Lake Macdonald Dam Improvement Project

Early Works Environmental Management Plan (EWEMP)

Revision C | October 2024

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Document control

Document History			
Rev	**Date**	**Reason for Issue***	**Approved for Release by**
A	27/09/2024	Issued for Approval	Sarah Carroll
B	10/10/2024	Issued for Approval	Sarah Carroll
C	29/10/2024	Issued for Approval. Revision to adopt comments from OCG, DESI, NSC, DTMR	Sarah Carroll

Current Document Reviewers and Approvers		
Date	**Name**	**Reviewer or Approver Signature**
28/10/2024	Jason Richard	
28/10/2024	Sarah Carroll	

Revision Tracking		
Date	**Rev**	**Updates made**

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Abbreviations

Abbreviation	Meaning
AMS	Activity Method Statement
CHMA	Cultural Heritage Management Agreement
CNVIA	Construction Noise and Vibration Impact Assessment
CPESC	Certified Professional in Erosion & Sediment Control
CSM	Community & Stakeholder Manager
CSS	Cooroy State School
DTATSIPCA	Department of Treaty, Aboriginal and Torres Strait Islander Partnerships, Communities and the Arts
DESI	Department of Environment, Science and Innovation
DOR	Department of Resources
ECP	Environmental Control Plan
Eng	Engineer
EMS	Environmental Management System
ESCP	Erosion and Sediment Control Plan
EPBC	Environmental Protection and Biodiversity Conservation
EMP	Environmental Management Plan
ESM	Environment and Sustainability Manager
EWEMP	Early Works Environmental Management Plan (this Plan)
EWCEMP	Early Works Construction Environmental Management Plan
FSC	Fauna Spotter Catcher
HSEQ	Health, Safety, Environment and Quality
HVNL	Heavy Vehicle National Law
IAR	Impact Assessment Report
IECA	International Erosion Control Association
JH	John Holland
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NATA	National Association of Testing Authorities
NSC	Noosa Shire Council
NTU	Nephelometric Turbidity Unit
PM	Project Manager
SEP	Site Environmental Plan
SMP	Species Management Program/Plan

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Sup	Supervisor
TMP	Traffic Management Plan
TRA	Task Risk Assessment
TCP	Traffic Control Procedure
TGS	Traffic Guidance Scheme
TPZ	Tree Protection Zone
TRH	Total Recoverable Hydrocarbons
TSS	Total Suspended Solids
WoNS	Weeds of National Significance
WSC	Worker Start Cards
WRA	Workplace Risk Assessment
WTP	Water Treatment Plant
WQO	Water Quality Objectives

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Executive Summary

The Six Mile Creek Dam Safety Upgrade Project (the Project) – now known as the Lake MacDonald Dam Improvement Project - was declared a Coordinated Project for which an Impact Assessment Report (IAR) was required on 22 December 2017. The Coordinator-General's Evaluation Report (CGER) for the Project was released on 20 May 2019. The CGER recommended that the project should proceed subject to conditions. The Commonwealth Minister for Environment also approved the project under the *Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act*)* (subject to conditions) on the 7 November 2019.

Seqwater intends to commence a package of Early Works in 2024 in readiness for the main project works in 2025. The Early Works package includes the establishment of preliminary site facilities, including construction of hardstand areas and internal site access roads, establishment of site offices, installation of pumps and pipework for lake lowering, minor vegetation clearance to allow site access, and limited delivery and stockpiling of materials to facilitate these early works.

This Early Works Environmental Management Plan (EWEMP) has been prepared to ensure that the environmental and social effects of the proposed works are effectively managed, monitored and reported, and that the local community (and other key stakeholders) are appropriately engaged prior to and during the works.

The scope of the Early Works has been designed to avoid triggers for additional permits and approvals. The disturbance footprint is limited to the existing operational area of the Noosa Water Treatment Plant (WTP) and avoids Matters of State Environmental Significance (MSES) - Protected Plants, areas known or likely to support features of Cultural Heritage Significance.

A small number of trees within the existing operational areas of the WTP will be cleared to facilitate construction of an access track as part of the Early Works. Both the EPBC Act approval for the Project and the CGER authorise the clearing of up to 3ha of vegetation within a defined vegetation clearing extent. The approved vegetation clearing extent for the Project includes the Early Works footprint in its entirety.

This EWEMP includes control plans for environmental aspects such as water quality, noise and vibration, air quality and flora and fauna. A Community and Stakeholder Engagement Plan and a Traffic Management Plan (TMP) have also been prepared specifically for the Early Works.

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1. Introduction

1.1. Background

Lake Macdonald Dam is one of several dams across Southeast Queensland to be upgraded as part of Seqwater's Dam Improvement Program. Seqwater is responsible for the ongoing safety of the Dam and with a growing population downstream, there are more people at risk in the extremely unlikely event of a dam failure.

The Lake Macdonald Dam Improvement Project will be the first major upgrade of the dam since it was built in 1965, and the walls were raised in 1980. The upgrade is a critical project in Seqwater's Dam Improvement Program and must result in a dam structure compliant with the legislative requirements of the Water Supply (Safety and Reliability) Act 2018 and the Queensland Dam Safety Guidelines.

While the upgrade will demolish the existing dam, delivering a new dam in its place, critical to its success will be the effective management of creek inflows, sensitive aquatic fauna and the interfacing local community. This important upgrade and spillway and embankment reconstruction will not only provide essential earthquake and flood protection but improve water supply certainty for the entire Sunshine Coast regional network.

The Impact Assessment Report (IAR) for the Project anticipated a six-month period of Early Works, including:

- Acquire remaining licences, permits and approvals for the works to be carried out.
- Closure of some recreational facilities and relocate the Gerry Cook Fish Hatchery.
- Establish site works area on Seqwater land, including site office facilities, signage, secure compounds, and mass concrete batch plant.
- Prepare laydown, stockpile, and borrow areas.
- Establish safe site access for construction traffic via Lake Macdonald Drive, Collwood Road, and internal haul roads.
- Drawdown of lake to 89 m AHD, including aquatic fauna relocation.
- Install sheet pile coffer dam along the upstream slope of the existing embankments and spillway.
- Decommission and remove the existing spillway and embankments.
- Construct a working platform in preparation for the new spillway foundation works (secant pile cells).

Some of the activities considered likely to occur in the Early Works phase as described in the IAR have either already occurred, are more appropriately regulated as a part of project activities which are yet to commence or require additional approvals which are yet to be obtained. A refined scope of Early Works has been developed to prepare the site for the commencement of the main works (project activities) in 2025 and is defined in Section 1.2 below.

1.2. Early Works Project Scope

The Early Works change will facilitate the commencement of the site works in (commencing November) 2024 and relates to activities which were described in the Project's IAR and assessed in the CGER. The Early Works would bring forward environmental impacts which are generally consistent with those described in the IAR associated with the following activities:

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- Construction activities between the approved hours of operation between 6:30 am to 6:30 pm Monday to Friday and 6.30 am to 4:00 pm Saturday.
- Limited vegetation removal and/or trimming and earthworks on Seqwater land to prepare stockpile areas and laydown areas for construction materials and equipment.
- Limited delivery of rock and aggregate materials for the purpose of the Early Works.
- Installation of pumps and pipes to enable lake drawdown.
- Establishment of site offices.
- Construction of internal access roads.

The Lake Macdonald Dam Improvement Early Works Package (the Project) is a separate package of works to the main project, commencement of the main project is triggered by the draw down of the lake, these works are intended to be Staged to allow for commencement of the Main Works once approved and includes the following detailed scope:

1. Site establishment

1. Hardstands for establishment of crib sheds, offices, toilets, and amenities.
2. Concreting walkways and steps for access to crib facilities.
3. Car parking area.
4. Installation of Permanent and temporary Security fencing and appropriate safety signage for the site.

2. Aquatic Fauna Survey

5. Launching of Marine vessels for survey works.
6. Use of Marine vessel mounted electronic survey equipment.

3. Access tracks

7. Excavating to solid material.
8. Placing geofabric and rock.
9. Compacting.

4. Vegetation clearing

10. Minor clearing within the established Water Treatment Plant (WTP) footprint for the installation of cribs, siphon pipes and access tracks only. No clearing of remnant vegetation is proposed under this EWEMP.

5. Installation of pump and pipe work for lake lowering

11. Leveling of areas – excavation over the right abutment.
12. Open channel drain with rip-rap to the high-bank of Six Mile Creek. No works proposed within the watercourse.
13. Importation of clean rock to create a pad.
14. Laying of pipes and hoses.

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15. Creating barrier fencing along road reserve to protect this infrastructure.

6. Laydown areas

16. Importing and stocking piling of clean rock.
17. Placement of shipping containers to store equipment.
18. Storage of sheet piles.

The Early Works are expected to be completed over a period of 4 months (weather permitting). During that period, the following critical controls will be in place to limit the environmental impacts of the works:

- All works will be restricted to the approved operational hours for the Project.
- Heavy vehicle movements will be limited to a maximum of 36 movements (two-way) to and from site per day during the Early Works period.
- All traffic during the Early Works will use the approved access routes for the Project, which limit heavy vehicle access to Lake MacDonald Drive.
- No go zones will be established to ensure that there are no impacts to Matters of State (MSES) or Matters of National Environmental Significance (MNES) because of the Early Works.
- Loading and unloading of materials will be scheduled during hours that would least affect sensitive receptors (e.g., minimal overlap with school pick-up and drop-off periods), and at locations away from sensitive receptors.

This management plans sets out the roles and responsibilities, mitigation measures and stakeholder engagement processes to manage the activities noted above. A visual layout of the proposed Early Works footprint can be found below in Figure 1.

Temporary stockpiling of rock is proposed for Hardstand 1 and Hardstand 2 areas. The rock will be used for ongoing haul road construction.

Hardstand 3 will also be constructed along the western edge of the lake.

1.3. Proposed Timing and Duration

Early Works are proposed to commence in November 2024 and extend to the end of February 2024 (weather permitting). The activity schedule for Early Works is shown in Table 1 below. These works will be undertaken within project approved hours of operation outlined in Section 1.2. Figure 1, below determines the current location and planning for the works:

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Table 1: Activity Schedule

Program of Works		
Activity	**Start Date**	**Duration**
1. Site establishment	7-Nov-24	4 Months
2. Hardstands and Laydowns	8-Nov-24	2 Months
3. Tree removal	8-Nov-24	1 week
4. Reservoir Lowering – Pump delivery	02-Nov-24	1 week
5. Reservoir Lowering – Pump Pads	11-Nov-24	3 Months
6. Reservoir Lowering – Pump & pipeline install	14-Nov-24	3 Months
7. Haul and Access Roads	22-Nov-24	2 Months
8. Cofferdam material Deliveries	21-Nov-24	3 Months

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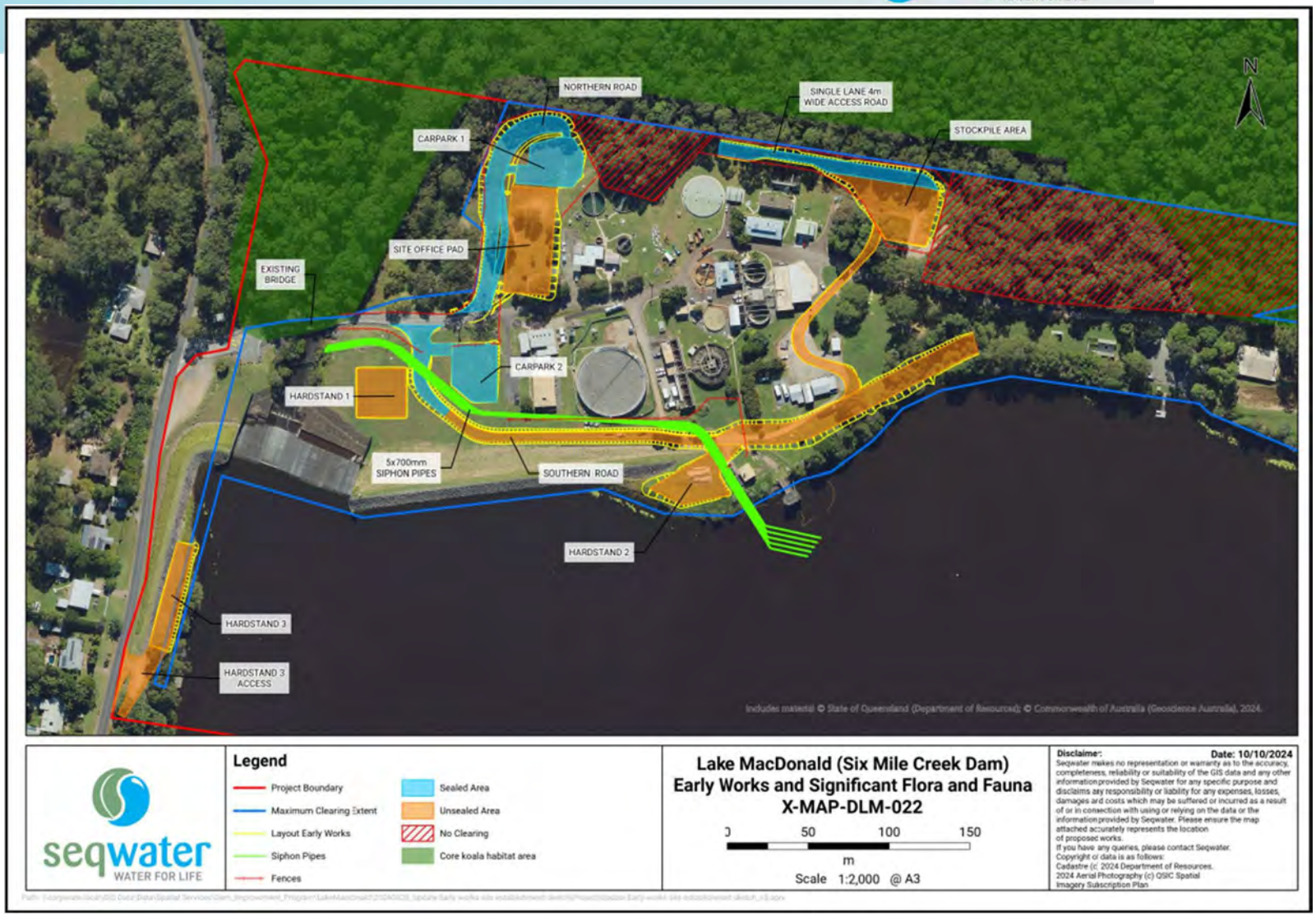

Figure 1: Proposed Early Works Site Establishment Footprint

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1.4. Objectives

This EWEMP sets out the environmental management requirements of Seqwater and its Principal Contractor for the Project. The specific objectives of this EWEMP are to:

- Minimise and manage environmental impacts associated with the Early Works
- Ensure compliance with environmental legal requirements and obligations
- Provide ongoing environmental performance review and compliance monitoring. The

intended outcomes of this EWEMP include:

- Establish procedures that will minimise adverse environmental, social and economic impacts
- Facilitate compliance with the relevant Legislation
- Enhancement of environmental performance on the Project for Seqwater, the environment, and community.

1.4.1. Additional Management Plans

Table 2 below describes how this plan aligns with the Early Works Construction Environmental Management Plan (EWCEMP) and other plans relevant to the Early Works scope.

Table 2: Environmental documentation relevant to the Early Works scope

Plan	Doc Number	Objective
Early Works Environmental Management Plan (EWEMP)	LMDIP-10000-GNL-ENV-MPL-00001	This Plan • Objectives outlined in Section 1.4
Early Works Construction Environmental Management Plan (EWCEMP)	TBC	• Contractor's EWCEMP designed for implementing the requirements of this EWEMP • Details the Contractor's relevant internal process and procedures
Appendix C IAR: Lake Macdonald Water Lowering – AMP Rev 2	LMDU-00000-GNL-ENV-REP-00002	• Sets parameters and mitigations for WQ monitoring and management immediately prior to and during lake drawdown (not part of the Early Works scope) • Sets parameters around aquatic survey requirements
Site Environmental Plans (SEPs)	NA	• Contractor developed SEPs are used to provide detailed site-specific environmental information to the workforce • SEPs link the requirements of this EWEMP to the implementation of controls onsite.

1.5. Location

The proposed Early Works are limited to the operational area of the existing Noosa WTP. The Project site can be directly accessed via the western access roads (Lake Macdonald Drive and the Seqwater Access Road crossing Six Mile Creek to the western entrance Noosa WTP). The eastern access road route via (Cooroy Noosa Road, Sivyers

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Road, Gumboil Road and Collwood Road) (Figure 2) to the eastern entrance to the Noosa WTP, is NOT to be used by project heavy vehicles and is to be maintained for emergency use only.

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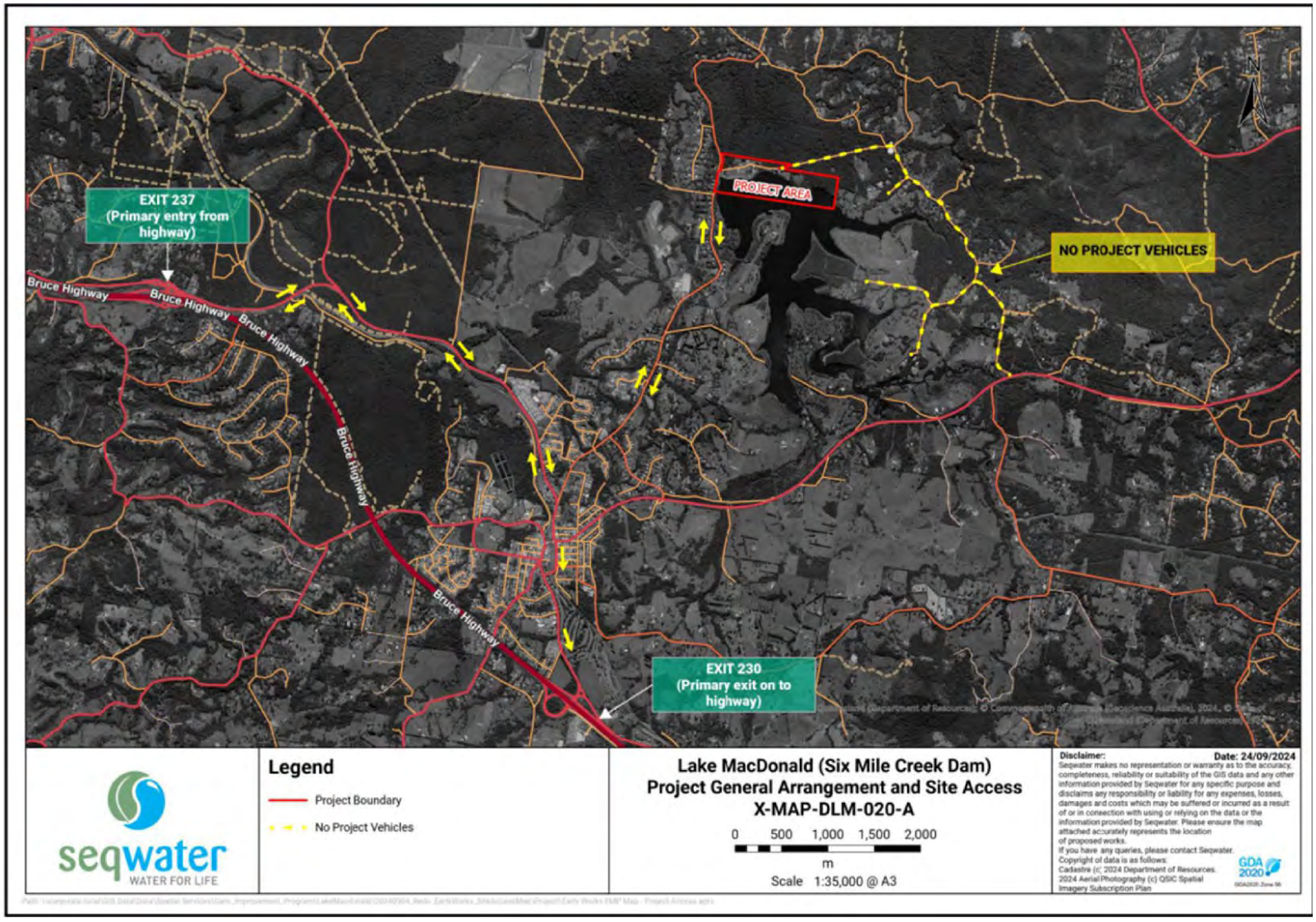

Figure 2: Project Location and Site Access

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2. Legislation and Regulatory Requirements

To ensure identified environmental impacts associated with the Early Works are minimised or avoided, this EWEMP may refer to relevant environmental legislation, controls, standards, and guidelines. The EWEMP also requires that the Early Works meet the community's expectations around environmental management. A list of applicable environmental legislation is provided in this section.

Table 3 is a list of all Federal and State Legislation/Acts applicable to this EWEMP.

Table 3: Legislation relevant to the project

Legislation	Application	Administering Authority
FEDERAL		
Environment Protection & Biodiversity Conservation Act 1999	As a controlled action, the project is subject to assessment and approval under this Act	DCCEEW - Department of Climate Change, Energy, the Environment and Water
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	Management of Aboriginal cultural heritage	DCCEEW - Department of Climate Change, Energy, the Environment and Water
STATE LEGISLATION		
Aboriginal Cultural Heritage Act 2003 (Qld)	Management of Aboriginal cultural heritage	DTATSIPCA - Department of Treaty, Aboriginal and Torres Strait Islander Partnerships, Communities and the Arts
Environmental Protection Act 1994 (Qld)	Overall environmental planning and protection	DESI - Department of Environment, Science and Innovation
Environmental Protection Regulation 2008 (Qld)	Overall environmental planning and protection specific to each environmental aspect	DESI - Department of Environment, Science and Innovation
Fisheries Act 1994 (Qld)	Management of fisheries' resources and habitats	DAF - Department of Agriculture and Fisheries
Land Protection (Pest and Stock Route Management) Act 2002 (Qld)	Management of weeds, pest animals and the stock route network	DAF - Department of Agriculture and Fisheries
Biosecurity Act 2014	Management of weeds and pests	DAF - Department of Agriculture and Fisheries
Native Title (Queensland) Act 1993 (Qld)	Management of native title	DOR – Department of Resources
Nature Conservation Act 1992 (Qld)	Management and protection of plants and animals and management of Protected Areas	DESI - Department of Environment, Science and Innovation

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Nature Conservation Regulation 1994 (Qld)	As above	DESI - Department of Environment, Science and Innovation
Vegetation Management Act 1999 (Qld)	Management of vegetation clearing	DOR – Department of Resources
Water Act 2000 (Qld)	Management of water usage, protection and treatment	DESI - Department of Environment, Science and Innovation
Work Health and Safety Act 2011 (Qld)	Management of workplace health and safety and hazardous chemicals	DJAG -Department of Justice and Attorney-General
State Development and Public Works Organisation Act 1971	The administering legislation for a coordinated project	DSDI - Department of State Development and Infrastructure

2.1. Permits and Approvals

The Early Works package is limited to works which do not require approvals additional to those below:

- Coordinator-General's Evaluation Report, Six Mile Creek Dam Safety Upgrade Project (May 2019).
- EPBC Approval 2017/9078 – commencement of the Early Works marks commencement of the action as defined by the Project's EPBC approval (November 2019).
- Coordinator-General's Change Report – Early Works – October 2024.

The scope of the Early Works has been minimised to avoid triggers for additional permits and approvals, including MSES, Protected Plants and MNES.

2.2. Environmental Policy

As outlined in Seqwater's Environmental Policy (Figure 3), Seqwater is committed to continuous improvement of environmental performance. Seqwater will comply with environmental performance requirements set by relevant legislation, monitor environmental performance, and continually improve our environmental management practice through our Environmental Management System certified to the International Standard (ISO 14001:2004). This policy applies to all of our employees and contractors and to any person or organisation that acts for or represents us.

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Policy Statement

Environment and Sustainability

Seqwater is a critical part of the urban water supply chain in South East Queensland, delivering a safe, sustainable and valued bulk water supply for more than 3.6 million South East Queenslanders. We also supply water to around 1,200 irrigators and rural customers, supporting Queensland's agriculture and other industries.

We are always looking forward, planning for South East Queensland's water security future and investing in and operating a vast range of water supply assets.

Our operations extend from Gympie in the north, to the New South Wales border in the south, and in the coming years will expand beyond the base of the Toowoomba ranges with the construction of the Toowoomba to Warwick pipeline.

We are one of the largest land managers in South East Queensland and one of the most geographically diverse water businesses in Australia, with many sites comprising significant natural and cultural heritage values.

On behalf of our communities, we provide important catchment health management, access to diverse recreation opportunities, and provide important flood mitigation services that contribute to the liveability and prosperity of South East Queensland.

We are committed to a positive culture of environmental responsibility and recognition of cultural heritage values.

To demonstrate our commitment, we will:

- prevent (by avoidance, reduction and/or control) pollution and harm to the environment
- apply sustainability principles across all organisational activities to enhance and protect environmental, cultural, economic and social values
- minimise resource consumption and generation of waste
- preserve and, where possible, enhance biological diversity and ecological integrity
- adopt innovative, knowledge driven and risk-based decision making in environmental management and climate change response
- promote and communicate continuous improvement and a positive culture of environmental and cultural heritage responsibility.

We will comply with environmental performance requirements set by relevant legislation, monitor environmental performance and continually improve our environmental and cultural heritage management practice and performance through our Environmental Management System certified to the International Standard ISO 14001.

This Policy aligns to our values of care, respect, courage and integrity which supports everything we do at Seqwater.

This Policy applies to all our employees and contractors and to any person or organisation that acts for or represents us.

Mr Will Harpham
Chief Executive Officer
25 July 2024

Honourable Dr Anthony Lynham
Chairperson
25 July 2024

Figure 3: Seqwater Environmental Policy

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3. Responsibilities and Implementation

As the Proponent, Seqwater will:

- Regulate the environmental and social performance of the Early Works.
- Act to facilitate the expression of community views.
- Administrate the head agreement/contract to ensure contract conditions are met.
- Liaise with and coordinate relevant agencies, including the Queensland government and Noosa Shire Council (NSC), to provide timely advice to the Principal Contractor for the smooth and efficient delivery of the Early Works.
- Ensure that the Principal Contractor is operating in accordance with this EWEMP. The Principal

Contractor will:

- Implement this EWEMP in accordance with their own Environmental Management System, processes, and procedures through an Early Works Construction Environmental Management Plan (EWCEMP).
- Ensure all construction works are conducted in accordance with approvals, the contract, relevant legislation, and local laws.
- Maintain for the duration of the construction phase, open and effective communication with the communities in the vicinity of the Project about the construction program, scale, duration and nature of the proposed work, and details of proposed impact mitigation measures.

Any sub-contractors will be the responsibility of the Principal Contractor and must adopt the principal contractor's EWCEMP, or a suitable alternative and will be required to operate under the head contract for the Project.

Role	Responsibilities and Authorities
Seqwater	• Manage the construction process as the Project proponent. • Provide readily available expertise for the construction Project as required. • Receive progress reports on performance by the Principal Contractor for the purpose of acknowledging compliance with contract conditions. • Review any additional site-based plans, operating procedures, control plans and other documents produced by the Principal Contractor and associated with the implementation of this EWEMP. • Ensure that the requirements of the Conditions of Contract (Environmental Management) and approved EWEMP included in the contract documentation are implemented. • Review any revisions to the EWEMP as required. • Maintain a current copy of the contract and the EWEMP, a record of the completion of planned actions, and monitoring records and reports, supplied by the Principal Contractor. • Initiate audits of environmental performance.

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Role	Responsibilities and Authorities
Contractor Project Manager (project team leader)	• Maintain a master copy of the EWCEMP, a record of the completion of planned actions, and monitoring records and reports, which are made available during audits. • Provide copies of the EWCEMP to the relevant Project staff, with responsibilities clearly defined in the EWEMP. • Ensure all staff are trained/inducted to site (including environmental management responsibilities) and that all training/inductions are recorded in a Training and Induction Register. • Ensure that environmental protection measures are implemented in accordance with EWEMP. • Coordinate regular monitoring in relation to environmental management issues and ensure that monitoring results are made available to the Proponent. • Ensure corrective actions arising from self-assessments and external audits are completed, and in accordance with the EWEMP. • Notify Seqwater and any relevant agency of all environmental incidents and maintain a record of events relating to the environmental incidents, including any remedial action taken. • Ensure there is adequate and accurate identification and reporting of all nonconformances, complaints and any other environmental issues that may arise during construction. • Provide relevant and timely information about construction activities that may impact on the relevant stakeholders and, as required, consult with individuals that may be directly impacted by construction activities to ensure direct Project impacts are being managed. • Undertake regular management reviews of the EWEMP, at scheduled intervals and on the identification of a system failure. • Ensures all personnel with positions accountable to the EWCEMP have suitable environmental qualifications and experience.
Contractor Construction Manager (project team member)	• Ensure appropriate waste facilities are provided on site and that maintenance and waste disposal is conducted by a licenced contractor, where required. • All vehicles accessing the site use the designated access routes, entries/exits, and parking locations. • All equipment is maintained and 'fit for purpose' before arriving at the site. • All environmental incidents and complaints are reported to the Contractor Environment and Sustainability Manager and the Contractor Project Manager.
Contractor Commercial Manager (project team member)	• Ensure environmental requirements are considered in procurement processes. • Facilitate procurement for items and subcontract packages required for conformance with this plan. • Ensure environmental requirements are included in subcontracts, this is to include but not be limited to the requirements of this EWEMP and relevant permits and approvals applicable to the works.

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Role	Responsibilities and Authorities
	• Ensure environmental performance is considered in sub-contract progress reviews.
Contractor Environment and Sustainability Manager (project team member)	• Prepare an EWCEMP in accordance this EWEMP. • Ensure implementation and compliance with the EWEMP, statutory approvals, legislation, codes of practice, and/or industry standards. • Conduct daily/weekly inspections of work activities, including completion of a weekly Inspection Checklist and ensure adherence to the environmental management measures required by the EWCEMP. • Day to day responsibility and authority for ensuring that the Environmental Management System (as applied on the Project) conforms to the requirements of the EMS and ISO14001. • Day to day responsibility and authority for reporting on the performance of the EMS (as applied on the Project) to the Project Manager. • Ensure any required exclusion zones are installed, complied with and maintained. • Ensure all procedures and processes identified in the EWCEMP are implemented. • Participate in toolbox talks as required to ensure staff are aware of key concerns and environmental management procedures. • Produce, revise, and audit the EWCEMP. • Facilitate Monthly 3rd-Party compliance audits including subcontractors. • Liaise with stakeholders, including regulatory agencies. • Maintain all documentation required by the EWCEMP. • Investigate any environmental incident or complaint, complete incident reports and implement appropriate corrective actions with the Project Manager. • Notifications to DESI on environmental incidents or non-compliances where appropriate. • Verify qualifications and competency of persons undertaking specialist environmental works.
Engineers (project team members)	• Ensure environmental management measures are established prior to commencement of construction activities. • Immediately report any non-conformances, near misses or environmental incidents to the Environment and Sustainability Manager (ESM). • Ensure and verify that corrective actions are undertaken when required for non- conforming work.
Healthy and Safety Manager	• Monitoring project activities for compliance with Occupation, Health, Safety and Rehabilitation (OHS&R) legislative requirements. • Ensuring control measures outlined in the Workplace Risk Assessment (WRA), Activity Method Statement (AMS), Task Risk Assessment (TRA) and Worker Start Cards (WSC) are implemented throughout the life of the project. • Preparing inspection reports and communicating OHS&R performance to the Contractors Project Manager. • Establishing and ongoing implementation of the incident and emergency procedures.

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Role	Responsibilities and Authorities
	• Inducting all personnel, subcontractors, and visitors about their safety obligations whilst onsite. • Ensuring that relevant licences, inductions, hazard assessments, and safety equipment as specified in the project documentation are in place before any work activity be carried out onsite. • Carrying out safety inspections, enforcing safe work practices, monitoring activities, and recording observations so that OHS&R objectives and effectiveness can be assessed and modified as required.
Community & Stakeholder Manager	• Monitoring project activities for compliance with John Holland and client community relations requirements. • Ensuring that the Construction Communications and Engagement Plan is correctly implemented. • Work with the environment, safety, and construction teams to implement strategies to minimise construction impacts on the local community. • Ensure community members are appropriately notified of project work. • Manage the project enquiries and responses. • Register and report community complaints and ensure adherence to the complaint's procedure.
Supervisors (project team members)	• Ensure that the EWEMP and associated ECP requirements are communicated to all personnel and are being fully implemented on site. • Be aware of all approval/contractual conditions relating to the work. • Perform surveillance and monitoring of environmental controls to ensure that they are established and maintained with requirements • Ensure rectifications of environmental controls are carried out as required. • Immediately report any non-conformances, near misses or environmental incidents to the ESM.
Subcontractors	• Implement requirements of All Project Personnel below. • Comply with reasonable directions given by the Principal Contractor regarding environmental matters. • Implement any measures as required by legislation, permits and approvals as apply to the subcontracted scope of work. • Comply with the requirements of this EWEMP as relevant to the subcontracted works.
All Project personnel (including Subcontractors)	**General Environmental Duty** • Under Section 319 of the EP Act, everyone has a general environmental duty to not undertake an activity that causes or is likely to cause environmental harm unless all reasonable and practicable measures are taken to avoid that harm. **Duty to Notify** • All staff and sub-contractors will attend a site-specific environmental induction and awareness training to ensure that all personnel are aware of their responsibilities in this regard.

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Role	Responsibilities and Authorities
	• The EP Act also imposes a 'duty to notify' (Section 320A - 320G) upon any person who becomes aware that their activities, or the activities of somebody working with them, has caused or threatens to cause material or serious environmental harm that is unlawful under the EP Act. All persons to follow the incident reporting processes outlined in Section 5.0 of this plan. • Environmental incidents, non-conformances and near misses are to be reported to the ESM.
Cultural Heritage Officer	• Seqwater's primary contact for the Kabi Kabi People's and to ensure project activities are in compliance with the Cultural Heritage Management Agreement (still in development).

3.1. Appropriately Qualified Persons

Management of the LMDIP Early Works scope will be undertaken by qualified staff with the appropriate training and experience. All staff must be trained in incident reporting and environmental awareness through the induction / onboarding process. All environmental activities are to be carried out by appropriately qualified personnel which will be verified by the Contractor Environment and Sustainability Manager.

3.2. Site Induction and Training

Before site personnel under the Project's control begin work, they must be inducted and aware of:

- the requirements of this EWEMP.
- the Principal Contractors EWCEMP.
- the Environment Policy (Figure 3).
- the significant environmental aspects and values in the vicinity of the project site and related actual or potential environmental impacts associated with their work.
- identify activities with a high risk of environmental impact.
- responsibilities and accountabilities of site personnel.
- the potential implications of not conforming with the project's compliance obligations.
- expectations for visitor site access requirements and associated workplace health & safety behaviours.

Note: the ECPs for this EWEMP also prescribe aspect-specific training and induction requirements.

Routine 'toolbox' discussions will be held to ensure that feedback can be provided on issues of interest or concern and that information arising from project-specific issues is communicated to all relevant staff. It is anticipated that 'toolbox' discussions will generally be prepared and delivered by Principal Contractor representatives.
Induction and 'toolbox' records will be maintained to verify attendance.

The Health and Safety Manager shall be responsible for the conduct of inductions and toolbox discussions, however typically subject matter experts will deliver relevant materials – e.g. Environment and Sustainability Manager for environmental matters, Community and Stakeholder Manager for communications and engagement and so on.

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3.3. Site Visitors

Any visitors to the site will be given a Site-specific Induction and will be escorted around the site by an authorised person. Visitors must remain with an authorised person at all times. The escort will alert the visitors to hazards on site *(including workplace health and safety issues and expected behaviours).*

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4. Documentation and Communication

4.1. Documentation and Records

Adequate documentation and records must be maintained to demonstrate compliance with the EWEMP. These records should be available at all times and readily accessible for independent inspection and audit. This includes, but is not limited to:

- Contract documents.
- Statutory permits and licences.
- Hazard, near miss, incident, and technical reports.
- Monitoring data results.
- Environmental audits and reviews.
- Environmental training records.
- Non-conformance reports and details.
- Complaints register.
- Community consultation reports.
- Inspection, calibration and maintenance records.
- Environmental incident investigations and reports.
- Corrective action reports.

The following documents must be readily accessible to personnel undertaking activities associated with the Project:

- A copy of the EWEMP and EWCEMP (Contractor doc).
- Copies of environmental checklists and forms required by the EWCEMP.
- Copies of relevant work instructions and procedures.
- Safety Data Sheets (SDS) for any chemicals stored or used on the site.
- Copies of permits, approvals and attached conditions.

4.2. Internal Communication

Environmental protection should be achieved through clear and concise internal communication. A list of the names, affiliations, and contact numbers (including afterhours numbers where necessary) of people within the designated environmental management reporting structure will be included at the start of the EWCEMP. Typical methods of communicating important messaging to the workforce will include:

- Toolbox talks as per section 3.2.
- Daily Prestart.
- Message boards (located at crib rooms / site office).
- Site signage.

Significant communications, including all reports, incident forms, and complaints will be documented and kept up to date and made available to relevant personnel online.

Emergency Response, emergency contacts and Incident notifications are covered in Section 5.

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4.3. External Communication

To ensure external communication is timely and transparent, only nominated personnel will be involved in consultation with external bodies on environmental issues. Seqwater and the Principal Contractor are responsible for nominating all staff members responsible for external communication. Seqwater may also invite personnel to attend meetings with agencies.

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5. Incident Management

5.1. Emergency Response, Incident Reporting / Non-Compliance Response

In an emergency call 000

Call the Seqwater Incident Hotline (07) 3270 4040 for all incidents and emergencies.

Contractor will develop and implement their own Incident Management procedure. All incidents and emergencies will be dealt with in accordance with the processes nominated in the Bulk Authority Emergency Response Plan: Whole of supply chain response, V1.0, August 2013. The Emergency Response Plan nominates the following 6 step response framework when an incident occurs, which results in the release of contaminants or has the potential for environmental harm the following actions will be taken as soon as practicable:

1. Identify and assess event severity;
2. Notify;
3. Establish command and control;
4. Manage the emergency;
5. Manage the recovery; and
6. Improvement Actions.

Instances of environmental harm that occur during construction will be reported to the Department of Environment, Science and Innovation (DESI), or other relevant regulatory agency by the ESM as soon as possible (as per Section 320 of the EP Act).

5.2. Emergency Contacts

All incidents and emergencies should be notified to your immediate Supervisor and the Seqwater Incident Hotline (07) 3270 4040, in the first instance.

