

management plan

Operational Environmental Management Plan

A Transurban Group plan

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* An automatic version of this document will be stored upon modifying. Before printing please insert the current version number into the table above and into the footer.

Definitions and Abbreviations

Term	Definition
Asset	NorthConnex Motorway, linking the M1 Pacific Motorway at Wahroonga to the Hills M2 Motorway at West Pennant Hills, its exit and entry ramps, surface structures, breakdown lanes, surface connections and interchanges, noise walls, ancillary facilities, ventilation structures, support infrastructure (including offsite signs), water management infrastructure.
Asset Footprint	Describes the area covered by the Asset. The extent of the above facilities defined as 'above ground Asset' referring to all surface and super infrastructure and 'below ground Asset' referring to all subsurface infrastructures.
Approved Project	NorthConnex Project SSI-6136
AQCCC	Air Quality Community Consultative Committee
Asset stakeholders	Refers to NWRG, Tollaustrust, DM Roads and all its sub-contracted entities that have some operational and management responsibilities in relation to the Asset.
CPAR	Corrective and Preventative Action Request
CTP	Compliance Tracking Program
EPA	New South Wales Environment Protection Authority – Previously known as Department of Environment and Climate Change (DECC), Department of Environment and Conservation (DEC), Department of Environment and Climate Change and Water (DECCW), Office of Environment and Heritage (OEH).
DM Roads	Downer Maintenance Roads – the NorthConnex Incident Response and Maintenance (I&M) Contractor
DPE	New South Wales Department of Planning and Environment – Previously known as Department of Planning, Industry and Environment (DPIE).
EIS	Environmental Impact Statement
EMS	Environmental Management System
Environmental Aspect	Defined by AS/NZS ISO 14001:2004 as an element of an organisation's activities, products or services that can interact with the environment
Environmental Impact	Defined by AS/NZS ISO 14001:2004 as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects
EP&A Act	The <i>Environmental Planning and Assessment Act 1979</i> and Regulations
HSE	Health, Safety and Environment
I&M	Incident Response and Maintenance
KPI	Key Performance Indicator

Term	Definition
LLBJV	Lendlease Bouygues Joint Venture (the Design & Construct Contractor)
MCC	Motorway Control Centre
MCoA	Minister's Conditions of Approval
MOC	Motorway Operations Complex
Motorway	The road, tunnel and other physical works, facilities, systems and services described in section 1.2 of the SWTC. See 'Asset'.
MSP	Management Sub Plan
M2i	M2 Motorway Integration Project
NCX	NorthConnex
NOW	New South Wales Office of Water
NWRG	NorthWestern Roads Group
O&M Agreements	Operation and Maintenance Agreements
O&M	Operation and Maintenance
OEMP	Operational Environmental Management Plan
SES	Safety, Environment and Stakeholder, as in NWRG NorthConnex SES Manager.
Significant impact	An impact that has a material effect
SWMS	Safe Work Method Statement
SWTC	Scope of Works and Technical Criteria
TfNSW	Transport for NSW – Previously known as Roads and Maritime Services (RMS) and Roads and Traffic Authority (RTA)

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Operational Environmental Management Plan

1. Introduction

This document forms the operational environmental management plan (OEMP) for the NorthConnex Motorway, which links the M1 Pacific Motorway at Wahroonga to the Hills M2 Motorway at West Pennant Hills (Asset). This OEMP provides a framework for environmental management according to the existing development approval and legislative requirements. It comprises of management procedures to minimise adverse environmental impacts as a result of the operation of the motorway.

1.1 Requirement for an Operational Environmental Management Plan (OEMP)

This OEMP is a requirement of Clause E30 of the Minister's Conditions of Approval (MCoA) for the NorthConnex project (SSI-6136). It has been prepared in accordance with the:

- Guideline for the Preparation of Environmental Management Plans, Department of Infrastructure, Planning and Natural Resources, 2004 (DIPNR, 2004) (refer to Appendix A for compliance table).
- NSW Government Environmental Management System Guidelines 2013, which provides a best practice guide to ensure a minimum standard and consistent approach to preparing environmental management plans.
- Transport for New South Wales (TfNSW) Services Quality Assurance Specifications, which provides general provisions for managing the environmental impacts of road infrastructure development.
- ISO 14001 Environmental Management Systems, which provide the systems allowing a company to managing its operations to minimise their environmental impact, to ensure legal compliance and to allow for continual improvement over time.
- the NorthConnex Project State Significant Infrastructure (SSI-6136) Approval, which describes the Minister of Planning's Conditions of Approval (MCoA) associated with maintaining and operating the Asset. This also includes:
 - Roads and Maritime Services — NorthConnex: Environmental Impact Statement — Volumes 1A, 1B, 1C, 2, 3, 4, 5 and 6, prepared by AECOM Australia Pty Ltd, dated July 2014
 - Roads and Maritime Services — NorthConnex: Submissions and Preferred Infrastructure Report — Volumes 1, 2, 3 and 4, prepared by AECOM Australia Pty Ltd, dated November 2014
 - NorthConnex (SSI 13_6136) – Modification request – Correction and clarification of ventilation outlet elevations (Modification 2), prepared by RMS, dated 5 December 2017.

This OEMP will be made available on the NorthConnex project website (www.northconnex.com.au) and will be provided to the public upon request.

1.2 Background

NorthConnex was constructed as a tolled motorway linking the M1 Pacific Motorway at Wahroonga to the Hills M2 Motorway at West Pennant Hills via twin motorway tunnels, each around nine kilometres in length. The NorthConnex Asset provides a safer and more efficient link, which forms part of the National Land Transport Network.

This OEMP describes the systems and procedures to ensure that the motorway operator:

- Provides all Asset stakeholders the best practice tools to apply during the operation and maintenance of the Asset to ensure it environmentally performs over the duration of the contract.
- Implements relevant project environmental commitments, safeguards and management measures.
- Compliance with relevant environmental legislation.

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- Ensures that the Asset's environmental risks are properly managed.
- Defines which environmental management, mitigation and monitoring control measures are to be implemented, who is responsible for their implementation, where the controls should be implemented and what reporting and corrective action should be undertaken.
- Ensures that all Asset stakeholders, including sub-contractors and other third parties, meet their environmental management obligations.

1.3 Asset description

The NorthConnex project includes the following key built elements:

- Twin motorway tunnels up to approximately nine kilometres in length with two lanes in each direction. The tunnels were constructed wide enough for a third lane in each direction, if required in the future.
- A northern interchange with the M1 Pacific Motorway and Pennant Hills Road, including tie-in with the M1 Pacific Motorway extending to the north of Edgeworth David Avenue, sections of tunnel for on-ramps and off-ramps, which also facilitate access to and from the Pacific Highway.
- A southern interchange with the Hills M2 Motorway and Pennant Hills Road, including sections of tunnel for on-ramps and off-ramps.
- Integration works with the Hills M2 Motorway including alterations to the eastbound carriageway to accommodate traffic leaving the Hills M2 Motorway to connect to the Project travelling northbound, and a new westbound lane on the Hills M2 Motorway extending through to the Windsor Road off-ramp.
- A Motorway Operations Complex located near the southern interchange on the corner of Eaton Road and Pennant Hills Road that includes operation and maintenance facilities.
- Two tunnel ventilation facilities, one at the southern end (north-western corner of the M2 Motorway and Pennant Hills Road intersection) and one at the northern end (Northbound main alignment near the connection with the M1 Pacific Motorway).
- Two tunnel support facilities incorporating emergency smoke extraction outlets and substations at Trelawney Street, Thornleigh and Wilson Road, Pennant Hills.
- Ancillary facilities for motorway operation, such as electronic tolling facilities, fibre connection to M7 control room, signage, fire and life safety systems including emergency evacuation infrastructure.
- Modifications to local roads as described in the Environmental Impact Statement.

More detailed description of the operational elements of the NorthConnex Project are listed below and are shown in the Sensitive Area Plans included in Appendix F, which illustrate the environmental constraints surrounding the Asset.

1.3.1 Hills M2 Motorway integration

The Hills M2 Motorway Integration was an extension of the NorthConnex Project and included modifications to the M2 Motorway, which were undertaken west of Pennant Hills Road to enable southbound traffic from the Asset to merge safely with existing westbound traffic on the M2 Motorway. The integration extends for a distance of around 3.5 kilometres west of the Pennant Hills Road interchange until the existing Windsor Road off-ramp and includes an additional westbound lane on the M2 Motorway, widening of Yale Close Bridge and Darling Mill Creek Bridge and lengthening of Barclay Road overbridge. This section of motorway will continue to be managed by the M2 Motorway operator.

Minor alterations to the M2 Motorway allow eastbound traffic from the M2 Motorway to leave the motorway and join the northbound carriageway of the Asset.

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1.3.2 Southern interchange

The southern interchange is located near the aboveground intersection of the M2 Motorway and Pennant Hills Road at Carlingford. The interchange provides connections to and from the Asset with the M2 Motorway and Pennant Hills Road. Existing movements catered for at the M2 Motorway intersection with Pennant Hills Road have been maintained.

Portals to the northbound on-ramp and southbound off-ramp along Pennant Hills Road are located south of Eaton Road. The main alignment tunnel portals emerge adjacent to the shoulders of the M2 Motorway to the west of Pennant Hills Road.

1.3.3 Northern interchange

The northern interchange is located near the intersection of the M1 Pacific Motorway and Pennant Hills Road at Wahroonga, and provides connections to the M1 Pacific Motorway, Pennant Hills Road and the Pacific Highway. Portals to the southbound on-ramp and northbound off-ramp for Pennant Hills Road are located to the east of Pennant Hills Road within the median of the Pennant Hills Road and M1 Pacific Motorway connector. The northbound portal of the main alignment tunnels emerge in the shoulders of the M1 Pacific Motorway to the north of Alexandria Parade in the vicinity of Bareena Avenue, Wahroonga. Local road changes around the northern interchange include the widening of Pennant Hills Road northbound (at Pearces Corner) to create a permanent additional right-turn lane onto the Pacific Highway.

The southbound portal merges off the shoulder of the M1 Pacific Motorway prior to Alexandria Parade, Wahroonga. Modifications to the M1 Pacific Motorway beyond the northern interchange have been undertaken. The tie in extends around 200 metres north of Edgeworth David Avenue in Wahroonga. Surface works along the M1 Pacific Motorway have involved widening of the road surface for the merge and diverge to and from the main alignment tunnels.

1.3.4 Tunnel support facilities

Two tunnel support facilities are provided at Wilson Road, Pennant Hills, and Trelawney Street, Thornleigh. Each tunnel support facility includes a substation and an emergency smoke extraction facility and fresh air intake.

1.3.5 Ventilation system and facilities

During operation, the ventilation systems draw fresh air into the tunnels via the facilities at Wilson Road, Pennant Hills and Trelawney Road, Thornleigh and the tunnel portals. Air is emitted from within the tunnels via two ventilation facilities at the northern and southern ends.

During emergency conditions, depending on the location of the incident, the ventilation system would extract smoke from the tunnels which would be emitted from one or more of the following locations:

- Southern ventilation facility located within the motorway operations complex
- Wilson Road tunnel support facility
- Trelawney Street tunnel support facility
- Northern ventilation facility located primarily above the cut and cover section of the northbound main alignment near the connection with the M1 Pacific Motorway
- Tunnel exit and entry portals.

Jet fans are mounted in pairs throughout the tunnels, with each pair separated by a minimum linear distance of approximately 90 metres. A total of around 65 fans are installed in the northbound tunnel and ramps and around 60 fans in the southbound tunnel and ramps. The fans operate automatically to maintain in-tunnel air quality requirements.

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Each ventilation facility consists of five axial fans. At full capacity, Northern and Southern ventilation outlets operate with four fans, with the fifth fan on standby. Each ventilation facility is around 20 metres in height, as measured from the ground level of the adjoining land.

Each tunnel support facility consists of four vertically mounted bi-directional axial fans. Emergency smoke extraction and normal mode requirements can be achieved with three fans, with the fourth fan on standby. During low speed traffic / congested conditions, the tunnel support may be used to supply additional fresh air to the tunnels.

1.3.6 Motorway operations complex

The Asset includes a 24-hour attended Motorway Operations Complex (MOC), located near the southern interchange on the corner of Pennant Hills Road and Eaton Road, West Pennant Hills. The MOC includes facilities necessary for the monitoring, maintenance and control of tunnel services including tunnel safety, ventilation, power, lighting and other road systems required for the safe and efficient operation of the tunnels. Facilities in the MOC include a tunnel control room, training / incident response room, workshop space, emergency vehicle depot, garage and parking facilities.

During normal operations approximately 50 staff would be working at the site. These staff would be involved with operation of the MOC and maintenance activities. At night staff numbers would reduce to approximately 5-10 staff involved in operation of the MOC and incident response.

1.3.7 Coral Tree Drive substation

Electricity supply infrastructure has been installed to supply power to the tunnel and associated mechanical and electrical equipment on the south-west side of the Pennant Hills Road and M2 Motorway interchange.

Figure 1.1 shows the location of the NorthConnex Motorway in the Sydney Orbital network and **Figure 1.2** shows the NorthConnex Motorway in more detail with operational facilities shown.

1.4 Operation and maintenance activities

Tollaustr shall undertake all operations and maintenance activities for the Asset. All maintenance activities are governed by the standards included in the NorthConnex Codes of Maintenance Standards. Actual maintenance tasks and frequencies are tabulated in the Operation and Maintenance (O&M) Manuals, which aim to meet or exceed the applicable standards and guidelines.

Tollaustr has the following operational and maintenance responsibilities in relation to the Asset:

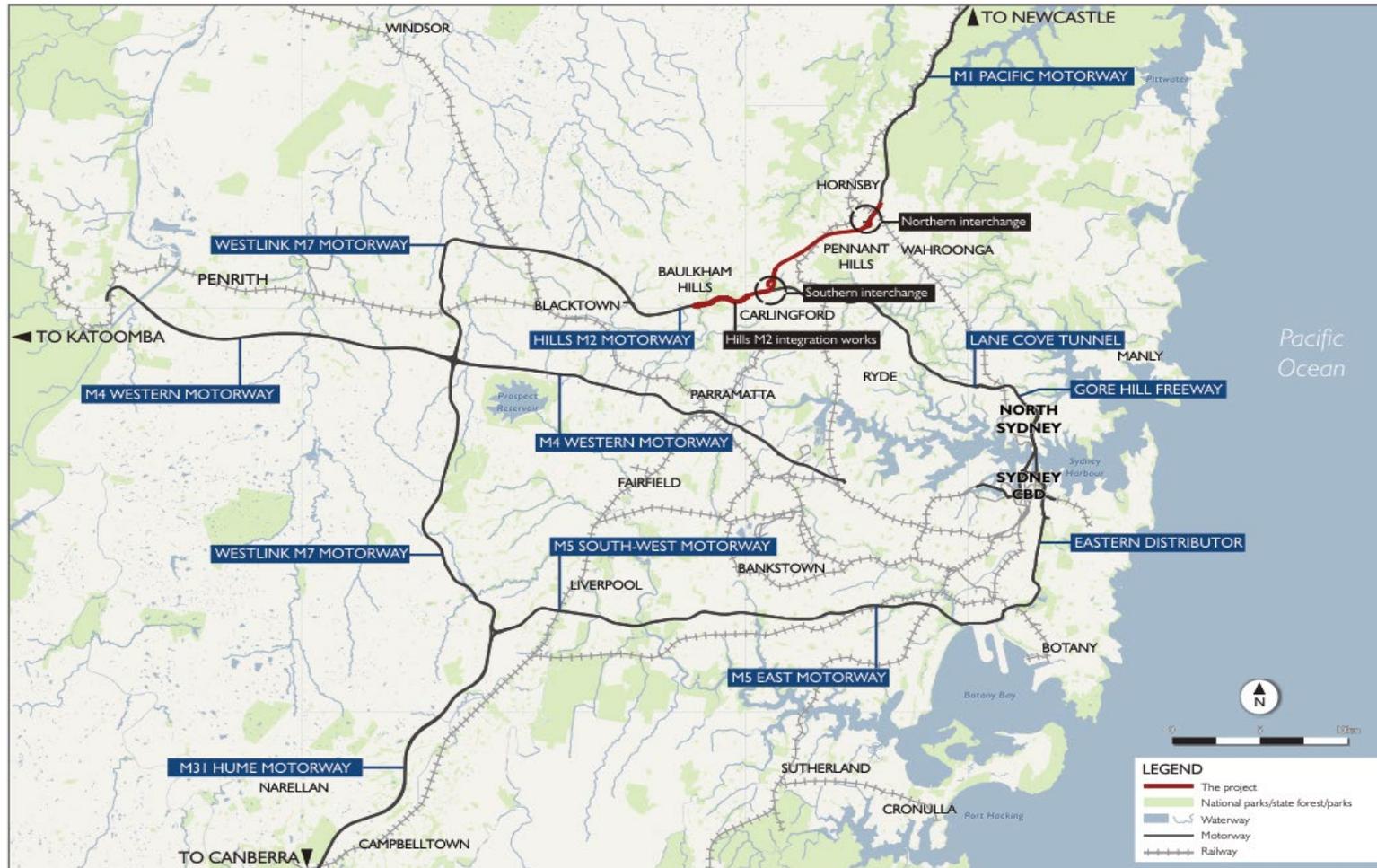
- Repair and maintenance of the NorthConnex Motorway, within the road boundaries undertaken according to the NorthConnex Code of Maintenance Standards, individual codes of which may be modified as required for Asset-specific repair and/or maintenance tasks.
- Maintenance activity that meets the required quality standards, including sourcing of spare parts and components and retention of complete maintenance records.
- Maintenance of the O&M Manual in an up-to-date manner and making it available to stakeholders when required.
- Performance of the O&M repair, maintenance and operational tasks as required by the O&M Manual.
- Reporting at the agreed intervals in relation to repair and maintenance and operational activities and KPIs.
- Demonstration of the application of systems, processes and practices that meet the Consolidated Project Deed and legal, environmental, and health and safety obligations, and any specific requirements of the Motorway Operator in relation to environmental management, and health and safety management.

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- Demonstration of the application of systems, processes and practices that meet the Consolidated Deed operational requirements as well as any specific requirements from the Motorway Operator in relation to road safety and traffic management.
- Engagement of sub-contractors to perform specific repair and/or maintenance tasks within the Asset boundaries.

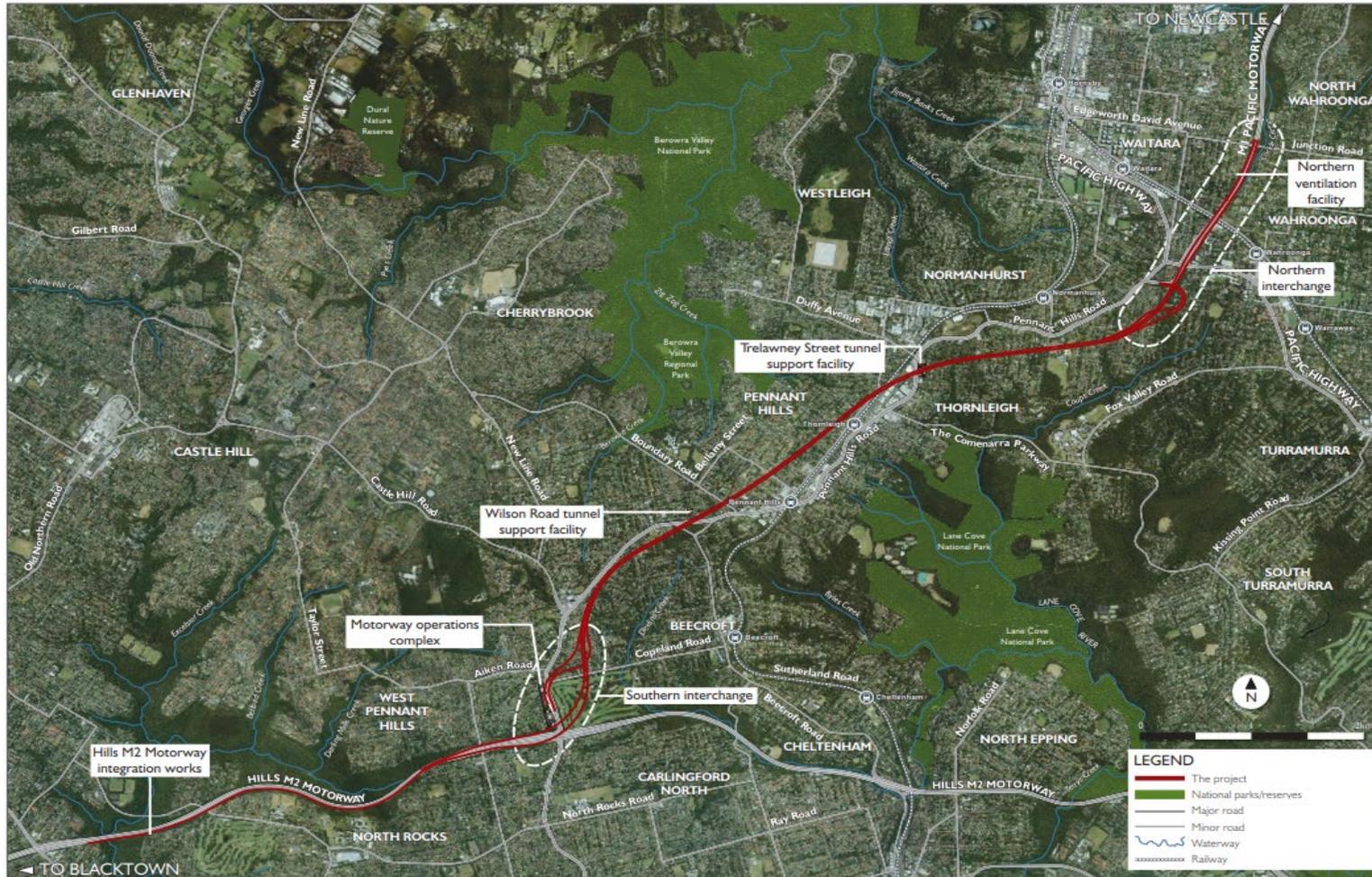
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Figure 1.1 NorthConnex Motorway location in the Sydney Orbital network



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Figure 1.2 NorthConnex Motorway Operational Overview



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1.5 Scheduling of operation and maintenance activities

The opening of the motorway was not staged, and it is operated and maintained 24 hours a day, 7 days a week, all year round.

Scheduled maintenance works are undertaken during daylight hours whenever possible, and may include, but not be limited to, landscaping, litter/graffiti removal, repairs and general maintenance activities. However, due to operational and safety requirements, and to minimise traffic disruptions, certain motorway maintenance activities are required to occur during hours of low traffic volumes, or during scheduled maintenance shutdowns. The majority of this work occurs outside of daylight hours.

Quarterly maintenance shutdowns occur throughout the year. This involves up to approximately 200 workers and contractors working in the tunnel for up to 10 nights per shutdown, completing scheduled maintenance and inspections. Workers assemble at the Southern compound for inductions and briefings prior to commencing works once the tunnel has been shut down. Shut down of the tunnel would generally be from 9:30pm to 5am. During this time the tunnel is closed to traffic and vehicles travel via Pennant Hills Road.

1.6 OEMP objectives and purpose

The purpose of the OEMP is to:

This OEMP and its supporting sub-plans apply to all NorthConnex, NWRG, Tollaust, DM Roads and its sub-contracted entities ('Asset stakeholders') that have operational and management responsibilities in relation to the Asset.

- Provide an easily interpreted reference document that ensures that project environmental safeguards are implemented correctly.
- Ensure compliance with the requirements of the environmental planning documents, the MCoA, Environmental Protection Licence (EPL), Trade Waste Agreements (TWA), applicable legislation and any other applicable licences and permits.
- Satisfy the environmental management contractual obligations placed on Asset stakeholders as described in the following three documents:
 - The O&M Deed
 - Scope of Works and Technical Criteria
 - TfNSW Quality Assurance Standards.

This is achieved by:

- Defining when environmental management, mitigation and monitoring control measures are to be implemented, who is responsible for their implementation and what reporting should be undertaken.
- Confirm compliance with the conditions within the MCoA, EPL and TWA's.
- Direct all Asset stakeholders to the controls to manage and mitigate any environmental impacts from the operation and maintenance of the Asset.
- Outline the procedures strategies to be implemented should any environmental incident occur.
- Ensure consistency with the Tollaust ISO14001 Environmental Management System.
- Ensures that all Asset stakeholders, including sub-contractors and other third parties, meet their environmental management obligations.

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In doing this the OEMP aims to maintain and operate the Asset in accordance with the NWRG *Environment Policy* and *Transurban Health, Safety and Environment Policy* (refer to **Appendix B** below) to minimise any environmental impacts. This policy describes Tollaust's vision and its overall aim that 'to ensure that all employees and contractors exercise individual responsibility for their own safety and for the safety of others; in our workplace or arising from our work, and actively participate in minimising impacts to our environment'. To achieve this vision Tollaust has committed to the targets in **Table 1.1** below, which it applies to its activities and supply chain.

Table 1.1 OEMP objectives and targets

Objective	Target
Minimising the impact of the operation and maintenance of the Asset on the environment.	<p>No formal action initiated by environmental regulators.</p> <p>All personnel complete an Environmental Induction before working on-site.</p> <p>High risk environmental activities will be captured by Hazard Registers and additional controls implemented.</p> <p>All personnel (management, workforce and subcontractors) are trained in their specific tasks so that activities are undertaken in an environmentally sustainable and responsible manner.</p> <p>Maintain an up to date environmental aspects, impacts and risk register using Active Risk Manager (ARM).</p>
Satisfy the Minister for Planning's conditions of approval and relevant regulatory environmental compliance.	No breach of environmental legislative or the requirements of the MCoA, EPL or TWA criteria as outlined in the OEMP Sub-plans
Develop, implement and maintain effective management systems for the environmental aspects of operations and maintenance	Maintain an ISO14001 accredited Environmental Management System.

1.7 OEMP format and scope

As outlined in Table 1.2, the OEMP comprises:

- The Tollaust Integrated Management System.
- The main OEMP document (this document).
- Five operational management sub-plans. The key principles, requirements, limits and thresholds that Asset Stakeholders are required to achieve are specified in each of the Sub-plans presented in Appendix G to Appendix L.

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Table 1.2 OEMP documents

Integrated Management System - Environmental		
Operational Environmental Management Plan		
Environmental Management Sub-Plans		
Operational Noise Management Plan (MSP 1) – Appendix H MCoA E24, E30 f(ii)	Water Quality Plan and Monitoring Program (MSP 2) – Appendix I MCoA E30 f(vi) & (vii)	Operational Air Quality Management Plan (MSP 3) – Appendix J MCoA E1 – E22, E30 f(i)
<ul style="list-style-type: none"> Noise management controls Vibration management controls Maintenance of noise mitigation infrastructure Maintenance of noise generating equipment (fixed plant) Manage operational road traffic noise Community communications and complaints management 	<ul style="list-style-type: none"> Groundwater levels and surface water flows Groundwater and surface water monitoring and sampling Water treatment and performance goals 	<ul style="list-style-type: none"> Air quality management controls Operations and maintenance activities Operations and maintenance of air quality mitigation infrastructure Maintenance of air generating equipment (fixed plant) Operational road traffic emissions Community communications and complaints management
Operational Traffic Management Plan (MSP 4) – Appendix K MCoA E27, MCoA E30 f(iii)	Excerpt from Urban Design and Landscaping Plan – Appendix L MCoA E30 f(v)	
<ul style="list-style-type: none"> Community communications Complaints management Public transport improvements surrounding Pennant Hills Road Toll strategy and ITS management, maintenance and repair Line marking, road surface and pavement repairs Legally enforceable mechanisms for both the Asset and Pennant Hills Road 	<ul style="list-style-type: none"> Weed control Litter management Graffiti clean-up Landscape management Tree and vegetation management 	

1.8 Integrated management system

Tollast operates an Integrated Management System. This includes management systems that are certified to AS/NZS ISO standards for Quality Management Systems (9001:2015), Occupational Health

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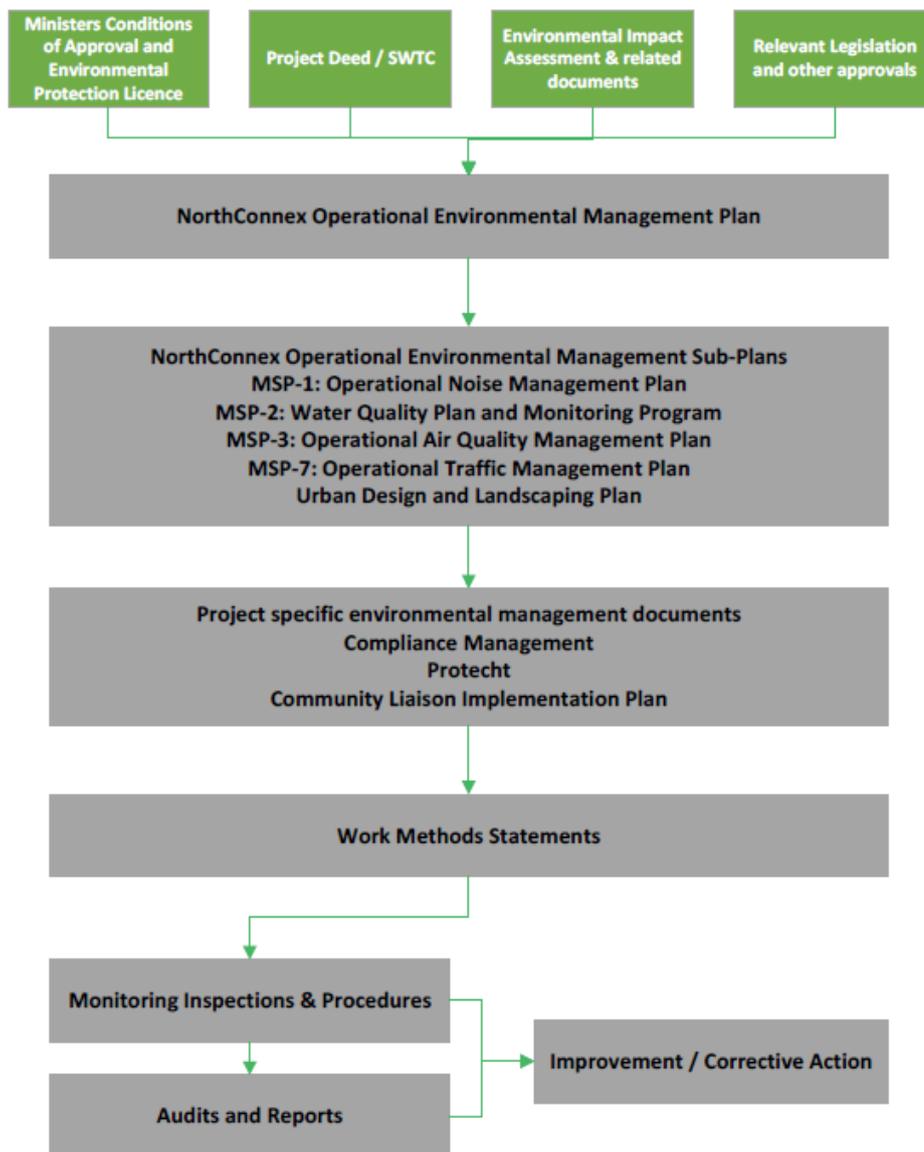
and Safety Management Systems (4801:2001) and Environmental Management Systems (EMS) (14001:2015). The EMS encompasses:

- Environmental policy
- Environmental planning
- Structure and responsibility
- Practices, procedures and processes
- Resources for developing, implementing, achieving, reviewing and maintaining the management system.

