

**University of Sydney, Susan Wakil Health Building (Stage 1) Including Blackburn Demolition
Construction Environmental Management Plan**

Demolition Period: October 2017 to July 2018

Construction Period: June 2018 to February 2020

Document

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Approver	Project Director

Approved

Revision	Name	Role	Signature	Date
3	Tony Fletcher	Project Leader		

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Management Reviews

Review Date	Details	Reviewed By	Signed
27/06/18	Reviewd prior to CC1 Submission	C. Paul	
		D. Ryan	

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1.0 Purpose

This Environmental Plan has been developed to:

- Guideline to manage environmental matters on the project
- ensure that the needs and expectations of the client are met;
- guideline to manage environmental matters on the project;
- ensure that the project meets contractual, legal and other environmental requirements;
- meet the requirements of ISO 14001 including the need for continual improvement;
- provide a link between the corporate and project management system; and
- provide all Laing O'Rourke personnel with systems, procedures and documentation necessary to undertake the construction of this project with environmental requirements.

2.0 Scope

This plan applies to the demolition of the Blackburn Building and the construction phase of the Susan Wakil Health Building (SWHB) project.

The Health Precinct site is located within the University of Sydney on the western end of the University's Camperdown campus and is directly adjacent to the RPA Hospital. Currently, the 13,000m² site is home to the Bosch 1A and 1B Buildings, and the Bosch Glasshouse.

Boarded to the East by Western Avenue, to the West by RPA Hospital and John Hopkins Drive, and to the South by Cadigal Lane, the site slopes steeply down to the North where it is bordered by the University Oval Number 01.

The site is almost the lowest point on the campus and is significantly affected by the requirement to manage overland flow of stormwater.

This Laing O'Rourke Australia Construction Pty Limited (Laing O'Rourke) EMP has been developed for the Construction phase of the project, in compliance with the Client's requirements and Laing O'Rourke's environmental management system.

The University of Sydney is developing its Health Precinct to create a contemporary, collaborative and flexible teaching and learning environment for students and staff alike. The existing 13,000m² Health Precinct is situated in the University's Camperdown campus, in an area currently home to the Bosch Buildings 1A and 1B, the Bosch Glasshouse, the Blackburn Building and a dangerous goods store. The precinct is bordered by Royal Prince Alfred Hospital (RPAH), St Andrew's Oval, University Oval No. 1 and grandstand, and Western Avenue.

The University has proposed three stages for the redevelopment of the precinct:

- Stage 1 – 22,120m² of new facilities to be built in the area adjacent to RPA. The Bosch Glasshouse and Bosch Buildings 1A and 1B will remain operational during construction and operation of the Stage 1 works.
- Stage 2 – 16,000m² of new facilities situated adjacent to Western Avenue, in the area occupied by Bosch Building 1A and the Bosch Glasshouse
- Stage 3 – 14,950m² of new facilities to be built in the area currently occupied by Bosch Building 1B, adjacent to St Andrew's Oval.

This EMP is for stage 1, the timing of Stages 2 and 3 are not finalised or known at this stage. The scope of works also includes the associated demolition works for the Blackburn Building and dangerous goods store.

This plan applies to all those activities, products and services on the site over which it has control or influence.

3.0 Distribution Policy

The master 'controlled' EMP document will be held within the Project's document management system where it can be accessed by personnel as necessary.

All paper copies of this EMP will be considered as 'uncontrolled' unless they have been allocated a 'copy number' in a colour other than black.

Where required, controlled copies of this EMP will be published as a hard copy, allocated a copy number (colour other than black), and distributed as follows:

Copy No.	Issued To
01	Project Leader
02	Environmental Manager
03	Client

The personnel to whom these copies have been issued will be sent amendments as they occur, and it is their responsibility to discard superseded pages and insert new pages.

3.1 *Issue, Revision and Re-issue*

The initial issue of this plan has been reviewed by the Regional Environmental Manager to ensure it meets the requirements of the current Environmental Management System and policy, contract, specifications and standards. The plan is approved for use on the project by the Project Leader. Evidence of initial review and approval is by signatures on the cover sheet.

Revisions of this EMP may be required throughout the duration of the project to reflect changing circumstances or identified deficiencies.

Revisions may result from:

- Management Review
- Audit (either internal or by external parties)
- Client complaints or non-conformance reports
- Changes to the Company's standard system
- Improvements requested by the Secretary as per Condition A17

Revisions shall be reviewed and approved by the Project Leader prior to issue. Updates to this plan are numbered consecutively and issued to holders of controlled copies.

4.0 Environmental Management System

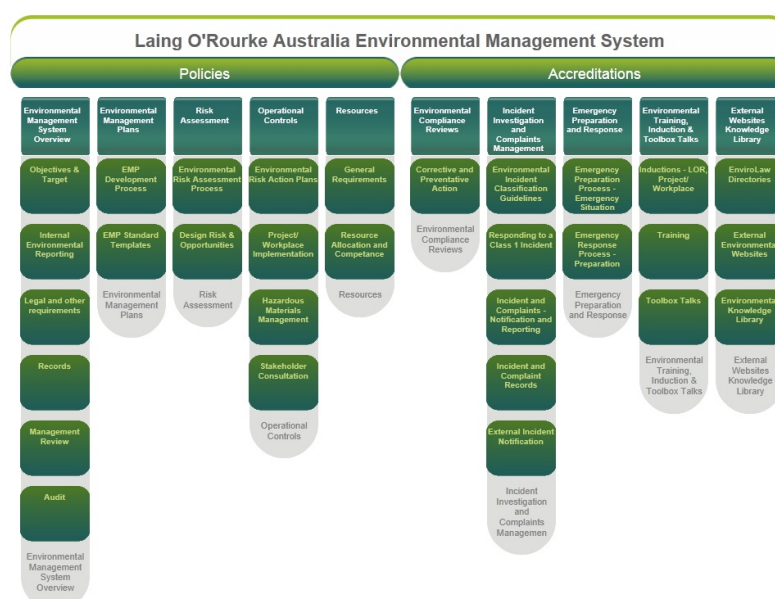
Laing O'Rourke Australia Construction Pty Limited operates an environmental system compliant with AS/NZS ISO 14001.

The Company is currently certified (No. C10086) with SAI Global.

All works carried out on the site will be in accordance with:

- Client requirements as detailed in the Contract
- Laing O'Rourke Australia Construction Pty Limited Environmental Management System as detailed on iGATE
- ISO 14001 Environmental Management System
- All legal requirements

This *Plan* references relevant parts of the Company's environmental management system and incorporates the additional elements necessary to satisfy the client's environmental system requirements. An outline of Laing O'Rourke's Environmental Management System is provided below.



5.0 Terms and Definitions

The following terms, abbreviations and definitions are used in this plan:

Terms	Explanation
SWHB	Susan Wakil Health Building
SCC	Sydney City Council
CIS	Campus Infrastructure Services
USYD	University of Sydney
EMP	Environmental Management Plan
EPA	NSW Environment Protection Authority
OEH	NSW Office of Environment and Heritage
LORAC	Laing O'Rourke Australia Construction Pty Limited
SDS	Safety Data Sheet
PER	Project Environmental Representative
Core Process and Enabling Processes	Core Process (Governance) and Enabling Process (Detail) provide a coordinated overview of the processes and controls in Laing O'Rourke.

6.0 References, Standards, Codes and Regulations

The project will be constructed in accordance with relevant standards, codes, acts and regulations. Appendix 2 provides a register of applicable legislative instruments relevant to the project

7.0 Policy

The Company maintains an Environmental Policy which will be:

- Displayed at prominent locations on the project site
- Communicated to site personnel during induction and training
- Made accessible to clients and concerned / interested members of the public

All personnel associated with the project including subcontractors must comply with the spirit and intent of the policy.



ENVIRONMENTAL

Laing O'Rourke is committed to the protection and enhancement of the environment. High environmental performance is an ongoing priority and is achieved by our actions in line with this policy. This policy sits alongside our Sustainability policy and Supply Chain policy as part of our global policy framework, underpinned by our Global Code of Conduct.

Our goal is to minimise the negative impacts of our operations and maximise the quality of the built environment for future generations. Through innovation and application of leading practice, we aim to steer the industry to design a sustainable and high-quality built environment with as little environmental impact as possible through the whole asset life-cycle.

Our goal will be realised by:

- Demonstrated leadership of our environmental agenda by senior leaders
- Complying with relevant legislation and other requirements specific to the context of our business and regularly evaluating and reporting compliance
- Preventing polluting emissions or discharges to the environment
- Proactively minimising environmental impacts, including being industry leading in minimising direct and embodied carbon emissions, and providing energy efficient/low carbon assets for our clients
- Continual improvement of the environmental performance of our activities, products and services through clear objectives, targets and programmes
- Exploring opportunities in the sourcing and life cycle aspects of our products, services and supply chain to reduce carbon emissions and demonstrate positive environmental outcomes
- Exploring opportunities for innovative technologies, products and processes that drive improved environmental outcomes/environmental benefits throughout the delivery and operation of the assets we build
- Communicating and addressing the risks and opportunities associated with the impacts of our activities, products and services
- Improving resource efficiency by reducing the use of natural resources and reducing waste, maximising resource recovery and diverting the waste we do produce away from landfill sites
- Reducing our water consumption and improving water efficiency in all of our operations
- Engaging our supply chain partners to improve their environmental performance and responsible sourcing of their materials, products and services
- Proactively protecting, preserving and enhancing biodiversity and land quality
- Enhancing employee understanding of environmental sustainability, through stimulating cultural change and providing clear direction
- Maintaining ISO 14001 certification for our principal businesses and progressing further certifications for our products and services

ENVIRONMENTAL POLICY.
EFFECTIVE DECEMBER 2015

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Our policies are reviewed and updated annually to evolve with the world around us to make Laing O'Rourke the company of first choice for all our stakeholders, whilst challenging and changing the image of construction worldwide.

The Board of Directors of Laing O'Rourke fully endorses this Policy.

I personally commit Laing O'Rourke to this Policy.



Ray O'Rourke
Chairman and Chief Executive

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8.0 Objectives and Targets

High level objectives and targets for this project are as follows:

Objective	Target	Reporting / Monitoring
Effective site environmental controls	Set-up prior to starting work in the affected area; Maintain effective controls	Inspection checklists
Meet or exceed the clients recycling targets	90% of all demolition and construction waste that is non-hazardous is recovered for reuse and/or disposed of appropriately.	Monthly reports/ waste dockets showing destination, quantity and type of waste
Environmental Lead Indicators	50% of project environmental inspections accompanied by supervisory or engineering personnel Environmental Toolbox Talks – 3 per month 100% of weekly environmental inspections signed off by the Project Leader	Monthly reports
Effective implementation of the environmental system	No level 1 Corrective Action Requests <3 level 2 risks each report <10 level 3 risks each report Closure of CARs within the nominated timeframe. Timely release of Environmental Hold Points	Audit report
Community issues carefully managed	Complainant contacted within two hours Matter closed out within one week.	Complaints form and Impact
Waste Management	Adhere to the projects waste management plan (prepared in accordance with the NSW Waste Avoidance and Resource Recovery Strategy 2014-2021). This plan would also be in line with the Laing O'Rourke's Waste Management initiatives, which aims to divert 80% of waste from landfill.	Waste Management Plan Waste Reporting and Resource Avoidance Purchasing Policy (WRAPP) Waste Reporting via IMPACT 2
Traffic Management	Adhere to the mitigation measures outlined within the Traffic Management Plan that would be prepared for the project. All deliveries and removal of materials occur site access gate 1 and 2 off Western Avenue onto Blackburn Circuit	Traffic Management Plan

Operational objectives and targets relating to significant environmental issues are contained in within the operational control procedures provided in *Appendix 4*.

9.0 Responsibilities and Authorities

Authorities and responsibilities for all positions are defined and communicated in Job Descriptions and project documentation. Reporting lines are shown in the Organisation Chart (available on the project network). Key responsibilities are indicated in the chart in *Appendix 11*.

Key responsibilities and authorities include:

9.1 Regional Director

- Ensure that independent audits of the environmental management system are conducted
- Review audit outcomes and take action as necessary
- Review regional environmental performance through the monthly reporting cycle
- Authorise resourcing on environmental issues
- Resolve major issues which cannot be resolved by the Sector General Manager

9.2 Sector General Manager

- Ensure that internal audits of the system are conducted
- Review audit corrective actions and take action as necessary to ensure timely close out of issues
- Authorise expenditure on environmental issues within limits of authority
- Resolve major issues which cannot be resolved by the Project Leader

9.3 Project Leader

- Ensure that project responsibilities and authorities are defined and communicated
- Provide adequate resources to meet environmental objectives
- Approve the EMP
- Ensure that the EMP is effectively implemented and maintained
- Appoint/nominate and provide support for the PER
- Report to senior management on the performance of the system and environmental breaches
- Take action to resolve environmental non-conformances and incidents
- Ensure suppliers and subcontractors comply with requirements
- Report environmental incidents to the client / local authorities as required

9.4 Site Manager

- Supervise all site construction activities and personnel by ensuring that they meet environmental and other requirements
- Organise and manage site plant, labour and temporary materials
- Ensure that site environmental controls are properly maintained and provide support for the PER
- Report all environmental incidents
- Take action to resolve non-conformances and incidents

9.5 Procurement Personnel

- Carefully select suppliers and subcontractors based upon their ability to meet stated requirements
- Ensure that purchase orders and agreements include environmental requirements as necessary
- Where practical, select materials which are “environmentally friendly”

9.6 Project HSE Representative

- Ensure that the EMP is effectively established, implemented and maintained at the project level
- Ensure compliance with all relevant statutes, regulations, rules, procedures, standards and policies
- Liaise with the Principal's Environmental Representative and/or Superintendent on environmental issues, including the written notification of non-conformances (incidents, emergencies or deviations from the EMP)
- Ensure that all personnel on site receive appropriate environmental induction and training and are aware of their environmental responsibilities under relevant legislation and the contract
- Report to the Project Leader on the performance of the system and improvement opportunities
- Provide support to the project team to enable them to meet their environmental commitments
- Ensure that environmental records and files are collected and maintained
- Regular compliance checking as required by this EMP
- Ensure that non-conformances and environmental incidents are recorded and written reports provided to the Client's Representative and Environmental Manager within 24-hours. Liaise with the required stakeholders to confirm the nature of the corrective action required and comply with the timeframe within which corrective actions must occur.
- Ensure that environmental controls, materials and equipment are maintained

9.7 Regional Environmental Manager

- Provide environmental support to the project team
- Coordinate internal audits

9.8 **Contractors**

- Comply with all legal and contractual requirements
- Comply with site environmental requirements
- Comply with management / supervisory directions
- Participate in induction and training as directed
- Report all incidents

9.9 **All Personnel**

- Comply with the relevant Acts, Regulations and Standards
- Comply with the Company's environmental policy and procedures
- Promptly report to management on any non-conformances, environmental incidents and/or breaches of the system
- Undergo induction and training in environmental awareness as directed by management
- Report all incidents
- Act in an environmentally responsible manner

10.0 Legal and Other Requirements

All personnel associated with the project will comply with all relevant requirements including:

- Laws – Acts, regulations, policies, etc
- Environment Protection Licence and permits
- Development consents
- Relevant industry standards / codes

An assessment of the relevant legislative instruments has been conducted and recorded in Appendix 2.

Licences, permits and approvals are outlined in Appendix 8 in the Project Permits and Approvals Register. The register is to be developed, at or prior to, the commencement of the project to outline the full scope of the project's requirements for Government authority approvals.

The register is to be reviewed in conjunction with the 6 monthly management review outlined in Section 21 or where there has been a change to relevant legislation.

The Register is to be reviewed and updated as the project progresses and compliance with the relevant conditions reported. Compliance conditions relating to items listed on the Permits and Licences Register are incorporated into this Environmental Management Plan. Specific details and controls are included in the associated sub-plans and Environmental Risk Action Plans.

The Register is to be issued to the Regional Environmental Manager for incorporation in to the Regional Permit and Approval Register.

A copy of relevant Permits, Licences and any development approvals relevant to Laing O'Rourke's activities will be kept on site.

10.1 Project Approval and Development Consent

The works are to be delivered through Part 3 sections 112 & 113 of the Environmental Planning and Assessment Act 1979. The approval process includes specific planning conditions and commitments that must be addressed in this EMP and delivered during the project.

A Conditions of Approval Compliance Tracking Matrix will be established upon commencement to ensure the approval conditions are captured, addressed and closed out. The Matrix includes all conditions relevant to Laing O'Rourke's scope of work and will be updated as the works progress and reviewed on a quarterly basis to verify compliance with each condition.

Specific conditions of approval relevant to construction activities are included in the project's Operational Controls in the aspect specific Environmental Risk Action Plans (ERAPs).

Non-compliances with the conditions will be documented and addressed through Impact's Assurance application.

10.2 Environmental Authority / Licence

No scheduled planning activities, as per the Protection of the Environment Operations Act, 1997, are required for the SWHB project.

The environmental authority or licence includes specific minimum requirements which are addressed within this EMP through the Operational Controls and specifically included in Environmental Risk Action Plans (ERAPs). These will be addressed and implemented by Laing O'Rourke as the project progresses.

A copy of relevant Permits, Licences and Development Consents will be kept on site as controlled documents in the project's Document Management System.

11.0 Environmental Risk Assessment and Control

Project wide environmental aspects and impacts have been identified and assessed in *Appendix 3*.

Significant environmental issues, with a risk ranking of High (10 – 16) or Medium (5 – 9), will be controlled to a degree which is commensurate with the level of risk and the level of influence which the Company has over these issues. The control measures to address these issues are documented in Environmental Risk Action Plans which are contained in *Appendix 4*.

Activities, aspect or impacts that represent an extreme risk (>17) after control measures have been applied must be reviewed / redesigned or have approval of the Regional Environmental Manager.

If additional risks are encountered on site, these will be addressed either by updating this EMP or by using separate *Environmental Risk Action Plans (E-T-8-1200)*.

An overview of this process is contained in *Appendix 10*.

12.0 Training, Awareness and Competence

All employees will receive suitable environmental induction / training to ensure that they are aware of their responsibilities and are competent to carry out the work.

Environmental requirements will be explained to employees during site induction and on-going training via tool box meetings, briefings, notifications and the like.

All employees (including subcontractors) will receive induction/ training in the following:

- Environmental Policy
- Site environmental objectives and targets
- Understanding individual authorities and responsibilities
- Site environmental rules
- Potential consequences of departure from rules
- Emergency procedure and response (e.g. Spill clean-up)
- Basic understanding of their legal obligations

Personnel performing tasks which can cause significant environmental impacts will be competent on the basis of appropriate education, training and / or experience.

All Laing O'Rourke operational staff on this project will be provided with training in the requirements and implementation of this Environmental Management Plan. Initial training in the project Environmental Management Plan shall be undertaken within 1 month of the HSEQ Launch. EMP training for new staff members shall be completed within 1 month of their commencement on the project.

Training in the operation and implementation of Laing O'Rourke's Environmental Management System shall be provided for all operational staff.

The Project Environmental Representative will establish a schedule of environmental training in conjunction with the development of this EMP.

Training in high risk aspects shall be undertaken as the project progresses. An outline of the proposed training is provided below. The training shall be scheduled to reflect the requirements of the construction program.

Aspect	Training Inclusion	Personnel Required	Timing / Frequency/Mean
Emergency Spill Response	<ul style="list-style-type: none"> • Use and location of spill kits • Spill control • Emergency response procedures • Presentation and assessment • Spill response drill • Identification of hydraulic hose fatigue 	Operational personnel	Project Induction Project Toolbox Talks Internal LOR course run as required for site personnel
Erosion and Sediment Control	<ul style="list-style-type: none"> • Standard erosion and sediment controls from the Lancôme 'Blue Book' • Implementation of controls on site • Erosion and Sediment Control Plans 	Operational personnel	Project Induction Project Toolbox Talks Internal LOR course run as required for site personnel
Heritage Awareness	<ul style="list-style-type: none"> • Stop works and reporting protocols for discovery of previously unknown heritage and archaeological items 	Operational personnel	Project Induction Project Toolbox Talks Protocol posted on message boards
Contamination Awareness	<ul style="list-style-type: none"> • Contamination status of site • Stop works protocols for unidentified potential contamination (hydrocarbons, asbestos, etc) 	Operational personnel	Project Induction Project Toolbox Talks Protocol distributed to workers and posted on message boards
Environmental Legal Obligations	<ul style="list-style-type: none"> • Applicable fines and prosecutions 	Operational personnel	Project Induction Project Toolbox Talks

Energy and Resource Usage	<ul style="list-style-type: none"> Awareness training of energy and resource efficiency in the workplace including office/compound and site initiatives such as harvesting rainwater for dust suppression instead of potable mains water and use of bio-fuels 	Operational personnel	Project Induction Project Toolbox Talks
Community / Stakeholder Awareness	<ul style="list-style-type: none"> Adjacent community and Project involvement Relevant Project stakeholders Accepted behaviours Approved hours of work 	Operational personnel	Project Induction Project Toolbox Talks
Biodiversity	<ul style="list-style-type: none"> Wildlife status of project and surrounds Stop work and reporting protocols for injured wildlife Measures to stop feral animals coming to site 	Operational personnel	Project Induction Project Toolbox Talks

Environmental content is to be included in Toolbox talks and pre-start briefings. All training and tool box meetings will be recorded.

