer / Supervisor	At all times
13	Where required a flocculant may be used to aid in the settling/aggregation of suspended solids. For details on how to chemically treat water, refer to Appendix 1. Chemical treatment of water should ONLY be undertaken by a suitably qualified person and with the necessary approvals.	Environmental Advisor / Project Engineer	As required
14	Install appropriate sediment control devices (e.g. sediment fences) around the perimeter of spoil sites prior to any surface disturbance.	Environmental Advisor / Supervisor	At all times
15	Minimise the extent and the duration of exposure of bare ground surface at any time, to prevent erosion at the source.	Environmental Advisor / Supervisor	At all times
16	Retain buffer strips of vegetation wherever possible, between construction works and sensitive features boundaries (e.g., streams) to help protect water quality. This will also enhance the natural filtering of sediment and reduce erosion.	Environmental Advisor / Supervisor	At all times
17	The Environmental Advisor shall provide direction for the location, installation, maintenance and removal of erosion control devices. The Environmental Advisor / Supervisor shall inspect erosion control devices to ensure they are installed to a suitable standard.	Environmental Advisor / Supervisor	At all times
18	Areas susceptible to erosion shall be identified by the Environmental Advisor / Supervisor and appropriate remediation measures implemented.	Environmental Advisor / Supervisor	At all times
19	Prioritise areas in the vicinity of water bodies, wetlands, steep grades, long slopes.	Environmental Advisor / Supervisor	At all times
20	Schedule land-disturbing activities during periods of low precipitation.	Environmental Advisor / Supervisor	At all times
21	When changes are warranted, amend the sequence scheduling in advance to maintain erosion and sediment control	Environmental Advisor / Supervisor	At all times

No.	Control measure	Responsibility	Timing
22	Delineate or flag sensitive or protected features such as “NO GO” zones, and include those locations in the E&SC Plan.	Environmental Advisor / Supervisor	At all times
23	Re-establish vegetation as soon as practicably possible to prevent erosion during/post construction.	Environmental Advisor / Supervisor	At all times
24	Maintain sediment controls regularly particularly after a rainfall event. Replace controls immediately when damaged. Remove sediment build up from all sediment control devices where the capacity of the sediment control device becomes less than 60%.	Environmental Advisor / Supervisor	At all times
25	Maintain natural drainage flow as much as practicable or possible.	Supervisor	At all times
26	Mechanically compact graded areas and stabilise (either through vegetation, blue metal, paving or chemical/ synthetic soil binders) to minimise the potential for erosion	Supervisor	At all times
27	Control site access using clearly marked roads and parking areas, use a minimum number of site entry and exit points	Supervisor	At all times
28	There shall be no discharge of sediment laden or contaminated water directly into waterways or stormwater. Water must need be filtered prior to being discharged. The quality of the discharge shall be visually inspected for oily sheen and turbidity. Laboratory testing may also be required.	Supervisor	At all times
29	Do not store waste materials (solid or liquid), chemicals or fuels within drainage lines	All personnel	At all times
Stockpiles and Spoil			
30	Locate stockpiles away from waterways, drainage lines	Environmental Advisor / Supervisor	At all times
31	Implement sediment control for runoff from stockpiles. This could include silt fences or sediment traps (or stockpiled soil must be placed on drop-sheets, in bunds or skips).	Environmental Advisor / Supervisor	At all times
Waterway crossings / works			
32	All waterway protection controls must be implemented and functional prior to the commencement of works.	Environmental Advisor / Supervisor	Ongoing
33	Where required diversion drains/channels/bunds shall be installed where possible to divert clean water from operational areas.	Environmental Advisor / Supervisor	Ongoing
34	All operators shall be trained in fuel and oil spill response.	Environmental Advisor / Supervisor	Ongoing
35	No refuelling to take place within 50m of a waterway where practicable.	Environmental Advisor / Supervisor	Ongoing

No.	Control measure	Responsibility	Timing
Plant movement and access			
36	Vehicles to observe and follow the designated speed limit whilst on site, and remain on designated roadways.	All personnel	At all times
37	Temporary sediment controls (basins, catch drains etc.) should be designed to prevent surface run-off entering nearby stormwater drains and waterways without treatment of in inundation by flood waters in a 1 in 2 year design flood event.	Environmental Advisor / Supervisor	Ongoing
38	Uncontaminated sediment removed from E&SC devices should be stockpiled and used for rehabilitation purposes where applicable.	Environmental Advisor / Supervisor	Ongoing
39	Relocate topsoil in a separate stockpile from any subsoil material.	Environmental Advisor / Supervisor	Ongoing
Dewatering and Discharge			
40	If minor dewatering is required, the discharge water must be limited to vegetated, grassed areas, away from creek lines and sensitive ecological habitats, and within the transmission line easement. If the discharge water is highly turbid, dewatering through a filter sock (or similar) that reduced suspended solids concentration not to be greater than 60mg/L would be considered, where appropriate, to minimise sedimentation.	Environmental Advisor / Supervisor	Ongoing
41	Visually check discharge for oily sheen	Environmental Advisor / Supervisor	Ongoing
42	Where possible, water with a suspended solids concentration not greater than 60mg/L shall be pumped from excavations onto grassed areas where natural filtration can occur prior to water entering watercourses.	Environmental Advisor / Supervisor	Ongoing
43	All other liquids (i.e. slurry/sludge) pumped from a trench are required to be filtered (i.e. through a filter bag), such that suspended solids concentration is not greater than 60mg/L prior to release into stormwater drains or pumped and removed from site for treatment (for example, if they contain chemicals that cannot be removed by filtration).	Environmental Advisor / Supervisor	Ongoing

No.	Control measure	Responsibility	Timing
44	The following criteria must be satisfied when pumping water off-site: • There are no on-site uses for the water in preference to off-site discharge • Water quality levels are within acceptable/allowable limits • Water is pumped in a manner that does not cause scouring and excessive sediment mobilization where the pump hose enters the waterway • Where water is discharged to the ground ensure the discharge does not become waterlogged and sediment does not build up • Water quality is monitored throughout the dewatering process and dewatering is immediately ceased if maximum allowable water quality thresholds are exceeded • A formally constructed sediment basin/dewatering pond is provided if required. • Where no areas are available to apply the above controls water shall be collected by a vac truck and removed from site for treatment and disposal.	Environmental Advisor / Supervisor	Ongoing
Rehabilitation and Demobilisation			
45	Erosion controls shall remain in place until 85% or more of natural ground cover has recovered	Environmental Advisor / Supervisor	At all times
46	All cleared sites shall be restored as soon as possible following completion.	Environmental Advisor / Supervisor	At all times
47	Ensure accurate reinstatement of soil profiles after disturbance where the disturbance is temporary in nature.	Environmental Advisor / Supervisor	At all times
Unexpected finds protocol (UFP)			
48	In the event material excavated contains unexpected contaminants, this material shall be appropriately stockpiled or placed in a skip bin at a designated location where it can be tested and classified prior to disposal / reuse. Restrict access to the storage areas.	Supervisor / Environmental Advisor	At all times

No.	Control measure	Responsibility	Timing
49	Signs of potential contamination include: • Presence of buried drums, chemical containers or dumped materials in the area (including asbestos, rubble and construction waste) • Visible appearance of contaminated soil, discolouration or staining of soil and bare soil patches • Unhealthy vegetation • Unusual odours originating from soil (fuels, solvents, rotten egg gas) • Oil / chemical sheen on water If any of these are detected during excavation works, stop and follow the process set out in Appendix 5.	All Personnel	Ongoing
50	Segregate contaminated and non-contaminated soils (non-contaminated soils can be re-used)	Supervisor / Environmental Advisor	As required
51	All contaminated soil movements for disposal or reuse shall be tracked/documented in an appropriate register.	Supervisor / Environmental Advisor	At all times
52	Only licensed vehicles to transport waste shall be used	Supervisor / Environmental Advisor	At all times
53	Where soil testing is required, sampling will be undertaken in accordance with AS4482.1 2005 & AS4482.2: 1999	Supervisor / Environmental Advisor	At all times
54	Laboratory analysis shall be undertaken by a NATA accredited laboratory to appropriately classify the soils for off-site disposal to an approved licensed landfill or on-site re-use.	Supervisor / Environmental Advisor	At all times
Monitoring			
55	General observations for the management of E&SC shall be undertaken using the Weekly Environmental Inspection Checklist. Inspection of erosion and sediment controls must be carried out weekly as well as before and after any rain event.	Environmental Advisor / Supervisor	At all times
56	All drains, sedimentation basins and other water and drainage management facilities shall be regularly inspected and maintained as required.	Environmental Advisor / Supervisor	Ongoing
57	Sedimentation basins and other water and drainage management facilities shall be regularly inspected and reviewed for adequacy having regard for changing circumstances.	Environmental Advisor / Supervisor	Ongoing

No.	Control measure	Responsibility	Timing
58	A water quality monitoring program may be developed and implemented by the Environmental Advisor as required by permits and/or project specifications. This may include in-situ and laboratory testing.	Environmental Advisor / Supervisor	During works
59	The integrity and correct functioning of drains and silt traps shall be inspected and maintained. Observations and corrective actions shall be recorded on the Weekly Environment Inspection Checklist. Works may also be postponed at the Construction Manager's discretion until further notice to prevent damage to the project site and associated properties.	Environmental Advisor / Construction Manager	During works
Reporting			
60	All complaints / incidents regarding E&SC shall be reported to the Environmental Advisor / Supervisor.	All site personnel	Following complaint / incident
61	The Environmental Advisor will ensure all incidents are reported to TransGrid.	Environmental Advisor	All times
62	Details of E&SC management including incidents shall be recorded on the Weekly Environment Inspection Checklist and reported.	Environmental Advisor	At all times
63	The Environmental Advisor will investigate all incidents and report findings to stakeholders.	Environmental Advisor	At all times
Contingencies			
64	Failure of E&SCs	• Repair or replace controls immediately; • Clean up and or remediate any impacts; • Investigate reason for failure; • Evaluate failure, investigate alternative controls and implement corrective actions.	
65	Inappropriate E&SC measures	• Review site environmental plan and install appropriate controls/structures. • Evaluate alternative controls and implement corrective actions.	
66	Insufficient maintenance	• Repair/reinstate • Review maintenance schedule, staff responsible and resources.	
67	Sustained exceedance of water quality criteria	• Investigate and identify potential source(s) of exceedance; • Control the source(s); • Clean up and/or remediate any impacts; • Implement appropriate controls; and • Review construction methods, control effectiveness and device design.	

9 Related Documents

9.1 Internal References

Doc Ref	Document Title
G-EN-FM-50388	HSEQ Factsheet - Silt and Sediment Controls
G-EN-FM-50386	HSEQ Factsheet - Dewatering a Trench
G-EN-FM-50387	HSEQ Factsheet – Saw cutting and Concrete Slurry
G-EN-FM-50388	Fact Sheet - Silt and Sediment Controls
G-EN-PR-00411	Spills and Leaks Management Procedure
G-EN-FM-50388	HSEQ Fact Sheet – Silt and Sediment Controls

10 Appendix 1: Chemical Treatment of Water

Water Quality Criteria

Captured Water has to meet the criteria set out in the table below prior to a controlled discharge:

Pollutant	Method of Testing	Limit
Oil/Grease	Visual	Stop discharge if oily sheen observed
pH	pH meter (on-site test)	6.5 – 8.5
Total Suspended Solids (TSS)	Sample + Send to Lab	< 60 mg/L
Suspended Solids	On-site test	< 50 NTU

Note : NTU may be used instead of TSS

In-Field Water Quality Sampling & Testing

In-field water quality sampling and testing should be undertaken as soon as the rainfall event has finished. In-field water quality sampling will determine the need for any pH adjustment and flocculation (application of gypsum).

Use a pH probe to test basin/detention pond pH levels. If pH levels are outside the above criteria (6.5 – 8.5) then pH adjustment will be required.

Use a turbidity (NTU) meter to test turbidity levels (turbidity can be used as an in-field representation of TSS, may need to be correlated). If NTU is greater than 50, flocculation (application of gypsum) will be required.

If in-field testing shows pH and NTU/TSS are within limits, continue with laboratory testing to confirm results.

Examine surface of water if there is any oil and grease on the water surface (e.g. sheen, discolouration). Oil-absorbent material is to be spread if there is contamination.

pH Adjustment

pH adjustment will be used to correct the pH value if the pH value of the water is outside the limit set out in the Table above. Due to the required mixing of the sediment basin water, pH adjustment should be undertaken prior to the application of flocculants (gypsum).

Lime is be used to increase the level of alkalinity (i.e. increase the pH value if pH < 6.5) whereas hydrochloric acid is to be used to increase the acidity (i.e. reduce the pH value if pH > 8.5).

Hydrochloric Acid Dosage

Based the pH value measured by the pH meter and the remaining volume calculated the acid dosage required for the basin can be calculated as:

(**Measured pH value** – 8.3) * 0.08 * (**Captured volume of the basin/detention pond in m^3**) = dosage (Litres)

For example, if the pH value = 9.5 and captured volume is 834m^3 then:

(9.5 – 8.3) * 0.08 * (834) = 80 Litres acid required.

Application of Hydrochloric Acid

1. Pour acid slowly in basin/detention pond with a flex drive pump. Use the hose of the pump to spread the poured acid evenly on the surface. Continue to pour acid in the basin and circulate the water for a further 5 minutes after finish pouring of acid.
2. Check the pH value 3 hours after the application of acid. Repeat pH adjustment as required until criteria levels achieved.
3. Clean the pH meter with water after use and ensure the electrode of the pH meter is kept moist.
4. Note that the pH adjustment should be done prior to an application of flocculate agent.

Flocculation Application of Gypsum

Gypsum (either liquid or ground) is an approved flocculation agent. In order to determine the dosage of gypsum, the captured volume in the basin is required to be determined.

Calculation of Liquid and Ground Gypsum Dosage Rates

Both Liquid and ground gypsum can be used as a flocculating agent.

The dosage of **undiluted liquid gypsum** (in litres) can be calculated as below

- Basin/Pond = (captured volume as calculated above / xxxm^3) * 50 = XXX L

The dosage of ground gypsum is 50kg to 100kg of ground gypsum per 100m^3 of basin/captured volume

Procedure for Diluting Gypsum

The procedure for diluting and applying liquid and ground gypsum is:

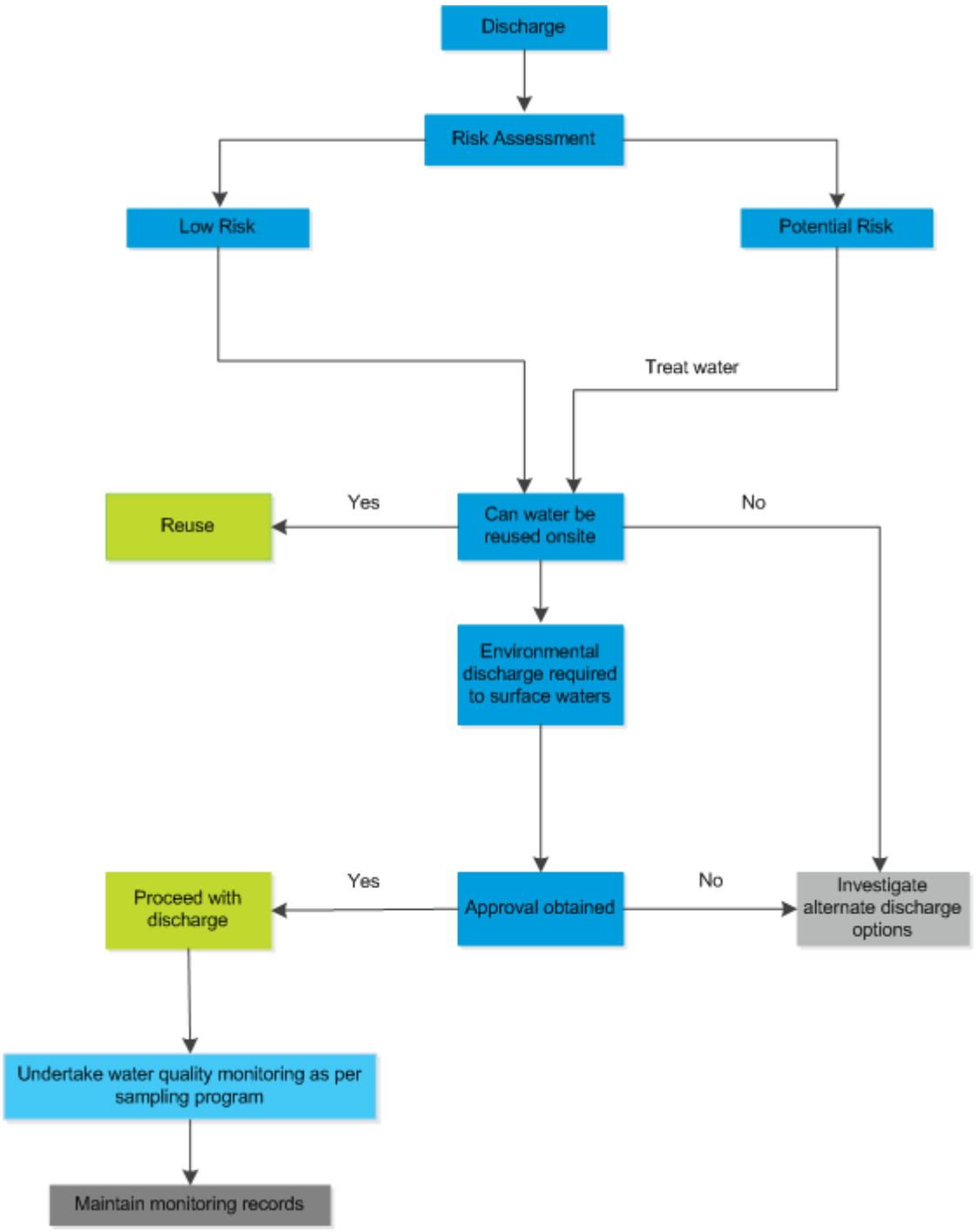
1. **Only mix enough to use.**
2. The liquid and ground gypsum must be diluted by mixing 1:2 gypsum: water ratio to filling sprayer tank.
3. Water must be placed in sprayer tank first prior to placing liquid and ground gypsum for mixing.
4. Put the hose in the inlet of the sprayer.
5. Switch on the engine of the sprayer tank and allow the mixture to circulate within the sprayer. Make sure the mixture is mixed well.
6. Maintain the existing setting and transport the mixture to the basin (this ensures the mixture is still circulating while transportation).
7. Apply the mixture to the water surface evenly.
8. Empty sprayer tank completely and clean sprayer tank probably after use.

Note: The reaction time may vary from 24 to 48 hours dependent on the water quality.

Oil & Grease

If oil or grease is observed on the surface of water (e.g. sheen or discolouration) at a sediment basin, containment materials (e.g. booms designed for lake, river or the sea) must be used to capture the oil. The captured contaminated water must be removed from the basin and disposed off-site.

11 Appendix 2 Discharge Process Flow Chart



12 Appendix 3 – Key Principles of E&SC

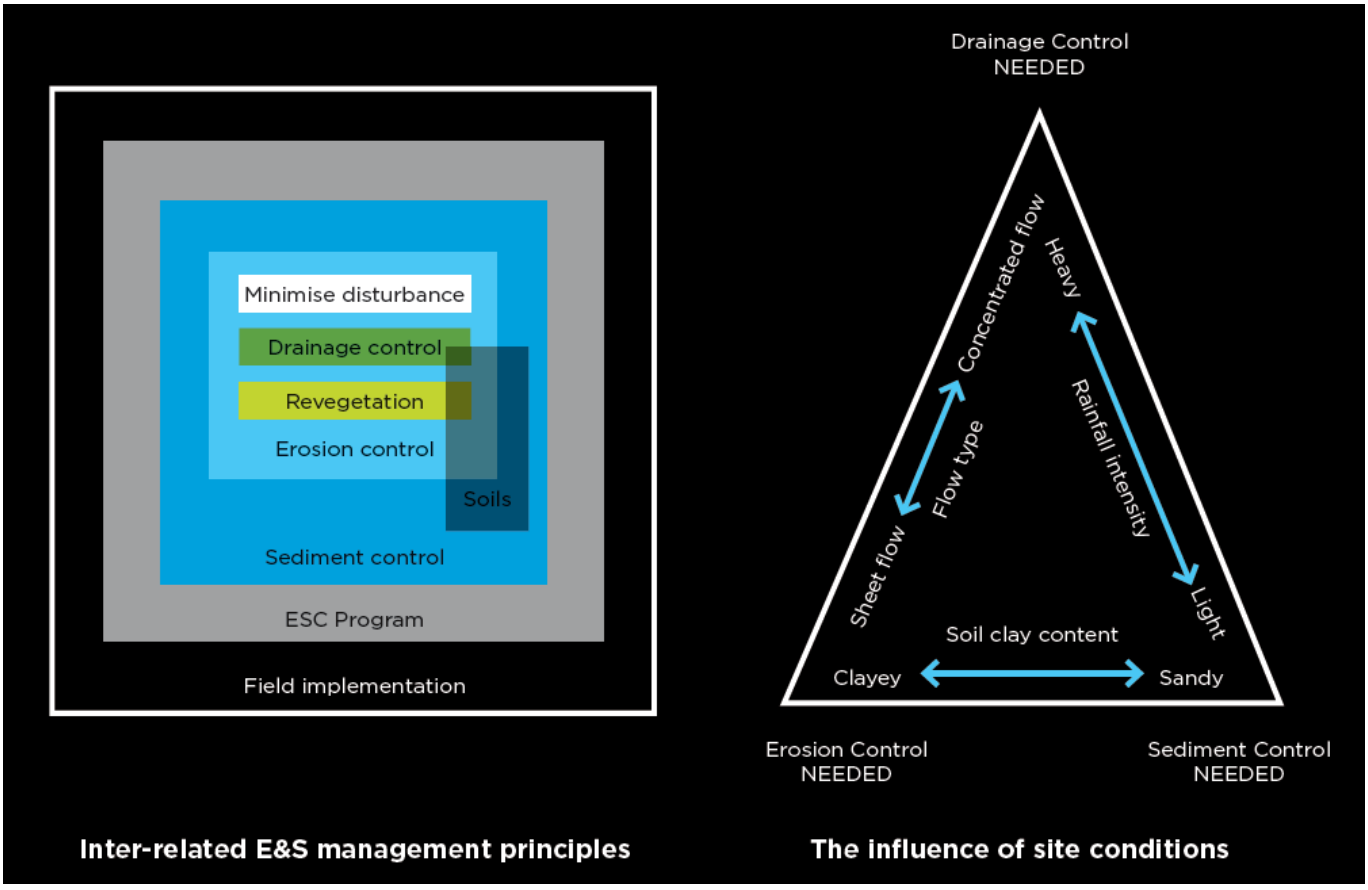
1. Identify potential hazard areas within the catchment e.g. watercourses, slopes, topographic features
    - Plan development
    - Sensitive areas defined
    - Appropriate design considerations
2. Integrate E&SC and construction Planning
    - Reduce length of surface flow i.e. divide the site into sub-catchments
    - Correct management/storage of stockpiles
    - Set clearing limits
    - Stockpiling locations
    - Review E&SC plans
3. Develop effective and dynamic E&SC Plans
    - Progressive/site specific ESCPs, EWMS – prepared prior to works commencing in the area
    - Adjust plans as required
    - Change controls as required
4. Minimise extent of disturbance and duration
    - Staging of works and construction sequence
    - Avoid ground disturbance during wet conditions
    - Plan works to avoid unnecessary clearing or bare surfaces
    - It is generally more critical to limit the duration of soil exposure than the extent of exposure
    - Limit vertical exposure i.e. slopes
5. Control runoff
    - Minimise water entering construction areas e.g. diversion channels/berms, divide into sub-catchments
    - Reduce flow velocities e.g. check dams
    - Clean water management
    - Dirty water management
    - Control water:
        - Entering the site
        - Running through the site
        - Exiting the site.
6. Control / minimise erosion FIRST – at its source.
    - Implement erosion controls to minimise sedimentation e.g. diversion banks
    - Protect streams and watercourses
    - Stage earthworks
    - Progressive revegetation
    - Preventing machinery trafficking finished soil surfaces
    - Maintaining all E&SC
7. Progressive revegetation and stabilised all disturbed areas
8. Maximise sediment retention on site
    - Maintain vegetation in flow lines
    - Installation of sediment fences
    - Sediment ponds
    - Stabilised entry and exit points
    - Installation of vibration grids
9. Maintain all E&SC in proper working order at all times
    - Maintenance is critical to overall site management and pollution prevention.
    - May involve rectifying:
        - Stormwater damage e.g. undermining

- Construction damage e.g. run over
- Silt accumulation
- Strengthening
- Replacement
- Assessment of effectiveness and location.