1.9 Integration with other plans and procedures

Figure 1.2 describes the relationship between this OEMP, and the other management documentation used to operate and maintain the Asset.

Figure 1.2 Operations and Management system framework



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1.10 OEMP consultation

In accordance with MCoA E30, the OEMP was prepared in consultation with relevant agencies. Table 1.3 provided below outlines the stakeholder consulted during the preparing of this document and Sub-plans.

Table 1.3 OEMP consultation

	Relevant Minister's Condition of Approval	NSW Environment Protection Authority	Local Government Areas / Local Council ¹	Department of Primary Industries (Water)	NSW Health	Sydney Water	AQCCC ²	Transport for NSW	Traffic Management Centre
Operational Environmental Management Plan	E30	✓	✓				✓	✓	
Operational Air Quality Management Plan	E30(f)(i)	✓	✓		✓		✓	✓	
Operational Noise Management Plan	E30(f)(ii) E24	✓	✓					✓	
Operational Traffic Management Plan	E30(f)(iii) E27							✓	✓
Water Quality Plan and Monitoring Strategy ³	E30(f)(vi) E30(f)(vii) B15	✓	✓	✓		✓		✓	

¹ Local Government Areas / Local Councils include Hornsby Council, The Hills Shire Council and Ku-ring-gai Council

² Air Quality Community Consultative Committee

³ WQP&MS reviewed and approved prior to OEMP preparation, and no further consultation required.

This document and Sub-plans were provided to relevant stakeholders, as shown in the above Table 1.3, for review and comment, and the document has been updated in response to comments provided.

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2. OEMP Governance

This section outlines the range of obligations placed on the Asset stakeholders to operate and manage the Asset in an environmentally responsible manner.

The OEMP is required by the MCoA E30. The MCoA must be complied with during operation and maintenance activities relating to Asset. However, the MCoA are not an exhaustive list of obligations that the Asset stakeholders must address in this OEMP. The following **Table 2.1** describes the range of environmental management and monitoring obligations and where they are addressed in this OEMP and associated Sub-plans.

Table 2.1 OEMP governance and obligations

Document	Controls	Document Reference
Planning approvals		
NorthConnex, Infrastructure Approval, SSI-6136, 13 January 2015 NorthConnex, Modification of Infrastructure Approval, SSI-6136, 29 June 2016 NorthConnex, Modification of Infrastructure Approval, SSI-6136, 26 February 2017 NorthConnex, Modification of Infrastructure Approval, SSI-6136, 18 December 2019	Determination that the project can be constructed and operated as described in environmental assessment documentation, and the Ministerial Conditions of Approval supporting subsequent upgrades.	2.1 Appendix G
Legal and Regulatory obligations		
Environmental legislation (various)	Statutory obligations on any Asset management organisation to control its impacts.	Appendix C
Environment Protection Licence (EPL)	Statutory obligation to fulfil the conditions of EPL 21386, in accordance with the POEO Act.	Appendix J Operation Air Quality Plan
Trade Waste Agreement (TWA)	Agreement with Sydney Water for the discharge of brine reject water from the Reverse Osmosis process in the Water Treatment Plant	Appendix I Water Quality Plan and Monitoring Program
Standards and guidance	Non-statutory requirements relating to the best-practice management of operational assets.	Appendix C
Contractual and other requirements		
Contractual requirements	Prescribing the obligations on the motorway operator for operating and maintaining the Asset including a range of environmental aspects, which are	Appendix C

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Document	Controls	Document Reference
	captured in the requirements of the MCoAs and REMMs.	

2.1 Planning requirements

In January 2015, the Minister for Planning issued the Minister's Conditions of Approval (MCoA) for the NorthConnex Project. The MCoA have been updated three times as outlined in Table 2.1 above and are current. This OEMP has been prepared to satisfy requirements of these conditions, specifically MCoA E30.

Table 2.2 summarises the requirement as set out by MCoA E30 and shows where these requirements have been addressed in this OEMP.

Table 2.2 OEMP requirements

CoA Condition E30	Where addressed in document
Prior to the commencement of operation, or as otherwise agreed by the Secretary, the Proponent shall prepare and implement an Operation Environmental Management Plan (OEMP) for the SSI. The OEMP shall outline the environmental management practices and procedures that are to be followed during operation and shall be prepared in consultation with relevant agencies and in accordance with the Guideline for the Preparation of Environmental Management Plans (Department of Infrastructure, Planning and Natural Resources, 2004). The OEMP shall include, but not necessarily be limited to:	This document Appendix A
(a) a description of activities to be undertaken during operation of the SSI (including staging and scheduling);	Section 1.3 & 1.4
(b) statutory and other obligations that the Proponent is required to fulfil during operation, including approvals, consultations and agreements required from authorities and other stakeholders under key legislation and policies;	Section 2, Appendix C
(c) overall environmental policies, guidelines and principles to be applied to the operation of the SSI;	Section 2, Appendix C
(d) a description of the roles and responsibilities for relevant employees involved in the operation of the SSI, including relevant training and induction provisions for ensuring that employees are aware of their environmental and compliance obligations under these conditions of approval;	Section 3
(e) an environmental risk analysis to identify the key environmental performance issues associated with the operation phase; and	Section 4, Appendix D
(f) details of how environmental performance would be managed and monitored to meet acceptable outcomes, including what actions will be taken to address identified potential adverse environmental impacts,	Section 4, Specific Sub-plans

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CoA Condition E30	Where addressed in document
including those safeguards and mitigation measures detailed in section 10 of the PIR (and any impacts arising from the staging of the construction of the SSI). In particular, the following environmental performance issues shall be addressed in the OEMP:	
(i) air quality;	Appendix J Operation Air Quality Management Plan
(ii) noise and vibration, through preparation of the Operational Noise Management Plan required under condition E24;	Appendix H Operational Noise Management Plan
(iii) traffic and transport, through preparation of the Operational Traffic Management Plan required under condition E27;	Appendix K Operational Traffic Management Plan
(iv) climate change and energy use;	Section 4.3
(v) visual amenity and landscaping;	Appendix L Excerpt from Urban Design and Landscape Plan
(vi) groundwater inflows, treatment and discharge, soil, and subsidence; and	Appendix I Water Quality Plan and Monitoring Program
(vii) surface water quality and hydrology.	
<p>The OEMP shall be submitted for the approval of the Secretary no later than one month prior to the commencement of operation, or as otherwise agreed by the Secretary. Operation shall not commence until written approval has been received from the Secretary.</p> <ul style="list-style-type: none"> Note: The approval of an OEMP does not relieve the Proponent of any requirement associated with this SSI approval. If there is an inconsistency with an approved OEMP and the conditions of this SSI approval, the requirements of this SSI approval prevail. 	The NorthConnex Operational Environmental Management Plan (OEMP) was approved by DPE on 21/4/2020,

Additional to the MCoA include several commitments relating to the operation and maintenance of the Asset, as the revised environmental management measures (REMMs), which are sourced from Section 10 of the Preferred Infrastructure Report (PIR). Status of compliance with these commitments has been reported in the Pre-Operation Compliance Report, in accordance with MCoA A13, and the compliance tables for relevant MCoA have been included in **Appendix G** of this OEMP.

2.1.1 Routine maintenance and minor work

This section applies to all routine and standard operation and maintenance activities and minor works undertaken on the Asset but does not apply to 'Emergency Works' or works that are not minor in nature. All works must have planning approval prior to commencement. Planning approval can occur through two main pathways.

- (1) The works are consistent with the definitions within the existing planning approval outlined in Table 2.1 above.
- (2) The works fall within the definitions provided in the State Environmental Planning Policy (SEPP) (Transport and Infrastructure) 2021, and can include:

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- Development permitted without consent (clause 2.111)
- Exempt Development (clause 2.112 & schedule 1)
- Complying Development (clause 2.113).

The definitions in the SEPP have been further defined by the TfNSW *Environmental Assessment Procedure for Routine and Minor Works* (EIA-PO5-01) (RMS, 2018) guideline. The guideline outlines what environmental assessment TfNSW require and should be read in conjunction with the following TfNSW procedures:

- Activity checklist for the routine and minor works (EIA-PO5-G01-T01)
- Standard safeguards list for routine and minor works (EIA-PO5-G01-T02)
- Step 2 memo template (EIA-PO5-G01-T03)
- Minor work REF template (EIA-PO5-G01-T05).

To determine where proposed works fall in the above categories, first identify and define the scope of the proposed activity then consult with the NorthConnex O&M Environmental Manager for advice on the level of assessment required. Four outcomes transpire from this review:

- Outcome A: The implementation of standard safeguards for routine activities for work on disturbed land.
- Outcome B: The completion of a Step 2 memo checklist for more notable routine and minor work.
- Outcome C: The preparation of a minor work REF using the standard template where there is a perceived environmental risk.
- Outcome D: The preparation of a REF.

Tollaust will need to refer to the full list included in the TfNSW Guidelines, as each activity has its inclusions and exclusions. Work that is excluded as routine and minor work may constitute 'development' and may require additional environmental assessment, including the preparation of a review of environmental factors. If the activity is excluded from the list or not listed Tollaust will need to consult the NorthConnex O&M HSE Advisor for advice.

All Step 2 memos and minor works review of environmental factors will be internally reviewed however they will need to be approved by TfNSW (Environment Branch) prior to commencing works.

The above guideline will apply to all 'routine and minor work' operations and maintenance activities to determine how they are to be managed prior to undertaking the work. The definition of 'routine and minor work' is described in Section 3 of the TfNSW guideline.

2.2 Legislation and regulatory obligations

All operations and maintenance activities must be planned and implemented in accordance with Commonwealth and State legislation. It must also consider best-practice standards and guidelines described by Government agencies, including TfNSW guidelines outlined in **Appendix C**.

2.2.1 Environmental legislation

Appendix C provides a summary of the key legislation and its relevance to the operations and maintenance of the Asset.

2.2.2 Permits and licences

Schedule 1 of the *Protection of the Environment Operations Act 1997* (POEO Act) contains a list of activities that require an Environment Protection Licence (EPL). In accordance with Section 35A of

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Schedule 1, an EPL has been obtained for the NorthConnex Tunnel ventilation outlets. EPL 21386 will be complied with during operation of the Asset.

Operation of the Water Treatment Plant (WTP) requires a Trade Waste Agreement (TWA) with Sydney Water Corporation (SWC). The Trade Waste Agreement is currently issued to Downer Maintenance Roads (DM Roads). This agreement regulates the discharge of backflush water from the WTP to the SWC sewer system. It does not regulate the treated water discharge from the WTP to Blue Gum Creek.

A Trade Waste Permit has also been obtained by Transurban for the operation of the vehicle wash bay at the MOC (Application #1011505). The washbay discharge is classified by Sydney Water as a 'Deemed Process' and does not require any ongoing monitoring or fee payments.

Permitting and licencing changes under legislation or due to operational or maintenance changes will be identified and obtained over the duration of the contract. The OEMP and its Sub-plans will be updated to include any environmental management obligations introduced under permitting and licencing changes.

2.2.3 Standards and guidelines

Tollaustr is required to perform and execute its obligations to satisfy the requirements, limits and thresholds listed in a number of Commonwealth and State standards and guidelines. **Appendix C** lists the relevant standards and guidelines that should be held on deposit as reference documents to support the OEMP.

3. OEMP Implementation

This section describes how the OEMP is to be implemented to achieve compliance with legislation, MCoA, EPL, TWA and other legal and contractual requirements.

3.1 Structure and responsibilities

The concession to operate the Asset is held by the NorthConnex Project Company. The Operation and Maintenance of the Asset is managed by Tollaustr, a subsidiary of Transurban, under the NorthConnex Operation and Maintenance (O&M) Deed. Incident Response and Maintenance of the Asset is executed by the NorthConnex Incident Response and Maintenance (I&M) Contractor DM Roads under contract to Tollaustr.

The NWRG NorthConnex Asset Manager is accountable for the overall implementation of the OEMP with the assistance of the NWRG NorthConnex Safety, Environment and Stakeholder (SES) Manager and NWRG NorthConnex Stakeholder and Community Specialist. The day-to-day management of the OEMP is delegated to NorthConnex Operation and Maintenance (O&M) Team, who implements the provisions of the OEMP via:

- NorthConnex O&M Maintenance Manager
- NorthConnex O&M Asset Operations Lead
- NorthConnex Environmental Manager
- NorthConnex O&M Work Health and Safety Advisor
- NorthConnex O&M Community Engagement Advisor
- DM Roads Manager.

The environmental management responsibilities for each of the above roles under the OEMP are described in **Table 3.1**. Key environmental contact information is included in **Appendix E**.

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Table 3.1 Environmental management responsibilities under the OEMP

	NWRG NorthConnex Asset Manager	NWRG NorthConnex SES Manager	NWRG NorthConnex Community Specialist	NorthConnex O&M Maintenance Manager	NorthConnex O&M Environmental Manager	NorthConnex O&M Asset Operations Lead	NorthConnex O&M WHS Advisor	NorthConnex O&M Community Engagement Advisor	DM Roads Manager - O&M Contractor
Overall responsibility for the implementation of environmental requirements outlined in the OEMP.	R	A	A	A	A	A	A	A	A
Allocating adequate resources to meet the requirements of the OEMP and sub-plans.	A	C	C	R	C	R	C	C	R
Liaising with TfNSW and notifying authorities in the event of an environmental incident.	R	C	C	R	A	R	C	C	C
Ensuring environmental requirements are fully integrated with operation and maintenance activities.	A	C	C	R	A	R	C	C	R
Maintaining, updating and execution of the OEMP and sub-plans in accordance with ISO14001 EMS standard.	C	C	C	R	A	A	C	C	R
Ensuring compliance with statutory, legal and regulatory requirements including MCoA, Project Deed, and SWTC.	R	A	C	R	A	R	C	C	A
Implementation of assessment, management, monitoring and reporting requirements of the OEMP.	C	A	C	R	A	R	C	C	A
Provide updates to NWRG and senior managers on the performance and implementation of the OEMP.	R	A	C	A	A	A	C	C	A
Complete annual review of the OEMP.	C	C	C	C	R	C	C	C	C
Identify where environmental measures are not meeting the objectives and targets and where improvement can be achieved	I	C	C	R	R	R	C	C	R
Ensuring all identified environmental licences, approvals and permits are obtained as required.	I	C	I	R	A	A	C	C	A
Managing environmental reporting within Transurban.	I	I	I	R	R	R	C	C	C

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	NWRG NorthConnex Asset Manager	NWRG NorthConnex SES Manager	NWRG NorthConnex Community Specialist	NorthConnex O&M Maintenance Manager	NorthConnex O&M Environmental Manager	NorthConnex O&M Asset Operations Lead	NorthConnex O&M WHS Advisor	NorthConnex O&M Community Engagement Advisor	DM Roads Manager - O&M Contractor
Managing environmental reporting to TfNSW.	C	C	C	R	R	R	C	C	C
Overseeing environmental monitoring activities, inspections and manage audit program.	I	C	I	R	A	A	C	I	R
Managing all specialist consultants with regards to environmental matters	I	C	I	R	A	A	C	C	A
Develop Asset inductions, toolbox talks and training programs regarding environmental requirements for all site personnel.	I	C	C	R	A	A	A	A	A
Stopping activities where there is an actual or immediate environment risk, or to prevent environmental non-conformance.	R	R	R	R	R	R	R	R	R
Ensure environmental risks are identified, appropriate management measures are implemented, and risk reviewed.	C	A	C	R	R	R	A	A	R
Assist the Community Relations Team to resolve environment-related complaints.	C	C	R	R	A	A	A	R	A
Managing day-to-day maintenance works and sub-contractors in compliance with the OEMP.	I	C	I	R	A	R	A	C	R
Plan work in a manner that avoids or minimises the impacts on the environment.	I	C	C	R	A	R	C	C	R
Manage efficient operation of environmental control and pollution prevention devices, and monitoring equipment including water detention basins, noise mitigation infrastructure and air monitoring equipment.	I	C	C	R	A	R	C	C	R
Prepare activity guidelines/standard operating procedures for all operations activities	I	C	C	R	A	R	C	C	R
Managing the day-to-day traffic operation as well as the Traffic Control Centre (TCC) Operators and service	I	C	C	A	C	R	C	C	R

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	NWRG NorthConnex Asset Manager	NWRG NorthConnex SES Manager	NWRG NorthConnex Community Specialist	NorthConnex O&M Maintenance Manager	NorthConnex O&M Environmental Manager	NorthConnex O&M Asset Operations Lead	NorthConnex O&M WHS Advisor	NorthConnex O&M Community Engagement Advisor	DM Roads Manager - O&M Contractor
crews in compliance with the OEMP and sub-plans.									
Respond to emergency events and environmental incidents in accordance with developed response procedures.	I	C	C	R	A	R	A	C	R

Responsible **R** Informed **I** Consulted **C** Accountable **A**

The Maintenance Manager, together with the Asset Operation Lead, are additionally responsible for ensuring there are the resources available to complete the tasks required for the OEMP. Specialists may be utilised from time-to-time to assist in the management of environmental issues as required under the OEMP. Specialist's areas of expertise may include:

- Acoustics (noise monitoring and modelling, noise assessments)
- Heritage (discovery of a heritage item, assessment of impact on a heritage item)
- Hydrology / hydrogeology (groundwater assessment, surface water impact)
- Waste (waste audit, waste classification)
- Air quality (air quality monitoring, modelling and assessment)
- Ecology (assessment of impact on flora or fauna).

The role of these Specialists would be to investigate issues relevant to their area of expertise and provide recommended actions to address the issues.

3.2 Training and induction

All Asset stakeholders will be required to undertake the following induction and training activities prior operating or maintaining the Asset:

- Health safety and environment (HSE) induction
- Toolbox sessions
- Environment awareness training
- Professional development training.

Training records are maintained for Tollaust employees through Transurban online learning available through TEN (internal intranet). Records of other Asset Stakeholders will be recorded in the Tollaust Asset Management System.

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3.2.1 HSE induction

All Asset stakeholders are required to successfully complete HSE induction training prior to undertaking operations or maintenance work. The HSE induction training identifies:

- High Risk Activities (confined spaces, ground disturbance and penetration, energy isolation, electrical work, crane and lifting operations, working at height, working near live traffic, mobile plant operations, driver and vehicle safety).
- Working remotely or in isolation.
- Other identified risks (hot work, hazardous chemicals and materials, asbestos, manual handling).
- Responsibilities and minimum requirements to address identified risks.
- HSE Management Plans.
- Authority to Access and Safe Work Method Statement (SWMS) process (which explains the duty to assess and identify all environmental, safety and quality risks and suitable controls to manage these risks).
- Specific issues for tunnels, bridges and gantries.
- Training and competency requirements.
- Environmental management principles (protect flora and fauna, maintain water quality, install erosion and sediment controls, maintain air quality, minimise noise and vibration, protect heritage and cultural areas, manage waste appropriately, manage hazardous substances, maintain site housekeeping).

3.2.2 Environment awareness training

Where required, general environment awareness training will be implemented. Topics may include:

- ISO 14001 Environmental Management Standards awareness, obligations and requirements
- TfNSW, NWRG and Tollaust environmental policies, procedures, standards and guidelines
- Job analysis and safe work method statements development
- Auditing (including spot and formal auditing) and workplace inspections
- Incident reporting and investigation
- Environment protection and sustainability including Tollaust corporate sustainability requirements;
- The waste hierarchy.

Awareness training maybe delivered through distance online training in the form of memoranda or instructions, or training sessions prepared and delivered by the NorthConnex O&M Environment Manager.

3.2.3 Toolbox sessions

Monthly toolbox meetings may be held to cover health, safety and environmental topics and may include:

- The environmental hazards and risks register
- OEMP changes
- Legislation changes
- Inspection findings and audit results
- Incident or near-miss investigations
- Suggestions from team members.

Asset stakeholders are also to attend specific toolbox talks relating to their operations and maintenance roles and responsibilities prior to working on the Asset.

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3.2.4 Emergency response training

Incident Response plans are held by both Tollaustr and DM Roads to detail their respective responsibilities relating to different types of incidents.

Incident response personnel

On ground Incident Response will primarily be undertaken by DM Roads personnel. DM Roads shall train all personnel that are required to participate in an incident response. The training covers the effective implementation of controls for:

- Spill response (eg oil, fuel, chemical)
- Containment
- Clean up and Waste disposal
- Features of the tunnel control system (e.g., deluges, water treatment plant).

Motorway Operations Complex (MOC)

Traffic Control Room Officers (TCRO's) based in the MOC are suitably trained in emergency response procedures. TCRO's will communicate and coordinate with Incident Response staff to respond to incidents. This is to ensure the correct and most-appropriate incident response is initiated. TCRO's will also coordinate with the NorthConnex O&M Asset Operations Lead to ensure that the correct authorities are contacted including, the Police, Fire Brigade, NSW EPA and other emergency response services.

Business continuity training

An annual emergency exercise takes place on either the Asset or M7 Motorway, Lane Cove Tunnel, M2 Motorway, Eastern Distributor, Cross City Tunnel, M8 or M5E once every four years. The exercise is focused on returning the Asset to normal operations, and tests:

- The emergency response procedure
- Traffic management control implementation
- Environmental protection control implementation
- Spill and emission containment practices, procedures and equipment
- Short-term incident management and long-term clean-up
- Post event reporting.

Learning from these events will feedback into Emergency Response Procedures including the Pollution Incident Response Management Plan (PIRMP).

3.3 Communications and reporting

There is a requirement to undertake internal and external communications in operating and maintaining the Asset.

3.3.1 Internal communications

Internal communication procedures have been developed to operate and maintain the Asset. **Table 3.3** lists the communications methods used to internally communicate environmental management issues.

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Table 3.3 Internal communication methods

Method	Description	Responsibility	Frequency
Management operational meetings	Meeting to discuss all operational issues	NorthConnex O&M Maintenance Manager	Monthly
Management review meetings	Review OEMP and supporting documents	NorthConnex O&M Maintenance Manager NorthConnex O&M Environmental Manager	At least annually
Training and awareness sessions	Improve awareness of all employees	NorthConnex O&M Asset Operations Lead NorthConnex O&M Maintenance Manager Operations Support Manager	At least one per quarter
Email	Issues, updates and schedules	NorthConnex O&M Maintenance Manager NorthConnex O&M WHS Advisor	As required
Toolbox talks	Discussions on site related issues	NorthConnex O&M Asset Operations Lead NorthConnex O&M Maintenance Manager NorthConnex O&M WHS Advisor NorthConnex O&M Environmental Manager	As required
NorthConnex Internet	Corporate information Air Quality information Community Notifications	NorthConnex O&M Maintenance Manager NorthConnex O&M WHS Advisor NorthConnex O&M Environmental Manager NorthConnex O&M Community Engagement Advisor	As required

3.3.2 External communications and reporting

External consultation with Government agencies, Local Councils and local community groups will be undertaken in accordance with **Table 3.4**. Consultation may also be undertaken with specialist resources to seek expert advice for environmental issues that are outside of the expertise of Tollaust staff. The NorthConnex O&M Environmental Manager should be consulted prior to communicating with specialist consultants.

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The NWRG NorthConnex Asset Manager is responsible for all communications in relation to operational matters with TfNSW and may seek the agreement of TfNSW to undertake specific activities, for example the erection of signage.

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Table 3.4 External communication methods

	NSW Environment Protection Authority	Local Council	TfNSW	Neighbouring properties	SafeWork NSW	NSWFB (including HAZMAT)	Asbestos specialist	Bushcare groups	Department of Health	Department of Planning & Environment Planning	AQCCC
Pollution incident that involves material harm# to the environment (actual or potential), such as: <ul style="list-style-type: none"> Chemical spill Contaminated wastewater spill Pollution of natural waterways 	EM	EM	AM		EM	TCRO			EM		
Illegal Dumping	EM	MM	AM								
Intention to use pesticides				MM							
Hazardous Waste removal	EM		AM								
Smokey Vehicles and Dangerous Goods Vehicles	EM										
Presence of Asbestos			AM		EM		MM				
Contaminated Land	EM	EM	AM								
Noxious weeds presence / removal		EM						MM			
Damage to replanted vegetation			AM					EM			
Damage or potential damage to threatened species			AM								
Damage or potential damage to Aboriginal Heritage items			AM								
Damage or potential damage to other Heritage items			AM								
Breach of MCoA			AM						EM	EM	AM
Breach of EPL Air Quality limits	EM		AM								AM

Material harm – It involves actual or potential harm to the health or safety of human beings or ecosystems that is not trivial, or it results in actual or potential loss or property damage exceeding \$10,000. This determination will be made by the NorthConnex O&M HSE Advisor and NorthConnex O&M Manager jointly and documented as necessary on the electronic database.

NorthConnex O&M Environmental Manager

EM

Traffic Control Room Officer

TCRO



PLAN

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Doc code NCX-EV-PL-001
 Doc owner Head of Operations
 Head of Planning and Maintenance

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NorthConnex O&M Maintenance
Manager

MM

NWRG NorthConnex Asset Manager

AM

3.3.3 Air Quality Community Consultative Committee (AQCCC)

In accordance with MCoA B8, the NorthConnex Air Quality Community Consultative Committee (AQCCC) was established prior to finalising the detailed design of the SSI and prior to the establishment of the ambient air quality monitoring stations. The AQCCC was established mid-2017 to provide input prior to and during the operation of the Asset, and consultation with the AQCCC will continue to be associated with the ongoing ambient air quality monitoring and auditing. The AQCCC will meet once per quarter and operate for a period of 2 years from the commencement of operations, as required by MCoA B8.

3.3.4 Advertising planned maintenance

All planned major maintenance works that have the potential to materially affect the traffic flows on the Asset will be advertised to ensure the public is aware of upcoming work. The advertising program may include local and Sydney papers, publication on the NorthConnex website, social media and radio broadcasts as appropriate to the nature, scale and duration of the proposed work.

The format of all written information is to comply with the requirements and standard formats provided by TfNSW, and where appropriate, NWRG NorthConnex Community and Stakeholder Specialist.

The variable message signs (VMS) servicing the Asset will be used to inform motorists of upcoming work with information of potential disruptions being provided in the preceding fortnight.

3.3.5 Media protocols

All Asset stakeholders will adhere to the following media communication protocol:

- Media enquiries will be directed to NWRG NorthConnex SES Manager
- No Asset stakeholder is authorised to make a public statement without consultation with NWRG NorthConnex SES Manager
- Enquires directed to Transurban or Tollaustr will be directed to the NWRG NorthConnex SES Manager
- Media will not be permitted onto the Asset footprint without TfNSW approval
- All Asset stakeholders will be made aware of this in their induction training.

