

PIRMP – Lane Cove Tunnel

A Transurban Group plan

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1. Abbreviations, acronyms and definitions

Term or acronym	Description
LCT-MRE	Lane Cove Tunnel and Military Road E-Ramp Pty Ltd
DPHI	Department of Planning, Housing and Infrastructure. Previously known as Department of Planning Industry and Environment (DPIE); Department of Planning and Environment (DPE); Department of Planning
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)
EPL	Environment Protection issued by the EPA Licence
MCC	Motorway Control Centre
MCoA	Minister's Conditions of Approval
OEMP	Operational Environmental Management Plan
POEO Act	Protection of the Environment Operations Act 1997
POEO Reg	Protection of the Environment Operations (General) Regulation 2009
TCRO	Traffic Control Room Officer
TfNSW	Transport for New South Wales
TMC	Traffic Management Centre
Tollaust	Tollaust Pty Ltd – a subsidiary of Transurban Limited
Ventia	Ventia Contractors Australia Pty Ltd (formerly Leighton Services) LCT Incident Response and Maintenance Contractor

2. Introduction

2.1 Background

LCT-MRE Pty Ltd (LCT-MRE) holds an Environment Protection Licence (EPL) issued by the NSW Environment Protection Authority (EPA) for two ventilation stacks associated with the Lane Cove Tunnel. As per the *Protection of the Environment Operations Act 1997* (POEO Act), LCT-MRE as holder has

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prepared the following Pollution Incident Response Management Plan (PIRMP) that complies with Part 5.7A of the POEO Act and in-line with *Protection of the Environment Operations (General) Regulation 2009 95A (1)* that restricts this plan to only cover pollution events from “Road Tunnel Emissions”.

If a pollution incident occurs in the course of an activity so that material harm to the environment (within the meaning of section 147 of the POEO Act) is caused or threatened, LCT-MRE will immediately implement this plan in relation to the activity required by Part 5.7A of the POEO Act. A written copy of this plan is kept at the Lane Cove Tunnel Office (5 Sirius Road, Lane Cove West) and is made available on request by an authorised NSW EPA Officer and publicly at (<https://www.linkt.com.au>).

2.2 Objectives

The objectives of this PIRMP are to:

- Minimise and control the risk of an emission pollution incident at the project by requiring identification of risks and the development of planned actions to minimise those risks.
- Ensure comprehensive and timely communication about an incident to the EPA and other relevant government authorities and the community who may be affected by the impacts of an emission pollution incident.

2.3 Scope

This PIRMP for the Lane Cove Tunnel (LCT) motorway covers pollution incidents that cause actual or potential material harm to the environment and/or human health. This PIRMP applies to the ‘scheduled activity’ to which the EPL relates and identified in Section 2.4 below.

2.4 Ventilation outlet and system description

Both ‘Road Tunnel Emission’ outlets work utilise the natural mixing of the atmosphere to efficiently disperse air pollutants. This results in nearby residents experiencing little, if any, exposure to emissions. The first ventilation outlet is located at 5 Sirius Road, Lane Cove (Figure 1) and the second stack located at 6 Marden Street, Artarmon (Figure 2) are pictured below. The broader location is shown in *Appendix B – Broader Location Map*:

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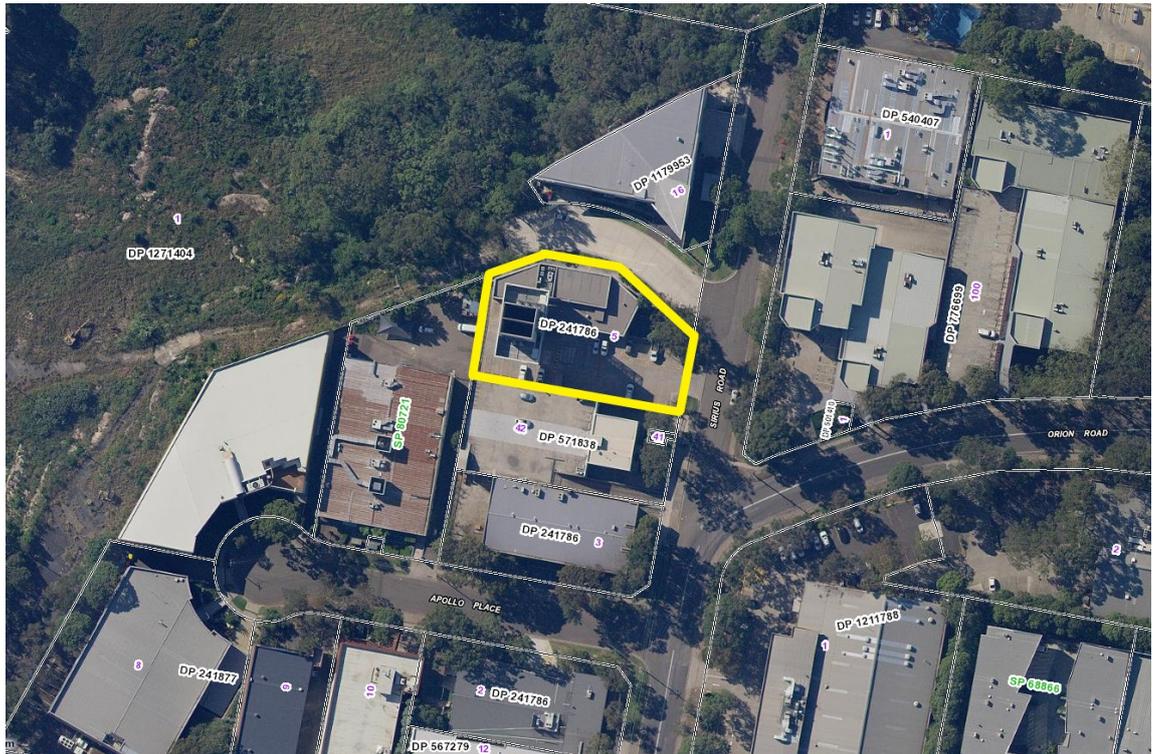


Figure 1: Location Map - 5 Sirius Road, Lane Cove West



Figure 2: Location Map - 6 Marden Street, Artarmon

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3. What is a ‘pollution incident’?

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.

3.1 Process to be implemented during and immediately after a Pollution Incident

Pollution incidents causing or threatening material harm to the environment must be notified to EPA.

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 (details in section 1.7). ‘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.

The process outlined in *LCT-OP-CL-002 Air Quality Exceedance* is followed during and immediately after a Road Tunnel Emission incident.

If the incident presents an imminent threat to health or property call ‘000’.

3.2 Incident Notification Information

Following a pollution incident, it must be reported immediately. The relevant information about a pollution incident required under Section 150 of the POEO Act 1997 consists of the following:

- (1)
 - a) the time, date, nature, duration and location of the incident
 - b) the location of the place where pollution is occurring or is likely to occur
 - c) the nature, the estimated quantity or volume and the concentration of any pollutants involved, if known

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- d) the circumstances in which the incident occurred (including the cause of the incident, if known
 - e) the action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution, if known
 - f) other information prescribed by the regulations.
- (2) The information required by this section is the information known to the person notifying the incident when the notification is required to be given.
- (3) If the information required to be included in a notice of a pollution incident by subsection (1) (c), (d) or (e) is not known to that person when the initial notification is made but becomes known afterwards, that information must be notified in accordance with section 148 immediately after it becomes known.

Additional information should also be recorded including:

- prevailing winds
- estimated height and magnitude of the emission
- location of any onsite fallout or offsite impacts
- likelihood of the pollutant reaching ground level
- possible impacts upon any sensitive receptors.

The above information needs to be recorded and reported immediately to the regulatory authorities via email or phone. Contact details are outlined in Section 3.3 below..

