Project N953
Construction Environmental Management Plan
Intermodal Logistics Centre at Enfield

Plan approved by:

Name	Title	Approved
Brad Hale	Community & Systems Manager	27 September 2010

Details of revisions

Level	Details	Date	Initial
1.0	Sydney Ports Corporation and LCPL Branch Environmental Manager comments addressed	22 September 2010	George Kollias
1.1	Minor changes addressing additional Sydney Ports comments. Some comments could not be addressed were they relate to formatting undertaken by the Leighton Way System.	27 September 2010	George Kollias

Notes:

1. The Leighton Way, which forms part of the Leighton Management System, holds the current electronic version of this plan.
2. The electronic version is controlled.
3. Key personnel will be notified of changes to the electronic version by way of the content change management system in The Leighton Way.

Details of Version Amendments:

Plan Control

The Project System Co-ordinator will maintain, review and update this plan.

Amendment

Each new version to the plan will be distributed and changes to the recent version will be highlighted. The version number is included at the bottom of each page at the end of the document number. When amendments occur, the entire document will be reissued with the revision number updated accordingly. All amendments to the plan will be approved by key personnel. Minor amendments can be made to the electronic copy of this document without reissuing.

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01 Project Description

The project comprises the development of a new Intermodal Logistics Centre (ILC), associated road and rail infrastructure works, services and environmental enhancement works.

The ILC at Enfield will be used for the transfer and storage of container freight to and from Botany Bay, packing and unpacking of containers within the proposed warehouses and storage of empty containers for later re-use or for return to the port.

The ILC at Enfield will comprise:

- an intermodal terminal (IMT) for the loading and unloading of containers between road and rail and short term storage of containers;
- the provision of warehousing for the packing and unpacking of containers and short-term storage of cargo;
- empty container storage (ECS) facilities, constructed by Sydney Ports, for the storage of empty containers for later packing or transfer by rail;
- the provision of a light industrial and commercial (LIC) area complementary to operations at the ILC which will act as an interface to adjacent uses along Cosgrove Road;
- a Community and Ecological Area for ecological enhancement and community opportunities. The area also serves as a buffer between operations of the ILC site and residences to the south of the ILC site;
- off-site works comprising construction of a road bridge over RailCorp existing New Marshalling Yards for access to Wentworth Street, local road works on Cosgrove Road and reconstruction of the Norfolk Road and Roberts Road intersection, to manage access/egress of vehicles to/from the ILC site, and rail connections to the freight rail network.

02 Introduction

This Early Works Construction Environmental Management Plan (CEMP), which has been prepared by Leightons Contractors Pty Ltd (LCPL), sets out the environmental management system (EMS) to be used to manage and mitigate the environmental impacts from the early works construction of the Project.

The CEMP has been prepared under Sydney Ports overarching CEMP Framework (CEMPF) Rev 10 (Sept, 2010).

It also sets out the processes and procedures by which LCPL will:

- Ensure compliance with the Minister's Conditions of Approval (MCoA) dated 5 September 2007 including Modifications (MOD) MOD1 dated 7 October 2008, MOD2 dated 30 March 2009 and MOD4 dated 27 May 2010;
- Ensure compliance with all relevant Environmental Legislation including the Protection of the Environment Operations Act 1997;
- Ensure compliance with the Environmental Assessment (EA) and Preferred Project Report (PPR) Statement of Commitments;
- Ensure compliance with Community Consultation Plan for Main Construction;
- Conform to the requirements of International environmental standard AS/NZS ISO 14001:2004.

This CEMP has been prepared to be consistent with the Guideline for the Preparation of Environmental Management Plans (DIPNR 2004) and LCPL's management system (called the "Leighton Way").

This CEMP will be amended to include the Main Construction works once Sydney Ports has approved the commencement of the Main Construction works.

This CEMP and it's sub-plans will be implemented by all personnel during the construction phase of the Project.

03 Environmental Management System

Leighton Contractors Pty Ltd are certified to AS/NZS ISO14001 and have distinct processes to manage environmental matters. These procedures exist within the LCPL nanagement system known as 'The Leighton Way'.

The Leighton Way

The Leighton Way provides specific processes on how to manage environmental matters. These processes form the basis for environmental management and are amended where necessary to become more project specific. These processes are then combined to form part of the CEMP. These processes provide the high level detail on how to manage environmental issues on site.

Construction Environment Management Plan

This Construction Environment Management Plan (CEMP) incorporates all of the requirements of the project approval documents and other requirements including the contract Leighton Contractors has with Sydney Ports to construct the Early Works.

The CEMP feeds down into the Sub Plans; topics of this CEMP are further expanded upon in the Sub Plans as discussed below.

The CEMP includes LCPL's Compliance Tracking Program, which tracks compliance with Ministers Conditions of Approval.

A Constraints Map is provided as Appendix A to show the location of and set the context of the site.

Sub Plans

Sub Plans are used as stand alone documents that deal directly with certain environmental aspects and impacts of high risk. The Sub Plans for the Project include:

- Soil & Water Management Plan;
- Noise & Vibration Management Plan (D-G);
- Traffic Management Plan (D-G);
- Air Quality & Dust Management Plan (D-G);
- Flora & Fauna Management Plan;
- Waste, Reuse & Recycling Management Plan;
- Energy & Water Management Plan;
- Stakeholder & Community Involvement Plan.

Sub Plans with the annotation 'D-G' require the Director-General's approval required under the MCoA for this phase of the project, in particular MCoA 6.3 (a), (b) & (e). Other items of MCoA 6.3 will be addressed by the Principal, Sydney Ports Corporation, and referenced in this CEMP and in Sydney Ports' CEMPF.

04 Construction Activities

The remaining construction activities at the Intermodal Logistics Centre are broken up into approximately four stages: Stage 2 Early Works, Stage 3 Main Construction, Stage 4 Tenant Works and Stage 5 Light Industrial and Commercial Area Works as defined in Sydney Ports' CEMPF.

The Early Works package is the subject of this Construction Environmental Management Plan. Early Works package will comprise:

- Overbridge Construction
- Northern and Southern Rail Connections
- Noise earth barrier (south-east)
- Frog Habitat Construction (not including frog movement corridor or landscaping)
- Other minor works including construction of the gravel access track in the southern part of the site, Early Contractor Involvement Services (ECI), Ethylene Gas Pipeline (EGP) protection and High Voltage Electricity Connection (Part 5 Approval)

Overbridge Construction works involve the construction os a 2-lane concrete bridge over RailCorp's neew Enfield Marshalling Yard, with a connection to Wentworth St. It will be undertaken during normal, day-time shifts and over possession shifts (either extended hours on weekdays or out of hours during weekends) as necessitated by Rail Operators, Railcorp or National Pacific. Approval for Out of Hours works will be requested from the Director-General as required by the MCoA, through the submission of Out of Hours Proposals which will include Construction Noise Impact Statements (CNIS).

Overbridge Construction works will be the first componenet of the Early Works to be undertaken and will include:

- Traffic management works on Wentworth St to establish the site including approach slab, concrete paving and asphalting
- Works to construct the western abutment (Abutment A) including placement of barriers along existing freight line, constructing formwork, and pouring and placing concrete to build abutment wall
- Non-destructive digging to investigate services and soil testing to establish contamination risk
- Any necessary adjustment to railway signals and systems at the footings of the bridge to enable construction
- Piling adjacent to the existing freight line and rail lines of the New Enfield Marshalling Yards, which includes the placement of reinforcing cages, pouring concrete and breaking back of pile caps to start pylon reinforcement
- Formwork and concrete pours at the eastern abutment (Abutment B) and 7 pylon locations to build them up from the ground level to below the Superstructure
- Delivery of large bridge girders from off-site and crainage work to lift and install girders into place across bridge spans
- Installation of bridge parapets and all finishing activities

Other works to occur include:

- Northern and southern rail enabling works will be undertaken off-site on RailCorp land, including the construction of rail connections and undertaking changes to signalling
- Noise earth barrier installation will be undertaken in the south-eastern corner of the site. Noise earth barrier installation will occur concurrently with Ethylene Gas Pipeline (EGP) protection
- Frog habitat Construction will be undertaken in accordance with the Frog Protection Plan (Biosphere, Jun 2009) and the Frog Management Plan (Biosphere, Mar 2010)

- Early Contractor Involvement (ECI) Services - LCPL will undertake investigations into the activities of the Main Construction phase (Stage 3). This includes the investigation of compaction and geotechnical options for stabilising deep fills on the site. Compaction trials will involve the staged implementation of conventional Vibratory Roller, Impact Roller and Heavy Dynamic Compaction and vibration monitoring to establish Safe Working Distances for use during Main Construction
- High Voltage Connection proposed under a Part 5 approval process through Sydney Ports. Determination under Part 5 of the Environmental Planning and Assessment Act is still pending and works will not commence until this is received. The High Voltage Connection involves making a connection between an electrical substation in South Strathfield and the site, to provide an 11kV electricity feeder. An existing buried conduit route will be used, with a scope of works for the main part only including exposing pits and pulling power cables. A directional drilling operation is required to be constructed under a concrete lined section of the Upper Cooks River. These works are covered by this CEMP, and do not require this CEMP's Director-General approval as they are subject to a separate approval process.

05 Objectives and Targets

LCPL has developed core values to guide the culture and behaviours of all company employees. These core values include commitments to respect the environment and community by continually seeking opportunities for positive environmental outcomes. LCPL is committed to:

- Doing more, use less;
- Thinking of future generations;
- Going beyond mandatory compliance.

In addition to these core values, LCPL's corporate objectives are to:

- Eliminate regulatory non-compliance;
- Reduce waste;
- Avoid unnecessary environmental impacts.

Environmental objectives and targets for the Project have been developed to align with these corporate values.

Project Environmental Objectives and Targets

Environmental Impact	Objective	Target
Environmental approvals	Project to be constructed in accordance with the MCoA, the EA and Preferred Project Report	No identified non-conformances with MCoA
Effect on the natural ecosystem due to project activities	To ensure there are no adverse effects on the natural ecosystem during the course of construction as a result of project activities beyond those predicted in the EA or subsequent environmental assessments for the works	To have no release of toxic materials to the natural ecosystem To cause no unnecessary damage to the natural ecosystem during construction. This includes any impacts on fauna and flora attributable to site works

Water pollution resulting from project activities	To ensure no unplanned water is discharged except in the event excessive rainfall (in excess of 95th %'ile according to Bluebook) and of a flood which endangers life or property	To ensure that the quality of natural waterways are not adversely affected during construction To have no legal breaches or regulatory action in relation to project discharges
Generation of waste	To minimise the generation of waste by: Eliminating and avoiding waste wherever possible Recycling waste to other uses where practicable Ensuring waste materials are deposited in bins/ designated areas and that the waste is removed	To separate waste into streams to maximise recycling / reuse and to minimise (where practicable) waste sent to landfill
Energy & Water	To raise awareness of the issues of Sustainability Implement measures to reduce energy and water use	To minimise energy and water usage
Spoil	Maximise the reuse of spoil	No spoil suitable for reuse will be disposed to landfill
Air pollution resulting from project activities	To minimise emissions and ensure any release of pollutants to the air is within applicable limits	To minimise emissions and to receive no complaints in relation to dust generated by the project
Noise pollution resulting from project activities	To keep noise within statutory and contractual requirements	To receive no complaints in relation to noise generated by project activities
Contaminated land	To identify any contaminated land and ensure there are no adverse impact on human health or the environment	Contaminated spoil to be managed in accordance with DECCW requirements and the project approval No soil contaminated due to construction activities
Deposition of mud on roadways	To avoid the deposition of mud on roadways as a result of project activities	To receive no complaints or regulatory action relating to mud being deposited on roadways as a result of project activities

Effect on Indigenous Heritage	To protect and respect any items of indigenous significance which may be discovered during the Early Works	To cause no damage to any items of indigenous significance identified during the course of the project
Effect on Non-Indigenous Heritage	To protect any items of non-indigenous significance during the project	To cause no damage to items of non-indigenous significance during the course of the project

06 Policies

LCPL corporate division endorses environmental practices within the company by sanctioning a LCPL Environmental Policy. This Policy is included as Appendix B to this CEMP and will be fully applied on the ILC at Enfield project.

07 Director-General's Approvals

The MCoA for the project are provided in the Sydney Ports' CEMPF. The MCoA will be used as part of LCPL's Compliance Tracking Program. The following MCoA conditions relate directly with this CEMP:

MCoA No. and Description	Reference
4.1 The Proponent shall develop and implement a **Compliance Tracking Program** to track compliance with the requirements of this approval. The Program shall include, but not necessarily limited to:	This CEMP and LCPL's Compliance Tracking Program involving the tracking of compliance against the MCoA (as discussed above).
a) provisions for periodic review of the compliance status of the project against the requirements of this approval;	Monthly internal tracking against MCoA as part of LCPL's Compliance Tracking Program.
b) provisions for periodic reporting of compliance status to the Director-General;	Sydney Ports' CEMPF
c) a program for independent environmental auditing at least annually, or as otherwise agreed by the Director-General, in accordance with ISO 19011:2002- Guidelines for Quality and/ or Environmental Management Systems Auditing; and	Sydney Ports' CEMPF. See also Section 12.4.3 of this CEMP
d) mechanisms for rectifying any non-compliance identified during environmental auditing or review of compliance.	Non-compliance mechanisms implemented in accordance with CEMP Section 12.4.4

6.2 Prior to the commencement of site preparation works or construction of the project, the Proponent shall prepare and submit for the approval of the Director-General a **Construction Environmental Management Plan** to detail an environmental management framework, practices and procedures to be followed during site preparation and construction of the project. The Plan shall be prepared in accordance with *Guideline for the Preparation of Environmental Management Plans* (DIPNR 2004) and shall include, but not necessarily be limited to:	This CEMP
a) a framework consistent with that presented in Chapter 21 of the document referred to under condition 1.1b) of this approval;	This CEMP and Sub Plans
b) a description of all activities to be undertaken on site during site establishment and construction of the project including an indication of stages of construction, where relevant;	Sydney Ports' CEMPF
c) statutory and other obligations that the Proponent is required to fulfil during site establishment and construction, including all approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies;	This CEMP Section 08, and Section 1.4 of respective Sub Plans
d) specific consideration of measures to address any requirements of the DECC during site establishment and construction;	DECCW consultation undertaken by Sydney Ports Corportation and appended to CEMPF. LCPL addresses requirements provided by DECCW through the implementation of this CEMP and Sub Plans. This CEMP is inaccordance with DECCW requests for environmental management plans for each stage of development. This CEMP will be audited against ISO 14001, as required by DECCW. In accordance with the DECCW Consultation Documents, potential environmental impacts associated with construction will be managed by the implementation of appropriate environmental management systems as detailed in this CEMP and Sub Plans. This CEMP and Sub Plans address the key issues identified in the DECCW Consultation Documents being: • Community consultation (Stakeholder and Community Involvement Plan);

	• Construction hours (Noise & Vibration Management Plan); • Reasonable and feasible noise and vibration mitigations, and noise monitoring for 'out of hours' works (Noise & Vibration Management Plan); • Sediment and erosion controls (Soil & Water Management Plan); • Potential site contamination investigated and managed (Soil & Water Manangement Plan); • Air quality associated with construction works is managed (Air Quality & Dust Management Plan); • Waste management principles applied (Waste, Reuse & Recycling Management Plan); • Storage and reuse of stormwater be investigated (Soil & Water Management Plan and Energy & Water Management Plan).
e) a description of the roles and responsibilities for all relevant employees involved in the site establishment or construction of the project.	This CEMP Section 10 and processes within Section 12
f) details of how the environmental performance of the site preparation and construction works will be monitored, and what actions will be taken to address identified adverse environmental impacts. In particular, the following environmental performance issues shall be addressed in the Plan:	This CEMP and/or Sub Plans
i) measures to monitor and manage dust emissions;	Air Quality & Dust Management Plan (Sub Plan)
ii) measures to monitor and minimise soil erosion and the discharge of sediment and other pollutants to lands and/ or waters during construction activities; and	Soil & Water Management Plan (Sub Plan)
iii) measures to monitor and control noise emissions during construction works;	Noise & Vibration Management Plan (Sub Plan)
g) a description of the roles and responsibilities for all relevant employees involved in site preparation and construction of the project and a program for how these employees will be trained in responsibilities identified in the plan;	This CEMP Section 10 and processes within Section 12
h) complaints handling procedures to be applied during operation of the project (conditions 5.2 and condition 5.3 of this approval);	Stakeholder and Community Involvement Plan (Sub Plan)
i) the issue-specific management plans listed under condition 6.3 of this approval.	See MCoA 6.3 below

The Construction Environmental Plan shall be made available for inspection by the public upon request following its approval by the Director-General.	The Sydney Ports' CEMPF and this CEMP and Sub Plans will be made available on the Sydney Ports' website
6.3 As part of the Construction Environmental Management Plan for the project, required under condition 6.2 of this approval, the Proponent shall prepare and implement the following **Management Plans**:	Sub Plans to the CEMP have been prepared by LCPL where responsibility lies with the contractor
a) a Construction Noise Management Plan to outline construction noise mitigation, monitoring and management measures to be implemented to minimise noise impacts during construction of the project. The Plan shall include, but not necessarily be limited to:	Noise and Vibration Management Plan (Sub Plan)
i) details of construction activities and a schedule for construction works;	Noise and Vibration Management Plan (Sub Plan) Section 2.2
ii) identification of construction activities that have the potential to generate noise and/ or vibration impacts on surrounding land uses, particularly residential areas;	Noise and Vibration Management Plan (Sub Plan) Section 2.2
iii) where the relevant construction noise goals contained in the *Noise Management Guideline - Construction Noise* (formerly published as Chapter 171 of the *Environmental Noise Control Manual*) are predicted to be exceeded at sensitive receivers, provision for the application of all practicable and reasonable noise mitigation measures to seek to achieve the relevant construction noise goals;	Noise and Vibration Management Plan (Sub Plan) Section 2.4
iv) procedures for notifying residents of construction activities that are likely to effect their noise and vibration amenity, as well as procedures for dealing with and responding to noise complaints; and	Noise and Vibration Management Plan (Sub Plan) Section 3.1 and Stakeholder and Community Involvement Plan (Sub Plan)
v) a description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be conducted, how the results of this monitoring would be recorded; and, if any non-compliance is detected.	Noise and Vibration Management Plan (Sub Plan) Section 5.1

b) a Construction Traffic Management Protocol to detail how heavy vehicle movements associated with the project will be managed during construction. The Protocol shall specifically address the movement of oversize loads to and from the site, the management of construction traffic, restrictions to the hours of heavy vehicle movements to avoid road use conflicts, and the transport of construction waste materials;	Traffic Management Plan (Sub Plan)
c) a Heritage Interpretation Plan and Strategy to detail how heritage items to be retain on-site will be protected during site preparation and construction, and how relocated heritage items will be protected and maintained during those works. The Plan shall include a strategy for the on-going management and interpretation of heritage items and values on the site, and shall be prepared in accordance with NSW Heritage Office guidelines;	The Sydney Ports' CEMPF provides details with regards to this MCoA LCPL addresses the management of retained or uncovered heritage items as relevant to the Early Works in this CEMP Section 12.3.4 and 12.3.5
d) a Landscape and Ecological Area Management Plan to detail how the site will be landscaped and maintained. The Plan shall be generally consistent with the Landscape Masterplan presented in the document referred to under condition 1.1b) of this approval and shall include, but not necessarily be limited to;	The Sydney Ports' CEMPF provides details with regards to this Plan which is not applicable to the Early Works as there is no landscaping involved. The Flora & Fauna Management Plan (Sub Plan) has referenced aspects of landscape and ecological area management.
i) provision for the use of locally-endemic native species for landscaping the site;	Not relevant for this stage of the Project
ii) consideration of landscaping locations and densities to maximise visual screening of the project from residential receptors and public open space;	Not relevant for this stage of the Project
iii) measures to maximise the retention of locally-endemic native species existing on the site, and removal of weeds and non-indigenous vegetation; and	The Flora & Fauna Management Plan (Sub Plan) includes measure to retain native species, and manage weeds and other non-indigenous vegetation, particularly in the southern portion of of the site
iv) measures for the enhancement, revegetation and on-going management of the Ecological Area on the site, including measures to provide suitable habitat for *Litoria Aurea*;	The Flora & Fauna Management Plan (Sub Plan)

e) a Construction Dust Management Protocol to detail how dust impacts will be mitigated, monitored and managed during construction of the project. The Plan shall include procedures for the identification of situations in which site preparation or construction works may contribute to an ambient PM10 concentration (24-hour) of greater than 50 ugm-3 at any offiste residential receptor, with details of measures to be implemented (including alteration or cessation of works, as may be relevant) to prevent or minimise exceedance of this criterion, in so far as the exceedance amy relate to activities associated with the project.	Air Quality & Dust Management Plan (Sub Plan)

The requirements of Sydney Ports' Heritage Interpretation Plan and Strategy have been incorporated into this CEMP as required. As indicated in the CEMPF, the Landscape and Ecological Area Management Plan is not applicable to this phase of the project. The Frog Management Plan, attached in Sydney Ports' CEMPF addresses the requirements of Condition of Approval 6.3d)iv) in relation to the provision of a suitable habitat for the Green and Golden Bell Frog. Condition 6.3d)iii) is addressed in the Flora and Fauna Management Plan, a Sub Plan of this CEMP.

08 Relevant Legislation

A general list of the relevant legislation applicable or potentially applicable to the Early works Construction is contained in the following table:

Legislation	Summary
Environmental Planning and Assessment Act 1979 and Environmental Planning and Assessment Regulation 2000	The project must comply with the Minister's Conditions of Approval.
Protection of the Environment Operations Act 1997	The project must comply with section 120 of the POEO Act 1997 which prohibits the pollution of waters, an Environmental Protection Licence (EPL) is not required for the project.
Heritage Act 1977	This Act aims to conserve items of heritage significance. Measures to protect the pedestrian bridge and pillar water tank are provided in the Sydney Ports' CEMPF and incorporated into this CEMP.
Threatened Species Conservation Act 1995	This Act establishes a framework for the protection of threatened species, populations and ecological communities in NSW. The construction works will not directly impact on any known threatened species, populations, endangered ecological communities (EEC) or critical habitats.

National Parks and Wildlfie Act 1974	The proposed works would not affect any items or places of Aboriginal significance and therefore no approvals would be required under this Act.
Waste Avoidance and Resource Recovery Act 2001	The Act aims to reduce the environmental harm associated with inappropriate waste management and promotes the efficient use of resources under the principles of ecologically sustainable development.
Fisheries Management Act 1994	This Act provides protection for aquatic reserves under the Act. The project would have no impacts on protected areas or impede fish passage.
Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)	Under this Act, activities that have the potential to impact matters of national environmental significance or are on Commonwealth Lands are subject to additional assessment and referral requirements. The project will not impact matters of national significance or any Commonwealth land. In response to a referral to the Department of Environment an Heritage (DEH), DEH advised Sydney Ports that no approval is required under the EPBC Act (for details refer to the EA).
Roads Act 1993	Road opening permits are required to be obtained from the relevant Road Authority (Strathfield Council). Road opening permits will be obtained where required.

09 Training and Awareness

Leighton Contractors has its own in-house Environmental Awareness Programme (EnviroEssentials), which addresses LCPL key construction risk areas including Legal and Regulatory Compliance, Erosion and Sediment Control, Noise and Vibration, Heritage and Ecology.

Relevant construction personnel will attend the EnviroEssentials programs for Legal and Regulatory Compliance. This will include those people in roles in a position of leadership and influence including site engineers, supervisors and construction managers.

In addition to specific training, a mandatory site specific site induction will be held for all construction personnel to ensure they understand the specific site requirements. The induction will include as a minimum:

- Approved Construction Hours (including arrival and departure times)
- Erosion and sediment control plans and procedures
- Approved traffic routes
- Noise restrictions and monitoring
- Site noise controls
- Sensitive receivers (including residential and special use areas)
- Site rules in relation to parking and general behaviour of staff

- Waste reduction, re-use and recycling
- Potential Green and Golden Bell Frog Habitat
- Heritage constraints

10 Organisation and Responsibilities

Environmental management on the Project will be under the control of the Project Manager. The day-to-day environmental management duties will be provided by the site Environmental Manager (EM). The site EM will liaise directly with the LCPL NSW Branch Environmental Manager to ensure the Project is meeting all its corporate, contractual and legal environmental requirements.

The responsibilities for environmental management are as per the Sydney Ports' CEMPF. These and other roles are expanded upon further as follows:

Project Manager

Overall accountability for compliance with all applicable environmental legislation, conditions of approval and Contract obligations.

Environmental Manager (EM)

Implement the project environmental management system and CEMP.

Ensure that all Project environmental obligations are met.

Facilitate environmental induction / training.

Coordinate response to all environmental incidents.

Manage sub-consultants where necessary.

Prepare documentation to demonstrate compliance and report on compliance.

Conduct site inspections and system environmental audits.

Ensure corrective actions are implemented.

Liaise with the Sydney Ports Environmental Representative (SPER) for environmental matters on site.

Stop work immediately if an unacceptable impact is likely to occur or to require other reasonable steps to be taken to avoid or minimise any adverse impacts. In the event of stopping works, notify Sydney Ports and LCPL NSW Branch Environmental Manager within 24 hours.

Construction Manager

Responsible for compliance with all applicable environmental legislation, conditions of approval and Contract obligations.

Area Manager / Project Engineer

Directs and implements on-site environmental management measures across all sites.

Site Superintendent

Manages on-site construction in relation to environmental management for their site. Reports to the Project Manager or Construction Manager any non-compliance against set criteria.

Site Foreman

Manages on-site construction in relation to environmental management for their site. Reports to the Site Superintendent or Area Manager any non-compliance against set criteria.

Sydney Ports Environmental Representative

Reviews the CEMP and amendments to the CEMP in conjunction with other Sydney Ports personnel.

Liaise with LCPL site Environmental Representative for all environmental matters and incidents.

Conduct inspections on site where necessary.

Carry out environmental audits of the project.

LCPL NSW Branch Environmental Manager

Provides assistance where necessary in the management of environmental matters on the Project.

Provides information / direction on environmental matters that have arisen on other LCPL projects which are pertinent to the appropriate environmental management on the Project.

Gives guidance where necessary on environmental matters that directly influence the environmentally safe running of the Project.

11 Emergency Contacts and Response

A 1800 has been established for the project, and will be available 24 hours a day, seven days a week. The contact details are as follows:

Project telephone no.: 1800 708 228

A LCPL delegated personnel will have the authority to stop or direct works in an emergency situation. Procedures as detailed in the project Safety Plan and Incident Management Plan will be followed in the event of an emergency.

Other contact details for the project include:

Email: ilcenfield.project@sydneyports.com.au

Mail: PO Box 117, Enfield NSW 2136

012 Environment

12.1 Consult & Communicate

12.1.1 Communicate environmental requirements

Description

Communication with the work force and other Project Personnel on environmental issues is necessary to ensure compliance during work activities.

Roles

Environmental Manager, Engineer, Safety & Health Manager, Project Personnel, Foreman

Process

Shift pre-starts

Prior to each work shift a pre-start meeting will be held. These pre-starts are usually chaired by the Foreman with input provided by other Foreman, the Engineers, the Safety & Health Manager, the Environmental Manager and any other person on the project. The pre-start will provide relevant information to Project Personnel on the hazards / issues that may be expected during the course of the shifts work. If there is expected to be environmental hazards / issues whilst carrying out activities these will be discussed.

It is encouraged for Project Personnel to provide feedback on possible environmental issues that may arise during work activities.

Toolbox talks

Toolbox talks are held when issues of an important nature have occurred or changes to work conditions have been recommended / highligted and information is to be disseminated to the work force. The issue may be a project based matter or come from sources outside of the project.

The toolbox talk will be recorded on a Toolbox Talk Record sheet with all attendees printing and signing the sheet.

Tools

12.1.2 Establish Environmental Committee

Description

The advice provided to a project or workplace team on environmentally related matters and issues.

Roles

Environmental Manager, Project Personnel

Process

A Safety, Health and Environmental Committee will be set up for the Early Works, so that all safety, health and environmental matters are dealt with at the same meeting.

Election of the Committee

Interested Project Personnel can put themselves forward as a member of the committee, with as many members taken from the different disciplines on the project as practicable.

The site Environmental Manager or his delegate will be part of the committee to ensure information on environmental matters applicable to the construction works are discussed.

The personnel on the committee will alter during the progress of the works to ensure members come from the new disciplines at that point in the construction works.

Functions of the Committee

The environmental component of the committee's functions is to assist the project team or workplace team in protecting the environment, minimising pollution and respecting the local community through facilitating sound environmental management practices, including the following:

- Assess and review risks to the environment arising from work.
- Make recommendations about measures to eliminate or control risks.
- Introduce or alter the procedures for monitoring risks to the environment.
- Propose changes to work premises, systems, methods, plant or substances that may affect the environment.
- Analyse incident investigations.
- Make decisions about the procedures for consultation on environmental matters.
- Assess and review permits and licences as applicable and conformance with requirements.
- Recognise and reward individual and team efforts on environmental performances.
- Promote project achievements.

Conducting meetings

At its first meeting, the Committee will appoint a chairperson, establish a constitution and agree the regularity of subsequent meetings, but will be at least every three months.

Documents will be made available to the committee where necessary, to allow feedback with the following items provided for information:

- Incident review.
- Corrective actions.
- Trend analysis.

- Changes to legislation, standards or site rules.
- Changes to the workplace or work methodologies.
- Inspections and audits, including by regulatory agencies.
- Nominations of awards / recognition.
- Material developed for internal or external promotion of project achievements.

Distribution of minutes

The nominated person will take minutes of the meeting and distribute them to:

- all members of the committee (both attendees and absentees)
- all noticeboards
- the Project Manager

Tools

Environmental Committee Meeting Minutes Template
Project Committee Members

12.2 Identify & Assess

12.2.1 Environmental Risks, Aspects and Impacts

Description

Environmental risk identification and assessment provides a way of mitigating a foreseeable risk from determining the consequence and likelihood of an outcome.

Roles

Environmental Manager

Process

The ongoing determination of environmental aspects and impacts will be achieved through a risk management process. The process results in the development of environmental risks and a corresponding mitigation strategy. The risk is based on the environmental aspect, the scale of the impact, the type of potential impact and the likelihood of the occurrence.

An outline of the project wide environmental aspects and impacts identified are included as Appendix C to this CEMP. Management strategies for each are referenced as part of Environmental Management Plans, ECMs and project procedures.

The environmental risks will be reviewed by the site Environmental Manager as part of the overall review of the project. This will be carried out at least every six months or prior to a major change in work activities.

Environmental risk assessments also form part of the Safety, Health and Environment Work Method Statements (SHEWMS) procedure whereby activities are documented and controls are put in place to mitigate the proposed risk.

Tools

12.3 Implement Controls

12.3.1 Air quality

Description

Air quality can have major impacts on human and environmental wellbeing. Management principles are designed to reduce and control the effects of air pollution generated from site activities on adjacent receptors, travelling public, workers and flora and fauna.

Roles

Environmental Manager, Foreman, Project Personnel

Process

Air quality sensitive receptors for the project

The locations of sensitive receptors for the project have been detailed in the Project's EA. These are detailed in the Air Quality / Dust Management Plan.

Monitoring air quality

- In accordance with the Project Approval, Sydney Ports Corporation has installed two dust monitoring stations for the project, one at the north west portion of the site and one in the south east portion of the site
- These stations monitor impacts at the residential sensitive receptors to the north-west and south-east of the site
- Monitoring has previously been undertaken for PM10 at these two stations and will form a baseline for the construction phase of the project. Real time monitoring will continue at these locations with data being made available to LCPL during the construction phase and any issues that arise being investigated by LCPL
- A meteorological station is co-located with the dust monitoring station in the south east of the site
- The Environmental Manager will be responsible for monitoring the real-time data and informing Project Personnel and Foreman.
- Further information on this is contained in the Air Quality / Dust Management Plan

Mitigation of air quality impacts

- Strategies for controlling dust that will be employed for the early works include the use of water carts, reduced speeds, signage to vehicle drivers and plant/equipment and barriers
- Watering of roads and stockpiles will be carried out and the retrieval of deposited dirt from sealed access points and affected roads with street sweepers will be carried out
- All dust-generating activities will be monitored and inspected daily
- Stockpiles will be situated away from sensitive receptors and stabilised if they will be left longer than a month
- Burning of vegetation or materials onsite is prohibited
- Allowances will be made for wind direction and high wind warnings during working hours.
- Cleared areas on site will be progressively rehabilitated and stabilised to reduce air pollution, as soon as is practical
- Any unreasonable release of odours, dust and smoke to the atmosphere will not be allowed
- All construction related plant and vehicles will go through a wheel-wash before exiting the site

Further guidance is provided in the Air Quality / Dust Management Plan.

Tools

SafetyLaw & EnviroLaw

12.3.2 Asbestos

Description

Asbestos is found in many forms - as sprayed insulating coating on steelwork and concrete, lagging on pipes and boilers, insulation board in walls and on doors and ceilings, asbestos cement for roof and wall coverings, pipes and tanks, decorative plasters, asbestiform mineralogy.

Roles

Environmental Manager, Supervisor, Project Personnel, Contractor

Process

Asbestos Management Plan

Legislative compliance requires that an Asbestos Management Plan (may be documented as a Remediation Action Plan - RAP) is to be developed for the project where the presence or risk of exposure to asbestos has been identified. Currently Sydney Ports has various documents for the project with the document 'Remediation Action Plan for Known Soil Contamination Intermodal Logistics Centre @ Enfield' being used for the purpose as an Asbestos Management Plan.

Managing known sources of asbestos

Asbestos previously existed on the site but has now been remediated. Asbestos contamination has been contained in a number of containment cells and capping areas as shown in Sydney Ports CMP for Construction. The capped areas and containment cells will not be impacted during the course of construction. However, if a design change occurs that may have an impact on this area, the requirements of the CMP for Construction will be complied with.

Some bonded asbestos material has also been discovered in the existing Building 31, to be used as LCPL's Main Site Office. This identified asbestos will be removed by a licenced contractor and disposed of at an appropriate licensed facility.

Although the site has been remediated there is the possibility of unexpected asbestos being found at the site during construction. If asbestos is found elsewhere, an exclusion zone will be provided around the area and a Licensed Contractor will be used to remove the contaminant. If asbestos is known to be in the vicinity of construction activities, the Supervisor and other Project Personnel including the workforce will be notified to ensure correct techniques are included in the SHE Work Method Statement (SHEWMS) for the task. If asbestos in soil is identified, remediation works will be undertaken in accordance with the Contamination Management Plan for Construction which is appended to Sydney Ports' CEMPF.

Waste testing and tracking

Any asbestos unearthed on site will be tested in accordance with the relevant legislation requirements. Depending on the concentrations of the asbestos material found, the course of action will be as per the requirements in the Sydney Ports document - 'Remediation Action Plan for Known Soil Contamination Intermodal Logistics Centre @ Enfield' and the Contamination Management Plan for Construction attached in Sydney Ports' CEMPF.

Any asbestos material which needs to be disposed of off site will be sent to a licensed landfill facility. The material will be tracked using waste tracking records.

Contractors who are handling and disposing of waste will be suitably licensed and will be aware of safety and environmental requirements for handling and disposal. All disposal dockets will be provided to the site Environmental Manager as a record of disposal.

All test records and waste disposal records for asbestos will be kept for at least seven years.

Tools

SafetyLaw & EnviroLaw

12.3.3 Contaminated land

Description

Describes the process for identifying and managing contaminated land on the project site.

Roles

Environmental Manager

Process

Identifying contaminated land

Due to the previous uses of the site, different contamination types were found in some parts of the site. However, remediation of the Sydney Ports' ILC site was undertaken during 2009 and part of 2010 in accordance with the Remediation Action Plans and Site Audit Statements issued by an accredited Site Auditor under the Contaminated Land Management Act (refer to Sydney Ports' CEMPF for details). LCPL will carry out its works in accordance with the various documents provided by Sydney Ports and identified in Sydney Ports' CEMPF. If unexpected contamination is found during construction, the remediation of affected areas will follow the procedures established in the Soil & Water Management Plan, developed as part of this CEMP and the Contamination Management Plan for Construction.

Mitigation of contaminated land impacts

In addition to managing the constructed containment cells, LCPL will take measures to prevent further contamination as follows:

- Site inspections will be undertaken to determine the presence of unexpected contaminated land, and soil tested to determine contaminants.
- Areas of known existing contamination will be marked on the Constraints map.
- The volume of contaminated material, if any, will be defined during construction.
- Machinery and equipment will be inspected prior to its arrival on site as described in the process 'Inspect plant, vehicles and equipment'.
- If excavation of material is required in contaminated areas, this will be done in accordance with directions from the Site Auditor, Sydney Ports, the requirements of the Contamination Management Plan for Construction and as required by relevant legislation. This type of material will be removed to a nominated site using a waste tracking system.
- Identified contaminated soils will be excavated and stored separately to ‘clean’ soils and volumes will not be altered by ‘diluting’ the impacted soils with clean materials.
- Details of contaminated land control methods will be detailed by the site Environmental Manager in Monthly Environmental Reports.
- Treatment of spills will be managed as per the process 'Report environmental incidents'.

Further guidance regarding Contamination Management is provided in the Soil & Water Management Plan (SWMP). The SWMP also includes Sydney Ports' Contractors Obligations for Excavation for ILC at Enfield and the Unexpected Find Procedure.

Tools

SafetyLaw & EnviroLaw

12.3.4 Cultural heritage - Indigenous

Description

Management of Aboriginal and Torres Strait Islander cultural heritage is a statutory requirement. Cultural heritage is defined as areas, objects and places displaying archaeological or historic significance. This includes objects situated on or under the surface of the land. In addition, the EPBC Act 1999 lists Commonwealth interests as issues in Environmental and Cultural Heritage management.

Roles

Environmental Manager, Foreman, Project Personnel

Process

Existing Indigenous environment

It is not anticipated that indigenous heritage items will be found during the course of construction with the likelihood of disturbing indigenous artefacts, highly unlikely due to previous disturbances on the site.

Mitigation of cultural heritage impacts

LCPL will take the following measures to mitigate impacts on indigenous cultural heritage:

- Should any potential indigenous heritage items be discovered during the course of the works, the works will cease immediately, barriers / para-webbing will be provided around the affected area and Sydney Ports and DECCW will be notified. Consent for disturbing any indigenous objects or artefacts will be necessary from DECCW (NPWS) before any works recommence in accordance with Section 90 of the NP&W Act 1974.

Duty of Care

Project Personnel will take all reasonable care not to damage items of indigenous cultural heritage if found on site.

Discovery of heritage item/s

When any heritage item is discovered during construction, the following steps will be taken:

1. Work will cease and care taken to minimise further disturbance.
2. The Foreman will be notified immediately, who will then report the find to the site Environmental Manager.
3. The area will not be disturbed until an assessment is completed, an inspection undertaken and direction to proceed from DECCW and Sydney Ports provided.
4. The exact location of the discovery will be photographed.
5. All relevant management measures to protect the site will be implemented, eg. restrict access to the area to prevent further disturbance, erect barriers and proceed with protective measures.

Tools

12.3.5 Cultural heritage - Non-indigenous

Description

Management of cultural heritage is a statutory requirement. Cultural heritage is defined as areas, objects and places displaying archaeological or historic significance. This includes objects situated on or under the surface of the land. In addition, the EPBC Act 1999 lists Commonwealth interests as issues in Environmental and Cultural Heritage management.

Roles

Environmental Manager, Stakeholder & Community Relations Representative, Foreman

Process

Existing heritage items

A number of heritage items are located on the ILC Site. The Pillar Water Tank and the Pedestrian Footbridge are designated for relocation by Sydney Ports prior to LCPL commencing on site. In accordance with the Project Approval, the Pillar Water Tank will be relocated to the south of the site and the footbridge will be relocated off the site to a heritage organisation. No other known heritage items are located within the project footprint.

Mitigation of cultural heritage impacts

- Fence off and provide signage around known heritage items
- The site Environmental Manager or site Stakeholder & Community Relations Representative will liaise with the appropriate Sydney Ports' personnel to obtain information on any other culturally significant areas or objects on the project.
- All recorded known areas to be shown on a control map.
- Ensure protocols exist for communication of newly discovered artefacts / objects / areas and the process for the project to proceed to afford these areas adequate protection.
- Management protocols for a cultural heritage area shall be in accordance with the relevant Sydney Ports' heritage procedure (as per the Heritage Protection Plan attached in Sydney Ports' CEMPF).

Duty of Care

Duty of care exists under the Heritage Act 1977 legislation for non-indigenous heritage and requires prevention of damage unless instructed otherwise to proceed.

Discovery of heritage item/s

When any heritage item is discovered during construction, the following steps will be undertaken:

1. Work will cease and care taken to minimise further disturbance.
2. The Foreman will be notified immediately, who will then report the find to the site Environmental Manager who in turn will notify Sydney Ports and/or DECCW.
3. The area will not be disturbed until an assessment is completed, an inspection undertaken and direction to proceed provided.
4. The exact location of the discovery will be photographed and documented.
5. The site will be protected by the erection of barriers / para-webbing and managed to restrict access to prevent disturbance of materials or the site and to proceed with other protective measures.

Tools

12.3.6 Erosion and Sediment control

Description

The effects of poor management of erosion and sediment control can lead to pollution and potential prosecution. This procedure describes the process to be used to guide the implementation and operation of erosion and sediment controls on the project.

Roles

Environmental Manager, Construction Manager, LCPL NSW Branch Environmental Manager, Project Personnel

Process

This process covers the key principles of planning, design, construction and operation of erosion and sediment controls.

These key principles are expanded upon in the Soil & Water Management Plan, developed as part of this CEMP.

Approach to Erosion and Sediment Control

LCPL's policy is to eliminate and minimise erosion first and control sediment second.

Other factors that influence this approach include:

- The local environment, in particular the frequency, intensity and duration of rainfall events, the proximity to local waterways and their environmental protection status.
- Local terrain and geographical constraints.
- The construction staging of the project.
- The scale of earthworks on the project, which have a higher risk with large cut, fill and earthworks operations.

These factors have been considered in the project risk assessment. The environmental risk assessment is led by the site Environmental Manager, with input from the Construction Manager and other Construction personnel where required.

Planning

Key planning considerations are:

- Preventing erosion through limiting disturbance, staging access controls, location of materials storage areas and the use of ground cover
- Avoid the need for erosion control by diverting runoff around site
- Control water on site to minimise concentrated and high velocity flows
- Plan construction activities so that soil exposure and other potential risks can be eliminated and permanent controls can be installed during the early stages of construction
- Staging of controls to allow for the dynamic nature of some construction works
- Rehabilitate areas as soon as practicable to minimise exposure of bare areas in conjunction with permanent landscaping works
- Ensure all erosion and sediment controls are kept in a properly functioning condition until all works are completed and the site is rehabilitated.

Design of Controls

The site Environmental Manager will manage the design of the Erosion and Sediment Controls.

Key Design Considerations are:

- Ensuring there is no pollution of external waters.
- Use of industry best practice guidelines - in general, the ‘'Blue Book" - Managing Urban Stormwater: Soils and Construction (Landcom, 2004) is recognised as the industry ‘'best practice" design manual.
- Discharge only in accordance with water quality criteria for the site.
- Industry best practice and lessons learned from previous projects.
- Consultation will be undertaken with the Construction Team and where necessary Sydney Ports and relevant authorities to ensure any specific requirements are integrated into the design.
- Where practical, temporary sediment basins will be located in the same location as the permanent detention basins and will be shown on Erosion and Sediment Control Plans (ESCPs).
- The Erosion and Sediment Control Plans will include the following detail: volumes of the basin, outlet structure detail, spillway detail, compaction rates, maximum wall slope and materials to be used in construction.
- The use of physical controls (eg use of barrier fences) to restrict access to certain areas

Construction of Controls

The Construction Manager is responsible for ensuring Erosion and Sediment Controls are constructed in accordance with the design and relevant standards.

Key construction considerations are:

- Basins are to be constructed in accordance with Managing Urban Stormwater: Soils and Construction (Landcom, 2004) (the ‘Blue Book').
- The site Environmental Manager will check to ensure sediment basins are built according to the design and will report any deficiencies to the Construction Manager
- Sediment controls fences are installed correctly
- Ensure entry and exit points are adequately stabilised with crushed aggregate / hardstand / rumble grids
- All vehicles and equipment directly associated with the construction works must pass through a wheel wash prior to leaving the site.

Operation of Controls

The Construction Manager will ensure corrective actions as identified by the site Environmental Manager during routine inspections are implemented and that approval to discharge by the site Environmental Manager is obtained prior to release of treated water to the environment.

The three key operational areas are:

- ***Ongoing Inspection and Maintenance of Sediment Controls*** - Formal Inspection to be undertaken weekly and the day after heavy storm events by the site Environmental Manager. This will guide and prioritise the maintenance programme so that key risks are mitigated.
- ***Treatment of Sediment Laden Water to enable discharge*** - this is to be achieved by settlement (over time) or accelerated settlement using Gypsum (preferred), Alum, or other suitable flocculants.

- ***Discharge to the environment*** - Water quality must be of a satisfactory standard and must comply with the discharge limits specified. Prior to discharge the site Environmental Manager must be notified to arrange the necessary testing prior to discharge to ensure compliance with the water quality criteria.

Water quality discharge criteria for the site will be 50ntu for turbidity and pH between 6.5 and 8.5 with no visible oil and grease.

DISCHARGING DIRTY WATER TO THE ENVIRONMENT IS A CRIMINAL OFFENCE - IF IN DOUBT SEEK ASSISTANCE FROM THE ENVIRONMENTAL MANAGER

Training and Awareness

The site Environmental Manager will be responsible for organising the delivery of training packages and will be assisted by the LCPL NSW Branch Environmental Manager.

To help improve the education and awareness of personnel that are involved on a day to day basis the following will be considered for implementation:

- *Toolbox Talks* - for site personnel to address site specific day to day issues, following incidents and to communicate opportunities for improvement
- *Formal Site Practical Training* - for site personnel involved in the planning, installation and maintenance of erosion and sediment control features
- *Formal Planning and Design Training* - for Project Personnel involved in the planning and design of erosion and sediment controls

Tools

Environmental Checklist

12.3.7 Fauna and flora

Description

All native animals are protected under the NSW legislation - National Parks & Wildlife Act 1974 and the Threatened Species Act 1995 and the Federal legislation - Environment Protection Biodiversity Act 1999. The Acts list vulnerable species for which a permit is required if disturbing or relocating them. Protected flora species are listed to protect ecosystems and bioregion areas where associations of plant species are under threat by development during clearing.

Roles

Environmental Manager, Sydney Ports Consulting Herpetologist

Process

The EA for the project (October 2005) indicated that the ILC site is a highly disturbed area with very little original topography or original vegetation remaining.

It indicated that none of the plant communities in the site constituted threatened species or ecological communities, as no plant species that were listed on either TSC Act or the EPBC Act were recorded within the ILC site.

Similarly, due to the high disturbed nature of the site there was no indication of any native fauna on the site. The only threatened species recorded was a Grey-headed Flying Fox flying overhead which was not roosting or feeding in the area.

Although Green and Golden Bell Frogs (GGBF) were not observed on the site during studies carried out for the EA, potential GGBF habitat is located on the site. The potential habitat will be managed as set out in Sydney Ports 'Frog Management Plan and Frog Protection Plan'. Potential GGBF habitat within the site has already been provided with frog protection fencing. LCPL will inspect and maintain the existing frog protection fencing. Information will be provided within the site inductions to ensure Project Personnel are aware of the location of the potential GGBF habitat and the management process for the GGBF.

The overall management of fauna and flora on the project site is the responsibility of the site Environmental Manager.

Identifying endangered species and sensitive areas

If there are sightings of rare or endangered flora or fauna species on site photographs will be taken, if possible, and the sighting recorded. The site Environmental Manager will be notified to ensure the sighting is notifiable.

If endangered species of fauna or flora are encountered the area will be cordoned off to protect them until removed and/or relocated if possible.

Areas of specific sensitivity, including the location of the potential GGBF habitat, will be identified and illustrated on the site constraints map. This information will be conveyed to the workforce during site inductions, toolbox talks and pre-start meetings.

Mitigation of impacts

- All clearing operations will follow the Vegetation Removal Procedure.

- Any native vegetation existing at the southern part of the site (at the heritage precinct and Frog Habitat Creation Area (except frog ponds area)) will be retained in accordance with the Flora and Fauna Management Plan.
- Project personnel will be instructed to check for any trapped wildlife in excavations or under stockpiles of materials. This issue will be covered in the project induction so employees are aware of dangers to both themselves and the trapped wildlife.
- Parking will be allowed in designated areas only and drivers of vehicles will be instructed to stay within these designated areas which will be fenced off from the rest of the work site.
- Frog inspection and clearances will be carried out before works are undertaken and in accordance with the Frog Protection Plan.
- Weeds will be removed in accordance with the Flora and Fauna Management Plan.

Liaison with Wildlife groups

- Communication with outside groups (eg. WIRES and Sydney Ports Consulting Herpetologist) will be coordinated through the site Environmental Manager.
- The contact details for WIRES is 1800 641 188.

Weeds and pests

It was noted that there are a number of weed species within the site area identified in the EA. The Flora and Fauna Management Plan will be used to facilitate the control of weeds.

Managing injuries to animals

- Any injuries or fatalities to wildlife caused by work activities, and their treatment, will be recorded.
- Employees will be instructed not to handle wildlife unless appropriately trained.
- A veterinarian or Wildlife Officer from a suitably qualified agency like WIRES will be phoned to treat / remove badly injured animals.
- Wildlife Handlers will be required to sign off their on-site duties against any fauna handled and /or removed for treatment to a vet or wildlife shelter.
- In accordance with the FPP, Sydney Ports Representative / Sydney Ports Consulting Herpetologist to be contacted if live or dead GGBF found.

The issue, mitigations and monitoring of fauna and flora are further expanded upon in the Flora & Fauna Management Plan, developed as part of this CEMP.

Tools

Environmental Checklist
SafetyLaw & EnviroLaw

12.3.8 Groundwater quality

Description

Groundwater is the water located beneath the ground surface. The level of the water table on the project is anticipated to be below excavations except for piling operations.

Roles

Environmental Manager, Area Manager, Foreman

Process

The Early Works are not likely to intercept the groundwater table, except for the construction of the bridge bored piles. If excess water is produced from the bored piling, it will be re-used on site wherever possible

To minimise the possibility of groundwater contamination the following mitigation measures will be used:

- Concrete washdown areas are to be constructed for concrete washout of agitators, pumps and other concrete equipment.
- Concrete washdown pits are to be constructed and operated in accordance with DECCW guideline "Environmental Best Management Practice Guideline for Concreting Contractors" (DEC, 2004).
- During excavation works the excavated areas will be inspected by the Foreman and/or Area Manager to ensure groundwater table has not been reached.
- SHEWMS will provide details on the procedures required if the groundwater is intercepted during excavation. Assistance will be provided by the site Environmental Manager where necessary.

Groundwater is further discussed in the Soil & Water Management Plan, developed as part of this CEMP.

Tools

Water Release Approval

12.3.9 Noise and Vibration

Description

Describes the measures to be taken to control noise and vibration on the project.

Roles

Environmental Manager, Area Manager

Process

The EA for the project assessed the noise and vibration impacts during the construction of the Early Works.

Noise

The EA indicated that construction noise has the potential to exceed criteria during some activities.

Refer to the Noise and Vibration Management Plan for details of the mitigation measures associated with the noise impacts for the project.

Vibration

The EA indicated that the vibration caused by the different activities during construction activities would be negligible at the nearest sensitive receivers.