3.3.6 24-hour contact line and emergency contacts

There are a number of communication channels available for the public to provide feedback, enquires and complaints. The combination of channels ensures customers are able to make contact 24/7. The Table 3.5 below details the channels available, and highlights the team responsible for managing the first interaction:

Table 3.5 Available communication channels

Team	Available Channels
Customer Service	<ul style="list-style-type: none"> • Telephone: Transurban Linkt Customer Service (13 33 31) • Email: resolve@transurban.com • Web: Enquiry / complaint forms are available on the Asset websites • Social Media: Facebook and twitter
Tollaustr	<ul style="list-style-type: none"> • Telephone: The Asset Control Room (via Linkt 13 33 31)

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Team	Available Channels
	<ul style="list-style-type: none"> Mail: communication is able to be sent in the post, directly to the NorthConnex Office or the Tollaust postal address (enquiries@northconnex.com.au)

The above channels are advertised on the TfNSW and NorthConnex websites.

The Asset website can be found at www.northconnex.com.au, and will be routinely updated in relation to:

- Upcoming maintenance activities
- Tolling queries
- Scheduled operations and maintenance activities
- Monitoring data
- Other relevant community information.

3.3.7 Community contact and complaint management.

Community contact and complaints regarding the Asset will be managed in accordance with the Community Liaison Implementation Plan (CLIP). The NorthConnex O&M Community Engagement Advisor and the NWRG NorthConnex SES Manager is the only entity authorised to handle and respond to complaints.

All compliments and complaints will be recorded, and the resolution tracked in an approved document in accordance with the CLIP.

4. Environmental aspects, impacts and risks

As required by AS14001 clause 6.1.2, significant environmental aspects are defined in this document are those associated with the Asset that:

- Have the potential to cause, or result in, a significant environmental impact
- Are subject to regulation such as a MCoA, EPL, TWA, licencing, or criteria (such as water discharge criteria)

Due to the complexity of the Asset O&M activities, it is conceivable that various aspects would carry a varying degree of environmental impact and risk which needs to be managed accordingly.

4.1 Current and ongoing environmental risk analysis

The Environmental Aspects, Impacts and Risk Register is to be maintained in the Active Risk Manager (ARM) system.

It is a controlled management system that will be managed by the Risk Manager NSW and WestConnex.

It is a live management system and is reviewed quarterly and updated as required.

It may be independently reviewed annually to ensure the assessment is current and the information is accurate.

The analysis will be made available to TfNSW upon request.

The OEMP works under a process of environmental risk analysis to identify potential environmental impacts associated with the Asset, environmental performance criteria, development standards and other mitigation measures, and any significant residual environmental impacts. Where additional key

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environmental impacts are identified through this environmental risk analysis an appropriately detailed assessment of this key environmental impact will be included.

The OEMP has adopted the Transurban *Enterprise Risk Management Framework (reference PRRI003)*. This framework is consistent with Australian Standard AS ISO 31000: 2009 Risk Management, Principles and Guidelines.

4.2 Ongoing environmental risk analysis

The environmental risk analysis process is dynamic and iterative. It will be reviewed quarterly, when there are changes to the legislation or operation and maintenance protocols on the Asset.

Environmental risks have been identified and recorded in Active Risk Manager (ARM). Additional risks are identified through mechanisms including audits, incident reviews, site observations, site meetings or toolbox talks. New, atypical, non-routine or major environmental risks will be included and assessed under the environmental risk analysis. They will be included during quarterly risk reviews to ensure the hazards are identified, controlled, and ideally, eliminated prior to their occurrence. The Transurban Risk Manager – NSW & WCX is responsible for conducting the review with input from the NorthConnex O&M Environmental Manager and updating ARM to respond to the outcomes.

Appendix D provides a snap shot of Significant Environmental Aspects, Impacts and Risks for the Asset. The most current register is maintained in Active Risk Manager (ARM), which is reviewed and updated on a quarterly basis.

4.3 Environmental mitigation measures and controls

Environmental mitigation measures have been identified in this document or the applicable Sub-plans found in the Appendices. Key environmental risks and associated mitigation measures and controls have been identified in the risk assessment process outlined in **Section 4.1**. In addition, the ongoing risk analysis process described above in **Section 4.1** will be implemented to maintain the Environmental Aspects, Impacts and Risk Register, which will in turn identify additional risks and mitigation measures.

Further guidance for other minor environmental risks can be found in the topics below or in the HSE quick reference guides available on the Transurban Employee Network (TEN) intranet site. Further controls can also be found in TfNSW Resource 2 environmental assessment procedure for routine and minor works – Safeguard's list' (March 2018). Additional guidance on specific issues can be found in the sections below.

4.3.1 Contaminated land

Contaminated land contains substances (typically from historical commercial or industrial activity) that exceed levels which are considered suitable for the current land use. Exposure to contaminated soils or water, such as when excavating, can pose a risk for workers and the public. Contamination can also harm the environment and impact infrastructure.

Activity / Step	Mitigations	Responsibility
1.1	Check for indicators of contaminated land such as odorous material, oil staining, oil sheen, buried waste or unusually coloured material. If potentially contaminated soil is identified, stop work and restrict access to the area and contact the NorthConnex O&M Environmental Manager.	NorthConnex O&M Maintenance Manager

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Activity / Step	Mitigations	Responsibility
1.2	If contaminated soil is identified then soil must be classified to determine transport, tracking, licensing and disposal requirements. This may require specialist assessments.	NorthConnex O&M Environmental Manager

5. Emergency preparedness and response

Incidents on the Asset will be managed through the NCX Incident Management Manual (NCX-OP-MN-001), NCX Incident Management Team (IMT) Guide (NCX-EMM-GU-001) and the B7 Tunnel Ventilation, Traffic Incident Response and Traffic Management Systems Integration Protocol. All Asset stakeholders will be trained in emergency preparedness and response relevant to their position as per Section 3.2 of the OEMP.

5.1 Emergency planning and prevention

The primary objective is prevention. This will be achieved by:

- Site audits and inspections of the Asset, operations and maintenance activities and procedures.
- Systems and procedure audits, reviews and updates.
- Mandatory training as outlined in the Training Management Plan (NCX-LD-PL-1), with additional training for people exposed to, or responsible for managing, emergency response.
- Undertaking emergency exercises.
- Preparedness through maintenance of emergency response equipment and materials.

5.2 Emergency response

Tollaustr has in place the NCX Incident Management Manual (NCX-OP-MN-001). It specifically describes the:

- Processes and procedures that are to be followed during an operational emergency (e.g., fire, road traffic accident, explosion).
- Traffic management measures that are to be implemented during an emergency to prevent escalation.
- Infrastructure management procedures that are to be implemented during an emergency to prevent escalation.
- Training and testing measures that are to be implemented to ensure all Asset stakeholders are familiar with the plan and their responsibilities and reporting obligations.
- Requirement for rehearsal, review and regular updates.

5.3 Management of pollution incidents and material harm

An environmental incident may or may not result in an emergency. Not all incidents are emergencies. The principal focus of pollution management is prevention and control.

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In 2012 the NSW Government introduced the need for all scheduled and licenced activities to operate pollution incident response management plans (PIRMPs). As the Asset is a scheduled activity under the POEO Act 1997; a PIRMP (NCX-HSE-PL-001) has been prepared for the Asset under the EPL in accordance with *Environmental Guidelines: Preparation of Pollution Incident Response Management Plans* (NSW EPA, 2012). Tollaust will also work under the *Environmental Incident classification and reporting procedure* (RMS, 2018). The above documents outline the following process for reporting a pollution incident.

Pollution incidents causing or threatening material harm to the environment must be notified to EPA. A 'pollution incident' includes a leak, spill or escape of a substance, or circumstances in which this is likely to occur. Material harm to the environment includes on site harm, as well as harm to the environment beyond the premises where the pollution incident occurred.

An incident is required to be notified if there is a risk of 'material harm to the environment', which is defined in section 147 of the POEO Act as:

(a) harm to the environment is material if:

(i) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or

(ii) 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

(b) 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.

It is a requirement to report pollution incidents immediately to the EPA, NSW Health, Fire and Rescue NSW, SafeWork NSW and the local council. 'Immediately' has its ordinary dictionary meaning of promptly and without delay. This will ensure that pollution incidents are reported directly to the relevant response agencies and they will have direct access to the information they need to manage and deal with the incident in a faster time.

This process is outlined in the Incident Management flowchart shown in **Figure 5.1** and will be employed for internal notification. Email and phone contacts for notification are contained in **Appendix E**.

The following specific incidents have the potential to cause material harm to the environment:

- Hydrocarbon and chemical spills
- Fire and smoke releases
- Air release outside of MCoA limits (see Appendix J - Operational Air Quality Management Plan)
- Water release that does not comply with the requirements of MSP2- Water Quality Plan and Monitoring Program (Appendix I)
- Road traffic accidents
- Illegal waste dumping (fly-tipping)
- Tunnel ventilation system failure
- Striking utilities and services.

The following hierarchy of actions will be employed during 'material harm' incidents:

- Call '000' if the incident presents imminent threat to human health or property
- Ensure the site is safe and employ the site containment and evacuation procedure
- Implement controls to manage any pollution (providing it does not pose or relate to a human health risk)

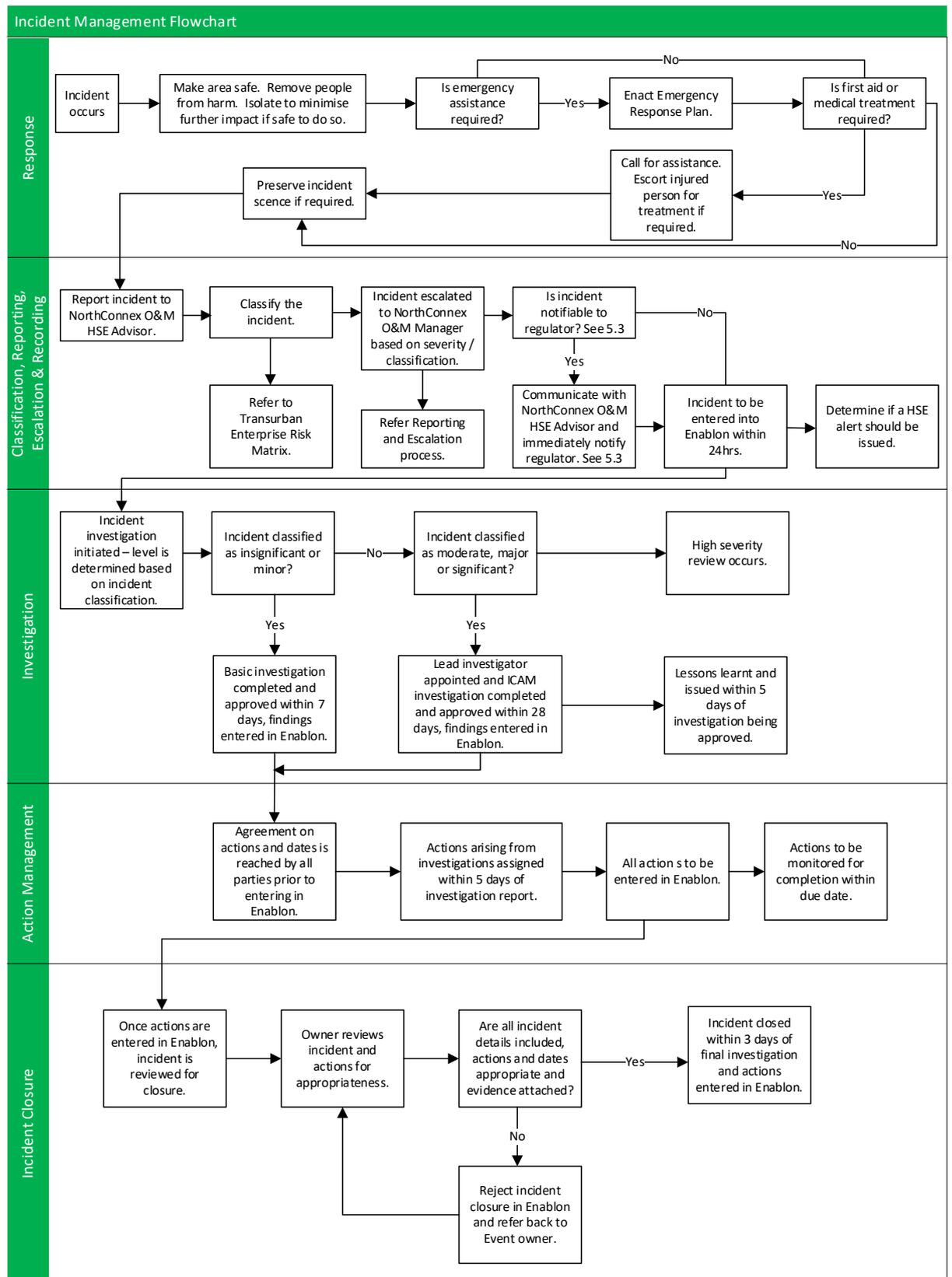
Operational Environmental Management Plan

- Deploy and maintain activities for as long as is needed to control, minimise and rectify the incident
- Implement notification processes for TfNSW, EPA, Government agencies and the community.

Incidents are also be recorded in Enablon, Tollaust's incident management system. Enablon is a customised software package which facilitates a systemic approach for reporting, tracking, addressing and closing out reported environmental and safety incidents.

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Figure 5.1 Incident management flowchart



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5.4 Post-incident

The following post-incident actions may take place:

- Prepare an incident report, identify learnings, communicate and feedback internally
- Develop a corrective action and rehabilitation plan to address residual impacts
- Implement restoring controls (at a point where it is safe and would not increase the risk of pollution)
- Identify training needs and implement training requirements
- Report back to notified Government agencies and NWRG.

6. OEMP compliance and evaluation

This section addresses ongoing monitoring, inspections and test plan requirements, reporting obligations, non-conformance reporting, subcontractor requirements and operational audits of the OEMP.

6.1 Subcontractor environmental management

All subcontractors performing activities on the Asset are required to work under this OEMP and associated Sub-plans. They may be required to provide their own EMP relating to the activities they are contracted to perform.

The subcontractor's EMP will document their environmental controls and standard operating procedures. The NorthConnex O&M Environmental Manager, with the support of the NorthConnex O&M Maintenance Manager, will review and approve the subcontractor EMPs on commissioning and prior to commencing works or on an annual basis for retained subcontractors.

6.2 Monitoring, inspection and audits

The inspection, monitoring and reporting schedule for the Asset are specified in the respective OEMP management Sub-plans.

An independent operational audit of the Asset operations, maintenance and the effectiveness of this OEMP will be completed annually. Audit findings will be reported to TfNSW within 4 weeks of the date of this audit. An action plan to respond to corrective actions will be completed by Tollaust within 4 weeks of receiving the final report. The actions will be documented in the Improvement and Corrective Action Record (ICAR) system and passed on the NorthConnex O&M Asset Operations Lead or NorthConnex O&M Maintenance Manager for close out.

6.3 Non-conformance reporting and notification

The Enablon system is used to record non-conformances. Identified corrective actions determined by the relevant manager and will reflect the nature and scale of the incident and whether it presents a material risk to human health, the environment or risk damaging property. The corrective actions shall be preventative based where possible. They will be implemented, monitored, checked and reviewed through the ICAR system. ICAR's are completed by using reported feedback provided by the Asset stakeholders.

The corrective action process is summarised as:

- Asset stakeholders notify the NorthConnex O&M Environmental Manager of the non-conformance.

Operational Environmental Management Plan

- The relevant manager prepares either an environmental incident report and/or environmental improvement notice for entry into Enablon to allow tracking and reporting.
- The relevant manager assigns corrective actions and responsible Asset stakeholder including timeframes, follow-up dates and close-out expectations in the ICAR system.
- The action is closed out in the ICAR. Any ongoing actions are entered into Protecht for ongoing monitoring, follow up and observation that the non-conformance and associated risk has been ideally removed or is being appropriately managed to limit the potential for material harm as far as is reasonably practical.
- NorthConnex O&M Environmental Manager is to review the Protecht system once per quarter for summary reporting so as to provide feedback to senior management.

7. OEMP review and records management

7.1 OEMP review

The OEMP and Sub-plans will be checked, reviewed and updated annually or as required if there is a significant change in operations, maintenance, personnel, organisational structure, reporting lines, or legislation.

The review will ensure that contractual obligations are being executed in accordance with the requirements of this OEMP and that identified issues and corrective actions are being appropriately managed and reported. The NorthConnex O&M Environmental Manager will be responsible for the review.

The review will be conducted by:

- NWRG NorthConnex Asset Manager
- NWRG NorthConnex SES Manager
- NorthConnex O&M Manager NSW Operations
- NorthConnex O&M Maintenance Manager
- NorthConnex O&M WHS Advisor.

As a minimum the review will cover:

- Management, Government agency, independent specialist and TfNSW comments
- Audit findings
- OEMP Objectives and Targets
- Environmental monitoring outcomes
- Incidents and non-conformances
- Changes in organisation structure and responsibilities
- Changes in operations and maintenance responsibilities
- Changes in legislation.

Between reviews, the NorthConnex O&M Environmental Manager will have the authority to change or modify the systems and processes of the OEMP by way of preparing addenda. Revisions made under this process will be incorporated into annual reviews and forwarded to TfNSW and DPE.

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7.2 Records management

Tollaust under the guidance of the NorthConnex O&M Environmental Manager will be responsible for managing all environmental records and information relating to this OEMP, including:

- The OEMP and Sub-plans
- Water, noise, air quality, heritage, waste, and flora and fauna monitoring data (where required)
- Operations and maintenance activities
- Checklists
- Induction and training details
- Environmental incident reports and actions in Enablon, ICAR's and Protecht
- Complaints/comments register
- Audit report findings and follow-up corrective actions (internal and external)
- Subcontractor monitoring
- Waste management records (eg quantity, disposal location)
- Meeting minutes
- Monitoring environmental planning obligations
- Government Agency correspondence.

Records will be held for 10 years. TfNSW, NWRG, DPE and key Government Agencies will have access to all records upon request. Records will be managed in accordance with Tollaust's ISO:9001 accredited quality management system.

Operational Environmental Management Plan

Appendix A: Compliance table for DIPNR, 2004

EMP Element	Document Reference
Background	
Introduction	Section 1
Project Description	Section 1.2
EMP Context	Section 1.3, Section 1.4
EMP Objectives	Section 1.3
Environmental Policy	Section 3, Appendix B
Environmental Management	
Environmental management structure and responsibility	Section 3.1
Approval and licensing requirements	Section 2
Reporting	Section 5 & 6
Environmental training	Section 3.2
Emergency contacts and responses	Section 5, Appendix E
Implementation	
Risk assessment	Appendix D
Environmental management activities and controls	Section 4, Appendix D, Appendices H - L
Environmental control plans or maps	Appendix F
Environmental schedules	Appendices H - L
Monitor and Review	
Environmental monitoring	Section 4, Appendices H - L
Environmental auditing	Section 6.2
Corrective actions	Section 6.3,
EMP review	Section 7

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Appendix B: Health, Safety and Environment Policy

Tollaustr complies with the NWR Environmental Policy and the Transurban Health, Safety and Environment Policy. The policies describe Transurban's vision and its overall aim that 'to ensure that all employees and contractors exercise individual responsibility for their own safety and for the safety of others; in our workplace or arising from our work, and actively participate in minimising impacts to our environment'. To achieve this vision Transurban has committed to a number of targets that it applies to its activities and supply chain.

Operational Environmental Management Plan



ENVIRONMENTAL POLICY

March 2022

Purpose

To recognise that what we do, and how we do it, has a tangible impact on the productivity of the Sydney region and beyond, the daily lives of the residents and the environment on which we all depend. This Policy applies to directors, companies and staff of NWRG, contractors and visitors.

Our Approach

We aim to ensure that our business partners, staff and contractors actively participate in minimising impacts to our environment and are committed to the principles of ecologically sustainable development.

To achieve our vision throughout our business activities and supply chain, we have committed to:

- continually improve our environmental performance;
- meet our environmental compliance and legislative obligations;
- eliminate or reduce risks that may lead to harmful environmental incidents;
- integrate environmental considerations into planning and procurement decisions, including encouraging good environmental practices and life cycle considerations from our contractors and suppliers;
- prevent pollution to land and waterways;
- manage natural habitat quality and noise along our motorway assets;
- implement opportunities to improve energy efficiency including increased use of renewable energy sources where possible;
- reduce waste to landfill through efficient reuse and recycling;
- minimise our use of potable water;
- work with our partners to identify opportunities to manage the environmental impact of our customer's use of our assets;
- enhance the biodiversity value of our motorway corridors and assets; and to
- seek to improve the environment performance of our offices and depots.

To ensure that we deliver on these commitments, we have developed and implemented an Environmental Management Policy and System to:

- systematically identify and manage environmental risks and opportunities;
- set objectives and measurable targets;
- heighten compliance and regulatory awareness;
- prevent or reduce environmental harm;
- deliver environmental awareness training to maintain a supportive culture;
- effectively engage with stakeholders;
- measure progress towards our targets; and
- transparently report on our environmental performance and achievements.

Monitoring

Our Environmental Policy is available to all staff, contractors and to the public, to communicate our environmental commitment. Our Environmental Management System will be regularly monitored, audited and reviewed to ensure it remains effective and aligned with best practice.

Ian Whitfield
Executive General Manager
NorthWestern Roads Group

Operational Environmental Management Plan



SUSTAINABILITY POLICY

May 2022

Purpose

We are committed to sustainability as a core business objective. This will be embedded in everyday decision-making and operational processes as well as long-term corporate plans and strategies. We must balance business growth and performance in delivering stable and growing returns to shareholders with protecting and enhancing the environment, the wellbeing of our people and the community in which we operate.

We know the decisions we make today need to ensure delivery of our services for our customers for the longer term. We cannot do this alone. We rely on delivering better outcomes in partnership with customers, stakeholders, suppliers and regulators. We will do this through our sustainability principles listed below.

Our Approach

Ensuring responsible operations

We will operate our motorways responsibly whilst respecting our neighbours, local communities and the environment.

Long-term sustainable investment

We will take a longer-term view of managing our business to ensure we remain attractive to equity investors and debt providers.

Delivering efficient operations

We will seek to reduce the use of natural resources, minimise waste, deliver efficient and effective operations for both today and the future and work with our supply chain to improve our resilience.

Sustainable and safe workforce

We will work to ensure that we not only provide employment and improved employability of our current workforce but will provide opportunity for future staff of all skills and backgrounds. We want our people to be fit and healthy and return home safely each day and are committed to zero harm.

Mitigating climate change

We will minimise our carbon footprint associated with energy and fuel use, reduce our consumption of resources and their associated carbon or identifying lower carbon alternatives.

Climate change adaptation

We will understand the potential impact of climate risk on our business and our services and develop efficient and effective resilient responses to minimise this impact.

Reconciliation

Work with our partners to advance reconciliation in Australia through their respective Reconciliation Action Planning processes.

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Sustainable procurement

Work with our partners to advance our procurement practices to align with the International Guideline for Sustainable Procurement (ISO 20400) and relevant local and international regulations pertaining to labour and human rights practices, including modern slavery.

Ensuring strong corporate governance

Good corporate governance is central to our approach to enhance the sustainability of our business. We are committed to upholding strong corporate governance principles and practices in the way we govern our operations.

Monitoring

We will report regularly to our investors and key stakeholders on progress of sustainability practice and outcomes.

A handwritten signature in black ink that reads 'I. Whitfield'.

Ian Whitfield
Executive General Manager
NorthWestern Roads Group

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Health, Safety & Environment Policy
A Transurban Group policy 

Transurban is a toll road owner and operator with a vision to provide a healthy and safe operating environment for every employee, contractor and visitor to our workplaces. This includes supporting both physical and mental wellbeing and minimising our impact on the environments we operate in.

We take an integrated approach to the management of health, safety and environment (HSE) risks by ensuring all employees and contractors exercise individual accountability for their own safety, for the safety of others and actively participate in minimising impacts to the environment.

We apply our HSE approach and frameworks to;

- eliminate or minimise hazards and risks that have the potential to cause injuries, health issues, environmental impacts or pollution at our workplaces or arising from our work activities;
- focus on the key HSE risks, critical preventative controls and related assurance activities;
- support our workforce and contractors by promoting physical and mental wellbeing;
- ensure HSE is embedded into every part of our business and that all employees and people we interact with know they are expected to work safely and have the right to a safe work environment;
- drive visible, proactive HSE Leadership through support, awareness and training to managers and employees, continually enhancing and improving our HSE culture for our workplaces and our customers;
- integrate HSE considerations into business planning and procurement decisions, through proactive communication, consultation and co-ordination ;
- promote better work practices through analysis of our hazards, risks, incidents and near misses and harnessing and sharing this knowledge across the business;
- provide an open and transparent process for HSE concerns and opportunities to be confidently reported;
- raise awareness of relevant legislation and other legal requirements and provide training and guidance to achieve compliance;
- promote sustainable and environmentally sound work practices;
- ensure HSE related objectives and targets serve to continuously improve our HSE approach, performance, HSE management system ; and
- ensure we consider HSE as part of everything we do.

We see HSE as a core component of our values, and our continued success depends on genuinely living our values of:

- Integrity
- Collaboration
- Accountability
- Ingenuity
- Respect

Our HSE management performance is monitored, reviewed and reported. Assurance is provided to our leadership and the Board through continuous oversight of our HSE management activities and assessments of our HSE culture.

By maintaining our focus and commitment to HSE we will ensure that we continue to provide safe workplaces and minimise our impact on the environment.


Scott Charlton
 Chief Executive Officer
 July 2020

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Appendix C: Legislation, Standards and Guidelines

The Tables below provide a summary of the key legislation, standards and guidelines and their relevance to the operations and maintenance of the Asset.

Table C-1 Key legislation provisions and their relevance to the OEMP.