The key personnel and emergency services to be contacted in the event of an emergency are shown in Table 4 below. The list of emergency contacts is to be provided to all personnel during induction training and is also to be placed in all site vehicles and heavy machinery.

Table 4: Seqwater Emergency Contacts (as per Incident on-call roster)

Position	Contact Details
Seqwater Incident Hotline	07 3270 4040
WTP North *(includes North Pine WTP)*	07 3035 5765
Duty General Manager	07 3035 5763
Duty Manager	07 3035 5760
Duty Communications Advisor	07 3247 3000
Flood Centre	07 3831 0795
WTP South	07 3035 5761
WTP Central	07 3035 5782
Supply Systems	07 3270 4082

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Catchments	07 3035 5776
Drinking Water Quality	07 3035 5764
Dam Safety	07 3035 5762
Environment	07 3035 5779
Process Improvement	07 3035 5780
WHS	07 3035 5783

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6. Monitoring, Auditing and Reporting

For clarity, monitoring, reporting, and auditing obligations under CGER conditions in Appendix 2, Schedule 2 do not apply to Early Works – these obligations are triggered when the main project activities commence. However, monitoring, auditing, and reporting processes have been established for the Early Works and these are described below.

6.1. Monitoring

Monitoring will be a requirement for each environmental aspect addressed in the EWEMP. Monitoring is the establishment and operation of procedures to measure, record, and evaluate the level of impact on the environment during the execution of the Project.

The monitoring of environmental impacts will be carried out in accordance with the requirements for each ECP described in the EWEMP, relevant legislation, and the conditions of any permit, where relevant. Monitoring procedures will be developed in accordance with standard protocols and the requirements of the DESI, Department of Agriculture and Fisheries (DAF), Department of Resources (DOR), and other relevant agencies as appropriate. All equipment used for environmental monitoring will be calibrated and maintained to the standards recommended by the supplier/manufacturer. Calibration and maintenance records will be documented for each piece of monitoring equipment and available for inspection as required.

Environmental monitoring samples, if taken, will be sent for analysis to a National Association of Testing Authorities (NATA) registered laboratory, where applicable. All records of laboratory analysis results and quality assurance will be auditable and available for inspection, on request, by regulatory agency officials or their representatives. Site-specific environmental monitoring requirements for each environmental aspect are detailed throughout Section 7.

6.2. Regular Monitoring

The Contractor will undertake regular monitoring activities to ensure the project upholds a high standard of compliance. This will include but not be limited to:

Daily Observations

Supervisors will record daily observations in their site diaries. Any environmental-related observations will be provided to the ESM before the end of each working day. Any observations that are still outstanding at the time of the Weekly Environmental Inspection Checklist will be incorporated into the checklist inspection.

Weekly Environmental Inspection Checklist

The Contractor will develop a Weekly Environmental Inspection Checklist that will be tailored to cover each environmental aspect in the Environmental Control Plans (ECPs) outlined in Section 7. The Inspection will cover all active working areas across the project including any areas of potential impact outside the project area. The objective of the checklist is to highlight any areas where intervention / action is required to prevent a potential
non-compliance. Actions will be recorded in the checklist and assigned due dates and tracked to closure through the Contractors Corrective Action Register (CAR). The inspection process will be the responsibility of the ESM.

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6.3. Auditing

Aspects of the Project with a potential for environmental impact will be subject to periodic environmental audits. The objective of audits will be to verify compliance with applicable Commonwealth, state and local government environmental permits, approvals, and regulations issued for the Project.

Audits will also seek to continuously verify the suitability of each ECP outlined in the Principal Contractor's EWEMP (Section 7). Each audit will be reviewed by Seqwater and all recommendations and actions raised will be addressed. Copies of audit reports and details of corrective actions will be made available for regulatory inspection, on request.

6.3.1. General

The Project will undertake planned Health Safety and Environment (HSE) audits to provide confirmation that the project is compliant with its regulatory approval conditions. The Early Works package will not be subject to third party audits or independent audits – but may be subject to surveillance system audits, high risk audits or EWEMP Audits, which are described below. The contractor will develop comprehensive obligations register that will be used to track compliance with each specific condition.

The following audits will be included in the Early Works auditing program:

- This EWEMP prescribes a Contractor requirement for quarterly audits (internal) to validate the specific conformance requirements with their EWCEMP.
- All audit types can and will involve subcontractors, suppliers and consultants depending on the nature and scope of the audit.

Contractor will:

a. define the audit criteria and scope for each audit.
b. select auditors and conduct audits to ensure objectivity and the impartiality of the audit process.
c. ensure that the results of the audits are reported to relevant management.

Third Party Audits

This EWEMP prescribes a Contractor requirement for monthly audits to validate the specific conformance requirements with their EWCEMP.

These will involve subcontractors, suppliers and consultants depending on the nature and scope of the audit. Contractor will:

a. define the audit criteria and scope for each audit
b. select auditors and conduct audits to ensure objectivity and the impartiality of the audit process
c. ensure that the results of the audits are reported to relevant management The monthly

compliance audits will be provided to the OCG for information purposes.

Internal Communications Audits

Communications regarding environmental management will be audited periodically to ensure that:

- The communication structure is effective
- All actions are performed and recorded.

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These audits will also include follow-up of specific or corrective actions raised during previous audits to ensure that actions are complete.

6.4. Reporting

The Principal Contractor will prepare a monthly report for Seqwater documenting compliance with this EWEMP and include the following (as a minimum):

- A summary of all monitoring data and associated compliance/non-compliance
- An evaluation of compliance with the EWEMP
- Any environmental incidents occurring within the reporting period – including an assessment of the impacts (if any) associated with the incidents/non-conformance along with any actions taken to prevent reoccurrence
- A summary of any audit finding should any audit be undertaken during the applicable reporting period.
- Any updates to the EWEMP
- Any updates to the Register of Approvals, licences and permits
- Positive environmental outcomes
- Complaints received
- Corrective actions and contingency
- Rolling updates on the projects resource use e.g. fuel & emissions/water consumption/fill/rock/concrete & steel use/waste generation etc
- Updates on the project environment performance against agreed objectives criteria listed in this EWEMP.

Table 5 consolidates all the reporting that applies to each environmental aspect under the applicable Environmental Control Plan (ECP). Additional reporting is detailed in each ECP throughout Section 7.

Table 5: General ECP Reporting

No	Reporting Required	Role	When
1.	Record all environmental-related complaints, identify cause(s), take appropriate actions to prevent recurrence and record the measures taken. This log will be available to regulatory authorities upon request. Complaints to be managed in accordance with Section 8	ESM	Following complaint /incident
2.	Details of field monitoring observations shall be reported via the Weekly Environmental Inspection Checklist, and communicated to staff during pre-starts, toolbox and team meetings as appropriate.	ESM	Throughout Early Works
3.	All monitoring results are to be maintained in Project Files.	ESM	Throughout Early Works
4.	All environmental complaints / incidents shall be reported immediately to the ESM and CSM.	All Staff	Following complaint /incident
5.	Incidents details shall be entered into Project Files in accordance with Section 5.	ESM	Following Incident
6.	Summary of environmental incident management to be provided in the monthly Project Safety/Quality/Environment Report.	ESM	Monthly

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No	Reporting Required	Role	When
	Monthly report to Seqwater that includes details of environmental monitoring results, audits, non-compliances, complaints, and incidents.		
7.	Monthly 3rd-party audits of this Plan will be undertaken as part of the EWCEMP auditing process.	Regional HSEQ	Monthly

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7. Environmental Management

Environmental Control Plans (ECPs) have been developed to align with the key environmental aspects associated with the Early Works. These ECPs are condensed versions of the Environmental Sub-Plans that will be submitted for approval of the full Coordinated Project in 2025. Each ECP outlines the aspect scope, objectives, performance criteria, impacts and applicable mitigation measures, along with monitoring and reporting requirements.

7.1. Water Quality ECP

1.0 Scope

This ECP is applicable to all phases of the "Early Works Package", described in Section 1.2 above, associated with the LMDIP and applies to the management of water and its quality.
This ECP predominantly relates to the management of waters impacted by the Early Works scope only. Some definitions relating to water management are as follows:
Construction Impacted Water: is any surface water runoff that comes into contact with the project's active construction footprint and is discharged through release points associated with ESC structures installed in accordance with the Erosion & Sediment Control Plan (ESCP) in Appendix C.
Retained Waters: any Construction Impacted Water held onsite in depressions, open excavations, sumps or ESC structures that do not discharge.
Construction wastewater: Any waters used for other construction activities such as washdown facilities / tool washing / concrete washout

2.0 Objective

- To preserve water quality within the Six Mile Creek Catchment area and maintain the Environmental Values (EVs).
- Minimise the risk of increased erosion and/or sediment deposition on the surrounding environment.
- Prevent degradation of surface and groundwater.
- Ensure that water quality objectives (WQOs) defined in this Plan are met throughout all construction activities.
- Ensure compliance with all contractual and legislative requirements

3.0 Performance Criteria

3.1 General

- CPESC (Certified Professional in Erosion & Sediment Control) approved erosion and sediment control plans (ESCPs) have been developed for the Early Works scope and must be complied with – Refer Appendix C.
- All discharges from site shall be via discharge points approved in the ESCP or undertaken in accordance with the relevant discharge permit requirements.
- No discharge of construction contaminated water to the Noosa WTP Supernatant Lagoon and licensed discharge point.
- Monitoring demonstrates existing ecosystem attributes and water quality within Six Mile Creek is maintained throughout construction period.
- Water quality aspects of the approved Adaptive Management Plan are adhered to.
- All relevant contractual obligations, legislation, standards and code requirements are met, and compliance is able to be demonstrated through monitoring and audit.

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- Groundwater shall not be contaminated as a result of the construction.

3.2 Targets and Water Quality Objectives (WQO)

- The following Preliminary WQOs will be used to establish the minimum standard of any retained waters on site before they can be discharged.
- The discharge criteria for retained waters are presented in Table 6 and are based on:
  1. Environmental Protection (Water) Policy 2009, Mary River environmental values and water quality objectives Basin No. 138, including all tributaries of the Mary River, July 2010, Table 2 (page 15) "Freshwater lakes/reservoirs".
  2. Historic water quality data collected by SEQ Water and other reputable sources.

Table 6: Discharge Criteria

	Discharge to Receiving Water		
Water Parameter	**Units**	**Catchment WQ Objective**	**Project Discharge Criteria**
pH	pH	6.5 – 8.0	6.5-8.0 or ±0.5 of receiving water
Turbidity	NTU	< 50	<50 or background +10% whichever is the greater
Dissolved Oxygen	%	85 – 110% saturation	For downstream release 85 – 110% saturation or 90% of background For in-lake release, no measurable associated change at any surface water monitoring location
Hydrocarbons	N/A	No hydrocarbon sheens observed	No hydrocarbon sheens observed

Note:

1. In the event of inconsistency between this plan and any permit or approval, the conditions of the approval prevail to the extent of the inconsistency

Table 7: Background Water Quality Summary

Water Parameter	**Units**	**Discharge Criteria**	**Median Water Quality Result**			
			Lake Macdonald - dam wall [2]	**Lake Macdonald - mid-dam** [2]	**Lake Macdonald tailwater** [2]	**Six Mile Creek - downstream** [3]
pH	pH	6.5-8.0 or ±0.5 of receiving water	6.8	7.0	6.4	6.78
Turbidity	NTU	<50 or background +10% whichever is the greater	3.6	3.05	17.9	7.9
DO	%	For downstream release 85 – 110% saturation or 90% of background	85.3	93.3	11.78	49.1

Note:

1. Grey shading indicates median results that did not achieve the WQO

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2. The median is based on more than 8 years of monthly monitoring data collected by Seqwater at 6 sites within and downstream of Lake MacDonald, with a sample size of at least 576 samples.
3. Median calculated from data collected by frc environmental during the AHMP program and baseline surveys for the current project

7.1.1. Aspects and Impacts

Aspect	Potential Impact
Water Quality	• Degradation of local water quality within Six-Mile Creek as a result of uncontrolled / untreated runoff from the construction site. • Sedimentation of aquatic environments, loss of aquatic habitats, smothering of aquatic vegetation.
Fuels and chemicals	• Fuels and / or chemicals migrating offsite, thereby temporarily impacting water quality

7.1.2. Mitigation Measures

No.	Actions	Role	When
General Requirements			
1.	ESCs must be maintained to ensure 60% effective capacity.	ESM	Throughout Early Works
2.	Removed sediment to be added to existing stockpiles, redistributed to land outside of overland flow paths or appropriately disposed of, off site.	Sup	Throughout Early Works
3.	Sediment controls that are damaged or otherwise rendered ineffective shall be immediately replaced.	Sup	Throughout Early Works
4.	Prolonged (5 business days or immediately if more than 5mm of rain forecast within 24 hours) open excavations shall have berms and/or diversion drains on their perimeter to divert overland storm water runoff away from the excavation. Where appropriate, utilise sandbags and/or geofabric to reduce flow velocity and minimise erosion within the drainage channel.	Sup	Throughout Early Works
5.	The ESM will provide direction for the location, installation, maintenance and removal of ESC devices to control construction impacted waters as per the ESCP in Appendix C. Control devices shall remain in place until approval is given for their removal by the ESM.	ESM	Throughout Early Works
Design and Planning			
6.	CPESC plans have been developed in line with IECA guidelines for the Early Works site establishment and are presented in Appendix C. Any significant deviations from this plan will need to be endorsed by the CPESC and approved by Seqwater.	ESM/Sup	Workplace Planning
7.	Soil loss has been calculated for each sub-catchment providing a risk profile of Very Low to Moderate across the site. As such Type 2 & 3 ESCs have been strategically planned to mitigate soil losses as far as practical.		Workplace Planning

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No.	Actions	Role	When
8.	All drains and berms have been sized to cater for a 1 in 10 year ARI due to the proposed construction timeframe. All drains and berms to be constructed as per the drawings in Appendix C.	Project Team	Workplace Planning
9.	The key ESCs used to control erosion and sedimentation across the site will be: - **Clean water diversion** – reducing the amount of water impacted by construction - **Dirty water catch drains** – Collecting construction impacted waters and diverting them to treatment devices and approved discharge points - **Rock Filter Dams** – Type 2 control generally used as the final control filtering construction impacted waters prior to release to environment - **Silt curtain** – deployed within sections of the lake where construction impacted waters enter the reservoir - **Silt fence** – generally used to contain sediments locally to exposed areas - **Soil binder** – to secure exposed surfaces until they can be stabilised	ESM/ /Eng	Throughout Early Works
10.	Unless otherwise approved, the location of these works shall not encroach on any area outside of the licenced construction area. Project boundary and no- go zones will be clearly defined with flagging and no-go signage.	ESM/ /Eng	Workplace Planning
11.	ESCPs have been developed with consideration to: • Local climatic conditions and seasonal variations; • Soil types, particularly dispersive, sodic or saline soils; • Local hydrology affecting the construction zone; • Local drainage, including temporary and overland flow paths and quantities.	ESM/ /Eng	Workplace Planning
12.	Works will limit as far as practicable the disturbance of vegetation, waterways and drainage lines in particular Six Mile Creek. All clearing limits and vegetation no-go zo zones will be clearly defined with flagging and signage.	ESM/	Workplace Planning
13.	There will be no works within any watercourses or water ways as part of this scope.	PM	All stages
14.	Work should be scheduled to ensure that any temporary erosion control works are in place by the end of work each day, especially before weekends, if rain is imminent, or when permanent erosion control works are not in place.	ESM/ /Eng	Workplace Planning
De-watering and Discharge			
15.	Retained waters must meet water quality discharge criteria in Table 6 prior to discharge. Filtration or other treatment may be required to achieve discharge criteria. If discharge criteria cannot be met after treatment, water must be collected by a licensed contractor for off-site disposal.	Sup	Throughout Early Works
16.	Construction impacted water and retained water must only be discharged from the identified discharge points in the ESCP in Appendix C	Sup	Throughout Early Works
17.	Construction wastewaters must not be discharged and must be stored in pits / tanks prior to collection and off-site disposal by licenced wastewater contractors.	Sup	Throughout Early Works

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No.	Actions	Role	When
18.	Scour protection to be applied to all stormwater drainage outlets and other discharge points.	Sup	Throughout Early Works
19.	Field testing of retained waters by the ESM must record compliance with project WQOs prior to discharge.	ESM/Sup	Throughout Early Works
20.	Any retained waters can be reused onsite as dust suppression.	Sup	Throughout Early Works
21.	No discharge of construction impacted waters to the Noosa Water Treatment Plant Supernatant Lagoon and licensed discharge point.	ESM/Sup	Throughout Early Works
Inductions and Training			
22.	Site inductions will include the following specific components for surface water and erosion & sediment control management: • Awareness of potential impacts to surface water including the aquatic ecology of Lake MacDonald, Six Mile Creek and the Mary River. • Protocols relating to stormwater, construction water management & dewatering, including the requirement for water quality validation prior to recycling or re-use and prior to discharge. • Description of the mechanisms by which erosion and sedimentation occur, and the associated environmental impacts. • The use of ESC devices to mitigate impacts, and ideal operation of these devices. • The requirement for ESC devices to be implemented and maintained in accordance with Site Environment Plans and ESCPs. • Prohibition of discharge of construction contaminated water directly to the Noosa Water Treatment Plant Supernatant Lagoon and licensed discharge point. • All site personnel to inform the ESM if they become aware of damaged ESCs.	ESM	Throughout Early Works
23.	All personnel involved in discharge of surface water from Site will be appropriately trained including in monitoring, treatment and discharge requirements.	ESM	Throughout Early Works
24.	Surface water and erosion & sediment control toolbox talks will be implemented as relevant and required to reinforce information provided during site inductions.	ESM	Throughout Early Works
Site Preparation/Clearing			
25.	Clearing limits must be clearly identified and physically demarcated. Vegetation to be protected/retained shall be clearly marked and identifiable. Refer Figure 1 and Appendix D.	ESM/ Sup	Workplace Planning
26.	Clearing shall be planned in accordance with approved design documentation and further minimised – retaining grass and other vegetation to the fullest extent practicable.	Eng	Throughout Early Works

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No.	Actions	Role	When
27.	Stabilised construction access/egress points shall be installed.	Sup	Throughout Early Works
Plant movement and access			
28.	Controls (washdown bays / rumble grids) must be in place to prevent tracking dirt and mud onto roads.	Sup	Throughout Early Works
29.	Mobile plant and vehicles, including deliveries must use designated travel routes, site access routes, site access tracks and lay down areas.	All personnel	Throughout Early Works
30.	Whilst on site, vehicles to remain on the designated roadways and observe the site speed limits.	All personnel	Throughout Early Works
31.	Vehicle and plant to park in designated hard stand zones when not in use.	All personnel	Throughout Early Works
32.	Spoil, mud or the like spilt onto sealed roads to be removed within a reasonable timeframe through use of a street sweeper or other means, daily visual inspections of the road will determine the frequency of street cleaning requirements.	Sup	Throughout Early Works
Stockpiling			
33.	Topsoil, subsoil and vegetative material to be stockpiled separately in designated areas, clearly demarcated and identified. Stockpiling locations can be seen in Figure 1 and Appendix D.	Sup	Throughout Early Works
34.	No temporary construction stockpiles to be located within drainage lines, flood zones or any area otherwise likely to be inundated with water.	Sup	Throughout Early Works
35.	Stabilise exposed soils by using materials such as mulch, biodegradable matting, geotextile fabrics, and/or soil stabilisation products. Suppress earthworks, batters, access tracks and other exposed areas with a bonding agent or water on dry windy days to minimise soil erosion and dust. Rehabilitation will occur as soon as practical after achieving final earthworks profiles.	Sup	Throughout Early Works
36.	All stockpiles, batters and other erosion sensitive areas shall be adequately stabilised through velocity reduction covering, grassing, vegetation, soil binding, water diversion or other as required.	Sup	Throughout Early Works
37.	Where suitable, silt fencing or equivalent measures shall be installed around the perimeter of exposed/disturbed soil stockpiles and at the toe of exposed batters.	Sup	Throughout Early Works
38.	Maximum topsoil stockpile height 1.5m. Maximum subsoil stockpile height 4m.	Sup	Throughout Early Works

7.1.3. Monitoring

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No.	Monitoring Required	Role	When
1.	All water quality monitoring will comply with Queensland Monitoring and Sampling Manual 2018 as per the *Environmental Protection Act 1994* and Environmental Protection Regulation 2019.	ESM	At all times
2.	Using the Early Works WQ Monitoring Schedule (Appendix F), the ESM will implement monitoring activities including: 1. Establishing permanent monitoring locations DS01 and I1 prior to Early Works starting. Refer Figure 4 and 5: Water Quality Monitoring Locations. DS01 site selection will be located downstream of any areas where construction runoff can enter the creek. 2. ensuring that calibrated or verified monitoring and measurement equipment is used and maintained, as appropriate to evaluate the Project's environmental performance and the effectiveness of the EMS. 3. communicating relevant environmental performance information both internally and externally, as identified in Project communication processes and as required by its compliance obligations. 4. retaining appropriate documented information as evidence of the monitoring, measurement, analysis and evaluation results. 5. establishing, implementing and maintaining the processes needed to evaluate fulfilment of Project compliance obligations.	ESM	At all times
3.	General observations for the daily management of ESCs shall be documented in site dairies.	Sup	Daily Throughout Early Works
4.	Weekly Environmental Inspection Checklist will include assessment of functionality of all ESCs	ESM	Weekly and during and after storm events >10mm
5.	Water quality monitoring results to be maintained in site a register and made available to relevant parties upon request.	ESM	As required
6.	If an unplanned spill or incident occurs in the construction area or as part of associated activities of the Project, targeted water quality monitoring will be carried out up and down stream of the incident to determine potential impacts from the event.	ESM	Prior to discharge
7.	Visual inspections of the construction site during and after rainfall to ensure that mitigation measures are in place, ESC measures are in working order and no erosion is evident. Additional monitoring may be required to determine the extent of stormwater runoff after pulse events.	ESM/Eng/ Sup	Prior to discharge
8.	ESM will monitor construction impacted waters at the nominated discharge locations during flow events to ensure compliance with Table 6. ESM will monitor retained waters onsite, if the water meets discharge criteria in Table 6 a permit to dewater will be issued. ESM to monitor the dewatering activity as per permit conditions. Retained waters that cannot meet the discharge criteria will be removed from site and disposed by licenced contractor.	ESM	Prior to discharge
9.	Monthly 3rd-party and audits of this ECP will be undertaken as part of the EWCEMP auditing process.	Regional HSEQ	Monthly

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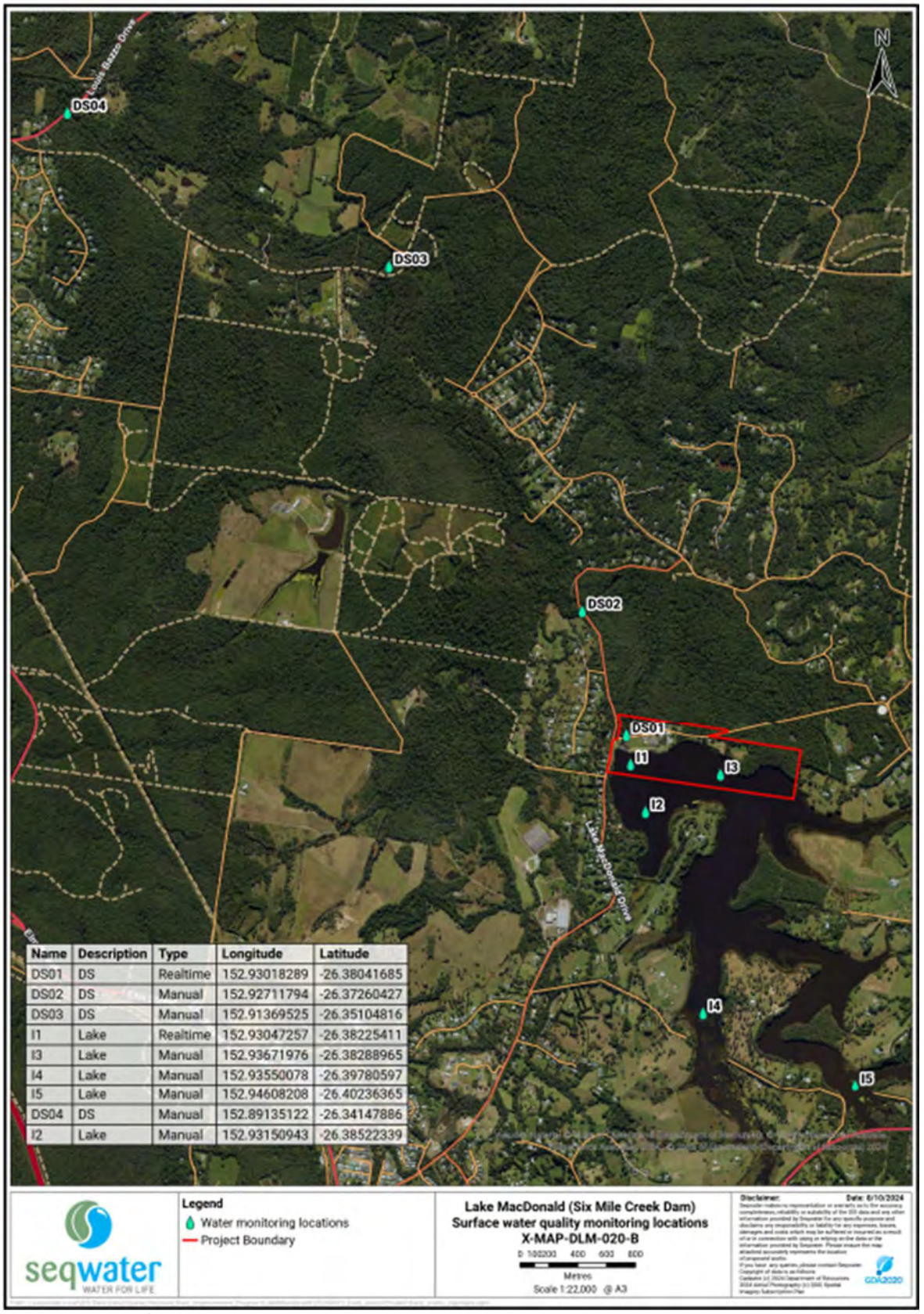

Figure 4: Water Quality Monitoring Locations

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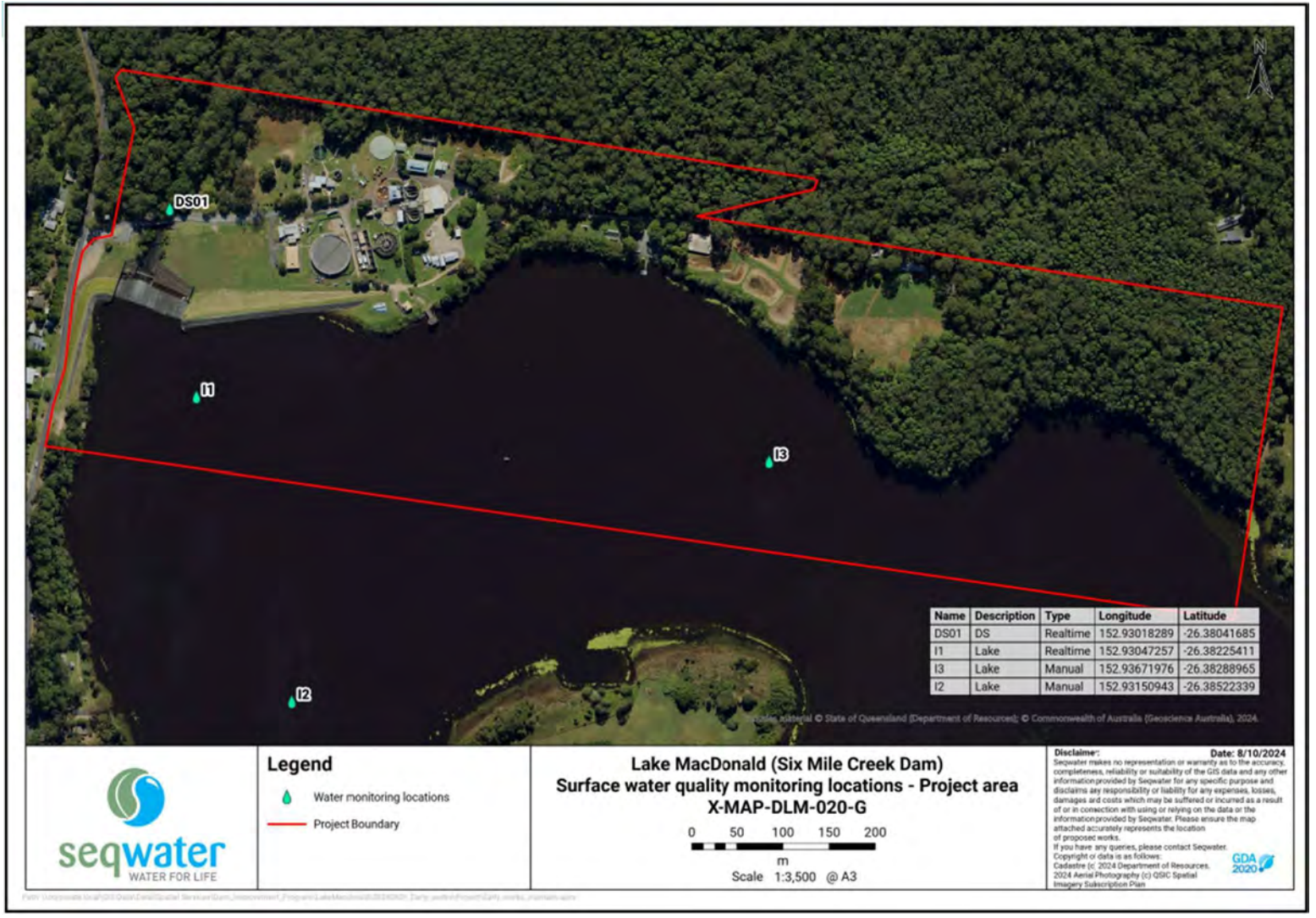

Figure 5: Water Quality Monitoring Locations

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7.1.4. Corrective Actions

Risk / Problem	Suggested corrective action
Sediment observed entering Six-Mile Creek	• Investigate the cause of the sediment release • Amend ESCs onsite to prevent re-occurrence • Determine if remediation removal of sediment is feasible or necessary • Monitor the effectiveness of the amended ESCs during next rain event • Reporting to DESI if serious environmental harm or material environmental harm have occurred or are likely to occur.
Project WQO's are exceeded during monitoring	• Determine if site discharges are contributing to the monitored exceedances by comparing upstream background levels • Investigate potential WQ influences from outside the project (i.e. WTP) • Amend ESCs onsite if required

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7.2. Vegetation, Flora and Fauna ECP

1.0 Scope

This ECP is applicable to all phases of the "Early Works Package", described in Section 1.2 above, associated with the LMDIP and applies to the management of Vegetation, flora and fauna. **Only clearing of minor regrowth and landscaping vegetation within the existing operational Seqwater facility is being proposed.**

As the proposed clearing is within a Koala Priority Area, the Early Works must comply with the State Government Supported Infrastructure – Koala Conservation Policy –2023 (Koala Conservation Policy). Development to which the Koala Conservation Policy applies must comply with the Infrastructure Self-Assessment Criteria. The Project is exempt from the Self-Assessment Criteria because it is development for a Coordinated Project. However, there are requirements which apply to all Government Supported Infrastructure in Southeast Queensland and
these are set out in this ECP, as relevant.

2.0 Objective

- Minimise vegetation disturbance
- Flora and fauna management practices must meet all legislative and contractual requirements.
- Retained vegetation is not compromised by site clearing works, gross mechanical disturbance, or impacts associated with sedimentation and/or pollutants from the works area.

3.0 Performance Criteria

3.1 General

- Retained vegetation/habitat is not compromised by Early Works.
- No clearing of vegetation outside of the approved extent of Early Works.
- Clearing of koala habitat trees must be carried out in a way that complies with sequential clearing conditions of the Koala Conservation Policy.
- Development must ensure that measures are taken in construction practices to not increase the risk of death or injury to koalas.

3.2 Listed Flora and Fauna

Flora / Fauna	Commonwealth Listing	State Listing	Other Notes
Giant barred frog (*Mixophyes iteratus*)	Endangered	Endangered	The closest record is 185 m downstream of Six Mile Creek.
Tusked frog (*Adelotus brevis*)	-	Vulnerable	The closest record is along Collwood Road, in roadside drainage near Tewantin National Park.
Richmond Birdwing Butterfly (*Ornithoptera richmondia*)	-	Vulnerable	Recorded on site. Observed in the vicinity of Gumboil Road.
Regent Honeyeater (*Anthochaera Phrygia*)	Critically Endangered	Endangered	Not recorded during surveys
Blackbreasted button-quail (*Turnix Melanogaster*)	Vulnerable	Vulnerable	Not recorded during surveys.
Australasian bittern (*Botaurus poiciloptilus*)	Vulnerable	-	Not recorded during surveys.

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Koala (*Phascolarctos cinereus*)	Endangered	Endangered	Not recorded during surveys.
Swift parrot (*Lathamus Discolour*)	Critically Endangered	Endangered	Not recorded during surveys.
Southern Penda (*Xanthostemon oppositifolius*)	Vulnerable	Vulnerable	Not recorded during surveys.
Scrub Turpentine *(Rhodamnia rubescens)*	Critically Endangered	Critically Endangered	Recorded within the project area. No clearing required for Early Works.
Native guava *(Rhodomyrtus psidioides)*	Critically Endangered	Critically Endangered	Recorded within the project area. No clearing required for Early Works.

4.0 Fauna Emergency Contacts		
Contact Name	Contact Address	Contact Phone number
RSPCA QLD		1300 ANIMAL (1300 264 625)
Cooroora Veterinary Clinic (Mo-Fri 7.30am to 5.30pm, Sat & Sun 8:30am- 5pm)	12 Diamond St, Cooroy Qld, 4563	(07) 54476733
Animal Emergency Centre Noosa (Mon-Friday 6pm to 8am, Weekends 24/7)	28 Eenie Creek Road, Noosaville, Qld, 4566	(07) 53537005
Koala Rescue Queensland (24- hour statewide Koala emergency service)		Ray - 0423 618 740 Murray - 0431 300 729 Susan- 0466 439 947
Australia Zoo wildlife hospital – open 24 hours	1638 Steve Irwin Way, Beerwah Qld, 4519	(07) 54362097

7.2.1. Aspects and Impacts

Aspect	Potential Impact
Biosecurity	Spread of weed species through vehicle movements across the site Introduction and / or increase in pest fauna
Dust management	Smothering of adjacent vegetation, resulting in impacts to photosynthesis
Fuels and chemicals	Fuels and / or chemicals leaking into adjacent vegetation or Six Mile Creek, thereby temporarily impacting habitat quality
Water Quality	Degradation of suitable breeding habitat for frog species (e.g. giant barred frog, tusked frog and cascade tree frog)
Fauna Management	Fauna mortality from vehicle / machinery strike

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7.2.2. Mitigation Measures

No.	Actions	Role	When
General Requirements			
1.	Implement slow speed limits of 10 km per hour onsite to allow for animals to move out of the way and for drivers to have the ability to safely stop if an animal is identified within the vehicle path.	All personnel	At all times
2.	Any disturbance of vegetation must remain within the extents shown in Figure 1 and Appendix D. For clarity, the blue line shown as "maximum clearing extent" refers to the approved clearing extent for the entire Project and clearing for the Early Works is limited to the Early Works layout as shown.	All staff	At all times
3.	No Project Personnel shall intentionally damage or injure native flora or fauna.	All staff	At all times
4.	No feeding of native fauna by project personnel. No domestic animals are to be brought to site.	All Staff	At all times
5.	Cover, protect or ensure escape measures are installed in excavations to prevent fauna from becoming trapped.	Sup	At all times
6.	No plant / vehicles / equipment / materials to be stored within the Tree Protection Zone (TPZ). Trees to be protected will be clearly identified with bunting/tape, and TPZ is assumed to be the drip line if not clearly demarcated. All forms of installation and excavations within the TPZ shall comply with AS 4970-2009 'Protection of trees on development sites.	Sup	At all times
7.	Orientate temporary construction lighting to prevent light overspill into fauna habitat areas (including aquatic habitat).	Sup	At all times
8.	Re-use uncontaminated topsoil (including any stored seed bank) in any revegetation/landscaping activities.	Sup	At all times
9.	Topsoil, subsoil and vegetative material to be stockpiled separately in designated areas, clearly demarcated and identified in Figure 1 and Appendix D.	Sup	At all times
10.	All handling of fauna will be conducted by suitably qualified fauna spotter-catchers, engaged prior to and for the duration of vegetation removal. For any injured fauna immediately call the relevant contact in 4.0 above and follow the advice given	ESM	At all times
11.	TPZ shall be demarcated where there is a high risk of incursion into the zone.	Sup	At all times
Pre-construction and Planning			
12.	Within the site induction, site personnel will be educated on how to recognise the physical attributes of species protected under the EPBC Act and to STOP, MANAGE and NOTIFY when encountered.	ESM	Prior to construction
13.	Implement clear 'No-Go' flagging demarking the approved clearing extent for the Early Works package.	ESM / All personnel	Prior to construction and at all times
Disturbance and Clearing of Vegetation			

No.	Actions	Role	When
14.	Damage to flora not pre-approved for clearing should be immediately reported to ESM and treated as an incident and as a non-conformance.	All Staff	At all times
15.	Leave rootstock in ground to stabilise the soil, where practical.	Sup	At all times
16.	Retain all felled trees and hollows where possible for placement to provide further fauna habitat.	Sup	At all times
17.	Strictly no burning of cleared vegetation.	All Staff	At all times
Sequential clearing of Koala habitat			
18.	Clearing of the koala habitat trees is carried out in a way that ensures koalas on the area being cleared (the clearing site) have enough time to move out of the clearing site without human intervention by: a) Carrying out the clearing in stages b) Ensuring not more than 50% of the area to be cleared is cleared in any 1 stage c) ensuring that between each stage and the next there is at least 1 period of 12 hours starting at 6p.m. on a day and ending at 6a.m. on the following day during which no trees are cleared on the site	ESM Fauna Spotter	During clearing operations
19.	Clearing of the koala habitat trees is carried out in a way that ensures, while the clearing is carried out, appropriate habitat links are maintained within the clearing site and between the site and its adjacent area, to allow koalas living on the site to move out of the site.	ESM Fauna Spotter	During clearing operations
20.	No koala habitat tree in which a koala is present, and no koala habitat tree with a crown overlapping a tree in which a koala is present, is cleared.	ESM Fauna Spotter	During clearing operations

7.2.3. Monitoring

No.	Monitoring Required	Role	When
1.	Inspection of exclusion/buffer zones to occur during weekly inspections.	ESM	Weekly and proceeding any works in buffer zone
2.	General monitoring of construction areas for evidence of adverse impact which may result from construction activities.	ESM	Weekly

7.2.4. Reporting

No.	Reporting Required	Role	When
1.	All incidents regarding flora and fauna shall be reported immediately to the ESM. In the event of a fauna/vehicle strike by project staff to and from the project site, the normal incident reporting process shall be followed as well as notifying the ESM who will then contact the fauna spotter catcher (FSC) to take assess and take the animal to a wildlife carer or for medical attention if required. Fauna deaths resulting from vehicle strike by project staff will be recorded as an incident.	All Staff	Following incident

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2.	Any incident that has caused or is likely to cause material harm will be reported to the Client. Any impacts to threatened (vulnerable or endangered) fauna are to be reported to DESI within 24 hours of the occurrence.	PM / ESM	Following incident

7.2.5. Corrective Actions

Risk / Problem	Suggested corrective action
Fauna trapped in active work areas	• Remove potential risks to fauna, including temporary stop to works • Contact Project Environment Representative or Supervisor • Determine an escape route for fauna out of the construction area and move all personnel and equipment clear of the route. • If fauna does not leave on its own accord, Project Environment Representative to organise a registered carer or spotter/catcher to arrange capture and release. • Once fauna is removed, inspect and secure fauna exclusion fencing layout or other entry points to prevent fauna entry.
Injured fauna onsite	• For any injured fauna onsite notify the FSC immediately. Isolate the animal to ensure works cease in the immediate area as to minimise stress on the animal. Call the relevant contact in 4.0 above and follow the advice given

7.3. Light ECP

1.0 Scope
This ECP is applicable to all phases of the "Early Works Package", described in Section 1.2 above, associated with the LMDIP and applies to the management of light and light spill.
2.0 Objective
• Minimise the impacts of construction light escape on local communities (nearby sensitive receivers) and nocturnal ecological processes. • Minimise impacts to neighbourhood amenity.
3.0 Performance Criteria
3.1 General
• No Complaint or community concern regarding light spill/escape • No regulatory action against the project due to light spill/escape
There are no planned night works or non-standard hour works for this Early Rorks package.

