Stewardship Maintenance Contract

Sydney West Zone

Construction Environmental Management Plan

Bells Line of Road – Overtaking Lane 6

& Safety Works Site 12

February 2017

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Document control

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Document revision

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Registered controlled copy recipients will automatically receive updates as and when amendments are made. Amended pages will be issued together with a transmittal form, and recipients are to ensure superseded versions are replaced and destroyed to prevent inadvertent use.

A hard copy of this document shall be maintained within the site office for the duration of the project and may be accessed by employees, sub-contractors, Zero Harm Representatives and project personnel. On project completion, the CEMP and associated documents are to be stored with the Project Files.

Distribution list

Rev No	Issued to
0	Roads and Maritime Project Manager
0	Roads and Maritime Environmental Representative
0	DM Construction Manager
0	DM Project Manager
0	DM Site Supervisor
0	DM Environmental Manager
0	Stakeholder and Community Relations Manager

Abbreviations

Name / abbreviation	Definition
ATWP	Authority to Work Permit
CAR	Corrective Action Request
CEMP	Construction Environmental Management Plan
CEP	Community Engagement Plan
DM	DownerMouchel
DM EA	DownerMouchel Environmental Advisor
DM EM	DownerMouchel Environment Manager
DM PM	DownerMouchel Project Manager
EMP	Environmental Management Plan
EMS	Environmental Management System
ESCP	Erosion and Sediment Control Plan
ICMS	Integrated Contract Management System
NCR	Non-conformance Report
REF	Review of Environmental Factors
RES	Regional Environmental Staff
Roads and Maritime	Roads and Maritime Services
ROL	Road Occupancy Licence
SMC	Stewardship Maintenance Contract
SWMS	Safe Work Method Statement
TMP	Traffic Management Plan

1 Introduction

Roads and Maritime Services (Roads and Maritime) propose to provide a new eastbound overtaking lane on Bells Line of Road to improve traffic efficiency west of Bilpin, and provide a right turn bay into the Bilpin Springs Road and Mount Irvine Road intersection just west of Bilpin (the Project). The works would provide widening of the existing carriageway eastbound (northern side) to provide a new 700 metre long eastbound overtaking lane between Mount Irvine Road and Bilpin Springs Road, and safety works at the western end of Bilpin School Road to facilitate a new right turn into Bilpin Springs Road. Within the program of work the proposed eastbound overtaking lane and intersection safety work is referred to as OT6 and SW12 respectively.

In 2012, the Australian and NSW governments jointly announced a Long Term Strategic Corridor Plan (the Plan) for the Bells Line of Road. The Plan recommends measures and priorities for the short, medium and long term future development of this corridor to improve road safety and to maintain traffic efficiency. As part of this larger program of works, an overtaking lane is needed at OT6 and safety works are required at SW12. The nearest eastbound overtaking lane opportunity is currently some 10 kilometres west of OT6 and the proposal would provide an eastbound overtaking opportunity as well as providing road safety improvements between Mount Irvine Road and Bilpin School Road.

A Review of Environmental Factors (REF) was prepared by Jacobs and DownerMouchel (DM) and assessed by Roads and Maritime in accordance with Part 5 of the *Environmental Planning and Assessment Act 1979*. The Project, and the activities described in the PREF, was approved by Roads and Maritime on 21 January 2016.

1.1 Purpose of this plan

The purpose of the CEMP is to provide a structured approach to the management of environmental impacts arising from the works. This CEMP forms part of the overall environmental management system and details environmental protection measures for all phases of work including:

- Site establishment;
- During works/construction;
- Post works/construction (including any rehabilitation activities and maintenance of erosion and sediment controls).

Implementing this CEMP will ensure that the Project meets project specific regulatory and policy requirements, in a systematic manner. This CEMP:

- Describes the Project in detail, including activities to be undertaken and relative timing
- Provides specific mitigation measures and controls to be applied on site to avoid or minimise negative environmental impacts
- Provides specific mechanisms for compliance with applicable policies, approvals, licences, permits, consultation agreements and legislation
- Describes the environmental management related roles and responsibilities of personnel
- States objectives and targets for issues that are important to the environmental performance of the Project

- Outlines a monitoring regime to check the adequacy of controls as they are implemented during construction.

The processes, safeguards and mitigation measures defined within this CEMP shall be implemented by all parties, including employees, contractors and subcontractors, and will apply to all site based activities associated with the Project.

Subcontractors as a minimum will be required to comply with the requirements of this CEMP and may prepare their own CEMP as required providing it meets the requirements stated in this CEMP.

For more detailed and specific information regarding objectives and targets, aspects and impacts, legislative requirements, training and awareness, communications, monitoring, corrective action, incident management and document control; and how they are applied to the Project, refer to the DownerMouchel (DM) Stewardship and Maintenance Contract (SMC) Environmental Management Plan (EMP).

1.2 Objectives

The objectives of this plan are to:

1) Provide an overarching methodology to be followed to manage and mitigate potential impacts environmental impacts during construction of this project; and
2) Provide specific guidance on how to manage specific environmental issues during the completion of common construction activities.

1.3 Environmental Management Documentation

This CEMP is the overarching site and activity specific management plan for the Project, and its relationship with the DM SMC Environmental Management System (EMS) is as shown in the following Figure 1-1.

1.4 References

This document has been produced in accordance with:

- the requirements of the approved Project REF (Jacobs, 2015)
- the DownerMouchel Stewardship and Maintenance Contract Environmental Management Plan (the DM SMC EMP) and subordinate procedures, plans and checklists.
- Roads and Maritime QA Specification G36 (Environmental Protection (Management system))

1.5 Environmental Sub-plans

Various environmental sub-plans support the CEMP and include:

- Biodiversity Management Plan (BMP) – Appendix B
- Noise and Vibration Management Plan (NVMP) – Appendix C
- Erosion and Sediment Control Plan (ESCP) – Appendix D
- Traffic Management Plan (TMP) – Appendix E

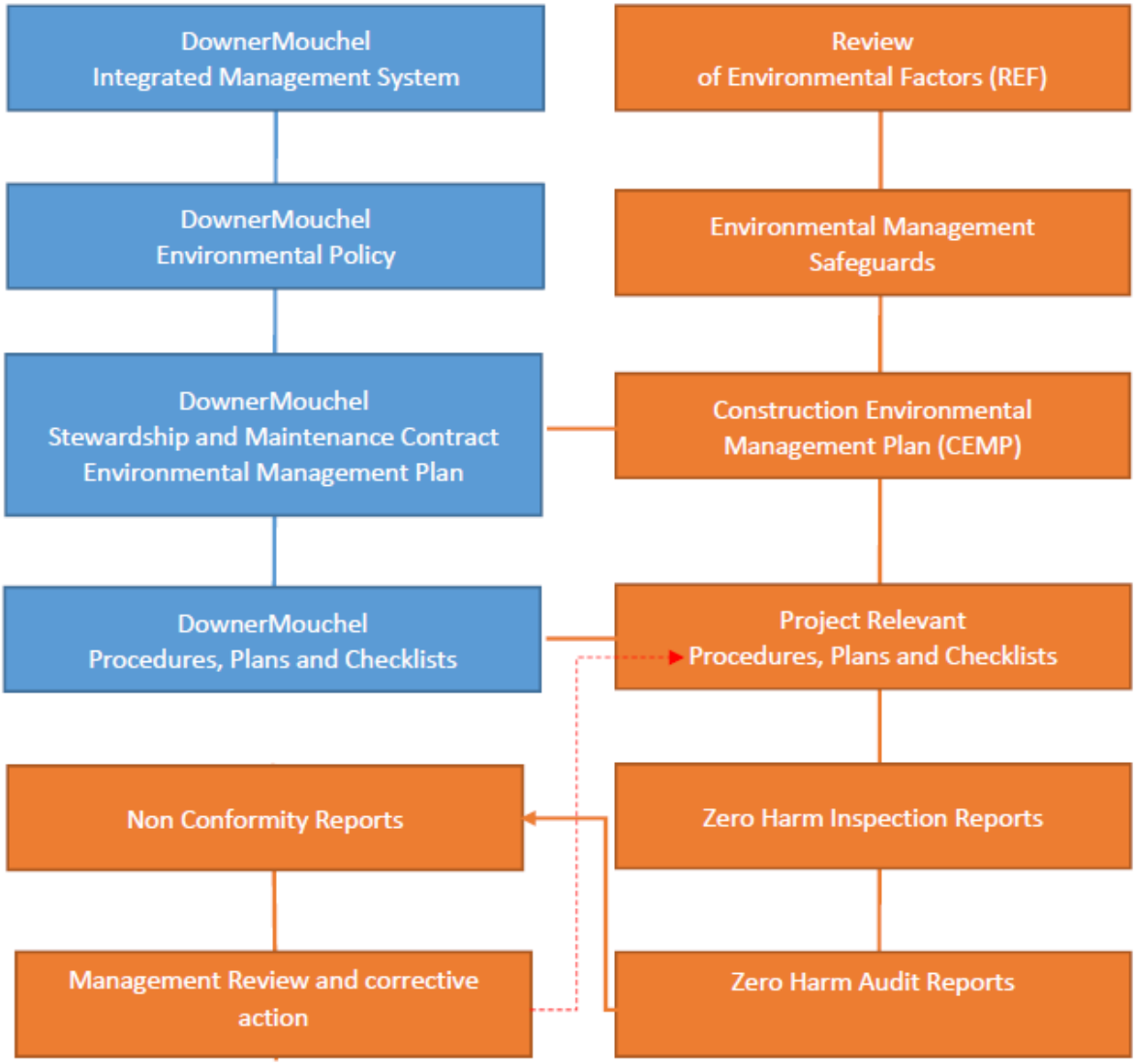


Figure 1-1 Relationship between the DM EMS and project environmental management documentation

1.6 Distribution

This CEMP will be made available to all personnel and subcontractors working onsite and made available on the site notice board. Copies will be distributed to:

- Roads and Maritime Project Managers
- Roads and Maritime Environmental Representatives
- DM Construction Manager
- DM Project Manager
- DM Site Supervisor
- DM Environmental Manager, and
- Stakeholder and Community Relations Manager.

1.7 Revision

Should any process identify any issues or items within the documents that need updating, it will be the responsibility of the Environmental Site Representative to prepare the revised documents.

Revised versions of the CEMP will be made available to relevant stakeholders through the distribution process described in Section 1.6.

2 Project Overview

2.1 Project Details

Roads and Maritime Services (Roads and Maritime) propose to provide a new eastbound overtaking lane on Bells Line of Road to improve traffic efficiency west of Bilpin, and provide a right turn bay into the Bilpin Springs Road and Mount Irvine Road intersection just west of Bilpin (the Project) (Figure 2-1 below). The Project at OT6 would provide a new 700m long eastbound overtaking lane (including a 460-metre overtaking lane, 90 metre diverge and 150 metre merge taper), along with the following:

- A new 3.3m wide travel lane to the north of the existing road formation of 460 metres in length (forming two eastbound lanes)
- A new road shoulder on the eastbound lane ranging from two to three metres
- New road surfacing along the extent of the overtaking lane
- New signage and line marking
- Construction of roadside batters and drainage
- Two cut shotcrete faced retaining walls

The Project at SW12 includes pavement widening works at the western end of Bilpin School Road to facilitate a new right turn into Bilpin Springs Road together with the following:

- A new right turn bay into Bilpin Springs Road
- A new two metre road shoulder on the westbound lane
- New road surfacing along the extent of the works
- New line marking
- Construction of roadside batters and drainage.

Six ancillary sites (AS) were identified in the Project REF, however none which will be employed during the construction period. Subject to the approval of an addendum REF, ancillary facilities will be established and operated behind Ramones Service Centre at the western limit of the OT6 works.

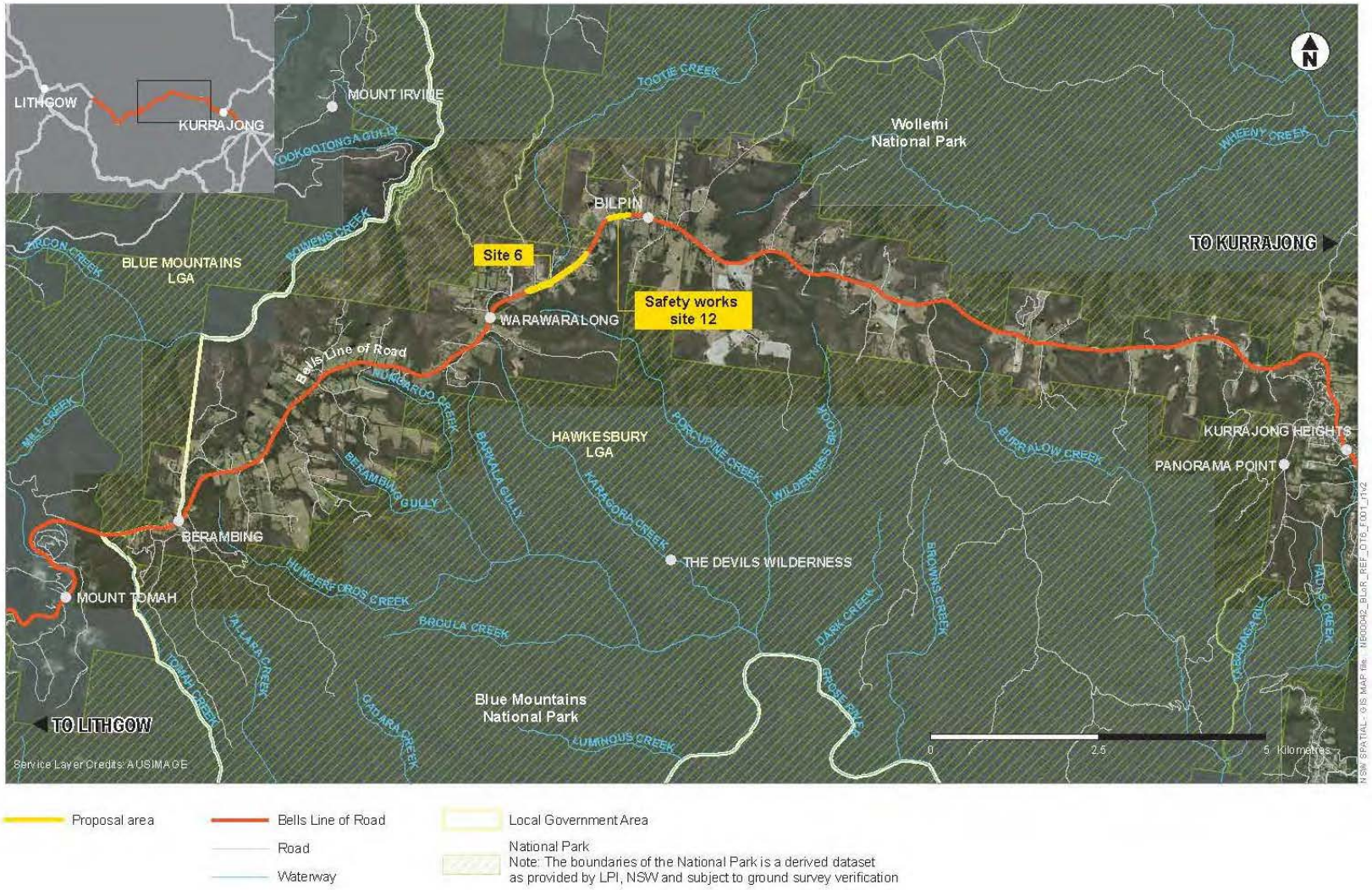


Figure 2-1 Project location

2.2 Work Methodology

The following work methodology and staging (Table 2-1) has been summarised from the approved REF, and should be considered indicative only. The sequencing of construction activities during the Project may vary due to operational requirements or weather delays.

Table 2-1 Indicative construction activities and staging

Component	Typical activities	Equipment
Pre-construction site establishment		
	• Establishment of temporary fencing • Implementation of initial environmental safeguards • Delineation of clearing boundaries • Establishment of construction ancillary sites (AS) and access • Installation of temporary traffic controls such as safety barriers, signage and line marking in accordance with traffic plan.	Fences, portable sheds, portable, toilets, flatbed truck
Site Preparation		
	• Pre-construction identification and marking of sensitive areas as identified in this REF and the EMP • Demarcation of the construction impact area from the design extent, being generally two metres from the base edge of fill batters and four metres from the top edge of cuttings. • Installation of temporary environmental controls including erosion, sediment and water quality controls • Preparation of construction diversion drains • Vegetation clearing (over an area of about 4,400 m2) would be carried out using manual methods done in accordance with Roads and Maritime Biodiversity Guidelines (Roads and Maritime 2011) • Grubbing (over an area of about 17,500 m2 and 3,000 m2 at OT6 and SW12 respectively) in accordance with Clearing and Grubbing QA Specification G40 • Stripping and stockpiling of topsoil for storage and reuse (unless removed from any weed exclusion zones, in which case it will be disposed of at a licensed facility)	Trucks, bulldozers, cherry pickers, excavators, backhoes and hand tools
Relocation/protection of services		
	• Decommission of 12 existing power poles on the northern side • Installation of 12 new concrete power poles and wiring for 11kV along northern side between Station 660 and Station 970, crossing the road at Station 970 and continuing along the southern side of road between Station 970 and Station 1380, then crossing the road again at Station 1380 to connect back to the existing electrical system • Trimming of vegetation surrounding powerlines, where it is not already cleared as part of the road design. Service and Installation Rules of New South Wales (SIR), August 2012, Clause 3.5.3 – Clearance from Structures, Vegetation and Ground state that:	Backhoes and small equipment

Maintain minimum clearance above ground, and from trees, shrubs and structures, when calculating the height of supports required for the service. Minimum clearance depend on: *(c) Trees and shrubs. Make adequate allowance for growth and the effect of wind. A minimum clearance of 1.5m is required from bare conductors and 0.5m from insulated conductors.* • Relocation of five existing underground Telstra assets between Station 735 and Station 800, a road crossing at Station 890, two drive way crossings at Station 910 and Station 1040, and between Station 1060 and Station 1210 requiring two road crossings to avoid private property on northern side of the road	
Earthworks	
• Earthwork for new pavement and drainage construction • Removal, stockpiling and management of spoil and unsuitable material within nominated stockpile areas • Based on estimates drawn from the concept design for the proposal, it is predicted that about 10000m3 and 1000m3 of imported fill would be required for OT6 and SW12 respectively • Construction of shotcrete faced retaining walls.	Trucks, bulldozers, excavators, graders, water carts, compactors, rollers, piling drill rig
Drainage	
• Construction of gutters, new and modified table drains including small excavation and grading • Extending or replacing culverts in four locations using pre-cast 450mm reinforced concrete pipe and a precast headwall to the existing cross drainage culvert outlet.	Excavators, trucks, small equipment
Road pavement construction	
• Construction of pavement layers including compaction of select, sub-surface drainage, sub-base and base layers and surfacing.	Trucks, graders, water carts, compactors, bitumen sprayers, asphalt paver, vibratory rollers and rubber-tyrerollers
Other works	
• Topsoil rehabilitation, revegetation and landscaping.	Utility vehicles, trailer, hand tools, trucks, back hoes.

2.3 Construction hours and duration

Construction work is expected to commence mid-2016. The construction work would be carried out during standard working hours, as follows:

- Monday to Friday, 7am to 6pm
- Saturday, 8am to 1pm
- Sunday and Public Holidays, no work.

Out of hours' work would be carried out in line with the procedures contained within the EPA *Interim Construction Noise Guideline* (ICNG) (DECC 2009) and the Roads and Maritime

Environmental Noise Management Manual Practice Note vii – Roadworks outside normal working hours (RTA 2001). Procedures would include notifying the local community, including local residents and businesses, prior to the start of any work. If *Practice Note vii – Roadworks outside normal working hours* requirements cannot be achieved, the Roads and Maritime contract manager would be informed and the Noise and Vibration Plan would need to be updated to outline additional site specific noise management measures and additional consultation requirements prior to the out of hours works commencing.

The proposal is anticipated to have a construction duration of about 13 weeks and 24 weeks for SW12 and OT6 respectively, weather permitting.

Works during all periods would be subject to Road Occupancy Licences (ROL).

2.4 Plant and equipment

Indicative plant and equipment employed during the construction of the Project is summarised in table 2-1.

2.5 Earthworks

The proposal would require earthworks for the re-shaping of batters and construction of the widened carriageway. All earthworks would occur along the northern side of the road corridor (eastbound direction) for OT6 and on the southern side of the road corridor (westbound direction) at SW12.

2.6 Traffic Management

During construction, construction vehicles and machinery would require access to the Project site and construction compounds. It is estimated that haulage trucks would make about 1000 trips and 200 trips to and from the proposal across the duration of construction for sites OT6 and SW12 respectively. On average, there would be about one or two additional trips each day to move other plant and machinery to and from the site, for the period of construction. Road traffic would most likely be impacted by the Project in situations where construction work is being carried out under traffic control (i.e. partial closure of the road and implementation of road work speed limits). Where possible, the Project would be programmed to minimise impact on traffic using the local and regional road network. Lane closure would be subject to ROL and the requirements of the Roads and Maritime Traffic Management Centre. During the lane closures reduced speed limits would be imposed.

Access to residential properties with direct access off the Bells Line of Road would be maintained throughout the duration of construction via the main residential access points, although temporary closures of these main residential access points would be expected at times. There are informal access points that would provide access to some of these properties should the main points require temporary closure. For most of the project, disruption to this access for residents would be short term only i.e. measured in hours. These temporary alternative access arrangements would be communicated to property owners in advance of those works. Should concrete barriers be used, gaps would be provided at property access points.
Standard traffic management measures would be employed to minimise short-term traffic impacts expected during construction. These measures would be identified in a traffic

management plan (TMP) and would be developed in accordance with the Roads and Maritime's Traffic Control at Work Sites Manual (RTA 2010) and Roads and Maritime Specification G10 – Control of Traffic.

2.6.1 Ancillary facilities

An addendum was submitted to Roads and Maritime seeking approval to establish and operate an ancillary facility including a construction compound and stockpile on a cleared paddock behind Ramone's Service Centre on Lot 1/DP1180424, which is located at approximately 2742 Bells Line of Road Bilpin.

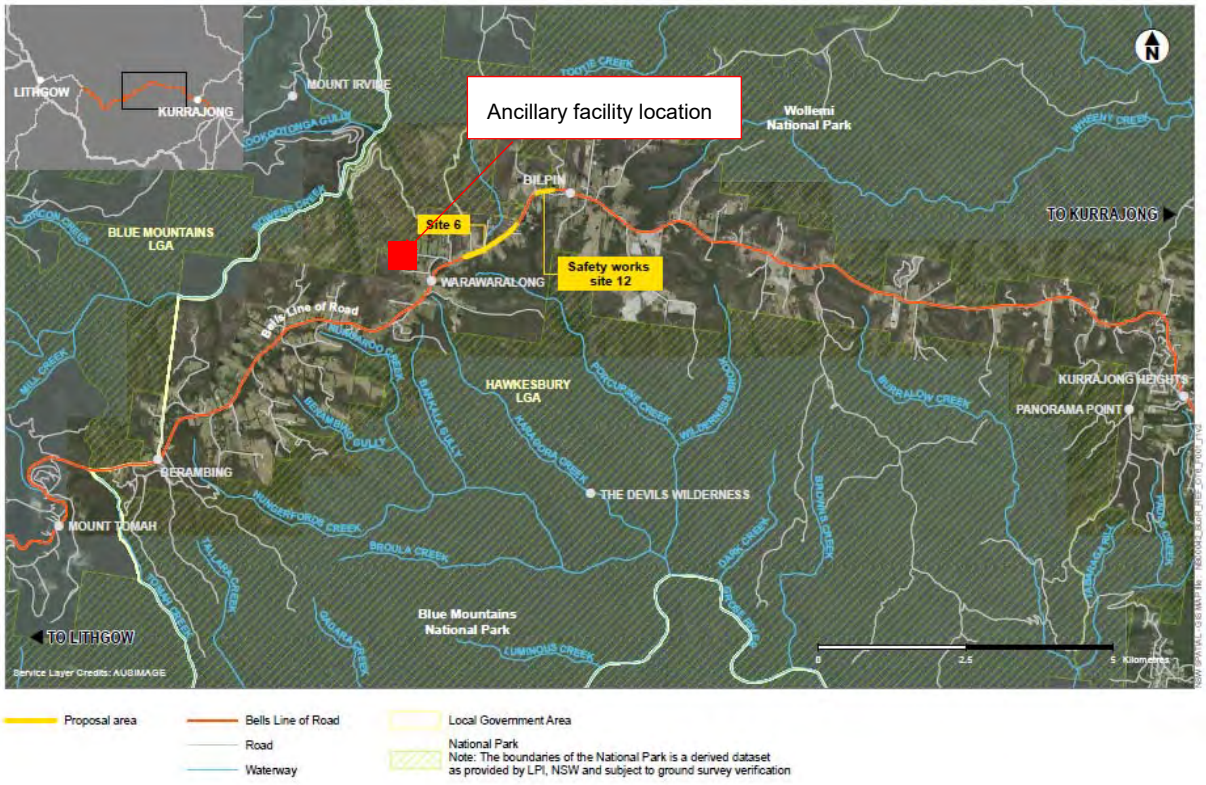


Figure 2-2 Location of ancillary facilities, western limit of OT6 works

Figure 2-3 Ancillary facility location, behind Ramones Service Centre

3 Statutory and Other Requirements

3.1 General Environmental Obligations

All construction personnel working on the Project are required to observe the following general environmental obligations:

- Avoid pollution of land, air and water
- Take all reasonable actions to minimise noise arising from construction activity
- Exhibit good neighbourly behaviour
- Ensure that all equipment is properly maintained
- Preserve the natural and cultural environment
- Stop work immediately and notify DM and the relevant authorities of a discovery of non-Aboriginal or Aboriginal heritage items or places, threated species or environmental incidents
- Participate in all environmental training, toolbox talks and prestart meetings
- Conduct their work in compliance with the approved REF and CEMP

3.2 Legal and other requirements

In accordance with the DM SMC EMP, the following legislation and regulation have been deemed relevant to the Project, however it is noted that there is no requirement for an additional permit, licence or other approval to be issued under any of these legislatives acts.

Table 3-1. Project relevant legislation and regulation

Legislative/regulatory instrument	Summary and relevance to Project
Environment Protection and Biodiversity Conservation Act 1999 (Cwth) (EPBC Act).	This Project on its own does not trigger referral to the Commonwealth as an action under the EPBC Act. However, the broader program of works (Kurrajong Heights to Mount Tomah) has been referred to the Commonwealth Department of the Environment due to the cumulative loss of Turpentine Ironbark Forest of the Sydney Basin Bioregion (vegetation listed as critically endangered under EPBC Act), across the separate overtaking lane proposals across the Bells Line of Road. This CEMP and sub-plans have been developed to address the specific Conditions of Approval (CoA) accompanying the determination made by the Federal environmental department and are summarised in section 8.
Environmental Planning and Assessment Act 1979 (EPA&A Act)	The EP&A Act establishes the system of environmental planning and assessment in NSW. This Project is subject to the environmental impact assessment and planning approval requirements of Part 5 of the EP&A Act. Part 5 of the EP&A Act specifies the environmental impact assessment requirements for activities undertaken by public authorities, such as Roads and Maritime, which do not require development consent under Part 4 of the Act. The Project REF documents the likely impacts of the Project on the environment, details mitigation measures to be implemented and was determined by Roads

	and Maritime to proceed in compliance with Part 5 of the EP&A Act. It was approved on 21 January 2016.
Contaminated Land Management Act 1997 (CLM Act)	Section 60 of the Act imposes a duty to notify the Office of Environment and Heritage (OEH), and potentially investigate and remediate land if contamination is above EPA guideline levels. Consideration of the types and volumes of wastes arising from the construction of the Project indicate that surface and sub surface materials will likely be classified as 'General Solid Waste' (non-putrescible). *DA-ZH-ST068 Fill Material Management* shall apply where construction activity exposes potentially contaminated materials.
Heritage Act 1977 (Heritage Act)	The Heritage Act provides for the conservation of environmental heritage in NSW. There are four local heritage places located within proximity to the proposed work. It is considered unlikely that the project would impact Non-Aboriginal cultural heritage. *DA-ZH-ST076 Heritage Management* shall apply if unexpected finds are uncovered or if the scope of work changes to an extent that may impact on these heritage items or places. This includes the 'stop work' requirement specified in standard safeguards in section 8 of this CEMP.
National Parks and Wildlife Act 1974	The Act requires consent from OEH for the destruction or damage of Indigenous objects. The Project is unlikely to disturb any Indigenous objects, however if unexpected archaeological items or items of Indigenous heritage significance are discovered during the construction of the Project, all works would cease and *DA-ZH-ST076 Heritage Management* shall apply together with the 'stop work' requirement specified in the standard safeguards.
Threatened Species Conservation Act 1995 (TSC Act)	The Threatened Species Conservation Act 1995 (TSC Act) aims to conserve biological diversity by protecting and encouraging the conservation of threatened species, populations and ecological communities and their critical habitats. The TSC Act also lists Key Threatening Processes, which comprise matters that threaten the survival or evolutionary development of a species, population or ecological community. An assessment of the potential impacts of the proposal on threatened species, populations, ecological communities and critical habitat listed on the TSC Act has been carried out in accordance with section 5A of the EP&A Act. *DA-ZH-ST071 Flora and Fauna Management* together with the safeguards outlined in section 8 will apply during the construction of the Project.
Noxious Weeds Act 1993 (NW Act)	The Noxious Weeds Act 1993 (NW Act) provides for the declaration of noxious weeds. Noxious weeds may be considered noxious on a National, state, regional or local scale. All private landowners, occupiers, public authorities and Councils are required to control noxious weeds on their land under Part 3 Division 1 of the NW Act. As such, if present, noxious weeds in the proposal footprint would need to

	be assessed and controlled. Several noxious weed species were identified in the construction impact area. DA-ZH-ST067 Biosecurity Management together with the standard safeguards outlined in section 8 will apply during construction of the Project.
Protection of the Environment Operations Act 1997 (POEO Act)	In accordance with Part 5.7 of the POEO Act, the EPA must be notified of any pollution incidents that occur onsite. *DA-ZH-ST054 Hazardous Chemicals and Dangerous Goods Storage Principles and Transportation* together with the standard safeguards will apply during construction of the Project. DA-ZH-PR006 Incident Reporting and Investigation will apply should any spills deemed pollution incidents occur during the construction of the Project.
Waste Avoidance and Resource Recovery Act 2001	This Act promotes waste avoidance and resource recovery. *DA-ZH-ST063 Waste Management* together with safeguards will apply during construction of the Project.

4 Environmental Management System

The DM SMC EMP acts as the principal environmental management document for all DM SMC works and is fully applicable to this Project. It is not intended for this CEMP to encompass all the DM environmental policies, procedures and processes, but to define the procedures and guidance applicable to this Project.

4.1 Environmental Policy

The Downer Environmental Policy *DI-ZH-PO001 Environmental Policy* outlines the Organisations commitment to compliance with environmental laws, regulations, codes of practice and project requirements. The policy will be displayed at the site office and be communicated to all personnel attending site for the first time and regularly throughout the construction period.

4.1.1 Associated procedures

Note: DM adopts the fully developed and accredited Downer Integrated Management System, which incorporates the EMS. Therefore, the Policies and Procedures associated with this Plan are comprehensive and supported by standards, work instructions, guides etc.

The complete suite of policies, procedures, associated standards, registers, work instructions, guides etc. are held in the IMS and should be used in conjunction with this Plan. The key DM policies and procedures relevant to this Project and CEMP are listed below and can be found in Appendix G.

DownerMouchel policies

- DI-ZH-PO001 Environmental Policy

DownerMouchel procedures and standards

- SMC-CA-WI-307-020 Communication and Stakeholder Engagement Plan
- DA-ZH-FM116.2 Zero Harm Management Supervisor Inspection
- DA-ZH-FM116.10 Zero Harm Observation
- DA-ZH-FM116.9 Environmental Inspection Checklist
- DA-ZH-PR006 Incident Reporting and Investigation
- DA-ZH-ST054 Hazardous Chemicals and Dangerous Goods Storage Principles and Transportation
- DA-ZH-ST063 Waste Management
- DA-ZH-ST064 Soil and Water Management
- DA-ZH-ST068 Fill Material Management
- DA-ZH-ST069 Environmental Noise and Vibration
- DA-ZH-ST070 Air Quality Management
- DA-ZH-ST071 Flora and Fauna Management
- DA-ZH-ST076 Heritage Management
- DA-ZH-ST135 Traffic Management
- DA-ZH-ST067 Biosecurity Management

4.2 Roles and responsibilities

Roles and responsibilities are commensurate with those described in the DM SMC EMP and Zero Harm Management Plan.

Specific roles for the Project are as follows:

- The nominated subcontractor is TBC
- The DM Project Manager (DMPM) is Peter Korovesis
- The DM Site Supervisor (DMSS) is Jim Boylan
- The DM Site Engineer (DMSS) is Michael Nahoum
- The Zero Harm Manager (ZHM) is Graeme Worsley
- The Environmental Manager (EM) and Advisor (EA) are Cameron Weller and Tim Donnan

4.2.1 Project Manager

- Responsible for the implementation and overall compliance to the EMP;
- Ensure environmental risk and improvement is a consistent agenda item at all workgroup meetings for the project;
- Ensure all employees within their area/s of control receive appropriate training to perform their work in a legal and competent manner;
- Ensure environmental responsibilities and accountabilities have been defined and communicated to contractors engaged within their area/s of control;
- Ensuring the Project Risk Register is established, reviewed and maintained;
- Ensuring the Training Needs Analysis is done for all project personnel;
- Provide regular feedback to, and support the environmental commitment of the Supervisor;
- Ensuring appropriate equipment and plant is provided and maintained;
- Regularly monitor environmental performance & compliance;
- Participate as required in consultative forums pertaining to environmental management;
- Being a part of the planning and design stages of trade activities;
- Initiate environmental processes within their area/s of control, including toolbox meetings, inspections, and the identification, assessment and control of risks;
- Promote the reporting of incidents, near misses, hazards, non-conformances, system improvements and customer complaints and ensure corrective actions are implemented in a timely manner;
- Consult HS&E Representatives on workplace changes that have the potential to impact the environment;
- Conduct or review the initial Zero Harm design risk evaluation at project commencement;
- Ensure any identified Hazardous Substances and/or Dangerous Goods are managed;
- Ensure the EMP is reviewed, maintained and any changes communicated to site personnel over the life of the project
- Ensure *DA-ZH-FM007.1 Zero Harm Activity Plan* addressing daily and periodic tasks specific to the project is provided to ensure that periodic activities such as toolbox meetings and other related tasks and checks are undertaken in a timely manner.

4.2.2 Site Supervisor(s)

- Ensure all employees within their area/s of control have appropriate training to perform their work in a legal and competent manner;
- Assisting in preparation of site specific environmental controls;
- Ensure all employees and contractors are aware of the requirements of, and comply with environmental controls applicable to their work;
- Provide regular feedback to, and support the environmental protection practices of their employees;
- Participate as required in consultative forums pertaining to environmental management;
- Being a part of the planning and design stages of trade activities;
- Provide assistance to the Business Manager to ensure the Training Needs Analysis for Project Personnel is done;
- Leading by example and promoting sound Zero Harm practices at every opportunity;
- Monitor the performance of Contractors through the issue and control of Authority To Work Permits (ATWP);
- Ensure that all personnel on site are provided with a site induction and are aware of site hazards, controls and aspects of the Zero Harm Management Plan applicable to their work on site;
- Initiate environmental processes within their area of control;
- Conduct pre-start meetings, toolbox talks, risk assessments and environmental inspections;
- Promote the reporting of incidents, near misses, hazards, non-conformances, system improvements and customer complaints;
- Actively engage in day-to-day environmental discussion with employees under their supervision and control;

4.2.3 Zero Harm Manager

- Provide senior support to the Project Manager and EA to ensure environmental works are carried out in accordance with the EMP, respective Sub Plans and DownerMouchel procedures.
- Provide technical support to DM Management.
- Assist in the investigation of any incidents.
- Consult, as necessary, with Roads and Maritime on environmental matters.
- Provide technical advice and support to the Business Manager in the establishment of environmental objectives, targets and strategies for the project;
- Facilitate the reporting of environmental performance, including trends analysis of lag and lead indicators;
- Provide technical advice and support to Line Management in the identification, assessment and control of environmental risks;
- Providing advice on Zero Harm to all employees;
- Insisting on sound Zero Harm practices at all times;
- Monitor and communicate legislative changes and best practice initiatives to management and employees;
- Advise on project compliance with legislation and the DM Management System;

- Establish and implement internal environmental auditing programs for the project including the development of subsequent action plans to address identified deficiencies;
- Assist the Project manager in the identification, development and implementation of environmental training programs for project employees and management;
- Monitor, facilitate and lead when required the incident reporting and investigation process - including ICAM investigations for serious incidents; and
- Assist in evaluating the effectiveness of the Environmental Management Plan.

4.2.4 Environmental Manager/Advisor

- Providing advice on environmental matters specified within Roads and Maritime G36M and conditions of approval;
- Facilitate with and liaise with the Principal and with all relevant authorities on environmental matters;
- Create and maintain a register of all environmental management documents, approvals and REF's for the Contract;
- Assist management and employees by ensuring that the CEMP is established, implemented and maintained in compliance with Roads and Maritime G36M, including all sub- plans and supplementary method statements, and upgrades to these documents (as needed) to remain current with the progress of the works;
- overall responsibility for the on-site establishment, management, monitoring and maintenance of environmental controls such as erosion and sediment controls;
- Facilitating regular inspections and auditing of all contract works to ensure that environmental safeguards are being adhered to and implemented;
- Monitoring environmental measures and raising non-conformances where set targets are not being met and where improvements can be implemented;
- Preparing reports for management monthly outlining the works undertaken and the achievements that have been met, as well as identifying those areas where improvements were made;
- Facilitating environmental induction and toolbox talks for all site personnel;
- Specific authority to stop work on any activity where deemed necessary to prevent environmental non-conformities;
- Notification of environmental incidents and involvement in investigations.
- Support and monitor the timely close-out of corrective actions within their area of control
- Ensure compliance with the project activity schedule.

4.2.5 Workforce

- Visible commitment to environmental procedure and instruction.
- Participate in all EMP defined induction and instruction.
- Formulation and participation in associated Work Method Statement/Safe Work Method Statement.
- Implement environmental controls as detailed in inductions, Work Method Statements/Safe Work Method Statements, all aspects of this CEMP and all associated Sub Plans, compliance documents, procedures and standards.
- Report environmental incidents and issues to their respective Supervisor or to the Zero Harm Advisor.

- Use equipment provided to reduce environmental hazards or emissions.
- Participate in daily, weekly environmental inspections.
- Contribute to the overall project goal for zero environmental impacts and incidents by making suggestions for improvement where identified.

4.2.6 Contractors

- Comply with all aspects of this EMP and all associated compliance documents, permits, procedures and standards.
- Conduct risk assessments and provide Safe Work Method Statements to DownerMouchel prior to construction.
- Undertake induction as defined by this EMP and comply with project environmental instructions.
- Provide to DownerMouchel details of all Hazardous Substances (contained within Material Safety Data Sheet) proposed for use in Contractor scope.
- Provide other environmental related data to DownerMouchel, including NGER data, waste generation and water consumption.
- Attend site meetings when requested.
- Report, investigate and implement corrective measures arising from associated environmental incidents.
- Attend environmental training and awareness sessions.

4.3 Management of Contractors

DA-ZH-PR022 Visitor and Contractor Management is designed to ensure that Contractors undertake their activities in a manner which meets the expectations of DM's policies and procedures.

Contractor evaluations will be conducted prior to engagement and/or when there is a significant change to scope of work being performed using *DA-ZH-FM022.3 Contractor Evaluation Form* pre-assessment to ensure that the contractor achieves an 'Acceptable' rating or approval which is 'Conditional' on the use of DownerMouchel IMS.

Specifically, contractors of DownerMouchel must register their attendance when entering or leaving the site, notify their DownerMouchel Host or Project Manager before proceeding on to the site; and complete the relevant inductions pursuant to *DA-ZH-PR022 Visitor and Contractor Management.*

All Contractors must obtain evidence of the online induction undertaken and present the induction evidence/receipt to DownerMouchel Manager prior to commencement of work.

DownerMouchel Managers will issue individual Contractors with a Contractor Induction / ID Card, valid for one year from the date of issue.

DownerMouchel will ensure that all Contractors are aware of their environmental responsibilities and comply with the requirements of this CEMP when performing works under the contract. This will be achieved by:

- Including the relevant environmental requirements in the contract documents;
- Requiring the Contractor to develop a (or a series) of Erosion and Sediment Control Plans (ESCPs) for the works and update as required;

- Clearly communicating the subcontractors' responsibilities for ensuring compliance with relevant environmental legislation, approvals, licences and permits;
- Providing adequate environmental induction training;
- Establishing surveillance program to monitor the environmental performance of subcontractors;
- Participation in any risk assessment workshops.

The subcontractors will be made aware of:

- The importance of conformity with the Environmental Policy and the requirements of the CEMP;
- Their roles and responsibilities in achieving conformity with the requirements of this CEMP;
- The potential consequences of departure from the specified procedures and work method statements.

Subcontractors may develop their own CEMP to comply with all relevant requirements from the REF, CEMP and any EWMSs and will be regularly inspected and/or audited against these requirements. The Contractor CEMP will be reviewed and approved by the DM Environmental Manager prior to the commencement of works on the site.

4.4 Training needs identification

The training needs for the Project will be identified in the Project Zero Harm Management Plan.

Having regard to the hazards and risks associated with the work activity, DM will provide training so that all employees are competent to perform all tasks in a way that does not adversely impact on themselves, the environment or the community.

Environmental awareness training will be provided to all personnel involved with the project (including all subcontractors and visitors), through the specific inductions, and will ensure awareness of regulatory, Roads and Maritime, and DM environmental requirements and commitments.

4.4.1 Specialist training

Detailed and task specific training will be provided to key personnel when deemed necessary. Communication and consultation

4.4.2 Training records management

Training assessments, attendance registers and other records will contain information and be managed in a process consistent with the requirements of *DA-ZH-PR003 Training and Competency Management* and *DA-QA-PR009 Records Management*.

Training records will include details on the course, dates, attendees and trainer details.

4.5 Environmental Inductions

All personnel, including subcontractors, are required to attend a compulsory site induction that includes an environmental component prior to commencement on site. The Environmental Manager (or delegate) will conduct the environmental component of the site induction. The environmental component will include an overview of:

- Relevant details of the CEMP including purpose and objectives
- Key environmental issues, i.e. protection of sensitive areas, dust and noise management
- Conditions of environmental licences, permits and approvals
- Specific environmental management requirements and responsibilities
- Mitigation measures for the control of environmental issues
- Incident response and reporting requirements
- Information relating to the location of environmental constraints.

A record of all environment inductions will be maintained and kept on site. The Environmental Manager may authorise amendments to the induction where required to address project modifications, legislative changes or amendments to this CEMP or related documentation.

4.5.1 Toolbox talks and environmental awareness

Toolbox talks or pre-start meetings will be undertaken by the Contractor and/or Site Supervisor and/or Environmental Manager each day and again prior to specific activities being undertaken, and include general and specific discussion of the following key environmental aspects of the Project.

4.6 Communications

4.6.1 Internal Communication

DM is committed to ensure effective communication and consultation is undertaken on a regular basis at all levels of the business. The Project Manager and Supervisor shall ensure this occurs in accordance with *DA-ZH-PR013 Communication and Consultation*. The methods of communication on site will include:

- Pre-Start Meetings;
- Zero Harm Start-up (Pre-Commencement) Toolbox Talk;
- Zero Harm Inductions;
- Noticeboards;
- Toolbox Talks;
- Zero harm Alerts/ Bulletins/ Initiatives;
- DM Project Management Plans;
- Environmental Work Method Statements.

4.6.2 External Communication

Refer also to *SMC-CA-WI-307-020 Communications and Community Engagement Plan* for a more details regarding community engagement.

If a subcontractor is approached by a member of the public or the media in regards to the works, they will provide them with a DM business card and tell them to call the contact centre for any enquiries / complaints.

4.6.3 Liaison with EPA

The following DownerMouchel representatives will be available to be contacted by the EPA on a 24-hour basis and have the authority to take immediate action including shutting down an activity, or to effect any pollution control measure, as directed by an EPA representative.

Name	Role	Contact Details
Igor Karaman	Construction Manager (acting)	0428 463 440
Mudassar Hafeez	Senior Project Engineer	0407 949 866

Roads and Maritime will be notified immediately should a representative of the EPA attend site. A follow- up report will be submitted to Roads and Maritime within 1 working day summarising the following:

- Purpose of the visit;
- Outcome of the visit;
- Actions resulting from the visit; and
- Status of the actions resulting from the visit.

5 Incident Reporting and Investigation

In the event of an incident that may have resulted in a near miss or an impact to the environment or community, DownerMouchel employees and contractors are expected to respond appropriately in accordance with *DA-ZH-PR006 Incident Reporting and Investigation Procedure.*

Incidents that cause or threaten Material Harm to the environment must be externally notified to each relevant authority by DownerMouchel Management immediately in accordance with Part 5.7 of the *Protection of the Environmental Operations Act 1997* (POEO Act). The relevant authorities to be notified are listed in Table 5-1.

Harm to the environment is material if:

- It involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or
- It results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations), and
- Loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.
- For the purposes of Section 5.7 of the POEO Act, it does not matter that harm to the environment is caused only in the premises where the pollution incident occurs.

Table 5-1 List of relevant authorities that need to be notified immediately after an incident causing or threatens to cause material environmental harm.

Contact / organisation	Contact details
Emergency Services* Fire and Rescue NSW NSW Police NSW Ambulance Service	000
***Only ring 000 if the incident presents an immediate threat to human health or property and response by an emergency services agency is warranted. If the incident does not require an initial combat agency, or once the 000 call has been made, notify as listed below**	
EPA	131 555
Council / Other local authority	Hawkesbury Council (02) 4560 4444
Department of Health	02 9391 9000
WorkCover	13 10 50
Fire & Rescue NSW – Operational Communications	1300 729 5791

5.1 DownerMouchel Incident Reporting and Investigation

DownerMouchel have developed an Incident Reporting and Investigation Procedure (DM-OHS-PR-106) to ensure incidents are managed and investigations occur in a systematic manner and that corrective actions are identified and implemented. This reporting and investigations process will also be conducted in accordance with *DA-ZH-PR006 Incident Reporting and Investigation Procedure*.

Where an incident occurs it may have resulted in the activation of the emergency management process, for this reason this procedure should be read in conjunction with *DM-OHS-PR-107 Emergency Management*. Additionally, where there has been a significant injury or fatality this procedure shall also be read in conjunction with *DM-OHS-WI-106-010 Managing Serious Injuries & Fatalities or Dangerous Events* & *DA-ZH-PR151 Crisis Management*.

This procedure applies to all DownerMouchel personnel and subcontractors and consultants procured by them and visitors to DownerMouchel controlled sites.

5.2 Roads and Maritime Incident Reporting and Investigation

DownerMouchel will notify Roads and Maritime verbally as soon as practicable and, in any case in writing within 24 hours, of any incident that has been reported to the EPA under Part 5.7 of the POEO Act.

All other incidents will be reported to Roads and Maritime verbally as soon as practicable and, in any case, in writing within 24 hours of the incident occurring and coming to your attention, including lessons learnt from each environmental incident. All efforts must be undertaken immediately to avoid and reduce impacts of the incident and suitable controls put in place.

All environmental incidents, including 'pollution incidents'; will be managed and reported in accordance with the *Roads and Maritime Environmental Incident Classification and Reporting Procedure and Roads and Maritime Environmental Incident Report*.

6 Evaluation and performance

6.1 Monitoring / inspections

DM will undertake regular site environmental inspections to assess the adequacy and effectiveness of the environmental mitigation measures as per *DA-ZH-PR116 Zero Harm Inspections and Observations* and *DA-ZH-FM116.9 Environmental Inspection Checklist*. Where required, the subcontractor will provide appropriate resources to undertake these inspections with DM.

Site inspections by Roads and Maritime Regional Environmental Staff (RES) will also be undertaken periodically. DM and the subcontractor where appropriate will provide resources to undertake these inspections with Roads and Maritime.

Environmental inspections are detailed further in Section 13 of the DM SMC EMP.

6.2 Records

The Project will maintain legible records to demonstrate compliance with this CEMP and the requirements of the approved REF. Records will be maintained in accordance with the *DA-QA-RP006 Downer Records Management Procedure* and will include, but not limited to:

- Monitoring/inspection reports
- Internal audit reports
- External audit reports
- Reports of environmental incidents, other environmental nonconformities, complaints, action taken and follow-up action (including complaints register)
- Minutes of meetings
- Induction training records
- Register of Erosion and Sediment Control Plans

These records will be held for at least five years after the date of completion of the Project and will be available to Roads and Maritime staff on request.

6.3 Non-conformance

Environmental non-conformances and corrective actions will be detected through processes such as monitoring, inspections (internal and external), audits (internal and external) and receipt of complaints. Environmental non-conformances and corrective actions will be resolved per *DA-QA-PR005 Corrective and Preventative Action*.

The process for managing environmental non-conformances will be as follows:

- When an environmental non-conformance is detected, the nature of the event will be evaluated by the EM or EA, the effectiveness or need for new/additional controls will be reviewed and strategies identified to prevent recurrence. Corrective actions will be identified and entered into the Corrective Action Register. The register will detail the non-conformance, the corrective and preventative actions proposed and the responsibilities and timing for completion of the actions;
- Where the environmental non-conformance is associated with an inspection, audit or monitoring event, the actions will be linked to the record of that event;
- Where a new non-conformance is raised by Roads and Maritime during a site inspection, or audit, a Nonconformity Notification may be issued.

- Nonconformity Notifications issued by Roads and Maritime will be handled in the same manner as any other non-conformances.
- Once an action is completed, the register will be updated to close the action including input of comments and completion date; and
- The register will be reviewed by the Environmental Team (EM, EA) to ensure actions are being completed in time.

6.3.1 Corrective Action Requests

If surveillance, site inspections or an audit by Roads and Maritime identifies that the CEMP does not comply with the provisions of the contract, or Roads and Maritime identifies a major environmental risk, a Corrective Action Request (CAR) may be issued.

Environmental non-conformances that might trigger a CAR might include:

- Failing to comply with the environmental regulations or license/permit conditions
- A serious breach of Roads and Maritime specification requirements
- Carrying out an unsafe work practice that has the potential to cause harm to the environment (i.e. near misses)
- Activities that have caused actual harm to the environment not permitted by the project, or covered in the environmental assessment documentation
- Deficiencies or concerns raised by client representatives and/or by state and local authorities or agencies

The process for managing a CAR issued by Roads and Maritime will be the same as any non- conformance.

Once the CAR is rectified, the completed CAR is to be returned to Roads and Maritime with seven (7) days after the CAR is issued to DM; and the Corrective Action Register updated to close out the action.

6.4 Incident Action Close Out

In addition to the above, where an issue is of more serious nature, has been identified repeatedly or constitutes a breach of regulatory obligations, the following will apply:

- When required, the work on the identified operation or site will be stopped until remedial action is taken to eliminate the issue;
- An incident report will be completed and incident logged in the incident register;
- The incident report will be forwarded to the Roads and Maritime Program Manager
- The incident will be reported in monthly management reports to Roads and Maritime;
- Where the issue has been identified in an audit, a Non-Compliance Report (NCR) will be used instead of an incident report, where this is considered appropriate by the Auditor.

Tracking of environmental non-conformances and associated corrective actions will be the responsibility of the EM or as delegated by the EM.

7 Environmental Management

7.1 Summary of management measures and mitigation strategies

The following section has been summarised from the approved REF and provides a summary of the environmental management safeguards to be implemented to address the impacts discussed in section 7. References to the SMC EMP may also require implementation of specific DM procedures listed in section 3.3 *Associated Procedures* and made available in Appendix G.