3.3 Regulatory Authorities

The current contact details of the five relevant authorities under Section 148 of the POEO Act are outlined in the table below:

Authority	Email	Phone
NSW EPA	info@epa.nsw.gov.au	131 555
NSW Health	MOH-EHB@doh.health.nsw.gov.au	02 9391 9000
DPHI	infrastructure.notifications@planning.nsw.gov.au Compliance@planning.nsw.gov.au information@planning.nsw.gov.au	1300 305 695
SafeWork NSW	contact@safework.nsw.gov.au	131 050
Fire and Rescue	contact@frnsw.nsw.gov.au	In Emergencies call '000' Rural Fire Service 1800 679 737
Local Council	Lane Cove Municipal Council	(02) 9911 3555

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Authority	Email	Phone
	Willoughby City Council	(02) 9777 1000
	Ryde City Council	(02) 9952 8222

3.4 Actions to be taken during or immediately after a Pollution Incident

When a Pollution Incident is indicated by alarms being triggered in the control room, the TCRO immediately validates to the best of their ability that the data is correct, and the monitoring equipment appears to be operating correctly. The TCRO then notifies the Duty Manager who will escalate as outlined in the 'ED Incident Management Manual' (LCT-OP-MN-001) to the appropriate staff including the NSW Environment Manager and Head of Environment. The TCRO would escalate to a 'Triple 000 call' if required and coordinate with TfNSW, TMC and other motorway control centres as required.

Depending on the nature of the incident, the TCRO will implement the relevant procedure, or checklist from the following:

- Traffic Management and Safety Plan
- Evacuation Management Procedure
- Stationary Vehicle
- Vehicle Collision
- Fire
- On Road Hazards
- Incident Response Plan.

The NSW Environment Manager would coordinate the notification of regulatory agencies such as DPHI, EPA, MoH, Councils and SafeWork NSW. The information outlined in Section 3.2 needs to be recorded and reported immediately to the regulatory authorities via email or phone. Contact details are outlined in Section 3.3.

3.5 Community Notifications

The process in determining whether or not the community is to be notified depends on the type, intensity and potential of impact to the community. Community stakeholder notification is required for incidents or events resulting from the LCT which:

- Will result in an unacceptable impact to community stakeholders during the incident (where community stakeholders are present, such as, residing in their houses or using adjacent recreational facilities at the time of the incident).
- Will result in an unacceptable impact to a community area that is to be used by community members in the days and weeks following the incident. These community stakeholders may not be present during the incident but might be present in the following days.

An unacceptable impact is defined as one which has the potential to adversely affect the health of a member of the community. This takes into consideration immediate health impacts (that occur during the incident) and health risks in the period following the incident.

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The NSW Asset Manager, NSW Environment Manager and Head of Environment in consultation with the LCT Duty Manager will make the above determination and trigger the stakeholder notification process. The LCT Duty Manager will initiate and coordinate the notification process.

The process for notification of stakeholders relates directly to the nature of the hazard. In the event there is an unacceptable risk to the community from the pollution incident, the identified community will be notified. In this event the following actions, where appropriate and safe to do so, may include:

- Providing information to the Traffic Management Centre for distribution
- Use of technology such as Variable Message/Motorway signage
- Local Media – Radio / TV if required
- Update to the Linkt website
- Further face to face/telephone contact
- Letterbox drops
- Email.

Tollaust will use a combination of the above mechanisms to ensure that relevant community messages are quickly and effectively distributed amongst the affected community.

It is likely that during the notification process, the incident will likely be under the control of emergency services personnel. In such an event the capabilities of emergency agencies would also be utilised where appropriate. LCT Duty Manager and NSW Environment Manager will provide all the necessary assistance to the incident controller including escalating to the Tollaust Community Advisor.

For air pollution incidents that may affect community members, those community members may be asked to either close their doors and windows and stay indoors until further notice or the vacate the premises.

Tollaust will provide regular updates of any pollution incidents either via letterbox drop, notices in local papers and/or via door knocks, use of variable message signs, and local radio as required in consultation with relevant authorities.