7.3.1. Aspects and Impacts

Aspect	Potential Impact
Social	Disturbance or nuisance to neighbouring residences/sensitive receivers
Breeding cycles	Additional artificial light can unnaturally alter breeding cycles of some fauna

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Feeding	Additional artificial light can unnaturally attract fauna causing mortality or creating an unnatural feeding process

7.3.2. Mitigation Measures

No.	Actions	Role	When
Planning			
1.	Contractor to develop site specific SEPs that include relevant lighting controls showing how to correctly setup site facilities to minimise lighting impacts	ESM	Workplace Planning
2.	During the design and layout of the construction compound, including the location of temporary lighting and security light, the design, type and orientation of lighting devices (particularly those required outside of normal working hours) shall be taken into account and actioned to minimise the potential for fugitive emissions of light that could cause environmental nuisance or impacts to nocturnal ecological processes. Design, positioning and orientation of lighting devices shall adhere to the following principles. • All bright lights should be positioned as close to the ground as practical. • Light should be shielded so that it is directed toward the ground, minimising light spill towards any surrounding habitat and residential properties. • Utilise lighting that does not attract as many insects (e.g. yellow and "warm" light LEDs). • Use only the minimum amount of lighting needed for safety. • Avoid the use of naked bulbs and use narrow spectrum bulbs • Use motion sensor lights to only illuminate areas in use.	Eng	Workplace Planning

7.3.3. Monitoring

No.	Monitoring Required	Role	When
1.	General observations for the daily management of lighting controls shall be documented in site dairies.	Sup	Daily Throughout Early Works
2.	Regular inspection of lighting controls shall be undertaken using the Weekly Environmental Management Inspection Checklist.	ESM	Weekly
3.	Appropriate monitoring and surveillance will be undertaken upon receipt of any lighting nuisance complaint or community concern.	ESM	On receipt of complaint or community concern
4.	Monthly 3rd-party audits of the EWCEMP to occur including this management plan.	ESM	Monthly
5.	Monthly report to Seqwater water that includes details of lighting related monitoring results, audits, non-compliances, training, and incidents.	ESM	Monthly

7.3.4. Corrective Actions

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Risk / Problem	Suggested corrective action
Complaint regarding nuisance lighting	• Investigate the complaint and determine how the lighting can be altered (positioning / direction / type) to resolve the issue whilst maintaining the minimum level lighting required for site safety / security.

7.4. Noise and Vibration ECP

1.0 Scope

This ECP is applicable to all phases of the "Early Works Package", described in Section 1.2 above, associated with the LMDIP and applies to the management of noise and vibration.

2.0 Objective

- To minimise noise and vibration impacts from construction activities at residential locations near the Dam construction areas.
- Minimise impacts to neighbourhood amenity.
- Protect buildings, structures and other sensitive assets from vibration impacts.

3.0 Performance Criteria

3.1 General

1. Compliance with the targets in Section 7.4.1 of this Plan.
2. No verified complaints or community concerns regarding noise or vibration.
3. Noise & Vibration from construction activities will not exceed the objectives set out in Table 8. Refer to Table 9 for project hours of operation

Table 8: Acoustic Quality Objectives

Sensitive Receptors	Time of Day	Acoustic Quality Objective (dB(A))			Environmental Value
		LAeq,adj,1hr	LA10,adj,1hr	LA1,adj,1hr	
Residence (for outdoors)	Daytime and evening	50	55	65	Health and well-being
Residence (for indoors)	Daytime and evening	35	40	45	Health and well-being
	Night-time	30	35	40	Health and wellbeing, in relation to the ability to sleep

4. Vibration levels do not exceed Human Comfort criteria as Table 10

Table 9: Hours of Operation

Standard hours	Monday – Friday 6:30 am to 6:30 pm Saturday 6:30 am to 4:00 pm

There are no planned night works or non-standard hour works for this Early Works package.

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Table 10: Ground Borne Vibration - Human Comfort Guidelines

Building	Work Period	Resultant PPV, mm/s	
		Lower limit	Upper limit
Dwellings (including hotels and motels)	Standard hours	1.0	2.0
	Non-Standard hours – evening	0.3	1.0
	Non-Standard hours – night time		
Medical/health buildings (wards, surgeries, operating theatres, consulting rooms)	All	0.3	1.0
Educational/research facilities (rooms designated for teaching/research purposes)	While in use		
Community buildings (libraries, places of worship)	While in use	1.0	2.0

7.4.1. Aspects and Impacts

Aspect	Potential Impact
Noise	• Excessive noise generated by project activities causing exceedances with the project noise objectives • Disturbance to residents
Vibration	• Excessive vibration generated by project activities causing exceedances with the project vibration objectives • Damage to property or services • Disturbance to residents

7.4.2. Construction-Scenario specific noise impacts and mitigation measures

Of all the construction scenarios (CS) that were modelled in the CNVIA, only CS1 & CS2 will be relevant to this scope. Table 20 in Appendix A presents the construction equipment list and sound power levels. The noise levels described in Table 20 are a worst-case scenario of a piece of equipment operating at full power. It's likely that actual noise levels will be lower.

CS1 was modelled in the CNVIA and predicted exceedances at four (4) dwellings along Lake Macdonald Drive. The clearing of trees at Hardstand 3 will impact residents on Lake Macdonald Drive with the operation of chainsaws and a chipper for less than 1 day. Mitigations outlined in Action 11 in Section 7.4.3 will be specific to this activity.
All other vegetation clearing associated with Early Works is expected to be completed in 3 days and grubbing activities will continue for approximately 2 weeks.

CS2 was modelled in the CNVIA and there were found to be no exceedances.

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7.4.3. Mitigation Measures

No.	Actions	Role	When
General			
1.	All operations, including deliveries, must comply with approved project working hours and follow the procedure set out in this plan for any expected exceedances.	All personnel	Throughout Early Works
2.	As an overriding approach to noise and vibration management, Contractor and Subcontractors shall take all measures necessary to keep noise and vibration to a minimum. Such measures shall include but not be limited to: • minimising exposure areas. • limiting working hours (where practicable). • physical barriers and/or screens. • sympathetic selection and location of equipment and plant on Site. • use of silenced equipment or battery powered equipment (where practicable). • programming noise intensive works to the daytime. • turning off vehicles and equipment when not in use.	All personnel	Throughout Early Works
3.	Where practicable, temporary site buildings will be positioned to shield noise from construction road and access points. Maximise the offset distance between noisy plant and nearby noise sensitive receptors or, where appropriate, ensure plant are screened utilising: • Purpose built barriers. • Materials stockpile. • Site sheds, buildings or other structures. • Natural topographical barriers.	Sup	Workplace Planning
4.	Temporary haul roads designed to minimise the need for reversing.	Eng/Sup	Workplace Planning
5.	Loud hailers or whistles shall not be used, except where necessary for emergency response or evacuation scenarios.	Sup	Throughout Early Works
6.	Maintain a site activity log, recording the type of activities taking place during various times of the day to assist with the retrospective investigation of community complaints relating to noise or vibration complaints.	Sup	Throughout Early Works
Planning			
7.	Contractor must notify any potentially impacted stakeholders if delivery of significant equipment will be required out of hours - **Minimum 5 days** prior to activity. Ensure that mitigation measures as previously listed in Action 2 have been implemented prior to works commencing.	ESM	Workplace Planning
8.	Where practicable, schedule noisy work such that it would coincide with high levels of ambient noise. Scheduling will seek to avoid the coincidence of noisy plant working simultaneously close together and will aim to minimise consecutive works in the same locality.	Eng/Sup	Workplace Planning

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No.	Actions	Role	When
Inductions and Training			
9.	Site inductions will include the following specific components for noise and vibration escape management: • The close proximity of noise and vibration sensitive properties on Lake Macdonald Drive. • Noise and vibration escape sources during construction. • Potential impacts of excessive noise, vibration escape on sensitive receivers. • The importance of managing noise, and vibration at the source. • Noise, and/or vibration escape monitoring that will be carried out during the Project.	ESM	Workplace Planning
10.	The Project Team will regularly educate site staff (such as during toolbox/pre- start meetings) to maximize awareness of Project noise goals and nuisance noise generating activities, and encourage minimization of these activities, including: • unnecessary or overuse of horns and engine idling. • use of compression air brakes adjacent to sensitive areas. • shouting and swearing at shift start/end. • efficient material handling procedures to reduce unnecessary loud banging sounds.	PM	Throughout Early Works
Construction Scenario 1			
11.	• Community consultation with sensitive receivers with adequate notice of upcoming activity • Use of battery chainsaws where possible • Undertake chainsaw works during non-noise sensitive time periods for those properties which are predicted to exceed the criteria. • Turn chipper and chain saws off when not in use		
Site Access			
12.	All works (including deliveries) will occur in accordance with the approved construction hours, noise targets and vibration limits specified in this ECP.	ESM	Throughout Early Works
13.	Entry and departure of heavy vehicles to and from the site are restricted to the standard daytime construction times.	Eng/Sup	Throughout Early Works
Plant and Equipment			
14.	All vehicles, plant and equipment will undergo a Plant Hazard Assessment (PHA) prior to gaining access to the site. Plant with the lowest noise rating that meets the requirement of the task shall be used. For works in close proximity to sensitive receptors, where practicable, use electric motors in preference to combustion motors. Where enclosures are fitted to equipment, ensure doors and seals are in good working order and that doors can be closed properly against the seals.	SM	Throughout Early Works

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No.	Actions	Role	When
15.	Vehicles, plant and equipment will be regularly inspected and maintained to ensure optimal operation. Daily pre-start inspections and plant/vehicle logbooks will be used to record and determine inspection and maintenance suitability and schedules.	All personnel	Throughout Early Works
16.	All plant and equipment (including trucks) are to minimise any idling and shall be turned off (or throttled down if appropriate) when not in use.	All personnel	Throughout Early Works
17.	Where practicable, plant and equipment shall be fitted with appropriate noise control/attenuation devices and maintained and operated to ensure that noise emissions are minimised. • Noise suppression devices shall be maintained to manufacturer's specifications. • All mechanical equipment shall be silenced via the best means practicable. • Any access panels in acoustics canopies shall be kept closed at all times while the equipment is in operation.	All personnel	Throughout Early Works
18.	Equipment with directional noise characteristics (emits noise strongly in a particular direction) are to be orientated so that the noise is directed away from sensitive receivers.	All personnel	Throughout Early Works
19.	Acoustic enclosures or localised noise screens could be incorporated and maintained around fixed plant or over individual pieces of equipment as appropriate based on the 2023 CNVIA.	Sup	Throughout Early Works
20.	Horns shall not be used as communication devices, two-way radios or hand signals shall be the preferred method of communication between plant/vehicle operators and other work crew members.	All personnel	Throughout Early Works
21.	Where reversing alarms are required for mobile equipment such as dozers, scrapers, cranes, graders, excavators, trucks, loaders etc., their acoustic range should be limited to the immediate danger area. Alternatives to traditional reverse beepers could include the use of: • "Smart Alarms" which adjust their volume depending on the ambient level of noise. • Low frequency "quacker" alarms. • Spotters, CCTV camera and audio notification. • In all cases, the requirements of Occupational Health and Safety Regulations must be addressed.	All personnel	Throughout Early Works
22.	Trucks are not to use engine brakes on approach or entry into the site along Lake Macdonald Drive and the residential area within Cooroy.	All personnel	Throughout Early Works
23.	Deliveries shall be planned as to minimise the potential for trucks to queue on Lake Macdonald Drive.	Eng	Throughout Early Works & Workplace Planning
24.	The use of noisy hand tools such as grinders, impact wrenches and hammers are to be used as far away as practicable from sensitive receptors. Temporary	All personnel	Throughout Early Works

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No.	Actions	Role	When
	barrier screens may be erected where necessary. Metal on metal contact will be avoided were practicable.		
25.	Reduce the potential for impacts from construction traffic (particularly on Lake Macdonald Drive) by: • Undertaking regular site road maintenance (and inspections) to minimise impact noises from trucks travelling over irregularities in the road surface (such as pot-holes, washouts or ruts). • Limiting vehicle speeds in critical areas both on and off site. • Allowing for one-way traffic flow through the site to minimise the use of reversing alarms as much as practicable and minimise traffic delays. • Limiting excessive acceleration from site exits.	Eng/Sup	Throughout Early Works
26.	Provision of a temporary noise barrier for specific activities where practicable and recommended by a subject matter expert.	All personnel	Workplace Planning

7.4.4. Monitoring

To minimise potential for noise and vibration related complaints, where practicable, works (including deliveries and HV movements) will be undertaken within site construction working hours (Table 9).

Unattended noise monitoring shall be completed at a minimum of two locations (Figure 6) throughout the entire construction period to monitor noise levels against the Project construction noise targets specified in Table 8. In addition to the unattended monitoring, spot attended monitoring will be undertaken by the ESM or delegate in response to complaints, to plan for upcoming high-risk work (noise), or to validate the performance of the unattended monitoring.

Where noise and/or vibration monitoring is required in response to a complaint, additional monitoring will be undertaken (at receivers' location) in accordance with Australian Standards and the Department of Environment & Science Noise Measurement Manual (2013 DEHP). Noise and vibration will be assessed against the targets defined in Table 8 & Table 9. If noise & vibration monitoring confirms exceedances of the project objectives outlined, then an investigation will be initiated to identify the source and recommend appropriate mitigation measures

Noise logging will be conducted in accordance with procedures outlined in Australian Standard Australian Standard AS1055-1997 – Acoustics – description and measurement of environmental noise.

No vibration monitoring is proposed for the Early Works scope unless specific complaints are received. No high- impact vibration works are proposed.

Further information on baseline noise conditions can be found in Appendix A.

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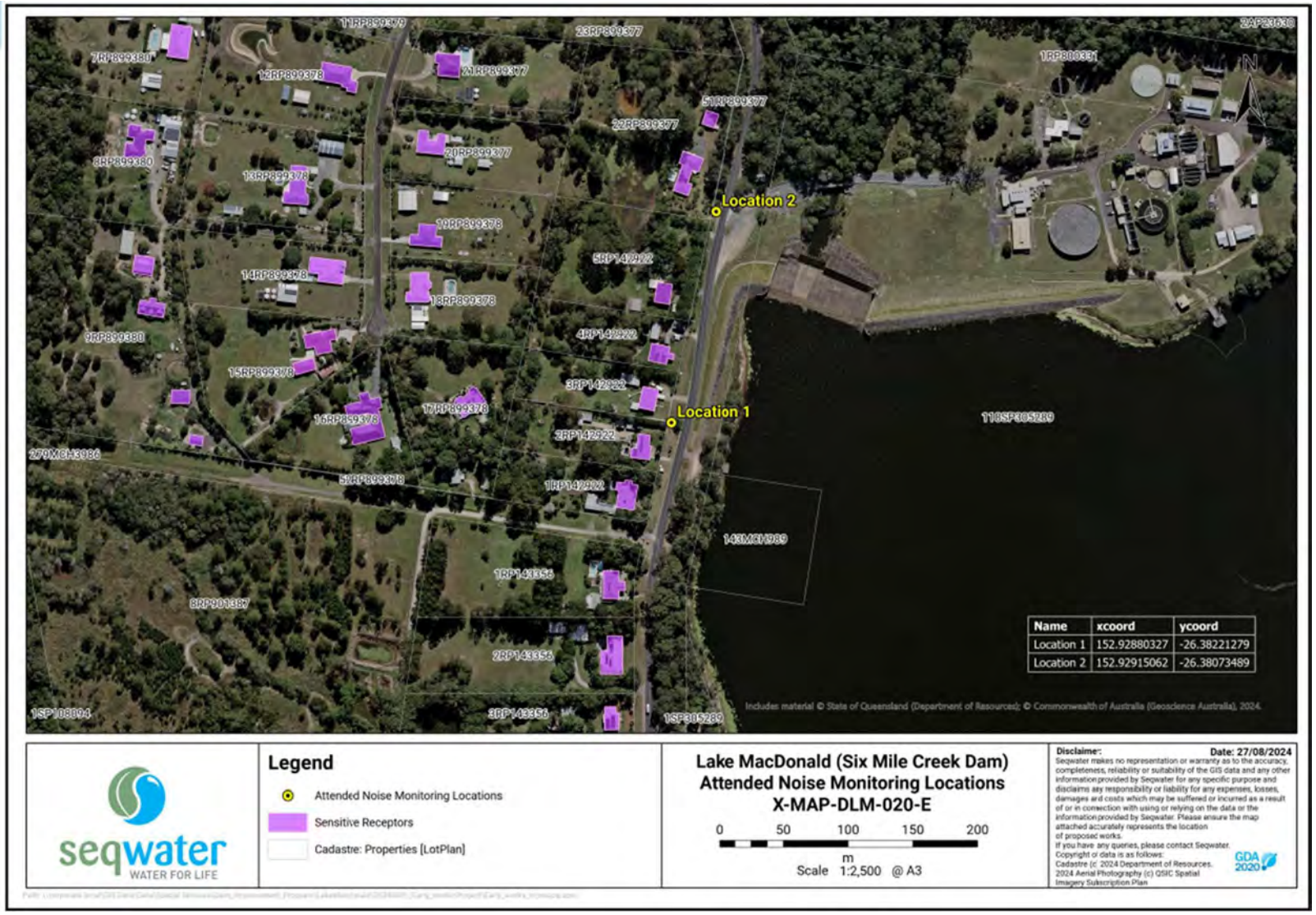

Figure 6: Sensitive receivers and unattended noise monitoring locations

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No	Monitoring Required	Role	When
1.	Undertake the Noise Monitoring Program as outlined in Section 7.4.4 of this ECP	ESM	Throughout Early Works
2.	**Environmental noise & vibration monitoring** Ongoing monitoring and review of the site noise and vibration management practices will be undertaken: • In response to a valid community complaint regarding construction noise or vibration. • When review of upcoming construction schedule indicates a high likelihood for impact at nearest sensitive receptor locations. • Vibration monitoring will be conducted if during construction complaints are received or unforeseen activities are required that have an associated vibration risk. All vibration measurements shall be conducted using laboratory calibrated equipment in accordance with BS 7385-2-1993 and calibration in accordance with BS 6955-0:1988 • The purpose of monitoring is as an active management tool to assist with investigating the likely sources of construction noise impact • Quantifying the extent of likely impact (through comparison with the Project noise goals). • Identifying the need for further controls or modified site noise and/or management practices. • Establishing the effectiveness of noise and/or vibration mitigation implemented.	ESM	As Triggered during Early Works
3.	Contractor will measure meteorological conditions on a continuous basis (including wind speed and wind direction) to assist with the investigation of complaints. Meteorological data will be uploaded to a cloud sever to be accessed by computer or mobile app.	ESM	Regularly Throughout Early Works
4.	Where noise monitoring is required in response to valid community complaints, it will be performed at a location representative of the nearest affected sensitive receiver to the site or a location representative of the complainant(s) dwelling.	ESM	Regularly Throughout Early Works
5.	General observations for the daily management of noise and vibration controls shall be documented in site dairies.	ESM	Daily Throughout Early Works
6.	Regular inspection of noise and vibration controls shall be undertaken using the Weekly Environmental Management Inspection Checklist and uploaded to Project Pack Web.	ESM	Weekly
7.	Effectiveness of noise and vibration controls shall be regularly reviewed for adequacy having regard for changing circumstances.	ESM	Regularly Throughout Early Works
8.	Monthly 3rd-party audits of this Plan will be undertaken as part of the EWCEMP auditing process.	HSEQ	Monthly

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7.4.5. Reporting

No	Reporting Required	Role	When
1.	All monitoring results are to be maintained in Project Records. Reporting will note: • The time of monitoring. • The type and location of activities occurring on site at the time of monitoring. • The location of monitoring positions with respect to site noise sources (also marked on a plan). • Noise generating activities audible at the monitoring location. • Other extraneous noise sources which could influence the noise level measurements. • Weather conditions prior to and during the monitoring (or complaint).	ESM	Throughout Early Works

7.4.6. Corrective Actions

No	Reporting Required	Role	When
Community concern received relating to noise and/or vibration	• Investigate - consult with Supervisors, plant/equipment Operators, Project Engineers, Construction Manager. • Conduct physical monitoring (be undertaken under the guidance of a suitably qualified person) • Implement appropriate management and mitigation measures – expert advice shall be sought as required. • Conduct increased engagement with community (in consultation with the client) as per Section 8	ESM	On receipt of complaint or community concern
Project noise and vibration targets are being consistently exceeded	• Review noise and/or vibration mitigation measures applied to the task and implement additional controls as practicable in consultation with relevant sub-contractors, expert advice and affected stakeholders (where appropriate). The Project noise level goals would be used to assist with determining the need for further corrective actions. • Where further source noise controls or mitigation in the sound transmission path are not practicable or ineffective in further controlling noise levels, controls at the receiver will be investigated.	ESM	On receipt of excessive monitoring data results
Creation of excessive vehicle noise emissions	• Repair or undertake maintenance on equipment, plant and vehicles where necessary.	Eng/Sup	As required

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	• Remove non-compliant equipment, plant and vehicles from operation where repair or maintenance is not practicable. • Restrict equipment, plant and vehicle hours of operation when working in the vicinity of sensitive receivers.		

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7.5. Hazardous Substances ECP

1.0 Scope

This ECP is applicable to all phases of the "Early Works Package", described in Section1.2 above, associated with the LMDIP and applies to the management of hazardous substances.

2.0 Objective

- Prevent adverse environmental impacts from hazardous substances and dangerous goods.
- Protect human health and aquatic and terrestrial ecological process in and around Lake Macdonald and Six Mile Creek.
- All fill imported to the Six Mile Creek dam site is clean and free from any contaminants.
- Ensure materials moved within or exported from site are managed so as to avoid harm to the environment or human health.

3.0 Performance Criteria

3.1 General

- No environmental incidents resulting from mismanagement of hazardous substances and/or dangerous goods.
- All personnel subject to a workplace induction.
- Compliance with relevant standards, guidelines and legislation.
- Containment and effective clean-up of all spills involving materials that may cause environmental harm, and measures taken to prevent the incident from recurring.
- Bunds are correctly sized and fit for purpose.
- No contaminated fill material brought to site.
- All hazardous substances onsite have been assessed through the TRA and Hazardous Chemical Risk Assessment process.

3.1 Hazardous Substance and Dangerous Goods

This ECP has identified the following hazardous substances that will by onsite for the Early Works Package:

Table 11: Inventory of hazardous materials

Hazardous Material	Storage vessel	Reagent Form	DG Class	Comment	Location Storage
LPG	9L gas cylinders	Liquefied gas	2.1	Not hazardous	Workshop
Lubricating oils / greases	Mobile servicing truck	Liquid /solid	2.2	Not hazardous	Mobile service truck / DG Container
Diesel & Petrol	2000L Double-skinned container	Liquid	4	Hazardous	Mobile service truck / Bulk Fuel Storage
Contaminated soil from any hydrocarbon spills	Skip bin	Soil / solid	2.2	Hazardous	Reagent Store

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7.5.1. Aspects and Impacts

Aspect	Potential Impact
Water Quality	• Fuels and / or chemicals migrating offsite, thereby temporarily impacting water quality
Land Contamination	• Uncontrolled release of Fuels and / or chemicals to land resulting in land or groundwater contamination

7.5.2. Mitigation Measures

No.	Actions	Role	When
Inductions and Training			
1	Site inductions will include the following specific components for hazardous chemicals: • Summary of hazardous chemicals that are likely to be present on Site. • Key requirements for handling, transportation and storage. • Identification of hazardous and other chemicals including awareness of other items/substances such as unexploded ordinances (UXO), known or suspected ground contamination and the findings of any surveys for such materials that have been conducted.	ESM	Workplace Planning
2	All relevant personnel will undertake adequate environmental awareness and training covering the requirements of the EWCEMP regarding the sourcing, tracking and transportation of fill material.	ESM	Workplace Planning
3	First aiders and all workers who store or handle hazardous chemicals must be adequately trained to ensure they are aware of the associated risks and requirements for the safe use and handling of hazardous chemicals.	ESM	Throughout Early Works
4	All personnel who store or handle hazardous chemicals must be aware of spill response protocols.	ESM	Throughout Early Works
5	All personnel to be briefed on emergency response protocols.	ESM	Throughout Early Works
Importation of Fill			
6	All fill material brought on to the site must meet the requirements of: • Biosecurity Act 2014 • Environmental Protection Act 1994	Eng	Throughout Early Works
7	The source of the imported fill must not be listed on the Environmental Management Register (EMR) or Contaminated Land Register (CLR) unless documented evidence demonstrating the material is free of contamination can be provided and is verified by a suitably qualified person as defined by the *Environmental Protection Act 1994* contaminated land provisions.	Eng	Throughout Early Works
8	Conduct visual inspections of the imported fill material to ensure that it contains no waste material including: • Signs of hydrocarbon contamination.	Eng	Throughout Early Works

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No.	Actions	Role	When
	• Plastics or other wastes. • Vegetative materials. • Concrete wastes. • Scrap steel. Any signs of potential contamination would require validation sampling and testing as per AS 4482.		
9	Obtain documentation from the fill provider, which must include: • Date of arrival on site • Volume / quantity of fill material • Provider • Source of fill material • Certification that the material is weed free • Documentation that confirms the site of the fill material is not listed on the EMR/CLR (unless verified clean – see item 7 above). Potential local licensed suppliers who will be asked to tender include: • Kin Kin Quarry – 250 Sheppersons Ln, Kin Kin, Qld • Boral Quarry – 720 Moy Pocket Rd, Moy Pocket, Qld • Curra Quarry – 1 Bruce Highway, Curra, Qld • Image Flat Quarry – 178 image flat Rd, Nambour, Qld • Anderleigh Quary - 270 Sorenson Rd, Gunalda, Qld	Eng/Sup	Throughout Early Works
Hazardous Chemicals/Dangerous Goods Selection and Risk Management			
10	Any hazardous chemical not approved for use by the project which is intended to be brought to site needs to be assessed and approved. As part of these assessments, consideration is given to whether a similar, less hazardous product can be substituted. If a substance cannot be eliminated or substituted, Hazardous Chemical Risk Assessment must be developed, and the Site Chemicals Register must be updated to include the newly approved chemical.	ESM	Workplace Planning
11	Emergency response procedures will include, at a minimum: • Containment of the hazardous chemical and any solid or liquid effluent. • Notification of relevant authorities and third parties. • Disposal of containment materials. • Protection of persons involved in the clean-up operations.	SM	Workplace Planning
Receipt			
12	The ESM and Safety Manager must ensure that a copy of the manufacturer's Safety Data Sheet is obtained before a chemical is brought to Site. Note: SDSs are accessible through Chemwatch .	All personnel	Throughout Early Works
13	Any container containing hazardous chemicals must be inspected to ensure it is in a sound condition, can safely contain the chemical, and is clearly labelled .	All personnel	Throughout Early Works
Hazardous Chemical Storage and Labelling			
14	Plan the location of facilities, plant laydown areas, refuelling areas, stockpiles or chemical storage areas so that they avoid draining towards surface water or stormwater systems.	All personnel	Workplace Planning

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No.	Actions	Role	When
15	Spill kit and fire response equipment must be located where chemicals and fuelled plant or equipment is being stored, operated or maintained.	ESM/SM	Throughout Early Works
16	Hazardous chemicals must be correctly labelled in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals. Labelling must also comply with Schedule 9 Part 3 of the Work Health and Safety Regulation 2011 (Qld). Where possible, chemicals should be kept in their original container with the original labelling from the manufacturer/supplier. Where chemicals must be decanted, the method defined in the relevant SDS, and hazardous chemical risk assessment or documented risk assessment must be followed. New containers must be appropriate for the chemical they will hold and must be correctly labelled. Hazardous chemicals MUST NOT be decanted into food or drink containers. Provide appropriate signage using HAZCHEM coders that is visible at all times. Signage must also provide contact details for the Environmental Representative and Safety Officer in case of an emergency.	All personnel	Throughout Early Works
17	All chemicals will be stored with the appropriate SDS sheet available and in compliance with Australian Standard AS 1940. Maintain records of the existing inventory, storage location, personnel training, and waste disposal for all chemicals, fuel and dangerous goods used on site.	All personnel	Throughout Early Works
18	The GHS & Dangerous Goods Segregation Chart (refer to Hazardous Chemicals Management Procedure) is to be used to ensure all chemicals are segregated as required and quantities are appropriate for the storage environment.	All personnel	Throughout Early Works
Fuel Handling, Transport and Storage			
19	Fuel handling, transport and storage will be managed in accordance with Fuel Handling, Transport and Storage (refer to Hazardous Chemicals Management Procedure).	ESM/SM	Throughout Early Works
20	The appropriate SDS will be available wherever fuels are being transported, stored or handled.	All personnel	Throughout Early Works
21	Refuelling areas will be positioned > 20m from any waterway edge/entry point (drain). Refuelling will occur in designated hardstand areas or over appropriate bund/spill tray. Refuelling bund collars or blow back collars will also be made available for large volumes (>300L).	All personnel	Throughout Early Works
Disposal of Contaminated Materials			
22	The transport and disposal of hazardous chemicals is to be undertaken in accordance with relevant Manufacturer SDS disposal requirements and disposed of as Regulated Waste. *Refer to Hazardous Chemicals Management Procedure.*	ESM	Throughout Early Works

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7.5.3. Monitoring

No	Monitoring Required	Role	When
1.	Hazardous chemicals management and storage are to be monitored daily, with observations entered into daily diaries where necessary. The site chemical register will be used to verify types and volumes of chemicals stored onsite and must be kept updated to reflect exactly what's stored onsite. Daily inspections will include storage areas for any defects with bunding, floor, cover, structure, hoses, valves and pumps or associated infrastructure.	Sup	Daily
2.	Regular equipment checks by operators for evidence of leaks and fitness of hydraulic hoses and seals. Maintenance or repairs completed as necessary to prevent drips, leaks or likely equipment failures.	ESM/SM	Daily
3.	Hazardous chemicals management and storage are to be inspected as part of a weekly environment or HSE site inspection. Inspections of spill kits to be included as part of the weekly environmental inspections.	ESM/SM	Weekly
4.	Monthly 3rd-party audits of this Plan will be undertaken as part of the EWCEMP auditing process.	Regional HSEQ	Monthly

7.5.4. Reporting

No	Reporting Required	Role	When
1.	Complaints / incidents regarding hazardous chemicals will be reported immediately to the PER and/or Safety Advisor/Manager. Record any environmental incidents involving spills, including the time of incident, persons involved, incident details, mitigation measures, and actions taken to minimise the probability of recurrence. Immediately report any large spills or potential risk of spills to the Environmental Representative. Reporting of all incidents shall follow the procedure outlined in Section 4.3.	All personnel	Following incident

7.6. Cultural Heritage ECP

1.0 Scope
This ECP is applicable to all phases of the "Early Works Package", described in Section 1.2 above, associated with the LMDIP and applies to the management of Cultural heritage.
2.0 Objective
• Ensure that any item or place of heritage significance is recorded and protected; • Ensure that appropriate heritage management practices are implemented as required; and • Ensure that appropriate parties are consulted in the event of an unanticipated heritage discovery.
3.0 Performance Criteria
3.1 General

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- Cultural heritage duties of care are met.
- No loss of heritage value outside of the Project scope.
- Unanticipated heritage discoveries are recorded, communicated and managed appropriately.
- Appropriate stakeholders are engaged to advise on unanticipated discoveries.

3.2 Existing Cultural and Historical heritage

Historical Heritage

While no historic heritage registered places, landscapes or other features are located within the Project area, several features have been identified during the IAR assessment (Refer to Table 6.1) as having potential local heritage significance. These are detailed in the table below indicating potential for direct and indirect impact. None of these features will be directly impacted by the Early Works Scope.

See table below for field assessment of existing historical features.

FEATURE	SIGNIFICANCE	IMPACT
Noosa Water Treatment Plant		
Lime building	Local	None
Clarifier No. 1	Local	None
Backwash tank No. 1	Local	None
Dam wall and spillway	Local	Direct
Camp Cooroora		
Scout activity centre	Local	Indirect
Bush-style kitchen	Local	Indirect
Rotunda	Local	Indirect
Open air chapel	Local	Indirect
Flagpoles	Local	Indirect
Entrance gate and wall	Local	Indirect
Fireplace	Local	Indirect
Other		
Lake Macdonald brick structure with dedication plaque near left embankment	Local	Direct

Aboriginal Cultural Heritage

Seqwater have a Proponent Commitment in the CGER to implement the following: following measures to mitigate potential impacts on cultural heritage:

- Developing a cultural heritage management agreement for the project in consultation with the Kabi Kabi First Nation People. Negotiations are currently underway to finalise this agreement however it is not required as part of Early Works.
- Creating photographic record of structures of potential local heritage significance that require demolition, for example the original dam wall and spillway and salvage/relocate the dedication plaque. These records have been captured in the Cultural Heritage Assessment Reports.

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- Establishing temporary exclusion flagging or fencing around historic structures within Camp Cooroora to reduce potential for accidental damage. No impacts to Camp Cooroora are proposed as part of Early Works.

A search of the DATSIP Aboriginal Cultural Heritage Database on 23 July 2018 identified one record (KC:G17) of an Aboriginal heritage site within the wider Project activity area. The accuracy of the site's location is given as 'estimated' meaning the original recording did not include any accurate information as to the physical location of the site. Based on information available, the estimated location of the site is now within the current inundation area of Lake Macdonald. If the site was located within the current dam footprint, it is probable there is no physical evidence left of the site. However, the former location of the ceremonial ground may still be considered of importance to Aboriginal people.

A second record has been entered into the DATSIP database (KC-0310-1) 30/11/23. It has been Identified as a scar tree. Locations can be seen in Figure 7.

Neither of these sites or any other known Aboriginal Cultural Heritage sites will be disturbed by the Early Works.

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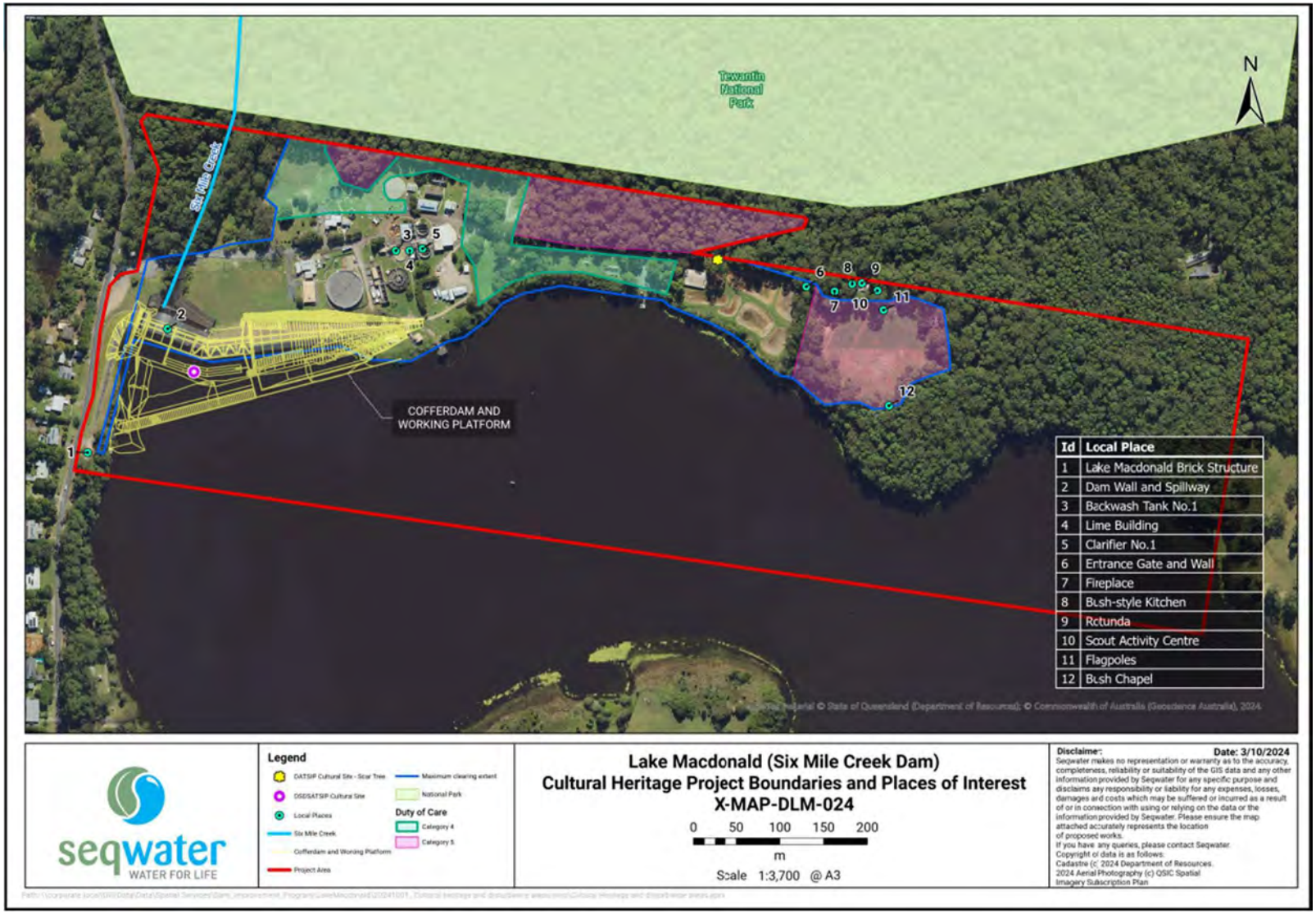

Figure 7: Project Activity Area – Cultural Heritage Locations

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7.6.1. Aspects and Impacts

Aspect	Potential Impact
Heritage values	• Destruction of European or Aboriginal heritage values as a result of project activities.