10. Monitor controls and adjust E&SC to maintain performance standard
    - Site inspections and rectification of failures
    - Water quality monitoring as required
    - Updating plans in response to inspections, poor water quality results

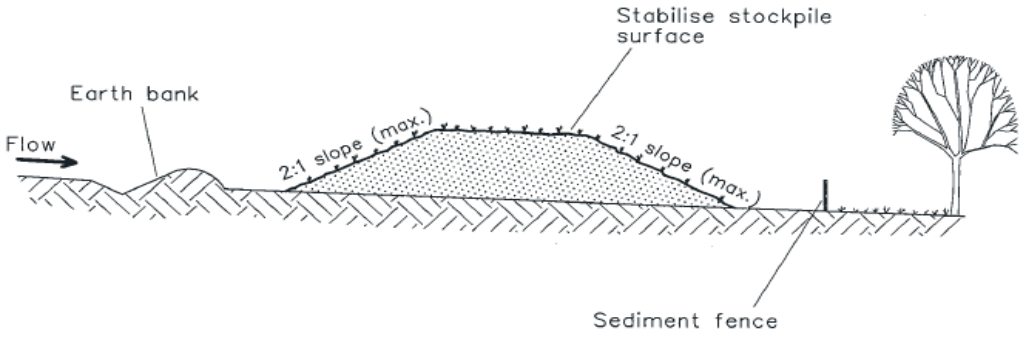
The above key principles are applicable to all sites, however their application can vary significantly from site to site and region to region.

For example in the tropical regions of Australia the primary focus is on drainage control. Without effective drainage controls, all E&SC can be washed away or rendered ineffective. In temperate regions the focus is more on erosion control or possible sediment control.



13 Appendix 4 - Typical Erosion and Sediment Controls

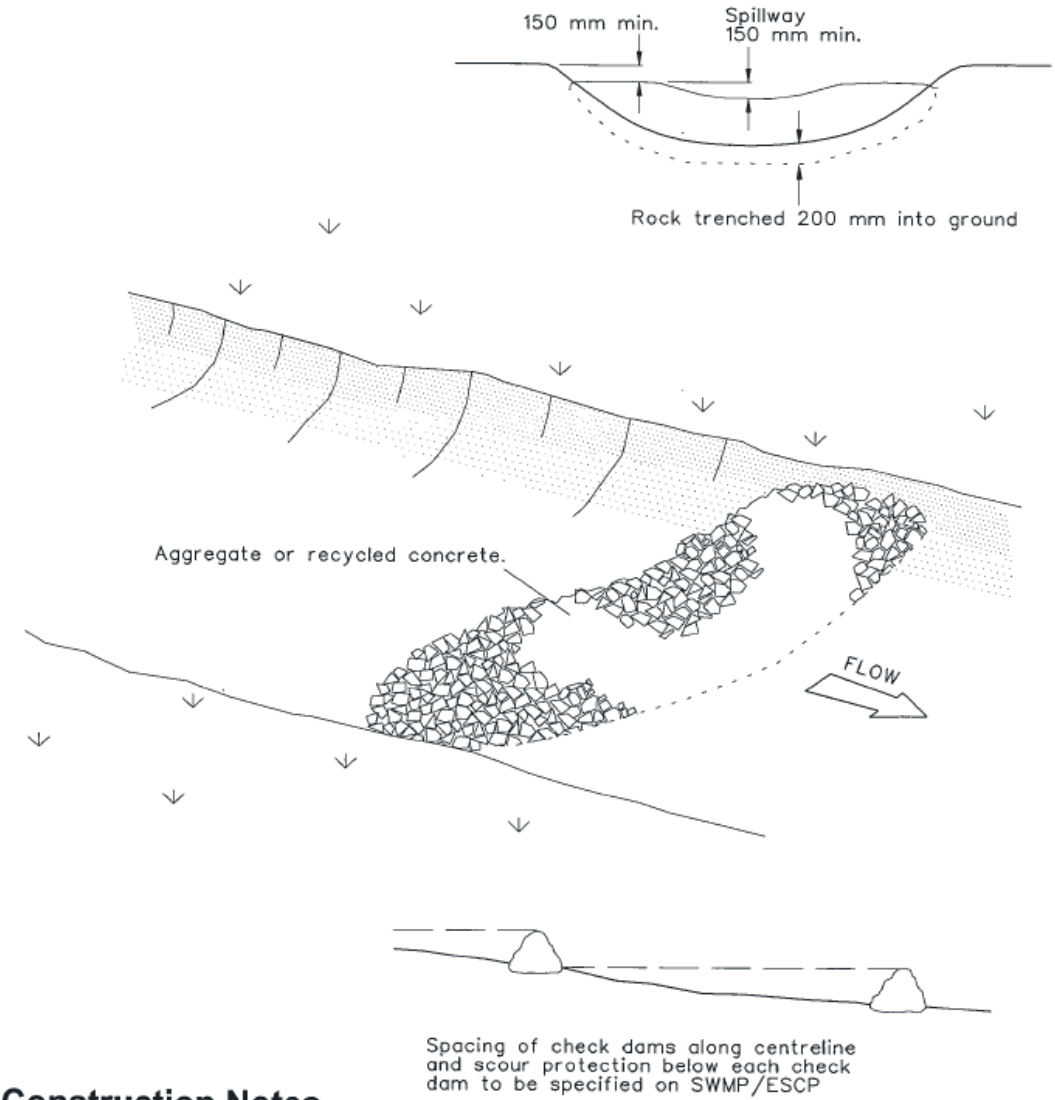
Source: Landcom, (2004). Soils and Construction Volume2 Managing Urban Stormwater (4th Edition).



Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

STOCKPILES **SD 4-1**

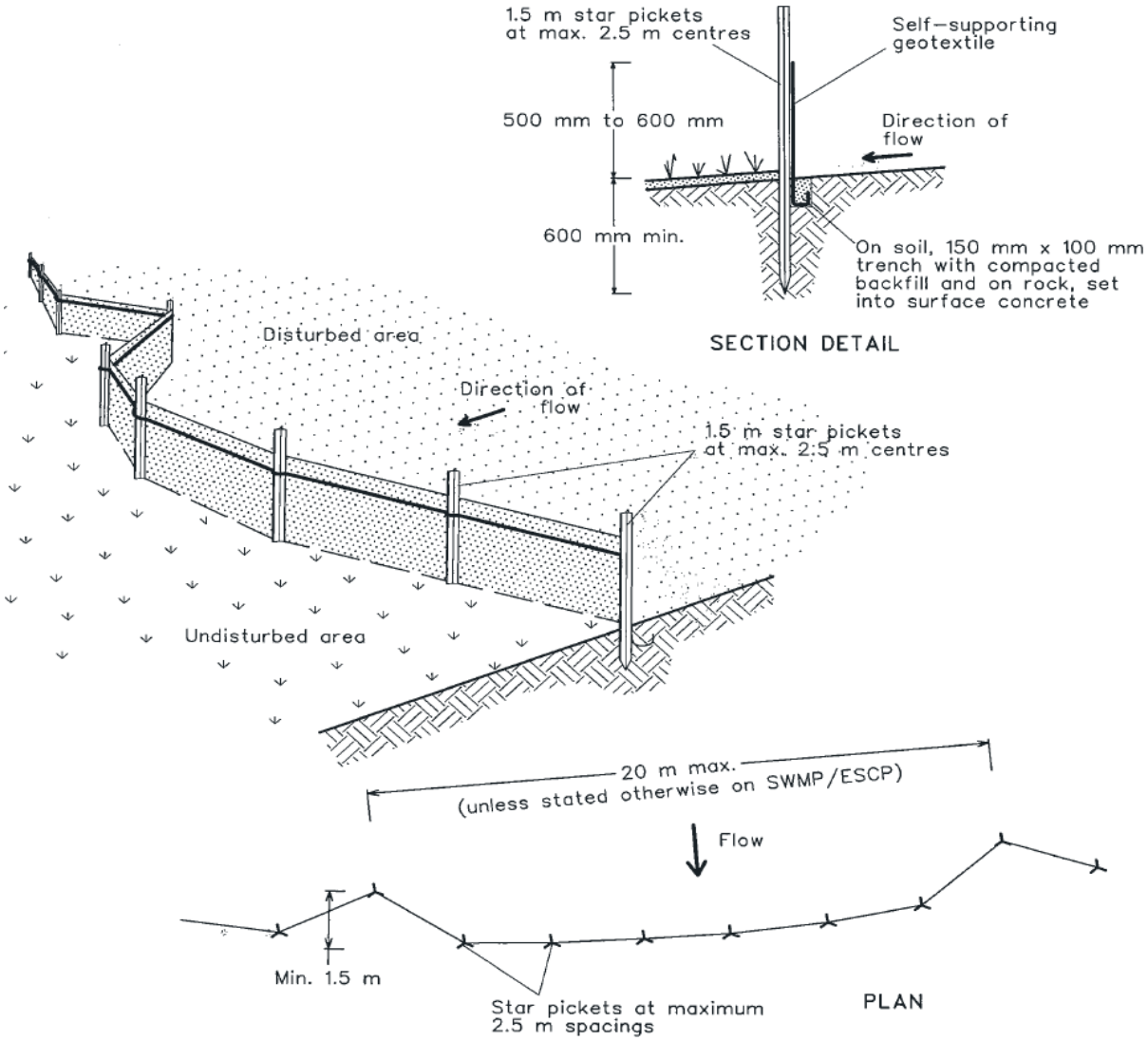


Construction Notes

1. Check dams can be built with various materials, including rocks, logs, sandbags and straw bales. The maintenance program should ensure their integrity is retained, especially where constructed with straw bales. In the case of bales, this might require their replacement each two to four months.
2. Trench the check dam 200 mm into the ground across its whole width. Where rock is used, fill the trenches to at least 100 mm above the ground surface to reduce the risk of undercutting.
3. Normally, their maximum height should not exceed 600 mm above the gully floor. The centre should act as a spillway, being at least 150 mm lower than the outer edges.
4. Space the dams so the toe of the upstream dam is level with the spillway of the next downstream dam.

ROCK CHECK DAM

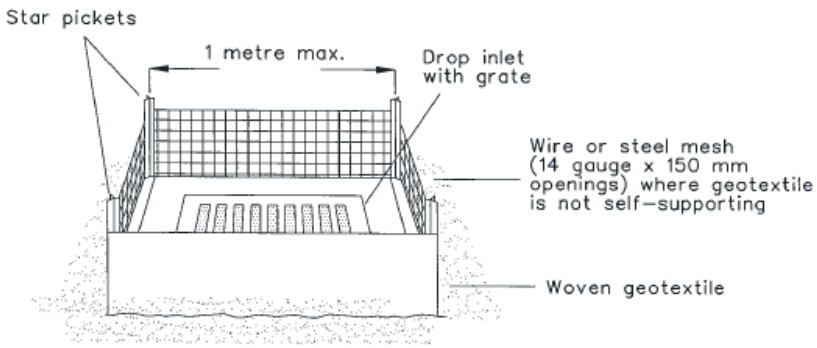
SD 5-4

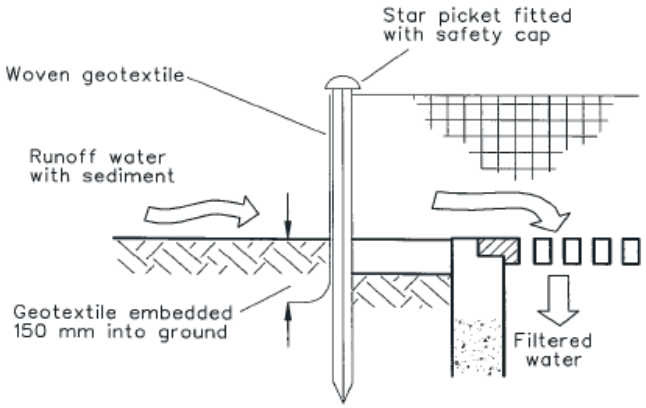


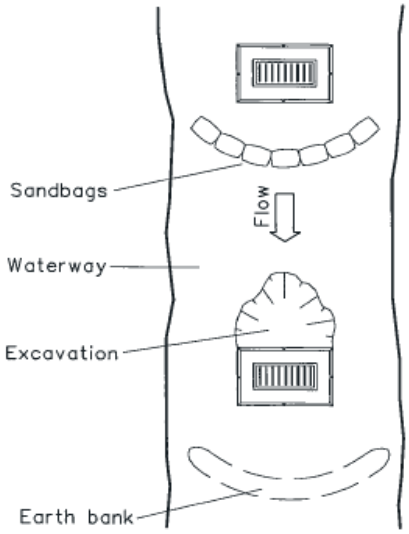
Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

SEDIMENT FENCE **SD 6-8**





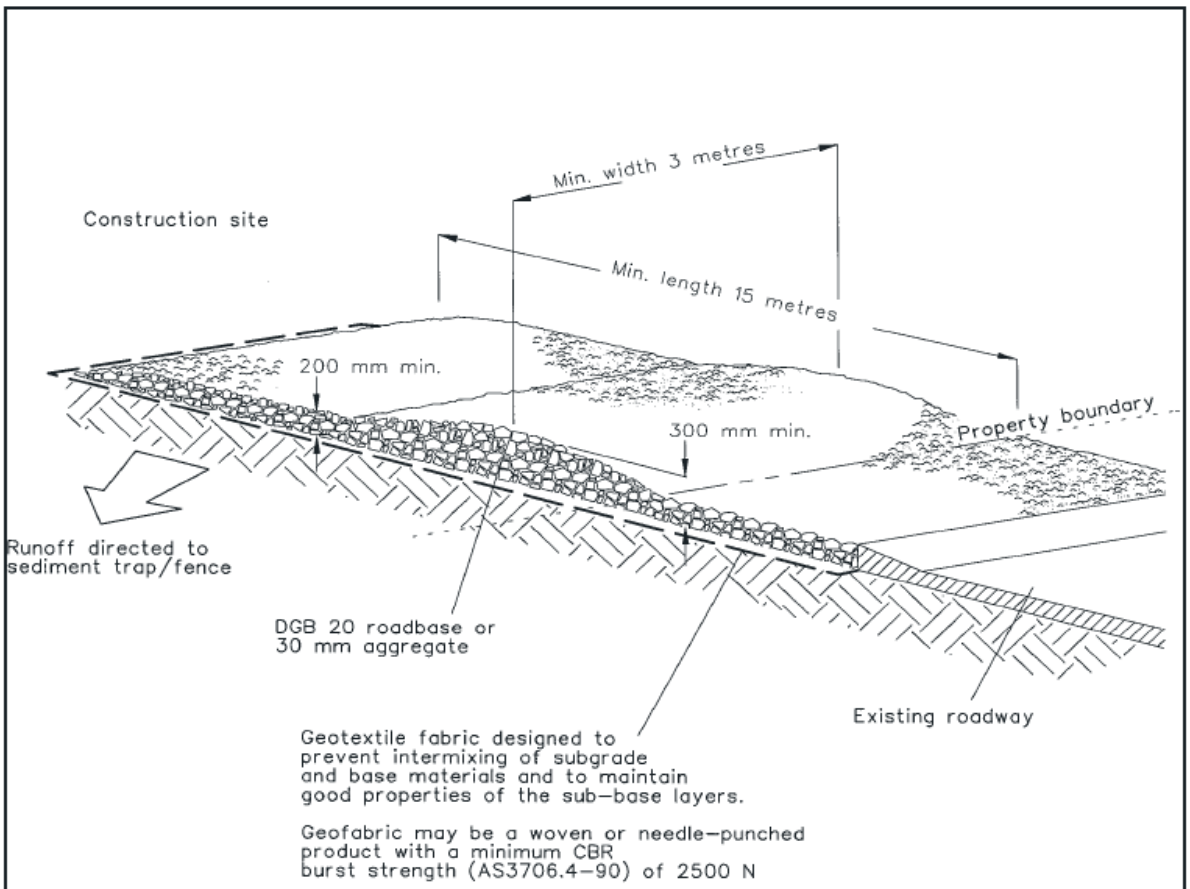


For drop inlets at non-sag points, sandbags, earth bank or excavation used to create artificial sag point

Construction Notes

1. Fabricate a sediment barrier made from geotextile or straw bales.
2. Follow Standard Drawing 6-7 and Standard Drawing 6-8 for installation procedures for the straw bales or geofabric. Reduce the picket spacing to 1 metre centres.
3. In waterways, artificial sag points can be created with sandbags or earth banks as shown in the drawing.
4. Do not cover the inlet with geotextile unless the design is adequate to allow for all waters to bypass it.

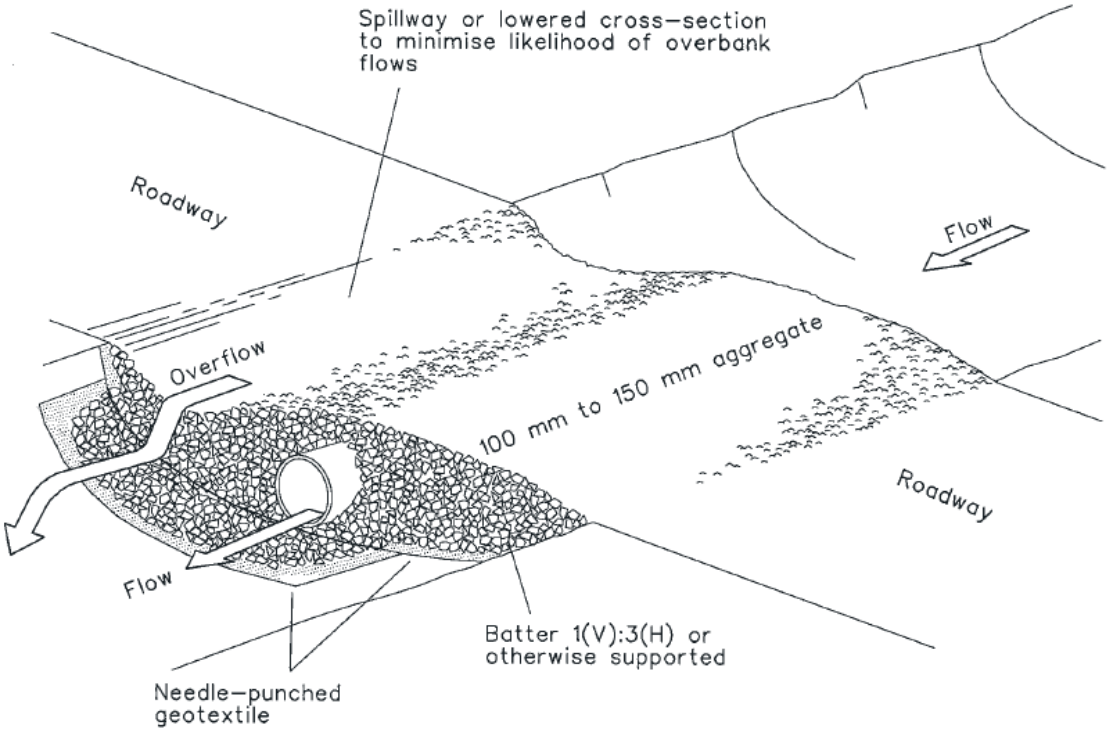
GEOTEXTILE INLET FILTER **SD 6-12**



Construction Notes

1. Strip the topsoil, level the site and compact the subgrade.
2. Cover the area with needle-punched geotextile.
3. Construct a 200-mm thick pad over the geotextile using road base or 30-mm aggregate.
4. Ensure the structure is at least 15 metres long or to building alignment and at least 3 metres wide.
5. Where a sediment fence joins onto the stabilised access, construct a hump in the stabilised access to divert water to the sediment fence