LCPL will carry out Dynamic Compaction trials to determine the potential vibration impacts and mitigation measures during the ECI Services. The responsible Area Manager and site Environmental Manager will coordinate this task.

Refer to the Noise and Vibration Management Plan for further details of the mitigation measures associated with the vibration impacts for the project.

Tools

12.3.10 Waste management

Description

A general environmental duty of care exists to manage and control waste materials. Note: Asbestos waste management requirements is include in Section 12.3.2.

Roles

Environmental Manager, Contractor

Process

The DECCW Waste Management Hierarchy will be implemented for the Early Works: avoidance of unnecessary resource consumption, resource recovery (including reuse, reprocessing, recycling and energy recovery), and disposal. Waste in and waste out will be measured to determine the percentage by which waste outputs have been reduced.

The following will be adhered to:

- Protection of the Environment Operations Act 1997.
- Waste Avoidance and Resource Recovery Act 2001.
- Protection of the Environment Operations (Waste) Regulation 2005.
- Protection of the Environment Operations (General) Regulation 2009.
- DECCW Waste Classification Guidelines.
- NSW Government (DECCW) Waste Reduction and Purchasing Policy (WRAPP).

Mitigation of waste

Waste management principles and mitigation measures are further discussed in the Waste, Reuse and Recycling Management Plan, developed as part of this CEMP.

The Environmental Manager will implement the following controls to mitigate project waste:

- Identification of possible waste streams generated by the project and management opportunities (e.g. avoid / reuse / recycle).
- Provision of the appropriate number and types of bins onsite for each of the different types of waste. Bins will be clearly marked and monitored for cross-contamination of wastes.
- Disposal of any hazardous wastes according to legislative requirements.
- Tracking of disposal of hazardous wastes or goods through dockets and manifests.
- Salvage and reuse of materials (electrical cables, fences) and recycling wherever possible.
- Recycling of waste oils and disposal of waste tyres at approved locations only.
- Details of waste disposed of and recycled will be recorded in the monthly Environmental report to Sydney Ports.
- Treated timbers, which contain arsenic and pesticide treatments, and/or contain chlorine residues, will be managed and disposed of appropriately.

Waste management principles and mitigations are further discussed in the Waste, Reuse and Recycling Management Plan, developed as part of this CEMP.

Waste management licenses, permits and approvals

The following will be observed in regards to licenses, permits and approvals:

- Asbestos Contractor will be appropriately licensed to undertake asbestos removal works
- The disposal of regulated waste materials require a licence
- Manage excavated spoil in accordance with Sydney Ports Contamination Management Plan for Construction (attached in Sydney Ports' CEMPF) as required, to ensure it is suitable for future land use of the site
- Asphalt and concrete are not regulated wastes.
- Radioactive materials such as certain types of batteries or electronic equipment require a licence to remove.
- Nuisance laws exist to limit littering around sites and are a general duty of care provision.
- Hazardous materials and pollutants require tracking documentation.

Waste removal

At completion of the project:

- waste piles will be removed from site to the correct receiving facilities
- specialised bins will be emptied, waste tracking dockets received, and all bins and skips returned to owners
- all project lay-down areas will be cleared of items and waste
- the site office area will be cleaned and all items and waste removed.

Tools

Environmental Checklist

12.4 Review & Monitor

12.4.1 Inspect site - environment

Description

Environmental site inspections are used to identify hazards and deficiencies and assess compliance against regulatory requirements and best practice processes and intiatives. Environmental site inspections will cover all aspects of the project works.

Roles

Environmental Manager, Project Personnel, Foreman

Process

Daily inspections

All Employees are to conduct a daily visual site inspection of their area whilst on site and report any environmental hazards to their Supervisor by using the Passport Hazard Report (part of LCPL Hazard Reporting system, see OH&S and Rail Safety Plan for more details) facility or verbally informing their Supervisor of a deficiency.

Each Foreman will conduct a visual site inspection of work areas every day to ensure any potential environmental hazard or deficiency is identified, assessed and controlled as required.

The relevant points from the inspection will be recorded in the Foremans Daily Diary and/or by issuance of a Passport Hazard Report.

Weekly and monthly inspections

A Weekly Site Inspection Checklist and Monthly Site Inspection Checklist (refer CEMP Appendix D) is to be completed as a record of an inspection by the Environmental Manager and/or other appropriate Project Personnel including Foremen and Engineers. The checklists provide prompts to allow for the recording of implemented controls and/or deficiencies or lack of environmental controls.

Any environmental hazard or deficiency identified during the inspection will be managed and recorded through Cintellate (LCPL's hazard reporting and tracking software system, which manages inspections, close-out and trend reporting). The Environmental Manager will follow up the deficiency and close out when actions are complete.

The Safety, Health and Environmental Committee will have access to the inspection reports where required for follow up during meetings.

Leighton Contractors Branch inspections

The Leighton Contractors NSW/ACT/NZ Branch Representatives will perform four inspections per year on the project. The inspection will consist of a walk-around of the project site areas. Findings will be recorded on the Workplace Inspection checklist and relevant personnel advised of the findings.

Senior Management Walk and Talk will be conduted as detailed in the process 'Conduct senior management walk and talk' on the Leighton Way. Findings will be provided to project personnel.

Sydney Ports or regulatory body inspections

Sydney Ports representatives will inspect the project where necessary. Environmental findings from these inspections will be provided to relevant Project Personnel and the Environmental Manager to discuss and disseminate to appropriate persons.

Regulatory bodies may inspect the project where they believe it is deemed necessary, usually following a complaint or the like. Actions to rectify deficiencies will be undertaken where required.

Inspections of Sub-Contractors activities

In addition to the system audit / surveillance carried out on the Sub-Contractor's activities, the Foreman may carry out inspections of all works in progress to assess Sub-Contractors environmental performance. Sub-Contractors will be required to participate in environmental audits and inspections of their activities.

If Sub-Contractor work on site is being performed contrary to the applicable environmental processes in place and/or applicable legislative requirements, action to remedy the situation will be undertaken immediately. This may include a direction to stop if necessary.

Environmental Representative inspections

The Environmental Manager will undertake fortnightly inspections of the site with the Sydney Ports Representatives to determine compliance with the MCoA and other environmental requirements.

The Environmental Manager has the authority to stop works until the appropriate controls are implemented.

Independent Site Auditor Inspections

Sydney Ports' Independent Site Auditor will undertake an annual inspection of the site as part of the annual audit against MCoAs and CEMPs.

Tools

Environmental Checklist

12.4.2 Environmental baseline and condition monitoring

Description

Baseline readings of environmental aspects are undertaken prior to commencing works. 'Compliance monitoring' then compares those readings to the observed conditions while work is in progress. This continued monitoring establishes compliance levels.

Roles

Environmental Manager, Consultant

Process

Environmental monitoring has been undertaken for the project as detailed in the project EA, October 2005. This background monitoring will be taken as a baseline as detailed in Chapter 11 of the EA for noise and Chapter 12 of the EA for dust.

During the Early Works, the Environmental Manager may determine that additional monitoring should be undertaken to provide additional baseline monitoring data before the Main Construction phase. This will be organised and run during the Early Works phase, with special attention to ensuring construction works during this phase doesn't affect this background data.

Noise

Noise monitoring in the EA was undertaken at six residential locations around the periphery of the site. This monitoring will be taken as the baseline. Some additional baseline noise monitoring may be undertaken by Leighton Contractors' Noise Consultant to verify existing background levels and develop Construction Noise Impact Statements (CNIS). These CNIS may be submitted to the Department of Planning as supporting information for Out of Hours Approval request.

For details of compliance monitoring, refer to the Noise and Vibration Management Plan.

Dust

Dust monitoring PM10 has been undertaken at two locations in the north and south sections of the site. This monitoring will be taken as a baseline whilst works are being carried out on the site.

For further details of ongoing PM10 monitoring, refer to the Air Quality and Dust Management Plan for more details.

Vibration

Dilapidation or condition surveys will be performed on sensitive buildings and roads around the periphery of the site, prior to vibration intensive works occurring in an area that may affect this property. These surveys will be undertaken by Specialist Consultants.

These dilapidation survey are discussed further in the Noise and Vibration Management Plan and the Stakeholder and Community Involvement Plan.

Tools

12.4.3 Conduct project internal audits

Description

This procedure describes the process for project internal audits which are part of the continual improvement process used to identify opportunities and ascertain whether systems, processes and products comply with specified, agreed and/or statutory requirements. The procedure for Business Unit audits of Projects is described in the process "Conduct internal audits".

Roles

Systems Manager, Senior Project Team, Client, Supplier, Contractor, LCPL NSW Branch Systems Manager, Auditor, Auditee, Project Team

Process

Auditing approach

Project internal audits will be performed to ensure compliance with:

- statutory requirements
- LCPL requirements
- requirements of the Project Management System

as well as identify opportunities for improvement.

Develop Audit Schedule

The Project Systems Manager will consult with the Senior Project Team and develop a Project Audit Schedule for the project during the project start-up phase using the approved template.

Audit timing and frequency will be planned to suit the status, importance and risk of the activities and areas to be audited. The audit schedule will be based on the significance of risks and results of previous audits and the procurement schedule.

At the project start-up stage, the focus will be on the preparation of management plans to ensure the Client’s requirements as specified in the project agreement are fully addressed. Risks and opportunities will also be fully assessed at an early stage so as to minimise impacts to the project. When proceeding to the construction stage, audits will focus on the review of onsite construction activities. At project close, the focus will be on proper close-out of outstanding and defect items and the proper handover of relevant documentation to the Client for operation and maintenance purposes.

Scope of audits will include compliance to the Project Management System and Leighton Contractors requirements.

If any consultant, Supplier or Contractor managed by Leighton Contractors is applying their own management system, it will be included in the audit schedule.

The Project Systems Manager will issue the Project Audit Schedule to the LCPL NSW Branch Systems Manager as assurance that the project is auditing all of the content of The Leighton Way.

Maintain and Update Audit Schedule

The Project Systems Manager will maintain and update the Project Audit Schedule throughout the life of the project.

The Project Systems Manager will consult with the Senior Project Team and update the Project Audit Schedule by the end of December to cover the coming year (i.e. in December 2009 to cover audit activities in 2010) or up until the end of the project.

Auditor Competence Requirements

Leighton Contractors specifies the following competencies for personnel undertaking audits:

	Desired	Minimum
Auditor Training	Lead Auditor	Internal Auditor
Experience of Subject	3 years	1 year

Where an Auditor does not have sufficient experience in a subject, they will arrange for suitably experienced personnel to help plan and conduct the audit(s).

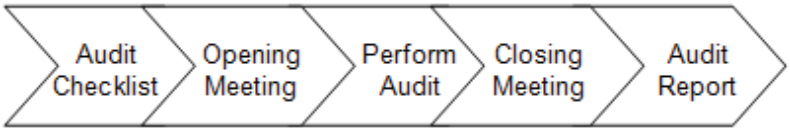
Perform Contractor / Supplier audits

Supplier audits will be performed at intervals dependent on the risk of the product or service.

Audit reports will be retained and a copy forwarded to the project management team. Supplier corrective actions will be reviewed and, if necessary, the audit schedule amended to include more frequent audits of the Supplier.

Audit Process

An audit involves the following stages:



Issue Audit Checklist

The Auditor will review the relevant documentation to prepare a draft Audit Checklist. Before the audit, the Auditor will circulate this checklist to all attendees for comment. Where comments are returned, these will be consolidated by the Auditor who will issue a final Audit Checklist and audit notification to the Auditee.

Perform Opening Meeting

At the start of the audit, an opening meeting will be conducted to establish the communication protocols that will apply during the audit and to introduce and discuss the Audit Plan. The Audit Meeting Attendance Record will be signed off by all attendees.

Undertake Audit

The Auditor will record the audit findings in the Audit Checklist and identify and classify deficiencies or improvements identified during audits as either Observations, Recommendations, or Corrective Action Requests:

- Corrective Action Request - where no process exists to manage a specific aspect of the project, or where a process exists but has not been implemented
- Observation - where a process exists and has been implemented but where there are minor issues, where no process exists but it cannot be demonstrated that it is required

- Recommendation - where there is an opportunity for improvement

Perform Closing Meeting

After collecting, verifying and reporting on findings, the Auditor will conduct a closing meeting to debrief the Auditee with the audit findings and action items for agreement and sign off. The Audit Meeting Attendance Record will be signed off by all attendees.

Issue Audit Report

The Auditor will prepare and issue an audit report that includes an Audit Action List to the Auditee.

The Auditor will raise Corrective Action Requests on Incite as described in the topic "Raise Corrective Action Request".

Observations and Recommendations should be considered for action by the Project Team.

Tools

Audit Entry Exit Meeting Record
Audit Meeting Attendance Record
Audit Register
Audit Report and Checklist
Audit Schedule
Audit Schedule (Word version)
Corrective Action Request (CAR)
Task Observation

12.4.4 Corrective Action

Description

During construction, where environmental issues are identified, corrective actions will be implemented. Where hazards and potential deficiencies are identified, they will be managed using the appropriate environmental system.

Roles

Environmental Manager, Project Manager

Process

An environmental issue may be found through a verification process such as monitoring, inspecting, auditing or receipt of a complaint. The process for managing environmental issues is as follows:

- When an environmental issue is found through inspections, corrective actions will be identified and documented on the Inspection checksheet. This sheet will detail the issue, the corrective and preventative actions proposed and the responsibilities and timing for completion of the actions.
- Where the environmental issue is associated with an audit or monitoring event, the actions will be linked to the record of that event.
- Once an action is complete, the environmental checksheet will be updated to close the action including input of comments and completion date.

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

- Where required, the activity associated with the issue will be stopped and will not recommence until such time as remedial action is taken to eliminate the issue.
- An Environmental Nonconformance Report (NCR) will be documented using the project document management system.
- Where necessary, an incident report will be logged in Cintellate (LCPL Corporate reporting system). The incident will be forwarded to the person responsible for completion of the corrective action.
- Once the corrective action has been implemented the incident will be closed out.
- The incident will be reported in monthly reports provided to LCPL NSW branch.
- The tracking of environmental incidents will be undertaken by the site Environmental Manager or their delegate.
- Appropriate notification of issues of a serious nature will be provided to the relevant authority by the site Environmental Manager or Project Manager.

Tools

12.4.5 CEMP Review

Description

This describes the process for the ongoing review of the CEMP and its associated documents.

Roles

Environmental Manager, Project Manager

Process

The CEMP, its operation and implementation and the associated elements of the accompanying environmental management systems, will be reviewed half-yearly to ensure that the environmental system is conforming with the MCoA, LCPL EMS, LCPL Policy, Legal and Contractual requirements and other associated environmental documents. In addition, if during the project, corrective or preventative actions are raised indicating deficiencies in the CEMP or EMS, this will trigger the review process.

The Project Manager will be responsible for initiating the management review process in accordance with the management review program for the project. The site Environmental Manager is responsible for managing the review and implementing any of the recommendations that arise through the review process and the subsequent amendments to the CEMP and associated documents.

Tools

12.5 Manage Incident

12.5.1 Report environmental incidents

Description

Describes how environmental incidents are classified (as low to high severity) and reported.

Roles

Environmental Manager

Process

Classifying incidents

The reporting of environmental incidents relating to harmful effects is classified into three levels of incident:

- Level 3: Low severity occurrence defined as pollution or degradation with short-term (less than one month) and reversible detrimental effects on the environment and/or community. For example, minor oil spill completely remediated.
- Level 2: Medium severity defined as pollution or degradation with persistent (greater than three months) but not reversible detrimental effects on the environment and/or community.
- Level 1: High severity event defined as pollution or degradation that has or may have irreversible detrimental effects on the environment and/or community, for example, illegal clearing of endangered plants.

The LCPL Incident Management Reporting System - Cintellate, contains more detailed incident classifications.

Recording incidents

- Details of incidents will be entered by the site Environmental Manager or their delegate into the Cintellate Incident Management System as soon as possible following an incident.
- All Level 3 incidents will be reported at project-level only.
- Level 2 incidents will be reported to the Leighton Contractors' NSW Branch Office and to SPC.
- All Level 1 events will be reported to the Leighton Contractors' NSW Branch Office, Corporate Office and SPC. In liaison with Sydney Ports, environmental incidents with actual or potential significant off-site impacts on people or the biophysical environment will be notified to the Director-General as soon as practicable after the occurence of the incident.

Tools

Environmental Incident Register
Environmental Incident Report
SH&E Incident Management System

12.5.2 Manage incidents involving hazardous substances

Description

Describes the management of incidents involving hazardous substances include fire, explosion, spillage, leakage or other escape into the environment.

Roles

Environmental Manager, Safety & Health Manager, Personnel

Process

The Project will maintain an emergency response capability with a suitable number of spill kits available in the event of an environmental spill.

In the event of an incident or near miss involving a dangerous goods spill or leak:

- Personnel will take immediate action to reduce any risk associated with the spill or leak
- the Safety & Health Manager will investigate the incident to determine the likely cause, record the outcome of the investigation and take appropriate remedial actions
- the site Environmental Manager will review the risk assessment as detailed in the project risk register and take appropriate actions to reduce risk.
- excavate or remove contaminated ground (spills up to five litres or less) in a sensitive area, or remedy through an approved process
- the site Environmental Manager will coordinate remediation works through the DECCW if the spill is a Level 2 Medium with a persistent impact over three months
- the site Environmental Manager will conduct soil sampling and monitoring of the cleanup area if required
- the site Environmental Manager will obtain inputs from Consultants if required.

Reporting of spills will be conducted as follows:

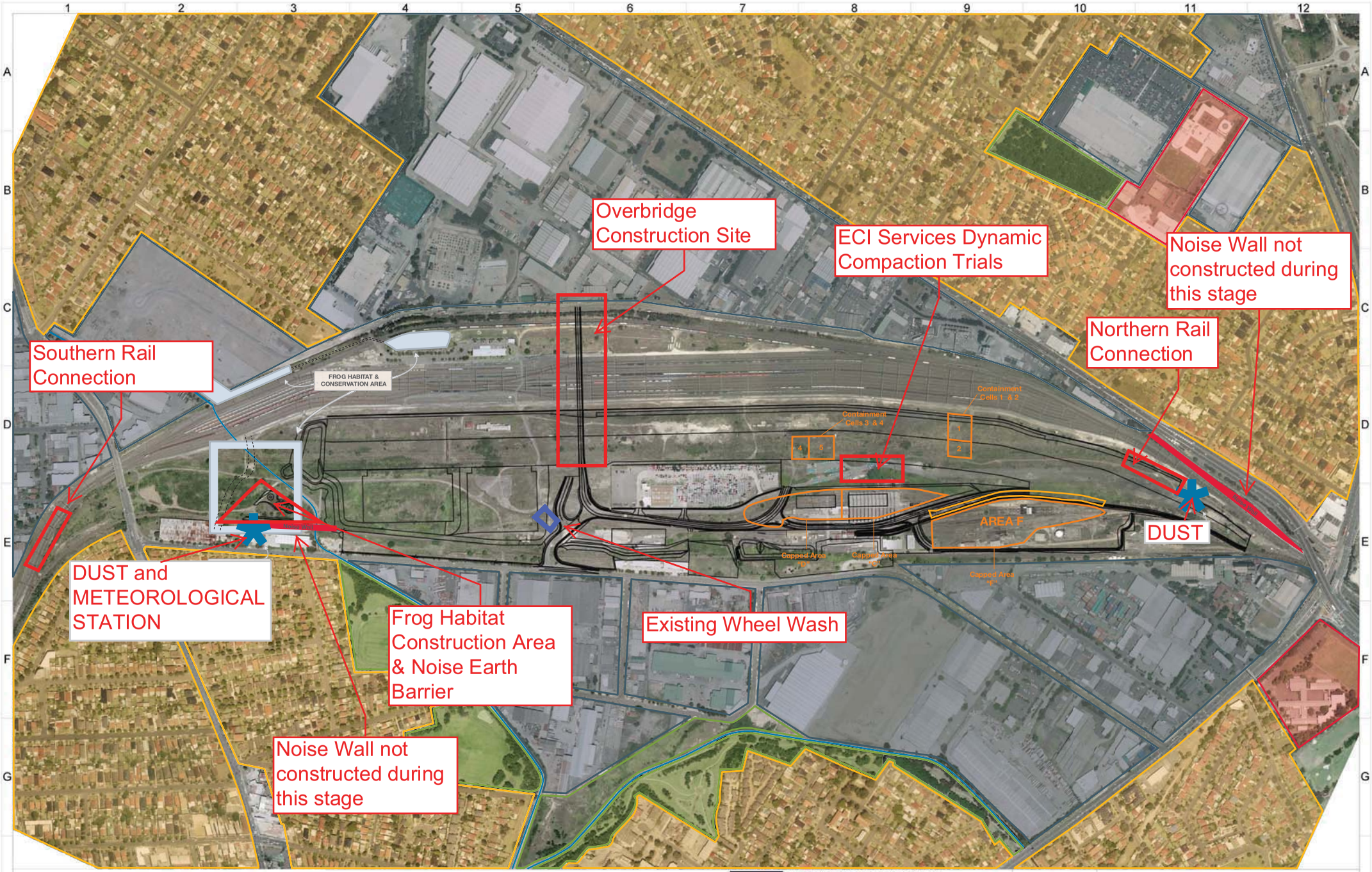
- LEVEL 3: Less than 20 litres will be reported through the internal Cintellate Incident Management System and Monthly Environmental Report.
- LEVEL 2: Over 20 litres will be reported to the Project Director immediately and managed according to the project Emergency Response Plan / Incident Management Plan.
- LEVEL 1: Significant spills / incidents may require upward reporting.

The appropriate authorities will be notified in accordance with the Section 12.5.1 of the CEMP, and Emergency Response procedures as part of the OH&S and Rail Safety Management Plan.

Tools

SH&E Incident Management System

Appendix A: Constraints Map



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ENFIELD INTERMODAL LOGISTICS CENTRE

Constraints Map - Early Works

Appendix B: LCPL Environmental Policy

Leighton Contractors Group Environmental Policy

'CREATING A SUSTAINABLE FUTURE'

Leighton Contractors is committed to environmental sustainability. We strive to balance our economic and operational requirements with social responsibilities whilst minimising the impact of our business activities on the environment and surrounding communities.

To assist us in achieving our environmental objectives we will undertake the following:

- Promote a culture of innovation, engagement and participation;
- Promote the efficient use of energy and water, reduction of waste, recycling of materials and prevention of pollution;
- Improve our energy efficiency and management of our greenhouse emissions;
- Maintain an Environmental Management Systems in accordance with AS/NZS ISO 14001;
- Meet or exceed relevant environmental legislation and other criteria to which we subscribe;
- Regularly review our environmental performance and identify and implement opportunities for improvement;
- Influence our suppliers and subcontractors with our approach towards responsible environmental practices;
- Promote practices, systems, values and behaviours that contribute to environmental sustainability;
- Demonstrate leadership in environmental management both internally and within the industries we operate.

This policy will provide the framework for setting environmental objectives and targets within our business.

P J McMorrow
Managing Director
Leighton Contractors Pty Ltd

Appendix C: N953 CEMP Aspects and Impacts Register

Aspect / Risk Issue	Key Impact / Risk Effect	Risk Analysis			Indicative Mitigation Measures	Environmental Management Documents
		P	C	High Med Low		
Air Quality / Dust	Dust and odour due to: • Clearing/ surface earthworks during worksite establishment and ongoing construction • Clearing/ bulk earthworks • Spoil handling: stockpiling, loading and haulage • Wind erosion of exposed areas and temporary spoil stockpiles • Spoil fines accumulated on sealed areas • Vehicular movements over unpaved areas • Tracking of dirt onto roads resulting in offsite dust generation • Emissions from petrol/diesel driven work equipment and vehicles • Works on contaminated sites	H	M	M	<u>Normal Conditions Mitigation:</u> • Vehicles, equipment, machinery used and all facilities – designed, operated and maintained to control the emission of smoke, dust and fumes. • Induct personnel on air quality and dust control requirements. • Ensure suitable compaction of temporary haul roads. • Height of exposed spoil stockpiles to be restricted to prevent dust risk. • Spraying (water sprays, sprinklers and water carts) of unsealed surfaces and stockpiles with water or other suitable liquids. • ERSED devices cleared of silt on a regular basis. • All disturbed areas stabilised, revegetated and/or landscaped as soon as practicable. • Minimise the extent of disturbed areas. Seal/revegetate as soon as practicable. • Public roads to be kept free of tracked mud/dust. • Truck tailgates to be secure and trucks are not to be overfilled. • Trucks travelling to and from the site carrying dry spoil to be fitted with appropriate covers. • Limit time trenches are open and seal/close pits not being actively worked on. • Check dust monitoring stations. • Check visible dust at sensitive receivers. <u>Extreme Conditions Mitigation:</u> • Modify or cease operations during high winds.	Air Quality & Dust Management Plan

Aspect / Risk Issue	Key Impact / Risk Effect	Risk Analysis			Indicative Mitigation Measures	Environmental Management Documents
		P	C	High Med Low		
Noise and Vibration	Noise and vibration due to: • Piling • Surface earthworks • Truck and vehicle movements (spoil and delivery). • Clearing activities • Road upgrade works	H	H	H	• Works will be carried out within the standard Construction Hours (7am to 6pm M-F, 8am to 1pm Sat) with the exception of works that necessitate out of hours works due to limitations from Authorities. • Where possible, plant and equipment will be located and orientated to direct noise away from sensitive receivers. Existing topography and buildings will be used to increase acoustic shielding to the adjacent receivers where possible. • Site worksites will be designed to minimise the need for reversing movements with all vehicles and self-propelled plant entering and leaving the premises in a forward direction, where possible. Where it is impractical to avoid reversing movements, all steps will be taken to minimise these movements. • Mobile plant and trucks operating on site for a significant portion of the project will have reversing alarm noise emissions minimised, where possible, recognising the need to maintain occupational safety standards • Piling rigs to be fitted with resilient dollies placed in between the pile and the hammer and the hammer may be shrouded to provide acoustic attenuation • Where possible, noisy construction activities to be carried out where least impact will occur on sensitive receivers (e.g. school exam periods). • Construction equipment to be selected, operated and maintained to minimise noise impacts and where necessary fitted with residential grade silencers. • Vehicles, plant and equipment to be turned off when not in use • Operators of plant and equipment informed of noise control requirements and location of closest residents • Liaison with local communities, particularly during evening and night-time works. • Managing construction vehicle routes and speed of vehicles. • Noise and vibration complaint management procedure. • Periodic equipment/plant noise monitoring. • Noise and vibration monitoring at sensitive receivers.	Noise and Vibration Management Plan
Water Quality	Sedimentation/ water pollution	H	H	H	• Appropriately designed erosion control structures (e.g. silt fences, haybales,	Soil and Water

Aspect / Risk Issue	Key Impact / Risk Effect	Risk Analysis			Indicative Mitigation Measures	Environmental Management Documents
		P	C	High Med Low		
and Erosion	due to: • Construction works in high rainfall periods • Slow or ineffective design and/or installation of erosion and sediment control measures • Ineffective maintenance of environmental control measures • Stripping and clearing of vegetation • Stripping and placement of topsoil • Slow rehabilitation/ re-vegetation works • Access/egress points • Concreting operations • Fuel and chemical storage and handling • Pollutants from plant wash down activities, including washing out concrete mixers and trucks • Oil, grease and fuel from equipment operation and maintenance • Litter and effluent from site offices and compounds.				sandbags) to be installed, maintained and cleaned regularly to mitigate risk of water pollution leaving the site. • Locate spoil stockpiles, plant and equipment away from drainage lines or watercourses. • Where possible, any overland flow will be diverted around the site using berms and drains. Impervious surfaces outside construction areas will be directed to existing stormwater inlets. • All stormwater pits that lie within disturbed areas shall be sealed or isolated to prevent run-off from disturbed areas entering the drainage system. • All site access points to be constructed using stabilised road base. Major site access points for trucks hauling spoil will be bitumen sealed if the access points are to be used for more than one month. • Unsealed roads will be topped and maintained with stabilised aggregate. • Sealed internal roads are to be kept free of excess accumulated sediment/spoil and where required swept on a regular basis. No sediment tracked off site. To be removed immediately. • Wheel cleaning devices at exit of site. • Vehicle maintenance, wash down and refuelling areas will be bunded, have oil/water separators installed and will be serviced by licensed contractors. Liquid wastes will be handled and transported for disposal at an appropriate DECCW licensed treatment facility. • Where appropriate, geotextile underlay to be used under work areas such as piling platforms and access tracks. • Rehabilitation and landscaping works of disturbed areas to be undertaken as soon as practicable • Portaloos managed by licensed operators to ensure no overflow or spillage of sewage contaminants • Ensure grades/ slopes of excavation area are managed to reduce water ponding. • All run-off from disturbed areas within the work site, including water collected in excavations and sediment control structures, will only be discharged to	Management Plan

Aspect / Risk Issue	Key Impact / Risk Effect	Risk Analysis			Indicative Mitigation Measures	Environmental Management Documents
		P	C	High Med Low		
					receiving waters when confirmed as complying with discharge guidelines. Where required, waters will be treated and then tested to confirm compliance. • Erosion control devices will be inspected following major rainfall events. Sediment removed will be assessed and if suitable combined with stockpiled project spoil for reuse/disposal. • Final surface of new reclaimed area to be profiled and stabilised for dust and sediment control using a temporary bituminous coating sprayed over the surface. Bituminous coating to be selected to minimise any potential impact on waterways. Spraying of bituminous coating to be timed to avoid wet weather conditions during or soon after works carried out.	

Aspect / Risk Issue	Key Impact / Risk Effect	Risk Analysis			Indicative Mitigation Measures	Environmental Management Documents
		P	C	High Med Low		
Biodiversity (Terrestrial)	Environmental risks to terrestrial biodiversity include: • Decreases in surface water quality from sediment laden stormwater, fuel, oils, effluent, chemicals, etc • Contamination of ground water/soils from fuel, oils, chemicals, effluent, etc • Declines in the condition, vigour and extent of native plant communities • Declines in native fauna populations due to disturbance and habitat degradation. • Predation and disturbance of native fauna by feral predators	M	H	H	• Construction and maintenance of security fencing to prevent access of people, domestic pets and feral animals. • Construction worksite boundary to be surveyed and identified by fencing clearly visible to construction workers and plant operators. Construction equipment and personnel will not be permitted outside the surveyed areas. • Vegetation clearance markers to be installed prior to the commencement of vegetation clearance. Vegetation clearing will be limited to within the construction footprint. Protective fencing to remain in place until the risk of accidental clearing from construction activities is removed. • Identify and record noxious and other weeds that occur in vicinity of the construction areas. Noxious and other weeds identified must be suppressed and destroyed. Weed control methods to be used are to be appropriate for each noxious weed and adhere to the local control authority's directions. • Before an area of the site is cleared a qualified arborist will make a pre-clearing assessment. • Trees and bushes to be removed are to be checked for the presence of active nests of birds and arboreal mammals. These trees will not be removed or pruned until the animals have been moved or relocated. • Cleared weed free vegetation is to be reused or recycled to the greatest extent practicable. • Retain trees in areas that are not planned to be used for infrastructure. No areas of wasteland are to be left after construction is complete. • No fill of indeterminate origin to be used on the worksites to reduce the potential for introduction of weed species. Imported fill to be used on the worksites is to be validated to reduce the potential for introduction of weed species. • Design and implement a trapping and eradication program which targets pest animals within the construction site, though particular emphasis should be given to targeting crib room and site office environments.	Flora and Fauna Management Plan

Aspect / Risk Issue	Key Impact / Risk Effect	Risk Analysis			Indicative Mitigation Measures	Environmental Management Documents
		P	C	High Med Low		
Traffic and Access	Delays and disruptions due to increased traffic from construction activities; spoil and material import by road; transport of wide/long loads by road; lane closures and diversions. Safety of road users and work staff Maintain access for local community and transport operators	H	H	H	• Develop construction staging to minimise number of lane closures, maximising traffic flows • Delivery of wide/long loads during off peak periods • Where lane closures are necessary, work will be carried out during off peak periods • Install appropriate warning and advisory signage • Temporary speed reductions adjacent to work zones • Monitor road surface and promptly repair any damage or remove foreign material • Install appropriate traffic control devices • Isolate work areas using concrete or water filled barriers • Lane closures to be kept to a minimum and occur during off peak periods	Traffic Management Plan

Aspect / Risk Issue	Key Impact / Risk Effect	Risk Analysis			Indicative Mitigation Measures	Environmental Management Documents
		P	C	High Med Low		
Waste and Spoil Management	Inappropriate disposal, or loss of control, of wastes from site including sewage from site amenity buildings, general and office refuse, vegetation from clearing and grubbing operations. Contamination of soil and water from oil, fuel spills and excavated contamination.	M	L	L	• Apply waste hierarchy principles – avoid-reduce-reuse-recycle. • Waste materials to be contained in waste bins or other suitable containers, and collected for recycling, reuse or disposal by the Waste Contractor. • Determine “cut and fill” earthworks balance and, where possible, schedule works to maximise reuse on the Project and minimise double handling and need for stockpiling, thereby minimising the transport and dumping of excess material or the importation of material. • Presence of unexpected contamination to be monitored visually during excavation. Should unusual or visibly contaminated material be uncovered, all works in that area would cease and the Environmental Manager contacted immediately to determine appropriate course of action • Any contaminated spoil/ materials, will be separated, contained and managed and disposed to prevent migration and further contamination whilst maintaining compliance with NSW DECCW requirements and the Project Approval. • Any waste oil containers or spent fuel drums to be labelled and stored in bunded area, in accordance with NSW EPA and NSW WorkCover requirements, prior to removal off site. • Spill kits will be available on site. • Weekly inspections of the worksite and waste storage areas will occur to ensure litter/ debris is regularly cleaned up and contained on site. • All spoil to be monitored and tracked on the site waste disposal register as per the EPA guidelines, including characterisation of the spoil to determine correct disposal locations and volumes. • All vehicles carrying materials to be adequately covered to prevent any loss of material.	Waste, Reuse and Recycling Management Plan Soil and Water Management Plan

Aspect / Risk Issue	Key Impact / Risk Effect	Risk Analysis			Indicative Mitigation Measures	Environmental Management Documents
		P	C	High Med Low		
Indigenous and Non-Indigenous Heritage	Heritage items identified prior to works commencing Damage or impacts to previously unidentified indigenous or non-indigenous heritage items	L	L	L	• Indigenous heritage and non-indigenous heritage consultants to be nominated and available to be contacted in the event of an unexpected heritage find. • Fencing to be installed around heritage items on site to demarcate from the project site, including clear signage and to ensure no entry by plant or equipment. • If suspected heritage sites or relics are identified during construction works then all work that may impact on that area shall cease immediately and protective para-webbing fencing will be installed until relevant authorities, including nominated heritage consultants, have been contacted and the best practice, feasible course of action has been decided upon.	Construction Environmental Management Plan
Visual Impact and Rehabilitation	Visual impact of construction sites, vegetation clearing and road works adversely affecting the local community.	M	L	M	• Disturbed areas will be stabilised by the use of appropriate treatments, as soon as practicable following construction. • Following construction, a staged rehabilitation program will be followed, where required. • Site compounds and areas surrounding them will be kept tidy and be regularly cleaned and maintained. • Clear information will be provided to nearby residences and businesses in relation to the type and duration of site activities.	Soil and Water Management Plan, Stakeholder and Community Involvement Plan

Aspect / Risk Issue	Key Impact / Risk Effect	Risk Analysis			Indicative Mitigation Measures	Environmental Management Documents
		P	C	High Med Low		
Hazards, Risks and Safety	Pollution or environmental incidents due to: • Uncontrolled use of plant and equipment. • Inappropriate storage of dangerous goods and hazardous substances. • Inappropriate material excavation and haulage • Uncontrolled waste management. • Contaminated land and water.	H	H	H	• Undertake a hazard assessment of the project, prior to commencement of construction, noting locations and procedures for fuel and chemical storage and handling. • Scheduling and undertaking regular high-level monitoring and review of hazards. • Empower individual staff to stop work where a risk or hazard is considered likely to occur. • Implementing measures to reduce identified risks to an acceptable level throughout the project. • Providing adequate emergency procedures and equipment for response to management of any environmental pollution event. • Training all staff in emergency protocol and handling of dangerous goods and hazardous substances. • Preparing protocols for notifying the appropriate authorities in case of an emergency. • Preparing procedures to ensure compliance with all legislative and industry standard requirements for handling and storing of hazardous substances and dangerous goods. • Preparing procedures to ensure that flammable goods, oils and other hazardous liquids are only stored in bunded areas, which comply with the relevant WorkCover, EPA and Australian standards. • Ensuring that all hazardous activities such as washing out of concrete delivery vehicles, washing down of construction plant, refuelling plant and handling hazardous chemicals will be undertaken only at appropriate locations and where appropriate environmental protection controls are in place. • Conducting regular audits on storage areas to identify and address storage concerns. • Reporting all spills and leaks and ensuring spill control and clean-up materials are readily available for use.	Construction Environment Management Plan Safety Plan

Aspect / Risk Issue	Key Impact / Risk Effect	Risk Analysis			Indicative Mitigation Measures	Environmental Management Documents
		P	C	High Med Low		
Energy and Resource Use	Wastage of resources and energy	M	M	M	• Incorporate energy and resource efficiently into construction methodologies • Construction methodologies to include selecting energy and time efficient methods whilst addressing other concerns (e.g. ripping rather than rock breaking); utilising well-maintained new equipment, minimising down-time of equipment through preventative maintenance programs, reducing idling when not in use and monitoring emissions for signs of inefficient operations (smoke). • Ensure use of generators is minimised overnight or when not required to conserve fuel and energy. • Minimise water and energy use during construction activities. • Incorporate energy costs in developing spoil transport strategies and reuse options in spoil disposal.	Energy & Water Management Plan
Environmental Documentation	Failure to follow requirements detailed in CEMP and Management Plans Failure to obtain necessary Licences/ Approvals Non-Compliance with Environmental Requirements Failure to report pollution events to the DECCW	M	H	H	• Review legislation and licence conditions and incorporate into environmental management system • Ensure appropriate approvals and licences are obtained prior to commencing associated construction activities • Ensure mitigation measures detailed in the EMP and Sub Plans are disseminated to appropriate personnel for implementation • Ensure any pollution events are reported to the appropriate authorities.	Construction Environment Management Plan Sub Plans

Appendix D: Environmental Checklist

Environmental Checklist

Project:	**Project No:**	
Date:	**Time:**	☐ AM ☐ PM
Weather:	**Rain:**	

Site Activity:
e.g. bridge piling

1. Soil, Contamination and Water Quality

- ☐ Controls implemented as per latest erosion and sediment controls plan / SHEWMS / WMP / GMP
- ☐ Minimise disturbance, progressively rehabilitate, and maximise cover
- ☐ Are sediment controls being maintained and have capacity to filter run-off
- ☐ Are sandbags or other sediment controls installed around stormwater pits
- ☐ Are spoil stockpiles appropriately located and managed to prevent sediment loss
- ☐ Are all vehicles associated with construction using wheel wash/rumble grids before leaving the site
- ☐ Are all vehicle loads covered to prevent release of material
- ☐ Is stormwater runoff controlled through sedimentation controls including sediment fence, sandbags etc
- ☐ Is water being captured in sedimentation basins where used
- ☐ Is captured water being reuse or treated and tested if discharged
- ☐ Is the Bureau of Meteorology being monitored so planning takes into account weather forecasts
- ☐ Is plant and equipment checked daily to ensure there are no leakages of oil, fuel or other liquids
- ☐ Is known contamination being managed in line with obligations
- ☐ Is there any encroachment on or damage to capping layers of existing containment cells
- ☐ Spoil being managed appropriately from the Overbridge works
- ☐ Unexpected finds (Including asbestos) reported, managed in accordance with Unexpected Finds Procedure
- ☐ Are concrete washouts being used and have sufficient capacity
- ☐ Are chemicals stored and used in accordance with MSDS
- ☐ Is chemical storage sufficient (120%) of the volume stored
- ☐ Are spill kits and other spill control material available at the active work areas
- ☐ Are any accidental spillages reported, controlled immediately and actions taken to prevent reoccurrence
- ☐ Mobile generators or pumps in an appropriately bunded location while deployed onsite
- ☐ Maintenance and cleaning of plant on hardstand areas with appropriate controls
- ☐ If Acid Sulphate Soils suspected, it is investigated and controls implemented

Comments:

2. Air Quality and Dust

- ☐ Is regular water of active work areas undertaken, including stockpiles and haul roads
- ☐ Is a 20km/hr speed limit applied and enforced on the site
- ☐ Is real-time dust monitoring being monitored and activities modified where currently or likely to exceed
- ☐ Is the area of disturbed or exposed land at any one time minimised
- ☐ Are staff educated on correct material handling procedures and dust management
- ☐ Is any site dirt tracked onto public roads by construction vehicles
- ☐ Are stockpiles stabilised and managed as to avoid dust generation
- ☐ Constant visual observation for excessive dust production
- ☐ Slow or stop dust generating activities which cannot be adequately controlled by water or other means
- ☐ Rumble grids/rock rumbles/wheel washes being used to minimise dirt tracked onto roads

- ☐ Are streets near exit to site clean / swept?
- ☐ Dust generating loads are covered coming to and leaving the site
- ☐ Concrete / rock breaking activities have water available for dust suppression
- ☐ All plant and equipment in good working order to minimise emissions
- ☐ Offensive odours from excavations reported and investigated

Comments:

3. Noise and Vibration

- ☐ Are the works being carried out within the prescribed hours unless approved through DoP
- ☐ Noise controls implemented as per Plan, GMP, WMP, SHEWMS, or Out of Hours Approval
- ☐ Non-tonal reversing beepers or smart alarms used on vehicle & plant regularly used onsite
- ☐ Checking noise levels of individual items of plant aren't excessive
- ☐ Respite periods for noise intensive works near residential receivers
- ☐ Orientate plant and equipment so that noise generated is directed away from residential receivers
- ☐ Position items of noisy plant and equipment away from each other as far as practicable
- ☐ Switch off plant and equipment that is idling unnecessarily
- ☐ Use silenced compressors and generators
- ☐ Determine Safe Working Distances and monitor vibratory activities
- ☐ Undertake vibration monitoring during vibratory works trials as part of ECI Services
- ☐ Undertake condition surveys of residences and commercial buildings potentially impacted by vibration
- ☐ If noise or vibration monitoring shows values approaching criteria or exceeding, implement reasonable and feasible measures to attempt to reduce levels

Comments:

4. Flora and Fauna

- ☐ Frog Habitat exclusion zones adhered to
- ☐ Exclusion fence in good order, inspected and maintained before nightfall
- ☐ Frog Clearances undertaken in areas of known or suspected frog habitat
- ☐ Any found frogs being managed in accordance with Frog Protection Plan
- ☐ Any proposed use of pesticides around frog habitat areas assessed by the Environmental Manager
- ☐ Indirect impacts of construction (e.g. spills and air quality) being managed
- ☐ Only site run-off and potable water can drain through frog habitat areas, other sources must be investigated
- ☐ Take measures to protect all native fauna from the impacts of construction activities
- ☐ Manage tree removal in the southern portion of the site to maximise retained vegetation, through checklist
- ☐ Manage weeds onsite through checklist
- ☐ Pesticides used in accordance with legislation and regulations, training requirements and notification requirements
- ☐ Pesticide application records must be completed and submitted to Sydney Ports within 24hours
- ☐ Pesticides must not be applied within existing potential frog habitat and frog habitat creation area
- ☐ Controls for pesticide application being followed (not while hot, windy, raining)
- ☐ Noxious weeds must be disposed of at a DECCW licensed landfill
- ☐ Manage feral animals to maintain safe, clean and native fauna-friendly site

Comments:

5. Waste Management

- ☐ People using reduce, reuse, recycle and dispose hierarchy
- ☐ Waste and spoil onsite being classified in accordance with the DECCW's Waste Classification Guideline
- ☐ Waste materials being tracked
- ☐ Segregate waste streams to prevent contamination of reusable and recyclable materials

- ☐ All waste concrete being reused on-site or recycled off-site
- ☐ No disposal of clean soils to off-site
- ☐ Collect and store waste oil, other liquids and spillages in suitable containers and store in bunded areas before disposal
- ☐ All permanent bunded storage areas covered
- ☐ Site free of litter and good housekeeping maintained

Comments:

6. Traffic

- ☐ Are the works being carried out in accordance with the Construction Traffic Management Protocol
- ☐ Are all vehicles parking within the site to minimise impact on Cosgrove Road
- ☐ Are all heavy construction traffic using the designated arterial roads
- ☐ There are no truck movements outside construction work hours

Comments:

7. Community

- ☐ Are the works being carried out in accordance with the Stakeholder and Community Liaison Plan
- ☐ Have activities with potential community impact been assessed by the Community Manager
- ☐ Are any contacts made to project personnel directed to the 1800 numbers
- ☐ Are controls being implemented in accordance with method statements and approvals to minimise community impact
- ☐ Are work areas outside the site left in a safe and clean condition

Comments:

8. Heritage

- ☐ Items of European Heritage significance stored, protected and signed in the southern portion of the site
- ☐ If any suspected indigenous or non-indigenous heritage items are discovered, stop works and investigate

Comments:

INSPECTION DETAILS

Inspected By: **Signature:**

Other Comments:

Intermodal Logistics Centre at Enfield

Soil and Water Management Plan

Details of revisions

Level	Details	Date	Initial
1.0	For submission as part of Sydney Ports' CEMPF and LCPL's CEMP to Director-General	21/09/10	GK
1.1	Minor changes addressing additional Sydney Ports comments.	27/09/10	GK

Contents

1 Introduction

1.1 Purpose and Scope

This Soil and Water Management Subplan (SWMP) forms part of the Construction Environmental Management Plan (CEMP) for the Enfield Intermodal Logistics Centre (ILC)'s Early Works (the "Project"). The purpose of the SWMP is to describe how Leighton Contractors (LCPL) will manage and control the erosion and sedimentation, potential soil contamination (including asbestos) and potential chemical contaminant risks associated with the construction of the Project.

The plan has been prepared to address the requirements of: a number of the Ministers Conditions of Approval; the mitigation measures detailed in the Environmental Assessment (EA) (SKM 2005) and Sydney Ports Corporation (Sydney Ports) Construction Environmental Management Plan Framework (CEMPF) (SPC 2010); and all applicable legislation.

1.2 Background

The EA for the Project assessed the geology, topography, soils, groundwater, water quality, hydrology and hydraulic impacts during the construction and subsequent operation of the Project. A detailed description of the methodology for construction and assessment of these aspects is provided in Chapters 9 and 10 of the EA.

The EA determined that construction activities have the potential to disturb soils during the remediation works, installation of infrastructure and site forming activities (earthworks and grading). A Soil and Water Management Plan, written in accordance with 'Managing Urban Stormwater, Soils & Construction, Volume 1, 4th Edition' (Landcom 2004) (from here on referred to as 'Bluebook') was called for to determine the methods of managing erosion and sediment control issues.

The EA discusses the implementation of various erosion and sediment controls including sedimentation basins to manage the issue of potential turbid water runoff generated during the course of construction.

Groundwater was identified to be as two aquifers on-site; a perched aquifer within the base of the deeper fills and a deeper aquifer associated with the underlying natural clays. Previous studies have found that any potential groundwater contamination is likely to reflect the regional (degraded) background conditions.

The EA found that areas of the site was contaminated in parts, but with the appropriate remediation strategy being prepared and implemented, contaminant exposure or mobilisation risks would be addressed. Sydney Ports Corporation (Sydney Ports) has undertaken the required remediation on the Sydney Port's ILC site and has obtained Site Audit Statements in accordance with the Project Approval (refer to Sydney Ports' CEMPF). Contamination contained on site as part of the remediation works and the appropriate controls are detailed in

the Contamination Management Plan for Construction. This Soil and Water Management Plan is written in accordance with the requirements of this reference document and the Project Approval.

Provided that the proposed mitigation measures discussed in the EA are implemented during the construction phase, no negative impacts with respect to geology, soils, contaminated lands, or hydrology are anticipated as a result of the project.

1.3 Objectives

The key objectives of the SWMP are to ensure the potential soil and water impacts from the Project are minimised and managed in accordance with the requirements of the Project Approval and applicable legislative requirements. To achieve this objective, the LCPL project team will undertake the following:

- Continually review and update this Soil and Water Management Plan and the control measures required by it
- Develop and implement Erosion and Sediment Control Plans (ESCP) in accordance with 'Bluebook' for activities with the risk generate significant erosion and pollution of receiving waters
- Manage accumulated site run-off appropriately to ensure no turbidity, pH or fuels/oils affected water enters receiving waters, with the preference for on-site reuse instead of treated and tested discharges
- Construct and maintain sedimentation basis on the site to aid the collection, treatment and reuse of site run-off
- Ensure all stockpiled materials are adequately located, stabilised and maintained to prevent erosion and dispersal of the materials
- Manage construction activities so as to not contaminate the site and comply with the Project Approval and regulatory requirements in relation to contamination

1.4 Legislation and Guidelines

Legislation

The main legislation relevant to soil and water management includes:

- **The Environment Planning and Assessment Act (1979)** - the project has been assessed and approved under Part 3A of the EP&A Act. The Project has been approved in accordance with Section 75J of the Act with a number of Conditions of Approval that must be complied with. Section 75 U of the EPA Act lists various approval requirements that do not apply to an approved Part 3A project.
- **Protection of the Environment Operations Act (1997)** – Construction of the project will be undertaken in accordance with the POEO Act, which covers a range of environmental offences including pollution offences. Specifically, Section 120 of the Act which prohibits the pollution of waters. An Environment Protection Licence (EPL) is not required for the project under the POEO Act as the project is not listed as a "scheduled activity". No voluntary licence for water discharges is considered necessary at this point, as the preference for any captured site run-off would be for re-use onsite for dust suppression. Where discharge is necessary for safety or other

reasons, treatment and testing will be undertaken to ensure the water is compliant with the criteria established in this plan.

- **Contaminated Land Management Act (1997) –** The management of any unexpected contamination during construction will be undertaken in accordance with the CLM Act, guidelines prepared under the CLM Act and the applicable requirements of the project approval.

Ministers Conditions of Approval

The Ministers Conditions of Approval relevant to SWMP with details of the condition and how it is addressed are described in Table 1.