NSW Legislation	Relevance
General	
<p><i>Environment Planning and Assessment Act 1979 (EP&A Act)</i></p> <p><i>Environmental Planning and Assessment Regulation 2000 (EP&A Regulation)</i></p>	<p>Primary legislation for the management of planning in NSW.</p> <p>The Act provided development consent for the project through the Ministerial Conditions of Consent. This provided conditions for the operation and maintenance of the Asset.</p> <p>Any changes to the motorway not included in previous consents require approval under this Act.</p>
<p><i>State Environmental Planning Policy (Transport and Infrastructure) 2021</i></p>	<p>In general, this legislation allows for the maintenance and management of infrastructure assets to occur without the need to obtain consent from Local Councils.</p>
<p><i>Roads Act 1993</i></p>	<p>The Act established the authorities who are responsible for the management of roads in NSW. In the case of the Asset, its management falls to TfNSW as a classified road.</p> <p>Tollaust has advised responsibilities for managing certain aspects of the Asset as defined under the Act. It is required to seek confirmation and agreement from TfNSW under the Act prior to undertaking certain operation or maintenance activities.</p>
<p><i>Local Government Act 1993</i></p>	<p>The main purposes of this Act are to provide the legal framework for an effective, efficient, environmentally responsible and open system of Local Government in NSW, regulate the relationships between the people and bodies comprising the system of Local Government in NSW and to require Councils, councillors and council employees to have regard to the principles of ecologically sustainable development in carrying out their responsibilities.</p> <p>This Act is relevant to maintenance issues involving local traffic management, waste disposal (stormwater management) and building approvals.</p>
<p><i>Work Health and Safety Act 2011</i></p> <p><i>Work Health and Safety Regulation 2017</i></p>	<p>The Act sets out Asset stakeholders' responsibilities in operating and managing the Asset. It details the requirements to ensure the safety and wellbeing of the workforce, users of the Asset and the community in the local area.</p> <p>The Act requires Transurban to monitor its health and safety requirements and link this into its environmental and social obligations. It also requires Transurban to report all relevant safety incidents to SafeWork NSW and/or the relevant environmental authorities.</p>
Pollution management	
<p><i>Protection of the Environment Operations Act 1997 (POEO Act)</i></p>	<p>The Act is the key piece of environment protection legislation in NSW. It outlines offences for water, air, land, waste and noise pollution. It provides for Environmental Protection Licences (EPL's) for scheduled</p>

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NSW Legislation	Relevance
<p><i>Protection of the Environment Regulation</i></p> <ul style="list-style-type: none"> - (General) 2009 - (Clean Air) 2010 - (Noise Control) 2017 - (Waste) 2014 	<p>activities, issuing of Environmental Protection Notices, fines and penalties, investigations and enforcement.</p> <p>Applicable to the Asset EPL, in accordance with the Schedule 1 of the POEO Act.</p> <p>The Act still requires Tollaust to manage its operations to limit the potential for water, noise, land and/or air pollution. Tollaust holds an Environmental Protection Licence issued under section 55 of the POEO Act for the release of road tunnel air emissions. Tollaust is also required to manage its waste streams and notify NSW EPA immediately in instances where a pollution incident 'has the potential to cause or threaten material harm to the environment'.</p>
Aboriginal and non-Aboriginal heritage	
<p><i>National Parks and Wildlife Act 1974</i></p> <p><i>National Parks and Wildlife Regulation 2002</i></p>	<p>The Act provides protection of Aboriginal sites and objects. In the Act there is provision for the management of unexpected Aboriginal heritage finds.</p> <p>The Act requires an Aboriginal Heritage Impact Permit (AHIP) if an Aboriginal object or land is to be impacted.</p>
<p><i>Heritage Act 1977</i></p> <p><i>Heritage Regulation 2016</i></p>	<p>Provides for the conservation of buildings, works, archaeological relics and places of heritage value. It requires any impact on heritage values to be undertaken under an approval or permit, or the need to obtain an exception if the impact would be minor in nature.</p> <p>The Act also describes the reporting and management obligations on Transurban in the event of encountering heritage values during its operations and maintenance of the Asset.</p>
Soil and water management	
<p><i>Sydney Water Act 1994</i></p>	<p>This Act requires consent to discharge wastewater to a sewer through a Trade Waste Agreement.</p> <p>DM Roads holds a TWA's for the WTP. This relates to the reject from the WTP Reverse Osmosis process.</p> <p>Transurban gained approval for the discharge of water from the vehicle washbay (Application #1011505) This activity is classed by Sydney Water as a 'Deemed Process' and does not require ongoing reporting or fees to be paid.</p>
<p><i>Contaminated Land Management Act 1997</i></p> <p><i>Contaminated Land Management Regulation 2013</i></p>	<p>The general objective of the Act is to establish a process to investigate, and where possible remediate, land that is considered to pose a risk to human health.</p> <p>However, it requires Transurban to immediately notify NSW EPA if it is suspected that its operations have resulted in ground contamination or encountered/ remobilised contamination.</p>
Waste management and recycling	
<p><i>Waste Avoidance and Resource Recovery Act 2001</i></p>	<p>This Act relates to the management and reduction of waste including the consumption of natural resources and final disposal of wastes. It also ensures environmentally responsible transporting, reprocessing and handling of wastes.</p>

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NSW Legislation	Relevance
	This Act sets obligations to effectively manage and monitor waste generation and resource consumption and ensure that all waste is handled, stored, transported and disposed of in a responsible manner.
Dangerous goods management	
<i>Environmentally Hazardous Chemicals Act 1985</i> <i>Environmentally Hazardous Chemicals Regulation 2017</i>	The Act regulates the use of (groups of) chemicals through the implementation of chemical control orders and the need to secure a licence to hold, store, manage and use any regulated chemicals. Transurban would need to obtain such a licence should its operations require their use.
<i>Pesticides Act 1999</i> <i>Pesticides Regulation 2017</i>	The major objectives of this Act are to promote the protection of human health, the environment, property and trade in relation to the use of pesticides. The Act included provisions for training of staff using pesticides and recording details of herbicide use. Outlines community notification processes for the use of pesticides. The provisions of this Act are to be adopted within any land management and land clearance activities to ensure human health, the environment and property are protected. Community notification for the use of pesticides above given thresholds.
<i>Dangerous Goods (Road and Rail Transport) Act 2008</i> <i>Dangerous Goods (Road and Rail Transport) Regulation 2014</i>	This Act provides for the transport and management of Dangerous Goods. It specifies controls that prevent the transport of dangerous goods on certain roads, which includes tunnels. Transurban has limited the transport of dangerous goods by road users through the NorthConnex tunnel.
Flora and fauna	
<i>Biodiversity Conservation Act 2016</i> <i>Biodiversity Conservation Regulation 2017</i>	The main objectives of this Act are to maintain a healthy, productive and resilient environment for the greatest well-being of the community, consistent with the principles of ecologically sustainable development. This includes the listing of threatened flora and fauna species and threatened ecological communities as either critically endangered, endangered or vulnerable. It also outlines key threatening processes. A process for biodiversity offsets is also outlined. In constructing the Asset associated protected and threatened ecological values were identified and managed. Whilst the operation and maintenance of the Asset is unlikely to impact on ecological values and threatened species, there is provision for this during ground clearance and excavation work. This Act needs to be considered in any ground clearance work to ensure that threatened flora, fauna and ecological communities are not significantly impacted by the Asset. A licence may be required under the Act to harm or impact on a threatened species.
<i>Fisheries Management Act 1994</i> <i>Fisheries Management (General) Regulation 2010</i>	The major objective of this Act is to conserve, develop and share the fishery resources of the state for the benefit of present and future generations. If sediment was to be removed from a waterway Tollaust may need to seek a permit from NSW Primary Industries (Fisheries) to

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NSW Legislation	Relevance
	'remove sediment or obstructions from a waterway, impacts on a creek or river bank, temporary or permanent blockage of fish passage, or disturbance to mangroves or marine grasses'.
<i>Biosecurity Act 2015</i> <i>Biosecurity Regulation 2017</i>	<p>This Act provides for a coordinated approach to the control of weeds in NSW. The Act requires private occupier, public authorities, corporations and local Councils to control noxious weeds on land under their management. It also empowers Councils to give notice to undertake appropriate control according to the specified category.</p> <p>In constructing the Asset noxious weed management controls were put in place.</p> <p>Should ground clearance work be required then the provisions of this Act relating to the consideration and obligated responsibilities on noxious weed management must be adopted.</p>
<i>The State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017</i> <i>The Hills Shire Council - Tree management guidelines for trees on private land (2019)</i> <i>Hornsby Shire Council Development Control Plan (2013)</i> <i>Parramatta Development Control Plan 2011 - Part 5 Other Provisions</i> <i>Ku-ring-gai Development Control Plan - Part 13</i>	<p>This SEPP and associated Council documents regulate the management of vegetation, specifically trees. They outline the requirements for the approval of tree removal.</p> <p>Tree removal requires a Tree Memo to be completed and approved by TfNSW prior to commencing work.</p>
Commonwealth Legislation	
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	<p>The Act is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places defined in the EPBC Act as matters of national environmental significance.</p> <p>This Act needs to be considered in any work that may impact on listed flora, fauna, ecological communities or heritage places by the Asset.</p>

The Motorway Operator is also required to perform and execute its obligations to satisfy the requirements, limits and thresholds listed in a number of Commonwealth and State standards and guidelines.

Table C-2 and **Table C-3** lists the relevant standards and guidelines that should be held on deposit as reference documents to support the OEMP.

Table C-2 Key standard and guidelines relevant to the OEMP

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Policies, Standards and Guidelines	Relevance
General	
G36 Environmental Protection (TfNSW, 2020)	Environmental protection
EIA-PO5-01 Environmental Assessment Procedure for Routine and Minor Works (RMS, 2015).	Management of routine and minor work
Interim Community Consultation Requirements for Applicants (DEC, 2005) International Association for Public Participation: Spectrum of Public Participation (IAP2, 2007) Community Engagement Policy Statement (RMS, 2012).	Community consultation
Aboriginal and non-Aboriginal heritage	
Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (NSW OEH, 2011) Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW, 2010 (NSW OEH, 2010) Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (NSW DECCW, 2010) Procedure for Aboriginal Heritage Consultation and Investigation (PACHCI, RMS, 2011)	Investigating and managing Aboriginal heritage
Standard Management Procedure, Unexpected Archaeological Finds (RMS, 2012)	Management of unexpected finds
NSW Heritage Manual (Heritage Office and Department of Urban Affairs and Planning, 1996) Assessing Heritage Significance (Heritage Office, 2001) Statements of Heritage Impact (Heritage Office and Department of Urban Affairs and Planning, 2002) How to Prepare Archival Records of Heritage Items, (Heritage Office, 1998)	Investigating and managing non-Aboriginal heritage
Soil and Geology	
Stockpile Site Management Guidelines (RMS, 2008) Waste Classification Guidelines Part 4: Acid Sulfate Soils (NSW EPA, 2014) G38: Soil and Water Management: Soil and Water Management Plan (TfNSW, 2020)	Soil and water management
Acid Sulfate Soils Assessment Guidelines (Acid Sulfate Soil Management Advisory Committee, 1998) Acid Sulfate Soil Manual (Acid Sulfate Soil Management Advisory Committee, 1998) Guidelines for the Management of Acid Sulphate materials: Acid Sulphate Soils, Acid Sulphate Rock and Monosulphidic Black Ooze (RMS, 2005) Waste Classification Guidelines Part 4: Acid Sulfate Soils (EPA, 2014)	Acid sulphate soils
Noise	

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Policies, Standards and Guidelines	Relevance
Interim Construction Noise Guidelines (DECC, 2009) Construction Noise and Vibration Guidelines (RMS, 2016)	Maintenance and repair noise management
Environmental Noise Management Manual (RMS, 2001) Noise Mitigation Guidelines (RMS, 2015) Road Noise Policy (RNP, RMS, 2011).	Operational road traffic noise
Industry Noise Policy (EPA, 2000)	Operational equipment noise
Australian Standard: AS 1055 Acoustics (Standards Australia, 2011)	Description and measurement of environmental noise
Landscaping and Visual	
RMS QA Specification M3 (under M321 Landscape Maintenance) Bridge Aesthetic Guidelines (RMS, 2012) Noise Wall Design Guidelines (RMS, 2012) The Guidelines for Landscape Character and Visual Impact Assessment (EIA-N04, RMS, 2013) Landscape Design Guideline (RMS, 2018) Beyond the Pavement (RMS, 2014) G36: Environmental Protection (RMS, 2016) G40: Clearing and Grubbing (RMS, 2016)	Landscape, urban design and vegetation management
Australian Standard (AS) 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting (Australian Standards, 1997)	Light spill
Flora and fauna	
Biodiversity Guidelines – Protecting and Managing Biodiversity (RMS, 2011) Environmental Impact Assessment Practice Note: Biodiversity Assessment (EIA-N06, RMS, 2016) Discussion Paper- Compensating for Edge Effect (RMS, 2000 and 2005) Matters of National Environmental Significance: Significant Impact Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999 (DEWHA, 2009) Threatened Biodiversity Survey and Assessment: Guidelines for developments and activities (working draft, NSW DEC, 2004) G40: Clearing and Grubbing (RMS, 2016)	Threatened species management
Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (NSW DPI - Fisheries, 2005)	Safe fish passage
Surface water quality and hydrology	
Code of Practice for Water Management: Roads and Development Management (RMS, 1999) Guidelines for Treatment of Stormwater Runoff from the Road Infrastructure (AP- R232, Austroads, 2003) Technical Guideline: Temporary Stormwater Drainage for Road Construction (RMS, 2011)	Stormwater runoff management

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Policies, Standards and Guidelines	Relevance
<p>Managing Urban Stormwater Soils and Construction: Volume 2D Main Road Construction (DECC, 2008)</p> <p>The Blue Book: Managing Urban Stormwater: Soils and Construction, Volume 1 (Landcom, 2004)</p>	
<p>Floodplain Risk Management Guideline: Practical Consideration of Climate Change (NSW DECC, 2007)</p> <p>Guidelines for Controlled Activities: Watercourse Crossings (NSW DEC, 2008)</p>	Working in flood plains and over/close to watercourses
<p>Best Practice Guidelines for Contaminated Water Retention and Treatment Systems (NSW Government, 1994)</p> <p>Storage and Handling Liquids: Environmental Protection: Participants Manual (NSW EPA, 2007) Storage and treatment of firefighting water</p>	Storage and treatment of firefighting water
<p>Guidelines for Construction Water Monitoring (RMS, undated)</p> <p>AS/NZS 5667.1:1998 Water Quality, Sampling, Guidelines on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples (Standards Australia, 1998)</p> <p>Australian and New Zealand Guidelines for Fresh and Marine Water Quality: Volume 1 –The Guidelines ('the ANZECC guidelines', ANZECC, 2000)</p> <p>Guidelines for Construction Water Quality Monitoring (RMS, 2003)</p> <p>The Blue Book: Managing Urban Stormwater (MUS): Soils and Construction, Volume 1 and Volume 2 (Landcom, 2004)</p>	Water quality sampling
<p>G38: Soil and Water Management (RMS, 2016)</p> <p>Stockpile Site Management Guidelines (RMS, 2008)</p> <p>Code of Practice for Water Management: Roads and Development Management (RMS, 1999)</p> <p>Guidelines for Bunding and Spill Management (NSW EPA, 2011)</p> <p>Australian Standard AS 1940B:1993: The Storage and Handling of Flammables and Combustibles (Standards Australia, 1993)</p> <p>Australian Standard AS 4452B:1997: The Storage and Handling of Toxic Substances (Standards Australia, 1997)</p>	Soil and water management
<p>Guidelines for Assessment and Management of Contaminated Groundwater (DEC, 2007)</p> <p>Environmental Direction: Management of Tannins from Vegetation Mulch (RMS, 2012)</p> <p>Guideline for the Management of Contaminated Land (RMS, 2013)</p> <p>Incident classification and reporting procedure (Road and Maritime, 2018)</p>	Contaminated waters and leachate management
Transport and Traffic	
<p>Guide to Traffic Management (Austroads, 2014)</p> <p>Guide to Traffic Generating Developments (Roads and Traffic Authority, 2002, as amended)</p>	Traffic management and working on public roads

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Policies, Standards and Guidelines	Relevance
Traffic Control at Work Sites (Version 6.1, 2022, TfNSW)	
Air Quality, Greenhouse Gas and Climate Change	
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, revised edition (World Council for Sustainable Business Development and World Resources Institute, 2004) Greenhouse Gas Assessment Workbook for Road Projects (Transport Authorities Greenhouse Group 2011, TAGG Workbook) National Greenhouse Accounts Factors (DCCEE, 2014)	Minimisation of greenhouse gas generation
Air Quality Management Guideline (9TP-SD-107/2, Transport for NSW, 2016) Guidelines for Controlling Dust from Construction Sites (NSW EPA, 2003)	Dust Management
Australian Standard AS/NZS AS 5334: 2013 Climate Change Adaptation for Settlements and Infrastructure (Standards Australia, 2013) Climate Change Impacts and Risk Management: A Guide for Business and Government (Department of the Environment and Heritage, Australian Greenhouse Office, 2006) TfNSW Climate Change Plan (TfNSW)	Climate change adaptation
Environmental Compliance Report: Liquid Chemical Storage, Handling and Spill Management - Part B Review of Best Practice and Regulation (NSW DEC, 2005) Storing and Handling Liquids, Environmental Protection: Participants Manual (NSW DECC, 2007) Excavated Natural Material Exemption 2014 (NSW EPA, 2014) Excavated Public Road Material Exemption 2014 (NSW EPA, 2014) Raw Mulch Exemption 2014 (NSW EPA, 2014) Reclaimed Asphalt Pavement Exemption 2014 (NSW EPA, 2014) Stormwater Exemption 2014 (NSW EPA, 2014) Waste Classification Guidelines (NSW EPA, 2014) Management of Wastes on RMS Land (RMS, 2014)	Materials handling and storage and waste management
Waste Avoidance and Resource Recovery Strategy (NSW EPA, 2014) Sustainability Policy: Waste Reduction and Purchasing Policy (WRAPP, NSW OEH, 2011)	Waste hierarchy
Fact Sheet 1: Virgin Excavated Natural Material (RMS, 2015) Fact Sheet 2: Excavated Natural Material (RMS, 2015) Fact Sheet 3: Excavated Public Road Materials (RMS, 2015) Fact Sheet 4: Reclaimed Asphalt Pavements (RMS, 2015) Fact Sheet 5: Asbestos Waste (RMS, 2015) Fact Sheet 6: Waste Sampling (RMS, 2015)	TfNSW waste factsheets
Waste Reduction and Purchasing Plan (RMS, 2010)	Reduction of resource consumption

Table C-3 Key organisational standard and guidelines relevant to the OEMP

Operational Environmental Management Plan

Policies, Standards and Guidelines	Relevance
Organisation	Document Title
Australian Standard	AS 1055 Acoustics – Description and measurement of environmental noise
	AS 1940 - The Storage And Handling Of Flammable And Combustible Liquids
	AS 2922 Ambient air - Guide for the siting of sampling units
	AS 3580 Methods of Sampling and Analysis of Ambient Air – including AS3580.9.8-2001 – Determination of Suspended Particulate Matter – PM10 Continuous Direct Mass Method using Tapered Element Oscillating Microbalance Analyser.
	AS/NZS ISO 14001 Environmental Management Systems – Specifications with Guidance for Use
	AS/NZS ISO 8402 Quality Assurance and Quality Management Vocabulary
TfNSW Specifications	TfNSW G2 General Requirements
	TfNSW G10 Control of Traffic
	TfNSW G22 Occupational Health and Safety (Major Works)
	TfNSW G36 Environmental Protection
	TfNSW Quality System
	TfNSW G38 Soil and Water
	TfNSW G40 Clearing and Grubbing
	TfNSW R178 Vegetation
	TfNSW B30 Clearing, Excavation and Backfill for Bridgeworks
	TfNSW Guidelines-Compliance Guidelines for Waste Minimisation and Management Act 1995 and Regulation 1996
	Environmental Impact Assessment Guidelines, Version 3
	TfNSW Schedule of Environmental Legislation
	Acid Sulphate Soil: Guidelines
	Heritage Guidelines
	Community Involvement – Practice Notes and Resource Manual
Roadscape Guidelines	
Urban and Regional Design Practice Notes	
NSW DECC/EPA Publications	NSW Industrial Noise Policy
	DECCW – Waste Classification Guidelines – Part 1: Classifying Waste
	Approved Methods for the Sampling and Analysis of Air Pollutants in NSW 2007 - DECCW.

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Policies, Standards and Guidelines	Relevance
National Association of Testing Authorities (NATA)	NATA Accreditation Requirement Guidelines
NSW Department of Housing Publication	Managing Urban Stormwater Soils and Construction (Blue Book)

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Appendix D: Significant Environmental Impacts, Aspects and Risks

The Environmental Aspects Impacts and Risk Register will be maintained in the Active Risk Manager (ARM) system. The below table provides a summary of Significant Environmental Aspects, Impacts & Risks. The risk matrix is provided in **Figure D-1**.

Figure D-1 Risk Matrix

Likelihood	Almost Certain	5	11	18	23	25
	Likely	4	10	17	20	24
	Possible	3	9	13	19	22
	Unlikely	2	7	12	15	21
	Rare	1	6	8	14	16
	Insignificant	Minor	Moderate	Major	Significant	
	Impact					



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Environmental impacts and control measures

Table D-2 summarises the most common and likely significant environmental risks from operating, maintaining and repairing the Asset. This is a snapshot of the live documentation which is held in the Active Risk Manager (ARM) system. It describes the environmental impact and the mitigation, management and monitoring strategies that are being employed to manage each risk. The process of environmental risk analysis is central to identifying environmental safeguards, safe working methods and seeking opportunities for continual improvement relating to the Asset's operations and maintenance.

Table D-2 Significant Environmental Aspects, Impacts& Risks

Description of Environmental Risk	Pre control risk level			Proposed control measures*	Responsibility	Target risk level		
	Consequence	Likelihood	Risk Rating			Consequence	Likelihood	Risk Rating
Air Quality	Major	Likely	High	<ul style="list-style-type: none"> - Air quality monitoring and reporting - Preventative maintenance of ventilation equipment - Operational plans and procedures - OEMP and Sub-plan - QA/QC plan for monitoring - Erosion controls as outlined in the Dept. of Housing 'Erosion and Sediment Control Handbook' (2004). 	NorthConnex O&M Asset Operations Lead NorthConnex O&M Maintenance Manager	Moderate	Unlikely	Medium
Inadequate water management	Major	Likely	High	<ul style="list-style-type: none"> - Water Treatment Plant. - Monitoring of WTP discharge water quality. 	NorthConnex O&M Maintenance Manager	Moderate	Unlikely	Low
Inadequate soil management	Minor	Unlikely	Low	<ul style="list-style-type: none"> - Implement erosion and sediment controls as outlined in the Dept. of Housing 'Erosion and Sediment Control Handbook' (2004). - Stop works and investigate potential contaminated soil. - Assurance on contractor controls during works. 	NorthConnex O&M Maintenance Manager	Minor	Rare	Low

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Description of Environmental Risk	Pre control risk level			Proposed control measures*	Responsibility	Target risk level		
	Consequence	Likelihood	Risk Rating			Consequence	Likelihood	Risk Rating
Impact on flora	Minor	Unlikely	Low	- Identification of flora surrounding the site, including threatened species and Endangered Ecological Communities prior to commencing works. - Management of noxious weeds.	NorthConnex O&M Maintenance Manager	Minor	Rare	Low
Impact on fauna	Minor	Unlikely	Low	- Identification of fauna habitat surrounding the site, including threatened species and Endangered Ecological Communities prior to commencing works. - Where fauna is encountered that requires handling or rescue, contact a fauna rescue organisation such as WIRES or Sydney Wildlife.	NorthConnex O&M Maintenance Manager	Minor	Rare	Low
Unplanned disturbance of cultural or heritage item	Insignificant	Unlikely	Low	- Identification of know cultural sites or heritage items near the Asset during job planning. - Follow the TfNSW Standard Management Procedure – Unexpected Heritage Items (TfNSW 2013), including stopping work until investigated. - Check heritage item registers	NorthConnex O&M Maintenance Manager	Insignificant	Rare	Low
Noise or vibration impacts above acceptable levels	Moderate	Possible	Medium	- Inform the community before any programmed non construction hours work is undertaken by providing the following information - programmed times and locations of work, noise and vibration impact predictions, noise and vibration mitigation measures being implemented, and contact number. - Ensure a contact number is available for enquiries and complaints from the general public.	NorthConnex O&M Maintenance Manager	Minor	Unlikely	Low

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Description of Environmental Risk	Pre control risk level			Proposed control measures*	Responsibility	Target risk level		
	Consequence	Likelihood	Risk Rating			Consequence	Likelihood	Risk Rating
				<ul style="list-style-type: none"> - Unless required for technical reasons, undertake high noise generating work during the day, or early in the evening. If required to be undertaken at night; avoid short sharp sounds from impacts during night work to minimise sleep disturbance to neighbouring residents. - Where possible, undertake works in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block. - Works shall comply with the TfNSW Noise and Vibration Guideline (Aug 2016). 				
Inadequate light management	Minor	Unlikely	Low	- Plan works and site machinery to reduce light spill to adjoining residents and bushland.	NorthConnex O&M Maintenance Manager	Minor	Rare	Low
Inadequate waste management practices (including Asbestos)	Moderate	Possible	Medium	<ul style="list-style-type: none"> - Classification of waste in accordance with the EPA Waste Classification Guidelines (November 2014). - Transport of waste by a licensed contractor, including waste tracking. - Waste disposed at a landfill licensed to receive the waste type. - Asbestos management plan 	NorthConnex O&M Maintenance Manager	Minor	Unlikely	Low
Accidental spillage of fuel, chemicals or other hazardous liquids as a result of vehicle leakage or road accidents on the	Major	Possible	High	<ul style="list-style-type: none"> - Store chemicals in accordance with Australian Standard 1940. - Maintain spill kits and fire extinguishers at all times in all incident response and maintenance vehicles. 	NorthConnex O&M Maintenance Manager	Minor	Unlikely	Low

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Description of Environmental Risk	Pre control risk level			Proposed control measures*	Responsibility	Target risk level		
	Consequence	Likelihood	Risk Rating			Consequence	Likelihood	Risk Rating
motorway causes reduced water quality in local waterways								
Overuse of energy	Minor	Possible	Medium	- Ensure regular maintenance of solar panels is undertaken. - Use of environmentally compatible materials during maintenance/upgrade activities. - Use of high efficiency appliances, where possible. - Use of LED lighting, where possible.	NorthConnex O&M Maintenance Manager	Minor	Unlikely	Low

* All proposed control measures include:

- Procedures outlined in OEMP and O&M Manual.
- Staff and Contractor inductions and training.
- Regular inspection, calibration, maintenance and testing of infrastructure and equipment.

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Appendix E: Key Environmental Contacts

Title	Name	Phone Number
The Motorway Operator		
NWRG NorthConnex Asset Manager	Thomas Bourke	0477 310 912
NWRG NorthConnex SES Manager	Daniel Lovett	0419 978 091
NorthConnex Stakeholder and Community Specialist	Tracey Baker	0437 760 409
NorthConnex O&M Asset Operations Lead	Giovanna Di Biasi	0484 865 157
NorthConnex O&M Maintenance Manager	Martin Sparks	0419 480 347
NorthConnex O&M Environmental Manager	Scott Tinsley	0439 135 015
NorthConnex O&M WHS Advisor	Liam O'Grady	0419 426 233
NorthConnex O&M Community Engagement Advisor	Erin McKnight	0427 375 369
External Parties		
EPA	info@epa.nsw.gov.au	131 555
Fire and Rescue NSW	info@fire.nsw.gov.au	000 (emergency) 1300 729 579 (non-emergency)

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Title	Name	Phone Number
NSW Health	ENHWU@doh.health.nsw.gov.au	9391 9000
Department of Planning, and Environment	rob.sherry@planning.nsw.gov.au	1300 305 695
SafeWork NSW	contact@safework.nsw.gov.au	131 050
Hornsby Council	hsc@hornsby.nsw.gov.au	9847 6666
The Hills Shire Council	Council@thehills.nsw.gov.au	9843 0555
Ku-ring-gai Council	kmc@kmc.nsw.gov.au	9424 0000
Parramatta Council	council@cityofparramatta.nsw.gov.au	1300 617 058

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Appendix F: Sensitive Area Plans

This appendix contains sensitive area plans completed during the Environmental Assessment process in 2015. The indicate the construction footprint, groundwater and surface water monitoring points, biodiversity, threatened flora, vegetation types, heritage items and sensitive receivers such as schools.