Responsibility Key:

- DM Project Manager (DM PM)
- DM Site Supervisor (DM SS)
- DM Environmental Representative (DM ER)
- DM Communications (DM Comms)
- Contractor – Principle contractor engaged to complete the scope of work

Management measures and mitigation strategies		Responsibility	Timing
1	All environmental safeguards must be incorporated within the following documents: - Project Environmental Management Plan - Detailed design stage - Contract specifications for the proposal - Contractor's Environmental Management Plan	Project manager	Pre-construction
2	A risk assessment must be carried out on the Proposal in accordance with the Roads and Maritime Services Audit Pack and OSD risk assessment procedures to determine an audit and inspection program for the works. The recommendations of the risk assessment are to be implemented. A review of the risk assessment must be undertaken after the initial audit or inspection to evaluate is the level of risk chosen for the project is appropriate. Any works resulting from the proposal and as covered by the REF may be subject to environmental audit(s) and/or inspection(s) at any time during their duration.".	Project manager and Regional environmental staff	Pre-construction and after first audit

3	The environmental contract specifications must be forwarded to the Roads and Maritime Services Senior Environmental Officer for review at least 10 working days prior to the tender stage.	Project manager	Pre-construction
4	The Roads and Maritime Services Project Manager must notify the Roads and Maritime Services Environmental Officer Sydney Region at least 5 days prior to work commencing.	Project manager	Pre-construction
5	All businesses and residences likely to be affected by the proposed works must be notified at least 5 working days prior to the commencement of the proposed activities.	Project manager	Pre-construction
6	Environmental awareness training must be provided, by the contractor, to all field personnel and subcontractors.	Construction contractor	Pre-construction and construction
Biodiversity			
7	A Biodiversity Management Plan (BMP) is to be prepared and included within the CEMP. The BMP is to include (but not be limited to) the following: • A site walk with appropriate site personnel including Roads and Maritime representatives to confirm clearing boundaries and sensitive location prior to commencement of works • Identification (marking) of the clearing boundary and identification (marking) of habitat features to be protected e.g. use of flagging tape • A map which clearly shows vegetation clearing boundaries and sensitive areas/no go zones • A detailed pre-clearing and clearing procedure in accordance with Roads and Maritime Biodiversity Guidelines (2011) including requirements of Guide 1, 2, 4, 5, 6 ,7 & 9 (including pre-clearing surveys to identify habitat trees, identification of suitable site for the release of fauna, two stage clearing process) • Incorporation of management measures identified as a result of the pre-clearing survey report, completed by an ecologist, (G40, section 2.4) and nomination of actions to respond to the recommendations made • Identification in toolbox talks where biodiversity would be included such as vegetation clearing or works in or adjacent to sensitive locations • Identification of control/mitigations measures to prevent impacts on sensitive locations or no go zones • A stop works procedure in the event of incident with any fauna discovered on the project site that require handling or rescue.	Construction Contractor	Pre-construction

	To prevent injury and mortality of fauna during the clearing of vegetation, an experienced and licensed wildlife carer and/or ecologist would be present to supervise vegetation clearing and capture and relocate fauna where required. Fauna handling and vegetation clearing would be carried out in accordance with procedures provided in the Roads and Maritime Biodiversity Guidelines (RTA 2011)		
8	• Wildlife road signage would be installed within the Bells Line of Road corridor within five kilometres of the proposal area. • Opportunities to maintain fauna connectivity across concrete safety barriers during construction (e.g. investigation of concrete barriers with gaps for small fauna movement and jute mesh ladders) would be investigated and considered • Barriers would be located to separate construction works and live traffic. There would be breaks in the barriers to facilitate driveway access. This would limit this risk of fauna being trapped between the barrier and traffic.	Design contractor	
9	• The maximum clearing extent as detailed in the REF cuttings should be identified and marked before construction and exclusion zones established in all retained areas • Access for tree removal would be provided from the road to avoid damage to surrounding vegetation	Construction contractor	Pre-construction and construction
11	• A weed management plan would be implemented as part of the EMP in accordance with Roads and Maritime Biodiversity Guidelines (RTA 2011) and the Introductory Weed Management Manual (Natural Heritage Trust 2004) • The contractor is to prepare and implement a machinery hygiene protocol to ensure that weed seeds and propagules are not spread to other areas. Refer DA-ZH-ST067 Biosecurity Management and Appendix E of the Biodiversity Management Plan (Pest and Disease Management)	Construction contractor	Pre-construction and construction
12	• The recent history of construction vehicles would be investigated and plant would be cleaned in appropriately bunded areas prior to being transferred to site to avoid spreading pathogens. o This cannot be practically achieved, so DM propose to ensure that all equipment is washed down and inspected prior to entry. *DA-ZH-ST067 Biosecurity Management* and *DA-ZH-FM067.1 Hygiene Inspection Form* will be implemented to address this.	Construction contractor	Pre-construction and construction

	• A risk assessment would be undertaken prior to construction to confirm if pathogens are present in the area. If confirmed, a pathogen management plan would be prepared and incorporated into the biodiversity management plan. o This is to be addressed during the pre-clearance assessment survey, with any additional mitigation measures incorporated into the Biodiversity Management Plan • Construction plant would be cleaned prior to arrival on site to reduce the likelihood of transporting pathogens to the proposal area from previous work sites. o *DA-ZH-ST067 Biosecurity Management* and *DA-ZH-FM067.1 Hygiene Inspection Form* will be implemented to address this.		
13	• Stockpiled material would be limited to nominated areas and as shown in the Erosion and Sediment Control Plan and managed in accordance with Roads and Maritime's Stockpile Management Procedures.	Construction contractor	Pre-construction and construction
14	• An offset strategy would be developed in accordance with Guideline for Biodiversity Offset (Roads and Maritime 2011) for the overall loss of State and Commonwealth listed threatened vegetation. The offsets would be coordinated and developed in consultation with Office of Environmental and Heritage and Commonwealth Department of the Environment.	Roads and Maritime Project Manager	Pre-Construction
Noise and Vibration			
15	A Construction Noise and Vibration Management Plan (CNVMP) would be developed during finalisation of the construction methodology and the detailed design phase. The CNVMP would include but not be limited to: • A map indicating the locations of potentially affected properties and residences. • A quantitative noise assessment in accordance with the EPA Interim Construction Noise Guidelines (DECCW, 2009) • Management measures to minimise the potential noise impacts from the quantitative noise assessment and for potential works outside of standard working hours (including implementation of *EPA Interim Construction Noise Guidelines (DECCW, 2009)* • A risk assessment to determine potential risk for discrete work elements/activities likely to affect residents. • A map indicating the locations of likely potential impacts. • A process for assessing the performance of the implemented mitigation measures. • A process for documenting and resolving issues and complaints.	Construction contractor	Pre-construction

	• A construction staging program incorporating a program of noise and vibration monitoring for sensitive receivers • A process for updating the plan when activities affecting construction noise and vibration change. • Equipment selection: Where alternative plant is available, the plant emitting the lowest noise levels is to be selected. Similarly, where an alternative method for undertaking a process or activity would result in reduced noise emissions, this must be considered where practical. • Distance: Throughout each construction activity, stationary plant items are to be located as far from receivers as practical. • Screening: Where activities are in very close proximity to residences for extended periods, the erection of temporary hoarding/screens is to be considered. • Enclosures: Where smaller, stationary plant is located closer to residences low noise equipment or enclosures are to be used. • Engine silencers: Mobile plant and equipment are to be chosen to include exhaust silencers or be suitable for fitting residential class mufflers. • Reversing alarms: Reversing alarms that have a tonal noise character are to be avoided during out of hours' activities. Quacker style or 'smart' reversing alarms are to be used during night time activities. • Where residences are predicted to be in excess of the "Highly Affected" criterion, respite periods should be included in the program of works. • Where out of standard hours' activities are proposed, contact the potentially affected receivers by letter and inform them of the proposed work, days and dates of work and hours involved. The contact would be made at least 5 days before the start of any work. • Where out of standard hours' activities are proposed, noisier works would be completed before midnight.		
16	• Where high impact vibratory rollers are placing adjoining residential structures at risk of damage, a building condition survey would be conducted prior to work commencing. o Refer to section 6.2 of the Construction Noise and Vibration Management Plan for details of recommended minimum offset distances from source to receiver and a brief scoping process to determine the need for monitoring and/or building condition surveys.	Contractor	Pre-construction

	• Vibration emissions would be minimised where possible, this may include the use of appropriate sized machinery and the consideration of alternative equipment and methods, where feasible and reasonable.		
17	Community: • Noise receivers would be notified of the construction work schedule and expected noise levels prior to the commencement of construction. • Where residences are predicted to be in excess of the "Highly Affected" criterion, respite periods should be included in the program of works. o As a guide, high noise and vibration generating activities near receivers should be carried out in continuous blocks that do not exceed 3 hours each, with a minimum respite period of one hour between each block. The duration of each block of work and respite should be flexible to accommodate the usage and amenity at nearby receivers. (CNVG, Roads and Maritime 2016)	Construction contractor	Construction
18	A community liaison phone number and site contact would be provided so that noise and vibration-related complaints can be received and addressed in a timely manner. The number would be available on Roads and Maritime website and on the site compound fencing.	Construction contractor	Construction
19	• Where out of hours' activities are proposed, the procedure for consultation with affected residents as outlines in the Environmental Noise Management Manual should be followed. • All out of hours works would comply with the Roads and Maritime ENMM Practice Note vii – Roadworks outside normal working hours requirements • If Roads and Maritime ENMM Practice Note vii – Roadworks outside normal working hours requirements cannot be achieved, the Roads and Maritime contract manager would be informed and the Noise and Vibration Plan would need to be updated to outline additional site specific noise management measures and additional consultation requirements prior to the out of hours works commencing.	Construction contractor	Construction
Non-Aboriginal heritage			
20	If unexpected heritage item/s, archaeological remains or potential relics are uncovered during the works, all works would stop in the vicinity of the material/find and the Roads and Maritime Standard Management Procedure - Unexpected Archaeological Finds 2012 would be followed.	Roads and Maritime and Construction Contractor	Pre-construction and construction
Aboriginal Heritage			

21	In the event of an unexpected find of an Aboriginal heritage item (or suspected item): • Work will cease in the affected area and Roads and Maritime's Environmental Officer, Sydney Region and Roads and Maritime' Senior Environmental Specialist for Aboriginal Heritage will be contacted on advice on how to proceed. • The Roads and Maritime Standard Management Procedure -Unexpected Archaeological Finds 2012 will be followed.	Construction contractor	Pre-construction and construction
Landscape character and visual amenity			
23	The final revegetation and landscaping design would continue to consider the objectives and principles of the Blue Mountains Framework document (Great Western Highway Urban Design Framework – Blue Mountains Lapstone to Katoomba).	Design Contractor	Detailed design
24	Design of the surface finish of the pre-cast panel should ensure they are integrated with the landscape setting, and consider an appearance that is compatible with existing sections of cut slope along adjoining sections of the Bells Line of Road	Design Contractor	Detailed design
25	Where the proposed works immediately adjoin areas of native forest vegetation, site soil testing and characterisation should be carried out by a NATA accredited subcontractor to determine the potential for adapting, stripping and reusing the topsoil for landscape and revegetation purposes.	Construction contractor	Construction
26	A NATA accredited subcontractor would also assess the potential for a mix of recovered soil and mulch to be used as topsoil for areas of revegetation to promote embankment stabilisation and to control the amelioration of the topsoil mix.	Construction contractor	Construction
27	Revegetation would be carried out where appropriate on all areas disturbed by the proposal, including cut and fill embankments, subject to sight line and clear zone requirements. The appropriateness of revegetation works is to be considered on a site-by-site basis.	Construction contractor	Construction
28	Site compound areas would be located and designed to take account of views from occupied nearby properties and roads and minimise the removal of existing vegetation. These areas should be restored to their original condition at completion of the work.	Construction contractor	Construction
29	Methods to provide screening of ancillary sites from motorists and residents would be implemented. This may include fencing with material attached (for example, shade cloth) or using compound elements such as sheds to screen views.	Construction contractor	Construction
30	Worksite areas would be maintained in a tidy condition, ensuring the works do not present an unsightly view to passing motorists.	Construction contractor	Construction
Traffic and access			

31	Consultation with emergency service authorities would be undertaken during development of the EMP.	Roads and Maritime	Detailed Design
32	A construction traffic management plan would be prepared and implemented in accordance with the *Traffic Control and Worksites*, version 4.0 (Roads and Maritime, June 2010). The construction traffic management plan would enable the safe management of traffic, provide for the safety of construction personnel and minimise impacts on the local community.	Construction contractor	Pre-construction
33	Vehicular property access would be maintained where possible including private property and small businesses. Consultation with property owners would be undertaken prior to any changes to property accesses.	Construction Contractor	Construction
Socio-economic			
34	A communication plan will be prepared and included in the EMP. The communication plan will include: • Requirements to provide details and timing of proposed construction activities to affected residents as well as o Businesses (Ramone's Service Centre, Exclusive Trailers, Timbercrete Products, Bilpin Springs Orchard, Pine Crest Orchard, Bilpin Springs Lodge Bed and Breakfast, Christopher's Cottage, Bilpin Service Centre, AMPOL Service Station, Australia Post Office, Apple Bar o Busways o Bilpin Public School o Hawkesbury and Blue Mountains Councils • Contact name and number for complaints • Procedure to notify adjacent land users for changed conditions during the construction period such as traffic, pedestrian or driveway access The communications plan will be prepared in accordance with G36M requirements and Roads and Maritime Community Engagement and Communications Manual (2012). The communications plan would include a complaint handling procedure and register and maintained for the duration of the proposal. The Community Engagement Plan (CEP) specific to the Bells Line of Road OT6 Project is included as Appendix F.	Construction Contractor	Pre-construction and Construction

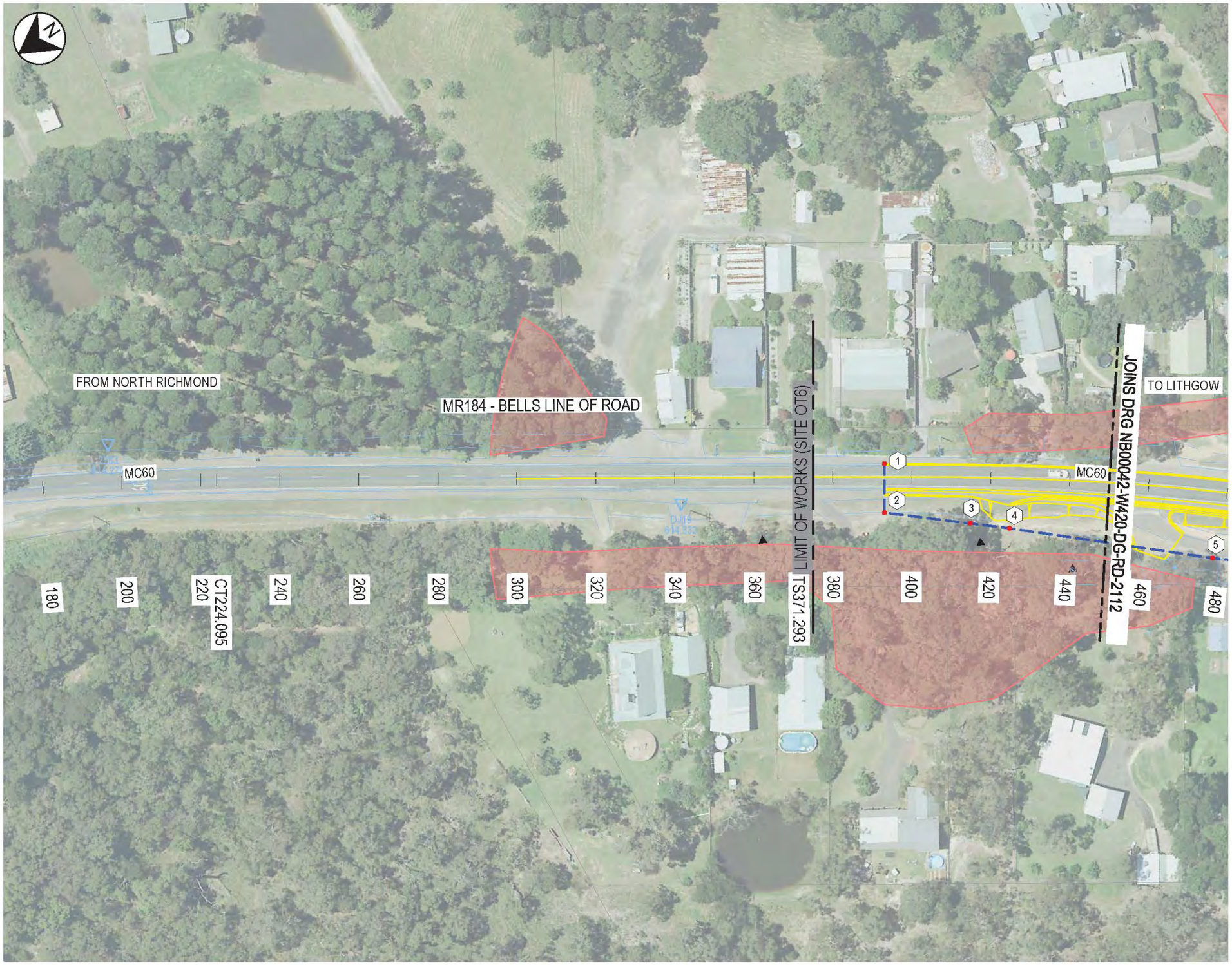
35	Consultation would occur with nearest residential receivers, the property owners and Bilpin Public School prior to the establishment of ancillary sites 1 and 2. • Additional safeguard - consultation would occur with nearest residential receivers and commercial operators (where applicable) for the establishment of the ancillary facility behind Ramone's Service Centre (subject to the approval of the addendum REF)	Construction Contractor	Construction
36	Notification to affected businesses and residents would be required in advance of utility disruptions.	Construction Contractor	Construction
Water quality, hydrology and soils			
37	An Erosion and Sedimentation Control Plan (ESCP) would be prepared prior to construction and is to include as a minimum: o Identify site catchment and sub-catchments, high risk areas and sensitive areas The likely run-off from each sub-catchment Separation of on-site and off-site water The direction of run-off and drainage points during each stage of construction The locations of other erosion and sediment control measures (eg rock check dams, swales and sediment fences) o Controls/measures to be implemented on wet weather events o A mapped plan identifying the above process for reviewing and updating the plan on a fortnightly basis and/or when works alter.	Construction contractor	Construction
38	Erosion and sediment control measures would be implemented and maintained in accordance with Managing Urban Stormwater: Soils and Construction (Landcom 2004) with reference to Roads and Maritime G38 Erosion and Sediment Control Plan prior to the commencement of construction. These measures will address Roads and Maritime Technical Guideline: Temporary Stormwater Drainage for Road Construction, 2011.	Construction contractor	Pre-construction
39	Erosion and sediment control measures are to remain in place until the works are complete or areas have stabilised.	Construction contractor	Construction
40	Emergency spill kits would be kept on site at all times and all staff would be made aware of the location of the spill kit and trained in its use.	Construction Contractor	Construction
41	The vehicles refuelling process will include a person attending the refuelling facility / vehicle and a spill kit on the vehicle.	Construction contractor	Construction

42	Vehicle wash down is to occur in a designated bunded area.	Construction contractor	Construction
43	If a spill or incident occurs, the Roads and Maritime Environmental Incident Classification and Management Procedure are to be followed and the Roads and Maritime Contract Manager notified immediately.	Construction contractor	Construction
44	If unexpected contamination is discovered at any stage of a project, work must stop immediately and the procedures of any sites specific contingency plans should be followed. Environment Branch and relevant agencies should also be contacted immediately in accordance with the Roads and Maritime Environmental Incident Classification and Reporting Procedure. Should any signs of contamination be identified during the proposed works, the materials shall be tested and assessed against the site assessment criteria.	Construction contractor	Construction
Air quality			
45	Air quality management measures would be included as part of the EMP. Relevant measures from Roads and Maritime QA Specification G36M would be applied to ensure that airborne pollutants do not cause undue disruption or inconvenience in the vicinity of the work. • DM Standards *DA-ZH-ST064 Soil and Water Management* together with *DA-ZH-ST070 Air Quality Management* will be applied to the Project, with the aim of avoiding the generation of airborne pollutants from all Project related works	Construction contractor	Construction
Waste management			
46	Waste and resource management measures would be included in the EMP which will include the following (as a minimum): o The type, classification and volume of all materials to be generated and used on site including identification of recyclable and non-recyclable waste in accordance with EPA Waste Classification Guidelines o Quantity and classification of excavated waste material generated as a result of the proposal (Refer Roads and Maritime Waste Management Fact sheets 1-6, 2012) o Strategies for re-use of cut and fill materials on site, where possible o Destinations for each resource/waste type either for on-site reuse or recycling, offsite reuse or recycling, or disposal at a licensed waste facility	Construction contractor	Pre-construction and Construction

	o Procedures and disposal arrangements for unsuitable excavated material or contaminated material o Site clean-up requirements for each construction stage. The standard waste management measures outlined in the DM SMC EMP will apply to the Project including *DA-ZH-ST063 Waste Management.* A waste management register will be maintained by all contractors/sub-contractors and supported by all waste management records, dockets and receipts.		
47	Procurement will endeavour to use materials and products with a recycled content where that material or product is cost and performance effective.	Construction contractor	Detailed design & pre-construction
48	Cleared weed free vegetation will be chipped and reused onsite to stabilise disturbed soils where required, or alternatively disposed of a suitably licensed waste facility To comply with the EPA mulch reuse guideline.	Construction contractor	Construction
49	Types of waste collected, amounts, date/time and details of disposal are to be recorded in a waste register.	Construction contractor	Construction
50	Work sites would be maintained, kept free of rubbish and cleaned up at the end of each working day and in accordance with DA-ZH-ST063 Waste Management, all waste management records, dockets and receipts retained.	Construction contractor	Construction
51	Suitable waste disposal locations would be identified and used to dispose of litter and other wastes on-site. Suitable containers would be provided for waste collection.	Construction contractor	Pre-construction & Construction
Cumulative environmental impacts			
52	The EMP would be updated as required to incorporate potential cumulative impacts from surrounding development activities as they become known. This would include a process to review and update mitigation measures as new work begins or if complaints are received.	Construction contractor	Pre-Construction
53	An offset strategy would be developed in accordance with Guideline for Biodiversity Offset (Roads and Maritime 2011) for the overall loss of State and Commonwealth listed threatened vegetation. The offsets would be coordinated and developed in consultation with Office of Environmental and Heritage and the Commonwealth Department of Environment.	Roads and Maritime Project Manager	Pre-Construction
54	Traffic management would be coordinated through the Transport Management Centre, considering all works on the Bells Line of Road and the Great Western Highway, so as to not cause unacceptable	Roads and Maritime	Construction

	travel delay during the construction period. This would include notification via VMS and the Roads and Maritime Live Traffic Website.		

8 Appendix A – Maps & Plans



LEGEND

GENERAL

- EXISTING CADASTRAL BOUNDARY
- EXISTING FENCE
- SURVEY CONTROL MARK (BL03 492.987)

ALIGNMENT AND EARTHWORKS (REFERENCE ONLY)

- MC60 — CONTROL LINE AND STRING LABEL
- EARTHWORKS & GROUND INTERFACE

CLEARING

- CLEARING LIMIT
- 35 — CLEARING SETOUT LABEL
- CLEARING SETOUT POINT

ENVIRONMENTAL FEATURES

- HABITAT TREE
- BLUE MOUNTAINS SHALE CAP FOREST
- TURPENTINE IRONBARK FOREST

NOTES

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3. CLEARING LIMIT CO-ORDINATES MUST BE VERIFIED ON SITE PRIOR TO CONSTRUCTION TO DETERMINE EXTENT OF TREE CLEARING AND TRIMMING.

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NB00042-W420-DM-RD-DESIGN-OT6_IFC_B.txt

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PROJECT MANAGER	EDA	18.11.16

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SCALE 1:1000 (10 0 10 20) AT A3
CO-ORDINATE SYSTEM: MGA Zone 56 | HEIGHT DATUM: A.H.D.

CLIENT: NSW Government — Transport Roads & Maritime Services
RMS PROJECT No: T/06439

CONTRACTOR: Downermouchel

DESIGNER: JACOBS
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PROJECT
HAWKESBURY CITY COUNCIL
RMS STEWARDSHIP MAINTENANCE CONTRACT - SYDNEY WEST
MR184 - BELLS LINE OF ROAD
IMPROVEMENT PROGRAM - LOT 1 - SITE OT6
CLEARING PLAN
SHEET 1

FOR CONSTRUCTION

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LEGEND

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PROJECT
HAWKESBURY CITY COUNCIL
RMS STEWARDSHIP MAINTENANCE CONTRACT - SYDNEY WEST
MR184 - BELLS LINE OF ROAD
IMPROVEMENT PROGRAM - LOT 1 - SITE OT6
CLEARING PLAN
SHEET 2

FOR CONSTRUCTION

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LEGEND

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- CLEARING SETOUT POINT

ENVIRONMENTAL FEATURES

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IMPROVEMENT PROGRAM - LOT 1 - SITE OT6
CLEARING PLAN
SHEET 3

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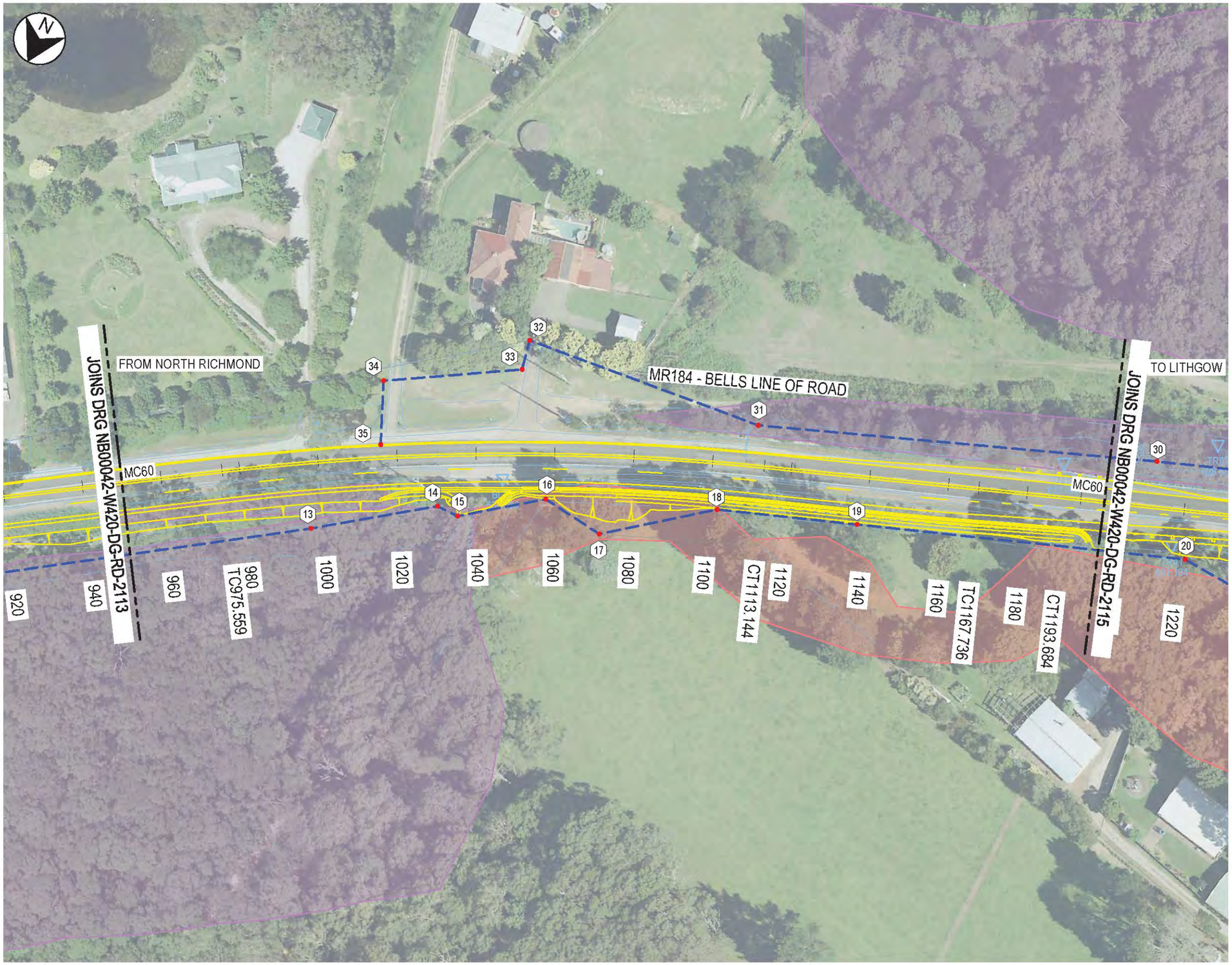

LEGEND

GENERAL

- EXISTING CADASTRAL BOUNDARY
- EXISTING FENCE
- BL03 492.987 — SURVEY CONTROL MARK

ALIGNMENT AND EARTHWORKS (REFERENCE ONLY)

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CLEARING

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- 35 — CLEARING SETOUT LABEL
- CLEARING SETOUT POINT

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- HABITAT TREE
- BLUE MOUNTAINS SHALE CAP FOREST
- TURPENTINE IRONBARK FOREST

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NB00042-W420-DM-RD-DESIGN-OT6_IFC_B.txt

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CO-ORDINATE SYSTEM: MGA Zone 56 | HEIGHT DATUM: A.H.D.

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CONTRACTOR: Downermouchel

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PROJECT
HAWKESBURY CITY COUNCIL
RMS STEWARDSHIP MAINTENANCE CONTRACT - SYDNEY WEST
MR184 - BELLS LINE OF ROAD
IMPROVEMENT PROGRAM - LOT 1 - SITE OT6
CLEARING PLAN
SHEET 4

FOR CONSTRUCTION

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PROJECT MANAGER	EDA	18.11.16

ORIGINAL DRAWING AT A3 SIZE
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PROJECT
HAWKESBURY CITY COUNCIL
RMS STEWARDSHIP MAINTENANCE CONTRACT - SYDNEY WEST
MR184 - BELLS LINE OF ROAD
IMPROVEMENT PROGRAM - LOT 1 - SITE OT6
CLEARING PLAN
SHEET 5

FOR CONSTRUCTION

PHASE	RMS REGISTRATION No	
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9 Appendix B – Biodiversity Management Plan

Stewardship Maintenance Contract
Sydney West Zone

Biodiversity Management Plan

Bells Line of Road – Overtaking Lane 6
February 2017

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Document control

Rev	Date	Author	Revision detail	Reviewed by	Approved by
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1	27/01/17	TD	Final, Minor edits	TA	CW
2	03/02/17	TD	Final, incorporating pre-clearance survey report	RM/TA	TD

Document revision

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A hard copy of this document shall be maintained within the site office for the duration of the project and may be accessed by employees, sub-contractors, Zero Harm Representatives and project personnel. On project completion, the CEMP and associated documents are to be stored with the Project Files.

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0	DM Construction Manager
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1. Introduction

This Biodiversity Management Plan (BMP) forms part of the Construction Environmental Management Plan (CEMP) for the construction a new eastbound Overtaking Lane Site 6 (OT6) on Bells Line of Road to improve traffic efficiency west of Bilpin (the proposal). The proposal is being delivered by DownerMouchel (DM) as part of the Stewardship Maintenance Contract with the Roads and Maritime Services (Roads and Maritime).

A pre-clearance survey of vegetation designated for removal or trimming along a 1.1km section of the Bells Line of Road was conducted (Appendix 1), and included the proposed ancillary facility site the subject of an addendum REF. This is the study area.

Works aligned to the Safety Works (SW) 12 package have been excluded from this management plan.

1.1 Purpose

The purpose of this BMP is to describe how potential impacts associated with biodiversity shall be managed during the construction phase of the project. It has been prepared to meet the requirements of the Federal approval (EPBC 2014/7346, 3 Nov 2015) issued by the Department of the Environment for the combined safety works along Bells Line of Road, between Mount Tomah and Kurrajong Heights NSW.

This Sub-Plan has been developed in accordance with *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (Biodiversity Guidelines).

2. Objectives

The objectives of this plan are to:

1) provide an over-arching methodology to manage and mitigate potential impacts to biodiversity during the construction of OT6;
2) to provide specific guidance on how to manage biodiversity during the completion of OT6;
3) provide a framework that complies with the conditions of the Federal Approval EPBC 2014/7346.

The processes defined within this Sub-Plan shall be implemented by all parties either directly employed by DM or subcontracted and will apply to all activities listed in the SMC. For information regarding objectives and targets, aspects and impacts, legislative requirements, DM training and awareness, communications, monitoring, corrective action, incident management and document control; and how they are applied to the Project, refer to the DownerMouchel SMC EMP.

3. Confirmation of biodiversity features

Biosis (2017) indicated that the pre-clearance assessment largely confirmed the findings of previous vegetation mapping undertaken as part of the Project REF, however has refined the mapping to include areas of exotic grassland not previously mapped.

3.1 Vegetation Communities

The vegetation communities present within the study area are outlined in in table 3-1.

Table 3-1 Summary of vegetation communities present within the study area

Vegetation Community	Conservation Status	Total area (ha)	Area to be removed (ha)
Turpentine-Ironbark Forest of the Sydney Basin Bioregion	EPBC Critically Endangered	0.89	0.53
Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion	TSC Act – Endangered	1.22	0.69
Exotic Trees and Shrubs	n/a	0.18	0.08
Exotic Grassland	n/a	1.9	0.51

A summary of the findings outlined in Biosis (2017) and summarised in table 3-1 is as follows:

- A total of 0.89 hectares of the native vegetation within the study area is consistent with the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act*) listed critically endangered ecological community (CEEC) Turpentine-Ironbark Forest in the Sydney Basin Bioregion (Turpentine-Ironbark Forest CEEC). The vegetation is of moderate to high condition.
- The entire 1.22 hectares of native vegetation within the study area is consistent with the NSW *Threatened Species Conservation Act 1995 (TSC Act)* listed endangered ecological community (EEC) Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion (Blue Mountains Shale Cap Forest EEC). This encompasses the 0.89 hectares of Turpentine-Ironbark Forest CEEC discussed above
- The remaining 0.33 hectares of Blue Mountains Shale Cap Forest EEC (TSC Act only) vegetation occurs in moderate to poor condition and is subject to significant edge effects and does not meet the EPBC Act listing criteria for Turpentine-Ironbark Forest CEEC due to various factors including:
    - absence of one or more structural layers; mid-storey or canopy,
    - absence of Turpentine within the canopy layer,
    - dominance of exotic species within the understorey,
    - less than 10% cover of canopy trees; and
    - patch size under 1 hectare.
- The vegetation community present at the far western end of the study area, and to the west side of the Mount Tootie Road intersection, is consistent with Exotic Trees and Shrubs, and amounts to a total area of 0.18 hectares.
- The remainder of the vegetation within the study area consists of 1.9 hectares of Exotic Grassland primarily occurring along the roadside interface and the area proposed for the site compound and stockpile area.

3.2 Threatened species

One threatened fauna species, Gang-gang Cockatoo *Callocephalon fimbriatum* (Vulnerable, TSC Act) was recorded within the study area during the pre-clearance assessment. No foraging habitat such as Black Sheoak *Allocasuarina littoralis* was recorded within the study area. Moderate quality sheltering habitat was found to be present. Gang-gang Cockatoo are likely to utilise the study area whilst travelling between foraging and breeding habitat as part of their seasonal movements but are considered unlikely to take up permanent residence due to the close proximity to a busy roadway.

No threatened flora species were recorded within the study area during the pre-clearance assessment.

3.3 Habitat tree identification

Hollow-bearing tree identification was conducted according to Roads and Maritime Biodiversity Guidelines (RTA 2011) with stags (standing dead trees) included in the count. A total of 34 hollow-bearing trees were identified within or directly adjacent to the study area, 15 of which are within the clearing limits along OT6. The remaining 19 hollow-bearing trees were rooted outside of the clearing limits but bore overhanging branches which may require trimming as part of the Project.

Biosis (2017) notes that the observer's view from the ground was partially obscured by a number of large canopy trees at the western end of the study area. This may have limited the identification of all hollows in this area and it is possible that hollows exist which have not been observed or recorded.

3.4 Noxious Weeds

Four noxious weed species listed in the Hawkesbury River County Council Local Control Authority area were identified within the study area, these being Blackberry *Rubus fruticosus sp. agg.,* Small-leaved Privet *Ligustrum sinense,* St. Johns Wort *Hypericum perforatum* and Fireweed *Senecio madagascariensis*. Only Fireweed was not previously known within the study area and covered under the Project REF.

3.5 Suitable fauna relocation sites

Fauna found within the study area during vegetation clearing works will be relocated in the adjacent Blue Mountains World Heritage Area (Blue Mountains National Park and Wollemi National Park) which will allow all relocated fauna to remain within their natural home range. Any injured fauna encountered within the study area is to be taken to the closest veterinary hospital for examination and then released to a WIRES Wildlife Carer for fostering and eventual release.

Kurrajong Veterinary Clinic (16 Old Bells Line of Road, Kurrajong, Phone: (02) 5473 1216) has been recommended by Biosis.

4. Summary of impacts

Biosis (2017) summarises the actual and potential impacts arising from the OT6 project as:

- A total of 0.53 hectares of vegetation assessed as both Sydney Turpentine-Ironbark Forest CEEC (EPBC Act) and Blue Mountains Shale Cap Forest EEC (TSC Act) is to be removed subject to EPBC Act Conditional Approval (2014/7346) (Commonwealth of Australia, 3 November 2015) and the Project REF (Roads and Maritime 2015) approved under Part 5 of the NSW EP&A Act.

- A total of 0.69 hectares of vegetation Blue Mountains Shale Cap Forest EEC (TSC Act only), 0.08 hectares of Exotic Trees and Shrubs and 0.51 hectares of Exotic Grassland are expected to be removed in furtherance of the Project.
- 15 hollow-bearing trees will also require removal in pursuance of the Project. The removal of this vegetation inclusive of the 15 hollow-bearing trees has been assessed and approved under the Project REF (Roads and Maritime 2015).
- One threatened species, Gang-gang Cockatoo, was recorded within the study area during the pre-clearance assessment. The Project REF identified areas of foraging and shelter habitat for this species within the larger project area, albeit no foraging habitat and limited sheltering habitat was mapped as occurring within the OT6 clearing limits (Roads and Maritime 2015). An Assessment of Significance has been prepared for the Gang-gang Cockatoo within Appendix F of the Project REF and approved under Part 5 of the EP&A Act.
- Section 4.11.2 of Appendix F of the Project REF has highlighted the potential for introduction of Phytophthora and Myrtle Rust to the study area via construction vehicles and plant. No signs of either Phytophthora or Myrtle Rust were observed within the study area during the pre-clearance assessment. Based on the absence of these pathogens within the study area, the broader recommendations within the Project REF including the search of Government owned websites for the most recent known locations of pathogen contamination are not considered necessary.
- If Phytophthora is identified within the study area over the duration of the Project, the mitigation measures recommended within Section 5.2.7 of Appendix F of the Project REF and the Weed and Pathogen Management sub-Plan in the Project BMP (DownerMouchel 2016b) should be enacted. This includes the installation of exclusion zones with fencing and signage in addition to provision of vehicle and boot wash down facilities to prevent potential for further spread.
- Large areas of dense noxious weed infestation were identified within the study area with the associated topsoil containing a high abundance of noxious weed propagules. It is recommended that all topsoil in the areas identified as containing dense noxious weed populations be removed from site and disposed of at the nearest registered waste facility, rather than be re-used on site.
- Potential worsening of existing weed infestations including noxious weeds and potential introduction of novel weed species. A Pest and disease management protocol has been developed in accordance with recommendations provided in the Project REF and within Appendix E the Project BMP.

5. Management measures and safeguards

The following management measures and safeguards are recommended to address the likely and potential impacts arising from the Project, and incorporate a range of specific measures outlined in Biosis (2017) as a result of the pre-clearance surveying.

5.1 Management measures and safeguards

Management measures and safeguards		Responsibility	Timing
General			
FF01	To the fullest extent practicable, minimise disturbance to any native vegetation surrounding the study area.	DM Site Supervisor	Pre-construction and construction
FF02	Where possible, any trees to be retained should be protected in accordance with Australian Standard AS4970 – 2009 Protection of trees on development sites, during construction, operation and decommissioning of the site compound.	DM Site Supervisor / PM	Construction
FF03	Native vegetation designated for retention should be enclosed within an "environmental exclusion zone" which is either fenced or flagged with accompanying signage over the duration of the Project.	DM Site Supervisor	Pre-construction and construction
FF04	All tree trimming is to be conducted by a suitably qualified and experienced arborist.	DM Site Supervisor	Pre-construction and construction
FF05	Hollow-bearing tree removal is to be conducted under the supervision of an ecologist by qualified arborists using the two-stage process outlined in the Roads and Maritime Biodiversity Guidelines (RTA 2011). Stage 1: All non-habitat vegetation surrounding the marked hollow-bearing trees is to be removed, leaving the hollow-bearing trees to remain standing for a minimum of 24 hours to allow fauna to vacate remaining habitat. Stage 2: Once the minimum time period has lapsed, the hollow-bearing trees to be inspected by an ecologist. If resident fauna is observed, the hollow section is to be lowered with minimal impact to the ground and the animal allowed to move on of its own volition. If injured, the fauna to be taken to	DM Site Supervisor	Pre-construction and construction

	a WIRES carer or appropriate veterinarian for care. All felled habitat trees are to be inspected by an ecologist prior to mulching.		
Training and induction			
FF06	Training will be provided to all personnel (including subcontractors), on flora and fauna requirements from this plan through inductions, tool box/pre-start meetings	DM Site Supervisor	Pre-construction and construction
FF07	Biodiversity management measures are to be included in toolbox talks for works such as clearing or those adjacent to sensitive receivers.	DM Site Supervisor / PM	Construction
FF08	A project ecologist will be appointed prior to the commencement of construction.	DM Environmental Manager	Pre-construction
FF09	Appropriate erosion and sediment control measures should be installed at all sites to avoid sedimentation of receiving water bodies or other indirect impacts to surrounding biodiversity values	DM Environmental Manager	Pre-construction and construction
Actions prior to clearing			
FF10	A surveyor will set out all of the project elements prior to the clearing limit being determined. The clearing limit will be delineated using flagging tape erected by star pickets or similar alternatives that are highly visible.	DM Site Supervisor / subcontractor	Pre-construction
FF11	A map will be developed, which clearly shows vegetation clearing boundaries and sensitive areas/no go zones.	DM Environmental Manager	Pre-construction
FF12	Habitat trees (i.e. hollow-bearing trees) will be identified during pre-clearing assessments and will be clearly marked on-site by an ecologist.	DM Environmental Manager	Pre-construction
FF13	All habitat requiring protection identified in the environmental assessments or approvals within the clearing limits is to be identified and marked on-site by a suitably qualified person.	DM Environmental Manager	Pre-construction

FF14	After all habitats requiring protection are identified at the site, exclusion zones are to be established to protect these areas. Exclusion zones may also be installed around areas which are known to contain weeds, pathogens or pests.	DM Environmental Manager	Pre-construction
FF15	Signage should be erected at all exclusion zones advising persons not to enter and the nature of the exclusion zone; i.e. environmental protection area, weed management area.	DM Site Supervisor	Pre-construction
FF16	A site walk with appropriate site personnel including RMS representatives to confirm clearing boundaries and sensitive location will occur prior to commencement of works.	DM Environmental Manager	Pre-construction
FF17	A pre-clearance checklist/vegetation disturbance permit (**Appendix B**) must be completed and signed by the site Environmental Representative prior to the commencement of clearing activities.	Environmental Manager	Pre-construction
FF18	Management measures identified through the pre-clearance survey are to be incorporated into pre-clearing or clearing activities.	DM Site Supervisor	Pre-construction and construction
FF19	Avoid stockpiling equipment or parking vehicles or plant within the Tree Protection Zone (TPZ) of native canopy trees to be retained within or adjacent to the study area.	PM / Site Supervisor /Subcontractor	Pre-construction and construction
FF20	Stockpiled material would be limited to nominated areas and as shown in the Erosion and Sediment Control Plan and managed in accordance with Roads and Maritime's Stockpile Management Procedures.	DM Site Supervisor	Pre-construction and construction
Actions during clearing			
FF21	During clearing activities, routine inspections are to be completed by the Site Supervisor using the Vegetation clearing (during works) checklist included in **Appendix C**.	DM Site Supervisor	Construction

FF22	To prevent injury and mortality of fauna during the clearing of vegetation, an experienced and licensed wildlife carer and/or ecologist would be present to supervise vegetation clearing and capture and relocate fauna where required. This safeguard would only be implemented during the felling of identified habitat trees.	DM Site Supervisor / PM	Construction
FF23	Ensure that trees are felled away from exclusion zones, if possible. Due to the proximity of the road, this may not be possible in all situations.	Subcontractor	Construction
FF24	Tree removal is to be accessed from the road where possible to avoid damaging surrounding vegetation.	Subcontractor	Construction
Weed and pathogen management			
FF25	The pest and disease plan in **Appendix E** is to be implemented to ensure that weed seeds and propagules are not spread to other areas. *DA-ZH-ST067 Biosecurity Management and DA-ZH-FM067.1 Hygiene Inspection Form* are to implemented by DM site supervisors.	DM Site Supervisor	Pre-construction and construction
FF26	All machinery used for tree trimming is to be cleaned and sterilised before and after use in accordance with Australian Standard AS4373 – 2007 Pruning of amenity trees.	Subcontractor	Pre-construction
FF27	All green waste and topsoil located within identified noxious weed exclusion zones should be removed from site and disposed of at the nearest registered green waste facility.	DM Site Supervisor	Construction
FF28	Mitigation measures recommended within the Weed and Pathogen Management sub-plan in the Project BMP (DownerMouchel 2016b) should be enacted in the event that Phytophthora is identified within the study area over the duration of the Project.	DM Site Supervisor	Pre-construction and construction
FF29	All additional weeds including small infestations of noxious weeds are to be treated in accordance with the methods outlined in the Noxious and Environmental Weed Control Handbook (NSW DPI 2014) and the Weed and Pathogen Management Plan in the Project BMP.	DM Site Supervisor	Pre-construction and construction

FF30	All construction vehicles and plant are to be free of any soil, mud and plant debris adhering to tyres, undercarriage or chassis before entering the study area to prevent introduction of plant pathogens.	DM Site Supervisor	Pre-construction and construction
FF31	In the event that Phytophthora or Myrtle Rust is identified within the study area over the duration of the Project, all workers, vehicles and plant arriving to OT6 will be required to undergo a thorough wash-down procedure. This includes soaking work boots in a footbath containing the disinfectant (Phytoclean) to remove all soil and plant debris before entering or exiting the study area. This is in addition to applying the hygiene procedures outlined in Section 5.2.7 of the Project REF and *Arrive Clean, Leave Clean: Guidelines to help prevent the spread of invasive native plant diseases and weeds threatening our native plants, animals and ecosystems* (Commonwealth of Australia 2015).	DM Site Supervisor	Pre-construction and construction
FF32	The NSW Department of Primary Industries is to be notified in the event that any Myrtaceae species designated for felling, trimming or retention is found to exhibit signs of Myrtle Rust. All areas identified as containing Myrtle Rust are to be established as exclusion zones with fencing and signage. Strict hygiene protocols in accordance with the Arrive Clean, Leave Clean (Commonwealth of Australia 2015) guideline document are to be enacted.	DM Site Supervisor	Pre-construction and construction
FF33	Minimise soil transportation within or out of the study area to reduce the spread of weeds.	DM Site Supervisor	Pre-construction and construction
Interacting with fauna			
FF34	The Project Manager or Project Ecologist is to liaise with the nearest veterinary hospital (Kurrajong Veterinary Clinic (16 Old Bells Line of Road, Kurrajong, Phone: 02 5473 1216) before clearing commences to determine availability to assist with injured native fauna	PM	Pre-construction
FF35	Barriers would be located to separate construction works and live traffic. There would be breaks in the barriers to facilitate driveway access. This would limit this risk of fauna being trapped between the barrier and traffic.	DM Site Supervisor	Pre-construction and construction

FF36	In the unlikely event that unexpected threatened species or native fauna species are identified during the project, works should cease and an ecologist contacted in accordance with Section 5.2.2 of the Project REF and the Fauna Management Procedure in the Project BMP (Appendix F)	All personnel	Pre-construction and construction
Monitoring, inspections and reporting			
FF37	Prior to and during clearing, the checklists in **Appendix B** and **Appendix C** are to be completed.	DM EM / PM	Pre-construction and construction
FF38	Regular environmental inspections will be undertaken to ensure works are in accordance with the mitigation measures outlined in the BMP.	DM EM / PM	Pre-construction and construction

6. Monitoring and inspection

In addition to the requirements outlined in Section 6 of the CEMP, Table 4-1 summarises the monitoring and reporting to be undertaken during pre-construction and construction phases of the project to meet the requirements of this plan.

Table 6-1 BMP monitoring and reporting requirements

Monitoring and reporting requirements	Responsibility
Pre-Construction: • Complete Appendix B: Pre-clearing checklist. • Ensure pre-clearing inspection has been undertaken by an ecologist, and report is provided. • Ensure that vehicle hygiene inspections are conducted on all plant/machinery arriving onsite in accordance with DA-ZH-FM067.1 Hygiene Inspection	Site Supervisor / Project Manager
Construction: • Complete Appendix C: During clearing checklist. Review regularly throughout construction. • Record all road kill on a register, and review locations where road kill occurred and investigate installing mitigation measures to minimise the risk of road kill in that location to re-occur.	Site Supervisor

Appendix A – Extent of vegetation clearing

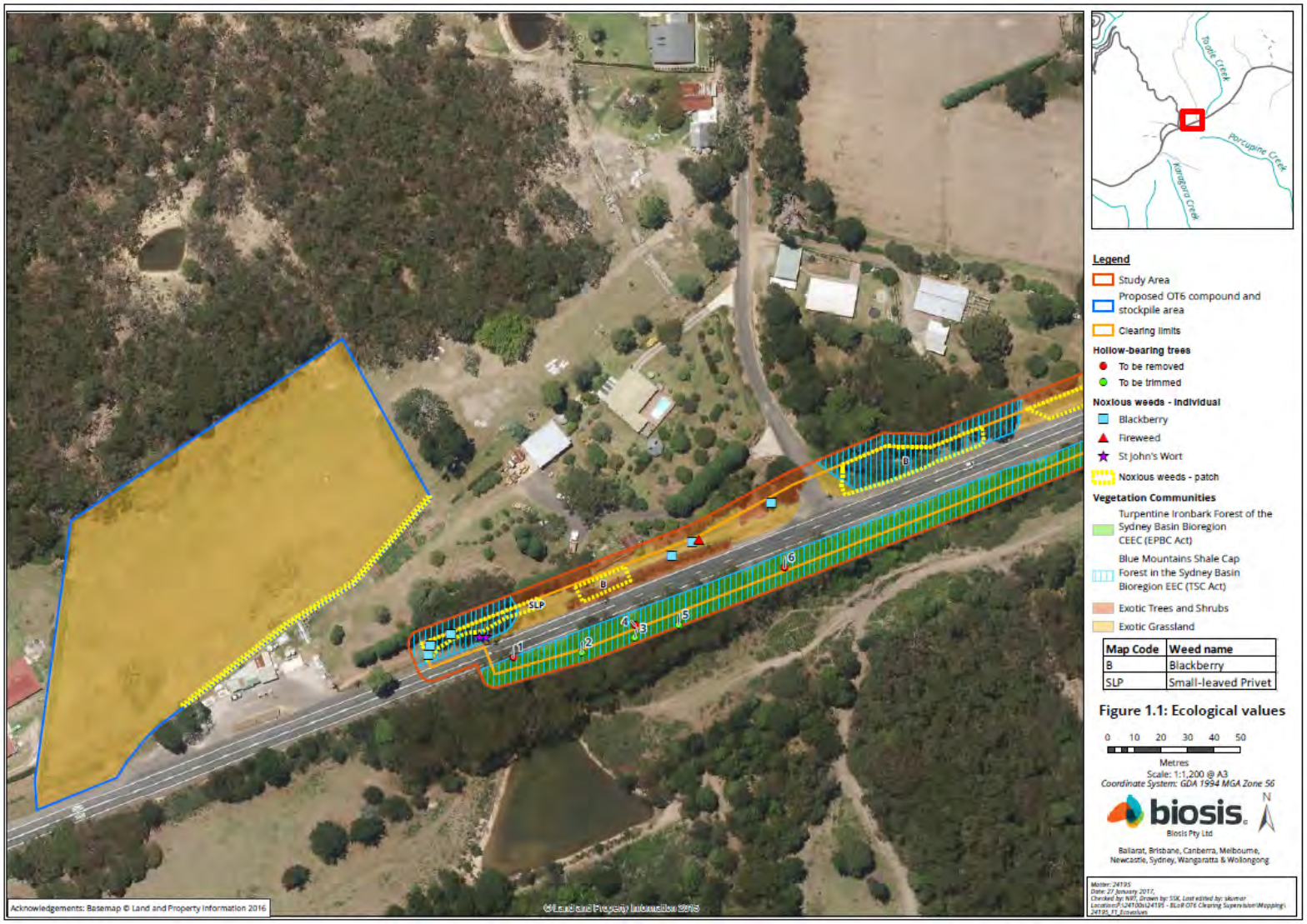

Figure A-1: Ecological values, OT6 Project Site

Figure A-2: Ecological values, OT6 Project Site

Figure A-3: Ecological values, OT6 Project Site

Appendix B – Pre-clearing checklist/ Vegetation Disturbance Permit

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Insert client logo here or delete and merge this table cell with the next.

Vegetation Disturbance Permit

Project Name
Project Document Number & Version: Project Document Number & Version Number

FORM HANDLING INSTRUCTIONS
▪ Use this permit where a hold point for a vegetation disturbance is nominated and agreed to by the project during the project's Planning phase, unless an alternative or equivalent land and vegetation disturbance procedure is mandated by the Client. ▪ For further information on vegetation disturbance, refer to ***DA-ZH-ST149 Vegetation Disturbance***.

SECTION 1 – WORK DETAILS & PERMIT VALIDITY – WORK SUPERVISOR OR SITE ENGINEER					
Date Requested:		Name:			
Project Name:			Map Attached?	☐ Yes	☐ No
Company:					
Permission is requested to disturb the following area:					
Purpose of disturbance?					