Following approval of the EMP Laing O'Rourke site staff are required to sign the EMP acknowledgment form in Appendix 13.

13.0 Communication and Reporting

With respect to the functioning of the project's environmental system, Company employees, the client and other interested parties will be kept informed as necessary.

13.1 Internal

Internal communication methods include:

- Management reports
- Site inspection reports
- Audit reports
- Incident reports
- Noticeboards
- Site meetings
- Employee induction, training and tool box sessions
- Briefings, notifications and alerts

13.2 External

External communication methods include:

- Site meetings with the Client
- All significant incidents notified to the client
- Project reports to client at progress meetings and in the Project Report
- Meetings and correspondence with interested parties (e.g. Local council and EPA) as necessary
- Discussions with adjoining land owners / neighbours and the community who may be affected by the project

14.0 System Documentation

The Company's Environmental Management System is part of an integrated management system which is known as iGATE. The core elements of the project management system are described in this EMP.

15.0 Document Control and Records

All project documentation, including environmental records, will be controlled in accordance with [General Administration](#). Environmental records will be:

- kept as objective evidence of compliance with environmental requirements
- filed in accordance with [Document Control - Company Records and Filing](#).

16.0 Operational Control**16.1 Working Hours**

- The hours of construction, including delivery of materials to and from site, may only be carried out between the following hours:
 - Between 7:00 am to 6:00 pm, Mondays to Fridays inclusive; and
 - 7:30 am to 3:30 pm Saturdays.
- No work may be carried out on Sundays or public holidays
- Activities may be undertaken outside of these hours:
 - If required by the Police or a public authority for the delivery of vehicles, plant or materials; or
 - If required in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or
 - Works are inaudible at the nearest sensitive receivers; or
 - If a variation is approved in advance in writing by the Secretary or her nominee
- Notification of any activities undertaken outside of the approved working hours must be given to affected residents.
- Works shall be carried out in accordance with the University of Sydney's 'Campus Infrastructure and Services Contractor Handbook'

16.2 24hr Contact Details

- 24hour Contact details during the construction phase of the project are as follows:

Contact	Role	Mobile	Email
Luke Allman	Site Manager	0439 203 340	LAallman@laingorourke.com.au
Tony Fletcher	Project Leader	0408 288 943	TonyFletcher@laingorourke.com.au
Swaithi Gowda	Environmental Manager	0427 780 571	sgowda@laingorourke.com.au
Danielle Ryan	H&S Manager	0418 851 257	DanielleRyan@laingorourke.com.au
Chris Paul	Senior Project Engineer	0448 241 416	Chrispaul@laingorourke.com.au
Complaints Hotline		TBC	TBC

16.3 General

Specific operational controls to manage environmental issues are defined in either or all of the following:

- ERAPs contained in Appendix 4
- Sub-plans contained in Appendix 4 or standalone documents referenced below and in Appendix 4
- SWMS, JSEA's, HAZID, CRAW, Inspection and Test Plans / checksheets (as appropriate)
- Work instructions (e.g. refuelling and servicing)

Significant environmental issues, with a risk ranking of High (10 – 16) or Medium (5 – 9), will be controlled Environmental Risk Action Plans and issue specific Sub-plans as required.

Additional controls and criteria will be established and maintained where the absence of such could result in the environmental policy, objectives and targets not being met.

16.4 Hold Points

The activities outlined in the table below are not to proceed without objective review and approval by the nominated authority. These activities below are considered hold points. These hold points should be incorporated into the working plans for the project (SWMS, work instructions, construction methodologies, etc)

Item	Process Held	Acceptance Criteria	Approval Authority
Environmental Management Plan	Site activities	Site specific Environmental Management Plan has been developed, reviewed and approved.	Project Leader
Dewatering	Dewatering / pumping water off the site.	Verification that the water quality criteria have been met.	Site Manager

Item	Process Held	Acceptance Criteria	Approval Authority
Sediment and erosion control measures	Construction activities involving ground disturbance.	Sediment and Erosion Control Plan has been developed, reviewed, approved and implemented	Site Manager
Site clearing / vegetation removal	Commencement of site clearing or vegetation removal.	Clearing limits have been verified against the project approval environmental assessment, limits have been set-out and vegetation to be retained has been delineated and or protected.	Project Leader
Construction Methodologies – direct delivery and subcontract works.	Construction process representing potential medium or high impact to the environment.	Construction methodology / SWMS / JSEA have been reviewed by the Site Environmental Management Representative and address the requirements of the EMP ERAPs.	Senior Project Engineer/ Project Engineer/ Site Engineer
Dangerous Goods	Transport of dangerous goods	Verification that transport vehicles meet the requirements.	Site Manager
Dangerous Goods	Storage of dangerous goods	Verification that bunded storage is provided and that offset distances are maintained for the storage area.	Site Manager
Controlled/ Hazardous Waste	Transport of Controlled / Hazardous waste from the site	Verification that the waste has been classified in accordance with the guidelines, transport licensing in place and landfill can lawfully receive the waste	Project Leader
Spoil Transport	Removal of spoil from site	Verification that the spoil has been classified and the disposal location can lawfully receive the waste.	Project Leader
Traffic and Pedestrian Management Plan (TPMP)	Works Certificate Issue Site Activities	A TPMP must be prepared by an appropriately qualified person and approved by the Certifying Authority. This plan must address the following as a minimum: <ol style="list-style-type: none"> 1. Ingress and egress of vehicles to the Subject Site 2. Loading and unloading, including construction zones; 3. Predicted traffic volumes, types and routes & limits of construction traffic movements during night-time hours; 4. Consideration of any cumulative traffic impacts associated with other works being undertaken on the site; and 5. Pedestrian and traffic management methods. 	Project Leader Certifying Authority
Construction Noise and Vibration Management Plan (CNVMP)	Works Certificate Issue Site Activities	A CNVMP must be prepared by a suitably qualified person to address the provisions of the Australian Standard (AS) 2436 (2010), and Interim Construction Noise Guideline (Department of Environment and Climate Change (DECC)).	Project Leader
Waste Management Plan (WMP)	Works Certificate Issue Site Activities	A WMP must be prepared by an appropriately qualified person and approved by the Certifying Authority. This plan will include the following as a minimum: <ol style="list-style-type: none"> 1. Show where the storage of garbage bins and recycling containers will be located; and 2. Provide details demonstrating compliance with: <ol style="list-style-type: none"> a) Relevant legislation; 	Project Leader Certifying Authority

Item	Process Held	Acceptance Criteria	Approval Authority
		b) The methodology in which the containment and control of emissions of fibres to the air will be managed.	
Project Determination (Planning Approval for State Significant Development (SSD))	Any works associated with Packages 1B and 1C	Determination & development consent obtained prior to works associated with Packages 1B and 1C being undertaken. CEMP updated to reflect Conditions of Approval and mitigations measures associated with the above determinations.	Project Leader

Proceeding past a specified Hold Point without authorisation is a system non-conformance.

16.5 Environmental Control Plan

The project Environmental Control Plan(s) is prepared to assist in the planning and delivery of the project. It is specific to the site or work area and outlines the location of protection measures, monitoring requirements, conditions of approval and environmentally sensitive areas. It is the practical application of the proposed control measures.

The Environmental Control Plan is to be used in project inductions, work site set-up, reviewing ongoing environmental performance, included as information in tender documents to subcontractors were applicable and in support of ancillary environmental approvals.

The project Environmental Control Plan shall include but not limited to:

- The worksite layout and boundary, including entry/exit points and internal roads and clearing limits
- Location of adjoining land-use and nearest noise sensitive receivers
- Location and type of sediment and erosion control measures, including size / capacity of detention basins and wheel wash facilities
- Location of site offices
- Location of spill containment and clean-up equipment
- Location of worksite waste management facilities
- Hours of work applicable to the worksite (including deliveries and any restrictions on high noise generating activities).
- Document control and approval details
- Location of environmentally sensitive areas (e.g. threatened species, critical habitat, contaminated areas, heritage zones, etc)
- Vegetation and trees to be protected
- Location of known heritage (indigenous and non-indigenous) items
- Location of stormwater drainage and watercourses leading to / from the worksite
- Specific environmental management requirements from licenses, approvals or permit conditions
- Key environmental risk issues and the specific mitigation measures

The plan is in addition to any erosion and sediment control plans or other documentation that specify the location of environmental controls on site.

16.6 Design

The project is a design and construct contract in which Laing O'Rourke is responsible for the design functions. The following environmental issues should be considered during the design of the temporary works:

- How to minimise any adverse impacts on the environment including energy efficient operation, incorporation of sustainable or recycled materials
- How to improve design efficiency to conserve natural resources
- Address the requirements of Laing O'Rourke's sustainability agenda
- How to meet environmental codes, regulations and other requirements

These issues should be considered, while taking into account the practicalities and economic realities of the project/site.

The design process is controlled in accordance with the Project Design Execution Plan, Design Brief and the requirements outlined in the Engineering Design and Design Management Swim Lane in Core Process.

16.7 Procurement

The supply of goods and/or services by suppliers and subcontractors will be carefully controlled in accordance with Project Leader and Commercial Managers procedures in Core Process and as follows:

- Environmental issues should be taken into account when selecting subcontractors and suppliers as provided in E-P-3-0410 Procure Evaluate Select.
- Suppliers of chemicals and hazardous substances will be required to submit SDS's with delivery or prior to chemicals arriving at site. Prior approval to bring hazardous substances to site may need to be obtained from the client.
- Subcontractors will be required to submit an environmental control plan covering work which is likely to have a significant impact on the environment. Alternatively, they will be required to work under this EMP.
- The environmental performance of subcontractors will be monitored during site inspections.

16.8 Handling, Storage, Packaging and Transport

The handling, storage, packaging and transport of goods will be controlled in accordance with [the Procurement Swim Lane in Enabling process and E-P-3-0410 Procure Evaluate Select](#).

Dangerous Goods/Hazardous materials will be stored and handled in accordance with Material Safety Data Sheets and the requirements of the Australian Dangerous Goods Code.

The Dangerous Goods (Road and Rail Transport) Act includes specific requirements in relation to the transport of dangerous goods. Where dangerous goods are to be transported as a result of the project, the requirements of the Act must be complied with by Laing O'Rourke and third parties.

In particular, regardless of the quantity, appropriate transport documentation must be included with each load unless a specific exemption exists.

Transport documentation must include the following:

- Project/workplace name, contact number
- Transporter name, contact number
- Transport date, origin and destination
- Product name, classification, container type, quantity

Form E-T-8-1232 Dangerous Goods Transport Note may be used.

These materials will be stored in a safe area (e.g. bunded and/or store) which will prevent or contain accidental spillage and harm to the environment. Further details are provided in Appendix 4 in the ERAP - Delivery and Storage of Chemicals, Fuels & Oils and including Dangerous Goods requirements.

SDS's must be stored along with or at the point of storage.

16.9 Traffic Management

Refer to the project specific Construction Pedestrian & Traffic Management Plan (CPTMP) reference N116133 prepared by GTA Consultants.

The report has been prepared in consultation with the Sydney Co-ordination Officer (TfNSW), City of Sydney, and University Sydney.

16.10 Noise & Vibration Management

Refer to the project specific Construction Noise & Vibration Management Plan (CNVMP) reference M17183RP4 prepared by Resonate. The author and reviewer both have significant experience and are both members of the Australian Acoustical Society.

The report has been prepared in consultation with the City of Sydney, Royal Prince Alfred Hospital, University of Sydney, Wesley College, Elegance Catering, and all adjoining stakeholders.

16.11 Management of Dust & Odours

To satisfactorily manage both Dust and Odours throughout the course of the works the following controls will be implemented to prevent adversely affecting stakeholders.

- Air Quality Monitoring will be undertaken throughout the course of the works at both periodic and random intervals dependant on the activities being undertaken.
- Spraying formations and exposed work areas to suppress dust using water carts, tankers and other suitable equipment
- Minimise traffic on exposed areas – create designated haul roads
- Cover haul vehicles loads & ensure tail gates are closed when operating on public roads
- Provide shaker grids or rumble strip at site egress points. Note where aggregate is used, minimum size is 150mm

- Remove mud from haul vehicles prior to entering public roads via the rumble grid and designated washdown point
- Remove spilt mud by construction equipment or vehicles on public roads
- Reprogram dust generating work during periods of high wind
- Provide awareness training in the need to minimise dust during site inductions and toolbox talks
- Regular visual monitoring of dust generation
- Maintenance of Plant & Equipment as per manufacturers requirements

16.12 Stormwater Control & Discharge

All water discharges are noted as Holdpoints within the works and shall not occur without a signed and valid Permit to Discharge. The following controls shall be implemented prior to the discharge of stormwater

- Carry out all conditions required by the regulating authority in the license / permit
- Treating water as necessary to meet water quality criteria including pH correction, reduction of total suspended solids, metals, oil, and grease or other contaminants of concern
- Undertaking water testing using approved methods prior to discharging the water off site
- Undertaking insitu water quality testing for the area to be dewatered and the receiving environment to confirm comparability and compliance with water quality discharge obligations
- Monitoring the pump outlet at all times during pumping and ceasing pumping immediately should the water quality change at the outlet

16.13 Erosion & Sediment Control

The following Erosion & Sediment controls shall be implemented throughout the works. Once installed, Erosion & Sediment Controls shall be inspected on a weekly basis, or after a significant weather event – whichever is more onerous.

- Water diversion drains are in place to prevent clean water from entering the site from upstream/offsite areas
- There are no areas where run-off from disturbed areas can leave the site without sediment controls
- Sediment controls are maintained and have a minimum of 70% sediment storage capacity
- Wheel wash/shaker grid and hardstand are installed at site exits to prevent tracking sediment onto roadways. Roadways are clear of tracked sediment.
- Stormwater pits that receive site runoff and all stockpile areas have functioning sediment controls in place. Erosion control provided for long term stockpiles.
- Stockpiles are located away from any concentrated overland flows, and located outside of flood prone areas (i.e. above the 20-year average return interval flood event limit)
- Sediment basins are sized in accordance with the requirements of the Blue Book, Best Practice ESC (IECA 2008) guidelines, the environmental licence and the relevant conditions of approval

16.13.1 Tracking materials from site onto local roads

Materials will not be allowed to track from site onto the local roads. A vehicle wash bay (rumble grid) will be installed on the exit of the site. The road / hardstand from the rumble grid to the local road will be sealed (asphalt or similar) to prevent the wheels collecting further debris after being washed.

16.14 Ground Water Management

The SWHB does not have a basement and the bulk earthworks required for the works sit in excess of 5m above the ground water table. As such the ground water table will remain unaffected.

During piling, the Continuous Flight Auger (CFA) will be manned with a spotter, and spill kit. In the event of a machine leak (Petrols, Oils, Lubricants) spill kits will be utilised to manage the incident.

16.15 Unexpected Finds

The Project Unexpected finds procedures covers the appropriate procedures for unearthing Asbestos, Polychlorinated biphenyls (PCBs) and Lead based paint. Refer to Appendix 14 for the UXF Flow Chart

16.16 Waste Classification (& validation)

All materials on site are to be classified on site prior to disposal. Classification is to be undertaken by an accredited NATA laboratory. Once classified, the appropriate Chain of Custody is to be applied to load showing full traceability of the material prior to it being disposed. All materials are to be disposed of to a licensed facility.

16.17 Manufacture, Construction and Fabrication Processes

These processes will be controlled in accordance with the Project Team (Operations/Construction & HSEQ) Swim Lane and the procedures provided in 2237 Plan Workmanship, Quality Inspections and Commissioning.

Environmental requirements, relating to manufacture, construction and fabrication processes, are defined in:

- Construction methodologies, Safe Work Method Statements and JSEAs
- Inspection and Test Plans, Task Complete Checklists and associated documents
- Contract documents
- Environmental control procedures

16.18 Plant and Equipment

Plant and equipment owned by Laing O'Rourke will be maintained in a safe and serviceable manner in accordance with Project Team (Operations/Construction & HSEQ) Swim Lane and the procedures provided in 2113 Plant Operational Control.

In particular the following requirements apply:

- Plant will be inspected prior to operation on site. In particular fuel lines, hydraulic hoses or other items with the potential to impact the environment are to be inspected. Items found to be worn, damaged or otherwise degraded are to be replaced prior to operation
- Plant will be serviced, re-fuelled and washed-down only in approved areas where hydrocarbons can be captured and then properly disposed
- Fuelling will be carried out in bunded areas when fuelling from bulk tanks
- Plant and equipment will be maintained to prevent / fix oil leaks
- Plant will be driven and operated only in approved areas
- Plant will have effective pollution control and sound attenuation devices fitted
- Site lighting to comply with AS4282: Control of obtrusive effects of outdoor lighting. Site lighting to be on a timer to ensure compliance during hours of work.

17.0 Further information on environmental controls is contained in *Appendix 4. Emergency Preparedness and Response*

The types of environmental emergencies which could occur on this site are shown in *Appendix 6*.

The client and relevant statutory and regulatory authorities (such as the EPA) will also be informed as necessary. Environmental emergencies will be handled as follows:

- Immediately report all incidents to the Project Leader and Site/Construction Manager who will assess the situation and manage the following steps:
- Immediately take all reasonable steps to contain further damage or danger to personnel, public, property and the environment
- Inform relevant authorities in accordance with the regulatory requirements provided in Section 19 below.
- Contact emergency service personnel as necessary (eg. fire dept., spill clean-up services, etc). Site emergency response team will also be contacted.
- Provide notification to the Regional Environmental Manager, HSE General Manager and Head of Legal immediately via phone and email.
- Inform the Client's Representative as necessary and in accordance with contractual requirements (nominated in Section 19 below)
- Complete a detailed report of the incident using IMPACT.
- Liaise with the Client's Representative regarding corrective and preventive actions required and the timeframes within which these actions must occur.
- The designated personnel will undertake the corrective and preventive actions.

Information on the handling of hazardous materials is contained in the *SDS* file.

Emergency Services contact numbers are to be displayed in the main site office.

18.0 Monitoring and Measurement

Key characteristics of the project operations and activities which have a significant impact on the environment will be regularly monitored and measured.

This will include:

- recording of information to track performance
- monitoring operational controls
- level of conformance with objectives and targets

[E-T-8-1227 Environmental Inspection Report](#) will be used to monitor environmental issues on site and issued to the Project Leader. The report will be completed on a weekly basis.

A Supervisors safety and environmental checklist [E-T-8-0905 Management H & S and Environmental Checklist](#) will be completed by the Project Supervisors weekly to monitor environmental issues on site and issued to the Project Leader/ Site Manager for review and signing.

Issues identified during environmental inspection requiring further action beyond normal practice or maintenance and are to be logged into Impact via the Assurance Application.

Non-conformance to Operational Control procedures or to the Environmental Management System that cannot be rectified immediately shall be recorded and addressed by raising a [E-T-8-0113 Non-conformance Report](#) or logged into the Assurance application in Impact.

The following environmental issues / non-conformances are to be included within Impact as corrective actions.

- Internal inspection outcomes that cannot be rectified immediately – actions nominated on E-T-8-1227 and E-T-8-0905
- Incidents and associated corrective actions
- Internal audit observations/non-compliance
- Client audits or other notice of non-compliance
- Notices or action from regulatory authorities

Where environmental inspection or monitoring outcomes are required to be logged into Impact, a workplace visit is to be created and the associated actions generated.

Where deemed necessary by the Project Environmental Representative and as a result of revisions to project scope or changes to project risks, additional Environmental Risk Action Plans to control potential impacts will be developed.

18.1 Corrective Actions

Corrective actions are differentiated by risk ranking. The nominated timeframes to resolve items on the CAR Register are as follows:

CAR Risk Ranking	Timeframe for resolution
1	Action needs to be commenced immediately to resolve the issue
2	Action needs to be resolved within 1 week.
3	Action needs to be resolved within 1 month.