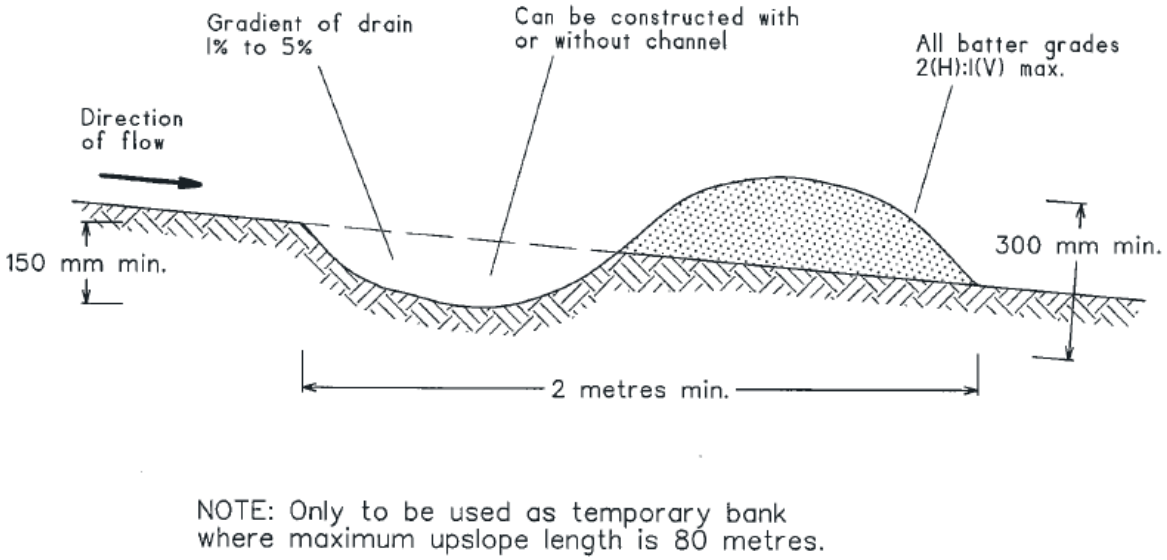
STABILISED SITE ACCESS **SD 6-14**



Temporary Waterway/Drainage Line Diversion

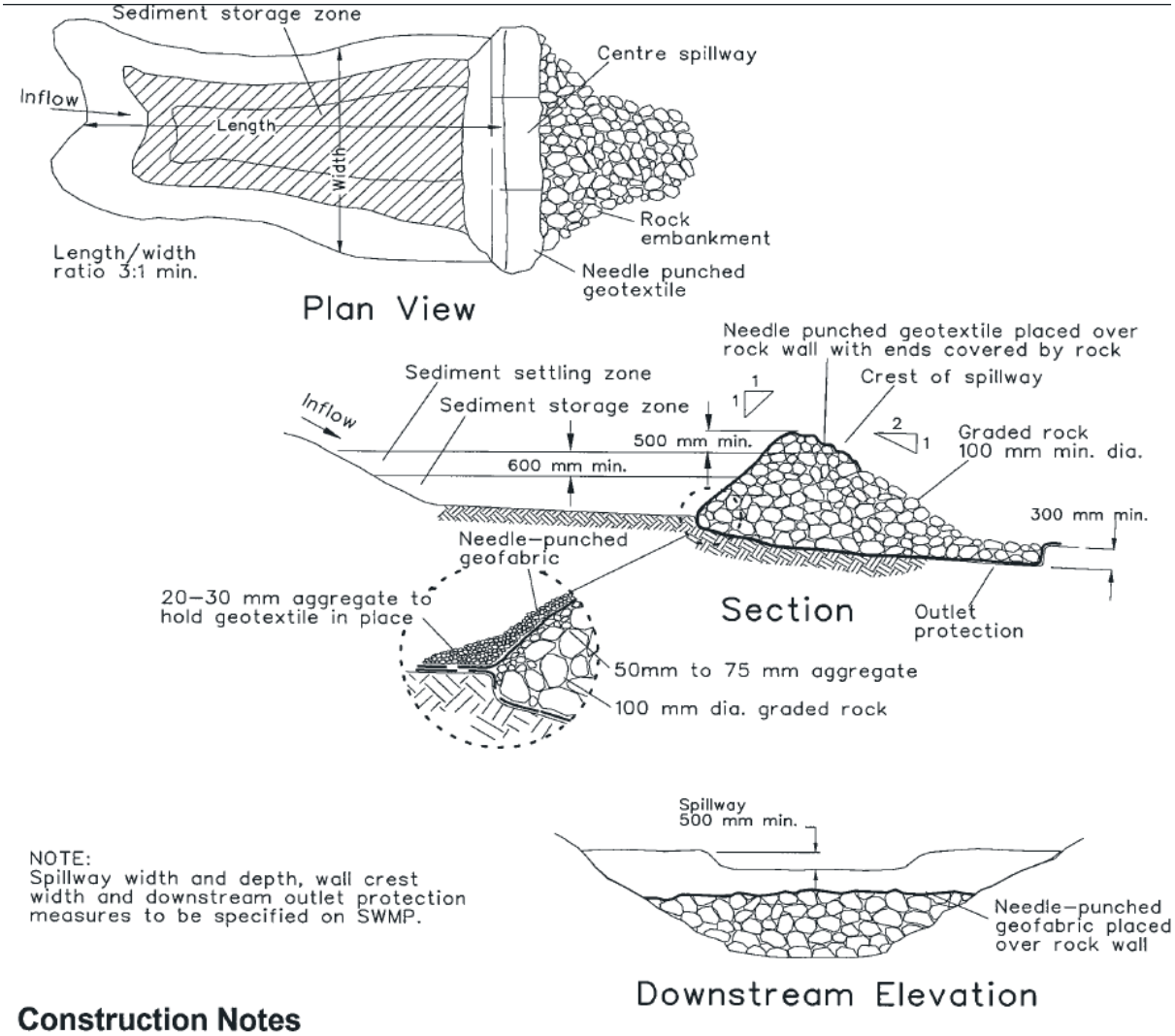
Figure 5.3(b) Alternate check dam system. Where products like these are used, they should be installed with an appropriate erosion control blanket below them and covering at least 0.7 metres each side (c.f. SD 5-4)

Drainage Line High Erosion Soil Management – Rock Check Dam and Sediment Fence Combination



NOTE: Only to be used as temporary bank where maximum upslope length is 80 metres.

Earth bank Roll over Bund



NOTE:
Spillway width and depth, wall crest width and downstream outlet protection measures to be specified on SWMP.

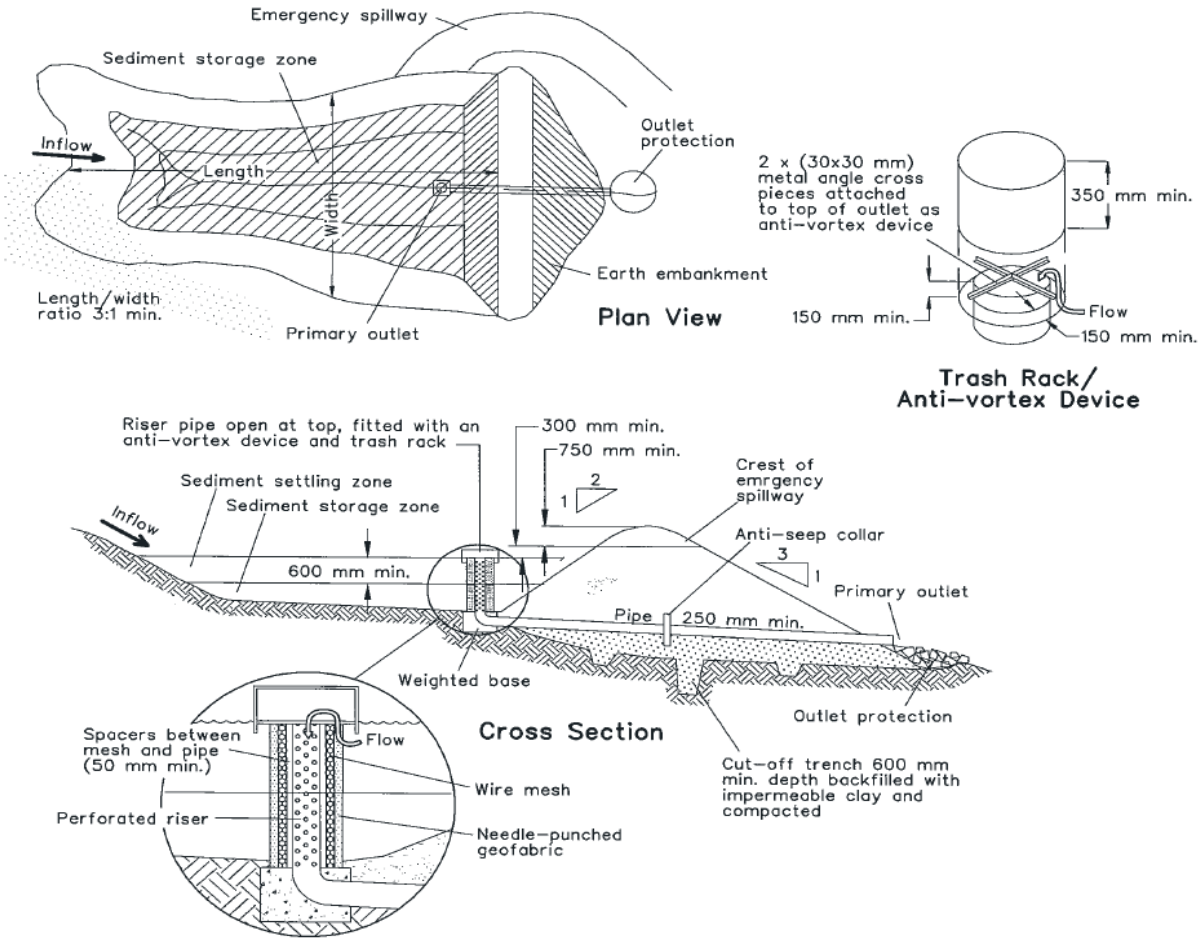
Construction Notes

1. Remove all vegetation and topsoil from under the dam wall and from within the storage area.
2. Excavate to 300 mm depth for base of the dam wall.
3. Line the excavation with a needle-punched geotextile allowing sufficient to line below the wall, and over the upstream rock and the spillway to 500 mm below the spillway exit on the downstream face.
4. Make up the wall profile and outlet protection with100 mm (min.) diameter graded rock. Spread a layer of 50 mm to 75 mm diameter aggregate over the upstream batter for a more even surface, and add 100 mm to 150 mm of 20 mm to 30 mm gravel over the 50 mm to 75 mm diameter aggregate.
5. Lay geotextile over the upstream batter and through the spillway, fixing in place with 100 mm rock.
6. Place a "Full of Sediment" marker to show when less than design capacity occurs and sediment removal is required.
7. Replace the upstream geotextile layer each time sediment is removed

ROCK SEDIMENT BASIN

(APPLIES TO 'TYPE C' SOILS ONLY)

SD 6-1



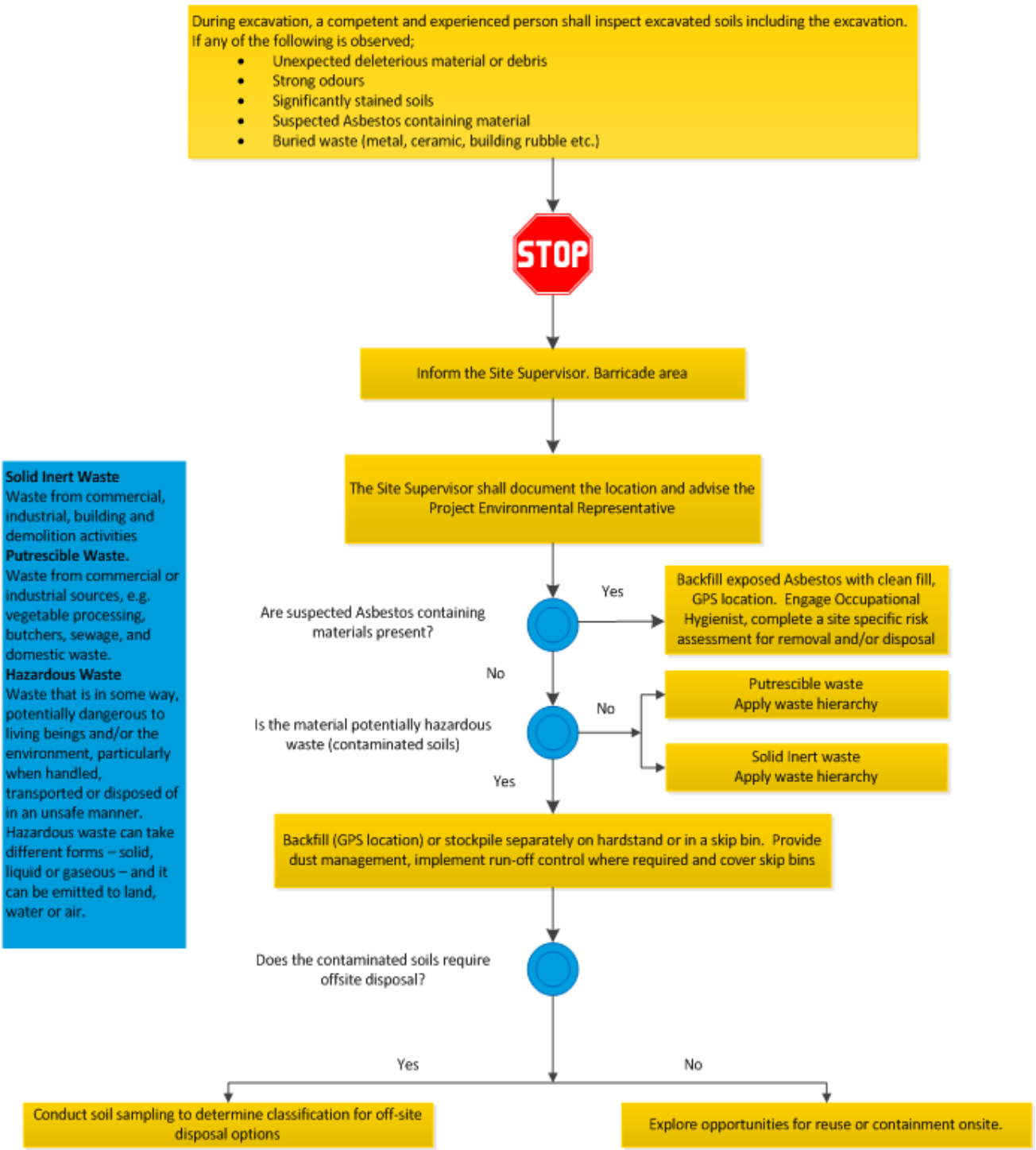
Construction Notes

1. Remove all vegetation and topsoil from under the dam wall and from within the storage area.
2. Form a cut off trench under the centreline of the embankment 600 mm deep and 1,200 mm wide, extending to a point on the watercourse wall above the riser sill level.
3. Maintain the trench free of water and recompact the materials with equipment as specified In the SWMP to 95 per cent Standard Proctor Density.
4. Select fill according to the SWMP that is free from roots, wood, rock, large stone or foreign material.
5. Prepare the site under the embankment by ripping to at least 100 mm to help bond the compacted fill to the existing substrate.
6. Spread the fill in 100 mm to 150 mm layers and compact it at optimum moisture content following the SWMP.
7. Install the pipe outlet with seepage collars as specified in the SWMP and Standard Drawing 6-3b.
8. Form batter grades at 2(H):1(V) upstream and 3(H):1(V) downstream or as specified in the SWMP

EARTH BASIN - DRY
(APPLIES TO 'TYPE C' SOILS ONLY)

SD 6-3

Appendix 5: Flowchart for UFP



Contents

1 Purpose

This Plan addresses the management of environmental impacts associated with atmospheric emissions produced by construction activities.

2 Scope

This Plan defines management strategies to minimise the potential for, and impacts from emissions to air resulting from construction activities.

This Plan does not intend to mitigate or address Health and Safety risks; these will be managed through Health and Safety Plans and Procedures.

The objectives of this Plan are to:

- Minimise impacts of dust generated during construction activities;
- Minimise impacts of dust generated during transport of materials;
- Minimise complaints from the community in relation to dust generated from construction activities;
- Minimise greenhouse gas (GHG) emissions resulting from construction activities;
- Report NGERs data;
- To avoid and minimise air quality impacts surrounding sensitive receivers (e.g. residential properties, schools and native vegetation) during construction;
- Protect, educate and promote environmental awareness during construction; and
- Leave a positive environmental legacy post-construction.

3 Responsibilities

Role	Responsibility
Group Manager Environment & Sustainability	Provide Zinfra with advice in relation to air quality and support the Project in complying with State/Territory regulations
HSE Managers/ Advisors	Manage activities to assess air quality and provide training, monitoring and reporting on the day-to-day operation of the Plan, regular auditing of operations.
Project Managers	Ensure air quality and dust control measures are implemented in accordance with this Plan.
Site Supervisors	Coordinate implementation of this Plan.
All Employees / Contractors	Responsible for minimising greenhouse gas emissions and reporting air quality and dust control issues to their immediate supervisor. Aware of the requirements to control dust and odour emissions from the site.

4 Definitions

Term	Definition
Atmospheric Emissions	Any emissions to air, for any period of time, for solid, liquid or gaseous matter e.g. dust, greenhouse gases, primary air pollutants.
Dust	Generic term used to describe fine particles that are suspended in the atmosphere. This term is non-specific with respect to the size, shape and chemical make-up of the particles.

Term	Definition
Greenhouse gases (GHG)	Components of the atmosphere that contribute to the greenhouse effect. These include Carbon Dioxide (CO_2), Methane (CH_4) Sulfur hexafluoride (SF_6) and Nitrous Oxide (N_2O).
NGERS	National Greenhouse and Energy Reporting scheme
Primary air pollutants	Gaseous emissions containing toxic gases, often produced by burning fossil fuels (e.g. diesel). Examples include Oxides of Nitrogen (NOx), Oxides of sulfur (SOx), Hydrogen Sulfide (H_2S), Volatile Organic Compounds (e.g. Hydrocarbons) and Carbon Monoxide.

5 Legislative Requirements

Each State/Territory has specific legal regulations that govern air quality issues (listed below).

In case any incidents of material or serious harm are caused or threatened, the matter shall be recorded in ASPIRE. Refer to **G-HS-PR-00153 Zinfra Incident Management Procedure** for more details.

Ref	Document Title
ACT	*Environment Protection Regulation 2005*

6 Environmental Impacts

Atmospheric emissions produced from construction activities are likely to include the following, but not limited to:

- Vegetation clearing and grubbing;
- Bulk earthworks/ground disturbance;
- Drilling;
- Transport, loading, and unloading of topsoil and fill from trucks;
- Vehicle movements, especially on unsealed roads;
- Wind erosion on cleared areas and stockpiles;

Atmospheric emissions have the potential to impact the environment. Examples include but not limited to:

- Reduced visual amenity;
- Odour emissions
- Dust fallout affecting flora and fauna outside the designated impact footprint;
- Discharge of inhalable particulates and atmospheric pollutants; and
- Greenhouse gas emissions;

Air emissions also create adverse impacts through generating public complaints and can lead to prosecution by the Regulator where emissions are determined to exceed prescribed levels.

7 Project Overview

7.1 Existing Conditions

The land uses surrounding the Project are a mixture of urban, rural and industrial:

- rural land is currently the dominant land use, and is located to the north, west and south

- to the north-east and east are the suburbs of Holt and MacGregor
- the Lower Molonglo Water Quality Control Centre is located to the west
- the Belconnen landfill is located to the north.

Potential sources of air pollution within the area is localised vehicular traffic and residents using wood-fired heaters, which would release particulates into the local airshed. Odours emitted from the Belconnen landfill and the Lower Molonglo Water Quality Control Centre may be experienced from time to time.

Based on the Air Quality Index, the air quality is generally classified as good (ACT Government, 2017). This details little or no risk from air pollution.

The closest sensitive receivers to the Project are located within 100 metres of some sections of the transmission lines. These receivers are predominantly residential and rural properties. The Belconnen Golf Club is also located in this area.

7.2 DA and EIS Conditions

The Construction Air Quality Management Planis a sub-plan that forms part of the overarching Construction Environmental Management Plan (CEMP)

It has been developed in accordance to the relevant conditions of the DA and EIS Conditions (see Table 1).

Table 1

DA Condition Ref	EIS Condition Ref	Condition
	C-AQ1	A construction air quality management plan (CAQMP) as part of the CEMP would be produced for the construction phase of the Project. This would identify specific construction activities with potential to impact air quality and measures to minimise impacts. This includes the following:
		if necessary, dust suppression techniques shall be implemented, and incorporated into the ESCP, as per the techniques outlined in the “Blue Book”, such as water spraying of surfaces and covering stockpiles
		wheels of all site equipment and vehicles would be cleaned so that material with potential to generate dust is not spread
		vehicles and equipment shall be maintained in accordance with the manufacturer’s specifications
		progressively revegetating or otherwise rehabilitating disturbed areas as works are completed
		all waste to be removed from site and disposed to an appropriately licenced waste facility. No burning of any waste to be permitted. The transfer off site shall be done by covered trucks
		protocol for handling and responding to community complaints.
	C-GHG1	Using low greenhouse gas-intensive construction materials (where a suitable substitute for a high greenhouse gas-intensive material is available).
	C-GHG2	Using low greenhouse gas-intensive construction materials (where a suitable substitute for a high greenhouse gas-intensive material is available).
	C-GHG3	Implementing energy-efficient work practices, such as switching off construction plant, vehicles and equipment when not in use to minimise idling.
	C-GHG4	Identifying measures for mitigation as part of site inductions, training and pre-start talks.
	C-GHG5	Procuring construction services and materials locally to minimise the distance travelled and therefore emissions of vehicles accessing the site.
	C-GHG6	Regularly monitoring on energy, resource use and associated greenhouse gas emissions as part of the environmental reporting requirements specified within the CEMP.
	C-GHG7	Selecting materials during construction planning to ensure products that reduce embodied carbon are considered and used.
	C-GHG8	Ensuring clearance of vegetation be limited to the minimum that is required for the Project.
	C-CC1	Ensuring all vegetation cleared be disposed of at a registered compost facility in the Canberra region and that it is not to be sent to landfill or burnt.
	C-CC2	Monitoring weather forecasts and specific weather warnings.
	C-CC1	Positioning fire extinguishers at site offices and within construction vehicles (in case of bushfires).

	C-CC3	Being alert to fire warnings and notices.
	C-CC4	Keeping the construction site clear of debris wherever possible (in case of severe winds).
	C-CC5	Considering specific measures for wet season as part of the broader ESCP.
	C-CC6	Ensuring major earthworks are planned to reasonably not coincide with periods of expected rainfall or high winds.