SECTION 2 – PERMISSIBILITY – ENVIRONMENT OFFICER OR ZERO HARM OFFICER			
Consideration	**Yes**	**No**	**Comment/ Requirement**
Has the area to be disturbed been inspected?	☐	☐	
Is the disturbance consistent with the project's planning and consent conditions and legislative requirements?	☐	☐	

SECTION 3 – ENVIRONMENTAL ASSESSMENT & CONTROLS – ENVIRONMENT OFFICER OR ZERO HARM OFFICER			
Consideration	**Yes**	**No**	**Comment/ Requirement**
Is an ecological pre-clearance survey required as per planning approvals and/ or permits?	☐	☐	*Include pre-clearance survey reference.*
Are there any specific community/ stakeholder notification procedures that need to be followed?	☐	☐	
Are there any additional requirements from private or crown property owners?	☐	☐	
Is there a requirement for biosecurity/ weed control within the disturbance area? Refer to ***DA-ZH-ST067 Biosecurity Management.***	☐	☐	
Has an erosion and sediment control plan (site advisory sheet) been prepared for the activity? Refer to ***DA-ZH-ST064 Soil and Water Management.***	☐	☐	*Include site advisory sheet reference.*

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SECTION 3 – ENVIRONMENTAL ASSESSMENT & CONTROLS – ENVIRONMENT OFFICER OR ZERO HARM OFFICER, continued			
Consideration	**Yes**	**No**	**Comment/ Requirement**
Are there any avoidance areas that require demarcating? E.g. habitat trees, cultural heritage sites, or threatened species.	☐	☐	*Include site advisory sheet reference.*
Have topsoil/ vegetation/ mulch stockpile locations been identified where necessary? Refer to ***DA-ZH-ST064 Soil and Water Management***.	☐	☐	*Include site advisory sheet reference.*
Are any other environmental controls required to mitigate or guard against associated environmental risks?	☐	☐	

SECTION 4 – PERMIT AUTHORISATION – ENVIRONMENT OFFICER OR ZERO HARM OFFICER & WORK SUPERVISOR OR SITE ENGINEER			
Work Supervisor or Site Engineer		**Environment Officer or Zero Harm Officer**	
I declare that I have reviewed and understand the: ▪ permit validity (Section 1) ▪ environmental controls (Section 3); and ▪ requirements of standard ***DA-ZH-ST149 Vegetation Disturbance***.		I declare that I have: ▪ reviewed the scope of work with the Work Supervisor/ Site Engineer ▪ completed an assessment of permissibility (Section 2) ▪ am satisfied that appropriate environmental controls are documented (Section 3); and ▪ reviewed and understand the requirements of standard ***DA-ZH-ST149 Vegetation Disturbance***.	
Name:		Name:	
Signature:		Signature:	
Date:		Date:	

SECTION 5 – PRE-START CHECKLIST – WORK SUPERVISOR OR SITE ENGINEER		
	Yes	**N/A**
Where required in Section 3, boundary pegging and flagging has been inspected, is in accordance with the Vegetation Disturbance Standard, and is clearly visible.	☐	☐
Where required in Section 3, all avoidance areas (if any) are demarcated.	☐	☐
A physical walk around of the disturbance area has been conducted with each operator/ worker (and spotter, if required).	☐	☐
A pre-start meeting has been completed with all personnel involved in the activity, and all personnel have signed the relevant SWMS that adequately addresses environmental risks.	☐	☐
All personnel supervising the works have a copy of this permit, and the relevant site map(s) indicating environmentally sensitive areas, at all times.	☐	☐
Where required in Section 3, an ecological pre-clearance survey has been carried out.	☐	☐

SECTION 6 – AUTHORISATION TO COMMENCE WORK – WORK SUPERVISOR OR SITE ENGINEER			
Name:			
Signature:		Date:	

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Appendix C – During clearing checklist

Biodiversity Management Plan

Vegetation clearing (during works) checklist

Project No. / Name:	
Project Location:	
Date:	
Checklist completed by:	

ID	Action/requirement	Status	Corrective actions (if status non-compliant)
1	Exclusion zone fencing and signage, and environmental controls (e.g. erosion control measures) are in good working order and remain fit for purpose		
2	All plant/equipment is being cleaned and disinfected prior to entering and leaving site		
3	Clearing limits remain clearly visible and are being adhered to		
4	Pre-clearance ecological surveys are being undertaken as required		
5	Where possible, equipment and materials are being set and stored away from tree protection zones		
6	Mulch, topsoil and other materials are being stockpiled separately and stockpile heights are being limited to 2 m		
7	Cleared weeds are being stockpiled separately and lawfully disposed of		
8	A suitably qualified person is present when necessary to supervise clearing works and relocate or rescue fauna as required.		
9	A register of fauna encountered during the works is being kept and is up to date		
10	All hollow-bearing trees required to be cleared are being inspected by a suitably qualified person prior to being felled.		
10	Hollow-bearing trees required to be cleared are felled in a controlled manner by lowering them to the ground.		
11	Hollow-bearing trees are to be left for a period of at least 24 hours after being felled, before being moved.		
12	Site run-off water is not being re-used on-site.		

Appendix D – Identification of Tree Protection Zone

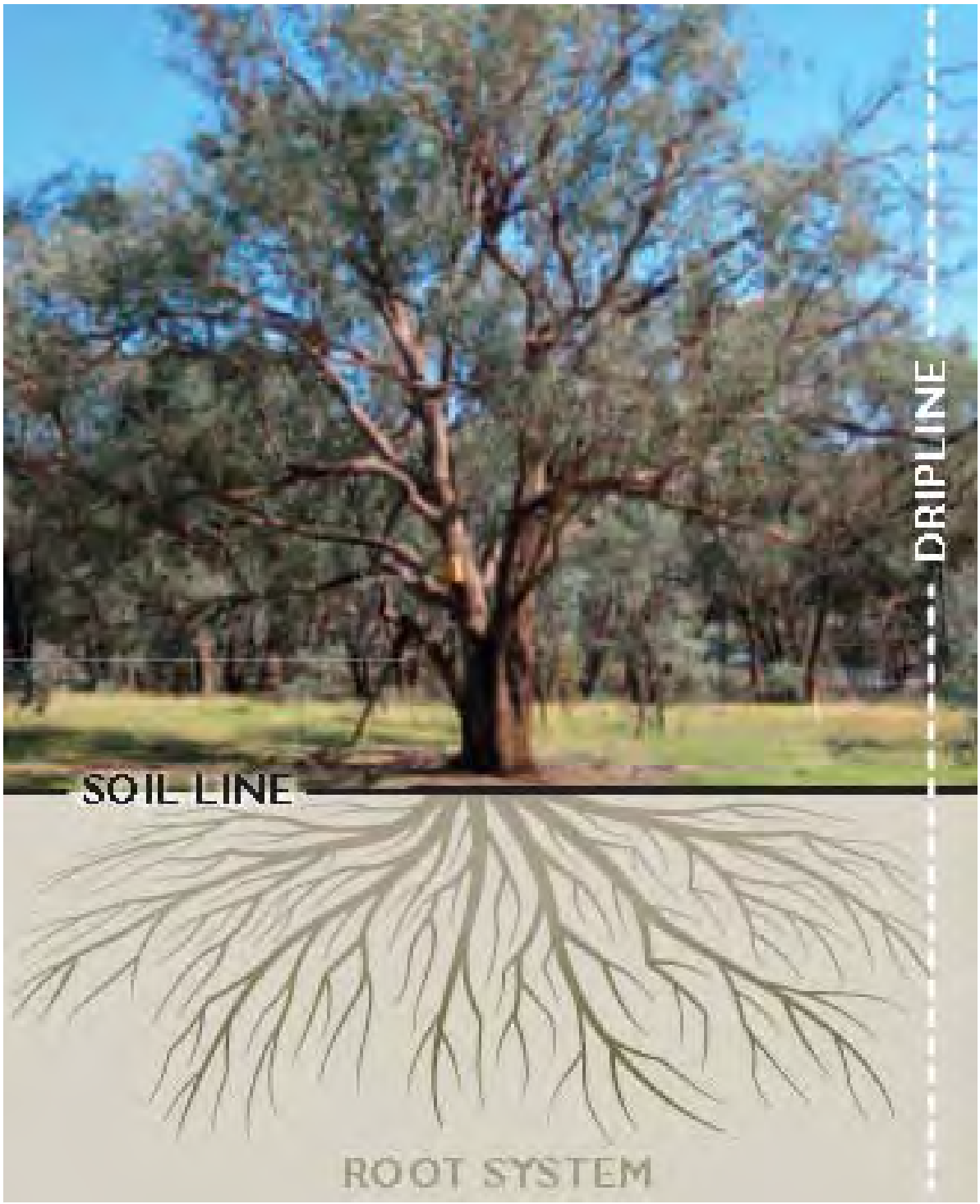

Figure D1 - TPZ and dripline, (Source: Biodiversity Guidelines)

Appendix E – Pest and disease management

Introduction

Under Section 13 of the *Noxious Weeds Act 1993* (NW Act), Roads and Maritime, as a public authority, is obliged to control noxious weeds on land that it owns and prevent noxious weeds from spreading to adjoining properties.

Weed Identification

Weeds on the site were surveyed by an ecologist as part of the Project REF, and confirmed during the pre-clearance survey (appendix A).

Four noxious weed species listed in the Hawkesbury River County Council Local Control Authority area were identified within the study area, these being Blackberry *Rubus fruticosus sp. agg.*, Small-leaved Privet *Ligustrum sinense*, St John's Wort *Hypericum perforatum* and Fireweed *Senecio madagascariensis*. These noxious weed species will require management to suppress the population and prevent further spread. Blackberry, St John's Wort and Small–leaved Privet are already known within the project area and are covered under the current REF, whereas Fireweed is an addition to the project area.

Relevant documents

- DA-ZH-ST067 Biosecurity Management
- DA-ZH-FM067.1 Hygiene Inspection

Weeds

The following measures are to be implemented during construction and maintenance works to manage potential biodiversity impacts arising from weeds:

- Weed infestations located within the Project site have been identified, mapped (Appendix 1) and clearly identified on the ground with flagging to ensure they are easily identifiable by the clearing and earthworks contractor.
- All plant and equipment is to be cleaned to remove any debris and materials prior to entering site. This is necessary to minimise the risk of weeds and pathogens being transferred to the site.
- All equipment used to handle weeds is to be cleaned after use.
- Securely cover loads of weed-infested materials, to ensure that it is not inadvertently dispersed to other areas.
- Dispose of all weed-contaminated soils at appropriately licenced waste management facilities.
- Separate weeds from native vegetation, where native vegetation is to be used for mulch. Do not use weeds for mulch.
- All additional weeds including small infestations of noxious weeds are to be treated in accordance with the methods outlined in the Noxious and Environmental Weed Control Handbook (NSW DPI 2014) and this weed and pathogen management plan.

Pathogens

Pathogens are agents that cause disease in flora and fauna and are usually living microorganisms such as bacterium, virus, or fungus. Pathogens can be spread on footwear, vehicles and machinery. Precautions are necessary to limit the spread of pathogens during construction and maintenance works. Biosis (2017) found that no signs of either Phytophthora or Myrtle Rust were observed within the study area during the pre-clearance assessment. However, the following recommendations have been made to address the potential for plant pathogens, specifically Phytophthora and Myrtle Rust, to be introduced or discovered during the Project:

- All machinery used for tree trimming is to be cleaned and sterilised before and after use in accordance with Australian Standard AS4373 – 2007 Pruning of amenity trees.

- All green waste and topsoil located within identified noxious weed polygons (Appendix 1; Figure 1) should be removed from site and disposed of at the nearest registered green waste facility.
- All additional weeds including small infestations of noxious weeds are to be treated in accordance with the methods outlined in the Noxious and Environmental Weed Control Handbook (NSW DPI 2014) and the Weed and Pathogen Management Plan in the Project BMP.
- All construction vehicles and plant are to be free of any soil, mud and plant debris adhering to tyres, undercarriage or chassis before entering the study area to prevent introduction of plant pathogens.
- In the event that Phytophthora or Myrtle Rust is identified within the study area over the duration of the Project, all workers, vehicles and plant arriving to OT6 will be required to undergo a thorough wash-down procedure. This includes soaking work boots in a footbath containing the disinfectant (Phytoclean) to remove all soil and plant debris before entering or exiting the study area. This is in addition to applying the hygiene procedures outlined in Section 5.2.7 of Appendix F of the Project REF and Arrive Clean, Leave Clean: Guidelines to help prevent the spread of invasive native plant diseases and weeds threatening our native plants, animals and ecosystems (Commonwealth of Australia 2015).
- The NSW Department of Primary Industries is to be notified in the event that any Myrtaceae species designated for felling, trimming or retention is found to exhibit signs of Myrtle Rust. All areas identified as containing Myrtle Rust are to be established as exclusion zones with fencing and signage. Strict hygiene protocols in accordance with the *Arrive Clean, Leave Clean (Commonwealth of Australia 2015) guideline document are to be enacted.*

Appendix F – Fauna Management Procedure

If fauna is encountered during works, it is important that the following management procedure is followed:

- Stop works within the vicinity of the animal;
- If the animal is injured, the Site Supervisor is to contact (Kurrajong Veterinary Clinic, 16 Old Bells Line of Road, Kurrajong, Phone: 02 5473 1216.
- If the animal is unharmed and the works can be postponed, leave the animal to vacate the site on its own accord. If works are unable to be delayed, the Site Supervisor is to contact the licensed fauna ecologist/wildlife carer to safely relocate the animal.
- Works can re-commence once the animal has been collected or relocated.
- The Site supervisor is to keep a record of all fauna rescued and relocated during the works and passed on to the Environmental Manager to record in a register.
- If animals are found dead on the road, record the death in a register. Review the location where the roadkill was found, and investigate installing mitigation measures to minimise the risk of road kill in that location to re-occur.

Appendix G – Pre-clearing Assessment Report for OT6

3 February 2017 (Final Report Version 2)

Cameron Weller
Environmental Scientist
Hutchison Weller
102, 1 Gurrigal Street
Mosman NSW 2088

Dear Cameron,

Re: Pre-clearance assessment for the Bells Line of Road Overtaking Lane Site 6

Project no. 24195

The following correspondence provides a summary of the methods and results of the pre-clearance survey of vegetation designated for removal or trimming along a 1.1 kilometre stretch of Bells Line of Road from 306 metres west of Mount Tootie Road to129 metres north-east of Horsfield Road (the study area) (Appendix 1: Figure 1). The study area also includes 1.30 hectares of private property (part of Lot 3 DP 1001411) proposed for the Bells line of Road Overtaking Lane Site 6 (OT6) compound and stockpile area. This area is currently the subject of an addendum REF under review by NSW Roads and Maritime Service (Roads and Maritime).

The entire study area, including the proposed OT6 compound and stockpile area, equates to 4.02 hectares. This includes 1.22 hectares of native vegetation, 2.08 hectares of exotic trees and shrubs, and 0.99 hectares of hardstand (Bells Line of Road, side roads and driveways).

Vegetation removal is required to enable the construction of a new eastbound overtaking lane and new pavement on the north side of Bells Line of Road as part of the Bells Line of Road OT6 – Mount Tootie Road to Horsfield Road (the Project). In pursuance of the Project, Biosis has been engaged by Hutchison Weller on behalf of DownerMouchel to undertake a pre-clearance survey and supervise clearing works.

This assessment has been undertaken by Biosis (qualified and experienced ecologists), in accordance with the following document and approvals:

- *Bells Line of Road – Overtaking Lane 6 and Safety Works 12 Review of Environmental Factors* (Roads and Maritime 2015).
- *Bells Line of Road Corridor Improvement Program Biodiversity Assessment Report* (Roads and Maritime 2014).
- *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects* (RTA 2011).
- *Stewardship Maintenance Contract – Sydney West Zone- Bells Line of Road, Overtaking Lane Site 6 and Safety Works Site 12 Construction Environmental Management Plan* (CEMP), (DownerMouchel 2016a).
- *Stewardship Maintenance Contract – Sydney West Zone- Bells Line of Road, Overtaking Lane Site 6 and Safety Works Site 12 Biodiversity Management Plan* (BMP), (DownerMouchel 2016b).

- EPBC Act Conditional Approval (2014/7346) (Commonwealth of Australia, 3 November 2015).

Methodology

The pre-clearance survey of vegetation to be removed or trimmed along Bells Line of Road between Mount Tootie Road and Horsfield Road was undertaken on 24 January 2017 by Nicola Trulock (Ecologist) of Biosis accompanied by Tim Donnan (Environmental Advisor) of DownerMouchel.

The pre-clearance survey consisted of the following:

- Verification/identification of vegetation within the study area.
- Verification/identification of weeds or weed infestations and recommendations for management.
- Check for presence of fauna habitat including tree hollows, nests, bushrock and large woody debris.
- Identification and marking of all individual habitat trees within the study area to be removed.
- Identification and marking of any unsound trees within the study area and determination of appropriate management.
- Assessment of potential impacts associated with the Project and determination of optimal mitigation measures.

Findings

Confirmation of biodiversity features

The pre-clearance assessment has largely confirmed the findings of previous vegetation mapping undertaken as part of the Project REF (Roads and Maritime 2015). However, Biosis has refined this mapping to include areas of exotic grassland not previously mapped.

The vegetation communities present within the study area are outlined in Table 1 below.

Table 1 Vegetation communities present within the study area

Vegetation community	Conservation status	Total area (ha)	Are to be removed (ha)
Turpentine-Ironbark Forest of the Sydney Basin Bioregion	EPBC Act - Critically Endangered	0.89	0.53
Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion	TSC Act –Endangered	1.22	0.69
Exotic Trees and Shrubs	n/a	0.18	0.08
Exotic Grassland	n/a	1.9	0.51

A total of 0.89 hectares of the native vegetation within the study area is consistent with the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed critically endangered ecological

community (CEEC) *Turpentine-Ironbark Forest in the Sydney Basin Bioregion* (Turpentine-Ironbark Forest CEEC) This vegetation has been mapped throughout the study area in large patches of moderate to high condition (Appendix 1: Figure 1) comprising of three structural layers; an overstorey of native canopy trees, a midstorey of small trees and large shrubs and an understorey of native grasses, low shrubs, ferns and herbs.

The canopy layer consists of Turpentine *Syncarpia glomulifera*, Sydney Red Gum *Angophora costata*, Blue Mountains Mahogany *Eucalyptus notabilis*, Grey Ironbark *E. paniculata*, Sydney Peppermint *E. piperita*, Monkey Gum *E. cypellocarpa* and Red Bloodwood *Corymbia gummifera*. The midstorey and understorey layers are dominated by native species such as Sweet Pittosporum *Pittosporum undulatum*, Parramatta Wattle *Acacia parramattensis*, Sunshine Wattle *Acacia terminalis*, *Pultenaea scabra*, Elderberry Panax *Polyscias sambucifolia*, Spiny-headed Mat-rush *Lomandra longifolia*, Blue Flax-lily *Dianella Caerulea*, Maidenhair Fern *Adiantum aethiopicum* and Weeping Grass *Microlaena stipoides*.

The entire 1.22 hectares of native vegetation within the study area is consistent with the NSW *Threatened Species Conservation Act 1995* (TSC Act) listed endangered ecological community (EEC) *Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion* (Blue Mountains Shale Cap Forest EEC). This encompasses the 0.89 hectares of Turpentine-Ironbark Forest CEEC (EPBC Act) referred to above.

The remaining 0.33 hectares of Blue Mountains Shale Cap Forest EEC (TSC Act only) vegetation occurs in moderate to poor condition and is subject to significant edge effects. This vegetation comprises of three structural layers an overstorey of canopy trees, a midstorey of small trees and tall shrubs and an understorey of native grasses and herbs. The canopy layer includes White Stringybark *E. globoidea*, Sydney Peppermint, Blue Mountains Mahogany and Turpentine. The midstorey and understorey layers are dominated by native species such as White Dogwood *Ozothamnus diosmifolius*, Parramatta Wattle, Sunshine Wattle, Elderberry Panax, Spiny-headed Mat-rush, Blue Flax-lily, Pomax *Pomax umbellata* and Blady Grass *Imperata cylindrica*.

This Blue Mountains Shale Cap Forest EEC (TSC Act only) vegetation does not meet the EPBC Act listing criteria for Turpentine-Ironbark Forest CEEC due to various factors including absence of one or more structural layers; mid-storey or canopy, absence of Turpentine within the canopy layer, dominance of exotic species within the understorey, less than 10% cover of canopy trees and patch size under 1 hectare.

The vegetation community present at the far western end of the study area, and to the west side of the Mount Tootie Road intersection, is consistent with Exotic Trees and Shrubs, and amounts to a total area of 0.18 hectares (Appendix 1: Figure 1). The Exotic Trees and Shrubs community consists of a canopy layer of planted Radiata Pine *Pinus radiata* over a shrub layer of Cotoneaster *Cotoneaster glaucophyllus*, Domestic Apple *Malus domestica*, Small-leaved Privet *Ligustrum sinense* and Spanish Heath *Erica lusitanica.* The understorey is predominantly comprised of exotic grasses and herbs such as Cocksfoot *Dactylis glomerata*, African Lovegrass *Eragrostis curvula*, Catsear *Hypochaeris radicata*, and Purpletop *Verbena bonariensis*.

The remainder of the vegetation within the study area consists of 1.9 hectares of Exotic Grassland primarily occurring along the roadside interface and the area proposed for the site compound and stockpile area. The Exotic Grassland community consists of one structural layer only, an understorey dominated by exotic grasses and herbs. Species recorded include Cocksfoot, African Lovegrass, Catsear, Spear Thistle *Cirsium vulgare*, Purpletop, Dandelion *Taraxacum officinale*, Self-heal *Prunella vulgaris* and Buffalo Grass *Stenotaphrum secundatum*. Native species are uncommon and sparsely dispersed throughout this community including but were found to include Common Couch *Cynodon dactylon*, Common Rush *Juncus usitatus* and Weeping Grass.

A full list of flora recorded throughout the study area can be found in Appendix 2.

Threatened species

One threatened fauna species, Gang-gang Cockatoo *Callocephalon fimbriatum* (Vulnerable, TSC Act) was recorded within the study area during the pre-clearance assessment. No foraging habitat such as Black Sheoak *Allocasuarina littoralis* was recorded within the study area. Moderate quality sheltering habitat was found to be present. Gang-gang Cockatoo are likely to utilise the study area whilst travelling between foraging and breeding habitat as part of their seasonal movements but are considered unlikely to take up permanent residence due to the close proximity to a busy roadway.

An Assessment of Significance (AoS) under Section 5A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) has been prepared within the Biodiversity Assessment Report (Roads and Maritime 2014) located in Appendix F of the Project REF (Roads and Maritime 2015) which has concluded that significant impact to the Gang-gang Cockatoo is not likely as a result of the Project.

No threatened flora species were recorded within the study area during the pre-clearance assessment.

A list of fauna recorded as utilising the site during the current field assessment can be found in Appendix 3.

Habitat tree identification

Hollow-bearing tree identification was conducted according to Roads and Maritime Biodiversity Guidelines (RTA 2011) with stags (standing dead trees) included in the count. A total of 34 hollow-bearing trees were identified within or directly adjacent to the study area, 15 of which are within the clearing limits along OT6 (Appendix 1: Figure 1 and Appendix 4). The remaining 19 hollow-bearing trees were rooted outside of the clearing limits but bore overhanging branches which may require trimming as part of the Project.

It should be noted that the observer's view from the ground was partially obscured by a number of large canopy trees at the western end of the study area. This may have limited the identification of all hollows in this area and it is possible that hollows exist which have not been observed or recorded.

Additional habitat features

No further habitat features in the form of large woody debris or bushrock were identified within the study area.

Noxious weeds

Four noxious weed species listed in the Hawkesbury River County Council Local Control Authority area were identified within the study area, these being Blackberry *Rubus fruticosus* sp. agg., Small-leaved Privet *Ligustrum sinense*, St. Johns Wort *Hypericum perforatum* and Fireweed *Senecio madagascariensis* (Appendix 1: Figure 1). These noxious weed species will require management to suppress the population and prevent further spread. Blackberry, St John's Wort and Small–leaved Privet are already known within the project area and are covered within the Biodiversity Assessment Report (Roads and Maritime 2014) located in Appendix F of the Project REF (Roads and Maritime 2015), whereas Fireweed is an addition to the project area. Information about this noxious weed is outlined in Table 2.

Table 2 Additional noxious weeds recorded within the study area

Scientific Name	Common Name	Class	Legal Requirements
Senecio madagascariensis	Fireweed	4	*The plant must not be sold, propagated or knowingly distributed*

Suitable fauna relocation sites

Fauna found within the study area during vegetation clearing works will be relocated in the adjacent Blue Mountains World Heritage Area (Blue Mountains National Park and Wollemi National Park) which will allow all relocated fauna to remain within their natural home range. Any injured fauna encountered within the

study area is to be taken to the closest veterinary hospital for examination and then released to a WIRES Wildlife Carer for fostering and eventual release.

Kurrajong Veterinary Clinic (16 Old Bells Line of Road, Kurrajong, Phone: (02) 5473 1216) is recommended.

Impact assessment

The proposed OT6 Overtaking Lane and site compound/stockpile area works involve the following impacts to ecological features:

- Loss of 0.53 hectares of Turpentine-Ironbark Forest CEEC (EPBC Act).
- Loss of 0.69 hectares of Blue Mountains Shale Cap Forest EEC (TSC Act).
- Loss of 0.76 hectares of poor quality Gang-gang Cockatoo sheltering habitat.
- Removal of 15 hollow-bearing trees.
- Potential introduction of pathogens Phytophthora *Phyotophthora cinnamomi* and Myrtle Rust *Uredo rangelii.*
- Potential worsening of existing weed infestations including noxious weeds.
- Potential introduction of novel weed species.

A total of 0.53 hectares of vegetation assessed as both Sydney Turpentine-Ironbark Forest CEEC (EPBC Act) and Blue Mountains Shale Cap Forest EEC (TSC Act) within the Biodiversity Assessment Report (Roads and Maritime 2014) located within Appendix F of the Project REF (Roads and Maritime 2015) is to be removed subject to EPBC Act Conditional Approval (2014/7346) (Commonwealth of Australia, 3 November 2015) and the Project REF (Roads and Maritime 2015) approved under Part 5 of the NSW EP&A Act.

Furthermore, a total of 0.69 hectares of vegetation Blue Mountains Shale Cap Forest EEC (TSC Act only), 0.08 hectares of Exotic Trees and Shrubs and 0.51 hectares of Exotic Grassland are expected to be removed in furtherance of the Project. In addition, 15 hollow-bearing trees will also require removal in pursuance of the Project with the potential for an additional 19 hollow-bearing trees to undergo minor branch trimming. The removal of this vegetation inclusive of the 15 hollow-bearing trees has been assessed within the Biodiversity Assessment Report (Roads and Maritime 2014) located within Appendix F of the Project REF (Roads and Maritime 2015) and approved under the Project REF (Roads and Maritime 2015).

One threatened species, Gang-gang Cockatoo, was recorded within the study area during the pre-clearance assessment. The Biodiversity Assessment Report (Roads and Maritime 2014) located in Appendix F of the Project REF (Roads and Maritime 2015) identified areas of foraging and shelter habitat for this species within the larger project area, albeit no foraging habitat and limited sheltering habitat was mapped as occurring within the OT6 clearing limits (Roads and Maritime 2015). An Assessment of Significance has been prepared for the Gang-gang Cockatoo within Appendix F –Biodiversity Management Plan (Roads and Maritime 2014) of the Project REF (Roads and Maritime 2015) and approved under Part 5 of the EP&A Act.

Section 4.11.2 in the Biodiversity Management Plan (Roads and Maritime 2014) located in Appendix F of the Project REF (Roads and Maritime 2015) has highlighted the potential for introduction of Phytophthora and Myrtle Rust to the study area via construction vehicles and plant. No signs of either Phytophthora or Myrtle Rust were observed within the study area during the pre-clearance assessment. Based on the absence of these pathogens within the study area, the broader recommendations within section 5.2.7 of the Biodiversity Assessment Report (Roads and Maritime 2014) which forms Appendix F of the Project REF (Roads and Maritime 2015) including the *search of Government owned websites for the most recent known locations of pathogen* contamination are not considered necessary.

If Phytophthora is identified within the study area over the duration of the Project, the mitigation measures recommended within Section 5.2.7 of the Biodiversity Assessment Report (Roads and Maritime 2014) which forms Appendix F of the Project REF (Roads and Maritime 2015) and the Weed and Pathogen Management sub-Plan in the Project BMP (DownerMouchel 2016b) should be enacted. This includes the installation of exclusion zones with fencing and signage in addition to provision of vehicle and boot wash down facilities to prevent potential for further spread. Further recommendations regarding plant pathogens based on the findings of the pre-clearance assessment can be found in the recommendations section below.

The Project has the potential to increase the abundance and extent of existing weed infestations including noxious weeds. A Weed and Pathogen Management sub-Plan has been developed in accordance with recommendations provided in the Biodiversity Assessment Report (Roads and Maritime 2014) located in Appendix F of the Project REF (Roads and Maritime 2015) as an attachment within the Project BMP (DownerMouchel 2016b).

Large areas of dense noxious weed infestation were identified within the study area with the associated topsoil containing a high abundance of noxious weed propagules. It is recommended that all topsoil in the areas identified as containing dense noxious weed populations (Appendix 1: Figure 1) be removed from site and disposed of at the nearest registered waste facility, rather than be re-used on site. This is to avoid unintentional spread of noxious weed throughout the study area. Recommendations designed to reduce the spread of weed infestations and prevent the introduction of novel weed species can be found in the recommendations section below.

Recommendations

Given there are requirements for removal of all native vegetation within the clearing limits including canopy trees, the focus of the recommendations is to minimise disturbance to any surrounding retained native vegetation and fauna habitat. These recommendations include:

- To the fullest extent practicable, minimise disturbance to any native vegetation surrounding the study area.
- Where possible, any trees to be retained should be protected in accordance with Australian Standard AS4970 – 2009 Protection of trees on development sites, during construction, operation and decommissioning of the site compound.
- Avoid stockpiling equipment or parking vehicles or plant within the Tree Protection Zone (TPZ) of native canopy trees to be retained within or adjacent to the study area in accordance with management measure FF17 in the Project BMP (DownerMouchel 2016b).
- Native vegetation designated for retention should be enclosed within an "environmental exclusion zone" which is either fenced or flagged with accompanying signage over the duration of the Project.
- The Project Manager or Project Ecologist is to liaise with the nearest veterinary hospital (Kurrajong Veterinary Clinic [16 Old Bells Line of Road, Kurrajong, Phone: 02 5473 1216]) before clearing commences to determine availability to assist with injured native fauna in accordance with management measure FF28.
- In the unlikely event that unexpected threatened species or native fauna species are identified during the project, works should cease and an ecologist contacted in accordance with Section 5.2.2 of the Biodiversity Assessment Report (Roads and Maritime 2014) located in Appendix F of the Project REF (Roads and Maritime 2015), management measures FF22 and FF31 and the Fauna Management Procedure in the Project BMP (DownerMouchel 2016b).
- Minimise soil transportation within or out of the study area to reduce the spread of weeds.

- Four noxious weeds within the Hawkesbury River County Council Local Control Authority area were identified within the study area (Table 2). Measures outlined in the Weed and Pathogen Management Plan should be implemented to minimise the spread of these species. All green waste and topsoil located within identified noxious weed polygons (Appendix 1; Figure 1) should be removed from site and disposed of at the nearest registered green waste facility.
- All additional weeds including small infestations of noxious weeds are to be treated in accordance with the methods outlined in the Noxious and Environmental Weed Control Handbook (NSW DPI 2014) and the Weed and Pathogen Management Plan in the Project BMP (DownerMouchel 2016b).
- All construction vehicles and plant are to be free of any soil, mud and plant debris adhering to tyres, undercarriage or chassis before entering the study area to prevent introduction of plant pathogens.
- In the event that Phytophthora or Myrtle Rust is identified within the study area over the duration of the Project, all workers, vehicles and plant arriving to OT6 will be required to undergo a thorough wash down procedure. This includes soaking work boots in a footbath containing the disinfectant (Phytoclean) to remove all soil and plant debris before entering or exiting the study area. This is in addition to applying the hygiene procedures outlined in Section 5.2.7 of the Biodiversity Assessment Report (Roads and Maritime 2014) located in Appendix F of the Project REF (Roads and Maritime 2015) and the following document:
  - *Arrive Clean, Leave Clean: Guidelines to help prevent the spread of invasive native plant diseases and weeds threatening our native plants, animals and ecosystems* (Commonwealth of Australia 2015).
- All tree trimming is to be conducted by a suitably qualified and experienced arborist. All machinery used for tree trimming is to be cleaned and sterilised before and after use in accordance with Australian Standard AS4373 – 2007 Pruning of amenity trees. All green waste is to be disposed of at the nearest registered green waste facility.
- The NSW Department of Primary Industries is to be notified in the event that any Myrtaceae species designated for felling, trimming or retention is found to exhibit signs of Myrtle Rust. All areas identified as containing Myrtle Rust are to be established as exclusion zones with fencing and signage. Strict hygiene protocols in accordance with the Arrive Clean, Leave Clean (Commonwealth of Australia 2015) guideline document are to be enacted, these include:
  - Immediately on leaving exclusion zone areas personal items such as glasses, mobile phones and wallets are to be disinfected. All outer clothing is to be thoroughly washed after exiting the exclusion area and entering areas of unaffected vegetation (Disposable overalls can be worn and once removed, placed in a sealed plastic bag and discarded after exiting the exclusion zone).
  - All plant material resulting from felling or trimming trees identified with Myrtle Rust are not to be removed from site and instead are to be buried within the exclusion zone. If burial is not feasible, all plant materials are to be double bagged and the outer surface of the bag sprayed with a solution of 70% ethanol or methylated spirits and 30% water before being disposed of at the nearest waste facility (do not dispose of at a green waste facility).
- Appropriate erosion and sediment control measures should be installed at all sites to avoid sedimentation of receiving water bodies or other indirect impacts to surrounding biodiversity values in accordance with management measure FF04 in the Project BMP (DownerMouchel 2016b) and the Erosion and Sediment Control Plan in the Project CEMP (DownerMouchel 2016a).
- Hollow-bearing tree removal is to be conducted under the supervision of an ecologist by qualified arborists using the two stage process outlined in the Roads and Maritime Biodiversity Guidelines (RTA 2011).

- Stage 1: All non-habitat vegetation surrounding the marked hollow-bearing trees is to be removed, leaving the hollow-bearing trees to remain standing for a minimum of 24 hours to allow fauna to vacate remaining habitat.
- Stage 2: Once the minimum time period has lapsed, the hollow-bearing trees to be inspected by an ecologist. If resident fauna is observed, the hollow section is to be lowered with minimal impact to the ground and the animal allowed to move on of its own volition. If injured, the fauna to be taken to a WIRES carer or appropriate veterinarian for care. All felled habitat trees are to be inspected by an ecologist prior to mulching.

Conclusion

This assessment has fulfilled DownerMouchel's obligation to engage an Ecologist to undertake a pre-clearance survey to comply with EPBC Act Conditional Approval (2014/7346) (Commonwealth of Australia, 3 November 2015) in addition to conditions in the following Project documents;

- NSW Roads and Maritime Bells Line of Road – Overtaking Lane 6 and Safety Works 12 Review of Environmental Factors (RMS 2015).
- Roads and Maritime Biodiversity Guidelines (RTA 2011).
- Stewardship Maintenance Contract – Sydney West Zone- Bells Line of Road, Overtaking Lane 6 and Safety Works Site 12 CEMP (DownerMouchel 2016a).
- Stewardship Maintenance Contract – Sydney West Zone- Bells Line of Road, Overtaking Lane 6 and Safety Works Site 12 (DownerMouchel 2016b).

Upon completion of the pre-clearance survey it has been determined that the above mentioned recommendations are to be applied regarding the felling of 15 hollow-bearing trees, potential trimming of 19 native trees, fauna relocation areas, noxious weed treatment and correct disposal of green waste, and use of suitably qualified arborists.

I trust that this advice is of assistance to you however please contact me if you would like to discuss any elements of this ecological advice further.

Yours sincerely,

Nicola Trulock
Botanist
Biosis Pty Ltd
0429 792 906

References

- Commonwealth of Australia 2015. *Arrive Clean, Leave Clean: Guidelines to help prevent the spread of invasive native plant diseases and weeds threatening our native plants, animals and ecosystems*. Australian Government Department of the Environment, Canberra.
- DownerMouchel 2016a. Stewardship Maintenance Contract – Sydney West Zone - Project Construction Environmental Management Plan – Bells Line of Road, Overtaking Lane 6 and Safety Works Site 12. DownerMouchel, Sydney.
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- DPI 2017. Noxious Weed Declarations: Hawkesbury River County Council. Accessed on 24/01/2017 from URL: http://weeds.dpi.nsw.gov.au/WeedDeclarations?RegionId=53
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- Roads and Maritime 2015. *Bells Line of Road – Overtaking Lane 6 and Safety Works 12 – Review of Environmental Factors*. Prepared for Roads and Maritime Services by Jacobs Group Australia.
- Roads and Maritime 2014. *Bells Line of Road Corridor Improvement Program Biodiversity Assessment Report*. Prepared for Roads and Maritime Services by Jacobs Group Australia.
- RTA 2011. Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects. Accessed on 4/02/2016 from URL: http://www.rms.nsw.gov.au/documents/about/environment/biodiversity_guidelines.pdf

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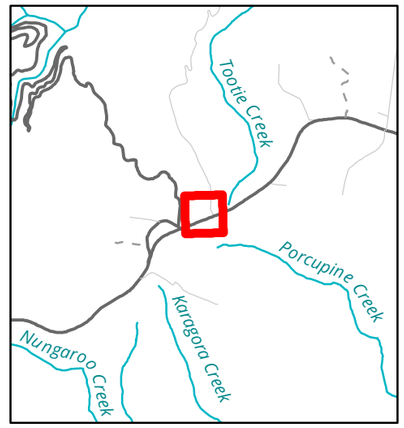
Appendices

Appendix 1 Figure 1



Legend

- Study Area
- Proposed OT6 compound and stockpile area
- Clearing limits

Hollow-bearing trees

- To be removed
- To be trimmed

Noxious weeds - individual

- Blackberry
- Fireweed
- St John's Wort
- Noxious weeds - patch

Vegetation Communities

- Turpentine Ironbark Forest of the Sydney Basin Bioregion CEEC (EPBC Act)
- Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion EEC (TSC Act)
- Exotic Trees and Shrubs
- Exotic Grassland

Map Code	Weed name
B	Blackberry
SLP	Small-leaved Privet

Figure 1.1: Ecological values

0 10 20 30 40 50

Metres

Scale: 1:1,500 @ A3

Coordinate System: GCS GDA 1994

N

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Matter: 24195
Date: 01 February 2017,
Checked by: NRT, Drawn by: SSK, Last edited by: lharley
Location:P:\24100s\24195 - BLoR OT6 Clearing Supervision\Mapping\24195_F1_Ecovalues

Acknowledgements: Basemap © Land and Property Information 2016

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Legend

- Study Area
- Proposed OT6 compound and stockpile area
- Clearing limits

Hollow-bearing trees

- To be removed
- To be trimmed

Noxious weeds - individual

- Blackberry
- Fireweed
- St John's Wort
- Noxious weeds - patch

Vegetation Communities

- Turpentine Ironbark Forest of the Sydney Basin Bioregion CEEC (EPBC Act)
- Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion EEC (TSC Act)
- Exotic Trees and Shrubs
- Exotic Grassland

Map Code	Weed name
B	Blackberry
SLP	Small-leaved Privet

Figure 1.2: Ecological values

0 10 20 30 40 50

Metres

Scale: 1:1,500 @ A3

Coordinate System: GCS GDA 1994

N

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Matter: 24195
Date: 01 February 2017,
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Location:P:\24100s\24195 - BLoR OT6 Clearing Supervision\Mapping\24195_F1_Ecovalues

Acknowledgements: Basemap © Land and Property Information 2016

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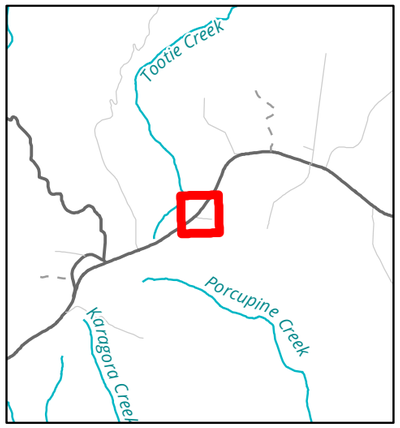

Legend

- Study Area
- Proposed OT6 compound and stockpile area
- Clearing limits

Hollow-bearing trees

- To be removed
- To be trimmed

Noxious weeds - individual

- Blackberry
- Fireweed
- St John's Wort
- Noxious weeds - patch

Vegetation Communities

- Turpentine Ironbark Forest of the Sydney Basin Bioregion CEEC (EPBC Act)
- Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion EEC (TSC Act)
- Exotic Trees and Shrubs
- Exotic Grassland

Map Code	Weed name
B	Blackberry
SLP	Small-leaved Privet

Figure 1.3: Ecological values

0 10 20 30 40 50

Metres

Scale: 1:1,500 @ A3

Coordinate System: GCS GDA 1994

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Location:P:\24100s\24195 - BLoR OT6 Clearing Supervision\Mapping\24195_F1_Ecovalues

Acknowledgements: Basemap © Land and Property Information 2016

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Appendix 2 Flora

Flora species recorded from the study area

Flora species recorded by Biosis, 24/01/2017

Status	Scientific name	Common name
Native species		
	Acacia implexa	Hickory Wattle
	Acacia parramattensis	Parramatta Wattle
	Acacia terminalis	Sunshine Wattle
	Angophora costata	Sydney Red Gum
	Austrostipa rudis	Speargrass
	Billardiera scandens	Hairy Apple Berry
	Bursaria spinosa	Native Blackthorn
	Cissus hypoglauca	Giant Water Vine
	Clematis glycinoides	Headache Vine
	Commelina cyanea	Native Wandering Jew
	Corymbia gummifera	Red Bloodwood
	Cyathea australis	Rough Treefern
	Cynodon dactylon	Common Couch
	Daviesia ulicifolia	Gorse Bitter Pea
	Dianella caerulea	Blue Flax-lily
	Dichondra repens	Kidney Weed
	Echinopogon ovatus	Forest Hedgehog Grass
	Entolasia marginata	Bordered Panic
	Eragrostis leptostachya	Paddock Lovegrass
	Eucalyptus cypellocarpa	Monkey Gum
	Eucalyptus globoidea	White Stringybark
	Eucalyptus notabilis	Mountain Mahogany
	Eucalyptus piperita	Sydney Peppermint
	Eucalyptus racemosa	Narrow-leaved Scribbly Gum
	Geranium solanderi	Native Geranium
	Glycine microphylla	Small-leaf Glycine
	Glycine tabacina	Variable Glycine

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	Goodenia ovata	Hop Goodenia
	Grevillea phylicoides	Grey Spider Flower
	Hakea dactyloides	Finger Hakea
	Hibbertia aspera	Rough Guinea Flower
	Hibbertia dentata	Twining Guinea Flower
	Hydrocotyle peduncularis	A Pennywort
	Imperata cylindrica	Blady Grass
	Indigofera australis	Australian Indigo
	Juncus usitatus	Common Rush
	Kennedia rubicunda	Dusky Coral Pea
	Leptospermum polygalifolium	Tantoon
	Lomandra longifolia	Spiny-headed Mat-rush
	Lomatia silaifolia	Crinkle Bush
	Micrantheum ericoides	-
	Microlaena stipoides	Weeping Grass
	Monotoca scoparia	-
	Myrsine variabilis	-
	Notelaea longifolia	Large Mock-olive
	Oplismenus hirtellus	Basket Grass
	Oxalis perennans	-
	Ozothamnus diosmifolius	White Dogwood
	Parsonsia straminea	Common Silkpod
	Persoonia pinifolia	Pine-leaved Geebung
	Pittosporum undulatum	Sweet Pittosporum
	Polyscias sambucifolia	Elderberry Panax
	Pomax umbellata	Pomax
	Prostanthera rhombea	-
	Pultenaea scabra	-
	Rytidosperma pilosum	Smooth-flowered Wallaby Grass
	Smilax glyciphylla	Sweet Sarsparilla
	Syncarpia glomulifera	Turpentine
	Xerochrysum bracteatum	Golden Everlasting
Exotic species		
	Acer palmatum	Japanese Maple

	Agapanthus praecox subsp. *orientalis*	Agapanthus
	Andropogon virginicus	Whisky Grass
	Axonopus fissifolius	Narrow-leafed Carpet Grass
	Bromus catharticus	Prairie Grass
	Centaurium tenuiflorum	Branched Centaury
	Cirsium vulgare	Spear Thistle
	Cotoneaster glaucophyllus	Cotoneaster
	Cyperus eragrostis	Umbrella Sedge
	Dactylis glomerata	Cocksfoot
	Eragrostis curvula	African Lovegrass
##	*Hypericum perforatum*	St. Johns Wort
	Hypochaeris radicata	Catsear
##	*Ligustrum sinense*	Small-leaved Privet
	Lonicera japonica	Japanese Honeysuckle
	Malus domestica	Apple
	Paspalum dilatatum	Paspalum
	Paspalum urvillei	Vasey Grass
	Passiflora edulis	Common Passionfruit
	Phytolacca octandra	Inkweed
	Pinus radiata	Radiata Pine
	Prunella vulgaris	Self-heal
##	*Rubus fruticosus* sp. agg.	Blackberry complex
##	*Senecio madagascariensis*	Fireweed
	Setaria parviflora	Slender Pigeon Grass
	Sonchus oleraceus	Common Sowthistle
	Stenotaphrum secundatum	Buffalo Grass
	Taraxacum officinale	Dandelion
	Trifolium repens	White Clover
	Verbena bonariensis	Purpletop
	Watsonia meriana cv. bulbillifera	Wild Watsonia

- Noxious species listed within the Hawkesbury River County Council Local Control Authority area.

Appendix 3 Fauna

Fauna species recorded from the study area

Fauna species recorded by Biosis, 24/01/2017

Status	Scientific name	Common name
Birds		
O	*Callocephalon fimbriatum*	Gang-gang Cockatoo
W	*Calyptorhynchus funereus*	Yellow-tailed Black-Cockatoo
O	*Malurus cyaneus*	Superb Fairy-wren
O	*Zosterops lateralis*	Silvereye
Mammals		
F	*Oryctolagus cuniculus*	Rabbit
Reptiles		
O	*Tiliqua scincoides*	Eastern Blue-tongue

O = observed, W = heard call, F = traces.

Appendix 4 Hollow-bearing trees marked in OT6

Hollow bearing trees recorded from the study area

Hollow bearing trees recorded by Biosis, 24/01/2017

Tree ID	Latitude	Longitude	Species	Condition	DBH (cm)	Feature type	Hollow size (cm)	Notes
Hollow-bearing trees to be removed								
1	-33.5068	150.5000	*Eucalyptus cypellocarpa*	Good	145	Hollow	7	Potential hollow, to be checked by an arborist and supervising ecologist before felling.
4	-33.5068	150.5002	*Eucalyptus cypellocarpa*	Good	165	Spout	10	
						Spout	10	
6	-33.5066	150.5011	*Eucalyptus piperita*	Good	85	Spout	5	
8	-33.5055	150.5039	*Angophora costata*	Good	85	Spout	7	
9	-33.5053	150.5040	*Angophora costata*	Good	80	Spout	7	
12	-33.5050	150.5045	*Syncarpia glomulifera*	Good	125	Spout	10	
						Spout	15	
13	-33.5048	150.5048	*Eucalyptus piperita*	Good	55	Hollow	7	
14	-33.5048	150.5049	*Eucalyptus notabilis*	Good	65	Basal hollow	30	
15	-33.5048	150.5050	*Syncarpia glomulifera*	Good	70	Spout	5	
						Spout	7	
16	-33.5053	150.5040	*Angophora costata*	Good	70	Spout	10	

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Tree ID	Latitude	Longitude	Species	Condition	DBH (cm)	Feature type	Hollow size (cm)	Notes
17	-33.5046	150.5052	*Eucalyptus piperita*	Good	85	Spout	7	
						Spout	7	
18	-33.5046	150.5054	*Eucalyptus piperita*	Good	115	Hollow	15	
19	-33.5045	150.5055	*Angophora costata*	Good	120	Spout	5	
						Spout	7	
						Spout	7	
						Spout	7	
						Spout	10	
						Spout	15	
23	-33.5042	150.5061	*Eucalyptus piperita*	Good	150	Spout	15	
						Spout	20	
						Hollow	25	
26	-33.5040	150.5065	*Angophora costata*	Good	85	Spout	12	
Hollow-bearing trees to be trimmed								
2	-33.5068	150.5002	*Eucalyptus cypellocarpa*	Good	165	Spout	5	No hollow-bearing limbs extend over the clearing limits.
						Spout	10	
3	-33.5068	150.5005	*Eucalyptus cypellocarpa*	Good	145	Spout	10	No hollow-bearing limbs extend over the clearing limits.
						Spout	15	
5	-33.5068	150.5006	*Eucalyptus cypellocarpa*	Good	155	Spout	5	No hollow-bearing limbs extend over the clearing limits.
						Spout	5	
						Spout	5	

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Tree ID	Latitude	Longitude	Species	Condition	DBH (cm)	Feature type	Hollow size (cm)	Notes
7	-33.5055	150.5035	*Eucalyptus notabilis*	Good	75	Hollow	5	No hollow-bearing limbs extend over the clearing limits.
10	-33.5052	150.5041	*Eucalyptus notabilis*	Good	40	Hollow	7	No hollow-bearing limbs extend over the clearing limits.
11	-33.5051	150.5042	*Eucalyptus notabilis*	Good	85	Spout	5	No hollow-bearing limbs extend over the clearing limits.
						Spout	7	
						Spout	9	
20	-33.5043	150.5057	*Eucalyptus piperita*	Good	65	Spout	5	No hollow-bearing limbs extend over the clearing limits.
21	-33.5043	150.5057	*Eucalyptus piperita*	Good	60	Spout	7	No hollow-bearing limbs extend over the clearing limits.
22	-33.5042	150.5058	*Corymbia gummifera*	Good	45	Hollow	7	No hollow-bearing limbs extend over the clearing limits.
24	-33.5041	150.5061	*Corymbia gummifera*	Good	95	Spout	5	No hollow-bearing limbs extend over the clearing limits.
25	-33.5040	150.5064	*Eucalyptus piperita*	Good	80	Spout	5	No hollow-bearing limbs extend over the clearing limits.
27	-33.5038	150.5066	*Eucalyptus piperita*	Good	105	Spout	7	No hollow-bearing limbs extend over the clearing limits.
						Spout	7	
28	-33.5038	150.5068	*Corymbia gummifera*	Good	75	Spout	10	No hollow-bearing limbs extend over the clearing limits.
						Spout	10	
29	-33.5038	150.5068	Stag	Dead	45	Hollow	5	No hollow-bearing limbs extend over the clearing limits.
30	-33.5037	150.5069	*Corymbia gummifera*	Good	80	Spout	5	
						Spout	7	

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Tree ID	Latitude	Longitude	Species	Condition	DBH (cm)	Feature type	Hollow size (cm)	Notes
31	150.5071	150.5071	*Corymbia gummifera*	Good	95	Spout	10	No hollow-bearing limbs extend over the clearing limits.
						Spout	12	
						Hollow	7	
32	150.5078	150.5078	*Corymbia gummifera*	Good	45	Hollow	5	No hollow-bearing limbs extend over the clearing limits.
33	-33.5030	150.5080	*Eucalyptus haemastoma*	Good	105	Hollow	10	Planted native. No hollow-bearing limbs extend over the clearing limits.
34	-33.5052	150.5445	*Eucalyptus globoidea*	Good	105	Spout	7	No hollow-bearing limbs extend over the clearing limits.
						Hollow	12	

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10 Appendix C – Noise and Vibration Management Plan

Stewardship Maintenance Contract

Sydney West Zone

Noise and Vibration Management Plan

Bells Line of Road – Overtaking Lane 6

February 2017

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Document control

Rev	Date	Author	Revision detail	Reviewed by	Approved by
A		TD	Issued for Review	CW	CW
B	16/01/17	TD	Issued for Review	RM/TA	CW
0	25/01/17	TD	Final, issued for use	TA	CW
1	03/02/17	TD	Final, incorporating final RMS review	TA	TD
2	15/02/17	TD	Issued for Use	TA/RM	CW

Document revision

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A hard copy of this document shall be maintained within the site office for the duration of the project and may be accessed by employees, sub-contractors, Zero Harm Representatives and project personnel. On project completion, the CEMP and associated documents are to be stored with the Project Files.

Distribution list

Rev No	Issued to
0	Roads and Maritime Project Manager
0	Roads and Maritime Environmental Representative
0	DM Construction Manager
0	DM Project Manager
0	DM Site Supervisor
0	DM Environmental Manager
0	Stakeholder and Community Relations Manager

Abbreviations and definitions

Name / abbreviation	Definition
dBA	Decibels using the A-weighted scale measured according to the frequency of the human ear.
DM	Downer Mouchel
DM SMC EMP	Downer Mouchel Sydney Maintenance Contract Environmental Management Plan
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPP	Environmental Protection Plans
Feasible and reasonable	Consideration of best practice taking into account the benefit of proposed measures and their technological and associated operational application in the NSW and Australian context. Feasible relates to engineering considerations and what is practical to build. Reasonable relates to the application of judgement in arriving at a decision, taking into account mitigation benefits and cost of mitigation versus benefits provided, community views and nature and extent of potential improvements.
ICNG	Interim Construction Noise Guideline, DECC 2009
$L_{Aeq\ (15min)}$	The A-weighted equivalent continuous (energy average) A-weighted sound pressure level of the construction works under consideration over a 15-minute period and excludes other noise sources such as from industry, road, rail and the community.
$L_{A\ (max)}$	The A-weighted maximum noise level only from the construction works under consideration, measured using the fast time weighting on a sound level meter.
PCEMP	Project Construction Environmental Management Plan
PM	Downer Project Manager
RBL	The Rating Background Level for each period is the medium value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period (day, evening and night)
REF	Review of Environmental Factors
RMS	Roads and Maritime Services
SMC	Stewardship Maintenance Contract
SWP	Sound Power Level
SPL	Sound Pressure Level

1. Introduction

This Construction Noise and Vibration Management Plan (NVMP) forms part of the Construction Environmental Management Plan (CEMP) for the construction of a new eastbound overtaking lane on Bells Line of Road to improve traffic efficiency west of Bilpin, and provide a right turn bay into the Bilpin Springs Road and Mount Irvine Road intersection just west of Bilpin (the Project).

Works aligned to the Safety Works (SW) 12 package have been excluded from this management plan.

The purpose of the NVMP is to describe how potential impacts associated with noise and vibration shall be managed during pre-construction, construction, and post-construction activities associated with the project.