Table 1: Relevant Ministers Conditions of Approval

MCoA	Description	Reference
Water Quality and Hydrological Impacts		
2.28	Except as may be expressively provided under an Environment Protection Licence applicable to the project, the Proponent shall comply with section 120 of the *Protection of the Environment Operations Act 1997* which prohibits the pollution of waters.	This Soil and Water Management Plan (SWMP)
2.29	Soil and water management controls shall be employed to minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during site preparation and construction activities, in accordance with Landcom's Managing Urban Stormwater: Soils and Construction (Bluebook)	This SWMP
2.30	All stockpiled construction materials shall be adequately located, stabilised and maintained to prevent erosion or dispersal of the materials.	This SWMP Sect 4.1
2.31	The Proponent shall construct and maintain stormwater detention basins on the site, generally consistent with the basin sizes/ locations presented in the document referred to under condition 1.1h) of this approval. Opportunities to reuse stormwater from detention basins for ecological areas or for site operations shall be investigated during detailed design of the project, and where practicable, the Proponent shall utilise collected water preferentially to external potable water supplies for operational activities on the site, subject to testing to confirm the suitability of collected water quality.	Required for Operation. However, construction phase sedimentation basins may be constructed during Early Works in the location of proposed Stormwater Detention Basins or elsewhere . This SWMP Sect 4.1, sedimentation basins will be

MCoA	Description	Reference
		sized according to Bluebook.
2.32	All quarantine and machinery wash down waters and amenities wastewater shall be directed to sewer (subject to Sydney Water Corporation approval), or to an appropriately licensed liquid waste disposal facility.	Required for Operation. This SWMP Sect 4.1. Maintenance of plant and equipment during construction
2.33	The Proponent shall design, install, maintain and operate rainwater tanks for the collection of water for domestic uses on the site. Collected rainwater shall be used preferentially to external potable water supplies.	Required for operation. This SWMP Sect 4.1
Waste Management		
2.42	The Proponent shall ensure that contaminated areas of the site that are disturbed by construction works associated with the project are remediated prior to the commencement of project operations at these areas. All remediation works shall be undertaken in accordance with the requirements of the Contaminated Land Management Act 1997 and Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (EPA, 1997).	This SWMP Sect 4.1 and Appendix A
2.43	Prior to the commencement of construction works associated with the project that may disturb contaminated areas of the site, the Proponent shall submit to the Director-General a Site Audit Statement(s), prepared by an accredited Site Auditor under the Contaminated Land Management Act 1997, verifying that the area of the site on which construction is to be undertaken has been or can be remediated to a standard consistent with the intended land use. A final Site Audit Statement(s), prepared by an accredited Site Auditor, certifying that the contaminated areas have been remediated to a standard consistent with the intended land use is to be submitted to the Director-General prior to operation of the remediated site(s).	This SWMP Sect 4.1 and Appendix A
2.44	The Proponent shall manage any asbestos or asbestos-contaminated materials that may be uncovered during the construction, commissioning and operation of the project strictly in accordance with the requirements under *Protection of the Environment Operations (Waste) Regulation 2005*	This SWMP Sect 4.1

MCoA	Description	Reference
	and any guidelines or requirements issued by the DECC in relation to those materials.	

Guidelines

The development of Erosion & Sediment Control plans, design and implementation of sedimentation/detention basins, use of other erosion and sediment controls, and management of water will be undertaken in accordance with Landcom's *'Managing Urban Stormwater, Soils & Construction, Volume 1, 4th Edition'*, referenced here on as it's commonly known name, the 'Bluebook'.

The management of any unexpected contamination and/or works in containment cells/capping areas will be in accordance with the *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (EPA, 1997), the Contamination Management Plan for Construction (attached in Sydney Ports' CEMPF) and the Conditions of Approval. The Summary Flowchart for Excavation (Appendix A) will also guide much of the works on the site.

Control of fuels, oils and other chemicals will be undertaken in accordance with DECCW's *Bunding and Spill Management Guidelines* and any relevant legislation or Australian Standard.

2 Identify and Assess

2.1 Existing Environment

Overview

The project site comprises three geological formations including Bringelly Shale, Minchinbury Sandstone and Ashfield Shale, all part of the Wianamatta Group. Weathering processes occurring on the site are likely to produce residual silty and clayey natural soils. The site also has the potential to contain swampy soils and alluvial deposits as a result of the low-lying nature of the southern section of the site.

The site gradually slopes from the west to the east, with surface waters draining to four drainage lines. These culvert lined drainage lines are the head waters for both Coxs Creek and the Cooks River, before their confluence 300m to the east of the site.

The majority of the site has no known occurrence of acid sulphate soil (ASS) material. There is a small section in the south east of the site adjacent to Cox Creek where there is a low probability of ASS occurring at depths greater than 3m below ground surface.

Previous studies have identified two aquifers on-site, a perched aquifer within the fill and a deeper aquifer associated with the underlying clays and shales. Perched aquifers drain to the underlying aquifer, and the general subsurface flow is towards the base of the culverts which lie along buried watercourses. Previous studies have found that the groundwater contamination is not significantly widespread and any potential contamination is likely to reflect the regional (degraded) background conditions.

The potential for flooding exist in the southern part of the site at Coxs Creek and to the west of the project site, where the upper reaches of the two northern drainage lines flood local streets and businesses.

The site has a history of previous industrial use and as a result there is potential for ground contamination. As part of the project's Stage 1B, remediation works were undertaken during 2009 and 2010 at the Sydney Ports' ILC site in accordance with the project approval and Site Audit Statements (SAS) issued by an accredited Site Auditor under the CLM Act. The SASs are available in Sydney Ports' project website. Unexpected contamination and any works required in containment cells/capping areas will be undertaken in accordance with the project approval and the Contamination Management Plan for Construction (attached in Sydney Ports' CEMPF).

Any contamination issues for off-site works must also be addressed as these areas have not been the assessed in past studies. This includes areas required for the Overbridge Construction works.

Background Water Quality

Existing water quality data is available from previous monitoring as presented in the EA. The data provided is from mean results for wet weather flows in Coxs Creek (**Table 2**) and dry weather flows in the two northern drains (Central and DELEC Drains respectively) (**Table 3**).

Table 2: Mean Water Quality in Cox Creek (Wet Weather Flows)*

Parameters	**Guideline Concentration (ANZECC 2000)**	**Wet Weather Concentrations**	
		Upstream of site	**Downstream of site**
Faecal Coliforms (cfu/100mL)	1000	57000	54000
Total phosphorus (μg/L)	25	198	211
Total nitrogen (mg/L)	0.35	4.10	3.28
Suspended Solids (mg/L)	-	14.0	50.0
Turbidity (NTU)	6-50	46	144
Dissolved oxygen (mg/L)	>6	10.6	8.9
BOD (mg/L)	-	4.0	5.0
pH	6.5-8.5	8.1	8.0
Grease (mg/L)	-	10.0	2.0
Copper (μg/L)	1.4	20	34
Lead (μg/L)	3.4	20	36
Zinc (μg/L)	8.0	130	240

***Taken from Scientific Sciences monitoring 1992.**

Table 3: Mean Water Quality in Central and DELEC Drains (Dry Weather Flows)*

Parameters	**Upstream of site**	**Downstream of site**
DELEC Drain		
Suspended Solids (mg/L)	6	8.3
BOD (mg/L)	7.6	8.3
pH	7.8	7.6
Grease (mg/L)	2	2.3
Central Drain		
Suspended Solids (mg/L)	11.3	11.3
BOD (mg/L)	9	9.3

Parameters	Upstream of site	Downstream of site
pH	7.5	7.5
Grease (mg/L)	3.6	4

***Taken from Freight Corp monitoring average results 1999 - 2001.**

2.2 Construction Activities

Construction activities that have the potential to cause impacts include the following:

Site Preparation

- Establishment of haul roads
- Site clearance
- Earthworks
- Construction of sedimentation ponds
- Transporting of and management of site material

Bridgeworks

- Piling
- Transporting and stockpiling excavated material
- Concrete pump-out and wash down

Road and Rail Infrastructure

- Vehicle movements
- Off Site Access Works
- Reinforced earth wall for road embankment
- Install services, drainage and capping material for new rail line
- Earthworks
- Cleared areas for pavement works

2.3 Potential Impacts

Soil Erosion

The soils on-site are considered to have moderate to high erodibility. Potential for erosion will be reduced by the low gradients of the site. In accordance with the project MCoA, this Soil and Water Management Plan has been prepared prior to commencement of works onsite and as part of the Construction Environmental Management Plan (CEMP). This has beeen prepared in accordance with principles and practices provided in 'Managing Urban Stormwater, Soils & Construction, Volume 1, 4th Edition', (Landcom, 2004) (Bluebook). Erosion and sediment control measures identified in this plan will be implemented prior to construction commencement, and maintained in an appropriate manner until all ground surfaces are stabilised, sealed or revegetated. As such, no erosion and sedimentation impacts are predicted.

Acid Sulphate Soils

Works in the southern portion of the site would not lead to a lowering of ground water levels or works beyond 2m below the natural ground surface. Therefore, no ASS management measures need to be considered as part of the detailed design.

Water Quality

During construction, the main potential water quality impacts from the ILC site would be the export of sediments and other potential pollutants, to the local waterways due to the exposure of soils to erosion. Erosion and sediment control structures and good site practices would be implemented to minimise the potential for adverse impacts on local surface water quality during the construction phase.

With controls in place, the quality of water leaving the site is likely to meet the established guidelines, that is ANZECC and water quality criteria for those items the construction site can potential impact (turbidity, pH and oil/grease).

Contamination Mobilisation

Any unexpected residual contamination and constructed containment cells/capping areas will be managed in accordance with the Contamination Management Plan for Construction to ensure contamination mobilisation does not occur. Contamination risks for both on-site and off-site works will be assessed in an ongoing manner during construction. Where there is a risk of contamination exposure, measures will be implemented in accordance with the Contamination Management Plan for Construction (Coffey Environments, Nov 2009).

An appropriately qualified consultant will provide advice on mitigation measures required for works that involve disturbance of containment cells/capping areas and for the management of any unexpected contaminants found during construction in line with the above document and DECCW's guideline Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.

Groundwater

During the site validation, Coffey carried out groundwater sampling and assessment at the site (Coffey, April 2010; "Validation Report for Separable Portion 2, 3, 4 and 5 ILC @ Enfield"). Coffey concluded in its assessment that the groundwater within the site was not significantly impacted and that the levels of chemicals in the groundwater were representative of background concentrations. The Early Works are not anticipated to cause any impacts on groundwater.

3 Consult and Communicate

3.1 Training and Awareness

Leighton Contractors has an environmental training program called Enviro-Essentials (see CEMP for more details) which addresses LCPL key construction risk areas including erosion and sediment control.

Additional training and awareness will be provided during the course of the project. Training of key staff on Erosion and Sediment Control Plan (ESCP) development, managing erosion, and correct choice and installation of sediment control structures will be provided by accredited Soil Conservation trainers.

Awareness will be provided through the provision of erosion and sediment control handbooks to Supervisory Staff, alerts and posters and through discussion of erosion and sediment control aspects at pre-start and mass toolbox talks.

Similarly, training and awareness regarding topics of contamination management, acid sulphate soils and spill control will also be undertaken.

In addition to specific training, a mandatory site specific site induction will be held for all construction personnel to ensure they understand the specific site requirements. The induction will include as a minimum:

- ESCP required for works that have high erosion and sedimentation risks
- Implementation of the controls as per the ESCP, as far as practicable before the work starts
- Management of turbid water and sedimentation basins
- Minimise wastage and reuse as much water as possible on-site
- Water treatment and testing before any discharge, HOLDPOINT requiring Environmental Manager sign-off before discharge
- Inspections and monitoring of site

4 Implement Controls

4.1 Mitigation Measures

The following mitigation measures will be implemented to minimise erosion and sedimentation impacts:

- Erosion and Sediment Control Plan (ESCP) developed and implemented in accordance with 'Bluebook' for works with the potential to cause erosion and sedimentation. See examples for Overbridge Construction and Frog Habitat Construction (Appendix B)
- ESCP to be implemented as far as practicable before the work starts (staging of erosion and sediment controls may be required)
- Only disturb areas necessary for the works to be done
- Re-establish ground cover or stabilise areas that have been disturbed
- Monitor weather forecasts, current weather from on-site meteorological station, and plan works accordingly
- Reduce the velocity (and erosivity) of run-off by reducing flow lengths through the installation of sandbags, check banks, speed humps and other devices in exposed areas
- Install a range of appropriate sedimentation control devices to establish a series of control before water is directed to sedimentation basins
- Establish and maintain appropriately sized sedimentation basins to capture turbid site run-off
- Sizing of sedimentation basins for the catchments and typical rainfall characteristics of the area will be in accordance with Bluebook
- Sedimentation will be in the approximate locations as per design of operational detention basins
- Manage and treat captured water in sedimentation basins for reuse on-site (preferred) and for controlled discharge where necessary for safety or other operational reasons
- Treatment of the captured water will be in accordance with the LCPL procedure for Sediment Basin Flocculation (Appendix C)
- Gypsum or Aluminium Sulphate will be used to flocculate suspended sediments and pH buffering with an acid may also be required

- Water to be discharged from site is to be treated and tested to meet ANZECC water quality criteria for protection of aquatic ecosystems, that is, no visible oil/grease, NTU <50 and pH 6.5 - 8.5
- HOLDPOINT Following treatment and testing, discharges from site must be approved by the Environmental Manager or delegated representative who has the appropriate training before discharge
- All discharges from basins are to be recorded on the Sedimentation Basin Checklist (Appendix D)
- All other discharges from site that can't be reused on not placed in sedimentation pits, whether water accumulated in tanks, pits or excavations, are to be recorded on the Discharge Water Quality Checklist (Appendix E)
- Where there is a need for additional water for dust suppression and other activities, over and above water captured and reused, a potable water supply will be used
- Potable water use for dust suppression and other construction activities will be monitored
- Other sources of water may be investigated. Relevant licenses and permits would be obtained prior to water extraction
- Rainwater tank(s) to be installed at the Main Site office (Building 31) and where possible elsewhere. Use captured rainwater to be re-used
- Appropriately locate and manage stockpiles so as to not to create a potential sediment source that could contaminate nearby watercourses, by diverting run-on water, providing sediment controls to filter run-off , and stabilising where necessary
- All vehicle associated with construction works will pass through the rumble grids or wheel wash prior to leaving the site
- Vehicle loads will be covered to prevent the release of material

The following mitigation measures will be implemented to minimise contamination mobilisation impacts:

- Works in containment cells/capping areas or for any unexpected contamination found during site works are to be managed in accordance with the Contamination Management Plan for Construction (Coffey 2009) (attached in Sydney Ports' CEMPF)
- Follow the procedure attached in Appendix A for all intrusive works
- Notification to Sydney Ports is required prior to intrusive works in containment cells and capping areas in accordance with Contamination Management Plan for Construction
- The removal of spoil excavated from the adjacent operational railway tracks of the New Enfield Marshalling Yards to a bunded stockpiling area is required for Safety and Operational reasons at the Overbridge Construction site. A procedure will be developed to guide the initial handling and transport of spoil away from the operational railway tracks, and an investigation of levels of contamination happening in parallel with this removal.
- A Site Auditor is to be involved for any intrusive construction works that involve disturbance of contaminated soils (unexpected contamination or works in

containment cells) in accordance with the MCoA, Plans and Procedures detailed above

- Contractors must comply with any requirements and conditions of any Site Audit Statements or interim advice provided by Site Auditor on remediated sites
- Any identified asbestos or asbestos-contaminated materials that may be uncovered during the construction will be managed strictly in accordance with the requirements of Protection of the Environment Operations (Waste) Regulation, Occupational Health & Safety Act (see Safety & Health Plan + Rail Safety Plan) and any guidelines or other established requirements
- Unexpected Finds Procedure (Appendix F) to be followed when unknown contamination or asbestos is found during the course of site activities
- All Concreting works must be undertaken in accordance with the DECCW's Environmental Best Management Practice Guideline for Concreting Contractors, including installing concrete washout facilities where necessary
- Machinery will be checked before being used onsite through plant risk assessment, and daily during plant pre-starts checks

The following mitigation measures will be implemented to manage spillage prevention and containment:

- Storage and handling of chemicals must be in accordance with the Material Safety Data Sheets
- Temporary bunding is required, particularly in any location with direct drainage to a waterway or environmentally sensitive areas, to manage any spillage of a chemical, fuel or lubricant
- Refuelling operations should be undertaken away from drains and watercourses and must not be left unattended
- Adequate quantities of spill control materials (spill kits and others) must be kept readily available
- In the event of an accidental spillage, spilled materials will be controlled, contained and cleaned up as soon as practicable
- Spill wastes will be disposed of appropriately
- Impervious bunds for storage must of sufficient capacity to contain at least 120% of the stored chemicals
- Bunds will be monitored during the weekly checklist inspection and any required maintenance and decanting will be directed by the Environmental Manager
- Controls around transportation of smaller receptacles of chemicals to site and appropriate application of materials will be detailed in Safety Health Environmental Work Method Statement (SHEWMS) or similar
- Mobile generators or pumps will be placed in an appropriately bunded location while deployed onsite
- Maintenance and cleaning of plant and equipment on hardstand areas with appropriate controls

- Routinely check plant and equipment for leaks and promptly action items of clean-up and repair required
- Amenities wastewater will be directed to sewer or collected by an appropriately licensed contractor

The following mitigation measures will be implemented to minimise potential for acid generation if Acid Sulphate Soils (ASS) are discovered:

- If suspected ASS is excavated implement the Unexpected Finds Procedure (Appendix F)
- Additional control plan for ASS should be developed if/when risk increases due to activity or methodology to be undertaken changes. Should include procedures for sampling and measures for management of actual or potential ASS
- Awareness training regarding what ASS looks and smells like, the potential effects of acid generation and pollution downstream

5 Review and Monitor

5.1 Monitoring, Inspections and Reporting

Documented weekly environmental inspections that will include checks on aspects of soil and water will be undertaken by the site Environment Manager (EM) and forwarded to the Construction Manager (CM). These inspections will be undertaken for the duration of the Project. Issues that cannot be closed out immediately will be entered into an action list and reported as described in the CEMP.

The weekly environmental checklist is included as an Appendix to the CEMP and includes a section on soil, water contamination and potential ASS impact.

Water quality testing will be undertaken where controlled discharge of captured, treated and tested site water is necessary for safety or other operational reasons, as detailed in Section 4.1 Mitigation Measures.

All discharges from basins are to be recorded on the Sedimentation Basin Checklist (Appendix D)

All other discharges from site that can't be reused on not placed in sedimentation pits, whether water accumulated in tanks, pits or excavations, are to be recorded on the Discharge Water Quality Checklist (Appendix E)

No specific water quality monitoring of receiving waters is required by the MCoA or contract.

5.2 Auditing

Six monthly internal audits for compliance against the MCoA will be undertaken. The audit will include a detailed site inspection and assessment of compliance with this plan. The audit will assess air quality / dust monitoring, reporting, effectiveness of controls, community and complaints management. The site EM will be responsible for managing and implementing audit actions and the Project Manager will have overall accountability for ensuring compliance.

External independent environmental audits will be undertaken by Sydney Ports' annually in accordance with the Project Approval (for details refer to Sydney Ports' CEMPF).

6 Manage Incident

6.1 Incident Management Framework

All environmental incidents on the project will be managed by LCPL in accordance with the incident management protocol as described in the CEMP and OH&S and Rail Safety Management Plan. This includes internal and potentially external notification and recording, reporting and response processes.

7 Appendices

Appendix A

Flowchart for Excavation - ILC at Enfield

Received 24/6/10

Contractors' Obligation for Excavation for ILC at Enfield: Sheet 1 of 2

For excavation within the site in:

- Lot 2, DP 1006861
- Lot 14, DP 1007302
- Lot 101, DP 1001498

Is excavation within an area of known contamination as shown in Drawing SEDP140B?

No

Commence excavation

Unexpected contamination found?

Yes

Implement and comply with the Contamination Management Plan for Construction (Coffey, 2009) as summarised below:

- Immediately notify SPC of the identified or suspected contamination;
- Engage an appropriately qualified environmental consultant to carry out an assessment of the nature and extent of the unexpected contamination
- Liaise with an accredited site auditor under the CLM Act;
- Carry out any required remediation work in accordance with the remediation acceptance criteria specified in the RAP (Coffey, 2009a) and site auditor requirements to remove or contain the identified contamination;
- Carry out any required validation work to demonstrate that the identified contamination has been adequately remediated or managed; and
- Report the works conducted to a standard suitable for review by an accredited site auditor.

No

Continue Excavation

Yes

Works impact Containment Cell A (including buffer zones)

Implement and comply with the requirements of Appendix A of the Contamination Mgmt Plan for Construction: Site Management Plan Asbestos Soil Containment Cell – Separable Portion 1 Intermodal Logistics Centre @ Enfield (Coffey, 2009) as summarised below:

Any intrusive works or maintenance activities which fully or partially penetrate the containment cell cap must be authorised by SPC;

- Comply with the SMP, applicable legislation and regulations during the works. If actions are undertaken that substantially modify SP1 (e.g. re-development), such that the capping layer in the containment cell in SP1 is likely to be disturbed, a new SMP must be prepared by a suitably qualified environmental consultant;
- Assess property and activity specific environmental and health and safety risks associated with the work;
- Prepare a Site Specific Health and Safety Plan (SSHSP), Site Specific Contamination Management Plan (SSCMP), SWMS and a Contingency Plan, prior to commencement of works;
- Induct all personnel undertaking the works to the requirements of this SMP, the SSHSP and the SSCMP;
- Comply with and implement control measures in accordance with the SMP, SSHSP and SSCMP during the works;
- Respond to and manage environment, health and safety incidents;
- Following the completion of works submit a report to SPC, describing the works undertaken, disposal procedures, mitigation measures implemented, any environmental incidents that occurred including response, clearance results, and steps taken to making good the cap; and
- Ensure the works area is restored to a safe condition with cap fully reinstated following completion of works.

Works impact Containment Cells 1, 2, 3 and 4 (including buffer zones)

Implement and comply with the Contamination Management Plan for Construction (Coffey, 2009) as summarised below:

Inform SPC in writing, at least 10 working days prior to the commencement of any such works, and submit with the notification a work plan for review and agreement, addressing, as a minimum, the following:

- Monitoring of the works by an appropriately qualified environmental consultant;
- Supervision by an AS1 licensed contractor during any required removal and off-site transportation of any asbestos impacted soil. This may not be required for works only in the buffer zones, depending on discussions with SPC;
- Dust minimisation during excavation, transport and placement works;
- Tracking and recording the excavation locations and the management of excavated contaminated soils;
- Contingency Plan for unforseen environmental issues;
- Reinstatement of the cap and the geo-fabric marker layer of the containment cell to its former condition;
- Inspection by an appropriately qualified environmental consultant to validate the rectification works;
- SPC approved placement or off-site disposal (following waste classification) of excavated contaminated soil to meet site remediation objectives; and
- Reporting of the works conducted to a standard suitable for review by an accredited site auditor under the Contaminated Land Management Act

Works impact Capping Areas D/E and F (including buffer zones)

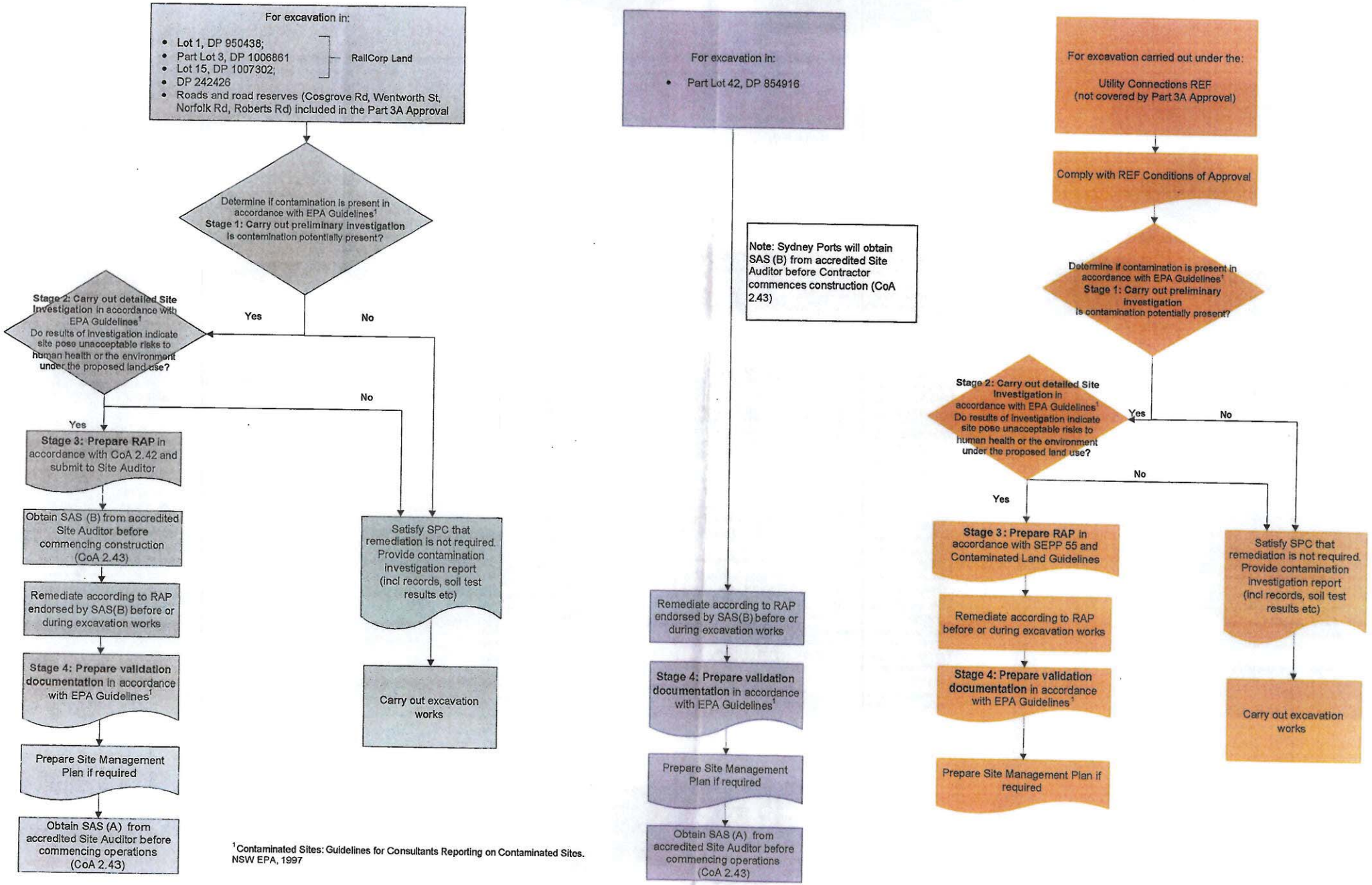
Implement and comply with the Contamination Management Plan for Construction (Coffey, 2009) as summarised below:

Inform SPC in writing, at least 10 working days prior to the commencement of any such works, and submit with the notification a work plan for review and agreement, addressing, as a minimum, the following:

- Monitoring of the works by an appropriately qualified environmental consultant;
- Dust minimisation during excavation, transport and placement works;
- Tracking and recording the excavation locations and the management of excavated contaminated soils;
- Contingency Plan for unforseen environmental issues;
- Reinstatement of the cap and the geo-fabric marker layer of the containment cell to its former condition;
- Inspection by an appropriately qualified environmental consultant to validate the rectification works;
- SPC approved placement or off-site disposal (following waste classification) of excavated contaminated soil to meet site remediation objectives; and
- Reporting of the works conducted to a standard suitable for review by an accredited site auditor under the Contaminated Land Management Act

Contractor to provide SPC with documentation in accordance with the contract (e.g. as constructed drawings etc.) to enable SPC to obtain the final Site Auditor's Statement SAS(A).

Contractors' Obligations for Excavation for ILC at Enfield: Sheet 2 of 2



[1] Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites. NSW EPA, 1997

Appendix B

Example ESCPs for Frog Habitat Construction and Establishment of Bridge Compound

Erosion and Sediment Control Plan

Project No.: **N953**

ESCP No.0001 Rev A

ERSED Principles

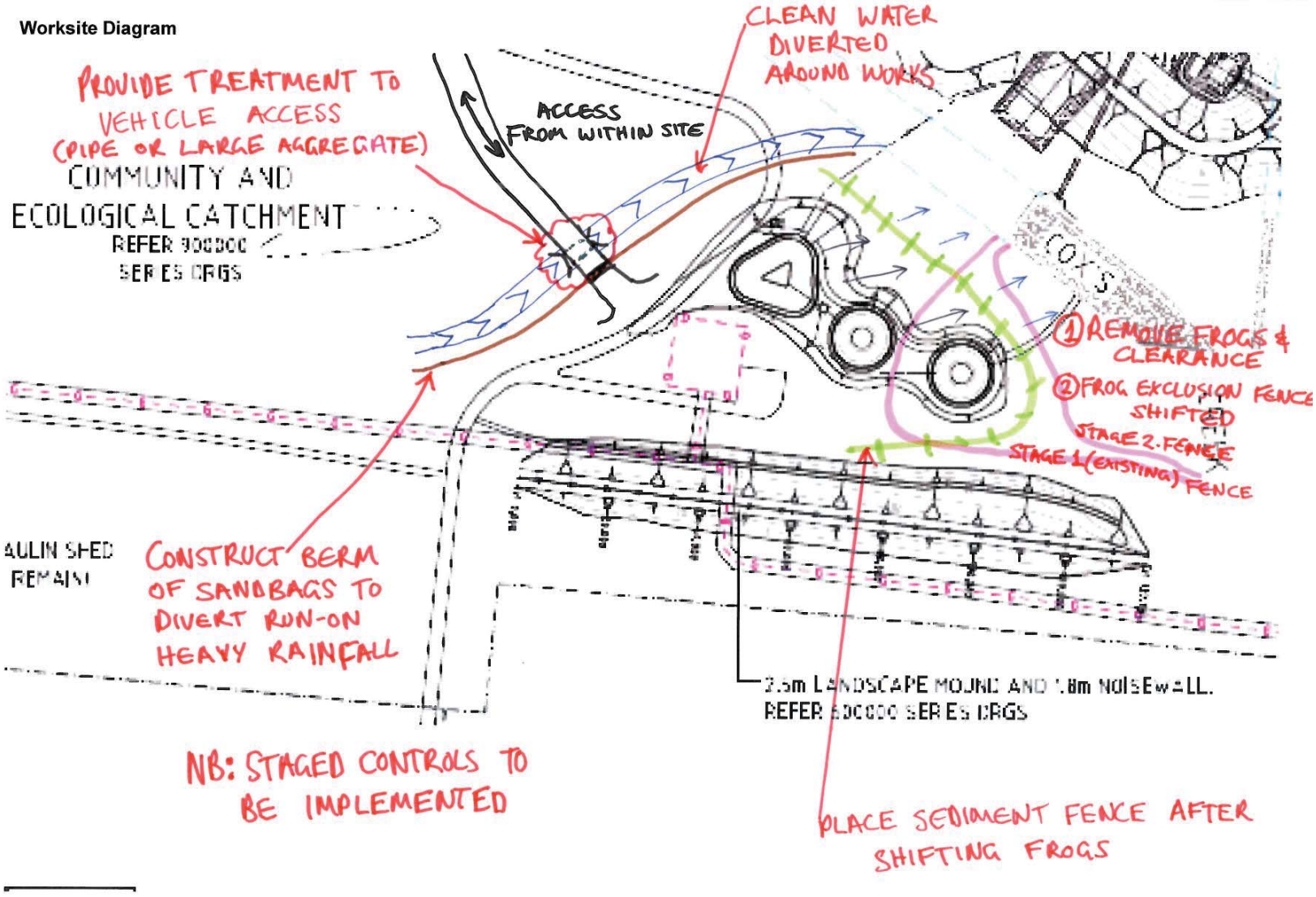
- The implementation of temporary erosion and sediment controls will be progressive and continual.
- Minimal disturbance at all times and "No Disturbance Zones" are to be enforced where practical.
- Erosion control measures will be designed so that they are as close as possible to the potential source of sediment.
- All stormwater pits that lie within disturbed areas shall be protected to prevent dirty run-off from disturbed areas entering the drainage system.
- Any temporary controls will be reinstated at the end of each day.
- Sediment fences will be inspected for undercutting, sagging and overtopping, and repaired immediately.
- Sand bags will be replaced when punctured or are not working effectively.
- Each day and after rainfall events, sediment and erosion controls will be inspected to ensure performance is as designed.

Legend

- Clean Water Diversion
- Dirty Water
- Sand Bags / Sed Fence
- Stormwater Protection
- 'No Disturbance Zone'
- Check Dams
- Berm

Note - Refer to Bluebook Handbook for setup, control types, diversion types and maintenance requirements.

Worksite Diagram



Erosion and Sediment Control Plans

Erosion and Sediment Control Plans (ESCP) will be developed for each work area prior to the start of construction. These will be signed off by the Environmental Manager.

Hold Point for Dewatering Onsite

Prior to any dewatering and/or discharge contact Environmental Manager or delegate and train representative who will signoff the hold point once water is "clean". Testing and, where necessary, treatment of any dewatered construction water must be undertaken prior to discharge. This may occur within excavation or in a sealed container(s).

Description of Works: Construction of Frog Habitat	
Location (Chainage): FHCA	**Date:** 9/9/10
Site Foreman:	**Signature:**
Environment Manager:	**Signature:**

Erosion and Sediment Control Plan

Project No.: **N953**

ESCP No.0002 Rev A

ERSED Principles

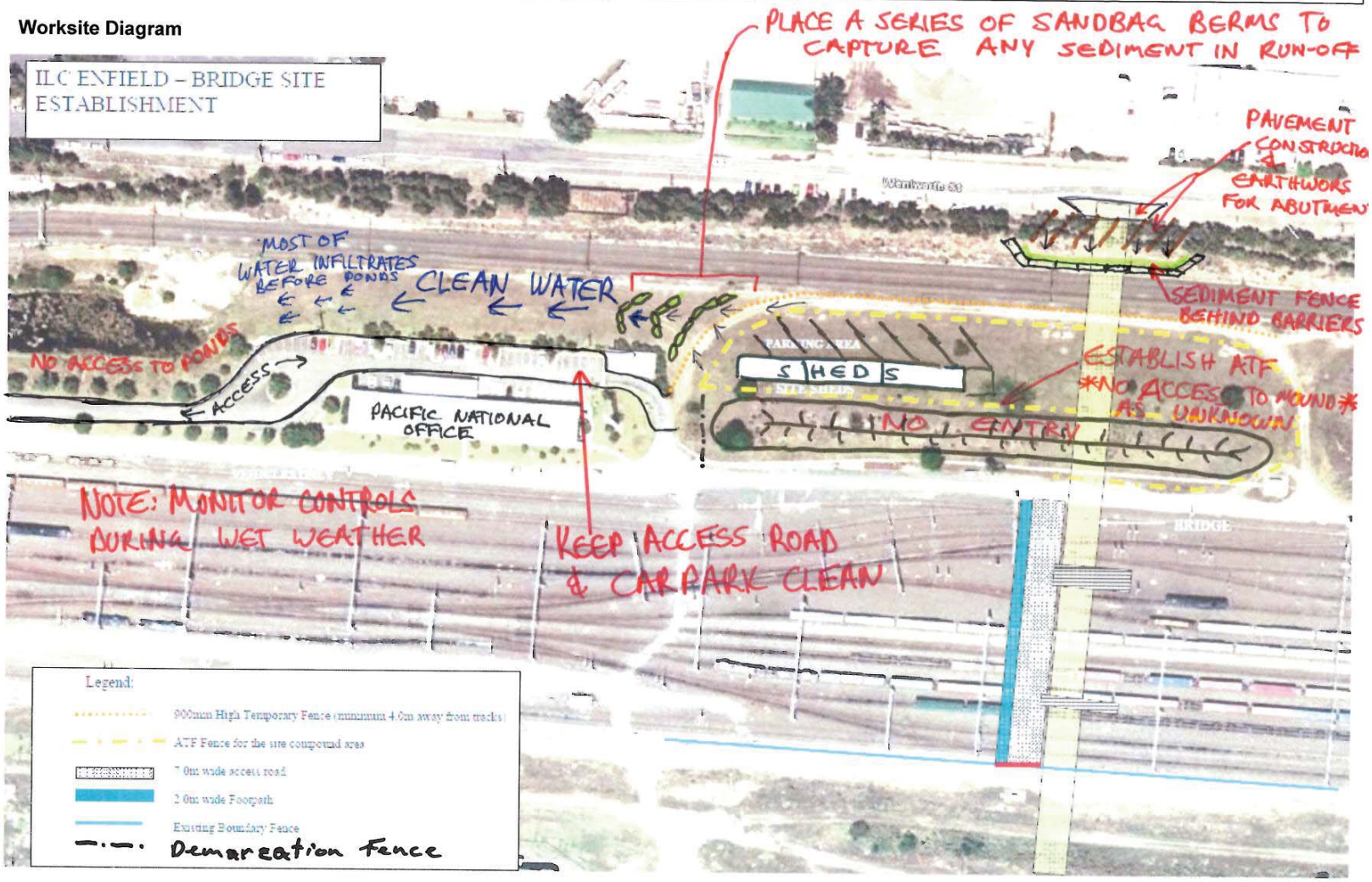
- The implementation of temporary erosion and sediment controls will be progressive and continual.
- Minimal disturbance at all times and "No Disturbance Zones" are to be enforced where practical.
- Erosion control measures will be designed so that they are as close as possible to the potential source of sediment.
- All stormwater pits that lie within disturbed areas shall be protected to prevent dirty run-off from disturbed areas entering the drainage system.
- Any temporary controls will be reinstated at the end of each day.
- Sediment fences will be inspected for undercutting, sagging and overtopping, and repaired immediately.
- Sand bags will be replaced when punctured or are not working effectively.
- Each day and after rainfall events, sediment and erosion controls will be inspected to ensure performance is as designed.

Legend

- **Clean Water Diversion**
- **Dirty Water**
- **Sand Bags / Sed Fence**
- **Stormwater Protection**
- **'No Disturbance Zone'**
- **Check Dams**
- **Berm**

Note - Refer to Bluebook Handbook for setup, control types, diversion types and maintenance requirements.

Worksite Diagram



Erosion and Sediment Control Plans

Erosion and Sediment Control Plans (ESCP) will be developed for each work area prior to the start of construction. These will be signed off by the Environmental Manager.

Hold Point for Dewatering Onsite

Prior to any dewatering and/or discharge contact Environmental Manager or delegate and train representative who will signoff the hold point once water is "clean". Testing and, where necessary, treatment of any dewatered construction water must be undertaken prior to discharge. This may occur within excavation or in a sealed container(s).

Description of Works: Establish Bridge Compound	
Location (Chainage): BRIDGE COMPOUND	**Date:** 9/9/10
Site Foreman:	**Signature:**
Environment Manager:	**Signature:**

Appendix C

Sediment Basin Flocculation Procedure

Sediment Basin Flocculation

Description

This procedure details the requirements to be followed for sediment basin flocculation and water discharge to minimise environmental impact and to comply with water quality criteria. Deep excavations can also act as a sediment basin and accumulate large volumes of water. Any water accumulated in deep excavations must be treated and disposed of in accordance with this procedure. Further detail is provided in the "Blue Book - Managing Urban Stormwater - Soils and Construction" or other relevant local guideline. Manufacturer specifications, best practice and past experience should also guide the flocculation of sediment basins.

Roles

DECCW, Environmental Manager, Foreman, Leading Hand, Site Employee

Process

Training

All personnel who are involved with the flocculation of sediment basins are to be inducted into this (and site specific) procedure (s) via a toolbox talk prior to any flocculation and discharge activities occurring.This will include the Leading Hand, Foreman and any Site Employee directly involved in flocculation and release of water.The Environmental Manager will be responsible for organising and delivering the toolbox talks.

Responsibility

It is the responsibility of the Leading Hand, Foreman and relevant Site Employees to ensure that any flocculation and discharge is undertaken in accordance with this procedure and approval is obtained from the Environmental Manager to discharge treated water to the environment.

Determine Discharge Point

The discharge point is detailed in the relevant Erosion and Sediment Control Plans. The Environmental Manager will be consulted with during the design and construction phase to ensure that the discharge point does not cause scouring or damage to natural vegetation.

Re-use of Sediment Basin Water

Where practicable, water from sediment basins is to be reused **on site** for dust suppression without any treatment. Approximate volumes of water re-used should be recorded on the ‘Water Release Approval' Tool or other mechanism in agreement with the Environmental Manager.

If the water cannot be utilised on the site, it is to be discharged off site, following the process below.

Water Treatment

No Treatment Required

If the water is clear, the Environmental Manager is to be consulted with and the water tested prior to discharge**,** providing minimum water quality standards are met (refer to details below). All discharges must be approved by the Environmental Manager.

Flocculation

If the water is visibly dirty, it will need flocculation prior to testing and subsequent discharge.

Gypsum is the preferred flocculant as it has a relatively low potential to harm the environment. The ''Blue Book'' provides guidance to application rates and methods for flocculating with Gypsum, however site conditions (eg soil type) will also influence the type and application of flocculants.

Other flocculants can also be used that in certain circumstances will accelerate flocculation. These include Powdered and Liquid Alum, Coagulants and Polyelectrolytes. Use of any flocculant should be discussed and agreed with the Environmental Manager.

Care is to be taken with the choice of flocculant, its dosage rate and any special requirements to ensure that toxic situations are not created with consequent damage to ecology or to the health of the operator.

A site specific procedure for the flocculation of sediment basins should be developed prior to construction activities occurring at site taking account of local and site conditions, type of flocculant and the need to provide pH buffering. The site procedure should consider manufacturers specifications for dosing rates, Material Safety Data Sheets (MSDS) and industry best practice guidelines. This procedure shall be prepared by the site Environmental Manager.

pH Buffering

In some instances, particularly when gypsum is used, pH buffering may be required to ensure the pH of the discharge is within acceptable limits. The Environmental Manager will provide guidance with regard to appropriate buffering solutions and their application.

Oil and Grease

If an oily sheen is present on the surface of the water, a hydrophobic oil boom (or other suitable device) will be used to skim off the sheen.

Alternatively, the oily water can be removed by a liquid waste contractor and disposed of at a facility approved by the Environmental Manager.

Safety

SAFETY FIRST

ENSURE THE MSDS FOR STORAGE AND HANDLING OF THE FLOCCULANT AND OTHER CHEMICALS IS FOLLOWED

ALL WORKING NEAR WATER PROCEDURES MUST BE FOLLOWED

Test Water

Once the water has been flocculated and appears clean, the Environmental Manager must be contacted to test the water.

The following criteria must be met prior to any discharge, unless specified in the Environment Protection Licence or prescribed by the local DECCW.

- pH - 6.5 - 8.5
- Total Suspended Solids (TSS) - <50mg/L*
- Oil and Grease - None Visible

A sample will be collected by the Environmental Manager to be sent to the laboratory for testing of the above parameters. Samples should be collected from 30cm below the surface of the water in accordance with AS/NZS 5667.1: 1988.

If agreed with the DECCW a relationship between TSS and Turbidity can be established to facilitate immediate prompt discharge of sediment basins. This could be achieved with the assistance of the laboratory.

Obtain Approval to Discharge - HOLD POINT

If the above criteria are not met, the Environmental Manager will advise the Foreman or his delegate that further treatment and testing is necessary.

If the above criteria are met, the Environmental Manager will approve the discharge of the water by completing and signing the Water Release Approval Tool.

HOLD POINT - NO WATER IS TO BE DISCHARGED UNTIL THIS APPROVAL HAS BEEN GRANTED

Discharge Water

Once approval has been given, water may be discharged. The method for discharge will depend upon the design of the sediment basin. Generally discharge will either involve pumping, decanting or syphoning.

Any discharging activities whether offsite or onsite must be under constant supervision by the Foreman or his delegate to prevent the discharge of dirty water. If pumping is used, the suction inlet must be lifted off the floor of the basin (either propper or floated) to prevent the pump from discharging dirty water or sludge from the bottom of the basin. A concrete plinth or similar physical barrier may also be installed within the basin to prevent highly concentrated sediment from being drawn from the bottom of the sediment basin as the clear water becomes drawn down. Any observations made should be recorded on the ‘Water Release Approval Tool' and kept on file.

Appendix D

Sedimentation Basin Checklist

SEDIMENTATION BASIN CHECKLIST

Sedimentation Basins Inspection Checklist (Must Complete All Sections)

Basin ID: _____	**Date of Rain Event: _____** **Amount of Rain: _____**mm	**Date Inspected: _____**

What is the approximate volume of water in the basin (as a % of the total capacity)? _____%

	CONTROL MEASURE	YES	NO	COMMENTS
1	Is maintenance to the basin required? (eg spillway, wall etc)			
2	Does the basin need de-silting? (ie >30% capacity reduced by silt)			
3	Is any oil and/or grease visible on the surface of the water? If visible, remove using a suitable absorbent material.			
4	Any additional water pumped/drained in? Additional flocculants added?			Date & time _____ Amount _____ Date & time _____ Amount _____
5	**Flocculate Basin** How much flocculent was added? (Guide: 32kg/100 cubic metres Gypsum) (Guide: 4kg/100 cubic metres Alum) How much Lime / Alum was added to meet the required pH range? (if required)	Flocculent used: (Alum/Gypsum) Amount _____kg Date & time added _____ Amount _____kg Date & time added _____		
6	**Allow 24hrs then Sample Basin** If NTU>45 re-flocculate or sample and send grab sample to Lab <u>Discharge Permitted only if all of the following are met:</u> ➢ NTU<45 ➢ No oil or grease visible ➢ pH is between 6.5 - 8.5	Date & time of test_____ Turbidity = _____NTU pH = _____ Oil or grease visible - (Yes/No)		
7	**If Laboratory Results Required** **Discharge Criteria** TSS < 50mg/L Oil and Grease < 10mg/L PH 6.5 – 8.5	TSS = _____mg/L Oil and Grease = _____mg/L PH = _____		
8	**Date Of Discharge:** **Date Valve Closed on Discharge:**	_____ _____		

Additional Comments:

Approved by (MUST BE AN AUTHORISED PERSON):	**Discharged by:**

Appendix E

Discharge Water Quality Checklist

DISCHARGE WATER QUALITY CHECKLIST

Discharge Water Quality Checklist (Must Complete All Sections)

Location: _____	**Date of Rain Event: _____** **Amount of Rain: _____**mm	**Date Inspected: _____**

What is the approximate volume of water to be discharges? _____ L / kL

	CONTROL MEASURE	YES	NO	COMMENTS
1	Can the water be re-used for dust suppression or other?			
2	Is it necessary to discharge water? (note reason)			
3	Is any oil and/or grease visible on the surface of the water? If visible, remove using a suitable absorbent material.			
4	Any other potential contaminants other than turbidity, pH or oil/grease of concern			
5	**Flocculate pit, tank or excavation** How much flocculent was added? (Guide: 32kg/100 cubic metres Gypsum) (Guide: 4kg/100 cubic metres Alum) How much Lime / Alum was added to meet the required pH range? (if required)	Flocculent used: (Alum/Gypsum) Amount _____kg Date & time added _____ Amount _____kg Date & time added _____		
6	**Allow 24hrs then sample water** If NTU>45 re-flocculate or sample and send grab sample to Lab <u>Discharge Permitted only if all of the following are met:</u> ➢ NTU<45 ➢ No oil or grease visible ➢ pH is between 6.5 - 8.5	Date & time of test_____ Turbidity = _____NTU pH = _____ Oil or grease visible - (Yes/No)		
7	**If Laboratory Results Required** **Discharge Criteria** TSS < 50mg/L Oil and Grease < 10mg/L PH 6.5 – 8.5	TSS = _____mg/L Oil and Grease = _____mg/L PH = _____		
8	**Date Of Discharge:** **Location of Discharge:** **(Must not affect frog habitat)**	_____ _____		

Additional Comments:

Approved by (MUST BE AN AUTHORISED PERSON):	**Discharged by:**

Appendix F

Unexpected Finds Procedure

Unexpected Find Procedure
Contamination, Asbestos & Acid Sulphate Soil

Purpose

This Procedure details the methodology to be followed to identify and manage unexpected contaminated material during the construction of the Project. The objective of this Procedure is to minimise human health and environmental risks from the disturbance of contaminated land during the Project, and to ensure that contaminated material is managed, handled and/or transported in accordance with the following requirements:

- Ministers Conditions of Approval (MCoA), particularly MCoA 2.42, 2.43 & 2.44
- Contaminated Land Management Act 1997
- Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (EPA, 1997)
- Contamination Management Plan for Construction (Coffey, November 2009)
- Validation Report for Separable Portion 2, 3, 4 and 5 ILC at Enfield (Coffey, April 2010)
- Interim Advice Letter Implementation of Remedial Action Plan for Separable Portions 2, 3, 4 and 5 ILC @ Enfield (Environ, July 2010)
- Remedial Action Plan (RAP) (Coffey 2009a)
- Waste Classification Guidelines (DECC 2008)
- Occupational Health and Safety Act 2000 and asbestos guidelines

Scope

This Procedure is applicable to all personnel and subcontractors if suspected contaminated material (including, but not limited to, total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), metals, volatile organic compounds (VOC) or asbestos containing materials) or acid sulphate soils are encountered at any location of the ILC Enfield Project.

Induction / Training

The Environmental Manager (EM) will ensure all personnel responsible for managing potential contaminated land/spoil and fill issues understand the requirements of this Procedure. All Project personnel will also be inducted on the identification of potentially contaminated land.

Identifying potentially contaminated land

The Project personnel will be informed to be aware of the following visual and olfactory signs of contamination while working:

- Unexpected oil/diesel/tar, sheens, saturated with PSH (phase separated hydrocarbon)
- Hydrocarbon odours or any unusual chemical odour
- Discoloured soil
- Asbestos troughing, pieces, fibre cement sheets, fibres; and/or
- Acid Sulphate Soils (ASS) or potential ASS as grey, gluggy soils with rotten egg gas smell

Potential contamination may be encountered in various potential situations during construction including (but not limited to):

- Unexpected storage tanks and associated underground fuel infrastructure, including fill lines and breather lines;
- Buried drums and waste containers
- Free product of phase separated hydrocarbon (PSH); and
- Buried asbestos or other material at concentrations above the remediation criteria (Coffey 2009a)

Procedure for Contaminated Land (No Suspected Asbestos Risk)

1. Managing potential contamination

If signs of contamination are identified during the works or as part of any investigations (i.e. phase 1 assessment) in any material during construction and there is no suspected asbestos risk, the following process will be followed:

a) Cease work in the area of concern immediately;

b) Isolate the area with barrier tape or any other physical barrier to prevent workers from entering the potentially contaminated location;

c) If possible relocate workers to another work location away from area of potential contamination;

d) Report the area of concern to the Superintendent and EM immediately;

e) Superintendent or EM will contact the Safety Manager and Area Manager;

f) EM will determine if it is defined as contaminated as per Contamination Management Plan for Construction. At this point EM may determine that it is not in fact considered contamination and works can proceed;

NB: Odorous and stained soils could be encountered during construction. However, the site specific remediation criteria specified in the RAP indicate that these soils, if not saturated with PHS, are suitable for the proposed land use and require no further remediation to render the site suitable for the proposed use.

g) EM will notify Sydney Ports of the identified or suspected contamination;

h) Area Manager will delegate an Engineer responsible for the management of this unexpected find;

i) Engineer responsible will follow the procedure Flowchart for Excavation - ILC at Enfield (Soil & Water Management Plan Appendix A). Advice and support will be given by the EM during the process;

j) EM will engage a suitably qualified contaminated land management consultant

k) Engineer coordinate with contaminated land management consultant to inspect the site and carry out an initial assessment of the nature and extent of the contamination

l) EM or consultant will liaise with accredited Site Auditor under the Contaminated Land Management Act

m) EM or consultant will advise Engineer what remediation is required

2. Undertake the required remediation

Occupational Health & Safety requirements must be satisfied before commencing remediation works.

Carry out any required remediation works in accordance with the RAP (Coffey 2009a) and Site Auditor requirements to remove or contain the identified contamination.

Engineer in charge will liaise with consultant, plan and undertake the works to remediate. The Environmental Manager and Area Manager will be responsible for overseeing the process.

3. Carry out the validation work

Carry out any required validation work to demonstrate that the identified contamination has been adequately remediated or managed in line with RAP.

Engineer in charge will liaise with consultant, plan and undertake any validation work required. The Environmental Manager and Area Manager will be responsible for overseeing the process.

Environmental Manager will report that works have been undertaken to a standard suitable for review by an accredited Site Auditor.

4. Recommence work

Environmental Manager will report progress to Sydney Ports during the above processes. Environmental Manager will be responsible for providing Sydney Ports with documentation in

accordance with the contract (e.g. as constructed drawing etc.) to enable Sydney Ports to obtain the final Site Auditor's Statement SAS(A).