4. Roles and Responsibilities

As required by the act; the roles and responsibilities are described below of those key individuals who are responsible for activating the PIRMP, managing the response and notifying relevant authorities:

Role	Responsibility	Contact Details (24hr)
LCT Incident Control Room – TCRO's	<ul style="list-style-type: none"> • Responsible for managing the initial response to a pollution incident including traffic management. • Responsible for advising the Asset Operations Lead / Duty Manager. 	13 31 11
Asset Operations Lead / Duty Manager	<ul style="list-style-type: none"> • Responsible for activating the PIRMP • Notify relevant stakeholders including the NSW Environment Manager. 	0429 814 461
NSW Environment Manager	<ul style="list-style-type: none"> • Authorised to notify relevant authorities under section 148 of the POEO Act. 	13 31 11

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5. Inventory of Pollutants

Due to the nature of the generation of pollutants relevant to the EPL, the ventilation system expels gaseous exhaust emissions immediately and does not store pollutants on the premises. As per the requirements set out in the POEO Act; there is no pollutant register detailing pollutant type, maximum quantity and location of potential pollutants appended to this PIRMP. Pollutants relevant to the EPL are described in Section 5.1 below.

5.1 Hazards to the Environment and Human Health

→ Due to the EPL relating to the scheduled activity 'Road Tunnel Emissions' monitoring is conducted on the LCT ventilation, and the following potential hazards to the environment and human health have been identified: Carbon monoxide (CO)

CO is a colourless, odourless gas produced by the incomplete combustion of fuels containing carbon (for example, oil, gas, coal, and wood). CO is absorbed through the lungs, where it reacts to reduce the blood's oxygen-carrying capacity.

Adverse health effects of exposure to carbon monoxide are linked with carboxyhaemoglobin (COHb) in blood. In addition, association between exposure to carbon monoxide and cardiovascular hospital admissions and mortality, especially in the elderly for cardiac failure, myocardial infarction and ischemic heart disease; and some birth outcomes (such as low birth weights) have been identified (NEPC 2010).

→ Nitrogen Dioxide (NO₂) and Nitrogen oxides (NO_x)

Nitrogen dioxide (NO₂) is a brownish gas with a pungent odour. It exists in the atmosphere in equilibrium with nitric oxide. The mixture of these two gases is commonly referred to as oxides of nitrogen (NO_x). NO_x refers to a collection of highly reactive gases containing nitrogen and oxygen, most of which are colourless and odourless. Nitrogen oxide gases form when fuel is burnt.

As NO_x is a product of combustion processes, motor vehicles and industrial combustion processes are the major sources of ambient NO_x in urban areas. NO₂ can cause inflammation of the respiratory system and increase susceptibility to respiratory infection. Exposure to elevated levels of nitrogen dioxide has also been associated with increased mortality, particularly related to respiratory disease, and with increased hospital admissions for asthma and heart disease patients. Asthmatics, the elderly and people with existing cardiovascular and respiratory disease are particularly susceptible to the effects of nitrogen dioxide.

→ Volatile Organic Compounds (VOC)

VOC were implicated as a major precursor in the production of photochemical smog, which causes atmospheric haze, eye irritation and respiratory problems. VOC are emitted from vehicle exhausts. Three primary VOC (benzene, toluene and xylenes) are components of petroleum and diesel fuel and are typically the focus for assessments of engine combustion emissions.

Benzene is an airborne substance that is a precursor to photochemical smog. Benzene exposure commonly occurs through inhalation of air containing the substance. It can also enter the body through the skin, although it is poorly absorbed this way. Low levels of benzene exposure result from car exhaust. Benzene is considered to be a toxic health hazard and a carcinogen. It has high acute toxic effects on aquatic life and long-term effects on marine life and agricultural crops. Human exposure to very high levels for even brief periods of time can potentially result in death, while lower level exposure can cause skin and eye irritation, drowsiness, dizziness, headaches and vomiting, damage to the immune system, leukemia and birth defects.

Toluene (methylbenzene) is a highly volatile chemical that quickly evaporates to a gas if released as a liquid. Due to relatively fast degradation, toluene emissions are usually confined to the local area in which it is emitted. Human exposure typically occurs through breathing contaminated air, but toluene can also

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be ingested or absorbed through the skin (in liquid form). Toluene usually leaves the body within twelve hours.