7.6.2. Mitigation Measures

No.	Actions	Role	When
General			
1.	All site operations are to be carried out in accordance with the Cultural Heritage Management Agreement (CHMA) as agreed between Seqwater and the Kabi Kabi Peoples Aboriginal Corporation **Note** – This CHMA will be revised and updated, as required, upon receipt from Seqwater of a finalised version of the CHMA.	ESM/ Seqwater	Throughout Early Works
Inductions and Training			
2.	Site inductions will include the following specific components for cultural heritage: • Cultural heritage values in the Project area (both within the lake area and in the terrestrial surrounds), and the importance of protecting and preserving these values • Information on mitigation and control measures • The requirements of this plan, as well as any other legislative and contractual obligations • The procedure in the event of an unanticipated discovery or accidental damage of a heritage item or place • The requirements of any CHMA • Locations on a site plan of any known areas/items of cultural heritage significance • Specific location of recently identified scar tree	ESM	Throughout Early Works
3.	The Kabi Kabi Peoples Aboriginal Corporation will be invited by the Principal to deliver a Cultural Heritage Awareness Presentation. The purpose of the presentation is to outline Kabi Kabi cultural heritage values and connection with the works area. Information from this presentation will be incorporated into the Contractor's site induction.	Seqwater	Throughout Early Works
Planning			
4.	Procedure for unexpected (chance) finds of cultural heritage artefacts, will be reviewed if, and when, the signed, finalised CHMA is provided by Seqwater to capture any site-specific unanticipated discovery requirements or updated field data.	ESM	Workplace Planning
5.	Scar tree (KC-0310-1) will be barricaded, flagged and toolboxed as a protected tree during the course of the Early Works. Or until such time as testing of the tree has been completed.	ESM	Workplace planning

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<table>
<tr><th>No.</th><th>Actions</th><th>Role</th><th>When</th></tr>
<tr><td>6.</td><td>Aboriginal cultural heritage monitoring shall be required during ground disturbance works within the works area at locations as directed by the Seqwater Superintendent. Nominally, these locations are identified as ‘Duty of Care Category 5’ areas within the Aboriginal heritage due diligence assessment (IAR Appendix L, Annex 1), and are
subject to any agreement between the Principal and the Kabi Kabi Peoples Aboriginal Corporation.</td><td>Seqwater</td><td>Workplace Planning</td></tr>
<tr><td>7.</td><td>Contractor must provide the Seqwater Superintendent a minimum of 30 days’ written notice when scheduling ground disturbance works in locations subject to Aboriginal cultural heritage monitoring to ensure adequate notice is provided to the The Kabi Kabi Peoples Aboriginal Corporation.
Contractor must not commence ground disturbance works in locations subject to Aboriginal cultural heritage monitoring if no Kabi Kabi Peoples Aboriginal Corporation
cultural heritage personnel are present without the written approval of the Superintendent.</td><td>PM</td><td>Workplace Planning</td></tr>
<tr><td>8.</td><td>Contractor shall nominate a locked container in the project site office for temporary storage of portable cultural heritage finds recovered during project works. Following the completion of project works, Contractor shall facilitate the transfer of the
collected finds in consultation with the Principal and The Kabi Kabi Peoples Aboriginal Corporation and/or regulatory authorities.</td><td>PM</td><td>Workplace Planning</td></tr>
<tr><td>9.</td><td>The Principal’s Cultural Heritage Officer shall be the primary point of contact with the Kabi Kabi Peoples Aboriginal Corporation for Aboriginal cultural heritage management under the contract. The site contains a number of buildings and features assessed as having local heritage significance.</td><td>PM</td><td>Workplace Planning</td></tr>
<tr><td>10.</td><td>Duty of Care Guidelines for Workplace Planning

The assessment in Chapter 13 of the IAR categorised the relevant activities and locations in accordance with the Duty of Care Guidelines. The table below, extracted from table 13-3 of the 2019 edition of the IAR, summarises the assigned category. This table is included into this ECP for the purposes of assisting with workplace planning and construction programming:

<table>
<tr><th>Activity / Location</th><th>Duty of Care Category</th><th>Description</th></tr>
<tr><td>Majority of Project area</td><td>Category 2 – Activities causing No Additional Surface Disturbance</td><td>Where an activity causes No Additional Surface Disturbance of an area it is generally unlikely that the activity will harm Aboriginal cultural heritage or could cause additional harm to Aboriginal cultural heritage to that which has already occurred</td></tr>
</table></td><td>PM</td><td>Workplace Planning</td></tr>
<tr><td colspan="4">Unanticipated Discovery Procedure – Aboriginal/Indigenous</td></tr>
<tr><td>11.</td><td>Refer to the following sources of information: https://www.datsip.qld.gov.au/people-communities/aboriginal-torres-strait-islander-cultural-heritage/human-remains</td><td>ESM</td><td>Throughout Early Works</td></tr>
<tr><td>12.</td><td>Stop project activities within at least 50m radius of the New Find. Do not move or relocate any possible cultural heritage finds.</td><td>All personnel</td><td>Throughout Early Works</td></tr>
</table>

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No.	Actions	Role	When
13.	Immediately inform site supervisor and take all reasonable steps to preserve and protect the find from harm until such time that it is inspected and managed. Any items found shall be left in an as-found condition and a temporary barrier shall be erected to prevent access to the find.	All personnel	Throughout Early Works
14.	Where no representatives of the Aboriginal Party are present at time of discovery, a New Finds Form (Seqwater Form No. FRM-00895) shall be completed and the Seqwater Cultural Heritage Officer notified immediately. Where the discovery includes human remains, report the incident to the police immediately (in consultation with the Project Manager and Environment and Sustainability Manager).	ESM	Throughout Early Works
15.	The Cultural Heritage Officer will contact the relevant Aboriginal Party to discuss management of the find (such as mitigation / relocation or similar).	Seqwater Cultural Heritage Officer	Throughout Early Works
16.	Project Activities must be amended to avoid further impact to the find where possible until an agreed course of action has been decided.	PM	Throughout Early Works
17.	If authorised representatives of the Aboriginal Party are present at time of discover, discuss mitigation options on site and implement with the agreement and support of the Aboriginal Party representatives.	Cultural Heritage Officer / ESM	Throughout Early Works
18.	Once agreed management measures have been decided and implemented, work can recommence ensuring that all measures are complied with.	ESM	Throughout Early Works
19.	Document the discovery in Project files, ensuring that photographic evidence of the scene and location is recorded.	ESM	Throughout Early Works
20.	Communicate necessary information to project personnel as appropriate, ensuring that sensitive information (such as the location/s of places of heritage significance) is disseminated only as necessary.	ESM	Throughout Early Works
Unanticipated Discovery – Non-Aboriginal/Indigenous			
21.	Refer to the following sources of information for the relevant State or Territory: https://www.qld.gov.au/environment/land/heritage/archaeology/discoveries/	ESM	Throughout Early Works
22.	In the event of an unanticipated discovery, works must cease in the area, all plant and equipment removed to a suitable distance, the area cordoned off to prevent entry and the PER immediately notified.	All personnel	Throughout Early Works
23.	Advise the responsible Seqwater representative immediately of the unanticipated discovery.	ESM	Throughout Early Works
24.	Where the discovery includes human remains, report the incident to the police immediately.	ESM	Throughout Early Works
25.	Formally advise the appropriate Government body.	ESM	Throughout Early Works

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No.	Actions	Role	When
26.	Document the discovery in Project Files, ensuring that photographic evidence of the scene and location is recorded.	ESM	Throughout Early Works
27.	Seek the written (email permissible) advice of the appropriate Government body with regard to: • Necessary protection measures for the Site; • Necessary archaeological undertakings; • Appropriate course of action, including management and protection measures for the removal of any items or protection of any places; • Any further reporting obligations .	ESM	Throughout Early Works
28.	Maintain the integrity of the discovery during operations, ensuring to prevent any unauthorised entry and follow the directions of the Police and appropriate Government body	All personnel	Throughout Early Works
29.	Only recommence works once written authorisation is provided by the appropriate Government body and/or traditional owner group/s.	ESM	Throughout Early Works
30.	Communicate necessary information to project personnel as appropriate.	ESM	Throughout Early Works

7.6.3. Monitoring

No.	Monitoring Required	Role	When
1.	Daily observation of heritage protection measures will be made and recorded in Site Diaries (where applicable).	Sup	Daily
2.	Heritage management will be inspected as part of a weekly environment or HSE site inspection. Results of the weekly inspection will be entered into Project Files.	ESM	Weekly
3.	Monthly 3rd-party audits of this Plan will be undertaken as part of the EWCEMP auditing process.	Regional HSEQ	Monthly

7.6.4. Reporting

No.	Reporting Required	Role	When
1.	Any findings of any archaeological items shall be reported to Seqwater and relevant regulatory authorities as required	ESM	Following discovery

7.7. Weed and Pest ECP

1.0 Scope
This ECP is applicable to all phases of the "Early Works Package", described in Section 1.2 above, associated with the LMDIP and applies to the management of weeds and pests.
2.0 Objective
• Prevent the introduction of new weed and pest animal species to the Site.

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- Prevent the spread of weed species within the Site.
- Restricted invasive plants and introduced flora are not present in study area are not introduced.
- Restricted invasive plants already present in the study area are not spread as a result of Project activities.
- Pest infestations do not increase as a consequence of the Project and existing populations of introduced fauna are controlled.

3.0 Performance Criteria

3.1 General

- Construction activities undertaken in accordance with this Plan.
- No introduction or spread of new weeds or pests to Site.
- Effective management of existing weeds and pests.
- Obligations under the Queensland Biosecurity Act 2014 are met.
- All mobile plant entering the site have a valid weed hygiene certificates.
- Documentation is available showing quarry sites inspected for weeds prior to extraction.
- Infestation of weed species is reduced.
- No additional weed or pest infestations or increase in distribution as a consequence of the construction activities.
- All employees working on site attend induction training sessions to identify weeds.

3.2 Listed Species (Pest and Weed)

A total of 25 flora species recorded within the project area were considered environmental weeds, of which five are listed as Category 3 restricted matter under the Biosecurity Act 2014 and two are listed as a Weed of National Significance (WoNS).

Table 12 below lists the identified Environmental weeds recorded within the project study area. PEST FLORA

The listed weed species, with the exception of lantana (*Lantana camara*), were generally present in low abundance. Lantana was present at most sites and was occasionally dense in areas where significant disturbance had occurred. This was most notable in the area immediately north of the fish hatchery.

PEST FAUNA

Four pest fauna species were observed during the field survey, namely cane toad (*Rhinella marina*), Domestic dog (*Canis familiaris*), Red Fox (*Vulpes Vulpes*) and Black Rat (*Rattus rattus*). Earlier studies have also identified Peking duck (*Anas platyrhynchos domesticus*), and Asian house gecko (*Hemidactylus frenata*). All species are commonly occurring fauna species across Queensland and only the Red Fox is a "restricted Matter" under the Biosecurity Act.

Table 12: Weed Species

Scientific Name	Common Name	Endemicity	WoNS	Category 3 Restricted Matter
Asparagus aethiopicus	Ground asparagus	Invasive	Yes	Yes
Bambusa vulgaris	Bamboo	Invasive		
Cinnamomum camphora	Camphor tree	Invasive		Yes
Citrus limon	Bush lemon	Invasive		

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Corymbia torelliana	Cadaghi	Invasive		
Diospyros khaki	Persimmon	Invasive		
Dypsis lutescens	-	Invasive		
Eugenia uniflora	Brazilian cherry tree	Invasive		
Heptapleurum actinophylla	-	Invasive		
Lantana camara	Lantana	Invasive	Yes	Yes
Melinis minutiflora	Molasses grass	Invasive		
Murraya paniculata	Satinwood	Invasive		
Paspalum mandiocanum	Broadleaf paspalum	Invasive		
Passiflora edulis	Common passionfruit	Invasive		
Passiflora suberosa	Corky passionflower	Invasive		
Pinus elliottii	Slash pine	Invasive		
Schinus terebinthifolius	Pepper tree	Invasive		Yes
Senna pendula var. glabrata	Easter cassia	Invasive		
Senna septemtrionalis	Arsenic bush	Invasive		
Setaria sphacelata	South African pigeon grass	Invasive		
Solanum mauritianum	Wild tobacco	Invasive		
Solanum torvum	Devil's fig	Invasive		
Sphagneticola trilobata	Singapore daisy	Invasive		Yes
Syagrus romanzoffiana	Queen palm	Invasive		
Urochloa mutica	Para grass	Invasive		

QLD weed info sheets for all Cat 3 Restricted Matter species can be found in Appendix E

7.7.1. Aspects and Impacts

Aspect	Potential Impact
Biosecurity	• Spread of weed species through vehicle movements across the site • Introduction and / or increase in pest fauna species

7.7.2. Mitigation Measures

No.	Actions	Role	When
Inductions and Training			
1.	Site inductions will include the following specific components for weed and pest management: • Identification & explanation of weed and pest species known to be present on the Site. • Ecological impacts associated with invasive weeds and pests. • Mitigation and hygiene measures for controlling weeds and pests. • Awareness of human vectors in the introduction of weeds and pests.	ESM	Prior to commencing work

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No.	Actions	Role	When
2.	Weed and pest control activities will generally be conducted by specialist contractors, however if any site personnel are directly involved in weed or pest control activities, appropriate training will be provided.	ESM	Throughout Early Works
3.	Pest & Weed toolboxes will be conducted by the environment team regularly to the team, and posters placed around crib huts and offices with a list and picture of pest species and mitigation measures.	ESM	Throughout Early Works
Planning			
4.	Workplace planning and construction programming will, where relevant, give priority to species of greatest environmental threat as per the NSC Biosecurity / Pest Management Plan and Biosecurity Act 2014.	ESM	Workplace Planning
5.	Subcontractor engagement and contracts will contain weed and pest management requirements including the requirement for all plant, equipment and machinery, and aquatic vessels to be clean on arrival and provided appropriate documentation to validate cleaning.	Eng	Workplace Planning
Weed and Pest Hygiene			
6.	All mobile plant, vehicles, including deliveries, must use designated travel routes, site access tracks and lay-down areas.	All personnel	Throughout Early Works
7.	Mobile plant and vehicles must be clean of any mud or organic material, prior to arriving or departing from site to prevent the spread of weeds and disease.	All personnel	Throughout Early Works
8.	Vehicles and plant to be used for clearing must be sourced from "clean" areas or carry weed hygiene certification or be verified as cleaned.	Eng	Throughout Early Works
9.	Upon arrival at the Project area, all vehicles, plant and equipment and portable infrastructure will be inspected for the presence of weeds and loose soil. Inspections will conform to the standard required in the *Vehicle and Machinery Inspection Procedure* (Qld Govt. 2013)[1]. If required, vehicles, plant and equipment, portable infrastructure and aquatic vessels arriving to site may be refused entry and be directed to be cleaned to remove weeds/loose soil at an off-site wash-down facility. Weed hygiene declarations **or** a completed Project Pre-Acceptance Checklist will be obtained for all vehicles, plant and equipment, portable infrastructure and aquatic vessels being onboarded to site confirming that the plant is clean, free of organic materials (mud, dirt, weeds or seeds) prior to arrival.	Sup	Throughout Early Works
10.	Washing of vehicles, plant and equipment will be undertaken in an appropriately bunded wash down facility.	All personnel	Throughout Early Works
11.	Vendors supplying materials with the potential to contain weeds or pests (e.g. soil/fill, mulch etc.) will be required to provide written assurance that all supplied materials are free from any weeds or pests.	Eng	Throughout Early Works
General Construction Management			
12.	Ensure construction personnel do not create environments favourable to pest fauna, including:	ESM	Throughout Early Works

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No.	Actions	Role	When
	• Ensure waste is managed appropriately. Bins with securable lids, must be provided across the work site and emptied on a regular basis • Ensure effective site drainage to minimise ponding water across the site		
13.	A pre-construction inspection of the Site is to be undertaken by the ESM or another person with appropriate skills and knowledge to identify weed and pest species.	ESM	Workplace Planning
14.	Known weed infested areas will be marked 'Quarantine/No-Go Areas'.	ESM	Throughout Early Works
15.	Plant and equipment working in areas with weed infestations shall be washed-down prior to conducting work in areas that are weed free.	Sup	Throughout Early Works
16.	All food scraps and other waste materials must be covered and removed off site regularly to reduce attraction to feral animals.	Sup	Throughout Early Works
17.	Rehabilitate disturbed areas following completion of construction to prevent pest species from becoming established as per the project requirements for rehabilitation.	ESM	Throughout Early Works
Weed and Pest Treatment and Eradication			
18.	The process for physically removing weed infestations will be as follows: • Only designated machinery to be used for the task. Minimise entry to the area. • Bobcat (or similar) used to scrape off top layer of vegetation & 50mm soil profile and place into a dump truck • ESM to confirm all required removal of infested material is complete • Complete a QLD weed declaration confirming the contaminated material and dispose to an approved designated landfill. • If the material needs to be stockpiled temporarily it must be segregated from all other stockpiles, clearly signed and contained by installing a silt fence around. • All machinery used to complete the task must be washed down and re-issued with a valid weed declaration • ESM to continue monitoring the area for weed re-emergence during weekly environmental inspections	Sup / ESM	Physical weed removal
19.	Any chemical weed/pest treatment and eradication will be undertaken by appropriately qualified and licensed personnel - i.e. person must possess a Commercial Operators Licence issued under the Agricultural Chemicals Distribution Control Act 1966.	ESM	Chemical Weed Treatment

7.7.3. Monitoring

No	Monitoring Required	Role	When
1.	Visual observation for weeds and pests will be undertaken daily, where necessary observations shall be entered into site diaries.	Sup	Daily Throughout Early Works

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2.	Vehicles, plant, equipment and machinery shall be inspected for cleanliness daily during its pre-start.	All personnel	Daily
3.	Visual inspection of weed and pest matters (including inspection of any weed hygiene records) shall be undertaken as part of weekly environmental inspections. Presence of pests are to be monitored as part of weekly site inspections. Where restricted invasive plants are identified they shall be reported to the ESM for Weed and Pest Treatment and Eradication	ESM	Weekly
4.	Site washdown area/s shall be included in weekly environmental inspection checklist.	ESM/Sup	Weekly
5.	Monthly audits of weed hygiene records (as part of the Monthly Environment Report).	ESM	Monthly
6.	Monthly 3rd-party audits of this Plan will be undertaken as part of the EWCEMP auditing process.	HSEQ	Monthly

7.7.4. Reporting

No	Reporting Required	Role	When
1.	Employees/contractors working on site must report: • presence of restricted invasive plants to the supervisor by the end of the working day. • presence of feral animals to the Environmental Representative.	All personnel	As required
2.	Weed and pest management actions shall be summarised in the monthly report provided to Seqwater.	ESM	Monthly
3.	Any new or additional pest and weed species identified onsite will be managed in accordance with this plan and the plan will be updated accordingly to include any new or unexpected species.	ESM	As required

7.8. Waste and Resources ECP

1.0 Scope
This ECP is applicable to all phases of the "Early Works Package", described in Section 1.2 above, associated with the LMDIP and applies to the management of waste and resources.
2.0 Objective
• To prevent or minimise the generation of wastes, where practical, and to appropriately contain, control and dispose of all waste generated. • Maximise waste reuse and recycling and, where practicable, divert waste from landfill.
3.0 Performance Criteria
3.1 General

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- Implementation of waste management hierarchy onsite (reduce, re-use, recycle, disposal) and effective and sustainable disposal strategies on site.
- No environmental incidents resulting from improper waste management.
- Recycling and re-use of waste streams wherever practicable.
- Quantity of waste delivered to landfill minimised wherever practicable.
- Hazardous and non-hazardous chemicals and substances used during all phases of the Project will be selected and managed to minimise the potential adverse environmental impacts associated with their disposal.
- All waste is disposed of lawfully, with documentation for trackable waste.
- Ensuring construction and storage areas are clean and tidy and don't attract vermin.

3.2 Waste Types

This plan acknowledges that various types of waste will be generated during construction but not limited to:

- Unsuitable material, including spoil, rock and earthen material.
- Roadbase.
- Vegetation wastes (where unable to be recycled).
- General construction waste (e.g. timber, general waste, packaging, plastics, materials).
- Concrete.
- Regulated/trackable waste (e.g. sewage and grey water).
- Construction wastewaters (e.g. washdown water)
- Hydrocarbons, oil & solvent containers.
- Hydrocarbon liquids.
- Contaminated soil from any hydrocarbon spills.
- Steel and scrap metal.
- Hazardous substances.
- Paper, cardboard, glass.
- Office waste.

Early Works estimated waste		
Waste stream	Quantity (unit)	Disposal/recycle/reuse
Earthen material.	1750 (T)	Reuse
General construction Waste, Hydrocarbon waste, Asbestos, Bricks, Batteries, Terracotta, Tyres, Fabrics, Timber, Gyprock, Metal, Plasterboard, Glass, Plastics, Rubble, Rocks, Tiles, Soil, Office waste, Sand.	6(m^3)	Landfill
Commercial Cardboard & Recycling Bins.	4 (m^3)	Recycle
General waste, organics/food waste, commingled recycling, cardboard recycling's, clear plastic shrink wrap, oil filter recycling, hygiene & washroom, document destruction.	24(m^3)	Landfill

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Portaloo's, demountable toilets, septic tanks, pump tanks and holding tanks, semi solid waste, Washdown pits, silt traps, oily water.	1600(L)	Disposal
Green waste.	3173(m^3)	Reuse
Concrete.	3(m^3)	Recycle

Note ** All of the forementioned waste streams will be disposed of via the appropriate disposal method at a local licensed waste facility. Examples of the local licensed waste providers are listed below:

Local Licenced waste providers	
Waste stream	**Licensed Receiving Facility**
Unsuitable earthen material, demolition material, rock, concrete	Kin Kin Quarry – 250 Sheppersons Ln, Kin Kin, Qld
	Boral Quarry – 720 Moy Pocket Rd, Moy Pocket, Qld
	Curra Quarry – 1 Bruce Highway, Curra, Qld
	Image Flat Quarry – 178 image flat Rd, Nambour, Qld
	Anderleigh Quary - 270 Sorenson Rd, Gunalda, Qld
General construction Waste, Hydrocarbon waste, Asbestos, Bricks, Batteries, Concrete (clean), Terracotta, Tyres, Fabrics, Timber, Gyprock, Metal, Plasterboard, Glass, Plastics, Rubble, Rocks, Tiles, Soil, Electronics, Office waste, Sand, Appliances Furniture, Branches, Blue board, Clothes	Whale Bins, 1 Page St, Kunda Park & Remondis Australia, 28 Sippy Ck Rd, Tanawha, Qld
General construction Waste; Bricks, Batteries, Concrete (clean), Terracotta, Tyres, Fabrics, Timber, Gyprock, Metal, Plasterboard, Glass, Plastics, Rubble, Rocks, Tiles, Soil, Electronics, Office waste, Sand, Appliances, Furniture, Branches, Blue board, Clothes	Rowcon Recycling, 108 Fred Chaplin Circuit, Bells Ck.
Ferrous and non-ferrous scrap metal	Sims Metal, 42 Hoopers Rd, Kunda Park, Qld
Commercial Cardboard & Recycling Bins	Noosa Shire Council
Single use and rechargeable batteries	
Cleaning products, automotive products, paints, thinners, adhesives, varnishes, gas cannisters/bottles, oils	
General waste, organics/food waste, commingled recycling, cardboard recycling's, clear plastic shrink wrap, oil filter recycling, hygiene & washroom, document destruction	JJS waste & Recycling, 95 Cordwell Rd, Yandina, Qld
Portaloo's, demountable toilets, septic tanks, pump tanks and holding tanks, semi solid waste, Washdown pits, silt traps, oily water	Suttons Cleaning service, Cooroy.

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7.8.1. Aspects and Impacts

Aspect	Potential Impact
Waste generation	• Excess waste generation as a result of inadequate procurement practices • Localised pressure on waste receiving facilities
Contamination	• Land or water contamination resulting from poor waste management practices.
Local amenity	• Rubbish and wastes mobilising from the construction site via wind / water degrading local amenity

7.8.2. Mitigation Measures

No.	Actions	Role	When
Inductions and Training			
1.	Site inductions will include critical elements of this plan including but not limited to the following specific components for waste management: • Identification of waste types, including non-hazardous waste, hazardous waste and Listed/Controlled/Regulated wastes. • Key requirements for handling, transportation and storage, including segregation of wastes. • Waste storage facilities on the Site.	ESM	Throughout Early Works
2.	All subcontractors that will produce waste will be provided with an NGER Data Letter and Subcontractor Energy, Water and Waste Report.	ESM	Workplace Planning
Workplace Planning			
3.	Location of waste bins, stockpiles and other waste handling areas are to be nominated on the Contractors SEP's.	ESM	Workplace Planning
4.	Waste minimisation measures will be included in tendering, subcontracting and procurement processes wherever practicable.	Eng	Workplace Planning
Waste Avoidance and Reduction			
5.	Existing items will be re-used wherever practicable to reduce wherever practicable the need for additional purchases.	All personnel	Throughout Early Works
6.	All waste wherever practicable will be either segregated on-site or comingled and separated off-site. Waste will then be reused, recycled or disposed of in an appropriate manner at licensed facilities. Waste segregation measures will consider separate bins for: • General waste (construction and other); • Concrete/masonry waste ; • Metals; • Paper, cardboard & recyclables etc. ; • Plastics ; • Glass; • Hazardous wastes .	All personnel	Throughout Early Works

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7.	Recycling bins will be provided in office and crib rooms.	ESM	Throughout Early Works
8.	Recycling skips (co-mingled or otherwise) will be provided within the vicinity of on-site works.	Sup	Throughout Early Works
General Waste Handling, Housekeeping and Storage			
9.	Waste bins and skips will be provided for all office and crib facilities. Wastes will be separated into recyclable waste, non-recyclable waste and Listed/Controlled/Regulated waste.	All personnel	Throughout Early Works
10.	Waste skips/bins will meet the following provisions: • Adequate number for waste segregation (recycling, re-use and disposal) and sufficient volume; • Labelled to clearly identify the contents; • Appropriate for the waste being contained – be compatible, leak-proof and fit for purpose; • Be accessible and appropriately located; • Be covered (where necessary) to prevent ingress of rain and prevent animals from entering.	Eng/ Sup	Throughout Early Works
11.	Sanitary waste facilities will be provided for all female ablutions.	Eng	Throughout Early Works
12.	Waste will be removed by an appropriately licensed waste subcontractor and taken to an appropriately licensed recovery or disposal facility. The subcontractor is to provide monthly reports detailing: • Date(s) of waste collection; • Description of waste; • Cross reference to relevant waste transport documentation; • Quantity of waste collected; • Origin of waste; • Destination of waste (for listed/controlled/regulated wastes); • Intended fate of waste, e.g. re-use, recycling or disposal.	ESM	Throughout Early Works
13.	No waste is to be burned on Site.	Sup	Throughout Early Works
14.	No waste other than spoil (which may only be placed in designated areas) is to be buried or placed in long-term on-site containment.	All personnel	Throughout Early Works
15.	Where practicable, ensure the movement of hazardous materials and regulated wastes occurs at non-peak times to minimise the possibility of traffic conflicts and associated risks. Movement outside of normal working hours (refer to Noise and Vibration Management Plan) shall only be conducted under an approved out-of-hours work permit.	All personnel	Throughout Early Works
Regulated Waste Management			

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16.	Regulated waste which will require segregation typically include, but are not limited to: • Waste oil; • Oil filters; • Grease; • Coolant; • Solvents; • Oily-water mixtures; • Empty hydrocarbon drums; • Absorbent materials contaminated with hydrocarbons; • Contaminated soil; • Tyres; • Sanitary and clinical wastes; • Sewage; • Biological waste.	All personnel	Throughout Early Works
17.	Dedicated waste receptacles suitable for storage and segregation of Regulated wastes will be provided as necessary. Containers and storage areas will comply with storage requirements as per SDS and relevant Australian Standards. Refer Storage and Control of Hazardous Chemicals (refer to Hazardous Chemical Management Procedure) and Hazardous Chemical Disposal Requirements (refer to Hazardous Chemical Management Procedure).	Eng/Sup	Throughout Early Works
18.	All Regulated waste will be removed by an appropriately licensed waste contractor who holds a current license to transport such waste. The waste contractor will provide: • A copy of their current license (record to be retained). • Records for all Regulated waste (in the form of a Waste Transport Certificate or equivalent).	ESM	Throughout Early Works
19.	Soil contaminated with hydrocarbons will be managed as Regulated waste. Depending on the size of contamination appropriate protection, storage, testing and remediation are to occur.	ESM	Throughout Early Works

7.8.3. Monitoring

No	Monitoring Required	Role	When
1.	Waste management will be monitored daily, with observations entered into daily diaries where necessary.	Sup	Daily
2.	Waste management will be inspected as part of a weekly environment or HSE site inspection. Results of the weekly inspection will be entered into Project Files.	ESM	Weekly
3.	Keep and audit records of any regulated/trackable waste removed from the site, including name and licence number of waste transporters, volume and description of waste transported, destination of waste, and licence number of the waste treatment operator. Registers and manifests maintained to track waste material.	ESM	As required
4.	Monthly 3rd-party audits of this Plan will be undertaken as part of the EWCEMP auditing process.	Regional HSEQ	Monthly

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5.	Discharges from site associated with waste management shall be monitored in accordance with the requirements of the relevant ECP (e.g. Water for release to water, noise and vibration for noise, air quality etc).	ESM	As required

7.8.4. Reporting

No	Reporting Required	Role	When
1.	All subcontractors will provide an Energy, Water and Waste Report monthly.	Sub	Monthly
2.	Records of waste quantities generated (including that reported by subcontractors) and any associated waste transport certificate documentation will be entered into Project Files.	ESM	Throughout Early Works
3.	This plan will be amended to include any new or unexpected wastes onsite not covered in this plan.	ESM	As required
4.	Contractor shall provide certification of the percentage (by weight) of waste that is reused or recycled and include in monthly reporting.	ESM	Monthly

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7.9. Dust and Air Quality ECP

1.0 Scope
This ECP is applicable to all phases of the "Early Works Package", described in 1.2 above, associated with the Lake Macdonald Dam Improvement Project and applies to the management of dust and air quality.
2.0 Objective
• To minimise the potential to generate air quality impacts at residences and remnant vegetation communities near the construction areas. • Prevent any adverse impacts from dust on the environment during the construction phase of the Project • Establish and maintain personal awareness of the importance of dust management practices during the construction phase of the Project.
3.0 Performance Criteria
3.1 General
• Construction activities undertaken in accordance with this Plan. • No verified complaints or community concerns relating to dust generation during the construction phase of the Project. • No significant visible dust outside of the Project area boundary. • Dust monitored against the Targets contained in section 7.9.2 and Table 13. • All workforce personnel (including subcontractors) to complete a Project induction, which will include an overview of dust management practices.

7.9.1. Aspects and Impacts

Aspect	Potential Impact
Dust generation	• Excess dust generation as a result of project activities • Environmental nuisance to local residents • Smothering of localised vegetation foliage
Air Quality	• Poor localised air quality • Health impacts to workers and residents

7.9.2. Targets & Monitoring Program

The following parameters and program in Table 13 will be monitored and the results used to assess the performance of the measures contained within this plan. Figure 8 shows the proposed monitoring locations however these can be subject to change based on when and where high-impact activities are occurring.

This includes monitoring of deposited particulate concentrations, along with wind speed and wind direction, to provide data on dust levels. Continuous monitors may be deployed on a "for cause" basis where complaints or evidence suggests a dust management problem is occurring.

These systems may be configured with an automatic alarm system using short-term trigger levels (e.g. 150 µg/m3 as a 1-hour average) to alert site staff (via email or SMS) that elevated concentrations are beginning to be detected, so that additional mitigation measures can be implemented.

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Adverse results from any monitoring activity will be investigated as per this plan as soon possible to identify the cause and to take appropriate corrective action.

The results of the monitoring will be reported to SEQ Water monthly as per Section 6.3 of this plan, demonstrating compliance with the following criteria during the construction period:

1. PM10 (only monitored during high-risk periods or in response to complaints):
    a. 24-hour average concentration - 50 µg/m3
2. Dust deposition:
    b. Residential areas - 120 mg/m2/day

In determining compliance with this criterion, regard will be had to pre-existing background air quality and the quality of prevailing air conditions at the time of sampling/exceedance.

This may include assessment of other regional air quality monitoring stations to determine if an external source of particulate matter is causing and contributing to the sampled results.