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PLAN

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Doc owner Head of Operations
Head of Planning and Maintenance

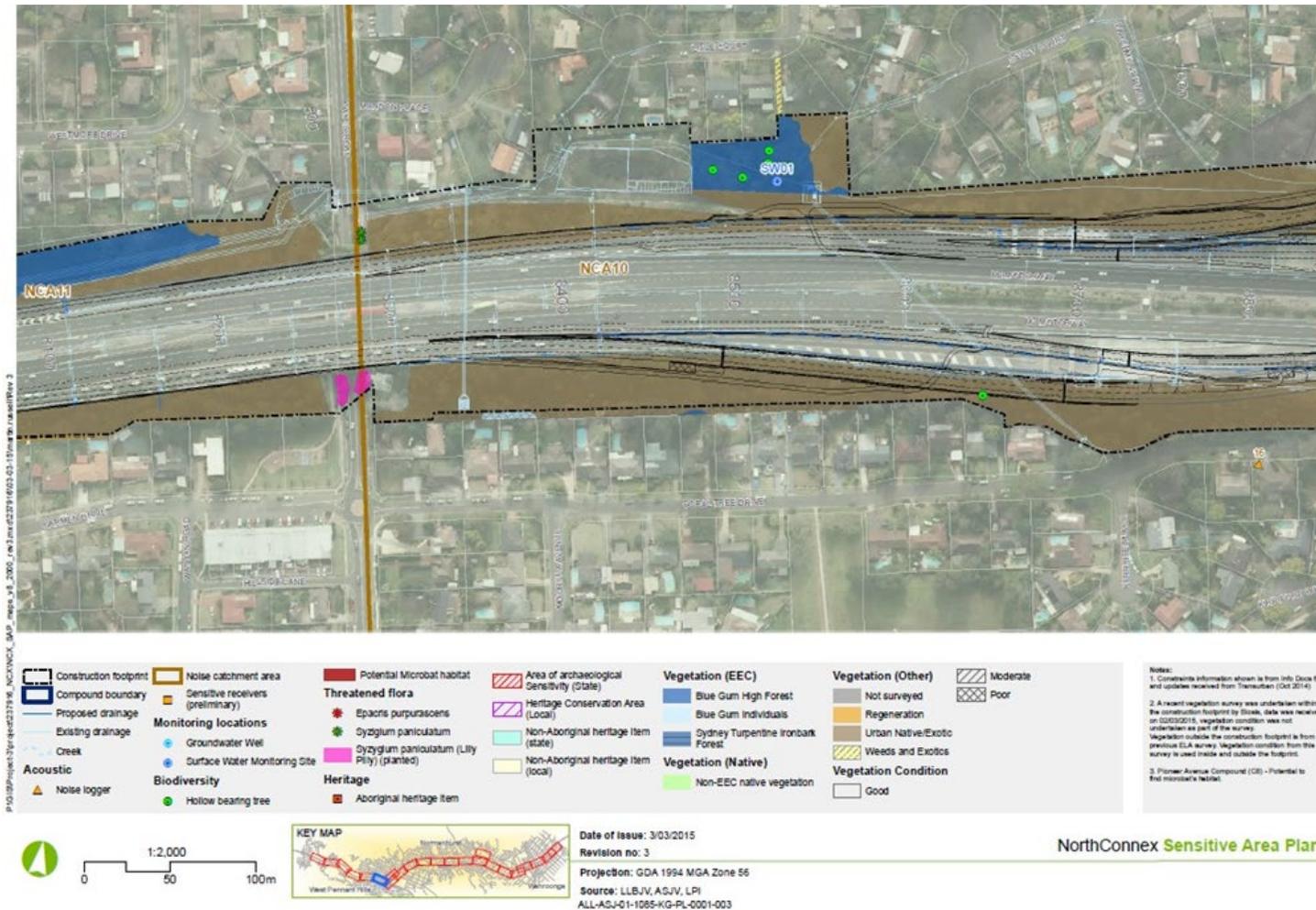
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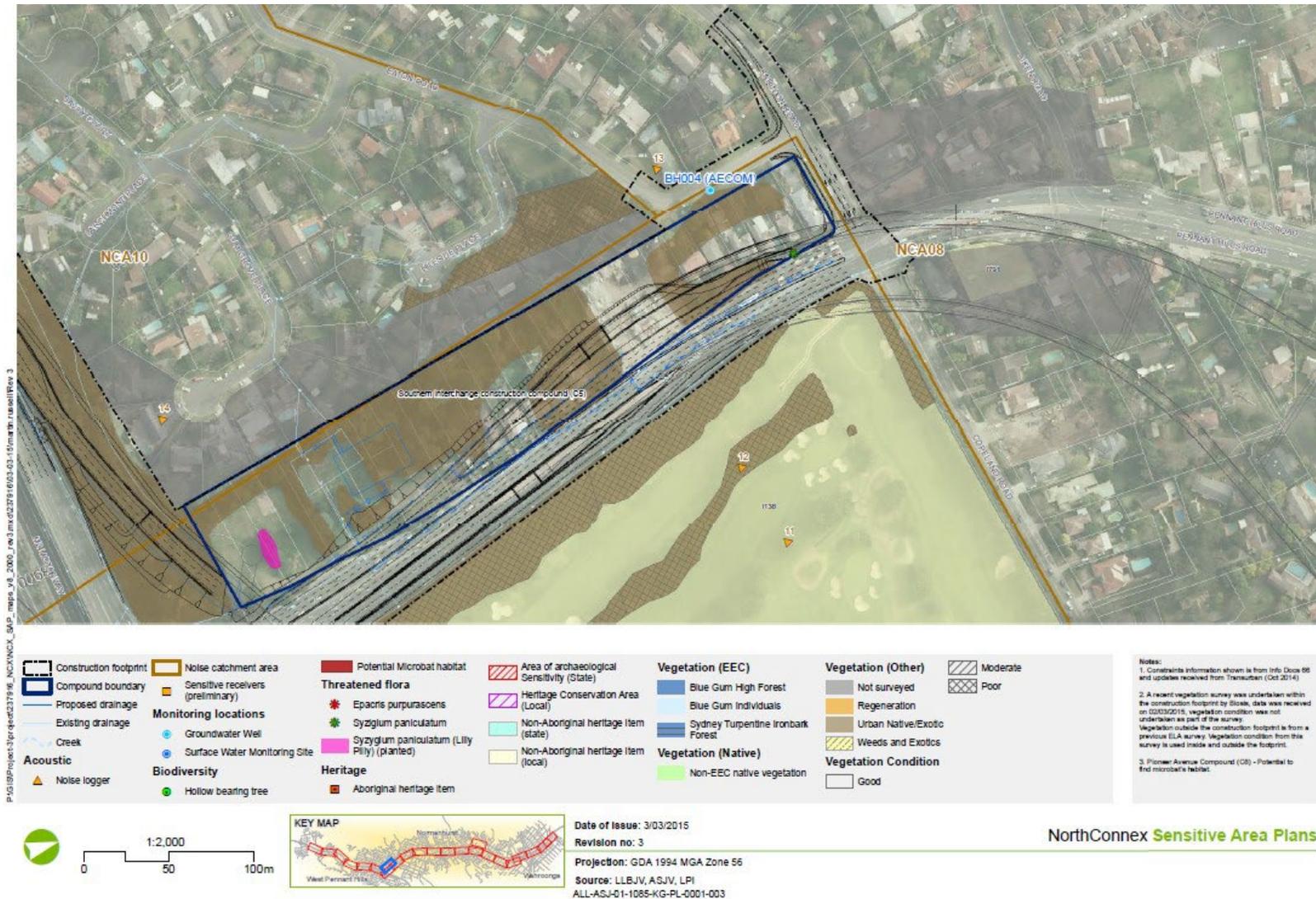
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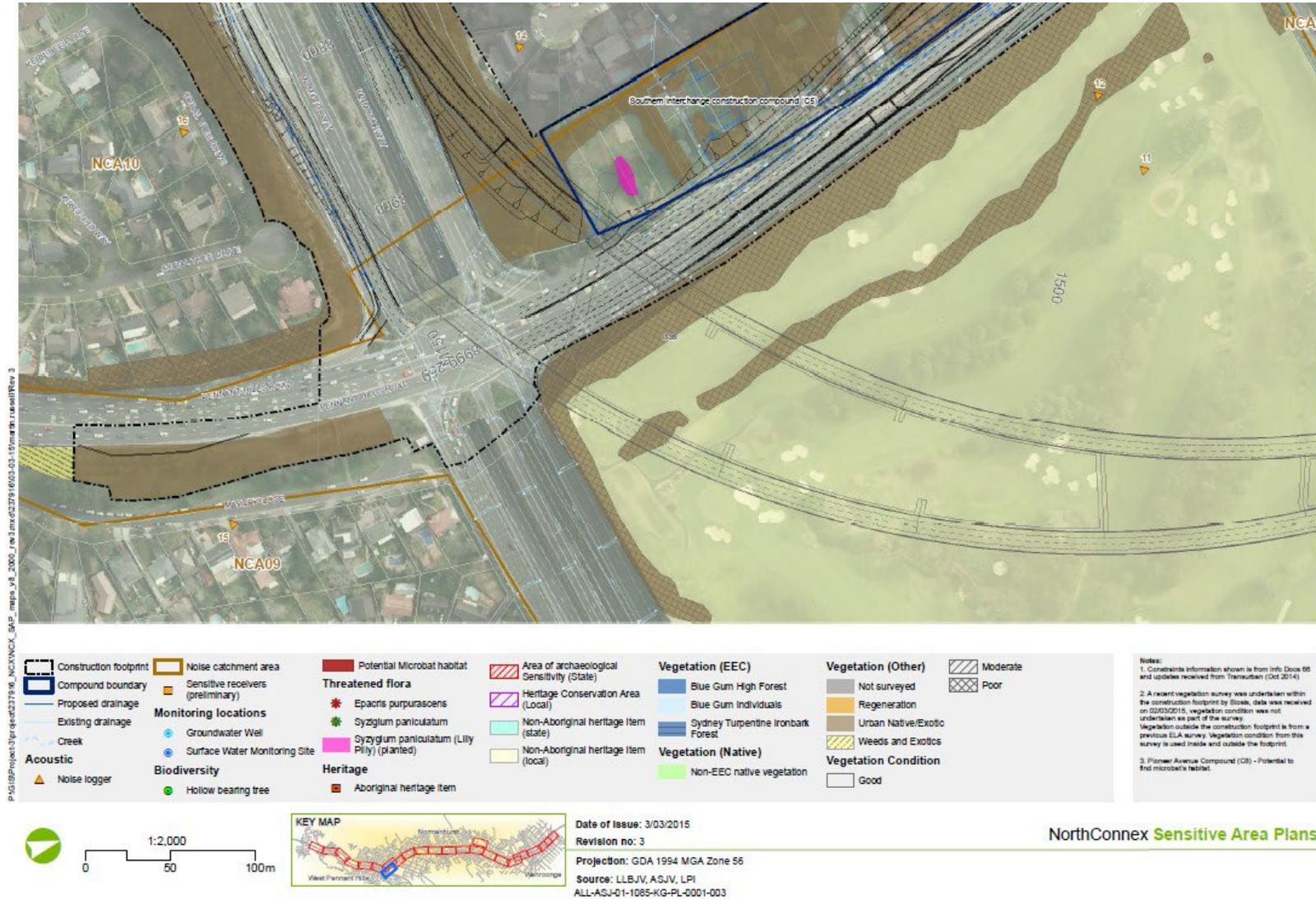
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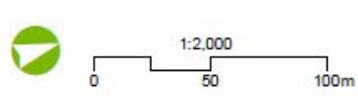


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<ul style="list-style-type: none"> Construction footprint Compound boundary Proposed drainage Existing drainage Creek Acoustic <ul style="list-style-type: none"> Noise logger 	<ul style="list-style-type: none"> Noise catchment area Sensitive receivers (preliminary) Monitoring locations <ul style="list-style-type: none"> Groundwater Well Surface Water Monitoring Site Biodiversity <ul style="list-style-type: none"> Hollow bearing tree 	<ul style="list-style-type: none"> Potential Microbat habitat Threatened flora <ul style="list-style-type: none"> Epaoris purpurascens Syzygium paniculatum Syzygium paniculatum (Lilly Pilly) (planted) Heritage <ul style="list-style-type: none"> Aboriginal heritage item 	<ul style="list-style-type: none"> Area of archaeological Sensitivity (State) Heritage Conservation Area (Local) Non-Aboriginal heritage item (state) Non-Aboriginal heritage item (local) 	Vegetation (EEC) <ul style="list-style-type: none"> Blue Gum High Forest Blue Gum Individuals Sydney Turpentine Ironbark Forest Vegetation (Native) <ul style="list-style-type: none"> Non-EEC native vegetation 	Vegetation (Other) <ul style="list-style-type: none"> Not surveyed Regeneration Urban Native/Exotic Weeds and Exotics Vegetation Condition <ul style="list-style-type: none"> Good 	<ul style="list-style-type: none"> Moderate Poor
--	---	--	--	--	---	--

Notes:

1. Constraints information shown is from Info Docs 66 and updates received from Transurban (Oct 2014)
2. A recent vegetation survey was undertaken within the construction footprint by Block, data was received on 02/03/2015, vegetation condition was not undertaken as part of the survey. Vegetation outside the construction footprint is from a previous EIA survey. Vegetation condition from this survey is used inside and outside the footprint.
3. Pioneer Avenue Compound (C8) - Potential to find microbat's habitat.



Date of issue: 3/03/2015
 Revision no: 3
 Projection: GDA 1994 MGA Zone 56
 Source: LLBJV, ASJV, LPI
 ALL-ASJ-01-1065-KG-PL-0001-003

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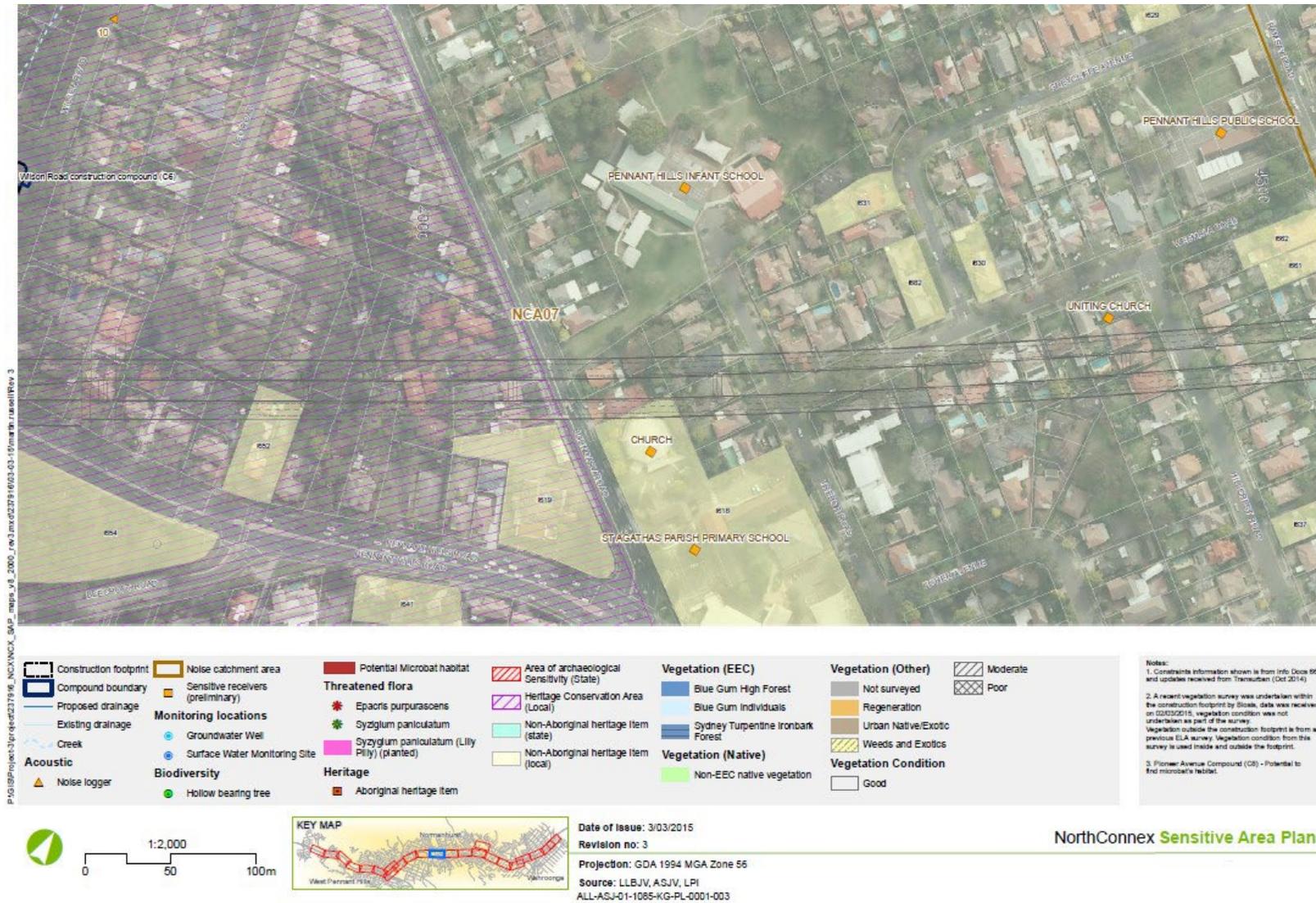
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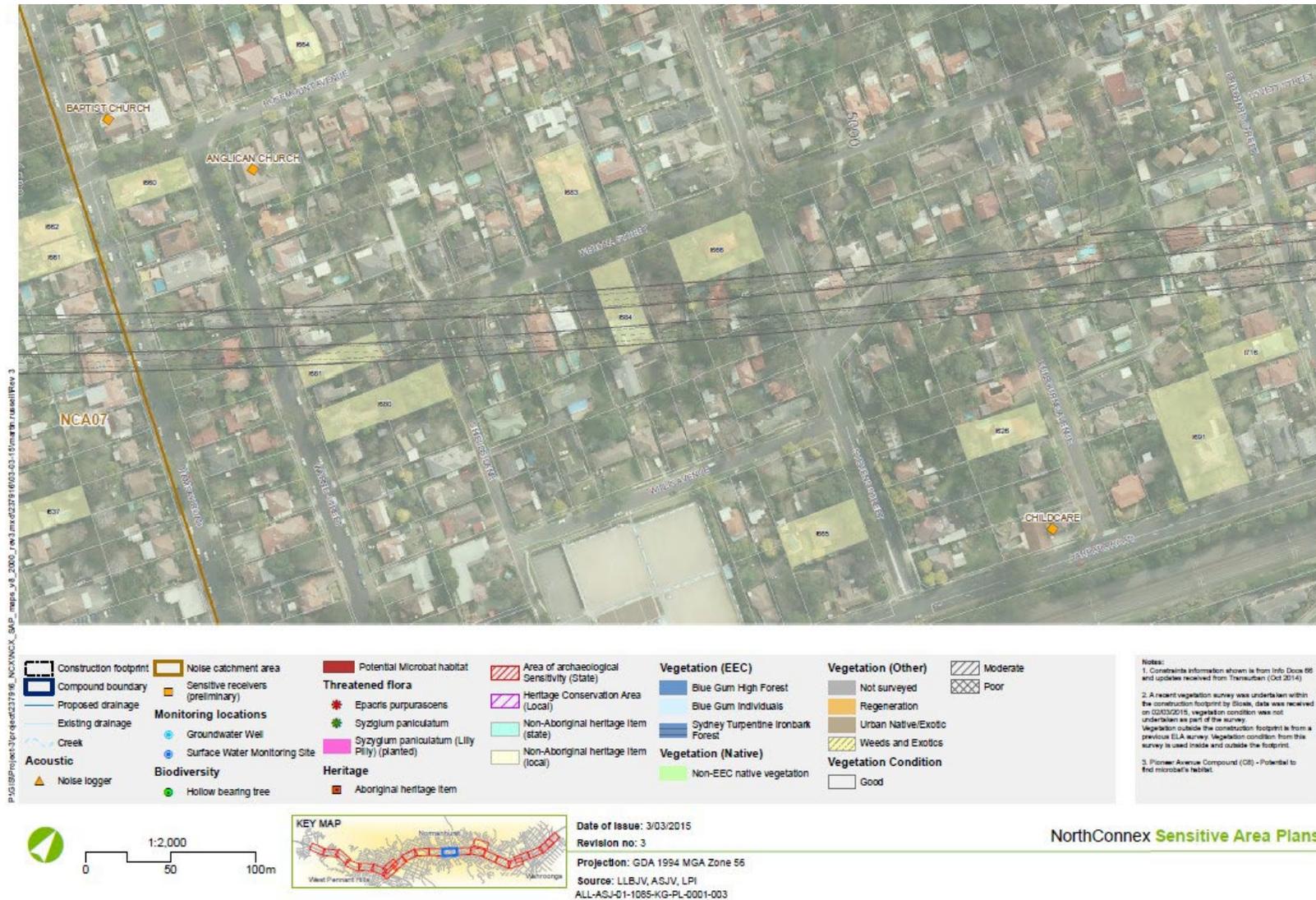
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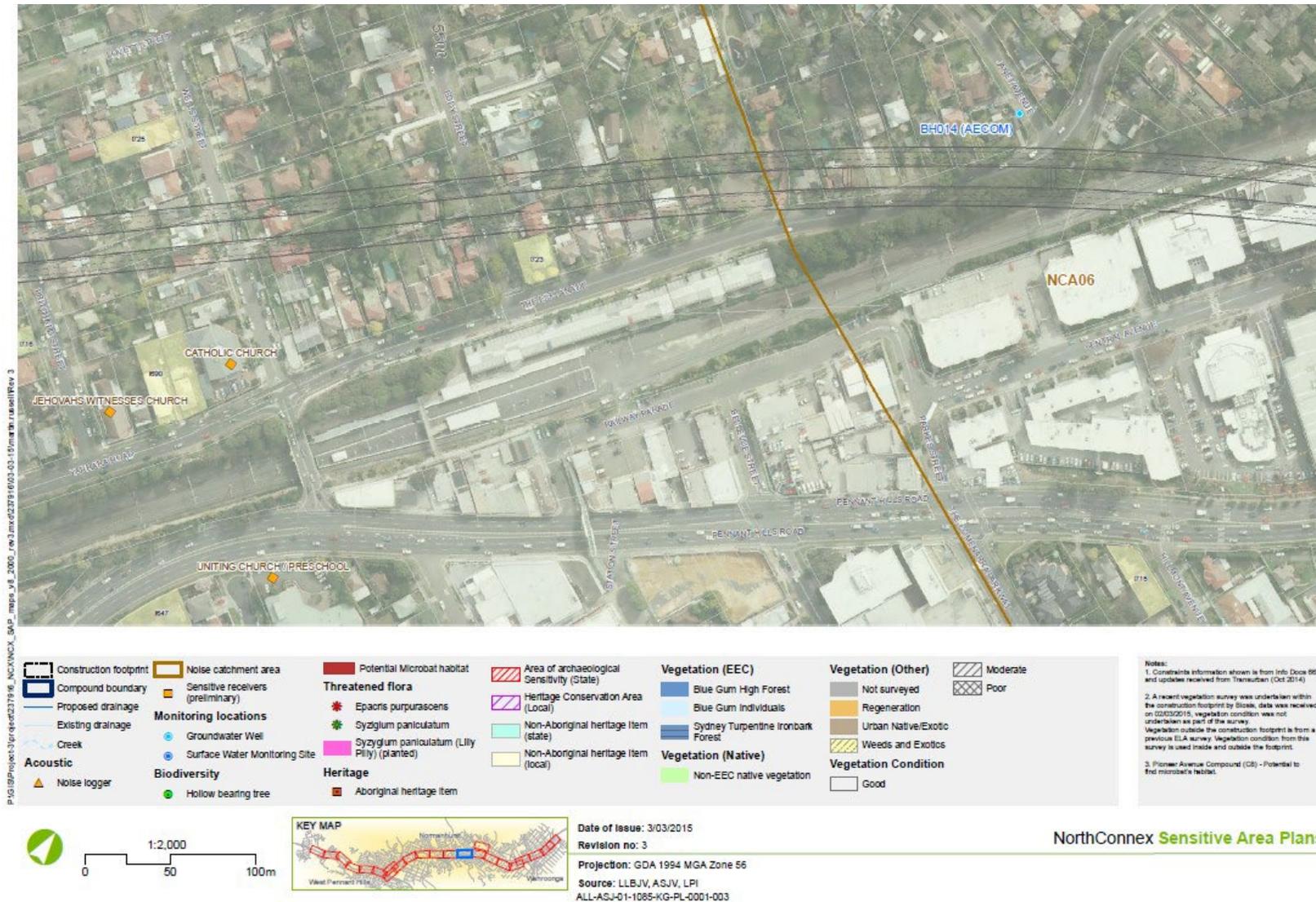
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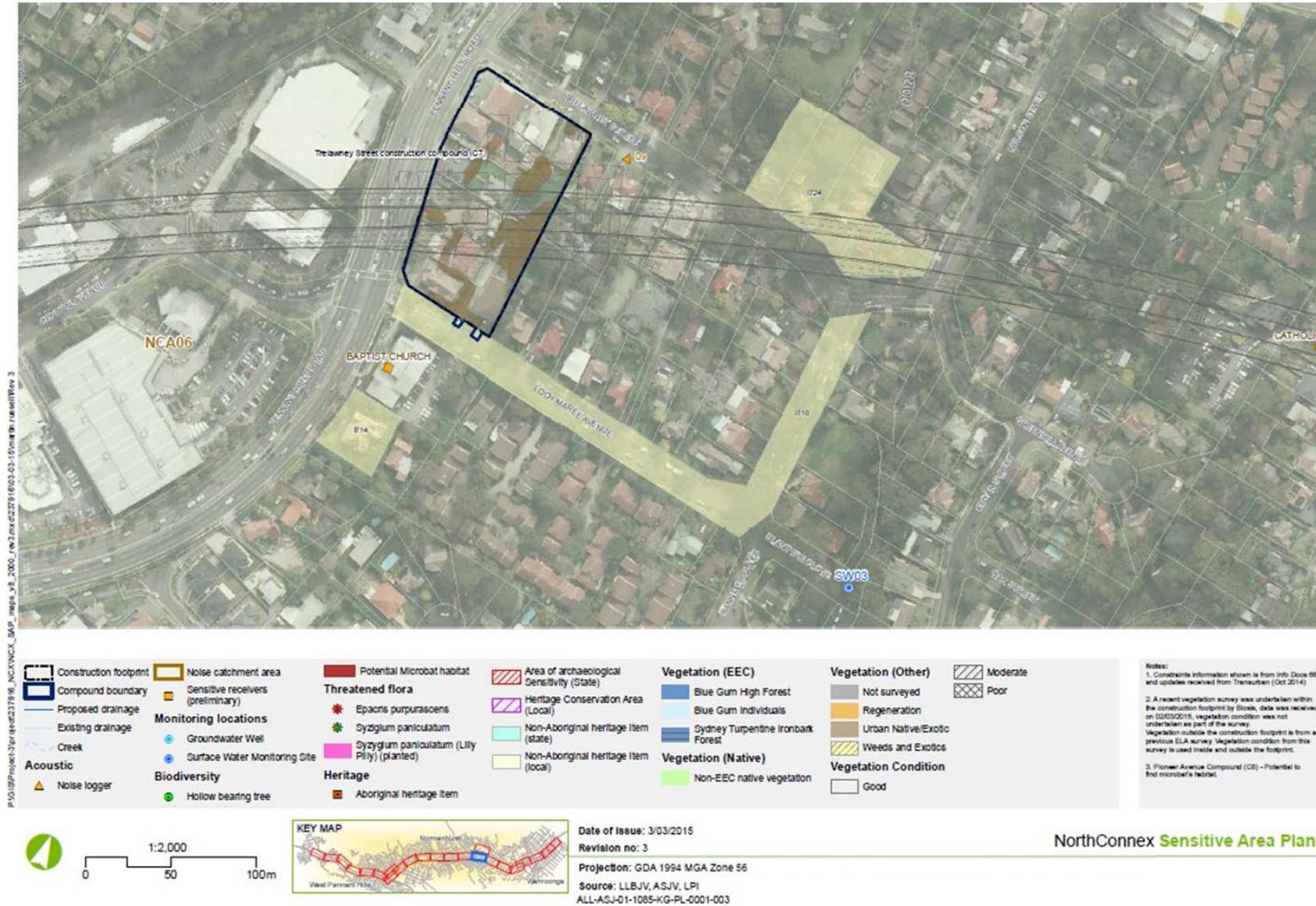
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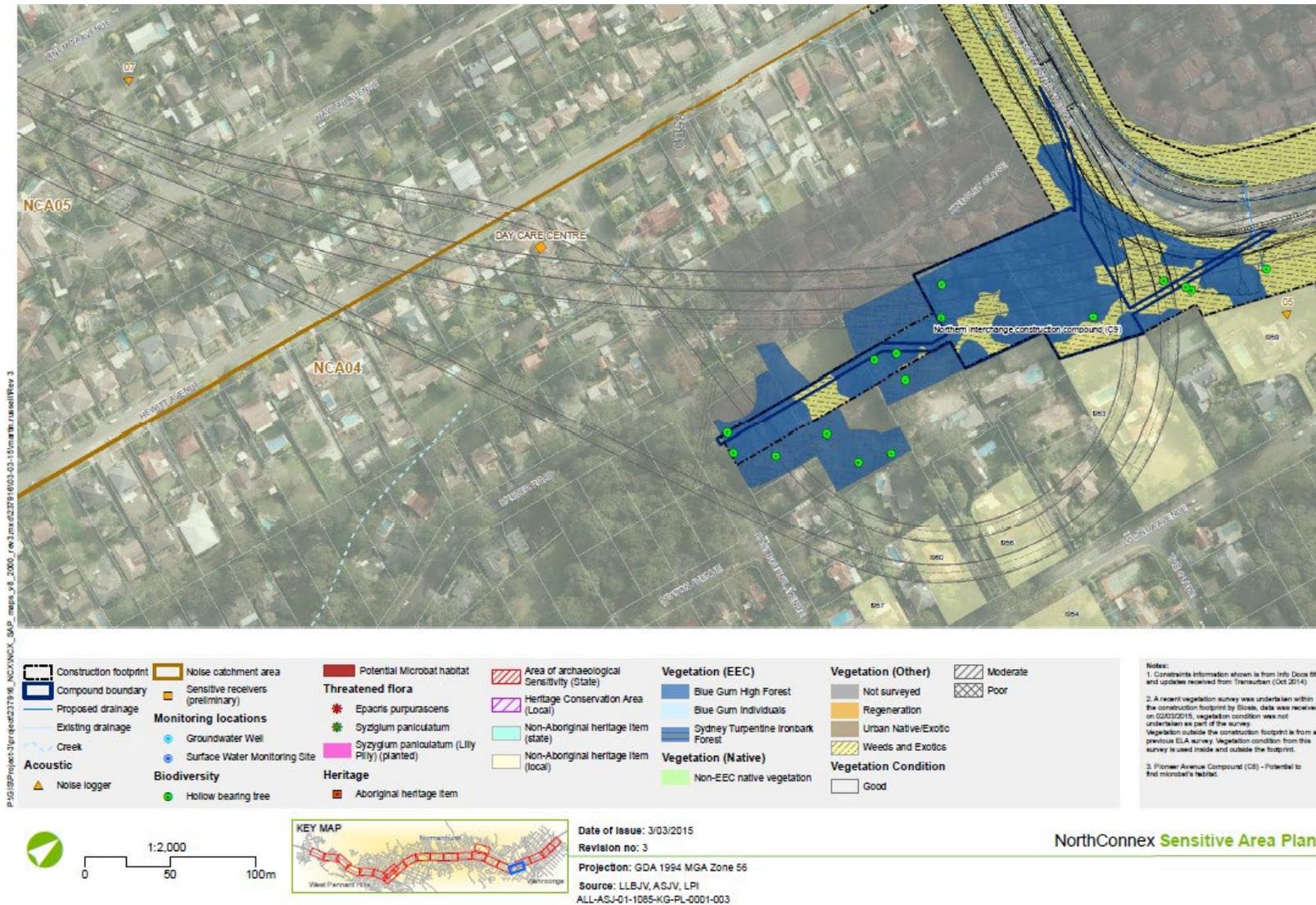
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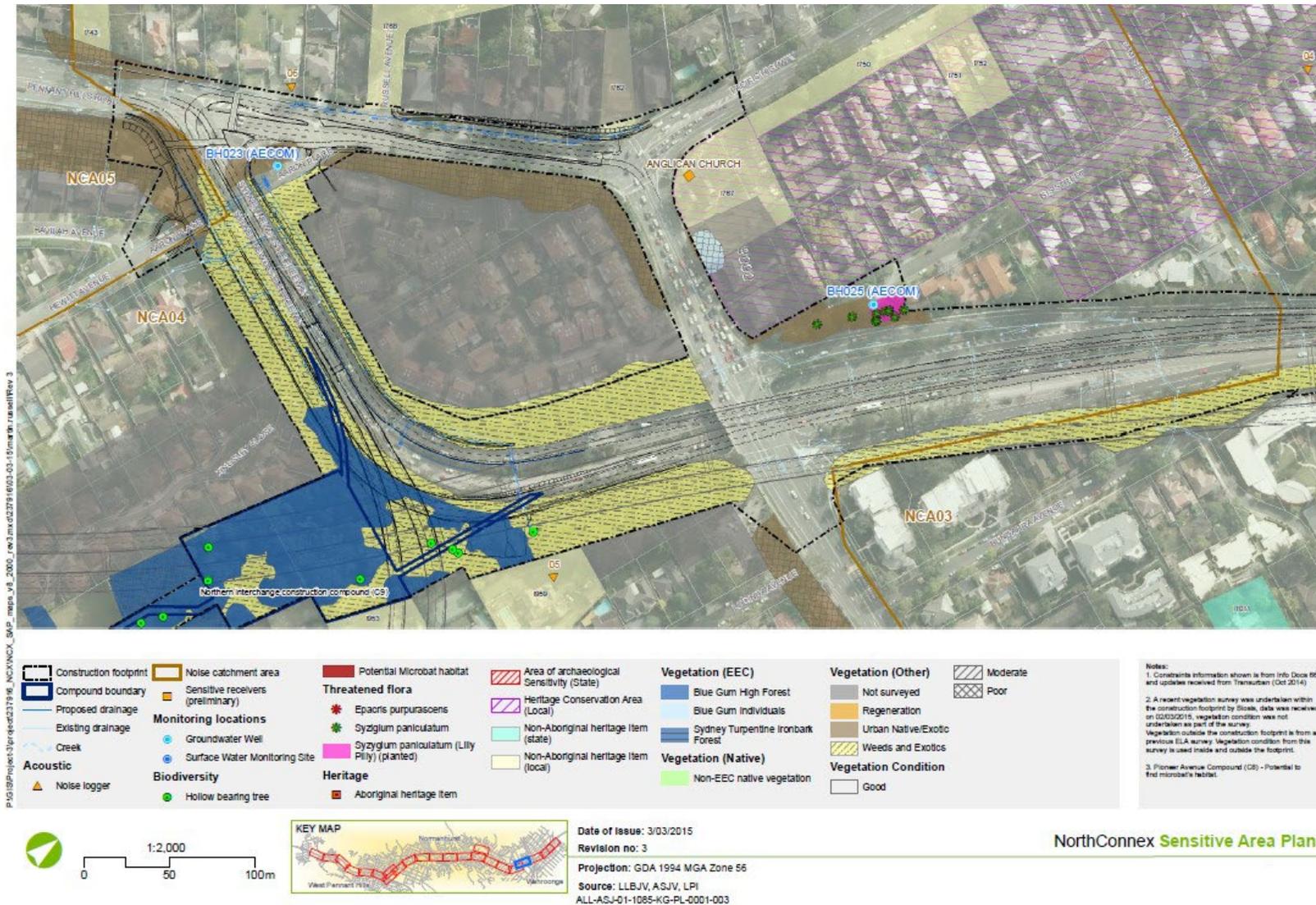
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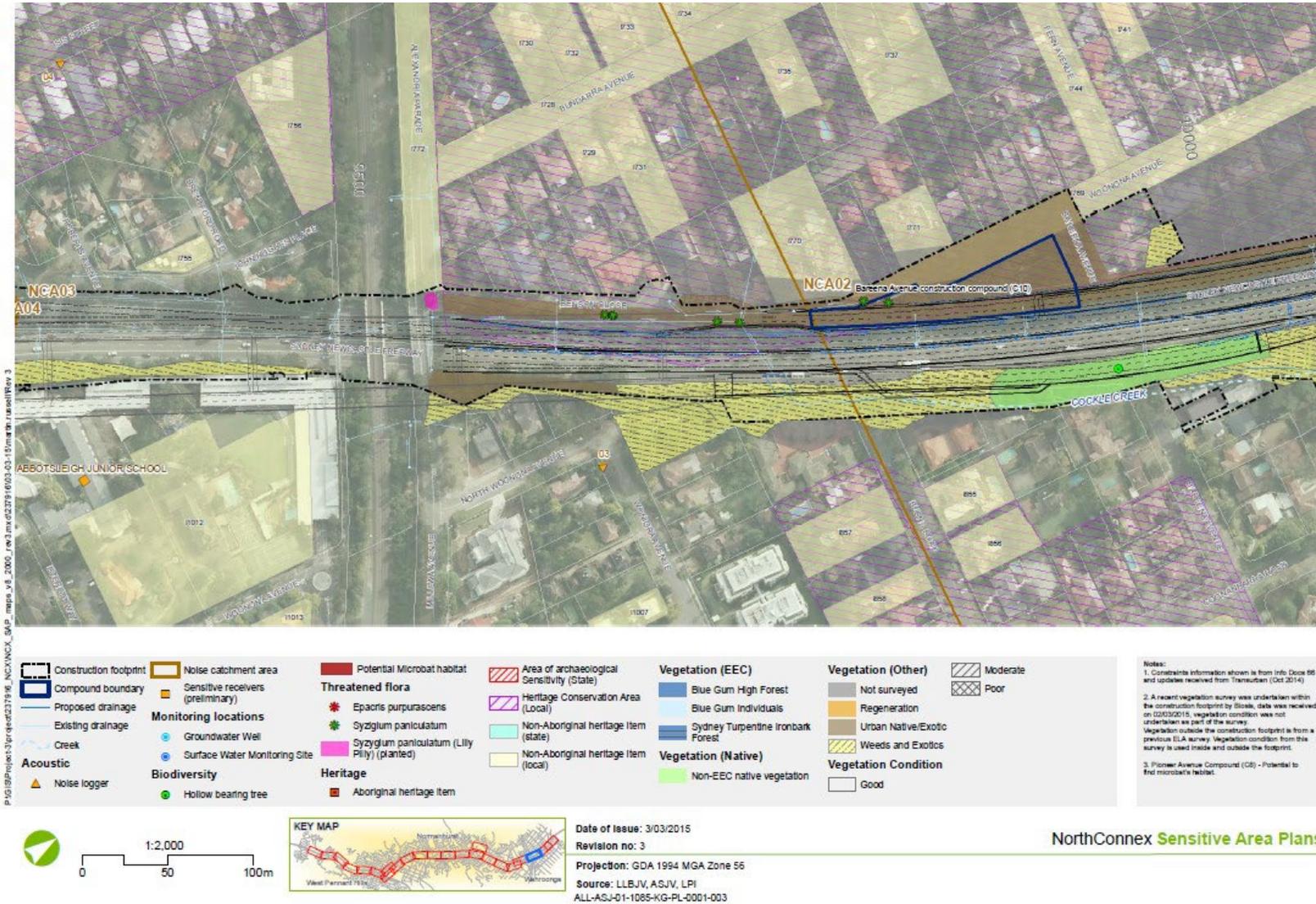
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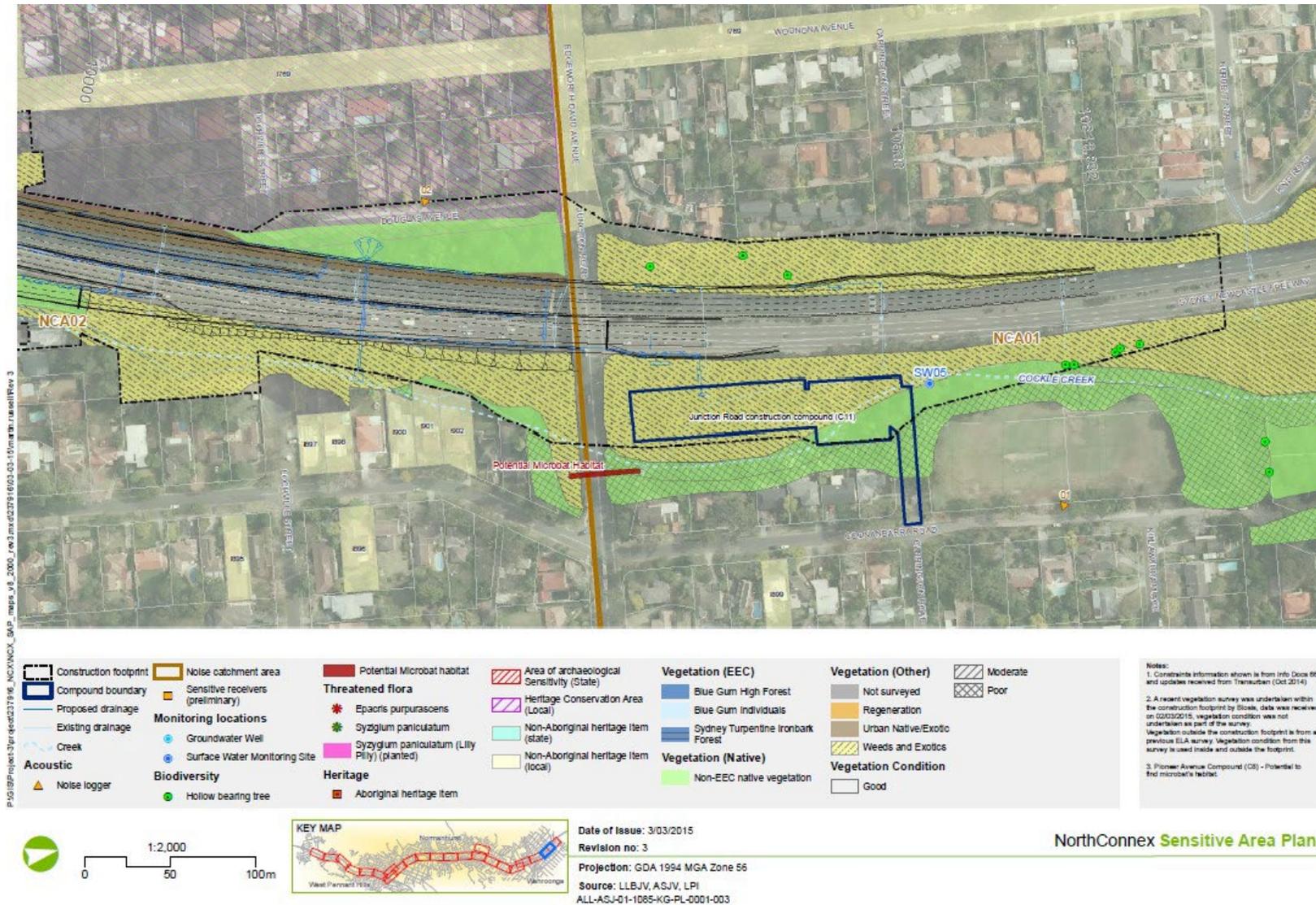
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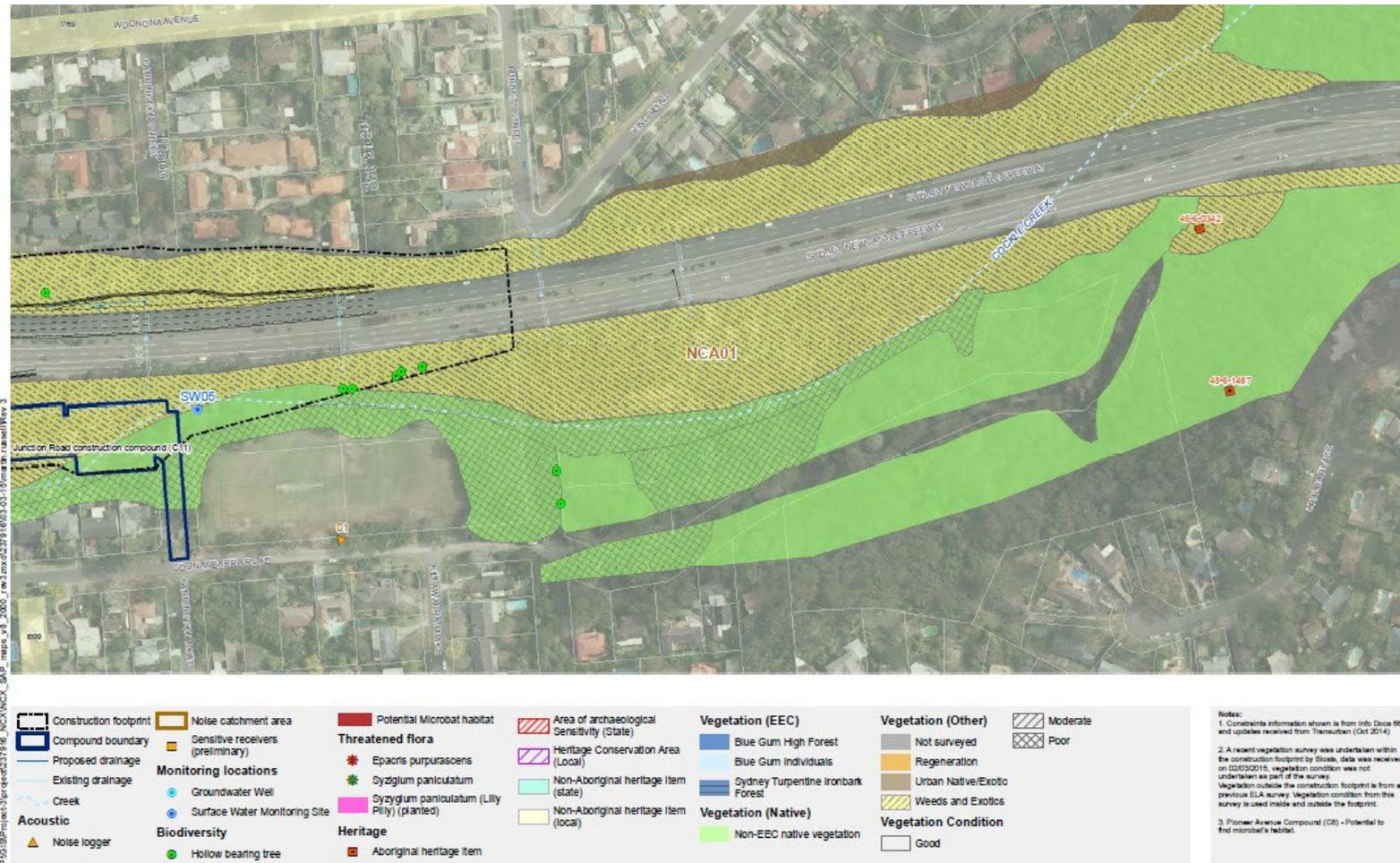
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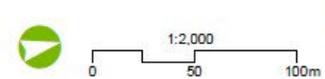