8 Mitigation Strategies

No.	Control measure	Responsibility	Timing
General			
1	Mobile plant movements shall be restricted to designated routes. Plant / machinery shall be turned off when not in use.	All	At all times
2	No burning permitted on-site.	All	At all times
3	All cleared vegetation shall be disposed of at a registered compost facility in the Canberra region and sent to landfill.	Construction Manager/Supervisor	At all times
4	Control the emission of smoke, dust, fumes and other pollution into the atmosphere in accordance with State legislation and regulations.	All	At all times
5	Minimise or avoid dust-generating activities in dry and windy conditions	Construction Manager/Supervisor	At all times
7	Use geo-textiles, hessian or mulched vegetation on localised areas to minimise dust emissions	Construction Manager/Supervisor	As required
8	Deep rip smooth surfaces and leave areas rough and cloddy to reduce wind velocity	Construction Manager/Supervisor	As required
9	Ensure all dust control devices are maintained according to manufacturer's requirements.	Construction Manager/Supervisor	At all times
Stockpiles and Spoil			
10	Soils shall be stockpiled only when necessary and for short durations. Stockpile heights shall be kept to a minimum. Stockpiles which have potential to give rise to windblown dust shall be wetted.	Construction Manager/Supervisor	At all times
11	Locate stockpiles away from waterways, drainage lines and residences	Construction Manager/Supervisor	At all times
12	Minimize the handling of stockpiles, number of stockpiles and the time of exposure	Construction Manager/Supervisor	At all times
13	Design stockpiles with slopes preferably no greater than 2:1 (horizontal: vertical)	Construction Manager/Supervisor	At all times
14	Topsoil shall be stockpiled separately and in stockpiles no higher than 2 metres	Construction Manager/Supervisor	At all times

No.	Control measure	Responsibility	Timing
15	Ensure all construction related stockpiles are regularly watered to prevent dust emissions during high wind conditions. If stockpiles are to be maintained for longer than 28 days, other management options including hydroseeding may be investigated to prevent dust erosion from these long term stockpiles. Stockpiled materials e.g. sand, aggregate, cut material, shall be stabilised to reduce dust generation	Construction Manager/Supervisor	As required
Dust Emissions			
16	Clearing shall be conducted in a staged manner to limit exposed areas.	Construction Manager/Supervisor	As required
17	Loose, uncovered areas of soil shall be stabilised as soon as possible following clearing.	Construction Manager/Supervisor	As required
18	Any disturbed areas no longer required shall be rehabilitated, as soon as practicable, to promote soil stability and prevent dust generation.	Construction Manager/Supervisor	As required
19	Weather forecasts shall be examined to identify when conditions may contribute to dust emissions.	Construction Manager/Supervisor	As required
20	Vehicle speeds shall be restricted to minimise dust generation.	Construction Manager/Supervisor	At all times
21	Dust suppression techniques shall be employed where material cannot be stabilised e.g. water carts, sprays, dust guards, wind breaks or covers.	Construction Manager/Supervisor	At all times
22	When using water to suppress dust for construction, ensure it does not create run off that may contaminate surface waters	Construction Manager/Supervisor	At all times
23	Visually monitor dust levels surrounding construction sites to determine effectiveness of dust suppression measures.	Construction Manager/Supervisor	At all times
Plant and Equipment			
24	Vehicles, plant and equipment shall be regularly maintained and pre-start checks conducted.	All	Ongoing
25	All vehicles and plant in operation shall be fitted with emission control devices and not left idling un-necessarily.	Fleet Management	Prior to mobilisation
26	Vehicles and equipment shall be regularly inspected for faults and excessive emissions.	All Personnel	Ongoing
27	All plant and equipment not functioning normally (with respect to emissions – e.g. excessive smoke) shall be taken out of service immediately and/or repaired.	All Personnel	Ongoing
28	All machinery shall be maintained as per the manufacturer's guidelines. Particular care shall be taken to ensure that all filters/emission control devices are replaced within the specified time.	Fleet Management	Ongoing

No.	Control measure	Responsibility	Timing
30	Vehicle journeys shall be optimised to reduce fuel consumption and emissions where possible or practicable.	All Personnel	Ongoing
31	A register of vehicles and equipment and a log of fuel used for all vehicles and equipment for the duration of the contract shall be maintained for GHG reporting purposes.	Fleet Management	Ongoing
Movement of Materials offsite			
32	Trucks shall be kept clean to ensure that loose material being dislodged during road transport is minimised. If necessary, a “cattle grid” may be installed prior to the truck exiting a work or construction site to assist the removal of loose material.	Construction Manager/Supervisor	Ongoing
33	Loads shall be covered wherever possible to ensure that materials do not generate dust whilst being transported.	Construction Manager/Supervisor	Ongoing
Monitoring Records			
34	The site shall be continually visually monitored for excessive dust generation	Construction Manager/Supervisor	Ongoing
35	Following any nuisance dust complaint, a visual inspection of the area shall be undertaken and investigated.	Construction Manager/Environmental Advisor	As required
36	Any air quality issues shall be recorded on the Environmental Inspection Checklist.	Construction Manager/Environmental Advisor	Daily/Weekly
37	As required, air quality monitoring may be undertaken to investigate any ongoing complaints relating to environmental nuisance caused by construction dust and/or particulate matter. Monitoring may be carried out at a place(s) relevant to the potentially affected dust sensitive receptor.	Construction Manager/Environmental Advisor	As required
Reporting			
38	All complaints / incidents regarding dust shall be reported and investigated in accordance with the Incident Management Procedure.	All	As required
39	All complaints shall be recorded in ASPIRE.	Construction Manager/Environmental Advisor	As required
40	All concerns/complaints shall be resolved in a timely manner, by considering all practicable means to mitigate air quality impacts.	Construction Manager/Environmental Advisor	As required

9 Related Documents

9.1 Internal References

Ref	Document Title
G-HS-PR-00153	Incident Management Procedure
G-EN-PR-00238	Soil and Water Management on Sites Procedure

Contents

1. Purpose

This Plan applies to all wastes associated with the production, storage, transport and disposal of construction waste, municipal solid waste and hazardous waste.

2. Scope

This Plan defines strategies to minimise environmental impacts from solid wastes associated with construction activities. Waste generation shall be minimised in accordance with the waste management hierarchy.

In most cases, alternative materials and chemicals must be considered in the first instance. Consideration of non-controlled, non-toxic materials and non-hazardous chemicals shall be made to reduce the generation of controlled waste. Where technically feasible, consideration of using water based solvents, detergents, and cleaners over hydrocarbon or petroleum based solvents and the use of water based coatings and paints shall be made.

Where possible, the purchase and delivery of materials shall be scheduled to coincide with actual use. This reduces the possibility of material fouling, drying, or spoilage, which would render unused raw material a waste. Additionally, storage space is reduced, and the costs and liabilities associated with multiple product handling and accidental spillage is reduced.

3. Responsibilities

Role	Responsibility
Group Manager Environment & Sustainability	Provide advice in relation to waste management and support the Project in managing and complying with waste tracking regulations
HSE Managers and Advisors	Ensure employees and contractors are aware of the waste management requirements and safe handling of waste streams
Project Managers and Team Leaders	Ensure compliance with the waste management strategy and any applicable waste tracking and disposal requirements on site or at depots
Employees, Contractors	Comply with the waste management strategy set out in this Plan

4. Definitions

Term	Definition
Controlled Waste	Controlled or Hazardous wastes have physical, chemical or other properties that make them an environmental or health hazard. Waste types listed as having environmentally significant characteristics. The term is used by the Cth, NSW, WA, Tas. The equivalent term is Trackable/Regulated Waste (Qld, ACT), Listed Waste (SA, NT) or Prescribed Industrial Waste (Vic)
Holding tank/Ablution	Any tank used for the collection and storage of sewage.
Inert waste	Inert wastes are not biodegradable, flammable, or chemically reactive
NATA	National Association of Testing Authorities
PCB	Polychlorinated Biphenyls
Putrescible wastes	Wastes that contain organic materials such as food, animal, or vegetable wastes that readily biodegrade in a landfill.
SDS	Material Safety Data Sheet
Solid wastes	Solid wastes are classified as controlled or general wastes
Waste	A waste is any solid, liquid, or gas that is no longer wanted or needed.
Waste receptacle	Examples include, but are not limited to skip bins, litterbins, containers, trays and other vessels utilised to store solid waste
WTC	Waste Transport Certificate

5. Legislative Requirements

Number/ Ref	Document Title
ACT	*Environment Protection Act 1997; Environment Protection Regulations 2005*

6. Project Overview

The Project has the potential to utilise a range of different resources and generate a number of different waste types throughout the construction phase.

Anticipated waste streams include:

- green waste generated during vegetation trimming and removal at the Stockdill Substation site, transmission line towers/pole sites and vegetation required to be removed to provide adequate buffer zones (including APZs) within the transmission line easement
- excess spoil from excavation works (the estimated excess earthworks volume for the Project is 5,500 cubic metres)
- steel and other metals associated with the removal or redundant equipment including dismantled transmission line structures
- potentially contaminated oil from the two transformers
- general construction waste such as off-cuts, packaging and excess construction material (such as concrete, timber, plastic and metal)
- empty OPGW drums
- waste oils, greases and lubricants from maintenance of construction plant and equipment
- domestic waste from site personnel including food scraps, glass and plastic bottles, paper and plastic containers.

6.1. DA and EIS Conditions

The Waste and Recycling Management Plan is a sub-plan that forms part of the overarching Construction Environmental Management Plan (CEMP)

It has been developed in accordance to the relevant conditions of the DA and EIS Conditions (see Table 1).

Table 1

DA Condition Ref	EIS Condition Ref	Condition
	C-WR1	As part of the overarching CEMP for the Project, a waste and recycling management plan would be prepared prior to construction works commencing. The plan would detail standard environmental management measures to manage resource consumption and to avoid, re-use and dispose of waste during construction. These measures would include:
		applying the waste hierarchy (avoid, minimise, re-use/recycle, dispose) during construction. Opportunities to re-use or recycle construction and demolition waste (such as the decommissioned transmission towers) should be investigated
		applying the waste hierarchy (avoid, minimise, re-use/recycle, dispose) during construction
		treating any wastewater collected prior to discharge, in accordance with current standards
		disposing green waste from vegetation removal to a green waste recycling facility
		maintaining the work sites for the substation and transmission lines in a tidy state, and appropriately disposing of all general litter (including food scraps, plastics, glass bottle)
		a site induction for staff and contractors working on the Project would include the waste management strategies identified in the CEMP sub-plan
		providing reuse and recycling infrastructure at construction sites
		using a licensed contractor to remove contaminated waste, under current ACT EPA Guidelines

		where appropriate, sourcing of materials would be undertaken using locally available resources and materials
		concrete trucks shall be permitted to flick wet wipe their discharge chutes with the effluent discharged into prepared bored holes, prepared excavations/formwork or a watertight receptacle for disposal (to be shown on the ESCP). No concrete washout is permitted. All surplus concrete shall be returned to the concrete suppliers for recycling and not be discharged on site
		in relation to the TransGrid work activities at the substations - All oil handling shall be undertaken in accordance with TransGrid procedure Oil Management in Substations. Any oil/ oil bearing equipment shall be appropriately stored in a suitably bunded area. Any oil that is suspected of containing PCB shall be tested for PCBs (at a NATA certified laboratory). Previous TransGrid records indicate insulating oil is PCB-free but contamination levels are to be verified as part of the disposal process
		all waste generated and surplus spoil from the construction of the Project shall be transported to appropriately licenced waste disposal or transfer facilities.

7. Environmental Impacts

Construction activities has the potential to adversely impact the environment as a result of multiple waste stream generation such as but not limited to the following;

- General industrial waste;
- Steel;
- Timber;
- Soil and rock from excavations;
- Putrescible waste;
- Glass and aluminium from;
- Paper and cardboard;
- Sewage and effluent;
- Contaminated soil;
- Contaminated absorbent materials;
- Waste oils, grease and fuels;
- Chemicals;

Inappropriate use, handling, transport, storage and disposal can lead to adverse impacts, including but not limited to the following;

- pollution,
- degradation of visual amenities
- fire hazard
- odour generation
- Impact to flora and fauna habitats
- Attract fauna
- mixing of waste streams leading to cross-contamination,
- increased costs and expensive treatment.
- Inappropriate waste management can also lead to fines and prosecutions by regulators.

7.1. What constitutes waste?

Waste is a broad classification varying from general litter to more environmentally significant materials that, because of their chemical, biological or physical nature, pose a potential and actual risk to health, property or the environment.

7.2. Sources of Waste

Sources of waste fall broadly into four categories:

1. Municipal Solid Waste
2. Commercial and Industrial Waste
3. Construction and Demolition Waste
4. Hazardous Waste

Municipal Solid Waste is not hazardous and is associated with day-to-day activities of households and offices. It includes kerbside or hard rubbish collections, food scraps, garden waste and litter. It is usually collected by councils and recycled or sent to landfill.

Commercial and Industrial Waste is generated by offices and businesses and includes cardboard, paper, glass and plastic containers, aluminium cans and toner cartridges. These products are generally recyclable.

Construction and Demolition Waste includes waste such as bricks, concrete, carpet, plasterboard, metals, wood, tyres and other construction or demolition materials. These materials can usually be reused and recycled.

Hazardous Waste presents a hazard to the environment and can be flammable, combustible, corrosive, reactive or toxic. It includes products such as fuel, pesticides, cleaning agents and water treatment chemicals. These materials are generally not recyclable and may require treatment prior to disposal.

7.3. Controlled Waste

The safe handling, transport, storage, treatment and disposal of hazardous wastes are guided by specific State/Territory Regulations. These wastes are known as **Controlled Waste** (Cth, NSW, WA, Tas), **Regulated Waste** (Qld, ACT), **Prescribed Industrial Waste** (Vic) or **Listed Waste** (SA, NT). For the purpose of this document they will be referred to as Controlled Wastes.

Refer to **G-EN-PR-00027 Controlled Waste** for more details on requirements in each State/Territory**.**

7.4. Scheduled Waste

In addition to Controlled Waste, there are three types of wastes for which State/Territory governments have agreed to implement a national management approach. These are called **Scheduled Wastes** and include:

- **Polychlorinated Biphenyls** (PCBs) – used in capacitors due to insulation properties

Refer to **G-EN-PR-00197 Oil Filled Equipment and PCBs** for more information on PCBs.

7.5. Waste Management Hierarchy

All waste shall be managed in accordance with the waste management hierarchy which states that waste should be managed in accordance with the following order;

Process:	Example of Implementation:
Avoidance/Reduce	Investigate opportunities for avoiding or reducing waste production on site and in offices or depots as a first step e.g. order supplies in bulk to reduce packaging waste, read documents on screen instead of printing or use double-sided printer settings
Reuse	Use of the waste for a similar purpose to the original material e.g. reuse storage containers, use washable mugs instead of disposal cups in kitchens
Recycling	May involve a process or use of material different to the use of the original material e.g. recycling of scrap metals, recycling of office paper and toner cartridges
Recovery of Energy	Some products may have a residual value, particularly if not contaminated with other materials e.g. waste oil can be processed back for reuse as pristine oil, most components of mobile phones can be recovered to make new products
Treatment	Onsite or offsite treatment may be required by the regulator prior to removal from site or prior to disposal e.g. contaminated soils, hazardous waste, sediment-laden stormwater
Containment	Involves the securing of waste in an appropriate container prior to its disposal so as not to contaminate other waste streams or the environment e.g. bunding of oil-filled transformers prior to disposal, segregating waste into separate bins prior to recycling or disposal to landfill
Disposal	involves subcontractors for transport, treatment and disposal e.g. Controlled Wastes like asbestos, PCBs or contaminated soils

8. Mitigation Strategies

No.	Control measure	Responsibility	Timing
Planning			
1	All waste shall be managed in accordance with legislation, Australian standards, local government requirements and this Plan . • Identify and categorise the wastes that will be generated and estimate their volumes where possible; • Communicate waste handling, segregation, storage and spill response requirements • Ensure that waste storage sites and procedures take into account fire, safety, worker health, pests, native animals and odour control; • Classify waste to determine handling, transportation, storage, disposal and tracking requirements. • Engage an appropriately licensed waste transporter as required. • Obtain a Waste Transport Certificate (WTC) (or equivalent) to accompany the waste during transport. • Ensure the waste receiving facility where the waste is being transported can legally accept the waste • Retain all relevant documentation regarding transport and disposal of the waste	PM/Site Engineer/HSE Advisor	At all times
2	Undertake an assessment of potential wastes to be generated prior to the delivery phase of the project. This assessment will identify waste elimination, reduction measures and opportunities for the re-use and recycle of construction waste.	PM/Site Engineer/HSE Advisor	Prior to construction
3	Appropriately designated/designed facilities to handle all identified waste streams shall be implemented including all necessary segregation, storage and spill response requirements.	PM/Site Engineer/HSE Advisor	Prior to construction
4	All waste facilities shall be located away from natural drainage systems and low-lying areas. The area shall have a closed drainage system.	PM/Site Engineer/HSE Advisor	Ongoing
5	Waste shall be segregated into different waste streams at all sites, offices and depots to minimise the amount of waste going to landfill.	PM/Site Engineer/HSE Advisor	Ongoing
6	Waste management/segregation requirements shall be communicated to all personnel through inductions, pre-starts, toolbox and training.	Supervisor/HSE Advisor	Ongoing

No.	Control measure	Responsibility	Timing
7	Putrescible wastes shall be sufficiently enclosed (baled/wrapped, composted etc.) for odour control	Supervisor/HSE Advisor	At all times
8	No controlled waste shall be comingled with uncontrolled waste. No mixing of recyclables and non-recyclables shall occur where practicable.	Supervisor/HSE Advisor	At all times
9	Controlled wastes movements to an off-site facility shall have an accompanying WTC or equivalent.	Supervisor/HSE Advisor	At all times
10	All waste shall be tracked and recorded; • Date of pickup of waste • Description of waste • Cross reference to relevant waste transport documentation • Quantity of waste • Origin of the waste • Destination of the waste (for Controlled wastes) • Intended fate of the waste, e.g. type of waste treatment, reprocessing or disposal	HSE Advisor	At all times
11	Store and dispose of chemicals in accordance with the SDS and Australian standards for storage of chemicals and dangerous goods	Supervisor/HSE Advisor	At all times
Waste Minimisation			
12	To minimise packaging wastes and storage containers, supply materials shall be purchased in bulk wherever practicable. Packaging and storage containers shall be re-used or recycled wherever practicable.	Procurement/PM/ HSE Advisor	Ongoing
13	Unused products, materials and empty containers shall be returned to suppliers wherever practicable or through an industry disposal programs.	Procurement/PM/ HSE Advisor	Ongoing
14	Materials such as wooden pallets and packing materials that can be recycled shall wherever practical be returned to the supplier or removed by a commercial waste management subcontractor for recycling or reuse.	Procurement/PM/ HSE Advisor	Ongoing
15	Off-site non-recyclables and recyclables shall be removed by a commercial waste management subcontractor to an approved facility.	Procurement/PM/ HSE Advisor	Ongoing
16	A waste recycling program for office waste shall be implemented at Project site. Recycling bins for recyclable wastes will be also maintained at all site yards.	Procurement/PM/ HSE Advisor	Ongoing
Waste Storage			

No.	Control measure	Responsibility	Timing
17	All waste storage containers shall be covered/closed at all times to prevent spillage, fauna access, wind-blown litter and be secured to resist severe weather conditions.	Supervisor/HSE Advisor	Ongoing
18	Receptacles shall be placed in areas that are easily accessible.	Supervisor/HSE Advisor	Ongoing
19	All receptacles shall be clearly identified/labelled for its designated waste stream.	Supervisor/HSE Advisor	Ongoing
20	Notify Supervisor of inadequate or damaged waste receptacles.	All personnel	Ongoing
21	Waste identified for recycling (e.g. scrap steel, aluminium cans, glass, paper and cardboard waste) shall be segregated and stored separately from other solid wastes.	Supervisor/HSE Advisor	Ongoing
22	General construction materials (including scrap pipe, metal fabrication and concrete) shall be re-used where practicable and safe.	Supervisor/HSE Advisor	Ongoing
23	Work areas shall be tidy and litter free (including cigarette butts).	Supervisor/HSE Advisor	Ongoing
Hazardous Waste			
24	Controlled wastes shall be managed in accordance with State/Territory Regulatory requirements.	Supervisor/HSE Advisor	Ongoing
25	After removing excess liquids for disposal/recycling, allow liquid residue in containers (e.g. paint tins) to evaporate and harden in the container before disposing.	Supervisor/HSE Advisor	Ongoing
PCB			
26	All oil handling shall be undertaken in accordance with TransGrid procedure Oil Management in Substations. Any oil/ oil bearing equipment shall be appropriately stored in a suitably bunded area. Any oil that is suspected of containing PCB shall be tested for PCBs (at a NATA certified laboratory). Previous TransGrid records indicate insulating oil is PCB-free but contamination levels are to be verified as part of the disposal process	Supervisor/HSE Advisor	As required
27	Undertake PCB management in accordance with Zinfra Oil filled Equipment and PCB Procedure	Supervisor/HSE Advisor	As required
Spoil Reuse			

No.	Control measure	Responsibility	Timing
28	Measures for the storage, stockpiling and disposal of materials during construction include: • Locate stockpiles on relatively level ground, away from areas of ecological and heritage value and away from drainage lines and waterways • prior to removal of material for off-site disposal, assess for suitability for beneficial reuse. Where material is intended for beneficial reuse, a beneficial reuse assessment (BRA) shall be undertaken in accordance with the ACT EPA 2014, Information Sheet 4 – Requirements for the reuse and disposal of contaminated soil in the ACT • any hazardous materials required for the operation and maintenance of the Project would be stored in accordance with relevant ACT EPA guidelines.	Supervisor/HSE Advisor	As required
Disposal			
29	All wastes shall be removed by a licensed waste contractor. Waste shall be collected and segregated onsite and either reused, recycled or disposed of in an appropriate manner at licensed facilities as per State/Territory Regulatory Requirements	Supervisor/HSE Advisor	Ongoing
30	All solid waste generated shall be segregated and stored in designated areas.	Supervisor/HSE Advisor	Ongoing
31	No waste shall be burnt or buried on-site	Supervisor/HSE Advisor	Ongoing
32	A centralised waste facility shall be managed and maintained or as per site/project requirements	Supervisor/HSE Advisor	Ongoing
33	All clean, empty (liquid) containers shall be returned to relevant suppliers for disposal/recycling/refilling/ where practicable.	Supervisor/HSE Advisor	Ongoing
Designated washout areas			
34	An appropriately designed and designated wash area for concrete wash out/vehicle wash down shall be installed to prevent discharge of pollutants to ground and/or water. Once the pit is full the hardened waste concrete shall be recycled or disposed.	Supervisor/HSE Advisor	Ongoing
Sewage			

No.	Control measure	Responsibility	Timing
35	Site-specific authorisation may be required for the installation and operation of any onsite sewage facility. Sewage facilities must be designed and operated in accordance with the applicable State/Territory regulations.	Supervisor/HSE Advisor	Ongoing
36	Sewage or grey-water wastes shall not be discharged into watercourses or to ground unless there is regulatory approval(s) to do so. Sewage and grey-water waste from flushable toilets and potable water facilities shall be contained in an approved holding tanks or ablution tanks. Sewage may also be treated prior to holding using portable treatment plants. Portable toilets shall be located at strategic locations away from any watercourse or drainage channels. All toilet and sewage holding tanks shall be regularly serviced and pumped out by a waste management contractor.	Supervisor/HSE Advisor	Ongoing
Monitoring			
37	Wastes shall be inspected on a daily basis to ensure that any materials which may cause land and/or water contamination or create odour problems are dealt with in a timely manner.	Supervisor/HSE Advisor	Ongoing
38	Information regarding waste management shall be kept, including: • Waste description • Quantity and source • Collection, segregation and storage arrangements • Treatment and/or disposal methods including recycling • Waste quantities shall be reported in the Project Monthly Report	Supervisor/HSE Advisor	Ongoing
39	Where required Soil sampling shall only be carried out by a suitably qualified person.	HSE Advisor	As required
40	Chemical analysis of soils must be carried out by a National Association of Testing Authorities (NATA) Accredited laboratory.	HSE Advisor	As required
Records			
41	All records of waste tracking, transport, analysis, disposal and destruction must be kept to comply with the relevant State/Territory regulations.	HSE Advisor	As required

9. Related Documents

9.1. Internal

Number/Ref	Document Title
G-EN-PR-00027	Controlled Waste
G-EN-PR-00048	Contaminated Soil Procedure
G-EN-PR-00197	Oil Filled Equipment and PCBs Procedure
G-EN-PR-50181	Hazardous Substances and Dangerous Goods
G-HS-PR-50178	Asbestos Procedure
G-EN-FM-50381	Waste Disposal Form
G-EN-FM-00666	HSEQ Fact Sheet – Waste Management

Stockdill 330/132kV Substation Construction & 330kV Transmission Line Connections

C1537

ABJ-XTC-810024

Emergency Response Plan

Document ID:	P810024-HS-PL-003
Date of Issue:	9/4/2019
Version :	1
Approving Manager:	[redacted]
Signature:	[redacted]

Contents

1 Purpose

The purpose of this plan is to manage emergency situations should they occur and ensure the safety of all personnel and minimise the risk of any event occurring.