Short-term exposure to high levels of toluene can cause dizziness, sleepiness, unconsciousness and sometimes death. Long-term exposure can cause kidney damage and permanent brain damage that can lead to speech, vision and hearing problems, as well as loss of muscle and memory functions. The substance can cause membrane damage in plant leaves and is moderately toxic to aquatic life with long-term exposure.

Xylenes are flammable liquids that are moderately soluble in water. They are quickly degraded by sunlight when released to air, and rapidly evaporate when released to soil or water. They are used as solvents and in petrol and chemical manufacturing. Xylenes can enter the body through inhalation or skin absorption (liquid form), and can cause irritation of the eyes and nose, stomach problems, memory and concentration problems, nausea and dizziness. High-level exposure can cause death. The substances have high acute and chronic toxicity to aquatic life and can adversely affect crops.

→ Solid Particles

Airborne particles are commonly differentiated according to size based on their equivalent aerodynamic diameter. Particles with a diameter of less than or equal to 50 micrometres (mm) are collectively referred to as total suspended particulates (TSP). TSP primarily cause aesthetic impacts associated with coarse particles settling on surfaces, which also causes soiling and discolouration. These large particles can, however, cause some irritation of mucosal membranes; they pose a greater risk to health when ingested if they are contaminated. Particles with diameters less than or equal to 10 mm (known as PM10) are primarily created through crushing and grinding of rocks and soil, and typically comprise soot, dirt, mould and pollen. These particles tend to remain suspended in the air for longer periods than larger particles (minutes or hours) and can penetrate into human lungs. Fine particulates (those with diameters less than or equal to 2.5 mm, known as PM 2.5) are typically generated from vehicle exhaust, bushfires and some industrial activities, and can remain suspended in the air for days or weeks.

As these fine particulates can travel further into human lungs than the larger particulates and are often made up of heavy metals and carcinogens, fine particulates are considered to pose a greater risk to health. Exposure to particulate matter has been linked to a variety of adverse health effects, such as respiratory problems (for example coughing, aggravated asthma, chronic bronchitis), lung damage and non-fatal heart attacks. Furthermore, if the particles contain toxic materials (such as lead, cadmium, zinc) or live organisms (such as bacteria or fungi), toxic effects or infection can occur from inhalation of the dust.

→ Polycyclic Aromatic Hydrocarbons (PAH)

PAH are a group of over 100 chemicals, which are formed through the incomplete combustion of organic materials, such as petrol. Exposure to these chemicals can cause a range of adverse reactions, including irritation of the eyes, nose and throat and skin. Exposure to very high levels can result in symptoms such as headaches, nausea, damage to the liver and kidneys, and damage to red blood cells. A number of PAH were declared to be probably or possibly carcinogenic to humans by the IARC. PAH can attach to dust particles and be transported through the air. The compounds break down over days or weeks through chemical reactions in the atmosphere. PAH are moderately or highly acutely toxic to birds and aquatic organisms and moderately/highly chronic toxicity to aquatic life. Some can cause damage and death to crops. PAH can bioaccumulate and are moderately persistent in the environment.

Overall, poor air quality can have impacts on the environment and human health.

5.2 Likelihood of Hazards to the Environment and Human Health occurring

Air quality assessments were conducted as part of the LCT Environmental Impact Statement. As the concentrations of the parameters considered to be hazards were considered to be well below the

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assessment criteria, the likelihood of any such hazards creating a pollution incident during normal operations of the tunnel are considered very low.

During an emergency situation, such as a fire in the tunnel, concentrations of the parameters may be elevated to a point where a pollution incident may occur. Experience across other tunnels in Sydney shows that such scenarios are rare, in part due to the controls outlined in Section 5.3 below, and as such the likelihood is considered low.