Works shall be implemented in accordance with the management measures and mitigation strategies set out within this sub-plan and has been developed in accordance with *Interim Construction Noise Guidelines, 2009* (ICNG).

The processes defined within this Sub-Plan shall be implemented by all parties either directly employed or subcontracted by DM and will apply to all activities listed conducted at the Project site.

For information regarding objectives and targets, aspects and impacts, legislative requirements, DM training and awareness, communications, monitoring, corrective action, incident management and document control; and how they are applied to the Project, refer to the DownerMouchel SMC EMP.

1.1 Objectives

The key objective of the NVMP is to ensure that impacts to the local community and the built environment from noise and vibration are minimised. Specific objectives include:

- Identifying sensitive receivers and ensuring appropriate environmental controls and procedures are implemented during construction activities.
- Minimising potential adverse noise and vibration impacts to the environment and community.
- Managing impacts if they occur through a systematic analysis of mitigation strategies.
- Ensure appropriate measures are implemented to address the relevant safeguards and management measures described in the REF.

1.2 Distribution

This CEMP will be made available to all personnel and subcontractors working onsite and made available on the site notice board. Copies will be distributed to:

- Roads and Maritime Project Managers
- Roads and Maritime Environmental Representatives
- DM Construction Manager
- DM Project Manager
- DM Site Supervisor
- DM Environmental Manager, and
- Stakeholder and Community Relations Manager.

1.1 Revision

Should any process identify any issues or items within the documents that need updating, it will be the responsibility of the Environmental Site Representative prepare the revised documents.

Revised versions of the CEMP will be made available to relevant stakeholders through the distribution process described in Section 1.6.

2. Existing environment

2.1 Sensitive receivers

Receivers within a radius of 300 metres from the proposal area have all been categorised as residential or commercial. Identified sensitive receivers for this project are shown in Figure 2-1. Bilpin Public School is a primary education facility located immediately adjacent the south-eastern extent of SW12. Several other commercial premises are located within proximity of OT6 and SW12 these include:

- Ramones Service Centre
- Exclusive Trailers
- Timbercrete Products
- Bilpin Springs Orchard
- Pine Crest Orchard
- Bilpin Springs Lodge Bed and Breakfast
- Christopher's Cottage
- Bilpin Service Centre
- AMPOL Service Station
- Australia Post Office
- Apple Bar

2.2 Background noise environment

The daily environmental noise measurement profile for the monitoring location is shown in Table 2-1, obtained from unattended noise logging carried out from 9-17 July 2014 at 1 Mount Tootie Road. The rating background level (RBL) in the table is the median of the background noise levels for the site and is used in determining the construction noise management level (NML). The L_{Amax} and L_{Aeq} levels provide additional information on the existing noise environment.

Table 2-1 Summary of monitoring results – environmental noise descriptors (dB(A))

Description	Day			Evening			Night		
	L_{Amax}	L_{Aeq}	RBL	L_{Amax}	L_{Aeq}	RBL	L_{Amax}	L_{Aeq}	RBL
1 Mount Tootie Road	68.6	55.8	36.8	66.4	52.6	24.8	66.8	48.8	21.0

* Where the RBL is less than 30dB(A), the RNP sets the criteria as 30 dB(A) for assessment purposes

Existing noise levels along the proposal are heavily influenced by road traffic noise and fauna influences such as bird song. Background noise levels reduce during the night reflecting the intermittent traffic flows at this time. However, evening and night time traffic movements have a high percentage of heavy vehicles, which tends to maintain LA_{eq} noise levels during these periods.

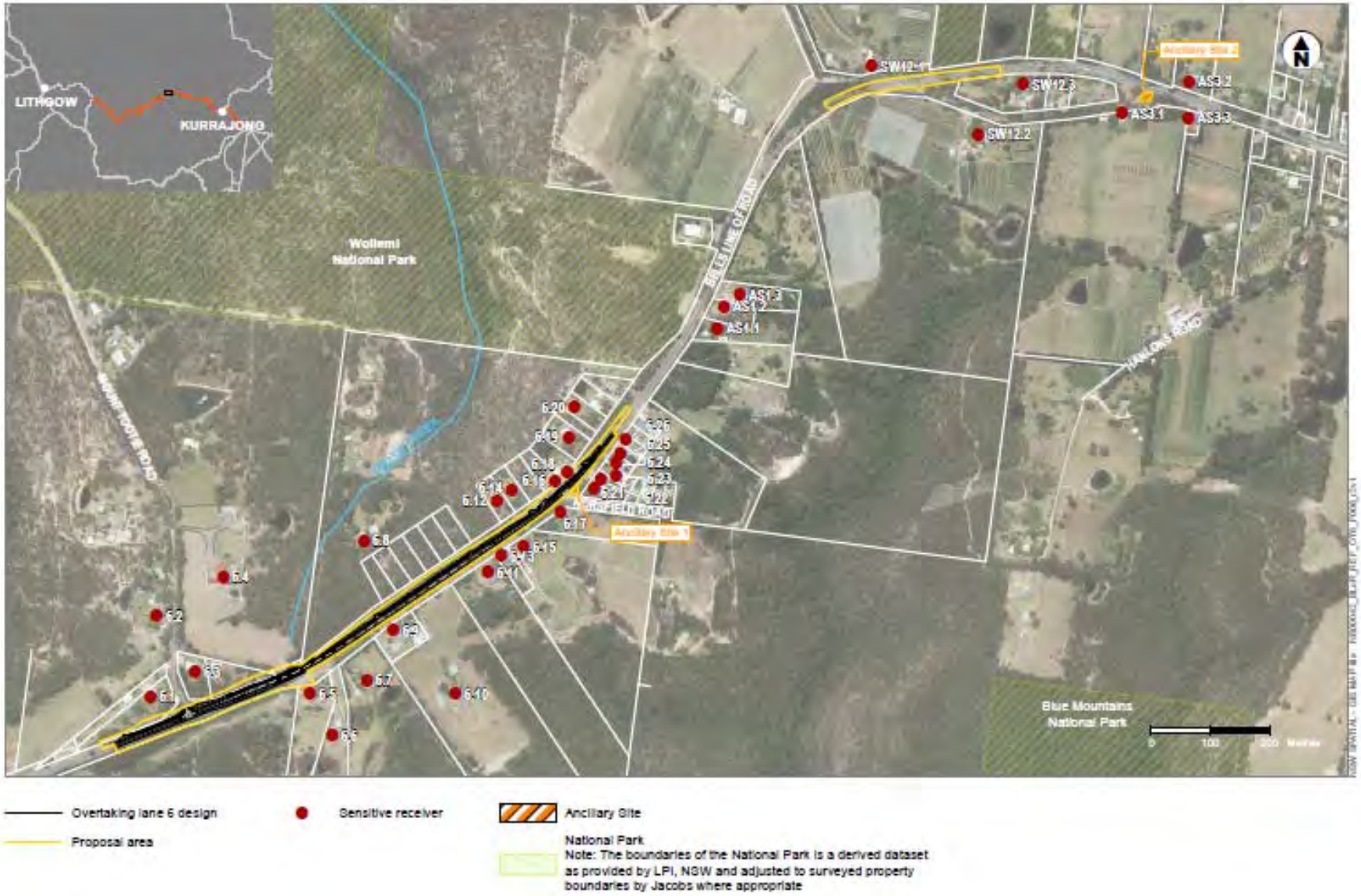


Figure 2-1 Location of sensitive receivers

3. Noise and vibration criteria for NSW

3.1 Construction noise criteria

Construction noise management levels are determined by the NSW 'Interim Construction Noise Guideline' (Table 3-1) (ICNG, DECC 2009).

Table 3-1 Construction Noise Management Level at residential receivers

Time of Day	Management Level	Application
During standard construction hours	Noise affected RBL + 10 dB(A)	The noise affected level represents the point above which there may be some community reaction to noise and: • Where the predicted or measured LAeq (15min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially affected residents of the nature of the works to be carried out, the expected noise levels and duration as well as contact details.
	Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (RMS) may require respite periods by restricting the hours that very noisy activities can occur, taking into account: 1. Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid- morning or mid-afternoon for works near residences). 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times
Outside recommended standard construction hours	Noise affected RBL + 5 dB(A)	A strong justification would typically be required for works outside the recommended standard hours and: • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable work practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community

Source: DECC 2009

In general, these criteria provide that, for residential receivers, the construction noise should not exceed the background by more than 10 dB(A) during standard hours, and by more than 5 dB(A) out of hours (that is, for night-time works). If these levels are exceeded, then receivers are considered noise affected and all reasonable and feasible noise measures should be used to minimise noise. 75dB(A) is the level at which receivers are considered highly noise affected.

3.2 Adopted project NMLs

Construction NMLs were based on the background noise level data collected during the noise monitoring. Due to the nature of the noise environment and the varying distances from the existing road, all receivers within the proposal area have been assigned the same background noise levels for the assessment of construction noise impacts. This approach of grouping receivers into a single noise catchment area is a conservative estimate of noise levels. The NMLs for the proposal are presented in Table 3-2.

Table 3-2 Noise catchment areas and noise management level (dB(A))

Noise catchment areas	Daytime (7am–6pm) NML dB(A)	Evening (6pm–10pm) NML dB(A)	Night-time (10pm–7pm) NML dB(A)
All receivers	47	35	35

3.3 Construction vibration

Potential construction vibration impacts have been assessed based on the equipment types and distance from works. The results are shown in Table 3-3. These predicted levels are based on typical ground conditions and provide an indication of the expected vibration impacts for the works.

Table 3-3 Estimated vibration levels – vertical axis

Activity	Distance from activity (metres)					
	5	10	20	30	40	50
Structural damage (peak particle velocity mm/s)						
High impact vibratory roller	10	6	2.5	1	0.5	0.2
Heavy rock hammer	4.5	3	1.5	0.4	0.35	0.3
Medium rock hammer	0.2	0.06	0.02	0.01	-	-
Human comfort m/s^2						
High impact vibratory roller	8.2	4.9	2.05	0.82	0.4	0.16
Heavy rock hammer	2.9	1.9	1.0	0.3	0.2	0.2
Medium rock hammer	0.1	-	-	-	-	-

4. Impacts and control measures

Common construction and maintenance activities which have potential to cause impacts to noise and vibration if not properly managed include:

- Site establishment;
- Earthworks;
- Road preparation i.e. asphalt milling;
- Laying new asphalt;
- Finishing works and landscaping.

Further to this, works which occur outside of standard construction hours also pose potential impacts to local receivers.

4.1 Construction phases

The proposed activities for the overtaking lane upgrade include road widening, re-grading sections of the alignment, intersection upgrades, asphalting, and line marking. These activities would use a variety of equipment throughout the duration of the works. The typical construction activities and equipment have been summarised in Table 5-1 for individual construction phases.

Table 4-1 Construction activities

Component	Typical activities	Equipment
Pre-construction site establishment		
	• Establishment of temporary fencing • Implementation of initial environmental safeguards • Delineation of clearing boundaries • Establishment of construction ancillary sites (AS) and access • Installation of temporary traffic controls such as safety barriers, signage and line marking in accordance with traffic plan.	Fences, portable sheds, portable, toilets, flatbed truck
Site Preparation		

• Pre-construction identification and marking of sensitive areas as identified in this REF and the EMP • Demarcation of the construction impact area from the design extent, being generally two metres from the base edge of fill batters and four metres from the top edge of cuttings. • Installation of temporary environmental controls including erosion, sediment and water quality controls • Preparation of construction diversion drains • Vegetation clearing • Grubbing • Stripping and stockpiling of topsoil	Trucks, bulldozers, cherry pickers, excavators, backhoes and hand tools
Relocation/protection of services	
• Decommission existing power poles on the northern side • Installation of new concrete power poles and wiring along northern side crossing the road and continuing along the southern side of road between, then crossing the road again to connect back to the existing electrical system • Trimming of vegetation surrounding powerlines, where it is not already cleared as part of the road design. Service and Installation Rules of New South Wales (SIR), August 2012, Clause 3.5.3 – Clearance from Structures, Vegetation and Ground state that: i. Maintain minimum clearance above ground, and from trees, shrubs and structures, when calculating the height of supports required for the service. Minimum clearance depends on: ii. (c) Trees and shrubs. Make adequate allowance for growth and the effect of wind. A minimum clearance of 1.5m is required from bare conductors and 0.5m from insulated conductors. • Relocation of five existing underground Telstra assets between Station 735 and Station 800, a road crossing at Station 890, two drive way crossings at Station 910 and Station 1040, and between Station 1060 and Station 1210 requiring two road crossings to avoid private property on northern side of the road	Backhoes and small equipment
Earthworks	
• Earthwork for new pavement and drainage construction • Removal, stockpiling and management of spoil and unsuitable material within nominated stockpile areas • Based on estimates drawn from the concept design for the proposal, it is predicted that about 10000m3 and 1000m3 of imported fill would be required for OT6 and SW12 respectively • Construction of shotcrete faced retaining walls.	Trucks, bulldozers, excavators, graders, water carts, compactors, rollers, piling drill rig
Drainage	
• Construction of gutters, new and modified table drains including small excavation and grading • Extending or replacing culverts in four locations using pre-cast 450mm reinforced concrete pipe and a precast headwall to the existing cross drainage culvert outlet.	Excavators, trucks, small equipment

Road pavement construction	
• Construction of pavement layers including compaction of select, sub-surface drainage, sub-base and base layers and surfacing.	Trucks, graders, water carts, compactors, bitumen sprayers, asphalt paver, vibratory rollers and rubber-tyre rollers
Other works	
• Topsoil rehabilitation, revegetation and landscaping.	Utility vehicles, trailer, hand tools, trucks, back hoes.

4.2 Construction hours and duration

Construction work is expected to commence mid-2016. The construction work would be carried out during standard working hours, as follows:

- Monday to Friday, 7am to 6pm
- Saturday, 8am to 1pm
- Sunday and Public Holidays, no work.

Out of hours' work would be carried out in line with the procedures contained within the EPA *Interim Construction Noise Guideline* (ICNG) (DECC 2009) and the Roads and Maritime *Environmental Noise Management Manual Practice Note vii – Roadworks outside normal working hours* (RTA 2001).

Procedures would include notifying the local community, including local residents and businesses, prior to the start of any work. If *Practice Note vii – Roadworks outside normal working hours* requirements cannot be achieved, the Roads and Maritime contract manager would be informed and the Noise and Vibration Plan would need to be updated to outline additional site specific noise management measures and additional consultation requirements prior to the out of hours works commencing.

The proposal is anticipated to have a construction duration of about 13 weeks and 24 weeks for SW12 and OT6 respectively, weather permitting. Works during all periods would be subject to Road Occupancy Licences (ROL).

4.3 Construction noise and vibration impacts

4.3.1 Construction noise

To predict the potential impacts from construction noise at a sensitive receiver location, the construction activities were modelled. The prediction considers the closest point where works would be undertaken to a receiver and therefore represent a worst-case scenario. Predicted noise levels were then compared to the proposal NMLs.

The predicted noise level for each receiver is presented in Table 4-2 and indicates the potential for exceedance of the noise goals at each of the receiver locations during each phase of the works

Table 4-2 Predicted noise levels from construction activities (by receiver)

Receiver	Distance works m	NML, $L_{Aeq,\ 15\ mins}$			Predicted construction noise at receiver locations, $L_{Aeq\ dB(A)}$					
		Day	Eve	Night	Site Prep	Minor Earthworks	Road Prep	Asphalting	Line marking	Landscaping
6,1	51	52	35	35	61	67	67	64	56	61
6.2	174				53	59	59	56	48	53
6.3	63				63	69	69	66	58	63
6.4	189				55	**61**	**61**	**58**	50	55
6.5	38				70	**76**	**76**	73	65	70

Receiver	Distance works	NML, $L_{Aeq, 15\ mins}$			Predicted construction noise at receiver locations, $L_{Aeq\ dB(A)}$					
6.6	117				57	**63**	**63**	60	52	57
6.7	64				67	**73**	**37**	70	62	67
6.8	124				57	**63**	**63**	60	52	57
6.9	16				80	**86**	**86**	83	75	80
6.10	168				53	**59**	**59**	56	48	53
6.11	27				73	**79**	**79**	**76**	68	73
6.12	58				65	**71**	**71**	68	60	65
6.13	18				81	**87**	**87**	**84**	76	81
6.14	58				64	**70**	**70**	67	59	64
6.15	26				73	**79**	**79**	**76**	68	73
6.16	23				70	**76**	**76**	73	65	70
6.17	16				**82**	**88**	**88**	**85**	**77**	**82**
6.18	21				**75**	**81**	**81**	**78**	70	**75**
6.19	57				65	71	71	68	60	65
6.20	75				61	67	67	64	56	61
6.21	30				73	**79**	**79**	**76**	68	73
6.22	25				73	**79**	**79**	**76**	68	73
6.23	42				69	**75**	**75**	72	64	69
6.24	28				72	**78**	**78**	**75**	67	72
6.25	23				74	**80**	**80**	**77**	69	74
6.26	18				**82**	**88**	**88**	**85**	**77**	**82**

Note: Bold text indicates values exceeding the highly noise affected level.

Out of hours' work

The potential noise impacts of work outside standard works hours is presented in table 4-3.

Table 4-3 Predicted noise levels outside standard construction hours

Receiver ID	Distance to works	Night time NML	Sleep Disturbance Criterion	Predicted Construction Noise (L_{AEQ} dB(A)			Maximum construction noise level LAmax dB(A)
				Utility Adjustments	Asphalting	Line Marking	
6,1	51	35	45	61	64	56	69
6.2	174			53	56	48	61
6.3	63			63	66	58	71
6.4	189			55	**58**	**50**	63
6.5	38			70	**73**	**65**	78
6.6	117			57	**60**	**52**	65
6.7	64			67	**70**	**62**	75
6.8	124			57	**60**	**52**	65
6.9	16			80	**83**	**75**	88
6.10	168			53	**56**	**48**	61
6.11	27			73	**76**	**68**	81
6.12	58			65	**68**	**60**	73
6.13	18			81	**84**	**76**	89
6.14	58			64	**67**	**59**	72
6.15	26			73	**76**	**68**	81
6.16	23			70	**73**	**65**	78
6.17	16			**82**	**85**	**77**	**90**
6.18	21			**75**	**78**	**70**	**83**
6.19	57			65	68	60	73
6.20	75			61	64	56	69
6.21	30			73	**76**	**68**	81
6.22	25			73	**76**	**68**	81
6.23	42			69	**72**	**64**	77
6.24	28			72	**75**	**67**	80
6.25	23			74	**77**	**69**	82
6.26	18			**82**	**85**	**77**	**90**

Noise generated from works outside of standard construction hours is likely to exceed sleep disturbance criteria at all locations. Any out of hours work required would be carried out in line with the Roads and Maritime Environmental Noise Management Manual Practice Note vii – Roadworks outside normal working hours (RTA 2001). If Practice Note VII – Roadworks outside normal working hours requirements cannot be achieved, the Roads and Maritime contract manager would be informed and the Noise and Vibration Plan would need to be reviewed to ensure that additional site specific noise management measures and additional consultation requirements are sufficient prior to the out of hours works commencing.

Ancillary facility construction and operation

Table 4-4 summarises the predicted noise levels above the background and NML from the construction and operation of the ancillary facility and for the nearest commercial/retail receiver 50m to the south (Ramones Service Centre) and residential receiver 90m to the west. The NML for the establishment and operation of the ancillary facility have been derived from the R1 representative noise category provided in the CNVG (Roads and Maritime, 2016).

Table 4-4 Predicted noise levels

Receiver	Distance to Receiver	Line of sight to receiver	NML db(A)	Predicted Noise Level db(A)	Level above background dB(A)	Level above NML dB(A)
Compound Establishment						
Commercial/Retail	50m	Yes	70	69	29	-
Residential	90m	Yes	50	63	23	13
Compound Operation						
Commercial/Retail	50m	No, barrier in place	70	64	24	-
Residential	90m	No, barrier in place	50	58	18	8

The NML would be exceeded for the nearest sensitive residential receiver located 90m to the west for construction and operations occurring during standard hours, by 13 and 8 dB(A) respectively. NML's would not be exceeded at the commercial/retail receiver located 50m to the south, based on the NML of 70 dB(A) for those receiver types during standard hours. Standard hours correlates to the period between 7am and 6pm Monday to Friday and 8am to 1pm Saturdays. It is not proposed that the facility is operated outside standard hours for the duration of the construction period.

4.3.2 Construction vibration

The REF determined that vibration would:

- have potential adverse impacts on human comfort within 30 metres of high impact vibration-generating activity;
- vibration would have potential adverse impacts on structures within 20 metres of high impact vibration-generating activity.

Where high impact vibratory rollers are to be used and that may place adjoining residential structures at risk of damage, a building condition survey would be conducted prior to work commencing.

Appropriately sized equipment would be selected in order to minimise vibration emissions where possible e.g. Use less intensive vibration (low impact) construction methods wherever possible.

Where vibration issues are identified during the works, alternative equipment and construction methodologies would be investigated.

Vibration monitoring will be carried out in response to complaints or for the purposes of refining construction methods or techniques to minimise vibrations.

5. Management measures and safeguards

The below table outlines the control measures and safeguards which will be implemented to manage potential noise and vibration impacts:

Management measures and mitigation strategies		Responsibility	Timing
General			
NV1	Training will be provided to all project personnel, including relevant sub-contractors, on noise and vibration requirements from this plan through inductions and toolbox talks.	DM Site Supervisor	Pre-construction and construction
Noise			
NV2	Equipment selection: Where alternative plant is available, the plant emitting the lowest noise levels is to be selected. Similarly, where an alternative method for undertaking a process or activity would result in reduced noise emissions, this must be considered where practicable.	DM Site Supervisor / subcontractor	Construction
NV3	Distance: Locate compressors, generators, pumps and any other fixed plant as far from residences as practical.	DM Site Supervisor	Construction
NV4	Enclosures: Where smaller, stationary plant is located closer to residences low noise equipment or enclosures are to be used.	DM Site Supervisor	Construction
NV5	Screening: Where activities are in very close proximity to residences for extended periods, the erection of temporary hoarding/screens is to be considered.	Site Supervisor / PM / Subcontractor	Construction
NV6	Engine silencers: Mobile plant and equipment are to be chosen to include exhaust silencers or be suitable for fitting residential class mufflers.	DM Site Supervisor	Construction
NV7	Unless required for technical reasons, undertake high noise generating work (such as hydraulic hammer) during standard construction hours, or early in the evening if required to be undertaken outside of standard construction hours; avoiding short sharp sounds from impacts during night work to minimise sleep disturbance to neighbouring residents.	Site Supervisor	Construction
NV8	Where residences are predicted to be in excess of the “Highly Affected” criterion, respite periods should be included in the program of works. • As a guide, high noise and vibration generating activities near receivers should be carried out in continuous blocks that do not exceed 3 hours each, with a minimum respite period of one hour between each block. The duration of each block of work and respite should be flexible to accommodate the usage and amenity at nearby receivers. (CNVG, Roads and Maritime 2016)	Site Supervisor / PM	Construction
NV9	Reversing alarms: Reversing alarms that have a tonal noise character are to be avoided during out of hours activities. Quacker style or ‘smart’ reversing alarms are to be used during night time activities.	Site Supervisor / Subcontractor	Construction

Out of hours' works			
NV10	Where out of hours activities are proposed, the procedure for consultation with affected residents as outlined in the Environmental Noise Management Manual would be followed.	PM / Comms Team	Construction
NV11	All out of hours work should be carried out in line with the Roads and Maritime Environmental Noise Management Manual Practice Note vii – Roadworks outside normal working hours (RTA 2001).	PM / Site Supervisor	Construction
NV12	If Roads and Maritime ENMM Practice Note vii – Roadworks outside normal working hours requirements cannot be achieved, the Roads and Maritime contract manager would be informed and the Construction Noise and Vibration Management Plan (this document) would need to be updated to outline additional site specific noise management measures and additional consultation requirements prior to the out of hours works commencing.	PM / EM	Construction
NV13	Where high impact vibratory rollers are placing adjoining residential structures at risk of damage, a building condition survey would be conducted prior to work commencing.	PM / RMS	Construction
NV14	Appropriately sized equipment would be selected in order to minimise vibration emissions where possible e.g. Use quieter and less vibration emitting construction methods where feasible and reasonable.	PM / Site Supervisor / Subcontractor	Construction
NV15	Where vibration issues are identified during the works, alternative equipment and construction methodologies would be investigated.	PM / Site Supervisor / Subcontractor	Construction
NV16	A community liaison phone number and site contact would be provided so that noise and vibration-related complaints can be received and addressed in a timely manner. The number would be available on Roads and Maritime website and on the site compound fencing.	Comms Team / RMS	Construction
NV17	Noise receivers would be notified of the construction work schedule and expected noise levels prior to the commencement of construction.	Comms Team	Construction
NV18	All complaints received will be managed in accordance with the Community Involvement Plan. This will include the process which is to be implemented for resolving conflicts and issues.	Comms Team / PM	Construction
NV19	Regular environmental inspections will be undertaken to ensure works are in accordance with the mitigation measures outlined in the NVMP.	DM Env. Manager (EM) / DM Site Supervisor / DM PM	Construction
NV20	Noise and vibration monitoring will be undertaken in accordance with Section 6 of this management plan.	DM EM	Construction
NV21	The noise and vibration management plan would be reviewed in response to complaints and amended where appropriate throughout the construction phase.	DM EM / PM	Construction

6. Monitoring and corrective action

Routine inspection of the worksite will include checks for noise and vibration impacts in line with procedures and frequencies outlined in the Project Zero Harm Management Plan and *DA-ZF-FM116.9 Environmental Inspection Checklist*. Inspections will occur not less than fortnightly, and in conjunction with environmental inspections conducted by Roads and Maritime Services.

6.1 Noise monitoring

Noise monitoring will also be undertaken when required for resolution of complaints.

Where noise levels are found to exceed values recommended in the ICNG, the source of excessive noise generation will be identified, and any additional feasible and reasonable measures available will be implemented to either reduce noise emissions or reduce the impacts on receivers.

Details of site activity and equipment usage will be noted during construction noise monitoring.

Acoustic instrumentation employed in the noise monitoring surveys will comply with the requirements of *AS1259.2-1990 Acoustics – Sound Level Meters, Part 2: Integrating – Averaging and carry appropriate NATA* (or manufacturer) calibration certificates.

6.2 Vibration monitoring

Vibration monitoring will be carried out in response to complaints or for the purpose of refining construction methods or techniques to minimise vibrations and the risk of cosmetic damage to residential and commercial buildings and structures.

The CNVG (Roads and Maritime, 2016) recommends minimum safe working distances for vibration intensive plant to sensitive receivers to mitigate against structural damage to buildings and structures (Table 6-1).

Where it is proposed to use vibration intensive plant, the following will apply:

- Determine rating or size/weight of the vibration intensive equipment
- Determine the offset distance from the nearest proposed work zone to the sensitive receivers shown in Appendix A of this plan
- If the proposed works are within the minimum working distance radius for cosmetic damage shown in Table 6-1, the following will apply prior to any works being conducted:
    - Review the plant selection and ensure it is appropriately sized for the works. If smaller, more efficient equipment is feasible, substitute the plant/equipment and reassess the vibration risk
    - Based on the plant/equipment selection and minimum offset distance recommendation, conduct building condition survey on all sensitive receivers within the minimum working distance radius prior to any works being conducted
    - Conduct attended vibration monitoring during the works to validate the assumptions and allow for further review and or/adjustment of plant/equipment \
    - Where vibration is found to exceed recommended levels, further actions to reduce the potential impacts will comprise further review/alteration of work methods and/or reducing the size of the equipment.
- In the event a complaint relating to property damage is received, an inspection of the property would be undertaken and a building condition report prepared.

Vibration monitoring will be carried out in accordance with:

- For structural damage vibration – *German Standard DIN 4150 and BS 7385: Part 2 – 1993.*

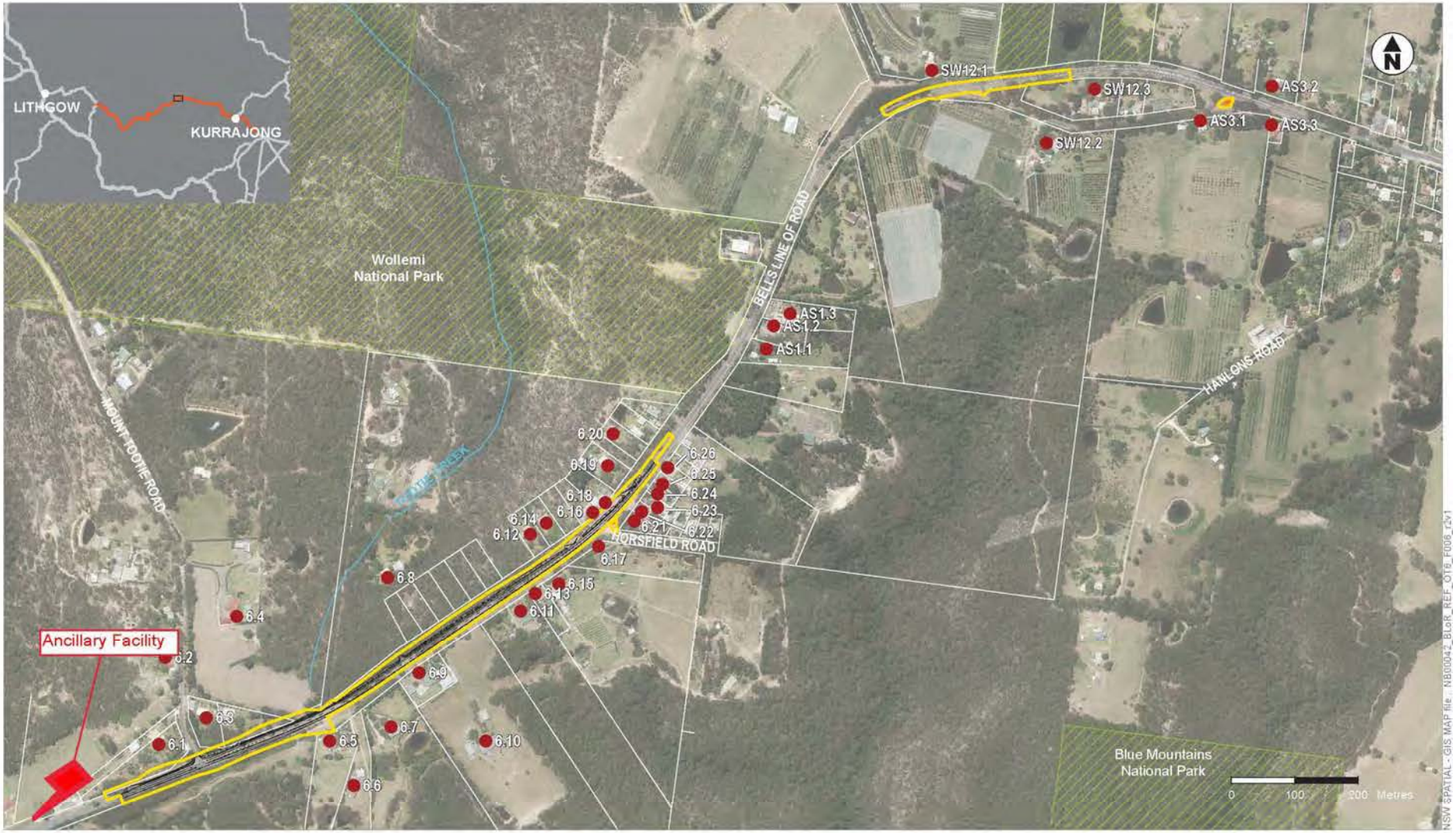
- For human exposure to vibration – the evaluation criteria presented in the *Environmental Noise Management Assessing Vibration: A Technical Guideline (DECC 2006).*

Table 6-1 Recommended minimum working distances for vibration intensive plant from sensitive receiver

Plant item	Rating / Description	Minimum working distance	
		Cosmetic damage (BS 7385)	Human response (OH&E Vibration guideline)
Vibratory Roller	< 50 kN (Typically 1-2 tonnes)	5 m	15 m to 20 m
	< 100 kN (Typically 2-4 tonnes)	6 m	20 m
	< 200 kN (Typically 4-6 tonnes)	12 m	40 m
	< 300 kN (Typically 7-13 tonnes)	15 m	100 m
	> 300 kN (Typically 13-18 tonnes)	20 m	100 m
	> 300 kN (> 18 tonnes)	25 m	100 m
Small Hydraulic Hammer	(300 kg - 5 to 12t excavator)	2 m	7 m
Medium Hydraulic Hammer	(900 kg – 12 to 18t excavator)	7 m	23 m
Large Hydraulic Hammer	(1600 kg – 18 to 34t excavator)	22 m	73 m
Vibratory Pile Driver	Sheet piles	2 m to 20 m	20 m
Pile Boring	≤ 800 mm	2 m (nominal)	4 m
Jackhammer	Hand held	1 m (nominal)	2 m

Note: More stringent conditions may apply to heritage or other sensitive structures

Appendix A – Map of potentially affected properties and residences



Overtaking lane 6 design

Proposal area

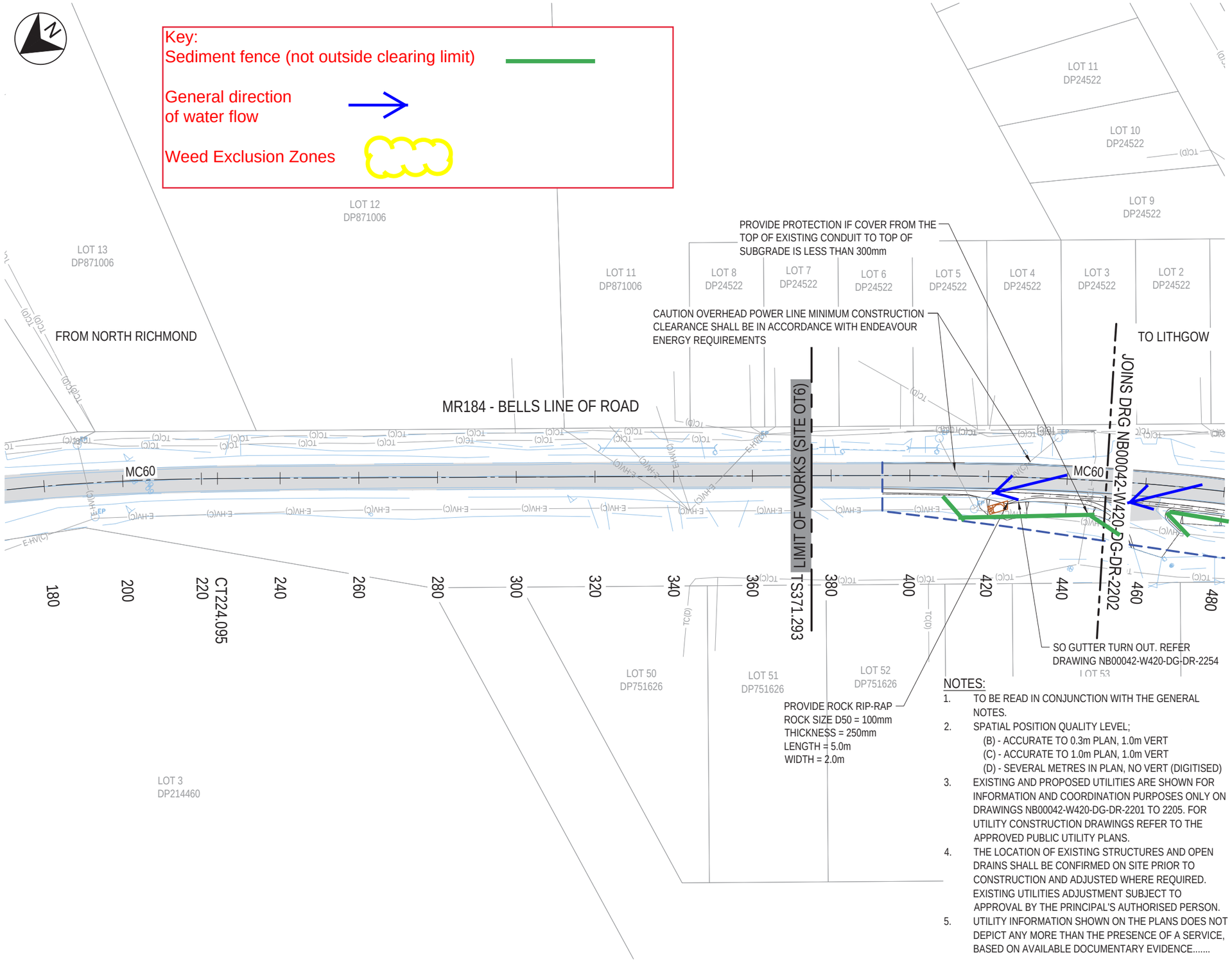
Sensitive receiver

Ancillary Site

National Park

Note: The boundaries of the National Park is a derived dataset as provided by LPI, NSW and adjusted to surveyed property boundaries by Jacobs where appropriate

11 Appendix D – Erosion and Sediment Control Plan



LEGEND

REFERENCE ONLY
- EXISTING PAVEMENT
- EXISTING CADASTRAL BOUNDARY
- EXISTING FENCE

CLEARING
- CLEARING LIMIT

DRAINAGE & WATER QUALITY (FOR CONSTRUCTION)
- EXISTING STORMWATER PIT
- EXISTING STORMWATER HEADWALL
- EXISTING STORMWATER PIPE
- EXISTING STORMWATER PIPE TO REMOVE
- 450 STORMWATER PIPE, SIZE & FLOW DIRECTION
- STORMWATER HEADWALL
- STORMWATER PIT
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- T01.J OPEN CHANNEL LABEL
- OPEN CHANNEL - GRASS (REFER NOTE 7)
- OPEN CHANNEL - ROCK (REFER NOTE 7)
- OPEN CHANNEL - CONCRETE (REFER NOTE 7)
- LEVEL SPREADER (REFER NOTE 8)
- SCOUR PROTECTION

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- E-HV HIGH VOLTAGE ELECTRICAL OVERHEAD
- POWER POLES
- TC TELEPHONE LINE UNDERGROUND
- T TELEPHONE LINE OVERHEAD
- TELEPHONE LINE OVERHEAD POLE

EXISTING UTILITIES TO REMOVE (INFORMATION ONLY)
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NOTES:

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NOTES:

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6. SEDIMENT MUST BE REMOVED FROM THE EXISTING CULVERTS PRIOR TO COMMENCEMENT OF WORKS.
7. REFER DRAWINGS NB00042-W420-DG-DR-2253 FOR THE DETAILS AND SETOUT OF THE OPEN CHANNEL
8. PROVIDE LEVEL SPREADER AT THE END OF CHANNEL FOR DETAILS REFER DRAWING NB00042-W420-DG-DR-2254.
9. ALL EXISTING ELECTRICAL CONNECTIONS TO PRIVATE PROPERTIES MUST BE REINSTATED BY A LEVEL 2 ASP, AFTER CONSULTATION AND AGREEMENT WITH PRIVATE LAND OWNERS.
10. NO INTRUSIVE WORKS ARE PERMITTED WITHIN PRIVATE PROPERTY INCLUDING THE PRESCRIBED LAND.

REV	DATE	DESCRIPTION	DRAWN	REVIEWED	APPROVAL
B	18.11.16	RE-ISSUED FOR CONSTRUCTION	GD	DB	DB
A	04.11.15	ISSUED FOR CONSTRUCTION	GD	JE	DB

	INITIAL	DATE
DRAFTSPERSON	JT	18.11.16
DRAFTING CHECK	SG	18.11.16
DESIGNER	GD	18.11.16
DESIGN CHECK	SM	18.11.16
PACKAGE MANAGER	DB	18.11.16
PROJECT MANAGER	EDA	18.11.16

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CO-ORDINATE SYSTEM: MGA Zone 56
HEIGHT DATUM: A.H.D.

CLIENT: NSW GOVERNMENT Transport Roads & Maritime Services
RMS PROJECT No: T/06439

CONTRACTOR: Downermouchel

DESIGNER: JACOBS
100 Christie Street
St Leonards, SYDNEY, NSW 2065
AUSTRALIA
Tel: (02) 9928 2100 Fax (02) 9928 2500
Web: www.jacobs.com

PROJECT
HAWKESBURY CITY COUNCIL
RMS STEWARDSHIP MAINTENANCE CONTRACT - SYDNEY WEST
MR184 - BELLS LINE OF ROAD
IMPROVEMENT PROGRAM - LOT 1 - SITE OT6
DRAINAGE AND UTILITIES PLAN
SHEET 1

FOR CONSTRUCTION

PHASE	RMS REGISTRATION No	
IFC	DS2015/000494	
STATUS	DRAWING No	REV
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Key:
Sediment fence (not outside clearing limit)

General direction of water flow

Weed Exclusion Zones

LOT 10 DP24522
LOT 9 DP24522
LOT 3 DP24522
LOT 2 DP24522
LOT 1 DP24522
LOT A DP373113
LOT E1 DP394566
LOT E2 DP394566
LOT 49 DP751626
LOT 54 DP751626
LOT 55 DP751626
LOT 56 DP751626
LOT 57 DP751626
LOT 53 DP751626
LOT 42 DP751626

HORSFIELD ROAD

MR184 - BELLS LINE OF ROAD

FROM NORTH RICHMOND

TO LITHGOW

CAUTION OVERHEAD POWER LINE MINIMUM CONSTRUCTION CLEARANCE SHALL BE IN ACCORDANCE WITH ENDEAVOUR ENERGY REQUIREMENTS

CAUTION OVERHEAD POWER LINE MINIMUM CONSTRUCTION CLEARANCE SHALL BE IN ACCORDANCE WITH ENDEAVOUR ENERGY REQUIREMENTS

CAUTION OVERHEAD POWER LINE MINIMUM CONSTRUCTION CLEARANCE SHALL BE IN ACCORDANCE WITH ENDEAVOUR ENERGY REQUIREMENTS

JOINS DRG NB00042-W420-DG-DR-2201

JOINS DRG NB00042-W420-DG-DR-2203

MC60

MC60

SC451.977

CS573.675

ST653.558

TC656.135

CT677.074

420 440 460 480 500 520 540 560 580 600 620 640 660 680 720

LEGEND

REFERENCE ONLY
- EXISTING PAVEMENT
- EXISTING CADASTRAL BOUNDARY
- EXISTING FENCE

CLEARING
- CLEARING LIMIT

DRAINAGE & WATER QUALITY (FOR CONSTRUCTION)
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- EXISTING STORMWATER HEADWALL
- EXISTING STORMWATER PIPE
- EXISTING STORMWATER PIPE TO REMOVE
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TITLE	INITIAL	DATE
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ORIGINAL DRAWING AT A3 SIZE
SCALE 1:1000 10 0 10 20 AT A3
CO-ORDINATE SYSTEM: MGA Zone 56
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DESIGNER: JACOBS
100 Christie Street
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AUSTRALIA
Tel: (02) 9928 2100 Fax (02) 9928 2500
Web: www.jacobs.com

PROJECT
HAWKESBURY CITY COUNCIL
RMS STEWARDSHIP MAINTENANCE CONTRACT - SYDNEY WEST
MR184 - BELLS LINE OF ROAD
IMPROVEMENT PROGRAM - LOT 1 - SITE OT6
DRAINAGE AND UTILITIES PLAN
SHEET 2

FOR CONSTRUCTION

PHASE	RMS REGISTRATION No	
IFC	DS2015/000494	
STATUS	DRAWING No	REV
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Key:
Sediment fence (not outside clearing limit)

Culvert inlet protection

General direction of water flow

Weed Exclusion Zones

LOT 11
DP706779

DP706779

LOT 3
DP774739

FROM NORTH RICHMOND

JOINS DRG NB00042-W420-DG-DR-2202

CAUTION OVERHEAD POWER LINE MINIMUM VERTICAL CLEARANCE SHALL BE IN ACCORDANCE WITH ENDEAVOUR ENERGY REQUIREMENTS

MR184 - BELLS LINE OF ROAD

CAUTION OVERHEAD POWER LINE MINIMUM VERTICAL CLEARANCE SHALL BE IN ACCORDANCE WITH ENDEAVOUR ENERGY REQUIREMENTS

LOT 1
DP519581

TO LITHGOW

JOINS DRG NB00042-W420-DG-DR-2204

MC60

MC60

T01.R

680 700 720 740 760 780 800 820 840 860 880 900 920 940 960 TC975.559

CT677.074

REFER NOTE 8

CAUTION OVERHEAD POWER LINE MINIMUM VERTICAL CLEARANCE SHALL BE IN ACCORDANCE WITH ENDEAVOUR ENERGY REQUIREMENTS

EXISTING TELSTRA CABLE TO BE REPLACED BY NEW TELSTRA CABLE WITHIN 1xP50 CONDUIT. MINIMUM COVER SHALL BE IN ACCORDANCE WITH TELSTRA REQUIREMENTS.

LOT 42 DP751626 | LOT 43 DP751626 | LOT 45 DP751626 | LOT 46 DP751626 | LOT 47 DP751626 | LOT 48 DP751626 | LOT 58 DP751626

LEGEND

REFERENCE ONLY
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- EXISTING CADASTRAL BOUNDARY
- EXISTING FENCE

CLEARING
- CLEARING LIMIT

DRAINAGE & WATER QUALITY (FOR CONSTRUCTION)
- EXISTING STORMWATER PIT
- EXISTING STORMWATER HEADWALL
- EXISTING STORMWATER PIPE
- EXISTING STORMWATER PIPE TO REMOVE
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SCALE 1:1000 (10 0 10 20) AT A3
CO-ORDINATE SYSTEM: MGA Zone 56 | HEIGHT DATUM: A.H.D.

CLIENT: NSW Government — Transport Roads & Maritime Services
RMS PROJECT No T/06439

CONTRACTOR: Downermouchel

DESIGNER: JACOBS
100 Christie Street
St Leonards, SYDNEY, NSW 2065
AUSTRALIA
Tel: (02) 9928 2100 Fax (02) 9928 2500
Web: www.jacobs.com

PROJECT
HAWKESBURY CITY COUNCIL
RMS STEWARDSHIP MAINTENANCE CONTRACT - SYDNEY WEST
MR184 - BELLS LINE OF ROAD
IMPROVEMENT PROGRAM - LOT 1 - SITE OT6
DRAINAGE AND UTILITIES PLAN
SHEET 3

FOR CONSTRUCTION

PHASE	RMS REGISTRATION No	
IFC	DS2015/000494	
STATUS	DRAWING No	REV
100%	NB00042-W420-DG-DR-2203	B

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Key:
Sediment fence (not outside clearing limit)

Culvert inlet protection

General direction of water flow

Weed Exclusion Zones

LOT 3
DP774739

VERTICAL CLEARANCE SHALL BE IN ACCORDANCE WITH ENDEAVOUR ENERGY REQUIREMENTS

LOT 1
DP774739

LOT 1
DP734092

PROPOSED TELSTRA CABLE WITHIN 1xP50 CONDUIT TO BE PLACED UNDER BELLS LINE OF ROAD. MINIMUM COVER SHALL BE IN ACCORDANCE WITH TELSTRA REQUIREMENTS.

FROM NORTH RICHMOND

JOINS DRG NB00042-W420-DG-DR-2203

MR184 - BELLS LINE OF ROAD

1m SHARED TRENCH FOR TELSTRA AND ENDEAVOUR ENERGY SERVICES

TO LITHGOW

JOINS DRG NB00042-W420-DG-DR-2205

MC60

920 940 960 TC975.559 980 1000 1020 1040 1060 1080 1100 CT1113.144 1120 1140 1160 TC1167.736 1180 CT1193.684 1220

REFER NOTE 10

PROVIDE ROCK RIP-RAP
ROCK SIZE D50 = 100mm
THICKNESS = 250mm
LENGTH = 5.0m
WIDTH = 2.0m

SO GUTTER TURN OUT. REFER DRAWING NB00042-W420-DG-DR-2254

PROVIDE ROCK RIP-RAP
ROCK SIZE D50 = 100mm
THICKNESS = 250mm
LENGTH = 3.5m
WIDTH = 2.0m

GUTTER WIDTH OF SPECIAL KERB MAYBE LOCALLY NARROWED TO 600mm TO AVOID PROPERTY IMPACT IF REQUIRED

LOT 42
DP751626

LOT 15
DP581784

LOT 32
DP630942

LEGEND

REFERENCE ONLY
- EXISTING PAVEMENT
- EXISTING CADASTRAL BOUNDARY
- EXISTING FENCE

CLEARING
- CLEARING LIMIT

DRAINAGE & WATER QUALITY (FOR CONSTRUCTION)
- EXISTING STORMWATER PIT
- EXISTING STORMWATER HEADWALL
- EXISTING STORMWATER PIPE
- EXISTING STORMWATER PIPE TO REMOVE
- 450 STORMWATER PIPE, SIZE & FLOW DIRECTION
- STORMWATER HEADWALL
- STORMWATER PIT
- 2-2-01 STORMWATER PIT LABEL (STRUCTURE NUMBER, DRAINAGE LINE, SITE NUMBER)
- T01.J OPEN CHANNEL LABEL
- OPEN CHANNEL - GRASS (REFER NOTE 7)
- OPEN CHANNEL - ROCK (REFER NOTE 7)
- OPEN CHANNEL - CONCRETE (REFER NOTE 7)
- LEVEL SPREADER (REFER NOTE 8)
- SCOUR PROTECTION

PROPOSED UTILITIES (INFORMATION ONLY)
- EU ELECTRICAL UNDERGROUND
- E-HV HIGH VOLTAGE ELECTRICAL OVERHEAD
- POWER POLES
- TC TELEPHONE LINE UNDERGROUND
- T TELEPHONE LINE OVERHEAD
- TELEPHONE LINE OVERHEAD POLE

EXISTING UTILITIES TO REMOVE (INFORMATION ONLY)
- QUALITY LEVEL (REFER NOTE 2)
- TC(C) TELEPHONE CONDUIT
- E-HV(C) LOW VOLTAGE ELECTRICAL OVERHEAD
- POWER POLE

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- TC(C) TELEPHONE CONDUIT
- E-HV(C) HIGH VOLTAGE ELECTRICAL OVERHEAD
- E-LV(C) LOW VOLTAGE ELECTRICAL OVERHEAD
- TRANSMISSION LINE
- EP POWER POLE
- TP TELEPHONE POLE

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RMS PROJECT No T/06439

CONTRACTOR: Downermouchel

DESIGNER: JACOBS
100 Christie Street
St Leonards, SYDNEY, NSW 2065
AUSTRALIA
Tel: (02) 9928 2100 Fax (02) 9928 2500
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PROJECT
HAWKESBURY CITY COUNCIL
RMS STEWARDSHIP MAINTENANCE CONTRACT - SYDNEY WEST
MR184 - BELLS LINE OF ROAD
IMPROVEMENT PROGRAM - LOT 1 - SITE OT6
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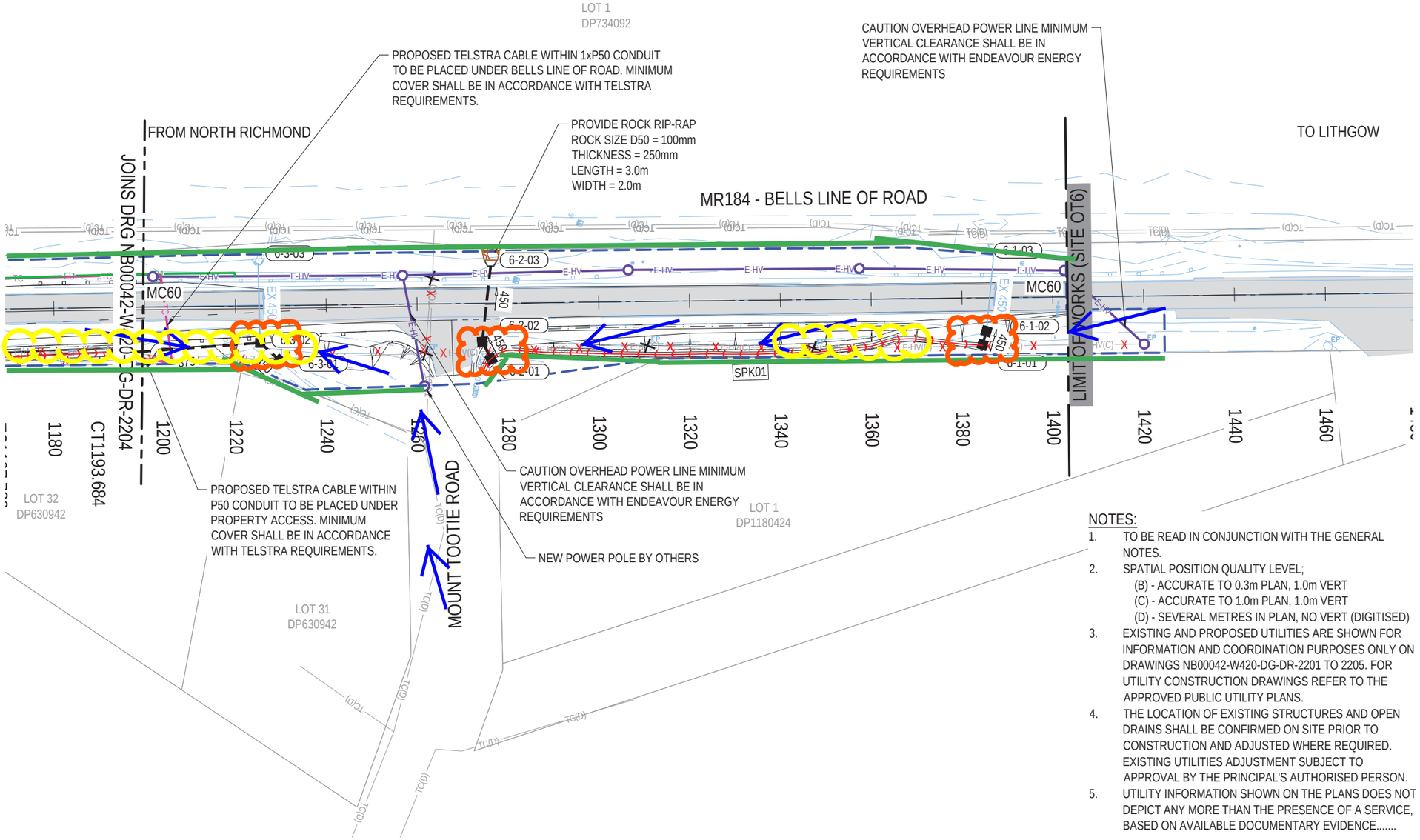
Weed Exclusion Zones



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- EXISTING FENCE

CLEARING
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DRAINAGE & WATER QUALITY (FOR CONSTRUCTION)
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- EXISTING STORMWATER PIPE TO REMOVE
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SHEET 5

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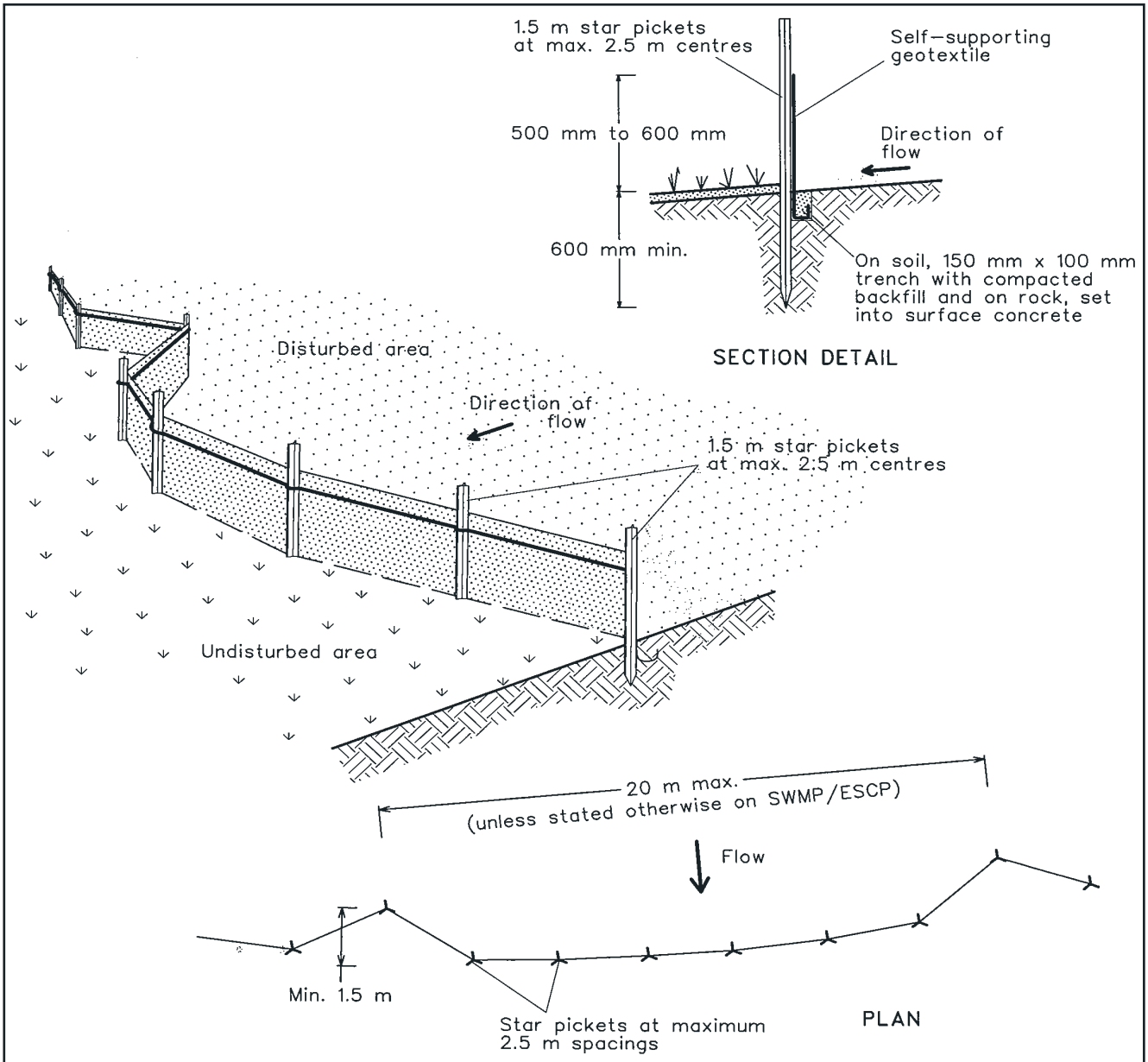


Construction Notes

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

12 Appendix E – Traffic Management Plan

To be supplied by the contractor prior to commencement of works

13 Appendix F – Community Engagement Plan

RMS Stewardship Maintenance Contract

DOWNER MOUCHEL

Work Package 420 RMS Project Number T/06439/01

Bells Line of Road Corridor Improvement Strategy

COMMUNITY ENGAGEMENT PLAN

5 April 2016

RMS Stewardship Maintenance Contract

Document title: Project Number T/06439/01
Bells Line of Road Corridor Improvement Strategy
Community Engagement Plan

Date: 5 April 2016

Client name: DownerMouchel

Document history and status

Revision	Date	Description	By	Review	Approved
01	05/04/16	Community Engagement Plan – first draft	G.Illuzzi		

Contents

1. Introduction 1
2. Communications objectives 2
3. About the project 3
4. Key messages 4
5. Risk management 5
6. Evaluation 7

Appendix A. Program map
Appendix B. Overarching Stakeholder list
Appendix C. Community Engagement Action Plan – Overall program
Appendix D. Distribution Area for program wide communication material
Appendix E: Enquiries and complaints process

1. Introduction

This plan provides an overview of how communications will be carried out with the community and stakeholders during the construction of the Bell for the Bells Line of Road Corridor Improvement Program.