2 Scope

The plan outlines both emergency and evacuation actions to be taken in the event of an emergency and the responsibility of personnel during such an event.

3 Project or Workplace Description

Project Component	Description
Customer	TransGrid
Scope of works	Scope of work under this Contract covers establishment of the new Stockdill 330/132kV substation, associated transmission line connections, and remote end works. Stockdill 330/132kV Substation will supply the ACT area loads with one feeder at 330kV to Williamsdale and two feeders at 132kV to EvoEnergy. It sources supply from Upper Tumut and Canberra through two 330kV feeders. In addition, the new substation has a 330/132kV transformer and associated switchbays. Following the commissioning of the Stockdill 330/132kV substation the Canberra No.2 and No.3 transformers (including auxiliary transformers) will be decommissioned and disposed. Minor civil, secondary system and LV alterations will also be completed. Separable Portion 1 - 330kV Transmission Line Connections Separable Portion 2 - Stockdill 330/132kV Substation Construction Separable Portion 3 - Canberra No.2 & No.3 Transformer Decommissioning & Disposal
Location	Approximately 14 kilometres north-west of Canberra, immediately to the west and south-west of the suburbs of Holt and MacGregor, respectively, and to the southeast of the NSW ACT border
Project/Workplace operating hours	Except in emergency situations construction shall be undertaken during the following hours: Monday to Friday 7 am to 6 pm; Saturday 8 am to 1 pm No work undertaken on Sundays or public holidays without prior approval
Project Duration	20 months
Project Commencement	February 2019

4 Emergency Prevention

Prevention of emergency events is primary objective during Zinfra operations.

The project / site will undertake all necessary precautions to avoid emergency situations. This includes:

- Implementing and maintaining fire prevention controls by ongoing general housekeeping, removal, correct storage and handling of Hazardous Substances and Dangerous Goods; and abiding by fire authority restrictions and total fire ban days
- Implementing risk management strategies to ensure risks are minimised so far as is reasonably practicable before work activities commence.

5 Emergency Preparedness

5.1 Possible Emergencies

Potential emergency events include:

1. Evacuation (General)
2. Chemical Spill
3. Confined Space Entry
4. Excavation / Trench Collapse
5. Electrocution / Electric Shock
6. Fall from Height / Post-fall
7. Fire / Smoke
8. Injury / Multiple Injury / Illness
9. Storm / Lightning
10. EWP Failure
11. Mobile Plant Failure / Incident
12. Transport / Vehicle Collision

5.2 Emergency Control Organisation Roles and Responsibilities

ROLE	RESPONSIBILITY
Project / Contract / Workplace Manager	• Preparation, annual review, maintenance and implementation of the ERP, particularly after an Emergency or response exercise or a change in the ERP. • Determine the make-up of the ECO. • Authorisation of the ECO to overrule the normal management structure in the event of an emergency. • Ensure that all positions in the ECO understand and accept their roles and responsibility. • Arrangement of evacuation response exercises based on the ERP. • Organisation of training for ECO personnel and other Company personnel. • Notify the client of the emergency

ROLE	RESPONSIBILITY
All roles in Emergency Control Organisation	• Initiate an appropriate response to an emergency situation. • Review the implementation of the ERP. • Attend emergency pre-briefing and de-briefing meetings • Review the ERP • Make recommendations for changes to the ERP.
Incident Manager	• Manage the ERP • Make changes to the ERP as required. • Ascertain the nature of the emergency. • Evaluate need for evacuation, and direct Area Controllers to initiate • Confirm that the appropriate emergency service has been notified • Maintain a log of the events. • Ensure that all emergency communication systems are operable and maintained • Ensure that the evacuation alarm has been sounded, if required. • Confirm Emergency services have been called (If required). • Proceed to designated command area immediately. • Direct Area Controller(s) to meet Emergency Services at main entrance and communicate required information for emergency. • Advise emergency services of the emergency status. • Await the directions of emergency services. • Instruct staff to return to sections, when safe to do so • Initiate incident reporting procedures at conclusion of emergency • Report findings to management and workers.
Area Controller	• Reports to the Incident Manager. • Implement the emergency procedures for their area of responsibility. • In the event of an emergency, seek advice from the Incident Manager; • Report the status of the emergency to the Incident Manager. • Ensure that the appropriate emergency service has been notified, if not already done by the Incident Manager. • Commence evacuation if the circumstances on their area warrant this. • Search the area to ensure all persons have evacuated. • Advise workers as soon as possible of the circumstances and actions to be taken. • Close all doors (if possible) upon evacuation. • Ensure orderly evacuation of personnel to protected areas, e.g. muster points. • Assist persons with disabilities. • Ensure orderly flow of persons into protected areas.

ROLE	RESPONSIBILITY
First Aider/s	• Reports to the Incident Manager • Apply 1st aid treatment • Notify of any injuries during an emergency or as a consequence of evacuation. • Ensure that all 1st Aid equipment is maintained • Be involved in any investigation involving injured Company personnel during an emergency or as a consequence of evacuation.

5.3 Emergency Contact Details

The Project / Workplace Specific Emergency Contact details are contained in 9 Appendix 1 Emergency Contact List.

5.4 Emergency Response Hardware / Equipment

According to the potential emergency events, the necessary hardware / equipment required to deal with such scenarios is contained in the specific emergency response scenarios maintained in the appendices of this document.

Whenever emergency equipment is used, Zinfra must ensure that the equipment is replenished.

As part of the scheduled inspection program, Zinfra personal must inspect key emergency hardware / equipment.

An authorised external authority must inspect all firefighting equipment at least every 6 months.

5.5 Emergency Response Training

All personnel conducting works on the Stockdill 330/132kV Substation Construction & 330kV Transmission Line Connections project, including subcontractors and customer personnel who are not visitors, must be informed of the following information:

- General requirements of this ERP;
- Who are the key personnel identified in this ERP;
- The location of the emergency exits;
- The location of the evacuation muster point;
- The location of emergency hardware / equipment;
- Evacuation requirements.

All employees must be given this instruction at the project induction.

All Visitors must be inducted in relevant emergency evacuation procedures and muster points during the initial site induction. Visitors should be escorted by a fully inducted representative of Zinfra or the relevant subcontractor at all times whilst on site.

The training must also be conducted according to individual roles and responsibilities defined as per Emergency Control Organisation, or specific risk scenarios (e.g. Working at heights).

Training must also be provided to members of the Emergency Control Organisation. This should include use of firefighting equipment and how to conduct the evacuation of persons. This may take the form of practising emergency drills and making a record of attendance.

5.6 Emergency Response Exercises

Simulation exercises must be carried out at least every six months, to test the effectiveness of the ERP. The aspects of the ERP that must be tested and evaluated are as following, but not limited to:

- Response times in initiating the requirements of the ERP; e.g. contacting external Emergency Services; Client; Controllers initiating and clear their respective areas etc.;
- Effectiveness of emergency hardware / equipment including its suitability, location and accessibility;
- Effectiveness of communications;
- Response to injury; and
- Recovery mechanisms.

The outcome of the drill should be recorded on G-HS-FM-00596 Evacuation Exercise Evaluation.

The ERP must be reviewed at the conclusion of each response exercise and may result in:

- Changes to the ERP.
- Changes to emergency equipment in respect to suitability, location and accessibility.
- Further training for ECO personnel.
- Changes to communication methods.

For more details on conducting emergency drills, refer to G-HS-PR-50191 Emergency Drills.

6 Emergency Response

6.1 Emergency Alarm and Evacuation Communication

The project site is **not** fitted with an automatic evacuation alert system.

Constant communication will be maintained onsite via the use of portable UHF radios. Refer to signage onsite and the daily pre-start for the correct radio channel. All site supervisors must carry a portable UHF radio for communication.

In the event of an emergency:

- If there is an emergency, call “Emergency”, “Emergency”, “Emergency” on the site UHF channel that you are on. This will instigate a response from Zinfra. Maintain radio silence unless you are directly involved with the emergency situation.
- The decision to evacuate the site is made by the Incident Manager / Area Controller. If an evacuation is deemed necessary, the Incident Manager / Area Controller will initiate the evacuation.
- The Incident Manager will sound an air horn in a cycle of three seconds on three seconds off. Or shouting repeatedly “Evacuate” to ensure all personnel on the site are aware of the need to evacuate.
- The Incident Manager will also make communications with the wider windfarm via UHF radio to advise them of the situation.
- All persons upon the alarm are to leave their work area via the closest, safe exit and meet at the designated muster point. No person is to leave the assembly location unless directed by the Incident Manager / Area Controller.
- The Daily Pre-Start will be used to confirm all personnel onsite are present at the emergency muster point.

The Project /site Evacuation muster point is located in 10 Appendix 2 Site Evacuation Map and in strategies location at the site.

6.2 Specific Emergency Response Scenarios

The specific emergency response scenarios are detailed within the appendices of this plan.

7 Post Emergency Recovery

Incident Notification and Investigation must be identified in line with G-HS-PR-00153 Incident Management.

An evaluation of the effectiveness of this Emergency Plan must also be undertaken and documented. Any changes identified as necessary must be addressed as soon as practicable.

Personnel involved in the emergency response or are witness to the event should be offered the Employee Assistance Program (EAP) to assist with any post event trauma support.

Zinfra's EAP service provider is Optum Livewell. They can be contacted on 1300 361 008 or online via the Zinfra Human Resources intranet page.

8 Internal Document References

Document Number/Ref	Document Title
G-HS-PR-50185	HSE Emergency Preparedness
P810019-01-G-FM-00002	HSE Risk Register
G-HS-PR-00153	Incident Management
G-HS-PR-50191	Emergency Drills
G-HS-FM-00596	Evacuation Evaluation
G-HS-FM-50187	Emergency Contact Numbers Template
G-HS-FM-00377	First Aid Assessment
G-HS-FM-50187	Field Emergency Response Procedure

9 Appendix 1 Emergency Contact List

Project:	Stockdill 330/132kV Substation Construction & 330kV Transmission Line Connections
Customer	TransGrid
Job no.:	ABJ-XTC-810024
Address:	Stockdill Drive, West Belconnen, ACT

Zinfra Emergency Contacts		
Role	**Name**	**Contact #**
Project Manager - SS	[redacted]	[redacted]
Incident Manager - SS	[redacted]	[redacted]
Area Controller - SS	[redacted]	[redacted]
Project Manager - TL	[redacted]	[redacted]
Incident Manager - TL	[redacted]	[redacted]
Area Controller - TL	TBA	
HSE Advisor / First Aid Coordinator	[redacted]	[redacted]
RTW Co-Ordinator	[redacted]	[redacted]
Environmental, Cultural Heritage & Landowner Liaison	[redacted]	[redacted]
External Emergency Contacts		
Emergency Services		**000 / 112**
Medical Centre 1	Holt Medical Centre 8 Holt Place, Canberra ACT 2615	02 6254 3324
Medical Centre 2	Belconnen Walk-In Centre 56 Lathlain Street, Belconnen ACT 2617	13 22 81
Hospital 1	Calvary Public Hospital Bruce 4 Mary Potter Circuit, Bruce ACT 2617	02 6201 6111
Hospital 2	University of Canberra Hospital 20 Guraguma Street, Bruce ACT 2617	02 6244 2222
Local Police	Belconnen Police Station Bejamin Way, Belconnen ACT 2617	02 6256 7777
Client Representative	[redacted]	[redacted]
Zinfra Employee Assistance Provider	[redacted]	1300 361 008

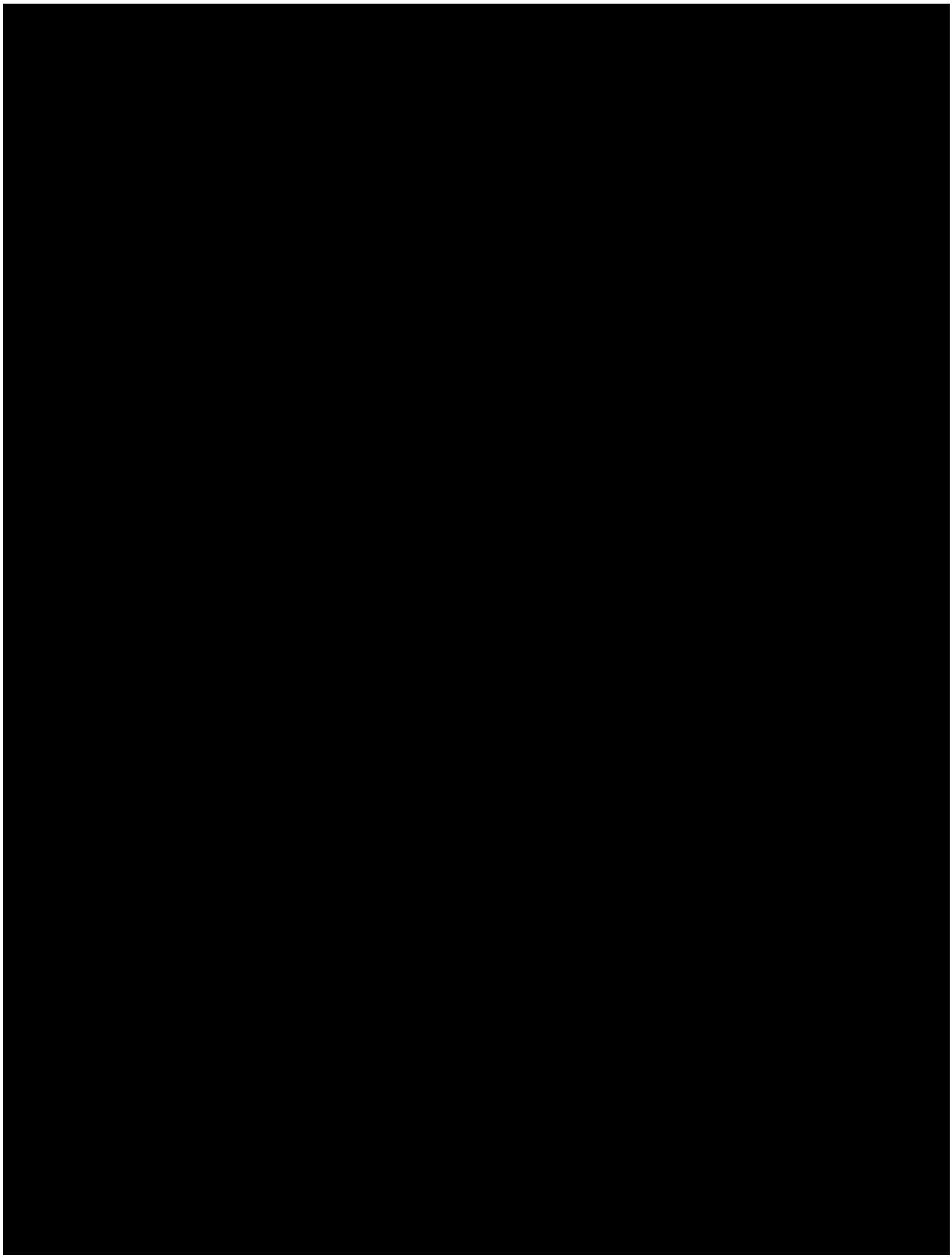
Key Client Contacts

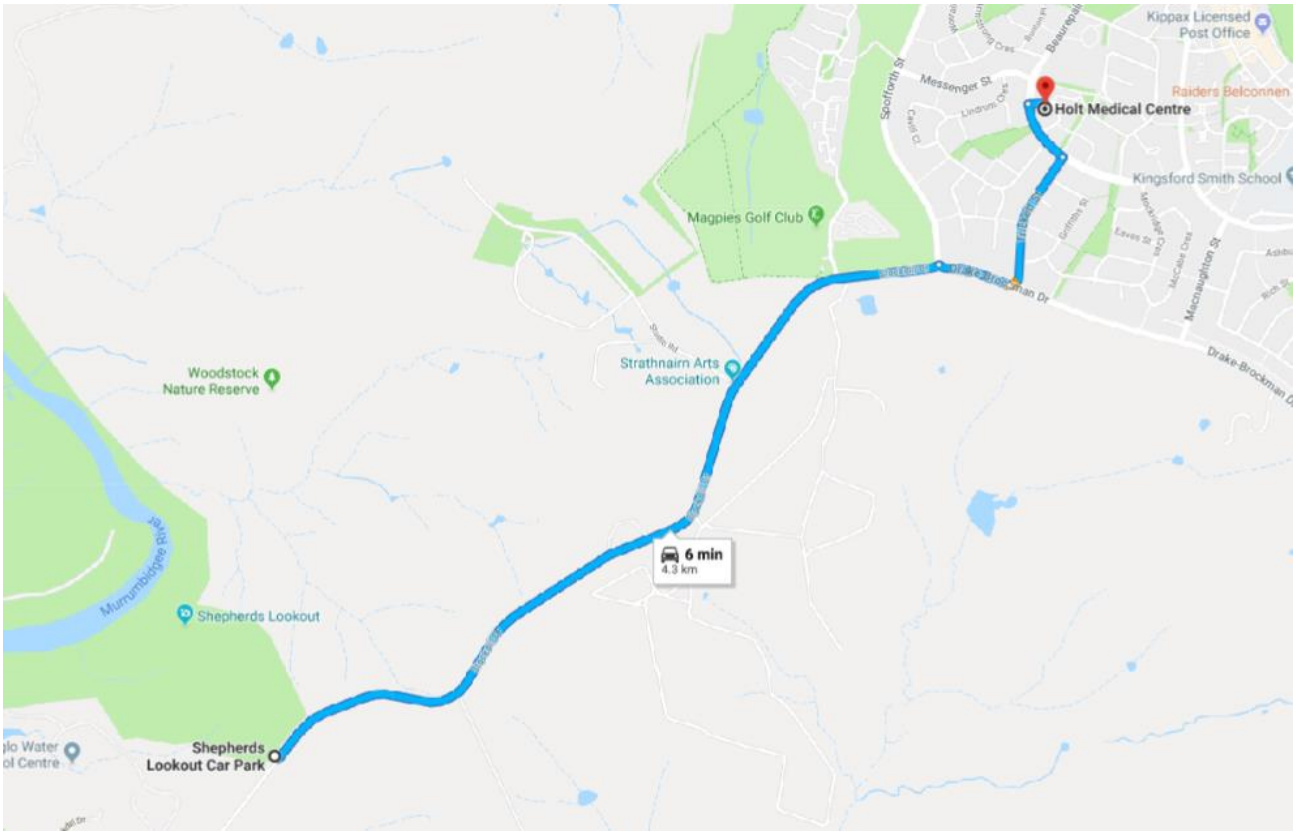
Company Name	Role	Contact Name	Contact #
TransGrid	Operator in Charge	TBA	TBA
TransGrid	Project Manager	[redacted]	[redacted]
TransGrid	Client Site Representative	[redacted]	[redacted]
TransGrid	Environmental Advisor	[redacted]	[redacted]
TransGrid	Community Relations Manager	TBA	TBA
TransGrid	Safety Advisor	TBA	TBA

Other Key Contacts

Company Name	Contact Name	Contact #
Council (water & waste)	Icon Water	02 6248 3111
Evo Energy	https://www.evoenergy.com.au/	131093
Environment Protection Authority (EPA)	environment.protection@act.gov.au	13 22 81
ACT Emergency Services Agency (ESA)	http://esa.act.gov.au/	13 22 81
ACT Pollution hotline	https://www.accesscanberra.act.gov.au/app/answers/detail/a_id/3024/~/reporting-pollution	13 22 81
Telstra	https://say.telstra.com.au/customer/general/forms/report-damage-to-telstra-equipment	13 22 03

10 Appendix 2 Site Evacuation Map and Medical Centre / Hospital Locations





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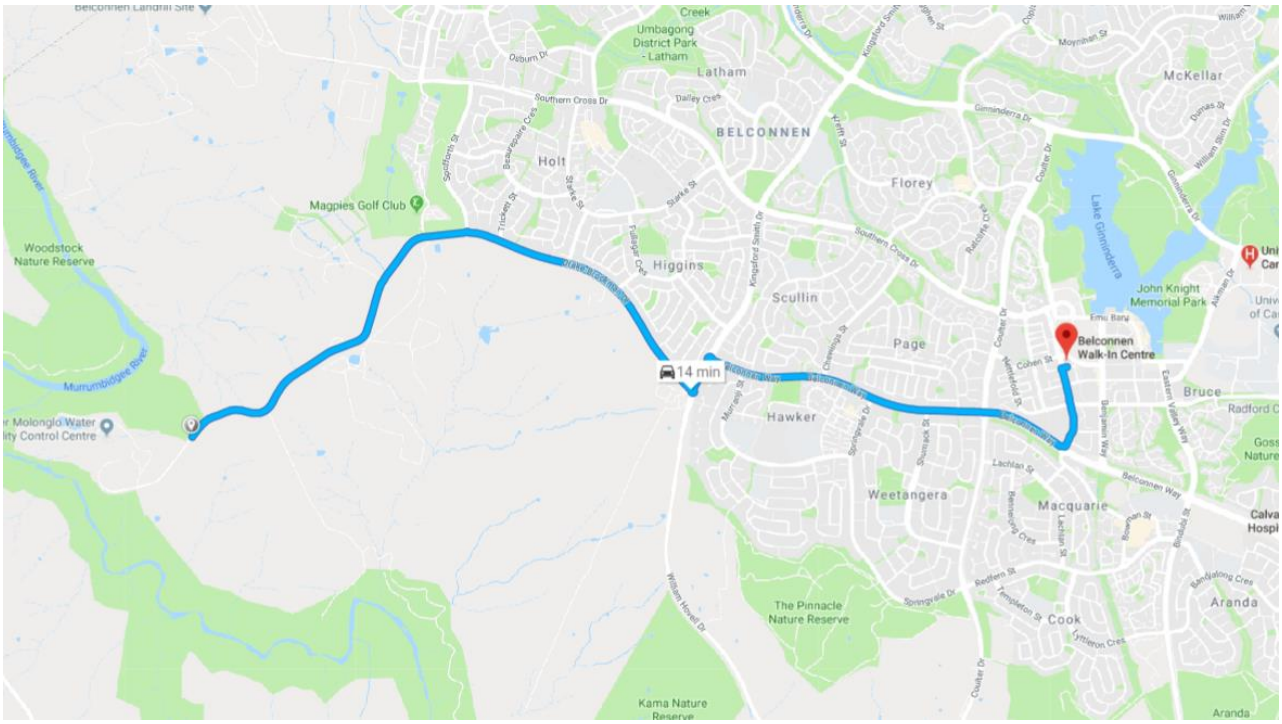