Work will not recommence onsite without the prior written approval of the EM.

Procedure for Suspected or Known Asbestos Risk

1. Managing potential asbestos

If signs of asbestos contamination are identified in any material during construction the following process will be followed:

a) Cease work in the area of concern immediately;

b) Isolate the area with barrier tape or any other physical barrier to prevent workers from entering the potentially contaminated location;

c) Keep area wet, but without causing potential asbestos dust particle to become air-bourne

d) Foreman to notify workers through direct communication or revised pre-start of the potential risks and controls being implemented to mitigate these risks. If possible relocate workers to another work location away from area of potential contamination;

e) Report the area of concern to the Superintendent and EM immediately;

f) Superintendent or EM will contact the Safety Manager and Area Manager;

g) EM and/or Safety Manager will determine if asbestos is defined as Bonded or Friable, and advise the Superintendent and Engineer of the process this find will be managed;

h) EM will notify Sydney Ports of the identified or suspected asbestos contamination;

i) Area Manager will delegate an Engineer responsible for the management of this asbestos find;

j) Engineer responsible will follow procedures of Soil & Water Management Plan and Safety Plan to organise collection and disposal of asbestos. Advice and support will be given by the Safety Manager and EM during the process;

Occupational Health & Safety requirements must be satisfied before commencing collection.

k) For Bonded Asbestos pieces, trained and ticketed site staff may collect and bag these pieces in accordance with procedures in the Safety Plan. Bags will be placed in a secured bin for later disposal by a licensed Asbestos Contractor;

l) Friable Asbestos will be managed by an AS1 licensed contractor, with the appropriate air monitoring, disposal techniques and clearance certification being undertaken; and

m) The Environmental Manager or consultant will liaise with the Site Auditor.

2. Recommence work

Following the collection and disposal of friable asbestos, and clearance certification (for friable asbestos), the Safety Manager or Environmental Manager will give the approval for works to recommence.

Procedure for Suspected or Known Acid Sulphate Soil

1. Managing potential ASS

If signs of acid sulphate soils are identified in any materials being excavates during construction, especially where near a creek line, the following process will be followed:

a) Pause work in the area of concern to allow investigation;

b) Report the area of concern to the Superintendent and EM immediately;

c) EM will undertake visual inspection and pH tests to identify if acid sulphate soils or not;

e) If confirmed as ASS, that soil will be taken to a designated area on the main project site and treated with lime to neutralise generated or potential acid, in line with management procedure

f) Appropriate reuse or treated soil will be determined by the EM, in consultation with the accredited Site Auditor

2. Recommence work

Work may recommence when actual or potential ASS material has been moved to the treatment area.

Enfield Intermodal Terminal

Noise and Vibration Management Plan

Details of revisions

Level	Details	Date	Initial
1.0	For submission as part of Sydney Ports' CEMPF and LCPL's CEMP to Director-General	21/09/10	GK
1.1	Minor changes addressing additional Sydney Ports comments	27/09/10	GK
1.2	Minor changes addressing additional Sydney Ports' comments	28/09/10	GK

Contents

1 Introduction

1.1 Purpose and Scope

This Construction Noise and Vibration Management Subplan (CNVMP) forms part of the CEMP for the Enfield Intermodal Logistics Centre's Early Works (the "Project''). The purpose of the CNVMP is to describe how Leighton Contractors will manage and control noise and vibration risks associated with the construction of the Early Works.

The plan has been prepared to address the requirements of Condition 6.3 a) of the Ministers Conditions of Approval, the mitigation measures detailed in the Environmental Assessment (EA) (SKM 2005) and all applicable legislation.

1.2 Background

The EA for the Project assessed the noise and vibration impacts during the construction and subsequent operation of the Project. A detailed description of the methodology for construction noise and vibration assessment is provided in Chapter 11 and Appendix E of the EA.

The EA found that construction noise has the potential to exceed noise goal criteria, particularly during earthworks activities. Where noise exceedances are likely, reasonable and feasible noise mitigation measures would be implemented to reduce impacts to as close as possible to predicted and goal levels.

An assessment of vibration impacts was undertaken for the EA. The EA determined there would be no vibration impacts during the construction phase as the majority of vibration typical vibratory activities (such as vibrating rollers) would not have an effect beyond 50m. Residential receivers are at distances greater than 50m, so the affected area was expected to be negligible.

Geotechnical and compaction trials are to be undertaken as one of the activities during the Early Contractor Involvement (ECI) Services investigations during the Early Works phase. The use of Impact Rollers and Dynamic Compaction to consolidate deep fills (up to max of 6m deep in parts) will be investigated. Compaction by methods with greater vibratory impact and that compact to greater depths is proposed over traditional techniques that require the removal and re-compaction and therefore greater soil disturbance. A comprehensive assessment of these vibratory activities is further discussed in Section 2.4 Predicted Impacts.

1.3 Objectives

The key objectives of the CNVMP are to ensure the potential noise and vibration impacts from the Project are minimised. To achieve this objective, the LCPL project team will undertake the following:

- Ensure appropriate environmental controls and procedures are implemented during construction to minimise noise and vibration impacts to all sensitive receivers
- To ensure appropriate measures are implemented to address the MCoA 2.13 to 2.16 and 6.3 a) and all relevant legislation

1.4 Legislation and Guidelines

Legislation

The main legislation relevant to noise and vibration management includes:

- **The Environment Planning and Assessment Act (1979)** - the project has been assessed and approved under Part 3A of the EP&A Act. The Project has been approved in accordance with Section 75J of the Act with a number of Conditions of Approval that must be complied with. Section 75 U of the EPA Act lists various approval requirements that do not apply to an approved Part 3A project.
- **Protection of the Environment Operations Act (1997)** – Construction of the project will be undertaken in accordance with the PoEO Act, which covers a range of environmental offences including noise generation. Specifically, Part 5.5 of the Act details noise pollution offences and requirements for the proper and efficient operation, maintenance and handling of plant, equipment and materials. An Environment Protection Licence (EPL) is not required for the project under the PoEO Act as the project is not listed as a ‘’scheduled activity’’.

Guidelines

Guidelines relevant to noise and vibration management include:

- **DECCW Interim Construction Noise Guideline (ICNG) 2009 –** the ICNG sets out ways to deal with noise impacts on residences and other sensitive land uses by presenting assessment approaches that are tailored to the scale of construction projects and indicate how work practices can be modified to minimise impacts. The ICNG sets out guideline management levels for noise impacts. These are referred to later in this plan
- **Environmental Criteria for Road Traffic Noise (ECRTN), 1999 –** The ECRTN provides a criteria that can be used to assess noise impacts for new and developed roads and methodologies that recognise the benefits of all noise mitigation measures. It is noted that DECCW are in the process of preparing an interim Guideline for Traffic Noise which is currently being reviewed. This plan will be reviewed when the interim plan is released.
- **NSW Industrial Noise Policy –** This guideline sets the criteria and objectives for the management of noise impacts from industrial and commercial sites. It does not cover the management of road traffic or construction noise.

- **Australian Standard (AS 2436-2010) –** Guide to Noise and vibration control on construction, demolition and maintenance sites - provides guidance on noise and vibration control and investigation and identification of sources, measurements of sound and vibration.
- **Assessing Vibration: A Technical Guideline –** This Guideline is based on the British Standard BS6472-1992, Evaluation of human exposure to vibration in buildings. Presents preferred and maximum vibration values for assessing human responses to vibration.

Ministers Conditions of Approval

The Ministers Conditions of Approval relevant to CNVMP with details of the condition and how it is addressed are described in Table 1.

Table 1: Relevant Ministers Conditions of Approval

MCoA	Description	Reference
2.13	The proponent shall minimise noise emissions from plant and equipment operated on the site by installing and maintaining, wherever practicable efficient silencers, low noise mufflers (residential standard) and by replacing reversing alarms with alternative silent measures, such as flashing lights (subject to occupational health and safety requirements)	This CNVMP Sect 4.1
2.14	The proponent, shall as soon as practicable during site preparation, and prior to the commencement of construction of rail trackwork and hardstand for the intermodal terminal empty container and warehousing components for the project, install earth mound noise barriers in the south east of the site, as generally described in the documents referred to under condition 1.1 of this approval	This CNVMP Sect 4.1 and Figure 1
2.15	The proponent shall only undertake site preparation and construction activities associated with the project that would generate an audible noise at any residential premises during the following hours: • 7am-6pm Mon - Fri inclusive • 8am to 1pm on Saturdays and • At no time on Sundays or Public Holidays This condition does not apply in the event of a direction from police or other relevant authority for safety reasons	This CNVMP Sect 2.3 This condition does not apply where works are approved by the Director-General under MCoA 2.16
2.16	The hours of site preparation and construction activities specified under condition 2.15 of this approval may be varied with the prior written approval of the Director-General. Any request to alter the hours of construction	This CNVMP Sect 2.3

MCoA	Description	Reference
	specified under condition 2.15 shall be • Considered on a case by case basis • Accompanied by details of the nature and need for activities to be constructed during the varied construction hours; and • Accompanied by sufficient information for the Director General to reasonably determine that activities undertaken during the varied construction hours will not adversely impact on the acoustic amenity of receptors in the vicinity of the site	
6.3	As part of the Construction Environmental Management Plan for this project, required under condition 6.2 of this approval, the Proponent shall prepare and implement the following management plans	-
6.3 a)	A Construction Noise Management Plan to outline construction noise mitigation, monitoring and management measures to be implemented to minimise noise impacts during construction of the project. The plan shall include but not necessarily be limited to:	This CNVMP
i)	Details of construction activities and a schedule of construction works	CEMP & This CNVMP Sect 2.2
ii)	Identification of construction activities that have the potential to generate noise and/or vibration impacts on surrounding land uses, particularly residential areas	This CNVMP Sect 2.2
iii)	Where the relevant construction Noise goals contained in the Noise Management Guideline (formerly published as Chapter 171 of the Environmental Noise Control Manual) are predicted to be exceeded at sensitive receivers, provision for the application of all practicable reasonable and feasible noise mitigation measures to achieve the relevant construction noise and vibration goals	This CNVMP Sect 4.1
iv)	Procedures for notifying residents of construction activities that are likely to affect their noise and vibration amenity as well as procedures for dealing with and responding to noise complaints: and	CEMP, this CNVMP Sect 3.1, and Stakeholder & Community Involvement Plan
v)	A description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be conducted, how the results of this monitoring would be recorded and if any non compliance is detected	This CNVMP Sect 5.1

2 Identify and Assess

2.1 Existing Environment

Overview

The project is bound by industrial land to the east and west and mixed industrial/residential to the north and south. Existing noise levels are dominated by traffic along the main arterial routes in addition to industrial uses, including the existing railway infrastructure of the new Enfield Marshalling Yards.

Sensitive Receivers

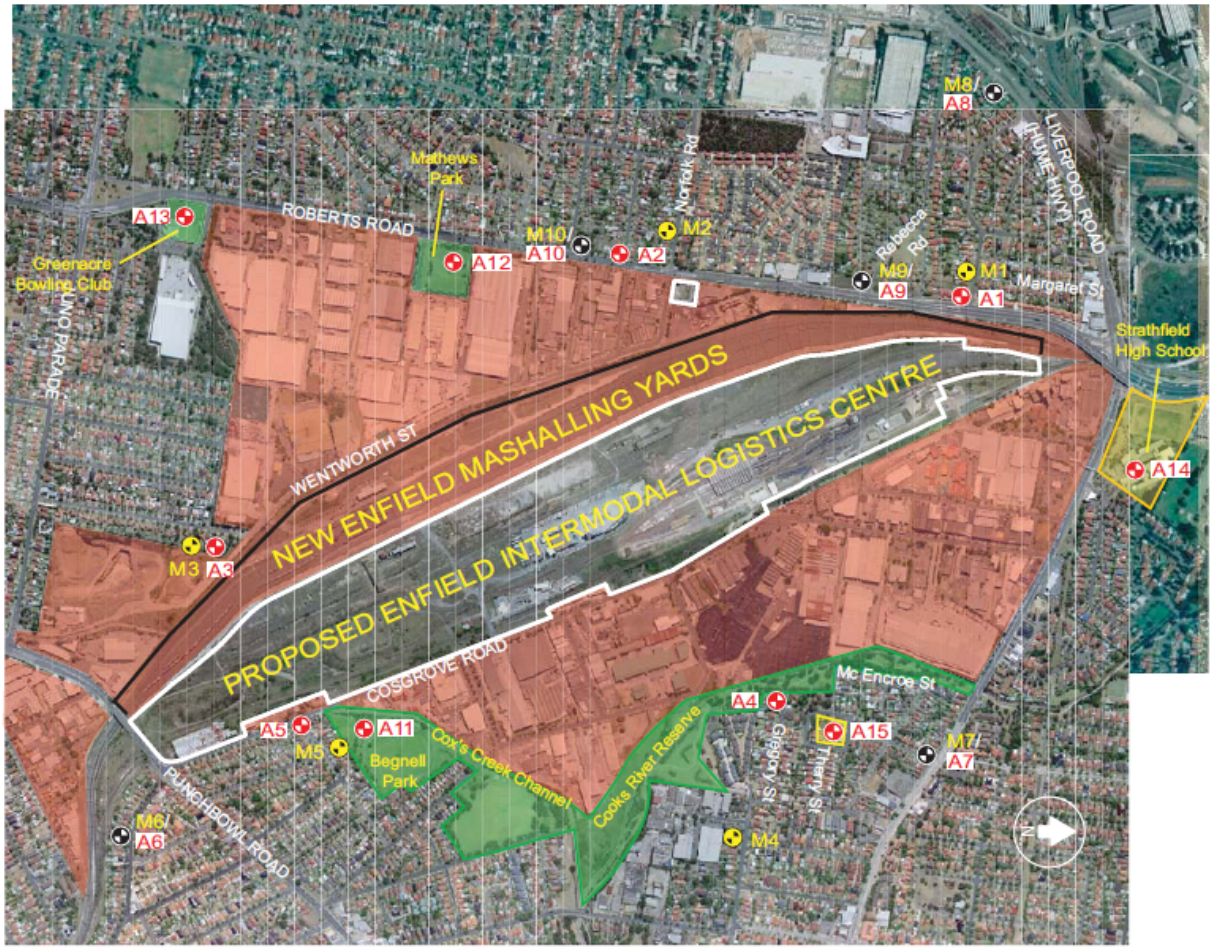
The nearest potential sensitive receivers include residences in the vicinity of:

- Cosgrove Road, south of Cox's Creek Channel
- Punchbowl Road, adjacent to the rail line and opposite the southern part of the site
- Wentworth Street (south) adjacent to the rail line at the Southern end of the site
- Norfolk Road and Roberts Road
- Rebecca Road and Roberts Road
- Margaret Street, backing onto Roberts Road; and
- Gregory Street, Therry Street and McEnroe Street, Strathfield South – adjacent to Cooks River Reserve)

Other Sensitive land uses identified in the study area include Strathfield High School, Begnell and Matthews Park and the Green Acre Bowling Club. These sensitive receivers are shown in Figure 1.

Background Noise Levels

Background noise levels were measured as part of the Environmental Assessment (SKM, 2005). Assessment and monitoring locations are shown on the Locality Map, Figure 1. The daytime levels are reported in Table 2 along with relevant noise criteria.



NOTES

- Industrial
- Recreational
- Educational
- Assessment locations
- Monitoring locations
- Combined Assessment and Monitoring locations

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Figure 1 : Locality Map Showing Site and Surrounding Land Use

Date : 22/06/05 | **Scale:** NTS

Ref : TB867-01P04 (rev 3)

Table 2: Background Noise Levels and Noise Criteria

Location	L_{90} Background Levels (7am – 6pm)	L_{eq} Ambient Noise Levels (7am – 6pm)	LA_{10} criteria (L_{90} +5dBA)	ICNG Criteria (RBL + 10dBA)	ICNG Daytime Indoor Criteria ($LA_{eq\ (15min)}$)
A1: 6 Jean Street	49	59	54	55	-
A2:42 Norfolk Road	48	61	53	58	-
A3: 14 Wentworth Street (South)	44	61	49	54	-
A4: 124B Dean Street	44	60	49	54	-
A5: 43 Blanche Street	41	55	46	51	-
A6: 40 Bazentin Street	41	56	46	51	-
A14: Strathfield High School	-	-	-	-	45dBA

Notes:

1. RBL not assessed as part of EA. LA_{90} has been adopted as RBL
2. The management levels prescribed by the Interim Construction Noise Guideline (ICNG) were released in 2009 (following project approval) and are considered relevant to the project

2.2 Construction Activities

The construction works for the new Overbridge over RailCorp's New Enfield Marshalling Yard will commence in 2010 and are expected to be completed in early 2011. The program for the remainder of the Early Works has not been finalised yet.

Construction activities that have the potential to cause acoustic impacts include the following:

Site Preparation

- Prepare haul roads
- Clearing & grubbing
- Excavation for the construction of frog ponds
- Removal of Unsuitable material

Earthworks and Drainage

- Earthworks and compaction works
- Stormwater drainage works

- Relocation of services
- Retaining walls/embankments

Road and Rail Infrastructure

- Off Site Access Works
- Excavation of abutment in rock
- Reinforced earth wall for road embankment
- Overbridge over rail New Marshalling Yards
- Install services
- Railway line connection works

2.3 Hours of Construction

Standard Hours of Construction

The approved hours for construction are 7am to 6pm (Monday to Fridays) and 8am to 1pm on Saturdays. Works will not take place on Sundays or Public Holidays.

All construction activities including site deliveries, heavy vehicle movements and the construction of any temporary noise walls (in accordance with MCoA 2.14A) will be undertaken within these hours.

Out Of Hours Works

Due to the nature of the project, there is potential that some works may be required outside standard approved hours. Such works may include (but not be limited to):

- works on neighbouring roads that can only be undertaken during low traffic flows (night)
- service works or diversions that can only be undertaken during periods of low demand
- Delivery of oversize plant and equipment that cannot be delivered safely during normal work hours due to RTA traffic restrictions

If works are required to be undertaken outside the standard hours, they will only commence with the approval of the Director General, following an assessment of noise impacts and appropriate notification of impacted members of the community.

Works that do not require approval from the Director General include:

- Emergency works directed by the Police or other Emergency Service (eg Fire Brigade)
- Works that have been assessed to be inaudible at the nearest residential premises

2.4 Potential Impacts

Construction Noise

The impacts of the construction phase were predicted in the EIA. Table 11-16 of the EIA provides a summary of predicted impacts for sites A1- A6 for the various stages of

construction. These locations represent the nearest residences. The assessment concluded that the noisiest periods would be during earthworks. In addition to compliance in residential areas, the noise impacts at Strathfield High School need to be managed, to minimise impact to school operations.

A summary of worst case predicted impacts can be seen in Table 3.

Table 3: Worst Case Predicted Noise Impacts Without Mitigation Measures (SKM, 2005)

Location	LA_{10} criteria (L_{90} +5dBA)	LA_{10} predicted
A1: 6 Jean Street	54	76
A2:42 Norfolk Road	53	62
A3: 14 Wentworth Street (South)	49	68
A4: 124B Dean Street	49	62
A5: 43 Blanche Street	46	81
A6: 40 Bazentin Street	46	75
A14: Strathfield High School	-	-

Notes to Table:

1. The predicted impacts assumed worst case scenario when all plant and equipment was operating simultaneously, equipment has no acoustic treatments and no shielding is afforded by building facades or intervening structures.

2. Predicted impacts against the ICNG criteria of RBL (LA_{eq}) + 10dBA have not been assessed, so compare with LA_{10} in the absence of LA_{eq} data

3. The noise criteria for Strathfield High School is $LA_{eq\ (15min)}$ <45dBA which is an indoor criteria

Out of Hours and Possession Approvals

Some Out of Hours or Rail Possession activities are likely to be required throughout the construction period. These activities may be required to be undertaken out of hours to:

- To ensure safety and protection of workers and members of the public;
- Scheduled possessions determined by Rail Authorities or Rail Operators;
- Reduce disruption to traffic and the community;
- Satisfy operational requirements of government agencies or authorities; or
- Due to unforeseen circumstances.

Examples include:

- RailCorp or Pacific National allow access to the New Enfield Marshalling Yards
- Temporary utility shutdowns during off peak periods for service installation works and cut-overs;
- Delivery to site, and removal from site, of over-sized plant and equipment to conform to RTA requirements, e.g. 40m long bridge girders on specialised trucks “Jinkers”;

- Minor works such as pothole and road repairs; and
- Large concrete pours that require extended hours to complete

MCoA 2.15 establishes construction hours for construction activities that generate an audible noise at any residential premises. Conversely, construction activities not audible at any residential premises including outside of standard hours, could comply with this Condition.

An Out of Hours Self-Assessment of construction activities will be undertaken by the Environmental Manager, where works can be shown to be inaudible at the nearest sensitive receiver through simple noise calculations and comparisons to past work, or through a more sophisticated noise assessment undertaken by the Leighton Contractors' Noise Consultant if simple calculations are not appropriate.

For works considered to be audible at a sensitive receiver out of standard construction hours, an application with a noise assessment (Construction Noise Impact Statement (CNIS)) and justification of why the work needs to be undertaken at such hours, will be submitted to the Director-General for approval on a case-by-case basis in line with MCoA 2.16.

For the Early Works, a CNIS will be submitted for assessment and approval by the Director-General for any audible (at residential receivers) Out of Hours and Possession associated with the Overbridge Construction.

Traffic Noise

The EA included an assessment of the noise impacts associated with the operation of the facility. The assessment indicated that the noise impacts from these truck movements would comply with the DECCW Environmental Criteria for Road Traffic Noise. As the number of truck movements during the construction phase is significantly less than the predicted vehicle movements (and with vehicle movements being primarily light vehicles) for the operational phase, it is expected that traffic noise impacts during the construction phase would also comply with the ECRTN criteria.

Vibration

Vibration impacts from traditional Vibratory Rollers are expected to be negligible as these types of rollers typically have a Safe Working Distance of 25m, and nearest sensitive receivers are approximately 50m or more from the source.

Geotechnical and compaction trials are to be undertaken as one of the activities of the Early Works construction phase. The use of Impact Rollers and Dynamic Compaction to consolidate deep fills (up to max of 6m deep in parts) will be investigated during these trials. Compaction by such methods with greater vibratory impact allows compaction to much greater depths. This is proposed over traditional techniques that require the removal and re-compaction in 150mm deep layers and consequent soil disturbance.

An initial assessment of these vibratory activity trials has been undertaken by Leighton Contractor's Noise and Vibration Consultants. This assessment has been provided in Appendix B for reference.

The assessment shows that Dynamic Compaction has the ability to migrate greater distances in the ground as compared to conventional Vibrating Roller and Impact Rolling methods. The trials have been programmed to provide a "ramp-up" in strength of impact. With the establishment of a conservative upper limit at which the trials must cease, monitoring during the trials at different distances will determine if trials can continue to proceed. Monitoring will

also allow appropriate Safe Working Distances to be established for the different methods of compaction.

The assessment determined that since the distance from source to the receivers have been maximised and the period of the Dynamic Compaction trials is only two weeks, vibration impacts (vibration dose) are still considered to be negligible/minimal. Notification was considered necessary to consult with the closer residential receivers. Although no impacts are predicted to occur, pre-construction dilapidation surveys are to be undertaken at residential houses and commercial premises adjacent.

3 Consult and Communicate

3.1 Stakeholder Consultation

A process for notifying the community prior to and during construction works (for particularly noisy or potentially vibration intensive activities) is included in the Construction Environment Management Plan (CEMP) and the Stakeholder and Community Involvement Plan. In summary this process involves:

- updating the community prior to and during the construction phases
- notifying residents and other sensitive receivers of particularly noisy activities
- notifying residents and other sensitive receivers of potentially vibration intensive activities
- a clear procedure for making, recording and responding to community complaints and impacts
- consulting with residents and other sensitive land uses such as schools to understand any specific requirements they may have that may restrict site operations

3.2 Training and Awareness

Leighton Contractors has an environmental training program EnviroEssentials which addresses LCPL key construction risk areas including Legal and Regulatory Compliance, Construction Noise and Vibration and other key risk areas such as Erosion and Sediment Control.

All relevant construction personnel will attend the EnviroEssentials program for Legal and Regulatory Compliance and Noise and Vibration. This will be focussed on roles in a position of leadership and influence including site engineers, supervisors and construction managers.

In addition to specific training, a mandatory site specific site induction will be held for all construction personnel to ensure they understand the specific site requirements. The induction will include as a minimum:

- Approved Construction Hours (including arrival and departure times)
- Approved traffic routes
- Noise restrictions and monitoring
- Site noise controls
- Sensitive receivers (including residential and special use areas)
- Site rules in relation to parking and general behaviour of staff

4 Implement Controls

4.1 Mitigation Measures

The following mitigation measures will be implemented to minimise noise impacts.

- Ensure that audible construction activities are only undertaken between 7am and 6pm Mondays to Fridays, and Saturday 8am to 1pm, unless approved by the Department of Planning, or for emergency or safety reasons
- The earth noise mound at the south-eastern corner of the site within the vicinity of Cosgrove Road will be constructed prior to main construction in accordance with Condition of Approval 2.14
- Non-tonal reversing beepers or smart alarm must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work, unless a safety risk assessment requires a tonal beeper
- An ongoing programme of testing, undertaken on a risk-based approach, will assess plant and equipment against Australian Standard AS 2436-2010. Where machinery does not comply, it will either be removed from site, replaced or upgraded with acoustic apertures, mufflers or other mechanical treatment to reduce noise impacts to acceptable levels
- When within 200m of a residential receiver, limit any construction activities that result in noise intensive, impulsive or tonal noise such as rock hammering, impact piling and saw-cutting to 3 hour shifts, ensuring 1 hour of respite is provided before re-starting with the activity, and between the hours of 8am and 6pm
- Where practicable, locating site facilities, offices and storage containers in areas where they provide additional shielding to residents and other sensitive receivers
- Orientate plant and equipment away from residential or other receivers
- Position items of noisy plant and equipment as far apart as is practicable from each other
- Ensure that where options exist, use least noisy construction methods, vehicles, plant and equipment
- Design the work site to minimise the need for truck reversing movements
- Switch off plant and equipment that is idling unnecessarily, especially during out of hours works
- Use vibration or rotary piling techniques for all piles where applicable. Where impact piling is required, limit the impact of noise emissions using measures such as limiting

hours of operation, lowering the height of use of hammers, shielding the pile driving by the positioning of construction equipment or use of acoustic shrouding and resilient dollies

- Use silenced generators and compressors
- Prevent vehicles and plant queuing and idling outside the site prior to the morning start time
- If parking of trucks with deliveries of bridge girders or over-sized plant required out of hours on Cosgrove Road, park away from residents and switch off engines immediately once stopped
- Blasting is not permitted
- Notify residents of construction activities likely to affect amenity due to noise or vibration in advance of the work
- Undertake condition surveys for residences and commercial buildings potentially impacted by vibratory activities
- Follow Head Earthworks Specification establishing vibration levels by type of receiver
- Undertake vibration monitoring during compaction trial and determine Safe Working Distances

If noise monitoring results indicate non-compliance with site criteria and/or excessive complaints are received, the following measures will be implemented where they have been assessed to be ‘’reasonable and feasible’’ (in accordance with the ICNG)

- Acoustic treatments of individual machines such as lining of engines and upgraded mufflers
- Providing “at source” acoustic plant enclosures and local noise hoardings
- Alter the hours of work to minimise intrusive noise to residential receivers
- Where there are no other reasonable and feasible alternatives, and intrusive noisy work is required to complete the work for a short duration (e.g. one shift), Leighton Contractors will consider other arrangements such as temporary acoustic barrier or if this is not practical then consider alternative accommodation to the impacted resident for the short period.

5 Review and Monitor

5.1 Monitoring, Inspections and Reporting

Documented weekly environmental inspections of potential noise and vibration activities and equipment will be undertaken by the Environment Manager (EM) and forwarded to the Project Manager (PM). These inspections will be undertaken for the duration of the Project. Issues that cannot be closed out immediately will be entered into an action list and reported as described in the CEMP.

The weekly environmental checklist is included as an Appendix to the CEMP and includes a section on noise and vibration impact inspections.

Noise monitoring during the Early Works will include monthly attended noise measurements at the Locations A1- A6 identified in Table 3, being the most potentially affected residents. Noise monitoring data will be recorded on the Noise Monitoring Record Sheet (Appendix A).

In addition to the above routine monitoring:

- An ongoing programme of testing, undertaken on a risk-based approach, will assess plant and equipment against Australian Standard AS 2436-2010. Equipment that does not comply with this standard will be upgraded with acoustic treatments or removed from site
- Supplementary monitoring may be undertaken when there is a complaint or when a new phase of work commences
- Noise monitoring may be carried out in response to exceedences of the construction noise levels identified in this plan, or for the purposes of refining construction methods or techniques to minimise noise
- Noise monitoring may be undertaken at Strathfield High School (Location A14) on a risk based approach, and also following any enquiry or complaint from the school

Where noise levels are found to exceed the predicted worst case levels, the source of excessive noise generations will be identified, and any additional reasonable and feasible measures available will be implemented to either reduce noise emissions or reduce the impacts on receivers.

Details of site activity and equipment usage will be noted during construction noise monitoring. Reports prepared following completion of the monitoring include the following:

- The locations and results of the construction noise monitoring
- Tabulation of noise monitoring results together with notes identifying the principle noise sources and operations

- Summary of any measurements exceeding the goals, and descriptions of the plant or operations causing these exceedences
- Details of corrective action applicable to goal exceedences and confirmation of its successful implementation

Vibration

Vibration monitoring will be undertaken during the compaction trials of the ECI Phase works to ensure levels of vibration experienced at residential and other receivers are compliant with the standards and guidelines. Vibration monitoring will also establish Safe Working Distances for Main Construction works.

5.2 Auditing

Six monthly internal audits for compliance against the MCoA will be undertaken. The audit will include a detailed site inspection and assessment of compliance with this plan. The audit will assess noise and vibration monitoring, reporting, effectiveness of controls, community and complaints management. The EM will be responsible for managing and implementing audit actions and the PM will have overall accountability for ensuring compliance.

6 Manage Incident

6.1 Incident Management Framework

All environmental incidents on the project will be managed by LCPL in accordance with the incident management protocol as described in the CEMP and OH&S and Rail Safety Management Plan. This includes internal and potentially external notification and recording, reporting and response processes.

7 Appendices

Appendix A

Noise Monitoring Record Sheet

Noise Monitoring Record Sheet

CHAINAGE OF CONSTRUCTION ACTIVITY (Up/Down):	**MONITORING LOCATION:**
DATE OF TEST:	**TEST CONDUCTED BY:**
ACTIVITY/ SERVICE:	**OPERATOR:**
DISTANCE FROM NOISE SOURCE: **WIND SPEED/DIRECTION:**	**INTERVENING GROUND (e.g. hard/soft, flat / fenced):**
METEROLOGICAL CONDITIONS (i.e. cloud cover):	
LABORATORY CALIBRATION: Acoustic Research Laboratories 8 / 5 / 08	
FIELD CALIBRATION:	
TEST PROCEDURE: AS 2659, INP & ICNG	

EXISTING BACKGROUND (RBL) **Reference Relevant Noise Catchment Area (NCA)**		**RBL:**	**NCA:**
L_{10} or L_{eq} Noise Goal: (RBL +10 stan +5 OOH)	**L_{A1} Noise Goal:** (Refer to CNIS)	**PREDICTED NOISE LEVELS** **Reference (EA or other):**	
		L_{eq}	**$L_{A1\ 60\ second}$**
RESULTS			
Start time: (24hr clock)		End time: (24hr clock)	
Time weighting:	(Fast) / Slow	Frequency weightings:	(A) / C / Flat
L_{eq}		$L_{A1\ 60\ second}$ (NIGHT WORKS ONLY)	
Exceedance of Noise Goal:		L_{eq}	L_{A1}
Difference to Predicted (CNIS):		L_{eq}	L_{A1}
Site Activities / Type of Plant in Operation		**Monitoring Comments**	

Site Diagram **(show monitoring location, buildings, construction zone other noise sources, distances, north up/down track)**

Appendix B

Dynamic Compaction Preliminary Vibration Assessment

ENFIELD INTERMODAL LOGISTCS CENTRE

DYNAMIC COMPACTION PRELIMINARY VIBRATION ASSESSMENT

ACOUSTICS AND AIR

REPORT NO. 10223-DC
VERSION B

WILKINSON MURRAY

ENFIELD INTERMODAL LOGISTCS CENTRE

DYNAMIC COMPACTION PRELIMINARY VIBRATION ASSESSMENT

REPORT NO. 10223-DC
VERSION B

SEPTEMBER 2010

PREPARED FOR

LEIGHTONS CONTRACTORS PTY LTD

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TABLE OF CONTENTS

GLOSSARY

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph overleaf, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

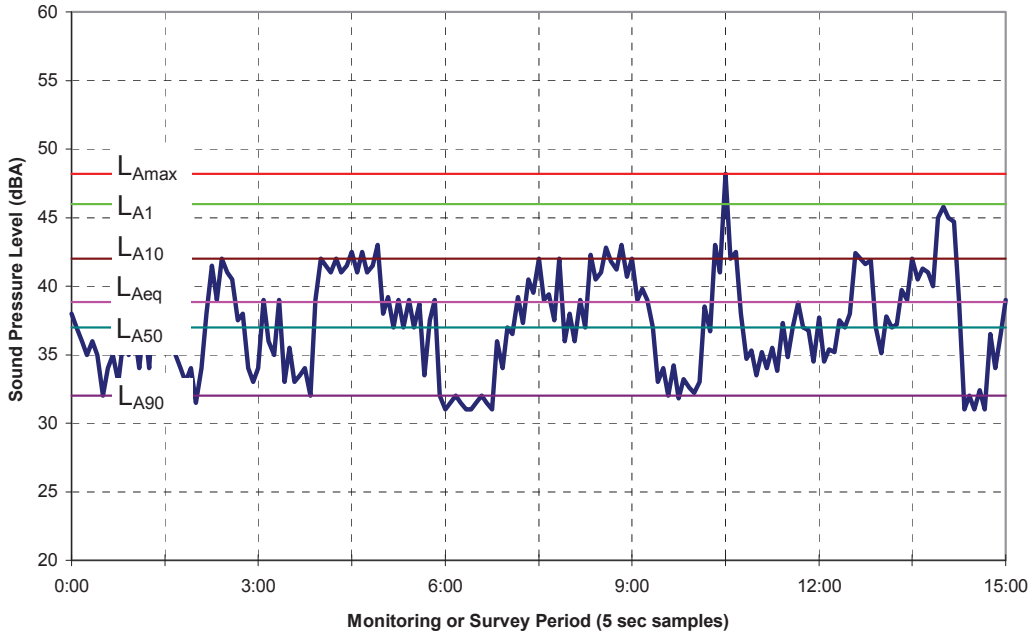
L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

L_{A50} – The L_{A50} level is the noise level which is exceeded for 50% of the sample period. During the sample period, the noise level is below the L_{A50} level for 50% of the time.

L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10^{th} percentile (lowest 10^{th} percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.


60
55
50
45
40
35
30
25
20
Sound Pressure Level (dBA)
LAmax
LA1
LA10
LAeq
LA50
LA90
0:00
3:00
6:00
9:00
12:00
15:00
Monitoring or Survey Period (5 sec samples)

1 INTRODUCTION

Wilkinson Murray have been engaged by Leightons Contractors Pty Ltd to conduct an assessment of noise and vibration arising from construction of the Enfield Intermodal Logistics Centre (ILC).

Specifically this report details assessment of vibration arising from Heavy Dynamic Compaction, Dynamic Replacement and Impact Rolling ground improvement works. This report details a preliminary assessment of these activities.

Note that Dynamic Compaction or Dynamic Replacement may not be used at the site as other ground treatments are being investigated in addition to these.

1.1 Dynamic Compaction and Dynamic Replacement

Dynamic Compaction and Dynamic Replacement (hereafter referred to collectively as Dynamic Compaction unless stated otherwise) involve impacting the ground with a large weight, dropped from a controlled height. Compaction is achieved through impacts in a grid formation. Several consecutive impacts are conducted in one location before the Dynamic Compaction apparatus (DC) is moved to another grid point.

Dynamic Compaction produces significant groundbourne vibration. Much of the impact energy is transmitted into the compacted material. Some energy is transmitted radially from the impact as surface waves (Rayleigh waves). The proportion of energy transmitted in these waves is dependant on several factors including the shear properties of the compaction material and the shape of the pounder (impacting weight).

Furthermore the attenuation of groundbourne vibration with distance depends on the properties of the ground between the source and receiver. Factors which can affect the propagation of vibration are damping (i.e. energy dissipation) and discontinuous or non-homogenous ground. For these reasons a ‘site law’ needs to be established to accurately predict vibration emissions.

1.2 Impact Rolling

Impact rolling involves rolling with a non-cylindrical drum, which can be either a triangular or square prism, so that the material is compacted through a series of impacts as the drum lands on each of the flat sides.

The vibration emissions from impact rolling are much smaller than those produced by Dynamic Compaction, though it is a similar mechanism through which compaction is achieved. The impact roller used on the ILC project will be either 11 or 17 tonnes.

2 ASSESSMENT METHODOLOGY

Due to the significant vibration emissions from Dynamic Compaction and the possibility for these vibrations to approach building damage limits it is necessary to exercise caution with this activity.

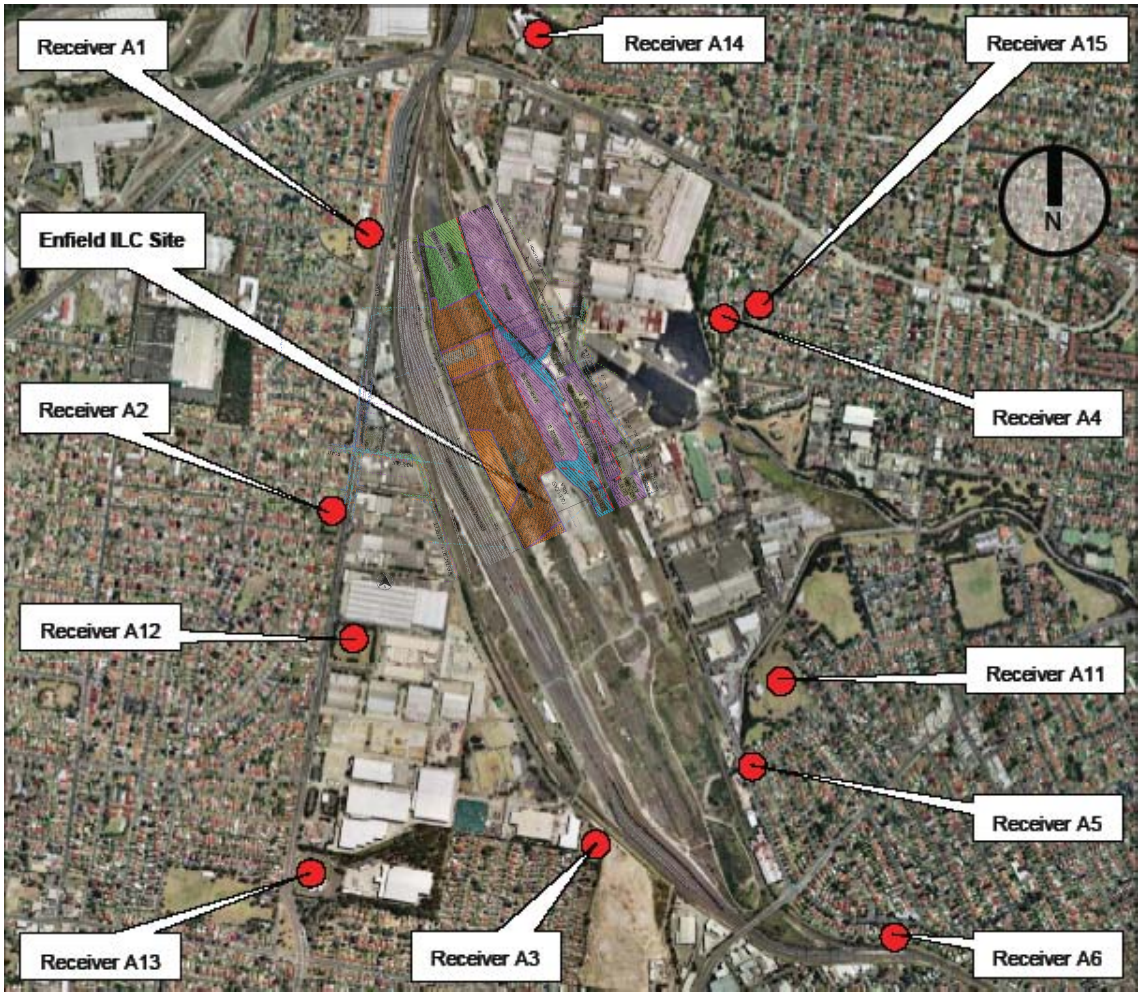
The purpose of this preliminary assessment is to predict vibration levels based on a desktop study of previous measurements. Following this assessment approval will be sought to conduct trial compactions with conservative drop energies to determine the ‘site law’.

After the determination of the ‘site law’ predictions will be refined.

3 SITE DESCRIPTION

The ILC site and surrounding sensitive receivers are shown Figure 3-1. The site is bounded to the west by existing rail lines and the Enfield Temporary Storage Facility (Rail). East of the site is a predominantly industrial area. Further away from the site residential receivers are located in all directions.

Figure 3-1 Aerial Photograph of the Site and Surrounding Receivers



The locations requiring different ground treatments are shown in Figure 3-2. The proximity of these works to residential receivers and also other potentially impacted structures is detailed in Table 3-1.

Figure 3-2 Ground Treatments

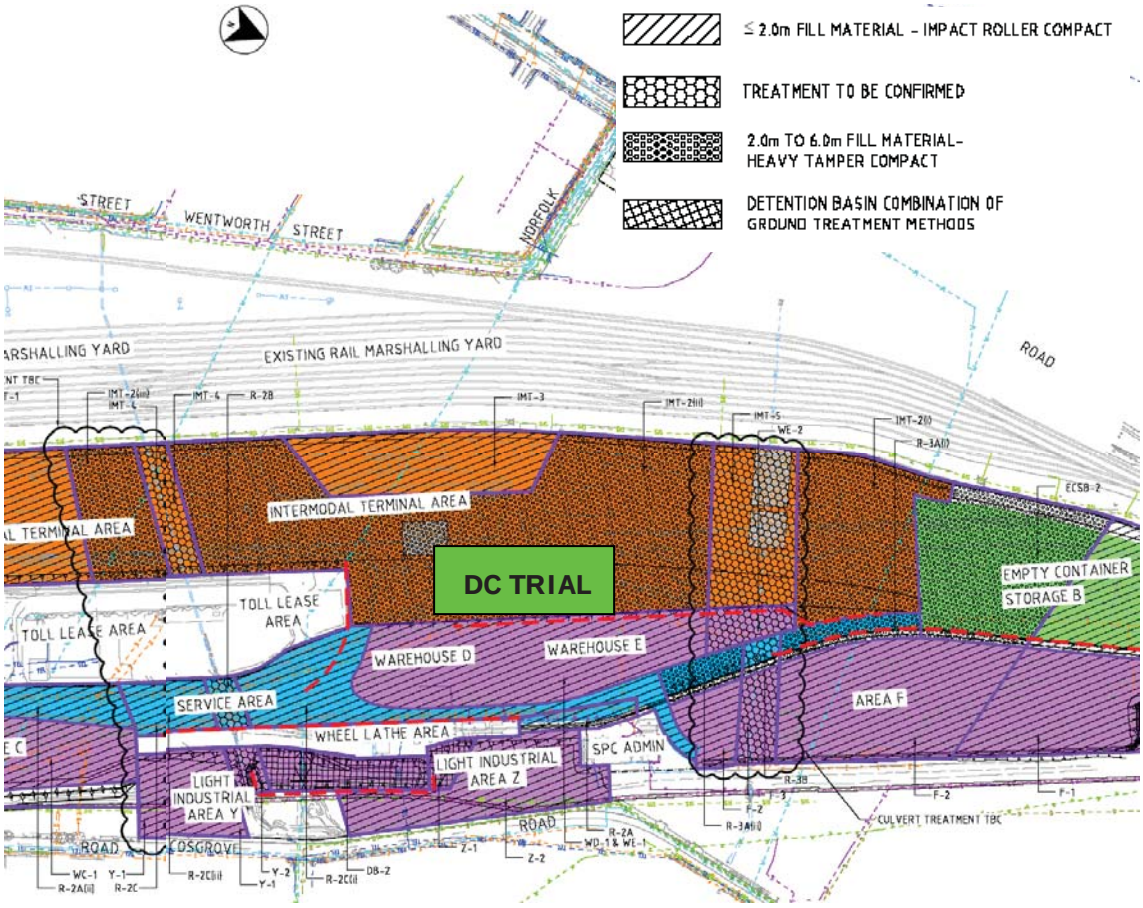


Table 3-1 Proximity of Dynamic Compaction and Impact Rolling Trial Locations to Potentially Impacted Receivers

Receiver	Distance to Impact Rolling Trial	Distance to Dynamic Compaction Trial
	Nearest	Nearest
A1	650m	560m
A2	350m	430m
A3	700m	1000m
A5	650m	1000m
A4	650m	430m
A14	1000m	900m
Rail lines	Minimum safe working distance to be determined by preliminary assessment and trial.	
Steel Water Main		
Brick Arch Culvert		
Site Office Buildings		
Toll Lease Building		

4 VIBRATION CRITERIA

Vibration criteria for construction works are not detailed in the project's Minister's Conditions of Approval.

The project's Earthworks Specification details the following vibration limits for the ground treatment works.

"Vibrations generated by the ground treatment works must not exceed the maximum peak particle velocities (ppv max) in [Table 4-1] *for the frequency ranges stated. In addition, ppv max at the nearest residential building must not exceed 1 mm/s. The levels provided are to be considered as maximum guidance levels not to be exceeded."*

Table 4-1 Earthworks Specification Vibration Limits

EBS	Maximum Peak Particle Velocity (mm/s)	Frequency Range (Hz)
Ethylene gas pipeline	20	1 to 20
Freshwater pipelines	50	Not applicable
Stormwater pipe culverts (concrete)	50	Not applicable
Stormwater pipe culverts (brick)	TBC	TBC
Commercial / industrial buildings	20	1 to 20
Facilities outside site – e.g. railtrack, drain	15	1 to 100

It is noted that the criteria detailed in Table 4-1 are, in some cases, conservative. DIN 4150 specifies vibration limits, below which vibration is not considered to potentially cause damage. These are detailed in Table 4-2.

Table 4-2 DIN4150 Vibration Limits

Structure	Peak Particle Velocity (mm/s)		
	1 to 10 Hz	10 to 50 Hz	>50 Hz
Vibration sensitive structures	3	3 to 8	8 to 10
Dwellings and buildings of similar construction	5	5 to 15	15 to 20
Commercial / industrial buildings	20	20 to 40	40 to 50
Steel pipes	100		
Concrete pipes	80		
Masonry pipes	50		

British Standard BS 7385 advises that to prevent damage from vibration a limit of 50 mm/s should be applied at "Reinforced or framed structures [and] industrial and heavy commercial

buildings" for dominant vibration frequencies above 4 Hz.

The condition of the existing brick culvert would need to be inspected to ascertain the most suitable vibration limit for this structure. We consider that the most likely construction would be akin to that of a commercial or industrial building. Giving consideration to the above standards we recommend that a vibration limit of 20 mm/s be adopted. If reinforcing is included in the construction of the culvert then vibration velocities up to 50 mm/s would be tolerable according to DIN 4150 and BS 7385.

It is noted that the vibration limits specified in the Earthworks Specification are generally conservative, however as these have been provided they are adopted for this assessment.

The 1 mm/s vibration limit at the nearest residential receiver is presumably intended to limit nuisance vibration as it is well below applicable building damage criteria (5 mm/s is generally adopted and even this limit is conservative, assuming an unusually low dominant frequency). Unlike building damage criterion, which if exceeded could potentially cause irreversible damage to structures, the impacts of slightly exceeding human comfort criteria are mild, with some short duration interruption to receivers possible. The level of vibration transmitted to receivers from dynamic compaction and impact rolling is largely dependant on the propagation path. Levels can vary between impact holes and it is possible for one, or several, holes to result in discrete increases in vibration. In light of these possible variations and the minimal impacts associated with few discrete higher vibration levels we strongly recommend that the limit be applied to the 95 percentile ppv level rather than the maximum. Note that this interpretation has no impact on this assessment but rather on compliance monitoring.

The specification does not specify whether the residential limit is to be applied externally or internally. As the construction of individual structures can affect the level of vibration internally, and this cannot be generically quantified, it is most convenient to apply the limits externally. This may result in slightly higher vibration levels internally, where structural resonances are excited, but this is considered acceptable for this type of vibration during the daytime. It is noted that Dynamic Compaction is more akin to intermittent vibration than it is continuous vibration and an assessment of Vibration Dose Value (VDV), which is typically applied to assess intermittent vibration, would likely permit higher vibration levels based on previous measurements.

5 VIBRATION PREDICTION

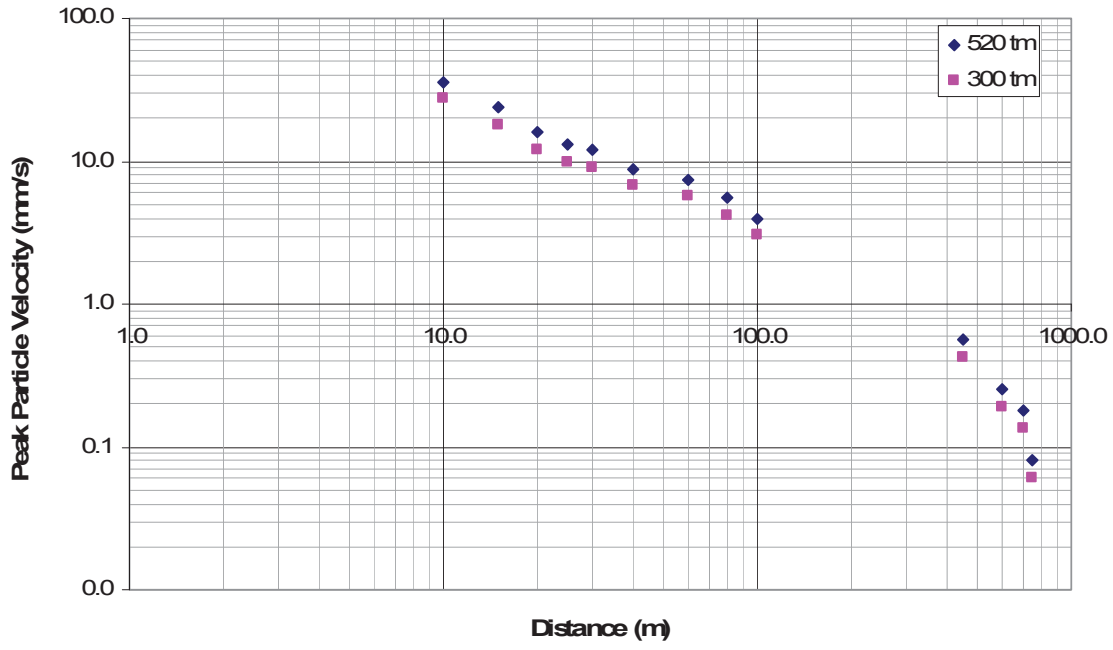
5.1 Dynamic Compaction

Vibration levels from Dynamic Compaction have been measured at a recent project in Sydney.