5.3 Controlling Hazards to the Environment

The abovementioned hazards are mitigated at LCT through the implementation of the following controls:

- As detailed section 1.4 and in the *Lane Cove Tunnel Operational Environmental Management Plan* and *Air Quality Management Sub-Plan* the tunnel's air quality is managed by the use of a fan circulation ventilation system that link to air quality monitoring equipment in the ventilation outlets and within the tunnel, traffic numbers and traffic speed.
- The computer system that monitors the tunnel includes the Air Quality monitoring data parameters. Alarms are sounded at several points if air quality parameter concentrations are increasing prior to the exceedance limit to allow mitigation actions to be implemented. The TCRO's are able to adjust variables such as the axial and jet fan speed, traffic speed, clean air inflow and ventilation system to improve the air quality in the tunnel and subsequently the ventilation outlets.
- Ventilation and traffic procedures implemented by the TCRO's who are operating the motorway 24 hours a day, 365 days per year. TCRO's are trained in and implement the operational procedures to control factors that influence pollutant concentrations and keep them below the concentration limits. This may include increasing clean air intake fan and outlet fan speeds, changing jet fan speeds, reducing traffic speeds, excluding traffic from the tunnel(s), or a combination of these actions. The TCRO's ensure that the ventilation system is operating efficiently to ensure pollutants are expelled from the tunnel through the ventilation outlets.
- TCRO Emergency and incident management procedures.
- Continuous in-tunnel air monitoring within the tunnel, undertaken in accordance with the EPL and MCoA.
- In tunnel infrastructure including emergency evacuation passages, cross passages, PA system and firefighting systems.
- Exclusion of Dangerous Goods from entering the tunnel to reduce the risk of fire and explosions.
- Quarterly and annual risk assessment reviews to ensure mitigations are working correctly.
- Personnel Protective Equipment (PPE) available to staff including high visibility clothing, masks, eye protection, ear protection, helmets, gloves and steel capped boots.

Controls are also described in the *Eastern Distributor Operational Environmental Management Plan* (LCT-EV-PL-001) and the associated *Air Quality Management Sub-Plan* (LCT-EV-PL-006).

6. Testing, Review and Amendment

This PIRMP will be tested in accordance with the requirements set out in the POEO Regulations as follows:

- To ensure that the information included in the plan is accurate and up to date and the plan is capable of being implemented in a workable and effective manner.
- Any such test is to be carried out:

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- At least once every twelve months
- Within one month of any pollution incident occurring, that resulted in 'environmental harm'.

The PIRMP will be tested undertaking desktop simulations and practical exercises. In the PIRMP the following details will be recorded on a continuous basis:

- *Review*: Date, version, author and nature of change (Page 2).
- *Test*: Date (tested), description of test, conducted by, date (update) register available in the Transurban DMS.

7. Staff Training

All TCROs receive training during the induction process to ensure that they can effectively implement the PIRMP. Ongoing training ensures that they are able to prevent and respond to exceedances should they occur. Training includes but is not limited to:

- Employee responsibilities and legal obligations in relation to stack exceedances and reporting requirements.
- Identification of site issues that may lead to an outlet exceedance.
- Appropriate immediate action to control and contain an incident including provision of contact details of relevant personnel for notification.
- Staff would be provided with information to reflect their response to an environmental incident.

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8. Appendix A: Compliance Register

Below describes how the above PIRMP complies with the requirements under Section 3 of The Guideline: Pollution Incident Response Management Plans (EPA 2020): for the preparation of PIRMP's:

Requirement	Section of PIRMP
3.3.1 Description and likelihood of hazards [clause 98C (1)(a) and (b)]	5.1 Likelihood of Hazards to the Environment and Human Health occurring
3.3.2 Pre-emptive actions to be taken [clause 98C(1)l]	5.3 Controlling Hazards to the Environment and Human Health
3.3.3 Inventory of pollutants [clause 98C(1)(d) al(e)]	5.0 Inventory of Pollutants
3.3.4 Safety equipment [clause 98C(1)(f)]	5.3 Controlling Hazards to the Environment and Human Health
3.3.5 Contact details [clause 98C(1)(g) and (h)]	4.0 Roles and Responsibilities 3.3 Regulatory Authorities
3.3.6 Communicating with neighbours and the local community [clause 98C(1)(i)]	3.5 Community Notifications
3.3.7 Minimising harm to persons on the premises [clause 98C(1)(j)]	5.3 Controlling Hazards to the Environment and Human Health
3.3.8 Maps [clause 98C(1)(k)]	2.4 Ventilation outlet and system description Appendix B: Broader Location Map
3.3.9 Actions to be taken during or immediately after a pollution incident [clause 98C(1)(l)]	3.4 Actions to be taken during or immediately following a Pollution Incident
3.3.10 Staff training [clause 98C(1)(m)]	7.0 Staff Training