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Description	Parameter		Methodology	Instrument	Location	Timing & Duration	Frequency
	Metric	Target *(during construction)*					
Deposited Particulate matter	Dust deposition rate ($mg/m^2/day$, monthly average)	120 $mg/m^2/day^2$ (measured via monthly average)	AS/NZS 3580.1.1:2016 AS/NZS 3580.10.1:2003	Dust Deposition gauges	Figure 8: Proposed air quality monitoring locations	On commencement of the Early Works and continuously during the works.	Monthly samples
PM10	$\mu g/m^3$	50 $\mu g/m^3$ 24-hour average	AS/NZS 3580.12.1:2015	Nephelometer	Figure 8: Proposed air quality monitoring locations	On commencement of the Early Works. May be discontinued after completion of peak risk activities (i.e. earthworks) if site has been compliant.	Real-time
Visual observation	Visible dust	Visible dust off-site, visibly impacting sensitive receiver	Site diary, checklists, photographic	Camera	Lake Macdonald Drive	For the duration of the Early Works.	Daily
Meteorology	Wind speed/ direction	n/a	AS/NZS 3580.14:2014	Meteorological station	Site Office	On commencement of the Early Works and continuously during the works.	Continuous monitoring

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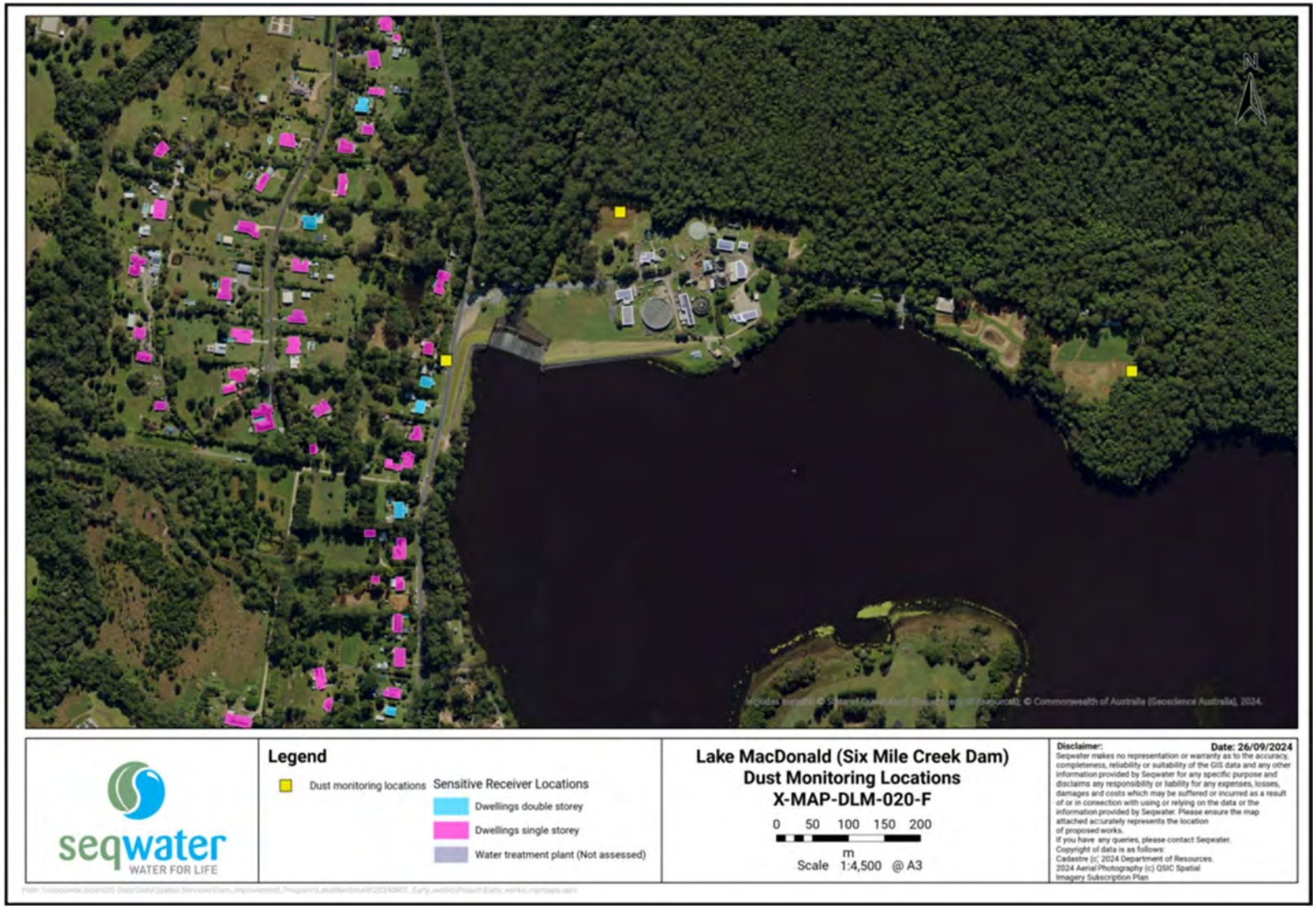

Figure 8: Proposed air quality monitoring locations

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7.9.3. Mitigation Measures

No.	Actions	Role	When
Inductions and Training			
1.	Site inductions will include the following specific components for dust and air quality management: • Dust and air quality management objectives, including the avoidance of dust generation during works. • Key dust and air quality management measures.	ESM	Prior to commencing work
Workplace Planning			
2.	During construction planning and programming: • Plan to sequence the works to keep the size of cleared areas to a minimum to limit exposed areas available for dust emissions by wind erosion, & • Retain existing vegetation, where practical, between construction activities and sensitive receptors to reduce particulate concentrations and dust deposition rates at receptors.	Sup/Eng	Workplace Planning & Design
3.	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site) as required. Where practicable, the wash shall be set back from intersection with public roads by an area of hard surfaced road to minimise carriage of residual dust and mud onto public roads. Washdown water to be pumped out using sucker trucks and disposed of at a licensed facility as per Section 7.1.	Sup	Workplace Planning
4.	Minimise the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	Sup	Workplace Planning
5.	For the diesel-powered dewatering pumps, locate the units a suitable distance from sensitive receptors to ensure no impact and ensure the exhaust emissions are discharged away from areas where workers or members of the public would be exposed to the plume.	Sup	Workplace Planning
6.	Set up meteorological station on site for continuous weather monitoring.	Sup	Workplace Planning
7.	Ensure community contact signage is clearly visible on-site boundary fencing to enable community feedback / complaints.	Sup	Throughout Early Works
Avoidance and Suppression			
8.	Where dust-generating activities are unavoidable, dust-suppression techniques to protect vegetation, worker health and amenity must be applied.	Sup	Throughout Early Works

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No.	Actions	Role	When
	• Techniques may include spraying surfaces with water trucks, irrigation and stabilisation and controls such as temporary enclosures. Use water sprays to control dust from unsealed traffic areas on site, particularly during periods of unfavourable wind conditions (easterly wind, greater than 5 m/s) • Dust suppressant additives may be used to increase effectiveness and to reduce the volume of water required.		
9.	Ensure there is an adequate water supply on the site for effective dust/particulate matter suppression/mitigation at all times, using non-potable water where possible and appropriate.	Sup	Throughout Early Works
10.	Avoid undertaking earthworks activities, where practicable, during dry/high wind weather conditions.	Sup	Throughout Early Works
On Site Haul / Access Road Management			
11.	Where practicable, heavy use haul roads will be sealed or have a low dust capping layer during the construction phase of the project.	Engineers	Throughout Early Works
12.	Haul truck loads are to be covered when travelling on public roads, the load must be lower than the sides of the truck and the truck is to be free of loose mud and dirt before entering public roads.	All personnel	Throughout Early Works
13.	For unpaved roads, the periodic application of water will be used for dust suppression. The frequency of application will be dependent on weather conditions and traffic volumes (See measures in Avoidance & Suppression above). Further measures for high-volume traffic areas, such as temporary gravel cover or dust suppression polymer, may also be required. For paved roads, the removal of accumulated material from roadways may occur via cleaning with spray trucks with brushes and/or by personnel with hand equipment (e.g. shovels, bristle brooms).	Sup	Throughout Early Works
14.	Install barriers alongside internal construction roads, or use some other suitable form of delineation, to deter driving off, nominated access roads.	Sup	Throughout Early Works
15.	Site access will be via designated access points only. These points will be stabilised through gravel pad or similar means.	Sup	Throughout Early Works
16.	Public roads adjacent to construction area are to be kept free from tracked materials and cleaned daily as required. Visual inspections to be undertaken daily of Lake Macdonald Drive.	Sup	Throughout Early Works
Materials Handling and Management			
17.	Along with stockpiling mitigations outlined in Actions 21-25 in Section 7.1.2, the following to be implemented	Sup	Throughout Early Works
18.	Loads in trucks transporting soil, aggregate or other dust generating materials to and from the construction area must be wetted down or covered.	All personnel	Throughout Early Works
19.	All trucks entering and leaving the site of works are to have any loads constrained in such a manner as to prevent the dropping or	All personnel	Throughout Early Works

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No.	Actions	Role	When
	tracking of materials onto the streets. This shall include ensuring that all wheels, tracks and body surfaces are free of mud and other accumulated contaminants before entering the sealed road network (including the use of shaker screens or rubble pads).		
20.	Dust generation from offloading/handling materials will be reduced by minimising the height of the drop, and by use of a chute, screens, enclosures, sprays, covers, dust guards, and dust extraction systems etc. as appropriate.	All personnel	Throughout Early Works
21.	Remove materials that have potential to produce dust from site as soon as practicable, unless being re-used on site.	All personnel	Throughout Early Works
22.	Avoid site runoff of water or mud, where practicable. Remove silt and other materials from around any erosion control structures, where practicable, following any significant rain event (>10 mm) to ensure deposits do not become a dust source.	Supervisors	Throughout Early Works
23.	Hydro-mulch, mulch, hydro-seed or stabilisation spray should be applied to batters adjacent to haul roads, as per the approved Erosion & Sediment Control Plan, to stabilise these areas and minimise wind-blown dust.	Sup	Throughout Early Works
24.	Ensure bagged supplies of fine powder materials are sealed after use and stored appropriately to prevent dust.	Sup	Throughout Early Works
Stockpile, Spoil and Laydown Area Management			
25.	Along with stockpiling mitigations outlined in Actions 26-31 in Section 7.1.2, the following to be implemented	Sup	Throughout Early Works
26.	Dust from open sources will be minimised by implementing control measures that are reasonably practicable such as compaction, enclosures and covers, and by increasing moisture content. Stockpiles will be managed to reduce dust-generation. Controls may include: • Locating stockpiles in areas protected from wind. • Minimising the number and size of stockpiles. • Using watering sprays, surface binders and/or covers on piles if wind is lifting material. Stockpile management shall be in accordance with the requirements of the applicable Erosion and Sediment Control Plan.	Sup	Throughout Early Works
27.	Minimise drop heights from loading shovels and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	Sup	Throughout Early Works
Vehicle, Equipment, Machinery and Vessel Emissions			
28.	All vehicles and machinery will be fitted with appropriate emissions- control equipment, will be maintained frequently and will be serviced to the manufacturer's specifications. Pre-start checklists and equipment maintenance logs indicating maintenance schedule shall be completed.	All personnel	Throughout Early Works
29.	Where practicable, low-sulphur fuel will be used to minimise emissions from plant and equipment.	Sup	Throughout Early Works

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No.	Actions	Role	When
30.	Regularly maintain diesel exhaust equipment and ensure compliance with appropriate design emission standards for in service vehicles.	All personnel	Throughout Early Works
31.	Ensure all vehicles switch off engines where idling time on-site is likely to exceed two minutes.	All personnel	Throughout Early Works
Atmospheric Emissions			
32.	Construction activities will be managed to minimise the generation of air emissions, if practicable. Measure may include: • Efficient use of fuel and electricity; • Coordinating vehicle movements to alleviate site, or entry/exit point congestion ; • Recycling and reusing construction materials; • Selection of materials and consumables with a lower greenhouse gas footprint • Load detection equipment for automatic starting and stopping of power generating sets with demand; • Inspections and preventative maintenance • Visual monitoring.	All personnel	Throughout Early Works
33.	Emissions of pollutants/contaminants to the atmosphere from welding, grinding, cutting, post weld heat treatment, abrasive blasting, painting and other related works will be minimised by the use of emission controls such as encapsulation, filtration, blast chambers, grinding shrouds and fume extractors.	All personnel	Throughout Early Works
34.	Burning of vegetation is not permitted for the Project.	All personnel	Throughout Early Works

7.9.4. Monitoring

No	Monitoring Required	Role	When
1.	Implement the air quality monitoring as described in Section 7.9.1 of this plan.	ESM	Throughout Early Works
2.	Visual inspection for airborne dust and dust deposition will be undertaken daily to assess the effectiveness of dust-suppression controls, where necessary observations shall be entered into site diaries.	Sup	Daily Throughout Early Works
3.	Continuous Meteorological Data recorded from an on-site station.	ESM	Daily Throughout Early Works
4.	Vehicles, plant, equipment and machinery shall be regularly inspected daily to ensure good working order.	Sup	Daily
5.	Visual inspection of airborne dust and dust deposition shall be undertaken as part of the weekly environmental inspection. The weekly inspection shall include regular off-site checks for dust soiling of surfaces (such as street furniture, cars and window sills within 100 m of site boundary).	ESM	Weekly
6.	Monthly 3rd-party audits of this Plan will be undertaken as part of the EWCEMP auditing process.	HSEQ	Monthly

7.9.5. Reporting

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No	Reporting Required	Role	When
1.	Record all dust, odour and other air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. This log will be available to regulatory authorities upon request. Report significant dust events that require mitigation measures to be implemented to the Environmental Representative and Construction Manager immediately. Complaints to be managed in accordance with Section 8.8.	ESM	Throughout Early Works

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8. Community and Stakeholder Engagement

8.1. Objectives and Approach

The community and stakeholder engagement objectives for the Early Works is to build genuine relationships with stakeholders and the community, while minimising and managing project impacts and disruptions. By maintaining a transparent and proactive approach, we aim to ensure clear communication and understanding of project activities, objectives, benefits, impacts, and outcomes, addressing issues promptly and effectively.

- To achieve this, the following engagement objectives and criteria have been applied:
  - Provide clear, consistent and timely information about the project to stakeholders and the community;
  - Provide communication in a variety of mediums;
  - Promote and raise awareness of the project and engagement activities being carried out;
  - Foster and develop relationships with stakeholders and the community;
  - Identify opportunities for community and stakeholder groups to be involved in the project;
  - Address and respond to community and stakeholder issues raised.

In achieving the objectives for community and stakeholder engagement during the Early Works, Seqwater and the Principal Contractor will continue to work closely with key stakeholders and those most impacted during the Early Works package. We will ensure that all workforce personnel (including subcontractors) complete a Project Induction, which will include an overview of community and stakeholder engagement, and that construction activities are undertaken in accordance with the ECP.

8.2. Strategy

Seqwater and the Principal Contractor aim to minimise disruptions and build strong, long-term relationships with stakeholders during the Early Works phase. Our strategy focuses on minimising impacts through proactive communication, meaningful stakeholder engagement, and continuous refinement of our approach based on stakeholder feedback.

To achieve these strategic goals, this EWEMP has been developed to address the project's key community and stakeholder outcomes during this phase. This section of the plan is a condensed version of the Construction Communications and Engagement Plan (CCEP), tailored specifically for the Early Works scheduled for late 2024. It is designed to ensure that the planned activities for the Early Works, considers the impacts to the community and outlines the mitigation strategies that will be in place.

Significant engagement activities have already taken place, as outlined in the Community and Stakeholder Engagement Overview in Section 8.4. Multiple engagement tools will be utilised to support the Early Works phase. Further details on these tools and activities are discussed in the Communication Tools Section 8.5.

Seqwater will do as much as reasonably practical to minimise construction impacts on nearby residents however throughout the Early Works and main project activities, some residents may feel aggrieved by perceived or actual loss of amenity. As such Seqwater have developed a *Resident Impact Management Strategy* that defines a framework for the Contractor and LMDIP team to address queries and complaints arising from construction-related impacts (and determine appropriate mitigation) in a consistent manner. This strategy will be enacted form the start of Early Works and remain in place throughout the main works construction program.

8.3. Early works key issues

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The associated community and stakeholder issues central to this work have been identified and are outlined below:

Minimising disruption to local communities – The project will make every effort to mitigate Early Works impacts and ensure that stakeholders are provided with sufficient information about the nature and duration of impacts and the measures in place to manage them.

Meeting the information needs of stakeholders and the community – Project stakeholders and the local community have been engaged by Seqwater and the Principal Contractor prior to the commencement of Early Works activities. Since January 2024, Project Updates, Community Newsletters, Community Information Sessions and geotechnical investigations have been undertaken and disseminated to the local community.

Managing the disruption to recreational users – Early Works activities will not impact Lake Macdonald. The parks and boat ramps are anticipated to remain open, as will the Noosa Botanic Gardens. The Noosa Trail will remain open; however, the car park near the construction area will not be available during construction. There are approximately six parking bays still available adjacent to the toilet block and parking is available at the Botanic Gardens. Depending on planning approvals, the Lake Macdonald Rowing Club will be relocated to a site away from the construction area, however, may be impacted if approvals are not secured before Early Works commence. The Principal Contractor will liaise with council to actively minimise disruptions and ensure appropriate notifications, signage, and alternative arrangements meet users' needs.

8.4. Community and Stakeholder Engagement Overview

Following the investment decision for the project, community and stakeholder engagement has been an integral part in the development of the approach to the EWEMP. The Project has initiated multiple community outreach activities to inform residents and have undertaken targeted engagement with adjacent residents and other stakeholders about the upcoming project and its potential impacts. The community has expressed concerns about the environmental impacts, including construction noise, truck movements, dust, light spill, vibrations, where the construction materials will be sourced from, traffic impacts, and effects on aquatic flora and fauna. During the Early Works phase, the planned activities will have minimal impact on light spill, vibration, or impact on aquatic flora and fauna. As part of the Project's proactive approach and in response to community feedback, the following activities have been undertaken:

- Establish a complaints procedure.
- Developed the EWEMP which includes this Communication and Stakeholder Engagement ECP tailoring our communications and the tools to the requirements of individual stakeholders and their circumstances, specifically for Early Works.
- Conducted community information sessions.
- Engaged with key stakeholders, including the dam users, NSC, emergency services, Kabi Kabi Peoples Aboriginal Corporation, Commonwealth Department of Climate Change, Energy, the Environment and Water, Ministers and the State representative.
- Engaged with Cooroy State School (CSS) and Milestones Early Learning to inform them about the project, identify mitigation measures for heavy vehicle traffic and noise, manage student crossing risks, and minimise truck haulage during peak school times.
- Carried outdoor-to-door interactions along Lake Macdonald Drive and Highland Drive.
- Conducted one-on-one meetings.
- Provided landowners along Lake Macdonald Drive, in the most impacted areas, the opportunity to participate in a pre-construction works property condition survey.

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- Developed a dedicated Lake Macdonald project website, which serves as a central hub for comprehensive information about the project. The site features regular updates and a frequently updated FAQ section to promptly address community questions.
- Distributed newsletters to 4,600 household in the area and provided regular media updates.
- A dedicated project phone number established.
- Installed site signage and banner mesh near the project area with the project contact number and links to website.

To further enhance community engagement, the project is in the process of re-establishing the Community Reference Group. A procurement activity to engage a facilitator will be finalised by October and we will soon be requesting expressions of interest from the public, with the aim of holding the first meeting in November 2024.

8.4.1. Early Works Stakeholder Engagement Activities

The project has undertaken targeted stakeholder engagement to inform the community about the proposed Early Works and potential impacts. Key activities include:

- Updating the project website to notify that the main works will not commence until 2025, while early and investigation works are continuing in 2024.
- Providing the Early Works plan to the NSC working group for their input and feedback.
- Presenting the proposed Early Works to the Local Disaster Management Group.
- Door-knocking to notify residents impacted by the early works.
- Engaging with Cooroy State School and Milestones Early Learning Centre.
- Issuing a project newsletter to 4,600 households, notifying them of the main works commencement and ongoing Early Works and investigation activities.
- Offering of a site visit to the Mayor and CEO of NSC to coincide with the Seqwater Board visit (19th September).
- Hosting an Early Works community information session on 12th October 2024 at Lake MacDonald which provided an opportunity for the local community to discuss specific concerns with Seqwater.
- Engaging with the Qld Department of Transport and Main Roads and Noosa Shire Council in relation to traffic and transport matters associated with the Early Works.

8.5. Communication Tools

The following communication tools will be utilised during the Early Works phase (this is a condensed list of the most commonly used tools).

- 24-hour community information line – 07 5472 1565
- Community email address - projectinfo@Seqwater.com.au
- Works Notification (targeted communications to residents via post or email).
- Community online enquiry
- Website
- Site signage
- Doorknock
- Letterbox drop
- Newsletters- online and hardcopies

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- SMS
- Briefings-MP, individuals and Media
- Stakeholder meetings
- Phone calls
- Specific notification (targeted communications to residents (via post or email).

The Project will periodically review communication tools to ensure they are effective and meet the needs of our stakeholders. All feedback will be securely documented in Consultation Manager. Seqwater and the Principal Contractor will maintain this database to record all consultation activities conducted throughout the project.

To ensure clear communication, only nominated representatives approved by Seqwater and Contractor will be involved in consultation with external stakeholders on environmental issues.

Site personnel will be advised to direct all media and public enquires to seqwater.media@seqwater.com.au or 07 3247 3000.

8.6. Early Works Stakeholder and Community Action Plan

The below Early Works Action Plan provides an outline of the communication activities that will be undertaken to support Early Works activities.

The Action Plan is designed to be flexible and will regularly be updated to reflect project status and anticipate upcoming activities. Where required, tailored communication and consultation strategies will be developed for specific activities or phases of work and will identify all affected commercial and residential properties, authorities, and transport operators as relevant to the activity. These are summarised in Table 14.

Table 14: Early Works Stakeholder and Community Action Plan

Proposed Timing	Project activity/issue	Communication/mitigation action	Implementation
Q4 2024	**Early Works start up** **Site establishment**	• Notify OCG of commencement of works outlined in Section 1.2	• Maximum 5 days after works have commenced
Q4 2024	**Early Works start up** **Site establishment:** • Access tracks • Hardstands for office facilities • Aquatic Survey • Vegetation clearing • Laydown areas • Large deliveries • Traffic increase	• Works Notification • Doorknock and letterbox drop to local residents • Project construction newsletter • Emergency services briefing • State MP briefing • SMS to adjoining landowners • Cooroy State School briefing • Milestones Early Learning Cooroy • Notifications to Council as part of the established working group. • Notification to local school bus operator (Polleys Coaches)	• Minimum 10 days prior to activity (subject to approval)

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Q4 2024 - **Q1 2025**	**Increase in traffic, transport, parking, road works, heavy vehicle movements and traffic changes**	• Distribution of a Works Notification to properties directly affected by the works via doorknock / letterbox drop • Direct liaison with key stakeholders (e.g. Schools, childcare centre and impacted residents) • Construction notification emailed to subscribed stakeholders • Construction notification and key messages uploaded to the project website • Co-ordination with local government • Consultation with NSC local Traffic Advisory Committee • Consultation with affected residents, businesses and transport providers • Manage pedestrian, cyclist and vehicle movements around the site • VMS or other advisory or directional signage (as required) • Please refer to the Traffic Management ECP (Section 9) for mitigation actions for traffic including traffic controls, road occupation approvals and vulnerable road users.	• Minimum 10 days prior to activity • Ongoing meetings with Council • Stakeholder meetings as required
Q4 2024- Q1 2025	**Delivery of significant equipment if it impacts local roads, private property access or is required out of hours**	• Works Notification • Doorknock • SMS alerts • Phone calls as needed	• Minimum 5 days prior to activity

Please note: Seqwater will minimise truck haulage during school pick-up and drop-off periods in consultation with CSS and Milestones Early Learning. Engagement with the school and childcare communities will involve project presentations, discussions, and agreements on appropriate mitigation and management measures. Additionally, the effectiveness of these measures will be monitored, and the EWEMP will be adapted as necessary. Seqwater has already engaged with CSS and Milestones Early Learning Centre regarding the Early Works, and the measures being implemented reflect feedback from both institutions.

8.7. Stakeholders

Stakeholders were identified based on the project's potential direct and indirect impacts, as well as records of previous interactions with the community, and correspondence with relevant government bodies, business groups, and community organisations. Engagement efforts will be strategically focused to address the specific needs and concerns of these stakeholders, ensuring effective communication and management throughout the project. The identified stakeholders include:

- Government Ministers and elected representatives
- Federal and State Government agencies and departments
- Local Government
- Service Utility Providers
- Emergency Services and agencies

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- Traffic and transport providers (taxi, bus, ridesharing)
- Kabi Kabi Peoples Aboriginal Corporation
- Directly affected stakeholders within the immediate work area (Lake Macdonald Drive)
- Directly affected stakeholders adjoining Six Mile Creek (downstream)
- Impacted stakeholders and businesses within a 1km radius (Highland Drive, Anembo Place, Lake Macdonald Drive)
- Impacted stakeholders on the proposed haul route (Lake Macdonald Drive, and Elm Street)
- Directly affected stakeholders immediately surround Lake Macdonald (Hayward Road, Cooroy Noosa Road, Pine Tree Drive, Fig Tree Lane, Sivyers Road, Gumboil Road, Hamersley Lane, Figbird Court, Collwood Road, Hoy Road)
- Education and early learning facilities (CSS and Milestones Early Learning childcare)
- Business directly affected and other local business networks – e.g. Cooroy Chamber of Commerce, hotels, restaurants, tourism operators and transport operators
- Environment and catchment care – e.g. Noosa and District Landcare, Noosa Parks Association and the Mary River Catchment Coordinating Committee (MRCCC)
- Members of the community and other community groups
- Recreational users e.g. visitors, peak and industry bodies, fish stocking associations, clubs, event organisers
- Cooroy Cemetery visitors
- Noosa Botanic Gardens visitors
- Media.

8.8. Enquiries and Complaints

This section highlights the enquiries and complaints management handling procedure (refer to flow charts below) has been developed to ensure effective management of all project enquiries, complaints, and feedback.

Community enquiries and complaints will generally be received via:

- Seqwater's 24-hour community hotline: 07 5472 1565
- Seqwater's email: projectinfo@Seqwater.com.au
- Seqwater's webpage - https://www.Seqwater.com.au/contact-us

The 24-hour community hotline, email address and webpage are maintained by Seqwater and in some instances will be responded to by the Principal Contractor, who will investigate and respond following the required response timeframes. All written project communications will include the community hotline, email, and web address.

All calls to Seqwater's **project info line** – (07) 3432 7000, will be answered by Seqwater (Monday to Friday 9am to 5pm). Calls to the **community hotline** (07 5472 1565) will be answered by the Principal Contractor 24 hours a day, seven days a week.

The project team will respond to a complaint within 48 hours of the complaint being received. The initial response to the stakeholder will be an acknowledgement to the complaint, with an internal task then set to a team member to close out the complaint. The second response the stakeholder will receive will be the formal response to the complaint with any associated actions that the project team will take, included.

If a complainant remains unsatisfied, the complaint will be escalated to a relevant Project Team Manager. Complaints that Contractor cannot resolve will be further escalated to Seqwater. All stakeholder interactions will be recorded in Seqwater's customer database, Consultation Manager in a timely manner and the following information must be recorded:

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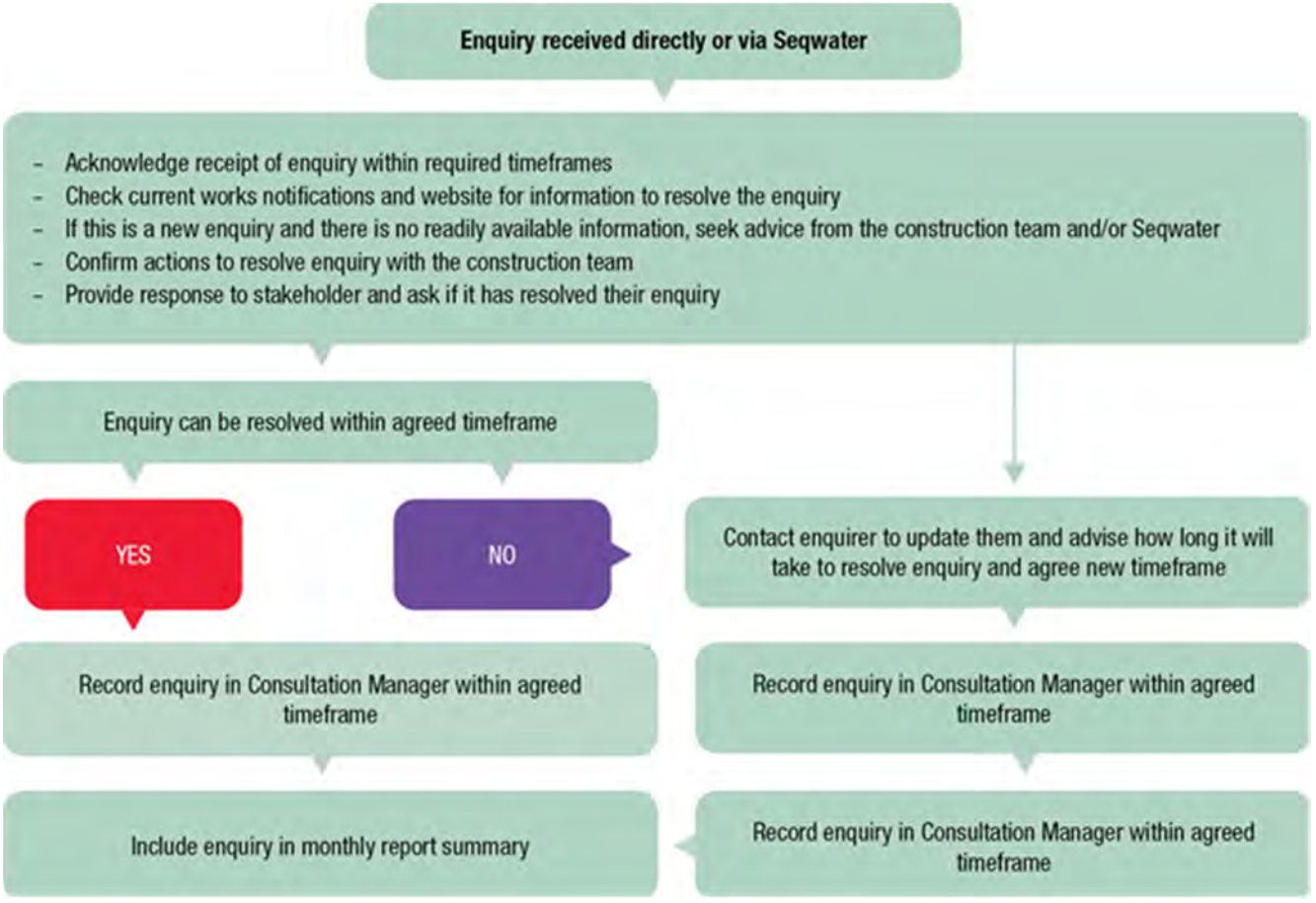
1) Date and time the complaint was received
2) Name and contact details of the complainant when provided and authorised by the complainant.
3) Nature of the complaint
4) Investigations Undertaken
5) Responsible team member to action complaint
6) Conclusions formed
7) Actions taken to resolve.

Enquiry Flow Chart



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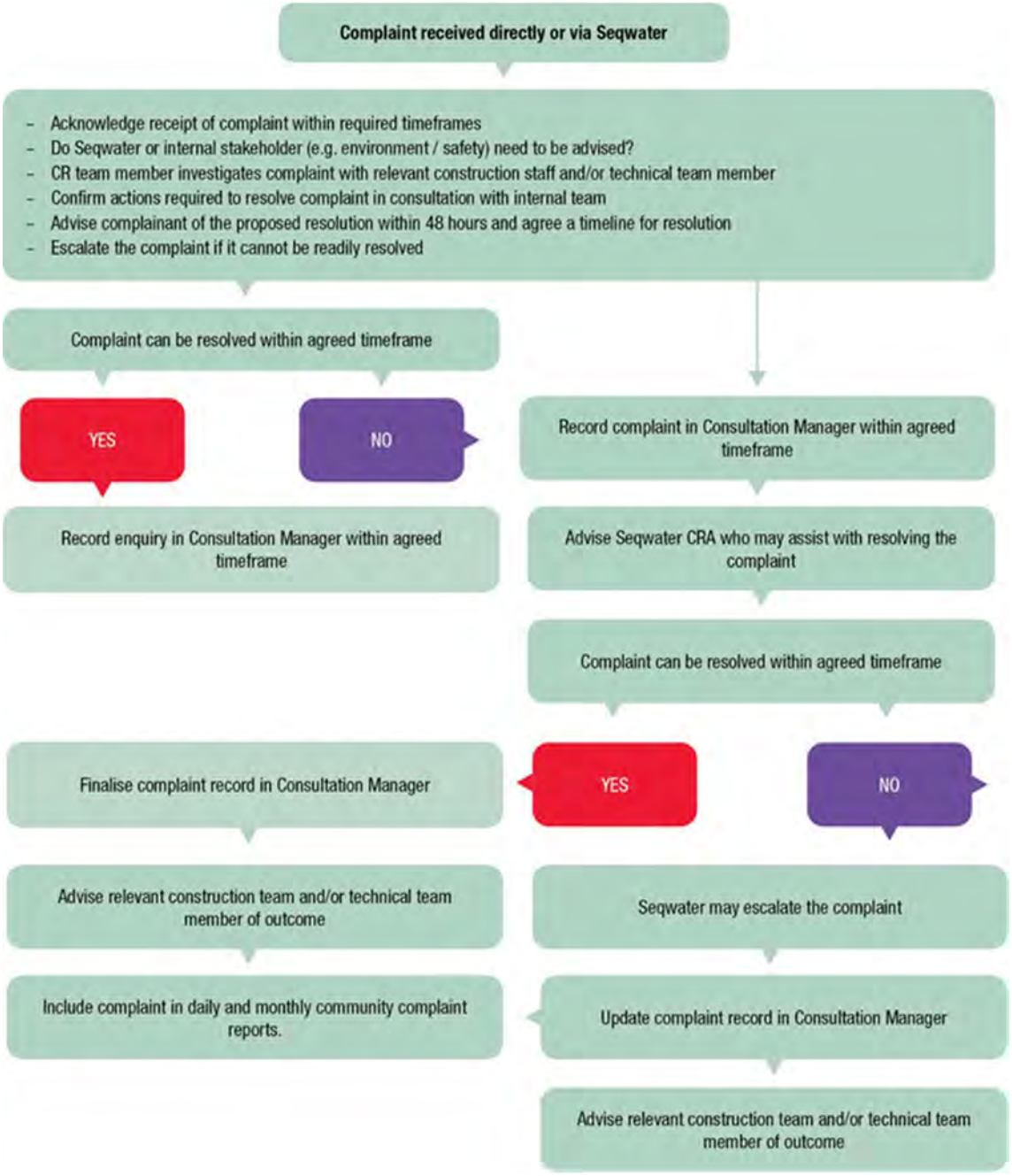
Complaint Flow Chart



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8.8.1. Enquiry Management

Table 15 below indicates the timeframe for required response timeframe for enquiries:

Table 15: Enquiry response timeframes

Nature of enquiry	Response time
All online enquiries	Initial acknowledgment within 48 hours.
General or information enquiries	Up to ten working days
Technical enquiries	Up to ten working days

8.9. Reporting Methods

Comprehensive reporting methods will be implemented to ensure accountability, track project progress, and facilitate ongoing evaluation of engagement activities. The following methods will be used to systematically document and report on various aspects of the project.

- Daily contact records in Consultation Manager
- Weekly, monthly (as per Section 4.4), and quarterly project reports

This plan will be kept on the premises, all complaints will be documented in Seqwater's Consultation Manager system, of which the Contractor has access to ensure timely tracking and management of complaints.

8.10. Safety Signage and Public Notices

Prior to commencement of the project works public signage will be erected to all boundaries of the construction site and at regular intervals to warn the public of safety hazards associated with the approved use.

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9. Traffic Management Plan ECP

This TMP ECP has been developed to align with the key traffic management aspects associated with the Early Works. The TMP ECP is a condensed version of the TMP that will be submitted for approval of the full Coordinated Project in 2025. The TMP outlines the aspect scope, objectives, performance criteria, impacts and applicable mitigation measures, along with monitoring and reporting requirements.

1.0 Scope and Location
This TMP ECP will facilitate the movement of construction and workers (via private vehicles) traffic to and from during the Early Works package of the LMDIP. This stage of the project will generate minimal impacts upon the road user and road network whilst the site is established, and preparations are made for the Project delivery stage. The project site can be directly accessed via the western access roads (Lake Macdonald Drive and the Seqwater Access Road known also as Collwood Road crossing Six Mile Creek to the western entrance Noosa WTP). The eastern access road route via (Cooroy-Noosa Road, Sivyers Road, Gumboil Road and Collwood Road) to the eastern entrance to the Noosa WTP, is NOT to be used by project construction vehicles. It may be used by work (via private vehicles) traffic. It will be maintained for emergency use also. Adequate on-site parking shall be provided to for construction workers. This parking shall be located at the western side of the Noosa WTP and shall be designed to ensure no queuing of vehicles arriving to site.
2.0 Objective
Contractor will manage traffic during this 'low impact' phase, to ensure the roadway, road users, and the local community are not negatively affected. The objective of the sub-plan is to ensure: a. The performance of the road network is not unduly impacted and the disruption and inconvenience to all road users are minimised for the duration of the works. b. The safety of all road users including road workers is maintained. c. Environmental and community impacts are minimised. This ECP will implement best practice control measures to maintain the level of service along all roads approaching and adjacent to the works site on Lake McDonald Drive and Elm Street / Cooroy Connection Road which is the approved heavy vehicle route to the Bruce Highway northern interchange.
3.0 Traffic Management
3.1 Contractor Approach
3.1.1 Proposed Timing and Duration
Early Works are proposed to commence in November 2024 and extend to the end of February 2025, weather permitting. This work will be performed within approved times/dates as discussed in Section 1.2. Current planning of this work and locations are proposed in Table 16. Even with the very low average hourly number of heavy vehicles, they will be minimised during school pick up and drop of times. Consultation has and will continue regularly. It should be noted that the Project has engaged with CSS and Milestones Early Learning Centre in relation to the projects Early Works and TMR's Road Safety team.

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Table 16: Activity Schedule

Works				
Shift	Activity	Road	Start Date	Duration
1	Site establishment	Lake MacDonald Drive	7-Nov-24	4 Months
2	Hardstands and Laydowns	Lake MacDonald Drive	8-Nov-24	2 Months
3	Tree removal	Lake MacDonald Drive	8-Nov-24	1 week
4	Reservoir Lowering – Pump delivery	Lake MacDonald Drive	02-Nov-24	1 week
5	Reservoir Lowering – Pump Pads	Lake MacDonald Drive	11-Nov-24	3 Months
6	Reservoir Lowering – Pump & pipeline install	Lake MacDonald Drive	14-Nov-24	3 Months
7	Haul and Access Roads	Lake MacDonald Drive	22-Nov-24	2 Months
8	Cofferdam material Deliveries	Lake MacDonald Drive	21-Nov-24	3 Months

3.1.2 Short-term traffic guidance requirements

The short-term traffic guidance setups established for the Early Works are not expected to have an impact on traffic operation and performance due to the low traffic volume periods identified for the works. In addition, the Contractor will conduct all work activities requiring the occupation of the road during the off-peak periods to minimise Level of Service (LoS) reduction.

It is acknowledged that the Elm Street / Lake Macdonald Road intersection has an existing deficiency in terms of heavy vehicle (semi-trailers and above) for swept paths in particular the left turn from Elm Street into Lake Macdonald Drive. Mitigation measures have been developed in the draft TGS for this issue.

Contractor will engage a Traffic Control Contractor to manage all road occupancies required for the Works and install short term traffic controls at roadwork sites in accordance with AS1742 Part 3 Manual of Uniform Traffic Control Devices – Work on Roads, the jurisdictional Code of Practice / Technical Manual and the Austroads Guide to Temporary Traffic Management (AGTTM).

3.1.3 Traffic Controllers

Contractor will only deploy Traffic Controllers who are accredited under Section 21 of the *Transport Operations - Road Use Management (TORUM) Act 1995* to perform the functions of a Traffic Controller as prescribed by Subdivision 6 of the Transport Operations (Road Use Management – Accreditation and Other Provisions) Regulation 2015.

Contractor will require all Traffic Controllers to operate at the highest standards and comply with their appointment's statutory conditions. Traffic controllers will:

- As per all project personnel, maintain a zero percent blood/alcohol concentration while performing traffic control functions,
- As per all project personnel, not perform traffic control functions while adversely affected by a drug or other medication causing functional impairment,
- Not direct traffic through a worksite, unless the worksite has an approach speed of 60 km/hr or less, as specified in the MUTCD Part 3,

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- Ensure that the Traffic Controller Ahead/PREPARE TO STOP sign is erected correctly, at the beginning of the shift, and direct traffic at and/or through a worksite, or other event as specified in the approved operating procedure for traffic,
- Only use equipment specified in the MUTCD Part 3 to direct or divert traffic through a worksite, and
- Ensure that the Traffic Controller Ahead/PREPARE TO STOP sign is removed when work is suspended throughout a shift or completed for the day.
- Not use mobile phones in any circumstances while directing traffic control operations.

3.1.4 Traffic Guidance Schemes

A TGS is a diagram showing signs and devices arranged to warn all traffic and guide it around, past or, if necessary, through a work site or temporary hazard. The design, selection and implementation of traffic control measures will comply with the MUTCD Part 3 and be guided by the AGTTM. A TGS is required to facilitate these Early Works and is contained in **Section 9.**

Equipment for TGSs will be installed in accordance with the Traffic Control Procedure (TCP) and relevant toolbox talks and traffic instructions. The TCP will be developed by the Contractor once the TGS has been approved.

Contractor 's nominated Traffic Representative will ensure that frequent face-to-face instructional meetings are held with all traffic management team members, including subcontractors. These meetings will provide training and instruction on contemporary issues, as well as reinforce the formal procedures and systems already in place.

Safe work methods will be outlined for all relevant works, including pavement marking, sign installation, road maintenance and traffic control set-ups. Activity Management Statements (AMS) will be drafted to incorporate recent learnings and best safe practices, with toolbox talks held weekly. Day-to-day information will be exchanged during pre-start briefings at the commencement of every shift. The field supervisor/traffic foreperson will run Toolbox talks and pre-start briefings. The nominated Traffic Representative and/or their delegate will attend weekly toolbox talks.