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Notes:

1. Constraints information shown is from Info Docs 98 and updates received from Transurban (Oct 2014)
2. A recent vegetation survey was undertaken within the construction footprint by Sloaks, data was received on 02/03/2015, vegetation condition was not undertaken as part of the survey. Vegetation outside the construction footprint is from a previous EIA survey. Vegetation condition from this survey is used inside and outside the footprint.
3. Pioneer Avenue Compound (C8) - Potential to find microbat's habitat.



Date of issue: 3/03/2015
 Revision no: 3
 Projection: GDA 1994 MGA Zone 56
 Source: LLEJV, ASJV, LPI
 ALL-ASJ-01-1085-KG-PL-0001-003

NorthConnex Sensitive Area Plans



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Appendix G: Pre-Operation Compliance Report Tables

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Minister's Conditions of Approval

The Minister's Conditions of Approval (MCoA) include a number of commitments relating to the operation and maintenance of the Asset. The below table has been included in the Pre-Operation Compliance Report, in accordance with MCoA A13, and summarises the Minister's Conditions of Approval specific to the operation of the Motorway and shows how these requirements have been addressed.

Table F-1: Relevant operational Ministers Conditions of Approval

MCoA	Obligation	Comment
Administrative Conditions		
A1	In addition to meeting the specific performance criteria established under this approval, the Proponent shall implement all feasible and reasonable measures to prevent and/or minimise any harm to the environment that may result from the construction or operation of the SSI.	All feasible and reasonable measures have been implemented to prevent and/or minimise harm to the environment that may result from construction of the SSI during the life of the project, as demonstrated within periodic compliance tracking reports.
A6	The Proponent shall ensure that all licences, permits and approvals are obtained as required by law and maintained as required throughout the life of the SSI. No condition of this approval removes the obligation for the Proponent to obtain, renew or comply with such licences, permits or approvals.	An Environmental Protection Licence, EPL21386 has been obtained to cover Scheduled activity of Road Ventilation. A Trade Waste Agreements have also been secured for the operation of the WTP and vehicle washbay.
A10	The Proponent shall take all appropriate measures to ensure that employees, contractors and sub-contractors are aware of, and comply with, the requirements of the conditions of this approval relevant to their respective activities.	The approved Operational Environmental Management Plan includes details on measures to

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MCoA	Obligation	Comment
A11	The Proponent shall be responsible for environmental impacts resulting from the actions of all persons that it invites onto the site, including contractors, sub-contractors and visitors.	ensure that employees, contractors and sub-contractors are aware of, and comply with, the requirements of the conditions of this approval relevant to their respective activities. See section 3.2.
A13	<p>The Proponent shall prepare and implement a Compliance Tracking Program, to track compliance with the requirements of this approval. The Program shall be submitted to the Secretary for approval prior to the commencement of construction and operate for a minimum of 24 months following commencement of operation, subject to the Secretary's review of the outcomes of the Independent Environmental Audit Report referred to in condition E31. The operation of the program may be extended if the Secretary determines that there has been unsatisfactory compliance.</p> <p>The Program shall include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> (a) provision for the notification of the Secretary prior to the commencement of construction and prior to the commencement of operation of the SSI (including prior to each stage, where works are being staged); (b) provision for periodic review of the compliance status of the SSI against the requirements of this approval (c) provision for periodic reporting of compliance status to the Secretary, including but not limited to: <ul style="list-style-type: none"> i) a Pre-Construction Compliance Report prior to the commencement of construction, ii) half-yearly Construction Compliance Reports, for the duration of construction, and iii) a Pre-Operation Compliance Report prior to the commencement of operation; (d) a program for independent environmental auditing in accordance with AS/NZS ISO 19011–2014 - Guidelines for Auditing Management Systems; (e) mechanisms for recording environmental incidents during construction and actions taken in response to those incidents; 	Compliance with the MCoA is tracked in the Protecht system that requires evidence to demonstrate that compliance has been achieved. See section 6.3.

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MCoA	Obligation	Comment
	<p>(f) provision for reporting environmental incidents to the Secretary during construction, in accordance with conditions A14 and A15;</p> <p>(g) procedures for rectifying any non-compliance identified during environmental auditing, review of compliance or incident management; and</p> <p>(h) provision for ensuring all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.</p>	
A14	The Proponent shall notify the Secretary and relevant public authorities of any incident with actual or potential significant on-site or off-site impacts on people or the biophysical environment within 24 hours of becoming aware of the incident. The Proponent shall provide full written details of the incident to the Secretary within seven days of the date on which the incident occurred.	Incidents reported as outlined in Section 5.
Environmental Performance		
Air Quality		
B3	<p>The ventilation outlet exit plane must have a minimum exit velocity of:</p> <p>(a) 13 metres per second; or</p> <p>(b) a velocity, or variable velocity, to be determined in the Tunnel Ventilation Incident Response and Traffic Management Systems Integration Protocol required under condition B7, but only if an equivalent or better environmental outcome than presented in the Proponent's most up to date air assessment can be demonstrated to the satisfaction of the Secretary, in consultation with the EPA.</p>	design report (Document Number: NCX-MEA-01-2800-ME-RP-0001) addressing this condition was certified for construction by the Sub IC on the 23rd of February 2018, Certificate No.: NCX-APP-01-2800-ME-CE-0001_04 and later verified by Level 5 Commissioning Reports (2800-ME-PR-0501 & 2800-ME-PR-0504 respectively). See Appendix J.
B4	The tunnel ventilation system shall be designed, constructed and operated to release emissions from the ventilation outlets and to avoid emissions from the portals or the tunnel support facilities at Wilson Road and Trelawney Street, except for emergency smoke management purposes in the event of a fire in the tunnel and periodic testing of the system.	
B7	Prior to operation, the Proponent shall prepare and implement a Tunnel Ventilation, Traffic Incident Response and Traffic Management Systems Integration Protocol in consultation with the Transport Management Centre, for the approval of the Secretary. The Protocol must be reviewed by a suitably qualified and experienced independent ventilation specialist to confirm that, before the tunnel is open to traffic, the ventilation/traffic management systems would operate together to ensure conditions E2, E3,	This protocol was approved by the Secretary on 12 June 2020 and is available on the NorthConnex website.

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MCoA	Obligation	Comment
	<p>E4, E8 and E11 are met. The Protocol should include a commissioning procedure to be completed before the tunnel is opened to traffic.</p> <p><i>Note:</i> * Tunnel ventilation design and operation, incident response triggers and procedures, and traffic management, should be fully integrated in accordance with the primary objective of ensuring the safety of motorists in the tunnel.</p>	
B8	<p>Prior to finalising the detailed design of the SSI and the establishment of the ambient air quality monitoring stations required under condition E7, the Proponent shall establish an Air Quality Community Consultative Committee (AQCCC) to provide input prior to and during the operation of the SSI. The AQCCC shall:</p> <p>(a) be comprised of:</p> <ul style="list-style-type: none"> i) two representatives from the Proponent and tunnel operator, ii) one representative from each of the relevant Councils, and iii) three representatives from the local community, whose appointment has been approved by an expression of interest process conducted by the Proponent in consultation with the Secretary; <p>(b) be chaired by an independent party put forward by the Proponent and approved by the Secretary;</p> <p>(c) meet at least four times a year, or as otherwise agreed by the chair and the Secretary;</p> <p>(d) review and provide advice on the location of the community based monitoring stations, operation environmental management plans and other operation stage documents, compliance tracking reporting, audit reports, or complaints; and</p> <p>(e) provide advice on the dissemination of monitoring results and other information on air quality issues.</p> <p>The AQCCC shall be operated for a period of two years from the commencement of operation, or as otherwise approved by the Secretary, in consultation with the chair.</p>	<p>The NorthConnex AQCCC committee was established mid-2017 and will continue to operate up to 2 years prior to the opening of NorthConnex in 2020. The purpose of the committee is to provide input into the location of the air quality monitoring locations and advice on related air quality matters. The committee comprises of representatives from the local community (4) representatives from the local councils, TfNSW and the tunnel operator NorthConnex Company Pty Ltd. The meeting is chaired by an independent person approved by DPE.</p>
Soil, Water Quality and Hydrology		
B9	<p>Except as may be provided by an EPL, the SSI shall be constructed and operated to comply with section 120 of the <i>Protection of the Environment Operations Act 1997</i>, which prohibits the pollution of waters.</p>	See Appendix I.

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MCoA	Obligation	Comment
B10	All activities taking place in, on or under waterfront land, as defined in the <i>Water Management Act 2000</i> should be conducted generally in accordance with the NSW Office of Water's Guidelines for Controlled Activities.	
B12	The proponent shall take all feasible and reasonable measures to limit operational groundwater inflows into each tunnel to no greater than one litre per second across any given kilometre.	
B14	All relevant information shall be provided to the relevant Council and/ or NSW State Emergency Service, to assist in the preparation of any new or necessary update(s) to the relevant plans and documents in relation to flooding, to reflect changes in flooding levels, flows and characteristics as a result of the SSI.	Relevant information has been provided in the form of the Flood Mitigation Strategy, which was provided 2 June 2016 and through consultation of the development of the Water Quality Plan and Monitoring Program (Appendix I), which includes information relating the to the overall management of water from the tunnel and surrounding operational facilities.
B15	<p>A Water Quality Plan and Monitoring Program shall be prepared and implemented to ensure that the project monitor and avoids or mitigates impacts on surface and groundwater quality and resources, during construction and operation. The Plan and Program shall be developed in consultation with the EPA, DPI (Fisheries), NSW Office of Water, and relevant Councils, for the approval of the Secretary, and shall include but not necessarily be limited to:</p> <ul style="list-style-type: none"> (a) identification of works and activities during construction and operation of the SSI, including tunnel discharge, runoff, emergencies and spill events, that have the potential to impact on surface water quality of potentially affected watercourses and riparian land; (b) a risk management framework for evaluation of the risks to groundwater and surface water resources and dependent ecosystems as a result of groundwater inflows to the tunnels, including definition of impacts that trigger contingency and ameliorative measures; (c) the identification of environmental management measures relating to surface and groundwater during construction and operation, including water treatment, erosion and sediment control plans and stormwater management measures consistent with Water Sensitive Urban Design measures, where relevant, and consistent with the measures detailed in the documents listed in condition A2, including the specifications and design details of the Water Treatment Plants; (d) commitment to designing discharge points into watercourses affected by the proposal to emulate a natural stream system, where feasible and reasonable; (e) the presentation of water quality objectives, standards and parameters, having regard to the Australian and New Zealand guidelines for fresh and marine water quality (Agriculture and Resource 	The Plan was issued for consultation between November 2017 and January 2018, with the final version approved by DPE on 11 October 2018.

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MCoA	Obligation	Comment
	<p>Management Council of Australia and New Zealand and the Australian and New Zealand Environment and Conservation Council 2000), developed in accordance with condition B16 and endorsed by EPA;</p> <p>(f) representative background monitoring data (including but not necessarily limited to representative data collected by the relevant Council, and considering seasonality) for surface and groundwater quality parameters, to establish baseline water conditions prior to the commencement of construction;</p> <p>(g) identification of construction and operational phase surface and groundwater quality monitoring locations (including watercourses, waterbodies and wetlands) which are representative of the potential extent of impacts from the SSI, including the relevant analytes and frequency of monitoring;</p> <p>(h) commitment to a minimum monitoring period of three years following the completion of construction or until the affected waterways and/ or groundwater resources are certified by a suitably qualified and experienced independent expert as being rehabilitated to an acceptable condition. The monitoring shall also confirm the establishment of operational water control measures (such as sedimentation basins and vegetation swales);</p> <p>(i) contingency and ameliorative measures in the event that adverse impacts to water quality are identified, with reference to the impact triggers defined in accordance with (b);</p> <p>(j) identification of and commitment to 'make good' provisions for groundwater users to be implemented in the event of a decline in water supply levels from existing bores associated with groundwater changes from either construction and ongoing operational dewatering caused by the SSI; and</p> <p>(k) reporting of the monitoring results to the Secretary, EPA, OEH, NSW Office of Water, DPI (Fisheries) and the relevant Council;</p> <p>The construction elements of the Plan and Program shall be submitted to the Secretary for approval prior to the commencement of construction of the SSI, as part of the Construction Soil and Water Management Plan required by condition D57(f). The operational elements of the Plan and Program shall be detailed in principle as part of the Construction Soil and Water Management Plan. The final operational elements of the Plan and Program shall be submitted to the Secretary for approval one year prior to the commencement of operation of the SSI, unless otherwise agreed by the Secretary. A copy of the Plan</p>	

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MCoA	Obligation	Comment
	and Program shall be submitted to the EPA, DPI (Fisheries), NSW Office of Water and relevant Councils prior to its implementation.	
B16	<p>As part of the Water Quality Plan and Monitoring Program, the Proponent shall provide details of how the potential impact of discharges on receiving waters would be avoided or minimised, which shall include but not necessarily be limited to:</p> <ul style="list-style-type: none"> (a) characterisation of current water quality in any receiving waters that could be affected by the proposal; (b) a statement of the ambient water quality objectives and the environmental values for the receiving waters relevant to the proposal; (c) a statement of the indicators and associated trigger values or criteria for the identified environmental values; (d) details of the significance of any identified impacts on surface waters including consideration of the relevant ambient water quality outcomes; (e) demonstration of how the proposal will be designed and operated to: <ul style="list-style-type: none"> i) protect the water quality objectives for receiving waters, where they are currently being achieved, and ii) contribute towards achievement of the water quality objectives over time, where they are not currently being achieved; and (f) demonstration that any groundwater discharge water quality is consistent with supporting a slightly to moderately disturbed level of aquatic ecosystem protection for receiving waters as defined by the Australian and New Zealand guidelines for fresh and marine water quality (Agriculture and Resource Management Council of Australia and New Zealand and the Australian and New Zealand Environment and Conservation Council 2000). 	
Heritage		
B18	The Proponent shall not harm, modify or otherwise impact any heritage items outside the SSI footprint.	No heritage items have been disturbed outside the SSI footprint.
B19	The Proponent shall detail avoidance, mitigation and management measures for all heritage items in the study area adopted in Volume 6, Technical Working Paper: Non-Aboriginal Heritage Assessment and	Any works completed outside the SSI boundary will be subject to a

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MCoA	Obligation	Comment
	Technical Working Paper: Aboriginal Cultural Heritage, of the document listed in condition A2(b), and any heritage item in the vicinity of the study area that may be affected by the SSI, noting the provisions of condition B18. The avoidance, mitigation and management measures are to be detailed in the Construction Heritage Management Plan required by condition D57(c) and the Construction Noise and Vibration Management Plan required by condition D57(b).	consistency assessment which includes a heritage assessment.
Waste Management		
B26	Waste generated outside the site shall not be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence or waste exemption under the Protection of the Environment Operations Act 1997, if such a licence is required in relation to that waste.	
B27	The reuse and/or recycling of waste materials generated on site shall be maximised as far as practicable, to minimise the need for treatment or disposal of those materials off site.	
B28	All liquid and/or non-liquid waste generated on the site shall be assessed and classified in accordance with <i>Waste Classification Guidelines</i> (Department of Environment, Climate Change and Water 2009).	
B29	All waste materials removed from the SSI site shall only be directed to a waste management facility or premises lawfully permitted to accept the materials.	
Property and Land Use		
B35	The Proponent shall construct and operate the SSI with the objective of minimising light spillage to residential properties and be generally consistent with the requirements of Australian Standard 4282-1997 Control of the obtrusive effects of outdoor lighting. Notwithstanding, the proponent shall provide at receiver treatment to mitigate residual night lighting impacts for properties adjoining or adjacent to the Motorway Operations Complex, in consultation with affected landowners.	See Appendix L
Sustainability		
B37	Opportunities to reduce operational greenhouse gas emissions shall be investigated during detailed design. The sustainability initiatives identified must be regularly reviewed, updated and implemented throughout the design development and construction phase, and annually during the operational phases.	Completed by NWRG annually