Refer to [the Project Team \(Delivery\) Swim Lane in](#) Core Process 66 Compliance and [C-P-8-0107 Continual Improvement Corrective and Preventative Action](#) for further detail.

Further monitoring and reporting activities against operational objectives and targets are listed in Section 9 of this Plan. If monitoring and measuring equipment is required, then it will be calibrated, maintained and controlled in accordance with Project Team (Operations/Construction & HSEQ) Swim Lane and the procedures provided in 2237 Plan Workmanship, Quality Inspections and Commissioning. Records of calibration will be kept in the Contract Filing System.

18.2 Monthly Environmental Reporting

In addition, the project shall complete on a monthly basis the Workplace Monthly Environmental Report C-T-8-1250a or Project Monthly Environmental Report C-T-8-1250b. The report template is located in Core Process Gateway 7 – Monthly Submission of Project data. Each report is to be included in the Monthly Project Review.

The report is to include specific details relating to risks, status of control measures, update to plans, ESCPs and the performance indicators nominated within the report.

18.2.1 Impact Monthly Data Application

On a monthly basis, monthly environmental indicators, energy use, water consumption and waste information shall be entered into Impact.

Monthly environmental indicators include:

- Number of workplace environmental inspections accompanied by supervisory or engineering personnel
- Number of environmental toolbox talks
- 100% of environmental inspections signed off by the Project Leader

Monthly Environmental Metrics

- Waste consumption
- Water usage including volume of water extracted from surface water sources and ground water sources
- Subcontractor energy and emissions data

18.2.2 Impact Assurance Application

Monthly oversight of inspection outcomes, audit issues and corrective actions provided through the Actions created within the Impact Assurance application. Actions are to be addressed in accordance with the timeframes outlined in section 18.1.

19.0 Incidents, Complaints, Corrective and Preventative Action

All incidents and complaints (including potential incidents) must be reported so that they can be investigated and prevented from recurring.

Form [E-T-8-1222 Environmental Incident and Complaint Report](#) shall be completed and issued to the Project Leader for all Potential or Actual Class 1 or Class 2 incidents. The completion of [E-T-8-1222 Environmental Incident and Complaint Report](#) for Class 3 incidents is at the discretion of the Project Leader. Notwithstanding Class 1, Class 2 and Class 3 incidents are to be recorded in IMPACT.

Incident Reporting & Investigation from the project sites is to be recorded in IMPACT, LORA's Online Incident Investigation Reporting Tool. IMPACT can be accessed from the LORA Intranet Home Page or remotely connected via the Internet where connection is possible and direct access to the LORA Intranet is not available. Incidents are to be logged in Impact within 48 hours of occurrence. For Class 1 and Class 2 incidents, an investigation must also be logged in Impact.

Incidents involving failures in hydraulic equipment shall have an [E-C-8-1426 Hydraulic Incident Notification](#) completed to identify the potential causal factors associated with the incident.

The Regional Environmental Manager, HSE General Manager and Head of Legal shall be notified by telephone as soon as practicable after any Actual or Potential Class 1 & Class 2 Incidents.

Environmental Incident is classified into three classes:

Class One	Class Two (Including Potential)	Class Three
Class One Environmental Incidents create permanent or long term damage to the environment. This damage will result in the environment taking 12 months or more to return to pre-existing conditions. Major environmental investigation and potential for large prosecution.	Class Two Environmental Incidents create short to medium term damage to the environment. This damage will result in the environment taking up to 12 months to return to pre-existing conditions Potential for prosecution or infringement notice	Class Three Environmental Incidents typically cause short term or nuisance damage. The damage is easily rectified usually within one day. Class 3 incidents do not cause medium or long term damage.

The classifications are explained in detail with examples in [the Laing O'Rourke Environmental Incident Classification Guidelines](#) which is available in the [Environmental Management System](#).

Class 3 Incidents

Where a Class 3 incident has occurred, the Laing O'Rourke Site Manager or immediate supervisor is to be informed. Class 3 incidents must be logged directly into IMPACT.

Actual or Potential Class 2 Incidents

Where an actual or potential Class 2 incident has occurred, Group Management is to be informed via the Project Leader.

Class 1 Incidents

Where a Class 1 incident occurs the HSE Director and the Head of Legal are to be informed immediately. The requirements of the flow chart in Appendix 1 are to be applied to all actual or potential Class 1 environmental incidents.

Class 1 incidents shall be subject to a Tap Root investigation.

Where complaints are received at project sites or workplaces involving the media or where the company image is likely to be affected, they shall be documented on the [E-T-8-0951A HSE Internal Incident Notification](#) form as provided below.

All Class 1 & Class 2 incidents will be reported to the relevant State & Federal Authorities as required under relevant Acts & Regulations. Further details are provided in the section External Incident Reporting below.

Complaints will be reported to external authorities in accordance with specific licence/permit or approval requirements.

Refer to the iGATE Environmental [External Websites](#) or [Legal Compliance Service](#) for the applicable legislation.

[E-T-8-0951A HSE Internal Incident Notification](#) shall be completed for all Actual & Potential Class 1 & Class 2 Incidents within 24 hours of the incident occurring and sent (email/fax) to the Distribution List as below:

- Project Environmental Representative
- Project Leader
- Regional Director
- Regional Environmental Manager
- Area Manager
- HSE Director
- Head of Legal

19.1 Incident and Complaints Reporting

Environmental incidents and complaints are to be investigated, documented, actioned and closed out as per the details provided in the investigation process above.

The form [E-T-8-1222 Environmental Incident and Complaint Report](#) shall be completed for all environmental incidents and complaints within **2 working days** of the incident and forwarded to the Project Leader.

Laing O'Rourke will provide notification of the incident to the Client's Representative as required and in accordance with the contract.

On this project and in accordance with the contract requirements, the Client is to be notified as follows:

Notification Type	Contract Requirement
Initial verbal notification	Immediately for actual or potential
Environmental Incident Report requirements	Within 24 hours

Class 1 & Class 2 reportable incidents shall be reviewed by the Regional Environmental Manager, HSE General Manager and Head of Legal prior to the issue of formal correspondence to external parties or regulatory authorities.

Management system non-conformances and recurring environmental incidents will be handled in accordance with [the Project Team \(Delivery\) Swim Lane in](#) Core Process 66 Compliance and [C-P-8-0107 Continual Improvement Corrective and Preventative Action](#).

Where an environmental non-conformance or incident is identified, Corrective and preventive actions shall be developed and may include:

- Review and improve existing environmental controls and job safety analyses/ work method statements
- Site rehabilitation
- Increased site inspections and monitoring
- Modify construction or installation methods
- Increase environmental awareness including re-training and tool-box meetings

Each incident shall be sufficiently investigated to allow specific and detailed corrective and preventative actions to be identified, actioned and closed out as outlined on Form [E-T-8-1222 Environmental Incident and Complaint Report](#) or suitable alternative (ICAM, etc).

Note: where a Class 1 Incident has occurred the HSE Director will initiate the investigation and allocate responsibilities, an external consultant may be engaged. Authorities are to be notified in accordance with the legislative time frames in the applicable state.

19.1.1 Senior Leaders Environmental incident review

For all Class 1 & Class 2 incidents, within 3 days the Project Leader will convene a briefing with the relevant Senior Business Leader/Area/Operations Manager to provide an update on the incident investigation and to allow the Area/Operations Manager to be actively involved in the investigation process. The briefing will include discussion on the progress of the investigation and any specific initial findings. A status report on any rectification work or maintenance activities to the relevant environmental controls will also be provided.

The following information relating to the incident investigation shall be forwarded to the Senior Business Leader/Area/Operations Manager and Regional HSE Manager.

- The condition of the environment and the status of any rectification or remediation works,
- The completed incident investigation report, including appropriate causal analysis and corrective actions,
- Program for the implementation of the corrective actions and any maintenance activities,
- A completed HSE Learning Bulletin template to be included in the monthly Learning Bulletin,
- Any other relevant information.

19.2 External Incident Notification

19.2.1 State Matters

The EPA must be notified immediately of all pollution incidents that cause or threaten material harm to the environment.

Harm to the environment is "material" if the effect (or potential effect) from an incident on the health or safety of humans or ecosystems is not trivial and or results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000.

Incidents requiring notification to the EPA must also be immediately notified to the Regional Environmental Manager and the Head of Legal.

If an incident presents an immediate threat to human health or property, 000 is to be called in accordance with the procedures outlined in the Construction Health and Safety Management Plan.

The EPA Environment Line is to be contacted on 131555.

The notification will need to include information on:

- The time, date, nature, duration and location of the incident
- The location of the place where pollution is occurring or is likely to occur
- The nature, the estimated quantity or volume and the concentration of any pollutants involved
- The circumstances in which the incident occurred (including the cause of the incident, if known)
- The action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution
- Other information prescribed by the regulations

In addition to notifying the EPA of pollution incidents other authorities as outlined below must also be notified immediately:

- The Ministry of Health (via the local Public Health Unit - 02 9391 9000)
- SafeWork NSW (13 10 50)
- The local council – Sydney City - (02) 9265 9333
- Fire and Rescue NSW on 000

Regardless of the actual or potential impact, these authorities must be notified under the amended legislation for all notifiable pollution incidents.

Further information in relation to the incident must be provided immediately if it becomes available after the initial notification. Records of contact with and details of the information provided to external authorities must be maintained in the project records. The Laing O'Rourke form E-T-8-0161 Record of Conversation may be used to record contact with the regulatory authorities.

19.2.2 Commonwealth Matters

Environmental incidents relating to the Environmental Protection and Biodiversity Conservation Act must be notified to the Secretary of the Department within 7 days of the event.

These types of incidents include the death or injury to the following:

- Migratory bird species
- Listed marine species
- Threatened species or listed ecological community (includes taking)

19.3 Client Complaints

All communications from the Client (including CAR's and Audit reports) expressing concern or dissatisfaction with the implementation or operation of the EMP shall be documented in the Assurance application in Impact. Client complaints cannot be rated risk ranking 3.

Public Complaints shall be handled as outlined in Clause 19 above using Form [E-T-8-1222 Environmental Incident and Complaint Report](#) and logged into IMPACT.

Management system non-conformances and recurring environmental incidents will be handled in accordance with the Environmental Management System – [Corrective and Preventative Action](#).

Corrective and preventive actions may include:

- Site remediation and rehabilitation
- Increased site inspections and monitoring
- Increase environmental awareness (re-training, tool-box meetings)
- Review and improve existing environmental controls and job safety analyses/ work method statements

20.0 Environmental Management System Audit

Auditing of the project Environmental Management System will be carried out in accordance with [Environmental Management System Overview](#).

The audit will evaluate compliance with this EMP and associated documentation including legal, contractual and other requirements.

The Regional Environmental Manager, in consultation with the other managers, will decide on the frequency, scope and timing of project/site audits.

It is expected that the project will be audited within 3 months of commencing on site and approximately every 3-6 months thereafter.

An audit report will be issued to management for action. Actions will be followed up for close-out of actions within 1 month of the issue of the audit report.

Audits shall be captured within the Assurance application in Impact. Actions associated with audits shall also be logged in the Assurance application in Impact.

21.0 Management Review

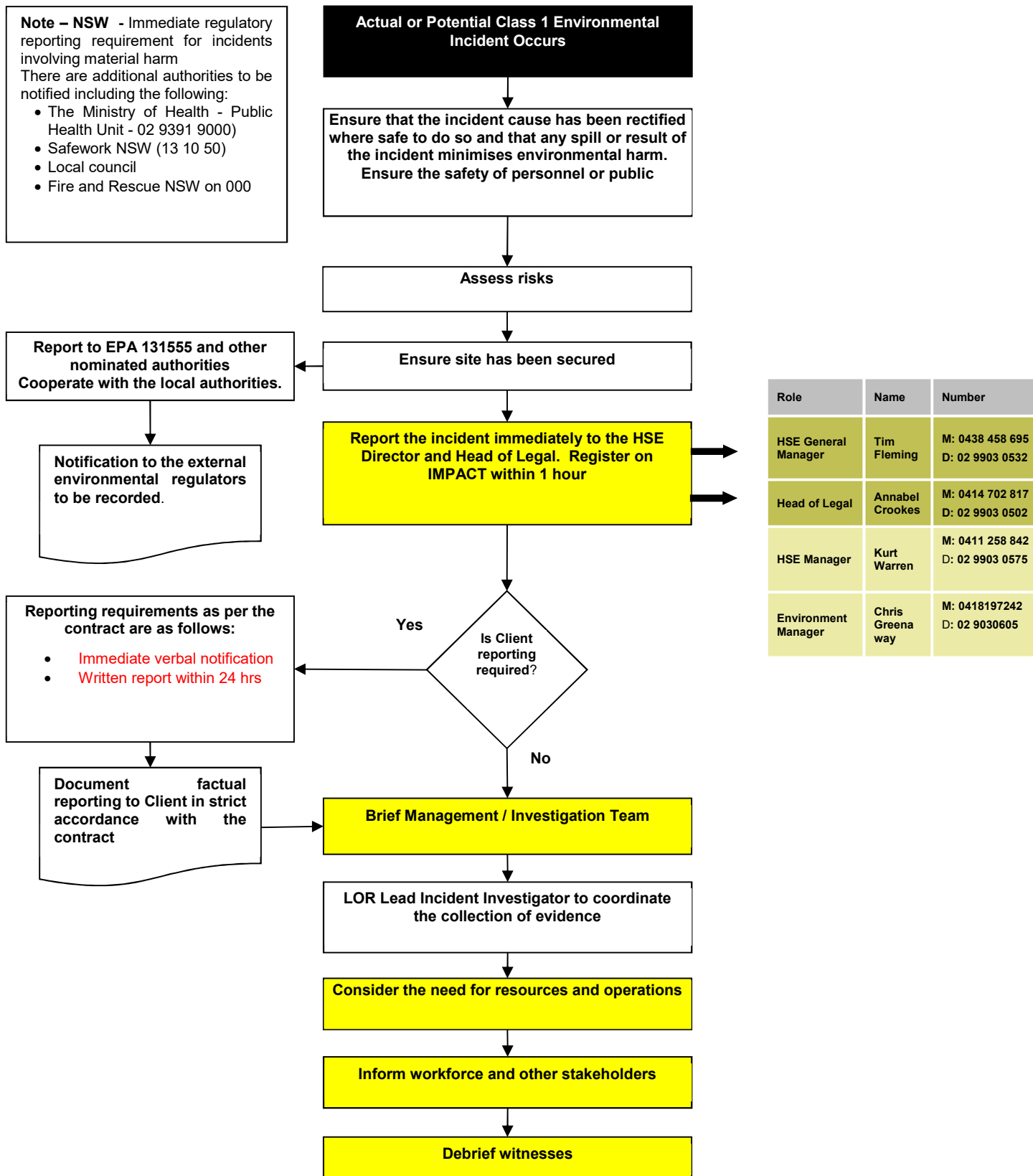
Project Management, will check the status and adequacy of the Project Environmental Management Plan to ensure that it meets current client and Company requirements as well as relevant environmental standards.

The Plan will be reviewed as and when required during the course of the contract when the following situations arise:

- Client recommendations for changes (particularly following initial review)
- Changes to the Company's standard system
- Opportunities for improvement or deficiencies in the project system are identified.
- Following an audit of the system or the occurrence of significant incidents and non-conformances

The management review may be undertaken during the HSEQ re-launch process which is undertaken at 6 monthly intervals.

APPENDIX 1 – Class 1 Incident Management Flow Chart



Environmental Management Plan

Project:
Susan Wakil AO health Building

Project No:
K34

Date:
12/09/2017

Rev:
01

APPENDIX 2 – Legal and Other Requirements

The relevant legal and other requirements are shown in the table below. Access to this legislation is available on iGATE at [LEGAL COMPLIANCE SERVICE](#)

Legal and Other Requirements	Summary of Obligations	Relevance to the Project / Notes and System
Environmental Planning Legislation		
<i>Environmental Planning and Assessment Act 1979</i>	This Act establishes a system of environmental planning and assessment of development proposals for the State.	High Relevance The DA conditions and obligations are incorporated into the specification documents and Laing O'Rourke's EMP.
<i>Local Government Act 1993</i> <i>Local Government (General) Regulation 2005</i>	The Local Government Act and Local Government (General) Regulation provide a legal framework for an environmentally responsible system of Local Government including the responsibility to administer various regulatory systems (e.g. Environmental Planning, Development Consents and Conditions of Approval).	High Relevance The local Council (the Local Government body for this area) has number powers to control local issues including Development Applications (other than state significant development).
<i>Roads Act 1993</i> <i>Roads (General) Regulation 2000</i>	This Act and Regulation primarily provide for such things as the opening and closing of public roads, identification of road boundaries and road widening, road levels, classification of public roads, road work, protection of public road and regulation of traffic, regulation of work, structures and activities.	No Relevance This Act is mostly an administrative Act for RMS and has minor relevance to carrying out the works.
<i>Soil Conservation Act 1938</i>	This Act makes provision for the conservation of soil resources, farm water resources and the mitigation of erosion. The Act is binding on the Crown, however the Crown is not liable for prosecution. The Act provides for notification in the government gazette catchments where erosion is liable to cause degradation of rivers, lakes etc (i.e. protected land).	No Relevance This Act has low relevance as the site is not located within "protected land". Further, such notification has not been given to the owner of the land.
<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwth)</i>	The main purpose of this Act is to provide for the protection of the environment especially those aspects that are of national environmental importance and to promote ecological sustainable development. The Act binds the Crown. Do not take, use, keep or interfere with "nationally significant" cultural and natural resources, protected wildlife and protected plants without Approval.	No Relevance This Act is of little relevance to the contractor on this project as it has been determined not to trigger the provisions of the act.