Table 17: TGS Schedule

Traffic Guidance Schemes						
Road Name	TGS No. **	Closure Type	START Minimised in consultation with CSS	Outside School times Start Time *	Outside School times End Time*	FINISH Minimised in consultation with CSS
Lake Macdonald Drive (Site and Hardstand 3 Entrances)	LMD-001	Intermittent Hold / Release for LV and HV traffic. Stop/ Slow (Pedestrian access to trail network)	6.30-9:00am	9:00am	2:00pm	2:00-5.00pm
Lake Macdonald Drive (Site and Hardstand 3 Entrances)	LMD-002	Shoulder Closure (if working in Shoulder)	6.30-9:00am	9:00am	2:00pm	2:00-5.00pm

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Lake Macdonald Drive (Into site)	LMD-003	Stop/Slow (if working in the road)	6.30-9:00am	9:00am	2:00pm	2:00-5.00pm
Elm Street and Lake Macdonald Drive Intersection	LMD-004	Stop/Slow on Elms Street northern approach Stop/Slow on Lake Macdonald Drive on eastern approach	6.30-9:00am As required	9:00am As required	2:00pm As required	2:00-5.00pm As required

**Note – TGS are required during school holiday periods. There will no restrictions on vehicle movements during the school holiday period (14 December 2024 – 27 January 2025)*

*** Appendix G for concepts of LMD-001 and LMD-004. LMD-002 to LMD-003 are currently under development by the Contractor and will be updated into this plan once complete. These will be adopted further from the SMEC prepared example found in Appendix G.*

The Lake Macdonald Drive Concept plan includes LMD-001 to LMD-002. It has been developed by SMEC and demonstrates the expected Lake Macdonald Drive site entrance and Hardstand 3 entrance TGS requirements. This can be found in Appendix G for reference.

The Elm Street and Lake Macdonald Drive Concept LMD-004 has been developed by SMEC to demonstrate the intent and in principal agreement with TMR to manage the Elm Street / Lake Macdonald Drive intersection specifically for semi-trailer movements at this intersection during the Early Works phase. This can be found in Appendix G for reference.

TGS LMD-003 will be submitted to NSC separately for approval once developed by the Contractor.

All TGS will be put in place on an as required basis to support the construction works.

3.1.5 Road Occupation Approvals

All road works within the operational footprint of the site will be undertaken during low volume, off-peak lane periods of the day. Seqwater currently has no traffic approvals from either TMR or NSC. The Contractor on Seqwater's behalf will apply to occupy the road for the purposes of installing a TGS. The contractor will submit applications to DTMR using Form M994 and the necessary NSC Application forms, as per Appendix B.

The Contractor is required to prepare and submit all permit applications to the relevant Road Authority (DTMR / Council) prior to the installation of temporary traffic controls/devices and/or occupying the road network

Special consultation will be undertaken with the road Authority and residents regarding special deliveries, such as oversize cranes, materials or plant.

The Project will maintain a register of all permits and approvals received during construction, which will be updated for each new and renewed permit and approval. The register will record details such as permit or approval number, description, location, and any applicable conditions.

The Contractor will liaise with the road authority in gaining approval for the works noting that the application may be accepted or rejected. Note, the road authority may elect to prohibit road or lane closures due to special events or other periods of high traffic demands.

3.1.6 Heavy Vehicle and Light Vehicle Movements

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The Early Works activities will generate HV right turn from Lake MacDonald Drive northbound entering the Site Access Road every ~17 minutes on average. This movement will be managed on site with daily traffic controllers as per the draft TGS LMD-001 which has been developed by SMEC. This will be finalised by the Contractor and submitted to the relevant Road Authority (DTMR / Council) for approval.

Table 18 shows the predicted HV movements into site, right turn from LMD northbound entering the site. The project will use best endeavours to limit HV movements around the school periods and the calculations below have taken this into account. (Refer assumptions in Table 17)

Table 18: Construction vehicle movements

Description	Heavy Vehicle Movements			
	Early Works Total (one-way)	Daily Average (two-way)	Hourly Average (two-way)	Average Intervals
Deliveries including; Heavy Vehicles Small Rigid Vehicle (SRV) Medium Rigid Vehicle (MRV) Heavy Rigid Vehicle (HRV) Articulated Vehicle (AV)	1,285	28.4	2.86	2 movements (in and out) every 21 minutes

Assumptions:

Measurement - 1 vehicle registers 2 movements (in/out)
Working days for heavy movements to be 5 days per week from Monday – Friday. Limited movements on Saturday. Working hours from 6:30am to 5:00pm
Most HV movements will be restricted during school peak hours 7-9am and 2-4pm with exception of quarry material which will continue during these hours at an average of 1 vehicle every hour.
All HV movements entering site will require the intervention of the on-site control (PTCD/Gatekeeper).
Site office LV movements will largely occur during a one -hour window around the start of the workday and a two-hour window at either end of the workday.

Figure 11 shows HV numbers for the entire project. The project has completed the TIA and the analysis of the traffic volumes specifically regarding the Early Works phase are within acceptable limits. Therefore, an upgrade to the Elm Street and Lake Macdonald Drive Intersection is not required for Early Works. Please note that the main works will likely require a localised widening to accommodate a semi-trailer turning into Lake Macdonald Drive from the north. The forecast early work HV traffic volumes indicate 3 movements per hour. Due to safety concerns for semi-trailers entering Lake Macdonald Drive from Elm Street a TGS with stop/go traffic controllers will be used for this Early Works stage. This is due to the semi-trailer failing to safely make the turn. All other HV vehicles execute this turn safely.

The low HV volumes have been detailed in Figure 9 and Figure 10. During peak times of the Early Works phase, it is likely the project will see 1 HV movement every 10mins.

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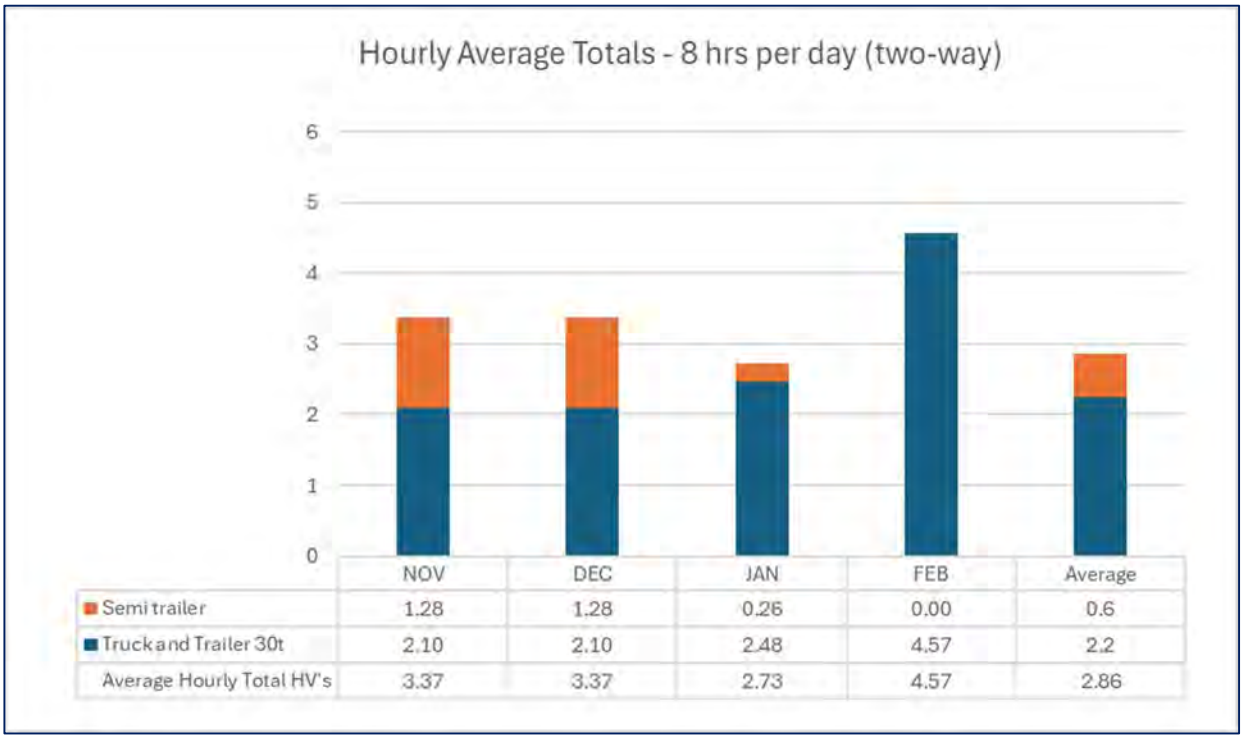
	NOV	DEC	JAN	FEB	Average
Semi trailer	10.0	10.0	2.0	0.0	4.8
Truck and Trailer 30t	22.0	22.0	26.0	48.0	23.6
Average Daily HV's	32.0	32.0	28.0	48.0	28.4

Figure 9 - Daily Average Totals (HV's)



	NOV	DEC	JAN	FEB	Average
Semi trailer	1.28	1.28	0.26	0.00	0.6
Truck and Trailer 30t	2.10	2.10	2.48	4.57	2.2
Average Hourly Total HV's	3.37	3.37	2.73	4.57	2.86

Figure 10 - Hourly Average Totals (HV's)

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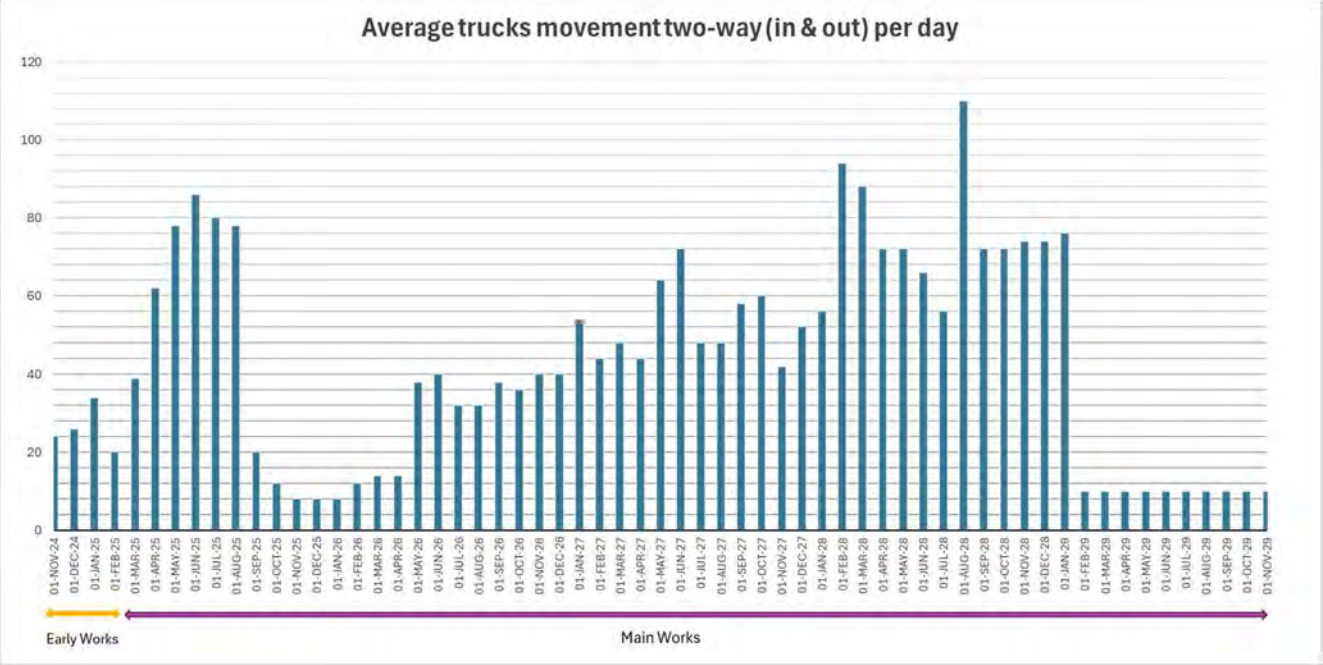

Figure 11: Average Truck Movements

During the Early Works period the peak personnel onsite will be approximately 50. All parking will be onsite during this phase and do not affect the school peak time frames as the personnel will commence work prior to school starting and will leave the site after school hours. The details of the expected LV movements can be seen in Figure 12. This shows the personnel histogram relevant to the Early Works scope.

There are four existing quarries which may be used to supply rock for the project. The potential quarries are:

- Boral, Moy Pocket
- Corbets Organics, Traveston
- Cordwells, Kin Kin
- Holcim, Beerburum

The likely haul routes from each of these quarries to the project site are shown in Appendix H.

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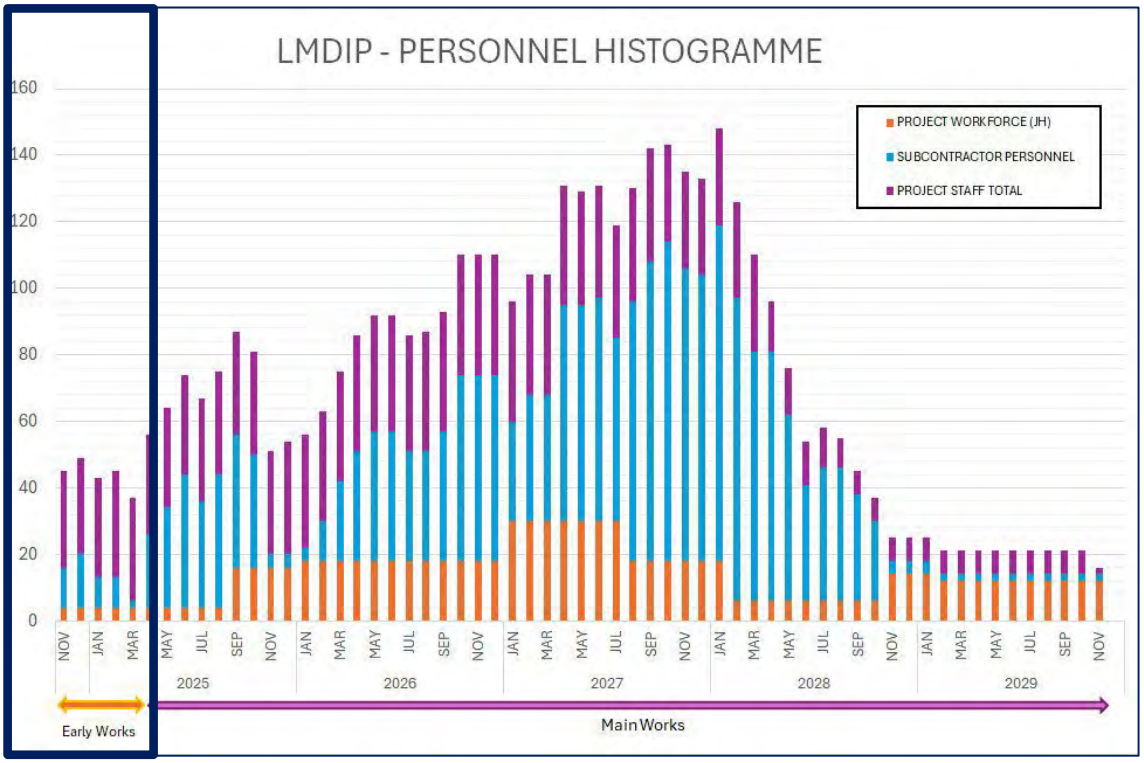

Figure 12: Personnel Histogram

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3.1.7 Oversize, Over mass Deliveries
The Project will receive excess-dimensional loads (OSOM) in compliance with the requirements of Heavy Vehicle National Law (HVNL) operating conditions. We will prepare AMS to ensure that work methods address: • Accurate and safe weighing or measuring the vehicle load • Safe retaining loads • Ensuring all loads are covered when entering and leaving site • Provide reliable evidence to calculate the weight or measurement of the vehicle or load • Ensure that loads or vehicles do not breach the Road Transport legislation • Exercise supervision or control of others involved in the loading of vehicles • Provide information, instruction, training and supervision to employees • Ensure compliance with the requirements of the Heavy Vehicle National Law (HVNL) regulation. • Unloading of special deliveries shall only take place during standard construction hours.

9.1.1. Mitigation Measures

No.	Actions	Role	When
Inductions and Training			
1.	Site inductions and training will include the following specific components for Traffic Management: • Operation Hours for trucks • Approved HV Haulage Routes • Requirements for loads to be fully covered when entering and leaving site • Speed limits and requirements along Lake Macdonald Drive • Access requirements for Light Vehicles • Hazard sheets to be developed for Lake Macdonald Drive to be distributed to drivers and will include information relating to operating hours, school bus route locations and times and holding times, requirements for noise (air brake operations), speed limits and TGS requirements.	ESM	Prior to commencing work
Workplace Planning			
2.	During construction planning and programming: • Works will be sequenced to minimise and limit truck movements during school zone hours of 7.00 - 9:00 am and 2:00 - 4:00pm. • Plan site deliveries outside of these school zone hours by the contracts with suppliers with specified start and finish times and hold vehicles on site. No marshalling areas are proposed at this Early Works stage prior to entering the school zone from the Bruce Highway. • Vehicles within the site do not enter areas of significant or protected vegetation and appropriate exclusion zones are identified.	Sup/Eng	Workplace Planning & Design

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No.	Actions	Role	When
	• TGS are to be developed and approved prior to works commencing.		
3.	Contractor to prepare and submit all permit applications to the relevant Road Authority (TMR/ Council) prior to the installation of temporary traffic controls/ devices and or/ occupying the road network. A register of all permits and approvals is to be maintained including: • Number • Description • Location and any applicable conditions	Sup	Workplace Planning & Design
4.	Development of safe work methods and AMS for all relevant works, including pavement marking, sign installation, road maintenance and traffic control set-up. OSOM shall be in compliance with the Heavy Vehicle National Laws (HVNL) and regulations with operating conditions and prepared to address the following: • Accurate and safe weighing or measuring the vehicle load • Safe retaining loads • Ensuring all loads are covered when entering and leaving the site • Provide reliable evidence to calculate the weight or measurement of vehicle or load • Ensure that loads or vehicles do not breach the Road Transport Legislation • Exercise supervision or control of others involved in loading of vehicles • Provide information, instruction, training and supervision to employees • Ensure compliance with the requirements for HVNL regulation.	Sup	Workplace Planning & Design
Avoidance and Suppression			
5.	Where dust-generating activities are unavoidable, dust-suppression techniques to protect vegetation, worker health and amenity must be applied. • Techniques may include spraying surfaces with water trucks, irrigation and stabilisation and controls such as temporary enclosures. Use water sprays to control dust from unsealed traffic areas on site, particularly during periods of unfavourable wind conditions (easterly wind, greater than 5 m/s) • Dust suppressant additives may be used to increase effectiveness and to reduce the volume of water required.	Sup	Throughout Early Works
6.	Ensure there is an adequate water supply on the site for effective dust/particulate matter suppression/mitigation at all times, using non-potable water where possible and appropriate.	Sup	Throughout Early Works

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No.	Actions	Role	When
7.	Avoid undertaking earthworks activities, where practicable, during dry/high wind weather conditions.	Sup	Throughout Early Works
8.	Pre-Start meetings and toolbox talks to discuss daily traffic updates and any changes to traffic conditions during the Early Works program	Sup	Workplace Planning & Design
9.	TGS to be in place prior to works commencing as per Table 16 TGS Schedule Note this will be on an as required basis.	Sup/Eng	Throughout Early Works
10.	General vehicle inspections to be undertaken on site arrival for all balance of equipment, including meeting biosecurity requirements	Sup	Workplace Planning
11.	Daily pre-starts, maintained in vehicles logbooks, for each plant and equipment including: • Operating conditions are in accordance with manufacturer specifications No weeps/ leaks/ damaged parts, and all safety equipment is present	Sup	Workplace Planning
12.	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site) as required. Where practicable, the wash shall be set back from intersection with public roads by an area of hard surfaced road to minimise carriage of residual dust and mud onto public roads.	Sup	Workplace Planning
13.	Verification of competency inspections by Supervisors of plant and equipment operators; and mandatory daily blood alcohol concentration testing and random drug testing.	Sup	Workplace Planning
14.	The location of nominated access tracks, haul routes and all environmental controls designed to control dust shall be include in the SEPs.	ESM	Workplace Planning
Haul/Access Road Management			
15.	Where practicable, heavy use haul roads will be sealed or have a low dust capping layer during the construction phase of the project.	Engineers	Throughout Early Works
16.	Haul truck loads are to be covered when travelling on public roads, the load must be lower than the sides of the truck and the truck is to be free of loose mud and dirt before entering public roads.	All personnel	Throughout Early Works
17.	For unpaved roads, the periodic application of water will be used for dust suppression. The frequency of application will be dependent on weather conditions and traffic volumes (See measures in Avoidance & Suppression above). Further measures for high-volume traffic areas, such as temporary gravel cover or dust suppression polymer, may also be required. For paved roads, the removal of accumulated material from roadways may occur via cleaning with spray trucks with brushes and/or by personnel with hand equipment (e.g. shovels, bristle brooms).	Sup	Throughout Early Works
18.	Install barriers alongside internal construction roads, or use some other suitable form of delineation, to deter driving off, nominated access roads.	Sup	Throughout Early Works
19.	Site access will be via designated access points only. These points will be stabilised through gravel pad or similar means.	Sup	Throughout Early Works

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No.	Actions	Role	When
20.	Public roads adjacent to construction area are to be kept free from tracked materials and cleaned daily as required. Visual inspections to be undertaken daily of Lake Macdonald Drive.	Sup	Throughout Early Works
Vulnerable Road Users			
21.	Existing formal and informal pedestrian connectivity will be maintained where practicable. Traffic entering Collwood Road will be held as per the TGS for Pedestrians crossing Collwood Road to access the Noosa Trail Network and Kookaburra Park from Lake Macdonald Drive	Sup	Throughout Early Works
22.	The carpark adjacent to Kookaburra Park will be closed during construction, however approximately six parking bays will remain open adjacent to the toilet block at Kookaburra Park	Sup	Throughout Early Works
23.	Existing formal and informal cyclist connectivity will be maintained where practicable. Traffic entering Collwood Road will be held as per the TGS for Cyclists crossing Collwood Road to access the Noosa Trail Network and Kookaburra Park from Lake Macdonald Drive	Sup	Project Delivery
24.	Physical or visual barriers are to be implemented to protect the work area and reduce risks of incidents between vehicles, road works and vulnerable road users. Treatment will also be designed to reduce potential for unwanted intrusion into the work area	Sup	Project Delivery
25.	Property access will be maintained during the Early Works, and no property restrictions and or/ closures without prior approval of the Road Agency representative and relevant property owner.	Sup	Project Delivery
26.	The local bus route 792 to CSS will be notified as per section 8.6 of this plan. It is not anticipated that bus services will encounter Heavy Haulage construction vehicles during their hours of operations (7.45 am to 8.45am and 2.30pm to 3.30pm), however drivers will be instructed to slow down and allow coaches to safely pass.	Sup	Project Delivery

9.1.2. Monitoring

No.	Monitoring Required	Role	When
1.	Visual inspections to be undertaken of the TGS prior to vehicle movements commencing	ESM	Throughout Early Works
2.	A dilapidation survey of the roads has been undertaken and daily visual inspections of the roads will be undertaken during the Early Works, records of road conditions are to be retained by the project.	Sup	Daily Throughout Early Works
3.	Regular communication with key stakeholders during the Early Works will be undertaken in line with Section 8 of this plan	CSM	Throughout Early Works
4.	Vehicles, plant, equipment and machinery shall be regularly inspected daily to ensure good working order.	Sup	Daily
5.	Daily inspections to be undertaken to of truck arrival and departure times to ensure compliance with delivery restriction times for school.	Sup	Daily

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9.1.3. Reporting

No.	Reporting Required	Role	When
1.	Record all traffic complaints, identify cause(s), take appropriate measures to reduce traffic impacts in a timely manner, and record the measures taken. This log will be available to regulatory authorities upon request. Complaints to be managed in accordance with Section 8.8 of this plan	ESM	Throughout Early Works

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APPENDIX A – Supplementary Noise Information

Baseline Noise Levels

In order to quantify the existing acoustic environment within the receptor catchment adjacent to the Project, SLR conducted attended noise surveys from 29 May to 7 June 2018 at two locations:

- Location 1: 43 Highland Drive, and
- Location 2: 407 Lake Macdonald Drive

A summary of baseline ambient noise levels is presented in Table 19.

Table 19: Summary of Measured Baseline Noise Levels (Source: *SMEC Six Mile Creek Dam Safety Upgrade Project Noise and Vibration Assessment)*

Parameter	Period	Average Noise Levels (dBA)	
		43 Highland Drive	407 Lake Macdonald Dr
LA1	Daytime (7am-6pm)	63	52
	Evening (6pm-10pm)	59	47
	Night (10pm-7am)	54	43
LA10	Daytime (7am-6pm)	56	46
	Evening (6pm-10pm)	46	42
	Night (10pm-7am)	45	36
Rating Background Level (RBL) 1	Daytime (7am-6pm)	40	34
	Evening (6pm-10pm)	40	30
	Night (10pm-7am)	40	28
LAeq	Daytime (7am-6pm)	55	47
	Evening (6pm-10pm)	47	47
	Night (10pm-7am)	49	40

Operator attended noise measurements were undertaken at the noise logger locations on 29 May 2018 during the daytime period. All significant noise sources were identified during the operator attended measurements and therefore the attended noise measurements allowed for the characterisation of the existing noise environment. The results of the operator attended noise measurement are shown in Table 20.

Table 20: Baseline noise monitoring - Description of Acoustic Environment

Location	Date & Time					Description of Acoustic Environment
		LA1	LA10	LA90	LAeq	
43 Highland Drive	29/05/18 1:16 pm	62	54	46	51	Noise generated by water rushing over the dam spillway was dominant (45 dBA SPL). Road traffic noise audible during vehicle passby on Lake Macdonald Drive (52 to 63 dBA SPL).

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						Insect noise clearly audible. Intermittent bird noise audible at times. No mechanical plant noise from water treatment plant was audible
407 Lake Macdonald Drive	29/05/18 1:50 pm	51	45	35	42	Insect noise was dominant (centred around 4KHz). Road traffic noise audible during vehicle passby on Lake Macdonald Drive (44 to 46 dBA SPL). Intermittent bird noise and dog bark audible at times. Wind generated noise in trees audible at times. No mechanical plant noise from water treatment plant was audible

Table 21 shows the modelled noise output from the predominant activity associated with the Early Works scope.

Table 21: Modelled construction activities and key plant noise levels (Source: CNVIA)

Scenario	Item	% of operation within 15-minute period	Equipment LwA dB (at 7m)	Total LwA15min dB (at 7m)
CS1 Clearing & Grubbing	excavator (30 T)	50	103	110
	chipper	50	110	
	Utes (x3)	20	85	
	tip-truck	50	105	
	street sweeper	5	91	
	skid steer	25	95	
	chain saws (x2)*	80	105	
CS2 Site gravel road construction	12 T single drum roller (low vib)	100	111	111
	Dozer	50	110	
	Wheeled loader	50	91	
	Grader	50	87	
	Trucks (incl water trucks)	20	91	
	Skid steer	100	83	
	Utes (4)	10	92	

Sensitive Receptors

The Project area is bordered to the north by Tewantin National Park and otherwise surrounded by a semi-rural residential area (Lake Macdonald suburb). The residential receptors along Lake Macdonald Drive near to the

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entrance to the site are identified as the most noise sensitive in the immediate area. It is expected controlling construction noise such that an acceptable level amenity is achieved this will also satisfy amenity requirements at surrounding nature reserve areas such as the Tewantin National Park.

The closest dwellings to the Project construction area are located:

- Approximately 30 m to the west of the left embankment
- Approximately 210 m to the west of the area in which the borrow pit may be located
- Approximately 215 m to the west of the closest proposed stockpile area; and
- Approximately 300 m to the east of the clay borrow area.

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APPENDIX B - Approval required for Early Works

ID #	Approval				Status Notes	Required / Recommended Actions / Key Issues	Timeline
	Title	Required for Early Works	Agency	Responsibility			
1.	Coordinator-General's Change Request – Early Works	Required	Office of Coordinator-General	Seqwater	• Extension to CGER currency period under the SDPWA Act granted on 16 May 2023 until the 20 May 2025. • RfPC1 was submitted in March 2024. Seqwater are working to update after CG review. • RFPC 2 (Early Works) requires approval prior to commencement of the works.	Will require approval of project change request (RfPC2) and this EWEMP to start works.	In draft (September 2024).
2.	Aboriginal Cultural Heritage Management Agreement	Not required as all works will occur in low risk, previously disturbed areas.	DTATSIPCA / Aboriginal Party	Seqwater	Aboriginal Cultural Heritage Agreement has been drafted and agreed upon. Awaiting final sign off from both parties	Awaiting final endorsement	
3.	Letter of no objection regarding works in Lake MacDonald Drive road reserve	Required	Noosa Shire Council	Contractor	NSC has provided Contractor with a letter of no objection to undertake the works on Lake MacDonald Drive associated with the Early Works. Works must comply with conditions imposed by NSC, including:	Confirm pedestrian and traffic controls with NSC prior to commencement.	Obtained.

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	(Noosa Shire Council) Road Corridor Permit, Permit to Occupy and Traffic Control Permit (DTMR)				• Any pedestrian or traffic management to be AGTTM & QGTTM compliant for all activities impacting road or footpath areas. • Reinstatement of all impacted areas is to be undertaken to their original condition and/or council satisfaction. • If tree removal is required, separate Council approval should be sought from Council's Parks Department. A Road Corridor Permit, Permit to Occupy and Traffic Control Permit will be required from DTMR before traffic controls can be put in place at the intersection of Lake MacDonald Drive and Elm Street.	Applications will be made subject to approval of the Early Works Project Change.	Required.
4.	Permit to tamper with animal breeding places - least concern animals (low risk)	May be required, has been obtained and may be implemented depending on outcomes of flora and fauna survey.	DES	Contractor	Requires only standard form completion.	Sign-on to standard low-risk Species Management Program (SMP). Updated Flora and Fauna Survey required	Obtained.
5.	EPBC approval.	Required. EPBC Approval required due likely impacts on	DCCEEW	Seqwater	The EPBC approval was given on 7 November 2019. The EPBC approval permits the clearing of all vegetation within the clearing extent presented in the Project's IAR (3ha of vegetation clearing in total). There are no conditions of	The EPBC approval requires that no clearing be undertaken outside the approved clearing extent.	Obtained. EPBC approval granted 7 November 2019.

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		MNES, including Koala.			approval relating to this clearing, other than a condition and a map defining the clearing extent. Vegetation clearing within the proposed Early Works footprint has therefore been approved under the EPBC Act. This includes approval to clear Koala habitat within the early works footprint. In addition, there are no offset conditions imposed for the Koala and no outstanding conditions requiring action prior to commencement of Early Works. No EPBC approval is required to clear threatened flora species which were listed following the commencement of the project's assessment process under the EPBC Act.	Early Works will not clear any areas outside the approved clearing extent.	
6.	Adaptive Management Plan required by Condition 2 and 3 of the EPBC Act condition of Approval.	Required. AMP approval required prior to the commencement of the action. Condition 3 of the EPBC approval requires that the AMP be implemented for the duration of the action.	DCCEEW	Seqwater	The Early Works will be carried out in a manner inconsistent with the approved AMP, however, the AMP calls up no actions which must be undertaken during the Early Works period. The purpose of AMP is to manage the environmental impacts associated with the Lake Macdonald lowering to facilitate construction of the upgraded Six Mile Creek dam, and to protect the Mary River cod, Australian lungfish, Mary River turtle, white-throated snapping turtle and giant barred frog. The primary objective of the plan is to prevent serious environmental harm due to the lowering.		Obtained. The AMP was approved by DCCEEW in 2020.

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					The first time-bound action of the AMP to be completed before drawdown is the commencement of water quality monitoring 1 month before lake drawdown. There are other activities required before the commencement of lake drawdown such as an evaluation survey (to determine fish community composition) within 2 weeks of drawdown. • Other EPBC conditions associated with the AMP have been satisfied, including: • Condition 2 a. – Habitat mapping is incorporated in the AMP (Appendix G) • Condition 2 b. – Water quality matters are outlined in section 3 of the AMP (Table 3-1) • Condition 4 – AMP independent expert review reports are provided. In addition, Seqwater responses to expert review recommendations are provided and the AMP (as submitted) has been updated to reflect the recommendations. • Condition 7 – An Aquatic Fauna Salvage and Relocation Management Plan is incorporated into the AMP.		

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APPENDIX C – EROSION & SEDIMENT CONTROL PLAN

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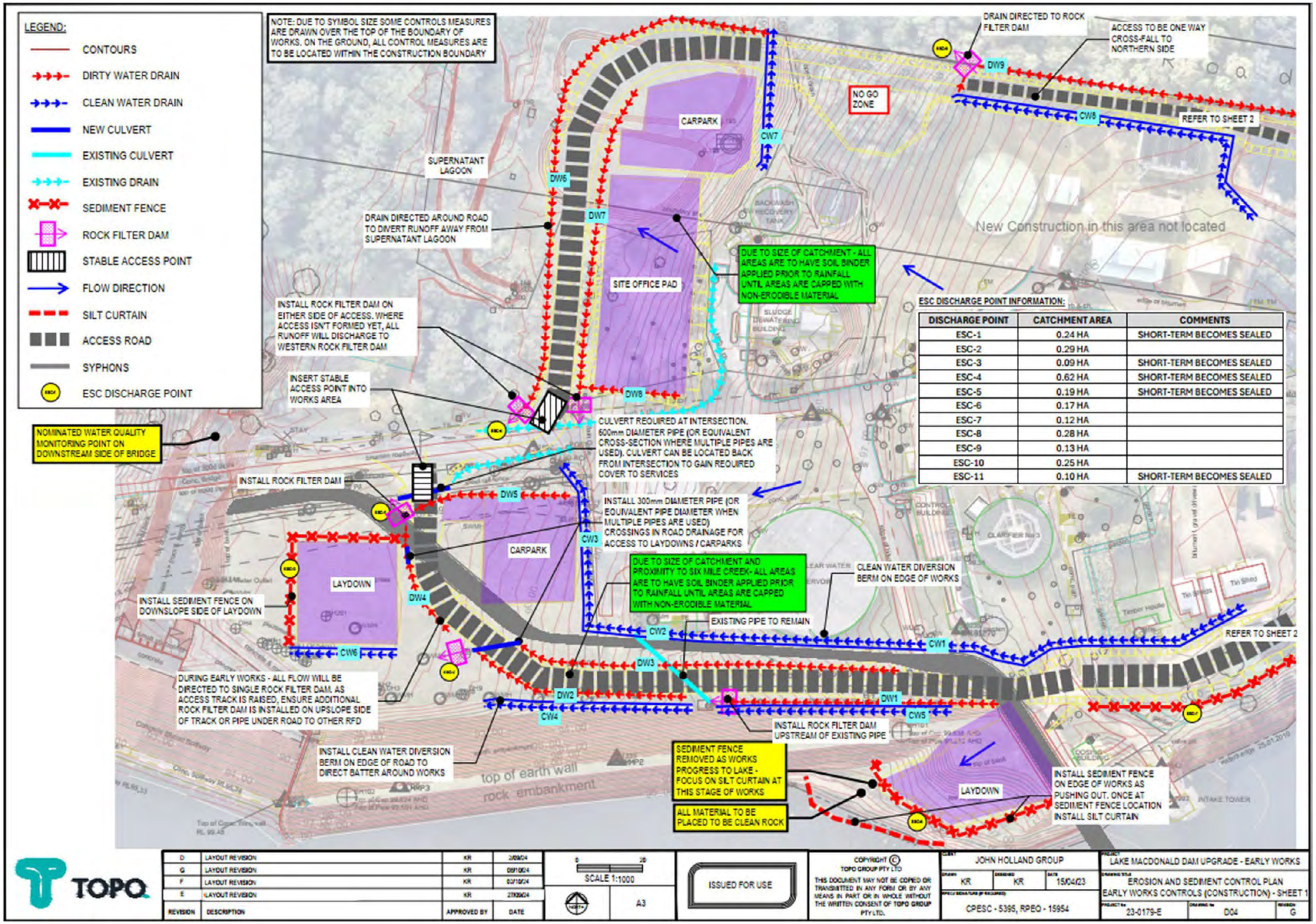

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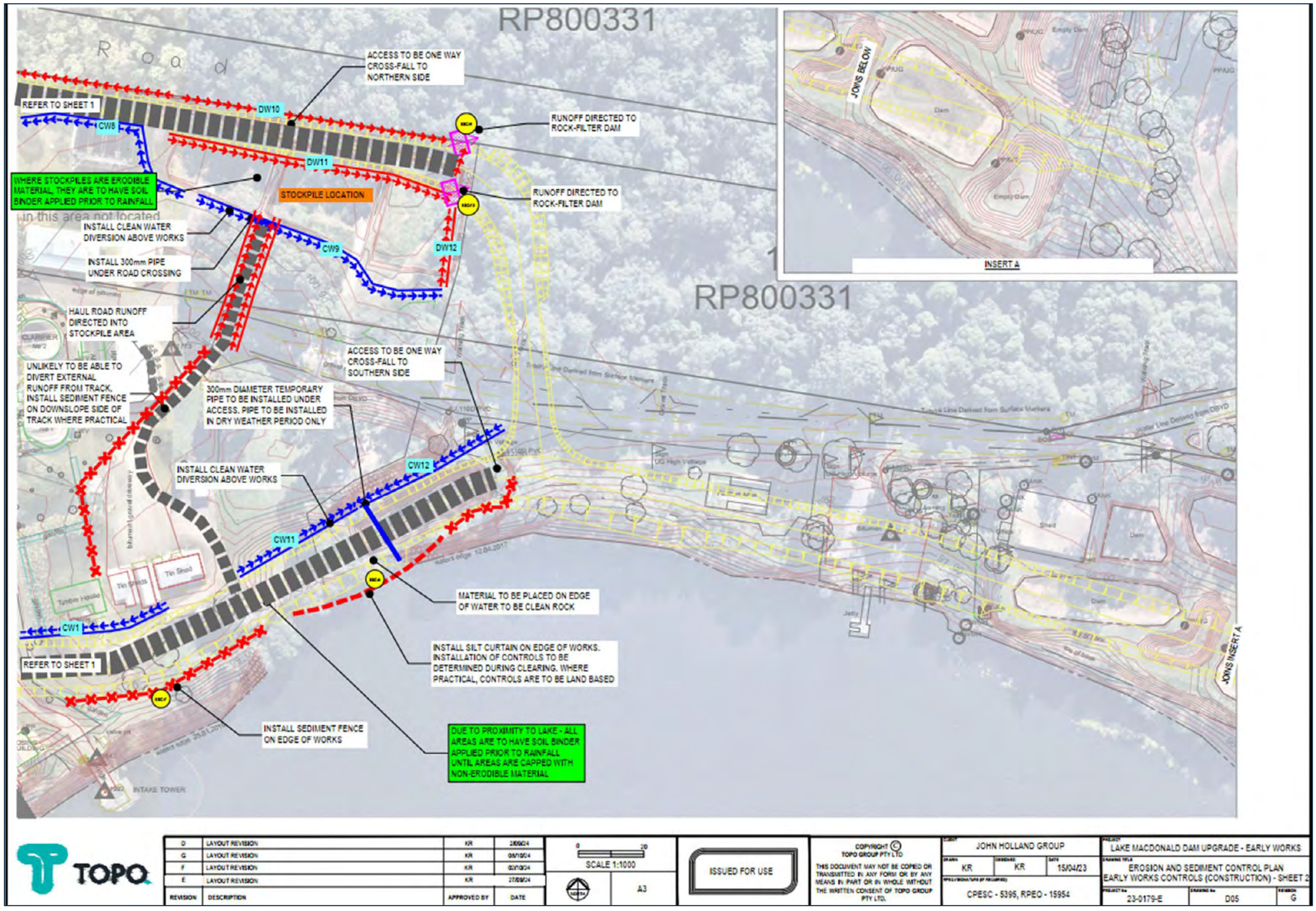