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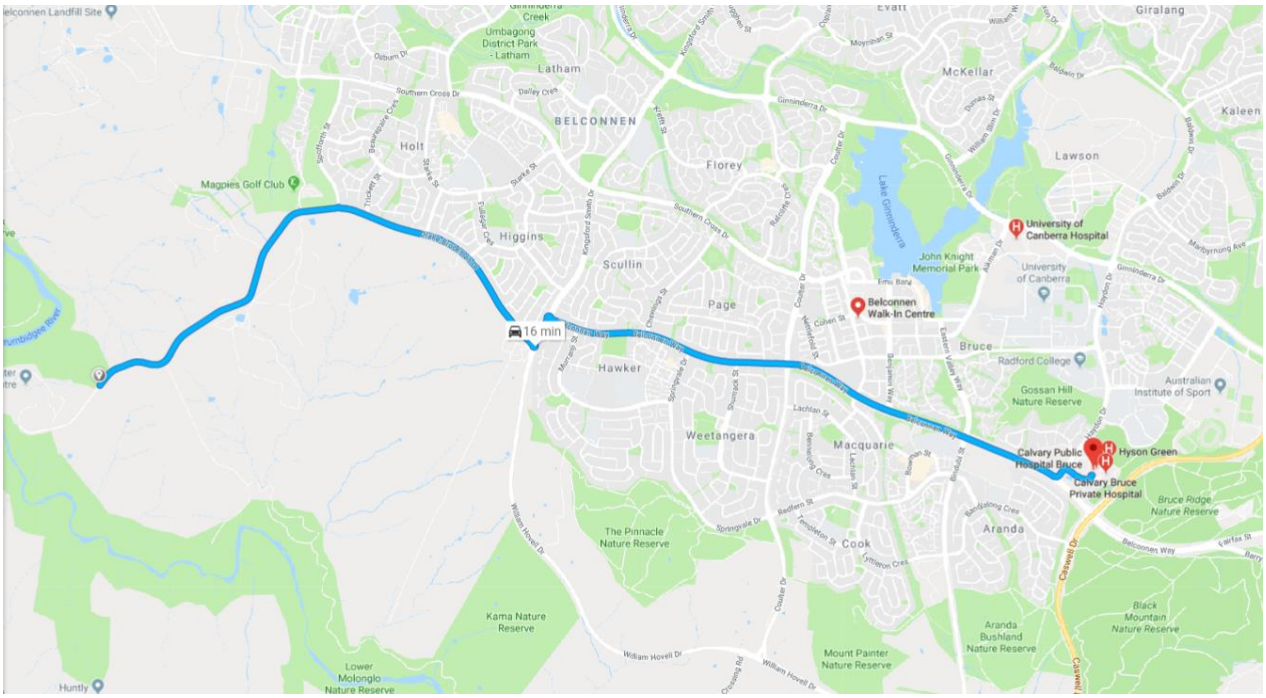

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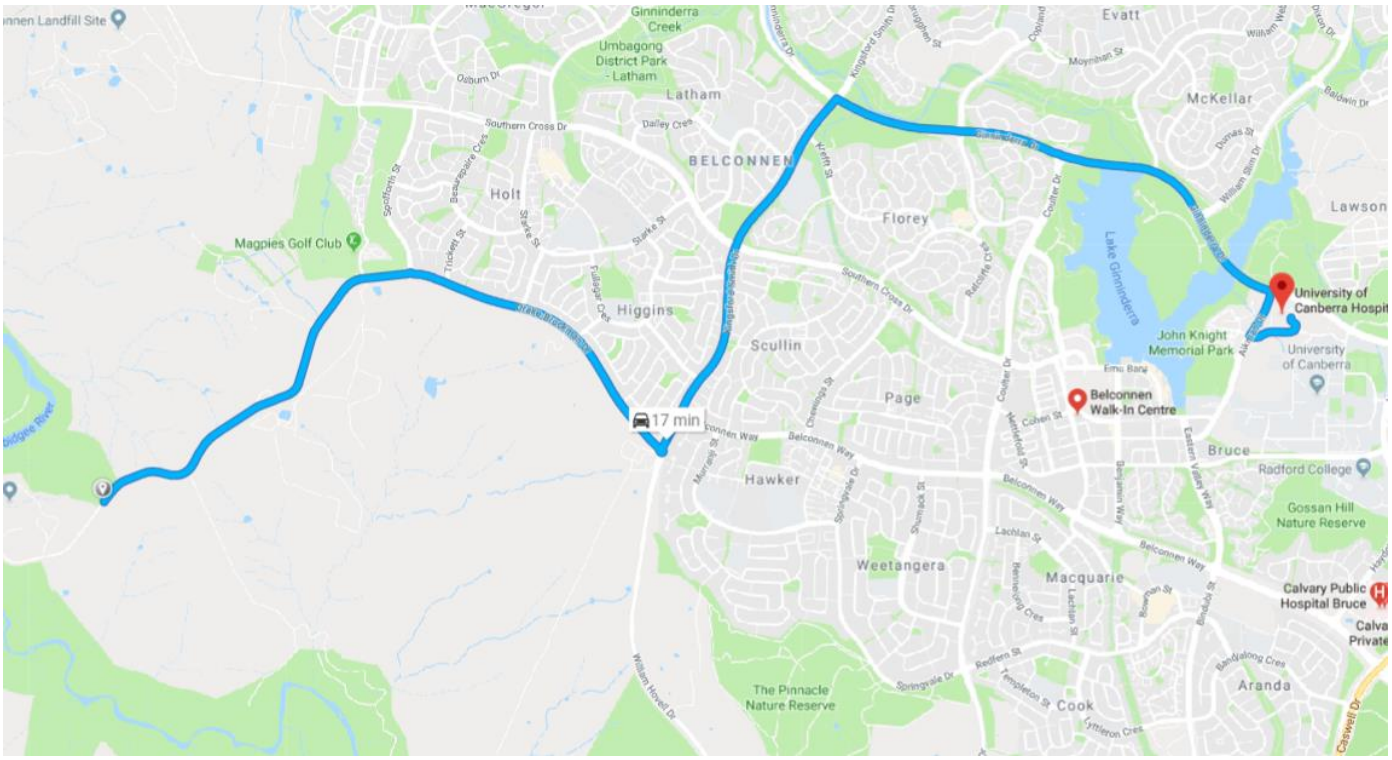

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11 Appendix 3 Emergency Control Organisation Responsibility Sign Off

Project/Site:	**Stockdill 330/132kV Substation Construction & 330kV Transmission Line Connections**	**Job no.:**	**ABJ-XTC-810024**
Address:	Stockdill Drive, West Belconnen, ACT		

Role	Name	Sign	Date
Project Manager	[redacted]		
Incident Manager - SS	[redacted]		
Area Controller - SS	[redacted]		
Incident Manager - TL	[redacted]		
Area Controller - TL	TBA		
HSEQ Advisor	[redacted]		
Return to Work Co-Ordinator	[redacted]		
First Aid Coordinator	[redacted]		
Enviro, Cultural Heritage & Landowner Liaison	[redacted]		
Acknowledgement of Responsibility Change			
Project Manager			
Incident Manager - SS			
Area Controller - SS			
Incident Manager - TL			
Area Controller - TL			
HSEQ Advisor			
Return to Work Co-Ordinator			
First Aid Coordinator			

12 Appendix 4 Evacuation (General) – Emergency Response

Response	Hardware / Equipment	Equipment location	Specific Emergency Response Training
Evacuation Alarm Activated **All personnel** 1. Stop work activity. 2. Switch off all equipment, machinery etc. 3. Head to muster point. 4. Remain at muster point until advised it's safe to return to site/workplace. **Incident Manager** 1. Assess situation 2. Contact appropriate emergency services (000 / 112) 3. Account for all known personnel on-site 4. Assist Emergency Services on arrival 5. Advise personnel when safe to return to site/workplace.	Fire extinguishers First aid kit Evacuation signage / points	Excavation areas	Nil

13 Appendix 5 Chemical Spill – Emergency Response

Response	Hardware / Equipment	Equipment location	Specific Emergency Response Training
First Able Person 1. Ensure the immediate safety of anyone in the vicinity of the spill, if safe to do so 2. Contact Incident Manager / Area Controller 3. Use appropriate Personal Protective Equipment (Refer to the Product SDS for appropriate emergency protection and treatment) 4. Cease the flow of the substance, if safe to do so 5. Contain spill using appropriate spill containment equipment, if safe to do so 6. Barricade area 7. Withdraw to safe position **Incident Manager / Area Controller** 1. Assess situation and evacuate if required 2. Ensure the immediate safety of anyone in the vicinity of the spill, if safe to do so 3. Contact emergency services 4. Identify and isolate potential sources of ignition, if safe to do so 5. Ensure all steps are being undertaken to prevent any spills leaving the site, if safe to do so 6. Determine appropriate clean-up actions and advise personnel when it is safe to re-enter site (on advice from emergency services). **After The Emergency** 7. For minor spills, review procedures within the individual SDS sheets. 8. For major spills, seek expert advice or emergency services advice. 9. Consider regulatory notification appropriate State and local authorities before operations are resumed in the affected areas. 10. Ensure that the spill area is rehabilitated 11. Ensure that any waste generated from the spill is disposed of appropriately	Fire extinguishers First aid kit Spill kits Alarm system Eye Wash Evacuation signage / points Safety Data Sheet	Main Office Amenities Site Locations	Nil

14 Appendix 6 Confined Space Entry – Emergency Response

Response	Hardware / Equipment	Equipment location	Specific Emergency Response Training
First Able Person 1. Warn persons nearby and request assistance 2. Initiate excavation from the space 3. Contact Incident Manager / Area Controller and First Aid Officer 4. Assist any persons who require help, if safe to do so 5. Do not enter the confined space without a safety observer and the appropriate training and protective equipment **Incident Manager / Area Controller** 1. Assess situation 2. Contact appropriate emergency services (000 / 112) 3. Ensure the immediate safety of anyone in the vicinity of the scene, if safe to do so 4. Coordinate rescue plan if there are personnel with the appropriate training available 5. Assist Emergency Services on arrival **First Aider** 1. Do not enter the confined space without a safety observer and the appropriate training and protective equipment 2. Provide first aid in line with training	Ladders Fire extinguishers First aid kit Evacuation signage / points Communication devices such as phone and radios Safety Data Sheet/s Atmospheric monitoring equipment Rescue harnesses Hauling/tripod systems Life rescue line Self-contained breathing apparatus	Main Office Amenities Confined Space Access point	PUASAR025A - Undertake confined space rescue RIIWHS202D-Enter and work in confined spaces

15 Appendix 7 Excavation / Trench Collapse – Emergency Response

Response	Hardware / Equipment	Equipment location	Specific Emergency Response Training
First Able Person 1. Initiate evacuation 2. Ensure the immediate safety of anyone in the vicinity of the site, if safe to do so 3. Barricade area and ensure no machinery or personnel enter areas of ground instability 4. Contact Incident Manager / Area Controller and First Aid Officer 5. Where uncertainty exists regarding the stability of the ground, evacuate all personnel 6. Assist any persons who require help, if safe to do so 7. Efforts to secure casualty/ies to safe area must be a priority, but only if safe to do so **Incident Manager / Area Controller** 1. Assess situation 2. Contact appropriate emergency services (000 / 112) 3. Ensure the immediate safety of anyone in the vicinity of the site, if safe to do so 4. If not already completed, barricade area and ensure no machinery or personnel enter areas of ground instability 5. Where uncertainty exists regarding the stability of the ground, evacuate all personnel 6. Efforts to secure casualty/ies to safe area must be a priority, but only if safe to do so 7. Coordinate rescue plan if there are personnel with the appropriate training available 8. Assist Emergency Services on arrival	Rescue equipment First aid kit Barricades Signage Excavating equipment Hand tools Shoring shields and propping equipment Ladders Evacuation signage / points Atmospheric monitoring equipment Rescue harnesses Hauling/tripod systems	Main Office Excavation areas	PUASAR030A - Undertake trench rescue UETTDRRF07B - Perform cable pit / trench / excavation rescue HLTAID001 - Provide cardiopulmonary resuscitation

16 Appendix 8 Electrocution / Electric Shock – Emergency Response

Response	Hardware / Equipment	Equipment location	Specific Emergency Response Training
First Able Person 1. Do not touch person - this may endanger yourself 2. Isolate power source 3. Ensure the immediate safety of anyone in the vicinity of the person, if safe to do so 4. Contact Incident Controller and First Aid Officer **Incident Controller** 1. Assess situation 2. Contact appropriate emergency / ambulance services (000 / 112) 3. Ensure the immediate safety of anyone in the vicinity of the person, if safe to do so 4. Keep casualty under observation until emergency services arrive 5. Ensure electrical coordinator on site investigates cause of electrocution / electrical shock and completes appropriate inspections and clearances if required **First Aider** 1. Provide first aid in line with training 2. Personnel not trained in first should not attempt to administer first aid.	First aid kit	Site Locations	HLTAID001 - Provide cardiopulmonary resuscitation

17 Appendix 9 Fall from Height / Post-fall –Emergency Response

Response	Hardware / Equipment	Equipment location	Specific Emergency Response Training
Each working at height scenario will be different; there the rescue procedure will vary and an additional rescue plan should be developed. It is a requirement that person conducting any work at height rescue have received the appropriate training to do so. **First Trained Person** 1. Initiate rescue procedures 2. Contact Incident Controller and First Aid Officer 3. Efforts should be made to rescue personnel ASAP due to suspension trauma **Incident Controller** 9. Assess situation 10. Contact appropriate emergency services (000 / 112) 11. Coordinate rescue plan if there are personnel with the appropriate training available 12. Assist Emergency Services on arrival **First Aider** 1. Provide first aid in line with training 2. Personnel not trained in first should not attempt to administer first aid.	Fall arrest rescue equipment Rescue plan First aid kit Barricades Signage Rescue Kit	Tower locations	UETTDRRF03B - Perform EWP rescue UETTDRRF04B - Perform tower rescue HLTAID001 - Provide cardiopulmonary resuscitation HLTAID003 - Provide first aid

18. Appendix 10 - Height Rescue - Emergency Response

Response	Hardware / Equipment	Equipment location	Specific Emergency Response Training
Emergency rescue scenarios can differ, depending on the site location, environmental conditions and task setup; the site should then be assessed and an additional rescue plan developed. It is a requirement that any person conducting any work at height rescue have received the appropriate training to do so. Efforts should be made to rescue personnel ASAP due to suspension trauma. **First Able Person** 1. Assess the situation for danger to yourself and others 2. Visually check the casualty to ensure further injury / danger is minimised, provide verbal reassurance 3. Raise the rescue kit 4. Attach the rescue kit sling to a suitable attachment point 5. Attach the personal rescue device to yourself 6. Attach rescue kit control descending device (CDD) to the rescue rope, test the functionality of the CDD 7. Attach yourself to the CDD and lock off CDD 8. Detach yourself from the structure 9. Descend to casualty and lock off CDD 10. Attach the personal rescue device to the rescue rope and to the casualty 11. Raise the casualty to take the weight off his attachment 12. Secure casualty's harness to rescuers 13. Slowly release the personal rescue device to transfer the full weight of the casualty to the rescuer 14. Lower the casualty to the ground 15. Disconnect self / casualty from the rescue rope 16. Move the casualty to a suitable location to allow first aid to be administered and seek medical assistance	Fall arrest rescue equipment First aid kit Rescue Kit	Work at Height areas	UETTDRRF04B - Perform tower rescue UETTDRRF03B - Perform EWP rescue UETTDRRF02B - Perform pole top rescue HLTAID001 - Provide cardiopulmonary resuscitation HLTAID003 - Provide first aid

19. Appendix 11 Fire / Smoke – Emergency Response

Response	Hardware / Equipment	Equipment location	Specific Emergency Response Training
First Able Person 1. Ensure the immediate safety of anyone in the vicinity of the fire or smoke, if safe to do so 2. Contact Controller and evacuate anyone in the vicinity of the fire 3. Assist any persons who require help, if safe to do so 4. Contain the fire by closing doors (do not lock) and isolate fire 5. Attack base of fire to extinguish using available firefighting equipment, if trained and if safe to do so 6. Remove persons from immediate danger. 7. Alert nearby persons and Controller 8. Confine fire and smoke. Close windows and doors (if safe to do so). 9. Extinguish or control fire (if safe to do so). **Controller** 1. Assess situation and evacuate if required 2. Evacuate anyone in danger or within the vicinity of the fire, if safe to do so 3. Contact Emergency Service / Fire Brigade (000 / 112) 4. Contain the fire by closing doors (do not lock) and isolate fire 5. Join employees / contractors at assembly point 6. Consider relocation of persons to alternate assembly point if necessary	Fire extinguishers First aid kit signage / points	Site locations	Nil

20 Appendix 12 Injury / Multiple Injury / Illness – Emergency Response

Response	Hardware / Equipment	Equipment location	Specific Emergency Response Training
First Able Person 1. Ensure the immediate safety of those injured/ill and anyone in the vicinity, only if safe to do so 2. Notify First Aid Officer and Controller and advise location, number of personnel involved, nature of incident, first aid requirements, and any further exposures likely to escalate incident. **Controller** 1. Assess situation 2. Keep uninvolved personnel out of the way 3. Contact ambulance and/or emergency services, if instructed by first aider **First Aiders** 1. D – Check for **Danger** to yourself and others 2. R – Check for a **Response,** if no response ↓ 3. S – **Send** for help – Call 000 / 112 or instruct Controller to do so 4. A – Check **Airway** is open and clear 5. B – Check for Normal **Breathing,** if not breathing ↓ 6. C – Start **CPR** 7. D – Attach **defibrillator** (AED), if available 8. Remain with casualty until told otherwise, only if safe to do so 9. Assist emergency services / ambulance staff as directed 10. Once patient/s removed, barricade area, only if safe to do so 11. Only provide assistance in line with training provided. 12. Personnel not trained in first aid must not attempt to administer first aid.	First aid kit Defibrillator	Car/vehicle	HLTAID003 - Provide first aid HLTAID001 - Provide cardiopulmonary resuscitation

21 Appendix 13 Storm / Lightning – Emergency Response

Response	Hardware / Equipment	Equipment location	Specific Emergency Response Training
Incident Manager / Area Controller / Site Manager **PREPARATION** 1. Clear all areas for loose objects that could cause injury or damage during high winds 2. Check that all drainage systems are intact and there are no build-up of materials to block water flow 3. Ensure sediment and erosion controls are in place and sufficient 4. Ensure all buildings / sheds / fences / facilities etc. are secured to prevent dislodging in high winds 5. Check and store materials securely; 6. Ensure 2-way radio communication is operational, where in place. **AS THE STORM APPROACHES** 1. Monitor the severity and directional path of the approaching storm; 2. 30x30x30 rule applies 3. Turn off and disconnect electrical equipment 4. Take shelter, and keep away from live electrical conductors and equipment if evacuation was not possible 5. Park up and shelter vehicles and equipment; 6. Close external doors; 7. Tape (cross fashion 'X' plus strips) or cover large windows; 8. Consider evacuation (if time permits) or have people go home prior to the storm **DURING THE STORM** **1.** Stay inside or at a safe place and ensure personnel are well clear of live electrical conductors and equipment **AFTER THE STORM HAS PASSED** 1. Contact State Emergency Services and keep updated 2. Report any damage to power lines, buildings, trees, or flooded waterways 3. Ensure the immediate safety of anyone in the vicinity of the storm damage, if safe to do so 4. Consider evacuation 5. Establish that all persons on site have been accounted for and inform emergency services upon arrival 6. Identify missing or injured persons	Masking tape Communications systems such as two-way radios Fire extinguishers First aid kit Spill Kit	Main office Facility /building structures	Nil

7. Assist Emergency Services on arrival **RETURNING TO SITE POST EVACUATION** 1. Co-ordinate a small group to attend site ahead of all personnel 2. Review site status including accessibility, integrity of structures, availability of power, water, telephone services; beware of dangers such as fallen power lines, trees, gas leaks etc. 3. Assess site security and safety 4. If safe to do so, notify other site personnel they may return to site. 5. Contact the local State Emergency Service if required; 6. Commence clean-up operations. 7. Re-instate erosion and sediment controls 8. Rehabilitate areas damaged by erosion and sediment movement			

22 Appendix 14 EWP Failure – Emergency Response

Response	Hardware / Equipment	Equipment location	Specific Emergency Response Training

General
• Do not attempt to rescue a person who is suspected of being in contact with live high voltage conductor or apparatus
• Do not attempt to use a fire extinguisher on or near high voltage conductor or apparatus
• Observe project emergency response procedures
 	
EWP Specific Emergency Escape Plan A - Mechanical Failure or Fire;
• Use CDD to descend from EWP bucket if EWP is de-energised
• Maintain safe clearance distances from electrical hazards during descent
• Persons shall not put themselves at additional risk at any time.
 	