. The plan includes:

- Stakeholder and issues identification and analysis
- Details of how project information (including details of upcoming work and community engagement activities) will be distributed
- Community feedback opportunities and mechanisms.

2. Communications objectives

In the delivery of communications on the project, the project team aims to:

- Build a positive working relationship with the local community and key stakeholders.
- Promptly investigate and, where possible, resolve issues affecting the community and stakeholders
- Minimise disruption for residents living in close proximity to the work site
- Minimise disruption for road users and public transport commuters
- Proactively communicate to minimise impacts
- Meet the reasonable needs and desires of the community for information and consideration of their views.

Communication activities will be underpinned by the following key objectives:

- Provide opportunities for stakeholders to be sufficiently informed about the project in a timely manner
- Provide two-way communication channels and personalised one-to-one contacts to encourage feedback
- Provide an open, accountable and transparent involvement process which demonstrates how the community and stakeholder input is considered
- Identify, track and address issues early to implement project controls which minimise further disruption.

Plan Review

This Community Engagement Plan will be reviewed and updated as activities change to reflect the stage of work, and associated stakeholder engagement activities. Any major changes will result in the plan being resubmitted to RMS for review and approval. This plan complies with the requirements of the RMS Contract Communication & Stakeholder Engagement Requirements (Schedule 6), and aligns with the over-arching DownerMouchel Communications & Stakeholder Engagement Plan for the SMC.

3. About the project

In 2012, the Australian and NSW governments jointly released the Bells Line of Road Long Term Strategic Corridor Plan. The Plan outlined the short, medium and long term developments on this road corridor that are needed to improve road safety and maintain traffic efficiency.

As a priority, seven overtaking lanes and a package of road safety improvements are underway between Kurrajong Heights and Mount Tomah.

Work Type	Location	What is Planned	Progress
Overtaking Lane 1	4 Km west of Kurrajong Heights, Westbound	0.7km overtaking lane. Work to start Mid November 2014	Completed August 2015
Overtaking Lane 2	6 Km east of Bilpin, Eastbound	1.0km overtaking lane. Work to start 2015.	Currently being constructed, due for completion September 2016
Overtaking Lane 3	4 Km east of Bilpin, Westbound	1.2km overtaking lane. Work to start 2015	Starting work April 2016
Overtaking Lane 4	7.5km west of Kurrajong Heights, Eastbound	1.0km overtaking lane. Works Complete	Construction completed September 2014
Overtaking Lane 5	2 Km east of Bilpin, Westbound	1.1km overtaking lane. Work to start 2015	Starting work in May 2016
Overtaking Lane 6	3 Km west of Bilpin, Eastbound	0.7km overtaking lane. Work to start 2016	Starting work in the 2015/16 Financial Year
Overtaking Lane 7	10 Km west of Bilpin, Westbound	0.7km overtaking lane. Work to start 2015	Started work in late 2015, expected to be completed mid 2016
Crash cluster at Site 8	East of Mount Wilson Road	1.4km long	Started April 2016 expected to be complete mid 2016
Crash cluster at Site 9	Between Bell and Mount Wilson Road	0.6km long	Completed November 2015
Crash cluster at Site 10	Near Bell	0.6km long	Completed November 2015

4. Key messages

- The NSW Government is funding this $48 million program of work to improve road safety and traffic efficiency on Bells Line of Road between Lithgow and Kurrajong Heights.
- Roads and Maritime invited the community and stakeholders to provide feedback on each of the overtaking lanes in 2014 and 2015.
- The benefits of the project include:
  - Improved traffic flow and a reduction in traffic delays.
  - Road safety improvements for all road user groups.
  - Enhanced and improved urban design.
- Most of the work will be carried out during the day.
- Every attempt will be made to minimise disruption to the community.
- Disruption to the community will be minimised.
- The local community will be separately notified of work at individual sites.
- For more information please contact DownerMouchel on 1800 332 660 or enquiries_nsw@downermouchel.com

5. Risk management

A range of stakeholder and project-driven issues have been identified. **Table 2** describes the nature of the issue, the potential risk to the project and mitigation measures.

Table 2: Risk and management measures for identified issues

Issue identified	Description	Risk	Mitigation measures
Traffic impacts	A Traffic and Access Management Plan outlining construction vehicle routes and detour plans will be developed to reduce congestion around the semi-rural area.	**H**	• Roads and Maritime/Council-approved traffic management plans will dictate extent of temporary impacts and further management activities. • Distribute regular notifications to provide details of upcoming works and management strategies. • Provide opportunities for the community to contact the project team to discuss impacts and suggest changes to reduce impacts. • VMS signage.
Traffic delays	Where possible current traffic movements are to be maintained during the works.	**H**	• Traffic control will be utilised.
Traffic detours	Traffic detours will be detailed in the Traffic and Access Management Plan.	**H**	• The project team will program work to minimise disruption to the public and local residents and liaise with the community regularly.
Cumulative impacts of the project given this is part of a wider program of work.	Construction fatigue along the corridor as a result of ongoing improvement work.		• The provision of information that clearly states the benefits of the work. • Programming of work in order to minimise impact on the community. • Liaison across project teams.
Community perception	Community feel that they were not listened to during the consultation period.	**H**	• Provide opportunities for the community to contact the project team to discuss impacts and suggest changes to reduce impacts. • Key messages include information about prior consultation.

Issue identified	Description	Risk	Mitigation measures
Noise and Vibration	DownerMouchel will select the most appropriate machinery to deliver these works to minimise noise and vibration and will closely monitor impacts during work.	H	• The team will ensure the most effective construction method is used for these work to minimise impact, where possible. • Noise and vibration impact assessments will be conducted to determine expected noise levels. • Various measures will be implemented to manage these noise impacts as stipulated in the EPL. • Stakeholders concerned about noise and vibration can contact the Project Infoline and a member of the Communications team will contact them within two hours to discuss their concerns.
Visual impacts of the work	Community feels that the work is impacting the visual amenity of the semi-rural area.	H	• We have prepared a Review of Environmental Factors to assess the environmental impacts of the proposal, including heritage impacts. This will be made available to view on the project web page. • Keep community members informed of visual impacts.
Public transport/ bus stop disruption	Local buses may be impacted by the work.	H	• Mitigation methods will be detailed in the Traffic and Access Management Plan, and the community notified in advance of all relevant information. • Bus services will remain in operation, and the project team will temporarily relocate bus stops if necessary in order to keep bus users safe and to provide easy access to services.
Vegetation removal and revegetation and other visual impacts	Concern about removal of native vegetation and EECs vegetation for construction.	H	• HYS process included information about vegetation removal. • Consultation was carried out as part of the Federal referral for the work in mid 2015. • Vegetation removal will be offset as required by the Federal referral.
Impacting the activities of Social, Cultural and Community groups.	Undertake appropriate consultation and schedule works to minimise impact to social, cultural and community groups.	L	• Impact is expected to be negligible.

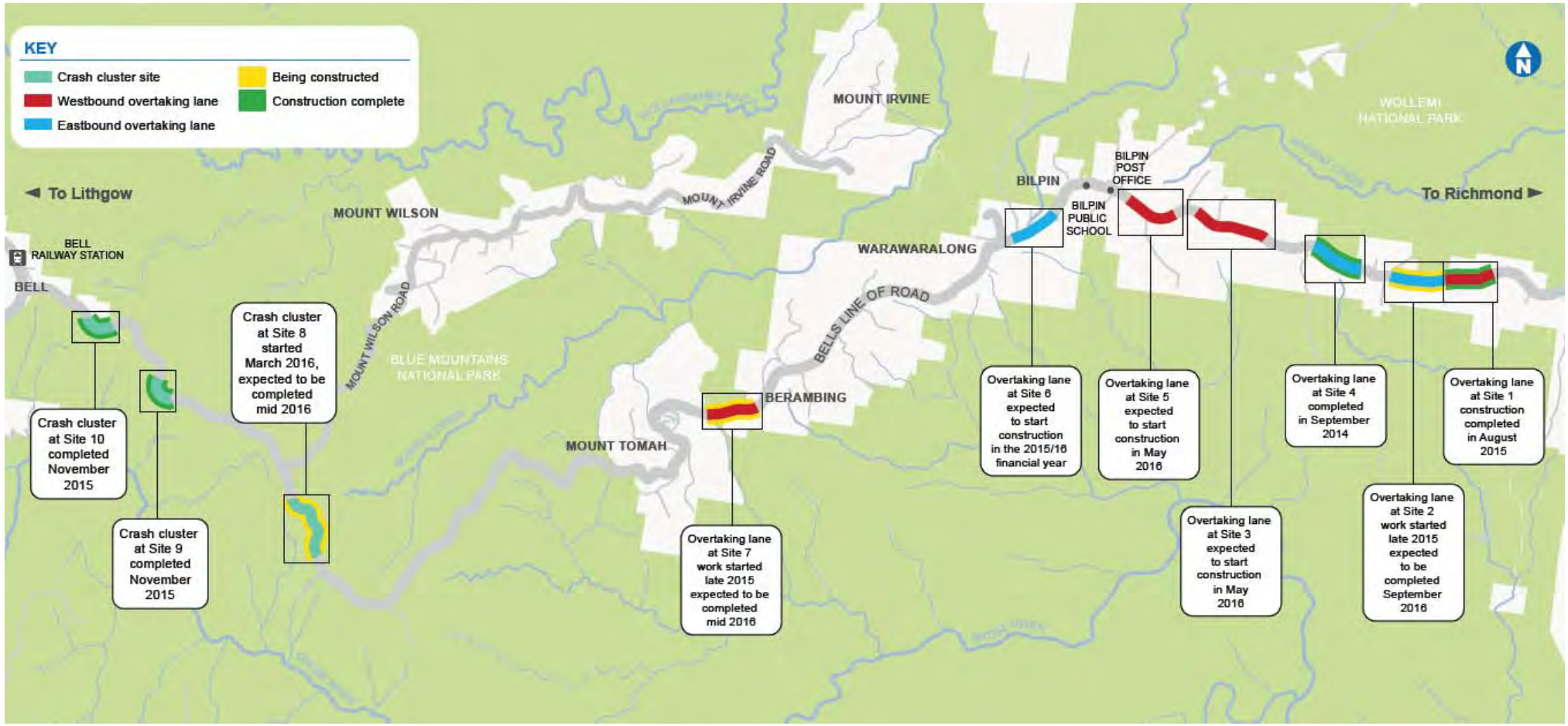
6. Evaluation

This Plan is a living document which will be updated on an ongoing basis as required, and following the direction provided by Roads and Maritime.

The effectiveness of this Plan will be evaluated through reporting to Roads and Maritime on measures such as:

- number of community enquiries
- number of avoidable complaints
- timeliness of responses
- communication activities completed
- feedback from the community and stakeholders

Appendix A. Program map



Appendix B. Overarching Stakeholder list

Table A: List of stakeholders

Stakeholder Category	Name	Organisation	Phone	Email	Postal Address	Consultation Method
Government members and senior officials	Trish Doyle MP	NSW Government – State member for Blue Mountains		bluemountains@parliament.nsw.gov.au	132 Macquarie Road SPRINGWOOD NSW 2777	Email Update
	Dominic Perrottet MP	NSW Government – State member for Hawkesbury		hawkesbury@parliament.nsw.gov.au	Suite 202 Rouse Hill Town Centre 10-14 Market Lane ROUSE HILL NSW 2155	Email Update
	Prue Car MP	NSW Government – State member for Londonderry		londonderry@parliament.nsw.gov.au	Shop 12 82 Victoria Street WERRINGTON NSW 2747	Email Update
	The Hon. Duncan Gay	Minister for Roads and Ports		office@gay.minister.nsw.gov.au		
	The Hon Louise Markus MP	Australian Government – Federal member for Macquarie	(02) 4577 2631		PO Box 855 WINDSOR NSW 2756	Email update
		Blue Mountains City Council	(02) 4723 5000	council@bmcc.nsw.gov.au	Locked Bag 1005 KATOOMBA NSW 2780	Email Update
		Hawkesbury City Council	(02) 4560 4444	council@hawkesbury.nsw.gov.au	PO Box 146 WINDSOR NSW 2756	Email Update
		Lithgow City Council	(02) 6354 9999 or 1300 661 303	council@lithgow.nsw.gov.au	PO Box 19 LITHGOW NSW 2790	Email Update
Emergency Services		NSW Police – Hawkesbury Local Area Command	(02) 4587 4099	palnet@police.nsw.gov.au	13 Mileham Street WINDSOR NSW 2756	Email Update
		Ambulance Service of		generalenquiry@ambul	Windsor Street	Email Update

Stakeholder Category	Name	Organisation	Phone	Email	Postal Address	Consultation Method
		NSW – Richmond office		ance.nsw.gov.au	WINDSOR NSW 2756	
		Fire & Rescue NSW – Richmond Fire Station	(02) 4578 1222	info@fire.nsw.gov.au	43 March Street RICHMOND NSW 2753	Email Update
		Rural Fire Service – Hawkesbury region	(02) 4560 6400	state.ops@rfs.nsw.gov.au	Macquarie Road WILBERFORCE NSW 2756	Email Update
		Rural Fire Service – Blue Mountains region	(02) 4784 7444	state.ops@rfs.nsw.gov.au	PO Box 600 KATOOMBA NSW 2780	Email Update
		Rural Fire Service – Lithgow region	(02) 6353 1862	state.ops@rfs.nsw.gov.au	PO Box 294 LITHGOW NSW 2790	Email Update
Government Agencies		Department of Planning and Environment	(02) 9228 6333 or 1300 305 695	information@planning.nsw.gov.au	GPO Box 39 SYDNEY NSW 2001	Email Update
		Traffic Management Centre		tmc.comms@tmc.transport.nsw.gov.au		
		Environment Protection Authority/OEH/National Parks	131 555	info@environment.nsw.gov.au	EPA Head Office, PO Box A290 SYDNEY SOUTH NSW 1232	Email Update
Transport		Busways		infoline@busways.com.au		Email Update
Businesses		Australia Post – Bilpin Office	(02) 4567 1108		Bells Line Of Road BILPIN NSW 2758	Leave additional notifications
		Bilpin Fruit Bowl	(02) 4567 1152	info@bilpinfruitbowl.com.au	2093 Bells Line of Road BILPIN NSW 2758	Email Update
		Apple Bar	(02) 4567 0335	bookings@applebar.com.au	2488 Bells Line of Road BILPIN NSW 2758	Email Update
		Shields Orchard	(02) 4567 1206 or 0427 772 431		2270 Bells Line of Road BILPIN NSW 2758	Doorknock during notification
		Bilpin Springs Lodge	(02) 4567 0300	res@bilpinsprings.com.au	PO Box 294 CAMMERAY NSW 2062	Email Update

Stakeholder Category	Name	Organisation	Phone	Email	Postal Address	Consultation Method
		Ferngrove Trees	(02) 4567 1348 0415 440 803	sales@ferngrovetrees.com.au	2909 Bells Line Of Road BILPIN NSW 2758	Email Update
		Exclusive Trailers	(02) 4567 1370 0409 694 594	kriss@exclusivetrailers.com.au	2683 Bells Line Of Road BILPIN NSW 2758	Email Update
		Bilpin Resort	(02) 4567 2117	bookings@bilpinresort.com.au	68 Powells Road BILPIN NSW 2758	Email Update
		Hawkesbury Hydrogen	0448 119 310	fiero128@ygmail.com	48 Ghost Hill Rd BERAMBING BILPIN NSW 2758	Email Update
		Wollemi Wilderness Retreat		wollemicabins@gmail.com		Email Update
		Bilpin Coaches	(02) 4567 2147 0418 806 260 - Operations Manager	info@bilpincoaches.com.au	6/18 Bells Line of Road BERAMBING NSW 2758	Email Update
		Tomah Mountain Lodge	(02) 4567 2111	tomahlodge@ozemail.com.au	25 Skyline Road MOUNT TOMAH via BILPIN NSW 2758	Email Update
		Stoned Decorative Pebble Supplies	02 4567 7468 0428 608 850	info@stoned.com.au	PO BOX 93 KURMOND NSW 2757	Email Update
	Susan Zaia & Adrian Emery	Rustic Spirit	(02) 4567 7170	enquiries@rusticspirit.com.au	Rustic Spirit Boutique Woodlands Sanctuary 23 Glenara Road KURRAJONG HEIGHTS NSW 2758	Email Update
Educational institutions		Bilpin Public School	(02) 4567 1154	bilpin-p.school@det.nsw.edu.au	2517 Bells Line of Road BILPIN NSW 2758	Email Update
		Kurrajong North Public	(02) 4567	kurrajongn-	Stone Terrace	Email Update

Stakeholder Category	Name	Organisation	Phone	Email	Postal Address	Consultation Method
		School	7291	p.school@det.nsw.edu.au	KURRAJONG HILLS NSW 2758	
		Kurrajong Public School	(02) 4573 1647	kurrajong-p.school@det.nsw.edu.au	1111 Grose Vale Road KURRAJONG NSW 2758	Email Update
Leisure	Greg Bourke (Curator)	The Blue Mountains Botanic Garden, Mount Tomah	(02) 4567 3000	tomah@rbgsyd.nsw.gov.au	Bells Line of Road via Bilpin BILPIN NSW 2758	Email Update
Utilities		Ausgrid	13 13 65	Emergency.services@ausgrid.com.au	GPO Box 4009 SYDNEY NSW 2001	Email Update
		Jemena	(02) 9397 9000	customerrelations@jemena.com.au	PO Box 6507 SILVERWATER NSW 2128	Email Update
		Sydney Water	13 20 92	roadrestoration@sydneywaer.com.au	PO Box 399 PARRAMATTA NSW 2124	Email Update
		Telstra	1300 368 387	simon.barlow@team.telstra.com; f0501488@team.telstra.com		Email Update
		PIPE Networks Pty Limited	(07) 3233 9800	enquiry@pipenetworks.com	Level 14 201 Kent Street SYDNEY NSW 2000	Email Update
		Optus	133 937	dartnsw@optus.com.au		Email Update
		Endeavour Energy	133 718	gipa@endeavourenergy.com.au	PO Box 811 SEVEN HILLS NSW 1730	Email Update
Care facilities/Religious facilities		Saint Gregory's Catholic Church Kurrajong				Doorknock during notification process
Community Groups	Julius Timmerman	Association of Concerned Mid-	(02) 4737 7412	fliss@tpg.com.au	22 Wilson St LAWSON NSW 2783	Email Update

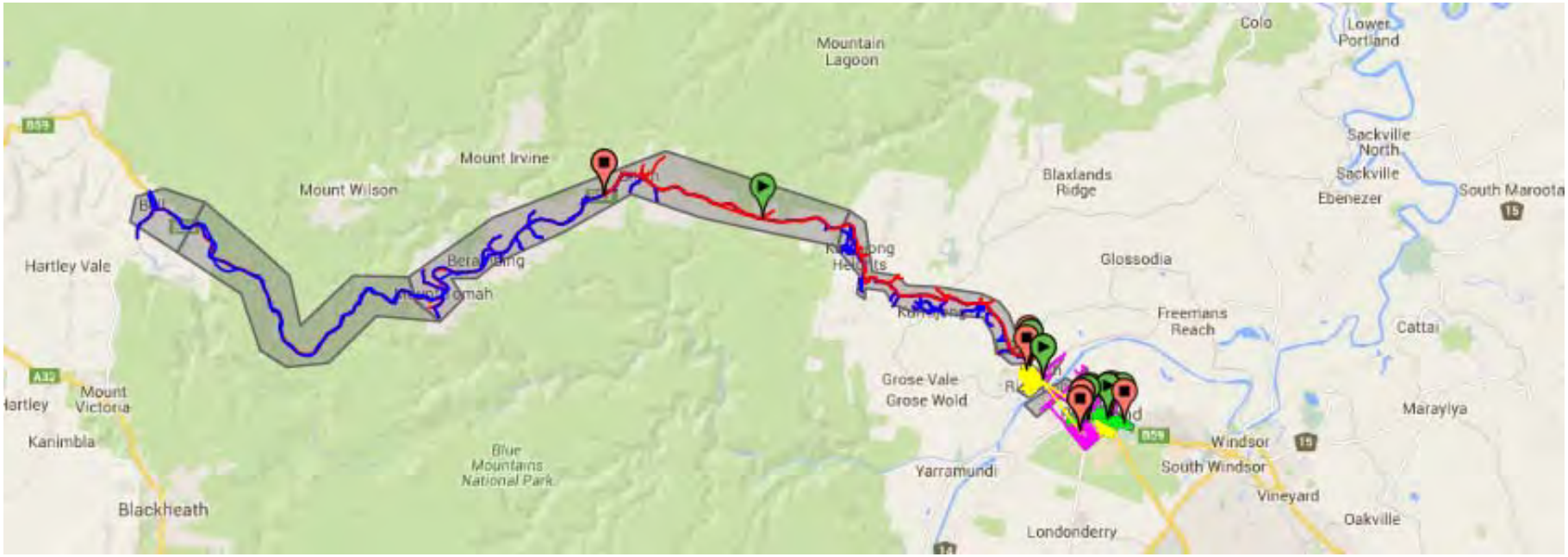
Stakeholder Category	Name	Organisation	Phone	Email	Postal Address	Consultation Method
		Mountains Residents				
		Mount Victoria Community Association Inc		admin@mountvictoria.nsw.au		Email Update
		Blue Mountains Sustainable Transport Alliance	Through Council.	council@bmcc.nsw.gov.au		Email Update - Contact Via Blue Mountains Council
	Robin Woods	Hawkesbury Rainforest Network Group	(02) 45 721 635	hrn97@tpg.com.au	HRN P.O. BOX 206 KURRAJONG NSW 2758	Email Update
	Glenn Sherlock - Strategic Planning Specialist Transport	Highway Water Issues Working Group	(02) 4780 5692	gsherlock@bmcc.nsw.gov.au		Email Update
		Blue Mountains Historical Society	(02) 4757 3824	bmhs@bluemountainshistory.com	PO Box 17 WENTWORTH FALLS NSW 2782	Email Update
		NSW Farmers Federation	02 9478 1000	emailus@nswfarmers.org.au media@nswfarmers.org.au	PO Box 459 ST LEONARDS NSW 1590	Email Update
	Steve Rawling - Convenor	Kurrajong Heights Action Group	(02) 4567 7979	casrawling@bigpond.com	1258 Bells Line of Road KURRAJONG HEIGHTS NSW 2758	Email Update
	Seamus Casey - President	Hartley Highway Action Group	(02) 6355 2113	hartleyprogress@gmail.com	PO Box 372 LITHGOW NSW 2790	Email Update
		Central NSW Councils (CENTROC)	(02) 6331 9246	Laura.Burgett@centroc.com.au	PO Box 333 FORBES NSW 2871	Email Update
	Keith Muir - Director	Colong Foundation for Wilderness, National	(02) 9261 2400	foundation@colongwilderness.org.au	Suite 201, Level 2, 332 Pitt Street	Email Update

Stakeholder Category	Name	Organisation	Phone	Email	Postal Address	Consultation Method
		Park Association			SYDNEY NSW 2000	
	Julius Timmerman	Association of Concerned Mid-Mountains Residents	(02) 4737 7412	fliss@tpg.com.au	22 Wilson St LAWSON NSW 2783	Email Update

Appendix C. Community Engagement Action Plan – Overall program

Activity	Nature & purpose	Audience	Timing	Responsibility
Community update – program wide	Prepare bi-annual community updates for the wider community and stakeholders to update them on the progress of the work.	Community and stakeholders	Quarterly	DownerMouchel.
Management of the community Infoline number and e-mail address	Respond to enquiries and complaints from the community and stakeholders in a timely manner	Community and Stakeholders	Ongoing	DownerMouchel
Contact cards	All members of the project team are issued with project contact cards to distribute to members of the community who approach them for project information. The cards feature the project's Infoline number and email address.	Community members as required	Entire project	DownerMouchel
Project website	All communication will be uploaded on the Roads and Maritime website.	All	Entire project	DownerMouchel
Site Specific Action Plans	Develop and work through each site specific community action plan.	Roads and Maritime Services.	Ongoing	DownerMouchel.

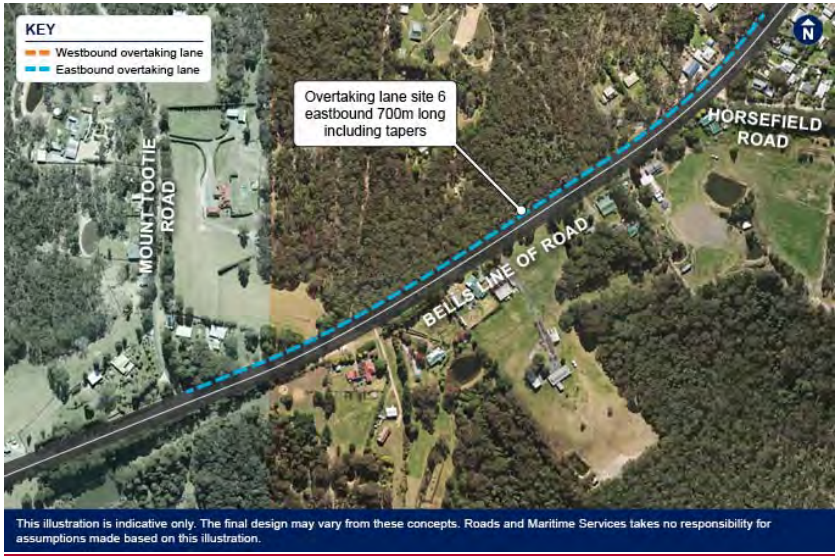
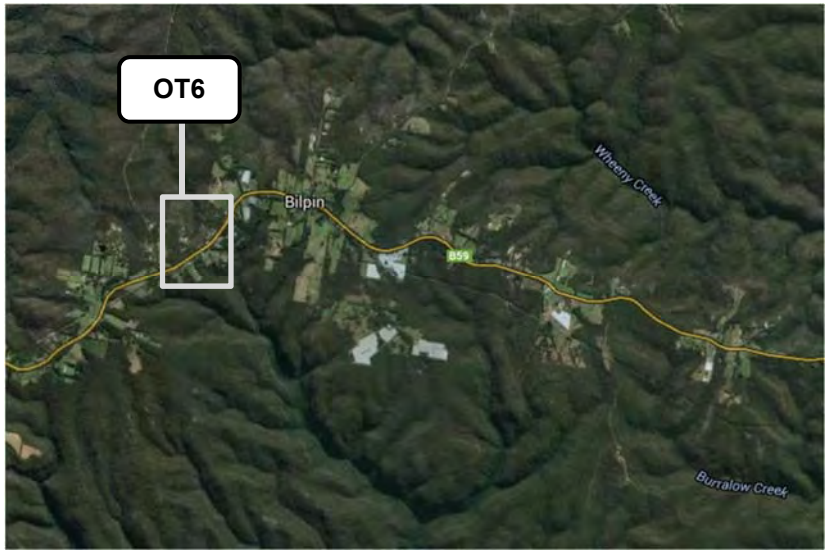
Appendix D. Distribution Area for program wide communication material



Appendix E: Enquiries and complaints process

	Communication material will direct enquiries about construction work to DownerMouchel on 1800 332 660 or nsw_projects@downermouchel.com
Enquiry	• Provide an initial response to all enquiries made by phone within two hours, where a phone number is provided • Investigate the enquiry and provide a follow-up call to the enquirer with an update within 48 hours • Provide an initial response acknowledging the receipt of enquiries via email, noting that a response will be provided within 48 hours, unless urgent and immediate response is required • Provide an initial written response to letters and faxes within five working days and verbally within two hours if a phone number is provided, and follow up with the outcome
Complaint	• Effectively manage complaints consistent with the Schedule 6 of our contract customer feedback policy • Provide an initial response to all complaints made by phone within two hours, where a phone number is provided • Investigate the cause of the complaint immediately and provide a follow-up call to the complainant with an update within 48 hours • Provide an initial response acknowledging the receipt of complaints via email, noting that a response will be provided within 48 hours, unless urgent and immediate response is required • Provide an initial written response to letters and faxes within five working days, and verbally within two hours if a phone number is provided, and follow up with the outcome

Appendix 6 Overtaking Lane Five (OT6) Site Specific Information

Item	Description
Timing	Construction target start 2016
Overview	Overtaking Lane Six (OT6) is a 0.7km Eastbound overtaking lane located 3 Km west of Bilpin. Part of Phase 1 of the Bells Line of Road Long Term Strategic Corridor Plan, • **The surrounding environment** – The site is surrounded by bushland and a number of residential and agricultural properties along the road. • **Impacts** – Majority of the work will be carried out within the road corridor, however property adjustment will be required for five properties. A full list of site specific impacts is located in the table under Site Specific Issues. • **Proposed communications approach** – Targeted stakeholder communication for OT6 is proposed with directly impacted stakeholders, located under stakeholder lists, by phone calls, emails, doorknocks and letters. Overarching Bells Line of Road stakeholders will be kept updated on OT6 via regular communication updates for the Bells Line of Road Corridor.  

Item	Description
Site Specific Issues	

Issue Identified	Description	Mitigation measures
Property acquisition/adjustment	Property acquisition/adjustment will be required in order to complete the works	• Affected landowners will be notified in advance to discuss the potential upcoming works and impact to their property. • RMS has strict requirements in the case of property acquisition.
Traffic Impacts	A Traffic and Access Management Plan outlining construction vehicle routes and detour plans will be developed to reduce congestion around the area.	• Roads and Maritime/Council-approved traffic management plans will dictate extent of temporary impacts and further management activities. • Distribute regular notifications to provide details of upcoming works and management strategies. • Doorknocks when appropriate to discuss high impact works and opportunities to reduce impacts. • Provide opportunities for the community to contact the project team to discuss impacts and suggest changes to reduce impacts. • VMS signage.
Night Works	Work will only be undertaken out-of-hours at night if necessary, and in order to minimise disruption to the community.	• As the investigations are at night, the community will be notified in writing in advance (at least seven days before work). • RMS sets strict requirements for noise assessment and mitigation which must be adhered to prior to any out-of-hours works commencing. This work will comply in full with the protocols.
Property Access Disruption	Temporary altered access for residents and business, while works move progressively along the site	• Where possible, current traffic movements and property accesses are to be maintained during the works. Any disturbance is to be minimised to prevent unnecessary traffic delays. • Access to businesses and residential properties must be maintained at all times
Noise and Vibration	DownerMouchel will select the most appropriate machinery to deliver these works to minimise noise and vibration and will closely monitor impacts during work.	• The team will ensure the most effective construction method is used for these works to minimise impact, where possible. • Noise and vibration impact assessments will be conducted to determine expected noise levels. • Various measures will be implemented to manage these noise impacts as stipulated in the EPL. • Stakeholders concerned about noise and vibration can contact the Project Infoline and a member of the Communications team will contact them within two hours to discuss their concerns.

Item	Description

Loss of trade	The potential for local businesses to experience loss of trade	• Use and promote local businesses to the project team where possible.
Fatigue	Construction on BLoR has been ongoing for over two years now which has caused some concern	• Continue to keep the community informed as the project progresses and the project's benefits.
Dissatisfaction with previous OTs	People unhappy with spray seal surface on previous OTs	• Continue to keep the community informed as the project progresses and inform them of reasons for spray seal and the project's benefits.
Uncertainty regarding OT5	Community against construction of both OT5 and 6	• Inform community that we will provide an update as the work progresses.

Stakeholders Lists

Attached

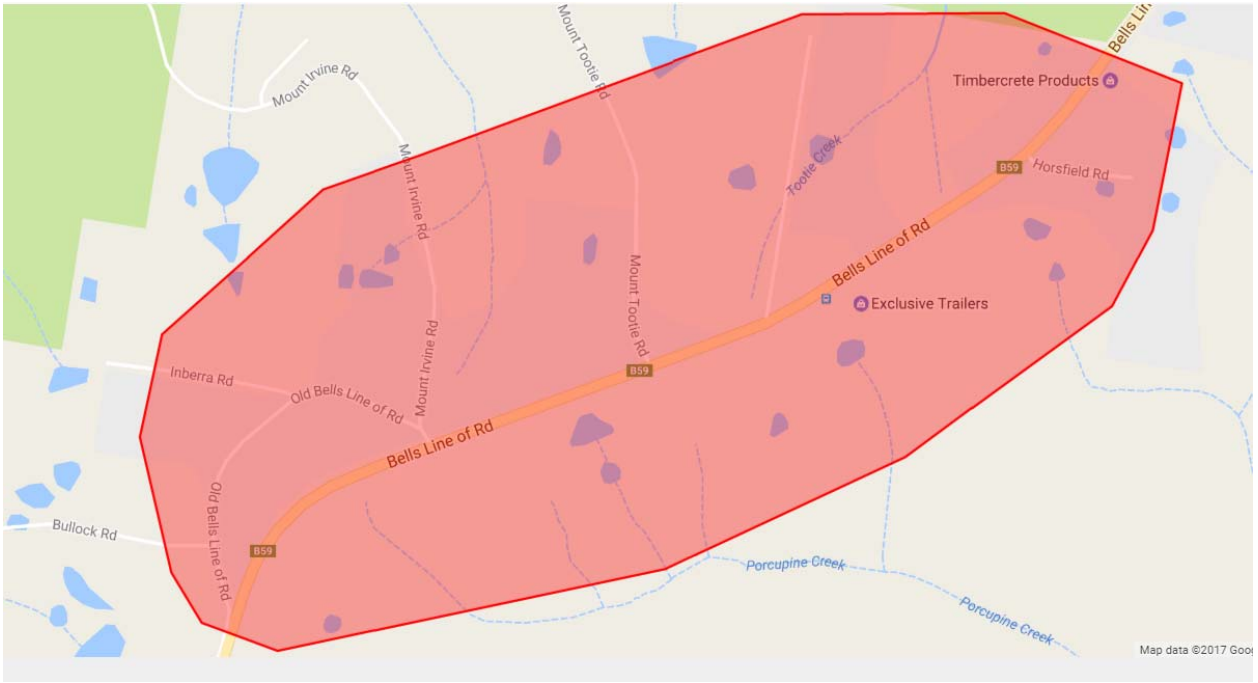
Bells Line of Road Stakeholders directly impacted by OT5

Name /address	Consultation Process	Specific Impacts	Mitigation
10 Mount Tootie Road BILPIN	Meeting and property adjustment agreement	Property Adjustment	Liaise with property owner, consult regarding impacts during design finalisation and arrange agreements as needed.
11 Mount Tootie Road	Meeting and Lease agreement	Potential Property Adjustment	Liaise with property owner, consult regarding impacts during design finalisation and arrange agreements as needed.
RFS	Ongoing discussions	Access to BLoR during construction	Liaise with RFS throughout the work
Bilpin School	Ongoing discussions	Access to the school	Liaise with RFS throughout the work

Item	Description

Action Plan

No.	Activity	Nature & purpose	Audience	Timing	Responsibility
1	Start of work letter	Inform local residents, property owners, and businesses of the proposed works	Local community	January 2017	DownerMouchel
2	Project update	Provide updates on the work	Local community	Every two months	DownerMouchel
3	Door knock	Doorknock to let people know about the site compound.	Targeted residents and local businesses in the vicinity of the site compound.	Feb 2017	DownerMouchel Design
4	End of work letter	Notify the community of end of work	Local community	Dates TBC	DownerMouchel
5	Respond to community enquiries received via DownerMouchel 1800 phone line and project email address	Timely and informative responses to community enquiries, effective and timely resolution of any complaints.	Local community	Ongoing	DownerMouchel Construction

Item	Description
Distribution Map	

14 Appendix G - DownerMouchel Plans, Procedures and Checklists

DownerMouchel policies

- DI-ZH-PO001 Environmental Policy

DownerMouchel procedures and standards

- SMC-CA-WI-307-020 Communication and Stakeholder Engagement Plan
- DA-ZH-FM116.2 Zero Harm Management Supervisor Inspection
- DA-ZH-FM116.10 Zero Harm Observation
- DA-ZH-FM116.9 Environmental Inspection Checklist
- DA-ZH-PR006 Incident Reporting and Investigation
- DA-ZH-ST054 Hazardous Chemicals and Dangerous Goods Storage Principles and Transportation
- DA-ZH-ST063 Waste Management
- DA-ZH-ST064 Soil and Water Management
- DA-ZH-ST067 Biosecurity Management
- DA-ZH-FM067.1 Vehicle Hygiene Inspection
- DA-ZH-ST068 Fill Material Management
- DA-ZH-ST069 Environmental Noise and Vibration
- DA-ZH-ST070 Air Quality Management
- DA-ZH-ST076 Heritage Management
- DA-ZH-ST135 Traffic Management

Downer
Relationships creating success

ENVIRONMENTAL SUSTAINABILITY POLICY

Downer is a leading provider of services to customers in global markets including Transportation, Mining, Energy and Industrial Engineering, Utilities, Communications and Facilities.

Our goal is to...

- minimise the short and long term impact of our activities on the environment and local communities through responsible environmental sustainable management within design, planning, delivery, construction, manufacturing and operation;
- promote a positive culture through implementing initiatives that foster sustainable innovation; and
- optimise our products and services to relentlessly improve our environmental sustainability performance and improve the sustainable use of natural resources.

Our commitment is to...

- comply with relevant environmental legislation, and appropriate industry guidelines, standards and requirements specified by our customers and regulatory agencies;
- strive for and implement responsible work practices that minimise the impact on local communities;
- implement and maintain the environmental management system in accordance with the International Standard AS/NZS ISO 14001 and integrate the requirements throughout the overarching operational systems;
- establish, monitor and review environmental sustainability objectives and targets to achieve continual improvement of our environmental sustainability performance;
- implement effective controls to identify, evaluate and mitigate adverse environmental risk of our work activities;
- take all practical steps to prevent pollution and protect biodiversity and ecosystems;
- drive innovation to address climate change mitigation and adaptation through reducing our energy and greenhouse gas emissions intensity;
- procure goods and services to minimise environmental risk and maximise environmental sustainable opportunities and benefits for the total life cycle;
- evaluate the performance, effectiveness and compliance of our environmental management systems through regular audits and reviews;
- provide ongoing education, training and encouragement to our workforce, contractors and suppliers in understanding their responsibilities for the implementation of environmental sustainability principles and practices; and
- communicate this policy and make it publically available.

Grant Fenn
CEO and Managing Director

Cos Bruyn
CEO New Zealand

Sergio Cinerari
CEO Infrastructure Services

David Overall
CEO Mining

Louis Nucifora
CEO Engineering, Construction & Maintenance

Michael Miller
Acting CEO Rail

Zero Harm Management / Supervisor Inspection

Workplace / Location:		Date:	/ /	Time:	:

PERSONS INVOLVED OR CONSULTED DURING INSPECTION

Name	Signature		Name	Signature

INSPECTION CRITERIA ***Scope of inspection to include contractors & subcontractors.*	**YES**	**NO**	**NOT OBSERVED**	**IMMEDIATE ACTION TAKEN / GENERAL COMMENTS**
People				
Persons wearing correct PPE	☐	☐	☐	
Persons engaged in regular safety discussion (pre-start meetings/ toolbox talks)	☐	☐	☐	
Persons properly inducted, including adequate site-specific induction	☐	☐	☐	
Persons can describe site hazards, evacuation and first aid procedures	☐	☐	☐	
Persons can describe course of action if a hazard is identified or job/task is unsafe	☐	☐	☐	
Contractors authorised to work on site (i.e. Authority to Work Permit)	☐	☐	☐	
Plant & Vehicles				
Plant subject to regular inspection (documented) - Daily Plant Check Sheets for Mobile Plant	☐	☐	☐	
Plant is fit for purpose, including adequate maintenance, cleaning, guarding, and warning systems (e.g. reversing alarms, flashing lights etc.)	☐	☐	☐	
Operators properly trained, licensed and competent	☐	☐	☐	
Traffic Management Plan in place (documented) – Controls in place as per plan	☐	☐	☐	
Reversing kept to an absolute minimum and spotters used correctly	☐	☐	☐	
Persons on foot maintain a safe distance from moving vehicles and plant	☐	☐	☐	
Safe speed maintained (brisk walking pace when around persons on foot)	☐	☐	☐	
Safe area established for onsite cleaning of plant & vehicles	☐	☐	☐	
Processes & Housekeeping				
Site risks identified, controlled and regularly reviewed (documented evidence)	☐	☐	☐	
Safe Work Method Statements (SWMS) and MSDSs available on site and kept up-to-date	☐	☐	☐	
Unsafe plant/equipment tagged out	☐	☐	☐	
Isolation, lock-out and tag-out applied during maintenance and repairs	☐	☐	☐	
Electrical equipment tagged, tested and fit for purpose	☐	☐	☐	
Emergency equipment available and serviced (e.g. fire, first aid & spill equipment)	☐	☐	☐	

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Zero Harm Management / Supervisor Inspection

INSPECTION CRITERIA ***Scope of inspection to include contractors & subcontractors.*	YES	NO	NOT OBSERVED	IMMEDIATE ACTION TAKEN / GENERAL COMMENTS
Manual handling adequately controlled (e.g. lifting aids, techniques, job rotation etc.)	☐	☐	☐	
Overhead and underground services identified and controlled	☐	☐	☐	
Chemicals and Dangerous Goods correctly used, labelled and stored	☐	☐	☐	
Permits issued for Hot Work, Confined Space Entry and Excavation/Trenching	☐	☐	☐	
General housekeeping maintained to an acceptable standard	☐	☐	☐	
Worksite amenities adequate (e.g. drinking water, toilets, shelter etc)	☐	☐	☐	
Environment				
Adequate collection and disposal of waste	☐	☐	☐	
Noise levels reduced as far as possible	☐	☐	☐	
Prevention of spills/leaks (e.g. bunding of drums, tanks and wash bay facilities)	☐	☐	☐	
Impacts on native vegetation, wildlife habitat and aboriginal heritage minimised	☐	☐	☐	
Other Issues Identified				

FURTHER ACTION REQUIRED	BY WHO	DUE DATE
		/ /
		/ /
		/ /
		/ /
		/ /

INX Reference #

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Environmental Inspection Checklist

Workplace / Location:		Date:	/ /	Time:	:

PERSONS INVOLVED OR CONSULTED DURING INSPECTION			
Name	Signature	Name	Signature

The inspection checklist is to be updated to be site specific. Refer to site specific Risk Registers, EMP or ZHMP.

INSPECTION CRITERIA *Scope of inspection to include contractors & subcontractors*	**C / NC / NA** *Compliant* *Not Compliant* *Not Applicable*	**IMMEDIATE ACTIONS TAKEN/ GENERAL COMMENTS**
Zero Harm Risk Management (*DA-ZH-PR028*)		
Risk assessments (SWMS/ Be A Star) on site include relevant environmental hazards and controls.		
Waste Management (*DA-ZH-ST063*)		
All sites (including car parks and compounds) are clean and litter free.		
Waste streams segregated where possible with no evidence of cross contamination.		
All bins required are supplied, labelled and covered. Easily accessible and collected regularly by a licenced waste contractor.		
All concrete washout/ waste disposed appropriately.		
Soil and Water Management (*DA-ZH-ST064*)		
All site access points are stabilised and adjoining public roads are free of mud and dirt.		
All erosion and sediment controls are correctly installed and maintained.		
No evidence of soil erosion or sediment deposition.		
Stockpiles <2 metres high, with a 2:1 or greater batter, and away from natural drainage lines.		
Temporary toilets and associated warning devices in working order.		
Water taps, hoses and pipes in working order and no evidence of leaks.		
Oil water separators in working order and emptied regularly.		
Biosecurity (Weed, Pathogen or Pest) Management (*DA-ZH-ST067*)		
Site biosecurity certification is implemented (stickers/ records).		
New infestations are not evident.		
Vehicles are washed down in a well maintained, designated wash down bay.		
Environmental Noise and Vibration (*DA-ZH-ST066*)		
All works are restricted to the specified hours of operation.		
Noise/ vibration impact controls are in place.		
Air Quality Management (*DA-ZH-ST070*)		
Dust suppression controls are implemented and there is no visible dust leaving site.		

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Vehicles/ plant transporting fill material have covered loads.		
Stack and vehicle exhausts are free from black smoke or significant visual emissions.		
Flora and Fauna Management (*DA-ZH-ST071*)		
All vegetation clearing or disturbance is approved and undertaken in compliance with permits and/ or site management plans.		
Boundary fencing/ flagging is installed to prevent access to protected areas.		
Controls in place to minimise disturbance to flora and fauna are maintained and effective.		
Disturbed/ exposed areas are stabilised and revegetated progressively.		
Heritage Management (*DA-ZH-ST076*)		
Heritage areas are known to site personnel, fenced, signed, and protected from disturbance.		
Hazardous Chemicals and Dangerous Goods (*DA-ZH-ST024*) and *DA-ZH-ST054 Hazardous Chemicals and Dangerous Goods Storage Principles and Transportation*		
Chemicals are correctly stored as per Australian Standard requirements, including appropriate segregation, minimum clearances around bulk fuel storage containers, and bunding is free of rubbish or waste water.		
All chemicals on site have a valid Safety Data Sheet. (<5 years old)		
Spill response equipment on site is relevant for works, available for all work crews, readily accessible and fully stocked.		
Drip trays are available for use during refuelling.		
Waste drums and IBC's are regularly emptied and disposed of.		
Fire Management (*DA-ZH-ST041 Hot Work*)		
Adequate firefighting equipment is available.		
Hot works permits are available and adhered to for all hot work activities.		
All fire restriction are monitored, communicated to work crews and adhered to.		
Energy Management		
All vehicles, plant (generators) and equipment (lights and appliances) not in use is switched off.		
OTHER ISSUES IDENTIFIED		
INSPECTION SIGN OFF		
Total number of corrective Actions Identified:		
Signature of Responsible Manager:		

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Zero Harm Observation

Observer(s):			
Workplace/ Location:		Date:	/ /
Task(s) Observed:			
Worker(s) Observed	☐ Employee (including Contractors)	☐ Employee only	☐ Contractor only

PERSONS INVOLVED OR CONSULTED DURING BEHAVIOURAL OBSERVATION

NAME:	NAME:

CATEGORY (CAT) *See reverse for category listing.*

PEO – People	MH – Manual Handling	WP – Work Practices
SER – Services	PE – Plant & Equipment	HK – Housekeeping
PPE – Personal Protective Equipment	PPI – Plant/ Pedestrian Interface	FP – Fall Protection
ISO – Isolation (Energy Sources/ Guarding)	ENV – Environment	TM – Traffic Management

BEHAVIOURAL OBSERVATIONS AND ACTIONS

Note: Behavioural Observation team member(s) to record each behavioural observation and action taken.

CAT	SAFE BEHAVIOURAL OBSERVATIONS

Are there any "STAR performers" observed or identified through discussion? If so, whom?