Wilkinson Murray understands that 'drop energy' of 300 tonne meters (tm)[1] is proposed by the compaction contractor to achieve the desired depth of compaction. The monitored data from a 520 tm 'drop energy' DC, which was monitored at another recent project in Sydney has been shown also. Predictions for the assumed 300 tm 'drop energy' have been based on this monitoring.

The ground response is considered to be a linear system. Therefore the output vibration can be adjusted according to the input energy, i.e. the square of the vibration is proportional to the 'drop energy'.

Table 5-1 Dynamic Compaction Prediction Curves



Based on the prediction curve presented in Table 5-1, the receiver vibration levels and safe working distances to sensitive structures have been calculated. These are presented in Table 5-2 and Table 5-3 respectively.

[1] Note that this is proportional to the actual kinetic energy of the drop, having removed the acceleration due to gravity, which is considered constant.

Table 5-2 Predicted Vibration Level at Surrounding Receivers – DC Trial

Receiver	Criteria (mm/s)		Predicted PPV (mm/s)
	Nuisance / Human Comfort	Building Damage[1]	Nearest
A1	1 mm/s	5 mm/s	0.25
A2			0.45
A3			0.03
A5			0.03
A4			0.45
A14			0.04

Note: 1. Advisable building damage criteria presented for reference only.

Table 5-2 shows that the vibration level at surrounding receivers is predicted to be within criteria during the Dynamic Compaction trial. We note that heavy railway lines, significant roads and industrial buildings are between the site and the receivers surrounding A1. It is possible that this propagation path contains sufficient discontinuities in ground make-up to attenuate vibration beyond that assumed in our predictions.

Table 5-3 Predicted Safe Working Distances

Structure	Criteria (mm/s)	Safe Working Distance (m)
Rail lines	15	18
Steel Water Main	50	5
Brick Arch Culvert	20	14
Site Office Buildings	20	14
Toll Lease Building	20	14

We note that the compaction depth is above the water table and as such expect that the actual damping in the system will be higher than that which has been assumed, based on our previous measurements. In this regard the predictions are considered likely to be conservative.

Note that the predicted vibration levels are for surface vibration. Buried pipelines in close proximity to the impact could receive significantly higher vibration levels than those assumed in our predictions, particularly if the pipelines lie within the compaction cone (dependant on the pounder geometry and the shear properties of the compaction material). If this is of concern it should be investigated during the trial. Assessment of such impacts is beyond the scope of this assessment but it is recommended that any monitoring for this purpose should involve a method for determining the instantaneous compressive force (e.g. load cell), which could be sufficient to plastically yield the pipeline, and also the displacement (e.g. suitably analysed accelerometer), which fundamentally determines the strain in affected structures (strain is the mechanism through which failure from vibration occurs).

5.2 Impact Rolling

We have been informed that the impact roller used for this project will be either an 11t or 17t roller.

A simple relationship was proposed by Derek Avalle (*Ground Vibrations During Impact Rolling, 2007*) to describe the vibration emissions from impact rolling under Australian conditions, based on significant monitoring data. This relationship is

$$PPV = 100*D^{-1}$$

where D is the distance from the roller (m) and PPV the peak particle velocity (mm/s).

This relationship was shown to predict the 85th percentile vibration level for the case studies. This is generally not sufficient for consideration of building damage but given a trial will be conducted to quantify the specific site law this relationship is considered sufficient for this assessment.

This relationship describes emissions from an 8t impact roller. Therefore it was necessary to adjust this prediction curve for the larger rollers proposed on this project. The impact energy was adjusted for the increased roller mass. Additionally a heavier roller is likely to have a larger cross section and consequently a greater 'drop height'. We have assumed that the geometry will increase proportionally in all directions and so the 'drop height' is increased proportionally to the cubic root of the mass ratio.

i.e. $H_1/H_2 <=> (M_1/M_2)^{1/3}$

These adjustments result in the following prediction curves

11t $PPV = 123*D^{-1}$, 17t $PPV = 165*D^{-1}$

Applying the above relationships yields the safe working distances in Table 5-4.

Table 5-4 Safe Working Distances

Structure	Criteria (mm/s)	Safe Working Distance (m)	
		11t	17t
Rail lines	15	8	11
Steel Water Main	50	2.5	3.3
Brick Arch Culvert	20	6	8
Site Office Buildings	20	6	8
Toll Lease Building	20	6	8
Residential	1	125	165

6 VIBRATION EMISSIONS TRIAL

The predictions contained in this report show that vibration emissions from the Dynamic Compaction and Impact Rolling can be managed to comply with building damage criteria. Dynamic Compaction is predicted to exceed the human comfort vibration limit at the nearest receivers. In the context of the vibration trial, which will have a limited duration, some impacts on receivers are considered acceptable and may be necessary to give good resolution of results at surrounding receivers.

6.1 Recommended Vibration Trial Procedure

During the trial we strongly recommend that conservative impact energies (i.e. drop heights of the DC) or buffer distances be adopted initially and vibration levels monitored closely. Pending the outcome of these initial measurements the impact energies could then be increased incrementally.

6.1.1 **Dynamic Compaction**

‘Drop Energy’ and Buffer Distances

As a starting point we recommend that initial drop energies for the DC be limited to 100 tm and, as a minimum, the buffer distances detailed in Table 5-4 be maintained. In practice it would be sensible to adopt larger buffer distances for the trial if geometry permits. Note that the impact on buried pipelines is not well known and so much larger buffer distances should be adopted for these structures.

Monitoring Locations

Surface monitoring is considered sufficient for the majority of structures. As discussed in Section 5.1 if buried pipelines are in close proximity to the impacts some consideration should be given to monitoring vibrations and loads within the ground, particularly if the pipelines are near the compaction zone.

As a guide monitoring at the following distances would provide a comprehensive overview of vibration emissions:

- 5m, 10m, 15m, 20m and 50m from the DC in order to determine the vibration emissions in close proximity for assessment of structural damage.
- 100m, 200m, 300m, 400m, 500m and 600m from the DC in order to determine the vibration levels at receivers.

Note that these distances are to be used as a guide only. Consideration needs to be given to the safety of the equipment. Monitoring beyond several hundred meters may prove difficult, particularly for lower ‘drop energies’. This too will need to be reviewed on site during the trial.

We recommend that monitoring be conducted in at least two directions to reduce the likelihood of localised features influencing the results.

It is unlikely that equipment and personnel will be available to simultaneously monitor all the desired locations. Therefore a control location should be selected and results normalized against data collected at this location.

Additional monitoring locations could be specified to investigate the effect of particular discontinuities, such as the trenches discussed in Section 6.2. In this case vibration should be measured immediately before, immediately after and again some distance further back.

Monitoring Equipment

The equipment should be capable of measuring PPV. Additionally recording waveforms could prove useful if further information is required from post analysis.

The dominant frequency of vibration should be determined at several locations, though it is not considered necessary for all monitoring locations.

Vibration in all three orthogonal axis should be measured in the near field (within 50m). Beyond this distance the majority of wave energy is transmitted via surface waves and monitoring in the vertical axis alone is considered sufficient.

Methods for effectively securing/mounting the transducers will be determined on site. As a guide it is likely that burying transducers (approx. 0.5m deep) will be necessary in the untreated material.

At the receiver distances consideration should be given to the collection of data that can be used in the computation of a VDV or eVDV.

Procedure

Each ‘drop energy’ should be monitored over at least two grid points, with a typical number of impacts occurring at each.

The monitored vibration levels should be reviewed in real-time.

The ‘drop energy’ should then be incremented by 50 tm. These increments can be reviewed on site with the progressive input of data.

6.1.2 **Impact Rolling**

Impact rolling produces far less vibration and as such a smaller scale trial is appropriate. We recommend that rolling be monitored at distances of:

- 2m, 5m, 10m and 20m from the Impact Roller in order to determine the vibration emissions in close proximity for assessment of structural damage.
- 50m, 100m and 200m from the Impact Roller in order to determine the vibration levels at receivers.

If levels at 200m are measured near or exceeding 1 mm/ s then measurements at greater distances are recommended.

We recommend data is collected for approximately 10 ‘drops’ at each monitoring distance.

Triaxial measurements are preferred, though measurements in the vertical axes only are sufficient. Determination of the dominant frequency of vibration should be made at a minimum of one monitoring location.

6.2 Vibration Mitigation

Trenches have been proposed as a means for mitigating vibration to sensitive structures. We consider that this will work well if the trench is located in the immediate vicinity of the sensitive structures. In our opinion minimal benefit should be expected from this measure at significant distances, e.g. residential receivers, because the wave energy in the ground will diffract around the discontinuity.

The attenuation benefits and effective range of these trenches should be investigated during the trial.

7 CONCLUSION

Wilkinson Murray have conducted a preliminary assessment of a proposed Trial of Dynamic Compaction and Impact Rolling ground treatments for the Enfield Intermodal Logistics Centre.

This report details predicted levels of vibrations and also safe working distances beyond which vibration is predicted to be within appropriate limits to not potentially cause building damage.

In general surrounding residential receivers are predicted to be within the specified criteria.

In order to determine site specific vibration emissions, which are dependant on the source, the compaction material and the propagation path, we propose to conduct a trial period of ground treatment works. These trial works will be closely monitored and following this vibration predictions will be refined.

Version	Status	Date	Prepared by	Checked by
A	Draft	10 September 2010	Adam Bioletti	Neil Gross
B	Final	21 September 2010	Adam Bioletti	

Intermodal Logistics Centre at Enfield

Construction Traffic Management Protocol

Details of revisions

Level	Details	Date	Initial
1.0	For submission as part of Sydney Ports' CEMPF and LCPL's CEMP to Director-General	27/09/10	BH
1.1	Minor amendments – added sections in MCoA conditions	28/09/10	BH
1.2	Minor amendments – additional Sydney Ports comments	28/09/10	GK

Contents

1 Introduction

Purpose of this plan

The Construction Traffic Management Protocol (CTMP) describes how Leighton Contractors Pty Ltd (LCPL) proposes to safely manage vehicular, cyclists and pedestrian traffic during the construction phase of the ILC project, including the Early Works but also the Main Construction of base infrastructure and remaining off-site works (as described in Sydney Ports' CEMPF).

LCPL acknowledges the safety of road users and the effective management of traffic is paramount to the successful day-to-day activities during the construction phase of this Project. This CTMP seeks to ensure the certainty of the delivery of the prescribed road user requirements including: provision of a safe environment for workers and the travelling public, and minimising impacts on the road network.

Scope

The CTMP details the road safety and traffic management principles, strategies and measures that will be applied to enable LCPL to comply with project approval and the requirements of relevant authorities / stakeholders.

The strategies identified in this plan / strategy document will specifically address the following:

- Traffic management objectives & targets,
- Constraints & risks
- Potential road network impacts
- Organisation and responsibilities
- Management process tools
- Describe the controls & measures to be applied
- Outline the specific community / stakeholder consultation process and community relations strategies for managing changed traffic conditions
- Auditing, inspections and monitoring
- Reporting

When developing this protocol, LCPL has considered all inputs including:

- Project approvals and associated environmental documents,
- Statutory obligations;
- Stakeholder requirements and concerns;
- Project constraints – managerial and physical, and
- LCPL policies and procedures.

Traffic Management Overview

LCPL recognises the effective management of construction impacts on the road network is critical to the success of our projects. We seek to build and maintain a reputation of giving the utmost consideration to the needs of road users, not only by providing safe environments but minimising impacts on the road network.

This protocol provides direction on the controls to be applied and demonstrates how LCPL will conform to the Project Approval and relevant stakeholder requirements.

The traffic management principles to be applied by LCPL on this project will ensure:

- the provision of a safe environment for road users and workers;
- any impact on road users is kept to a minimum;
- access is maintained for the local community, transport operators, (including over-dimension load movements) & commercial developments, and
- road users and local communities are regularly informed in relation to changed traffic conditions.
- Provide safe working areas for LCPL staff and subcontractors

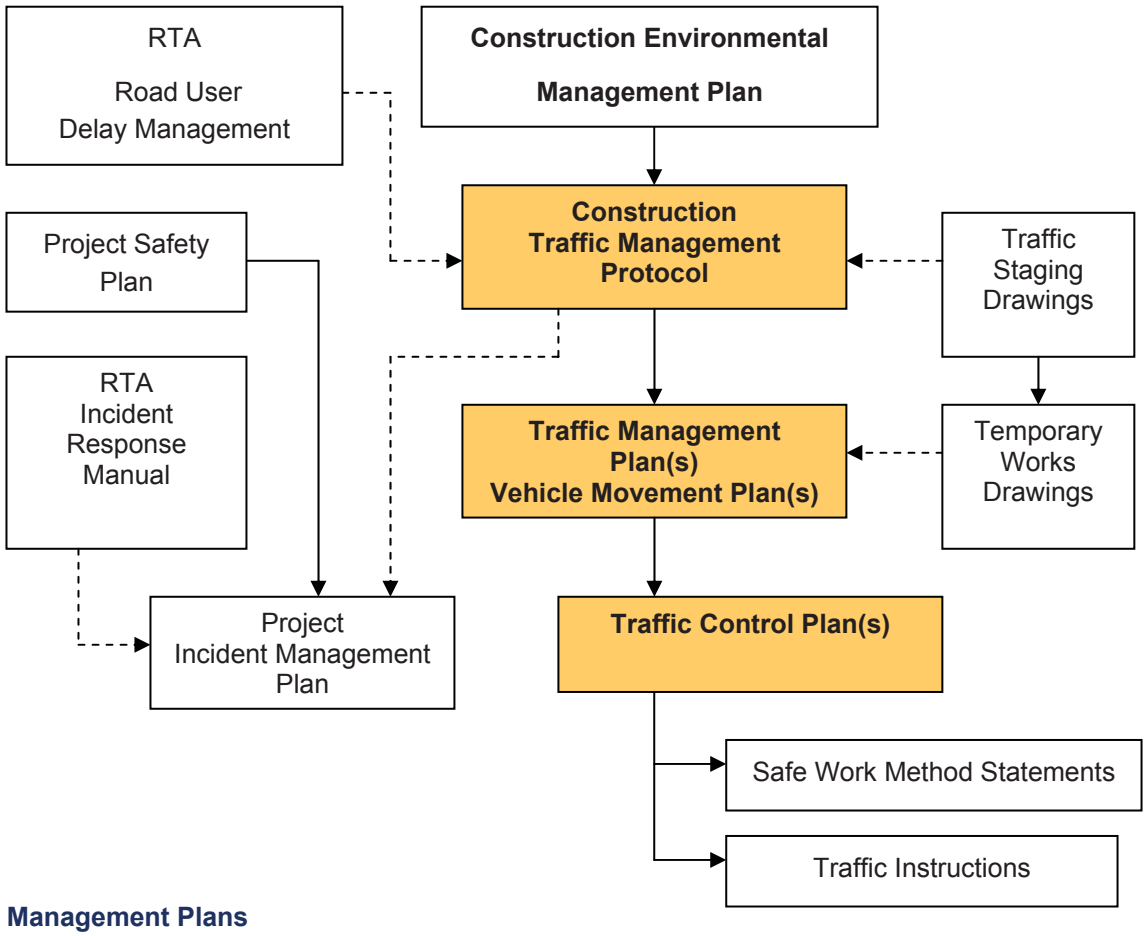
Plan Relationship

This CTMP provides the framework for the preparation of all plans, drawings and topic instructions dealing with the safe and effective management of traffic during the construction phase of the project. The plan / strategy interfaces with other Project Plans as part of the overall Project Management System.

The following documents and associated operational procedures are integrated with and are referenced from the CTMP:

- Vehicle Movement Plan(s)
- Traffic Management Plan(s);
- Traffic Staging Drawing(s) (TSDs);
- Traffic Control Plans (TCPs);
- Process instructions;
- Traffic instructions, and
- Safe Work Method Statements (SWMS).

Figure: Describes the relationship between the various traffic management documents.



Traffic Management Plans

Traffic Management Plans (TMPs) or Vehicle Movement Plans (VMPs) detail the specific road safety and traffic management measures that will be applied by the Project whilst undertaking the construction works. The TMPs are based on the principles and strategies of the Construction Traffic Management Protocol, and the obligations under the Project Approval and the requirements of relevant road authorities and other stakeholders. TMPs will include the associated traffic staging drawings, and where required, temporary works drawings.

Traffic Staging Drawings

Traffic Staging Drawings illustrate the proposed traffic staging to be implemented during the construction of the Project. These drawings: outline the sequencing, basic construction methodology, identify the need for temporary works, specify any particular traffic management measures / controls, define work areas, and illustrate the available travel lanes. The staging drawings are based on the design drawings, and are prepared in association with the over arching construction program.

Within the Traffic Management Plan, LCPL will prepare drawings for each traffic stage of the Project.

Traffic Control Plans (TCPs)

Traffic Control Plans are diagrams that illustrate the signs, road markings and devices that will be installed to warn traffic, and guide it around or past, or if necessary through the work site. These plans will address the specific measures stipulated within the TMPs and will comply with the requirements of Australian Standard AS 1742.3 – Traffic control devices for works on roads.

Processes

Processes are instruction documents that detail how particular activities are to be carried out during the Project. Specific Processes will be developed for traffic management activities as the need arises during the Project, including, but not limit to:

- Preparation of Traffic Control Plans;
- Lane closure / road occupancy & roadwork speed limit submissions;
- Temporary safety barriers, linemarking & signage;
- Inspecting traffic controls;
- Conducting road safety audits, and
- Wheel wash and exit controls.

When approved, these Processes are forwarded to relevant Construction Team members, and specific training sessions will be conducted.

Traffic instructions

Traffic Instructions are issued for specific road safety and traffic management matters that are applicable project wide. The types of issues may relate to: unsafe practices, reinforcement of road rules, new or amended instructions, non-conformance to standards etc. The instructions will concisely detail the problem identified, the corrective action that needs to be applied and method of communicating the instruction to the relevant personnel. Each traffic instruction will have a unique reference number.

Safety Health and Environment Work Method Statements (SHEWMS) or (SWMS)

Where it is considered that a work process must be carried-out in a strictly controlled manner to ensure the specified safety & quality requirements will be met, a specific SHEWMS will be prepared and implemented.

An LCPL Engineer will prepare SHEWMSs in consultation with workers, relevant functional managers and implement before the related work starts, to ensure the issues relating to safety and quality are appropriately addressed.

The provisions for working, on or adjacent to roadways, and the traffic control measures to be applied will be incorporated where necessary within the SHEWMS.

Program

Construction activity is programmed to commence in October 2010. The main construction period will take approximately 2 years with completion in 2012. Traffic management works will occur during all phases of construction.

Environmental Management System

The overall Environmental Management System for the Project is described in the **Construction Environmental Management Plan** (CEMP). The CEMP has been developed to comply with the requirements of the Minister for Planning's Conditions of Approval (MCoA), and ISO14001:2004 – Environmental Management Systems.

This Traffic Management Strategy includes the Construction Traffic Management Protocol required by the MCoA 6.3(b). There are a number of MCoA relating to Traffic Management, with the intent to prevent impacts on surrounding areas. Responsibility for certain MCoA during the Early Works and Main Construction phases will be with LCPL to comply with. Other conditions including those relating to Operational Phases will be the responsibility of Sydney Ports Corporation.

Construction hours of operation

In accordance with Conditions of Approval 2.15, LCPL will only undertake construction works associated with the project, during the following hours:

a) 7:00am to 6:00pm, Mondays to Fridays, inclusive;

b) 8:00am to 1:00pm on Saturdays: and

c) At no time on Sundays or public holidays.

The condition MCoA 2.15 does not apply in the event of a direction from Police or other relevant authority for safety reasons.

However, under MCoA 2.16, construction works associated with the project may be varied with the prior written approval of the Director-General allowing audible (at residential premises) works to be undertaken outside of the standard construction hours. Such out of hours work may be required by the Project to undertake traffic management and services road crossings on the busy roads that surround the site, particularly at the intersection of Norfolk Road and Roberts Road and on Cosgrove Road (not part of the Early Works).

Constraints

Constraints are those issues (eg. regulatory, physical or social) that define the environment and conditions under which the works must be undertaken. The road safety and traffic management constraints are defined by: the project approvals; requirements of road authorities and other stakeholders; traffic / transport legislation and technical standards.

A list of the various technical specifications, guidelines and standards identified as being applicable to the project are included in Appendix A of this plan / strategy.

Relevant conditions of the Minister's Conditions of Project Approval, with a cross reference to where the condition is addressed in this Plan or other Project management documents are provided in the table below.

Table: Ministers Conditions of Approval

MCoA No.	Condition /Commitment Requirements	Plan Reference
MCoA – 2.1	The proponent shall provide a shuttle bus service between Strathfield train station and the site during peak construction works, and shall encourage construction employees to utilise public transport rather than private transport to the site.	**CTMP Section 2**
MCoA – 6.3(b)	The Proponent shall prepare and implement a **Construction Traffic Management Protocol** to detail how heavy vehicle movements associated with the project will be managed during construction. The Protocol shall specifically address the movement of oversize loads to and from the site, the management of construction traffic, restrictions to the hours of heavy vehicle movements to avoid road use conflicts, and the transport of construction waste materials.	**CTMP Sections 2, 4 & 7**

Risks

Risk management, in accordance with the requirements of Australian / New Zealand / International Standard AS/NZS ISO 31000:2009 is an integral component of the Leighton Contractors' Management System.

Risk management for this project involves a systematic method of identifying, analysing and controlling the risks associated with the project's activities or processes, to minimise loss and maximise opportunities.

Assessments will be conducted to identify the potential road safety and traffic management risks associated with the Project. The risks identified will form part of the inputs during development of the traffic control plans.

Organisation and responsibilities

Project management overview

The Project Manager is responsible for the implementation of this CTMP. The Construction Manager and wider project team will comply with and deliver the requirements of this CTMP.

Traffic management roles and responsibilities

A Traffic Manager / Coordinator (LCPL NSW branch) may be used to provide road safety and traffic management assistance during the construction phase. The roles of the traffic manager are outlined below:

Traffic Manager

- Support construction staff in the planning and coordination of traffic management activities in timely and efficient manner.
- Manage the planning, development, implementation, revisions, and approvals of the CTMP/S, TMPs and Traffic Control Plans (TCPs).
- Ensure all traffic management measures are planned, implemented and maintained in accordance with best practice, including all relevant safety regulations and standards.
- Obtain and negotiate lane closure / road occupancy approvals and speed limit consents from the RTA and Council.

- Liaise and maintain a productive relationship with the RTA, Local Councils, Police, emergencies service agencies, and other stakeholders on all traffic and incident related issues.
- Assist the Design Team to facilitate the preparation of Traffic Staging Drawings, Temporary Works Drawings and TCPs, in accordance with the relevant standards.
- Monitor and evaluate the ongoing effectiveness of traffic management activities of the project, including road user delays and where necessary implement corrective actions to rectify any deficiencies.
- Investigate traffic related incidents / hazards, identify preventative measures and manage the implementation of actions to mitigate, future occurrences.
- Support the RTA's unplanned incident management strategy, and when requested coordinate the response of incident management teams and resources accordingly.
- Manage the Project's road safety audit and inspection process, implement corrective actions and maintain detailed records.
- Assist the Stakeholder and Community Relations Manager with the dissemination of changed traffic condition information to potentially affected parties, including road users, local communities and transport operators.

Other Construction Personnel and Responsibilities

- The Construction Team are responsible for all construction activities, including the implementation and maintenance of the various temporary traffic management arrangements. The other key construction personnel and their traffic management related responsibilities are described below.

Project Manager

- Reviews and approves the CTMP.
- Ensures the Project's road safety and traffic management objectives are achieved.

Construction Manager

- Co-ordinates traffic management activities within the construction team.
- Supports the delivery of the road safety and traffic management objectives in accordance with the CTMP.
- Review, Approve and Implement the TMP
- Provides direction and support to the Area Managers to enable effective planning of temporary traffic management arrangements.
- Ensures all construction team members receive the appropriate training.

Area Managers/Engineer(s) responsible for the work activity

- Assists in the delivery of the road safety and traffic management objectives outlined in the CTMP and TMPs.
- Plans and carries out all work activities and identifies the required traffic management arrangements to facilitate the works in accordance with the CTMP & TMPS.
- Liaises with the Traffic Manager in the planning and implementation of the required traffic management arrangements.
- Prepares TCPs to facilitate the works in consultation with the Traffic Manager and obtains approval from the Site Traffic Manager.
- Conducts regular inspections (including pre-starts) of traffic controls and VMPs and where necessary instructs the rectification of deficiencies.
- Allocates plant, equipment and resources for the works including the provision of the temporary traffic control arrangements.
- Conducts and keeps records of daily and weekly (day & night) inspections of the traffic control arrangements, assist audits and where necessary rectifies deficiencies.

Functional Personnel and Responsibilities

- Functional personnel provide support for all construction activities and their traffic management related responsibilities are described below.

Stakeholder & Community relations manager

- Represents the Project for all community and stakeholders issues.
- Conducts consultation with stakeholders for traffic planning, and provides an ongoing liaison role.
- Prepares and distributes changed traffic condition information to road users, transport operators and local communities.

2 Identifying Potential Construction Impacts

Description

This process identifies the construction activities and their potential impacts, which will enable the Project to develop effective mitigation solutions.

The process includes details of the: construction activities; construction site office(s); concept traffic staging; major traffic diversions; existing road network; traffic data and analysis and specific construction impacts.

Roles

Traffic Manager, Safety Manager, Construction Manager

Process

The Traffic Manager in conjunction with the Safety Manager and Construction Manager will sequence construction works with the objective to; maximise safety for workers and road users by isolating work areas from traffic flow, maintain existing capacity where possible, minimise road user delays, avoid major activities during peak periods, and avoid restrictions on transport operators.

The effective planning of all construction activities is the key to achieving these objectives.

Construction activities

The construction activities to be undertaken during the construction of this Project include:

- Establishment of site compounds.
- Establishment of construction work areas (including the installation of temporary concrete safety barriers etc).
- Services relocations.
- Installation of sediment control basins and additional erosion and sediment control.
- Construction of temporary road pavements, temporary construction access tracks and temporary median crossovers.
- Clearing and grubbing of trees and vegetation.
- Installation of transverse drainage pipes and structures.
- Installation of pavement stormwater drainage including sub-soils.
- Cut to fill earthworks.
- Deliveries of materials (e.g. steel reinforcement, concrete and quarry products).
- Construction of bridge piled footings, piers and headstocks.
- Transportation and placement of Super Tee bridge beams and planks.
- Construction of bridge decks and associated works.
- Local road works.
- Construction of permanent flexible and rigid pavement.
- Placement of top soil and planting of vegetation.
- Installation of road side furniture including permanent signage, safety barriers and traffic control facilities. This may involve the relocation of existing bus stops to suit the new road connections to local roads
- Construction of new rail track, signalling and overhead lines

Location of construction site compounds(s)

The areas chosen for the site compounds have been considered by LCPL to offer the best proximity to the worksites to minimise travel time on site. There were numerous physical and logistical constraints to locating the compounds and the best possible sites have been chosen.

Subsequently, LCPL will be establishing one main site compound and three smaller work compounds. These compounds are described below.

Site Compound

The Main Project Office – will be located north of an existing tenancy and Sydney Ports office on the Enfield Marshalling Yard as shown on the Vehicle Movement Plan N953-VMP 001 in Appendix B. Access to this site will be provided from the existing driveway to this tenancy (Gate A) which connects to the Cosgrove Road, north of Madeline Street.

Three other smaller compounds and permanent construction access points will be established for the project, at the following locations:

- Gate B Located opposite Hope Street and provides access to the Haul Road in the middle of the site. This gate will also provide access to other tenants using the site.
- Gate C: Located in Wentworth Street to provide access to the new road bridge over the rail line.
- Gate D: Located at the existing driveway for Pacific National in Wentworth Street. This provides access to a laydown area and site shed on the alignment of the proposed bridge site.

Some temporary access points may be required at Cosgrove Road during the construction of works adjacent to Cosgrove Road. The location Gates A-D are shown in Appendix B.

Traffic Generation

Estimated traffic generation of the main site office (Gate A) and other construction access points (Gates B, C and D) during peak construction are provided in the tables below. For Early Works the traffic generation can be adopted as (Gate A) – 50% of that within the table below, (Gate B) – 15% of that within the table below, (Gate C and D) – 100% of that within the table below. It is based on the experience of previous road projects with similar staff numbers. The adopted vehicle occupancy rates for: office staff, design staff, managers, supervisors, and technical staff, are 1 per vehicle, and 3 per vehicle for construction workers. The movements are typically 80% light vehicles/utes, 20% trucks/heavy vehicles.

Due to the nature of their work, managers, supervisors, surveyors, soil lab technicians, functional managers and plant mechanics will conduct regular trips throughout the day. In this regard, it has been estimated that these staff on average will undertake two in and out movements per day. All other staff will undertake one in and out movement per day. The typical site traffic flows will occur between 0630 and 1830 Monday to Friday, and between 700 and 1330 Saturdays. The estimated evening peak hour is based on most staff / workers departing between 1630 and 1830, (approximately 50% of total vehicles departing per hour).

Table: Estimated Traffic Generation of Main Project Office (Gate A)

Type	Number of Staff	Number of Vehicles	Trip Movements		Maximum Trips per day	Evening Peak Hour Trips
			In	Out		
Office / Design / Technical	20	20	20	20	40	10

Staff						
Managers / Supervisors / Surveyors / Lab Staff	30	30	60	60	120	30
Workers	60	20	20	20	40	10
Office Delivery and Service Vehicles	-	10	10	10	20	3
Plant Yard	5	5	10	10	20	5
Deliveries	-	25	25	25	50	6
Totals	**115**	**110**	-	-	**290**	**64**

Table: Estimated Traffic Generation of Construction Access (Gate B)

Type	Number of Staff	Number of Vehicles	Trip Movements		Maximum Trips per day	Evening Peak Hour Trips
			In	Out		
Office / Design / Technical Staff	10	10	10	10	20	5
Managers / Supervisors / Surveyors / Lab Staff	20	20	40	40	80	20
Workers	60	20	20	20	40	10
Office Delivery and Service Vehicles	-	2	2	2	4	1
Deliveries	-	50	50	50	100	12
Totals	**90**	**102**	-	-	**244**	**48**

Table: Estimated Traffic Generation of Construction Access (Gate C)

Type	Number of Staff	Number of Vehicles	Trip Movements		Maximum Trips per day	Evening Peak Hour Trips
			In	Out		
Workers	10	4	4	4	8	4
Deliveries	-	5	5	5	10	1
Totals	**10**	**9**	-	-	**18**	**5**

Table: Estimated Traffic Generation of Construction Access (Gate D)

Type	Number of Staff	Number of Vehicles	Trip Movements		Maximum Trips per day	Evening Peak Hour Trips
			In	Out		
Office / Technical Staff	4	4	4	4	8	2
Managers / Supervisors /	4	4	8	8	16	4

Surveyors / Lab Staff						
Workers	20	8	8	8	16	4
Office Delivery and Service Vehicles	-	10	10	10	20	4
Deliveries plant and precast bridge components	-	20	20	20	40	6
Totals	**28**	**46**	-	-	**100**	**20**

The above tables are an indication of the average movement per day during the works. These numbers will vary and increase during certain work activities requiring repeat bulk deliveries and haulage.

All site office access points will be: located at points that, as a minimum, provide safe intersection sight distance (SISD), or desirable entering sight distance (ESD); designed to accommodate the turning movements of the largest vehicle servicing the site, and appropriately signposted.

Further, security fencing, flood lighting and an appropriate security system to restrict public access to the compound areas will be provided.

The locations of the site compounds and access gates are illustrated in the Vehicle Movement Plan provided in Appendix C.

Employees Journey to Work

To encourage construction employees to utilise public transport rather than private transport to the site, a 12-seater bus will be provided during peak construction to provide transport between Strathfield train station and the site. This will satisfy condition 2.1 of the Minister's Condition of Approval.

Specific Traffic Management Plans (TMPs)

The works are separated into two distinct phases, which are listed below:

- Phase 1 Early Works, which includes construction of the new 8-span bridge and some early services works as described in the CEMP. Phase 1 of the project will not include any upgrades or major works to the existing road networks located around the site, but will include the bridge connection to Wentworth Street.
- Phase 2 includes the construction of the Intermodal Logistics Centre, rail work, upgrading of off-site roads, landscaped areas, utilities and all associated activities. Phase 2 of the contract will require off-site road upgrades and service diversions.

Specific TMP will be developed for each phase. Traffic Control Plans (TCPs) will be developed for the specific off-site that affect the road networks in the vicinity of the site.

Traffic staging

The effective management of traffic during the construction of the Project is critical. The development of the traffic staging is the first step, and the basis for all traffic management planning. The traffic staging will be developed as an integral part of the planning process, in association with the constructability assessment, and construction program.

A brief summary of the proposed traffic staging for the works in Roberts Road and Cosgrove Road (not part of the Early Works) is described below.

Roberts Road traffic staging

There are five stages planned for the upgrading of the intersection of Roberts Road and Norfolk Road.

Stage 1
The existing traffic arrangements are maintained. A traffic signal controller currently located at the vacant land will be relocated and the left-turn slip lane constructed behind concrete barriers. Also part of the traffic signal and refuge island, traffic signal posts and kerb and gutter works will be completed.

Stage 2
The kerbside lane in the southbound direction on Roberts Road will be closed for two weeks, reducing traffic lanes in the southbound direction to two lanes. This would allow construction of the concrete works (including kerb and pavement) at the left turn slip lane. Also the remainder of the concrete works at the island and installation of signal posts will be completed.

Stage 3
The median lanes on either side of Roberts Road south of Norfolk Road will be closed at night on weekdays for around one month. This would allow construction of the extension to the right turn bay on Roberts Road.

Stage 4
Final asphalt paving at the intersection of Roberts Road/ Norfolk Road and also in the upgraded section of Norfolk Road will be carried out at night for 1 week. This would require progressive temporary closure of relevant traffic lanes.

Stage 5
Linemarking of the new pavement surfaces in Roberts Road and Norfolk Road will be carried out at night under traffic control.

Cosgrove Road traffic staging

There are two main stages planned for the construction of the southern interchange (not part of the Early Works).

Stage 1
Existing traffic arrangement in Cosgrove Road is maintained with safety barriers will be installed to close the parking lane. This would allow the construction of the left turn slip lane.

Stage 2
The linemarking works for the right-turn bay into the site will be installed under one lane alternate traffic control. In addition a reduced 40km/h speed limit will be installed in Cosgrove Road during the works.

Traffic staging drawings will be prepared to illustrate the traffic management arrangements described above, including proposed main access points and major construction vehicle movements (refer to Section 7 “Manage Construction Traffic”).

Initial Traffic Staging Drawings for works in Roberts Road are shown in Appendix C.

Material haulage operations

LCPL recognises the effective management of haulage operations is necessary to minimise the impact on the road network.

LCPL will implement various controls and procedures for the haulage operations, to mitigate any road network impacts.

Identified Impacts

Road network

The construction of this project will impact on the existing traffic flows along Roberts Road, Norfolk Road (west), Wentworth Street, Cosgrove Road. However, as detailed in this plan LCPL will aim to isolate work areas, keep road user delays to an absolute minimum and maintain access for transport operators.

During the construction phase, the potential restrictions on the existing road network may include: reduced roadwork speed limits, temporary sidetracks and deviations, short-term one lane alternate operations, haulage operations, and over-dimension vehicle movements. However only Roberts Road, Wentworth Street and Cosgrove Road will be affected by short-term lane Closures. With the exception of short-term traffic control for oversize vehicle access, LCPL will maintain access for all vehicles along the affected roads.

In regards to the local road network, LCPL will prepare a road dilapidation report for all non-arterial roads likely to be used by construction traffic prior to commencement of construction and after construction is completed. A copy of this report will be provided to the relevant road authority (Strathfield Municipal Council or Bankstown City Council). With the exception of damage resulting from normal usage of the road, LCPL will repair any damage that has resulted from the construction of the project.

Consequently the main impact of the construction works on the road network will consist of the road users experiencing increased travel times. To keep the road user delays along Roberts Road to a minimum, LCPL will plan and stage all works to avoid road occupancies during peak periods. To assist this process, the Traffic Manager has analysed the RTA's historical traffic volume data along the road, and developed several user friendly traffic volume profiles. These traffic volume profiles are provided in the section below.

Traffic Flow Demand Profiles

This section discusses hourly, daily and weekly traffic patterns along the Roberts Road and Cosgrove Road. These patterns have been extracted from the RTA Traffic Volume Data for Sydney Region 2005. The traffic volumes have been factored up by 3% per annum to 2010 forecast flows based on general growth rates of traffic in Sydney. It should be noted that the recently published household survey of Sydney residents by the NSW Transport Data Centre in the 12 months to 2008/2009 indicated that weekday trip growth slowed to just 0.2% for the 12 month period.

These traffic patterns will form the basis for planning the construction staging works and road occupancies and diversions for this project.

Hourly Flows

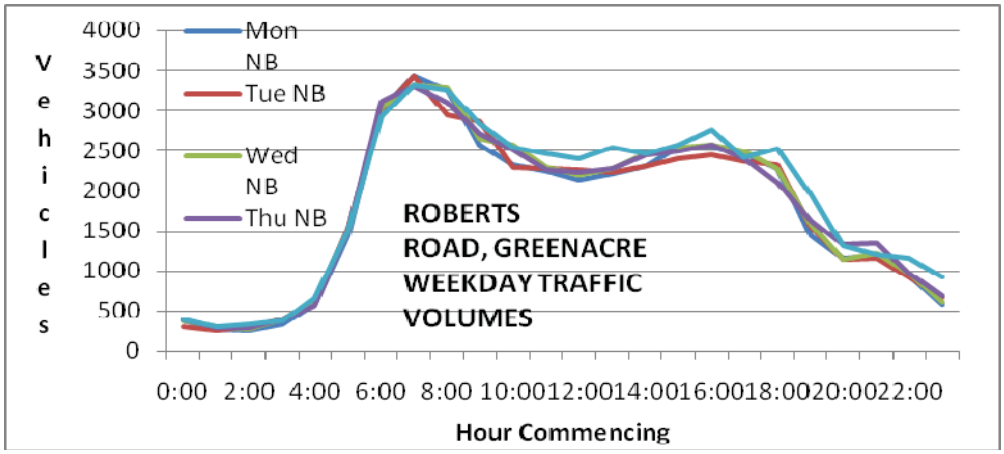
The northbound and southbound average hourly flows (vehicles per hour) over an average weekday (Mon to Fri) and an average weekend (Sat to Sun) are presented in the figures below. A review of the hourly profiles reveals the following patterns:

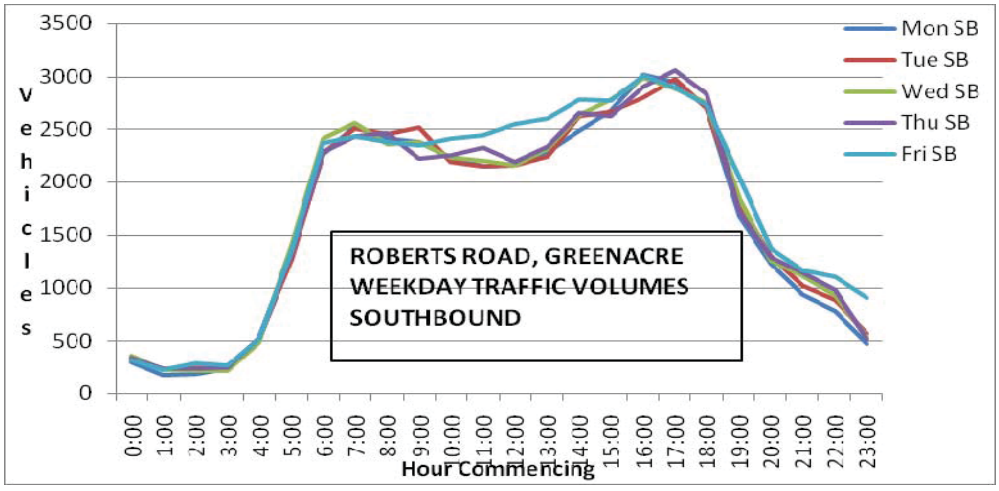
Roberts Road

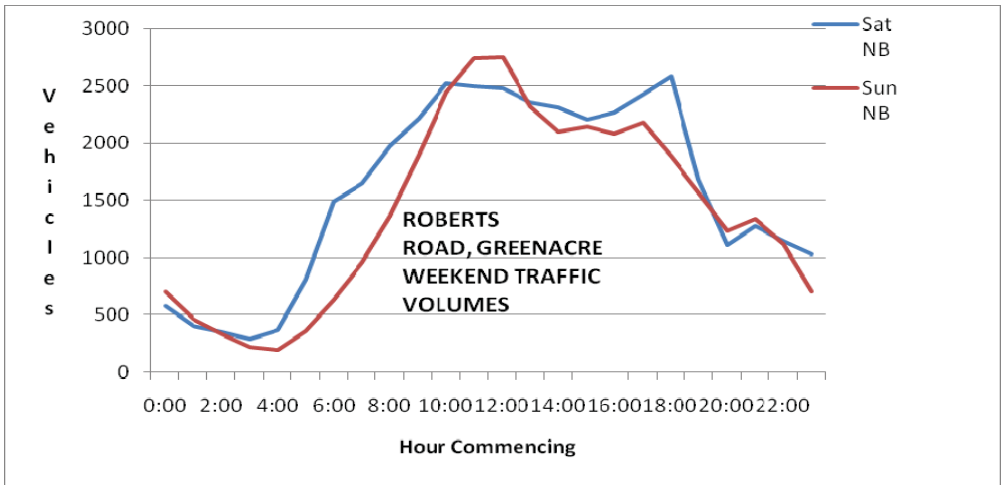
- The average weekday hourly flows peak between 6:00am and 9:00am in the northbound direction.
- For the southbound direction, the average weekday hourly flows peak between 4:00pm and 6:00pm.
- Traffic volumes are lower in the night between 9:00pm and 5:00am in both directions.
- The average weekend hourly flows peak between 11:00am and 5:00pm

Cosgrove Road

- The average weekday hourly flows peak between 6:00am and 8:00am and 4:00pm-6:00pm in the both directions
- After 6:00pm, traffic volumes drop below 400 vehicles per hour in each direction.
- In the weekend, hourly flows peak at around 400 vehicles per hour during the midday.
- After 6:00pm, traffic volume drops to below 200 vehicles per hour in each direction in the weekend.



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Hour Commencing
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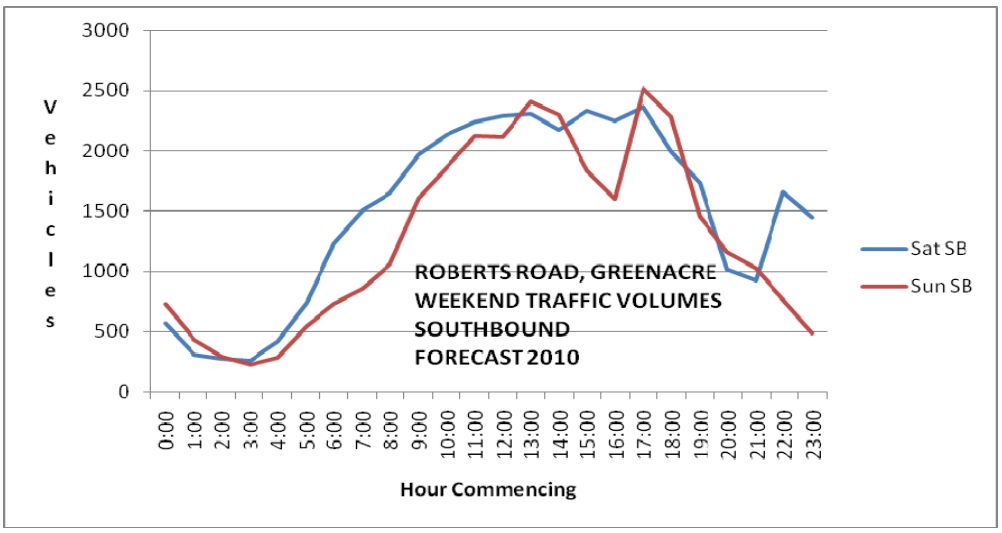
ROBERTS ROAD, GREENACRE
WEEKEND TRAFFIC VOLUMES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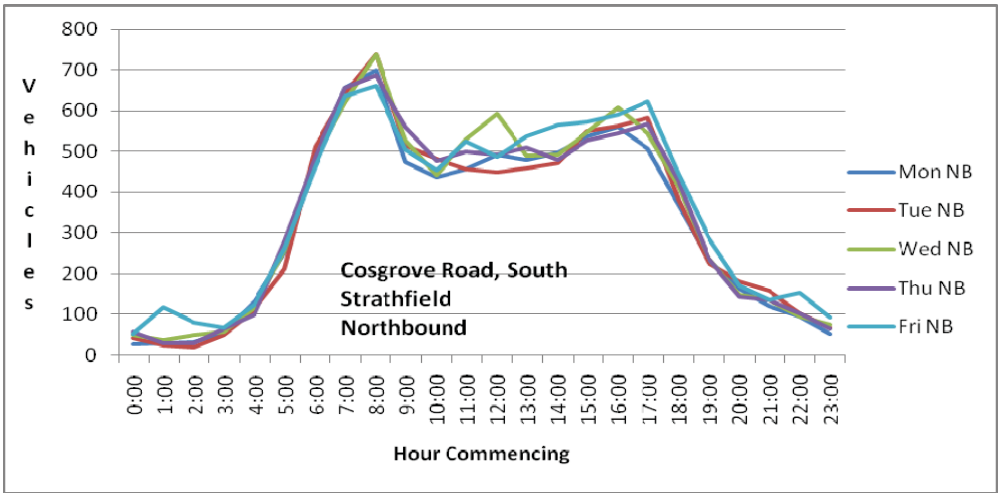
ROBERTS ROAD, GREENACRE
WEEKEND TRAFFIC VOLUMES
SOUTHBOUND
FORECAST 2010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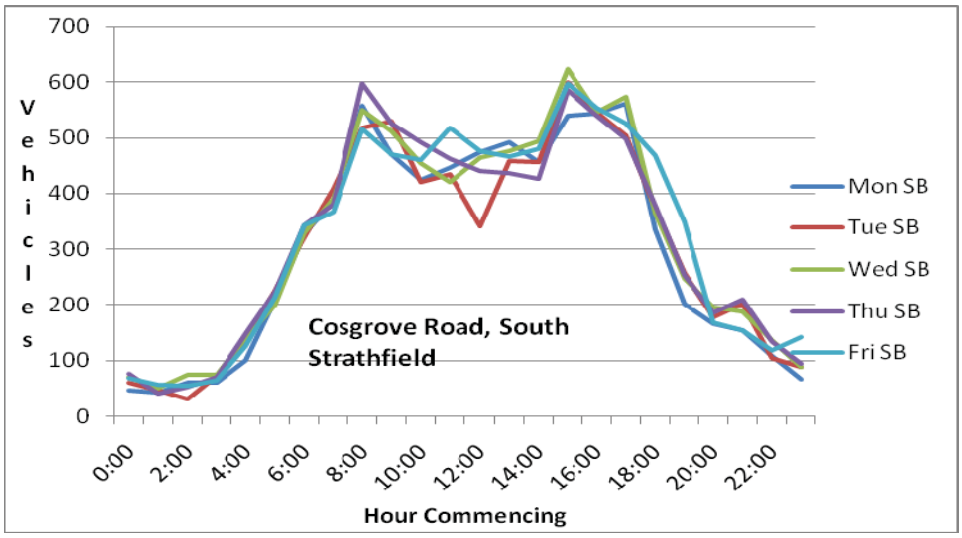
Cosgrove Road, South
Strathfield
Northbound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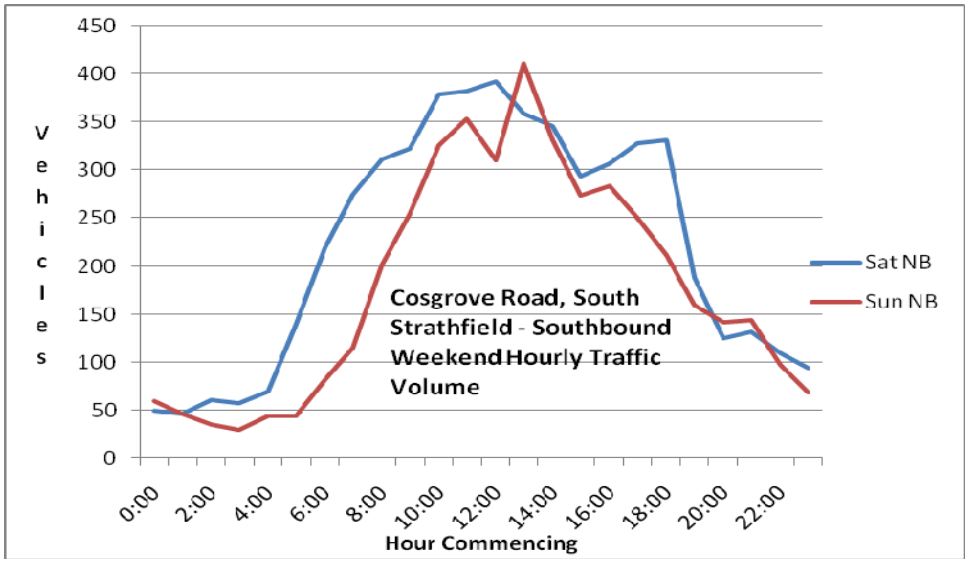
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Vehicles
Cosgrove Road, South Strathfield - Southbound Weekend Hourly Traffic Volume
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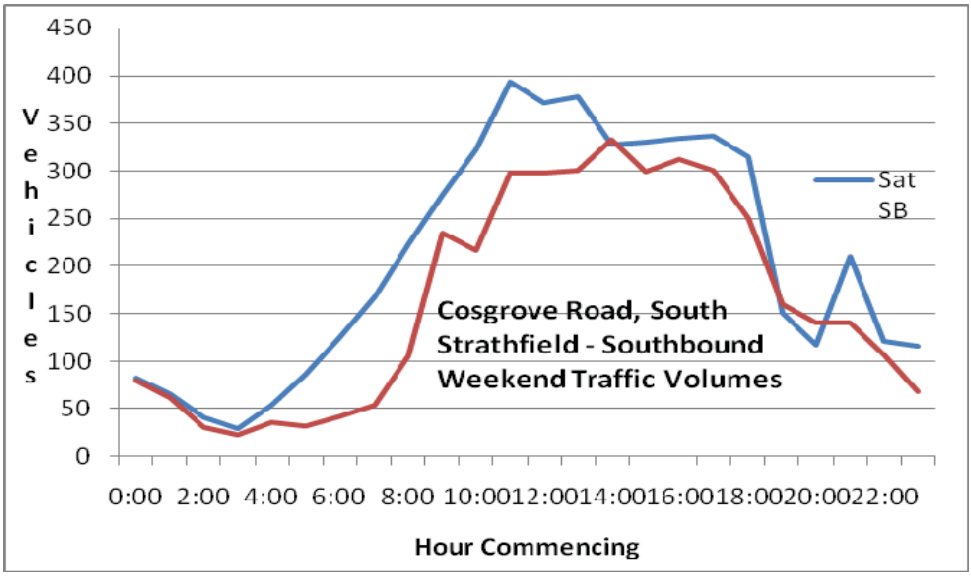
Hour Commencing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Vehicles
Cosgrove Road, South Strathfield - Southbound Weekend Traffic Volumes
Sat SB
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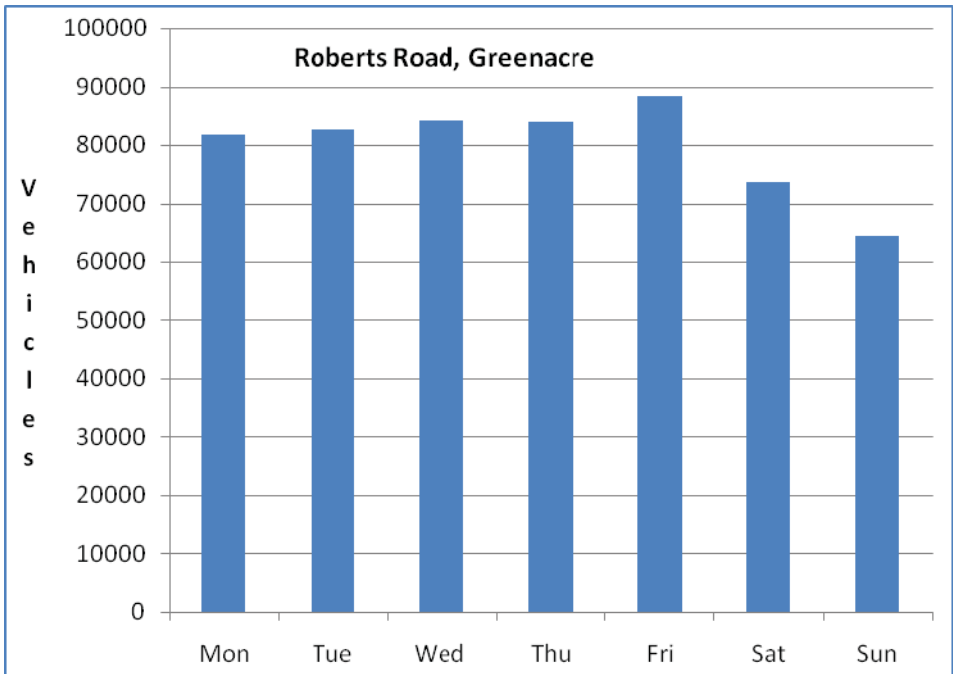
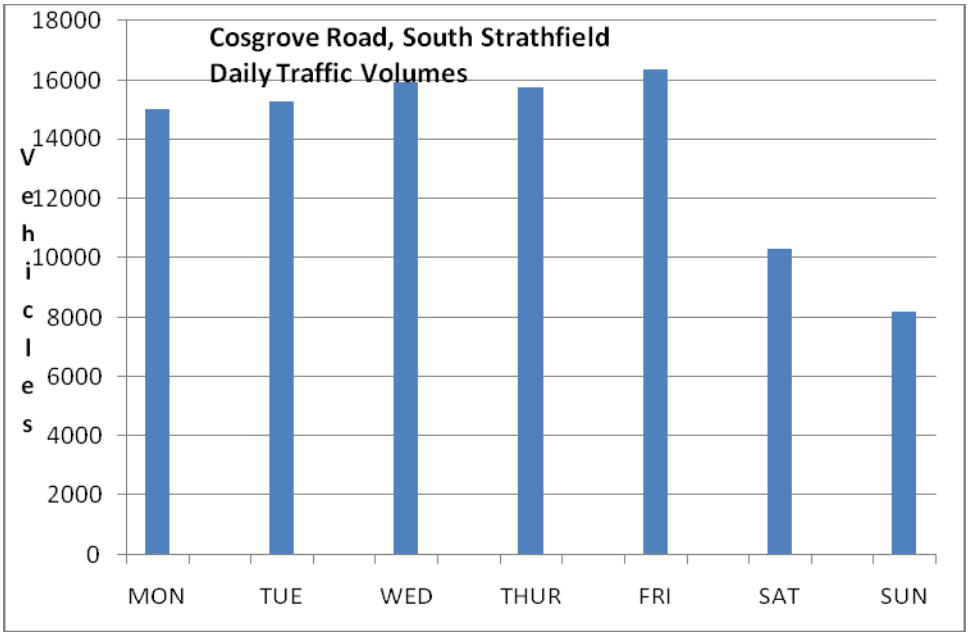
18:00
20:00
22:00
Hour Commencing

Daily Profiles

The figures below illustrate the estimated daily traffic demand profiles on Roberts Road, Greenacre and Cosgrove Road, South Strathfield. A review of the profiles indicates the following for the two roads:

- Daily traffic volumes increase gradually from Monday to Friday
- Traffic flows in the weekends are lower than in the weekdays.
- The highest traffic flows occur on Fridays and lowest traffic flows occur on Sundays.