Emergency Escape Plan B - EWP comes into contact with live conductors;
• EWP comes into contact with live conductors, remain on the EWP (unless there is a fire)
• Competent person to remain in place to warn all persons that the EWP is live and do not touch any part of EWP
• Notify electricity distributor
• Operate the EWP in such a manner to break contact (if possible)
• If unable to detach EWP from overhead conductors, remain on the EWP and take no further action until is confirmed that conditions are safe
• If it is essential to leave the EWP because of fire, the following actions shall be taken:
  • For persons in the bucket, escape using the CDD. When moving away from the EWP, shuffle or hop, keeping feet together to avoid step potential
  • When the EWP operator is immobilized, the power shall be isolated before assistance is given.
  • For persons on the chassis of the vehicle, jump well clear from the EWP and avoid touching the EWP and the ground at the same time. Do not step or climb off. Shuffle or hop, keeping feet together to avoid step potential
• Remove EWP from service until a competent person has inspected it
		In Vehicles and EWP
		
		Placed at work at height areas
			Nil

Emergency Escape Plan C - EWP Escape Using 2nd EWP Only to be used if live electrical hazards prevent descending with CDD; *Only to be used if live electrical hazard prevent safe descent using CDD* • Escape from 1st EWP into 2nd EWP must only occur if 1st EWP is de-energised • Check SWL for 2nd EWP to allow rescue of 1 person at a time or both people • 2nd EWP to be positioned adjacent to 1st EWP with a gap of less than 100 mm • 2nd EWP to be positioned according to the controls in this SWMS • Persons in 1st EWP must remain connected to an anchorage point at all times by using a double lanyard			

23 Appendix 15 Mobile Plant Failure / Incident – Emergency Response

Response	Hardware / Equipment	Equipment location	Specific Emergency Response Training
First Able Person 1. Contact Controller and request emergency services if required 2. Contact First Aid Officer 3. Switch off mobile plant ignition, if safe to do so 4. If plant is on fire, initiate fire suppression or use portable fire extinguisher (if trained and if safe to do so) 5. Assess plant and site damage, and take necessary actions to secure and isolate scene 6. If plant is in contact with power source, stay clear and advise occupants to stay with the plant and not to touch any metallic parts 7. Do not attempt to remove casualties from plant unless they are in immediate danger 8. Contain leaking fluids using sand, dirt, or fire extinguisher if safe to do so **Controller** 1. Assess situation 2. Contact appropriate emergency services 3. Ensure the immediate safety of anyone in the vicinity of the site, if safe to do so 4. Do not attempt to remove casualties from plant or scene unless they are in immediate danger 5. Assist Emergency Services on arrival **First Aider** 1. Provide first aid in line with training 2. Personnel not trained in first should not attempt to administer first aid.	Fire extinguishers Vehicle fire suppression systems First aid kit Spill Kit	Plant cabin Site Locations	Nil

24 Appendix 16 Transport / Vehicle Collision – Emergency Response

Response	Hardware / Equipment	Equipment location	Specific Emergency Response Training
First Able Person 1. Contact Controller and/or request emergency services if required 2. Contact First Aid Officer, if required 3. Switch off vehicle ignition, if safe to do so 4. If vehicle is on fire, initiate fire suppression or use portable fire extinguisher (if trained and if safe to do so) 5. Assess vehicle and site damage, and take necessary actions to secure and isolate scene 6. If vehicle is in contact with power source, stay clear and advise occupants to stay in the vehicle and not to touch any metallic parts 7. Do not attempt to remove casualties from vehicles unless they are in immediate danger 8. Contain leaking fluids using sand, dirt, or fire extinguisher if safe to do so **Incident Controller** 1. Assess situation 2. Contact appropriate emergency services (000 / 112) 3. Ensure the immediate safety of anyone in the vicinity of the collision, if safe to do so 4. Do not attempt to remove casualties from vehicles unless they are in immediate danger 5. Assist Emergency Services on arrival **First Aider** 1. Provide first aid in line with training provided 2. Personnel not trained in first should not attempt to administer first aid.	Fire extinguishers First aid kit Spill Kit	Site locations	Nil

25 Document Control

Approval

The following table lists personnel who are responsible for authorising the document:

	Title	Name	Signature	Date
Owner:	Project Director	[redacted]	[redacted]	9/4/19
Approver:	HSE Advisor	[redacted]	[redacted]	9/4/19

Document History

The following table lists the changes made to this document:

Version	Date	Amended by	Comments
A	16/01/2019	[redacted]	Initial draft issued for review & comment
0	0/04/2019	[redacted]	Approved for use
0	0/04/2019	[redacted]	Approved for use

Hazardous Substance Management Plan

Contents

1 Purpose

The purpose of this Plan is to define strategies to minimise the potential for, and impacts from hazardous materials storage, use and disposal associated with construction activities.

2 Scope

This Plan applies to all works associated with the procurement, storage, handling and disposal of hazardous substances. It is a requirement for all employees and subcontractors to follow this Plan in ensuring that;

- Best practice is adopted in the management of storage and handling of hazardous substances;
- The environment is not adversely affected by the use and storage of hazardous substances;
- Compliance with all legislative, permit and client requirements; and
- No reportable spills of hazardous substances to the environment.

3 Responsibilities

Role	Responsibility
Group Manager Environment & Sustainability	Provide Zinfra with advice in relation to hazardous substance management and support the Project in complying with State/Territory regulations
HSE Managers/ Advisors	Manage activities in relation to the procurement, storage, handling and disposal of hazardous substance. Provide training, monitoring and reporting on the day-to-day operation of this Plan, regular auditing of operations.
Project Managers	Ensure procurement, storage, handling and disposal of hazardous substance are implemented in accordance with this procedure.
Site Supervisors	Coordinate implementation of this procedure.
All Employees / Contractors	Responsible for correct procurement, storage, handling and disposal of hazardous substance. Aware of the requirements of this Plan.

4 Definitions

Term	Definition
AS	Australian Standard
Break away coupling	Close instantly to prevent spillage when there is excessive force/movement or when hoses accidentally come apart during refuelling.
Dangerous Goods	Dangerous goods are substances, mixtures or articles that, because of their physical, chemical (physicochemical) or acute toxicity properties, present an immediate hazard to people, property or the environment. Types of substances classified as dangerous goods include explosives, flammable liquids and gases, corrosives, chemically reactive or acutely (highly) toxic substances
Dry break coupling	Allows an operator to connect/disconnect hoses manually without spillage.
EPA	Environmental Protection Agency
Hazardous material storage includes	Interim, temporary, permanent and mobile storage of solid and liquid chemicals.
Hazardous material spills	Any leak (outside of a secondary containment area) or discharge of any oil or chemical.

Term	Definition
Hazardous substance	A substance which has the potential, to harm the health or safety of persons in the workplace For example: • Harmful / toxic – causing transient or permanent damage to body functions • Corrosive – causing damage to living tissue • Irritant – causing local irritation to living tissue • Sensitising – causing an allergic reaction • Carcinogenic – causing cancer • Mutagenic – causing genetic damage • Teratogenic – a substance toxic to human reproduction
SDS	Safety Data Sheet
NDT	Non-destructive testing

5 Legislative Requirements

Document Title
Work Health and Safety Act 2011, Parts 2 and 4
Work Health and Safety Regulations 2011, Chapter 1 Part 1.1, Chapter 3 Part 3.2 Division 9. Chapter 5 Part 5.2, Chapter 6, Chapter 7 Part 7.1, Chapter 9, Chapter 11, and Schedules 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 and 18
Dangerous Substances Act 2004
Dangerous Substances (General) Regulations 2004
Environment Protection Act 1997
Environment Protection Regulation 2005
National Code of Practice for the Control of Workplace Hazardous Substances
National Code of Practice for the Storage and Handing of Workplace Dangerous
AS 1216-2006 Class Labels for Dangerous Goods
AS 1692-2006 Steel tanks for flammable and combustible liquids
AS 1940-2004 The Storage and Handling of Flammable and Combustible Liquids
AS 2507-1998 The Storage and Handling of Pesticides

6 Project Overview

During construction various hazardous materials and chemicals will be required to be used and/or stored on site. Typically, hazardous materials and chemicals utilised during construction include (but not limited to):

- acetylene
- adhesives, glues, epoxies, etc
- concrete and other mortar products
- contact cleaners

- cold-galvanising spray
- fuels, oils and lubricants (such as diesel, unleaded petrol, thinners, etc.)
- paints and other paint markers.

6.1 DA and EIS Conditions

The Hazardous Substance Management Plan is a sub-plan that forms part of the overarching Construction Environmental Management Plan (CEMP)

It has been developed in accordance to the relevant conditions of the DA and EIS Conditions (see Table 1).

Table 1

DA Condition Ref	EIS Condition Ref	Condition
	C-HR2	A Hazardous Materials Management Plan would also be prepared and implemented, as part of the overarching CEMP, and would detail standard environmental management measures to manage the handling, storage and transport of hazardous materials during construction, in accordance with relevant ACT EPA guidelines, Australian Standards and regulatory requirements regarding safe work procedures.
	C-SC4	All chemicals or other hazardous substances shall be stored in bunded and weatherproof facilities away from drainage lines. The capacity of the bunded area shall be at least 130% of the largest chemical volume contained within the bunded area. The location of the bunded enclosure/s shall be shown on the Site Plans.
	C-HF2	Any bulk fuel/herbicide or hazardous material transport vehicles shall be parked on level ground a minimum of 40m away from waterways (including drainage and irrigation channels). No refuelling or bulk herbicide preparation shall occur within 40 metres of a waterway or open site drains.

7 Environmental Impact

Actual and potential impacts as a result of spills occur from activities including, but not limited to:

- The storage and handling of hazardous materials (e.g. inadequate containment, corrosion of containers, puncture of drums);
- Hose, line or other equipment failure on plant and equipment;
- Spillage during hazardous materials transfer or refuelling;
- Uncontrolled explosive reactions; and
- Use of Non-destructive test media (NDT).

Hazardous materials can negatively impact on the balance of ecosystem functions. Introduction of hazardous materials into an ecosystem can impact the health of humans, flora and fauna through:

- Disruption of reproductive processes;
- Deterioration of habitat;
- Contamination of food sources, ground/surface water and soil; and
- Alteration of soil structure and constituents.
- Hazardous materials spills may result in physiological harm or mortality of fauna.

8 Mitigation Strategies

No.	Control measure	Responsibility	Timing
Set Up			
1	Where materials or substances are required, the person initiating the purchase order is responsible for requesting a Safety Data Sheet (SDS) for the material or substance. Purchase of a non-hazardous or non-toxic products must be considered if it will achieve the same intent.	Procurement Officer/Field Engineer/HSE personnel	Prior to work commencing

No.	Control measure	Responsibility	Timing
2	Prior to purchase, a risk assessment must be completed for hazardous substances. The risk assessment will determine whether there is a risk to employees' health, environmental or other risks from using a hazardous substance. The risk assessment may be carried out for a work process and may cover more than one hazardous substance.	Procurement Officer/Field Engineer/HSE personnel	Prior to work commencing
3	All chemicals purchased must be approved via ChemAlert. All purchased goods, must be clearly and correctly labelled and SDS supplied must be less than 5 years old.	Procurement Officer/Field Engineer/HSE personnel	Prior to work commencing
4	Wherever possible, materials shall be purchased in bulk to minimise the amount of storage containers required and to minimise the amount of waste/empty containers generated.	Procurement Officer/Field Engineer/HSE personnel	Prior to work commencing
5	An inventory of substances stored at the workplace shall be established and maintained using the SDS. Copies of all SDSs shall be made readily available to all employees. A register shall be maintained to track the materials being brought, stored and used onsite. The manifest/chemical inventory shall be maintained for all chemicals to include storage location, volumes, type of chemical, and date.	Procurement Officer/Field Engineer/HSE	Prior to work commencing
6	Hazardous substances storage shall be identified in accordance with AS1216 and bunded in accordance with AS 1940 (The Storage and Handling of Flammable and Combustible Liquids 2004). All hazardous substances shall be stored only in the approved areas, with bunding, identified with signage, and other controls adequate for the type and size of storage.	Procurement Officer/Field Engineer/HSE /Supervisor	Prior to work commencing
7	Decanting of materials or substances from their original container to another container is not permitted unless the other container is clearly labelled and fit for purpose - identifying the material or substance - with adequate emergency information affixed.	All personnel	Prior to work commencing
8	The transport, use and storage of all hazardous materials and dangerous goods shall be in accordance with the manufacturer's specifications and relevant Legislation and Regulation.	All personnel	Prior to work commencing
9	All unused chemicals shall be removed from site as required or at demobilisation. Disposal of any hazardous materials shall be undertaken in accordance with State Policies, regulations and guidelines.	All personnel	At all times
Storage and Handling			

No.	Control measure	Responsibility	Timing
10	Hazardous substance storage areas shall: • be capable of meeting the volume and storage requirements for each substance (e.g. liquid hazardous materials, corrosives, oxidising agents, explosives etc.); • display relevant dangerous goods classification; • appropriately segregated; • enable safe handling; • incorporate spill control and loss prevention measures (e.g. bunding and drainage). • SDS to be readily available for all hazardous substances used or stored onsite	All personnel	At all times
11	Hazardous goods shall be stored and transported in accordance with the applicable requirements. The Environmental Advisor shall ensure hazardous goods are stored and transported in accordance with the following standards: • AS1940 The storage and handling of flammable and combustible liquids • AS1216 Class labels for dangerous goods • AS1678 Emergency Procedure Guides – Transport • AS3780 The storage and handling of corrosive substances • AS2809 Road tank vehicles for dangerous goods • AS2931 Selection and use of emergency procedure guides for the transport of dangerous goods Compliance with these standards shall be regularly inspected as part of the weekly inspections.	All personnel	At all times
12	Hazardous material storage areas shall be designed/constructed to protect storage and containment areas from stormwater ingress.	Field Engineer/HSE/ /Supervisor/ all personnel	At all times
13	Hazardous material storage areas shall be compliant with relevant regulations and Australian standards e.g. bunding, level gauges, overflow protection, drainage systems and hardstands.	Field Engineer/HSE/ /Supervisor/ all personnel	At all times
14	All storage shall be within internal bunded containers. If these are not used, bunds shall be constructed of impervious material and shall be protected from the weather. All fuels and oils to be stored in a barricaded and roofed area. The bund should be sufficient to capture at least 130% of the largest container.	Field Engineer/HSE/ /Supervisor/ all personnel	At all times
15	Secondary containment areas shall be maintained free of debris/water, with no more than 10% of the volume filled	Field Engineer/HSE/ /Supervisor/ all personnel	At all times
16	Secondary containment areas shall be emptied (using vacuum trucks or similar) prior to adverse weather conditions.	Field Engineer/HSE/ /Supervisor/ all personnel	Pre rainfall events
17	Any water removed from containment areas shall be regarded and treated as contaminated waste.	Field Engineer/HSE/ /Supervisor/ all personnel	Post rainfall events
18	Drip trays are to be placed under all stationary equipment that uses fuel, oil or lubricants that are not self-contained (e.g. generators, mobile lighting towers, pumps etc.).	Field Engineer/HSE/ /Supervisor/ all personnel	At all times

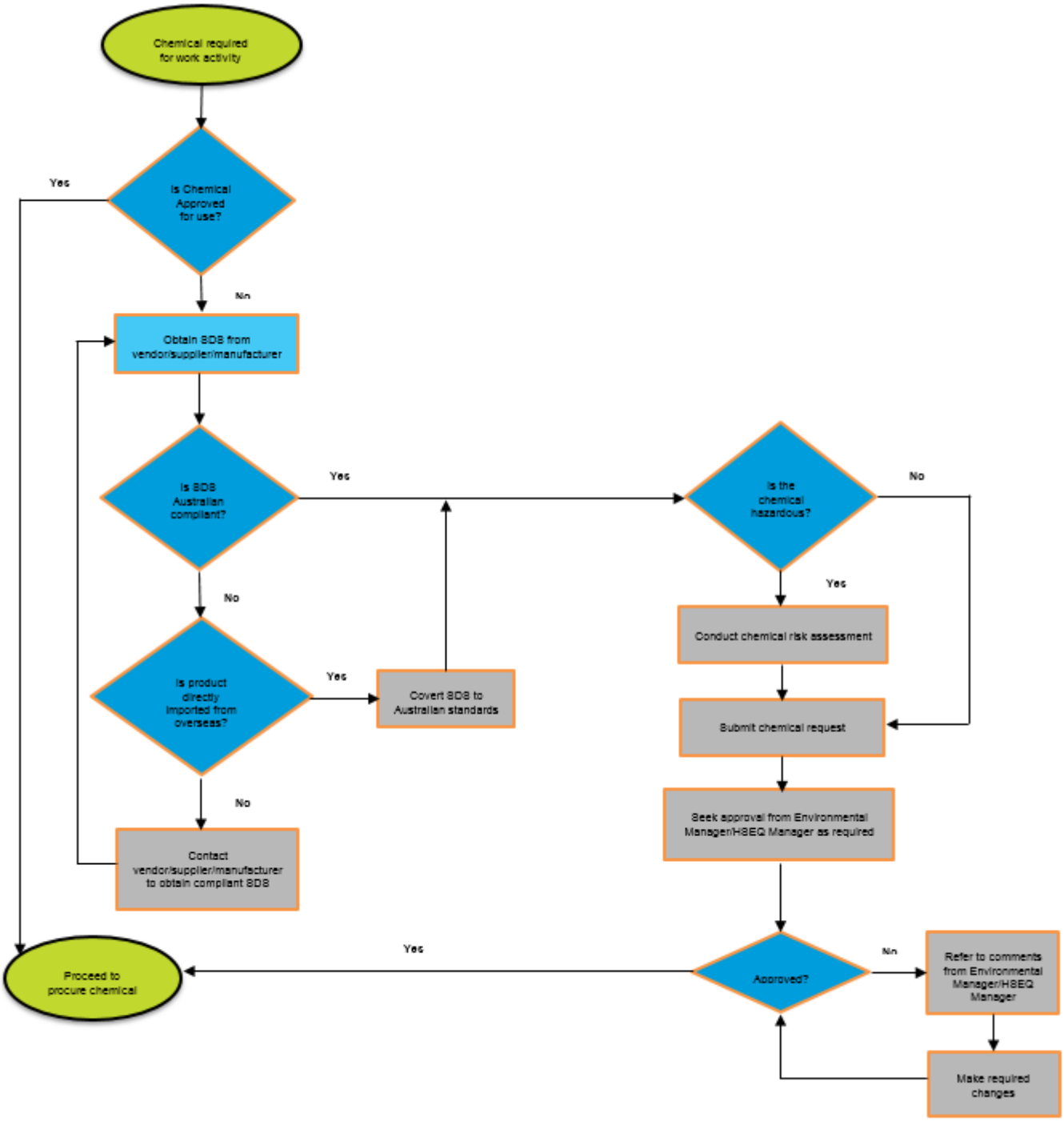
No.	Control measure	Responsibility	Timing
19	Tanks and machinery shall be equipped with measurement devices and overflow protection (e.g. flow and level meters, relief valves, overflow protection valves and emergency shutoff).	Field Engineer/HSE/ /Supervisor/ all personnel	At all times
Storage and Handling – Hazardous Solids			
20	Hazardous solids shall be stored such that they are protected from stormwater ingress.	Field Engineer/HSE/ /Supervisor/ all personnel	At all times
21	Hazardous solids shall be contained such that no accidental escape is possible (e.g. can't be wind-blown).	Field Engineer/HSE/ /Supervisor/ all personnel	At all times
Prevention and Maintenance			
22	Servicing of mobile plant shall be conducted within designated and contained areas.	Workshop	At all times
23	Should equipment require emergency servicing outside designated areas (e.g. due to breakdown), temporary containment shall be used (e.g. drip trays/ spill matting).	Workshop	At all times
24	Plant and equipment shall undergo regular maintenance (at a minimum in accordance with the manufacturer's recommendation) to reduce likelihood of equipment failure, spills and leaks.	Workshop	At all times
25	All vehicles and plant shall be inspected regularly. Inspections shall include checking for leaks and worn parts that may cause leaks (e.g. hydraulic hoses/connections).	All personnel	At all times
26	Maintenance and inspection records logs shall be kept for all work areas and plant and equipment.	All personnel	At all times
27	Hazardous materials storage areas, distribution lines/pipes, drainage and bunding shall be inspected maintained and updated regularly to ensure they are fit for purpose. Inspections, at a minimum shall include: • Assessment on condition and performance of foundations and supports; • Serviceability of fittings, vents, valves and lines; • Condition of welds, surface corrosion and paintwork.	Environmental Advisor/Supervisor	Weekly
28	Safe transfer of fuel or other hazardous liquids to and from the storage tanks shall be facilitated through the provision of devices such as dry-break couplings, automatic flow cut-off devices, and tank overflow controls.	All personnel	At all times
29	Wash down of plant and equipment shall be performed only in designated areas.	All personnel	At all times
30	All machinery used around creeks or drainage areas is to be stored outside the high banks of the watercourse (if required).	All personnel	At all times
Spill Response - Land (control, containment & clean-up)			

No.	Control measure	Responsibility	Timing
31	Hazardous substance spillage clean-up equipment shall be stored in readiness in accordance with AS1940 and Fire Safety regulations at the following locations: • near all major works, hazardous substance storage areas and refuelling utilities • Vehicle spill kits containing portable bunding, absorbent material, contaminant plastic bags and absorbent padding • hazardous chemical storage containers on site for storage of oil and fuel drums	Environmental Advisor/Supervisor	At all times
32	All spills in storage/containment areas shall be cleaned up immediately.	All personnel	At all times
33	Spill kits shall be made available throughout the relevant worksites and storage/decanting areas. Drip trays shall be used when decanting from large to small containers.	All personnel	At all times
34	Spill clean-up materials/kits shall be stored in all Zinfra vehicles or at the project site. The location and use of spill containment materials shall be identified in the environmental induction.	All personnel	At all times
35	All personnel shall be trained in the use of spill kits, absorbent material and other clean-up equipment for a spill response. Training shall take place during the environmental induction or at Toolbox meetings on a regular basis throughout the project.	All personnel	At all times
36	Spill containment, clean up and remediation shall be undertaken in accordance with a Spill Response Procedure.	All personnel	During a spill event
37	• Isolate source and Intercept/contain contaminated material; • Divert clean water around site • Clean-up oil/chemical with absorbent booms and pads, organic absorbent and bacteria • Remove contaminated material to a suitable site for remediation/disposal • Notify Supervisor immediately	All personnel	During a spill event
38	Minor oil and grease spills shall be cleaned up immediately (where safety permits) by project personnel as directed by the Environmental Advisor and/or Supervisor.	All personnel	During a spill event
39	Any ground contaminated through spillage of more than 5 litres, or less if in a sensitive location, shall be excavated and removed, or remediated through approved means. Contaminated material shall be removed to an appropriate facility for treatment (off site).	All personnel	Post spill event
40	Chemical spills shall be cleaned up immediately, where safety permits, in accordance with the Chemical Spill Procedure and EPA requirements. Disposal of remediated / clean-up materials shall be to an approved waste disposal facility. Materials shall be transported by an approved/licensed transporter. Notification in accordance with Client requirements shall be undertaken as soon as reasonably practical after the incident.	All personnel	Post incident

No.	Control measure	Responsibility	Timing
41	The analysis of the waste contaminant shall be conducted to identify the constituents of the waste, and permit for the correct handling, transportation, and disposal based on trigger levels. All waste higher than specified trigger levels shall be treated and handled as in accordance with the Spill Response Procedure.	Environmental Advisor	Post incident
42	Waste material generated from a spill clean-up shall be treated as regulated waste and disposed of in accordance with regulatory requirements. Consult the Spill Response Procedure.	All personnel	Post incident
43	All spills regardless of volume shall be reported and documented in accordance with Incident Reporting Procedure.	All personnel	At all times
Disposal			
44	Storage of any fuels, oils or chemicals shall be contained to ensure that water is not contaminated with oil or chemicals prior to disposal.	All personnel	At all times
45	All oils, oily waste, fuels and fuel containers must be removed from the site and disposed of at an approved waste disposal facility.	All personnel	At all times
46	The analysis of the waste contaminant shall be conducted to identify the constituents of the waste, and permit for the correct handling, transportation, and disposal based on trigger levels as required. All waste higher than specified trigger levels shall be treated and handled as in accordance with the Spill Response Procedure.	All personnel	At all times
Monitoring			
47	Inspections shall be undertaken of chemical, oil, fuel stores (including bunded areas) and spill kits. Information shall be recorded on the Environmental Inspection Checklist	Environmental Advisor	Weekly
48	Daily inspection of machinery and work practices shall be conducted to identify any potential contamination with runoff from fuels, oils, greases or other chemicals.	All personnel	Daily
49	General visual inspections shall be undertaken on machinery and work practices, which may cause contamination of runoff with fuels, oils, greases or other chemicals	All personnel	Daily
50	Prior to discharge of any water from bunds or bunded areas around hazardous substances, water quality monitoring (and analysis) should be undertaken. The Environmental Advisor will approve any discharging of water from bunds.		At all times
51	Following a spill or leak to a waterway, surface water monitoring may be undertaken to confirm no residual contamination remains.	Environmental Advisor	At all times
Reporting			
52	Incident notification & investigation Reports (identifying casual factors, corrective actions and preventative actions) shall be completed and forward to the Client and regulatory authority as required.	Environmental Advisor	As required