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9. Appendix B: Broader Location Map

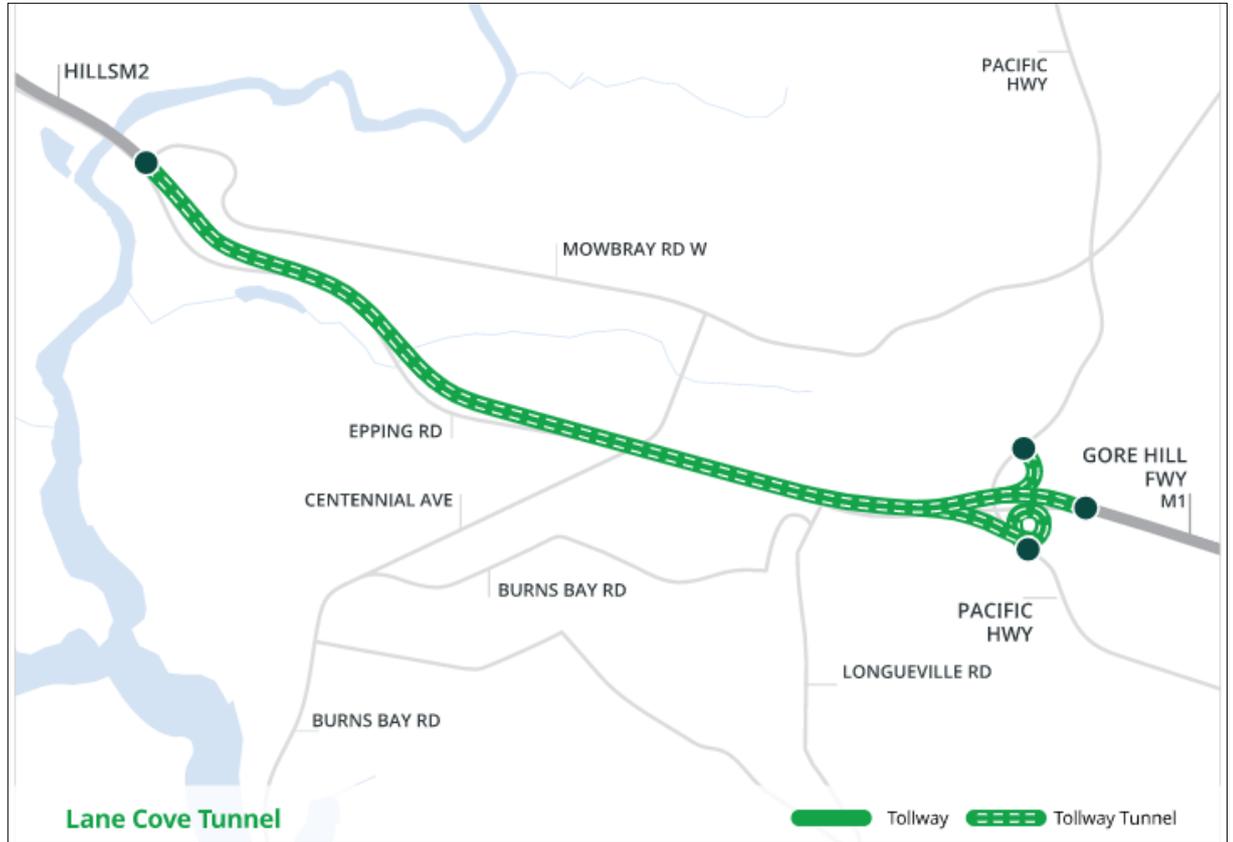


Figure 3: Broader Schematic Location Map

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Figure 4: Broader Aerial Location Map

Green Star – 6 Marden Street, Artarmon

Red Star – 5 Sirius Road, Land Cove West