Environmental Management Plan

Project:
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12/09/2017

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Legal and Other Requirements	Summary of Obligations	Relevance to the Project / Notes and System
<i>Native Vegetation Act 2003</i> <i>Native Vegetation Regulation 2013</i>	<p>This Act and Regulation provide for the conservation and management of Native Vegetation by requiring Development Consent to be obtained for the clearing of Native vegetation.</p> <p>Section 12 of the <i>Native Vegetation Act 2003</i> excludes the clearing of land carried out in accordance with consent under Division 3 of Part 9 of the <i>Roads Act 1993</i>. Clearing of native vegetation required for construction of the work under the contract would be covered by such consent.</p> <p>The Native Vegetation Regulation 2013 allows for the development of self-assessable codes for clearing of feral species, clearing of invasive species, environmental works, thinning native vegetation, clearing of paddock trees, and clearing of mulga.</p>	<p>No Relevance</p> <p>Clearing of native vegetation is not required outside of the contract.</p>
<i>Land and Environment Court Act 1979</i>	<p>The Land and Environment Court is constituted under this Act. The jurisdiction of the Court is divided into numerous classes. The relevant classes for the project covers matter such as the prosecution for offences under various environmental legislation and to appeal against conditions of approvals, permits or orders.</p>	<p>Low Relevance</p> <p>The relevance of this Act would only apply to work under the contract if Laing O'Rourke were prosecuted for an Environmental Offence.</p>
<i>Greenhouse Gas (GHG) Emissions National Greenhouse and Energy Reporting Act 2007</i>	<p>Corporations emitting more than 50kT of carbon dioxide equivalent units are required to register and report their Scope 1 and Scope 2 emissions for all Facilities in which they have Operational Control.</p> <p>Facilities emitting more than 25kT of carbon dioxide equivalent units must register and report Scope 1 and Scope 2 emissions.</p>	<p>High Relevance</p> <p>Laing O'Rourke Australia is a registered entity under this act. As such, where Laing O'Rourke has Operational Control, the Scope 1 and Scope 2 emissions associated with the project must be reported. This includes the collation and reporting of subcontractors site emissions. Laing O'Rourke does/does not have Operational Control of this facility.</p>
Contaminated Land Legislation		
<i>Contaminated Land Management Act 1997</i>	<p>This Act provides for a process to investigate and remediate land that has been contaminated and presents a significant risk of harm to human health. Section 60 of the Act is a "Duty to Report Contamination". This duty applies to owners of land and persons who become aware their activities have contaminated the land.</p>	<p>No Relevance</p> <p>The site is not listed on the register of contaminated sites within the Contaminated Land management Act 1997.</p>
Fire Control Legislation		
<i>Rural Fires Act 1997</i>	<p>This Act is intended to prevent, mitigate and suppress bush and other fires. It places a duty on Laing O'Rourke as the occupier of the site to extinguish fires during bush fire danger periods or if unable to do so notify appropriate fire fighting authorities of the existence of the fire and its location.</p>	<p>No Relevance</p> <p>This project site and surrounding areas are not prone to bush fires.</p>
Hazardous Substances Legislation		

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<i>Environmentally Hazardous Chemicals Act 1985</i>	This Act prohibits the manufacturing, processing, keeping, distributing, conveying, using, selling or disposing of an environmental hazardous chemical or waste (prescribed activity) except under the provisions of a chemical control or a licence. The EPA is required to prepare inventories of environmentally hazardous chemicals and declared chemical wastes.	Low Relevance It is not anticipated any environmentally hazardous chemicals or declared chemical waste will be used or stored on the site. The Act therefore has little relevance to the site other than being aware of the existence of registers of declared chemical wastes and environmentally hazardous chemicals.
<i>Dangerous Goods (Road and Rail Transport) Act 2008</i>	The purpose of this Act is to regulate the transport of Dangerous Goods by road and rail in order to promote public safety and protect property and the environment. The transport of Dangerous Goods is required to be appropriately licensed (both vehicle and driver). Depending on the quantities being transported, the Act outlines specific requirements for including appropriate placards on the transport vehicle, emergency procedures, PPE, manifest documentation and fire extinguishers.	Medium Relevance The relevance of the Act is in respect to the transport of dangerous good to & from the site. The project will require the use of a variety of dangerous goods. Laing O'Rourke will need to review and ensure Dangerous Goods requirements are addressed where transported by its vehicles, plant and equipment.
<i>Water Management Act 2000</i> <i>Water Management (General) Regulation 2004</i>	This Act repeals the Rivers and Foreshores Improvement Act, 1948 and the Water Act, 1912. The provisions of both the aforesaid Acts are progressively rescinded as Water Management Plans are prepared and gazetted for catchment areas within the state. This Act and Regulation provide for the protection, conservation and ecologically sustainable development of water sources of the State and in particular to protect, enhance and restore water sources and their associated ecosystems.	No Relevance This Act has no direct relevance at this time to the construction work under this contract. The project approval does not trigger the provisions of this Act.
<i>Dams Safety Act 1978</i>	This Act constitutes the Dams Safety Committee and confers and imposes on the Committee functions relating to the safety of certain prescribed dams.	No Relevance It is unlikely any action in respect to this project will endanger the safety of any prescribed dam
<i>Coastal Protection Act 1979</i>	This Act requires public authorities to notify the Coastal Council of NSW of any information, proposed activity or work that in the opinion of the public authority is relevant to the exercise of the function of the Coastal Council. It further empowers the Minister for the Department of Commerce to require public authorities to obtain consent prior to carrying out development in the coastal zone or giving consent to a person to occupy or carry out development in the coastal zone.	No Relevance The project is not located in areas associated with this act.
<i>National Parks and Wildlife Act 1974</i>	The relevance of this Act is firstly in respect to the protection and preservation of aboriginal artefacts. Discovery of material on site suspected as being of aboriginal origin must be reported and protected pending assessment and direction by the Client's Representative. Secondly it is an offence under Part 8A of this Act to pick or harm threatened species. (Refer to the notes under the Threatened Species Conservation Act for more information)	No Relevance No identified aboriginal artefacts have been identified within the construction area. The only relevance would be if new previous unknown artefacts were discovered during construction

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<p><i>Threatened Species Conservation Act 1995</i></p> <p><i>Threatened Species Conservation Regulation 2002</i></p> <p><i>Threatened Species Conservation (Savings and Transitional) Regulation 1996</i></p>	<p>This Act and Regulations provide for obtaining licenses to harm or pick threatened species populations or ecological communities whether plant or animal or to damage any critical habitat. The offence of picking or harming any threatened species is covered under the National Parks & Wildlife Act Part 8A. It is a defence under Part 8A of that Act if the offence was essential to carrying out development that is in accordance with a Development Consent within the meaning of the EP&A Act or an approval within the meaning of Part 5 of the EP&A Act.</p>	<p>No Relevance</p> <p>No threatened species of flora or fauna listed in the schedules of this Act have been identified within the area of the proposed work.</p>
<p><i>Fisheries Management Act 1994</i></p>	<p>This Act is applicable to all waters within the state including private and public waters and all permanent and intermittent waters. The Act is most relevant in respect to maintaining water quality and ensuring no polluted water from site works enters streams, creeks and waterways. In addition this Act also has relevance for the removal of marine vegetation.</p>	<p>Low Relevance</p> <p>Along with the POEO Act water discharging from the site must not pollute the adjacent streams or watercourses.</p>
<p><i>Marine Pollution Act 1987</i></p>	<p>This Act creates offences for discharges of oil, oily mixtures and noxious liquid substances from ships into State waters.</p>	<p>No Relevance</p> <p>The site is located adjacent to state waters and may involve the use of applicable vessels.</p>
<p><i>Noxious Weeds Act 1993</i></p>	<p>This Act provides for the classification and control of noxious weeds. Declared noxious weeds are classified as Class 1, State Prohibited Weeds; Class 2, Regionally prohibited Weeds, Class 3 Regionally Controlled Weeds, Locally Controlled Weeds and Class 5 Restricted Plants. The characteristics of each class is given in Section 8 (2) of the Noxious Weeds Amendment Act 2005. Class 1, 2 & 5 weeds are referred to in the Act as "Notifiable Weeds".</p>	<p>Low Relevance</p> <p>The Act applies to owners or occupiers of land including public authorities and thus does not apply to Laing O'Rourke.</p>
<p><i>Water Act 1912</i></p>	<p>This Act provides for licences to extract water for construction purposes either from surface or artesian sources. Should construction water be extracted from surface (other than sedimentation ponds) or artesian sources a licence will be required.</p>	<p>No Relevance</p> <p>It is not proposed that construction water will be obtained from surface (eg creeks, lakes etc) or artesian sources.</p>
<p><i>Heritage Act 1977</i></p>	<p>This Act provides for the preservation and conservation of heritage items such as building, works, relic, places of historic interest, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance.</p> <p>Under this Act a relic means any deposit, object or material evidence which is 50 or more years old and relates to the settlement of the area (not being an aboriginal settlement). It is an offence under this Act to wilfully and knowingly damage or destroy items of heritage value.</p> <p>Do not demolish damage, move or develop around any place, building, work, relic, moveable object, precinct, or land that is the subject of an interim heritage order or listing on the State Heritage Register or heritage listing in a Local Environmental Plan without an approval from the Heritage Council (NSW) or local council.</p>	<p>No Relevance</p> <p>The proposed works do not materially affect any local or state heritage items</p>
<p><i>Wilderness Act 1987</i></p>	<p>An Act to provide for the permanent protection of and proper management of Wilderness Areas and to promote the education of the public in the appreciation, protection and management of wilderness. The Act and associated Regulations provides a mechanism for the identification and declaration of Wilderness areas.</p>	<p>No Relevance</p> <p>This project is not within or immediately adjacent to a declared Wilderness area. This Act has little or no relevance to the project.</p>

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<i>Plantations and Re-forestation Act 1999</i>	This Act is intended to facilitate the reforestation of land and development of timber plantations. It provides codified environmental standards together with a streamlined integrated scheme for the establishment and management and harvesting of timber and other forest plantation products.	No Relevance The location of work under this contract is not located within or adjacent to reforested or plantation forest land.
<i>Australian Heritage Council (Consequential & Transitional Provisions) Act 2003</i> <i>Australian Heritage Council Act 2003 (Cwth)</i>	The Australian Heritage Council (Consequential and Transitional Provisions) Act 2003 repealed the Australian Heritage Commission Act 1975. The Australian Heritage Council Act 2003 establishes the Australian Heritage Council. The Council is required to identify places to be included in the National Estate and to maintain a Register of the National Estate of places.	No Relevance The site is not on Register of the National Estate of places.
<i>Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cwth)</i>	This Act provides for the preservation and protection from injury or desecration to areas and objects of particular significance to Aboriginals. Areas and objects can be protected by Ministerial Declaration and it is then an offence to contravene such a declaration.	No Relevance No areas or objects within the works site have been identified as being subject to such a declaration and this Act is of little relevance to the project.
<i>Ozone Protection Act 1989</i>	This Act provides for a system of controls and to regulate and prohibit the manufacture, sale, distribution, use, emission, re-cycling & disposal of stratospheric ozone depleting substances and articles that contain these substances. The impact is that appropriately qualified people in accordance with this Act must undertake all servicing and maintenance of this type of equipment.	Low Relevance The relevance of this Act will relate to the use of refrigerators and air conditioning units in site buildings and vehicles which still contain CFCs. Such items are unlikely to be found on site.
<i>Protection of the Environment Operations Act 1997</i>	This Act is of most relevance to work being carried out under this contract. It integrates into one Act all the controls necessary to regulate pollution and reduce degradation of the environment, provides for licensing of scheduled development work, scheduled activities and for offences and prosecution under this Act.	High Relevance The Act provides for the issuing of environmental protection notices to control work and activities not covered by licences. Section 148 of the Act requires a pollution incident causing or threatening material harm to the environment to be notified to the EPA and other authorities immediately.
<i>Sydney Water Act 1994</i>	This Act establishes the Sydney Water Corporation as a statutory State owned corporation. The functions of the Sydney Water Corporation is to supply and store water, provide sewerage services, provide stormwater drainage and dispose of waste water within its area of operations.	Low Relevance Coordination may be required with Sydney Water during the works
<i>Sydney Water Catchment Management Act 1999</i>	This Act establishes the Sydney Catchment Authority as a statutory corporation representing the Crown. The role of the Sydney Catchment Authority is to manage and protect the catchment areas and catchment infrastructure works, be a bulk water supplier and to regulate activities within or affecting the catchment areas	Low Relevance This project will not impact on areas regulated by the Sydney Catchment Authority.

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<i>Pesticides Act 1999</i> <i>Pesticides Regulation 1995</i>	This Act and Regulation establish a legislative framework to regulate the use of pesticides. They have the objective to promote the protection of human health, the environment, property and trade in relation to pesticides. It is an offence under this Act and Regulation to wilfully or negligently misuse pesticides.	Low Relevance It is not envisaged that pesticides will be used on the project by Laing O'Rourke.
<i>Waste Avoidance and Resource Recovery Act 2001</i>	This Act repeals the Waste Minimisation and Management Act, 1995. The purpose of the Act is to encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecological sustainable development. The Act provides for the making of policies and strategies to achieve these ends. It is an offence under the Protection of the Environment Operations Act to wilfully or negligently dispose of waste in a manner that harms or is likely to harm the environment.	Medium Relevance The relevance of the Act to this project is to implement the strategies by adopting the hierarchy of avoidance; avoidance of unnecessary resource consumption; resource recovery (including reuse, reprocessing, recycling and energy recovery), disposal (as a last resort).

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APPENDIX 3 – Risk Assessment

All environmental issues have been assessed in accordance with the table below:

Risk Assessment Rankings: >17 = Extreme 10 - 16 = High 5 - 9 = Medium 1 - 4 = Low

Environmental issues which have an initial risk ranking of Medium or High will require the development and implementation of Environmental Risk Action Plans.

Issues which have an initial Extreme risk will require the development and implementation of an issue specific sub-plan.

The risks must be reassessed following the consideration of control measures. An owner for the implementation of the management measures must be nominated.

Issues or activities that represent an Extreme risk after the application of control measures are not to be undertaken.

Aspect	Potential Environmental Impact	Initial Risk Rating			Control Measures	Residual Risk Rating			Responsible Person
		P x	C =	Risk		P X	C =	Risk	
Approvals and Licensing									
Not identifying appropriate approvals / licenses required or proceeding without them.	Works delayed, infringements, poor client relations, and reputational loss.	4	3	12	Check Environmental Assessment / REF / EIS and statutory documentation. Check contract documentation. Document requirement in EMP Establish a register of approvals, licenses, permits.	3	3	9	Project Leader/HSE Manager
Noise									
Noise from general demolition and construction activities resulting in impact to residents.	Disturbance to residents or neighbouring businesses. Potential for complaints.	4	4	16	Develop and implement a Construction Noise and Vibration Management Plan. Consult with the community in relation to upcoming activities that may result in concern. Monitor noise for compliance as the works progress at receiver locations. Provide periods of respite for high noise generating activities. Apply noise mitigation measures during entire project.	3	3	9	Demolition contractor/LOR LOR Demolition contractor/LOR LOR

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		P x	C =	Risk		P X	C =	Risk	
					Noise efficient equipment to be used on site.				
Noise during works required to be undertaken out of standard construction hours.	Disturbance to residents of the university	4	3	12	Gain approvals required to work outside standard approved hours from regulatory authority and client Implement noise mitigation strategies for out of standard hours work. Monitor noise for compliance to project goals.	3	3	9	LOR
Vibration									
Vibration intensive activities undertaken on the site such as impact piling, vibratory rolling, demolition, etc	Disruption, annoyance and nuisance to residents. Potential damage to university or hospital structures. Disruption to students during classes or exams as a result of vibration nuisance Effect on animal breeding in Bosch 1A building	3	3	9	Develop and implement a Noise and Vibration Management Plan. Determine vibration limits and structure/receiver offset distances. Consult with potentially affected parties prior to commencement of works on their upcoming activities that may be impacted by construction vibration. Ongoing vibration monitoring during vibration intensive works. Works to cease and work methods reassessed if vibration limits are exceeded	2	3	6	Demolition contractor LOR
Water Quality, Erosion & Sedimentation									
Sediment laden runoff from construction works leaving site.	Degradation of local watercourses. Increased turbidity in local water ways resulting in impact on aquatic life. Fines for sediment escaping site.	3	3	9	Divert clean water away from site Develop and implement sediment and erosion control measures including sediment basins, water collection and dispersal systems, etc. Ensure measures are inspected and maintained as the works progress and also prior to and post rainfall events. Provide training and awareness on the need to prevent pollution.	2	3	6	LOR/Contractors

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		P x	C =	Risk		P X	C =	Risk	
					Relevant people to undertake Erosion and Sediment Control training.				
Non-compliant water from construction works discharged from site	Non-compliant water entering stormwater system waterways (i.e. polluting - not compliant with discharge criteria).	3	3	9	Induction and toolbox talks Toolbox training on site procedures for water discharge Educate site staff on licence conditions and consequences of prosecution Environmental Manager/representative to approve all water discharges from site	2	3	6	LOR
Waste									
Waste disposal during construction and demolition.	Incorrect disposal of waste, further costs incurred for classifications and disposal, fines may be issued.	3	2	6	Develop a Waste Management Plan. Identify opportunities to incorporate recovered materials into the permanent works. Provide facilities on site for source separation and recycling. Ensure accurate waste records are retained. Removal of wastes from the site would only be undertaken by a licensed contractor as required by the POEO Act and with appropriate approvals, if required, for contaminated materials, etc. All material to be recovered off-site to be appropriately classified in accordance with the Resource Recovery Exemptions. All material that requires off-site disposal to be appropriately tested and classified against the Waste Classification Guidelines (DECC, 2008).	2	2	4	LOR

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Aspect	Potential Environmental Impact	Initial Risk Rating			Control Measures	Residual Risk Rating			Responsible Person
		P x	C =	Risk		P X	C =	Risk	
Earthworks spoil disposal.	Incorrect classification of waste (spoil) resulting in incorrect / illegal disposal/re-use.	3	4	12	Inductions, toolbox talks and training on recycling facilities and waste segregation practices. Separation of waste on site. Tracking of disposal processes. All contamination hotspots would be clearly marked in the field. Test for contamination if suspect materials are uncovered	2	2	4	LOR/Contractor
Washout of concrete in undesignated areas.	Sediment laden/alkaline water polluting surrounding stormwater system / watercourses.	3	4	12	Concrete washout areas clearly marked on Environmental Control Maps and delineated. Inductions on designated concrete washout areas. Subcontractors agreements to include project compliant waste management principles.	2	2	4	LOR
Contamination									
Management of contaminated or untreated materials	Non-compliant material and contaminated water entering surrounding waterways. Decrease in health of nearby ecosystems.	3	3	12	Develop contamination management procedures and protocols. Identify any contamination hotspots and incorporate procedures for these locations into construction documentation. Develop unexpected finds procedures.	2	3	6	LOR
Potential for discovery of unexpected contaminated spoil during construction and demolition.	Health effects resulting from airborne contamination, e.g. asbestos. Complaints received from odours released during excavations. Classification of spoil is changed and disposal options altered, costs incurred associated with	3	4	16	If contaminated soil is encountered, all works are to stop in the vicinity of the find and investigations commence. Induct personnel on location, type, nature, concentration of contaminants on site if found. Report all finds and provide information to USYD.	2	3	6	LOR/Contractor

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		P x	C =	Risk		P X	C =	Risk	
	disposal of higher classification of waste.				Processes implemented to manage the disposal of contaminated materials. Unexpected find procedure in place				
Encountering asbestos / contaminated material on site.	Transfer of material into previously uncontaminated area (outside work site) causing new contamination.	3	4	12	Inspections of excavated and filled surfaces would be made during construction to determine the presence of visible asbestos. Contaminated soils would not be stockpiled on the structural fill layer or formation layers to avoid cross contamination. Refer to Appendix 14 – Unexpected Finds Protocol	3	3	9	LOR/Contractor
Hazardous Materials									
Storage of hazardous substances, leaking plant and equipment and spillage from refuelling.	Localised ground contamination / pollution of stormwater and requiring clean-up and/or receiving fines. Risk of igniting volatile substances. Unauthorised access to site / potential vandalism/damage leading to pollution.	4	3	12	Induction, toolbox talks and training on appropriate handling and storage of liquids. All storm water drains should be identified prior to works. Storage areas to be away from sensitive areas and appropriately bunded. SDS approved prior to bringing hazardous substances on site including risk assessment. Plans showing storage locations and associated controls e.g. spill kits, etc. (Environmental Control Maps). Training in use of spill kits Contingency plans would be developed to deal with any spills which might occur during construction. Clearly label containers. Regular auditing and inspection of storage areas and materials.	3	3	9	LOR/Contractor

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		P x	C =	Risk		P X	C =	Risk	
					Make storage areas restricted access areas. Reduce/eliminate need for hazardous substances. Ensure all work sites are secure before leaving the site. All liquids i.e. fuels, paint etc are to be securely locked away at the end of each day.				
Fuel contaminated runoff from construction works leaving site	Fuel contaminated runoff entering stormwater or waterways (i.e. polluting - not compliant with discharge criteria).	3	4	12	All storm water drains should be identified prior to works and controls implemented. Refuelling of vehicles away from culverts, water courses. Appropriate bunding/storage of substances. Toolbox on site procedures for sediment controls and chemical storage. Educate site staff on project conditions and consequences of prosecution.	3	3	9	LOR/Contractor
Biodiversity									
Vegetation trimming / clearing required outside approved work area.	Unauthorised works / removal of vegetation outside defined work area, possibility of removing threatened species, fines incurred. Relevant authority not notified	3	5	15	Induction and tool box training on clearance zones and required protection measures Inspections during clearing activities/ designated enviro / Fencing in place/ clear marking of trees to be retained and cleared / demarcation areas / plans showing clearing areas. Pre clearing checklist to be completed before any clearing of vegetation. Sydney City Council to be notified two weeks in advance of any vegetation trimming or removal	3	3	9	LOR

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		P x	C =	Risk		P X	C =	Risk	
Clearing and grubbing of vegetation within work site.	Erosion of soils, uncontrolled runoff, sediment deposited into surrounding vegetated areas and water courses, and invasion of weeds. Wrong vegetation removed. Potential for injury to native fauna.	4	5	20	Inductions and toolbox training on erosion and sediment controls. Where possible works to be staged so environmental controls can be implemented after clearance works. Approved Erosion and Sediment Control Plans in place prior to starting works. Where applicable, mature trees and other native vegetation to be retained would be clearly delineated, with all construction activities excluded from these areas. Pre clearing checklist to be completed before any clearing of vegetation.	3	3	9	LOR/Contractor
Pest / rodent disturbance from site establishment	Potential to relocate into residential areas / cause of community complaint. Health associated risks with increased rodents.	3	3	9	Ensure site establishment has pest controls such as wire mesh around building bases to ensure pests do not use them for shelter. If issue is problematic during construction activities, pest control services to be implemented as soon as possible	2	3	6	LOR/Contractor
Air Quality									
General construction works; site establishment, earthworks, piling, drilling, etc	High dust activity in close proximity to residential and commercial premises, dust deposition at sensitive receivers, repairs and clean up needed, complaints received .	3	3	9	Develop Air Quality Management Plan. Inductions and toolbox training on Dust and Air Quality Management. Include provision for air quality monitoring during the works. Provide dust mitigation measures through water sprays/misting. Use of water carts during dry weather on haulage roads and excavations/batters.	2	3	6	LOR/Contractor