Specific impacts

Pedestrians and Cyclists

LCPL will give consideration to the potential of pedestrian and cyclist movements when preparing temporary works drawings and the Traffic Control Plan, and where warranted, implement temporary facilities in accordance with the RTA and AUSTROADS requirements.

During the construction works for upgrading of Roberts Road/Norfolk Road intersection, the pedestrian crossing at the northern leg of the intersection will be closed. However, pedestrians will be able to cross Roberts Road at the southern leg. Pedestrian warning signs will be installed to guide pedestrians.

On-street Parking

Parking of construction vehicles on Cosgrove Road and Wentworth St will be kept to a minimum and wherever possible will be within site compound areas. However by necessity some itinerant parking of construction vehicles on these roads will be required during certain works such as the following:

- Delivery of construction materials to work areas adjacent to these road ways
- Out of hours delivery of large precast elements subject to out of hours notifications and RTA permits
- Delivery of large cranes and construction equipment subject to out of hours notifications and RTA permits
- Road pavement works for intersections, tie ins to local roads
- Temporary closure of road shoulders to maintain a safe work place for works adjacent to the roadways
- Site investigation of services

Public Transport

The public transport provisions, in the vicinity of the site includes railway stations Strathfield, Bankstown, Punchbowl, Wiley Park and Lakemba generally around 2 to 4 kilometres from the site.

Two bus companies, Veolia Transport and Punchbowl Bus Company service the area. The services in the vicinity of the site include:

Bus Route Numbers	Route Description	Operator
913	Bankstown to Strathfield via Greenacre	Veolia Transport
914	Greenacre to Strathfield	Veolia Transport
939	Hurstville to Bankstown via Greenacre	Punchbowl Bus Company
946	Hurstville to Bankstown via Lakemba	Punchbowl Bus Company

LCPL will consider the potential impacts on these bus routes and stop facilities when preparing temporary works drawings and Traffic Control Plans. Where possible, LCPL will maintain the existing facilities, however where this cannot be achieved, the bus stop will be relocated and equivalent temporary facilities will be provided. All temporary facilities will be developed and constructed in accordance with the RTA and Ministry of Transport requirements. All proposed changes to existing routes and bus stops facilities will be

discussed with the Operator, prior to the commencement of works, and notifications will be provided to passengers.

Access to Properties

LCPL considers minimising the impact and maintaining the amenity of local residents in the vicinity of the construction works to be very important. In this regard, various environmental and traffic management measures will be applied, in particular those measures that maintain access to the road network. It is unlikely that access to properties will be affected during the Early Works but in the event that it may the following will be taken into account.

LCPL will aim to maintain existing property access points and access to community facilities. Where this cannot be achieved, LCPL will provide temporary alternative access tracks which will be constructed at no cost to the resident. All temporary access points and associated tracks will be: designed in accordance with RTA guidelines; accommodate the largest vehicles servicing the property; positioned at a location that has safe intersection sight distance; constructed of an all weather surface with appropriate drainage; and provide the minimum inconvenience to the resident. Where necessary, entrance gates and boundary fences will be adjusted to suit the temporary access tracks.

All proposed changes to existing access arrangements will be discussed with residents and businesses prior to the commencement of works. Upon completion of the construction works, the original property access for residents or businesses will be re-instated.

Potential environmental impacts

Potential impacts from the management of traffic are the same as those already identified within the Construction Environmental Management Plan (CEMP) and associated strategies. The mitigation measures identified within the CEMP and associated strategies will be implemented to ensure any potential adverse environmental impacts from traffic management are appropriately managed.

3 Minimise Road User Delay

Description

This process focuses on minimising delays experienced by road users during the construction phase of a project. It covers delay minimisation strategies, specific measures that can be applied and where guidance can be obtained.

Roles

Traffic Manager

Process

Overview

The reliable and efficient operation of the state road network is vital to NSW and Australia. Australian Standard 1742.3 Section 2.3.2 (b), states that work schedules shall be arranged to minimise:

- disruption of established traffic movements and patterns;
- interference with traffic at peak movement periods and at night, weekends, holiday periods and special events, and
- interference with public transport services.

LCPL acknowledges that maintaining the Level of Service of the road network and minimising the delays experienced by road users during the construction of any project is important. This process outlines the various strategies and measures that can be applied to minimise road user delays.

Despite the importance of minimising road user delays, LCPL will not pursue the minimisation of delays to the extent that it will compromise safety of workers or road users.

Delay minimisation strategies

The delay minimisation strategies to be applied by LCPL may include:

- minimising the impacts of each work area,
- maximising the operating performance of the individual routes;
- aim to maintain access; and
- coordinating works at each work area to ensure road users do not encounter several delays in quick succession.

Implement measures

Measures to minimise road user delays for the development of any major infrastructure project starts during the concept design phase and continues through to the opening and operation phase.

LCPL acknowledges that there are various measures that can be applied to minimise road user delays, which are generally divided in four categories:

- design of temporary works/staging
- isolation of work areas
- work methods
- planning of lane closure / road occupancies

Where practical, LCPL will apply the following measures:

- ensure road user delays are given consideration during the planning phase (i.e. develop alignments to avoid conflicts and potential impacts with the existing road network);
- during the planning phase develop traffic staging and temporary works that: avoid conflicts with the existing road network; maximises separation between work areas and travel lanes or isolates work areas, and maintains as far as reasonably practicable the existing Level of Service of the road network;
- isolate work areas from traffic flows (e.g. using alternative routes, temporary sidetracks, lane deviations / widening and temporary safety barriers);
- develop alternative work methods to minimise impacts (e.g. utilise more efficient plant / equipment, apply different design solution, enclosed work platforms, time of day applications);
- plan all lane closures / road occupancies with the aim to: minimise the actual work area, limit obstructions and restrictions, maximise the roads capacity, and avoid peak traffic flow periods;
- analyse traffic volume data to: establish the capacity of the road; assess the potential impact on traffic flows, and identify the best time to apply temporary traffic arrangements, so as to minimise the inconvenience to road users, and
- provide road users with changed traffic condition information to enable them to plan their journey and avoid the roadworks.

4 Maintain Access for Heavy Vehicles

Description

LCPL acknowledges the importance of maintaining access along Australia's major freight routes. This process provides details on: the heavy vehicle volumes; detail of over dimension loads.

Roles

Traffic Manager

Process

Transport Network

Trucks will use Roberts Road, Hume Highway and Punchbowl Road to access the site during construction works. Traffic Analysis for the environmental assessment of the project indicated that the percentage of heavy vehicles on these roads are low, ranging from 2.0 percent for Punchbowl Road to 4.7 percent for Roberts Road.

However it is still necessary to cater for the movement of heavy vehicles and especially over-dimension loads during the construction works.

Over Dimension Loads

The loads carried by the heavy vehicles vary, and over-dimension loads are transported regularly. These loads vary in width, height, length and mass.

The RTA's Special Permits Unit at Glen Innes controls the issuing of permits to enable operators to travel on the NSW route network. Subject to the size of the load, co-ordination with the NSW Police is also required.

In NSW rural areas, the transportation of over-dimension loads is only permitted during daylight hours.

The RTA's Operating Conditions: "Special permits for oversize and overmass vehicles and loads", (2007) document outlines the various operating restrictions and conditions.

The role of LCPL

To facilitate the movement of heavy vehicles the Traffic Manager will:

- give consideration to the movement of heavy vehicles and over-dimension loads when preparing temporary works drawings and Traffic Control Plans (adopting designs that provide a minimum lane width of 3.5m, and can accommodate the turning movements of a 26m long B-Double heavy vehicle);
- minimise traffic control operations at night that may disrupt freight movement;
- limit obstructions and restrictions on the carriageways, and when required provide alternatives to maintain access for transport operators including over-dimension load movements;
- liaise with the police, permit authority and operators, and provide up-to-date information to of any obstructions (specify minimum dimensions) that may impact on movement of over-dimension vehicles;
- keep a register of proposed over dimension vehicle movements for the Project, determine the best opportunity to proceed through the work site, and advise the transport operator accordingly;
- when traffic control operations are in place, Traffic Controllers will effectively co-ordinate the movement of over-dimension vehicles through the work site;
- Assist the RTA Special Permits Unit and over-dimension operators by notifying the RTA of any obstructions that may impact on over-dimension vehicle movements;
- where possible, arrange the removal and re-instatement of roadside furniture and traffic control devices that impede over-dimension vehicle movements, and
- regularly monitor heavy vehicle movements through the work site and when required implement the appropriate controls to mitigate potential hazards and or congestion.

5 Managing Pedestrians

Description

This process describes how LCPL will safely manage pedestrians during the construction of the project. LCPL recognises the importance of giving consideration to all road users, including vulnerable users and not just vehicle traffic. This process covers pedestrian needs; defining the work area; provision of temporary footpaths and provision of pedestrian crossings.

Roles

Traffic Manager, liaison with Roads and Traffic Authority, Strathfield Council, Bankstown City Council

Process

Identify pedestrian needs

When planning construction activities, LCPL will give consideration to the:

- number of pedestrians;
- type of pedestrian activity: whether office, retail, residential or recreational;
- origin and destination points of the pedestrians, and their desired travel path;
- needs of vulnerable pedestrians, such as young children, the elderly, vision impaired, disabled people, people with prams and trolleys and
- proximity of pedestrian generation developments, such as schools, shopping centres, railway stations, bus terminals etc.

The AUSTROADS Guide to Traffic Engineering Practice – Pedestrians Part 13, Section 1 provides guidance on the needs of pedestrians.

Define the work area

Unlike motor vehicles, pedestrian movements within and outside of the road reserve are generally unrestricted, with free access available to most areas.

To provide a safe environment for pedestrians, LCPL will clearly define the boundaries of all work areas, and where required provided defined walking paths.

Fencing will be installed to restrict physical access to hazardous areas and for site security, which will be appropriately sign posted. Various types of temporary and semi-permanent fencing may be installed, including plastic mesh; water filled plastic delineators; weldmesh pool fencing and chain wire mesh and so on. All physical barriers will be maintained during the project and appropriately secured to prevent injury to the public.

Provide temporary footpaths

Where the work areas restrict access to existing footpaths, LCPL will implement alternative routes and facilities. Alternatives may include using the opposite footpath, detours via other streets, or the provision of temporary footpaths through the work area.

All temporary footpaths will be:

- clearly defined;
- signposted appropriately to indicate the direction of the footpath;
- constructed of an all weather surface, free of trip hazards;
- designed to accommodate the type of pedestrians to be encountered within the area;
- where required, provided with pram ramps, hand rails and lighting;
- the minimum width specified by the RTA, and
- kept well maintained whilst in operation.

When pedestrians are diverted onto the existing roadways adjacent to traffic flows, additional treatments will be implemented by LCPL to ensure adequate separation is provided and it is clearly delineated. Section 9.3 of the RTA's Traffic Control at Worksites (TC@WS) manual provides guidance on the design parameters of footpaths.

The AUSTROADS Guide to Traffic Engineering Practice – Pedestrians Part 13, Sections 2 and 6 provides guidance on the design parameters of footpaths. RTA's requirements and specifications will be considered when designing alternative pedestrian footpaths and associated facilities.

A Traffic Control Plan will be developed by the Traffic Manager for all alterations to existing pedestrian footpaths.

Provide pedestrian crossings

Where feasible, the Traffic Manager will aim to maintain all existing pedestrian crossing facilities. Where this cannot be achieved alternative facilities that are a similar standard to the present facility will be provided.

Types of temporary crossing facilities may include pedestrian refuges; marked foot crossings; pedestrian actuated traffic signals; temporary grade separated pedestrian bridges and so on.

The AUSTROADS Guide to Traffic Engineering Practice – Pedestrians Part 13, Section 3 provides guidance on the design parameters of pedestrian crossing facilities.

A Traffic Control Plan will be developed by LCPL for all alterations to existing pedestrian crossing facilities.

LCPL will obtain approval from the relevant road authority (Strathfield Council, Bankstown City Council or the RTA), prior to adjusting any existing pedestrian crossing facility or the implementation of any new temporary facility.

6 Managing Bicycles

Description

This process describes how LCPL will safely manage cyclists during the construction of this project. LCPL recognises the importance of giving consideration to all road users, including vulnerable users and not just vehicle traffic. This process details cyclists' needs; defining the work area and hazards; provision of temporary cycle paths and provision of crossing facilities.

Roles

Project Manager, Traffic Manager

Process

Consider cyclist needs

When planning construction activities, LCPL will give consideration to the:

- number of cyclists;
- type of cycling activity: school children, recreational, commuter, utility, touring or sport training;
- origin and destination points of the cyclists, and the connectivity of their routes;
- needs of vulnerable cyclists, such as young children under 14 years;
- proximity of cyclist generating developments, such as schools, universities, public transport terminals, shopping precincts and CBDs etc, and
- the travel speed of cyclists.

The AUSTROADS Guide to Traffic Engineering Practice – Bicycles Part 14, Sections 2, 3 & Appendix B provides guidance on the needs of cyclists.

Define work areas and hazards

Unlike motor vehicles, bicycle movements can be either on or off road. Cyclists generally travel along footpaths, cycleways, shared paths, road shoulders, or within travel lanes.

To provide a safe environment for cyclists, the Traffic Manager will clearly define the boundaries of all work areas, and implement measures to mitigate any hazards.

Fencing will be installed to restrict physical access to hazardous areas and for site security, which will be appropriately sign posted. Various types of temporary and semi-permanent fencing may be installed, including: plastic mesh; water filled plastic delineators; weldmesh pool fencing; chain wire mesh and so on. All physical barriers will be maintained during the project and appropriately secured to prevent injury to the public.

Provide temporary cycle paths

Where work areas restrict access to formal designated cycle paths (as opposed to footpaths), the Traffic Manager will implement alternative routes and facilities. Alternatives may include using the opposite side of the road, detours via other streets/cycle routes, or the provision of temporary cycle paths through the work area.

All temporary cycle paths will be:

- clearly defined;
- signposted appropriately to indicate the direction of the cycle path;

- constructed of an asphalt or concrete smooth surface equivalent to the section of path on each approach to the temporary path, free of loose materials and obstacles;
- designed to accommodate the type of cyclists to be encountered along the route;
- where required, provided with ramps, holding rails and lighting; and
- kept well maintained whilst in operation.

The design parameters for off-road cycle paths are specified in AUSTROADS Guide to Traffic Engineering Practice – Bicycles Part 14, Section 6 and RTA's Traffic Control at Worksite Manual, Section 9. Section 9.4.3 of the RTA's manual specifies that the width of off-road cycle paths should be a minimum of:

- 2.0 metres for a separate two-way path, and
- 3.0 metres for a two-way path shared with pedestrians.

Where this cannot be provided, the path will match existing widths.

The Strathfield Municipal Council or Bankstown City Council's requirements and specifications will be considered when designing alternative cycle routes and associated facilities on local roads.

The provision of on-road cycle facilities requires careful assessment, and the following factors will be considered by LCPL:

- on-street parking conditions;
- travel speed of traffic;
- traffic volumes;
- bicycle volumes;
- experience of the cyclists;
- percentage of heavy vehicles;
- carriageway, lane, and parking lane widths available and
- the alignment of the road.

The AUSTROADS Guide to Traffic Engineering Practice – Bicycles Part 14, Section 4 and 5 provides guidance on the design parameters of on-road facilities.

A Traffic Control Plan will be developed for all alterations to existing cycle paths.

Provide cycle crossings

Where feasible, LCPL will aim to maintain all existing cycle crossing facilities. Where this cannot be achieved, alternative facilities that are a similar standard to the present facility will be provided.

Types of temporary crossing facilities may include general crossing treatments (Figure 6-29 AUSTROADS Guide); refuge islands; controlled traffic signals and so on.

The AUSTROADS Guide to Traffic Engineering Practice – Bicycles sections 4, 5 & 6 provide guidance on the design parameters of cycle crossing facilities.

A Traffic Control Plan will be developed by the Traffic Manager for all alterations to existing cycle crossing facilities.

LCPL will consult with any local bicycle user groups and obtain approval from the relevant road authority prior to adjusting any existing cycle facilities, or the implementation of any new temporary facilities.

7 Manage Construction Traffic

Description

This process covers the management of construction vehicle movements on site and throughout the road network. It details driver responsibilities, types of vehicles, hazardous movements, planning vehicle movements, haulage route on site, haulage route on-road network, access points, traffic control, monitoring, and safety and environmental controls.

LCPL will monitor the use of local roads by construction heavy vehicle traffic in consultation with Strathfield Municipal Council or Bankstown City Council. Haulage routes will be covered in the Project Induction and will be given to the delivery companies. Measures will be developed to minimise and/or restrict use of local roads by heavy vehicle traffic as far as reasonable and practicable.

Roles

Traffic Manager, Drivers, Project Manager

Process

The effective management of construction vehicle movements on site and throughout the road network is critical to the success of all projects. LCPL will plan all construction vehicle movements with the aim to minimise the risk to other road users and keep the traffic generated by the project to minimum.

The types of construction vehicle movements may include:

- deliveries of materials, supplies, plant or equipment to site;
- transportation of over dimension loads;
- deliveries of concrete from batching plants to site, and
- regular trips by construction personnel in work trucks and utes.

Driver responsibilities

All drivers employed on the ILC at Enfield, whether direct employees or contractors, have a responsibility to drive safely, and comply with State road regulations, the Australian Road Rules and any other directives issued on the project.

Drivers must exercise care at all times. Special care must be taken when exiting and entering traffic flows, and whilst travelling within the construction site.

Where issued, drivers must comply with requirements of the project's "Safe Driving Policy" and any Vehicle Movement Plans (VMPs) to be developed for specific work areas and routes.

Types of vehicles

The types of vehicles used on projects will vary depending on the type of infrastructure being constructed.

- **Off-road plant items / vehicles** may include: scrapers, dump trucks and all wheel drivers tippers.
- **On-road registered vehicles** may include: 4wd utilities; single unit trucks with or without dog trailers; semi-trailers; B-Doubles; and over dimension floats / platforms cranes and other heavy vehicles.

Hazardous movements

When planning construction vehicle movements, a SHEWMS will be prepared for each specific location. The following hazardous movements will require particular consideration:

- entering and exiting work sites to and from adjacent travel lanes;
- U-Turns movements across travel lanes and at median crossover points between dual carriageways is not allowed;
- reversing manoeuvres within the work area and in the adjacent travel lanes is minimised;
- travelling through the work area intermingling with construction personnel and in the vicinity of unprotected hazards is minimised, and
- the stopping of construction vehicles within the adjacent travel lanes.

LCPL will apply controls and measures to mitigate the risk of these hazardous movements including, but not limited to: restrict the practice of specific movements (e.g. turning bans); the provision of permanent major traffic controls and devices, installation of temporary traffic controls; the installation of deceleration, acceleration and turning lanes outside of the through lanes; educating drivers; installation of warning devices on vehicles and the application of VMPs.

Plan vehicle movements

LCPL acknowledges that attention must be given to the safe movement of construction vehicles when planning construction activities.

When planning construction vehicle movements for each stage of work, the Traffic Manager will:

- comply with all relevant environmental approvals;
- minimise the number of vehicle movements by balancing earthworks and recycling excavated materials;
- conduct a risk assessment to identify specific hazards and facilitate the application of mitigation measures;
- promote safe driving principles;
- develop on-road haulage routes that not only provides an efficient operation and uses major roads where possible, but minimises the impact on the local road network and local community;
- analyse, assess and mitigate the impacts of the traffic generated by the construction works;
- set-up depots and stockpiles at locations that minimise travel distances and impacts;
- prepare Vehicle Movement Plan (VMP) for all construction vehicle movements, whether on-site or on-road, and ensure the routes are communicated to all construction personnel;
- where feasible, restrict haulage operations to the construction corridor;
- minimise the number of access points and haul road crossings;
- evaluate the need for temporary traffic control and / or major traffic controls to separate conflicts;
- implement appropriate environmental controls;
- design and implement safe access points;
- provide an efficient and well maintained vehicle fleet; and
- determine the most appropriate hours of operation that will minimise the impact on the road network and local communities.

A Vehicle Movement Plan (VMP) is defined as a diagram that shows the preferred travel paths for vehicles associated with a work site entering, leaving or crossing the through traffic stream. A VMP should also show travel paths for trucks at key points on routes remote form the work site such as places to turn around, accesses, ramps and side roads.

A VMP may be combined with or superimposed on a TCP and a written document or drawing.

The hours of operation for the movement of construction vehicles will be in accordance with the approved operating hours in accordance with the environmental approval.

A Vehicle Movement Plan for this project is provided in Appendix E.

Manage haulage routes on-site

Whilst driving on construction sites there are a number of hazards a driver may experience, including: rough surfaces; deep excavations; low clearance; other larger plant; steep embankments, existing infrastructure etc.

Of equal importance is the safety of unprotected construction personnel working within the work site. For each stage of work LCPL will ensure that:

- a risk assessment is conducted for all work activities and vehicle movements;
- VMPs are developed for all regular vehicle movements;
- regular toolbox meetings are held to discuss on-site vehicle movements and the changes to work areas;
- all plant are fitted with the appropriate flashing yellow lights, reversing alarms, horns and two-way radios;
- access tracks are clearly defined and sign posted;
- pedestrian tracks and crossing points are defined and clearly sign posted;
- where possible, large items of plant, such as scrapers are separated from smaller plant items;

- where possible, workers do not operate within 3 metres of moving plant, and plant operators are tool boxed when moved into a new work area;
- spotters and / or Traffic Controllers are positioned when workers are operating in close proximity to access tracks and plant;
- appropriate warning signs are installed on the approach to hazards or conflict points;
- where necessary appropriate traffic controls are installed;
- consideration is given to the installation and enforcement of reduced on-site speed limits (i.e. maximum of 10km/h whilst passing workers on foot); and
- as necessary, delivery vehicles are to be managed on-site.

Manage haulage routes on the road network

LCPL will plan all vehicle movements to minimise the impact on the road network. Where possible, movements will be limited to the construction site, by fine tuning the design to achieve an earthworks balance and reusing materials generated by excavations to reduce the need for off- site transportation.

When on-road haulage operations are required LCPL will for each stage of work:

- conduct a traffic analysis to determine the number of vehicle movements and assess the potential impact on the road network;
- develop a route that maximises the use of the arterial roads and minimises the use of local roads;
- assess the route and determine the potential impacts on existing developments / traffic generating facilities (such as school, shopping centres, intersections, LATM etc);
- select a route that has a minimal impact, and or where the potential impacts can be effectively managed;
- as required, consult with Local Councils, road authorities and key stakeholders;
- select haulage vehicles that can safely negotiate the route;
- where possible, avoid movements during peak periods;
- develop a detailed VMP and toolbox all drivers;
- ensure the fleet are regularly maintained;
- prepare a plan to manage vehicle breakdowns and to clean up spills;
- develop contact lists for heavy tow operators; and

Heavy Vehicle Routes

Trucks will be required to deliver construction materials to site. It is also necessary to transport the construction waste to an appropriately licensed disposal facility

The proposed haulage routes for construction trucks on public roads are presented below.

Wentworth Street Access Points

Entry

From North: Trucks would approach from Warringah Freeway, Lane Cove Tunnel, M2 Freeway, M7 Freeway, left onto M4, right onto Centenary Drive, then Roberts Road, left onto Norfolk Road, right onto Wentworth Street and left onto site.

From South: Trucks would approach from M5, turn into M7, right onto M4, right onto Centenary Drive, then Roberts Road, right onto Norfolk Road, right onto Wentworth Street and left onto site.

From West: Trucks would approach from M4, right onto Centenary Drive, then Roberts Road, right onto Norfolk Road, right onto Wentworth Street and left onto site.

From East: Trucks would approach from Eastern Distributor, General Holmes Drive, M5 Motorway, right onto King Georges Road, then Wiley Avenue, then Roberts Road, right into Norfolk Road, right onto Wentworth Street and left onto site.

Exit

To North: From site, right into Wentworth Street, left into Norfolk Road, right into Roberts Road, then Centenary Drive, Homebush Bay Drive, Lane Cove Road, Ryde Road and left onto Pacific Highway.

To South: From site, right into Wentworth Street, left into Norfolk Road, right into Roberts Road, Centenary Drive, left into M4 Motorway, left into M7 Motorway and to the south via M5 Motorway.

To West: From site, right into Wentworth Street, left into Norfolk Road, right into Roberts Road, Centenary Drive, left into M4 Motorway.

To East: From site, right into Wentworth Street, left into Norfolk Road, left onto Roberts Road, then Wiley Avenue, King Georges Road and the east via M5 Motorway or Princes Highway.

Cosgrove Road Access Points

Entry

From North: Trucks would approach from Warringah Freeway, Lane Cove Tunnel, M2 Freeway, M7 Freeway, left onto M4, right onto Centenary Drive, left onto Hume Highway, right into Cosgrove Road and right into site.

From South: Trucks would approach from M5, turn into M7, right onto M4, right onto Centenary Drive, left onto Hume Highway, right onto Cosgrove Road and right into site.

Alternatively, trucks would approach from Princes Highway, left into King Georges Road, right into Punchbowl Road, left into Cosgrove Road and left into site.

From West: Trucks would approach from M4, right onto Centenary Drive, left onto Hume Highway, right onto Cosgrove Road and right into site.

From East: Trucks would approach from Eastern Distributor, General Holmes Drive, M5 Motorway, right onto King Georges Road, right into Punchbowl Road, left into Cosgrove Road and left into site.

Exit

To North: From site, left into Cosgrove Road, left into Hume Highway, right into Centenary Drive, Homebush Bay Drive, Lane Cove Road, Ryde Road and left onto Pacific Highway.

To South: From site, right into Cosgrove Road, right into Punchbowl Road, left into King Georges Road and to south via right turn onto M5 Motorway or right turn onto the Princes Highway.

To West: : From site, left into Cosgrove Road, left into Hume Highway, right into Centenary Drive, left into M4 Motorway.

To East: From site, right into Cosgrove Road, right into Punchbowl Road, left into King Georges Road and to east via left turn onto M5 Motorway or via left turn onto the Princes Highway.

Oversize and Overmass Vehicles

The movement of oversize loads to and from the site will need to be effectively managed. Over-dimension vehicles will be required to deliver the precast beams for the bridge and for delivery of machinery.

The RTA's Operating Conditions, "Specific Permits for Oversize and Overmass Vehicles and Loads Guidelines 2007" will apply. All operators are required to apply to the RTA for a permit oversize and overmass vehicles that exceed the statutory dimension limits (eg semi-trailer over 4.3m height, 2.5m wide, 19m long), or exceeding the maximum axle loadings for the vehicle configuration. In Sydney Metropolitan Zone during daytime an oversize vehicle must not travel after 6:00am. Additional restrictions also apply along the Freeways approaching Sydney.

Plan construction access points

The most hazardous movement for construction vehicles occur when the vehicle is entering or exiting the construction site to and from the adjacent travel lane. The risk is increased on

high speed / high volume roads where existing access points are limited, as drivers do not expect vehicles to be turning from or entering the traffic flows.

When planning construction access points for each stage of work the Project Manager will:

- where feasible, utilise existing local road junctions to access construction work areas;
- keep the number of access points to a minimum;
- ensure the new construction access points do not adversely impact on any existing intersections, traffic facilities or traffic generating developments;
- only install access points that are clearly visible, and have adequate sight distance (minimum Safe Intersection Site Distance (i.e. 130m @ 70km/h),
- design all junctions and access points in accordance with AUSTROADS Guide to Road Design, Part 4A – Unsignalised and Signalised Intersections and the RTA Road Design Guide;
- ensure the junction configuration has sufficient capacity to accommodate the traffic generated by the construction site;
- the access is designed to accommodate the turning movements of the largest vehicles that will be accessing the site;
- the treatment maximises rear end protection for vehicles turning right into the access;
- on high speed roads appropriate acceleration and deceleration lanes are provided;
- where installed, security fences and gates are indented to maintain clear sight lines and enable vehicles to park clear of the adjacent travel lanes;
- access junction must be constructed of a suitable all weather surface that prevents debris from being tracked onto the adjacent travel lanes and the potential road safety issues caused by damage to existing shoulder material;
- ensure all access points are clearly visible to approaching traffic and signposted accordingly.

The AUSTROADS Guide to Road Design, Part 4A – Unsignalised and Signalised Intersections and section 4 of the RTA Road Design Guide provide guidance on the design of junctions and access points.

No matter the type of junction configuration implemented, temporary traffic controls may be required from time to time to facilitate short-term major haulage operations and the movement of over-dimension vehicles.

Implement traffic controls

Risk assessments are conducted as part of the project risk strategy. Active Risk Manager (ARM) is used to manage these risks and specific controls put in place to mitigate particular hazardous traffic movements.

The type of temporary traffic controls to be installed by LCPL may include:

- truck warning signs in advance of access points;
- reduced speed zones on the approaches to work areas close to the road;
- traffic controllers at access points to facilitate entry and exit movements when required;
- road shoulder closures to provide safe work area behind safety barriers, and
- closure of slow and fast lanes to provide safe work area.

In addition, all access points will be appropriately signposted on the approaches and at the access. Consideration will be given to the use of unique identification numbers for all access points.

A SHEWMS in consultation with construction team will be developed. A Traffic Control Plan (TCP) will also be developed for all sign posting schemes, which may be a separate plan or incorporated within the VMP.

Implement environmental controls

The Project will implement various environmental controls and measures for the haulage operations to mitigate the impacts on surrounding environment and road network.

Measures to be applied by LCPL may include:

- the compulsory covering of all loads prior to leaving the site;
- provision of suitable wheel cleaning facilities at all major access points;
- dust suppression measures conducted regularly at loading / unloading areas and along the routes;
- haulage vehicle noise and pollution emission will be monitored to ensure they are in compliant with the vehicles manufacturer's specifications;
- clean-up crews, including street sweepers, will be available to manage material spills; and
- all materials will be managed in strict accordance of the Project's approvals and any subsequent approvals.

Further, environmental controls will be outlined in the Project's Environmental Management Plan and related sub-plans.

Monitor haulage operations

During haulage operations LCPL will conduct regular monitoring of the various haulage routes to ensure that:

- operations are complying with the Project's approvals and the requirements of the Construction Traffic Management Plan / Strategy;
- haulage vehicles are only travelling along designated routes;
- haulage operations are not causing traffic congestion throughout the road network;
- the VMPs are being applied and complied with;
- damage to pavements and traffic facilities are reported and rectified;
- haulage vehicles are fitted with appropriate warning devices;
- all necessary Traffic Control Plans are installed, and
- the required vehicle and access point environmental controls are applied.

The monitoring of local roads may be conducted in consultation with Strathfield Council and Bankstown City Council.

8 Obtain Lane Closure and Road Occupancy Approvals

Description

This process focuses on how LCPL will apply for the necessary approvals to occupy the road network and install temporary traffic control signs or devices. It covers: identifying the road authorities; road occupancy requirements on local roads; lane closure & road occupancy requirements; lane closure & road occupancy submission procedure; lane closure & road occupancy extension procedure; typical lane closure & road occupancy approval conditions, and lane closure & road occupancy authorisation limitations.

Roles

Traffic Manager, Project Manager, RTA, Councils

Process

Obtain approvals

LCPL will obtain the necessary approvals from the appropriate road authorities prior to conducting any works within the road reserve.

The three specific areas of approval will include:

- all development works within the road reserve and/or any changes to existing infrastructure;
- the temporary or permanent installation and/or changes of any regulatory traffic control device; and
- lane & road closures, occupation of the road network to conduct works, and the associated installation of temporary traffic control devices.

Identify the road authorities

The road authorities responsible for roads affected by the Project include Strathfield Municipal Council and the NSW Roads and Traffic Authority (RTA). The roads directly affected and the road authorities are outlined in the table below.

Table: Roads and responsible Road AUthority

Road	Classification	Road Authority
Hume Highway	**State**	**RTA**
Roberts Road	**State**	**RTA**
Punchbowl Road	**State**	**RTA**
Cosgrove Road	**Regional**	**Strathfield Council**
Norfolk Road East	**Local**	**Strathfield Council**
Norfolk Road West	**Local**	**Bankstown City Council**
Wentworth Street	**Local**	**Strathfield Council**

LCPL will liaise with key stakeholders and the relevant road authorities during the construction phases.

Lane closure & road occupancy local and regional roads

In accordance with the requirements of the Roads Act 1993, the approval of the relevant authority is required prior to undertaking works within the road reserve.

LCPL will obtain the approval of the relevant road authority prior to the installation of temporary traffic controls or devices and occupying the road network.

The submission to the road authority will include:

- brief details of the works to be conducted;
- any relevant design drawings of the works;
- program of the works;
- copies of Traffic Control Plans;
- if applicable, details of speed limit authorisation submission and
- contact details of a construction site representative.

The submission process flow chart is included as a Tool with this process.

Lane closure & road occupancy state roads

The RTA is responsible for the operational efficiency of the NSW Road Network, including the coordination of planned and unplanned incidents. The overall coordination of incidents is managed by the RTA's Transport Management Centre (TMC) at Eveleigh in Sydney.

The responsible contact for this section will be documented by LCPL, including details of the relevant contact for the RTA's approvals.

LCPL acknowledges that it is responsible for obtaining all necessary approvals for the implementation of lane closures & road occupancies, and understands the benefits of minimising unavoidable delays at separate work sites.

The Project manager acknowledges all road occupancies will be subject to the specific period of operation stated on the approval, and conditions on obtaining other necessary approvals.

LCPL acknowledges that a Road Occupancy Licence (ROL) scheme applies along the Hume Highway, and understands the benefits of co-ordinating the occurrence of delays at separate work sites. Consequently, except in the case of an emergency, or when directed by Police or Emergency Services, LCPL will obtain an ROL prior to the commencement of any works which:

- slows, stops or otherwise delays Roberts Road and Hume Highway;

- diverts Roberts Road or Hume Highway traffic from its normal course along the road carriageway, including lane closures, turning restrictions, side-tracks, detours and diversions; or
- occupies any portion of Roberts Road or the Hume Highway that is normally available for traffic, including road shoulders.

An emergency is defined as an unforseen event, which requires urgent attention to protect life or property or an occasion when emergency services (Police, Fire Brigade, Ambulance or State Emergency Services) take control of a portion of the road network.

LCPL acknowledges all road occupancies will be subject to the specific period of operation stated on the approved ROL, and conditions on obtaining other necessary approvals.

Despite the hours of operation stated in Section 1, all road occupancies will be subject to the specific period of operation stated on any approved Licence and conditions on obtaining the other necessary approvals.

Lane closure & road occupancy submission procedure

Any required ROL Application will be forwarded to the RTA Transport Management Centre, who have the responsibility for processing and approving ROL. The RTA generally requires at least 10 working days to process the application and will either grant or reject application within this period.

It should be noted the road occupancy requests must comply with the various road safety and traffic management principles, objectives and targets outlined in the Construction Traffic Management Plan.

The ROL/SZA submission process flow chart is included as a Tool under this topic.

Extensions of lane closure & road occupancy approvals

The RTA has limited the maximum period of a ROL to one month to 6 months. To obtain extensions, LCPL will be required to re-submit a completed ROL Application Form with a copy of original TCP, quoting the previous ROL number.

If the original lane closure & road occupancy submission is to be altered or changed, (e.g. change to times, TCP or proposed occupancy, work type etc), a new ROL submission will need to be prepared.

It is the responsibility of LCPL to ensure the validity of each approved lane closure road occupancy, thus regular monitoring of approval expiry dates is essential. The Traffic Manager will maintain a database, which will contain details of road occupancy approvals to assist with this process.

Road occupancy conditions

Generally, the RTA will apply conditions to the approvals, which may include:

- maximum traffic stoppage times;
- maximum queue lengths;
- maximum travel time delays;
- the provision of adequate roadway capacity to maintain an acceptable Level of Service;
- measures to provide information to road users;
- provision of a weekly schedule outlining the proposed road occupancies for the preceding week;
- records detailing the date and time of the road occupancy, and the location of all signs, and any other relevant information associated with the traffic control, must be kept.

The RTA has the power to revoke the approvals at anytime for breaches of the associated conditions.

Authorisation limitations

Generally, in accordance with any RTA requirement, the responsibility for implementation, coordination, and compliance with the lane closure & road occupancy approvals remains with LCPL and specifically, the Traffic Manager. The RTA's granting of the approval does not:

- constitute approval by the RTA of any actions that relate to traffic safety, occupational health and safety, or environmental issues and management;
- relieve LCPL or any person of their responsibility for compliance with legislation, regulations, or established operational procedures; or
- change any management accountability or responsibility.

9 Apply Roadwork Speed Limits

Description

Temporary roadwork speed limits are one of many traffic controls that can be implemented to manage the speed of traffic approaching, and passing through a work site.

This process outlines the methodology for applying roadwork speed limits, including: determining the need for a roadwork speed zone; submission procedure; process for obtaining extensions to the period of operation; speed zone conditions and limitations of speed zone authorisations.

Roles

Traffic Manager, RTA, Project manager

Process

Leighton Contractors Pty Ltd (LCPL) acknowledges that roadwork speed zones must be logical and credible, as well as enforceable. When considering the use of a roadwork speed zone, LCPL will adopt the principles outlined in AS 1742.3, which state that roadwork speed zones must;

- only be used where they are self-enforcing or will be enforced,
- not be used alone but with other traffic control signs and devices,
- not be used in place of more effective traffic controls, and
- only be used while roadworks are in progress or the lower standard road conditions exist.

Determine the need for a roadwork speed zone

Roadwork speed zone are only effective in controlling driver behaviour, if they appear reasonable to drivers. A reduced roadwork speed zone must only be implemented where it is warranted.

Roadwork speed zones should not be applied as the only option to control traffic, but as one measure along with other temporary traffic control signs and devices.

Roadwork speed zones may be installed to assist in controlling vehicle speeds when: traffic travels through the work site; workers are endangered by high speed traffic; dust or smoke reduces visibility; loose material is present on the road surface; the road geometry is of a lower standard; deep excavations exist adjacent to the travel lanes; the safety of a bridge structure is temporarily reduced and traffic is temporarily diverted onto opposing travel lanes or carriageways.

Section 4.9 of Australian Standards 1742.3 provides guidance to assist with the selection and installation of roadwork speed zones. Specifically Table 4.7 of AS 1742.3 outlines the general selection criteria for selecting the speed limits (40, 60 or 80 km/h).

To reinforce the reduced speed zones, LCPL will conduct regular reviews of the speed limit signage and consult with the NSW Police representatives to obtain enhanced enforcement of the roadwork speed zones, particularly during working hours.

LCPL will prepare a speed zone application and submit it to the RTA's Transport Management Office located at Eveleigh, at least 10 working days prior to the commencement of work. Once approved, a copy of the Speed Zoning Authorisation will be forwarded to the

local NSW Police Highway Patrol Office, and if necessary to the Local Council. LCPL accepts that it will be responsible for the management of records associated with the speed zone, in accordance with Section 8.2.6 of the RTA's TC@WS Manual.

Submission procedure

Guidance for applicants applying for Speed Zone Authorisation (SZA) is provided in the RTA's Road Occupancy Manual issued by the Transport Management Centre (TMC). The manual contains a number of explanatory notes, checklists, and application forms. The documents applicable to this project include: DTR (SZA) Application Explanatory Notes Form R and DTR (SZA) Application Form R which is attached as a knowledge resource to this Topic.

Upon the receipt of a request from the Project Engineer, the Traffic Manager will process the submission to the RTA in accordance with the ROL (SZA) process flow chart.

The SZA Application must be forwarded to the local RTA's Regional office that has the responsibility for processing an approving SZA. The RTA generally requires at least 10 working days to process the application and will either grant or reject application within this period.

Once approved, LCPL will forward a copy of the SZA to the local NSW Police Highway Patrol Office, and if necessary to the Local Council. LCPL accepts it will be responsible for the management of records associated with the speed zone in accordance with Section 8.2.6 of the RTA's TC@WS Manual.

The ROL/SZA submission process flow chart is included as a Tool under this Topic.

Extensions to period of operation

The RTA limits the period of operation of a SZA from one month to six months. To obtain extensions, the Traffic Manager will be required to re-submit a SZA submission. If there are no amendments, other than dates, to the original submission, the Traffic Manager will only be required to submit a completed SZA Application Form R with a copy of original TCP, quoting the previous SZA number.

If the original SZA submission has been amended, (eg change time, TCP, location or speed reduction etc), a new SZA submission will need to be prepared and submitted.

It is the responsibility of the Project Manager to ensure the validity of each approved speed limit, thus regular monitoring of the expiry dates is essential. The Traffic Manager will maintain a database which will contain details of speed limit consent to assist with this process.

Speed zone conditions

Generally, the RTA will apply conditions to speed limit authorisations, and has the power to revoke an approval at anytime for breaches of the conditions.

The typical conditions include, but not limited to:

- a copy of the SZA must be made available to the local NSW Police Highway Patrol representative, and RTA accordingly;
- the temporary roadwork speed zone must be installed in compliance with conditions, notes, applicable dates and locations stipulated in SZA;
- specific measures required to manage adjacent speed zones, or potential conflicts with other temporary speed zones at construction sites in the immediate area;
- all temporary roadwork speed limits must be installed as per the Traffic Control Plan and operated in accordance with the RTA requirements;
- similar to all regulatory signs, the speed limit signs are to be properly erected, and any contradictory signs or road markings are to be removed or covered; and
- records detailing the date and time the speed limit is in operation, the speed limit displayed, and the location of all signs, and any other relevant information associated with the speed limit, must be kept.

Authorisation limitations

Generally, in accordance with the RTA's requirements, the responsibility for implementation, coordination, and compliance of the speed zone remains with the Project, specifically the Traffic Manager. The RTA's granting of the approval does not:

- constitute approval by the RTA of any actions that relate to traffic safety, occupational health and safety, or environmental issues and management;
- relieve the Project or any person of their responsibility for compliance with legislation, regulations, or established operational procedures; or
- change any management accountability or responsibility.

10 Use Traffic Control Devices

Description

This process focuses on using traffic control devices to regulate, warn and guide road users. It provides guidance in the use of sign posting and road markings, variable message signs, flashing arrow signs, and portable traffic signals.

Roles

Project manager, Traffic Manager, Traffic Control Team

Process

Overview

Traffic control devices are all signs, traffic signals, road markings, pavement markers, traffic islands, and/or other devices placed or erected to regulate, warn and/or guide road users. The function of a traffic control device is to promote orderly traffic flow, regulate traffic (assign right of way, and indicate regulations in force), warn road users of hazards or regulatory controls ahead, (in particular they also warn of temporary hazards that could endanger road users or workers at roadwork sites), and guide traffic (e.g. guide signs to inform road users of directions to destinations, identify routes, and pavement markings to guide the travel path of vehicles).

Australian Standard 1742.2 Section 1.71 states traffic control devices should conform to the following principles:

- be capable of fulfilling an important need;
- command attention;
- convey a clear, simple meaning with the minimum number of messages required to obtain the desired response from the driver;
- command respect;
- be located to give adequate time for response, and
- not obscure any other traffic control devices.

LCPL acknowledges the importance of traffic control devices and how they influence traffic flow and the safety for road users, in particular where temporary traffic controls are implemented at work sites. During the construction of the project, LCPL will assess the appropriateness for traffic control devices in accordance with the relevant guides / standards, and where required, install the device correctly, and conduct regular maintenance.

Sign posting and road markings

Signs and road markings are an important aspect of road safety and traffic management. Regulatory signs control specific traffic movements, warning signs give advance notice of traffic hazards, road markings (& pavement markers) provide delineation and reinforce signage, and guide signs give advance guidance and advice of routes and destinations which assist all drivers to make clear, early decisions.

The aim of sign posting is to:

- warn and inform road users of conditions ahead;
- guide and control road users to safely negotiate the road ahead;
- ensure the signs and their structures are not a hazard in themselves;

- provide drivers with sufficient information to ensure there are no surprises along their path of travel, and
- to provide data in a controlled and consistent way to avoid information overload.

Ensure devices are installed correctly

LCPL recognises the value of providing road users with timely, clear and consistent messages and LCPL will ensure all signs, road markings and devices installed during the construction of the project are:

- assessed for use in accordance with the appropriate guidelines;
- manufactured in accordance with the requirements of the Australian Standards;
- installed in accordance with the relevant guides and standards;
- not contradictory to existing signs or markings;
- when no longer required, covered or removed, and
- regularly maintained and repaired / replaced when damaged or lose reflectivity.

All sign posting installed throughout the project will comply with the requirements outlined in the RTA's Traffic Control at Worksites Manual, the RTA's Interim Guide to Signs and Markings, AUSTROADS Guide to Traffic Engineering Practice, Part 8 – Traffic Control Devices and the relevant Parts of Australian Standard 1742.

In addition, to the sign posting requirements stipulated in the RTA's TC@WS manual and the Australian Standards, LCPL will be applying the following sign posting parameters:

- where possible, duplicate signs will be implemented for all short-term TCPs;
- The signs located in the enhanced advanced warning schemes approaching the Zones will be a minimum of Type C size;
- The minimum size of signs used on the project will be Type B, and
- Consideration will be given to the installation of short-term signs on permanent posts with secure covers, where works occur in the same location on a regular basis.

Further, LCPL will conduct detailed reviews of all short and long term signage every 2 months with the aim to ensure a clear and concise message is given to approaching road users, without creating sign clutter.

Develop Traffic Control Plans

Traffic Control Plans (TCPs) will be developed to illustrate all temporary traffic arrangements, including the various traffic control signs, road markings and devices to be installed.

The installation of home-made or non-standard signs will not be permitted on the project.

Utilise Variable Message Signs

LCPL considers Variable Message Sign(s) (VMS) are a very effective traffic control tool. During the construction of this project, LCPL may utilise portable VMS to enhance advanced warning sign posting and provide changed traffic condition information to road users.

When not required for construction activities, the VMS can also be utilised to support the RTA's incident management operations, and for the display of road safety messages.

The use of VMS and the appropriate message will be incorporated within the site specific TCPs.

The positioning and setting of VMS messages will be coordinated by the Traffic Manager.

LCPL will deploy the VMS and set standard messages in accordance with the RTA's requirements. Where applicable, VMS devices utilised on the project will comply with RTA's specifications.

Utilise flashing arrows signs

Flashing Arrow Signs (FAS) are key components of most TCPs, in particular for use when closing traffic lanes, and conducting mobile traffic control operations.

The requirements of when to utilise a FAS are stipulated in various sections of AS1742.3 and RTA's TC@WS manual. When stipulated by the TCP, LCPL will implement FAS in

accordance with Section 3.12 of the AS 1742.3 and Appendix D of the RTA's TC@WS manual.

Where applicable, FAS used on LCPL will comply with the RTA equipment requirements FAS/4 and be controlled by a trained traffic control team member.

11 Prepare Traffic Control Plans

Description

The provision of a safe environment for road users and works staff is a key objective. This process provides a comprehensive guide to the preparation of Traffic Control Plans (TCPs). It covers the design process; types of TCPs; a comprehensive TCP preparation checklist; outlines the need to conduct a site inspection, and TCP developer qualification requirements.

Roles

Traffic Manager, Project Engineer, Site Engineer, Project Employees, Contractors

Process

A TCP is a diagram showing signs and devices arranged to warn traffic and guide it around, past, or if necessary through a work site or temporary hazard.

All TCPs will be developed by LCPL, with the aim of:

- **Warning** drivers of changes to the usual road conditions,
- **Informing** drivers about changed conditions,
- **Guiding** drivers through the work site, and
- **Safety** for workers, motorists, pedestrians and cyclists.