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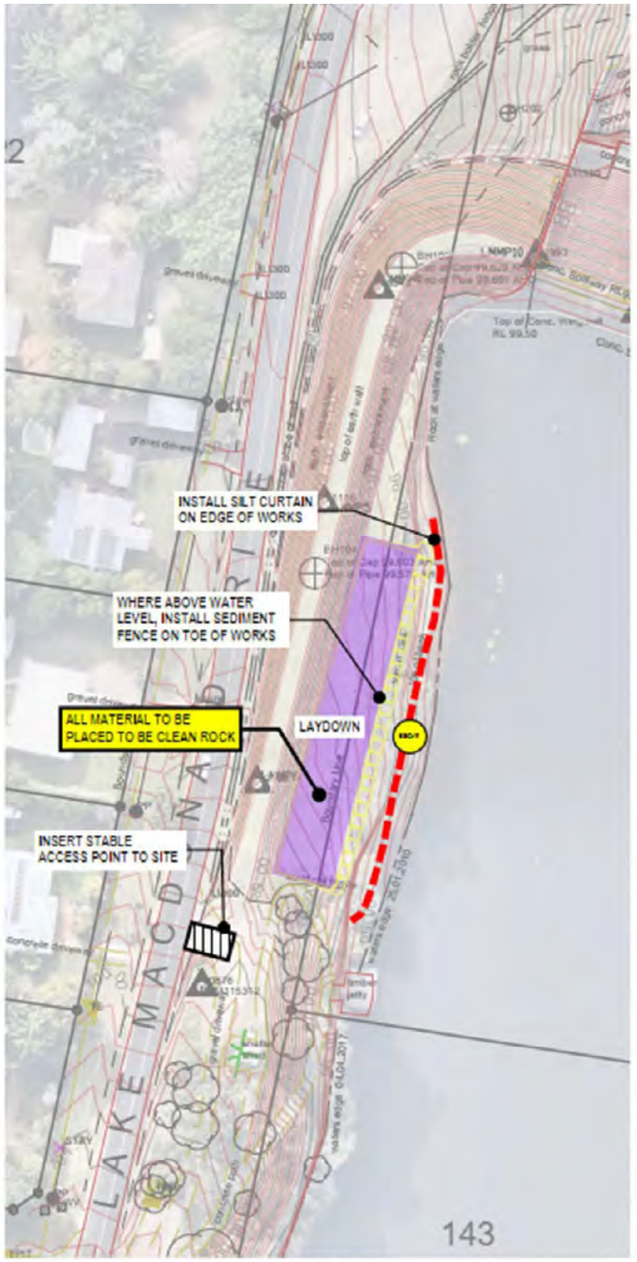

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G	LAYOUT REVISION	KR	09/10/24
F	LAYOUT REVISION	KR	02/10/24
E	LAYOUT REVISION	KR	27/09/24

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CLIENT: JOHN HOLLAND GROUP
DRAWN: KR | DESIGNED: KR | DATE: 15/04/23
SPEC / ENDORSEMENT (IF REQUIRED): CPESC - 5395, RPEQ - 15954
PROJECT: LAKE MACDONALD DAM UPGRADE - EARLY WORKS
DRAWING TITLE: EROSION AND SEDIMENT CONTROL PLAN EARLY WORKS CONTROLS (CONSTRUCTION) - SHEET 3
PROJECT No: 23-0179-E | DRAWING No: D06 | REVISION: G

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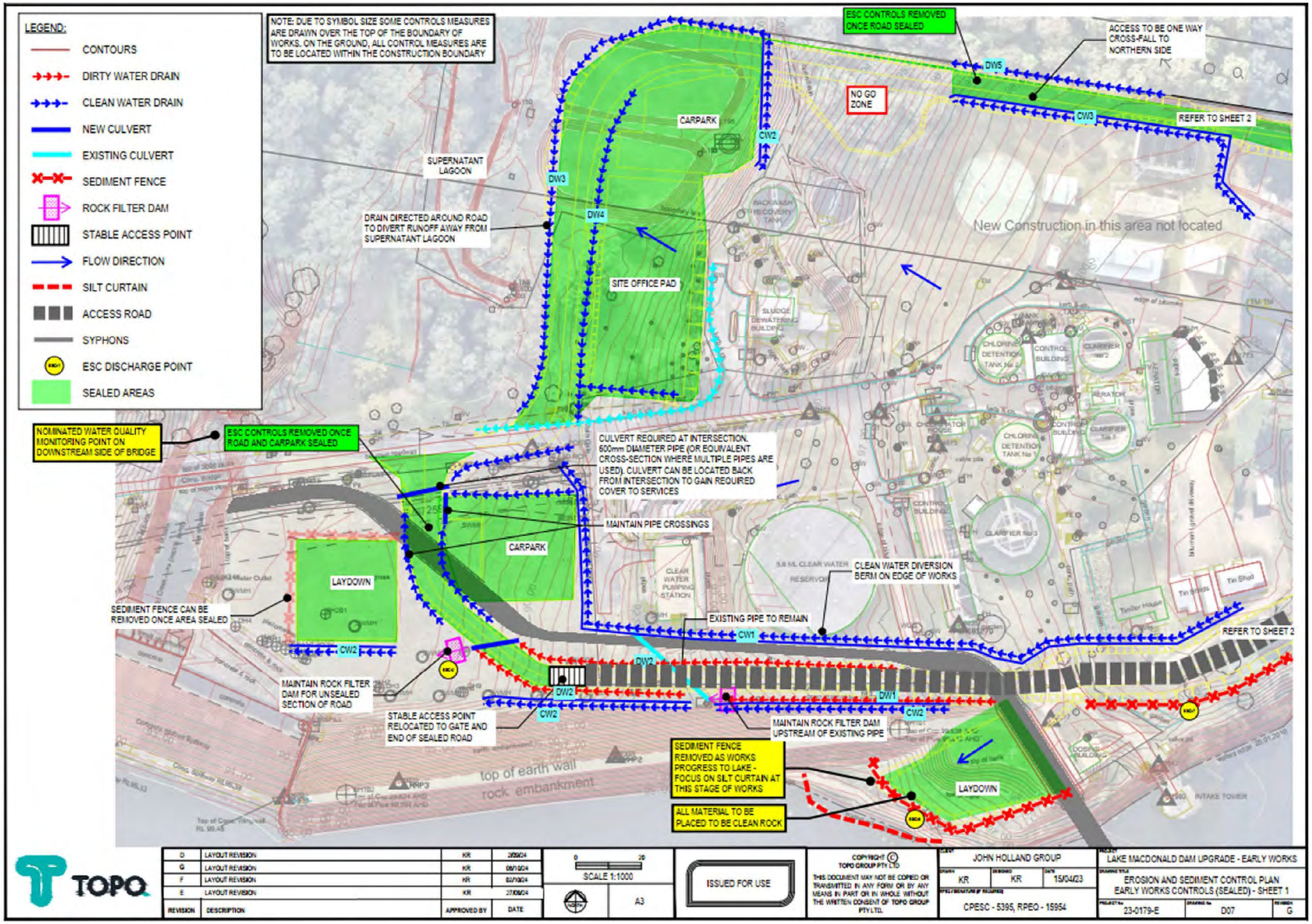

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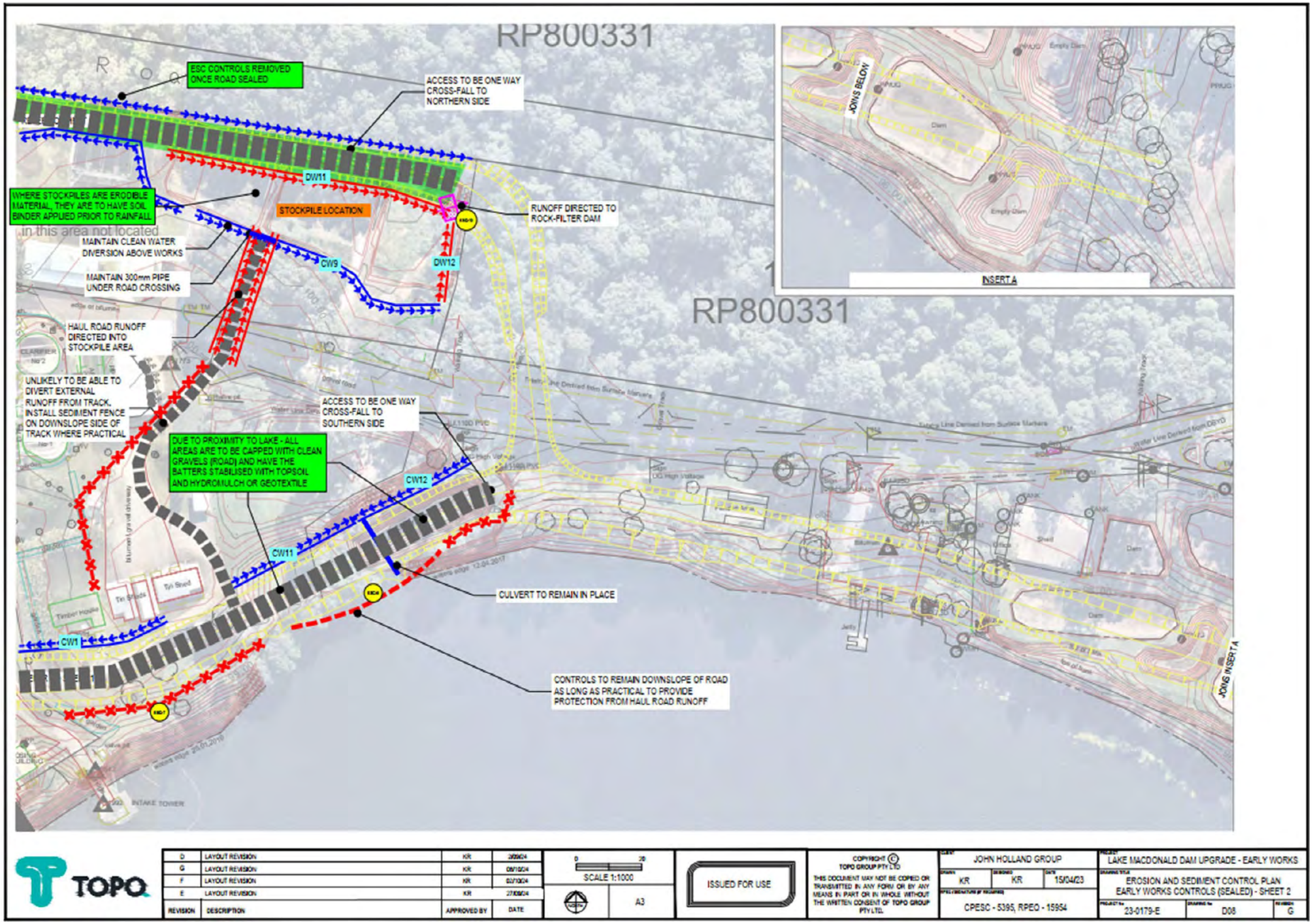

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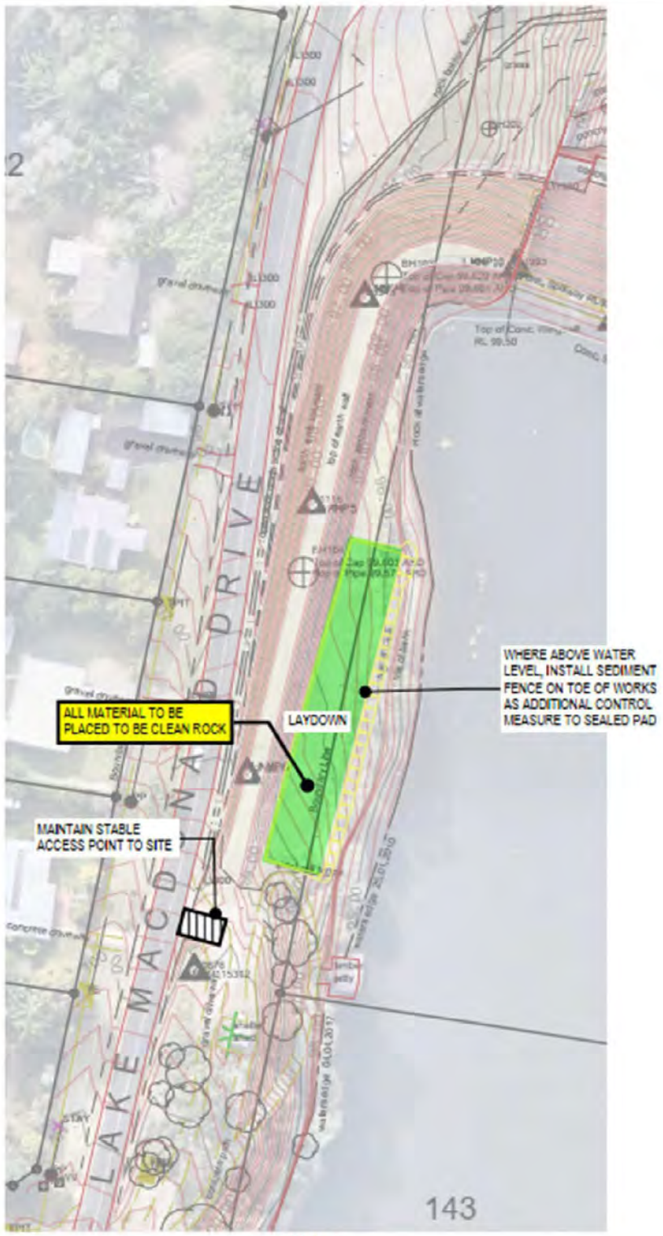

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F	LAYOUT REVISION	KR	02/10/24
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DRAWN: KR | DESIGNED: KR | DATE: 15/04/23
SPECIFICATIONS (IF REQUIRED): CPESC - 5395, RPEQ - 15954

PROJECT: LAKE MACDONALD DAM UPGRADE - EARLY WORKS
DRAWING TITLE: EROSION AND SEDIMENT CONTROL PLAN EARLY WORKS CONTROLS (SEALED) - SHEET 3
PROJECT No: 23-0179-E | DRAWING No: D09 | REVISION: G

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APPENDIX D – EARLY WORKS SITE ESTABLISHMENT LAYOUT

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APPENDIX E – QLD Weed Info Sheets (Cat 3)

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Asparagus ferns

Basket, climbing, feathered asparagus fern and bridal creeper

Asparagus ferns are popular garden ornamentals. They have escaped the garden and due to their invasive properties and the difficulty of removing them from bushland, gardeners should avoid planting all types of asparagus fern.

Seven species are listed as Weeds of National Significance.

Legal requirements

All seven WoNS asparagus ferns are category 3 restricted invasive plants under the *Biosecurity Act 2014*. They must not be given away, sold, or released into the environment.

Bridal creeper must be reported to Biosecurity Queensland within 24 hours of been sighted.

The Act requires everyone to take all reasonable and practical measures to minimise the biosecurity risks associated with invasive plants under their control. This is called a general biosecurity obligation (GBO). This fact sheet gives examples of how you can meet your GBO.

At a local level, each local government must have a biosecurity plan that covers invasive plants in its area. This plan may include actions to be taken on asparagus ferns. Some of these actions may be required under local laws. Contact your local government for more information.

Queensland Government

Bridal creeper

Bridal creeper (*Asparagus asparagoides*) is not climatically suited to most of Queensland, but has the potential to become a pest in cooler parts of southern Queensland, primarily found in gardens around Stanthorpe and Warwick. There are two forms, common bridal creeper and Western Cape bridal creeper. The Western Cape form has not been found in Queensland.

Description

Bridal creeper is a scrambler, with wiry annual stems up to 3 m long. The stems form a zig zag pattern. Stems are covered with heart-shaped green leaves. Leaves are glossy green, solitary, alternate, broadly ovate 1–7 cm long and 8–30 cm wide. The root system is extensive with tubers (up to 7.5 cm long) arranged in a rosette around a rhizome that grows vertically in the soil. It produces clusters of small, cream-coloured flowers
8–9 mm in diameter. Fruits ripen to dark red 6–10 mm in diameter and each contains a single, black, shiny, round seed, 3–4 mm in diameter.

Asparagus fern

Asparagus fern (*Asparagus scandens*), is a wiry climber. It generally occurs in subtropical to temperate high rainfall regions. Plants appear to need moisture all year round and favour riparian habitats. There are records of asparagus fern in south east Queensland and it has the potential to spread further North and West.

Description

Asparagus fern has long, flat branching thornless stems, twining up to 3 m. Leaves are lance shaped, flat with distinct midrib, dark green 5–15 mm long. Occur in groups of three. Flowers are small, white or pinkish white, solitary or in 2–3 per axil on short stalks. Fruits, fleshy, globular are up to 5–7 mm in diameter. Fruits ripen from green to orange-red, containing 1 black seed. Roots are fibrous with short rhizomes, often with narrow tubers; stems arise from a small central crown.

Basket asparagus fern

Basket asparagus fern (*Asparagus aethiopicus cv. Sprengeri*) is one of the most significant garden escapees invading the coastline. It survives well on sand dunes, shallow-soiled headlands and in rainforest understory. In some places it has become the dominant ground cover displacing native plants, even in undisturbed systems. Introduced from Africa, it is a problem along the entire coast and is also known as ground asparagus or asparagus fern. It has been recognised in Australia as a Weed of National Significance.

Description

Basket asparagus has long, arching, prickly stems up to 2 m long. The slender leaves are light green. It produces clusters of small, cream-coloured flowers (normally August to September) and fruits (normally September to October) up to 8 mm in diameter. Fruits ripen to bright red and each contains a single, black, round seed. Tubers bearing starch and water are present, but these do not regrow or reproduce. It is spread by fruit-eating birds.

Climbing asparagus fern

Climbing asparagus fern (*Asparagus africanus*) is another example of a garden plant wreaking havoc in the bush. As its name suggests, climbing asparagus fern is an accomplished climber and easily scrambles over other vegetation up to 12 m into the canopy. Naturalised in several coastal regions, climbing asparagus fern has the potential to smother trees and damage rainforests, vine scrubs and riparian vegetation.

Description

Climbing asparagus fern has narrow leaves and prickly stems that help it to clamber up and hang over other plants or supporting structure. Clusters of small, white flowers in spring are followed by green ripening to orange berries that are eaten and dispersed by birds. In the absence of a host on which to climb, this weed can grow as a scrambling, low shrub.

Feathered asparagus fern

Feathered asparagus fern (*Asparagus plumosus*) is a fast-growing climber native to South Africa. Feathered asparagus fern is a garden plant that causes serious environmental problems when it escapes into bushland. Feathered asparagus fern, like climbing asparagus fern is an accomplished climber and easily scrambles over other vegetation up into the canopy.

Description

Feathered asparagus fern can climb up to 5 m high. It has very fine leaves, thorny long stems and strong underground rhizomes. The flowers are greenish-white, bell shaped and 5–7 mm wide. Berries are green ripening to black and 4–5 mm wide. The roots appear swollen and thick and do not produce tubers. Feathered asparagus fern is very similar in appearance and impact to basket asparagus fern except feathered asparagus fern has black berries while basket asparagus fern has orange berries. Feathered asparagus fern prefers temperate to sub tropical areas. It flowers in spring to autumn and berries are produced during this time. Each berry contains one seed. Feathered asparagus fern is spread by birds and garden dumping.

Control

Managing asparagus ferns

The GBO requires a person to take reasonable and practical measures to minimise the biosecurity risks posed by asparagus ferns. This fact sheet provides information and some options for controlling asparagus ferns.

Prevention and early detection

Problems with existing plants may be contained if birds are prevented from accessing the berries. Be sure to avoid the irresponsible practice of dumping excess plants, berries or plant pieces in bushland. Unwanted plants should be disposed of at your local waste facility.

Physical control

Prevent birds from accessing berries. Dig out roots and dispose of them at your local waste facility.

Remove the entire crown and underground stem to prevent regrowth. This requires digging underneath the central growing point and lifting it out of the ground. Any regrowth that occurs can be kept under control by regular mowing or digging out.

Herbicide control

There is one herbicide registered for the control of ground asparagus fern in Queensland. A permit also allows people generally to use some herbicide products to control asparagus ferns as an invasive plants in various situations.

See Table 1 for the treatment options.

Prior to using the herbicides listed under this permit (PER11463) you must read or have read to you and understand the conditions of the permit. To obtain a copy of this permit visit apvma.gov.au.

Foliar application or the overall spray method is useful for dense monocultures of plants where there is no risk of damaging native vegetation. A small spray bottle can be used for areas around native vegetation to avoid off target drift.

The basal bark application method involves spraying or painting an herbicide and diesel mix to the lower sections of the stems for 15–30 cm from where it comes out from the crown. Apply to the whole circumference of each stem.

Native asparagus fern

Native asparagus (*Asparagus racemosus*) is the only native asparagus fern. It occurs in north Queensland and extends down to just south of Brisbane. It is a vine or small shrub that could be easily mistaken for climbing asparagus or feathered asparagus. The key difference is that the native species has longer leaflets that grow to 3 cm long.

More information

More information is available from your local government office or visit biosecurity.qld.gov.au.

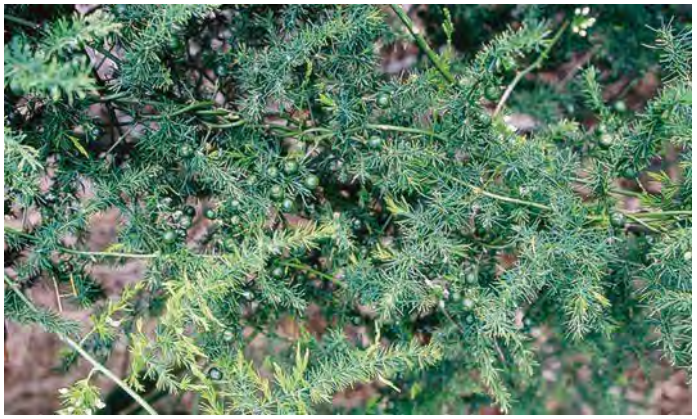
Table 1. Herbicides for the control of asparagus ferns

Situation	Herbicide	Rate	Registration details	Comments
Native conservation areas, pastoral grazing land, industrial sites such as railways, roadways, and utility rights-of-way	Aminocycopyrachlor 240 g/L (Method 240 SL) Aminocycopyrachlor 240 g/L (Method 240 SL)	200–500 mL per 100 L water	Registered	Ground asparagus fern Spot spray. Apply with handgun, or a hand-held or backpack sprayer. Use sufficient spray volume to thoroughly and uniformly wet target plant. Spray the vegetation starting at top and covering sides. Avoid spraying to point of run off as injuries to desirable species or ground cover may occur.
Non-agricultural areas, domestic and public service areas, commercial and industrial areas, bushland/ native forests, roadsides, rights-of-way, vacant lots, wastelands, wetlands, dunal and coastal areas	Dicamba 500 g/L (e.g. Kamba 500®)	200 mL per 100 L water on mature plants, up to 600 mL per 100 L on regrowth	APVMA permit PER11463 (expires 30/04/2027)	**Ground asparagus fern** Spot spray only for short-term knockdown
	Fluroxypyr 200 g/L (e.g. Flagship 200)	35 mL per 1 L diesel, kerosene or Biosafe		**Climbing and feathered asparagus ferns** Basal bark spray
	Metsulfuron-methyl 600 g/L (e.g. Kenso AgCare Ken-Met 600 WG)	10 g per 100 L water plus wetting agent or 100 g/ha plus wetting agent		**Ground asparagus fern and bridal creeper** Spot spray Do not use on coastal dunes or near the root zone of casuarinas or pandanus trees
	Diesel	Apply undiluted		**All invasive asparagus species** Paint or spot spray crowns Herbicide control trials suggest cutting all stems near ground level and spraying the entire central crown of the plant with undiluted diesel, to the point of runoff gives good control Careful application will ensure minimal risk to adjacent non-target plants

Read the label carefully before use and always use the herbicide in accordance with the directions on the label.

Bridal creeper (*Asparagus asparagoides*)

Basket or ground asparagus fern (*Asparagus aethiopicus* cv. *Sprengeri*)



Climbing asparagus fern (*Asparagus africanus*)

Feathered asparagus fern (*Asparagus plumosus*)
(Photo courtesy Sheldon Navie)

Climbing asparagus fern thorns

Climbing asparagus fern growth tip

Climbing asparagus fern plant form

Fact sheets are available from biosecurity.qld.gov.au. The control methods recommended should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, the department does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

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06/24

Broad-leaved pepper tree

Schinus terebinthifolius

The broad-leaved pepper tree is invading coastal dune areas, wetlands and along stream banks. It hosts mango black spot disease and harbours witches broom diseases that can affect citrus. The tree is choking out native plants and is becoming a serious problem. Broad-leaved pepper tree is a garden escapee and native to Brazil.

The broad-leaved pepper tree can also affect human and animal health as it contains toxic resins. Contact with the sap can cause persistent swelling, rashes, welts, running sores, a swollen face, colic and haemorrhages in the eyes. The pollen can cause respiratory difficulty.

Legal requirements

Broad-leaved pepper tree is a category 3 restricted invasive plant under the *Biosecurity Act 2014.* It must not be given away, sold, or released into the environment. The Act requires everyone to take all reasonable and practical measures to minimise the biosecurity risks associated with invasive plants under their control. This is called a general biosecurity obligation (GBO). This fact sheet gives examples of how you can meet your GBO.


Queensland
Government

At a local level, each local government must have a biosecurity plan that covers invasive plants in its area. This plan may include actions to be taken on broad-leaved pepper tree. Some of these actions may be required under local laws. Contact your local government for more information.

Description

Broad-leaved pepper trees can grow into a large spreading tree, up to 10 m high, sometimes up to 16 m high and 10 m wide. The leaves consist of 5–9 dark green leaflets. At the ends of the branches are small whitish flowers, followed by bunches of glossy, round red fruits 6 mm across. There are male and female trees, with only female bearing fruit.

Life cycle

Broad-leaved pepper tree has two obvious physiologically different growth phases; a reproductive growth phase in winter, with the main flowering period during autumn with a secondary smaller peak in spring and a vegetative growth phase during summer. However, flowering may occur throughout the year. Fruiting and seed dispersal occurs predominantly over winter.
Seedlings have a high survival rate. Plants reproduce from three years of age and overseas they have been recorded to live for about
35 years.

Methods of spread

Human movement through introduction of broad-leaved pepper tree as an ornamental shrub was responsible for initial spread of the invasive plant.

Broad-leaved pepper tree is primarily spread through seed dispersal by birds and mammals. The tree produces bright red berries that are attractive to frugivores or animals that eat fruit. Silver eyes, figbirds, currawongs and others are thought to disperse the seed.

Broad-leaved pepper tree can also reproduce from root suckers.

Habitat and distribution

Native to Brazil, Argentina and Paraguay. It was originally introduced and promoted as an ornamental shrub. It is now a serious threat to ecosystems, particularly in coastal regions, riparian zones and wetlands.

Broad-leaved pepper tree rapidly colonises disturbed bushland and dominates understorey vegetation. It out-competes and replaces native grasses, ground covers and shrubs, and is shade tolerant. It spreads rapidly on waterlogged or poorly drained soils, but will grow on drier land in higher rainfall areas.

Broad-leaved pepper tree has been found growing in a range of habitats from mangrove forests to coastal sand dunes. Thickets of broad-leaved pepper tree also form around water holes, shading out pasture.

Control

Managing broad-leaved pepper tree

The GBO requires a person to take reasonable and practical steps to minimise the risks posed by broad-leaved pepper tree. This fact sheet provides information and some options for controlling broad-leaved pepper trees.

Removal should be done in winter. Revegetation of the cleared area should be pre-planned to ensure that other weeds do not gain a foothold in the disturbed area and should include mulching to keep weeds down.

Physical control

Hand-pull or chip out young plants.

If the tree is chopped down, be prepared for it to regrow and for the roots to sucker, for up to six months. Treat these as they occur. Try cutting two inches below the soil, chip away all the bark and nail a tin plate down over the stump. Sometimes the plant won't start to regrow until 18 months after initial chopping.

Broad-leaved pepper tree can be put through a wood chipper to make mulch.

Take care to ensure your own and others safety when trimming or lopping broad-leaved pepper tree near power lines.

For electrical safety information visit worksafe.qld.gov.au/electricalsafety.

Herbicide control

There are several herbicides specifically registered for the control of broad-leaved pepper tree. A permit also allows people generally to use herbicides to control broad-leaved pepper tree as an invasive plant in various situations.

See Table 1 for the treatment options.

Prior to using the herbicides, you must read or have read to you and understand the conditions of the herbicide labels and permit. To obtain a copy of Permit PER11463, visit apvma.gov.au.

More information

More information is available from your local government or visit biosecurity.qld.gov.au.

Table 1. Herbicides for the control of broad-leaved pepper tree

Situation	Herbicide	Rate	Comments
Non-agricultural areas, domestic and public service areas, commercial and industrial areas, bushland/ native forests, roadsides, rights of way, vacant lots, wastelands, wetlands, dunal and coastal areas	Fluroxypyr 200 g/L (e.g. Wynca Fluroxypyr 200 Herbicide)	35 mL per 1 L diesel or kerosene	**Basal bark** Spray or paint the herbicide on the full circumference of each stem **Cut stump** Paint within 15 seconds of cutting APVMA permit PER11463 (Permit expires 30/04/2027)
	Glyphosate 360 g/L (e.g. Roundup)	1 L per 12 L water	**Cut stump** Paint within 15 seconds of cutting APVMA permit PER11463 (Permit expires 30/04/2027)
Forestry, pasture, commercial and industrial areas, rights of way, around agricultural buildings and public service areas	Aminopyralid 93.7 g/kg + metsulfuron-methyl 75 g/kg (e.g. Di-Bak AM Herbicide)	1 capsule every 10 cm of circumference	**Stem injection** Consult label for directions for use and critical comments
Agricultural non-crop areas, commercial and industrial areas, forests (including softwood plantations), pastures and rights-of-way	Fluroxypyr 333 g/L (e.g. Starane Advanced)	300 mL/100 L water	**Foliar spray** Winter application, mature leaves, fruiting
		21 mL/1 L diesel or Biosafe Biodegradable Herbicide Carrier	**Basal bark** Spray or paint the herbicide on the full circumference of each stem
Agricultural non-crop areas and rights of way, commercial and industrial areas, forests and pastures	Fluroxypyr 400 g/L (e.g. CropSure Fluroxypyr 400 Herbicide)	250 mL per 100 L water	
	Fluroxypyr 200 g/L (e.g. Wynca Fluroxypyr 200 Herbicide)	500 mL per 100 L water	**Foliar spray** Winter application or while the tree is in fruit, providing that no replanting of desirable broad-leaf plants is intended for six months

Read the label carefully before use and always use the herbicide in accordance with the directions on the label.

Fact sheets are available from biosecurity.qld.gov.au. The control methods recommended should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, the department does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

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01/24

Camphor laurel

Cinnamomum camphora

Camphor laurel was introduced into Australia from Asia in 1822. It has been planted as a garden ornamental throughout Queensland.

Camphor laurel is an attractive shade tree, but can be very destructive as it aggressively replaces native vegetation. The long-term consequences of its spread may result in the loss of native wildlife and agricultural productivity over large areas of South East Queensland.

Camphor laurel invades pastures and disturbed riparian systems. It tends to germinate under fences and power lines (wherever birds rest and deposit the seed). As a result, it can push fences over and disrupt power facilities.

Camphor laurel can replace the native blue gums, thereby threatening koala populations.

Queensland Government

Older camphor laurel trees develop a massive root system that can block drains and crack concrete structures. The average suburban backyard is far too small to accommodate a mature camphor laurel without problems. Removal of a mature tree can cost hundreds of dollars.

Legal requirements

Camphor laurel is a category 3 restricted invasive plant under the *Biosecurity Act 2014*. It must not be given away, sold, or released into the environment. The Act requires everyone to take all reasonable and practical steps to minimise the risks associated with invasive plants under their control. This is called a general biosecurity obligation (GBO). This fact sheet gives examples of how you can meet your GBO.

At a local level, each local government must have a biosecurity plan that covers invasive plants in its area. This plan may include actions to be taken on camphor laurel. Some of these actions may be required under local laws. Contact your local government for more information.

Description

Camphor laurel is a large evergreen tree, growing up to 20 m tall. The leaves have a glossy, waxy appearance and smell of camphor when crushed. In spring it produces lush, bright-green foliage and masses of small white flowers. The spherical fruits are green (changing to black when ripe) and 10 mm in diameter.

Life cycle

Camphor laurel flowers in spring and produces over 100,000 seeds a year. The seeds can stay viable up to three years and germination occurs from 4–20 weeks.

Methods of spread

Spread by people as an ornamental tree. Berries spread by water and birds.

Habitat and distribution

Camphor laurel is native to Taiwan, Japan and some parts of China. Since it was introduced, it has been planted all along eastern Australia from the Atherton Tablelands to Victoria. It is particularly common along watercourses and in soil types that once supported rainforest.

In south-east Queensland, it has the potential to develop dense infestations. A large camphor laurel tree may produce over 100 000 seeds every year. The seeds are readily spread by fruit eating birds.

Control

Managing camphor laurel

The GBO requires a person to take reasonable and practical steps to minimise the risks posed by camphor laurel.

This fact sheet provides information and some options for controlling camphor laurel.

Mechanical control

Removal of newly established or isolated seedlings by hand pulling or grubbing is effective. Bulldozing is only suitable for young trees that can be removed, roots and all. Failure to remove roots of mature trees will result in regrowth. Fire kills plant tops but produces regrowth from the base.

Take care to ensure your own and others safety when trimming or lopping camphor laurel near power lines.

For electrical safety information visit worksafe.qld.gov.au/electricalsafety.

Herbicide control

Selection of a suitable control method depends on the size of the target tree and its situation. A standing tree that has been treated may be a serious hazard to human safety or other structures when it falls. Removal of the bulk of the tree before treating the stump is preferred in such situations.

Table 1 details the herbicides registered for camphor laurel control. Before using any herbicide always read the label carefully. All herbicides must be applied strictly in accordance with the label.

Foliar spray

Foliar sprays can be used for young trees up to 3 m tall.

Basal bark

For trees up to 6 m, carefully spray around the base of each stem or trunk to a height of 40 cm above the ground. Ensure every part of the trunk is sprayed.

Cut stump

For small trees, cut each stem off as close to the ground as possible and **immediately** (within 15 seconds) apply the herbicide mixture liberally to the cut surface.

Stem injection

For trees taller than 6 m, stem injection using a modified axe is the most practical method—leave no more than 2 cm between cuts.

Axe cuts for stem injection of herbicides should be made at regular intervals all around the stem (or stems). Care should be taken to ensure the axe leaves a 'pocket' in the stem, into which the chemical is immediately injected.
Cuts should penetrate the sapwood (just under the bark), but not the hard central wood. Cuts made too shallow into the bark or too deep into the stem will result in regrowth. The practice of drilling holes in the stem prior to herbicide application is not recommended.

More information

More information is available from your local government or visit biosecurity.qld.gov.au.

2 Camphor laurel *Cinnamomum camphora*

Table 1. Herbicides for the control of camphor laurel

Situation	Herbicide	Rate	Comments
Agricultural non-crop areas, commercial and industrial areas, forests, pastures and rights-of-way	Triclopyr 300 g/L + Picloram 100 g/L (e.g. Conqueror)	350–500 mL/100 L water	High-volume spray for trees up to 3 m high; higher rate for trees over 3 m high
		500 mL/10 L water	High concentration/low volume application (gas gun or sprinkler sprayer) Trees less than 1.5 m high which are able to be sprayed from all sides Use high volume application on larger bushes
	Triclopyr 300 g/L + Picloram 100 g/L + Aminopyralid 8 g/L (e.g. Grazon Extra)	350–500 mL/100 L water	High concentration/low volume application (gas gun or splatter gun) Trees less than 1.5 m high
		500 mL/10 L water	High concentration/low volume application (gas gun or splatter gun) Trees less than 1.5 m high Use high volume application on larger bushes
	Triclopyr 600 g/L (e.g. Garlon 600)	170 mL/100 L water	High-volume foliar spray for trees up to 3 m high
	Triclopyr 600 g/L (e.g. Garlon 600)	1 L in 60 L diesel	Basal bark trees to 10 cm diameter or cut stump trees to basal bark size or greater
	Triclopyr 200 g/L + Picloram 100 g/L (e.g. Slasher)	Mix 1 part herbicide with 4 parts water	Stem injection application (consult label)
	Triclopyr 200 g/L + Picloram 100 g/L + Aminopyralid 25 g/L (e.g. Tordon RegrowthMaster)	Mix 1 part herbicide with 4 parts water	Stem injection application (consult label)
Pasture, non-crop, forestry, right-of-way and aquatic areas	Glyphosate 360 g/L (e.g. Roundup Biactive)	2 mL of 1:1 mix with water	Stem injection for trees up to 25 cm in diameter
		2 mL undiluted	Stem injection for trees 25–60 cm in diameter

Various glyphosate formulations are available but not all are registered for this use. Consult labels for rates. For aquatic or riparian areas only use glyphosate formulations registered for use in those situations.

Read the label carefully before use. Always use the herbicide in accordance with the directions on the label.

Fact sheets are available from biosecurity.qld.gov.au. The control methods recommended should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, the department does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

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08/23

Lantana

Lantana camara

Currently, lantana covers more than 5 million ha of subcoastal New South Wales to Far North Queensland. Small infestations of lantana have also been found in central west Queensland, the Northern Territory, Western Australia, South Australia and Victoria. Efforts are under way to control these.