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		P x	C =	Risk		P X	C =	Risk	
					Install dust controls immediately and continually through the project. Erosion and Sediment Control Plans approved before works commence. Controls are then reviewed for maintenance.				
Exhaust from plant and equipment.	Emissions resulting in air pollution.	3	2	6	Inductions and toolbox training on Dust and Air Quality Management. Well maintained plant/ equipment and pre-start checks and servicing. Non-complaint vehicles removed from site / repaired.	2	2	4	Contractorp
Heritage									
Unexpected heritage items encountered.	Work delays, additional studies, approvals required, damage to heritage item.	3	4	12	General inductions toolbox training on heritage management protocols. Label any known heritage items on Environmental Control Maps. If suspected heritage item encountered. Works to stop immediately and Environment Manager contacted. Heritage salvageable items list established and communicated	2	4	8	LOR/Contractor
Acid Sulphate Soils									
Disturbance of Potential Acid Sulphate soils and Actual Acid Sulphate Soils during excavations.	Mobilisation of metals within runoff to levels toxic to natural systems. Release of acidic runoff.	2	4	8	Develop and implement Acid Sulphate Soils Management Plan. Awareness training in the identification and management of ASS. Provide containment and treatment facility on site. Ensure ASS material is left underwater, disposed off site or appropriately treated in a bunded area with sump.	2	2	5	LOR

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		P x	C =	Risk		P X	C =	Risk	
Traffic									
Loss of on-street car parking in adjacent residential streets and commercial areas during construction.	Loss of parking availability to adjacent residential and commercial properties could result in community complaints.	2	2	4	Community notifications. Develop Traffic Management Plan / Traffic control procedures.	2	2	4	
General construction traffic disturbing public access between local roads.	Disturbance to local residents resulting in complaints being made, limited access, potential for delays at local road access points resulting in complaints.	2	2	4	Approved Traffic Management Plans in consultation with relevant authorities. Detour routes to be advertised/ notified. Approved access routes, detailed Traffic Control Plans. Clear notifications / signage.	2	2	4	LOR/Contractor
Management of heavy vehicles / haulage routes.	Complaints from sensitive receivers due to increased level and frequency of noise.	3	2	6	Designated haulage routes. Approved Traffic Management Plans. Community Notifications. Pedestrian management with traffic controller in place where required.	2	2	4	LOR/Contractor

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		P x	C =	Risk		P X	C =	Risk	
Truck deliveries out of normal working hours (un-approved).	Non-conformance with project requirements. Noise impact to community / potential complaints.	3	3	9	Personnel training of noise awareness to community included in induction and toolboxes. Induction on Construction Hours for deliveries. Communication of delivery times to suppliers. Community Notifications on project activities occurring locally. Code of conduct / selection criteria in place for subcontractors. Out of hours works approval where required (Environmental Protection Licence/ Planning Approval/ Council) Approved traffic/haulage routes. Planning and staging of works in approved hours as much as practical.	2	3	6	LOR
Resources and Energy Use									
Energy consumption by construction plant & operation of site compound facilities.	Inappropriate energy use, waste of energy resources, energy wastage costs, increased greenhouse gas emissions.	3	3	9	Inductions and toolbox training on waste management and energy saving practices in construction plant and equipment and during office work. No idling of plant equipment where possible onsite. Equipment / plant equipment inspections must be undertaken prior to use on site.	3	2	6	LOR
Water usage during construction activities.	Excess usage of potable water for construction activities leading to a decline in the amount of potable water for residents.	3	2	6	Include water conservation measures and verifiable targets. Capture and reuse rainfall and runoff for site activities.	2	2	4	LOR/Contractor

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		P x	C =	Risk		P X	C =	Risk	
Resource usage (e.g. building materials, water, fuels, packaging), waste generation and disposal.	Depletion of resources due to wastage (e.g. wastage of water / no recycling, poor management of procurement, ineffective removal of off-cuts, waste, i.e. no recycling).	2	4	8	Inductions and toolbox talks on recycling facilities and waste segregation, training/education on how to recycle. Procurement of materials (selection of materials) to be considered. Subcontractor's agreements to include project compliant waste management principles. Waste management undertaken in accordance with the Waste Avoidance and Resource Recovery Act 2001.	2	2	4	LOR

Environmental Risk Assessment Rankings

This table may be used as a guide in determining the level of risk for each environmental issue.

For each identified issue, consider the 'maximum credible' (not absolute worst case) risk that could result with **minimal or no controls** other than existing and using normal construction practices.

Note: Any one of the listed consequences must result in the use of the applicable consequence grading.

<u>Probability:</u>					<u>Consequence:</u>					
5 = Certain 4 = Likely 3 = Possible 2 = Unlikely 1 = Rare					5 = Severe 4 = Major 3 = Moderate 2 = Minor 1= Incidental					
<u>1 - 4</u> Acceptable		<u>5 - 9</u> Acceptable with control measures			<u>10 - 16</u> Requires the implementation of best practice			<u>17 and Above</u> = UNACCEPTABLE		
Likelihood (Probability and Frequency of Occurrence)				Consequence (Outcome or Severity of Occurrence)						
5	Certain	<ul style="list-style-type: none">Common or repeating occurrenceConsequence can reasonably be expected to occur in life of Project.			5	Severe	<ul style="list-style-type: none">Major pollution incident causing significant and widespread damage or potential to health or the environmentPersistent reduction in ecosystem function and value.Ongoing disruption and loss of protected species.Major prosecution likely, outcome in excess of \$500,000			

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Likelihood (Probability and Frequency of Occurrence)			Consequence (Outcome or Severity of Occurrence)		
4	Likely	<ul style="list-style-type: none"> Known to have occurred / "has happened" Conditions may allow the consequence to occur on the Project during its lifetime The event has occurred within the Business Unit within the previous 5 years. 	4	Major	<ul style="list-style-type: none"> Significant widespread and persistent changes to habitat, species or environmental media Significant pollution incident causing damage or potential damage to health or the environment external to the site. Potential for prosecution. Potential outcome between \$50,000 - \$500,000 Numerous substantial complaints Actual material environmental harm
3	Possible	<ul style="list-style-type: none"> Could occur / "heard of it happening" Exceptional conditions may allow consequences to occur on the Project, or has occurred nationally within the Australian Business. 	3	Moderate	<ul style="list-style-type: none"> Localised irreversible habitat loss or effects on habitat, species or environmental media Reportable incident to the relevant environmental regulator or other authority. Demonstrated breach of legislative, licence or guideline requirements. Likely infringement notice or fine, potential for prosecution up to \$50,000. Will cause complaints.
2	Unlikely	<ul style="list-style-type: none"> Not likely to occur Reasonable to expect that the consequence will not occur on the Project. Has occurred in industry but not in Business Unit. 	2	Minor	<ul style="list-style-type: none"> Localised degradation of habitat or short term impacts to habitat, species or environmental media. Pollution incident that marginally exceeds licence conditions or guidelines for acceptable pollution. Fine unlikely. Potential for complaints.
1	Rare	<ul style="list-style-type: none"> Practically impossible Not known to have occurred in industry or unheard of. 	1	Incidental	<ul style="list-style-type: none"> Localised or short term effects on habitat, species or environmental media. Fully contained on site and can be fully remediated. Little potential for fine or complaints. Insignificant or trivial incident

Probability ►	CERTAIN		LIKELY		POSSIBLE		UNLIKELY		RARE	
▼ Consequence	5		4		3		2		1	
5 – Severe	25		20		15		10		5	
4 – Major	20		16		12		8		4	
3 – Moderate	15		12		9		6		3	
2 – Minor	10		8		6		4		2	
1 – Incidental	5		4		3		2		1	

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APPENDIX 4 – Operational Control Procedures - Environmental Risk Action Plans

Environmental Risk Action Plans will be developed for each environmental issue which has a risk ranking of Medium or High.

Significant environmental issues will be managed according to the Environmental Risk Action Plans below.

Noise and Vibration	
Objective	<ul style="list-style-type: none">To comply with contractual requirements and ensure that noise and vibration from construction activities does not cause environmental nuisance.
Targets	<ul style="list-style-type: none">No valid noise / vibration complaints resulting from construction works.No unreasonable noise or vibration.No noise and vibration impacts on external receptors.
Legal, Contractual and Other Requirements	<ul style="list-style-type: none">Contract Specification ClausePlanning consent conditions – approval number: REF as per pat 5 of the Environmental Planning and Assessment ActProtection of the Environment Operations Act 1997Protection of the Environment Operations (Noise Control) Regulation 2000Local Government Act 1993AS2436 Guide to Noise Control on Construction, Maintenance and Demolition Sites;
Site specific planning / approval conditions / licence conditions	<ul style="list-style-type: none">The hours of construction, including delivery of materials to and from site, may only be carried out between the following hours:<ul style="list-style-type: none">Between 7:00 am to 6:00 pm, Mondays to Fridays inclusive; and7:30 am to 3:30 pm Saturdays.No work may be carried out on Sundays or public holidaysActivities may be undertaken outside of these hours:<ul style="list-style-type: none">If required by the Police or a public authority for the delivery of vehicles, plant or materials; orIf required in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; orWorks are inaudible at the nearest sensitive receivers; orIf a variation is approved in advance in writing by the Secretary or her nomineeNotification of any activities undertaken outside of the approved working hours must be given to affected residents.Works shall be carried out in accordance with the University of Sydney's 'Campus Infrastructure and Services Contractor Handbook'

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Noise and Vibration	
Controls (means and resources)	<ul style="list-style-type: none">Where construction vibration is found to be causing a disturbance to sensitive receivers, the construction methods shall be reviewed to reduce the impact where possible.Site offices, compounds and sheds will be located so as to have no negative impact on the noise amenity of nearby sensitive receptors.Delivery operations or other noise generating activities at compound and storage areas will take place during the designated construction hours nominated above, unless specifically required by Police or RTA requirements.Where practical, substitution of excessively noise processes with alternative processes.Avoiding where practical the use of noisy plant simultaneously close together or adjacent to sensitive receptors.High efficiency mufflers must be fitted to all plant and equipment to minimise the generation of noise.All plant will be maintained in accordance with the manufacturer's requirements.Noise generating equipment to be orientated away from sensitive areasUndertaking loading and unloading activities away from sensitive areas and during designated construction hours.Select the most appropriate plant and equipment to minimise noise generation and include where necessary screening and enclosures.On-site generators and auxiliary power sources used during construction should be positioned away from existing buildings to buffer noise/ vibration.Regular checks are to be undertaken to ensure all equipment and vehicles are in good working order and are operated correctly. Checking should include:<ul style="list-style-type: none">engine covers;defective silencing equipment;rattling components; andleakages in compressed air lines.Awareness training and information will be provided to project personnel in relation to the vibration requirements on the project and the need to minimise vibration when in close proximity to operational areas.Plant, equipment and processes shall be selected so as to limit construction related vibration.Restrict or modify working hours to minimise impact if required. Include periods of respite where possible when vibration generating activities are being undertaken.
Responsibilities	<ul style="list-style-type: none">The Site Manager will ensure construction activities comply with these requirements and implement the control measures.The Site Manager/Project Leader will obtain approval to work outside approved hours
Timeframe	<ul style="list-style-type: none">Duration of site works.

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Noise and Vibration

Monitoring and Reporting	<ul style="list-style-type: none"> The demolition subcontractor will undertake noise and vibration monitoring for the length of the contract Weekly inspections to be recorded on Form E-T-8-1227. Complaints to be recorded on form Environmental Incident and Complaint Report (E-T-8-1222 Environmental Incident and Complaint Report). Daily inspection (pre-start) checks and regular servicing of equipment. Daily / weekly check sheets to be kept for engine-driven or other 'noisy' equipment.
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Tree Protection

Objective	<ul style="list-style-type: none"> To comply with contractual and Development Consent requirements and ensure that on-site trees are protected, where required from construction activities.
Targets	<ul style="list-style-type: none"> Compliance with Development Consent requirements in relation to protected trees from Local Council. No damage/ death to trees marked as protected on the project. All Laing O'Rourke staff and subcontractors are informed of the requirements of protected trees on the project.
Legal, Contractual and Other Requirements	<ul style="list-style-type: none"> Contract specification clause Planning consent conditions – approval number: REF as per pat 5 of the Environmental Planning and Assessment Act Local Government Act 1993 Local Government (General) Regulation 2005
Site specific planning / approval conditions / licence conditions	<ul style="list-style-type: none"> Where the site adjoins a public space all trees adjacent to the site as well as those within the site will be protected in accordance with “AS4970 – 2009 Protection of Trees on Development Sites”
Controls (means and resources)	<ul style="list-style-type: none"> Ensure approval is provided to remove trees Appropriately trained and qualified tree removal contractors to be used. Awareness training in the need to preserve vegetation to be retained. Provide barricading or other suitable protection measures for trees to be retained
Responsibilities	<ul style="list-style-type: none"> Site Manager, Project Leader and Laing O'Rourke Staff to ensure all targets are met.
Timeframe	<ul style="list-style-type: none"> Duration of works by Laing O'Rourke.
Monitoring and Reporting	<ul style="list-style-type: none"> E-T-8-1227

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Dust and Air Quality	
Objective	<ul style="list-style-type: none"> To comply with contractual requirements and ensure that dust and other air emissions from construction activities do not cause impacts on sensitive receivers and equipment.
Targets	<ul style="list-style-type: none"> No valid dust & odor complaints from construction works or stakeholders No dust impacting on offsite activities or surrounding residences. No release of contaminants, (odour, smoke etc) into the air. Comply with construction contract conditions.
Legal, Contractual and Other Requirements	<ul style="list-style-type: none"> Contract specification Planning consent conditions – approval number: Protection of the Environment Operations Act 1997 Protection of the Environment Operations (Clean Air) Reg 2002 Local Government Act 1993
Site specific planning / approval conditions / licence conditions	<ul style="list-style-type: none"> As soon as practical following the completion of demolition the ground will be stabilised using an appropriate stabilising method All loads of demolition and excavation materials will be fully covered before leaving site and entering the public roadway Any mud deposited on the road network due to truck movement to and from site is to be cleaned up immediately.
Controls (means and resources)	<ul style="list-style-type: none"> Spraying formations and exposed work areas to suppress dust using water carts, tankers and other suitable equipment Minimise traffic on exposed areas – create designated haul roads Cover haul vehicles loads & ensure tail gates are closed when operating on public roads Provide shaker grids or rumble strip at site egress points. Note where aggregate is used, minimum size is 150mm Remove mud from haul vehicles prior to entering public roads Remove spilt mud by construction equipment or vehicles on public roads Reprogram dust generating work during periods of high wind Provide awareness training in the need to minimise dust during site inductions and toolbox talks Regular visual monitoring of dust generation Maintenance of Plant & Equipment as per manufacturers requirements
Responsibilities	<ul style="list-style-type: none"> The Site Manager/Project Leader to implement the requirements of this plan. Site Manager to inspect the works at regular intervals to identify areas of dust generation.

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Dust and Air Quality

Timeframe	<ul style="list-style-type: none">• Shaker grids to be installed prior to commencement of works• Water tankers and other measures available at the commencement of earthworks• Spilt mud and sediment to be removed from public roads prior to the end of each shift.• Duration of site works.
Monitoring and Reporting	<ul style="list-style-type: none">• Weekly inspections to be recorded on Form F1227• Complaints to be recorded on form Environmental Incident and Complaint Report (E-T-8-1222 Environmental Incident and Complaint Report).

Waste

Objective	<ul style="list-style-type: none">• To comply with contractual and legislative requirements and ensure that waste from construction activities does not have the potential to escape from the site and cause an environmental nuisance / harm.
Targets	<ul style="list-style-type: none">• No incidences where waste is stored in a position where it has the potential to move off-site.• All off site movements of waste will be tracked.• The principles of the waste management hierarchy will be adopted, where practicable.• Target to reuse or recycle 60% by weight of construction waste.• Waste will be minimised where ever possible.
Legal, Contractual and Other Requirements	<ul style="list-style-type: none">• Contract Specification Clause• Planning consent conditions – approval number: REF as per pat 5 of the Environmental Planning and Assessment Act• Protection of the Environment Operations Act 1997• Protection of the Environment Operations (Waste) Regulation 2005• Waste Avoidance and Resource Recovery Act 2001• Local Government Act 1993• Local Government (General) Regulation 2005

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Waste	
Site specific planning / approval conditions / licence conditions	<ul style="list-style-type: none"> • Prior to the commencement of works (including demolition or vegetation removal) a Waste Management Plan (WMP) should be prepared in accordance with the 'University of Sydney Site Management Plan' outlined in the 'Campus Infrastructure and Services Contractors Handbook', dated October 2014, and considers the following: • The name and address of the company/contractor undertaking the demolition/excavation works. • Where material transport of waste material is undertaken by a separate contractor, details (including name and address) of the transport contractor shall also be provided. • Identify the type and quantify waste likely to be generated through the demolition and construction phase and provide options or requirements for handling and disposal. Where available, recyclable site and construction waste would be recycled in accordance with the NSW Government's Waste Reduction and Purchasing Policy (WRAPP guidelines). • Non-recyclable waste would be regularly collected and disposed of at a licensed landfill or other disposal site in the area. • Any bulk garbage bins delivered by Authorised Waste Contractors would be placed and kept within the property boundary. • Waste management practices for the proposal would follow the resource management hierarchy principles embodied in the Waste Avoidance and Resource Recovery Act 2001. These practices include avoid unnecessary resource consumption; • recovering resources (including reuse, reprocessing, recycling and energy recovery); and disposal as a last resort • b) All excavated materials shall be tested, classified, and disposed of in accordance with the current Waste Classification Guidelines (OEH).
Controls (means and resources)	<ul style="list-style-type: none"> • Licensed waste contractors will be utilised to remove waste. • All waste is to be disposed of at a lawful facility. Note: A lawful facility includes one that has the appropriate Development Consent, Environment Protection Licence or is complying with EPA approved conditions and requirements. • Use a licensed contractor to remove waste from site. • Waste must be classified prior to disposal – refer to NSW EPA Waste Classification Guidelines • All spoil material removed from the site will be classified as per the NSW EPA Waste Classification Guidelines. Only a suitable Licensed or approved facility or approved site may receive the waste. • Records of the quantity and final location of the spoil material will be retained. • Use skip bins and ensure there are an adequate number of bins on site to hold all waste generated. • Provide bins to enable waste segregation • Provide recycling services. E.g. Paper, Concrete, Steel, Cardboard, Timber. • Ensure housekeeping is maintained and waste is disposed of to the appropriate bin. • Retain waste disposal permits and figures on the amount of waste that has been removed from site.