CAT	"AT–RISK" BEHAVIOURAL OBSERVATIONS OR UNSAFE CONDITIONS		
	1.		
	Action:	**Who:**	**By:**
	2.		
	Action:	**Who:**	**By:**

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CAT	"AT–RISK" BEHAVIOURAL OBSERVATIONS OR UNSAFE CONDITIONS, continued		
	3.		
	Action:	**Who:**	**By:**
	4.		
	Action:	**Who:**	**By:**
Any SWMS reviewed? *If so, please list*			

INX Reference #

CATEGORIES	EXAMPLES TO CONSIDER			
PEO (People)	▪ Persons engaged in regular safety discussion (pre-start meetings/ toolbox talks)	▪ Persons properly inducted, including adequate site-specific induction	▪ Persons can describe site hazards, evacuation and first aid procedures	▪ Persons can describe course of action if a hazard is identified or job/ task is unsafe
SER (Overhead and Underground Services)	▪ Excavation Permits/ authorisation	▪ DBYD (Dial before you Dig)	▪ Visual Aids installed	
PPE (Personal Protective Equipment)	▪ Long Sleeves, Long Trousers ▪ Glasses	▪ Double eye protection ▪ Hearing protection	▪ Hard Hat/ Head protection ▪ Gloves	▪ Lace up Boots ▪ Respiratory protection
ISO (Isolation, Energy Sources, Guarding)	▪ Correct use of locks? ▪ Equipment lockout ▪ Electrical equipment tested/tagged	▪ Stored Energy Hazards identified ▪ RCD's fitted	▪ Welders & Generators grounded ▪ Adequate lighting	▪ No exposed wires or cuts ▪ Load restraint
MH (Manual Handling)	▪ Lifting ▪ Pulling ▪ Pushing	▪ Keeping out of Pinch points ▪ Staying out of line of fire	▪ Keeping eyes on path/ job ▪ Ascending/ Descending	▪ Striking against ▪ Repetitive movements ▪ Ergonomics
PE (Plant & Equipment)	▪ Guards fitted ▪ Access/ Egress ▪ Cylinders stored correctly	▪ Storage ▪ Inspections/ PreStart checks ▪ Valid License	▪ Competent operators ▪ Fire protection ▪ Flashing lights	▪ Reverse alarm ▪ ROPS/ FOPS fitted ▪ Hand & power tools

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CATEGORIES	EXAMPLES TO CONSIDER			
PPI (Plant and Pedestrian Interface)	▪ Can't See, Can't Work maintained ▪ Vehicle Movement Plan (Worksite Diagram) ▪ Reversing kept to an absolute minimum and spotters used correctly	▪ Parties to acknowledge each other by exchange of hand signals and/ or verbal contact	▪ Persons on foot maintain a safe distance from moving vehicles and plant ▪ Use turn around bays instead of reversing, whenever possible to do so	▪ Safe speed maintained (brisk walking pace when around persons on foot)
ENV (Environment)	▪ Erosion ▪ Fauna & Flora	▪ Noise ▪ Dust	▪ Sediment ▪ Spillage	▪ Bunding ▪ Adequate collection and disposal of waste
WP (Work Practices)	▪ SWMS/WI ▪ Permit(s)	▪ Barricades ▪ Signage	▪ Observer ▪ Tag lines ▪ Excavation/ Trenching	▪ Hot Work ▪ Confined Space Entry
HK (Housekeeping)	▪ Leads off ground ▪ Accessibility	▪ Hoses	▪ Slip/Trip Hazards	▪ General Site Presentation
FP – Fall Protection	▪ Edge Protection ▪ Penetrations covered ▪ Overhead protection	▪ Harnesses ▪ Static lines ▪ Inertia reels	▪ Scaffolding ▪ Ladders ▪ Barricades	▪ Signs
TM – Traffic Management	▪ Traffic Management Plan in place	▪ Controls in place as per plan	▪ Traffic Control competency ▪ Risk Assessment	▪ Signs/Devices

KEY GUIDES

- The purpose of the ***Zero Harm Observations*** is to improve the Zero Harm behaviour and welfare of all people who work or visit our site.
- Demonstrate your genuine concern for the Health, Safety and welfare of our workers
- Include/ Engage workers including Contractors
- Focus on good practices as well as detecting poor practices.
- Recognise and reward desired behaviour; *(identify our STAR performers)*
- Observations should be focused and of short duration (Approx. 30-45 minutes max)
- Review past behavioural observation(s) to identify possible items to check
- Select areas of high risk or high activity
- Use mutual discussion to identify appropriate action and gain commitment to change
- Provide immediate feedback
- Take accountability for ensuring prompt follow up actions happen
- Behavioural Observation Teams should consist of at least two people to assist learning

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1 PURPOSE

To ensure that all accidents and incidents are properly investigated so that corrective action can be taken to prevent their reoccurrence.

2 SCOPE

This Management Procedure addresses the requirements associated with the initial response, classification, reporting and investigation of incidents within Downer Australia. This applies to all Downer Australia personnel and visitors.

For specific requirements relating to the management of emergencies, refer ***DA-ZH-PR015 Emergency Preparedness & Response.***

Transitional Note**:** this procedure supersedes ***MS005 Incident Reporting & Investigation*** in the **Works IMS,** ***E-SE-P08 Incident Management*** in **DEEMS** and ***DEE-SM-Pr028 Incident Reporting and Investigation*** in the **Emerging Sectors IMS**.

3 DEFINITIONS

INX InControl	The Zero Harm database used to record, investigate and follow-up Events (includes Audits, Hazards, Incidents, Inspections, Meetings, Observations, Risk Assessments, Reviews and Suggestions.
Incident/Injury Definitions	***Refer DG-ZH-MF7.1 Incident Reporting, Classification and Management*** ***http://intranet.downeredi.com/ZeroHarm/Zero%20Harm%20Document%20Library/DG-ZH-MF007.1%20Incident%20Reporting%20Classification%20and%20Management.pdf***
Personnel	A collective term used to describe Downer Australia Management, Employees, Contractors and Casual labour
Responsible Manager	The relevant Downer Australia Manager assigned with the authority, responsibility and control of a specific workplace area or function.
Zero Harm Alert	A notice requiring immediate communication and action due to the occurrence of a serious injury or risk. These should be discussed as soon as practicable (using ***DA-QA-TP005.1 Alert***).
Zero Harm Bulletin	A notice for communication of general risks or issues that should be communicated at the next available toolbox meeting (using ***DA-QA-TP005.2 Bulletin***).
Zero Harm Initiative	A notice for a proactive/innovative risk control, process, equipment and/or operation identified that may have benefits in other areas of the business and are disseminated accordingly (using ***DA-QA-TP005.3 Initiative***).
Scheme Project	A Scheme project is a project that is directly or indirectly funded by the Australian Government which meets the Office of the Federal Safety Commissioner (OFSC) Scheme thresholds

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4 REQUIREMENTS AND RESPONSIBILITY

The Downer Australia ***Incident Reporting & Investigation*** procedure comprises 4 key stages (Figure 1 and Table 1 below), each with a number of steps, plus an additional Rail Supplement.

Figure 1

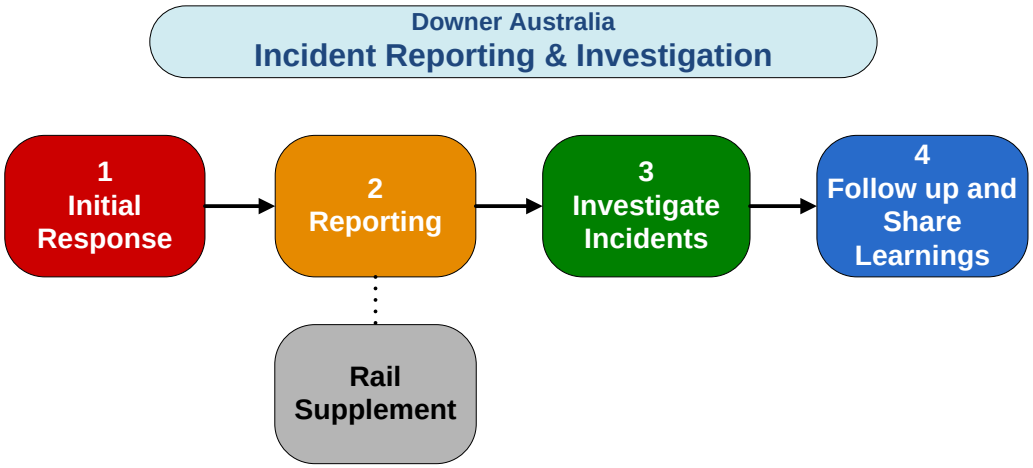

Table 1 – Incident Reporting and Investigation Management Procedure

Stages	Steps	Actions	Responsibility
1 Initial Response	Respond Immediately to Prevent Further Harm	Establish the nature of the Incident e.g., injury, property damage, environmental etc. **Take immediate steps** to stabilize or quarantine the area and ensure site emergency response personnel are notified i.e. First Aid Officers, Area Wardens etc. Also refer *Annex 1 DA-ZH-FM006.2 Incident Reporting & Investigation Flowchart*	All Personnel
	Preserve the Scene	Ensure incident scene is preserved where possible and critical information obtained, for example: ▪ Full names of injured persons; ▪ Exact time and location of incident; ▪ Photos of incident scene ▪ Sequence of events leading to incident; ▪ Statements from persons involved; ▪ Details of plant/equipment involved, including registration numbers for third party vehicles; For serious Incidents, ensure scene is preserved until authorities give permission to re-enter the area. Further Emergency Response requirements are detailed in ***DA-ZH-PR015 Emergency Preparedness & Response.*** Drug and Alcohol testing may be conducted for incidents involving plant / equipment operation and/or where operator error is a potential contributory factor.	All Personnel Responsible Manager

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Stages	Steps	Actions	Responsibility
2 Reporting	Classify Incident / Identify Reporting Requirements Provide Notifications	***Classify the Incident*** Refer *Annex 2* for the Classification of Workplace Incidents within Downer Australia; for detailed Injury classifications including MTI/RWI/LTI definitions, refer to ***DG-ZH-MF7.1 Incident Reporting, Classification and Management.*** Provide Person to Person Verbal notifications (not leaving messages) within 30 minutes and in accordance with the ***DA-ZH-FM006.2 Incident Reporting & Investigation Flowchart.*** All Incidents shall be recorded in the **INX InControl** database. Where this is not possible within a few hours, the Incident shall be captured via ***DA-ZH-FM006.1 Incident/Hazard Report Form*** or using the relevant ***INX InControl Forms*** and then entered into the **INX InControl** database within 48 hours. Supporting documents (e.g. photos) must be attached.	Responsible Manager
	Provide Written Notifications *(Capture Details)*	Document critical details, including: ▪ the full names and contact details of all people involved, including third parties and eye witnesses ▪ the exact nature of injuries, property damage or environmental harm sustained; ▪ statements from people involved in the Incident, including third parties and eye witnesses ▪ details of any plant or property involved in the Incident, including registration numbers of third party vehicles involved; ▪ photographs of the incident scene	
	Immediate Notifications	**Immediate Notifications** For Category 3, 4, 5 and 6 Actual & Potential Incidents, including all near misses (no harm), LTI's and additionally MTI's (Category 2), a ***DA-ZH-FM006.3 Immediate Notification Form*** shall be completed and emailed to the Divisional Chief Operating Officer's office within 8 hours of the Incident. The COO must convene a telephone conference with their operational Executive team, the line manager of the business that the incident has occurred in, and GM Zero Harm. The CEO should be invited as an optional attendee. All attempts should be made to schedule this within 1 working day of the incident notification being received.	Responsible Managers Divisional COOs

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Stages	Steps	Actions	Responsibility
2 Reporting, continued	Immediate Notifications, continued	The business unit that has had the incident is required to present during the teleconference: ▪ A description of the incident ▪ The outcomes of the incident ▪ The presence or absence of controls that should have been in place ▪ Initial findings known that may have contributed to the incident Initial lessons learned for the information of the business	Responsible Managers
	Complete Statutory Reporting	Following a Zero Harm **Notifiable Circumstance** or **Incident**, immediate verbal and written notification (using an approved form) shall be provided to the relevant authorities (i.e. WorkSafe, EPA, Rail Regulators) within required timeframes. If the client is undertaking reporting, confirm the client has fulfilled their reporting obligations. A copy of the client's report may also need to be obtained.	Regional Zero Harm Managers
	Office of the Federal Safety Commissioner (OFSC) Reporting	An OFSC Incident Report shall be completed for the following where Downer Australia are a Principal Contractor: ▪ All fatalities irrespective of the project value (notify immediately to 1800 652 500 and provide report within 48 hours); ▪ Any incident resulting in a LTI and RWIs (Restricted Work Injuries) where the project value is $3 million or more (provide report within 48 hours if a Notifiable Incident, otherwise provide report within 3 weeks) ▪ Any MTI (may include RWIs) or dangerous occurrence on a **Scheme Project** (provide report within 48 hours if a Notifiable Incident, otherwise provide report within 3 weeks). For further information relating to OFSC incident reporting requirements, refer the following link: *http://www.fsc.gov.au/Resources/AZ/Pages/OHSPerformanceReportingPack.aspx*	GM Zero Harm

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Stages	Steps	Actions	Responsibility
3 Investigate Incidents	Investigate all Incidents	All Incidents (irrespective of category) shall be subjected to an investigation within 48 hours of the Incident occurring and as per ***DG-ZH-MF7.1 Incident Reporting, Classification and Management.*** All Incident investigations shall: ▪ be conducted by persons with the required level of knowledge and training, which may include the use of subject matter experts; ▪ identify the factors that led to the hazard, injury, illness, incident or other system failure; ▪ recommend appropriate corrective actions to be taken; and ▪ prompt a review of systems / processes / procedures (incl. work instructions / SWMS) where required. Key steps include: ▪ Establishing an Investigation Team ▪ Gathering data ▪ Identifying contributory factors ▪ Identifying corrective actions ***Category 1-3 Incidents*** and/or as directed by BU Mgr/GM Zero Harm shall involve an individual with Incident Investigation Training e.g. ICAM, causal analysis or corrective action training.	Responsible Manager
	Conduct an ICAM Investigation	For ***Category 4-6 Incidents*** and/or as directed by BU Mgr/GM Zero Harm an ICAM investigation shall be conducted to establish immediate causes and root cause of the Incident. ***See DA-ZH-FM006.4 ICAM Report Template***, ***DA-ZH-FM006.5 ICAM Interview Guide*** and ***DA-ZH-FM006.6 Witness Statement Template.*** Investigations using the ICAM methodology for ***Category 3*** incidents or below are instigated at the discretion of the Business Unit Manager or GM Zero Harm. The ICAM / Incident Investigation methodology shall also be completed for incidents with a **Likelihood of 4 – 5** in accordance with the Risk Assessment Matrix. For investigative responsibilities by incident severity, refer the ***DG-ZH-MF7.1A Annex A - Downer Zero Harm Reporting & Investigation Matrix.***	Authorised ICAM Investigator Responsible Manager
	Implement Corrective Actions	All corrective actions arising from Incident Investigation shall: ▪ Be monitored through the I**NX Database** ▪ Have a responsible owner ▪ Be implemented within agreed timeframes ▪ Be closed-out once completed	Responsible Manager

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Stages	Steps	Actions	Responsibility
4 Follow up and Share Learning's	Monitor, Review and close-out Corrective Actions	All Incidents and related assigned corrective actions shall be managed via the **INX InControl** database and **closed out within a month** where practicable. Incidents unable to be closed out within this timeframe shall be monitored and monthly progress reports are to be provided until completed. Those matters representing the greatest safety risk is to be given priority when undertaking corrective action. Monthly update reports shall be reviewed by GM's and EGM's for all ***Category 4 to 6*** Incidents and corrective actions shall be reviewed for effectiveness.	Responsible Manager
	Zero Harm Notifications	Where corrective actions need to be shared across the wider business, a Zero Harm Notification shall be completed, distributed for communication through Tool Box talks. The process is as follows: 1. Zero Harm Alerts, Bulletins and Initiatives shall be developed using ***DA-QA-TP005.1 Alert*** and ***DA-QA-TP005.2 Bulletin*** and ***DA-QA-TP005.3 Initiative*** respectively by the business area who had the incident / discovered the risk as soon as possible, post the immediate notification teleconference. 2. The business will provide a copy of the Alert, Bulletin or Initiative to the responsible manager to review and approve. 3. The Alert, Bulletin or Initiative will then be provided to the Manager, Zero Harm Systems and Business Stream Zero Harm General Manager for approval. 4. The Executive General Manager (EGM) of the region shall authorise the Alert / Bulletin after quality checks are completed. 5. The document number for the Alert / Bulletin will be issued by a Dower Business Systems representative. 6. The EGM shall circulate the finalised Alert, Bulletin or Initiative to the Senior Management Team. 7. The Senior Management Team will then distribute the Alert, Bulletin or Initiative to their GMs and the wider business, including other Downer Australia Divisions where applicable.	Responsible Manager EGM Regional ZH Manager EGM Responsible Manager

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RAIL SUPPLEMENT – the following applies additionally for Rail Operational Events			
Stages	**Steps**	**Actions**	**Responsibility**
Rail General	All Category 3 Rail Events and Above	A ***DA-ZH-FM006.3 Immediate Notification Form*** shall be completed and emailed to the Senior Management Team within 8 hours of the **Incident.** This includes (but not limited to) Rail Collisions, Rail Derailments & Positive Drug / Alcohol tests	Responsible Manager
Rail bound plant or Hi-Rail vehicle involved in an Incident	Downer Rail bound plant or Hi-Rail vehicle	The Rail Plant Manager must be notified when a Downer rail bound plant or hi-rail vehicle is involved in a collision or derailment. The Rail Plant Manager will implement ***RLWI040*** (Maintenance & Inspection of Rolling Stock and Road-Rail Vehicles). Under no circumstances shall the plant be reinstated on track without the Rail Plant Manager or his representative's approval. A record of the inspection must remain with the relevant **INX** report.	
	Contractor / Supplier Rail bound plant or Hi-Rail Vehicle	All contractor / supplier rail bound plant or hi-rail vehicles(s) that have been involved in a derailment or collision must be inspected by a qualified and experienced maintainer and deemed free of defect prior to the plant being reinstated on Downer sites. A record of the inspection and the relevant qualification and experience must remain with the relevant **INX** report.	
	Contractor / Supplier Rail bound plant or Hi-Rail Vehicle (cont.)	Where the contractor / supplier chooses to dispose of the plant, a letter on the contracting / supply company letterhead must be sent to Downer stating the specific plant that has been disposed of. A copy of the letter must remain with the relevant **INX** report.	Responsible Manager
Positive Drug and/or Alcohol Tests	Drug/Alcohol Test Results	Positive Drug and/or Alcohol test results in Rail Operations are to be reported and managed in accordance with ***RLWI012 Drug & Alcohol Testing.*** If a worker was performing a critical task prior to a positive result and removal from site. The Supervisor must ensure that critical safety work has been checked for compliance to the applicable standard. An **INX** report is to be specifically submitted for Positive Drug and/or Alcohol results and marked "restricted" for privacy and security.	

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5 REFERENCED DOCUMENTS

PROCEDURES

DA-ZH-PR001	Responsibility and Accountability
DA-ZH-PR015	Emergency Management
DA-ZH-PR022	Visitor & Contractor Management

FORMS

DA-QA-TP005.1	Alert
DA-QA-TP005.2	Bulletin
DA-QA-TP005.3	Initiative
DA-ZH-FM006.1	Incident/Hazard Report Form
DA-ZH-FM006.2	Downer Incident Reporting & Investigation Flowchart
DA-ZH-FM006.3	Immediate Notification Form
DA-ZH-FM006.4	ICAM Report Template
DA-ZH-FM006.5	ICAM Interview Guide
DA-ZH-FM006.6	Witness Statement Template
DG-ZH-MF7.1	Downer Incident Reporting, Classification and Management
DG-ZH-MF7.1A	Annex A - Downer Zero Harm Investigation and Reporting Matrix
http://DG.inxsoftware.com/	INX InControl database

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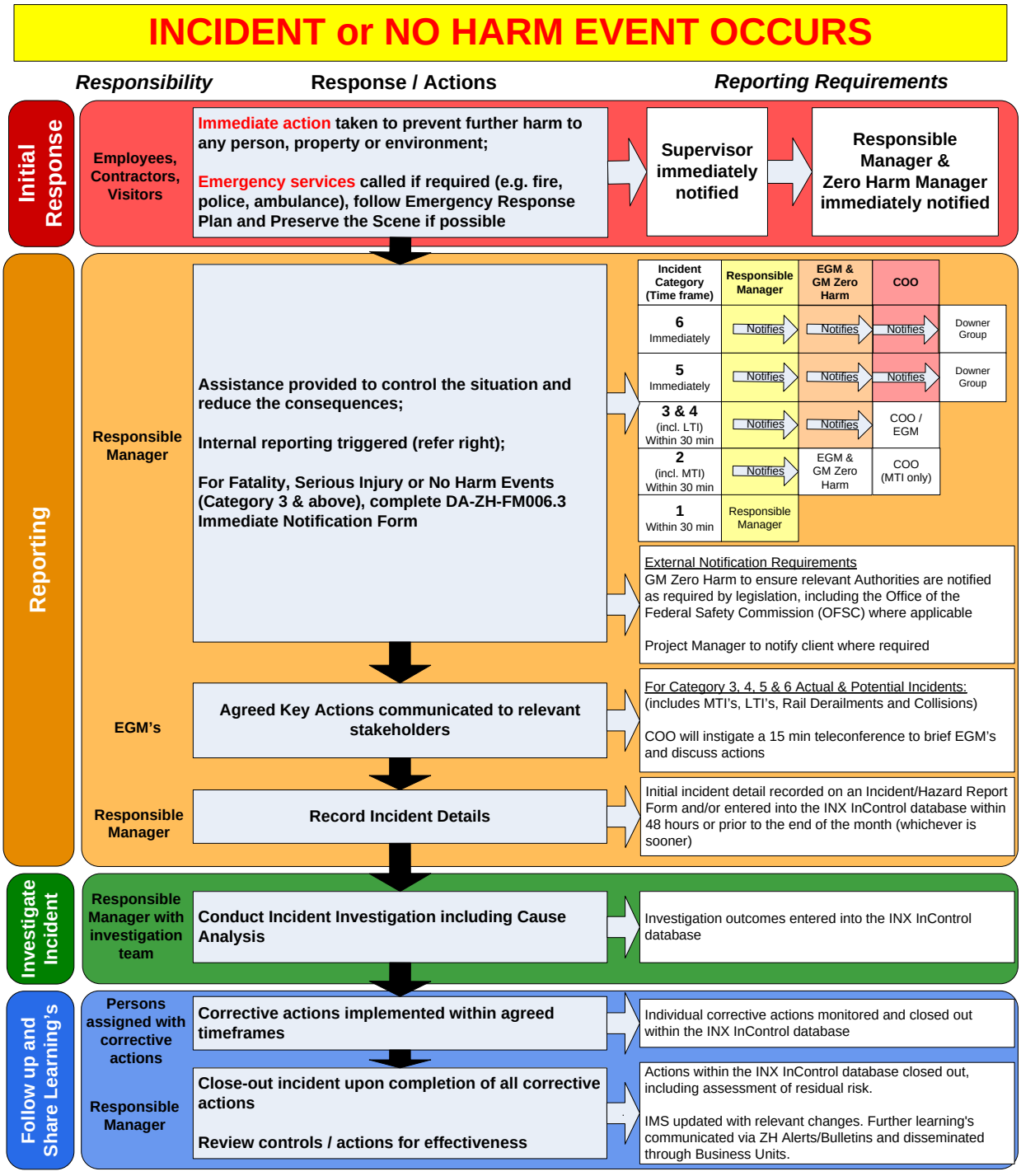
ANNEX 1 - DA-ZH-FM006.2 INCIDENT REPORTING & INVESTIGATION FLOWCHART



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ANNEX 2 – CLASSIFICATION OF WORKPLACE INCIDENTS WITHIN DOWNER AUSTRALIA

Severity (or potential severity) Ranking	Downer Severity (Category) Rating Level	Health and Safety	Environment and Community
Extreme	**6**	▪ Multiple fatalities or significant irreversible effects to numbers of people. ▪ Damage or harm with catastrophic loss That has the potential to impact Downer's Viability. ▪ Includes multiple Level 5 Incidents ▪ Loss of licence to operate.	▪ Catastrophic, widespread impact on the Environment resulting in irreversible damage. ▪ Complete loss of trust by affected community leading to long term social unrest and outrage
Very High	**5**	▪ Single fatality and/ or severe irreversible disability to one or more persons. ▪ Damage or harm with permanent loss of capability and has the potential the impact on the Divisional viability. ▪ Limitations to 'licence to operate.	▪ Significant impact or serious harm on the Environment reversible. ▪ Prolonged community outrage.
High	**4**	▪ Damage or harm with Permanent loss of function. ▪ Moderate irreversible disability of impairment to one or more persons. ▪ Lost time injury, more than 28 days lost. ▪ Includes Dangerous Occurrences.	▪ Significant impact or material harm on the environment or a notifiable incident. ▪ Long term community irritant leading to disruptive actions and requiring continual management attention.
Medium	**3**	▪ Lost Time Injury. ▪ Damage or harm with temporary loss of function.	▪ Moderate impact to the environment or material harm or a notifiable incident. ▪ Short term community unrest and dissention.
Low	**2**	▪ Medical Treatment injury. ▪ Damage or harm with no loss of function.	▪ Minor impact on the Environmental. ▪ Community complaint Requiring intervention and management attention.
Very Low	**1**	▪ First Aid treatment required. ▪ Insignificant disruption.	▪ Negligible impact on the Environment. ▪ No potential for community complaint.

For detailed Injury definitions, refer ***DG-ZH-MF7.1 Incident Reporting, Classification and Management.***

For further information refer to ***DG-ZH-MF7.1A Annex A - Zero Harm Investigation and Reporting Matrix.***

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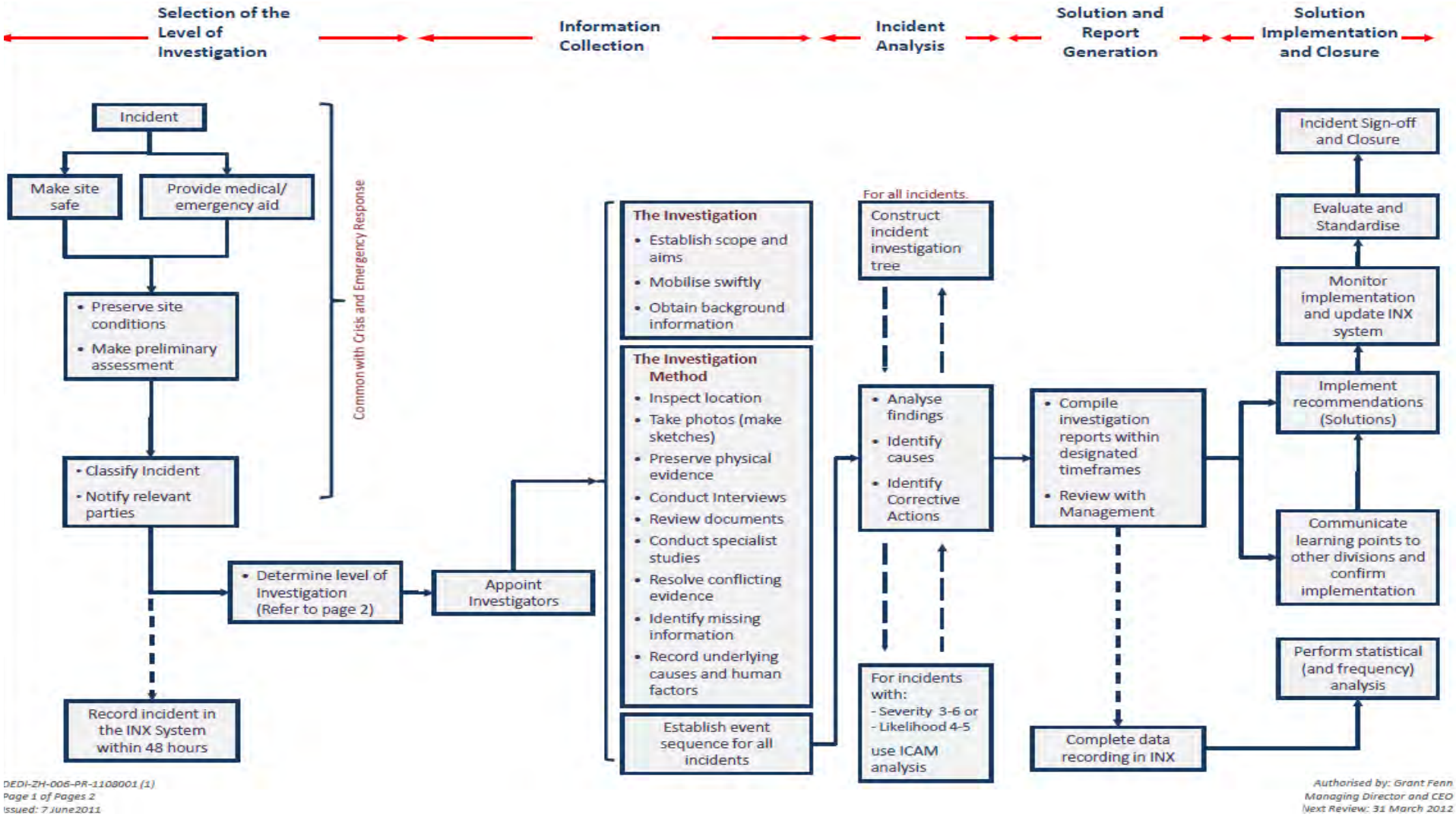
ANNEX 3 – DOWNER INCIDENT REPORTING, CLASSIFICATION AND MANAGEMENT



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Zero Harm Standard

This standard defines the requirements for ensuring the storage, disposal, and transportation of Hazardous Chemicals and Dangerous Goods is undertaken in a safe and compliant manner.

For the Planning and General Requirements, refer ***DA-ZH-ST024 Hazardous Chemicals and Dangerous Goods***.

Where a Downer Infrastructure client prescribes an alternative methodology for on-site processes that is of an equal or higher standard, the client's methodology shall be applied as determined by the responsible Zero Harm person.

For further information and external references, refer ***DG-ZH-CG024 Hazardous Chemicals and Dangerous Goods***, ***DG-ZH-CG054 Storage and Warehousing*** and ***DG-ZH-CG023 Safety Data Sheet.***

Planning / General Requirements	Responsibility
Storage of Hazardous Chemicals and Dangerous Goods	
Hazardous Chemicals and Dangerous Goods shall be stored in accordance with risk assessment outcomes and Safety Data Sheet (SDS) recommendations. OH&S statutory regulators and Emergency Services shall be notified of any hazardous chemicals that exceed storage quantities as defined in **Schedule 11** of the harmonised ***2012 Work Health and Safety Regulations***. **Important:** At Downer Infrastructure occupied sites/facilities (such as Asphalt Plants, Manufacturing facilities, depots etc...) a scaled site plan detailing the storage locations including the location of each Intermediate Bulk Container (IBC), site entry points, essential services (e.g. fire hydrants and isolation points), location of drains and a description of surrounding properties shall be made available. i)The following storage principals shall be adhered to as a minimum: ▪ volumes are kept as low as reasonably possible; ▪ locations are isolated from other work areas (including traffic areas) as much as reasonably possible; ▪ appropriate spill containment is provided where significant volumes of substance are stored (e.g. bunding, spill trays etc.); ▪ conditions (e.g. ambient temperature) do not adversely affect the stability of chemicals/substances; ▪ bulk containers, including tanks, piping, flanges, fittings etc. are inspected and tested in accordance with Australian Standards (e.g. periodic integrity testing of tanks); ▪ adverse reactions arising from the mixing of incompatible substances are prevented (including in the event of spillage) Reference to supporting guides such as the Australian Dangerous Goods Code (ADG), AS 1940 Storage and handling of flammable and combustible liquids and AS 1596 Storage and Handling of LP Gas is recommended.	Managers / Supervisors

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Planning / General Requirements	Responsibility
 Oxygen, Acetylene and other Compressed Gases ▪ Cylinders in use shall be adequately restrained (i.e. chained to a trolley or other appropriate device); ▪ Full and empty cylinders in storage shall remain upright and restrained to a wall (or similar) in an area away from sources of heat; ▪ Empty cylinders shall be stored separately to those that are full; ▪ Cylinders of like gases shall be stored together, except in the case of oxy/acetylene secured to a trolley for use; ▪ Oxygen and fuel gasses shall be stored separately from corrosive and flammable gases.	Managers / Supervisors
ii)Bunding Principals for Downer facilities All liquid Hazardous Chemicals and Dangerous Goods will be stored in a bunded area in accordance with statutory Environmental Protection Authority (EPA) or other regulatory requirements/guidelines applicable to bunding. AS1940 should be used to when designing bunds. Refer to figure 1 for an example storage design. ▪ Bunds will be constructed of impervious material (cinder blocks/bricks and mortar are not impervious and must be sealed) ▪ Bunds will hold 25% of the total volume stored or 110% (120% in SA) of the largest container (or interconnected system), whichever is larger. ▪ Where a sprinkler system is installed, the bund will hold output from the sprinkler system for a period of at least 20 minutes or a capacity of 133%. ▪ The storage vessel must be back from the bund wall (or shielded) to prevent jetting of the liquid outside the bund. Refer to AS1940 for specifications. ▪ A sump and pump (preferred option) to be available to empty any liquids within the bund. The pump must be locked and only accessible for persons with the competency to appropriately remove the liquid waste. Refer to AS1940 section 5.9.6. All liquid waste removals must be recorded within the inspection form along with the date and the authorising person. ▪ All liquid waste removal will be supervised and will be removed as per the decision flowchart in schedule 1. ▪ Ensure hazardous chemicals are not stored or pumped through underground piping, unless approval is sought from the **Manager, Environmental Sustainability**. ▪ Transfer areas are to be designed as per section 8 of AS1940. ▪ Check bunds and transfer areas regularly, ensuring drain valves are locked and there are no signs of leaks (***DA-ZH-FM116.8 Environmental Inspection Checklist Asphalt Plant*** and ***DA-ZH-FM116.9 Environmental Inspection Checklist***) ▪ Spill response material must be immediately available and accessible to the bund area. These conditions are also applicable to fixed plant with a fuel tank such as a generator. Refer to *figure 2.*	Managers

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Planning / General Requirements	Responsibility
Labelling (General Requirements)	
Ensure the manufacturer or importers label is affixed to the container of all Hazardous Chemicals and Dangerous Goods supplied for use in the workplace; **Compliant labels must include:** ▪ the product name; ▪ contact details of the Australian manufacturer or importer; ▪ information relating to the substance ingredients; ▪ relevant risk and safety phrases (e.g. "poison", "flammable", "hazardous" etc.); ▪ the class label and subsidiary risk label (if it is Dangerous Goods); Deliveries of chemical/substance containers without a compliant label must be rejected. In the event a chemical/substance cannot be identified it must be labelled as "***Caution, Do Not Use – Unknown Substance***" and immediately removed from general use. The relevant Manager/Supervisor must be notified and arrange for disposal of the substance by an approved waste disposal provider.	Managers/ Supervisors
DG Placarding Requirements	
<u>Buildings and Bulk Storage Containers</u> Dangerous Goods placarding shall be applied/installed on or adjacent to: ▪ the entry point/s to buildings housing volumes of Dangerous Goods in excess of quantities stipulated in relevant state Dangerous Goods legislation; ▪ the entry point/s to rooms or enclosed areas within buildings housing volumes of Dangerous Goods in excess of the above quantities; ▪ containers storing bulk volumes of Dangerous Goods (e.g. tanks/vessels). ▪ any storage areas housing volumes of packaged Dangerous Goods in excess of quantities prescribed in the relevant state legislation; Placards must be displayed in a clearly visible location away from other signs or writing that may detract or draw attention away from the placard.	Managers
<u>Road Vehicles</u> Road vehicles transporting Dangerous Goods where the quantity transported is above the specified limit (as per ADG7) shall be: ▪ Licensed to carry dangerous goods; and ▪ Placarded and labelled as specified in the Australian Dangerous Goods Code (ADG);	Managers

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On the Job	Responsibility
Disposal	
The disposal of Hazardous Chemicals and Dangerous Goods shall be undertaken in a safe manner that complies with ***DA-ZH-ST063 Waste Management***. Containers used for the storage of discarded Hazardous Chemicals and Dangerous Goods must be appropriately labelled with: ▪ "**Waste Only – Do Not Use**" or similar; ▪ The product name or general type of waste permissible in the container ▪ Class label (if Dangerous Goods) Hazardous chemicals shall be disposed by licensed waste disposal contractors at licensed facilities (obtain written proof), according SDS and risk assessment findings and to environment and/or operating license conditions. If hazardous chemical waste is to be stored on site prior to disposal, it shall: ▪ meet the storage requirements as detailed above ▪ be secured, where practicable, to prevent use, and ▪ be clearly marked as waste; Disposal of used spill kit materials shall follow requirements for the disposal of the substance/chemical absorbed. iii)For Asbestos disposal, refer ***DA-ZH-ST086 Asbestos Management***.	Managers/ Supervisors
Transportation	
The following shall be implemented for all vehicles and mobile plant used to transport Hazardous Chemicals or Dangerous Goods: ▪ A current copy of relevant SDS(s) is stored in the vehicle/plant cabin; ▪ PPE identified in the SDS, SWMS and/or Risk Assessment is available in the vehicle/plant; ▪ A spill kit is stored in the vehicle/plant (or otherwise remains in close proximity to the vehicle/plant at all times); ▪ Fire extinguisher(s) of the appropriate class is fitted to the vehicle/plant; ▪ Substance containers shall be appropriately restrained – in the case of four-wheel drives, station wagons and vans a cargo barrier shall also be fitted; Transport of compressed gas cylinders in enclosed vans or vehicles is to be avoided. If unavoidable, the van or vehicle must be sufficiently ventilated to prevent the build up of gases;	Managers

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On the Job	Responsibility
Where the quantity transported is above the specified limit (e.g. bulk haulage), additional requirements apply as specified in the Australian Dangerous Goods Code (ADG), which may include: ▪ A copy of the Standards Australia / New Zealand – "Dangerous Goods Initial Emergency Response Guide"; ▪ An up to date register/manifest detailing type and quantity of product being transported; ▪ A one (1) page double sided laminated Emergency Procedure Guide (EPG) for each product carried; ▪ A Bitumen Burns Card (for bitumen tankers and sprayers); and ▪ A copy of the Fire Ban General Exemption listing. Mandatory training and licensing of drivers / operators of vehicles carrying Dangerous Goods is required;	Managers

EMERGENCY PROCEDURE GUIDE — TRANSPORT

VEHICLE FIRE

EMERGENCY CONTACTS

FIRST AID

INHALED

EYES

FIRE BURNS

READ OTHER SIDE →

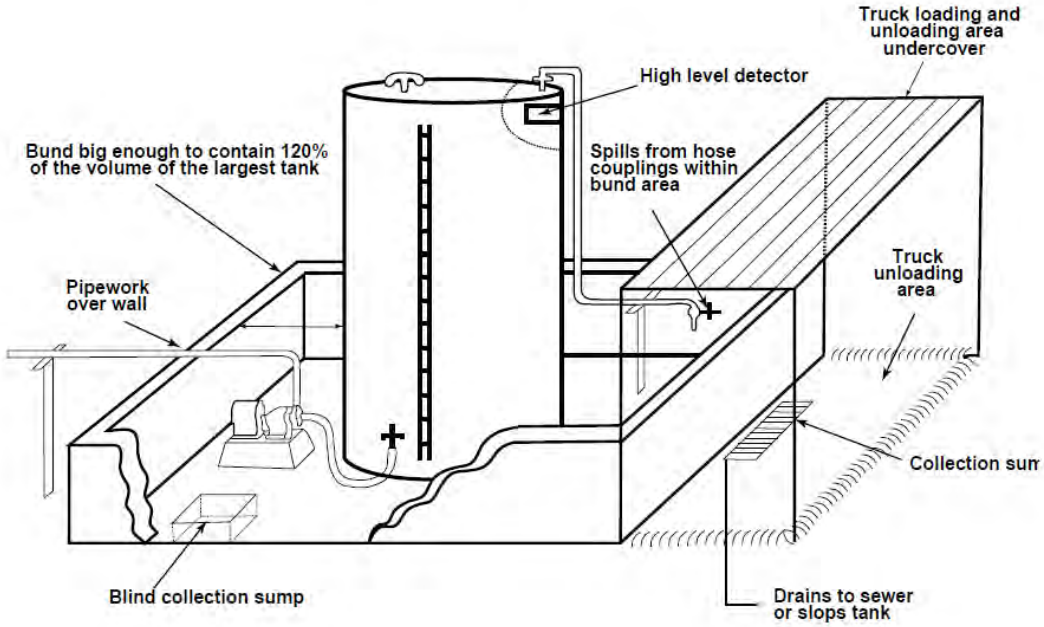

Figure 1: Example Hazardous Chemicals Storage
South Australia EPA, Bunding and Spill Management, June 2007

Figure 2: Bunding of Generators

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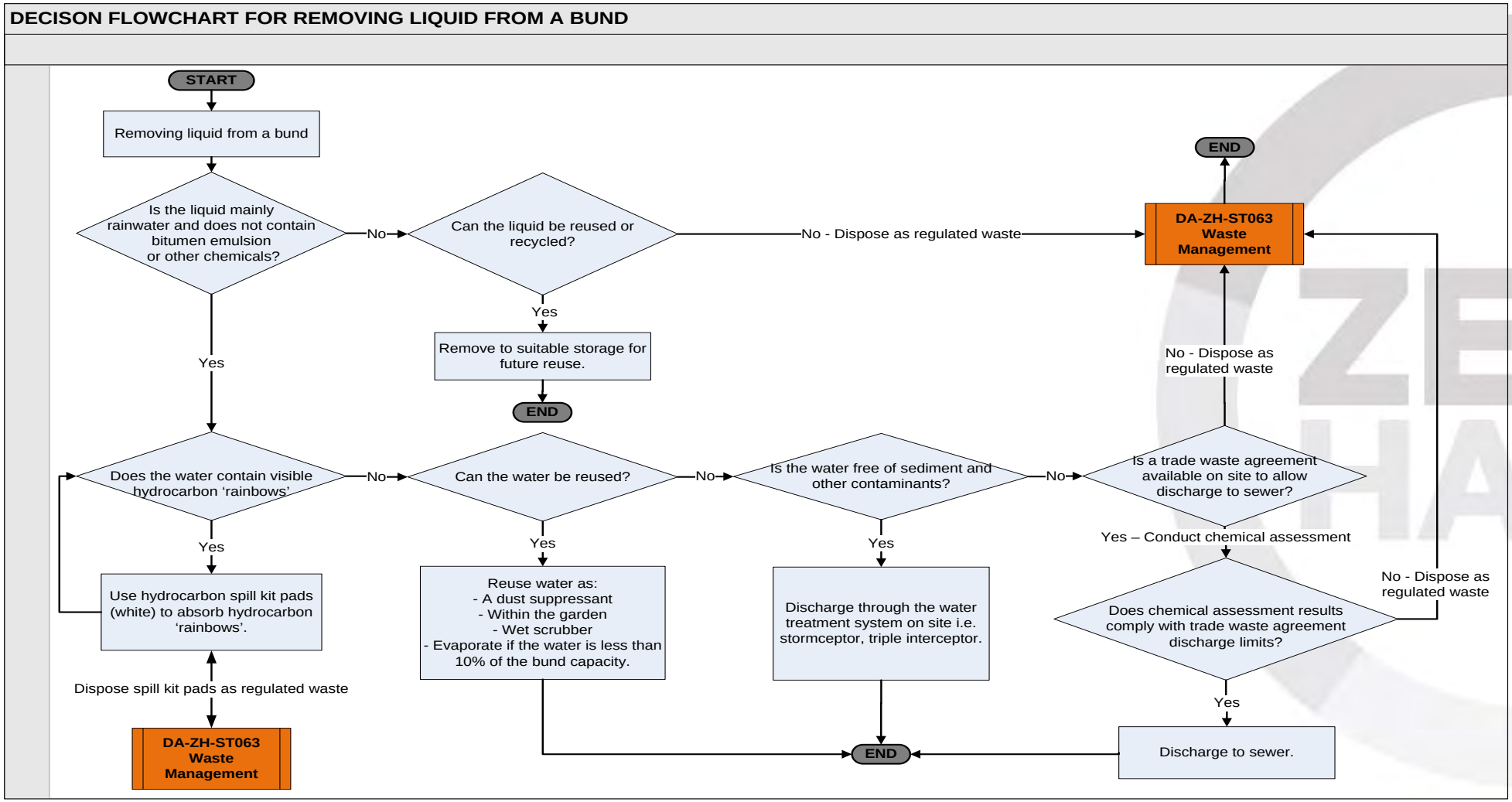
SCHEDULE 1: DECISION FLOWCHART FOR REMOVING LIQUID FROM A BUND



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Zero Harm Standard

For further information, refer Zero Harm Compliance Guideline Ecosystem Protection DG-ZH-CG071.

Planning	Responsibility
Biosecurity is the protection of the environment and human health from unwanted invasive weeds, plants and pathogens. Declared weeds, plant pathogens, and animal pests must be managed to prevent their spread, and as far as possible eradication on all Downer sites as well as in transit to and from fixed and mobile sites. Downer must ensure an initial self-assessment is conducted to determine the potential presence of weeds, pathogens and pests. This can be achieved through consultation with the land owner and local regulatory authorities, and reviewing environmental planning and approval documentation. Where a biosecurity risk is present on or adjacent to the site, a suitably qualified person(s) will complete a survey and assessment. (*Suitably qualified person - Tertiary qualification, e.g. Environmental Science, Ecologist and* experience as a minimum.) The resultant biosecurity management plan will be incorporated in the site or project Zero Harm Management Plan and include: • The type of weed, pathogen or pest; • The classification based on potential; environmental or health impact; • Propagation and spread characteristics; • The exact location/ degree of infestation; • Identification of work processes that have the potential to spread the weed, pathogen or pest; • identify vehicle clean down points (Figure 1); and, • Suggested mitigation options as per the hierarchy of control. **Most Preferable** AVOID ERADICATE REDUCE MANAGE **Least Preferable**	Managers & Supervisors
On the Job	**Responsibility**
Ensure that the location of biosecurity risks and control requirements are communicated to all personnel in the site induction. Where necessary, biosecurity management signs will be erected at strategic locations prior to any construction or clearing (Figure 2) to restrict access to infested areas and ensure personnel use designated access tracks. Where necessary, manage the potential spread and/or any existing infestations on-site through the establishment of biosecurity controls. Weed infested soils/waste must not be imported onto the worksite. Where a biosecurity threat is detected or suspected, it must be demarcated, avoided and/or treated as per the most recent information available from the relevant State biosecurity or agriculture department (Figure 3). Where applicable, contractors must declare in writing all vehicles and machinery are thoroughly washed to remove all soil/mud and plant material prior to entering site. It is recommended to include this requirement under special conditions of the contract and provide DA-ZH-FM067.1.	Managers & Supervisors

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Where applicable and required by the Client, all vehicles/plant/machinery upon arrival and prior to commencing any work on the site shall: • Be thoroughly washed or cleaned to remove all soil/mud and plant material. • Be visually inspected by a nominated person who will complete a Vehicle Hygiene Form – refer to DA-ZH-FM067.1 • In some instances a State Specific Weed Declarations Form will need to be completed in addition to the above. Where required by the Client, or by permit/approval requirements, establish vehicle cleandown points at strategic locations within or along the worksite corridor (Figures 5 and 6). Vehicle cleandown points should consist of: • A pad for inspecting and cleaning vehicles, plant and equipment. The pad is to be lined with concrete or a certified clean substrate to a minimum depth of 200mm. • The pad is to be sloped away from any uninfested native vegetation, and runoff from wash-downs is to be directed to a shallow earthen sump of sufficient capacity to capture all waste water and solids, and protected against overflow from rainfall. • A compressor for cleaning tracked equipment under dry soil conditions is to be provided when necessary. • A stiff bristled brush, scrapers and brooms for brushing soil material from equipment under dry conditions. • A high pressure water wash-down unit for use during wet conditions. Vehicles, plant and equipment will stop on the inspection pad at each cleandown point and visually be inspected for soil, soil slurry or plant material. Inspections will include tyres/wheels, undercarriage, belly plates, buckets and tracks of all equipment. Where biosecurity clean-down points are not appropriate, possible, or necessary; or as an alternative to static clean-down points, mobile biosecurity kits may be utilised. The kits should consist of: • Motorised pressure spray unit with spare spray heads and 200L tank; • Air compressor, complete with hoses, nozzles and wand; • Waste capture equipment (drum(s), buckets); • Stiff brushes for cleaning tyres and underside of vehicles (short and long handled); • Dustpan and brush for cleaning inside cabin of vehicles; • Plastic or steel scrapers for removing soil and plant material from tyres and vehicle undercarriage; and, • Strong plastic bags for collecting and sealing contaminated items for disposal. Regularly inspect biosecurity controls and signage in accordance with DA-ZH-PR116 Zero Harm Inspections and Observations. Maintain biosecurity controls and signage where necessary.	Managers & Supervisors
What if it Goes Wrong	**Responsibility**
If an adverse unintended result occurs to known declared weed sites, immediately implement the Incident Reporting and Investigation procedure DA-ZH-PR006. If it is proven that plant and animal pests, diseases and pathogens have been introduced as a result of the Project activities, these shall be eradicated. The method/s used will depend on the nature of the outbreak. Therefore contact the relevant State biosecurity or agriculture department for advice.	Managers & Supervisors

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Figure 1 - Identify and map biosecurity threats

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Figure 2 - Erect biosecurity management signage to indicate control requirements

Figure 3 - Known biosecurity risk isolated from the work site using high visibility fencing and signage

Figure 4 - Biosecurity hygiene stickers used on vehicles/ plant/ machinery

Figure 5 - Example cleandown point showing a pad of clean imported substrate and drainage sump

Figure 6 - Example concrete pad cleandown point

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Hygiene Inspection Form

VEHICLE DETAILS			
Type	☐ Excavator ☐ Dump Truck ☐ Light Vehicle ☐ Dozer ☐ Truck ☐ Trailer ☐ Loader ☐ Forklift ☐ Back hoe ☐ Crane ☐ Mulcher ☐ Other ((What is it?) _____		
Make (Toyota Hilux, 80 TTruck)		Registration Number	
TRANSPORT / OPERATOR DETAILS			
From (origin location)		To (destination location)	
Checklist Inspection Time/Date		Operator Name/ Telephone Number	

CHECKLIST (ONLY TICK THOSE APPLICABLE)		
General Area	**Specific Item**	**How Cleaned**
Vehicle Interior & Boot	☐ Footwells/Torn seats ☐ Carpet/Mats ☐ Tool box ☐ Boot ☐ Spare Tyre ☐ Trailer pin plugs ☐ Tow Hitch ☐ Rear Bumpers ☐ Air Conditioner Filter	☐ Vacuum ☐ Chemical Disinfection ☐Brush ☐ Other (specify)
Engine Bay	☐ Radiator, Grill & Fan ☐ glacier plate ☐ gear box (top) ☐ Under Batteries ☐ Recess under windscreen wipers ☐ Inside Wheel Arches ☐ Inside Bonnet Skins ☐ Air Filter Bowls & Air Cleaners ☐ Void spaces between oil & radiator core, engine & gear box ☐ Behind/under removable fuel cells	☐ Vacuum ☐ Chemical Disinfection ☐ Washing ☐ Brush ☐ Other (specify)
Underside/ Chassis	☐ Wheel arches, trims, flares, bumpers ☐ Idler wheels ☐ Behind Tyre Rims, tyre guards, tyre cuts/gashes ☐ under all guards & flares ☐ Dust dishes ☐ turn tables ☐ Axels/ Differentials ☐ fuel tanks (on top) ☐ ute trays ☐ under chassis rails and channels ☐ Mounting brackets ☐ spring hangers (above) & between spring leafs ☐ Inside tracks/track frames ☐ Hydraulic cover plates ☐ Belly Plates ☐Between Dual Wheels ☐ Rear plates ☐ Hollow section chassis channels	☐ Vacuum ☐ Chemical Disinfection ☐ Washing ☐ Brush ☐ Other (specify)
Attachments	☐ Buckets, blades, scoops, carry-all, tynes ☐ truncation arms ☐ Cutting teeth ☐ Counterweights ☐ pivot point/adaptors at rear of front blade ☐ stabilizer/rear wear plates ☐ Cages ☐ Loader Canopy ☐ Hydraulic arms ☐ Articulation points ☐ Blade Trunction arms ☐ Ripper Support frame	☐ Vacuum ☐ Chemical Disinfection ☐ Washing ☐ Brush ☐ Other (specify)

I have carried out the checklist inspection, and verified / performed cleaning as required

Inspector Name:		Telephone/Mobile:	
Inspection Location:		Inspection Date & Time:	
Signature:		Title:	

Objective: To minimize or prevent the spread of reproductive material (any part of the plant that is capable of reproduction including seed; stem or leaf cutting; and whole plant) of declared weeds during the transportation of plant and equipment from one location (origin) to another (destination).

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LEGISLATION AND PENALTIES

STATE / TERRITORY	RELEVANT LEGISLATION
Commonwealth	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth), s 12
ACT	Pest Plants and Animals Act 2005; Plant Diseases Act 2002; Land (Planning and Environment) Act 1991.
NSW	Noxious Weeds Act 1993; DPI (NSW) webpage: Noxious weed declarations in NSW.
QLD	Land Protection (Pest & Stock Route Management) Act 2002,; Land Protection (Pest & Stock Route) Regulation 2003, Schedule 2.
VIC	Catchment and Land Protection Act 1994, s 20, 70A, 71; DPI Publication: Declared Noxious Weeds - Listed by Common Name; DSE Publication: "Interim Guidelines and Procedures for Managing the Environmental Impacts of weeds on Public Land in Victoria".
SA	Natural Resources Management Act 2004, s 181, 182; & Commonwealth Legislation
WA	Agriculture and Related Resources Protection Act 1976, s 48, 49, 70; Agriculture Protection Board webpage: Declared plants in Western Australia
TAS	Weed Management Act 1999, s 56 - Tasmainian Washdown Guidleines for weed and Disease Control http://dpipwe.tas.gov.au/invasive-species/weeds/weed-hygiene

Legislation in some states nominates fines for not producing a weed hygiene certificate at destination.

Purpose of this form

To implement a system that records weed control measures so to ensure diligence in weed management.

- A vehicle/equipment / machinery that is proposed to be used at the destination location is clean prior to entry;
- This vehicle/equipment / machinery will not spread the reproductive material of weeds.

When is this form filled out?

Where a respective State has a documented process, that process shall be actioned. This DA form must be filled out where there is no respective State documentation. It is completed:

- For all plant / equipment, vehicles and machinery moving out of, across or into geographical boundaries and having the potential to spread, introduce or come in contact with plants declared as weeds;
- As a checklist inspection to verify weed control implementation (Brush / Blow down, Vacuuming, Washing, Chemical Disinfection etc.),

Who can inspect "things" and certify as weed free?