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Community Information and Reporting		
C2	<p>Prior to the commencement of pre-construction and construction, or as otherwise agreed by the Secretary, the Proponent shall ensure that the following are available for community enquiries and complaints for the duration of construction:</p> <ul style="list-style-type: none"> (a) a 24 hour telephone number(s) on which complaints and enquiries about the SSI may be registered; (b) a postal address to which written complaints and enquires may be sent; (c) an email address to which electronic complaints and enquiries may be transmitted; and (d) a mediation system for complaints unable to be resolved. <p>The telephone number, the postal address and the email address shall be published in newspaper(s) circulating in the local area prior to the commencement of construction and prior to the commencement of operation. This information shall also be provided on the website (or dedicated pages) required by this approval.</p>	See section 3.3.
C3	<p>Prior to the commencement of pre-construction and construction, or as otherwise agreed by the Secretary, the Proponent shall prepare and implement a Construction Complaints Management System consistent with AS 4269: Complaints Handling and maintain the System for the duration of construction and up to 12 months following completion of construction of the SSI.</p> <p>Information on all complaints received, including the means by which they were addressed and whether resolution was reached, with or without mediation, shall be maintained in a complaints register and included in the construction compliance reports required by this approval. The information contained within the System shall be made available to the Secretary on request.</p>	
C4	<p>Prior to the commencement of pre-construction and construction, or as otherwise agreed by the Secretary, the Proponent shall establish and maintain a new website, or dedicated pages within an existing website, for the provision of electronic information associated with the SSI, for the duration of construction and for 12 months following completion of the SSI. The Proponent shall, subject to confidentiality, publish and maintain up-to-date information on the website or dedicated pages including, but not necessarily limited to:</p> <ul style="list-style-type: none"> (a) information on the current implementation status of the SSI; 	

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	(b) a copy of the documents listed in condition A2, and any documentation supporting modifications to this approval that may be granted from time to time; (c) a copy of this approval and any future modification to this approval; (d) a copy of each relevant environmental approval, licence or permit required and obtained in relation to the SSI; (e) a copy of each current report, plan, or other document required under this approval; (f) the outcomes of compliance tracking in accordance with condition A13 of this approval; and (g) details of contact point(s) to which community complaints and enquiries may be directed, including a telephone number, a postal address and an email address.	
Construction Environmental Management, Reporting and Auditing		
Hazards and Risk		
D48	Dangerous goods, as defined by the Australian Dangerous Goods Code, shall be stored and handled strictly in accordance with: (a) all relevant Australian Standards; (b) for liquids, a minimum bund volume requirement of 110% of the volume of the largest single stored volume, within the bund; and (c) the Environment Protection Manual for Authorised Officers: Bunding and Spill Management, technical bulletin (Environment Protection Authority, 1997). In the event of an inconsistency between the requirements listed from (a) to (c) above, the most stringent requirement shall prevail to the extent of the inconsistency.	
Operational Environmental Management, Reporting and Auditing		
Air Quality		
In-Tunnel Air Quality		

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MCoA	Obligation	Comment																
E1	<p>The Proponent must monitor (by sampling and obtaining results by analysis) the pollutants, within the tunnel, specified in Table 4. The Proponent must use the sampling method, units of measurement and sample at the frequency specified opposite in the other columns.</p> <p>The number and siting of the monitoring stations inside the tunnel must be determined to permit an accurate calculation, per the requirements of condition E2, E3 and E5, and be independently verified in accordance with a methodology approved by the Secretary in consultation with the EPA. As a minimum there should be monitoring stations at the entry portals, the base of the ventilation outlets, ramp junctions and at the intermediate exhaust outlets (Wilson Street and Trelawney Street emergency smoke extraction facilities).</p> <p>Sampling points and visibility monitoring points established under this condition shall be audited prior to its commencement of monitoring for compliance with the requirements set out in Table 4. Verification and compliance auditing is to be undertaken by an independent person(s) or organisation(s) approved by the Secretary and paid for by the Proponent. Monitoring shall take place in accordance with this condition throughout operation of the SSI.</p> <p>Table 4 – In-Tunnel monitoring methodology</p> <table border="1" data-bbox="562 778 1368 895"> <thead> <tr> <th>Pollutant/parameter</th> <th>Units of measure</th> <th>Frequency</th> <th>Method¹</th> </tr> </thead> <tbody> <tr> <td>CO</td> <td>ppm</td> <td>Continuous</td> <td>Special Method 1¹</td> </tr> <tr> <td>NO₂</td> <td>ppm</td> <td>Continuous</td> <td>Special Method 1¹</td> </tr> <tr> <td>Visibility</td> <td>m⁻¹</td> <td>Continuous</td> <td>Special Method 1¹</td> </tr> </tbody> </table> <p><i>Note:</i></p> <p>1. <i>Special Method 1 means a method approved by the Secretary in consultation with the EPA.</i></p>	Pollutant/parameter	Units of measure	Frequency	Method ¹	CO	ppm	Continuous	Special Method 1 ¹	NO ₂	ppm	Continuous	Special Method 1 ¹	Visibility	m ⁻¹	Continuous	Special Method 1 ¹	<p>The number and siting of monitoring stations, along with Special Method 1 specific to E1 has been defined as AS3580.18:2017, wasand approved by DPI&EDPE on 19 December /12/2019 in consultation with the EPA.</p> <p>Todoroski Air Sciences were approved by the Secretary to complete verification and compliance auditing; the In-Tunnel Air Quality Independent Audit Report (NCX-MEA-01-2820-ME-RP-9001) has been completed and issued.</p> <p>See Appendix J Operational Air Quality Management Sub-plan, which was approved by DPE on 21/4/2020.</p>
Pollutant/parameter	Units of measure	Frequency	Method ¹															
CO	ppm	Continuous	Special Method 1 ¹															
NO ₂	ppm	Continuous	Special Method 1 ¹															
Visibility	m ⁻¹	Continuous	Special Method 1 ¹															
E2	<p>The tunnel ventilation system must be designed and operated so that the average concentration of CO and NO2, calculated along the length of the tunnel, does not exceed the concentration limit specified for that pollutant in Table 5.</p>	<p>A design report was submitted to meet this condition 19/9/2016 (NCX-</p>																

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	<p>Table 5 – In-Tunnel Single Point Exposure Limits</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Concentration Limit</th> <th>Units of Measurement</th> <th>Averaging Period</th> </tr> </thead> <tbody> <tr> <td>CO</td> <td>87</td> <td>ppm</td> <td>Rolling 15- minute</td> </tr> <tr> <td>CO</td> <td>50</td> <td>ppm</td> <td>Rolling 30 – minute</td> </tr> <tr> <td>NO₂</td> <td>0.5</td> <td>ppm</td> <td>Rolling 15- minute</td> </tr> </tbody> </table>	Pollutant	Concentration Limit	Units of Measurement	Averaging Period	CO	87	ppm	Rolling 15- minute	CO	50	ppm	Rolling 30 – minute	NO ₂	0.5	ppm	Rolling 15- minute	<p>MEA-01-2800-ME-RP-0001). Commissioning testing has been completed which confirms the ventilation systems capacity to adhere to this condition (NCX-MEA-01-2516-CS-SP-0001).</p>
Pollutant	Concentration Limit	Units of Measurement	Averaging Period															
CO	87	ppm	Rolling 15- minute															
CO	50	ppm	Rolling 30 – minute															
NO ₂	0.5	ppm	Rolling 15- minute															
E3	<p>The tunnel ventilation system must be designed and operated so that the concentration of CO as measured at any single point in the tunnel must not exceed the concentration limit specified for that pollutant in Table 6 under all conditions (including congested conditions).</p> <p>Table 6 In-Tunnel Single Point Exposure Limits</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Concentration Limits</th> <th>Units of Measurement</th> <th>Averaging Period</th> </tr> </thead> <tbody> <tr> <td>CO</td> <td>200</td> <td>ppm</td> <td>Rolling 3 - minute</td> </tr> </tbody> </table>	Pollutant	Concentration Limits	Units of Measurement	Averaging Period	CO	200	ppm	Rolling 3 - minute	<p>Further details are included in Appendix J - Operational Air Quality Management Sub Plan-plan.</p>								
Pollutant	Concentration Limits	Units of Measurement	Averaging Period															
CO	200	ppm	Rolling 3 - minute															
E4	<p>The tunnel ventilation system must be designed and operated so that the visibility in the tunnel does not exceed the level specified in Table 7.</p> <p>Table 7 – In-Tunnel Visibility Limits Along Length of Tunnel</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Average extinction coefficient Limit</th> <th>Units of Measurement</th> <th>Averaging Period</th> </tr> </thead> <tbody> <tr> <td>Visibility</td> <td>0.005</td> <td>m⁻¹</td> <td>Rolling 15-minute</td> </tr> </tbody> </table>	Parameter	Average extinction coefficient Limit	Units of Measurement	Averaging Period	Visibility	0.005	m ⁻¹	Rolling 15-minute									
Parameter	Average extinction coefficient Limit	Units of Measurement	Averaging Period															
Visibility	0.005	m ⁻¹	Rolling 15-minute															
E5	<p>In addition to the general reporting requirements specified in condition E17, the Proponent shall, within 24 hours, notify the Secretary, EPA and Ministry of Health of any recordings above the limits specified in conditions E2, E3 and E4. The notification shall detail the nature of the event, the concentration or visibility levels that occurred, the duration of the event, and the measures employed to minimise the concentration levels and/or improve the visibility levels.</p> <p>Upon receipt of this notification, the Secretary shall consider the circumstances of the event, including:</p> <p>(a) the nature of the event, including any details relating to the cause;</p>	<p>See Section 6.3 and Appendix J</p>																

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MCoA	Obligation	Comment
	<p>(b) the duration of the event;</p> <p>(c) the extent and severity of the event;</p> <p>(d) the frequency of the event, including whether an event with the same or similar circumstances has occurred previously.</p> <p>Based on consideration of the circumstances of the event, the Secretary may request the Proponent to prepare a Tunnel Air Quality Management Systems Effectiveness Report.</p>	
E6	<p>Within 20 working days of any request by the Secretary under condition E5, the Proponent shall prepare and submit a Tunnel Air Quality Management Systems Effectiveness Report on the overall system performance and cause and major contributor of any exceedances, detailing the following:</p> <p>(a) the overall performance and concentration levels in the tunnel for the preceding six month period (or since commencement of operation, where the SSI has operated for under six months), including average and maximum levels and time periods;</p> <p>(b) details of any instances throughout the operation of the SSI where pollutant concentration levels in the tunnel have exceeded the limits specified in E2, E3 and E4; and</p> <p>(c) consideration of improvements to the tunnel air quality management system, including but not limited to installation of the additional ventilation management facilities allowed for under condition B5, and discussion of whether those improvements are feasible and reasonable.</p> <p>The Tunnel Air Quality Management Systems Effectiveness Report is to be prepared by the Proponent and reviewed by a suitably qualified and experienced independent specialist(s). The Secretary shall approve the independent person/organisation.</p> <p>The Proponent shall comply with any requirements arising from the Secretary's review of this report.</p>	See Section 6.3 and Appendix J
Ambient Air Quality		
E7	<p>The Proponent shall monitor (by sampling and obtaining results by analysis) the pollutants and parameters specified in Column 1 of Table 8 at the following locations as a minimum:</p> <p>(a) two ground level receptors near the northern ventilation outlet, at locations suitable for detecting any impact on air quality from the outlet;</p>	In consultation with the AQCCC six monitoring stations were installed at the following locations: James Park (Hornsby); Carden Park (Wahroonga); Thornleigh Golf

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MCoA	Obligation	Comment
	<p>(b) two ground level receptors near the southern ventilation outlet, at locations suitable for detecting any impact on air quality from the outlet;</p> <p>(c) one location along Pennant Hills Road, at a location suitable for detecting any impact on air quality along Pennant Hills Road; and</p> <p>(d) one location away from any of the locations at (a), (b) and (c) suitable for providing background ambient air quality reference data for the project area.</p> <p>All monitoring stations shall be established subject to the land owner's and occupier's agreement. The Proponent must use the sampling method, units of measure, and sampling frequency specified in Table 8. The Proponent shall commence monitoring for at least twelve continuous months prior to operation. The locations are to be agreed to by the AQCCC. The Proponent shall meet all operating costs associated with the stations.</p> <p>The Proponent, following consultation with the AQCCC, shall review the need for the continuation of the ambient monitoring stations after a period of two years from commencement of operation. Any recommendation to close the stations shall require the approval of the Secretary in consultation with the EPA.</p> <p>The establishment and operation of the stations is to be undertaken in accordance with recognised Australian standards and undertaken by an organisation accredited by NATA for this purpose and approved by the Secretary in consultation with the EPA and the AQCCC. The quality of the monitoring results shall be assured through a NATA accredited process prior to the data being considered as a basis for compliance/auditing purposes.</p> <p>Monitoring results shall be made publicly available and shall be subject to an independent audit at six-monthly intervals (or at a longer interval, if approved by the Secretary). The auditor shall be approved by the Secretary in consultation with the EPA and the AQCCC, and the auditor's report shall be directly provided to the Proponent and the AQCCC.</p>	<p>Centre (Thornleigh); Headen Park (Thornleigh); Ashley Avenue (West Pennant Hills), and Larchmonth Place (West Pennant Hills). The monitoring data from each of these stations complies with the specifications within Table 8 of the Conditions of Approval, as well as complies with the NATA accreditation requirements. These stations have been monitoring since November 2019 with monthly monitoring reports being made publicly available on the NorthConnex Website.</p> <p>See Appendix J Operational Air Quality Management Sub-plan,</p>

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	<p>Table 8 – Ambient Air Quality Monitoring Methodologies</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Units of Measurement</th> <th>Averaging Period</th> <th>Frequency</th> <th>Method¹</th> </tr> </thead> <tbody> <tr> <td>NO</td> <td>pphm</td> <td>1-hour</td> <td>Continuous</td> <td>AM -12</td> </tr> <tr> <td>NO₂</td> <td>pphm</td> <td>1-hour</td> <td>Continuous</td> <td>AM- 12</td> </tr> <tr> <td>NO_x</td> <td>pphm</td> <td>1-hour</td> <td>Continuous</td> <td>AM- 12</td> </tr> <tr> <td>PM10</td> <td>µg/m³</td> <td>24-hour</td> <td>Continuous</td> <td>AS3580.9.8.2008²</td> </tr> <tr> <td>PM2.5⁵</td> <td>µg/m³</td> <td>24-hour</td> <td>Continuous</td> <td>AS3580.9.13-2013³</td> </tr> <tr> <td>CO</td> <td>ppm</td> <td>1-hour, 8-hour</td> <td>Continuous</td> <td>AM-2 & AM-6</td> </tr> <tr> <th>Parameter⁴</th> <th>Units of Measurement</th> <th>Averaging Period</th> <th>Frequency</th> <th>Method¹</th> </tr> <tr> <td>Wind Speed @ 10m</td> <td>m/s</td> <td>1 – hour</td> <td>Continuous</td> <td>AM – 2 & AM - 4</td> </tr> <tr> <td>Wind Direction @ 10m</td> <td>°</td> <td>1 – hour</td> <td>Continuous</td> <td>AM – 2 & AM - 4</td> </tr> <tr> <td>Sigma Theta @ 10m</td> <td>°</td> <td>1 – hour</td> <td>Continuous</td> <td>AM – 2 & AM - 4</td> </tr> <tr> <td>Temperature @ 2m</td> <td>K</td> <td>1 – hour</td> <td>Continuous</td> <td>AM - 4</td> </tr> <tr> <td>Temperature @ 10m</td> <td>K</td> <td>1 - hour</td> <td>Continuous</td> <td>AM - 4</td> </tr> <tr> <th>Other</th> <th>Units of Measurement</th> <th>Averaging Period</th> <th>Frequency</th> <th>Method¹</th> </tr> <tr> <td>Siting</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>AM-1 & AM-4</td> </tr> </tbody> </table> <p>Notes:</p> <ol style="list-style-type: none"> 1. Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (EPA 2007). 2. AS3580.9.8-2008, Methods for the Sampling and Analysis of Ambient Air – Determination of Suspended Particulate Matter – PM10 Continuous Direct Mass Method using Tapered Element Oscillating Microbalance Analyser (Standards Australia 2008). 3. AS3580.9.13-2013, Methods for the Sampling and Analysis of Ambient Air – Determination of Suspended Particulate Matter – PM2.5 Continuous Direct Mass Method using a Tapered Element Oscillating Microbalance Analyser (Standards Australia 2013). 4. TBD - location for meteorological monitoring station(s) to be representative of weather conditions likely to occur in the vicinity of the northern and southern ventilation outlets. 5. Appropriately modified to include size selective inlet for PM2.5 or as otherwise approved by the Secretary. 	Pollutant	Units of Measurement	Averaging Period	Frequency	Method ¹	NO	pphm	1-hour	Continuous	AM -12	NO ₂	pphm	1-hour	Continuous	AM- 12	NO _x	pphm	1-hour	Continuous	AM- 12	PM10	µg/m ³	24-hour	Continuous	AS3580.9.8.2008 ²	PM2.5 ⁵	µg/m ³	24-hour	Continuous	AS3580.9.13-2013 ³	CO	ppm	1-hour, 8-hour	Continuous	AM-2 & AM-6	Parameter ⁴	Units of Measurement	Averaging Period	Frequency	Method ¹	Wind Speed @ 10m	m/s	1 – hour	Continuous	AM – 2 & AM - 4	Wind Direction @ 10m	°	1 – hour	Continuous	AM – 2 & AM - 4	Sigma Theta @ 10m	°	1 – hour	Continuous	AM – 2 & AM - 4	Temperature @ 2m	K	1 – hour	Continuous	AM - 4	Temperature @ 10m	K	1 - hour	Continuous	AM - 4	Other	Units of Measurement	Averaging Period	Frequency	Method ¹	Siting	NA	NA	NA	AM-1 & AM-4	
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Parameter ⁴	Units of Measurement	Averaging Period	Frequency	Method ¹																																																																									
Wind Speed @ 10m	m/s	1 – hour	Continuous	AM – 2 & AM - 4																																																																									
Wind Direction @ 10m	°	1 – hour	Continuous	AM – 2 & AM - 4																																																																									
Sigma Theta @ 10m	°	1 – hour	Continuous	AM – 2 & AM - 4																																																																									
Temperature @ 2m	K	1 – hour	Continuous	AM - 4																																																																									
Temperature @ 10m	K	1 - hour	Continuous	AM - 4																																																																									
Other	Units of Measurement	Averaging Period	Frequency	Method ¹																																																																									
Siting	NA	NA	NA	AM-1 & AM-4																																																																									

Operational Environmental Management Plan

MCoA	Obligation	Comment
E8	<p>Should ambient monitoring of air pollutants exceed the following goals, the provisions of Condition E9 shall apply:</p> <ul style="list-style-type: none"> (a) CO – 8 hour rolling average of 9.0 ppm (NEPM); (b) NO₂ – One hour average of 0.12 ppm (245 µg/m³) (NEPM); (c) PM₁₀ – 24 hour average of 50 µg/m³ (NEPM); and (d) PM_{2.5} – 24 hour average of 25 µg/m³ (proposed NEPM). <p>Only monitoring station(s) that meet the requirements of Australian Standard AS2922 – 1987 shall be used for the purposes of assessing compliance with the ambient goals specified in this condition, unless otherwise agreed by the Secretary. A Protocol for the evaluation of a potential measurement that exceeds the criteria shall be developed by the Proponent and approved by the Secretary in consultation with the EPA, Ministry of Health and the AQCC.</p>	See Appendix J
E9	<p>Should the results of monitoring required under condition E7 show that any of the goals specified in Condition E8 have been exceeded for any given event (excluding extraordinary events such as bushfires, dust storms, etc. (as to be defined in the Protocol required under condition E10)), the Proponent shall immediately notify the Secretary, EPA and Ministry of Health. The notification shall be followed up with a detailed report within 20 working days, which shall be prepared by the Proponent, reviewed by a suitably qualified and experienced independent specialist(s), and submitted to the Secretary, on the cause and major contributor of the exceedance and the options available to prevent recurrence. The Secretary shall approve the independent person/organisation prior to the commencement of operation, or at some other time prior to preparation of the report.</p> <p>Where the operation of the tunnel is identified to be a significant contributor to the recorded exceedance, this report shall include consideration of improvements to the tunnel air quality management system so as to achieve compliance with the ambient air quality goals, including but not limited to installation of the additional ventilation management facilities allowed for under condition B5, and discussion of whether those improvements are feasible and reasonable.</p> <p>The Proponent shall comply with any requirements arising from the Secretary's review of the Report.</p>	See section 6.3 and Appendix J
Ventilation Outlets		

Operational Environmental Management Plan

MCoA	Obligation	Comment																																																																								
E10	<p>The Proponent shall install monitoring equipment to monitor pollutants inside the ventilation outlets. Pollutant monitoring inside the ventilation outlets (by sampling and obtaining results by analysis) shall be for the pollutants and parameters specified in Column 1 of Table 9.</p> <p>The Proponent must use the sampling method, units of measures and sample at the frequency specified in the other columns. Monitoring equipment installed under this condition is to be independently audited prior to its commencement of monitoring for compliance with the requirements set out in Table 9.</p> <p>Auditing is to be undertaken by an independent person(s) or organisation(s) approved by the Secretary and paid by the Proponent. Monitoring shall take place in accordance with this condition throughout operation of the SSI.</p> <p>Table 9 – Ventilation Outlet Emission Monitoring Methodologies</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Units of Measure</th> <th>Frequency</th> <th>Method¹</th> </tr> </thead> <tbody> <tr> <td>Solid particles</td> <td>mg/m³</td> <td>Continuous</td> <td>Special Method 1⁴</td> </tr> <tr> <td>Solid particles</td> <td>mg/m³</td> <td>Quarterly</td> <td>TM-15</td> </tr> <tr> <td>PM10</td> <td>mg/m³</td> <td>Quarterly</td> <td>OM-5</td> </tr> <tr> <td>PM2.5</td> <td>mg/m³</td> <td>Quarterly</td> <td>OM-5</td> </tr> <tr> <td>NO2 or NO or both, as NO2 equivalent</td> <td>mg/m³</td> <td>Continuous</td> <td>CEM-2</td> </tr> <tr> <td>NO2</td> <td>mg/m³</td> <td>Continuous</td> <td>CEM-2</td> </tr> <tr> <td>CO</td> <td>mg/m³</td> <td>Continuous</td> <td>CEM-4</td> </tr> <tr> <td>VOC2</td> <td>mg/m³</td> <td>Continuous</td> <td>CEM-8</td> </tr> <tr> <td>Speciated VOC</td> <td>mg/m³</td> <td>Annual</td> <td>TM-34</td> </tr> <tr> <td>PAH</td> <td>µg/m³</td> <td>Annual</td> <td>OM-6</td> </tr> <tr> <th>Parameter</th> <th>Units of Measure</th> <th>Frequency</th> <th>Method¹</th> </tr> <tr> <td>Velocity</td> <td>m/s</td> <td>Continuous</td> <td>CEM-6</td> </tr> <tr> <td>Volumetric flow rate</td> <td>M³/s</td> <td>Continuous</td> <td>CEM-6</td> </tr> <tr> <td>Moisture</td> <td>%</td> <td>Continuous</td> <td>TM-22</td> </tr> <tr> <td>Temperature</td> <td>°C</td> <td>Continuous</td> <td>TM-2</td> </tr> <tr> <th>Other</th> <th>Units of Measure</th> <th>Frequency</th> <th>Method¹</th> </tr> <tr> <td>Selection of sampling location</td> <td>N/A</td> <td>N/A</td> <td>TM-1</td> </tr> </tbody> </table> <p>Notes:</p> <p>(1) Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (EPA 2007) or an alternative method approved by the Secretary in consultation with the EPA.</p> <p>(2) Must include, but not limited to: Benzene, Toluene, Xylenes, 1,3-Butadiene, Formaldehyde and Acetaldehyde.</p>	Pollutant	Units of Measure	Frequency	Method ¹	Solid particles	mg/m ³	Continuous	Special Method 1 ⁴	Solid particles	mg/m ³	Quarterly	TM-15	PM10	mg/m ³	Quarterly	OM-5	PM2.5	mg/m ³	Quarterly	OM-5	NO2 or NO or both, as NO2 equivalent	mg/m ³	Continuous	CEM-2	NO2	mg/m ³	Continuous	CEM-2	CO	mg/m ³	Continuous	CEM-4	VOC2	mg/m ³	Continuous	CEM-8	Speciated VOC	mg/m ³	Annual	TM-34	PAH	µg/m ³	Annual	OM-6	Parameter	Units of Measure	Frequency	Method ¹	Velocity	m/s	Continuous	CEM-6	Volumetric flow rate	M ³ /s	Continuous	CEM-6	Moisture	%	Continuous	TM-22	Temperature	°C	Continuous	TM-2	Other	Units of Measure	Frequency	Method ¹	Selection of sampling location	N/A	N/A	TM-1	<p>Monitoring equipment has been installed as required in accordance with this condition.</p> <p>Special Method 1 specific to E10 has been defined as USEPA Performance Standard 11, as approved by the EPA.</p> <p>Todoroski Air Sciences are approved by the Secretary to complete the required independent auditing works.</p> <p>The Ventilation Outlets - Monitoring Independent Audit Report (NCX-MEA-01-2830-ME-RP-9001) has been completed and issued.</p> <p>See Appendix J Operational Air Quality Management Sub-plan.</p>
Pollutant	Units of Measure	Frequency	Method ¹																																																																							
Solid particles	mg/m ³	Continuous	Special Method 1 ⁴																																																																							
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CO	mg/m ³	Continuous	CEM-4																																																																							
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Temperature	°C	Continuous	TM-2																																																																							
Other	Units of Measure	Frequency	Method ¹																																																																							
Selection of sampling location	N/A	N/A	TM-1																																																																							

Operational Environmental Management Plan

MCoA	Obligation	Comment																														
	<p>(3) Must include, but not limited to; 16 USEPA priority PAHs, namely Naphthalene, Phenanthrene, Benz(a)anthracene, Acenaphthylene, Anthracene, Chrysene, Indeno(1,2,3-cd)pyrene, Acenaphthene, Fluoranthene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Fluorene, Pyrene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene.</p> <p>(4) Special Method 1 means a method approved by the Secretary in consultation with the EPA.</p>																															
E11	<p>The concentration of a pollutant discharged from the ventilation outlets referred to must not exceed the respective limits specified for that pollutant in Table 10.</p> <p>Table 10 — Ventilation Outlet Mass Pollutant Concentrations</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>100 percentile limit</th> <th>Units of measurement</th> <th>Averaging period</th> <th>Reference conditions</th> </tr> </thead> <tbody> <tr> <td>Solid particles</td> <td>1.1</td> <td>mg/m³</td> <td>1 hour, or the minimum sampling period specified in the relevant test method, whichever is the greater</td> <td>Dry, 273K, 101.3kPa</td> </tr> <tr> <td>NO₂ or NO or both, as NO₂ equivalent</td> <td>20</td> <td>mg/m³</td> <td>1 hour block</td> <td>Dry, 273K, 101.3kPa</td> </tr> <tr> <td>NO₂</td> <td>2.0</td> <td>mg/m³</td> <td>1 hour block</td> <td>Dry, 273K, 101.3kPa</td> </tr> <tr> <td>CO</td> <td>40</td> <td>mg/m³</td> <td>1 hour rolling</td> <td>Dry, 273K, 101.3kPa</td> </tr> <tr> <td>VOC (as propane)</td> <td>1.0 4.0</td> <td>mg/m³</td> <td>1 hour rolling</td> <td>Dry, 273K, 101.3kPa</td> </tr> </tbody> </table>	Pollutant	100 percentile limit	Units of measurement	Averaging period	Reference conditions	Solid particles	1.1	mg/m ³	1 hour, or the minimum sampling period specified in the relevant test method, whichever is the greater	Dry, 273K, 101.3kPa	NO ₂ or NO or both, as NO ₂ equivalent	20	mg/m ³	1 hour block	Dry, 273K, 101.3kPa	NO ₂	2.0	mg/m ³	1 hour block	Dry, 273K, 101.3kPa	CO	40	mg/m ³	1 hour rolling	Dry, 273K, 101.3kPa	VOC (as propane)	1.0 4.0	mg/m ³	1 hour rolling	Dry, 273K, 101.3kPa	See Appendix J
Pollutant	100 percentile limit	Units of measurement	Averaging period	Reference conditions																												
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VOC (as propane)	1.0 4.0	mg/m ³	1 hour rolling	Dry, 273K, 101.3kPa																												
E12	<p>An independent person or organisation, approved by the Secretary shall:</p> <p>(a) verify that compliance with ventilation outlet limits detailed in Table 10 will not result in air quality impacts greater than predicted in the documents listed in condition A2;</p> <p>(b) undertake an appropriate assessment to indicate how ventilation outlet discharge velocities have been optimised in consideration of energy requirements and air quality impacts at all sensitive receivers; and,</p> <p>(c) validate recorded monitoring data and certify compliance with the ventilation outlet limits.</p> <p>The information required in paragraphs (a)-(c) will be made available to the Secretary on request.</p> <p>The ventilation outlet limits detailed in Table 10 shall be reviewed on a five-yearly basis and may be lowered (i.e., made more stringent), subject to a sustainability assessment and there being improvements</p>	Report completed “NorthConnex Independent Review of Compliance against Ministers Conditions of Approval E12” (Jacobs 2022).																														