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Waste	
Responsibilities	<ul style="list-style-type: none"> Site Manager will ensure waste is correctly stored, classified, recorded, tracked and minimised at all times The Project Leader is accountable for ensuring lawful waste disposal All personnel are responsible for ensuring waste is placed in the bins provided.
Timeframe	<ul style="list-style-type: none"> Duration of site works.
Monitoring and Reporting	<ul style="list-style-type: none"> Skips monitored visually by the Site Supervision on a daily basis. Environmental Checklist E-T-8-1227 to be used to verify site waste practices Waste disposal records to be recorded in Waste Tracker through IMPACT

Water Quality, Site Drainage and Erosion and Sediment Control	
Objective	<ul style="list-style-type: none"> To comply with contractual and legislative requirements and ensure that water discharged off-site from construction and erosion and sediment control (ESC) activities does not cause environmental nuisance / harm.
Targets	<ul style="list-style-type: none"> No sediment impacts to the surrounding environment and waterways as a result of the works Prevent water quality impacts off site as a result of erosion and sedimentation.
Legal, Contractual and Other Requirements	<ul style="list-style-type: none"> Planning consent conditions – approval number: REF as per pat 5 of the Environmental Planning and Assessment Act Protection of the Environment Operations Act 1997 Local Government Act 1993
Site specific planning / approval conditions / licence conditions	<p>Prior to the commencement of work, suitable measures are to be implemented to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site. It is an offence to allow, permit or cause materials to pollute or be placed in a position from which they may pollute waters.</p>
Controls (means and resources)	<ul style="list-style-type: none"> Erosion and sediment control plans (ESCPs) will be developed and implemented prior to the commencement of topsoil stripping and earthworks. The development of ESCPs will be guided by the Blue Book and other guidelines where required. Particular attention will be paid to the design criteria for sediment fences, straw bales, catch drains, diversion drains, sandbags and similar controls Permanent drainage to be installed as early in the program as possible All water to be discharged in accordance with legislation and only after Laing O'Rourke approval. Discharge quality must comply with: <ul style="list-style-type: none"> TSS: $\leq 50\text{mg/L}$ (~Turbidity 30NTU). If this cannot be achieved through natural settling, then the trapped sediment laden water is to be flocculated with gypsum applied at a rate of approx. 40kg/100m³. pH: Between 6.5 and 8.5. Provide shaker grids or rumble strip at site egress points. Note where aggregate is used, minimum size is 150mm

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Water Quality, Site Drainage and Erosion and Sediment Control

	<ul style="list-style-type: none">• Top soil/mulch stockpiles to be not greater than 2.0m in height. All stockpiles will be located clear of watercourses and drainage works.• Wastewater management facilities shall only be provided through connection to existing sewer or proprietary storage and pump out systems are permitted.• Wastewater storage and pump out systems shall be procured, installed and operated in accordance with PS 11- including the provision of automatic cut off valves for inflows and high level alarms.• All disturbed surfaces will be revegetated within 1 month of final land forming and in compliance with the landscaping plans.• Erosion and Sediment Control devices are to be maintained when their capacity has been reduced by 25%.• Under no circumstances will temporary stockpiles be placed within 5m of the site boundary or in position where it could impact adjacent property.• Toolbox talks will be conducted for employees and subcontractors on the requirements of the Erosion and Sediment Control Plan.• The Erosion and Sediment Control Plan is to be maintained and up to date for the current site conditions• Use sand bag check dams to protect stormwater drains as required.• All ESC works will be removed immediately prior to final completion and all surfaces will be returned to pre-existing condition.
Responsibilities	<ul style="list-style-type: none">• All staff to ensure adequate ESC devices are installed and maintained.• The PER will undertake "at least weekly" inspections of on-site ESC devices, plus prior to expected rainfall and after rainfall.• The Site Manager is responsible for the repair/ management of any damage or additional ESC devices, as required.
Timeframe	<ul style="list-style-type: none">• Duration of site works.
Monitoring and Reporting	<ul style="list-style-type: none">• Visually monitored daily by site supervision.• Weekly inspections to be documented on the Weekly Environmental Inspection Checklist Form E-T-8-1227.• Maintenance activities for ESCPs shall be documented – items that cannot be immediately repaired are to be documented on the project CAR Register.• All water quality data including quantity, quality and dates of water release will be maintained the project records.

Traffic Management

Objective	<ul style="list-style-type: none">• To comply with contractual requirements and ensure that noise and additional traffic from construction activities does not cause an environmental nuisance
Targets	<ul style="list-style-type: none">• No valid complaints resulting from congestion from construction traffic outside the approved Traffic Management Plan• Comply with traffic management standards• No visible cueing in streets surrounding the site

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Traffic Management	
Legal, Contractual and Other Requirements	<ul style="list-style-type: none"> • Planning consent conditions – approval number: REF as per pat 5 of the Environmental Planning and Assessment Act • Protection of the Environment Operations Act 1997 • Roads Act 1993 • RTA Traffic Control at Worksites • Roads (General) Regulation 2000 • Local Government Act 1993
Site specific planning / approval conditions / licence conditions	<ul style="list-style-type: none"> • Prior to the commencement of any work on site including demolition and excavation a traffic management plan must be prepared and include the site location, approved activity, overall principals for traffic management, hours of work, truck routes, traffic and parking effects, pedestrian management and safety procedures and any relevant consultation with adjoining or surrounding stakeholders.
Controls (means and resources)	<ul style="list-style-type: none"> • A Traffic Management Plan shall be developed detailing the route to the site, times of activity, types of machinery, signage, traffic control measures, etc. • An approved Traffic Control Plan is required for any activity on/or immediately adjacent to public roads • The Traffic Management Plan will detail the monitoring and inspection requirements • There will be no cueing of vehicles on any roads adjacent to the site • There will be no construction parking in non-approved zones or parking areas • Ensure pedestrian access ways are clearly defined and maintained • Regular checks are to be undertaken to ensure all equipment and vehicles are in good working order and are operated correctly. Checking should include: <ul style="list-style-type: none"> ○ defective silencing equipment; ○ rattling components
Responsibilities	<ul style="list-style-type: none"> • The Site Manager is responsible for ensuring traffic management plans and TCPs are developed, approved and implemented
Timeframe	<ul style="list-style-type: none"> • Duration of site works.
Monitoring and Reporting	<ul style="list-style-type: none"> • E-T-8-1222 to be used to document complaints. • Daily inspection, checks and regular maintenance to be completed for traffic control measures.

Hazardous / Contaminated Material	
Objective	<ul style="list-style-type: none"> • To comply with contractual and legislative requirements and ensure that hazardous / contaminated material from construction activities does not cause an environmental nuisance / harm and is disposed of in accordance with legislative requirements.

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Hazardous / Contaminated Material	
Targets	<ul style="list-style-type: none">• No environmental incidences involving contaminated/ hazardous materials• No pollution events of the surrounding environmental and water ways by contaminated material• All off-site movement of any found contaminated material will be tracked
Legal, Contractual and Other Requirements	<ul style="list-style-type: none">• Contract specification clause• Dangerous Goods Safety Management Act 2001• Dangerous Goods Safety Management Regulation 2001• AS/ NZS 1940: 2004 - The Storage and Handling of Flammable and Combustible Liquids• Australian Dangerous Goods Code, 5th Edition
Site specific planning / approval conditions / licence conditions	<ul style="list-style-type: none">• The exportation of waste (including fill or soil) must be in accordance with the provisions of the protection of the Environment Operations Act 1997.• The exportation of waste (including fill or soil) from the site must be in accordance with the provisions of the <i>Protection of the Environment Operations Act 1997</i> and the Office of Environment and Heritage (OEH) <i>Environmental Guidelines Assessment, Classification and Management of Non-Liquid Wastes</i>.• If any contaminated materials or hazardous substances (for example, asbestos, polychlorinated biphenyls, synthetic mineral fibre, lead dusts, paint containing lead and ozone depleting substances) are encountered during demolition and construction, works must immediately cease and not recommence until such time that safe work method statements and appropriate documented practices are implemented, which may include any plans or approvals mentioned above.

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Hazardous / Contaminated Material	
Controls (means and resources)	<p>Suspected material may include that which is visibly different to surrounding material, fibrous in nature, exhibits hydrocarbon odours or other unexpected characteristics, unknown containers, piping, underground storage tanks, or similar structures are discovered;</p> <ul style="list-style-type: none">• Follow protocols in the contract, RAP or Client Environmental Management Plan• Immediately cease work and contact the Site Supervisor• Demarcate the 'unexpected find' to prevent access and install appropriate environmental and safety controls.• Project Leader to contact the client representative• If substance is assessed as not presenting an unacceptable risk to human health. Site Supervisor to remove controls and continue work.• In addition, the following controls will be incorporated;• Manage any contaminated material as per legislative/EPA requirements including the testing and assessment at the direction of the Client's representative.• Protect the environment by implementing control measures to divert surface runoff away from the potentially contaminated ground.• Capture and manage any surface runoff contaminated by exposure to contaminated ground.• Environmental awareness training relating to the identification and management of acid sulphate soils to be provided to all site personnel involved in earthworks, excavation or drainage construction activities• The Client's Representative shall be notified upon discovery of suspected ASS or PASS.• Implementation of a specific runoff control plan to prevent acid runoff from contaminating site areas and watercourses.• Suspected ASS/PASS stockpiles to be covered with plastic overnight
Responsibilities	<ul style="list-style-type: none">• Site Supervisors, Project Leader and Laing O'Rourke Staff to ensure all targets are met.
Timeframe	<ul style="list-style-type: none">• Contaminated Material: Duration of any contaminated material removal.• Hazardous Material: Duration of site works.
Monitoring and Reporting	<ul style="list-style-type: none">• Receipts for the disposal of any found hazardous material will be filed on site by the PER.• The finding of any contaminated material on site will be reported monthly by the PER using E-T-8-0908

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Trade Waste	
Objective	<ul style="list-style-type: none"> To comply with contractual and legislative requirements and ensure that trade waste from construction activities does not cause an environmental nuisance / harm.
Targets	<ul style="list-style-type: none"> All trade waste to be discharged in accordance with legislation and approvals. Educate Laing O'Rourke staff and subcontractors on the relevant legislation, the correct use of the washout system and the Laing O'Rourke Trade Waste Permit where required. Reduced impacts to the surrounding environment and waterways.
Legal, Contractual and Other Requirements	<ul style="list-style-type: none"> Contract specification clause Sydney Water Act 1994. Sydney Water Catchment Management Act 1999
Site specific planning / approval conditions / licence conditions	<ul style="list-style-type: none"> As per the University of Sydney sustainability guidelines trade waste to be separated into recyclable waste streams as far as possible. Project target is to have 90% of waste on site recycled or reused. All non-recyclable waste to be regularly collected and disposed of at a licensed landfill facility.
Controls (means and resources)	<ul style="list-style-type: none"> Provide a washout system on site which complies with all relevant legislation and contract conditions Any paint washout required shall only be undertaken in the designated areas with appropriate bunding and control measures. Ensure the washout system is in a location which is away from stormwater drains and water courses. Trade waste or other prohibited substances will not be discharged into infrastructure (storm water drains or sewerage system) without the approval. Note: Laing O'Rourke staff and subcontractors may be prosecuted if they are found illegally dumping trade waste and could be responsible for paying sewerage system repair costs. Toolbox talks will be conducted for Laing O'Rourke staff and subcontractors in the correct use of the washout system and legislation. Ensure the washout system is monitored and cleaned on a regular basis.
Responsibilities	<ul style="list-style-type: none"> The Project Leader will ensure a permit has been obtained prior to discharging trade waste The PER will ensure all relevant subcontractors undertake toolbox talks in relation to washout legislation and use.
Timeframe	<ul style="list-style-type: none"> At all times when there is site connection to sewage facilities
Monitoring and Reporting	<ul style="list-style-type: none"> Visually monitored daily by the PER. Inspection report F1227 detailing any trade waste issues will be completed by the PER.

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Concrete Washout	
Objective	<ul style="list-style-type: none"> To comply with contractual and legislative requirements in relation to the washing out of concrete on the project
Targets	<ul style="list-style-type: none"> Zero spills or uncontrolled release of concrete. No instances of uncontrolled concrete washout
Legal, Contractual and Other Requirements	<ul style="list-style-type: none"> The exportation of waste must be in accordance with the provisions of the protection of the Environment Operations Act 1997
Site specific planning / approval conditions / licence conditions	<ul style="list-style-type: none"> Contract Specification Protection of the Environment Operations Act (1997)
Controls (means and resources)	<ul style="list-style-type: none"> Concrete washout to be constructed with geo-fabric lining and bunded. Location of washout to be at least 20m away from any drainage line or stormwater system. Washout to be constructed to the dimensions of 6m x 3m x .5m deep prior to commencement of concrete works. Washout to be barricaded off on all sides when not in use to prevent unauthorised entry Washout area is to be inspected daily by the Site Manager to ensure residual water levels don't exceed 75% of capacity. Record of daily inspection to be kept in Site Manager's/Supervisor's diary when concrete washout is being undertaken. Washout area to be cleaned when the capacity has been reduced below 50%. Cleaning of washout to involve, removal of spoiled geo-fabric material and disposed off in licensed landfill. Records to be retained Where possible waste concrete shall be returned to the batch plant or concrete recycler. Concrete truck drivers are to be advised of the location of the washout area prior to arrival on site. The requirements relating to concrete washout on site are to be provided to the supplier prior to the works.
Responsibilities	<ul style="list-style-type: none"> The Site Manager will ensure that an approved and prepared area for concrete washout is available. All personnel are required to ensure that the requirements of this ERAP are implemented for their operations. Site Manager /Project Leader are required to advise Laing O'Rourke of any concrete spills. The Site Manager is responsible for confirming these requirements with the concrete supplier prior to the works.
Timeframe	<ul style="list-style-type: none"> Duration of site works.
Monitoring and Reporting	<ul style="list-style-type: none"> Weekly inspections to be recorded on Form E-T-8-1227. Incidents or spills of concrete to be recorded on form Environmental Incident and Complaint Report (E-T-8-1222 Environmental Incident and Complaint Report).

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Delivery and Storage of Chemicals, Fuels a Oils and including Dangerous Goods requirements	
Objective	<ul style="list-style-type: none"> To comply with contractual and legislative requirements in relations to the transport of dangerous goods To comply with contractual and legislative requirements in relation to the storage of chemicals, fuels and oils on the site. To ensure contractual and legislative requirements in relation to hazardous substances and dangerous goods are adequately addressed for all operations – there are specific additional requirements relating to the storage and transport of dangerous goods
Targets	<ul style="list-style-type: none"> Zero spills or uncontrolled release of fuel, oils or chemicals associated with Laing O'Rourke's Operations. Compliance with relevant transport and storage requirements All vehicles transporting dangerous goods have appropriate placards, licenses and emergency equipment and procedures
Legal, Contractual & Other Requirements	<ul style="list-style-type: none"> AS/ NZS 1940: 2004 – The Storage and Handling of Flammable and Combustible Liquids Dangerous goods (Road and Rail Transport) Act 2008 Dangerous goods (Road and Rail Transport) Regulation 2008 Australian Dangerous Goods Code, 7th Edition Contract specification
Site specific planning / approval conditions / licence conditions	<ul style="list-style-type: none"> All chemicals on site to be approved by the university and stored as per the SDS. Quantities should not exceed 1 weeks supply.
Controls (means and resources)	<p>The following are the minimum general control measures to be implemented on the project, however additional control measures may be required following the completion of the construction process procedure/work method statement for the proposed activity.</p> <ul style="list-style-type: none"> Minimise storage of fuel, oil, chemicals or other dangerous goods on site, though efficient and timely ordering. The SDS and material risk assessment and including any specific control measures are to be submitted where required to the Client's Representative for each and every substance to be brought on to site. A risk assessment relating to the use of these materials is to be completed in accordance with the Construction Health and Safety Plan prior to the arrival of these goods to site. SDS and associated documentation for each material to be reviewed prior to the completion of the risk assessment for the relevant construction process. A copy to be included with the SWMS. Ensure SDSs are available on site for all fuels, oils, chemicals and dangerous goods. Suppliers are to provide SDS prior to dispatch of the material. Chemicals, fuels and oils to be stored in a securely bunded area with appropriate signage, at all times when not specifically in use. Chemicals fuels, oils and chemicals to be stored inside impervious bunds of sufficient capacity to contain 110% of the stored volume. Bunded areas must have sufficient cover to prevent ingress of rain. Materials removed from the bunded storage area for use are to be returned to the bund at the end of each shift Storage sites are to be > 20m away from operational facilities, drainage lines, areas prone to flooding or on slopes > 1V:10H.

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- Driver or Supervisor to be in attendance at all times when unloading of fuel, oil or chemicals takes place on site.
- No water to be discharged from bunded areas into site drainage system. Contaminated water to be removed by appropriately licensed contractor & discharged to a suitably licensed waste facility.
- Delivery drivers are to be provided with specific drop off and storage instructions.
- Spill kits & absorbent material to be located adjacent to storage bunds.
- Training is to be provided to the workforce in the application of this ERAP and the use of spill kits.
- Absorbent material used to clean up spills to be disposed of in accordance with the EPA Waste Classification Guidelines.
- A register of Chemicals, Fuels/Oils and Hazardous materials is to be kept onsite and maintained for the duration of the project.
- Each construction method statement shall identify the use of chemicals, fuels & oils and hazardous materials.
- SWMSs to address the specific requirements relevant to the work to be undertaken and document relevant site control measures.

Dangerous Goods

- Ensure transporters of these materials are appropriately licensed. This includes relevant licenses for vehicles and drivers.
- Dangerous goods that are to be transported in receptacles greater than 500lt/kg may require specific licenses and shall not be transported by Laing O'Rourke without the Project Leader/Workplace Manager's approval.
- Where dangerous goods are transported by Laing O'Rourke, a SWMS must be developed and include dangerous goods requirements.
- Transport information/manifest is required to be included with any quantity of Dangerous Goods transported by Laing O'Rourke – Form 1232 Dangerous Goods Transport Note is to be used unless it can be demonstrated that the activity is exempt.
- The SWMS statement must address the requirement for Licensing, Placards or other specific regulatory requirements
- Transport activities in quantities that trigger the requirements of a "Placard Load" under the regulations require the following:
 - Transport vehicle to have appropriate Dangerous Goods Placard
 - Transport documents including manifests
 - Emergency procedures and information in an appropriate holder
 - 30B fire extinguisher
 - Double-sided reflectors
 - Driver safety equipment and PPE
 - Goods must be secured and where required segregated from incompatible goods.
 - Dangerous goods must be appropriately marked in accordance with the Australian Dangerous Goods Code

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Delivery and Storage of Chemicals, Fuels a Oils and including Dangerous Goods requirements

Typical dangerous goods associated with our operations include the following:

Type of Goods	DG Class	Type of Goods	DG Class	Type of Goods	
LPG Gas	2.1	Epoxy paint including hardener	8	Plumbing adhesive	3
Open Gear Lubricant	2.1	Chemical Anchor - parts A & B	8	Diesel	3
Marker Paint	2.1	Chemical Anchor	8	Joint/gap sealant	3
Silicone Lubricant	2.1	Chemical Anchor	8	Dry Film Lubricating Paint	3
Fuel Gas for welding/cutting	2.1	Adhesive Mortar	8	Joint/gap sealant	5.2
Fuel Gas for welding/cutting	2.2	Acid	8	Sealant	6.1
Air Operated Tool Lubrication	3	Degreaser (Pile Rigs)	9	Flocculant	8
Zinc Primer Paint	3	Engine Coolant	9	Rail Consumables Welding	1.4 S
Air tool lubricant - workshop	3	Antifreeze	9	Adhesive	3
Petrol-Unleaded	3	Grout	9		
Sealant	3	Form Oil	9		

Dangerous Goods Storage

- Dangerous goods storage on site must comply with the requirements of AS 1940:2004 including maintaining separation distances for incompatible materials.
- The proposed materials need to be assessed for compatibility and required separation distances or control measures implemented.
- Flammable materials storage is to be >15m from site facilities, officers, amenities or protected places.
- Quantities to be stored must be assessed to determine if they are considered manifest quantities - manifest quantities will require notification to WorkCover.
- A storage location plan is required and needs to include internal layout, location of registers/manifests for the storage location.
- Bunding to be impervious and of sufficient capacity to contain 110% of the stored volume
- Appropriate spill containment material and fire extinguishers are also required.

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Delivery and Storage of Chemicals, Fuels a Oils and including Dangerous Goods requirements

Responsibilities	<ul style="list-style-type: none"> Engineering personnel are responsible for identification of requirement to transport Dangerous Goods Relevant Project Leader or Site Manager is responsible for ensuring all vehicles carry appropriate placards, licenses, emergency equipment and procedures The Site Manager is required to ensure that sufficient bunds are available and that material is stored appropriately. Engineering personnel are responsible for ensure SDS and other relevant documentation are obtained and where required submitted to the Client's Representative prior to the material arriving on site. Relevant documentation also includes appropriate risk assessment. The Project Safety Advisor is responsible for ensuring the Chemicals, Fuels/Oils & Hazardous Substances register is maintained.
Timeframe	<ul style="list-style-type: none"> Duration of operations. The requirements apply to goods transported by Laing O'Rourke and third parties.
Monitoring and Reporting	<ul style="list-style-type: none"> Plant / project risk assessments Weekly inspections to be recorded on Form E-T-8-1227. Form E-T-8-1232 Dangerous Goods Transport Note Register of Chemicals, Fuels/Oils and Hazardous Materials Incidents or spills to be recorded on form Environmental Incident and Complaint Report (E-T-8-1222 Environmental Incident and Complaint Report). Storage areas are to be inspected by the Supervisory personnel on a weekly basis.