Downer Australia has internal resources qualified to inspect plant / equipment and machinery. These persons hold relevant environmental qualifications and can be sourced through the Divisional Compliance Manager.

Respective States have their own requirements so a check must be made of relevant guidance materials.

Dependent upon Contract arrangements, scheduling of inspections should be made with the authorised person giving at least 48 hours notice prior to the inspection.

Records of Inspections

A copy of this completed form together with any other weed hygiene certification shall be provided to the nominated Project / Environmental Representative.

STOP THE SPREAD OF WEEDS

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Zero Harm Standard

For further information, refer to Zero Harm compliance guideline ***DG-ZH-CG063 Management of Waste***.

<table>
<tr><th colspan="2">Planning Requirements</th><th>Responsibility</th></tr>
<tr><td colspan="3">Identifying Water/ Marine Environment Hazards</td></tr>
<tr><td colspan="2">Identify all potential risks associated with an uncontrolled release of contaminant to water/ marine environment. To further assist in the identification of these hazards, managers and supervisors should also consult:
Divisional BowTie analysis reports
previous incident reports
workers and contractors (e.g. discussion at pre-start meetings, toolbox talks or via STAR process)
previous risk assessments and permit to work documentation
previous hazard reports
previous audit and inspection reports
industry standards; and
relevant client document or work methods.</td><td rowspan="2">Managers/ Supervisors</td></tr>
<tr><td>The following are causes of uncontrolled release of contaminant to water/ marine environment are:
Earthworks in or nearby a waterway (relocating bed material)
Structural work above waterways (paint removal, surface preparation, reconstruction)
Works in or under waterways (under boring, erecting structures)
Inadequate or no storm water drain protection
Bulk transfer of liquid hydrocarbons.</td><td>The Critical Controls required to prevent uncontrolled release of contaminant to water/ marine environment are:
Construction of diversion drains/ earth berms, installation of temporary bunds to contain any unplanned releases
Early installation of containment measures (e.g. silt curtains, booms)
Installation of interceptors to prevent contaminants from entering waterways
Visual check for ullage (permit system).
The Critical Controls required to minimise the consequences of uncontrolled release of contaminant to water/ marine environment are:
Installation of silt curtains (downstream).</td></tr>
</table>

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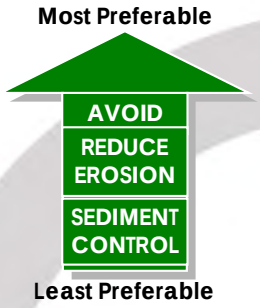
Planning	Responsibility

Activities that cause land disturbance or water contamination require a plan to be developed and incorporated into the site or project Zero Harm Management Plan. The purpose of the plan is to document the measures designed to mitigate soil erosion and control discharge of sediment, nutrients and other pollutants to land and other waters during works to the principles of the erosion and sediment control hierarchy.



Below is a guideline for what documentation is recommended based on the area of land disturbance. If unsure, always consult with the appropriate regulatory authority and/ or client.

Area of Disturbance (m2)	Nominal Type of Activity	Suggested Type of Plan
<250	Maintenance works, small installs.	Controls listed within the Zero Harm Management Plan.
250 – 2,500	Commercial developments, small subdivisions, civil works, urban and rural road/ rail construction, below ground pipeline/ cable installs.	ESCP addressing soil erosion and sediment pollution only.
>2,500	Large subdivisions, civil works and high risk works within or adjacent water course.	SWMP addressing soil erosion and sediment pollution, including a calculation as to the need for a sediment basin.
Fixed sites	Asphalt and bitumen plants, workshops and all other sites with a truck wash.	WMP addressing potential pollutants to water including an applicable treatment system.

(Source: Landcom 2004 – "Blue Book" Table 2.1 p2-1)

Managers & Supervisors

An Erosion and Sediment Control Plan (ESCP) will include but not be limited to:

- A drawing that clearly shows the site layout including:
- North point and plan scale.
- Approximate grades and directions of falls. (Contours 0.5m for gradients <15%, 1m for gradients 15-30% and 2m slopes >30%).
- Site boundaries, adjoining roads and sensitive surroundings.
- Construction access points.
- Site office, car park and location of stockpiles.
- Proposed construction activities and limits of disturbance.
- Approximate location of trees and other vegetation designated "No Go Zones".
- Existing and proposed drainage patterns and discharge points.
- Clean water diversion of upslope runoff around the disturbed areas.
- Location and details of proposed erosion and sediment control measures.
- Location of stockpile areas, including topsoil storage, protection and reuse methodology.
- Creek crossings and mitigation controls.

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Planning	Responsibility
▪ Commentary describing: ▪ Timing of works. ▪ Nature and extent of earthworks (cut and fill). ▪ Site rehabilitation proposals including schedules. ▪ Frequency and nature of maintenance regimes. A Soil and Water Management Plan (SWMP) should be submitted to the appropriate regulatory authority for review and comment prior to works commencing. In addition to the ESCP, the SWMP requires: ▪ Commentary describing the additional information. ▪ Outline the constraints, opportunities and assumptions that underpin the SWMP. ▪ Explain clearly any work phases/ stages. ▪ Outline how the various erosion and sediment control measures will be carried out on site. ▪ Engineering details with supporting design calculations for all necessary sediment basins, dirty water drainage channels and clean water diversions. ▪ Outline flocculation procedure, dosage rates and discharge schedule including test plan and discharge limits as detailed in Schedule 1. A Water Management Plan (WMP) will contain: ▪ A drawing that clearly shows the site layout including: ▪ North point and plan scale. ▪ Approximate directions of water flow including drainage, water treatment systems and discharge points. ▪ Site boundaries, adjoining roads and sensitive surroundings. ▪ Access points. ▪ Site office, car park and location of stockpiles/ dangerous goods/ hazardous substances storage locations. ▪ Commentary describing: ▪ Water treatment systems (Including onsite septic systems) and its operation. ▪ Maintenance and monitoring regime of water treatment systems. ▪ Truck wash water discharge limits – refer to trade waste agreement. ▪ Stormwater discharge limits – refer to your Manager Environmental Sustainability or Environmental consultant. ▪ Unplanned/ Uncontrolled discharge management. A Temporary Toilet Management Plan may be developed to detail management and control measures to eliminate or reduce environmental harm resulting from any uncontrolled discharge of waste water.	Managers & Supervisors

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On the Job	Responsibility

Avoid sources of emissions to water

Source/ Activities	Avoidance
Planning	▪ Implement the documented controls prior to conducting any other work.

Soil exposure from earthworks	▪ Expose the smallest possible area of land disturbance for the shortest possible time by:
	  ▪ Limit vehicle movement to existing tracks.
	  ▪ Maintain access tracks in sound condition to limit the likelihood of vehicles not using the track.
	  ▪ Ensure turning circles are constructed where required.
	  ▪ Protect areas of concentrated water flow by leaving and/or using existing topsoil with vegetation or installing protective matting or fabric.
	▪ Keep exposed areas clear of any drainage lines.
	▪ Rehabilitate disturbed areas quickly (as required by local guidelines).
	▪ Seal access tracks and pathways that are used for prolonged periods (recycled brick and other quarry material is suitable and will be removed at the end of the project).

Asphalt and bitumen plants, workshops etc.	▪ Divert clean water around stockpiles, hazardous substances storage area's etc. ▪ Seal access tracks and pathways ▪ All storm water runoff from areas that will not be contaminated can be harvested for reuse or if no other options are available discharged without treatment, i.e. runoff from a roof.

Managers & Supervisors

Reduce sources of emissions to water

Source/Activities	Reduction
Controlling sediment runoff from slopes and stockpiles from earthworks	▪ Divert clean water around stockpiles and install sediment fences on the down slope of stockpiles. ▪ Batter slopes should be tilled or mulched along the contour to reduce flow velocities and limit erosion. ▪ When locating stockpiles consider the vicinity of waterways, site boundary and other significant areas. Use the natural grade of the stockpile to divert run off away from waterways, roads etc. ▪ Where possible limit the height of stockpiles to less than 2.5m and batter the sides to 2:1 or flatter. ▪ Where possible cover stockpiles or seed stockpiles with sterile seed.

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On the Job		Responsibility
Source/ Activities	**Controls**	
Controlling sediment and heavy metal runoff from stockpiles (including RAP stockpiles) at asphalt and other similar sites.	▪ Keep stockpile areas clear of any drainage lines. ▪ When locating stockpiles consider the vicinity of waterways, site boundary and other significant areas. Use the natural grade of the stockpile to divert run off away from waterways, roads etc. ▪ Divert clean water around stockpiles. ▪ Where possible cover stockpiles or temporarily cover stockpiles during inclement weather. ▪ Pre-coat and cold mix will also be installed on a non-permeable surface and covered to ensure hydrocarbons do not leach into the ground or water.	
Hazardous Chemicals	▪ Bund hazardous chemicals and transfer areas as per ***DA-ZH-ST054 Hazardous Chemicals and Dangerous Goods Storage Principles and Transportation***. ▪ Cover bunds and transfer areas where possible. ▪ Clean spills immediately. ▪ Empty bund water as per ***DA-ZH-ST054 Hazardous Chemicals and Dangerous Goods Storage Principles and Transportation***.	
Vehicle & Mobile Plant	▪ Maintain vehicles and mobile plant as per the manufacturers' guidelines. ▪ Refuelling, servicing and maintenance of vehicles, plant and equipment is to occur on designated level ground only, and at >40m from any waters and other significant areas. ▪ Drip trays and spill kits are essential when using mobile refuelling locations and temporary bunding maybe warranted.	Managers / Supervisors

<u>Sediment Control</u>

Source/ Activities	Controls
Paved Roads	▪ Use street sweepers where there is a build-up of soil on paved roads. ▪ Use a drain warden, mesh and gravel inlet filter, geotextile inlet filter, sandbags or other locally approved method to reduce the sediment load on the water treatment system.

Sediment control measures when disturbing land	▪ Use sediment control measures that slow the water to allow the sediments to settle out.
	▪ Refer to:
	  ▪ NSW, Soils and construction – managing urban Stormwater.
	  ▪ SA, Stormwater pollution prevention.
	  ▪ Vic, Doing it right of subdivisions – temporary environmental protection measures for construction sites.
	  ▪ Qld, Erosion and Sediment control – a field guide for construction site managers.

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On the Job		Responsibility
Source/ Activities	**Controls**	
Dispersible soils when performing earthworks	▪ A sediment basin is required to capture and treat sediments (such as wet sediment basins, dry sediment basins, lined tanks, infiltration sumps etc.).	
Sediment ponds and dewatering	▪ Water from sediment ponds can be used to irrigate vegetated areas remote from waterways or alternatively be used for dust control. ▪ Water should be tested for total suspended solids (TSS) and pH prior to dewatering. The discharge limits can be found in schedule 1. ▪ A discharge permit using ***DA-ZH-FM064.1 Dewatering Permit*** will be issued prior to any manual dewatering.	
Asphalt and bitumen plants and other similar sites with the potential to pollute waterways	▪ A suitable water treatment system is to be installed. The water treatment system should treat as a minimum suspended solids and hydrocarbons. ▪ Stormwater discharged is to be regularly tested to ensure ongoing compliance with the discharge limits. ▪ Storm water from a treatment system should be reused or where no opportunities exist then it should be discharged to vegetated land. Discharging storm water to a waterway is a last resort.	Managers/ Supervisors

Creek Crossings

Source/ Activities	Controls
Planning	▪ No site will interfere with or obstruct the flow of water in a public waterway without the appropriate approvals from the local and state authority. Creek crossing will not disrupt natural stream flow and minimise the entry of sediment.
Vehicle & Mobile Plant	▪ Refuelling, servicing and maintenance of vehicles, plant and equipment is to occur on designated level ground only, and at >40m from any waters and other significant areas. ▪ Drip trays and spill kits are essential and temporary bunding maybe warranted.

Onsite Toilet Systems

Source/ Activities	Controls

Non sewered sites	▪ All onsite toilet systems (excluding potable portaloo type systems that are standalone or trailer mounted and sewage/ wastewater treatment plant's) must be supplied and fitted with:
	  ▪ Alarms on the waste storage tanks to indicate when storage tanks are at 90% full of full by volume capacity;
	  ▪ Automatic cut off valves on the potable water supply when the waste storage tanks are at 90% full of full by volume capacity;
	  ▪ Push taps (time flow taps); and

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On the Job		Responsibility
Source/ Activities	**Controls**	
Non sewered sites, continued	▪ Ensure the volume of the potable water tank does not exceed 90% of the volume of the wastewater storage tank. ▪ Carry out daily inspection of onsite septic systems. ▪ Maintain inspection & maintenance records. ▪ Immediately report any waste water leaks, spills or overflows regardless of volumes. ▪ Repair faulty or leaking equipment. ▪ Monitor the waste water storage tank and organise removal of liquid waste as required. ▪ Monitor the water supply tank and organise filling as required. ▪ Ensuring that taps and toilets are not left running.	

Truck Washes

Source/ Activities	Controls	Responsibility
Permits	▪ Truck wash bays that will discharge waste into the sewer will be approved by the appropriate water authority prior to installation. (For unsewered areas, other options are available such as store and dispose to a licensed facility, dedicated vegetated or landscaped area, evapo-transpiration bed, evaporation lagoon. Local or state approval maybe required for any of these methods of waste water disposal)	Managers/ Supervisors
Truck wash water	▪ All truck wash water waste is to be recycled where possible. ▪ Truck wash water will be treated with an appropriate water treatment system that will meet the requirements set out by the appropriate authority. ▪ Truck wash water is to be regularly tested to ensure ongoing compliance with the discharge limits.	
Truck wash construction	▪ Truck wash bays should be covered and bunded to ensure all water used in the truck wash process is captured and there is no infiltration of rainwater. ▪ Rainwater from the roof should be captured and used within the truck wash. ▪ Truck wash bay floor must be constructed of material of low permeability. ▪ The truck wash will be of appropriate size to prevent overspray. ▪ The floor of the truck wash bay will be graded to drain towards the collection point.	
Maintenance of truck wash	▪ Truck wash water treatment systems are to be maintained as per the manufacturer's specification. ▪ The floor and any sediment pits are to be cleaned regularly and waste disposed as per ***DA-ZH-ST063 Waste Management***.	

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On the Job	Responsibility
Monitoring and Review **Activities** / **Controls** Inspections for earthworks — ▪ Inspections are to occur weekly and prior to and immediately after a significant rain event. Inspections for Asphalt and bitumen plants, workshops and all other sites with a truck wash — ▪ Informal inspections are to occur weekly and prior to and immediately after a significant rain event. ▪ Formal inspections are to occur monthly as per ***DA-ZH-FM116.8 Environmental Inspection Checklist Asphalt Plant***. Water monitoring for Earthworks — ▪ Water should be tested for total suspended solids (TSS) and pH prior to dewatering. The discharge limits can be found in *Schedule 1*. **Activities** / **Controls** Water Monitoring for Asphalt and bitumen plants, workshops and all other sites with a truck wash — ▪ Stormwater and truck wash water discharge monitoring to occur as per schedule 2 below.	Managers / Supervisors

What if it Goes Wrong	Responsibility
Where trigger values or licence conditions are breached, immediately raise the event as per ***DA-ZH-PR006 Incident Reporting and Investigation*** and investigate the validity of the discharge limit and correct the root cause. Include a review of the relevant Plan.	Managers & Supervisors

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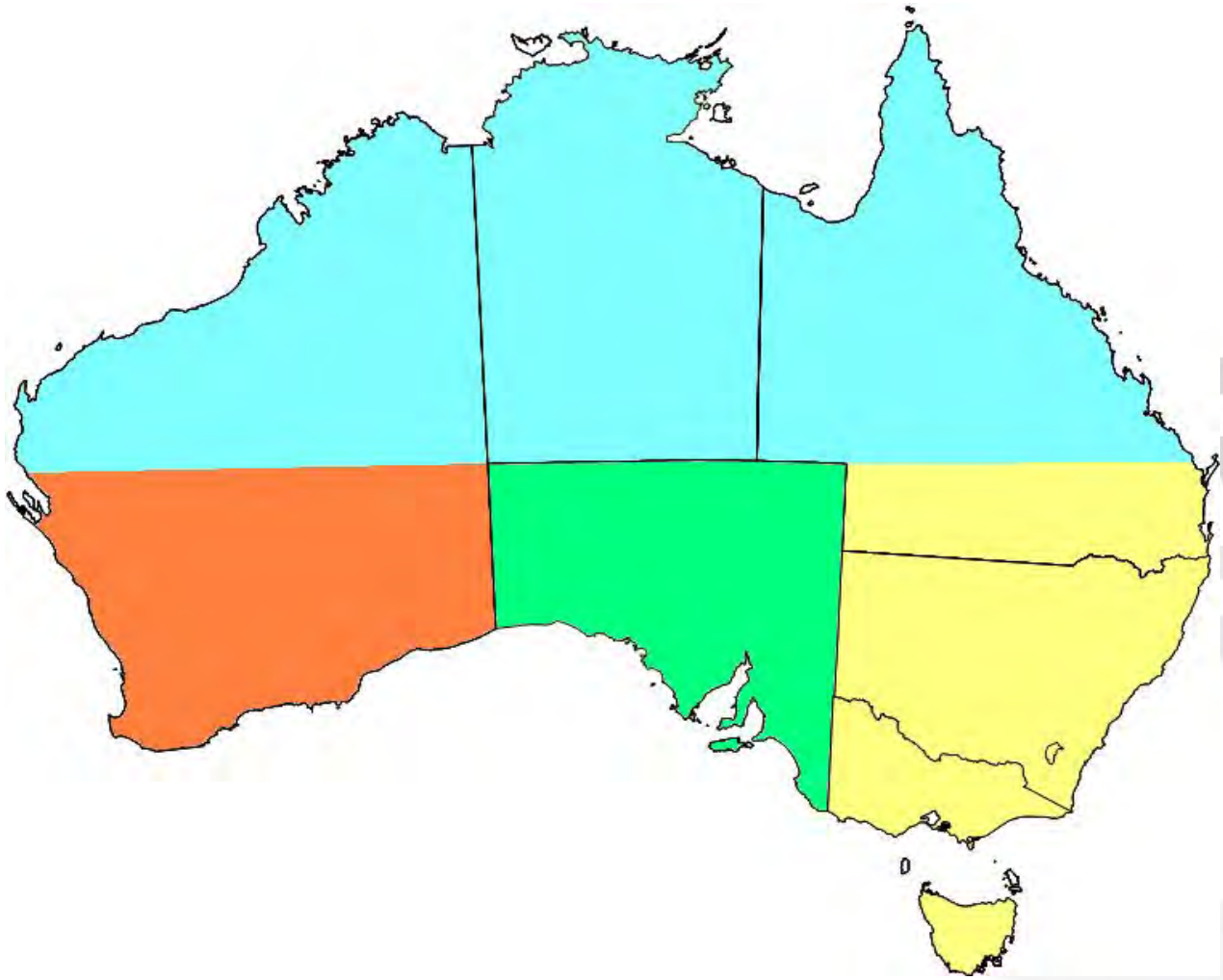
SCHEDULE 1 – DISCHARGE LIMITS



Legend of National Guidelines for Lowland River Water Quality:
Source: Australian and New Zealand Guidelines for Fresh and Marine Water Quality in 2000*

Area	pH	Turbidity/ Suspended Solids
Northern Australia	6.0-7.5	15mg/L
South Eastern Australia	6.5-7.5	50 mg/L
South Central Australia	6.5-9.0	50 mg/L
South Western Australia	6.5-8	20 mg/L

Note:

- State and local discharge limits always takes precedence.
- Refer to Australian and New Zealand Guidelines for Fresh and Marine Water Quality for more information.

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SCHEDULE 2 – WATER QUALITY MONITORING FOR ASPHALT AND BITUMEN PLANTS, WORKSHOPS AND TRUCK WASHES

Treatment System	Test Methodology	Indicators (Please refer to your Environmental Professional for the limits)	1st month following a new installation or major change to the site	Ongoing
Stormwater treatment system i.e. first flush device etc.	AS/NZS 5667.10 Guidance on sampling waste waters	▪ Total Petroleum Hydrocarbons (C6-C36) ▪ Monocyclic Aromatic Hydrocarbons (MAH) ▪ Metals ▪ Physical indicators such as (pH, Surfactants (LAS), Total Suspended Solids, Total Dissolved Solids, Biochemical Oxygen, Total Organic Carbon, Total Oil & Grease (µg/L), Total Phosphorus (µg/L))	Controlled test to ensure the treatment system operates as per design.	Test every quarter where there is a discharge. Exemptions to this rule maybe available from the Manager Environmental Sustainability on the bases of consistent compliant tests.
Wash water treatment system i.e. plate separator etc.	AS/NZS 5667.10 Guidance on sampling waste waters	As per relevant trade waste agreement.	Controlled test to ensure the treatment system operates as per design.	Test every quarter where there is a discharge.

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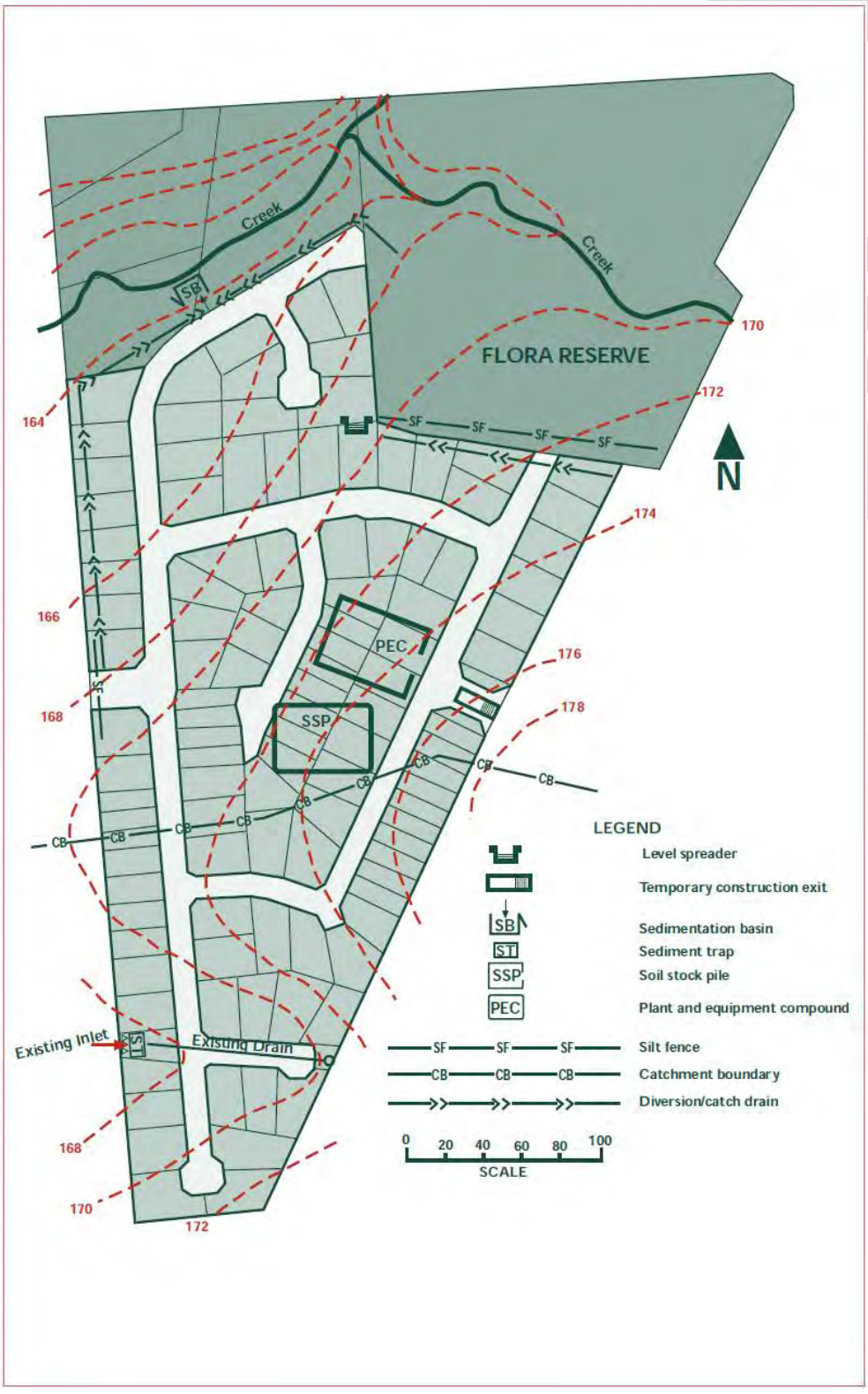
SCHEDULE 3 – EXAMPLE EROSION AND SEDIMENT CONTROL PLAN (EXCLUDING COMMENTARY)

Source: SA EPA Stormwater Pollution Prevention, Code of Practice for the building and construction industry, March 1999.



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Zero Harm Standard

For further information, refer to the following Zero Harm Compliance Guidelines:

- ***DG-ZH-CG063 Management of Waste***
- ***DG-ZH-CG065 Re-use and Recycling***
- ***DG-ZH-CG064 Waste Minimisation***; and
- ***DG-ZH-CG066 Waste Treatment***.

Planning	Responsibility
Before commencing any work, the management of waste must be considered as part of the Zero Harm Management Plan or Environment Management Plan and in some instances it may be necessary to develop a Waste Management sub-plan (WMP). Basic information to consider includes: ▪ Identification and classification of all waste streams specific to site ▪ Assessment of waste streams based on the waste hierarchy ▪ Estimation of waste types and quantities to be generated, optionally using ***DA-ZH-FM063.1 Waste Estimation Record*** to record this data ▪ Waste segregation, handling and storage arrangements ▪ Waste transport methods and disposal locations ▪ Permits/licenses required to store, transport or dispose of waste; and ▪ Regulated waste transporters and receiving facilities licenses. Regulated wastes must be disposed of as per the requirements of the applicable state legislation. Regulated wastes are those that are listed in the applicable regulations and typically include but are not limited to material contaminated with waste oil, oily water, oily containers, used spill kit material and rags, PCB's, solvents, paints, or epoxy resin. There are variations of what constitutes regulated wastes in each state. The following table is a reference list.	Managers & Supervisors

State	Regulated Waste Descriptor	Reference
National	Controlled Waste	Schedule A of the *National Environment Protection Measure, The Movement of Controlled Waste Between States and Territories 1998*
Victoria	Prescribed Industrial Waste	Schedule 2 of *Environment Protection (Industrial Waste Resource) Regulations 2009*
Northern Territory	Listed Waste	Schedule 2 of *Waste Management and Pollution Control Act 2009*
Queensland	Regulated Waste	Schedule 7 of *Environmental Protection Regulation 2008*

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Planning, continued	Responsibility

State	Regulated Waste Descriptor	Reference
Tasmania	Controlled Waste	Refer national reference: ▪ *Environmental Management and Pollution Control Act 1994 s3* ▪ *Environmental Management and Pollution Control (Waste Management) Regulation 2010 r5, 6 (3,4)*
New South Wales	Scheduled Waste Trackable Liquid Waste	Schedule 1 of *Protection of the Environment Operations (Waste) Regulation 2014*
ACT	Controlled Waste	Refer national reference: ▪ *Environment Protection Act 1997 s5, 137-140* ▪ *Environment Protection Regulation 2005, part 7 (cl56-62)*
South Australia	Listed Waste	Schedule 1 part B of the *Environment Protection Act 1993*
Western Australia	Intractable Waste	Schedule 1 of *Environment Protection (Controlled Waste) Regulations 2004*

Managers & Supervisors

On the Job	Responsibility

<u>Follow the Waste Management Plan</u>

Every effort must be made by all personnel to reduce the quantities of waste generated and to segregate wastes by:

- reviewing resource use
- monitoring and recording waste levels
- using best practice production and work methods
- separating waste streams at the source; and
- keeping the site litter free.

All waste streams are to be segregated and classified in accordance with relevant State regulations and guidelines. In some instances chemical analysis will be required to determine the classification of the waste, e.g. asbestos contained in fill material. For further information refer to ***DA-ZH-ST068 Fill Material Management***.

An annual review of the WMP should be conducted to improve waste management and reduce waste products on site.

Managers & Supervisors

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On the Job, continued	**Responsibility**

Safety Data Sheet (SDS)
 	
A SDS for each waste that has the potential to pose a risk to health or the environment must be available to personnel exposed to the waste.
 	
Type of Waste Containment
 	
▪ All waste must be contained, taking into consideration fire safety, pest and odour control and protection of soil and water.
▪ Ensure appropriate numbers of reciprocals are provided for all waste streams.
▪ If the waste is at risk of spreading across and off site, the waste must be covered.
▪ Regulated wastes must be stored in appropriately sealed, marked containers.
▪ Liquid waste including waste items with a potential to leak must be stored in a suitably covered, ventilated and bunded area.
 	
Disposal
 	
▪ Waste disposal methods must be determined following the implementation of the waste hierarchy.
▪ All waste must be disposed of using an authorised waste facility.
▪ There must be a waste tracking system to track all waste to the receiving facility, e.g.
  ▪ Use ***DA-ZH-FM063.1 Waste Estimation Record*** and keep waste certificates for all waste removed; or
  ▪ Use ***DA-ZH-FM063.2 Waste Disposal Register***.
 	
Additional Regulated Waste Requirements
 	
▪ Transporters and disposal facilities approved by the relevant state authority must be used.
▪ Where accredited/ approved agents are used to act on behalf of Downer, these must be approved by the relevant state authority.
▪ Current licenses must be maintained in site records for the transporters, disposal facilities and accredited/ approved agents.
▪ A suitable record must be kept for at least 7 years showing the relevant details as dictated by the state legislation (usually as a minimum the producer, transporter and receiving facility). Evidence may include the relevant EPA online tool, EPA certificates or a suitable receipt if accredited/ approved agents are used to act on behalf of Downer.
▪ An annual return may also be required by the relevant state authority.
 	
Reporting
 	
Every facility/ project is required to report their waste data into the **Environmental Data Reporting System (EDRS)**, or alternatively by completing ***DA-ZH-FM077.2 Environmental Data Collection Record*** and submitting to an authorised person who can enter the data into **EDRS**.
	Managers & Supervisors

What if it Goes Wrong	**Responsibility**
Implement ***DA-ZH-PR006 Incident Reporting and Investigation*** if waste materials have the potential to contaminate land, air, stormwater or a waterway.	Managers & Supervisors

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Zero Harm Standard

For further information, refer to the Zero Harm compliance guidelines ***DG-ZH-CG068 Contaminated Land***, ***DG-ZH-CG063 Management of Waste*** and ***DG-ZH-CG121 Waste Disposal***.

Virgin Excavated Natural Material (VENM) is:

- clay
- silt
- rock
- rock fines
- sand
- gravel

- that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities (i.e. material with contaminant levels below 'fill material' thresholds of local legislation)

- that does not contain sulfidic ores or soils, or any other waste

Waste for use as fill is: waste soil proposed for direct reuse, processed construction and demolition waste, and a homogenous mineral-based industrial residue.

<table>
<tr><th>Planning Requirements</th><th>Responsibility</th></tr>
<tr><td colspan="2">Identifying Hazards associated with undertaking Land/ Clean Fill Activities</td></tr>
<tr><td colspan="2">Identify all potential risks associated with unauthorised import and export of fill material. To further assist in the identification of these hazards, managers and supervisors should also consult:
▪ Divisional BowTie analysis reports
▪ previous incident reports
▪ workers and contractors (e.g. discussion at pre-start meetings, toolbox talks or via STAR process)
▪ previous risk assessments and permit to work documentation
▪ previous hazard reports
▪ previous audit and inspection reports
▪ industry standards; and
▪ relevant client document or work methods.</td><td rowspan="2">Managers/ Supervisors</td></tr>
<tr><td>The following are causes of unauthorised import and export of fill material:
▪ Inadequate or no testing of spoil
▪ Inadequate delineation and marking of contaminated areas
▪ Failure to identify contaminated fill material.</td><td>The Critical Controls required to prevent unauthorised import and export of fill material:
▪ Chemical analysis of spoil prior to transportation
▪ Contaminated areas marked/ signed/ painted/ flagged
▪ Random testing of load materials.
The Critical Controls required to minimise the consequences of unauthorised import and export of fill material are:
▪ Impermeable layer fitted adjacent to contaminated area to prevent further contamination.</td></tr>
</table>

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Planning	Responsibility

The generation of waste fill material is to be avoided or reduced where possible. Consider the waste hierarchy of controls for fill material prior to disposal from site. Once fill material is removed from site it is considered a waste. Document the waste fill removal process in the Zero Harm Management Plan giving consideration to the following:
 	
▪ Ensure all local legislation and council approvals and license requirements are met prior to generating fill.
 	
▪ Complete a preliminary site investigation to determine whether the current or previous land use presents a high or low potential for contamination. High risk sites (such as a manufacturing plant, foundry, power station, etc.) of having land contamination must be subject to a chemical assessment.
 	
▪ Where there is a potential for Asbestos Containing Materials (including Naturally Occurring Asbestos) to be present or disturbed, an assessment by an occupational hygienist or other competent person is required. If asbestos is confirmed refer to ***DA-ZH-ST086 Asbestos Management.***
 	
▪ Physically assess the site. If contamination is suspected or there is evidence of activities likely to result in contamination (for example, soil discolouration, odour or evidence of foreign materials) the area must be treated as potentially contaminated and a chemical assessment must then occur.
 	
▪ A chemical assessment can determine if the material is contaminated:
  ▪ Australian Standard 4482.1 (2005)- Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1, Non-Volatile and Semi-Volatile Compounds;
  ▪ Australian Standard 4482.2 (1999)- Guide to the investigation and sampling of sites with potentially contaminated soil, Part 2 – Volatile Substances; and,
  ▪ Relevant state authority guidelines.
 	
▪ Soils with acid sulfate potential represent a serious environmental risk and will be managed in accordance with relevant State and local guidelines. Two commonly referred to are:
  ▪ QLD ASS Technical Manual Soil Management Guidelines
  ▪ NSW ASS Manual
 	
▪ An agreement from Downer to the receiver (even where it is not a financial transaction) will be in writing and signed by each party. The agreement will reference the receipting system to be used. The receipts must contain the following:
 	
The product supplied under this Agreement has been inspected and, if necessary, processed to remove contamination in accordance with the relevant environmental laws or local regulations. All risk and responsibility – including, but not limited to any subsequent use or relocation – associated with the product is transferred from Downer to the Purchaser/ Transferee upon issue of this Receipt. The Transferee should refer to the relevant state environmental protection legislation and local government regulations to inform itself of its responsibilities in dealing with or disposing of the product.
	Managers & Supervisors

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Planning	Responsibility
Contaminated fill must be managed as per state and local legislative requirements. Receivers of fill material prior to receipt of fill material will: ▪ Ensure all local legislation and council approvals and license requirements are met prior to accepting fill materials. ▪ Ensure the supplier of fill materials is a Downer approved supplier. ▪ Refuse to accept any fill material until evidence determining fill material is acceptable as per legislative guidelines. ▪ Request a copy of the fill material generators site investigation as evidence of research to determine that material is acceptable for the receiving site as per legislative guidelines. This should include (at a minimum) details of parties involved, the volume of material and the origin of the fill material and any knowledge concerning their possible contamination. ▪ Physically assess the fill material generators site. ▪ Where fill material has not been classified as VENM as per state legislation or there is any doubt then conduct your own independent chemical assessment. ▪ Ensure any assessment and/ or analysis is indicative of the total fill being received. Waste for use as fill material must comply with the applicable local and state regulations contaminant levels. In some states, written permission must be sought prior to using waste for fill or a raw material.	Managers & Supervisors

On the Job	Responsibility
Generators of fill material will consider the following: ▪ Pre-receipt procedures for soil, which includes assessment and/or analysis that provides evidence of clean fill status (ensure the assessment and/ or analysis is indicative of the total fill that is generated) ▪ Staff training requirements ▪ Load inspection procedures ▪ Nonconforming load procedure ▪ Topsoil management (Topsoil is valuable for rehabilitating the site as it contains indigenous seeds adapted to the area) ▪ Fire management ▪ Noxious weed control ▪ Drainage and erosion control ▪ Visual amenity management ▪ Community engagement ▪ Monitoring and maintenance ▪ Site security and fencing (to prevent unauthorised access) ▪ Noise and dust mitigation procedures ▪ Traffic considerations.	Managers & Supervisors

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On the Job	Responsibility
Receivers of fill material will carry out the following: ▪ Receive delivery dockets from the drivers for each load and ensure it details the address of origin of the fill/raw material, the registration of the vehicles that transport fill and driver identity. ▪ Inspect the load of fill material being delivered. If you suspect possible contamination (e.g. wastes are mixed in the load or an odour is detected) do not accept it.	Managers & Supervisors

What if it Goes Wrong	Responsibility
If an adverse unintended result occurs follow ***DA-ZH-PR006 Incident Reporting and Investigation***.	Managers & Supervisors

State/ Territory	Classifying Waste Regulations/ Guidelines
Queensland	National Environment Protection Council (NEPC) 'The National Environment Protection (Assessment of Site Contamination) Measure (NEPM), 1999'
New South Wales	Department of Environment, Climate Change and Water NSW, 'Waste Classification Guidelines, Part 1:Classifying Waste'
ACT	Environment ACT, 'ACT's Environmental Standards: Assessment & Classification of Liquid & Non-liquid Wastes, June 2000'
Victoria	Environmental protection Authority, 'Industrial Waste Resource Guidelines, Soil Hazard Categorisation and Management'
Tasmania	National Environment Protection Council (NEPC) 'The National Environment Protection (Assessment of Site Contamination) Measure (NEPM), 1999'
South Australia	National Environment Protection Council (NEPC) 'The National Environment Protection (Assessment of Site Contamination) Measure (NEPM), 1999'
Western Australia	Department Of Environment And Conservation Landfill, 'Waste Classification and Waste Definitions 1996'
Northern Territory	National Environment Protection Council (NEPC) 'The National Environment Protection (Assessment of Site Contamination) Measure (NEPM), 1999'

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Zero Harm Standard

For further information, refer to Zero Harm Compliance Guidelines; ***DG-ZH-CG069 Environmental Noise***; ***DG-ZH-CG118 Control of Workplace Vibration***; and ***DG-ZH-CG030 HSE Aspects of Design and Development***.

Planning	Responsibility
Downer will take all reasonable and practicable measures to limit noise and vibration detectable outside of the site boundaries, which exceeds legislative requirements and may affect the amenity of neighbours and the community. The potential to generate noise and vibration needs to be considered at the planning/design stage of any new, or modifications to an existing, work site, plant or equipment. The level of planning will be determined by the relevant authority and to the principles of the noise hierarchy of control. A noise and vibration management plan will be incorporated into the site or project Zero Harm Management Plan and will include: ▪ Existing background level and legal requirement. ▪ Distance between the site and the area likely to be affected by the construction noise or vibration. ▪ Nature of neighbouring buildings and the activity therein, where the noise is likely to be heard, or vibration perceived (dilapidation report for vibration). ▪ The likely duration of construction, maintenance and demolition operations and the hours during which the above operations will be carried out. ▪ The predicted nature and levels of the noise or vibration. ▪ Any initiatives to reduce the impact of noise and vibration. Most Preferable AVOID REDUCE MANAGE ENGINEER Least Preferable Maintenance work (refer to local guidelines for a definition of maintenance work) not likely to affect the amenity of neighbours and the community, the noise and vibration management plan can be more qualitative and include: ▪ Identification of nearby residences and other sensitive land users. ▪ Description of approved hours of work (refer schedule 1) and scope of work. ▪ Description of what work practices will be applied to minimize noise and vibration. ▪ Description of complaints handling process.	Managers & Supervisors

State/ Territory	Regulation
Commonwealth	AS2436 – 2010 Guide to noise and vibration control on construction, demolition and maintenance sites. AS2187.2 – 2006 Explosives – Storage, transport and use – Use of Explosives BS 6472-1992 – Evaluation of human exposure to vibration in buildings BS 5228- 2 -2009 – Code of practice for noise and vibration control on construction and open sites ***Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration (ANZEC 1990)***
Queensland	***Environmental Protection (Noise) Policy 2008***

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Planning		Responsibility
State/ Territory	**Regulation**	
New South Wales	***Protection of the Environmental Operations (Noise Control) Regulation 2008*** ***Interim Construction Guideline July 2009*** ***Assessing Vibration: A Technical Guideline***	Managers & Supervisors
ACT	***Noise Environmental Protection Policy 2010***	
Victoria	***Environment Protection (Residential Noise) Regulations 2008*** ***State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade)***	
Tasmania	***Environmental Protection (Noise) Regulations 2004***	
South Australia	***Environment Protection (Noise) Policy 2007***	
Western Australia	***Environmental Protection (Noise) Regulations 1997***	
Northern Territory	***Waste Management and Pollution Control Act*** ***Noise guidelines for development sites June 2011***	

On the Job	Responsibility
Avoid/ Reduce Noise and Vibration: ▪ Avoiding portable radios, public address systems or other methods of site communication that may unnecessarily impact upon nearby residence. ▪ Employing other techniques for all high noise and vibration activities. E.g. bored piles rather than pile driving. ▪ Select demolition methods not involving impact where possible (e.g. hydraulic rock splitters rather than rock breakers). ▪ Choosing quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks. ▪ Choosing plant and equipment with low vibration generation characteristics. ▪ Limiting equipment that generates impulsive noise. ▪ Limiting vehicles reversing. ▪ Using broadband audible alarms on vehicles and elevating work platforms. ▪ Minimising truck movements. ▪ Blast vibration may be controlled by careful attention to blast details and the application of correct techniques Manage Noise and Vibration: ▪ Maximise the distance between noisy activities and noise sensitive land users. ▪ Schedule activities at appropriate times of the day. ▪ Avoid scheduling noise generating works over consecutive nights ▪ Plan routes for the delivery of materials and parking of vehicles to minimise noise. ▪ Operate plant and equipment in the quietest and most efficient manner.	Managers & Supervisors

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On the Job	Responsibility
▪ Regularly inspect and maintain plant and equipment to minimise noise and vibration level increases, and ensure all noise and vibration reduction devices are operating effectively. ▪ Maintain any pre-existing barriers or walls on a demolition or excavation site as long as possible. ▪ Undertake noisy fabrication off site where possible where noise can be controlled. ▪ Notify the community between 5 and 14 days prior to any activity with a high noise or vibration. ▪ Provide a website so the community can be informed on work operations. ▪ Organise demolition, earthmoving and ground impacting operations so as not to occur in the same time period <u>Engineer:</u> ▪ Barriers or other noise limiting devices that are part of the end product design to be installed as early as possible. ▪ Installing purpose built acoustic walls, baffles, sound proofing, landscaping. ▪ Using temporary site buildings and material stockpiles as noise barriers. ▪ Using hammer cushions when driving steel piles that minimise the vibration generated <u>Monitoring:</u> ▪ Regular monitoring maybe required to determine the accuracy of the predicted levels, also to ensure actual works are complying with the legal requirement. <u>Toll Free Complaints Hotline:</u> A complaints hotline may be required as part of approval/ contract conditions. Items to consider: ▪ Give complaints a fair hearing. ▪ Have a documented complaints process, including an escalation procedure so that if a complainant is not satisfied there is a clear path to follow. ▪ Call back as soon as possible to keep people informed of action to be taken to address noise problems. ▪ Call back at night-time only if requested by the complainant to avoid further disturbance. ▪ Provide a quick response to complaints, with complaint handling staff having both a good knowledge of the project and ready access to information. ▪ Implement all feasible and reasonable measures to address the source of complaint. Keep a register of any complaints, including details of the complaint such as date, time, person receiving complaint, complainant's contact number, person referred to, description of the complaint, work area (for larger projects), time of verbal response and timeframe for written response where appropriate.	Managers & Supervisors

What if it Goes Wrong	Responsibility
If a complaint is received or results of monitoring are non-compliant, cease or limit noise generating work and follow ***DA-ZH-PR006 Incident Reporting and Investigation***. Contact your local Environmental Sustainability Manager/ Zero Harm Advisor for further advice.	Managers & Supervisors

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Schedule 1: Approved Hours of Work for Construction Noise (including maintenance)

This is a guideline only and reference to the appropriate regulatory authority definitions and approval conditions is mandatory. It is always necessary, regardless of the legal requirement, to talk to the appropriate regulatory authority for construction projects about the noise and vibration management plan.

BL = Background level noise calculated or prescribed. The description, definition and calculation differ in each jurisdiction.

State/ Reference	Time of day	Comments
Qld Environmental Protection Act 1994 - SECT 440R	6:30 am-6:30 pm Monday to Saturday	Building works outside of these hours are permitted, as long as they do not result in audible noise at the nearest noise sensitive place
NSW Interim Construction Guideline July 2009	Recommended standard hours: Monday to Friday 7.00 am to 6.00 pm Saturday 8.00 am to 1.00 pm No work on Sundays or public holidays	Noise affected premises BL + 10dB(A) LAeq(15minute) Noise of 75dB(A) LAeq (15minute) represents a highly noise affected premises
	Outside recommended standard hours	Noise affected premises BL + 5 dB(A) LAeq(15minute)
ACT Noise Environmental Protection Policy 2010	Industrial Areas 6.00 am and 8.00 pm Other areas For less than 2 weeks 7.00 am and 8.00 pm Monday to Saturday and 8am and 8pm on Sunday and public holidays For more than 2 weeks 7.00am and 6.00pm Monday to Saturday, excluding public holidays Roadwork's not on a major road 7.00 am and 8.00 pm on Monday to Saturday and 8.00 am and 8.00 pm on Sunday and public holidays	For building work approved by a building permit.
Vic Noise Control Guideline Oct. 2008	Recommended standard hours: Monday to Friday 7.00 am to 6.00 pm Saturday 7.00 am to 1.00 pm Road Repairs: 7.00 am — 6.00 pm Monday to Saturday 9.00 am — 6.00 pm Sunday and Public Holidays	Noise Control Guideline to be followed
	Outside Standard hours: 6.00—10.00 pm Monday to Friday 1.00—10.00 pm Saturdays 7.00 am — 10.00 pm Sundays and public holidays	Noise affected premises BL + 10dB(A) LAeq(15minute) within 18 months Noise affected premises BL + 5dB(A) LAeq(15minute) after 18 months
	Night Works: 10.00 pm — 7.00 am Monday to Sunday	Noise Inaudible

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State/ Reference	Time of day	Comments
TAS Environmental Management And Pollution Control (Miscellaneous Noise) Regulations 2004	Recommended standard hours: 7.00 am and 6.00 pm Monday to Friday 8.00 am and 6.00 pm Saturday 10.00 am and 6.00 pm Sundays and statutory holidays	Consult relevant authority
SA Environment Protection (Noise) Policy 2007	7.00 am to 7.00 pm, Monday to Saturday and not a public holiday	Source noise level (continuous) doesn't exceed 45 dB(A) or BL if higher; or Source noise level (maximum) doesn't exceed 60 dB(A) or BL if higher. Outside these hours or conditions approval from Environment Protection Authority (EPA) is required.
WA Environmental Protection (Noise) Regulations 1997	Between 7.00 am – 7.00 pm other than Sunday and Public Holidays	The LA10 noise level at the sensitive premises must be below 45 decibels and 40 decibels if the noise is tonal. Unless the following controls are implemented: the construction is was carried out in accordance with control of environmental noise practices set out in section 4 of AS 2436-2010 the equipment used on the premises was the quietest reasonably available; and The local regulator (Council / Environment Regulator) MAY require a noise management plan to be submitted prior to carrying out work. *If you are unsure of a Noise Management Plan is required contact the regulator for clarification.*
WA Environmental Protection (Noise) Regulations 1997	Between 7.00 pm – 7.00 am and any Sunday or Public Holiday	The construction work is carried out in accordance with control of environmental noise practices set out in section 4 of AS 2436 2010 The equipment used on the premises was the quietest reasonably available; and A noise management plan must be completed and provided to the regulator and not later than 7 days before the construction work commenced. The plan must be approved but the regulator CEO prior to commencement At least 24 hours before the construction work commenced, written notice of the proposed construction work is provided to all occupiers of all premises effected by the works It was reasonably necessary for the construction work to be carried out at that time.
NT Noise guidelines for development sites June 2011	7.00 am and 7.00 pm Monday to Saturday 9.00 am and 6.00 pm Sunday or public holiday	If AS2436 – 2010 is followed. Construction noise levels should not exceed: in residential use areas BL plus 5 dB(A) LAeq in mixed commercial/residential use areas 60 dB(A) LAeq total in commercial use areas 65 dB(A) LAeq total in industrial use areas 70 dB(A) LAeq total Outside of these conditions a Noise and Vibration plan must be submitted to: Environmental Assessments Environment and Heritage Division PO Box 496, Palmerston NT 0831

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Zero Harm Standard

For further information, refer to Zero Harm Compliance Guideline ***DG-ZH-CG070 Air Pollution and Odour***.

Planning	Responsibility
Downer will take all reasonable and practicable measures to limit air and dust emissions from all activities conducted at fixed and construction worksites. The potential to generate air emissions needs to be considered at the planning/ design stages of any new or modification to a work site. Any controls will consider the emissions to air hierarchy of control. To the extent that it is reasonable to do so, air emissions should be dealt with in the following order of preference: **Avoid** – e.g. Using technology that avoids air emissions **Reduce** – e.g. Treating air emissions before disposal **Reuse** – e.g. Baghouse dust reused in asphalt production **Recycle** – e.g. Air emissions used in another industrial process **Manage** – e.g. Locating a thing that releases air emissions in a suitable are to minimize the impact of the air emissions. **Most Preferable** **Least Preferable** An Air Quality Management Plan will be incorporated into the site or project Zero Harm Management Plan and will include: ▪ Identification of areas or plant that can impact on air quality. ▪ Air modelling if deemed necessary i.e. if there are sensitive receptors close to proposed site. ▪ Monitoring and testing plan for areas where there are direct emissions as required by licence or permit requirements. ▪ Dust and odour control strategies specific to the worksite. ▪ Management options should air emissions exceed allowable limits. Access tracks will be clearly defined in the planning stage and use mandated via planned inductions to prevent unnecessary vehicle movement onto other areas.	Managers & Supervisors

On the Job	Responsibility
<u>Avoid & Reduce sources of air emissions by:</u> **Source/ Activities** | **Avoidance/ Reduction** Purchasing, Procurement, Supply Chain, Asset Management | ▪ Consideration to be given to purchase newest available technology for any new plant and equipment procurement to minimise energy use and avoid air emissions ▪ Source clean product where possible ▪ Upgrade/retrofit plant where possible and economically viable to limit emissions	Managers & Supervisors

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On the Job	Responsibility

Source/ Activities	Avoidance/ Reduction
Inadequate waste disposal (odour and smoke)	▪ No burning of wastes is permitted on site
Land clearing activities (e.g. site preparation, temporary amenities)	▪ Retention of as much ground cover as possible during clearing activities ▪ Plan activities to minimise exposure of disturbed soil
Transportation	▪ Eliminate unnecessary vehicle movements by car-pooling where practicable

Reuse & Reduce sources of air emissions by:

Source/ Activities	Reuse/ Recycle
Asphalt Production	▪ Collected baghouse dust can be reused in asphalt production.

Control & Management sources of air emissions by measures such as:

Source/ Activities	Control/ Management
Earthmoving and excavation	▪ Material (sand, soil and aggregate) stockpiled long term (stored >10 days) are to be adequately shaped and covered ▪ Material (sand, soil and aggregate) stockpiled short term (stored <10 days) are to be shaped, dampened and covered where possible ▪ Cease or modify operations during high or unfavourable wind conditions ▪ Use water trucks as required (e.g. - during heavy traffic periods, during the dryer months of the year, at a specific location) ▪ Disturbed areas to be stabilised as soon as practicable after construction to prevent or minimise wind-blown dust Vehicles transporting loose materials to and from the site will have the loads covered to prevent wind-blown dust emissions and spillages ▪ Water sprays and dust suppression surfactants
Diesel exhaust emissions	▪ Proper maintenance and tuning of engines to manufacturer's specifications ▪ Catalytic converters and exhaust filters ▪ Correct fuel specification ▪ Limiting idling time ▪ Avoiding overloading ▪ Appropriate height of discharge above ground level

Managers & Supervisors

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On the Job		Responsibility
Source/ Activities	**Control/ Management**	
Unpaved access roads and pathways, and the clearing of access roads	▪ Water sprays and dust suppression surfactants ▪ Revegetation ▪ Wind breaks (temporary cyclone fence with fine shade cloth attached) ▪ Seal high traffic surfaces/areas where possible ▪ Limit speed on all access tracks (40km or less and 10km for shared vehicle pedestrian areas)	Managers & Supervisors
Masonry activities (preparation of concrete, cement and mortar mixes; cutting stone, bricks or pavers)	▪ Avoiding cement dust emissions ▪ Managing stockpiles (sand, gravel) by using water sprays (when emptying cement bags into mixer) ▪ Wet cutting and drilling techniques	
Concrete drilling or cutting	▪ 'Wet' systems preferable ▪ Suitable extraction or ventilation ▪ Filtration and discharge	
Crushing or screening (i.e. sorting) aggregate materials	▪ Suitable extraction or ventilation ▪ Cyclones or filtration equipment	
Wind erosion from stockpiled material.	▪ Water sprays ▪ Bunker storage ▪ Limiting size of stockpiles ▪ Vertical barriers (or covering the pile if it is small) ▪ Use dust suppressant agents e.g. Gluon 240 on stockpiles, batters, access roads etc. ▪ Use dust screens (shade cloth or similar on boundary fences) where deemed necessary	
Sanding and grit blasting (Carborundum odours from grinding, cutting and sanding operations.)	▪ Dust suppression curtain (hessian, shade cloth) ▪ Suitable extraction and ventilation, filtration and discharge ▪ Appropriate extraction of fumes and ventilation, and suitable discharge to aid dispersion and dilution of odours, where this activity is generating complaints ▪ Considering wind speed and direction when undertaking these activities	
Surface finishing (e.g. spray painting)	▪ Controlling overspray ▪ Considering wind direction and potential impacts ▪ Dust suppression curtain (hessian, shade cloth) to minimise overspray (aerosol impact)	

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On the Job	Responsibility

Source/ Activities	Control/ Management
Smoke (engines and motors)	▪ Efficient combustion and proper dispersion
Use of resins, adhesives, caulking compounds, sealants, silicones,	▪ Appropriate extraction of fumes and ventilation, and suitable discharge to aid dispersion and dilution of odours, where this activity is generating complaints ▪ Considering wind speed and direction when undertaking these activities

Managers & Supervisors

Emissions Monitoring

- In accordance with approval conditions and/or protection licences and permits.
- Stack testing to be conducted as per the requirements set in schedule 1.
- Review for compliance after test results received.