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MCoA	Obligation	Comment
	in vehicle fleet emissions, if the Proponent is directed to do so by the Secretary following consultation with the EPA.	
E13	<p>Should the results of monitoring show that any of the ventilation outlet limits specified in Condition E11 have been exceeded, the Proponent shall immediately notify the Secretary, EPA and Ministry of Health. The notification shall follow up with a detailed report within 20 working days, which shall be prepared by the Proponent, reviewed by a suitably qualified and experienced independent specialist(s), and submitted to the Secretary, on the cause and major contributor of the exceedance and the options available to prevent recurrence. The Secretary shall approve the independent person/organisation prior to the commencement of operation, or at some other time prior to preparation of the report.</p> <p>Where the operation of the tunnel is identified to be a significant contributor to the recorded exceedance, this report shall include consideration of improvements to the tunnel air quality management system so as to achieve compliance with the ambient air quality goals, including but not limited to installation of the additional ventilation management facilities allowed for under condition B5, and discussion of whether those improvements are feasible and reasonable.</p> <p>The Proponent shall comply with any requirements arising from the Secretary's review of the Report.</p>	See section 6.3 and Appendix J
Emergency Discharge		
E14	<p>Conditions E2, E3, E4, E8 and E11 do not apply in an emergency to prevent damage to life or limb.</p> <p>The Proponent shall, as soon as reasonably practicable, notify the Secretary and the EPA of any such discharge.</p>	See Appendix J
Local and Sub-Regional Air Quality		
E15	The Proponent shall assist the relevant Council(s) in developing an air quality assessment process for inclusion in a Development Control Plan or other appropriate planning instrument, in considering planning and building approvals for new development in the area adjacent to the northern and southern ventilation outlets which would be within a potential three-dimensional zone of affectation (buffer volume). This process shall include procedures for identifying the width and height of buildings that are likely to be either affected by the plume from the ventilation outlet or affect the dispersion of the plume from the ventilation outlet through building wake effects. The Proponent shall meet all reasonable costs for the development	TfNSW have consulted with the relevant Councils. The report was finalised entitled 'NorthConnex Local Planning Air Quality Assessment Process', December 2019.

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MCoA	Obligation	Comment
	of this process and any necessary amendments to the planning instrument(s) required to implement the process.	
General Air Quality Reporting and Public Access to Monitoring Results		
E16	Prior to operation, the Proponent shall investigate, in consultation with the EPA the measures for smoky vehicle enforcement in areas surrounding the SSI, taking into consideration cost effectiveness. Any measures implemented as a result of investigation recommendations shall be in accordance with current TfNSW smoky vehicle enforcement programs. The effectiveness of the smoky vehicle enforcement measures shall be documented in the Independent Environmental Audit required under condition E31.	TfNSW have investigated measures in consultation with the EPA. These measures have been finalised and documented in a report dated November 2019 entitled "Options for Smoky Vehicle Enforcement in Areas Surrounding the SSI".
E17	The Proponent must develop and implement a reporting system for in-tunnel, ambient and ventilation outlet limits to the satisfaction of the Secretary in consultation with the EPA. The reporting system must be approved, fully implemented and operational prior to operation. Minimum analytical reporting requirements for air pollution monitoring stations shall be as specified in the Approved Methods of Modelling and Assessment of Air Pollutants in NSW (EPA 2007, or as updated).	This reporting system was developed in consultation with the EPA and approved as a component of the Operational Air Quality Management Sub-plan by DPE on 21/4/2020. See Appendix J
E18	Results of hourly updated real-time ambient monitoring of PM10, PM2.5, visibility, NO2, and CO at the approved monitoring stations, in-tunnel CO/NO2 and ventilation outlet measurements, and relevant meteorological data, shall be provided on a website and made publicly available each month in hard copy format in an easy to interpret format. These data shall be preliminary until a quality assurance check has been undertaken by a person or organisation accredited by NATA for this purpose. The availability of these data shall be conveyed to the local community by way of newsletter (including translation into common community languages in the area) and newspaper advertisement at least one month prior to the commencement of operation.	Available on the NorthConnex Website (www.northconnex.com.au)
Air Quality Auditing and Quality Assurance		
E19	The provision, operation and maintenance (including all auditing and validation of data) of all air quality monitoring and reporting shall be funded by the Proponent.	Currently funded by the Proponent under the Deed to NWRG

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MCoA	Obligation	Comment
E20	All continuous emissions monitoring systems installed and operated as a requirement of condition E10 shall undergo relative accuracy test audits at an interval not exceeding 12 months, or as otherwise agreed to by the Secretary in consultation with the EPA.	See Appendix J
E21	The Proponent shall appoint an external auditor to conduct an audit of the air quality monitoring (in tunnel and external) at six-monthly intervals or at any longer interval if approved by the Secretary. Air quality audits shall commence six months from commencement of operation. The auditor shall ensure that the operating procedures and equipment to acquire air monitoring, meteorological data and emission monitoring data and monitoring reporting comply with NATA (or equivalent) requirements and sound laboratory practice. The Proponent must document the results of the audit and make available all audit data for inspection by the Secretary upon request. A copy of the audit report shall also be issued to the Proponent and AQCCC.	Todoroski Air Sciences were approved by DPE on 24/6/2019 to complete 6-monthly audits, including NATA requirements. See Appendix J
E22	The Proponent shall undertake appropriate quality assurance (QA) and quality control (QC) measures for air quality and ventilation outlet emission monitoring data. This shall include, but not necessarily be limited to: accreditation/quality systems, staff qualifications and training, auditing, monitoring procedures, service and maintenance, equipment or system malfunction and records/reporting. The QA/QC measures shall be approved by an independent expert approved by the Secretary prior to monitoring of air quality and ventilation outlet emissions as appropriate.	Todoroski Air Sciences were approved by DPE on 24/6/2019 to ensure appropriate QA and QC measures are in place for air quality and ventilation outlet emission monitoring. See Appendix J
Noise and Vibration		
E23	The Proponent shall design and operate all fixed facilities, including the northern and southern tunnel portals; northern and southern ventilation facilities; the Motorway Operations Complex; the Trelawney Street and Wilson Road emergency smoke extraction outlets and the Coral Tree Drive switching station, with the objective of not exceeding the requirements of the NSW Industrial Noise Policy (EPA 2000) and the Sleep Disturbance Application Note to the Industrial Noise Policy (DEC 2007). The Proponent shall apply mitigation at existing receivers where the noise requirements cannot be achieved.	The Operational Noise Assessment Report has been prepared for the project. The Operational Noise Assessment Report details the design features of fixed facilities. See also Appendix H Operational Noise Management Plan which was approved by DPE on 7/7/2020
E24	A detailed Operational Noise Management Plan shall be prepared as part of the OEMP, to the satisfaction of the Secretary. The Plan shall provide details of noise and vibration control measures to be undertaken	See Appendix H

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MCoA	Obligation	Comment
	<p>during the operation stages, sufficient to address the technical requirements of the EPA, and generally in accordance with the Road Noise Policy (DECCW 2011) and the Industrial Noise Policy (EPA 2000).</p> <p>The Plan shall include, but not be limited to:</p> <ul style="list-style-type: none"> (a) tests for ascertaining acoustic parameters; (b) predicted noise levels; (c) noise criteria for operation of the project; (d) location, type and timing of erection of permanent noise barriers and/or other noise mitigation measures demonstrating best practice including silencers and building treatments for associated plant rooms and enclosures for exposed plant; (e) specific physical and managerial measures for controlling noise; and, (f) noise monitoring, reporting and response procedures including the monitoring on surrounding roads which experience significantly increased traffic volumes as a result of the project, including but not limited to North Rocks Road. 	
E25	<p>For the purpose of assessment of noise criteria specified in the Operational Noise Management Plan required under condition E24, noise from the development shall be:</p> <ul style="list-style-type: none"> (a) measured at the most affected point on or within the site boundary at the most sensitive locations to determine compliance with LAeq,T noise limits; (b) measured in the free field at least three to five metres from any vertical reflecting surface in line with the worst-affected dwelling facade to determine compliance with LAmix noise limits; and (c) subject to the modification factors provided in Section 4 of the NSW Industrial Noise Policy (EPA 2000), where applicable. 	See Appendix H
E26	<p>Monitoring of operational noise shall be undertaken in accordance with the Operational Noise Management Plan. The Proponent shall, in consultation with the EPA, assess the adequacy of the traffic noise and ventilation noise mitigation measures within one year of operation, with regard to the criteria specified in the Operational Noise Management Plan. Should assessment indicate a clear trend in traffic noise levels on surrounding roads which exceed Operational Noise Management Plan defined noise</p>	See Appendix H

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MCoA	Obligation	Comment
	criteria as approved by the EPA, the Proponent shall implement further reasonable and feasible mitigation measures in consultation with affected landowners and/or occupiers.	
Transport and Access		
E27	<p>Prior to operation, the Proponent shall prepare and implement an Operational Traffic Management Plan. The Plan shall outline the proposed measures to ensure the satisfactory performance of the SSI during operation. The Plan shall be prepared in consultation with the Transport Management Centre. The Plan shall include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> (a) detail of public transport improvements in and around Pennant Hills Road resulting from opportunities provided by the project, prepared in consultation with Transport for NSW; (b) a description of the tolling strategy for the SSI, with reference to the existing and proposed arrangements for the Sydney motorway network more generally; (c) details of legally enforceable mechanisms for restricting dangerous goods vehicles from the tunnel; and (d) details of legally enforceable mechanisms for restricting heavy vehicles from Pennant Hills Road, except where those vehicles are entering or exiting destinations accessible only via Pennant Hills Road or are subject to (c) above. <p>The Plan shall be submitted for the information of the Secretary at least one month prior to commencement of operation of the SSI.</p>	<p>The Operational Traffic Management Plan was prepared in consultation with TMC and was issued to DPE on 1/4/2020, satisfying the requirement to provide at least 1 month prior to operation. See Appendix K Operational Traffic Management Plan.</p>
E28	<p>At 12 months, and 5 years, after the commencement of operation of the SSI, or as otherwise agreed to by the Secretary, the Proponent shall prepare a Road Network Performance Review Plan in consultation with relevant Councils that includes:</p> <ul style="list-style-type: none"> (a) an updated analysis, including modelling of traffic impacts to the adjoining road network, as a consequence of the SSI. This shall include a review of new information available about potential land use changes; (b) an updated description and explanation of the extent of SSI improvements and the area of affected road network considered in the updated analysis and its consistency or otherwise with the affected network; 	<p>To be completed by TfNSW.</p>

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MCoA	Obligation	Comment
	<p>(c) identification of potential mitigation measures to manage any predicted traffic performance deficiencies, including bus priority measures and management measures to minimise toll avoidance, particularly for heavy vehicles;</p> <p>(d) the predicted traffic performance improvements from these measures, including any cumulative improvements;</p> <p>(e) justification of why the predicted 'without project' performance of any intersection on the adjoining road network cannot be improved; and</p> <p>(f) details of any complaints received relating to traffic, transport and access impacts, and how they have been addressed in the Plan.</p> <p>The Plan shall be submitted to the Secretary, Transport for NSW (in relation to impacts on bus services) and to relevant Council within 60 days of its completion and made publicly available.</p> <p>The purpose of the Plan is to optimise road network performance and manage the performance impacts of the SSI on the adjoining road network by identifying or confirming mitigation improvements that could be required in areas where traffic performance may be unsatisfactory at time of completion of construction.</p>	
Urban Design and Visual Amenity		
E29	<p>The ongoing maintenance and operation costs of urban design and landscaping items and works implemented as part of this infrastructure approval shall remain the Proponent's responsibility until satisfactory arrangements have been put in place for the transfer of the asset to the relevant authority. Prior to the transfer of assets, the Proponent will maintain items and works to the design standards established in the Urban Design and Landscape Plan required under condition B33.</p>	See Appendix L
Independent Environmental Audit		
E31	<p>Within 12 months of the commencement of operation, and at any other stage required by the Secretary, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the SSI. This audit shall:</p> <p>(a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;</p>	Audit completed on 28/2/2022.

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MCoA	Obligation	Comment
	<p>(b) include consultation with the relevant agencies and local Councils;</p> <p>(c) assess the environmental performance of the SSI and assess whether it is complying with the requirements in this approval, and any other relevant approvals (including any assessment, plan or program required under these approvals);</p> <p>(d) review the accuracy of predicted environmental outcomes discussed in the documents listed in condition A2;</p> <p>(e) review the adequacy of any approved strategy, plan or program required under the abovementioned approvals; and</p> <p>(f) recommend measures or actions to improve the environmental performance of the SSI, and/or any strategy, plan or program required under these approvals.</p> <p>Within 60 days of commissioning this audit, or as otherwise agreed by the Secretary, the Proponent shall submit a copy of the audit report to the Secretary and relevant public authorities, together with its response to any recommendations contained in the audit report.</p> <p>Notes:</p> <ul style="list-style-type: none"> • This audit team shall be led by a suitably qualified and experienced auditor, and include experts in air quality, biodiversity, noise and vibration, hydrology and any other fields specified by the Secretary. • The audit may be staged to suit the staged operation of the SSI. 	

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Environmental Impact Statement and Submissions Report

The below table has been included in the Pre-Operation Compliance Report, in accordance with MCoA A13, and summarises the relevant operational revised environmental management measures (REMMs), which are sourced from Section 10 of the Preferred Infrastructure Report (PIR) and shows how these requirements have been addressed.

Table F-2 Relevant operational Revised environmental management measures.

REMM	Obligation	Comment
Traffic and transport		
OpTT1	A road safety audit would be undertaken by qualified auditors as part of the detailed design, and again immediately prior to project opening, to examine the design from a road safety perspective and identify potential safety issues. This process would be undertaken in accordance with the TfNSW Accident Reduction Guide Part 2: Road Safety Audits (RTA, 2005a).	A Traffic Management & Safety Plan (TMSP) was developed for the Project, which acts as the Traffic Management Plan, required under this REMM (TT1), as well as acting as the Traffic and Access Management Plan, required under condition D57(a). The TMSP was approved on the 18/6/2015 by DPE.
Noise and vibration		
OpNV1	Feasible and reasonable mitigation measures would be developed and implemented to minimise noise impacts consistent with the requirements of the NSW Road Noise Policy and the Environmental Noise Management Manual. Specific noise mitigation measures for the project may include, where feasible and reasonable: <ul style="list-style-type: none"> • Low noise road surfaces. • Noise barriers. • At property acoustic treatments. 	See Appendix H

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REMM	Obligation	Comment
OpNV2	Operational traffic noise would be monitored at sensitive receivers between six months and one year after opening. If the traffic noise levels are above the predicted levels, consideration of additional feasible and reasonable mitigation measures would be undertaken.	See Appendix H
OpNV3	Operational ancillary facilities would be designed to meet project specific noise criteria derived in accordance with the NSW Industrial Noise Policy.	See Appendix H
Air quality		
OpAQ1	<p>A management framework would be developed and implemented to ensure that significant congestion is effectively managed, and that acceptable in-tunnel air quality is maintained. The framework would include:</p> <ul style="list-style-type: none"> • In-tunnel monitoring of carbon monoxide, nitrogen dioxide and / or visibility (extinction coefficient). • Monitoring of traffic conditions and traffic speeds within the main alignment tunnels, and upstream and downstream of the project. • Measures to limit and manage traffic entering the project tunnels in the event of significant congestion conditions that may lead to unacceptable in-tunnel air quality. This may include measures such as lane closures, rapid responses to incidents / breakdowns, and broader traffic network management. • Operational requirements to ensure that operation of the project's ventilation system reflects traffic volumes and in-tunnel air quality requirements. • Provision for the review of the management framework after a period of operation, once sufficient actual in-tunnel air quality and traffic data have been gathered. • Contingency measures in the event of elevated, unexpected in-tunnel air quality (including measures to manage emergency situations). • Provision for publication of relevant in-tunnel air quality performance data. • Review of the performance of smoky vehicle regulation / enforcement and whether additional or amended measures may be required. 	A Tunnel Ventilation, Traffic Incident Response and Traffic Management Systems Integration Protocol (MCoA B7) was approved by the DPE on 12/7/2020. A reporting system, as per E17 (MCoA), see Appendix J, which captures this requirement. Compliance with condition E18 ensures that air quality performance data is made available, and the effectiveness of the smoky vehicle enforcement measures, as per condition E16, shall be documented in the Independent Environmental Audit required under condition E31.
OpAQ2	Air quality in the vicinity of the project would be monitored for a specified time period following project opening. If pollutant concentrations contributed by the project are above predicted levels, additional feasible and reasonable mitigation measures would be considered to meet applicable predicted limits.	See Appendix J

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REMM	Obligation	Comment
Urban design, landscape character and views		
OpV1	Street tree plantings and landscaping would be used to visually soften operational ancillary facilities.	See Appendix L and the Urban Design and Landscape Plan
OpV2	The urban design and landscaping along the Hills M2 Motorway integration works would be consistent with the recently completed Hills M2 Motorway Upgrade project.	
OpV3	The visual impact of noise walls would be reduced through high quality urban design treatments in accordance with Noise Wall Design Guideline (RTA, 2006a).	
OpV4	Landscaped areas would be maintained.	
OpV5	Cut-off and directed lighting would be used at the interchanges, Hills M2 Motorway integration, motorway operations complex and M1 Pacific Motorway tie-in to minimise glare and light spill to surrounding receivers.	The design of the NCX Project is also required to comply with the Australian and TfNSW Standards when determining the location and height of lighting for the motorway (AS1158 and 5151). AS4282 is the Australian standard for light spillage, and although public road lighting is exempt due to potential to the safety of motorists, it was applied to the NCX design to ensure that the illumination level at residential properties is within the standard. See Appendix L
Biodiversity		
OpB1	A management plan would be developed and implemented to identify and mitigate potential ongoing impacts including procedures for: <ul style="list-style-type: none"> Management of weeds. 	See Appendix L and the Urban Design and Landscape Plan

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REMM	Obligation	Comment
	<ul style="list-style-type: none"> Management of riparian areas associated with the discharge of treated water. Maintenance of nest boxes. 	
Hydrogeology and soils		
OpHS1	Operations personnel would be competent and trained in systems and procedures.	See section 3.2
OpHS2	Procedures to address spills, leaks and tunnel washing would be developed and implemented during operation of the project.	See Appendix I
OpHS4	Feasible and reasonable opportunities would be identified for the reuse of captured groundwater.	
Surface water		
OpSW1	The management of potential surface water impacts during the operation of the project would be detailed as part of an OEMP.	See Appendix I
OpSW2	Procedures to quickly address any contaminant spill or accident would be developed prior to operation and implemented during operation project.	See section 5 and Appendix I
OpSW4	All feasible and reasonable opportunities for captured surface water reuse would be utilised in the first instance.	See Appendix I
OpSW5	On-site detention would be provided where required to mitigate impacts associated with increased impervious areas. This would involve the augmentation of existing basins and the construction of new basins.	See Appendix I
OpSW8	Operational drainage infrastructure would be regularly inspected and maintained.	See Appendix I
Hazards and risks		
OpHR2	Storage of dangerous goods and hazardous materials would occur in accordance with supplier's instructions and relevant Australian standards and may include bulk storage tanks, chemical storage cabinets / containers or impervious bunds.	See section 4.3.3

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REMM	Obligation	Comment
OpHR3	Storage, handling and use of dangerous goods and hazardous substances would be in accordance with the <i>Occupational Health and Safety Act 2000</i> and the Storage and Handling of Dangerous Goods Code of Practice (WorkCover NSW, 2005).	
OpHR4	Secure, bunded areas would be provided around storage areas for oils, fuels and other hazardous liquids. Impervious bunds would be of sufficient capacity to contain at least 110 per cent of the volume of the largest stored container.	
OpHR5	Bunds would be provided around activities such as vehicle refuelling, servicing, maintenance or wash-down, where there is a potential for spills and contamination.	
OpHR6	Material Safety Data Sheets would be obtained for dangerous goods and hazardous substances stored on-site prior to their arrival.	
OpHR7	The transport of dangerous goods and hazardous substances would be prohibited through the main alignment tunnels and on and off-ramp tunnels.	
OpHR8	An Incident Response Plan would be developed and implemented in the event of an accident or incident.	See section 5
OpHR9	The response to incidents within the motorway would be managed in accordance with the memorandum of understanding between TfNSW and the NSW Police Service, NSW Rural Fire Service, NSW Fire Brigade and other emergency services.	
Resources and waste		
OpRW1	Wastes would be managed and disposed of in accordance with relevant State legislation and government policies including the <i>Protection of the Environment Operations Act 1997</i> , <i>Waste Avoidance and Resource Recovery Act 2001</i> , <i>Waste Avoidance and Resource Recovery Strategy 2007</i> (DECC, 2007c) and the <i>Waste Reduction and Purchasing Policy</i> (RTA, 2009).	See section 4.3.4
OpRW2	Any mercury containing light globes used for the operation of the tunnel and operational ancillary facilities would be recycled at an accredited recycling facility.	These light globes are not used on the Asset
OpRW3	Opportunities for re-use of wastewater would be considered including irrigation of landscapes within the project, irrigation of Pennant Hills Golf Club and / or local parks in preference to discharge to the local stormwater system.	Discussions currently underway with NWRG ad Pennant Hills GC

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REMM	Obligation	Comment
OpRW4	In order to reduce demand on local water supplies, investigate options for providing water required for operation of the deluge system from wastewater produced through the tunnel drainage system where it meets appropriate quality parameters.	As all water from the tunnel flows to the WTP at the southern compound, the costs and logistics of taking the water to the northern compound where the deluge tank is located are not feasible
Greenhouse gas and climate change		
OpCC1	A stop work threshold (e.g., for extreme heat, storm events) for operation and maintenance activities would be implemented in line with current workplace health and safety practices.	See NCX WHS Plan
OpCC2	Emergency planning and management controls would be implemented during operation to reduce the risk of adverse climate impacts, maintain public safety and minimise congestion. For example, bushfire management would include measures to ensure safety such as reduced speed limits and temporary tunnel closures where required (refer to Section 8.2 Hazards and risk).	See section 5
OpCC4	The motorway operator would develop emergency response management plans in consultation with emergency management services, local governments and other relevant agencies to ensure better disaster management during extreme climate events.	See section 5
OpCC5	The motorway operator would monitor and review the performance of structures and materials in response to climate change related events. Where possible, the most cost- effective response would be to include adaptive measures in the regular maintenance of the project.	See section 4.3.6

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Appendix H: MSP 1 Operational Noise Management Plan

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Appendix I: MSP 2 Water Quality Plan and Monitoring Program

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Appendix J: MSP 3 Operational Air Quality Management Plan

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Appendix K: MSP 4 Operational Traffic Management Plan

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Appendix L: Excerpt from the Urban Design and Landscaping Plan

The below excerpt from the Urban Design and Landscaping Plan (UDLP) provides guidance for processes to manage the visual amenity and landscaping aspects of the Asset through operation. Figure K-1 below provides an example of how visual amenity has been considered throughout the design of the NorthConnex Project, and Table K-1 below provides mitigation measures applicable to the operation of the Asset in relation to maintaining visual amenity and landscaping.

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8.8 Visual impact

As part of the urban and landscape design, mitigation measures are incorporated into the overall scheme, to reduce the potential visual impact of the roadway upon the community and road users.

Design philosophy

To reduce the visual impact of the road on the environment and on the local community.

Principles

- Integrate road with the surrounding natural and cultural landscapes
- Provide screening of road from highly viewable locations and individual properties
- Retain existing landscape character.

Where visual screening is required for residences where it is currently not shown and where it cannot be provided by planting within the road corridor, consultation with affected receptors will be conducted in order to identify opportunities for providing at-receptor screen planting. Where agreed with the landowner, these measures will be implemented during the construction phase.

Table 8-3: Visual impact.

Strategy	Implementation
Use screen planting to reduce the visual impact of structures.	Implement suitable screen shrubs and trees along private property boundaries and against major built structures.
Reduce the visual impact of cut batters.	Vegetate all batters and exposed earthworks with suitable endemic species. Rounding and feathering of edges of the cutting to sculpt the landform into the natural landscape, to avoid an artificial character. Laying back cutting batters at upper portions of the cutting to assist with landscape integration.
Provide a unified design along the entire proposed highway route.	Carefully integrate all visible elements such as landscape, tunnel, embankments, abutments, barrier details, retaining walls, fencing, lighting, shared path, stairs, signposting structures and noise barriers to form a unified design.
Screen local road users and residents from noise barriers.	Install appropriate screen planting/landscaping in front of noise barriers.
Where possible, minimise use of fencing.	Implement soft landscape barriers.
Maintain existing vistas and views from heritage items	Appropriately place planting/landscaping and carefully integrate all elements visible from heritage items to maintain existing views and vistas from heritage items.



Figure 8-10: Screen Planting

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Table L-1 Operational mitigation measures applicable to Visual Amenity

Consideration	Mitigation Measure	Responsibility
Graffiti impacts to Asset buildings, noise walls, etc.	<ul style="list-style-type: none"> Maintain anti-graffiti treatment to all new concrete structures. Use materials that can be easily maintained and repaired from damage caused by vandalism or graffiti. Noise walls are painted with a readily available paint compound, identified as most effective primary treatment to remove or cover over graffiti. Maintain landscaped areas, which have taken into account many factors including plant needs for longevity and green screening to deter vandalism. Graffiti removal is undertaken within the timeframes identified in TfNSW Services Specification M3 – Routine Services. 	NorthConnex O&M Maintenance Manager
Maintenance of landscaped areas	<ul style="list-style-type: none"> Landscaped areas to be maintained as required. Inspections of rehabilitated and revegetated areas to be undertaken on a regular basis. If there is evidence of poor establishment consider replanting areas Continue to select plant species based on longevity and suitability to area. Consider replanting areas that have experienced die off. Undertake landscape maintenance identified in the NorthConnex Urban Design and Landscape Plan. <p>Ongoing weed management to prevent weed spread and propagation.</p>	NorthConnex O&M Maintenance Manager
Vegetation Management	<ul style="list-style-type: none"> Ongoing weed management to prevent weed spread and propagation. 	NorthConnex O&M Maintenance Manager
Visual/privacy impacted by Asset buildings	<ul style="list-style-type: none"> Use screen/planting to reduce the visual or privacy impact of structures. Maintain screen shrubs and trees along private property boundaries and against major built structures. 	NorthConnex O&M Maintenance Manager

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Consideration	Mitigation Measure	Responsibility
	<ul style="list-style-type: none"> Graffiti removal is undertaken within the timeframes identified in TfNSW Services Specification M3 – Routine Services. 	
Light spill impact to surrounding residents	<ul style="list-style-type: none"> Light spill to be managed to minimise impact to surrounding residents. Cut-off and directed lighting would be used at the interchanges, Hills M2 Motorway integration, motorway operations complex and M1 Pacific Motorway tie-in to minimise glare and light spill to surrounding receivers. The exterior lighting will comply with AS/NZS 1158.1.:2005 and AS/NZS 1158.3.1:2014. Category P4 is the lighting category that has been deemed fit for the surface building access roads. The selection of P4 is based on the relatively low traffic and pedestrian movement within the compounds and the anticipated low risk of crime in the area. Minimal use of up lighting to avoid nighttime light pollution. Use of LED lighting where practical 	NorthConnex O&M Maintenance Manager
Fencing and boundary	<ul style="list-style-type: none"> Asset boundary and security fencing are inspected once every quarter (or more often if needed) <input type="checkbox"/> to deter illegal dumping and trespass. 	NorthConnex O&M Maintenance Manager
Appearance of tunnel walls and portal areas	<ul style="list-style-type: none"> Undertake regular tunnel wall washing (approximately quarterly, dependent on traffic volumes) as part of the Planned Maintenance Schedule. 	NorthConnex O&M Maintenance Manager
Maintenance and Inspection Frequency	<ul style="list-style-type: none"> Daily drive by visual inspections of landscaped and rehabilitated areas Monthly targeted inspections of landscaped and rehabilitated areas Following inspections, where it is observed to be reduced line of sight or reduced sight stopping distances, response time for maintenance is typically 7 calendar days, pending criticality of work. Landscaping maintenance crew's complete routine fortnightly works including grass mowing, edge trimming, tree planting, watering, garden beds, shrub maintenance and general vegetation control including weed management. 	NorthConnex O&M Maintenance Manager