Lantana is mainly spread by fruit-eating birds and mammals. It forms dense thickets that can smother and destroy native vegetation and are impenetrable to animals, people and vehicles.

Queensland Government

Research indicates more than 1400 native species are negatively affected by lantana invasion, including many endangered and threatened species. As lantana is a woody shrub that has thin, combustible canes, its presence can also create hotter bushfires, altering native vegetation communities and pastures.

Legal requirements

All lantana species (*Lantana camara* and *Lantana montevidensis*) are category 3 restricted invasive plants under the *Biosecurity Act 2014*. They must not be given away, sold, or released into the environment. The Act requires everyone to take all reasonable and practical steps to minimise the risks associated with invasive plants under their control. This is called a general biosecurity obligation (GBO). This fact sheet gives examples of how you can meet your GBO.

At a local level, each local government must have a biosecurity plan that covers invasive plants in its area. This plan may include actions to be taken on lantana. Some of these actions may be required under local laws. Contact your local government for more information.

Description

Lantana camara is a heavily branched shrub that can grow in compact clumps, dense thickets or as a climbing vine.

The stems are square in cross section, with small, recurved prickles. Most leaves are about 6 cm long and are covered in fine hairs. They are bright green above, paler beneath and have round-toothed edges. Leaves grow opposite one another along the stem. When crushed the leaves produce a distinctive odour.

Flowers appear throughout most of the year in clustered, compact heads about 2.5 cm in diameter. Flower colours vary from pale cream to yellow, white, pink, orange and red. Lantana produces round, berry-like fruit that turn from glossy green to purplish-black when ripe.

Life cycle

Flowering and germination occurs all year round but peaks after summer rains. Several thousand seeds can be produced per square metre and these can remain viable for several years.

Research indicates some ornamental lantana varieties have the ability to set seed and can spread vegetatively. They also produce some viable pollen and have the potential to cross-pollinate with wild forms, creating new varieties that could naturalise in the environment.

If the number of naturalised varieties increase due to genetic drift from ornamental varieties, it will make finding effective biological control agents even more difficult and potentially extend the climatic tolerances and range of the weed's spread.

Methods of spread

Spread mostly through the garden ornamental trade, by fruit eating birds and mammals.

Lantana camara can also spread via a process known as layering, where horizontal stems take root when they are in contact with moist soil. It will also reshoot from the base of vertical stems.

Habitat and distribution

Lantana camara is native to the tropical and subtropical regions of North, Central and South America.

Lantana camara is found throughout most coastal and subcoastal areas of eastern Australia, from the Torres Strait islands to southern New South Wales. It grows in a wide variety of habitats, from exposed dry hillsides to wet, heavily shaded gullies.

Toxicity

Many lantana varieties are poisonous to stock. It is difficult to tell which varieties are toxic so it is better to treat all forms as potentially poisonous. The toxins in lantana include the triterpene acids, lantadene A (rehmannic acid), lantadene B, and their reduced forms.

Most cases of lantana poisoning occur when new stock are introduced into lantana-infested areas. Stock bred on lantana-infested country avoid lantana unless forced to eat it due to lack of other fodder. Young animals introduced to lantana areas are most at risk.

Symptoms of lantana poisoning depend on the quantity and type of lantana consumed and, under some circumstances, the intensity of light to which the animals are exposed.

Early symptoms of depression are noticeable, with head swaying, loss of appetite, constipation and frequent urination. After a day or two the eyes and the skin of the nose and mouth start yellowing with jaundice, and the muzzle becomes dry and warm. The eyes may become inflamed and have a slight discharge. The animal also becomes increasingly sensitive to light. Finally, the muzzle becomes inflamed, moist and very painful ('pink nose'). Areas of skin may peel and slough off. Death commonly occurs 1–4 weeks after symptoms occur. Death from acute poisoning can occur 3–4 days after eating the plant.

If animals show any of the early symptoms, they should be moved to lantana-free areas, kept in the shade and monitored. Veterinary treatment should be sought immediately. Some remedies may include intravenous fluids, treating skin damage with antibiotics, or drenching with an activated charcoal slurry.

Care should be taken when introducing new or young animals into a paddock if lantana is present. Ensure they have enough fodder to stop them eating lantana in quantities sufficient to result in poisoning. During drought, animals should not be placed in lantana-infested areas without alternative food.

Control

Managing *Lantana camara*

The GBO requires a person to take reasonable and practical steps to minimise the risks posed by *Lantana camara*. This fact sheet provides information and some options for controlling *Lantana camara*.

A general principle is to commence control programs in areas of light infestations and work towards the denser infestations using a mix (integration) of control methods. Size, density and geographic location of infestations are important considerations for choosing which mix of control methods to use.

For large lantana infestations, treatment with herbicides by foliar spraying is usually not economically feasible. However, fire, dozing/stick raking, slashing/cutting and aerial helicopter spraying are options that can reduce dense infestations, making follow-up spot treatments with herbicides more economically viable.

Lantana camara seed banks remain viable for at *least* four years, so follow-up control to kill seedlings before they mature is vital to ensure initial management efforts to control the parent bush are not wasted.

Appropriate fire regimes may become part of a management program to ensure *Lantana camara* invasiveness is reduced and pasture is maintained.

Removal of *Lantana camara* within areas of remnant vegetation may require a permit under the *Vegetation Management Act 1999*. Further information should be sought from the Department of Natural Resources before works commence.

Mechanical control

Stick raking or ploughing can be effective in removing standing plants. However, regrowth from stumps and/ or increased seedling germination in disturbed soil is common and the site will require follow-up treatment.

Grubbing of small infestations—for example, along fence lines—can be a useful and effective method of removing plants, although this is time consuming.

Repeated slashing can also reduce the vigour of lantana, exhausting its stored resources and reducing its likelihood of re-shooting.

Some locations—for example, very steep inclines or gullies—are not suitable for mechanical control options because of the danger of overturning machinery and soil erosion.

Fire

Regular burning will reduce the capacity of plants to survive; however, initial kill rates are variable.

The effectiveness of this method will depend on the suitability of available fuel loads, fire intensity, temperature, relative humidity, soil moisture and season.

Pasture re-establishment can then provide competition to inhibit lantana seed germination. Fire is not recommended in non–fire tolerant vegetated areas such as rainforest, or wooded or plantation areas.

A typical control program for fire may include:

- exclude stock to establish a pasture fuel load
- burning (may require a permit)
- sow improved pastures—consult your local Biosecurity Queensland officer for advice
- continue to exclude stock until pasture has established and seeded
- burn again in summer before rain and spot spray *Lantana camara* regrowth when > 0.5 m high and when it is actively growing (see Table 1).

Biological control

Since 1914, 32 biological control agents have been introduced into Australia in an attempt to control lantana. Eighteen have established, of which several insect species cause seasonal damage, reducing the vigour and competitiveness of lantana in some areas.

Biosecurity Queensland research programs continue to investigate agents suitable for release in Australia, and test the viability of these agents in an effort to identify more effective biological control agents.

It is important to remember that biological control alone should not be relied upon for managing lantana infestations. Consideration should be given to other available control techniques.

The four most important biological control agents are:

- **sap-sucking bug (*Teleonemia scrupulosa*)**
  Found in dry areas from Cooktown to Wollongong, the small, mottled bug feeds on the underside of leaves, growing tips and flower buds, causing the leaves to drop early and stop the plant from flowering.
- **leaf-mining beetle (*Uroplata girardi*)**
  Found in most lantana infestations from Cape Tribulation to Sydney as well as around Darwin, except in very dry or high altitude areas. The adult beetles are dark brown. They shelter in curled leaves and feed on the upper leaf surfaces. Larvae feed in leaves causing blotches to spread across the leaf. This beetle reduces plant vigour and can suppress flowering.
- **leaf-mining beetle (*Octotoma scabripennis*)**
  Found in most lantana infestations from Atherton to Wollongong. Adults of this species feed on the upper leaf surface, while larvae feed and mine the centre of the leaf and cause blotches. This activity reduces plant vigour and can suppress flowering.
- **seed-feeding fly (*Ophiomyia lantanae*)**
  Found from Cape Tribulation to Eden in New South Wales and also around Darwin and Perth. *Ophiomyia* is a small black fly that feeds on flowers and lays eggs on the green fruits. The maggots of the fly eat the seed and make the fruit unattractive to birds, reducing seed spread.

Other agents such as *Aconophora compressa* (a stem-sucking bug) and *Leptobyrsa decora* (a sap-sucking bug) have caused some damage in specific geographic areas.

Note: Landholders are advised not to consume their time collecting established insects for distribution. Due to their own ability to disperse, these insects will be periodically/ seasonally present in areas that are climatically suitable for them.

Herbicide control

Herbicide recommendations for lantana are shown in Table 1. Users of herbicides have a legal obligation to read herbicide labels and use only the registered rates.

Variation in results can be a result of inconsistent application methods, mix rates or seasonal variation. Red-flowered and pink-edged red-flowered lantana are often considered the most difficult to control because their leaves are often smaller and tougher. However, herbicides can kill these varieties if you carefully follow application procedures.

For single-stemmed lantana, basal bark spraying and cut stump methods also give good results at any time of year (but best when the plant is actively growing).
On multi-stemmed varieties, you will obtain best results by carefully applying herbicide to each stem.

When treating actively growing plants less than 2 m high, overall spraying of foliage to the point of run-off is recommended. Splatter gun techniques are also effective and particularly useful in hard-to-access areas. This is best done in autumn—when sap flows draw the poison down into the root stock, but before night temperatures get too cold.

Remove grazing animals from spray areas during and soon after treatment. Stress can cause increased sugar levels in the leaves of lantana plants, making them more palatable.

Landholders and contractors should check if the property is situated in a hazardous area. This prevents the use of some herbicides, as defined in the *Agricultural Chemicals Distribution Control Act 1966*.

More information

Contact your local government office for more information or visit biosecurity.qld.gov.au.

Table 1. Herbicides for control of *Lantana camara*

Situation	Herbicide	Rate	Optimum time[1]	Comments
Agricultural non-crop areas, commercial and industrial areas, forests, pastures and rights-of-way	Fluroxypyr 200 g/L (e.g. Flagship 200)	500 mL to 1 L/100 L water	October to April	Thorough wetting of plants is required, higher rate should be used for larger plants.
	Fluroxypyr 333 g/L (e.g. Starane Advanced)	300–600 mL/100 L water		
	Fluroxypyr 400 g/L (e.g. Comet 400)	250–500 mL/100 L water		
Domestic areas, commerical, industrial and public service areas, agricultural non-crop areas, forests and rights-of-way	Glyphosate 360 g/L (e.g. Roundup Biactive, Glyphosate 360)	1 L/100 L water	October to April	Wet plant thoroughly. Glyphosate affects any green plant it comes into contact with. Glyphosate is available in a range of strengths. Consult labels for rates for other glyphosate formulations.
	Glyphosate 450 g/L (e.g. Glyder 450)	800 mL/100 L		
	Glyphosate 540 g/L (e.g. Roundup PowerMax)	660 mL/100 L		
	Glyphosate 700 g/kg (e.g. Macspred Dri 700)	500 g/100 L		
Agricultural non-crop areas, commercial and industrial areas, pastures and rights-of-way	2,4-D 300 g/L + Picloram 75 g/L (e.g. Tordon 75-D)	0.65 L/100 L water	March to May	Thoroughly wet foliage and soil around base of plant. Legumes are affected if sprayed.
Non-crop and rights-of-way	Dichlorprop 600 g/L (e.g. Lantana 600)	500 mL/100 L water	December to April	Must thoroughly wet all leaves. Please refer to product label for situation details.
Agricultural non-crop areas, commercial and industrial areas, forests, pastures and rights-of-way	Triclopyr 300 g/L + Picloram 100 g/L + aminopyralid 8 g/L (e.g. Grazon Extra®)	350–500 mL/100 L water	Summer to autumn	Wet plant thoroughly. Use the higher rate on plants over 1 m. Legumes may be affected if sprayed.
	Triclopyr 300 g/L + Picloram 100 g/L (e.g. Conqueror)			
Pastures, rights-of-way and industrial areas	2 ,4-D amine 625 g/L (e.g. Ken-Amine 625)	320 mL/100 L water	March to May	Use a coarse spray with sufficient pressure to penetrate canopy and wet stems as well as foliage. Spray at the end of a wet Summer (March to May). Defoliation should occur but respraying of new growth will be necessary in following Autumn. Broadcast grass seed and keep stock off following Summer to allow the pasture to establish. Damage may result to pasture legumes. Red-flowered lantanas are more resistant to 2,4-D .
	2 ,4-D amine 700 g/L (e.g. Amicide Advance 700)	285 mL/100 L water Consult label for other formulations of 2,4-D		
Native pastures, rights-of-way, commercial and industrial areas	Metsulfuron-methyl 600 g/kg (e.g. Associate, Lynx® 600)	10 g/100 L water plus wetter	March to May	Plants up to 2 m tall. Thoroughly wet all foliage and stems. Spray should penetrate throughout the bush. Addition of a wetting agent e.g. Pulse is recommended. Results variable. Not found effective in tropics. Follow-up sprays are necessary.
Native pastures, rights-of-way, commercial and industrial areas	Glyphosate 360 g/L (e.g. Weedmaster Duo, Glyphosate 360) plus Metsulfuron-methyl 600 g/L (e.g. Associate, Ken-Met 600) + tank mix	400 mL glyphosate 360 + 3 g metsulfuron/ 100 L water	March to May	Apply to actively growing bushes up to 2 m tall. Spray to thoroughly wet all foliage and stems. Spray to penetrate throughout the bush. Do not apply during periods of summer drought stress. Addition of a wetting agent e.g. Pulse is recommended
Agricultural non-crop areas, commercial and industrial areas, forests, pastures and rights-of-way	Fluroxypyr 140 g/L + Aminopyralid 10 g/L (e.g. Hotshot)	500–700 mL /100 L water	October to April	Apply to actively growing plants. Spray all foliage, including stems, to the point of run-off. Use the lower rate on seedlings and regrowth 0.5–1.2 m tall and the higher rate on plants 1.2–2 m tall.
	(i) Basal bark (ii) Cut stump			
	Triclopyr 600 g/L (e.g. Garlon 600)	1 L/60 L diesel	Any time Best results when actively growing	(i) Apply to lower 40 cm of every stem Must ensure complete coverage around stem (ii) Cut close to ground level Immediately apply herbicide
	Triclopyr 240 g/L + Picloram 120 g/L (e.g. Access)			
	Picloram 44.7 g.L + Aminopyralid 4.47 g/L (e.g. Vigilant II® Herbicide Gel)	3–5 mm gel		(ii) If diameter of stump is > 20 mm, use a minimum of 5 mm gel thickness

Table 1. Herbicides for control of *Lantana camara* (continued)

Situation	Herbicide	Rate	Optimum time[1]	Comments
Agricultural non-crop areas, commercial and industrial areas, forests, pastures and rights-of-way	Glyphosate 360 g/L (e.g. Roundup, Weedmaster Duo)	Undiluted	Any time Best results when actively growing	APVMA permit PER11463 (expires 30/04/2027) Prior to using the herbicides listed under PER11463 you must read or have read to you and understand the conditions of the permit To obtain a copy of this permit visit apvma.gov.au.
	Splatter gun			
	Glyphosate 360 g/L (e.g. Weedmaster Duo, Glyphosate 360)	1:9 glyphosate + water	October to April	2 x 2 mL dose per 0.5 m height of lantana. Addition of Pulse Penetrant may improve control.
	Metsulfuron methyl 600 g/L (Associate, Lynx® 600)	2 g/L water	March to May	
	Aerial			Follow label directions for equipment and other requirements for aerial application.
Agricultural non-crop areas, commercial and industrial areas, forests, pastures and rights-of-way	Triclopyr 300 g/L+ Picloram 100 g/L (e.g. Conqueror) or Triclopyr 300 g/L + Picloram 100 g/L + Aminopyralid 8 g/L (Grazon Extra)	10 L/ha	When actively growing	Helicopter only. Minimum of 200 L water per ha. Follow-up re-spray will be required. Do not burn within six months of treatment.
	Triclopyr 300 g/L + Picloram 100 g/L (e.g. Conqueror) or Triclopyr 300 g/L + Picloram 100 g/L + Aminopyralid 8 g/L (Grazon Extra) + 2,4-D amine 625 g/L (e.g. Ken-Amine 625)	1.5 L + 6 L 2,4-D /ha		Helicopter only. Minimum of 200 L water per ha. Follow-up re-spray will be required. Do not burn within six months of treatment.
Non-crop and rights-of-way	Dichlorprop 600 g/L (e.g. Lantana 600)	6–8 L/ha		

[1]Optimum times are only a guide. *Lantana camara* must be actively growing for the herbicide to work.
Labels often recommend the additional use of a wetting agent or surfactant within the mix. Herbicides types vary in their selectivity against other species and soil residual.

Read the label carefully before use and always use the herbicide in accordance with the directions on the label.

Fact sheets are available from biosecurity.qld.gov.au. The control methods recommended should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, the department does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

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06/23

Singapore daisy

Sphagneticola trilobata

Singapore daisy is a mat forming ground cover. It spreads rapidly and smothers seedling, ferns and shrubs and will out-compete them for survival. Singapore daisy is invading all different environmental areas, even growing in sand.

Legal requirements

Singapore daisy is a category 3 restricted invasive plant under the *Biosecurity Act 2014*. It must not be given away, sold, or released into the environment. The Act requires everyone to take all reasonable and practical measures to minimise the biosecurity risks associated with invasive plants under their control. This is called a general biosecurity obligation (GBO). This fact sheet gives examples of how you can meet your GBO.

At a local level, each local government must have a biosecurity plan that covers invasive plants in its area. This plan may include actions to be taken on Singapore daisy. Some of these actions may be required under local laws. Contact your local government for more information.


Queensland
Government

Description

Singapore daisy is a vigorous ground cover or low climbing plant. The leaves are lush glossy green, usually 3 lobed and in pairs up the stem 4–18 cm long and 1.5–8 cm wide.

Singapore daisy produces yellow to orange-yellow daisy flowers about 2 cm. The flowers are held above the leaves on short leaf stalks. Seeds are elongated, brown 4–5 mm long. The amount of seed per flowers varies greatly.

Life cycle

Flowers mostly spring to autumn but will flower all year round. Most reproduction is vegetative, from stems nodes.

Methods of spread

Singapore daisy produces variable amounts of seeds but is mainly spread by cuttings via slashing and pruning.

Habitat and distribution

Singapore daisy is a garden escapee and native of tropical America. It prefers moist areas on a range of soil types. If can be found in gardens, parks, bushland, disturbed areas, along roadsides, lawns and footpaths.

It is becoming a problem by invading wetlands, irrigated areas and around drains.

Found in South East Queensland and coastal areas of northern and Central Queensland.

Control

Managing Singapore daisy

The GBO requires a person to take reasonable and practical measures to minimise the biosecurity risks posed by Singapore daisy. This fact sheet provides information and some options for controlling Singapore daisy.

As Singapore daisy likes to establish in disturbed areas, pre-plan revegetation of the area you are clearing. Take extra care when mowing or slashing around areas planted where Singapore daisy is planted so small fragments are not spread to other locations.

Physical control

Hand pull and dig up runners. The plant will regrow from the smallest cutting so dispose of waste carefully. Either burn waste or put into a black plastic bag and place in the sun for a few days before putting into the refuse bin. Repeated hand pulling will be required.

Herbicide control

There are two herbicides registered for use to control Singapore daisy and are listed in Table 1.

More information

For more information contact your local government or visit biosecurity.qld.gov.au.

Table 1. Herbicides for control of Singapore daisy

Situation	Herbicide	Rate	Registration details	Comments
Native pastures, rights-of-way, commercial and industrial areas	Metsulfuron-methyl 600 g/kg (e.g. Nufarm Associate)	10 g per 100 L water plus wetting agent	Registered	Spray thoroughly to wet all foliage, but not to cause run-off. Minimise contact with desirable species.
Native conservation areas, pastoral grazing land, industrial sites such as railways, roadways, and utility rights-of-way	Aminocycopyrachlor 240 g/L (e.g. Method 240 SL)	200–500 mL per 100 L water		Spot spray Apply with handgun, or a hand-held or backpack sprayer. Use sufficient spray volume to thoroughly and uniformly wet target plant. Spray the vegetation starting at top and covering sides. Avoid spraying to point of run off as injuries to desirable species or ground cover may occur.

Read the label carefully before use. Always use the herbicide in accordance with the directions on the label.

Fact sheets are available from biosecurity.qld.gov.au. The control methods recommended should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, the department does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

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APPENDIX F – Early Works Water Quality Monitoring Schedule

Location		Parameter					
	Co-ords (approx.)	Field Suite (pH, EC, DO, Turb, Temp)	Total N	Total P	TRH	Metals	Hydrocarbons
DS01	152° 55.80841776' E 26° 22.84125899' S	Continuous / Daily After 5mm rain event or pulse event	monthly	monthly	for cause	monthly	Visual by exception
DS02	152° 55.62707662' E 26° 22.35625612' S	Daily during discharge Weekly After 5mm rain event or pulse event	monthly	monthly	for cause	monthly	Visual by exception
DS03	152° 54.82171491' E 26° 21.06288983' S	Daily during discharge Weekly After 5mm rain event	monthly	monthly	for cause	monthly	Visual by exception
DS04	152° 53.48107317' E 26° 20.48873137' S	Daily during discharge Weekly After 5mm rain event	monthly	monthly	for cause	monthly	Visual by exception
I1	152° 55.82835411' E 26° 22.93524681' S	Daily or continuous	monthly	monthly	for cause	monthly	Visual by exception

** "for cause" indicates monitoring as required after a spill incident or where visual inspection suspects hydrocarbon contamination.*

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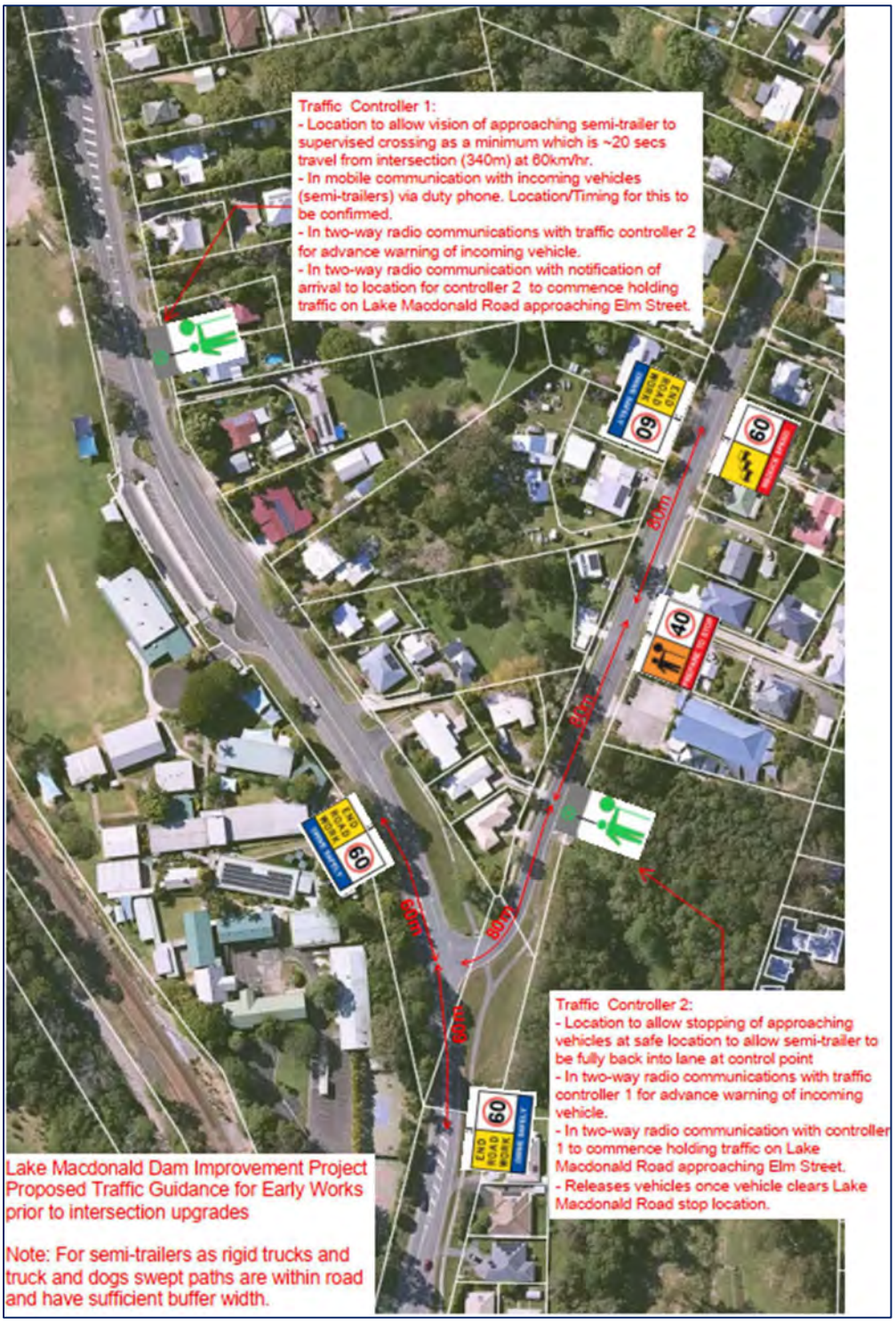
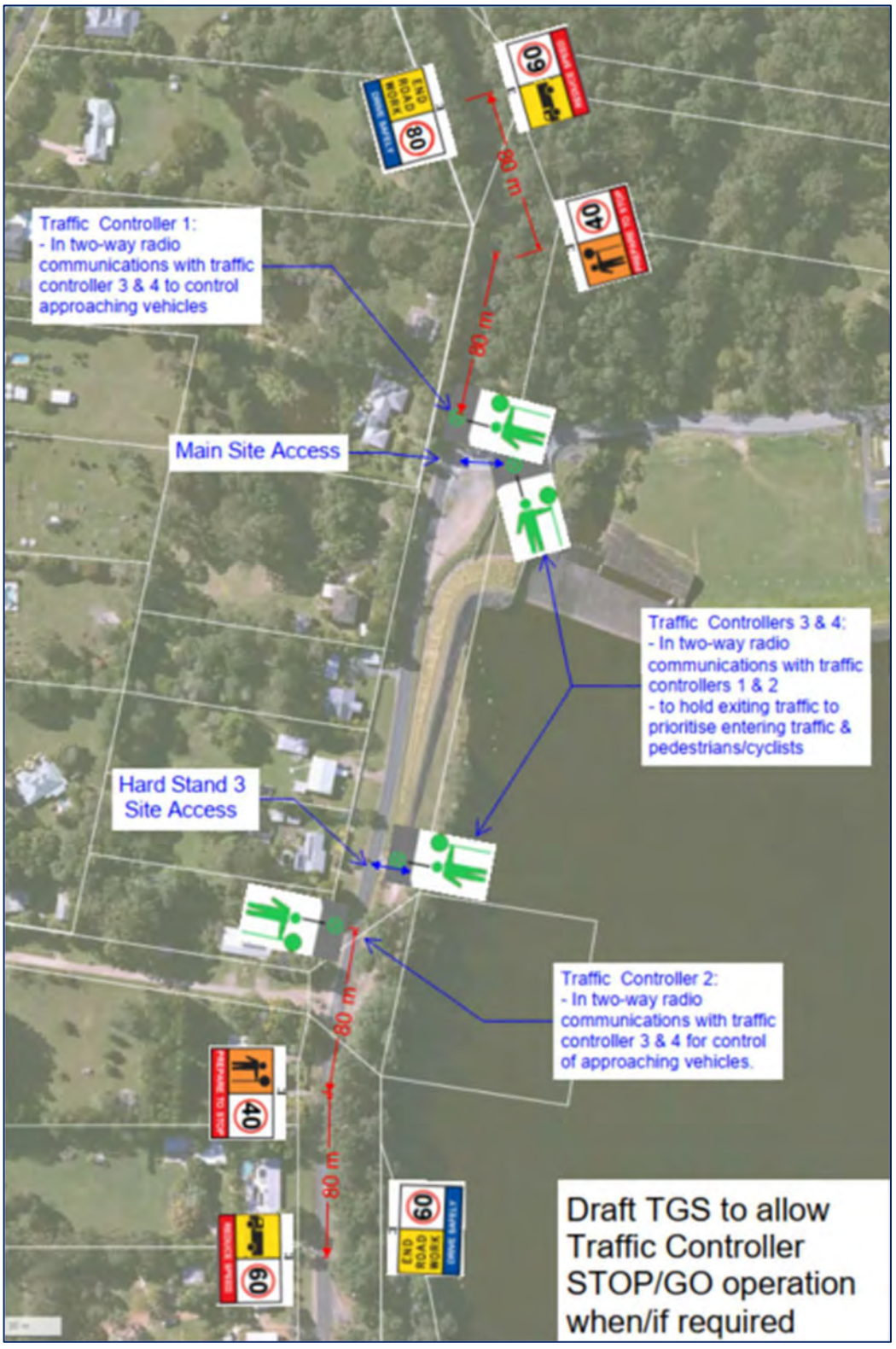
APPENDIX G – Critical TGS Concept Layouts

LMD-004: Lake Macdonald and Elm Street Concept Layout

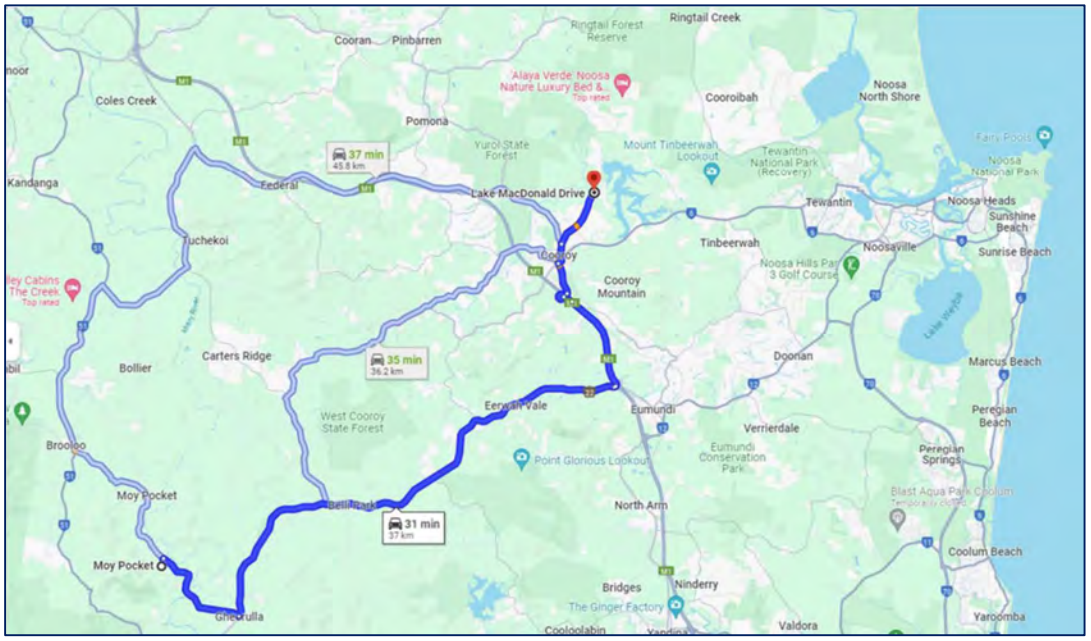


LMD-001: Lake Macdonald Drive Concept Layout

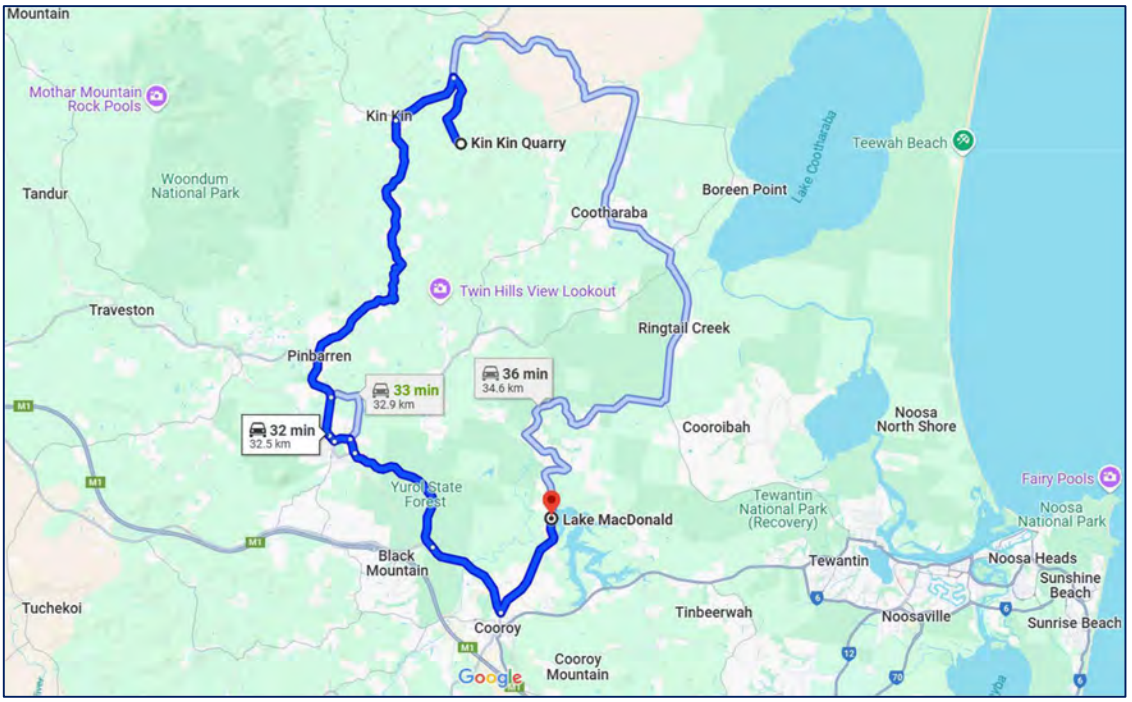


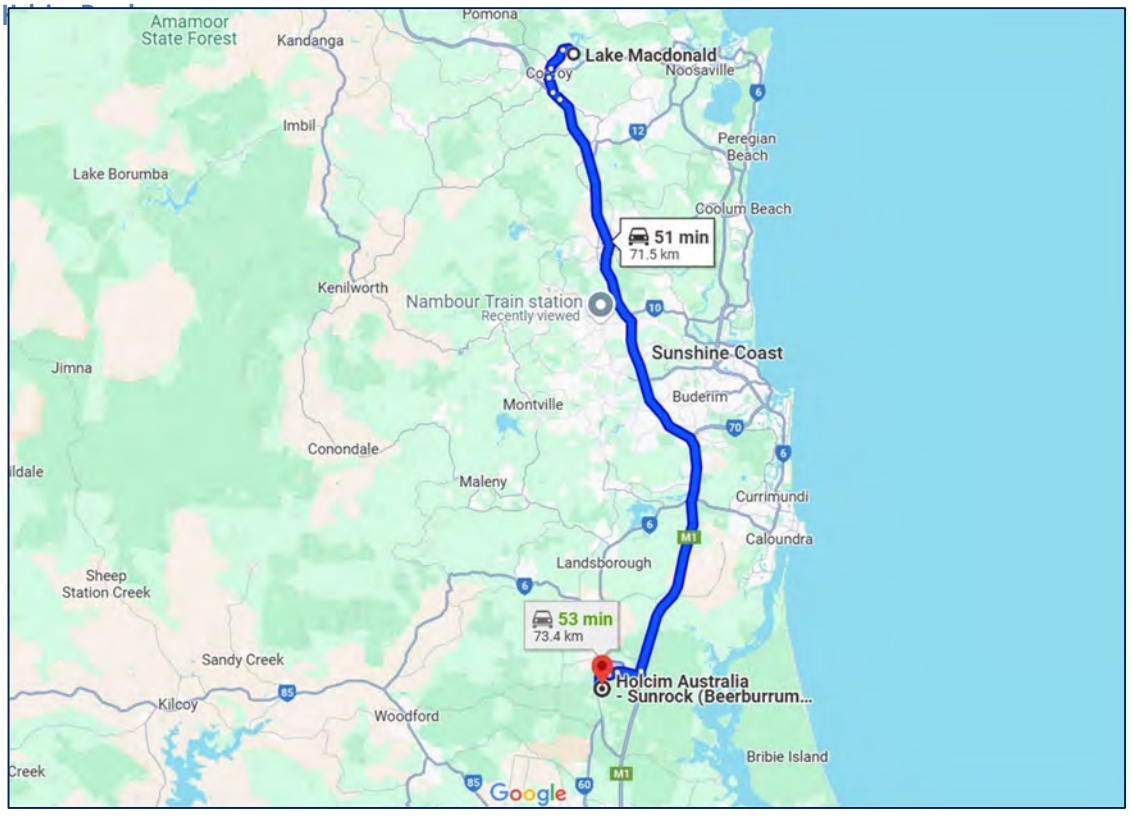
APPENDIX H – Expected Haulage Routes

Boral. Moy Pocket



Corbets, Traveston


Mountain
Mothar Mountain Rock Pools
Kin Kin
Kin Kin Quarry
Teewah Beach
Tandur
Woondum National Park
Boreen Point
Lake Cootharaba
Cootharaba
Twin Hills View Lookout
Traveston
Ringtail Creek
Pinbarren
33 min
32.9 km
36 min
34.6 km
32 min
32.5 km
Cooroibah
Noosa North Shore
Yuroi State Forest
Lake MacDonald
Tewantin National Park (Recovery)
Fairy Pools
Noosa National Park
Black Mountain
Tewantin
Noosa Heads
Sunshine Beach
Tuchekoi
Tinbeerwah
Noosaville
Sunrise Beach
Cooroy
Cooroy Mountain
Google


Amamoor State Forest
Kandanga
Pomona
Lake Macdonald
Noosaville
Imbil
Peregian Beach
Lake Borumba
Coolum Beach
51 min
71.5 km
Kenilworth
Nambour Train station
Recently viewed
Sunshine Coast
Jimna
Buderim
Montville
Conondale
Maleny
Currimundi
Caloundra
Landsborough
Sheep Station Creek
53 min
73.4 km
Sandy Creek
Holcim Australia - Sunrock (Beerburrum...
Kilcoy
Woodford
Bribie Island
Google