What if it Goes Wrong	Responsibility
All complaints and non-conformances to discharge limits will be reported through ***DA-ZH-PR006 Incident Reporting and Investigation***. This means: ▪ Entering the results into **INX**. ▪ Investigating the relevance of the discharge limits and the cause of the non-conforming discharge. ▪ Correct the discharge of non-conforming discharge.	Managers & Supervisors

Schedule 1: Stack Emission Discharge Limits

- Stack emission testing is required to ensure that emissions satisfy state legislative or other permit/licence conditions and will be detailed in the EITP for each site.
- Where stack testing is not stipulated by license conditions it must be carried out every 2 years, or as directed.
- Where stack testing is not stipulated by license conditions the testing must include total particulate testing as a minimum, additional testing can be conducted based on a site specific risk assessment
- All stack emission tests are conducted in accordance with Stack Testing Work Instruction.
- **All stack emission tests are issued in draft until approval is given by the Manager Environmental Sustainability or delegate for final issue**.
- All stack emission tests are compared to the license requirements or where not available the point source emission limits below. Where they are exceeded an incident report will be raised, investigated and corrected.
- Australia does not have national air quality emissions standards. Environment protection authorities in individual States and Territories set such standards. The values in set Schedule 1 are guideline values only. These values can be set higher or lower depending on State/Territory Environmental Regulatory Licenses and distance to sensitive site receptors and premises.
- For Queensland Air Emission Discharge Limits use NSW Regulation guidelines.

For maximum allowable point source emission limits outside of license/permits see below.

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Pollutant	Victorian Legislation SEPP (Air Quality Management) – Schedule D	South Australian Legislation EPP (Air Quality – Schedule 1: Maximum Pollution Levels)	New South Wales Protection of the Environment Operations (Clean Air) Regulations 2010 – Schedule 4			Tasmania Environment Protection Policy (Air Quality) 2004 – Schedule 1, Table 2 – In-Stack Concentrations)	Western Australia Clean Air (Determination of Air Impurities in Gases Discharged to the Atmosphere) Regulations 1983
Total Particulate	0.5g/m^3 *Pre 2001 plant emissions* 1. Solid fuel fired units 0.5g/m^3 2. All other units 0.25g/m^3	0.25g/m^3	**Group 1 – 0.4g/m^3 **Group 2, 3 or 4 – 0.25g/m^3 **Group 5 – 0.1g/m^3 **Group 6 – 0.05g/m^3			0.1g/m^3	0.25g/m^3 [A]
Oxides of Nitrogen* (NO_x)	0.35g/m^3 for gaseous fuels[#] 0.5g/m^3 for liquid or solid fuels[#] *Pre 2001 plant emissions* 1.0g/m^3	0.35g/m^3 for gaseous fuels 0.5g/m^3 for liquid or solid fuels	**Group 1, 2, 3 or 4 – 2.5g/m^3 for boiler operating on gas **Group 5 & 6 – 0.35g/m^3 for boiler operating on gas **Group 1, 2, 3 or 4 – 2.5g/m^3 for boiler operating on fuel other than gas **Group 5 & 6 – 0.5g/m^3 for boiler operating on fuel other than gas			0.35g/m^3 for boiler operating on gas 0.5g/m^3 for boiler operating on fuel other than gas	0.5g/Nm^3 [C]
Carbon Monoxide (CO)	2.5g/m^3	1.0g/m^3	1.25g/m^3			-	0.125g/Nm^3 [B]
Odour	Do not allow to be emitted from the premises any odours which may be offensive to the senses of human beings or a nuisance to any persons beyond the boundaries of the premises.	Odour criteria are population dependent—as the population density increases, the increased possibility of sensitive individuals raises the potential for odour complaints, and more stringent criteria are necessary. The predicted odour levels (three-minute means) must not exceed the following odour levels 99.9% of the time at sensitive receptors, not including houses on the property of the development (see table)	Any activity or plant in connection with which solid fuel is burnt	Group 1, in approved circumstances	Ringelmann 3 or 60% opacity	Schedule 3 – Odour Criteria Table 1. Known pollutant(s) see Schedule 2. Unknown mixtures limit is 2 odour units over a 1 hour period.	The Environmental Protection Act 1986 protects against "unreasonable emissions" – emissions of noise, odour or electromagnetic radiation which unreasonably interfere with the health, welfare, convenience, comfort or amenity of any person.
				Group 1, in other circumstances	Ringelmann 2 or 40% opacity		
				Group 2, 3, 4, 5 or 6, in approved circumstances	Ringelmann 3 or 60% opacity		
				Group 2, 3, 4, 5 or 6, in other circumstances	Ringelmann 1 or 20% opacity		
			An activity or plant in connection with which liquid or gaseous fuel is burnt	Group 1, 2, 3, 4, 5 or 6	Ringelmann 1 or 20% opacity		

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Pollutant	Victorian Legislation SEPP (Air Quality Management) – Schedule D	South Australian Legislation EPP (Air Quality – Schedule 1: Maximum Pollution Levels)	New South Wales Protection of the Environment Operations (Clean Air) Regulations 2010 – Schedule 4	Tasmania Environment Protection Policy (Air Quality) 2004 – Schedule 1, Table 2 – In-Stack Concentrations)	Western Australia Clean Air (Determination of Air Impurities in Gases Discharged to the Atmosphere) Regulations 1983
Odour (cont.)		**No. People** / **Odour Units** >2000 / 2 >350 / 4 >60 / 6 >12 / 8 <12 / 10			
Smoke (Visible Emissions)	Ringelmann 1(BS 2742C, 1957); or of such opacity as to observer's view to the same degree as emissions corresponding with Ringlemann 1 above. Note: 1. Ringlemann 2 acceptable for periods aggregating not more than 3 minutes in any 60 minute period. 2. Does not apply to emission of water vapour.	Smoke emitted from a chimney forming part of fuel-burning equipment or industrial plant must not appear to be darker than Shade 1 on either the Ringelmann Chart or the Miniature Smoke Chart.	For the purposes of Schedule 6, the approved circumstances for premises other than marine vessels are: a) that the smoke is emitted from the premises: • for a period of no more than 20 minutes per 24 hours, after lighting a boiler or incinerator from cold, being the period during which the boiler or incinerator is brought up to normal operation, or • for a period of no more than 10 minutes per 8 hours, as a result of blowing soot from a boiler, and b) that all practicable means are employed to prevent or minimise the emission of smoke during that period.	A concentration no darker than Ringelmann 1, except that the concentration may be darker (but not so to exceed Ringelmann 3) for up to 10 minutes in any period of 8 hours for lighting a boiler or blowing soot, but only as long as all practicable means are employed to prevent or minimise the emission of air impurities. (This limit does not apply to emissions involving water vapour.)	Do not burn, or allow to be burnt: • any material listed in **Schedule 2***** so as to cause or allow visible smoke to be discharged into the environment • any material so as to cause or allow **dark smoke****** to be discharged into the environment for more than 4 minutes in any hour (does not apply to the normal operation of road vehicles, trains or aircraft).

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* Nitrogen calculated as NO_2

** Classification of the Activity and Plant

*** Schedule 2: Carpet, Electrical, Fabrics or textiles, Organic solvent, Paint, Plastic (including polystyrene and the like), Printed circuit boards, Printing waste, Rubber, Timber that has been treated with preservatives, Tyres, Vehicles or vessels and their parts and Waste oil, fats or grease.

**** 'Dark Smoke' means smoke that, if compared with charts known as the Ringelmann Chart or Miniature Ringelmann

Chart described in regulation 5(7), would appear darker than shade 1 on either of those charts.

Note: Nitrogen calculated as NO_2 at a 7% oxygen reference level. Emission limit = C_M (20.9-%O_2 reference) / 20.9-%O_2 measured. C_M is the measured concentration of oxides of nitrogen in grams per cubic metre. Oxygen concentrations are expressed on a volumetric basis.

Schedule B – Intervention Levels for Class 1,2 and 3 Indicators, Victorian Government Gazette, S 240 21st December 2011.

A – WA DER using Maximum emission limit of particulate matter of 250mg/m^3 according to Western Australia's *EPA Environmental Code of Practice for Asphalt Plants 1991*.

B – WA DER using Maximum emission limit of CO and NOx according to *NSW Protection for the Environment Operations (Clean Air) Regulation 2010*.

C – WA DER using *The European Asphalt Pavement Association Environmental Guidelines on Best Available Techniques (BAT) for the Production of Asphalt Paving Mixes*.

An activity or operated plant on scheduled premises belongs to:

Group 1 if it:

- commenced before 1 January 1972
- commenced from 1 January 1972 as a result of a pollution control approval, pursuant to an application made before 1 January 1972
- ***Group 2*** if it commenced from 1 January 1972 as a result of a pollution control approval, pursuant to an application made between 1 January 1972 and 1 July 1979
- ***Group 3*** if it commenced from 1 July 1979 as a result of a pollution control approval pursuant to an application made between 1 July 1979 and 1 July 1986
- ***Group 4*** if it commenced from 1 July 1986 as a result of a pollution control approval pursuant to an application made between 1 July 1986 and 1 August 1997
- ***Group 5*** if it commenced from 1 August 1997 as a result of:
- a pollution control approval pursuant to an application made between 1 August 1997 and 1 July 1999
- an environment protection license pursuant to an application made between 1 July 1999 and 1 September 2005
- ***Group 6*** if it commenced on or after 1 September 2005, as a result of an environment protection license pursuant to an application made from 1 September 2005 (activities or operated plant that would belong to Group 6 will belong to Group 5, if the subject of a development consent approved before 1 September 2005).

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Zero Harm Standard

For further information, refer to Zero Harm Compliance Guideline ***DG-ZH-CG076 Heritage Conservation***.

Heritage is all the things that make up Australia's identity - our spirit and ingenuity, our historic buildings, and our unique, living landscapes. Our heritage is a legacy from our past, a living, integral part of life today, and the stories and places we pass on to future generations.

Planning	Responsibility
Downer will ensure all practicable measures are taken to limit the impact of Downer operations on heritage sites located on or near the work site. If planning a high impact activity such as ground disturbance, compaction, vibration, disturbance to trees, then determine if a heritage site can be impacted upon. Consultation with the land owner, the local Aboriginal authority and the local government authority is mandatory along with a National and State based search:	Managers & Supervisors

State	Link	Legislation Copies of these laws can be downloaded from ***www.austlii.edu.au***
National	***Australian Heritage Database*** ***EPBC – Protected Matters Search*** ***Indigenous Heritage***	Aboriginal and Torres Strait Islander Heritage Protection Act 1984 Environmental Protection and Biodiversity Act 1999
Queensland	***Heritage*** ***Indigenous Cultural Heritage***	Queensland Heritage Act 1992, Aboriginal Cultural Heritage Act 2003 Torres Strait Islander Cultural Heritage Act 2003
New South Wales	***Heritage Registers***	National Parks and Wildlife Act 1974 Heritage Act 1977
ACT	***Heritage Register***	Heritage Act 2004 Heritage Objects Act 1991
Victoria	***Heritage*** ***Aboriginal Heritage***	Heritage Act 1995, Aboriginal Heritage Act 2006
Tasmania	***Tasmania Heritage*** Contact Aboriginal Heritage Tasmania - ***http://www.aboriginalheritage.tas.gov.au***	Historic Cultural Heritage Act 1995 Aboriginal Relics Act 1975
South Australia	***Heritage***	Aboriginal Heritage Act 1988
Western Australia	***Cultural Heritage*** ***Aboriginal Heritage***	Heritage of Western Australia Act 1990 Aboriginal Heritage Act 1972
Northern Territory	***Heritage*** ***Sacred Sites***	Northern Territory Aboriginal Sacred Sites Act Northern Territory Heritage Act

If the preliminary investigation indicates the potential presence of heritage sites (or in Victoria conducting high impact activities within 200m of a waterway), a more comprehensive study by suitably qualified person(s) will be undertaken prior to any works commencing. (*Suitably qualified person has a minimum of relevant university qualification, e.g. archaeologist and expertise relevant to the site and its potential significance*).

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Planning	Responsibility
A comprehensive heritage study will be conducted in conjunction with project design and will take into consideration any potential for adverse impacts on surrounding heritage sites; the design will **avoid** any foreseen impact on heritage sites where possible. If the design cannot avoid potential heritage impacts, then the comprehensive heritage study will detail why and all practices that will **minimise** heritage impacts. Should the client provide the heritage study, Downer will validate the results by using the above tools and/or verifying a suitably qualified person was used to provide the heritage study. An exemption to this clause will be granted if the heritage study is approved by an appropriate regulatory authority. The outcome of the comprehensive heritage study will form the basis for any actions to protect the heritage sites and will be documented within the Zero Harm Management Plan (ZHMP) or Construction Environmental Management Plan (CEMP) and include: ▪ Establishment of existing conditions; ▪ Significance of the heritage site; ▪ Approval conditions; ▪ Downer's proposed management strategies; ▪ Downer's proposed monitoring strategies. The ZHMP or CEMP will be approved from the appropriate regulatory authorities prior to the actual or potential disturbance of a heritage site. Where earthworks are to occur, all emergency plans as per ***DA-ZH-PR015 Emergency Preparedness and Response*** must detail immediate notifications and response procedures in the event of a potential unexpected discovery of heritage sites, Aboriginal artefacts or Aboriginal remains to limit potential impacts.	Managers & Supervisors

On the Job	Responsibility
Heritage mitigation and general control measures as part of a ZHMP or CEMP, include: ▪ Relevant stakeholders are engaged to physically identify known heritage sites and artefacts. ▪ The location of the known heritage sites and artefacts will be displayed and communicated (examples are provided in *figure 2*). ▪ All known heritage sites and artefacts are protected using exclusion fencing, or similar physical barrier. ▪ The location of the heritage sites and artefacts are communicated to all personnel in accordance with ***DA-ZH-PR013 Communication and Consultation***. ▪ Cultural heritage monitors or consultants maybe engaged where specified by the Client or by the permit/approval. ▪ The removal or destruction of a known heritage site is prohibited, unless in accordance with a permit or other approval from an appropriate regulatory authority. ▪ Regular inspection of the implemented heritage and artefact control measures and site conditions are to be completed in accordance with ***DA-ZH-PR116 Zero Harm Inspections and Observations***. Actual and potential heritage sites and artefact areas are to be highlighted in the site induction. On more sensitive sites specific training in relation to heritage management should be considered to provide: ▪ Awareness of heritage sites;	Managers & Supervisors

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On the Job	Responsibility
▪ Overview of best practice to minimise impact;	
▪ Overview of incident reporting practices; ▪ Awareness of environmental responsibilities and obligations; and, ▪ Awareness of relevant legislation.	Managers & Supervisors
What if it Goes Wrong	**Responsibility**
If unknown suspected heritage sites or aboriginal artefacts are found during the course of works, immediately cease work in the area, barricade the area and implement the emergency plan to limit potential impacts. Liaise and cooperate with heritage stakeholders and await further instructions before recommencing works. If an adverse unintended result occurs to known significant sites, immediately implement ***DA-ZH-PR006 Incident Reporting and Investigation***.	Managers & Supervisors

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Figure 1 - Examples of heritage items.

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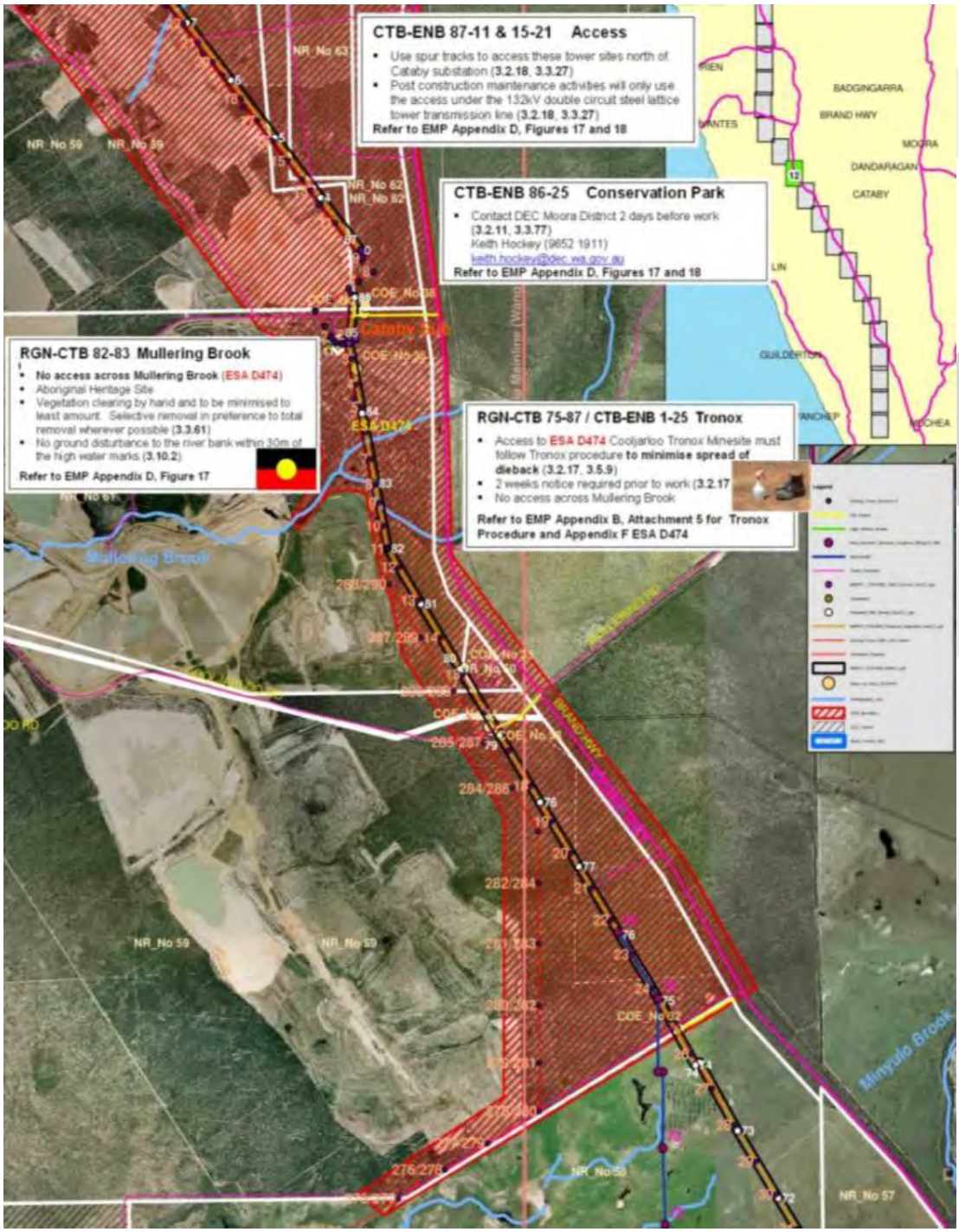

Figure 2 - Example of map showing sensitive aboriginal heritage locations

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Figure 3 - Example of heritage protection signage.

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Zero Harm Standard

This standard defines the processes and responsibilities for ensuring the safety of all persons and property working in the vicinity of vehicle or mobile plant traffic on roads.

For the design and maintenance requirements of vehicles, mobile plant and equipment, refer ***DA-ZH-ST057 Vehicles and Mobile Plant***. For the requirements and processes relating to the interaction of people and mobile plant movements within the worksite, refer ***DA-ZH-ST107 Plant and Pedestrian Interface***.

For further information, refer Zero Harm Compliance Guideline ***DG-ZH-CG135 Site Traffic Management***.

Key Definitions	
Complex Works (typically static worksites)	Any road works not otherwise covered by the definitions for mobile, very short-term or short-term works. Examples include, but are not limited to: Works extending beyond one shift or are left uncompleted overnight, Lane closures on freeways, Works involving re-direction of traffic, Works involving significant disruption to road networks or community services, Any work at a signalised intersection that requires alteration to the function of traffic signals or closure of a lane within the intersection, and Works with plans that will redistribute traffic, significantly lowering the level of service and safety of the surrounding local road network, including isolated intersections.
Short-Term Works	Any road works which meet the following criteria: Have a duration of more than 5 minutes but less than 1 shift (eg. Traffic light globe changing, louver changing, realigning signal lanterns), Do not involve leaving signs, devices or incomplete works overnight, Do not involve lane closures on a freeway or controlled access highway, Do not involve the redistribution of traffic, Do not significantly lower the level of service or safety on surrounding road networks, and Do not significantly disrupt local community services.
Very Short-Term Works	Road works with a duration of five (5) minutes or less at each location. Examples include, but are not limited to: Mobile inspections (vehicle/s moving on a roadway, shoulder or verge at a speed not more than 20km/hr below the limit), Frequently moving work (work involving multiple or moving work locations in close proximity such as grass cutting or rubbish removal), and Work at a single worksite for five (5) minutes of less (e.g. minor pavement maintenance).
Mobile Works	Works where a vehicle is required to travel on a roadway at less than 20km/hr below the speed limit (may include occasional stops for less than one (1) minute). Examples may include (but are not limited to) Line marking and Pavement testing;
Traffic Management Plan (TMP)/ Traffic Guidance Scheme (TGS)	A formal document prepared by a competent person that details the layout and nature of traffic control devices necessary to ensure the safety of all workers, and the minimization of disruption to other road users.
Vehicle Movement Plan (VMP)	A site plan / diagram that illustrates the organised movement of mobile plant and vehicles. In addition to vehicular movements and parking arrangements, this plan may also include identified hazards e.g. overhead power lines, road traffic, trees, bridges, waterways, ignition sources, etc.

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Planning / General Requirements	Responsibility
Ensure a Traffic Management Plan (TMP)/ Traffic Guidance Scheme (TGS) is documented and implemented for each of the following activities under their control: ▪ Complex Works ▪ Short-Term Works ▪ Very Short-Term Works, and ▪ Mobile Works All TMP/ TGS must comply with the requirements of *AS 1742.3 – Manual of Uniform Traffic Control Devices (MUTCD)*, and be approved by relevant authorities (Statutory or Local Government) where required. All Traffic Control/ Traffic Management arrangements must all meet the requirements of AS 1742.3 MUTCD, however implementation and compliance to this differs in each State and Territory. Ensure the requirements of the respective States/ Territories are adhered to along with the requirements of this standard.	Managers
All TMP/ TGS shall include appropriate diagrams that clearly illustrates the nature and layout of traffic control devices. All persons responsible for the development and implementation of TMP/ TGS (including Contractors) satisfy training and competency requirements as defined in the Training Section on the following pages. Safe Work Method Statements (SWMS) must be aligned to the TMP/ TGS and Vehicle Movement Plan(s), ensuring consistency between both documents. SWMS must be available for Traffic Control operators, and additionally for any task where Traffic has been identified as a risk. All relevant workers (including Contractors) must be formally advised of traffic management requirements for their respective workplaces and all necessary resources are made available for the proper implementation of TMP/ TGS. A copy of all TMP/ TGS shall be held at the respective worksite and freely accessible to all relevant workers. Regular inspections must be conducted by a competent person (refer to monitor compliance to TMP/ TGS (refer ***DA-ZH-FM135.2 Vehicle Movement Plan Development Guidance***) as well as the visual checks for any vandalism / damage to signage, etc. Traffic Management when required for road/rail level crossings must be approved by the Rail Infrastructure Manager – Representative. Immediately investigate and address any non-conformances to TMP/ TGS, including the immediate cessation of work where there is an immediate risk to safety or property. Refer *Annex 1 – Traffic Management Implementation Process Flowchart.*	Managers

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Planning / General Requirements	Responsibility

Relevant State/ Territory Road Authority contact details are:

State / Territory	Road Authority	Contact	Reference document or material
NSW	Roads and Traffic Authority (RTA)	***http://www.rta.nsw.gov.au/***	*Austroads Guide to Traffic Management*
QLD	Department of Transport and Main Roads	***http://www.tmr.qld.gov.au/***	*Traffic Management for Works on Roads - Code of Practice;* *Manual of Uniform Traffic Control Devices (MUTCD)*
VIC	VicRoads	***http://www.vicroads.vic.gov.au/***	*Code of Practice for Worksite Safety – Traffic Management*
SA	Transport SA	***http://www.transport.sa.gov.au/***	*Field Guide for Traffic Control Devices for WorkZone Traffic Management*
TAS	Department of Infrastructure, Energy and Resources - Transport	***http://www.transport.tas.gov.au/***	*Traffic Control for Works on Roads - Tasmanian Guide*
WA	Main Roads Western Australia	***http://www.mainroads.wa.gov.au/***	*Traffic Management for Events - Code of Practice*
NT	Northern Territory Transport Group	***http://www.transport.nt.gov.au/***	*Work zone traffic management training in the Northern Territory*
ACT	Move	***http://www.tccs.act.gov.au/tams_files/search?query=move***	*No information available*

IMPORTANT: Depots and fixed production facilities shall implement a Vehicle Movement Plan (VMP) for the site. For further information, refer section On the Job: Vehicle Movement Planning and ***DA-ZH-FM135.2 Vehicle Movement Plan Development Guidance***.	Managers
Contracted Traffic Management Services	
Ensure all Traffic Management contractors engaged within their respective areas are approved and evaluated in accordance with ***DA-ZH-PR022 Visitor and Contractor Management***. Traffic Management Contractors shall submit a completed ***DA-ZH-FM022.3 Contractor Evaluation Form*** prior to engagement and satisfy the following minimum requirements: ▪ Hold appropriate levels of Public Liability, Workers Compensation and Professional Indemnity Insurance. ▪ Have trained and competent personnel meeting the minimum requirements specified below and on Table 1. ▪ Have safe systems of work that formally incorporate risk management principals into the development and implementation of TMP/ TGS.	Managers

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Planning / General Requirements	Responsibility
▪ Provide a Safe Work Method Statement (SWMS) for Traffic Controllers incorporating both Road Traffic and Vehicular/ Mobile Plant movement risks and controls. ▪ Have personnel with sufficient experience in the development and implementation of TMP/ TGS. ▪ Have the appropriate resources and availability to meet the needs of Downer, including adequate traffic control personnel and equipment, and Have a sound safety record, without history of Statutory OHS prosecutions.	Managers
Training and Competency	
Ensure personnel conducting the activities in **Table 1** below are adequately trained and competent to the relevant Statutory Standards as detailed. For carrying out the following activities, Managers shall ensure personnel undertake the *Level 2 - Implement a Traffic Management Plan* course before carrying out the following activities: ▪ Development of Traffic Management/ Traffic Control Safe Work Method Statements (SWMS), including (but not limited to) SWMS for Installation and Removal of Traffic Control Signs and Devices, and SWMS for Traffic Control (Day or Night Works) ▪ Inspection of Traffic Control Implementation (i.e. Review Traffic Management Plans) ▪ Checking Traffic Control Signs and Devices for tampering / vandalism / damage / serviceability and rectifying and/ or reporting any faults, and ▪ Checking Traffic Control Signs and Devices for compliance to the Traffic Management Plan (i.e. correct signs are in place and positioned as specified)	Managers
Training and Competency Requirements (for Downer Infrastructure Traffic Control Personnel) Ensure all persons involved in the selection, design or implementation of TMP/TGS satisfy the following training and competency requirements: ▪ Successful completion of accredited training specified by the relevant state Road Authority as detailed in *Table 1* below, and ▪ Successful completion of training in the requirements of this standard, including demonstrated competency with applying the ***DA-ZH-FM135.1 Traffic Management Risk Assessment***.	

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Planning / General Requirements	Responsibility

Table 1: Training and Competency Requirements for Traffic Management Activities

Traffic Management Activity					
	Level 1a Handling Signage / Cones	**Level 1b** Control Traffic	**Level 2** Implement a Traffic Management Plan / Traffic Guidance Scheme	**Level 3** Develop and Authorise Traffic Management Plans / Traffic Guidance Schemes	**Level 4** Audit Traffic Management Plans/Sites
State	***Includes;*** *Placement of Cones and Signs under supervision;*	***Includes:*** *Placement of Signs under supervision;* *Use of a Stop/Slow Bat;* *Understanding of distances & approaches*	***Includes:*** *Selecting which TMP to use, and* *Interpreting & implementing an approved TMP;*	***Includes:*** *Principles for designing and developing TMPs, and* *Designing TMPs to suit workplace situations and conditions*	***Includes:*** *Inspection of traffic guidance schemes implemented to workplace situations and conditions.* *Record keeping and Auditing;*
VIC **TAS** **NT** **ACT**	RIIOHS205A – Control Traffic with a Stop-Slow Bat (1 day)		RIIOHS302A – Implement a Traffic Management Plan (2 days).	RIICC503A Prepare Work Zone Traffic Management Plans In Victoria, a minimum 2 years experience developing TMPs is acceptable	Level 2 acceptable
QLD	RIIOHS205A – Control Traffic with a Stop-Slow Bat (1 day)		RIIOHS302A – Implement a Traffic Management Plan (2 days).	RIICC503A Prepare Work Zone Traffic Management Plans	As required by Transport and Main Roads (TMR) Department
WA	RIIOHS205A – Control Traffic with a Stop-Slow Bat (1 day)		RIIOHS302A – Implement a Traffic Management Plan (2 days).	RIICC503A Prepare Work Zone Traffic Management Plans *Advanced accreditation is required for:* • *Complex TMPs RIICWD503A, and* • *Appointment as a Roadworks Traffic Manager (RTM)*	Level 2 acceptable
NSW	Yellow Ticket – 1 day (accredited provider)	Blue ticket (accredited provider)	Red Ticket (accredited provider)	Orange (accredited provider)	Level 2 acceptable
SA	Work Zone Traffic Management Training (1 day) Twelve (12) Month Refresher required			Qualified Traffic Engineer	Level 2 acceptable

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On the Job	Responsibility
Vehicle Movement Planning	
Every worksite must have a defined Vehicle Movement Plan (VMP). This can either be via a via a worksite layout plan (typically for fixed sites, production facilities, long term project sites or maintenance depots) or via the worksite diagram provision on the ***DA-ZH-FM028.4 Zero Harm PreStart and Risk Control Form*** for all other sites. To develop the VMP, ensure traffic areas are identified and subject to an appropriate risk assessment. The ***DA-ZH-FM135.2 Vehicle Movement Plan Development Guidance*** can also be used to assist in preparing and planning the worksite as well as to review to controls for effectiveness. Ensure relevant aspects of the VMP are included in site-specific inductions for employees, contractors and visitors entering the site. Fixed Site/ Depot VMP are to be displayed as a site map at the site office and employees, contractors and any visitors entering any area of operation shall be made aware of the requirements. Also refer ***DA-ZH-ST107 Plant and Pedestrian Interface***.	Managers/ Supervisors
Site Establishment and Execution	
Complex Works Ensure the development and implementation of TMP/ TGS for Complex Works are contracted to an approved Traffic Management Provider. Following receipt of a TMP/ TGS for Complex Works, the plan shall be reviewed and satisfy the following requirements prior to the commencement of works: ▪ Ensure all necessary resources are available for proper implementation of the TMP/ TGS ▪ Ensure responsibilities for implementation and review of the TMP/ TGS are clearly documented and understood by all relevant parties ▪ Where required, obtain necessary approvals from the relevant State Road Authority, and ▪ Ensure a documented inspection of traffic control devices is conducted prior to any personnel commencing work Ensure all relevant workers (including Contractors) are inducted to the worksite, including formal instruction relating to worksite traffic control. During the course of work, adherence to the TMP shall be monitored. Ensure any person entering the worksite is formally advised of applicable site safety requirements;	Managers/ Supervisors

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On the Job	Responsibility
The following requirements apply only to TMP/ TGS prepared by Downer Infrastructure personnel. Refer to the Planning section above for requirements pertaining to contracted Traffic Management Services. **Short Term, Very Short Term and Mobile Works** Ensure the following requirements are satisfied prior to commencement of any short-term, very short-term or mobile works: ▪ A ***DA-ZH-FM135.1 Traffic Management Risk Assessment*** has been completed for the specified works; ▪ A generic TMP/ TGS has been selected from the relevant State/ Territory Field Guide and referenced on the risk assessment form (minor modifications to generic TMPs/ TGSs may be accepted provided they are detailed on the risk assessment and comply to AS 1742.3) ▪ All requirements specified in the selected TMP have been implemented ▪ All persons responsible for the selection and implementation of the TMP/ TGS have satisfied training and competency requirements specified above ▪ Ensure a new Traffic Management Risk Assessment is completed following the identification of new risks or changed work conditions – Any subsequent amendments to the TMP/ TGS must be documented on the risk assessment and signed by all persons on the job In accordance with the risk assessment form, an accurate log shall be maintained of all Traffic Management activities undertaken during the course of the specified work;	

Monitor and Review	Responsibility
Managers shall ensure approved Traffic Control Subcontractors are subject to periodic reviews, including compliance assessments to AS 1742.3 (via the ***DA-ZH-FM135.2 Vehicle Movement Plan Development Guidance***). Traffic Management arrangements shall be monitored/ reviewed for compliance to the Traffic Management Plan/ Traffic Guidance Scheme and for any changes to conditions. Traffic Signs and Devices shall also be reviewed for tampering/ vandalism at regular intervals throughout the lifetime of the project. These reviews can be documented via the ***DA-ZH-FM028.4 Zero Harm PreStart and Risk Control Form***, the ***DA-ZH-FM135.2 Vehicle Movement Plan Development Guidance*** or via other means such as Daily Run Sheets for example.	Managers/ Supervisors

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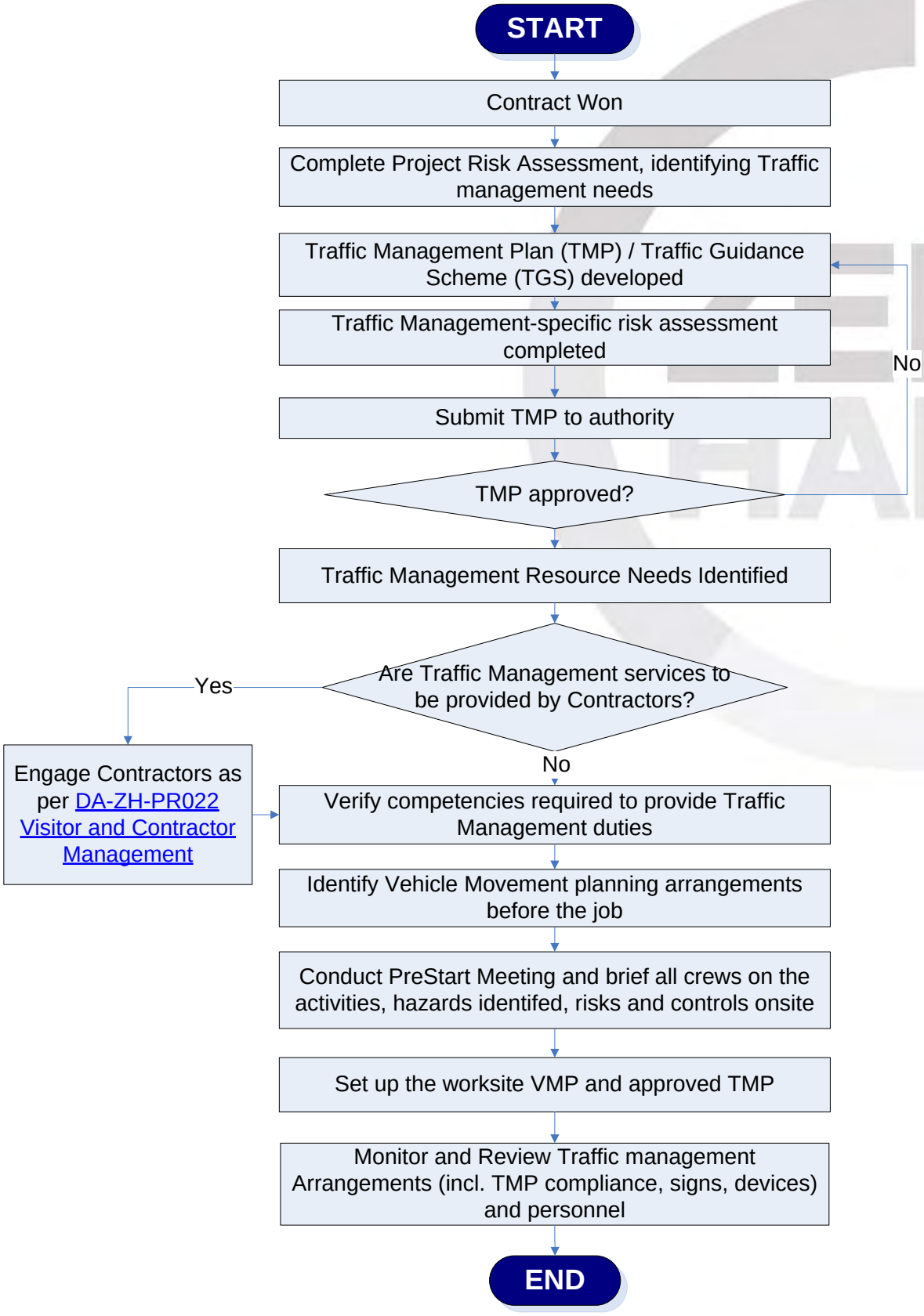
ANNEX 1 - TRAFFIC MANAGEMENT IMPLEMENTATION PROCESS FLOWCHART



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Zero Harm Standard

This standard applies to:

- work involving all material identified as, or suspected to be, asbestos-containing in all Downer operational areas (including naturally occurring asbestos); and
- materials encountered during work conducted by Downer workers off site.

Where the Zero Harm Management Plan stipulates that the Client's Asbestos Management System is used, the Manager must review the client system against this standard and adopt the higher standard, in consultation with the Client.

Where there is a requirement to remove and/ or dispose of asbestos, refer to ***DA-ZH-ST087 Removal and Disposal of Asbestos***.

The following definitions apply to this standard.

Competent Person	A person who has acquired through training or experience the knowledge and skills of relevant asbestos removal industry practice and holds a certification for asbestos assessor work or a tertiary qualification in occupational health and safety, occupational hygiene, science, building, construction or environmental health.
Downer Worker	All individuals working for Downer as: employees, contingent labour hire, contractors, subcontractors, apprentices, trainees, and work experience students.

Management Responsibilities	Responsibility

▪ Ensure that so far as is reasonably practicable, exposure of a person at the workplace to airborne asbestos is eliminated. If this is not reasonably practicable, the exposure must be minimised so far as is reasonably practicable. The exposure standard for asbestos must not be exceeded (see table below).
▪ Develop an Asbestos Register and an Asbestos Management Plan for all known asbestos containing material.
▪ Ensure that so far as is reasonably practicable, exposure of a person at the workplace to airborne asbestos is eliminated, however where asbestos containing material is to be removed and disposed of, the exposure is to be minimised as far as is reasonably practicable. The exposure standard for asbestos must not be exceeded (see table below).
The exposure standard for asbestos is the Safe Work Australia - Workplace Exposure Standards for Airborne Contaminants.
▪ Notify a competent person when the presence of asbestos containing material, including naturally occurring asbestos, has been identified. The competent person will provide guidance on safe work practices and assist in the development of the Asbestos Management Plan, including:
  ▪ control methods
  ▪ completing the asbestos removal permit
  ▪ maintaining asbestos registers (including the location, condition and friability); and
  ▪ reviewing the asbestos management process.
	Manager

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Management Responsibilities, continued	**Responsibility**
▪ Ensure that all Downer workers and/ or other persons/ companies who could potentially be exposed to naturally occurring asbestos: ▪ follow safe work procedures detailed in *Safe Work Australia Code of Practice - How to Safely Remove Asbestos* or *Health and Safety in Employment (Asbestos) Regulations 1998* and *Asbestos – New Zealand Guidelines for the Management and Removal of Asbestos 3rd Edition.* ▪ implement the correct control measures; and ▪ understand the risks associated with asbestos and asbestos containing materials, including naturally occurring asbestos.	Manager

Identification, Risk Assessment and Control	**Responsibility**
▪ Ensure that hazards associated with working in asbestos containing areas, with asbestos containing materials, have been identified and documented on the applicable Asbestos Register, and controls implemented by using an Asbestos Management Plan and Safe Work Method Statement (SWMS). The management of risk associated with asbestos must be managed as per ***DA-ZH-PR028 Zero Harm Risk Management.*** ! Consider elimination before all other options. **Elimination** – • The absence of asbestos in the workplace is the most desirable outcome, but the elimination of this hazard creates the potential of exposure during the removal process. • Careful consideration must be taken when deciding what course of action to take. **Substitution** – • Asbestos products shall be replaced by materials which are Asbestos free, and do not themselves constitute a health hazard. **Isolation and Engineering** – • Decontamination of all tools and equipment after use. • Use negative pressure exhaust units. • Using an Asbestos vacuum cleaner. **Administration** – • Air monitoring arrangements. • Adequate defined exclusions zones and signage. • Waste disposal program. **Personal Protective Equipment (PPE)** – • The use of P1, P2 and P3 supplied air respirators. • Full encapsulated protective equipment.	Manager

Identification and Assessment of Asbestos	**Responsibility**
The presence and the location of asbestos containing material on a site must be identified and assessed to determine whether an asbestos hazard exists. Where activities such as the generation of fill material could potentially disturb or unearth asbestos containing material (including naturally occurring asbestos), identification and assessment by a competent person must be completed.	Manager

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Identification and Assessment of Asbestos, continued	**Responsibility**
A competent person will carry out the identification and risk assessment process, including taking material samples, as required. Outcomes of the identification and assessment process must be documented in a formal report and include an Asbestos Management Plan. The purpose of the plan is to prevent exposure to airborne asbestos fibres for the duration of the time that asbestos containing materials are present in the workplace. The Asbestos Management Plan must: ▪ be clear and unambiguous ▪ set out the aims of the plan, what is going to be done, when it's going to be done and how it is going to be done; and ▪ contain procedures detailing the management of evacuation events associated with the potential exposure to airborne asbestos fibres.	Manager
Asbestos Labelling Requirements	**Responsibility**
All undisturbed asbestos containing material must be labelled, where practicable. The label, in conjunction with the Asbestos Register and site map of asbestos containing materials (or in New Zealand, clearly marked-up building plans), warns a person of the presence of asbestos containing material. The location of the label must be consistent with the location of the asbestos containing materials, as outlined by information in the Asbestos Register and the Asbestos Management Plan. A competent person must determine the positioning and number of labels required at an initial survey to ensure appropriate standards are followed. Enclosed areas which contain asbestos containing material must be signposted with cautionary warning signs. The purpose of cautionary warning signs is to ensure that the asbestos is not unknowingly disturbed without correct precautions being taken. As with all other areas containing asbestos materials, roofs must be appropriately signposted to warn Downer workers of the presence of asbestos containing materials. Labels used for this purpose must identify the materials as containing asbestos and must comply with *AS 1216: 2006 Class Labels for Dangerous Goods* or *NZS 5433: 2012 Transport of Dangerous Goods on Land*. All warning signs must comply with *AS/NZ 1319:1994 Safety Signs for the Occupational Environment*.	Manager
Asbestos Inspection	**Responsibility**
Ongoing inspections of the condition of asbestos containing materials must be conducted at a minimum frequency of bi-annually (or sooner if recommended in the Asbestos Management Plan). In New Zealand, the period between inspection will be determined by the condition and location of the asbestos, e.g. A visual assessment may be required at least annually however if the asbestos containing material is in good condition, and is unlikely to be disturbed, visual assessment at three-yearly intervals may be adequate. Inspections must be carried out by a competent person and documented in the Asbestos Management Plan, Asbestos Register and site Zero Harm Management Plan, if required.	Manager
Developing an Asbestos Management Plan	**Responsibility**
An Asbestos Management Plan sets out how asbestos identified at the workplace will be managed, e.g. what, when and how it is going to be done.	Manager

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Developing an Asbestos Management Plan, continued	**Responsibility**
An Asbestos Management Plan sets out how asbestos identified at the workplace will be managed, e.g. what, when and how it is going to be done. Asbestos Management Plans must include: ▪ the identification of asbestos and asbestos containing material, e.g. the locations of signs and labels ▪ an assessment of exposure risk ▪ an outline of how asbestos risks will be controlled, including consideration of appropriate control measures ▪ decisions, and reasons for the decisions, about the management of asbestos at the workplace, for example safe work procedures and control measures ▪ procedures for detailing accidents, incidents or emergencies of asbestos at the workplace ▪ workers carrying out work involving asbestos, e.g. consultation, information and training responsibilities ▪ monitoring procedures and results of workplace monitoring, if required; and ▪ a reference or link to the Asbestos Register for the workplace. Other information that may be included in the Asbestos Management Plan includes: ▪ a timetable for managing risks of exposure, e.g. priorities and dates for any reviews, circumstances and activities that could affect the timing of action ▪ identification of each person with responsibilities under the Asbestos Management Plan, including the person's responsibilities ▪ procedures (including a timetable) for reviewing and, if necessary, revising the Asbestos Management Plan and Asbestos Register. The Asbestos Management Plan must be made available to all Downer workers.	Manager
Using Contractors and Subcontractors	**Responsibility**

▪ In accordance with ***DA-ZH-PR022 Visitor and Contractor Management***, ensure the following requirements are satisfied prior to engaging contractors to perform asbestos work:
  ▪ The Contractor has been thoroughly evaluated and satisfies the necessary training, competency and license requirements for the intended work.
  ▪ The Contractor has been issued with an Authority to Work Permit (ATWP), i.e. ***DA-ZH-FM022.1 Authority to Work Permit***, prior to commencement of work, ensuring necessary inductions and safe work procedures have been completed.
In New Zealand, the Contractor has prepared an Asbestos Removal Plan prior to commencement of work, ensuring necessary permits, inductions and safe work procedures have been completed.
	Manager

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Consultation and Training	Responsibility

▪ Ensure that information, training and instruction provided to a Downer worker is suitable and adequate, having regard to:
  ▪ the nature of the work carried out by the Downer worker
  ▪ the nature of the risks associated with the work at the time the information, training or instruction is provided; and
  ▪ the control measures implemented.
▪ Ensure the information, training and instruction is provided in a way that is readily understandable by any Downer workers to which it is provided. Refer to ***DA-ZH-PR013 Communication and Consultation*** for further information on communication.
▪ Ensure any Downer workers who Downer reasonably believes may be involved in the carrying out of asbestos-related work are trained in the identification, safe handling and suitable control measures for asbestos and asbestos containing material. This training may include the following topics:
  ▪ purpose of the training
  ▪ health risks of asbestos
  ▪ types, uses and likely presence of asbestos in the workplace, including naturally occurring asbestos
  ▪ persons conducting a business or undertaking and the worker's roles and responsibilities under the Asbestos Management Plan
  ▪ where the Asbestos Register is located, how it can be accessed and how to understand the information contained in it
  ▪ processes and safe work procedures to be followed to prevent exposure, including exposure from the accidental release of airborne asbestos
  ▪ where applicable, the correct use of personal protective equipment (PPE) including respiratory protective equipment (RPE) (refer to ***DA-ZH-ST052 Personal Protective Equipment (PPE)*** for further information on PPE)
  ▪ the implementation of control measures and safe work methods to eliminate or minimise the risks associated with asbestos to limit the exposure to Downer workers and other persons
  ▪ the exposure standard and control levels for asbestos
  ▪ the purpose of any exposure monitoring or health monitoring that may occur.
 	
! All training and consultation must be appropriately documented.
 	
Workplace asbestos training is more general than the training that a worker undertaking asbestos removal work would receive. The specific training requirements for those undertaking the removal of asbestos refers to workers who are undertaking licensed asbestos removal work and are required to complete specific units of competency.
 	
Further information on these specific training requirements is available in *Code of Practice: How to Safely Remove Asbestos*.
  ▪ Records of all training must be kept while the worker is carrying out the work and for five years after the day the worker stops carrying out the work. These records must also be available for inspection by the regulator.
	Manager

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Monitoring Requirements	Responsibility
Health surveillance is an important part of the monitoring of exposure to hazardous materials, including asbestos, to ensure the health and safety of people in workplaces. Asbestos removalists must establish a health surveillance program, as determined by an assessment of the potential for exposure to asbestos, in accordance with the requirements of *NOHSC Model Regulations for the Control of Workplace Hazardous Substances [NOHSC:1005 (1994)*] and in consultation with relevant OHS authorities, to identify any specific health surveillance requirements. Additional guidance on health surveillance may be obtained from *NOHSC Guidelines for Health Surveillance [NOHSC: 7039 (1995)]*, which sets the minimum requirements for health surveillance for persons engaged in work that may expose them to asbestos or other hazardous substances. Guidelines for medical monitoring (for asbestos) in New Zealand are provided in *Asbestos – New Zealand Guidelines for the Management and Removal of Asbestos*).	Manager
Records Management	**Responsibility**
Records of asbestos related documentation, including training records, must be maintained in accordance with ***DA-QA-PR009 Records Management*** and ***DA-QA-FM009.1 Master Records Index.***	Manager/ Supervisor

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Zero Harm Standard

For further information, refer Zero Harm Compliance Guideline Ecosystem Protection DG-ZH-CG071.

Planning	Responsibility

All Downer Australia staff will ensure all practicable measures are taken to minimise any impact on flora and fauna on or adjacent to work sites. Downer will take responsibility to ensure an initial self-assessment is conducted to determine the potential presence of native flora and fauna. This can be achieved through consultation with Local, State and National regulatory authorities and the use of the following tools:

State	Link
National	http://www.environment.gov.au/epbc/pmst/index.html.
Queensland	http://www.derm.qld.gov.au/wildlife-
New South Wales	http://www.environment.nsw.gov.au/biodiversity/DraftBioStratMaps.htm
ACT	http://apps.actpla.act.gov.au/spatialplan/maps/map7.htm
Victoria	http://mapshare2.dse.vic.gov.au/MapShare2EXT/imf.jsp?site=bim
Tasmania	https://www.naturalvaluesatlas.tas.gov.au
South Australia	http://www.naturemaps.sa.gov.au/maps/viewer.aspx?site=NatureMaps#
Western Australia	http://naturemap.dec.wa.gov.au/
Northern Territory	http://www.infonet.cdu.edu.au/nrm/
Other	http://www.biomaps.net.au/

Where native flora and fauna is or has the potential to be found, a suitably qualified person(s) will complete a survey and assessment to ascertain quality of flora and fauna that may be adversely affected by the project/ works controlled by Downer. (*Suitably qualified person has a minimum of relevant university qualification, e.g. ecologist and expertise relevant to the site*).

Managers & Supervisors

A native flora and fauna survey and assessment will be conducted in conjunction with project design and will take into consideration any potential for adverse impacts on native flora and fauna; the design will **avoid** any foreseen impact on native flora and fauna where possible. If the design cannot avoid potential native flora and fauna impacts, then the native flora and fauna survey and assessment will detail why and all practices that will **minimise** native flora and fauna impacts.

The outcome of the native flora and fauna survey and assessment will form the basis for any actions to protect native flora and fauna on the job and will be documented within the Flora and Fauna Management Plan. These plans will form part of the Zero Harm Management Plan.

The Flora and Fauna Management Plan will be approved from the appropriate regulatory authorities prior to the actual or potential disturbance of native flora and fauna.

Revegetation can be voluntary or prescribed by the relevant authority. Revegetation will be completed in consultation with the appropriate regulatory authority (eg. Council/ landowner) and includes the development of a plan to detail:

- Measurable objectives and targets;
- Enough lead time to collect local indigenous seed and propagate material (up to 2 years);
- Options and methods of revegetation;
- Map of the revegetation areas;
- Assessment and controls for weed invasion; and,
- Assessment of reproduction rates.

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On the Job	Responsibility
Mitigation and general control measures as part of a Flora and Fauna Management Plan, including: • All activities will be conducted with minimum disruption to the natural habitat including the removal of rocks, debris or fallen branches on the land surface in order to prevent habitat loss. • All clearing of native vegetation will be kept to a minimum and only with a valid permit/approval from the relevant authority. • All plant/vehicles will be operated to minimise disturbance and spread of any weeds or pests. • The establishment of access points, machinery and truck turning areas, parking areas and temporary stack sites should be determined early to minimise impact. • Tracks should be maintained to prevent erosion, weed growth and waterlogging, to discourage drivers from driving off track. • Type and size of the machinery required should be appropriate to the job and selected to minimise disturbance. • Protective fencing and appropriate signage should be installed around native vegetation and maintained/monitored appropriately. • No spoil or stockpiles are to be placed on native vegetation. Materials should be placed on established lay down areas. Where applicable sensitive flora and fauna areas are to be highlighted in the site induction. On more sensitive sites specific training in relation to flora and fauna management should be considered to provide: • Awareness of native flora and fauna sites; • Overview of best practice to minimise impact; • Awareness of weed prevention; • Overview of incident reporting practices; • Awareness of environmental responsibilities and obligations; and, • Awareness of relevant legislation.	Managers & Supervisors
What if it Goes Wrong	**Responsibility**
If an adverse unintended result occurs to known native flora and fauna sites, immediately implement the Incident Reporting and Investigation procedure DA-ZH-PR006.	Managers & Supervisors