The TCPs are based on the principles and measures outlined in the Construction Traffic Management Plan / Strategy, and if applicable the relevant sections of the Traffic Management Plan.

Design TCPs

The TCPs are designed by LCPL in accordance with the requirements stipulated with Australian Standard 1742.3. Standard TCPs may be adopted directly from: the RTA's TC@WS Manual and AS1742.3. However, the standard TCPs must be modified to suit site conditions. Where modifications to the standard TCPs are necessary, these modifications must be shown clearly and recorded on a copy of the TCP.

To ensure compliance with these specifications LCPL has developed a Process for the preparation of TCPs that contains a detailed preparation checklist.

Where possible, LCPL will prepare all TCPs using computer aided software, which will provide a clear, concise, and consistent format and if possible, scaled dimensions. The aim is to avoid the use of deficient TCPs, remove the inconsistency of overlapping or adjoining TCPs, and give due consideration to the road design principles.

In addition to the specifications above, all unique TCP design parameters determined during the project will be tabled in a Traffic Guide, which will ensure these parameters are consistently applied project wide. For example, on this project a shadow vehicle with a flashing yellow light must be positioned on the approach to all Traffic Controllers.

Develop site-specific TCPs

Site specific TCPs will be developed by LCPL for both long and short-term works.

- Long-term relates to temporary arrangements that will be in place for a period longer than 1 shift. TCPs for long-term works will be prepared for the following:
  - closure of the kerbside lane or parking lane in Roberts Road and Cosgrove Road for construction of left-turn slip lane
  - shoulder closure and installation of safety barriers in Wentworth Street to construct bridge access

- provision of temporary safety barriers and construction access points.

- Short-term relates to a temporary arrangement that will be applied for 1 shift or less, and where normal operating conditions are reinstated after all temporary traffic management devices are removed from the roadway. Short-term TCPs will be installed as required to facilitate day-to-day construction activities such as installation of safety barriers, one-lane alternate operations, surveying & geotechnical activities, site deliveries, service investigations, maintenance activities, plant movements and haulage operations.

Provide Safe Clearances to Work Areas

Maintaining a safe environment for workers is critical, particularly when operating, on or near high speed roads. LCPL will be applying requirements that exceed those specified in Section 3.6 of the RTA's TC@WS Manual, and Section 4.2 of AS1742.3. The requirements adopted by LCPL are shown in the table below.

Table: Work Area Clearance Requirements

Speed Limit	Minimum Clearance
No Work Permitted	Within 1.2 metres
40km/h	Greater than 1.2 but less than 3.0 metres
60km/h	Greater than 3.0 but less than 4.5 metres
80km/h	Greater than 4.5 but less than 6.0 metres

The work area clearances stated in the above table are the absolute minimum requirements. Despite a reduced speed limit being in operation, the separation between workers and traffic will be maximised by applying lane closures, lane deviations, and or, by narrowing lane width.

The selection and installation of all temporary safety barriers for this Project will be in accordance with Section 6 of the RTA's Road Design Guide, and the applicable manufacturer's specifications.

Apply checklist

LCPL has developed a comprehensive checklist for the preparation of a Traffic Control Plan, which is based on the key considerations and factors that are stated within the Australian Standard 1742.3. This checklist can also be used as an auditing tool to check compliance of TCPs.

The Project Manager must ensure this checklist is applied when preparing TCPs.

Conduct site inspection

LCPL acknowledges that it is imperative that, prior to preparing a TCP, the Project Engineer, or Site Engineer responsible must conduct a detailed site inspection with the aim of identifying the existing lane configurations, junction treatments, traffic operations, traffic control signage, speed zone locations, side roads, alignment restrictions horizontal and vertical, private access points, bus stops, cycle / pedestrian facilities, bridge structures, roadside furniture, and any feature that may affect the installation of the desired TCP.

It should be noted that RTA will generally not approve a lane closure / road occupancy application if the TCP is deficient and measures are not included to address specific site issues.

Check qualifications

Although the checklist is for the use of all LCPL Employees and Contractors, a TCP can only be selected or modified by a suitably qualified person who has successfully completed the relevant RTA TC@/WS select/modify Traffic Control Plans course (red card). In addition, a

TCP can only be designed or audited by a person who has successfully completed the RTA TC@WS design/ inspect Traffic Control Plans course (orange card).

12 Conduct Traffic Control Inspections

Description

This process focuses on the continuous monitoring of temporary traffic controls at work sites during the construction phase. The aim of this process is to provide a safe environment for workers and road users, monitor compliance against the Traffic Control Plan and identify safety hazards in order to implement corrective solutions. This process details the type, frequency, responsibility and checklists for inspections.

Roles

Traffic Manager, Traffic Control Leading Hand, Site Engineer, Project Engineer, Project Manager

Process

Inspections of the temporary traffic controls will be conducted during the construction phase, focusing on monitoring compliance against the TCP and identifying safety hazards, to enable implementation of corrective solutions.

LCPL will conduct four main types of inspections on projects:

- pre-start and pre-close down inspections of short-term traffic control;
- weekly inspections of long-term traffic control;
- night inspections of long-term traffic control and
- pre-opening inspections of minor temporary traffic switches.

These inspections will be carried out in accordance with Appendix A of Australian Standard 1742.3.

Frequency

The Traffic Manager will ensure regular inspections of temporary traffic controls are conducted during the construction of this project.

The frequency of the traffic control at work sites inspections will be subject to the construction program and the types of activities in progress. The responsibility and frequency of inspections are summarised in the table below.

Inspection	Responsibility	Frequency
Pre-start & pre-close down	Traffic Control Leading Hand and Site / Project Engineer	Before works start and prior to closing down. The Leading Hand must also conduct regular inspections throughout the shift.
Weekly inspections	Foreman and Site / Project Engineer	On the day before the work begins, and at least once per week.
Night inspections	Foreman and Site / Project Engineer	At least once during the first week and at least every two months.
Pre-opening inspections of minor temporary traffic switches	Project Manager & Traffic Manager	Prior to opening any minor temporary traffic switches, lane deviations or sidetracks.

Note: The reference to the Site / Project Engineer in the above table refers to the engineer that is responsible for the work activity and the development / implementation of the TCP.

Inspection checklists

LCPL will apply comprehensive checklists to assist the inspection process.

The short-term, long-term, or night inspections checklist is based on the Appendix E of the RTA's TC@WS Manual. The pre-opening inspection of minor temporary traffic switches is based on Checklist 4 of the AUSTROADS Guide to Road Safety, Part 6: Road Safety Audit (2009).

These checklists are included as Tools under this Process.

13 Conduct Traffic Control Road Safety Audits

Description

This process focuses on road safety audits conducted during the construction phase, aiming to identify any deficiencies and or safety hazards, regardless of current practice, standards or operations, to enable LCPL to implement corrective solutions. It covers types of road safety audits, methodology for conducting road safety audits, frequency of audits, responsibility for conducting the various audits, and comprehensive audit checklists.

Roles

Road Safety Auditor, Project manager, Traffic Manager, Quality Manager, Performance Manager

Process

Overview

AUSTROADS defines a road safety audit as a formal examination of a future road or traffic project or an existing road, in which an independent, qualified auditor(s) reports on the roads crash potential and safety performance. There are various types of audits conducted on new road projects from feasibility audits through to pre-opening audits. Audits are also conducted to assess the safety of existing roads and temporary traffic arrangements implemented for roadwork.

These audits will be conducted in accordance with the AUSTROADS Guide to Road Safety, Part 6: Road Safety Audit (2009).

On the Enfield Intermodal Logistics Project, LCPL will be conducting both internal and external road safety audits. The type and frequency of the audits will be determined by the scale of the project, outcomes from risk assessments, and the contract requirements.

The internal audits will be conducted every month by the Traffic Manager and the project manager.

The external audits will be conducted every 6 months by a suitably qualified road safety and traffic engineering auditor. Pre-opening audits will be conducted prior to opening all new roads and for all major temporary traffic switches. LCPL will engage suitably qualified road safety auditor(s) who have undergone road safety audit training and received certification under the Institute of Public Works Engineering Australia (IPWEA) Accreditation Scheme to conduct the external audits. An experienced auditor who has achieved Road Safety Auditor Level 3 certification will lead the audit team.

Apply audit methodology

The following methodology will be applied on this project when conducting the road safety audits:

- a commencement meeting will be held between auditor(s) and construction representatives;
- reviewing relevant documents (including design plans, crash histories, previous audits etc);
- conduct site inspections during the day and night, noting deficiencies and hazards;
- assessing the inspection findings in accordance with relevant practices, guides and current standards;
- forwarding a draft list of deficiencies to the responsible Project Manager for review, and if necessary immediate action;
- prepare a concise audit report, which includes a table detailing the deficiencies identified;
- conduct a completion meeting with the Project Manager;
- the Project Manager provides a response to the audit findings; and
- where necessary, the Project Manager is to program necessary actions to rectify deficiencies.

LCPL will also apply this methodology and provide feedback to any road safety audits that are conducted by the RTA, or other stakeholders.

Audit frequency & responsibility

The Traffic Manager will be responsible for managing the Project's road safety audit program in coordination with the Quality Manager and or Performance Manager.

The responsibility and frequency of audits is summarised in table below.

Audit Type	Responsibility	Frequency
Internal audit of temporary traffic arrangements.	To be conducted by the Traffic Manager and project manager.	A sample of sites at least once per month.
External audit of temporary traffic arrangements.	Traffic Manager to engage a pre-qualified auditor who is external to the project.	A sample of sites at least every 6 months.
Pre-opening audit of new roads and or major temporary traffic switches.	Traffic Manager to engage a pre-qualified auditor who is external to the project.	Prior to the opening of all new roads and major temporary traffic switches.

In addition to the audits detailed above, the RTA also conducts fortnightly audits of the temporary traffic controls implemented throughout the Project as part of the Traffic KRA performance monitoring process. The RTA auditors apply a checklist similar to that applied by LCPL for the internal audits.

Apply audit checklists

LCPL will apply comprehensive checklists to assist the auditing process.

The internal audit checklist is based on the AS 1742.3 and the Appendix E of the NSW RTA's Traffic Control at Work Sites Manual.

The external audit checklist is based on Checklist 5 of the AUSTROADS Guide to Road Safety, Part 6: Road Safety Audit (2009).

The pre-opening audit checklist is based on Checklist 4 of the AUSTROADS Road Safety Audit guide (2nd Edition).

These checklists are included as Tools under this Process.

14 Manage Unplanned Incidents

Description

This process describes how LCPL will support emergency service agencies and RTA in the management of emergencies / unplanned incidents on roadways approaching and within the construction area, and assist in restoration of normal traffic conditions. It covers the emergency management responsibilities, RTA incident management responsibilities, unplanned incidents on the road network and construction site emergencies / unplanned incidents.

Roles

Project Manager, Traffic Manager, Safety Manager

Process

Types of incidents

The types of emergencies / unplanned incidents that may occur include, but are not limited to:

- motor vehicle crashes
- environmental spills
- terrorist attacks
- bomb threats
- construction type incidents
- structural catastrophic failures
- inclement weather conditions
- flooding
- anti-social behaviour

All incidents are entered into the safety database SHE Manager, by the Traffic Manager or project Safety Team member.

Manage emergencies

The Government of NSW acknowledges the inevitable nature of emergencies and their potentially significant social, economic and environmental consequences. Accordingly, the Government has enacted the State Emergency and Rescue Management Act, 1989 (as amended). Emergencies may be controlled by combat agencies or emergency operations controllers as specified in the State Emergency and Rescue Management Act, 1989 (as amended), which recognises the need for a coordinated response by all agencies having roles or responsibilities for such emergencies.

The State Emergency and Rescue Management Act identified agencies primarily responsible for controlling particular hazards/emergencies. Combat agencies particularly relating to NSW are detailed in the table below.

Table: Agency Responsibilities

Event	Agency
Law Enforcement / Emergencies	NSW Police
Fire:	NSW Fire Brigades
Hazardous Materials:	NSW Fire Brigades
Flood:	NSW State Emergency Service
Storm and Tempest:	NSW State Emergency Service

NSW RTA responsibilities

In accordance with its statutory obligations, RTA has the ultimate responsibility for road safety and traffic management of the State Road Network. It is the lead agency for traffic management in New South Wales, including the management of unplanned incidents in co-ordination with NSW Police. For further information refer to the "RTA and Police – Memorandum of Understanding Traffic Management of Incidents" (1999).

The RTA's Transport Management Centre (TMC) at Eveleigh is responsible for the management of unplanned incidents throughout the NSW road network. Under the RTA and Police MOU, the incident scene and responsibility is divided into three cordons:

- Inner Cordon – Police lead with RTA support;
- Outside the Inner Cordon – RTA lead with Police support; and
- Outside of Outer Cordon – RTA leads and manages.

LCPL may be requested by emergency service agencies or the RTA to provide support when emergencies/unplanned incidents occur within, or adjacent to the construction site.

Manage unplanned incidents on the road network

The occurrence of unplanned incidents within the construction site will potentially have negative impacts on the operation of the road network. Similarly incidents that occur on the surrounding road network can temporarily restrict construction activities.

LCPL will:

- apply and maintain communication protocols, particularly between construction site and RTA representatives;
- inform the RTA of any incident and provide assistance, if appropriate, for the duration of the incident;
- if resources are available, provide initial response to unplanned incidents with the aim to make incident scene safe, and prevent further harm to persons or property;
- provide support to emergency services, including traffic control in the vicinity of the incident;
- during major incidents provide a senior construction representative on-site to liaise with the RTA and emergency service agencies;
- reschedule planned works that will interfere with the incident, or create additional delays to those road users already affected by the incident, and
- disseminate road condition information to the RTA for their distribution to road users.

Manage construction site emergencies / unplanned incidents

LCPL will develop an Incident Management Plan and a Crisis Management Plan as part of the Project Safety Plan, which will incorporate standard operating procedures for managing construction site emergencies / incidents. These plans will:

- define LCPL's roles and responsibilities in the event of incident and emergencies;
- establish and define LCPL's emergency response procedures dealing with different category of emergency arising from construction, traffic, environmental incidents;

- identify and define the roles and responsibilities of key LCPL's project personnel during emergencies and incidents;
- list available LCPL's resources;
- define the RTA and emergency services roles and responsibilities in the event of an incident or emergency;
- outline the communication protocols and system;
- outline incident administration procedures including training, record keeping etc, and
- establish formal arrangements for the review and maintenance of the plan.

15 Manage Special and Major Events

Description

This process focuses on managing traffic for special / major events and includes key definitions, guidelines, responsibilities for managing special / major events, LCPL's role, examples of what constitutes an event and the four classifications of events.

Roles

Traffic Manager

Process

Definition

The NSW RTA defines a special / major event (in traffic management terms) as any planned activity that is wholly or partially conducted on a road, requires multiple agency involvement, requires special traffic management arrangements and may involve large numbers of participants and / or spectators. Major events would generally attract crowds in excess of 30,000 people.

LCPL acknowledges that special events contribute to society and reinforce the values of Australians.

Key guideline

In 2003, the NSW Government published "The Guide to Traffic and Transport Management for Special Events", which provides a comprehensive guide for organising, managing and controlling special events. This guide was developed in consultation with representative from: the NSW Premier's Department; RTA; Local Government Association; numerous NSW Local Councils; Police and members of the events industry.

Responsibility for special / major events

RTA has the ultimate responsibility for road safety and traffic management of the road network. RTA is responsible for the assessment and coordination of special events, which is conducted in consultation with event organisers, NSW Police and Local Councils.

Role of LCPL

LCPL acknowledges considerable planning is required to successfully move large volumes of people in an efficient manner to minimise disruption to normal transport patterns.

This process will be undertaken by LCPL to ensure special / major events of any category that may impact on the road network through or in the vicinity of a construction site are managed. LCPL will actively participate in regular forums, communicate, and cooperate in the management process with the RTA, event organisers and relevant project members and clients.

16 Consultation and Communication Strategy

Description

A detailed Stakeholder and Community Involvement Plan (SCIP) has been prepared by LCPL. The SCIP outlines initiatives which will be undertaken to keep the community informed and provide opportunities for community involvement during construction of this project.

The broad objectives for community relations and stakeholder relations are to:

- provide accurate information as the project proceeds.
- listen to the community and key stakeholders' feedback about the design and construction of the project and integrate into the project where appropriate.

Specific objectives are;

- identify affected landowners
- regularly disseminate up-to-date information to stakeholders, the wider community, including the road users, and affected landowners.
- provide for two-way communication between LCPL and all community and stakeholders, particularly adjoining landowners.
- prompt handling and resolution of issues affecting stakeholders and the wider community.
- meet the consultation related conditions contained in the Conditions of Approval.
- fulfil the consultation related commitments made by the RTA about the project in the environmental approval.

The (SCIP) also contains a subsection that outlines the specific consultation and community strategies to be applied for managing traffic.

LCPL, in conjunction with the RTA, will set up proactive measures to communicate with the community, road authorities, Local Councils, emergency service agencies and key stakeholders, including the Road Transport Coordination Group during the construction of this project.

The main objectives of the traffic communications strategies are to:

- provide timely, accurate and comprehensive traffic information to all potential and existing road users;
- allow and accommodate community and key stakeholder feedback regarding road safety and traffic management issues;
- minimise and manage traffic impacts and construction activities to protect locally affected residential and business amenity and
- ensure media are well informed.

This Process details the various components of the strategy including:

- identifying key stakeholders;
- consultation process;
- notification of emergency services;
- static roadwork information signs;
- use of variable message signs;
- changed traffic condition advertising and
- community letterbox notifications.

Roles

Project Manager, Community Relations and Communications Manager, Traffic Manager

Process

General

LCPL in conjunction with the client will disseminate changed traffic condition information using the following methods:

- consultation with key stakeholders;
- variable message and temporary roadwork information signage;
- changed traffic condition advertising (including website and RTA IRIS); and
- Community letterbox notifications.

Consultation

LCPL will regularly consult with key stakeholders. The Traffic Manager will regularly attend the meeting and update the Road Transport Coordination Group, and provide information sessions and workshops with key stakeholders.

Issues to be discussed at these forums may include: but are not limited to: potential risks associated with proposed changed traffic conditions; public safety; construction activities; community concerns; public transport issues; pedestrian and bicycle movements; and communication strategies etc.

The communication tools that LCPL will use for information dissemination with regard to traffic and transport for the project include:

- Notification to emergency services
- Static roadwork information signs
- Variable Message Signs (VMS)
- Changed traffic condition advertising
- Community letterbox notifications

17 Conduct Reporting

Description

This process focuses on reporting to the client, community, and other relevant stakeholders on all road safety and traffic management issues that may impact on the road network. This includes information to be reported, frequency and methods of reporting.

Roles

Traffic Manager, Project manager, SPC

Process

LCPL acknowledges the importance of keeping the client and stakeholders regularly informed.

Report traffic information

Traffic management information will be provided by the Traffic Manager to the Project manager, other relevant functional managers, Sydney Ports and Road Transport Action Group as required. Report information can vary depending on scale, nature, population and geography of the project and may include;

- reports on recent traffic, pedestrian and cyclist incidents.
- community and media feedback as they relate to road safety and traffic management issues;
- current and upcoming critical issues, (including those identified by the client, and other stakeholders and the proposed measures to address these issues as required);
- construction activities and scheduling;
- recent and proposed changed traffic conditions and the impacts on the operation of the road network;
- traffic analysis and modelling results, and the current performance of the road network and traffic systems;
- the current status of Traffic Management Plan, planned lane closure / road occupancy and roadwork speed limit, approvals and implementation;
- media and community information released and proposed to be released;
- results and feedback from recent inspections and road safety audits and
- performance results and trends of the project's traffic management targets.

Australian Standard 1742.3 (Appendix A) provides guidance on the specific information that should be recorded and reported for incidents that occur at roadwork sites.

Frequency of reporting

The frequency of reports provided by LCPL will be in the following four categories:

- immediate - reporting of major incidents and critical issues;
- within 1 working day - formal reports of major incidents;
- weekly reports - on planned lane closures / road occupancies and the performance results of recently implemented changed traffic conditions / operations;
- monthly reports - summarising: construction activities; proposed major traffic changes; upcoming media releases; incidents & issues; road network performance etc.

Methods of reporting

The methods of reporting to be applied by LCPL may include:

- verbal reports on issues of an urgent nature, (e.g. initial reporting of major unplanned incidents, adverse community / political feedback);
- safety incidents will be recorded in the safety database SHE, as per Safety reporting process.
- formal written reports in a format subject to client and stakeholder needs and
- presentations to consultative and stakeholder forums.

Appendix A

Applicable Specifications, Standards and Guides

Website: **www.austroads.com.au**

The search facility will produce the relevant reference.

- Australian Road Rules.
- Australian Standard 1742.3, Traffic control devices for works on roads.
- Australian Standard 1742 Parts 1 to 14, Manual of uniform traffic control devices (as required).
- Australian / New Zealand Standard – AS/NZS3845 Road Safety Barrier Systems.
- AUSTROADS Road Safety Audit Guide (2nd Edition) 2002.
- AUSTROADS Guide to Traffic Management – Part 1 Introduction to Traffic Management
- AUSTROADS Guide to Traffic Management – Part 5 Road Management
- AUSTROADS Guide to Traffic Management – Part 6 Intersections, Interchanges and Crossings
- AUSTROADS Guide to Traffic Management – Part 8 Local Area Traffic Management
- AUSTROADS Guide to Traffic Management – Part 11 Parking

Following AUSTROADS Guides to Traffic Engineering Practice are to be applied until they are superseded by the new release of the AUSTROADS Guide to Traffic Management.

- AUSTROADS Guide to Traffic Engineering Practice – Traffic Flow Part 1.
- AUSTROADS Guide to Traffic Engineering Practice – Roadway Capacity Part 2.
- AUSTROADS Guide to Traffic Engineering Practice – Traffic Studies Part 3.
- AUSTROADS Guide to Traffic Engineering Practice – Treatment of Crash Locations Part 4.
- AUSTROADS Guide to Traffic Engineering Practice – Intersections at Grade Part 5.
- AUSTROADS Guide to Traffic Engineering Practice – Roundabouts Part 6.
- AUSTROADS Guide to Traffic Engineering Practice – Traffic Signals Part 7.
- AUSTROADS Guide to Traffic Engineering Practice – Traffic Control Devices Part 8.
- AUSTROADS Guide to Traffic Engineering Practice – Arterial Road Traffic Management Part 9.
- AUSTROADS Guide to Traffic Engineering Practice – Local Area Traffic Management Part 10.
- AUSTROADS Guide to Traffic Engineering Practice – Parking Part 11.
- AUSTROADS Guide to Traffic Engineering Practice – Roadway Lighting Part 12.
- AUSTROADS Guide to Traffic Engineering Practice – Pedestrians Part 13.
- AUSTROADS Guide to Traffic Engineering Practice – Bicycles Part 14.
- AUSTROADS Guide to Traffic Engineering Practice – Motorcycle Safety Part 15.

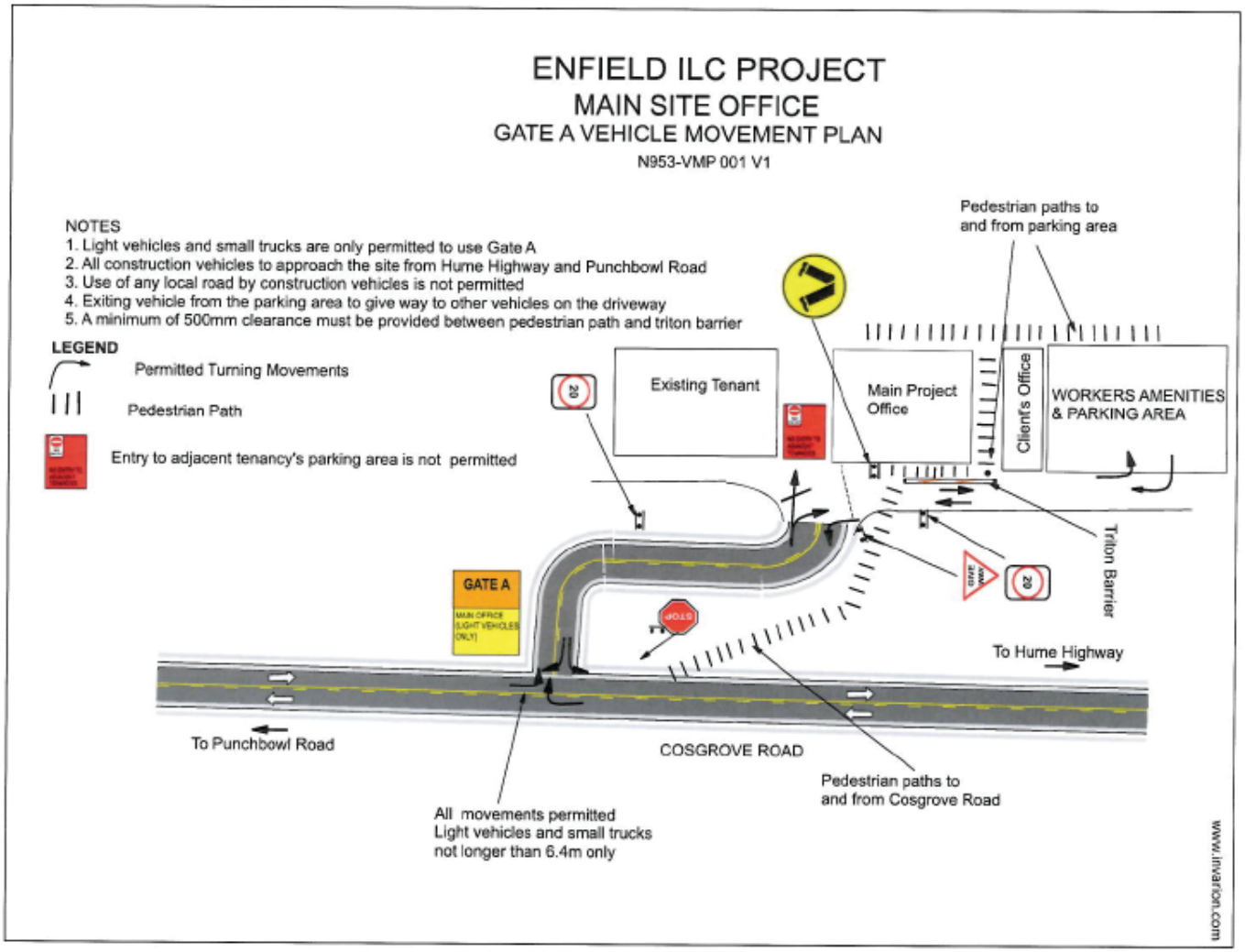
Appendix B

Vehicle Movement Plans

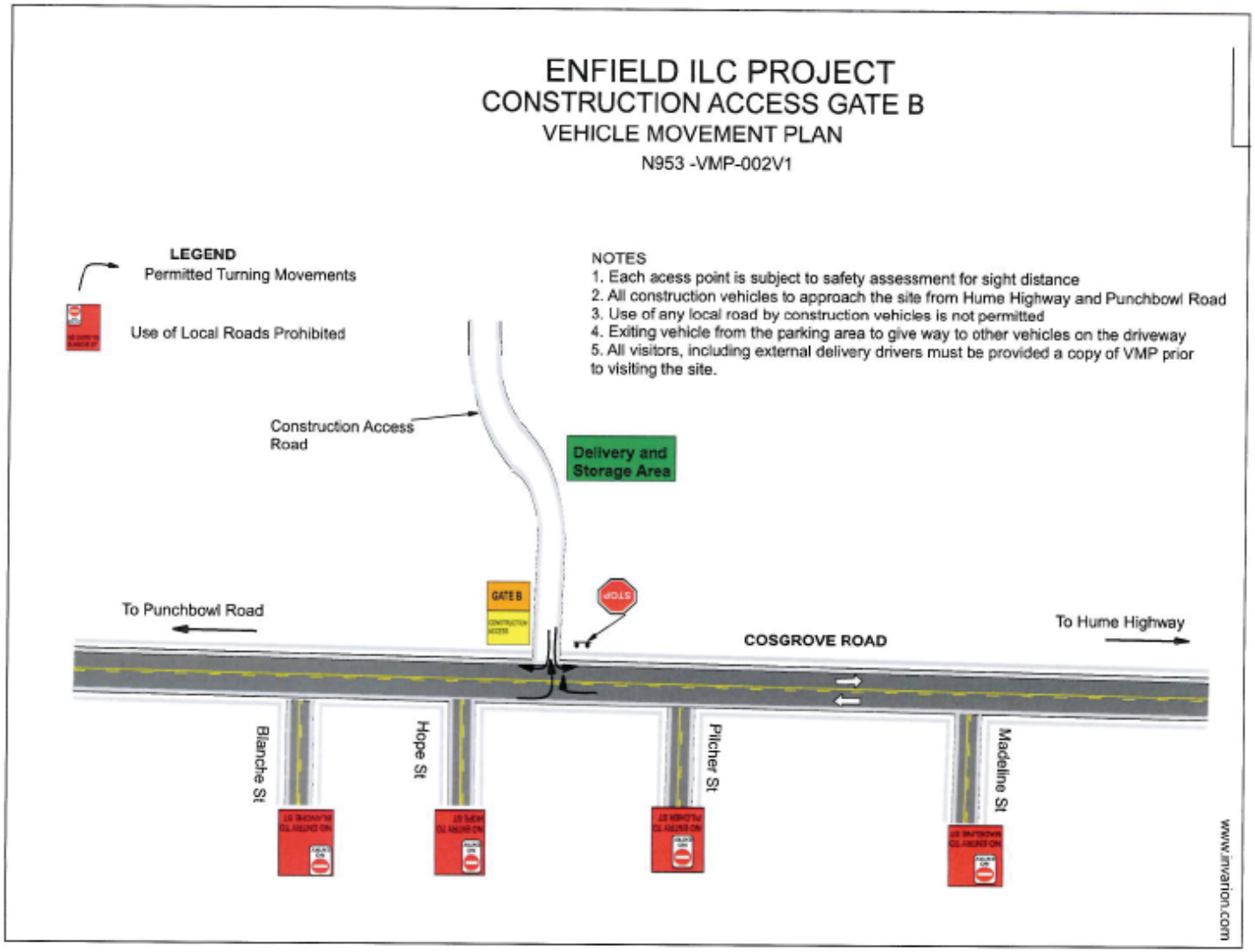

GATE A
GATE B
GATE C
GATE D
Belfield
GATE LAYOUT PLAN
Project: ILC at Enfield

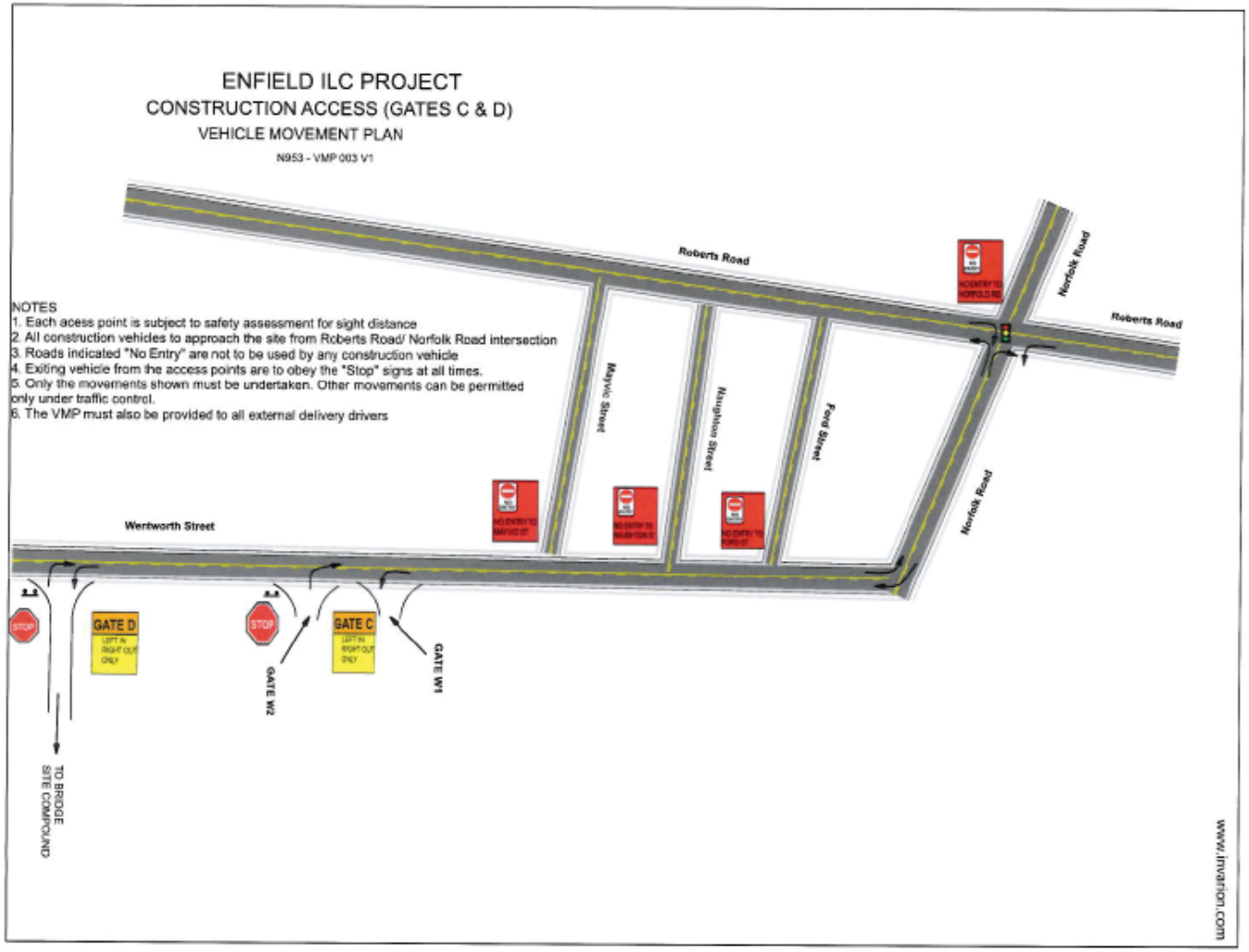
ENFIELD ILC PROJECT
MAIN SITE OFFICE
GATE A VEHICLE MOVEMENT PLAN

N953-VMP 001 V1



ENFIELD ILC PROJECT
CONSTRUCTION ACCESS GATE B
VEHICLE MOVEMENT PLAN
N953 -VMP-002V1



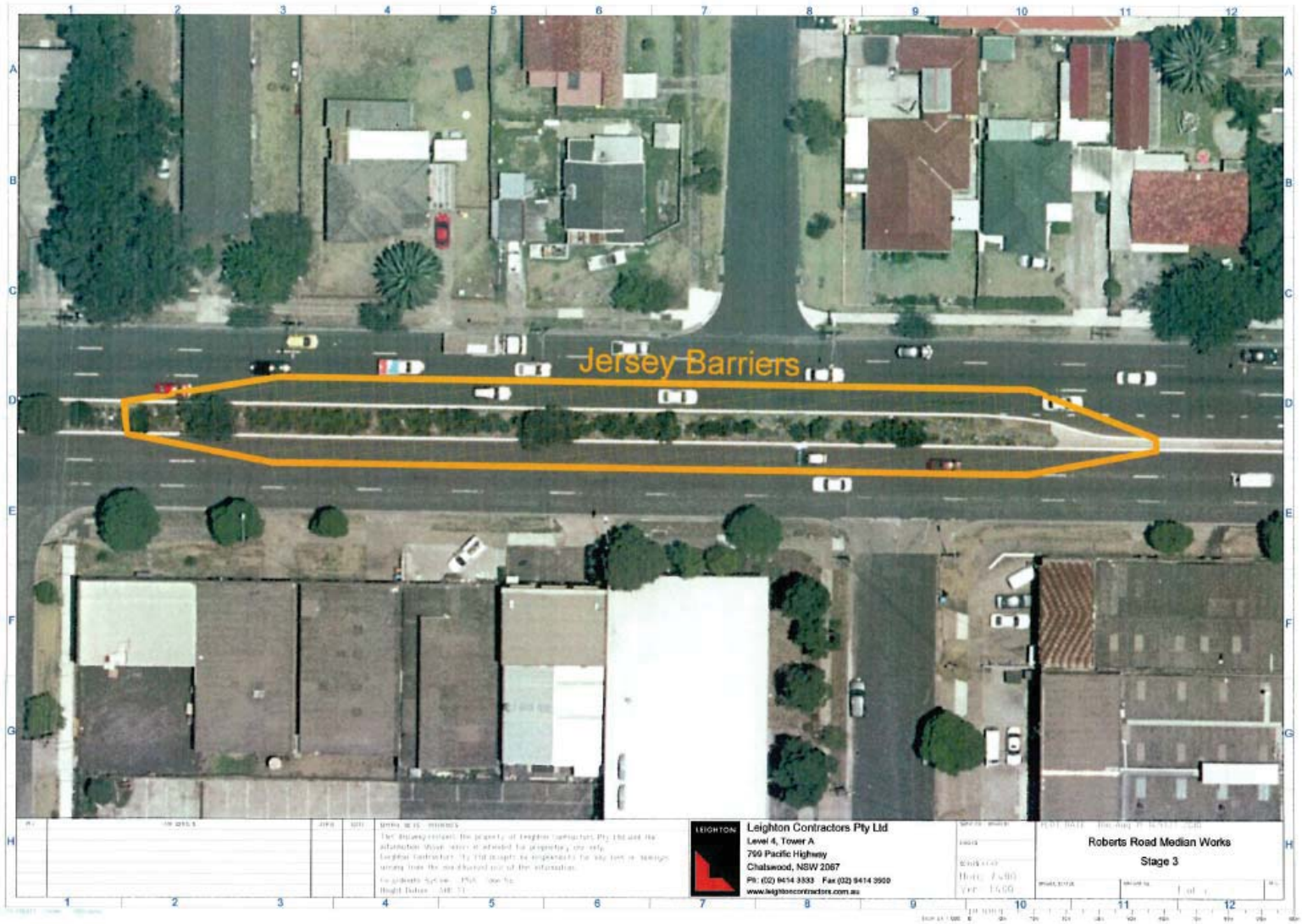

ENFIELD ILC PROJECT
CONSTRUCTION ACCESS (GATES C & D)
VEHICLE MOVEMENT PLAN
N953 - VMP 003 V1
NOTES
1. Each acess point is subject to safety assessment for sight distance
2. All construction vehicles to approach the site from Roberts Road/ Norfolk Road intersection
3. Roads indicated "No Entry" are not to be used by any construction vehicle
4. Exiting vehicle from the access points are to obey the "Stop" signs at all times.
5. Only the movements shown must be undertaken. Other movements can be permitted only under traffic control.
6. The VMP must also be provided to all external delivery drivers
Roberts Road
Norfolk Road
Roberts Road
Mayvic Street
Houghton Street
Ford Street
Norfolk Road
Wentworth Street
STOP
GATE D
LEFT IN RIGHT OUT ONLY
STOP
GATE C
LEFT IN RIGHT OUT ONLY
GATE W2
GATE W1
TO BRIDGE SITE COMPOUND
www.invarion.com

Appendix C

Traffic Staging Drawings


Jersey Barriers
Leighton Contractors Pty Ltd
Level 4, Tower A
799 Pacific Highway
Chatswood, NSW 2067
Ph: (02) 9414 3333 Fax (02) 9414 3509
www.leightoncontractors.com.au
Roberts Road Intersection
Stage 2


Jersey Barriers
Leighton Contractors Pty Ltd
Level 4, Tower A
799 Pacific Highway
Chatswood, NSW 2067
Ph: (02) 9414 3333 Fax (02) 9414 3000
www.leightoncontractors.com.au
Roberts Road Intersection
Stage 1


Jersey Barriers
Leighton Contractors Pty Ltd
Level 4, Tower A
799 Pacific Highway
Chatswood, NSW 2067
Ph: (02) 9414 3333 Fax (02) 9414 3999
www.leightoncontractors.com.au
Roberts Road Median Works
Stage 3

Enfield Intermodal Terminal

Air Quality & Dust Management Plan

Details of revisions

Level	Details	Date	Initial
1.0	For submission as part of Sydney Ports' CEMPF and LCPL's CEMP to Director-General	27/09/10	GK

Contents

1 Introduction

1.1 Purpose and Scope

This Air Quality & Dust Management Plan (AQDMP) forms part of the CEMP for the Enfield Intermodal Logistics Centre (ILC)'s Early Works. The purpose of the AQDMP is to describe how Leighton Contractors (LCPL) will manage and control the air quality and dust risks associated with the construction of the Early Works.

The plan has been prepared to address the requirements of Condition 6.3 e) of the Ministers Conditions of Approval, the mitigation measures detailed in the Environmental Assessment (EA) (SKM 2005) and all applicable legislation.

1.2 Background

The EA for the ILC Project assessed the air quality and dust impacts during the construction and subsequent operation of the Project. A detailed description of the methodology for construction air quality assessment is provided in Chapter 12 and Appendix F of the EA.

The EA found that air quality (mainly dust generation) is not likely to exceed adopted criteria provided that the proposed mitigation measures are implemented during the construction phase.

1.3 Objectives

The key objectives of the AQDMP are to ensure the potential air quality / dust impacts from the Early Works are minimised. To achieve this objective, the LCPL project team will undertake the following:

- Ensure that dust and exhaust emissions of plant and equipment produced by construction activities are controlled to an acceptable level and meet the criteria in the MCoA
- Minimise any adverse impacts on existing air quality
- Achieve particulate concentrations from construction activities that meet guideline values
- No environmental complaints, fines or prosecutions relating to dust and air emissions

1.4 Legislation and Guidelines

Legislation

The main legislation relevant to air quality / dust management includes:

- **The Environment Planning and Assessment Act (1979)** - the project has been assessed and approved under Part 3A of the EP&A Act. The Project has been approved in accordance with Section 75J of the Act with a number of Conditions of Approval that must be complied with. Section 75 U of the EPA Act lists various approval requirements that do not apply to an approved Part 3A project.
- **Protection of the Environment Operations Act (1997)** – Construction of the project will be undertaken in accordance with the PoEO Act, which covers a range of environmental offences including air pollution, nuisance dust deposition and offensive odours. Specifically, Part 5.4 of the Act which requires the occupier who operates any plant on the premises, to have suitably maintained plant and equipment, which is operated in a proper and efficient manner so as not to cause air pollution. With regard to odours at an unlicensed facility, odours must not be emitted so as to unreasonably interfere with the amenity of neighbours or the general public.

Ministers Conditions of Approval

The Ministers Conditions of Approval relevant to AQDMP with details of the condition and how it is addressed are described in Table 1.

Table 1: Relevant Ministers Conditions of Approval

MCoA	Description	Reference
Air Quality Impacts		
2.20	The Proponent shall install, operate and maintain a meteorological monitoring station to monitor weather conditions representative of those on the site, in accordance with: a) AM-1 Guide to Siting of Sampling Units (AS 2922-1987); b) AM-2 Guide for Horizontal Measurement of Wind for Air Quality Applications (AS 2923-1987); and c) AM-4 On-Site Meteorological Monitoring Program Guidance for Regulatory Modelling Applications. The Proponent shall install the meteorological monitoring station prior to the commencement of site preparation or construction works and shall use the station to undertake the monitoring required under condition 3.1 of this approval. This condition does not preclude the Proponent from reaching agreement with any other relevant party for the installation, operation and maintenance of a shared monitoring station, provided the outcomes of this condition are achieved.	Sydney Ports owned, operated and maintained. Leighton Contractors to monitor real-time data and compare to construction activities in accordance with MCoA 3.2
Odour		
2.21	The Proponent shall not permit any offensive odour, as defined under section 129 of the *Protection of*	AQDMP (this Plan) Section 4.1

MCoA	Description	Reference
	the Environment Operations Act 1997, to be emitted beyond the boundary of land owned by the Proponent (the site the subject of this approval).	
Dust Emissions		
2.22	The Proponent shall design, construct, commission, operate and maintain the project in a manner that minimises or prevents the emission of dust from the site including wind blown and traffic generated dust.	AQDMP (this Plan) Section 4.1
2.23	The Proponent shall take all practicable measures to ensure that all vehicles entering or leaving the site, carrying a load that may generate dust, are covered at all times, except during loading and unloading. Any such vehicles shall be covered or enclosed in a manner that will prevent emissions of dust from the vehicle at all times, to the extent practicable.	AQDMP (this Plan) Section 4.1
2.24	All activities on the site shall be undertaken with the objective of preventing visible emissions of dust beyond the boundary of the site. Should such visible dust emissions occur at any time, the Proponent shall identify and implement all practicable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust cease.	AQDMP (this Plan) Section 4.1
2.25	The Proponent shall manage, maintain and use internal haulage roads in order to prevent dust emissions. The measures to be implemented for the management of potential dust emissions from internal roads during construction shall be incorporated in the Construction Environmental Management Plan required under condition 6.3.	AQDMP (this Plan) Section 4.1
2.26	The Proponent shall apply and enforce a 25 km/ h speed limit on the site during site preparation and construction works to minimise the potential for dust generation.	AQDMP (this Plan) Section 4.1
2.27	The Proponent shall ensure that all vehicles and equipment directly associated with site preparation and construction works (as distinct from passenger vehicles) pass through a wheel wash prior to leaving the site.	AQDMP (this Plan) Section 4.1
Meteorological Monitoring		
3.1	From the commencement of site preparation and construction works associated with the project, the Proponent shall continuously monitor, utilising the	AQDMP (this Plan) Section 5.1

<table>
<tr><th>MCoA</th><th>Description</th><th>Reference</th></tr>
<tr><td></td><td>meteorological monitoring station referred to under condition 2.20 of this approval, each of the parameters listed in Table 4, utilising the sampling method indicated and applying a 15-minute average period to all results, and recording data in units specified in the Table.
Table 4 – Meteorological Monitoring
<table><tr><th>Parameter</th><th>Units of Measure</th><th>Sampling Method*</th><th>Method</th></tr><tr><td>Temperature at two metres</td><td>°C</td><td>AM-4</td><td>USEPA (2000) EPA 454/ R-99-005</td></tr><tr><td>Temperature at ten metres</td><td>°C</td><td>AM-4</td><td>USEPA (2000) EPA 454/ R-99-005</td></tr><tr><td>Wind speed at ten metres</td><td>ms^{-1}</td><td>AM-2 and AM-4</td><td>AS 2923-1987; USEPA (2000) EPA 454/R-99-005</td></tr><tr><td>Wind direction at ten metres</td><td>°</td><td>AM-2 and AM-4</td><td>AS 2923-1987; USEPA (2000) EPA 454/R-99-005</td></tr><tr><td>Solar radiation</td><td>Wm^{-2}</td><td>AM-4</td><td>USEPA (2000) EPA 454/ R-99-005</td></tr></table>*refer Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (EPA, 2005)</td><td></td></tr>
<tr><td colspan="3">Construction Dust Monitoring</td></tr>
<tr><td>3.2</td><td>The Proponent shall, from the commencement of soil disturbing works on the site until all large exposed areas have either been landscaped or sealed, continuously monitor ambient dust concentrations (PM10) at two of the most-affected residential receptor(s) to the site (with monitoring undertaken either on the boundary of the site or within the affected residential areas) employing the sampling and analysis methods specified under AM-18 or AS3580.9.8 or as otherwise agreed by the Director-General. Results of dust monitoring shall be recorded in µgm-3 and shall be utilised for the purpose of site preparation and construction dust management under condition 6.3(e) of this approval.</td><td>AQDMP (this Plan) Section 5.1</td></tr>
<tr><td colspan="3">CEMP Sub Plans</td></tr>
<tr><td>6.2</td><td>Prior to the commencement of site preparation works or construction of the project, the Proponent shall prepare and submit for the approval of the Director-General a Construction Environmental Management Plan to detail an environmental management framework, practices and procedures to be followed during site preparation and construction of the project. The Plan shall be prepared in accordance with Guideline for the Preparation of Environmental Management Plans (DIPNR 2004) and shall include, but not necessarily be limited to:
i) measures to monitor and manage dust emissions;</td><td>CEMP and AQDMP (this Plan)</td></tr>
<tr><td>6.3</td><td>As part of the Construction Environmental Management Plan for the project, required under condition 6.2 of this approval, the Proponent shall prepare and implement the following Management</td><td>AQDMP (this Plan)</td></tr>
</table>

MCoA	Description	Reference
	Plans: e) a Construction Dust Management Protocol to detail how dust impacts will be mitigated, monitored and managed during construction of the project. The Plan shall include procedures for the identification of situations in which site preparation or construction works may contribute to an ambient PM10 concentration (24-hour) of greater then $50\mu gm^{-3}$ at any off-site residential receptor, with details of measures to be implemented (including alteration or cessation of works, as may be relevant) to prevent or minimise exceedance of this criterion, in so far as the exceedance may relate to activities associated with the project.	

2 Identify and Assess

2.1 Existing Environment

Overview

The ILC site is bound by industrial land to the east and west and mixed industrial/residential to the north and south. DECCW has an air quality monitoring network that informs the public about air quality. The nearest DECCW air monitoring stations to the project are located at Lidcombe (approximately four kilometres north-west) and Earlwood (approximately six kilometres south east).

In accordance with Condition of Approval 3.3, Sydney Ports have procured and installed dust monitoring stations at the north-western and south-eastern portions of the site as detailed in the Sydney Ports' Construction Environmental Management Plan Framework document. A meteorological station is co-located with the dust monitoring station in the south-east of the site. These monitoring stations provide continuous real-time PM10 dust and meteorological monitoring. Sydney Ports will make the monitoring data available to LCPL for ongoing dust monitoring during construction.

Sensitive Receptors

Discrete receptors were nominated in the EA to allow ease of impact description. These receptors will represent other similar sensitive receivers around them. These receptors were as follows:

- R1 Cosgrove Road, eastern side of Cosgrove Road, south of Cox's Creek Channel
- R2 Cosgrove Road / Punchbowl Road, north eastern side of Cosgrove Road
- R3 Juno Parade, north side of road near intersection with Punchbowl Road
- R4 Wentworth Street, eastern side of road, north of Juno Parade
- R5 Roberts Road, western side of road, north of Jean St

The nearest residential areas are located to the south-east (R1, R2) and the north-west (R5) of the site.

Background Air Quality Levels

Background air quality levels were repeated in the Environmental Assessment. The average monthly maximums and average monthly average levels at Earlwood are reported in Table 2 along with relevant NSW EPA PM_{10} (24-hour) criteria (the MCoA also requires compliance with this criteria).

Table 2: PM_{10} (24-hour) concentrations at Earlwood (1996-2003)

Year	Average of Monthly Maximum (μg/m3)	Average of Monthly Average (μg/m3)	NSW EPA PM_{10} (24-hour) Criteria
1996	37.4	28.5	50 μg/m3
1997	37.8	24.3	
1998	36.0	23.2	
1999	25.2	18.5	
2000	32.3	21.1	
2001	27.1	18.5	
2002	34.9	23.3	
2003	31.2	21.5	
Average	32.7	22.3	

2.2 Construction Activities

Construction activities that are likely to cause air quality impacts include the following:

Site Preparation

- Vehicle movement on haul roads
- Site and vegetation clearance
- Earthworks
- Construction of frog ponds
- Transporting of and management of site material

Bridgeworks

- Vehicle movements
- Excavated material movement
- Breaking up of concrete material
- Abutment earthworks
- Pavement works

Road and Rail Infrastructure

- Vehicle movements
- Off-site access works
- Reinforced earth wall for road embankment
- Install services

- Railway line and connections
- Excavation of abutments at Punchbowl Road

2.3 Potential Impacts

Dust Deposition and PM10

The impacts of the construction phase were predicted in the EA. Table 12-5 of the EA provides a summary of predicted impacts for discrete receptor sites R1- R5 for the various stages of construction. The assessment concluded that the deposition rates for all receptor sites with dust mitigation measures in place met the given criterion.