No.	Control measure	Responsibility	Timing
53	Details of hazardous substances management shall be provided in a monthly project report	Environmental Advisor	Monthly
54	Record any environmental observations and non-conformances in ASPIRE	Environmental Advisor	As required
Decommissioning			
55	Inspect proposed decommissioning areas prior to decommissioning and provide specific decommissioning requirements. Requirements may include but are not limited to: • Removal of hardstand areas; • Removal of unused chemicals; • Removal of contaminated wastes; • Soil testing for contamination as required.	Environmental Advisor	Decommission

9 Chemical Approval Process Flow Diagram



10 Related Documents and Compliance Requirements

Documents, Standards and reference material associated with this document include:

Doc No. / Ref	Document Title
G-HS-PR-50181	Hazardous Substances and Dangerous Goods

Appendix A – Chemical Request Form

PRODUCT REQUEST DETAILS	
Requester Name	
Product Name (as per SDS)	
Subcontractor	
Quantity to be kept or used onsite Please state number of containers and size as per container (Grams, Litres, Mililiters)	
Location of Stock	
Proposed Use	
Product determined as Hazardous (as per SDS)	YES ☐ NO ☐
DOCUMENTATION REQUIRED	
Risk Assessment Attached (if determined as hazardous per above)	YES ☐ NOT APPLICABLE ☐
SDS Attached	YES ☐

**HSE USE ONLY	
Date product submitted to ChemAlert	
Name/Date of approval	
Added to Hazardous Substance Register	YES ☐ NOT APPLICABLE ☐
Documents uploaded to BMS	YES ☐
SDS Placed in Master Folder	YES ☐

Appendix B – Hazardous Substance Risk Assessment Form

Form	**Hazardous Substance Management Plan**		
Document No.:	**U54XF7SRAEYD-936308442-4533**	Version:	**1**
Process Area:	**Environmental Management**		

Zinfra

Business:		**Project /Contract/Workplace:**	
Location:		**Project No.**	
Product name:		**Manufacturer/Supplier:**	
SDS available:	☐ Yes (attach MSDS) ☐ No (obtain MSDS asap)		

PRODUCT FORM	PURPOSE	STORAGE	QTY HELD IN WEIGHT/VOL	WORK AREA USAGE	FREQUENCY OF USE
☐ Solid	☐ Maintenance	☐ Required Cabinet (flammable, corrosive)	☐ Small (<1kg/litre)	☐ Open Area	☐ Daily- More than once a week
☐ Liquid	☐ Cleaning	☐ Enclosed Area	☐ Med (1-20 Kg/Litre)	☐ Closed System/fume cupboard	☐ Weekly- Fortnightly
☐ Gas	☐ Construction	☐ Secured/isolated Area	☐ Large (>20KG/Litre)	☐ Artificial Ventilation	☐ Monthly/Bimonthly
☐ Gel	☐ Equipment Use	☐ Other:	☐ Other: 2166 Lt	☐ Natural Ventilation	☐ Quarterly-yearly/Infrequently

Process/Task/Use Specify how the substance is going to be used (e.g. spray, use brush, application by hand etc.)	Hazard: Routes of Entry				Hazard: Reaction				Hazard: Effect				Current Control Measures					Risk Assessment - Refer to Risk Matrix below			Additional Controls Required				
	Inhalatio n	Ingestion	Skin contact	Eye contact	Explosiv e	Flamma ble	Reactive	Corrosiv e	Chronic/ Long	Irritation	Sickness	Property Damage	PPE	Ventilatio n	SWMS/ Work	Monitorin g	Training	Likelihood	Consequence	Risk Ranking	PPE	Ventilatio n	SWMS/ Work	Monitorin g	Training
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐				☐	☐	☐	☐	☐
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Special Consideration/Requirements

☐ Health Surveillance* ☐ Expert Advice/Information* ☐ Onsite exposure monitoring*

Personal Protective Equipment (PPE) requirements

☐ Gloves	☐ Glasses	☐ Face Mask	☐ Boots	☐ Mask/filter
☐ Respirator	☐ Head Cover	☐ Ear Muffs	☐ Special Clothing	☐ Other

* Notes:

1. Health Surveillance – Refer to HSEQ Group and relevant legislation to determine the need for health surveillance/plan
2. Expert Advice – requires further guidance and information from a competent person e.g. occupational hygienist
3. Monitoring – determine the extent of inspection/supervision required for the process or task

LIKELIHOOD	CONSEQUENCE: Minor	Serious	Severe	Major	Catastrophic
Almost Certain	Moderate (7)	High (16)	Extreme (20)	Extreme (22)	Extreme (25)
Likely	Moderate (6)	Significant (12)	High (17)	Extreme (21)	Extreme (24)
Possible	Moderate (5)	Moderate (8)	Significant (13)	High (18)	Extreme (23)
Unlikely	Low (2)	Low (4)	Moderate (10)	Significant (14)	High (19)
Rare	Low (1)	Low (3)	Moderate (9)	Moderate (11)	Significant (15)

Prepared By:	Date:
Approved By:	Date:

Landscape Management & Protection Plan

Document Number:	P810024-EN-PL-015
Issue Date:	
Version Number:	Rev 0
Process Area:	Environmental Management

Contents

1 Introduction

This Landscape Plan outlines the management of vegetation and rehabilitation activities that will be undertaken for the Stockdill 330/132kV Substation Construction and 330kV Transmission Line Connections Project..

Zinfra is responsible for the supply, construction, testing and commissioning of the project as well as being responsible for all temporary landscaping plans/measures. TransGrid has included any permanent landscaping requirements into civil designs.

2 Vegetation across the Project

The ACT Second Electrical Supply Project Biodiversity Impact Assessment undertaken by WSP, February 2018, revealed that *a total of 161 species of flora were recorded within the Project study area. Of these, 92 (57%) were native species.*

The vegetation within the Project study area has been highly modified as a result of residential, commercial, recreational and agricultural development and now occurs predominantly as exotic pastures with scattered remnant patches of native woodland. Although highly modified the Project study area still retains some areas of native vegetation communities.

Table 7.4 of the ACT Second Electrical Supply Project Environmental Impact Statement, WSP February 2018, details the area of clearing to be undertaken across the project. This is reproduced in the table below

Table 1: Environmental Impact Statement Table 7.4

PLANT COMMUNITY	VEGETATION CODE (ACT PCT)	NC ACT (ACT)	EPBC ACT	CLEARING (ha)
Eucalyptus melliodora – E. blakelyi Tableland Grassy Woodland (this community does not meet the NC Act or EPBC Act thresholds for a threatened ecological community – see section 4.1)	ACT16	-	-	0.49
Eucalyptus macrorhyncha Tableland Grass / Shrub Forest	ACT25	–	–	0
Tableland Shrubland, *Kunzea ericoides*	ACT12 (2)	–	–	0.61
Exotic Grasslands with scattered trees	NA	–	–	21.12 (4.42 ha permanent removal, 16.7 ha of temporary disturbance of groundcover only)
Exotic plantings	NA	–	–	1.61
Native planting	NA	–	–	2.08
Total area of native vegetation communities to be removed[1]				**1.1**
Total threatened ecological communities to be removed				**0**
Total vegetation clearing[2]				**25.91**

(1) Native vegetation communities includes plant communities consistent with remnant vegetation communities i.e. with ACT PCT codes. Native plantings are not included as these do not correspond to native vegetation communities and consist of a mix of local and non-local indigenous species.

(2) Total vegetation clearing calculation includes all native and non-native vegetation such as exotic grassland and exotic plantings (including grape vines). As such the total vegetation clearing area is equivalent to the project footprint. This is an overestimate of vegetation clearing as it includes areas that have already been cleared for other development.

3 Site Restoration and Revegetation

3.1 Topsoil

Topsoil should be stripped from all areas of earthworks and stockpiled for use during rehabilitation. Stockpiles should be formed in accordance with the ESCP drawings, TL900497/2. Where an insufficient volume of topsoil from the stockpiles is available, additional topsoil may need to be imported from a reputable landscape suppler. It must be free of waste, phytophora and weed refuse material.

All material imported to site is to be validated by the supplier as contamination free.

3.2 Application of Top Soil

When earthworks works have been completed and a disturbed area is ready for restoration and revegetation, compacted sub soils are to be ripped. Ripping is undertaken when the soil is dry; perpendicular to the direction water will flow (e.g. horizontal for a batter). Maximum spacing for ripping is to be 1m. The topsoil must be reinstated to a depth of a minimum 100mm where natural soils are disturbed or replaced to the same depth prior to stripping.

All table drains and bench batters to be topsoiled with 100mm topsoil and 'jute matting' within 7 days of their construction. All batters to be topsoiled with 100mm topsoil and seeded within 7 days after completion of bulk earthworks. The civil contractor to carry out all necessary works to ensure at least a 70% strike of seed is obtained prior to leaving site.

All top soil reinstated should be in accordance with the Bluebook guidelines. Refer to drawing SD 4-2 and SD 7-1 (see Appendix 1).

3.3 Rehabilitation Zones

For the purpose of rehabilitation the Project Site has been broken into 4 different Zones based on the pre-exiting land use, pre-existing vegetation and specific rehabilitation requirements. The Rehabilitation Zones are described in Section 3.4 and the project area can be viewed in Figure 1**Error! Reference source not found.** and Figure 2.

3.4 Revegetation Strategy

The revegetation strategies to be implemented in each Rehabilitation Zone is outlined below. In all cases the final vegetation types may be supplemented with fast growing summer season sterile annual cover crops to assist with initial germination, ground stability and erosion control.

3.4.1 Rehabilitation Zone 1

Zone 1 is within the existing substation. Rehabilitation will consist of spreading existing gravel within the substation, importing similar looking gravel where additional gravel is required or spreading topsoil and grass seed similar to the species present within the substation.

3.4.2 Rehabilitation Zone 2

Zone 2 is below all transmission lines and easement. The extent of rehabilitation will differ throughout this zone as it varies from residential housing areas, to open grasslands and a vineyard.

Only vegetation above 3 metres high would require clearing in the easement. As the site consists of grassland with scattered trees and a small patch of woodland. Only some trees would be required to be cleared. Groundcover vegetation would be retained unless an access track or crane pad is required.

Any disturbed area that require rehabilitation outside the residential areas and the vineyard will be completed using a seed mix with local native grasses, specifically *Themeda triandra* and *Poa sieberiana*[1], this includes within areas of native vegetation.

[1] Environmental Impact Statement Table 7.8

3.4.3 Rehabilitation Zone 3

Zone 3 is the batters, vegetated swales and disturbed areas around the Stockdill substation. All these locations will be constructed as per drawing SDL200230/4 (SDL-DR-RG-0021).

The vegetated swales will be backfilled with jute mesh with topsoil to full depth(75mm) plus 25mm overtop. Revegetated turf with grass seeding, the same seed mix used in Zone 2 will be used.

3.4.1 Rehabilitation Zone 4

Zone 4 are the three rain gardens located around the Stockdill substation, details on SDL200230/6 (SDL-DR-RG-0030). These will be constructed as per the drawing and revegetation as per point R6 on drawing SDL200230/2 (SDL-DR-RG-0010) which details at least 50% of planted vegetation to be effective for nutrient removal, such as *carex appressa, goodenia ovata, juncas flavidus, lomandra longifolia, melaleuca ericifolia* or approved equivalent.

4 Screening Vegetation

Potential impacts on individual sensitive receivers depends on their sensitivity and the magnitude of change. In general, during the construction phase visual impacts will be of a short lived and temporary. Temporary impacts include the following:

- temporary construction compounds at the existing Canberra Substation and proposed Stockdill Substation;
- erection of fencing, barricades, gates and lighting to provide safe and secure worksites;
- establishment of construction access tracks;
- general construction activities, such as vegetation clearing, earthworks, stockpiling materials and the parking/use of construction plant and vehicles;
- construction vehicle movements and minor traffic disruption associated with construction traffic on the local road network;
- vehicle and mobile plant movements on paved and unpaved roads, haulage routes and other work areas;
- installation and removal of electricity infrastructure;
- lighting impacts – construction lighting for night works. The lighting will be orientated and operated to minimise light spill to surrounding receivers whilst providing a safe work environment. The night time lighting periods will be short term and not required for the full construction program.

Changes during construction will be temporary in nature and therefore represent a minor visual impact.

The proposed Stockdill Substation and transmission lines will introduce new industrial elements to an area that is considered semi-rural. Approximately half of the proposed transmission lines will be contained within existing transmission line easements with the other half to be contained within a new easement.

There will be limited established vegetation clearing for the Project as the proposed easement for transmission lines is located in an area relatively clear of trees and positioned to minimise the loss of native vegetation. A number of large native trees, and smaller trees and other vegetation, would be removed as part of the construction of the Stockdill Substation.

Overall, given the small number of public and private viewpoints affected and the maximum assessed impact level of major at only two viewpoints, the level of impact to viewpoints is considered acceptable when considered in the context of the site and the planned future change. The mitigation measures will also reduce the extent of impact to the most affected viewpoints.

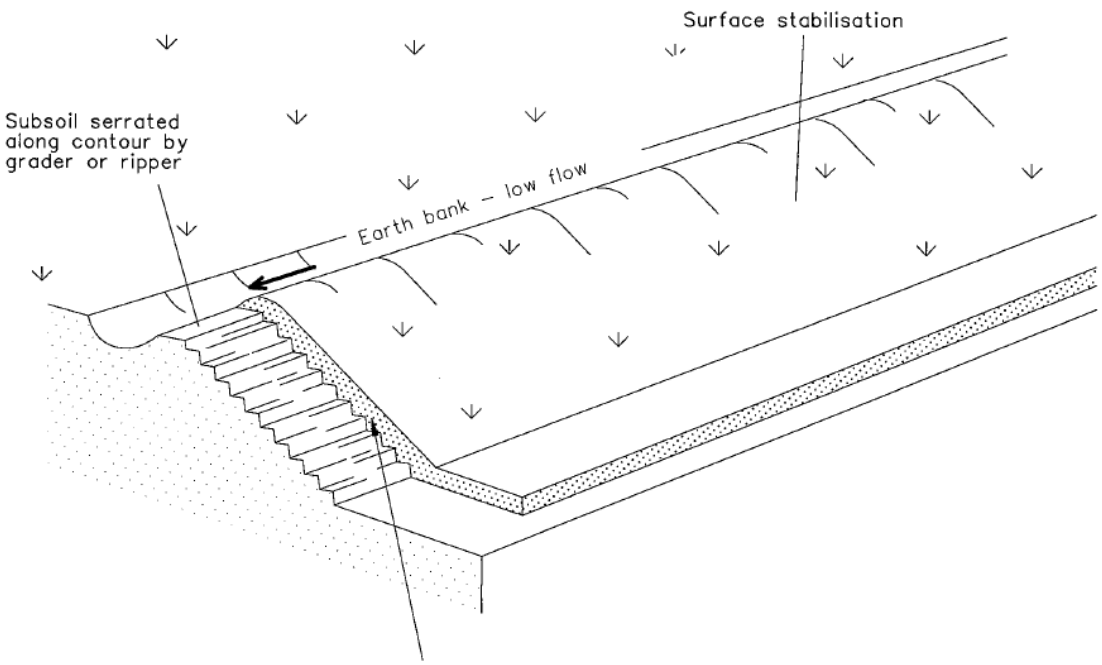
The following mitigations measures would be implemented to manage potential landscape character and visual impacts;

- Clearing around proposed Stockdill Substation – As far as possible existing trees would be retained along the Stockdill Drive boundary to maximise screening, and consideration would be given to additional vegetation screening to limit potential views toward the Stockdill Substation.
- The temporary sedimentation dam has been positioned to best avoid high quality Pink Tailed Worm Lizard (PTWL) habitat. The construction activity for the sediment pond should not impinge within the drip-line of any remaining trees.
- This will require the removal of one non-hollow bearing, *Eucalyptus blakleyi* tree, with the trunk and main branches of the felled tree to be left on site as a habitat feature.
- Landscaping is to include a number of *Eucalyptus blakleyi* replacement plants – in the vicinity of where the original tree is felled, however tree or shrub planting shall not occur within the rocky native grassland which is the PTWL habitat.
- All construction plant, equipment, waste and excess materials will be contained within the designated boundaries of the work sites and shall be removed from the site following the completion of construction.
- Disturbed areas will be revegetated or resurfaced as appropriate and progressively as works are completed in an area.
- Construction visual impact management will focus on minimising dust emissions
- Screening of views from the Billabong Aboriginal Development Corporation (PV7) – Additional vegetation screening at the Billabong Aboriginal Development Corporation and the properties to the south-east of the Project with an assessed moderate impact may reduce the impact of views of the nearest towers. Consultation will be undertaken with the owners of these properties in order to determine the feasibility of this.
- Screening of views from property to east, south of Stockdill Drive (PRV3) – Additional vegetation screening near the buildings may reduce the impact of views of the nearest towers on the opposite side of the existing towers. Consultation will be undertaken with the property owners to investigate if such screening is desired.
- Impact to private property PRV2 (vineyard) – Due to the very close proximity of the transmission easement and the need for existing vegetation to be cleared within the new easement, the Project will add to the existing visual impact from the existing transmission lines. There are no viable options to screen views from this property nor reduce impact via other possible treatments such as altering colours of structures. Consultation will be undertaken with the receptor on the potential impacts.
- At key linkage points, a mixture of plantings and tree retention either side of the powerline corridor is to be undertaken to ensure that the vegetation gap created by the powerlines (between vegetation patches and paddock trees) does not exceed 100m.
- Any potential vegetation screening will be agreed with landholders prior to finalising landscape mitigation measures.

The planting of screening vegetation has been discussed throughout the Environmental Impact Statement to limit potential views toward the Stockdill Substation. However there is no specific information on what vegetation species are proposed to be used. Additional all proposed locations for new vegetation are on private property, with the Environmental Impact Statement indicating that the landowners are yet to be consulted[2] regarding vegetation replating.

[2] Environmental Impact Statement Section 6.4

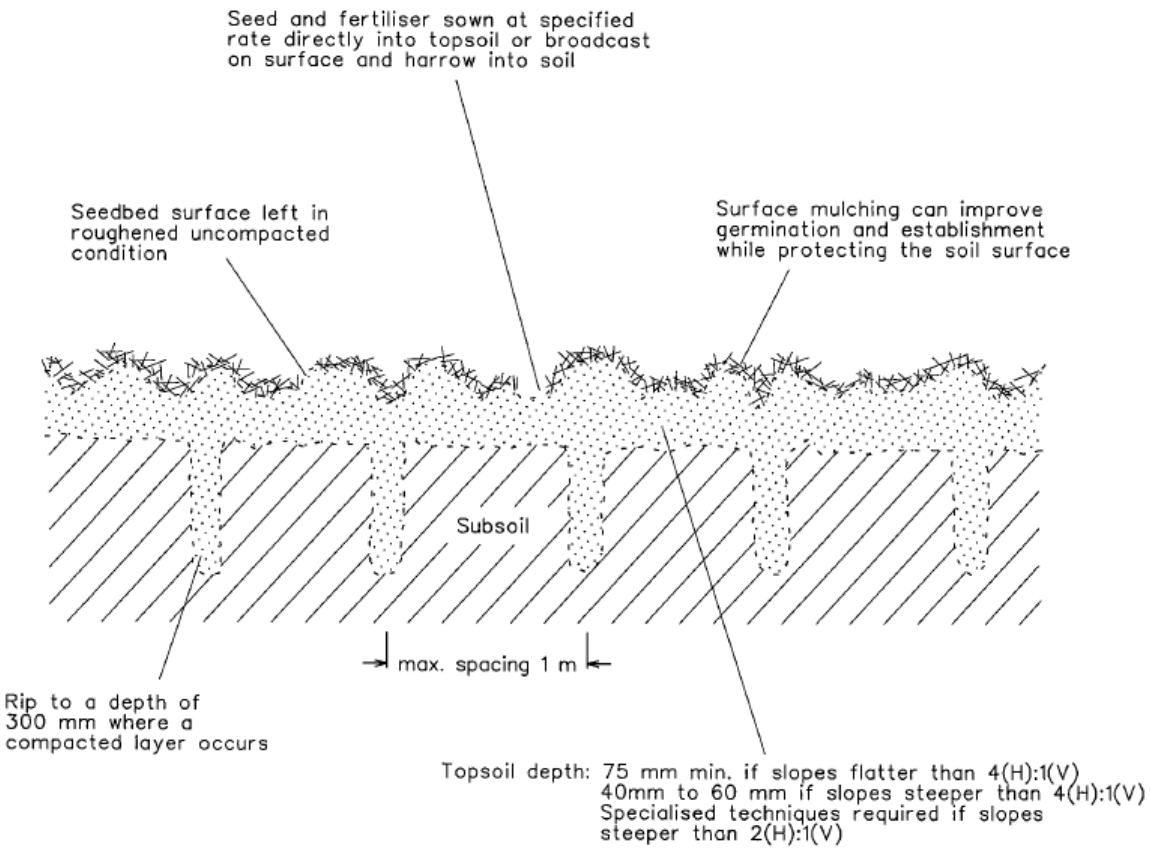
Appendix 1 Blue Book Drawings



Construction Notes

1. Scarify the ground surface along the line of the contour to a depth of 50 mm to 100 mm to break up any hardsetting surfaces and to provide a good bond between the respread material and subsoil.
2. Add soil ameliorants as required by the ESCP or SWMP.
3. Rip to a depth of 300 mm if compacted layers occur.
4. Where possible, replace topsoil to a depth of 40 to 60 mm on lands where the slope exceeds 4(H):1(V) and to at least 75 mm on lower gradients.

REPLACING TOPSOIL **SD 4-2**



Construction Notes

1. Loosen compacted soil before sowing any seed. If necessary, rip the soil to a depth of 300 mm. Avoid rotary hoe cultivation.
2. Work the ground only as much as necessary to achieve the desired tilth and prepare a good seedbed.
3. Avoid cultivation in very wet or very dry conditions.
4. Cultivate on or close to the contour where possible, not up and down the slope.

SEEDBED PREPARATION **SD 7-1**

Appendix 2 Landscaping elements of E&SC Plan