Flora and Fauna

Objective	To comply with contractual and legislative requirements and ensure that native fauna and flora are protected from construction activities.
Targets	<ul style="list-style-type: none"> No death or injury to fauna including the Green and Golden Bell Frog No unapproved destruction of flora
Legal, Contractual & Other Requirements	<ul style="list-style-type: none"> Environmental Protection and Biodiversity Conservation Act Threatened Species Conservation Act 1995
Site specific planning / approval conditions / licence conditions	<ul style="list-style-type: none"> Where the site adjoins a public space all street trees adjacent to the site/works area shall be protected at all times during demolition/excavation and construction in accordance with provisions of the Australian Standard AS4970--2009 Protection of Trees of Development Sites. All trees located within the immediate vicinity of the works area and not approved for removal by this activity approval shall be retained and protected in accordance with the Australian Standard "AS 4970-2009 Protection of Trees on Development Sites" and the recommendations (relevant to the scope of works within this REF) of the Arboriculture! Reports, prepared by Tree IQ and contained within
Controls (means & resources)	<ul style="list-style-type: none"> If native fauna is identified within the disturbance footprint, the person taking the action must take all necessary steps to minimise harm and mortality to those animals. Open excavations and storage areas to be inspected regularly for the presence of fauna species.

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	<ul style="list-style-type: none"> No clearing or vegetation removal to occur without the Client's approval All vegetation to be retained shall be protected. Works will only be undertaken in designated areas. The clearing limits and protected vegetation is to be clearly communicated to site personnel during site inductions and toolbox talks. Plant and equipment brought on to site must be cleaned and free of deleterious material, mud and other material that may harbour weed seeds Identification of noxious weeds is to be notified to the Client's representative for action. Construction plant, equipment and materials are not to be stored within the dripline of any trees or vegetation to be retained. No personnel on site are permitted to hunt, fish, feed, capture, extract, or otherwise disturb aquatic, animal, or vegetative species while performing any tasks in performance of the work.
Responsibilities	<p>All personnel are responsible for ensuring that the clearing limits are addressed and native flora and fauna species are protected.</p> <p>All site personnel to undertake toolbox talks in relation to the reporting process for injury/ death to fauna or clearing of flora occurring beyond the required limits for construction.</p>
Timeframe	Duration of the works.
Monitoring & Reporting	<p>Visually monitored daily</p> <p>Weekly environmental inspection report E-T-8-1227 detailing any flora and fauna.</p>

Archaeology and Heritage	
Objective	<ul style="list-style-type: none"> To comply with contractual and legislative requirements and ensure that existing and undiscovered heritage and archaeological items are protected from construction activities.
Legal, Contractual & Other Requirements	<ul style="list-style-type: none"> Heritage Act 1977 National Parks and Wildlife Act 1974
Targets	<ul style="list-style-type: none"> No disturbance or damage to existing known heritage sites or items. Unknown or undocumented heritage sites are not knowingly destroyed, defaced or damaged. Identify and protect any new artefacts or heritage sites before any harm can take place. Any relics found on site will be kept safe for consideration of incorporation into site fixtures
Controls (means & resources)	<ul style="list-style-type: none"> Awareness training on the need for the preservation of artefacts and items of heritage value to be provided during the site induction. Location of currently identified archaeological and heritage items are to be nominated on the Environmental Control Plan. Exclusion fencing will be provided around the perimeter of any identified heritage or archaeological items. Awareness training on the need to stop work and to report on new sites, artefacts or items of heritage value. Should any new items be discovered that are suspected of being of heritage significance, whether Indigenous or European, work in the specific area would cease and Laing O'Rourke is to be notified immediately. Should suspected heritage or archaeological items including human remains be found during the works, the following procedure will apply:

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	<ul style="list-style-type: none">○ Work is to cease in the area immediately and Laing O'Rourke notified○ The matter is to be referred to the client○ The object is to be left in place○ GPS coordinates of the item are to be noted○ Photographic records of the item and its location are to be made
Responsibilities	<ul style="list-style-type: none">● All personnel on site are to ensure that archaeological and heritage items are protected from damage or disturbance, unless● The Environmental Manager will ensure all site personnel undertake toolbox talks in relation to protection of nominated items that were previously unknown.
Timeframe	<ul style="list-style-type: none">● Throughout construction activities
Monitoring & Reporting	<ul style="list-style-type: none">● Visual monitoring weekly of any existing items● Completion of weekly environmental inspection report E-T-8-1227.

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APPENDIX 5 – Environmental Control Plan

Details on the minimum requirements for the Environmental Control Plan are provided in Section 16 Operational Control

UoS SWHB- Environmental Control Plan



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Appendix J

J Worksheets

J.1 The Standard Worksheet

Note: These "Standard Calculation" spreadsheets relate only to low erosion hazard lands as identified in figure 4.6 where the designer chooses to not use the RUSSE to size sediment basins. The more "Detailed Calculation" spreadsheets should be used on high erosion hazard lands as identified by figure 4.6 or where the designer chooses to run the RUSSE in calculations.

1. Site Data Sheet

Site name: UOS Health Precinct - Stage 1

Site location: Campdown, NSW

Precinct:

Description of site: Existing

Site Area	Site	Remarks
Total catchment area [ha]	0.44	
Disturbed catchment area [ha]	0.44	

Soil analysis

Soil landscape	Soil Hydrological Group D1/4	(DNH mapping if relevant)
Soil texture (clayey)	Type D1/4	Section 6.3.3(i), (k) and (l)

Rainfall data

Design rainfall depth [days]	5				See Sections 6.3.4 (i) and (k)
Design rainfall depth [percentile]	85				See Sections 6.3.4 (i) and (k)
1-day, 1-year rainfall event	38.8				See Section 6.3.4 (i)
Rainfall intensity: 2-year, 6-hour storm					See PD chart for the site
Rainfall erosivity [R factor]					Automatic calculation from above data

Comments: The soil for the site is mostly Sandy clay and Clay (Refer to Geotech Report GEOTLCOV25283AF by Coffey Services Australia Pty Ltd). Soil Hydrological Group/Texture has been assumed to be D1/4 & D1/4. The Sydney area rainfall depth has been used.

4. Volume of Sediment Basins, Type D and Type F Soils

Basin volume = setting zone volume + sediment storage zone volume

Setting Zone Volume

The setting zone volume for Type F and Type D soils is calculated to provide capacity to contain all runoff expected from up to the 1-year rainfall event. The volume of the basin's setting zone [V] can be determined as a function of the basin's surface area and depth to allow for particles to settle and can be determined by the following equation:

$$V = 10 \times C_u \times A \times R_{1\%} \times t_{set} \text{ [m}^3\text{]}$$

where:

10 = a unit conversion factor

C_u = the volumetric runoff coefficient defined as that portion of rainfall that runs off as stormwater over the 1-day period

$R_{1\%}$ = is the 1-day total rainfall depth [mm] that is not exceeded in 1 year percent of rainfall events. [See Sections 6.3.4 (i), (k), (l), (g) and (h)]

A = total catchment area [ha]

Sediment Storage Zone Volume

In the standard calculation, the sediment storage zone is 50 percent of the setting zone. However, designers can work to capture the 2-year rainfall as calculated by the RUSSE [Section 6.3.4 (i)], in which case the "Detailed Calculation" spreadsheet should be used.

Total Basin Volume

Site	C_u	$R_{1\%}$ [mm]	Total catchment area [ha]	Setting zone volume [m ³]	Sediment storage volume [m ³]	Total basin volume [m ³]
01	0.64	38.8	0.44	109.3	54.6	164.0

Plan View

Cross-section

Construction Notes

- Remove all vegetation and topsoil from under the dam wall and from within the storage area.
- Construct a cut-off trench 500 mm deep and 1,200 mm wide along the crestline of the embankment extending to a point on the gully wall level with the clear crest.
- Maintain the trench free of water and recompact the materials with equipment as specified in the SWMP to 95 per cent Standard Proctor Density.
- Select fill following the SWMP that is free of roots, wood, rock, large stone or foreign material.
- Prepare the site under the embankment by ripping to at least 100 mm to help bond compacted fill to the existing substrate.
- Construct the emergency spillway.
- Rehabilitate the structure following the SWMP.

EARTH BASIN - WET
(APPLIES TO TYPE D AND TYPE F SOILS ONLY)

SD 6-4

Rev	Description	Date	By	App
1	Initial Design	12/09/2017	LAING O'ROURKE	

LAING O'ROURKE

BONAECI

UNIVERSITY OF SYDNEY
SUSAN WAKIL HEALTH BUILDING

SOIL AND WATER MANAGEMENT
CALCULATION SHEET

Design: J1

Drawn: J1

Scale: 1:1

Draw: J1

Sheet: 41

Project Director Approved: [Signature]

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APPENDIX 6 – Emergency Preparedness and Response

The types of environmental emergencies that could occur on this site are tabulated below.

Note: This plan is designed to supplement the Client's site emergency response plan/s where available. In case of conflict, the Client's plan will apply.

Emergency	Preparation	Response	Responsibility
Significant adverse dust event due to weather conditions: High winds	<ul style="list-style-type: none"> Monitor meteorological conditions for the area - develop contingency for wind speeds in excess of 16m/s (55km/hr) High wind 'stop works' protocols in place Establish contingency strategy for additional dust control measures, additional water carts, dust suppressants, stockpile covers etc 	<ul style="list-style-type: none"> Dust generating activities will cease under direction of the Environment Manager or Site Supervisor until adverse conditions subside. Deploy additional mitigation measures to exposed areas stockpiles and other dust generating items will be water sprayed or covered. 	Site Supervisor PER
Discovery of friable asbestos.	<ul style="list-style-type: none"> Review previous land uses, environmental reports for potential for friable asbestos. Include asbestos awareness in the site induction where the potential exists Include contingency in relevant work procedures and SWMSs Identify potential service providers for asbestos control and removal. 	<ul style="list-style-type: none"> Quarantine suspected area Cover or provide dust mitigation strategy Engage licensed/approved removal and disposal organisation Complete post removal verification 	Project Leader Site Supervisor PER Safety Representative
Flooding	<ul style="list-style-type: none"> Monitor meteorological conditions – develop contingency strategy for rainfall > 100mm in 24hours or potential for > 1in 5 ARI All chemicals, fuels and other hazardous substances to be in secured containers and stored within a sealable shipping container Remove plant and equipment from low lying areas Secure plant that cannot be removed Review site drainage flow paths: Redirect site drainage to prevent flooding of residential/business premises Ensure site drainage does not concentrate surface flow Review and address the potential for excess water entering the site Review and maintain erosion and sedimentation controls 	<ul style="list-style-type: none"> Recover materials washed from site including sediment and other waste. Check effectiveness of erosion and sedimentation devices and other flood controls, maintain where required and safe to do so. 	Site Supervisor PER

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Emergency	Preparation	Response	Responsibility
Temporary erosion and sediment controls are damaged during rainfall.	<ul style="list-style-type: none"> Plan controls to be suitable for expected conditions Ensure sufficient materials, labour and plant are available for additional controls. 	<ul style="list-style-type: none"> A review of the site to be undertaken by a Environmental Manager and Site Supervisor. Controls to be repaired or replaced within 24 hours of detection, immediately if inclement weather current. 	Site Supervisor PER
Damage to sediment basin	<ul style="list-style-type: none"> Check basins for suitability to project requirements; size, treatment type, etc Basin outlet to be designed to remain functional in 1 in 20 ARI event Ensure basin construction is in accordance with QA requirements including relevant ITPs. 	<ul style="list-style-type: none"> Water in damaged basin to be pumped to another secure basin, or discharged if it meets the site criteria. Damage to be repaired as soon as practical. Repairs to be monitored when basin brought back online. 	Site Supervisor PER
Spill of hazardous or toxic substance (< 20L)	<ul style="list-style-type: none"> Awareness training of appropriate response and procedures to be incorporated into Project Induction SDS on site for all materials and kept up to date Adequate supply of absorbent materials available in the site compound and on vehicles at work location 	<ul style="list-style-type: none"> Report spills immediately to Site Manager and/or the Project Environment Representative Attempts to be made to limit or contain the spill using sand bags to construct a bund wall, use of absorbent material, temporary sealing of cracks or leaks in containers, use of geotextile or silt fencing to contain the spill. Site Manager and Supervisors to coordinate the response, clean up and disposal of the material Material to be disposed of in accordance with the manufacturers' recommendations and applicable legislation. 	Site Supervisor PER

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Emergency	Preparation	Response	Responsibility
Major spill of hazardous or toxic substance off site or to environmentally sensitive area (> 20L)	<ul style="list-style-type: none"> Awareness training of appropriate response and procedures to be incorporated into Environmental and Safety Induction SDS on site for all materials and kept up to date Adequate supply of absorbent materials available in the site compound and on vehicles in work location Emergency telephone numbers for Emergency Response organisations/fire brigade prominently displayed around office and issued to supervisors Initial contact to be made with relevant organisations at project commencement 	<ul style="list-style-type: none"> Report spill immediately to Project Leader and/or Site Manager who will notify the client Attempts to be made to limit or contain the spill using sand bags to construct a bund wall, use of absorbent material, temporary sealing of cracks or leaks in containers, use of geotextile or silt fencing to contain the spill, transferring remaining material. Implement procedures to notify the relevant authorities. Site Manager to coordinate the response, clean up Fire brigade or emergency organisations should be called if spill cannot be controlled by site resources. Evacuation procedures are to be implemented to remove non-essential personnel from the affected area On site client personnel are informed of the incident, internal reporting as per potential Class 1 matter. Access and egress to the area is established to ensure the appropriate vehicles have effective access and congestion is minimised. Senior Officer from fire brigade /emergency organisation assumes control of the operation with Laing O'Rourke personnel assisting as required. Commence data gathering and investigation once emergency is contained 	Project Leader Site Supervisor PER
Fire	<ul style="list-style-type: none"> Awareness training of appropriate response and procedures to be incorporated into Environmental and Safety Induction Fire extinguishers maintained, clearly labelled and distributed around site compound and vehicles Training in the use of fire extinguishers and which one to use for each type of fire First Aid supplies are stocked and adequate Emergency telephone numbers for Emergency Response organisations/fire brigade prominently displayed around office and issued to supervisors 	<ul style="list-style-type: none"> For small fires, attempts to be made to extinguish the fire or limit its spread with available fire extinguishers or water hoses if appropriate. Supervisor is to be informed immediately. Supervisor to contact client and external services where necessary (fire, ambulance) as a precautionary measure. All personnel in the vicinity to be assembled in the Evacuation Assembly Area and a head count performed 	Site Supervisor PER

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Emergency	Preparation	Response	Responsibility
	<ul style="list-style-type: none"> Initial contact to be made with relevant organisations at project commencement 	<ul style="list-style-type: none"> Any resulting fuel or chemical spill to be handled as detailed above Supervisor to coordinate with emergency services and provide assistance as required. 	
Vibration causing structural damage	<ul style="list-style-type: none"> Choose correct plant when working near structures; minimise size and impact Use safe working distances during planning phase Implement vibration monitoring at commencement of vibration generating works to ensure compliance with standards 	<ul style="list-style-type: none"> Activities causing vibration would cease under direction of the Environment Manager or Site Supervisor. Any occupants of buildings may be evacuated with due consideration to safety, and the area secured to prevent unauthorised access. A structural assessment to be undertaken; and if any damage is associated with construction, rectification work would be agreed. 	PER Project Leader
Unapproved clearing / damage to protected vegetation – threatened/endangered species	<ul style="list-style-type: none"> Clearly demarcate site boundaries Clearly demarcate clearing areas and brief site personnel Identify/mark vegetation to be retained or that is protected. Identify species that may be impacted, include material within the project induction Included requirements within construction planning documentation. 	<ul style="list-style-type: none"> Immediately cease activities Engage consultant to assess damage to vegetation and presence of any endangered or threatened communities. 	Site Supervisor PER
Injury/death to protected/endangered/threatened fauna	<ul style="list-style-type: none"> Identify potentially impacted species prior to commencement on site. Identify species that may be impacted, include material within the project induction Review/inspect vegetation to be cleared prior to clearing – utilise ecologist/spotter where there is the potential for endangered/threatened species Engage with local vet/WIRES representative on the appropriate contact/procedure Site procedure for the short term management of injured fauna 	<ul style="list-style-type: none"> Immediately cease activities upon discovery of injured fauna Implement procedure for short-term stabilisation and transport to Vet or WIRES Undertake additional vegetation inspection to identify any remaining fauna prior to recommencement. 	Site Supervisor PER
Damage / destruction of indigenous heritage item	<ul style="list-style-type: none"> Ensure site investigations detail any heritage items on or in proximity to the site. Include awareness material within the project induction Develop a 'stop works' protocol for any heritage find on site. 	<ul style="list-style-type: none"> Cease works and stabilise the area, under the direction of the Environmental Manager or Site Supervisor. The Environmental Manager is to report the remnants to the client and regulatory authority. 	PER

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Emergency	Preparation	Response	Responsibility
		<ul style="list-style-type: none">Request an archaeologist to assess the significance and archaeological potential of the uncovered feature.	
Damage / destruction of European heritage	<ul style="list-style-type: none">Ensure site investigations detail any heritage items on or in proximity to the site.Develop a 'stop works' protocol for any heritage find on site.	<ul style="list-style-type: none">Cease works and stabilise the area, under the direction of the Environmental Manager or Site Supervisor. Contact an archaeologist to assess the significance and archaeological potential of the uncovered feature.	PER

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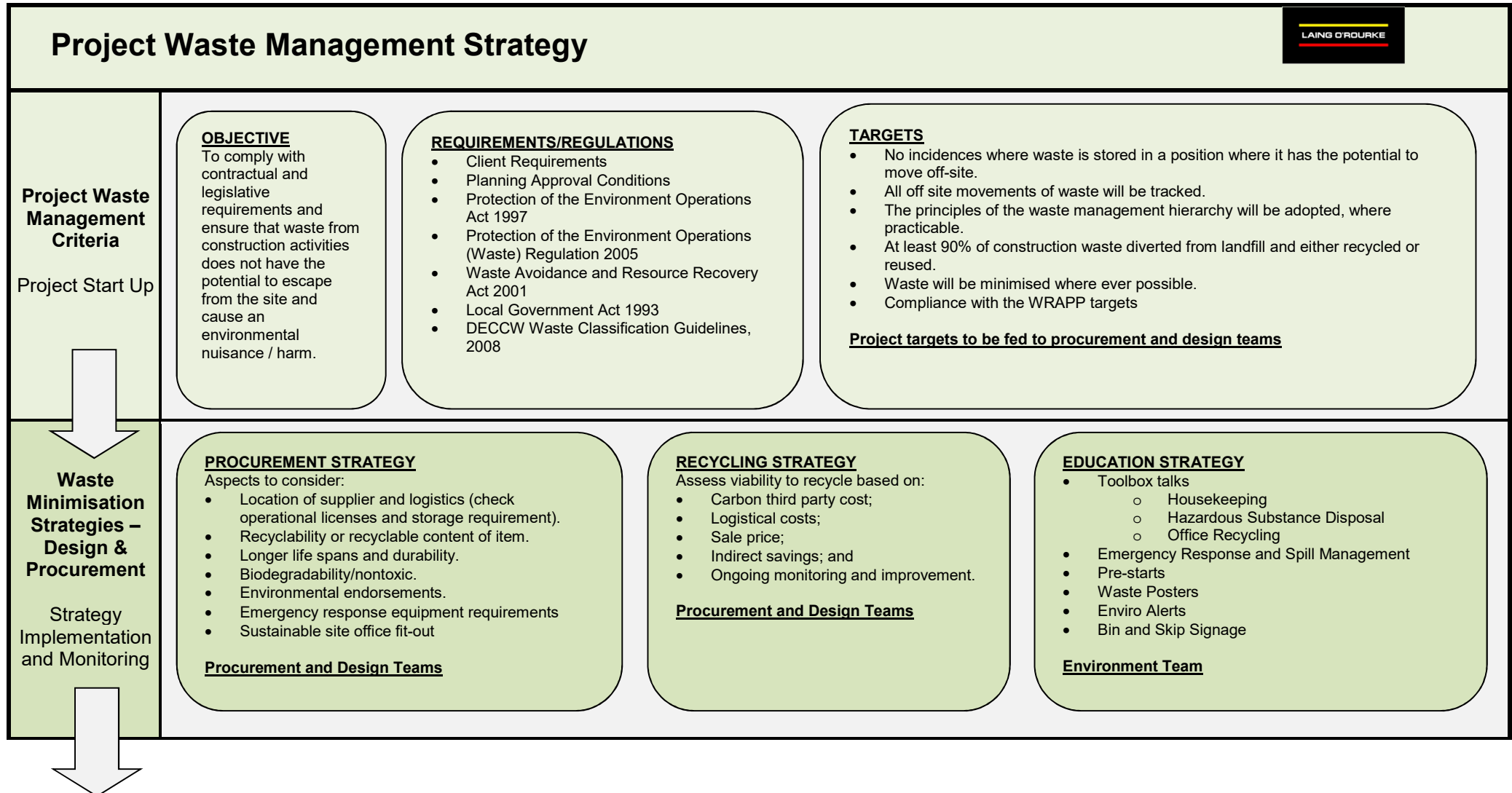
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APPENDIX 7 – Project Waste Strategy

The following strategy is an indicative guide to identify and state the type of waste that is intended to be controlled and recycled where practical.