A summary of worst case predicted impacts can be seen in Table 3.

Table 3: Worst Case Predicted Dust Impacts

Discrete Receptor	Site Criterion (g/m^2/month)	Refined Monthly Average Dust deposition (g/m^2/month)
R1	4.0	3.2
R2	4.0	2.5
R3	4.0	2.0
R4	4.0	2.1
R5	4.0	4.0

Notes to Table:

1. The dust deposition results are provided as a single result determined from an annual statistic.

SKM (2005) carried out AUSPLUME modelling of particulate matter (PM10) for the construction phase. The results showed that the long-term (annual average) air quality criteria for PM10 of 30μg/m3 would not be exceeded even by worst case construction activities. It also concluded that the 24hr criteria (50μg/m3) would not be exceeded if mitigation measures were implemented.

The EA concluded potential for off site dust emissions created during construction of the Project would be minimised through the development and implementation of a Dust Management Plan as part of the CEMP. This Plan satisfies this requirement.

3 Consult and Communicate

3.1 Stakeholder Consultation

A process for notifying the community prior to and during construction works (particularly for potentially dusty activities) is included in the Construction Environmental Management Plan (CEMP) and the Stakeholder and Community Involvement Plan. In summary this process involves:

- updating the community prior to and during the construction phases
- notifying residents and other sensitive receivers of potentially dusty activities
- a clear procedure for making, recording and responding to community complaints

3.2 Training and Awareness

Leighton Contractors has an environmental training program which addresses LCPL key construction risk areas including Legal and Regulatory Compliance, Air Quality issues and other key risk areas such as Noise and Erosion and Sediment Control.

All relevant construction personnel will attend the program for Legal and Regulatory Compliance and Air Quality. This will be focussed on roles in a position of leadership and influence including site engineers, supervisors and construction managers.

In addition to specific training, a mandatory site specific site induction will be held for all construction personnel to ensure they understand the specific site requirements. The induction will include as a minimum:

- Sensitive Receptors (what are they?)
- Measures to alleviate dust issues
- Inspections and monitoring of site

4 Implement Controls

4.1 Mitigation Measures

The following mitigation measures will be implemented to minimise air quality/dust or odour impacts.

- Continue the dust and meteorological monitoring program which commenced prior to the commencement of Early Works
- Check weather forecasts before Daily Pre-start and brief work crews of potential hot, windy days and additional controls required
- Undertake regular watering of active work area, including stockpiles and loads of soil being transported, to reduce wind blown dust emissions and monitor throughout the day
- Haulage trucks to use sealed or stabilised haul roads where possible when transporting materials on and off site
- Water cart to be used on haul roads to prevent dust generation
- Other suitable liquids may be used for dust suppression on haul roads following Sydney Ports approval for use
- Minimise area of disturbed or exposed land at any one time through staging of construction works
- Assess construction work activity and modify as appropriate if real-time dust and meteorological monitoring data indicates ambient air quality criteria (PM10 of 50μg/m3 (24h) is likely to be exceeded due to Early Works construction
- Cover, stabilise or revegetate stockpiles if to be left for extended periods, and progressively landscape exposed areas and where material is to remain in situ for a long period of time
- Concrete breaking activities to be minimised where possible; when concrete breaking is required, it will be sprayed with water to minimise dust
- Rock breaking activities are to have water available for dust suppression
- Plant and equipment in good order with appropriate maintenance log records will only be used on site
- Ensure all construction facilities are designed and operated to minimise the emission of dust, odour, smoke, cement dust, pesticide and other substances into the atmosphere
- All construction vehicles and equipment are to pass through a wheel wash before entering public roads or onto other completed pavements

- Planning of works to minimise bare areas
- Slow or stop dust generating activities which cannot be adequately controlled by water or other means
- Limiting the works during high wind occurrences
- Enforce a maximum speed limit of 20km/h on-site
- Maintain dust control equipment so that it is available when required, including during periods of dust generating activities or high wind speed
- Maintain exhaust systems of construction plant, vehicles and machinery in accordance with manufacturer's specifications and undertake periodic visual checks of exhaust systems' emissions
- Take all practicable measures to ensure that all vehicles entering and leaving the site carrying a load that may generate dust are covered at all times, except during loading and unloading
- During excavation works if there is an offensive odour emanating from the excavation, work will cease and the site Environmental Manager consulted on the management of the odour
- Maintain access to and security around the dust and meteorological stations
- Toolbox site crew on real-time status of dust and meteorological monitoring when significant events are occurring
- When real-time monitoring approaches or exceeds the criteria (PM10 concentration (24h) of 50μg/m3) and it can potentially be attributed to construction, dust generating works will be slowed or ceased, and appropriate controls including water cart implemented until dust levels are reduced
- Environmental Manager to provide required reports to Sydney Ports where exceedances in real-time monitoring are observed, within required timeframes (2 hours verbally and within 24 hours in writing). The report will include measures implemented to address the exceedances, where the likely cause of the exceedance is construction

5 Review and Monitor

5.1 Monitoring, Inspections and Reporting

Inspections

Documented weekly environmental inspections that will include air quality / dust / odour checks will be undertaken by the site Environment Manager (EM) and forwarded to the Construction Manager (CM). These inspections will be undertaken for the duration of the Early Works. Issues that cannot be closed out immediately will be entered into an action list and reported as described in the CEMP.

The weekly environmental checklist is included as an Appendix to the CEMP and includes a section on air quality / dust impact inspections.

Additional inspections undertaken onsite include Daily Site Supervisors Diary entries for actions taken onsite for that shift, and Monthly Site Inspections are undertaken by the Project Manager.

Monitoring

Diary visual monitoring of dust levels and work activities which have the potential to generate dust will be undertaken by the Site Supervisors and/or the Environmental Manager.

LCPL will also monitor the real-time continuous data from the Sydney Ports' owned monitoring stations located at the north-west of the site (PM_{10} monitoring station) and the south-east of the site (PM_{10} and meteorological monitoring station).

Results of the real-time continuous data will be utilised for the purposes of construction dust management in accordance with MCoA 6.3(e). This data will be viewed on the Sydney Ports' air quality consultant's website.

If the site's dust monitoring results indicate non-compliance with site criteria (i.e. PM10 concentration (24h) of 50μg/m3) and/or excessive complaints are received, the following actions will be undertaken to determine the source:

- Checks on the type of weather (e.g. wind direction, wet/dry weather) during the time in question and the regional background PM10 data
- Checks on the activities being carried out during the non-compliance
- Checks on other types of activities (outside influences) in the vicinity of the non-compliance
- Changing the way work activities are being carried out if the activities are the cause of the exceedance

Reporting

Where dust monitoring results indicate an exceedance of the MCoA established criteria of 50 μg/m3 (NSW EPA PM_{10} (24-hour) criteria) and the investigation as above indicates impacts are as a result of construction activities, the Environmental Manager will notify the Sydney Ports Superintendent within 2 hours verbally and within 24 hours in writing. The written report to the Superintendent should detail the incident, the actions taken to remedy the problem and the timing of such actions. A final report with proposed measures to prevent the occurrence of a similar incident must be submitted to the Superintendent within five business days.

5.2 Auditing

Six monthly interval audits for compliance against the MCoA will be undertaken. The audit will include a detailed site inspection and assessment of compliance with this plan. The audit will assess air quality / dust monitoring, reporting, effectiveness of controls, community and complaints management. The site EM will be responsible for managing and implementing audit actions and the Project Manager will have overall accountability for ensuring compliance.

Independent environmental auditing will be carried out annually as described in Sydney Ports' CEMPF.

6 Manage Incident

6.1 Incident Management Framework

All environmental incidents on the project will be managed by LCPL in accordance with the incident management protocol as described in the CEMP and OH&S and Rail Safety Management Plan. This includes internal and potentially external notification and recording, reporting and response processes.

Enfield Intermodal Terminal

Flora and Fauna Management Plan

Details of revisions

Level	Details	Date	Initial
1.0	For submission as part of Sydney Ports' CEMPF and LCPL's CEMP to Director-General	27/09/10	GK

Contents

1 Introduction

1.1 Purpose and Scope

This Flora and Fauna Management Subplan (FFMP) forms part of the CEMP for the Enfield Intermodal Logistics Centre (ILC)'s Early Works. The purpose of the FFMP is to describe how Leighton Contractors (LCPL) will manage and control the Flora and Fauna aspects and risks associated with the construction of the Early Works. These aspects and risks include:

- Preservation of native species at the southern part of the site, i.e. proposed heritage precinct and frog habitat area (except frog pond area which will require excavation)
- Manage weeds on the site
- Habitat conservation measures to protect the potential Green And Golden Bell Frog (GGBF) Habitat in accordance with Sydney Ports' Frog Protection Plan (FPP) and Frog Management Plan (FMP), and any other threatened species discovered on the site
- Appropriate Pesticide and Herbicide use, with specific controls to prevent impacts on potential and existing frog habitat areas, water ways, and other non-target areas
- Feral animal control

The FFMP has been prepared to address the relevant requirements of the Ministers Conditions of Approval including Condition 6.3d)iii) as applicable to this phase of the works, the mitigation measures detailed in the Environmental Assessment (EA) (SKM 2005), the Preferred Project Report (SKM, 2006) and all applicable legislation. Condition 6.3d)iv) is addressed in the Frog Management Plan (FMP) which is attached in Sydney Ports' Construction Environmental Management Plan Framework (CEMPF). Site landscaping is not part of the Early Works and therefore the Landscape and Ecological Area Management Plan required under Condition 6.3d) (specifically items i) and ii)) is not applicable to the Early Works phase of the project.

1.2 Background

The EA for the ILC Project assessed the Flora and Fauna aspects and impacts during the construction and subsequent operation of the Project. A detailed description of the flora and fauna issues and mitigations is provided in Chapter 13 of the EA.

The EA found that the ILC site represents a highly disturbed and modified environment that provides habitat to a number of common, disturbance tolerant flora and fauna species. Within the areas of likely disturbance, the habitats and vegetation communities present are considered to be of low ecological value. The ILC proposal is not considered to affect, threaten or have an adverse impact on any of those plants or animals listed under schedules

of the Threatened Species Conservation (TSC) Act or the Environmental Protection and Biodiversity Conservation (EPBC) Act.

The ILC site does, however, provide marginal habitat for the Green and Golden Bell Frog. The GGBF is an endangered species listed under Schedule 1 of the TSC Act. The creation of the Frog Habitat Area Creation Area (FHCA) would minimise the impact of any further disturbance or habitat loss that may result from the development of the ILC site. The development of the ILC site provides an opportunity to ameliorate adverse impacts on Green and Golden Bell Frogs that may be occurring in the area, as well as assisting with the conservation of the species. The development of secure, high quality habitat areas and the linking of the habitat areas to other Green and Golden Bell Frog sites nearby is consistent with the aims of the Green and Golden Bell Frog Draft Recovery Plan prepared by the NSW Department of Environment and Conservation (DEC, 2005).

An eight part test of significance under Section 5A of the EP&A Act was carried out as part of the EA to assess the potential impacts of the development of the ILC site on Green and Golden Bell Frogs. The test included the proposed mitigation measures outlined in the EA and concluded that risks encountered for dispersing frogs would be more than offset by the creation of habitat in the FHCA. It concluded that the proposed ILC development is not likely to have a significant effect on the Green and Golden Bell Frog.

1.3 Objectives

The key objectives of the FFMP are to ensure the potential flora and fauna impacts from the construction of the Early Works are minimised. To achieve this objective, the LCPL project team will undertake the following:

- Provide secure habitat for the Green and Golden Bell Frog by constructing the Frog Habitat Creation Area (FHCA) as part of the Community and Ecological area as per the Contract
- Minimise the likelihood of direct impacts to threatened species during the site works, including removal of any frogs found in the works area and construction of frog exclusion fencing
- Provide for the removal of weed in accordance with the Noxious Weeds Act and the protection of any native species at the southern part of the site (proposed heritage precinct and frog habitat area (excluding from ponds)

1.4 Legislation and Guidelines

Legislation

The main legislation relevant to flora and fauna management includes:

- **The Environment Planning and Assessment Act (1979)** - the project has been assessed and approved under Part 3A of the EP&A Act. The Project has been approved in accordance with Section 75J of the Act with a number of Conditions of Approval that must be complied with. Section 75 U of the EPA Act lists various approval requirements that do not apply to an approved Part 3A project.
- **Protection of the Environment Operations Act (1997)** – Construction of the project will be undertaken in accordance with the PoEO Act, which covers a range of environmental offences including pollution to waters and land.

- **Threatened Species Conservation Act (1995)** – The proposal would not directly impact on any known threatened species. Populations, endangered ecological communities or critical habitats. An assessment under Section 5A of the EP&A Act for the Green and Golden bell Frog undertaken for the EA concluded that it was unlikely that a significant impact to the species would occur as a result of the project.
- **Noxious Weeds Act** – There are no approvals or permit requirements under the Act. However, Sydney Ports and LCPL are required under the Act to control noxious weeds on the land under their control. Disposal of noxious weeds must be to a DECCW licensed landfill.

Ministers Conditions of Approval

The Ministers Conditions of Approval relevant to FFMP with details of the condition and how it is addressed are described in Table 1.

Table 1: Relevant Ministers Conditions of Approval

MCoA	Description	Reference
Ecology Impacts		
2.48	The Proponent shall implement all of the relevant actions for the site recommended in the Management Plan for the Green and Golden Bell Frog Key Population at Greenacre (DECC, May 2007), being: a) creation of overwintering habitat as part of the two-hectare improved foraging habitat at the southern end of the site; b) provision of linkages to the former Railcorp ponds; and c) restrictions on the use of herbicides in known frog habitat and attainment of water quality standards for water discharged from the site. These actions shall be incorporated within both the Construction Environmental Management Plan (refer to condition 6.2) and the Operation Environmental Management Plan (refer condition 6.4) as relevant, including provisions for monitoring the outcomes of these actions and periodically reporting outcomes to the DECC at a frequency agreed with the DECC.	LCPL will construct the Frog Habitat Creation Area (FHCA) in accordance with Sydney Ports' CEMPF The FHCA will have linkages to RailCorp ponds through an appropriate corridor as per Sydney Ports' Frog Management Plan (FMP) The requirements of the FMP, has been incorporated into the CEMP. This FFMP and the CEMP.
Construction Environmental Management Plan		
6.3d) iii) - iv)	d) iii) measures to maximise the retention of locally-endemic native species existing on the site, and removal of weeds and non-indigenous	This Flora & Fauna Management

MCoA	Description	Reference
	vegetation; and iv) measures for the enhancement, revegetation and on-going management of the Ecological Area on the site, including measures to provide suitable habitat for *Litoria Aurea*;	Plan (FFMP) and the FMP (attached in Sydney Ports' CEMPF). LCPL must incorporate the relevant LEAMP and FMP requirements in its CEMP/FFMP

2.1 Existing Environment

Overview

The ILC site represents a highly disturbed and modified environment that provides habitat to a number of common, disturbance tolerant flora and fauna species. Within the areas of likely disturbance, the habitats and vegetation communities present are considered to be of low ecological value. The ILC proposal is not considered to affect, threaten or have an adverse impact on any of those plants or animals listed under schedules of the TSC Act or the EPBC Act.

The ILC site does, however, provide marginal habitat for the Green and Golden Bell Frog (GGBF). The creation of the Frog Habitat Creation Area (FHCA) would minimise the impact of any further disturbance or habitat loss that may result from the development of the ILC site.

Weeds abound on the ILC site and appropriate management under the Noxious Weeds Act is required.

2.2 Construction Activities

Construction activities associated with the Early Works that are likely to cause potential impacts to existing site flora and fauna include the following:

Site Preparation

- Construction of FHCA
- Vehicle movement on nearby access roads
- Site clearance
- Earthworks

Road and Rail Infrastructure

- Vehicle movements
- Herbicide use
- Southern noise wall construction

2.3 Potential Impacts

As the site is highly disturbed the proposed Early Works is anticipated to have negligible impact on the site flora and fauna.

The implementation of Sydney Ports' Frog Protection Plan, Frog Management Plan, CEMP and this Flora and Fauna Management Plan will ensure impacts to flora and fauna, especially the Green and Golden Bell Frog, will be mitigated against. This FFMP and other Plans are consistent with the Environmental Assessment (EA) and DECC's *Management Plan for the Green and Golden Bell Frog Population at Greenacre* (DECC, 2007).

3 Consult and Communicate

3.1 Stakeholder Consultation

Frog Management

Sydney Ports has had ongoing consultation with DECCW regarding the Green and Golden Bell Frog. This has guided the development of the Sydney Ports' Frog Protection Plan and Frog Management Plan.

LCPL will continue to involve a Consulting Herpetologist in the management decisions regarding the Green and Golden Bell Frogs.

3.2 Training and Awareness

LCPL has an environmental training program which addresses Leighton Contractors' key construction risk areas including Flora and Fauna Management. All relevant construction personnel will attend the program. This will be focussed on roles in a position of leadership and influence including site engineers, supervisors and construction managers.

In addition to specific training, a mandatory site specific site induction will be held for all construction personnel to ensure they understand the specific site requirements. The induction will include as a minimum:

- Location of potential habitat of Green and Golden Bell Frog
- Requirements for Frog Clearance Surveys and No-Go Areas
- Careful construction of the Frog Habitat Creation Area
- Prevention of animal entrapment
- Appropriate pesticide notification, use and reporting
- Management of Weeds
- Clean work areas to prevent the attraction of feral animals

4 Implement Controls

4.1 Mitigation Measures

The following mitigation measures will be implemented to minimise Flora and Fauna risks:

- Implement frog protection fences and other No-Go Areas
- Construct and maintain frog protection fences in line with Sydney Ports' Frog Protection Plan
- Phased construction and removal of frog protection fencing in line with Frog Protection Plan
- Inspect and maintain frog protection fencing as required
- Obtain frog clearances in areas of known or suspected frog habitat before commencing works
- Construction of the Frog Habitat Construction Area to be carefully planned and implemented
- Manage indirect impacts on flora and fauna including construction spills and air quality impacts
- Imported site landscaping materials must comply with the relevant Australian Standards
- Water captured on-site in detention basins and potable water can be used for dust suppression and other activities where possible
- Manage pesticides around potential or existing frog habitats as per below section on pesticides
- Sitings of native fauna will be reported to the Environmental Manager, any actions required to protect observed native fauna from the impacts of the Early Works will then be determined
- Management of any trimming, clearing and grubbing of existing vegetation on the site through a Pre-Vegetation Removal Checklist (Appendix A)
- Native flora species remaining at the southern part of the site (proposed heritage precinct and frog habitat area excluding frog pond area) will be retained by restricting heavy machinery in the area to the minimum necessary and by increasing workers' awareness through inductions and pre-start toolboxes
- Firearms are not permitted on the construction site except for security purposes permitted by law

Controls for weed and pest management for the Early Works phase include:

- Management of weed management activities through the Pre-Vegetation Removal Checklist (Appendix A)
- Pesticides use must be used in accordance with the legislation and regulations, and training requirements must be complied with
- Notification of pesticide use is to be undertaken in accordance with the Sydney Ports' *Pesticide Use Notification Plan* especially where pesticides are to be used in public areas
- Pesticide application records must be completed when applying pesticides in accordance with the *Pesticides Regulations 2009* and a copy of the record submitted to the Sydney Ports Superintendent within 24hours of applying the pesticide
- Pesticides must not be applied within existing potential Frog habitat, the Frog Habitat Creation Area (once constructed), the movement corridor (once constructed)
- Pesticides must not be applied when winds may cause drift of pesticides into non-target areas including the frog zones above, and onto surface waters which drain into the frog zones above.
- Pesticides must not be applied on hot days where plants are stressed or after seed has set
- Pesticides must not be applied within 24 hours of rain or when rain is imminent
- The Sydney Ports Superintendent may give approval to cut and paint weeds with herbicides in or near the existing potential frog habitat areas
- Disposal of noxious weeds must be to a DECCW licensed landfill
- Manage feral animals as required to maintain a safe, clean and native fauna-friendly site

5 Review and Monitor

5.1 Monitoring, Inspections and Reporting

Inspections

Documented weekly environmental inspections that will include checks on aspects of Flora and Fauna will be undertaken by the site Environment Manager (EM) and forwarded to the Construction Manager (CM). These inspections will be undertaken for the duration of the Early Works. Issues that cannot be closed out immediately will be entered into an action list and reported as described in the CEMP.

The weekly environmental checklist is included as an Appendix to the CEMP and includes a section on Flora and Fauna aspects including Green and Golden Bell Frog management, threatened species protection, weed management and feral animal control.

Frog Inspections and Clearances

Frog protection fences are required to be erected in accordance with Section 4.1 Mitigation Measures and the FMP. Additionally to this, prior to any work occurring in the potential frog habitat areas, frog clearances must be carried out by a Consulting Herpetologist and a clearance letter issued. Works must not commence until the clearance letter has been issued by the Consulting Herpetologist.

Found Frogs

Any frogs found during frog clearances or monitoring surveys must be dealt with in accordance with the Frog Protection Plan. Whether alive, diseased, injured or dead, the Frog Protection Plan stipulates how the frogs are to be handled.

Pesticide Use

Pesticide application records must be completed when applying pesticides in accordance with the *Pesticides Regulations 2009* and a copy of the record submitted to the Superintendent within 24hours of applying the pesticide.

Records detailing application of pesticide should be consistent with Sydney Ports' Sample Pesticide Application Record Sheet.

5.2 Auditing

Six monthly interval audits for compliance against the MCoA will be undertaken by LCPL. The audit will include a detailed site inspection and assessment of compliance with this plan. The site EM will be responsible for managing and implementing audit actions and the Project Manager will have overall accountability for ensuring compliance. Annual independent environmental auditing in accordance with Condition 4.1c) is discussed in Sydney Ports' CEMPF.

6 Manage Incident

6.1 Incident Management Framework

All environmental incidents on the project will be managed by Leighton Contractors in accordance with the incident management protocol as described in the CEMP and OH&S and Rail Safety Management Plan. This includes internal and potentially external notification and recording, reporting and response processes.

7 Appendices

Appendix A

Pre-Vegetation Removal Checklist

PRE-VEGETATION REMOVAL CHECKLIST

Discuss any weed spraying or tree removal activity with the Environmental Manager.
No vegetation removal is allowed to occur without Environmental Manager's Approval.

Request Date:		**Area:**			
#	**Control Measure**	**Yes**	**No**	**N/A**	**Comments**
1.	Vegetation removal required? Provide works required and justification/comment				
2.	Has Environmental Manager been onsite to walk through?				
3.	Boundary of clearing zone determined, individual trees marked?				
4.	Are other approvals (Council or Railcorp) required because of location of trees?				
5.	Is retention of trees in areas not requiring removal being maximised? e.g. southern portion of the site				
6.	Protective fencing installed around sensitive area, including frog ponds?				
7.	Determine spray area for herbicides? Demarcated?				
8.	Trained persons spraying weeds?				
9.	Appropriate weather conditions for spraying: not hot & dry, windy or rain within 24hrs before or after?				
10.	Use of herbicides away from existing potential frog habitats or Frog habitat construction Area?				
11.	Prior notification for pesticide use in public areas complete?				
12.	Special permission required to cut and paint weeds within frog areas?				
13.	Any other issues to add or delete from the checklist?				

Completed by: Date:	Environmental Manager Approval: Date:

Enfield Intermodal Terminal

Waste, Reuse & Recycling Management Plan

Details of revisions

Level	Details	Date	Initial
1.0	For submission as part of Sydney Ports' CEMPF and LCPL's CEMP to Director-General	27/09/10	GK

Contents

1 Introduction

1.1 Purpose and Scope

This Waste, Reuse & Recycling Management Plan (WRRMP) forms part of the Construction Environmental Management Plan (CEMP) for the Enfield Intermodal Logistics Centre Early Works (the ‘’Project’’). The purpose of the WRRMP is to describe how Leighton Contractors will assess and where possible reduce waste produced during construction, maximise resource recovery opportunities, and indicate how waste will be managed, tracked and reported.

1.2 Objectives

The key objectives of the WRRMP are to ensure that resources are used efficiently and waste from the Project is minimised. To achieve this objective, the LCPL project team will undertake the following:

- Adopt the reduce, reuse, recycle, dispose hierarchy
- Minimise impacts from waste generation
- Minimise contamination of recyclable waste streams
- All concrete re-used as clean fill on site, or recycled at an off site facility
- No removal of clean spoil or soils from the construction site, unless absolutely necessary
- Ensure that all project personnel are aware of the importance of sound waste management practices and the actions they can take

1.3 Legislation and Guidelines

Legislation

The main legislation relevant to waste, reuse and recycling management includes:

- **The Environment Planning and Assessment Act (1979)** - the project has been assessed and approved under Part 3A of the EP&A Act. The Project has been approved in accordance with Section 75J of the Act with a number of Conditions of Approval that must be complied with. Section 75 U of the EPA Act lists various approval requirements that do not apply to an approved Part 3A project.
- **Protection of the Environment Operations Act (1997)** – Construction of the project will be undertaken in accordance with the PoEO Act, which covers a range of environmental offences for issues including waste management. Section 143 requires waste to only be deposited at an appropriate DECCW-licenced waste

disposal facility or other premises where waste can be legally disposed. Licensed transporters must be used to transport waste classified as industrial or hazardous.

- **Protection of the Environment Operations (Waste) Regulation (2005) + POEO Amendment Regulation 2008** – Schedule 1 sets out the types of waste to which waste tracking requirements apply. Clause 42 provides special requirements relating to the transportation, collection, storage, or disposal of asbestos wastes. Clause 51 enables the use of waste or waste-derived material as a fill.
- **Waste Avoidance and Resource Recovery Act (2001)** – Encourages the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development. This legislation's objective is to ensure that resource management options are considered against the avoidance, resource recovery and disposal hierarchy.

Ministers Conditions of Approval

The Ministers Conditions of Approval relevant to WRRMP with details of the condition and how it is addressed are described in Table 1.

Table 1: Relevant Ministers Conditions of Approval

MCoA	Description	Reference
Waste Management		
2.39	All waste materials removed from the site shall only be directed to a waste management facility lawfully permitted to accept the materials.	WRRMP (this Plan) Sect 4.1
2.40	The Proponent shall ensure that all liquid and/ or non-liquid waste generated, stored on the site or disposed of, is assessed and classified in accordance with the Waste Classification Guidelines (DECC, 2008).	WRRMP (this Plan) Sect 4.1
2.41	The Proponent shall ensure that the transport of any hazardous and/ or industrial and/ or Group A waste from the site is conducted strictly in accordance with any requirements that may be specified by the DECC in relation to the transport of those wastes.	WRRMP (this Plan) Sect 4.1
2.42	The Proponent shall ensure that contaminated areas of the site that are disturbed by construction works associated with the project are remediated prior to the commencement of project operations at these areas. All remediation works shall be undertaken in accordance with the requirements of the Contaminated Land Management Act 1997 and Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (EPA, 1997).	Soil & Water Management Plan
2.43	Prior to the commencement of construction works associated with the project that may disturb contaminated areas of the site, the Proponent shall submit to the Director-General a Site Audit	Soil & Water Management Plan

MCoA	Description	Reference
	Statement(s), prepared by an accredited Site Auditor under the Contaminated Land Management Act 1997, verifying that the area of the site on which construction is to be undertaken has been or can be remediated to a standard consistent with the intended land use. A final Site Audit Statement(s), prepared by an accredited Site Auditor, certifying that the contaminated areas have been remediated to a standard consistent with the intended land use is to be submitted to the Director-General prior to operation of the remediated site(s).	
2.44	The Proponent shall manage any asbestos or asbestos-contaminated materials that may be uncovered during the construction, commissioning and operation of the project strictly in accordance with the requirements under *Protection of the Environment Operations (Waste) Regulation 2005* and any guidelines or requirements issued by the DECC in relation to those materials.	WRRMP (this Plan) Sect 4.1 & Safety Management Plan

Other Guidelines

Development of this WRRMP referenced other guidelines relevant to waste, reuse and recycling aspects. These include the following:

- Green Waste Action Plans and Construction and Demolition Waste Action Plan
- Environmental Guidelines: Assessment, Classification and Purchasing Policy;
- NSW Government's Waste Reduction and Purchasing Policy (WRAPP);
- Waste Classification Guidelines (DECC 2008)
- DECCW Resource Recovery Guidelines
- Sydney Ports' Green Ports Guidelines

2 Identify and Assess

2.1 Construction Activities

Potential waste streams and the construction activities that generated them include:

- Green waste (vegetation) and weed waste during site clearing
- Sewage and domestic waste as applicable to all stages of construction at site amenities
- Materials unsuitable for reuse generated by sorting of materials during stockpiling and earthworks activities
- Unexpected contaminated soils and asbestos found during excavation
- Excess concrete, asphalt and masonry, steel, ballast and hazardous materials during the removal of pavements, built structures and rail
- Excess concrete, asphalt and masonry during construction of the Overbridge, abutments, retaining walls, drainage and paving
- Steel from the construction of new rail

2.2 Potential Impacts

With the appropriate controls implemented in accordance with this plan, there will be reduced risks to human health and degradation of the environment by the use of mechanisms that promote pollution prevention, the elimination of harmful wastes, the reduction in the use of materials, and the reuse, recovery and recycling of materials.

Any unexpected contaminated soils that may be found on the site will be carefully remediated and managed undertaken in accordance with the processes established in the Soil & Water Plan.

3 Consult and Communicate

3.1 Training and Awareness

Leighton Contractors has an environmental training program which addresses LCPL key construction risk areas including Legal and Regulatory Compliance, Air Quality, Noise and Erosion and Sediment Control and includes Waste Management.

All relevant construction personnel will attend the program. This will be focussed on roles in a position of leadership and influence including site engineers, supervisors and construction managers.

In addition to specific training, a mandatory site specific site induction will be held for all construction personnel to ensure they understand the specific site requirements. The induction will include the topic of Waste, Reuse and Recycling, and discuss:

- Implementation of the reduce, reuse, recycle, dispose hierarchy
- Segregating wastes to aid reuse and recycling
- Minimise contamination of recyclable waste streams
- Actions to be implemented onsite to reduce waste
- Requirements of waste tracking
- Made aware of the importance of sound waste management practices and the actions they can take
- Segregating stockpiles of spoil and avoiding the mixing spoil of different qualities, to maximise the reuse of suitable spoil during construction

Ongoing awareness will be provided through posters and alerts posted on noticeboards and in lunch rooms.

3.2 Discussion and Feedback

Discussion and feedback regarding ongoing success of waste management and resource recovery controls can be had through discussions with operators of plant and site personnel onsite, and at forums such as toolbox talks or at Safety & Environment Committee Meetings.

4 Implement Controls

4.1 Mitigation Measures

The following mitigation measures will be implemented to minimise waste, and maximise reuse and recycling:

- Adopt and promote the reduce, reuse, recycle dispose hierarchy
- Classify all wastes generated and stored on the site during construction in accordance with the DECCW's Waste Classification Guidelines (April 2008)
- Establish a Waste Register to track waste sent off-site, and reuse and recycling on and off-site
- Use tracking dockets, obtain and retain receipts for waste and recyclable material removed from site
- All waste materials removed from the site shall only be directed to a waste management facility lawfully permitted to accept the materials
- The transport of any hazardous, industrial or Group A waste from the site will be conducted strictly in accordance with any requirements that may be specified by the DECCW in relation to the transport of those wastes
- Any asbestos waste found is to be management in accordance with the specific requirements of the Waste Regulation, other DECCW requirements and safety requirements of the Safety Plan and relevant legislation
- Establish contracts with key waste management organisations to maximise re-use, recycling and appropriate disposal opportunities over the life of the project
- Include in waste contractor sub-contract agreements requirements to comply with statutory requirements, report quantities, types, dates and destination of material removed from site
- Calculate precise estimates and ordering prior to placing orders
- If possible, implement agreements with suppliers to return excess construction materials or packaging for future reuse
- Segregate waste streams to prevent contamination of reusable and recyclable materials
- All concrete re-used as clean fill on site, or recycled at an off site facility
- No removal of clean spoil or soils from the construction site, unless absolutely necessary

- Collect and store waste oil, other liquid wastes and spillages in suitable containers and store in a bunded area until collected for recycling or disposal. All permanent bunded storage areas must be covered
- Keep site free of litter and maintain good housekeeping at all times
- Provide paper recycling bins/boxes in all site offices. All paper waste to be sent to recycling facility.
- Encourage all project personnel to recycle paper and co-mingled recyclables in offices and compounds
- Provide education to staff and subcontractors regarding the importance of appropriately managing waste.
- Stockpile management – keep different material separate to maximise reuse of suitable material during construction

5 Review and Monitor

5.1 Monitoring, Inspections and Reporting

Documented weekly environmental inspections that will include waste, reuse and recycling checks will be undertaken by the site Environment Manager (EM) and forwarded to the Construction Manager (CM). These inspections will be undertaken for the duration of the Project. Issues that cannot be closed out immediately will be entered into an action list and reported as described in the CEMP.

The weekly environmental checklist is included as an Appendix to the CEMP and includes a section on waste, reuse and recycling compliance.

Waste information reportable under the NSW Government 'Waste Reduction and Purchasing Policy' must be provided to Sydney Ports Superintendent monthly and annually by 14 July for each financial year and at project completion.

Reporting on reuse and recycling efforts and on waste management will be undertaken by the Environmental Manager to Leighton Contractors NSW/ACT/NZ Branch as part of internal monthly reporting requirements.

5.2 Auditing

Six monthly interval audits for compliance against the MCoA will be undertaken. The audit will include a detailed site inspection and assessment of compliance with this plan. The audit will assess reuse and recycling efforts, waste tracking, reporting, and effectiveness of controls. The site EM will be responsible for managing and implementing audit actions and the Project Director will have overall accountability for ensuring compliance.

6 Manage Incident

6.1 Incident Management Framework

All environmental incidents on the project will be managed by LCPL in accordance with the incident management protocol as described in the CEMP and OH&S and Rail Safety Management Plan. This includes internal and potentially external notification and recording, reporting and response processes.

Enfield Intermodal Terminal

Energy & Water Management Plan

Details of revisions

Level	Details	Date	Initial
1.0	For submission as part of Sydney Ports' CEMPF and LCPL's CEMP to Director-General	27/09/10	GK
1.1	Minor changes addressing Sydney Ports' additional comments	28/09/10	GK

Contents

1 Introduction

1.1 Purpose and Scope

This Energy and Water Management Plan (EWMP) forms part of the CEMP for the Enfield Intermodal Logistics Centre (ILC)'s Early Works. The purpose of the EWMP is to detail the strategy Leighton Contractors (LCPL) will take to reduce the amount or improve the efficiency of energy and water use during construction stages of the Early Works, in an effort to achieve greater sustainability during construction compared to the "Do Nothing" option.

The EWMP has been prepared to address the Commitment made in the EA that Energy and Water Management Strategies would be developed as part of the CEMP. Suitable measures would be identified and implemented during the construction phase of the project. This EWMP addresses Environmentally Sustainable Development (ESD) aspects that are central to the intentions of all past and future project assessments and approvals.

1.2 Background

Sustainability refers to development that meets the needs of the present generation without compromising the ability for future generations to meet their needs (World Business Council for Sustainable Development). To achieve this, greater emphasis must be placed on decreasing our reliance on natural resources by minimising what resources we need to expend and utilising those resources efficiently. This in turn will lead to considerable reductions in the amount of waste and emissions that are generated.

Energy and water are two vital resources that are an obvious focus when attempting to improve the sustainability.

1.3 Objectives

The key objective of the EWMP is to minimise the potential impact of the Early Works on the resources of energy which include fuels (diesel/petrol) and electricity, and water from potable and other sources.

To achieve this objective, the LCPL project team will undertake the following:

- Raise awareness of the issues of Sustainability amongst all project personnel working on the Early Works
- Implement measures to reduce energy and water use

1.4 Legislation and Guidelines

Legislation

The main legislation relevant to energy and water management includes:

- **The Environment Planning and Assessment Act (1979)** - the project has been assessed and approved under Part 3A of the EP&A Act. The Project has been approved in accordance with Section 75J of the Act with a number of Conditions of Approval that must be complied with.
- **Protection of the Environment Operations Act (1997)** – Construction of the project will be undertaken in accordance with the PoEO Act, which covers a range of environmental offences including pollution to waters and land.
- **National Greenhouse and Energy Reporting Act (2007)** – Introduces a national framework for the reporting and dissemination of information about the greenhouse gas emissions, greenhouse gas projects, and energy use and production of corporations. Refer to Section 5.1.

Green Ports Guideline

Sydney Ports Corporation created the Green Port Guidelines with the aim of encouraging port developers and operators to adopt sustainable business approaches and to encourage innovation in design and operation.

The Guidelines and accompanying Checklist (attached in Appendix A) provide some simple strategies and practices to demonstrate how developments can be both environmentally friendly and commercially viable.

As the Green Ports Guideline intended, Leighton Contractors is using this as a guide and taking steps to implement simple environmental solutions to reduce energy consumption and water use amongst other things, and contribute to making port developments 'greener' places.

A completed Green Ports Guideline Checklist is provided as an Appendix to this Plan.

2 Identify and Assess

2.1 Existing Environment

Where many other projects are constructed without regard to issues of environmental sustainability, the ILC Early Works represents an opportunity to improve energy and water use beyond the 'norm', and lead by example to conserve these precious resources.

2.2 Resource Use

Construction activities that are likely to directly consume energy include any activity that requires plant and equipment which burns fuel, the majority of which are either diesel or petrol. Offices and compound, plus some construction activities require electricity to operate.

Other indirect uses of fuel and electricity includes staff travel to and from work, off-site transport and deliveries, and energy used to make the materials required for the Early Works.

Water is used on-site for various activities including: dust suppression of exposed areas, haul roads and stockpiles; during saw-cutting; for concrete curing; and for other activities. Within the Main Site Office and at satellite compounds water is used for drinking and food preparation, and at bathroom amenities.

2.3 Potential Impacts

With such a large project site and considering the number of plant items that will be required to undertake the Early Works, the greatest use of fuel will be for the running of diesel powered construction plant.

Again, the size of the ILC site and the significant amount of disturbance construction activities including earthworks entail, it is probable that the largest use of water will be for dust suppression activities.

3 Consult and Communicate

3.1 Training and Awareness

Leighton Contractors has an environmental training program which addresses LCPL key construction risk areas such as Legal and Regulatory Compliance, Air Quality, Noise and Erosion and Sediment Control and includes Energy Efficiency and Resource Use.

All relevant construction personnel will attend the program. This will be focussed on roles in a position of leadership and influence including site engineers, supervisors and construction managers.

In addition to specific training, a mandatory site specific site induction will be held for all construction personnel to ensure they understand the specific site requirements. The induction will include the topic of Energy & Water, and discuss:

- What is sustainability?
- Likely resource uses
- Actions to be implemented onsite to reduce energy and water use
- Ways to conserve energy and water around the office

Ongoing awareness will be provided through posters and alerts posted on noticeboards and in lunch rooms.

3.2 Discussion and Feedback

Discussion and feedback regarding ongoing success of energy and water management controls can be had through discussions with operators of plant onsite, and at forums such as toolbox talks or at Safety & Environment Committee Meetings.

4 Implement Controls

4.1 Action Items

The following Action items will be implemented to conserve energy and water resources. Energy Action Items include:

- Plant Management System to provide efficiencies through appropriate selection, maintenance and operation of plant and equipment
- Plant Management System to drive efficient use, reductions in amount of fuels (particularly diesel) used and minimising greenhouse gas emissions, e.g. maintenance and servicing to ensure operating as efficiently as possible
- Programming of work to prevent unnecessary waiting and idling
- Vehicle Movement Plans (part of safety and traffic procedures) establishing haulage patterns which provide efficient use of large earthworks plant
- Coordinate plant to avoid unnecessary truck movements and idling
- Switching of plant and equipment when not in use for extended periods
- Monitoring fuel usage
- Car-pooling and alternative modes of transport will be encouraged throughout the Early Works

Water Action Items include:

- Treatment and re-use of captured site run-off
- Use water from sedimentation basins in preference to mains water for dust suppression
- Monitor use of water for dust suppression and other activities, and investigate ways to reduce potable water demand
- Investigate other treatment options (tackifiers, suppressants, polymers etc.) for exposed areas, stockpiles and haul roads
- Investigate the installation and maintenance of sealed (with polymers, bitumen etc) haul roads within the site, which require less watering
- Rainwater tank(s) will be installed at Building 31 and plumbed for use in toilets
- Dual flush toilets in most compounds
- Purchase/used water efficient appliances in compounds

- Investigate use of ‘Desert Cubes’ or similar to allow waterless urinals

5 Review and Monitor

5.1 Monitoring, Inspections and Reporting

Documented weekly environmental inspections that will include checks on efficient use of energy and water will be undertaken by the site Environment Manager (EM) and forwarded to the Construction Manager (CM). These inspections will be undertaken for the duration of the Early Works. Issues that cannot be closed out immediately will be entered into an action list and reported as described in the CEMP.

The weekly environmental checklist is included as an Appendix to the CEMP and includes a section on air quality / dust impact inspections.

Data collection and reporting to Leighton Contractors NSW/ACT/NZ Branch includes data on energy and water usage amongst other things. This data is required as part of Leighton Contractor's reporting under National Greenhouse and Energy Reporting Act. Leighton Contractors will supply this data to Sydney Ports Corporation where required, to satisfy their reporting requirements.

5.2 Auditing

Six monthly interval audits for compliance against the MCoA will be undertaken. The audit may indirectly assess energy and water aspects. Annual Independent Environmental Auditing in accordance with Condition 4.1c) is addressed in Sydney Ports' Construction Environmental Management Framework.

5.3 Action Items Review

New Action Items may be added at any time to this Plan and implemented on-site as soon as possible. Improvement of existing items and innovation leading to new items will be encouraged throughout the project.

Furthermore, Action Items may be altered or deleted from time-to-time to where they are considered unviable, there is an unforseen issue with implementing what has been identified, or where further assessment has shown implementation will provide little value.

The site Environmental Manager will be responsible implementing the action items as per Section 4.1 and the Green Ports Checklist, with the support and financial backing of the Project Manager. The site Environmental Manager will be responsible for the regular review of Action Items.

6 Appendix A – Green Ports Guideline Checklist

Appendix A

Green Ports Guideline Checklist

Sydney Ports Corporation

Checklist

Applicant details

Name	Jason Pearson (Project Manager) George Kollias (Environmental Manager)	**Company**	Leighton Contractors
Address	71-73 Cosgrove Road		
City/Town	South Strathfield	**State**	New South Wales
Postcode	2136		
Telephone		**Mobile**	
Email			

Project details

Location of proposed development
Intermodal Logistics Centre (ILC) at Enfield
Description of proposed development
Early Works phase of the ILC
The details on this form are the provisions and intentions for maximising the environmental sustainability of this development.

Name	Jason Pearson		
Signature		**Date**	27 September 2010

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Materials selection	R1	Reduce the quantity of new materials being used by reusing materials or by utilising recycled materials.	Yes	Reuse of Building 31 as the main site office for use by all engineering, supervisory and support staff. This is in preference to clearing, levelling and importing via road transport new temporary office buildings. Note: other satellite compounds will require temporary building to be brought in Reuse of materials from excavated pavements and internal roads will be investigated Recycled aggregates conforming to relevant engineering specs will be used onsite	Occupation of the building after remedial works to improve potential issues of asbestos and lead paint. A clearance certificate will be issued prior to occupation and use
	R2	Encourage environmentally friendly production of materials.	N/A	Not applicable as the development of the ILC Early Works does not involve the production of materials	
	R3	Specify materials that have minimal embodied energy and environmental impact.	Yes	Investigate the procurement of concrete from nearby concrete plants of either Boral or Hanson to minimise emissions through transportation of one of the main products used in construction	Contract and use once awarded
	R4	Consider the end of life of materials and the whole building, design for deconstruction.	Yes	Improve the overall health of Building 31Main Site Office through the removal of asbestos items and managing lead paint, improving the indoor health of the building and adding life to its use	Occupation of the building after remedial works to improve potential issues of asbestos and lead paint. A clearance certificate will be issued prior to occupation and use

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Waste management	W1	Minimise the generation of wastes.	Yes	Implement a Waste, Reuse and Recycling Management Plan to identify opportunities to prevent over-ordering, maximise use of material onsite, reuse materials as far as practical, recycle material onsite or off-site and dispose to landfill only what absolutely has to	Waste, Reuse and Recycling Management Plan Project Induction
	W2	Facilitate recycling to reduce the amount of waste going to landfill.	Yes	Establish stockpiling and materials handling areas to segregate different waste streams and facilitate reuse and recycling on-site or off-site	Segregation of material onsite for appropriate reuse, recycling and disposal
	W3	Ensure the safe storage and handling of hazardous wastes.	Yes	Hazardous Substances will be used and stored safely and in an environmentally responsible manner, with covered and bunded storage areas and controls for use when in the field Hazardous wastes transported from site will be removed and disposed of by appropriately licensed contractors	Safety Management Plan CEMP Soil & Water Management Plan MSDS register Waste, reuse & Recycling Management Plan

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Water consumption	H1	Reduce consumption of potable water internally.	Yes	Rainwater tanks will be installed at Building 31 and water to be reused Dual flush toilets in most compounds	
	H2	Manage and monitor water usage and any leaks.	Yes	Will monitor water used on-site for dust suppression and other activities, and investigate ways to reduce potable water demand	
	H3	Reduce the quantity of potable water used for landscape irrigation.	N/A	No landscaping occurring during the Early Works	
	H4	Treat water on-site and reuse the treated water to reduce demand on the local potable water supply and the demand on the local infrastructure.	Yes	Sedimentation basins will be constructed to capture site run-off. Water will be treated for turbidity and/or pH if required. Water will be reused where possible for site activities including dust suppression	Soil & Water Management Plan

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Energy use	E1	Reduce energy consumption and hence greenhouse gas emissions.	Yes	Plant and equipment selected, maintained and operated to provide efficient use and minimise greenhouse gas emissions Use energy efficient appliances (such as fridges & printers). Ensure equipment turns off when not required, including computers	Plant Management System which includes pre-delivery inspection and daily pre-start checks Establish Vehicle Management Plans to allow smooth, efficient operation of large construction plant
	E2	Manage the use of energy to minimise consumption.	Yes	Implement timers for Main Office lighting and other lighting where practicable, allowing for lighting at night for security purposes	
	E3	Source energy from renewable sources.	No	Other benefits can be attained onsite surrounding minimising diesel use etc. Sourcing energy from renewable sources doesn't aid continuous improvement in the activities to occur onsite	
	E4	Source energy from alternate energy sources and use less greenhouse intensive fuels (in particular limit diesel use).	Yes	Improving efficiency of plant and equipment through appropriate selection, maintenance and operation, thus minimising diesel use	Plant Management System which includes pre-delivery inspection and daily pre-start checks Establish Vehicle Management Plans to allow smooth, efficient operation of large construction plant

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Transportation	T1	Encourage the use of alternative modes of transport by employees, in order to reduce the amount of inefficient/individual car travel and therefore greenhouse gas emissions.	Yes	Alternative modes of transport will be encouraged throughout the project, including car-pooling, cycling and public transport	
	T2	Reduce greenhouse gas emissions from operational vehicles and equipment.	Yes	Plant and equipment selected, maintained and operated to provide efficient use and minimise greenhouse gas emissions Coordinate plant to avoid unnecessary truck movement and idling Switching of plant and equipment when not in use for extended periods	Plant Management System which includes pre-delivery inspection and daily pre-start checks Establish Vehicle Management Plans to allow smooth, efficient operation of large construction plant

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Indoor environment	IE1	Improve the quality of indoor air to protect the health of employees and enhance productivity.	Yes	Improve the overall health of Building 31Main Site Office through the removal of asbestos items and managing lead paint, improving the indoor health of the building and adding life to it's use	Occupation of the building after remedial works to improve potential issues of asbestos and lead paint. A clearance certificate will be issued prior to occupation and use.
	IE2	Optimise daylighting and make best use of artificial lighting to assist eye health and productivity.	Yes	Use of existing windows in Building 31	
	IE3	Provide optimum acoustical environment for productivity and to prevent ear damage.	Yes	Appropriate placement of printers within the Main Site Office and locating the server in a separate utility room	

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Emissions	EM1	Protect the ozone layer and reduce the potential for global warming.	Yes	Ensure existing Air Conditioning System is working efficiently and without leaks	Air Conditioning Service Report(s)
	EM2	Limit the generation of air pollutants and ensure that they are emitted away from sensitive receptors.	Yes	Ensure existing Air Conditioning System is working efficiently and without leaks	Air Conditioning Service Report(s)
	EM3	Minimise odours.	Yes	No odours expected, but any instance of odour realised will be investigated	Air Quality & Dust Management Plan
	EM4	Minimise noise nuisance.	Yes	Many measures for the various activities of construction Monitoring will be conducted	Noise & Vibration Management Plan Monitoring record
	EM5	Avoid light spill into night sky or neighbouring properties/areas.	Yes	Light towers used for out of hours works will be orientated away from neighbours and potential frog habitats	Observations during Out of Hours works
	EM6	Avoid accidental contact with hazardous or poisonous goods.	Yes	Appropriate storage, handling and use of all chemicals	Safety Management Plan MSDS

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Water quality	HQ1	Manage stormwater to reduce peak stormwater flows and protect water quality.	Yes	Install sedimentation pond which will become the ultimate stormwater detention basis for the development	Soil & Water Management Plan
	HQ2	Manage water quality to protect the harbour and other water bodies.	Yes	Erosion and sediment controls including sedimentation basins and discharge procedures to prevent pollution of drains and watercourse with sediments, nutrients and other contaminants	Soil & Water Management Plan Erosion & Sediment Control Plans
	HQ3	Prevent damage from potential flood events and water table changes.	Yes	Acknowledge historical flooding upstream of the project site along Coxs Creek and drains which cross site. No restriction of flows within these drains	Soil & Water Management Plan

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Land use	L1	Encourage the redevelopment of sites that have previously been developed and remediate contaminated land.	Yes	Redevelopment of the site includes the management of previously remediated areas and potentially the remediation of unexpected contamination Low probability of Acid Sulphate Soils in the southern section of the site	
	L2	Use landscaping to enhance biodiversity and conserve and create habitat for flora and fauna.	N/A	Not applicable to Early Works	
	L3	Enhance visual amenity.	N/A	Not applicable to Early Works	
	L4	Avoid impact on identified heritage items.	Yes	Identified heritage items that remain on the site will be protected	CEMP Induction

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Environmental management	M1	Maintain good relationships with stakeholders and respond to any complaints.	Yes	Consultation with surrounding Stakeholders and Community will be undertaken in accordance with the Stakeholder & Community Management Plan	Stakeholder & Community Management Plan Induction
	M2	Provide a framework for identifying, managing and minimising environmental impacts, and maximising environmental benefits.	Yes	The CEMP established the Environmental System (EMS) to be used during the construction of the project Sub Plans have been developed for specific high risk aspects Works will be compliant to all relevant planning and environmental legislation Continuous Improvement and Innovation in relation to environmental aspects will be encourage as part of the ongoing use of the EMS	CEMP Sub Plans Inductions, Training & Awareness Inspections & Auditing Monitoring
	M3	Educate developers, tenants and employees about ESD and how to improve sustainability.	Yes	Improve worker knowledge about environmental issues and Sustainability through ongoing communications and awareness	Inductions, Training & Awareness