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Waste Management Strategies – Construction

All Personnel on Site

GENERAL WASTE

General Solid (non-putrescible)

- Non-recyclable waste materials
- Broken Glass
- Dried sediment collected from stormwater management systems
- Garden waste
- Drained oil filters
- Rags and oil-absorbent materials that only contain non-volatile petroleum hydrocarbons and do not contain free liquids
- Building rubble

Dispose to general waste skip bins or office bins

General Solid (putrescible)

- Food waste
- Putrescible Organi
- Manure

RECYCLABLE WASTE

General Solid (non-putrescible)

- Excess dried concrete
- Steel off cuts
- Reinforcing steel
- Timber
- Scrap Metal
- Paper and cardboard
- Comingled containers – milk bottles, drink bottles, cans, etc
- Non-putrescible cleared vegetation may be mulched and reused for landscaping or ground stabilisation if no invasive weeds included

Place in labelled skip bins or office bins

HAZARDOUS WASTE

Liquid

- Waste oils
- Paints

Solid

- Asbestos containing material including spoil from earthworks
- Empty oil and paint containers
- Oily rags
- Contaminated soil

Dispose to specific hazardous waste bin on site.

Asbestos is only to be handled or removed by occupational hygienist or appropriately licenced removal contractor (Class A - to remove friable asbestos, Class B - to remove non friable asbestos).

Specific oily rag bin to be used for oily rags, used spill kit material, etc.

Decant waste oils/paint into labelled, banded drums.

Licensed waste contractors only to collect and remove all wastes from site
Laing O'Rourke to ensure the waste facility is fully licensed to accept the types of waste being sent offsite
Transport and waste facility dockets required within 3 days of disposal from site
Laing O'Rourke to input and interpret data from waste tracking spreadsheet

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APPENDIX 8 – Project Permits and Licenses Register

Project Permit and Approvals Register	Applicable to the project (Yes / No)	Permit / licence / Approval Number / registration certificate	Commencement date	Expiry date	Surrender requirements	Project custodian	Project briefing date
Environmental Planning and Assessment Act 1979							
	Yes	Part 5 development without consent					
Environment Protection Licence	No						
	No						
Water Act 1912	No						
Section 10 Surface Water Licence	No						
Part 5 Section 112 Groundwater Licence	No						
Part 8 Division 3 Approval of controlled work	No						
Water Management Act 2000	No						
Section 56 Access Licences	No						
Section 89 Water use approvals	No						
Section 90 Water management work approvals	No						
Section 91 Activity Approvals	No						
Fisheries Management Act 1994	No						
Division 3 (Sections 199, 200, 201) Dredging and Reclamation	No						

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Project Permit and Approvals Register	Applicable to the project (Yes / No)	Permit / licence / Approval Number / registration certificate	Commencement date	Expiry date	Surrender requirements	Project custodian	Project briefing date
Section 205 Marine vegetation - regulation of harm Permit to Harm Marine Vegetation	No						
Section 220ZW Licence to harm threatened species, population or ecological community or damage habitat	No						
Sydney Water Act 1994	Yes						
Section 49 Offence to discharge into works - Trade Waste Permit	No						
Permit to Use Approved Metered Standpipes on Sydney Water Hydrants	Yes	Supplied by demolition contractor					
Hunter Water Act 1991	No						
Section 31 Offence to discharge into works - Trade Waste Permit	No						
Dangerous Goods (Road and Rail) Transport Act	No						
Section 6 Licensing of vehicles transporting dangerous goods	No						
Section 7 Licensing of drivers transporting dangerous goods	No						
Local Government Act	Yes						
Section 68 - What activities, general, require the approval of council	Yes						
Section 68A - Operation of a system of sewage management	Yes						

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Project Permit and Approvals Register	Applicable to the project (Yes / No)	Permit / licence / Approval Number / registration certificate	Commencement date	Expiry date	Surrender requirements	Project custodian	Project briefing date
Roads Act 1993	No						
Section 138 Works and structures - permit to undertake works to roads	No						
Work Health and Safety Regulation 2017	Yes						
Section 174ZS Notification to Safework	Yes	Demolition and asbestos					
Section 175L Major hazard facility must be registered or provisionally registered	No						
National Parks and Wildlife Act 1974	No						
Section 90 Aboriginal heritage impact permit	No						
Heritage Act 1977	No						
Division 3 Applications for approval	No						
Section 139 Excavation permit	No						
Marine Safety Act	No						
Section 29 Types of marine safety licences	No						
Management of Waters and Waterside Lands Regulations	No						
Division 3 Occupation of Waters	No						
Rural Fires Act 1997	No						

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Project Permit and Approvals Register	Applicable to the project (Yes / No)	Permit / licence / Approval Number / registration certificate	Commencement date	Expiry date	Surrender requirements	Project custodian	Project briefing date
Section 89 Issue of permits (includes "hot works" which would constitute lighting a fire)	No						
Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)	No						
Include details of approvals under this Act where applicable	No						
Other							
List other relevant legislation here							

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APPENDIX 9 – Environmental Incident Investigation Guidelines

Incident Investigation ([E-T-8-1222 Environmental Incident and Complaint Report](#))

Class 1 incidents shall be subject to an ICAM or Tap Root investigation. The following section outlines the environmental incident and complaint investigation. The actual detail required will vary depending on the class of the incident. In any case, form E-T-8-1222 Environmental Incident and Complaint Report is to be used to document the incident.

Step 1- Identify the class of incident and obtain the incident or complaint details.

Step 2 - Observation and information gathering.

The first priority is to understand the incident and how the incident occurred.

- **Take samples or obtain results (required for Class 1&2)** - laboratory results or insitu samples (Note: for Class 1 & 2 incidents NATA certified laboratories may be required)
- **Interview persons involved where required** - Include witnesses / supervisors / experts
- **Inspect the incident scene** - Take measurements (do not guess), photos, videos, drawings, diagrams / sketches.

Collect related documentation - Attach additional material as appropriate such as Work Method Statements, JSEA's, Environmental Risk Action Plans (ERAPs), Erosion and Sediment Control Plans, Risk Assessments, induction records, toolbox talks, pre-start, environmental training records, subcontractor/client incident report, relevant design documentation, maintenance records.

Step 3 - Give detailed description of the incident

- Outlined exactly what happened and give the following details as applicable:
- Area or people affected and pollutant type as appropriate
- Time, date and weather conditions
- Plant, equipment, organisations involved
- Potential stakeholders involved
- Describe the nature of the incident including:
- Breach of licence condition, Act or regulation
- Discovery of cultural heritage item, artefact, etc
- Unauthorised release of harmful substance to environment
- Penalty or fine imposed or protection order or notice issued.
- Performance of the environmental controls
- Describe the immediate remedial actions undertaken:
- Notify relevant parties
- Contain pollution or clean up affected area
- Repair to environmental controls
- Rectify damage and remediate the affected area

Step 4 - Undertake basic level incident analysis

List the elements involved including people, equipment and environment (weather conditions), procedures, organisational elements involved in the incident. List the essential and contributing factors for the items above.

Step 5 - Identify the corrective and preventative actions.

- Change to equipment/machinery design / maintenance
- Improve environmental control measures
- Implement additional resources
- Change to work methods, procedures or processes
- Change or additional induction training
- Address organisational issues

Step 6 - Implement the corrective and preventative actions outlined above

- Outline responsibilities and accountabilities
- Obtain relevant approvals for the corrective and preventative actions (i.e. Regulatory Authority or Client requirement)
- Provide proposed completion dates for the approved actions
- Document actions implemented and close out

Note: where a Class 1 Incident has occurred the HSE Director will initiate the investigation and allocate responsibilities, an external consultant may be engaged. Authorities are to be notified in accordance with the legislative time frames in the applicable state.

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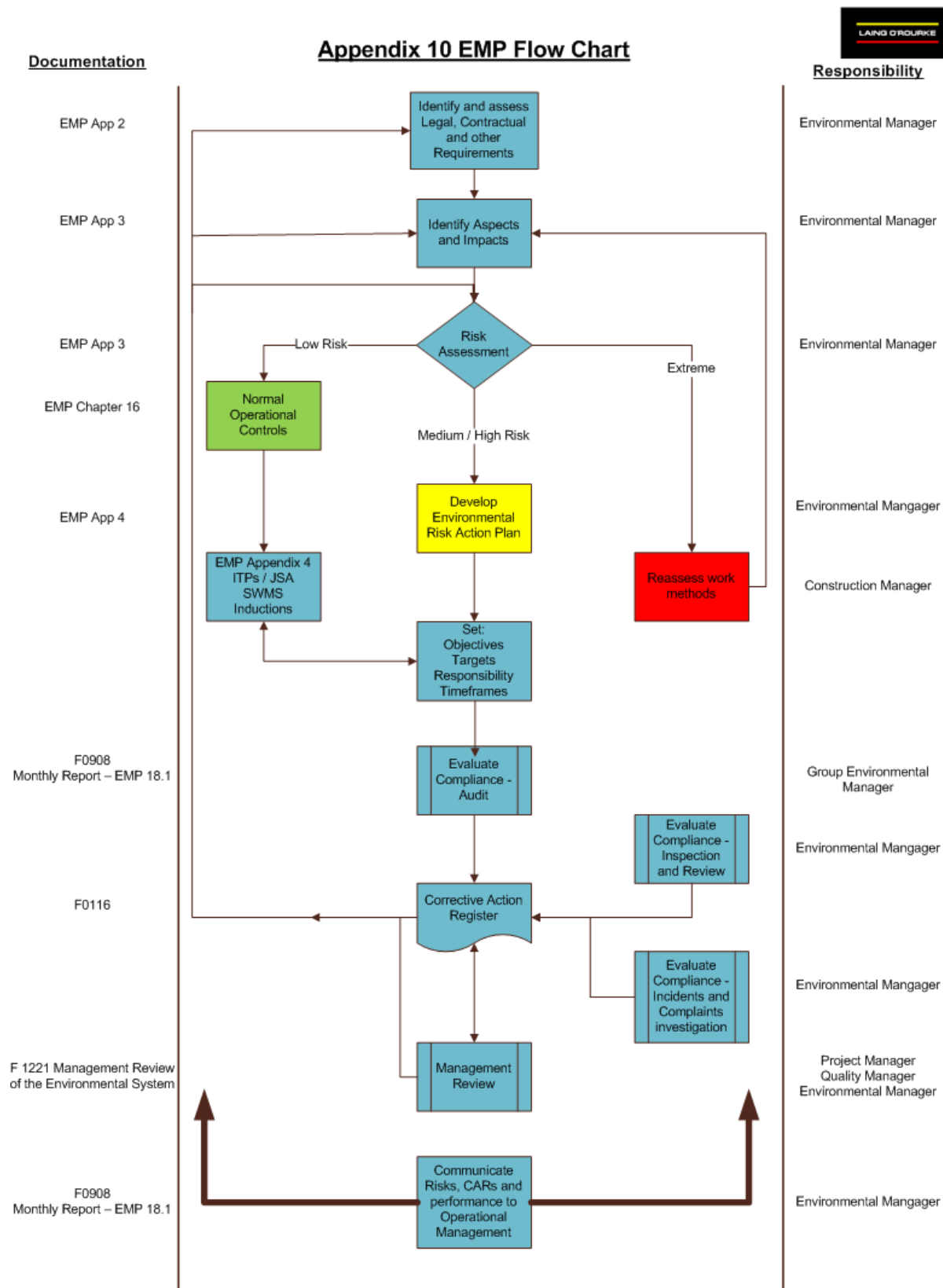
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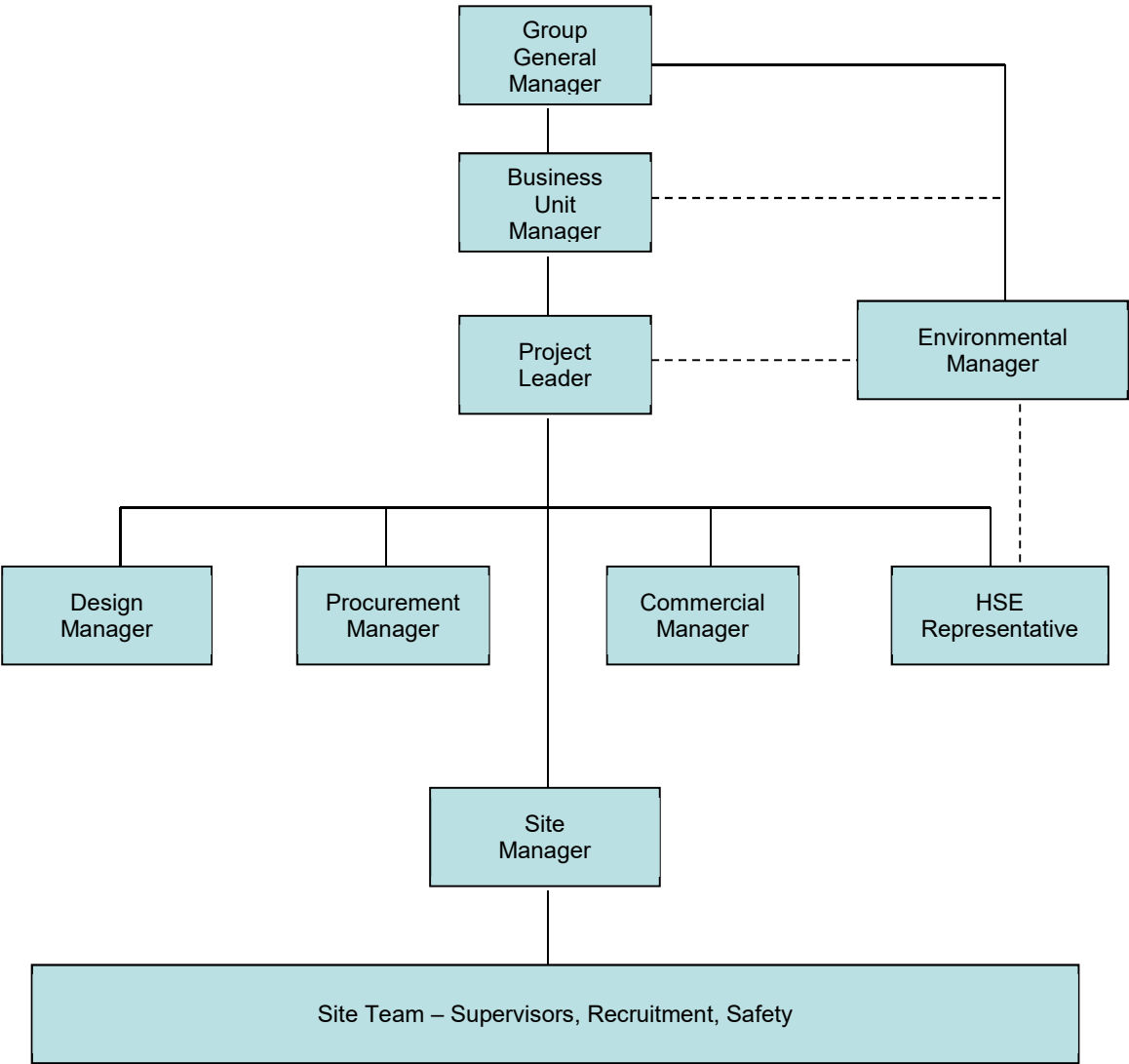
APPENDIX 10 – EMP Flow Chart



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APPENDIX 11 – Organisation Chart



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APPENDIX 12 – Other Attachments

- [E-T-8-1227](#) [Environmental Inspection Report](#)
- [E-T-8-1200](#) [Environmental Risk Action Plans](#)
- [E-T-8-1221](#) [Management Review of the Environmental System](#)
- [E-T-8-1222](#) [Environmental Incident Complaint Report](#)
- [E-T-8-1298](#) [Water Sampling Record](#)

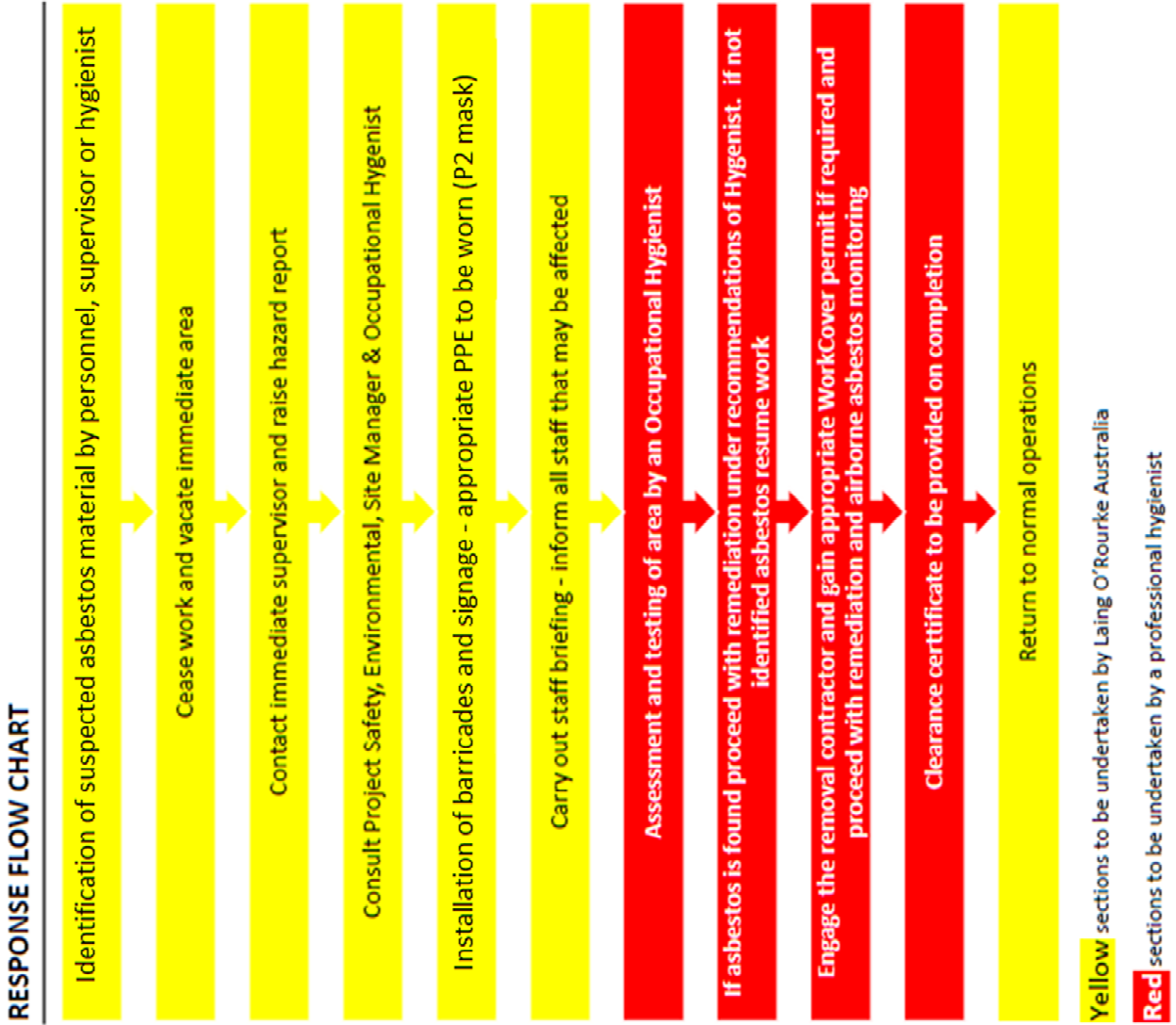
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APPENDIX 13 – Staff Acknowledgement Register

Environmental Management Plan Acknowledgment Register			
NAME	POSITION	SIGNATURE	DATE
	Project Leader		
	Project Safety Advisor / Environmental Representative		
	Senior Project Engineer		
	Site Engineer		
	Site Manager		

APPENDIX 14 – Unexpected Finds Protocol



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PPENDIX 15 – Conditions of Approval Compliance Tracking Matrix

Condition Number	Condition	Action	EMP Reference	Compliance Status	Responsibility Primary / Secondary	Laing O'Rourke Individual